PSP 25.1 Craigieburn North and PSP 25.2 English Street

INFRASTRUCTURE COSTING STUDY - REPORT

SB20434 | August 2014

JACOBS SKM

PSP 25.1 Craigieburn North and PSP 25.2 English Street Infrastructure Costing Study

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Prepared by:	Cameron Bond
Approved by:	David Felton
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Sinclair Knight Merz Pty Limited (Jacobs SKM)
ABN 37 001 024 095
Floor 11, 452 Flinders Street
Melbourne VIC 3000
PO Box 312, Flinders Lane
Melbourne VIC 8009 Australia

www.jacobsskm.com

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Executive summary

The Metropolitan Planning Authority (MPA) has identified the need for the preparation of cost estimates and concept level designs for nominated infrastructure projects in the Craigieburn North Employment Area (PSP 25.1) and English Street Precinct (PSP 25.2) Structure Plan (PSP) areas.

Functional Layout Plans (FLPs) and construction cost outputs will subsequently be used in the preparation of the Craigieburn North Employment Precinct Development Contributions Plan (DCP) and English Street Precinct DCP. Furthermore, these shall form the basis for the development levies to be paid by proponents as they develop their respective properties.

FLP's and cost estimates have been prepared that are suitable for use in stakeholder consultation and to inform the MPA of the required Right Of Way (ROW) and financial implications associated with the alignment and intersection treatments.

1. Project scope

Jacobs SKM was to develop and deliver the following three packages of work.

1.1 Intersection projects

Provide an interim and ultimate concept design of five signalised intersection and five roundabouts based on survey data, traffic modelling data (conducted by Jacobs SKM) and planning information provided by MPA.

Provide an indicative construction cost for each intersection as well as two pedestrian crossings based on our proposed design and provided survey information.

Intersection designs were to consider the following:

- Geotechnical constraints, including required earthworks, drainage, etc
- Utilisation of existing pavement, where appropriate
- Minimisation of redundant works where both an interim and ultimate treatment is required
- Relocation of existing services
- Requirements of vulnerable road users with primacy given to the needs of pedestrians and the safe and convenient connection of shared path networks
- The role of intersections as urban gateways with identification of opportunities for tree planting and landscaping of roundabouts where recommended as the appropriate treatment
- The efficient use of land including the confirmation of any additional land required for intersection flaring
- Whilst a drainage strategy and/or design is not within project scope, a typical drainage network is assumed for each intersection location

1.2 Road projects

Provide an interim and ultimate concept design of road upgrades in precincts along three road alignments (English Street, Brookville Drive/Amaroo Road and Summerhill Road) based on the cross-sections provided by the MPA, survey data, traffic modelling data and planning information.

Provide an indicative construction cost for the interim road design along each defined precinct based on our proposed design and provided survey information.

All three road alignment designs were to consider:

- Existing road alignment
- Existing services and planned infrastructure services
- Desired future road cross-section
- Area to be set aside on either side or both sides of the existing reserve
- Existing and future intersections
- Existing and future land acquisition of intersecting roads
- With relation to Brookville/Amaroo Road, land required for any realignments proposed
- Whilst a drainage strategy and/or design is not within project scope, a typical drainage network is assumed for all roads. An exception being the interim design of English Street, which shall utilise a table drain treatment on each verge area.

1.3 Bridge projects

Provide a concept design of one road bridge and one pedestrian bridge at appropriate crossing locations over Merri Creek based on survey data, hydrological information, cultural advice and environmental plans provided by MPA.

Provide an indicative cost estimate for each bridge design.

Bridge designs were to consider the following:

- The most suitable location for any crossings based upon the general locations identified by MPA in the PSP plans
- A basic assessment of survey data provided
- The minimisation of tree removal
- Locating intermediate support columns outside the existing water channel
- The most cost-effective type of structure to be employed for each individual project
- The need for any embankments or batters, including the associated requirements for any flaring of the road reserve to accommodate the recommended structure
- The required sizing of bridges to reflect the hydraulic volumes provided through relevant drainage strategies
- Written advice for the MPA as prepared by the Wurundjeri Tribe Land & Compensation Cultural Council Inc
- The Growling Grass Frog Concept Plan as prepared by Ecology Australia for the MPA

2. Outputs and deliverables

2.1 Intersection projects

Deliverables for this package include:

- One draft and one final interim and ultimate functional designs of five signalised intersections and five roundabouts, presented on alignment plans (shown together with the road alignments) showing interim and ultimate designs
- Construction cost estimate for each interim intersection design (including roundabouts) as well as two signalised pedestrian crossings based on current market rates and information provided by the design team. Indicative locations for the pedestrian crossings are shown on drawings SB20434-ECC-DG-0103 and SB20434-ECC-DG-0115, however these are not designed.
- Combined design report outlining design process, assumptions and final outputs as listed above, including calculated land areas of affected properties using the ultimate ROW boundary and supplied cadastral information (for each individual project)

2.2 Road projects

Deliverables for this package include:

- One draft and one final interim and ultimate functional designs of the three road alignment upgrades both shown superimposed in a total of 23 general arrangement plans and a key plan
- Construction cost estimate for the interim road of each precinct based on current market rates and information provided by the design team
- Combined design report outlining design process, assumptions and final outputs as listed above, including calculated land areas of affected properties using the ultimate ROW boundary and supplied cadastral information (for each individual project)

2.3 Bridge projects

Deliverables for this package include:

- One draft and one final design of one road bridge and one pedestrian bridge with a concept plan, elevation and section shown on one page for each bridge
- Construction cost estimate for the bridge based on current market rates and information provided by the design team
- Cost estimate for the undertaking of a CHMP for the overall bridge works
- Combined design report outlining design process, assumptions and final outputs as listed above

3. Design - Intersection projects

Reporting of the intersection projects will be separated into the two PSP areas, for ease of dissemination to Whittlesea and Hume Councils.

Intersection design has been conducted utilising the following standards and references:

- Austroads Guide to Road Design (AGRD)
- VicRoads Supplements to the AGRD
- VicRoads Traffic Engineering Manual Volume 2: Signs and Markings
  - Note that only concept level linemarking has been provided
- GAA Engineering Design and Construction Manual for subdivision in Growth Areas – April 2011

For calculated affected land parcel areas (in hectares), please refer to Appendix E.

3.1 PSP 25.1 Craigieburn North Employment Area

The following design methodology was adopted for the intersection treatments:

- Roundabouts have been designed to cater for the Austroads 19 m Semi on all movements. The Austroads 26 m B-double was used as the checking vehicle, resulting in a hardstand area being required on the central island (to cater for the larger swept path). The hardstand area is 1.0 m wide in the interim case and 1.6 m wide in the ultimate layout.
  - It is anticipated that in the ultimate case, the 19 m Semi will utilise both lanes of the arterial when conducting left turns from the minor legs. The current design however does cater for the 12.5 m Single Unit Truck/Bus to turn directly into the left lane.
  - Ultimate case roundabouts show a wider inside lane to allow for the swept path of the design vehicle conducting right and U turns. This width could be reduced if a wider overrun area is provided and the design vehicle is allowed to encroach on the apron.

    Note that turning movement clearances related to the design vehicle have been applied at the entry curve and circulating carriageway in all instances.
  - Splitter island kerb lines and line markings on the minor legs (interim case) project into the central median (i.e. geometry has been adopted to suit the ultimate conditions only, in order to minimise costs associated with redundant materials and construction activities). Due to the expected low speeds (50 km/h) and single circulating lane, this is proposed as an acceptable practice.

    Note that entry geometry and deflection requirements in accordance with AGRD Part 4B: Roundabouts – Table 4.2 have been successfully achieved and maintained in all instances, with values ranging between the absolute and desirable minimums.
  - Providing all the necessary sight lines are maintained, the roundabout central islands are large enough to accommodate landscaping (28 m Ø interim, 23.2 m Ø ultimate)
  - IN-25.1-1 has been positioned and designed to align with the urban structure road network as provided by the MPA. This has been achieved by scaling and importing the PDF image into the design file.
  - IN-25.1-4 has been positioned to provide a 30 m offset from the southern cadastral boundary (avoiding the line of trees)
  - IN-25.1-6 Option A (drawing SB20434-ECC-DG-0123) shows the ROW boundary of the northern approach aligned along the cadastral boundary of the Department of Environment and Primary Industries (DEPI) land parcel, resulting in impacts to the conservation area.

Option B (drawing SB20434-ECC-DG-0125) shows the northern approach deviate from the property boundary to allow for adequate separation between the property and intersection, thereby minimising effects to the DEPI parcel.

- Signalised intersections have been designed to cater for the Austroads 19 m Semi on all movements; including opposing right turns (where shown on the phasing diagrams supplied in the SKM *Craigieburn Employment Precinct North and English Street Intersection Analyses*). This has resulted in the median noses on some approaches being setback from the pedestrian crossings to allow for the required offsets to vehicle swept paths and other mandatory clearances. Therefore, pedestrians would be unable to seek refuge within the central median if experiencing difficulties crossing the arterial roads.
  - Allowing for a pedestrian refuge (preferred by VicRoads) would require the left turn slip islands to effectively double in size; causing the core of the intersection to widen in all directions (larger overall footprint). However, as there are no staged pedestrian crossings proposed in the SKM *Craigieburn Employment Precinct North and English Street Intersection Analyses*, this may not be an issue for concern.
  - The interim intersection of Brookville Drive and English Street (IN-25.1-2 southern and northern approaches) adopts a painted median after the deceleration lane taper. Whilst this allows the design vehicle swept path to traverse over the painted median nose, it also allows the hold line to remain as close to the intersection as possible.
  - The realignment of Brookville Drive and Amaroo Road (IN-25.1-5) applies a large radius horizontal curve (1000 mR) through the intersection core area. Tangents have been positioned as far away from the intersection as practical.
- All intersections have connections to the Shared Use Path network, via pedestrian zebra crossings and/or pedestrian paths

3.1.1 Costings

The following is a summary of costs, please refer to the detailed report in appendices for cost breakdown, and clarifications.

IN-25.1-1 INTERSECTION (ROUNDABOUT)	$	4,159,301
IN-25.1-2 ENGLISH / BROOKVILLE INTERSECTION	$	4,440,077
IN-25.1-3 BROOKVILLE / KINLOCH INTERSECTION (ROUNDABOUT)	$	3,617,477
IN-25.1-4 BROOKVILLE / ACCESS ROAD INTERSECTION (ROUNDABOUT)	$	3,609,423
IN-25.1-5 BROOKVILLE / SUMMERHILL INTERSECTION	$	4,099,792
IN-25.1-6 INTERSECTION (ROUNDABOUT) - OPTION A	$	4,159,301
IN-25.1-6 INTERSECTION (ROUNDABOUT) - OPTION B	$	4,849,601
IN-25.1-7 AMAROO / ACCESS ROAD INTERSECTION (ROUNDABOUT)	$	4,159,301

3.2 PSP 25.2 English Street Precinct

The following design methodology was adopted for the intersection treatments:

- Signalised intersections have been designed to cater for the Austroads 12.5 m Single Unit Truck/Bus on all movements, including opposing right turns (where shown on the phasing diagrams supplied in the SKM *Craigieburn Employment Precinct North and English Street Intersection Analyses)*
  - Note that, as Donnybrook Road is an arterial VicRoads owned asset and given its proximity to the commercial district of PSP 25.2, the intersection with English Street has been designed to cater for the Austroads 19 m Semi.
  - The SKM *Craigieburn Employment Precinct North and English Street Intersection Analyses* proposed left slip turns on the English Street approaches to the interim intersection with the East-West Access Road. The ultimate configuration did not show these islands, rather left turns from the outside through lane. The interim concept design has omitted these left slip turns as it would require increased long term costs with removing and relocating signal pedestals and associated infrastructure and the necessity to remove the islands themselves.

    A deceleration lane length in accordance with Austroads and VicRoads guidelines for V60 conditions has been shown on the northern approach.
- All intersections have connections to the Shared Use Path network, via pedestrian zebra crossings and/or pedestrian paths

3.2.1 Costings

The following is a summary of costs, please refer to the detailed report in appendices for cost breakdown, and clarifications.

IN-25.2-1 DONNYBROOK / ENGLISH INTERSECTION	$	6,173,420
IN-25.2-2 ENGLISH / EAST-WEST ACCESS INTERSECTION	$	4,082,118
IN-25.2-3 ENGLISH / NORMAN INTERSECTION	$	4,209,959

3.3 Pedestrian crossings

Indicative locations for the pedestrian crossings are shown on drawings SB20434-ECC-DG-0103 and SB20434-ECC-DG-0114, however these are not designed.

3.3.1 Costings

The following is a summary of costs, please refer to the detailed report in appendices for cost breakdown, and clarifications.

PEDESTRIAN CROSSING (per crossing)	$	253,105

4. Design - Road projects

Road projects have been designed utilising the following standards and references:

- Austroads Guide to Road Design (AGRD)
- VicRoads Supplements to the AGRD
- VicRoads Traffic Engineering Manual Volume 2: Signs and Markings
  - Note that only concept level linemarking has been provided
- GAA Engineering Design and Construction Manual for subdivision in Growth Areas – April 2011
- Typical cross sections supplied by MPA

For calculated affected land parcel areas (in hectares), please refer to Appendix E.

4.1 English Street (including Donnybrook Road)

The following design methodology was adopted when developing the road design:

- Donnybrook Road assumed design speed of V80
- Widening of Donnybrook Road shown to occur on southern side of cadastral boundary only (as instructed by MPA)
- English Street design speed of V60 (posted 60 km/h); minor roads intersecting English Street - V50
- Lane widening on horizontal curves has not been applied on English Street. As there is sufficient median width in both the interim and ultimate cases, this level of detail can be addressed at a detailed design stage.
- Within PSP 25.2, English Street has been positioned to allow for the widening to occur to the west of the cadastral boundary (between Donnybrook Road and Norman Road), excluding necessary intersection widening and /or flaring
- Within PSP 25.2, the location of the East-West Access Road (IN-25.2-2) has been selected to permit widening to occur to one side of the cadastral boundary only (widen to south). This may allow for consultation with only a single property owner.
- English Street (interim case) is shown having a 2.0 m gravel shoulder. It is assumed, for costing purposes, that there shall be a concrete edge strip applied between both the traffic lane and shoulder and shoulder and table drain (refer to Appendix C.1 for edge strip detail).
- IN-25.2-3: The cross section of both Norman Road and the unnamed road has been assumed to be a Residential Access Street, Level 2. This complies with the line work depicting this type of road/street shown on the Land Use Plans provided by MPA.
- Both the interim and ultimate designs of English Street retain a 6.0 m wide median, midblock, suitable for landscaping opportunities (providing sight lines are maintained where necessary) and appropriate WSUD treatments. However, the median narrows to 1.2 m wide on approach to the Merri Creek crossing to minimise structural width.
  - It should be noted that the 6.0 m median width is from the lip of kerb to lip of kerb, as per cross-sections provided by MPA
- A Shared Use Path connection to the Merri Creek has been shown on drawing SB20434-ECC-DG-0107. This arrangement is indicative only and is applicable in both the interim and ultimate scenarios. A 5% downgrade was assumed.

Note: Location and/or design of frontage roads was not considered

4.1.1 Service clashes

The following is a brief summary of potential issues related to service utilities:

- Future water main running parallel to Donnybrook Road may be under the bicycle lane
- Future sewer west of English Street in PSP 25.2 may need to be moved eastwards to be positioned within the road reserve corridor

4.1.2 Costing

The following is a summary of costs, please refer to the detailed report in appendices for cost breakdown, and clarifications.

DONNYBROOK ROAD			EXCLUDED
RD-25.2-1	ENGLISH STREET	$	1,265,482
RD-25.2-2	ENGLISH STREET	$	3,471,235

4.2 Brookville Drive/Amaroo Road

The following design methodology was adopted when developing the road design:

- Design speed of V60 (posted 60 km/h), minor roads intersecting Brookville Drive and Amaroo Road – V50
- Lane widening on horizontal curves has not been applied in the realignment of Brookville Drive and Amaroo Road. As there is sufficient median width and a wide kerbside lane (in both the interim and ultimate cases), this level of detail can be addressed at a detailed design stage. It is also expected that larger vehicles would utilise the wider outside lane in most instances.
    - To provide a shift closer to the cadastral boundary of Amaroo Road, a broken back horizontal curve scenario has been introduced (a single curve approach was investigated and determined not to be feasible); a length of straight greater than 2V (125 m) has been provided between these curves. As one of the curves forms part of the roundabout configuration (i.e. an approach curve southbound and departure curve northbound) and the expected speeds within this vicinity should be low (< 60 km/h), the proposed approach is deemed acceptable.
- Northern approach of Brookville to the intersection with English Street (IN-25.1-2) assumed to be an Industrial Access (single lane in each direction). This complies with the line work depicting this type of road/street shown on the Land Use Plans provided by MPA.
- Kinloch Court (IN-25.1-3) positioned to allow existing communications services to be clear of the carriageway and to provide the necessary offset to the tree reserve to the south
    - Kinloch Court cross section has been assumed to be an Industrial Connector (east approach) and Industrial Access (west approach), which is consistent with the line work depicted on the Land Use Plans provided by MPA
- Brookville Drive has been positioned to widen to the east between English Street and Summerhill Road, placing the existing services within the verge area in most instances and utilising existing pavement
- Amaroo Road has been shown to widen to the east towards the southern limits of PSP25.1. This is to align with the proposed widened road network of the Amaroo Business Park, as depicted in the *Amaroo Business Park Development Plan* by Goodman International (27 November 2008), provided by the MPA.

- The ultimate design of Brookville Drive and Amaroo Road retains a 6.0 m wide median, midblock, suitable for landscaping opportunities (providing sight lines are maintained where necessary) and appropriate WSUD treatments
    - It should be noted that the 6.0 m median width is from the lip of kerb to lip of kerb, as per cross-sections provided by MPA

Note: Location and/or design of frontage roads was not considered

4.2.1 Service clashes

The following is a brief summary of potential issues related to service utilities:

- Existing overhead electricity (11 kV and 66 kV lines) running parallel to the carriageway on both Brookville Drive and Amaroo Road. In the interim case, the poles are predominately located within the verge areas on either side of the single carriageway. However, in the duplicated ultimate scenario, the poles on the eastern side are located within the central median (as shown on drawings SB20434-ECC-DG-0109, 0111-0113 and 0115-0118).
    - It should be noted that it is unclear whether the redirection of the overhead lines from the median to the western side of the road reserve (SB20434-ECC-DG-0113) is above or below ground level. CAD layers as supplied by MPA (via Jemena) have this connection on a separate level (titled 'HVM') to the existing 11 and 66 kV overhead lines.
    - As the traffic volumes are unknown (One Way AADT), it could be expected that a worst case scenario coupled with a design speed of V60, would subsequently yield a clear zone requirement of approximately 4.1 m. As the lateral offsets from the edge of the carriageway to the hazards (the power poles) is typically between 2.0 - 4.0 m, many would require protection. However, current VicRoads guidelines (VicRoads Supplement to AGRD, Part 6 - Figure V4.1: Note 2), suggests it may be possible to reduce the clear zone width to an absolute minimum of 1.0 m.

      In accordance with the VicRoads Road Design Note RDN 03-01 - *The use of High Profile Barrier Kerb (HPBK)*, the proposed use of this kerbing type for the central median may provide adequate protection from hazards located within the median area, provided all necessary conditions related to the use of such products are adhered to. Note that it is possible that the 11kV services may be converted to an underground system once development of the area occurs.
- Existing communications utility running through the centre of the roundabout with Amaroo Road, continuing along the centre median, southbound, in the ultimate case

Note: Existing services (excluding electrical) and their locations are indicative only. The data has been manually transferred from PDF (supplied via a Dial Before You Dig enquiry) to CAD format.

4.2.2 Costings

The following is a summary of costs, please refer to the detailed report in appendices for cost breakdown, and clarifications.

RD-25.1-1 ENGLISH STREET	$	5,416,711
RD-25.1-3 BROOKVILLE DRIVE	$	16,908,943
SOUTHERN CULVERT - AMAROO ROAD	$	37,020

4.3 Summerhill Road

The following design methodology was adopted when developing the road design:

- Assumed design speed of V60
- Summerhill Road has been positioned to utilise as much existing pavement where possible, whilst widening fully to the south. This has avoided impacting the DEPI Conservation Area to the east (near the rail corridor).
    - As directed by MPA, the grade separation of Summerhill Road and the Melbourne-Sydney Rail Line (drawing SB20434-ECC-DG-0124) is shown to assume that concrete retaining walls would be adopted on the western approach (rather than fill batters). The extents and details of such an arrangement have not been designed and are outside of the project scope.
- The ultimate design of Summerhill Road retains a 6.0 m wide median, midblock, suitable for landscaping opportunities (providing sight lines are maintained where necessary) and appropriate WSUD treatments
    - It should be noted that the 6.0 m median width is from the lip of kerb to lip of kerb, as per cross-sections provided by MPA
- The earthwork batters shown at the Hume Freeway overpass are indicative only. These have been adopted and manipulated from the Mt Ridley Road Corridor Study concept design which modelled 3:1 fill slopes.
    - As the cross-section proposed by MPA consists of a four lane arterial (as opposed to the six lane VicRoads preferred option) the batters have been moved inwards approximately 3.5 m on each side
    - The ROW boundary has been offset 10.0 m from the batter toe to allow for construction, drainage and maintenance activities

Note: Location and/or design of frontage roads was not considered

4.3.1 Service clashes

The following is a brief summary of potential issues related to service utilities:

- Existing overhead electricity utilities running parallel to the roadway (close to the Shared Use Path on the northern side of the road reserve). However, it is expected that these may be converted to an underground system once development of the area occurs.
- Existing communications services potentially within the intersection (with Brookville/Amaroo) core area
- Existing water mains potentially parallel to carriageway (heading westbound) in the ultimate duplication case

Note: Existing services (excluding electrical) and their locations are indicative only. The data has been manually transferred from PDF (supplied via a Dial Before You Dig enquiry) to CAD format.

4.3.2 Costings

The following is a summary of costs, please refer to the detailed report in appendices for cost breakdown, and clarifications.

RD-25.1-4 SUMMERHILL ROAD	$	6,116,388

5. Design - Bridge projects

Bridge projects have been designed utilising the following standards and references:

- AS5100-2004 Bridge Design
- VicRoads Specifications (Section 600)
- Typical cross sections supplied by MPA
- Survey data accessed from services.land.vic.gov.au

5.1 Road bridge

The road bridge crossing over Merri Creek was designed using standard engineering practice and evaluation of appropriate solutions. The preferred solution which has been detailed includes the following:

- Road alignment plans were provided which required a preferred bridge crossing location. The bridge structure was positioned in accordance with the recommendations submitted within the report titled *Targeted Cultural Values Inspection of PSP 25.1 Craigieburn Employment Area North and PSP 25.2 English Street*, Figure 4 – Alignment Option A, as supplied via the MPA website.
- Survey data obtained from the Victorian State Government via "lands.vic.gov" formed the basis of the preliminary bridge length and height above existing waterway invert and was finalised against flood and survey data provided by MPA
- Design provides minimum two-lane vehicle carriageway, central median deviation, shoulders on each side and an allowance for a Shared Use Path on the north side of the bridge
- Future increase of trafficable lanes is planned through duplication of the carriageway with a second structure. However, the current bridge proposal has the capacity for widening on either or both sides should it be more appropriate
- Superstructure proposed nominates the use of Super T's as the preferred structure type
- One central pier located outside of the current channel to provide an appropriate in-service solution with consideration for constructability
- Design assumes the use of 'Regular' containment barriers (subject to a road safety audit for final implementation)
- Substructure allows for one central reinforced concrete pier and reinforced concrete abutments at each end with bored piles for support

Limitations:

- No vertical road alignment was available with finished road surface elevation to determine earthwork detailing at the interface of the bridge and roadway (i.e. built-up embankments or approaches cut into existing earth) so treatments were assumed based on survey data
- Bridge soffit levels were determined from hydraulic analysis provided by MPA
- The available information, particularly the 1 in 100 year flood levels, suggests a two-span bridge solution is appropriate for the proposed location in contrast to the proposal request to provide a clear-span solution
- No detailed geotechnical data was available to determine the most appropriate substructure detailing (i.e. pad footings, bored or driven piles, number of, size, depth, etc.)
- No allowances were made for services as none were nominated. Future requirements can be easily assimilated utilising conduits in barriers and the Shared Use Path reserve as well as the option of suspended pipes below the deck

5.1.1 Costings

The following is a summary of costs, please refer to the detailed report in appendices for cost breakdown, and clarifications.

BR-25.1-1	MERRI CREEK - ROAD BRIDGE	$	5,052,608

The Cultural Heritage Management Plan (CHMP) has been included within the estimate value above. Based on comparable requirements from another recent project it is estimated the CHMP will be in the order of $50,000 for this site.

5.2 Pedestrian bridge

The pedestrian bridge crossing over Merri Creek was designed using standard engineering practice and evaluation of appropriate solutions. The preferred solution which has been detailed includes the following:

- Proposal direction requested a bridge crossing in the most suitable location along Merri Creek to:
  - i.) connect Laffan Reserve with English Street precinct and
  - ii.) connect the shared trail along Merri Creek
- Hydraulic flood analysis and survey data provided by MPA formed the basis of bridge length and height above existing waterway invert
- Proposed location was chosen to minimise structure length, height above the ground, completely span the 1 in 100 year design flood level and limit the number of trees required for removal to accommodate the structure (as determined from available satellite imagery)
  - As anywhere within 200 m of Merri Creek is an area of cultural heritage sensitivity (*Targeted Cultural Values Inspection of PSP 25.1 Craigieburn Employment Area North and PSP 25.2 English Street*), minimising structure length and environmental impacts were a key focus
- Design provides minimum 4 m wide unobstructed allowance for Shared Use Path between face of fall protection railings
- Design allows for future widening of the structure on either or both sides should a growth in demand occur requiring such works to be carried out
- Superstructure comprised of standard Super-T concrete girders
- One central pier located outside of the current channel to provide an appropriate in-service solution with consideration for constructability
- Design assumes the use of standard handrails with minimum height as required by Australian Standards
- Substructure allows for reinforced concrete abutments at each end and one central reinforced concrete pier; all with bored piles for support (subject to detailed geotechnical investigation)

Limitations:

- No vertical alignment was available with finished profile elevation to determine earthwork detailing at the interface of the bridge and shared trail (i.e. built-up embankments or approaches cut into existing earth) so treatments were assumed based on survey data
- Bridge soffit levels were determined from hydraulic analysis provided by MPA
- The available information, particularly the 1 in 100 year flood levels, suggests a two-span bridge solution is appropriate for the proposed location in contrast to the proposal request to provide a clear-span solution
- No detailed geotechnical data was available to determine the most appropriate substructure detailing (i.e. pad footings, bored or driven piles, number of, size, depth, etc.)

- No allowances were made for services as none were nominated however future requirements can be assimilated

5.2.1 Costings

The following is a summary of costs, please refer to the detailed report in appendices for cost breakdown, and clarifications.

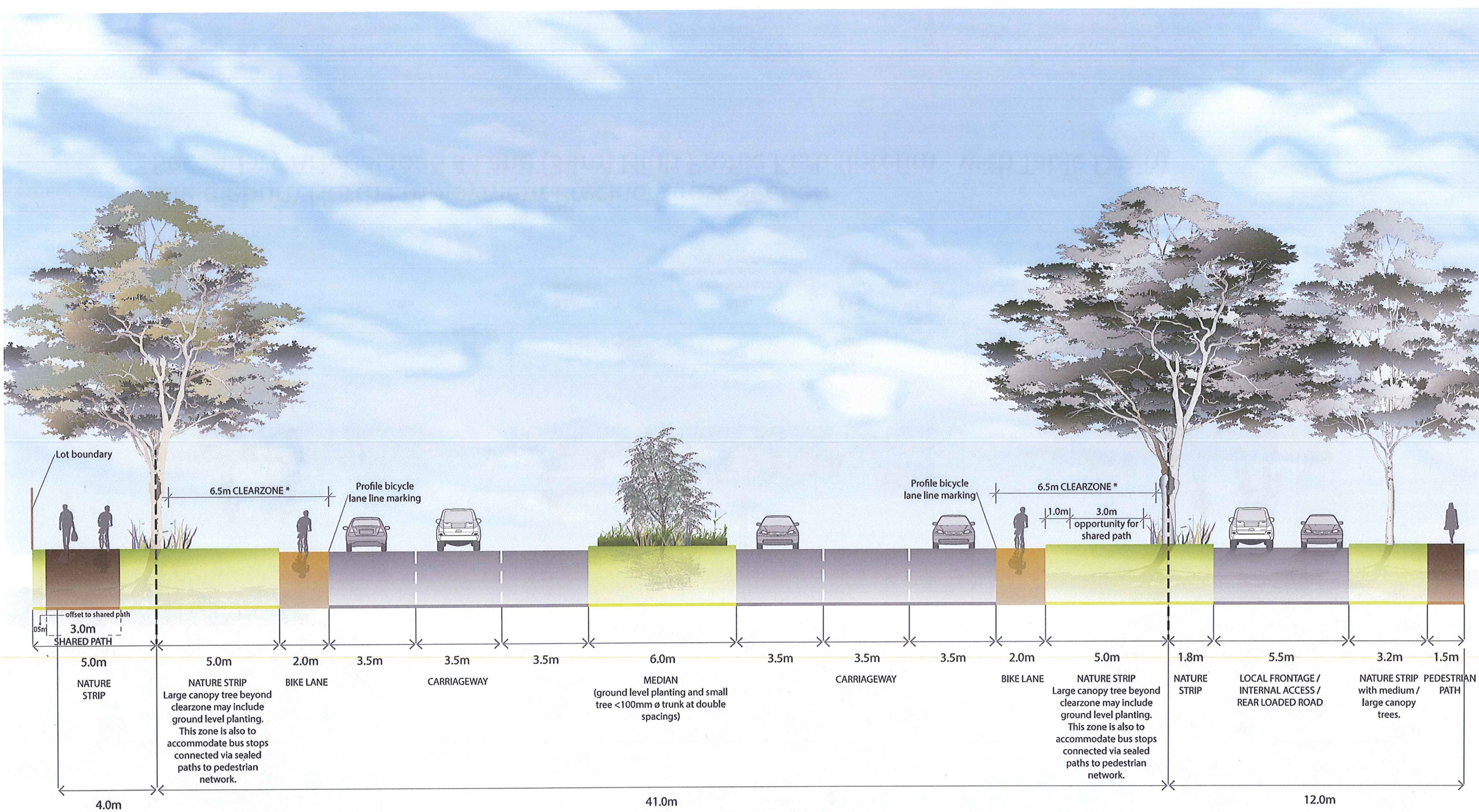
BR-25.1-2	MERRI CREEK - PEDESTRIAN BRIDGE	$	1,813,878

The Cultural Heritage Management Plan (CHMP) has been included within the estimate value above. Based on comparable requirements from another recent project it is estimated the CHMP will be in the order of $50,000 for this site.

Appendix A. **Drawing list**

Drawing Type	Drawing Number
Key Plan	SB20434-ECC-DG-0005
Alignment Plan - Sheet 1	SB20434-ECC-DG-0101
Alignment Plan - Sheet 2	SB20434-ECC-DG-0102
Alignment Plan - Sheet 3	SB20434-ECC-DG-0103
Alignment Plan - Sheet 4	SB20434-ECC-DG-0104
Alignment Plan - Sheet 5	SB20434-ECC-DG-0105
Alignment Plan - Sheet 6	SB20434-ECC-DG-0106
Alignment Plan - Sheet 7	SB20434-ECC-DG-0107
Alignment Plan - Sheet 8	SB20434-ECC-DG-0108
Alignment Plan - Sheet 9	SB20434-ECC-DG-0109
Alignment Plan - Sheet 10	SB20434-ECC-DG-0110
Alignment Plan - Sheet 11	SB20434-ECC-DG-0111
Alignment Plan - Sheet 12	SB20434-ECC-DG-0112
Alignment Plan - Sheet 13	SB20434-ECC-DG-0113
Alignment Plan - Sheet 14	SB20434-ECC-DG-0114
Alignment Plan - Sheet 15	SB20434-ECC-DG-0115
Alignment Plan - Sheet 16	SB20434-ECC-DG-0116
Alignment Plan - Sheet 17	SB20434-ECC-DG-0117
Alignment Plan - Sheet 18	SB20434-ECC-DG-0118
Alignment Plan - Sheet 19	SB20434-ECC-DG-0119
Alignment Plan - Sheet 20	SB20434-ECC-DG-0120
Alignment Plan - Sheet 21	SB20434-ECC-DG-0121
Alignment Plan - Sheet 22	SB20434-ECC-DG-0122
Alignment Plan - Sheet 23A	SB20434-ECC-DG-0123
Alignment Plan - Sheet 23B	SB20434-ECC-DG-0125
Alignment Plan - Sheet 24	SB20434-ECC-DG-0124
Alignment Plan - Sheet 25	SB20434-ECC-DG-0126
Merri Creek Road Bridge - General Arrangement	SB20434-ECR-DG-0201
Merri Creek Pedestrian Bridge - General Arrangement	SB20434-ECR-DG-0202

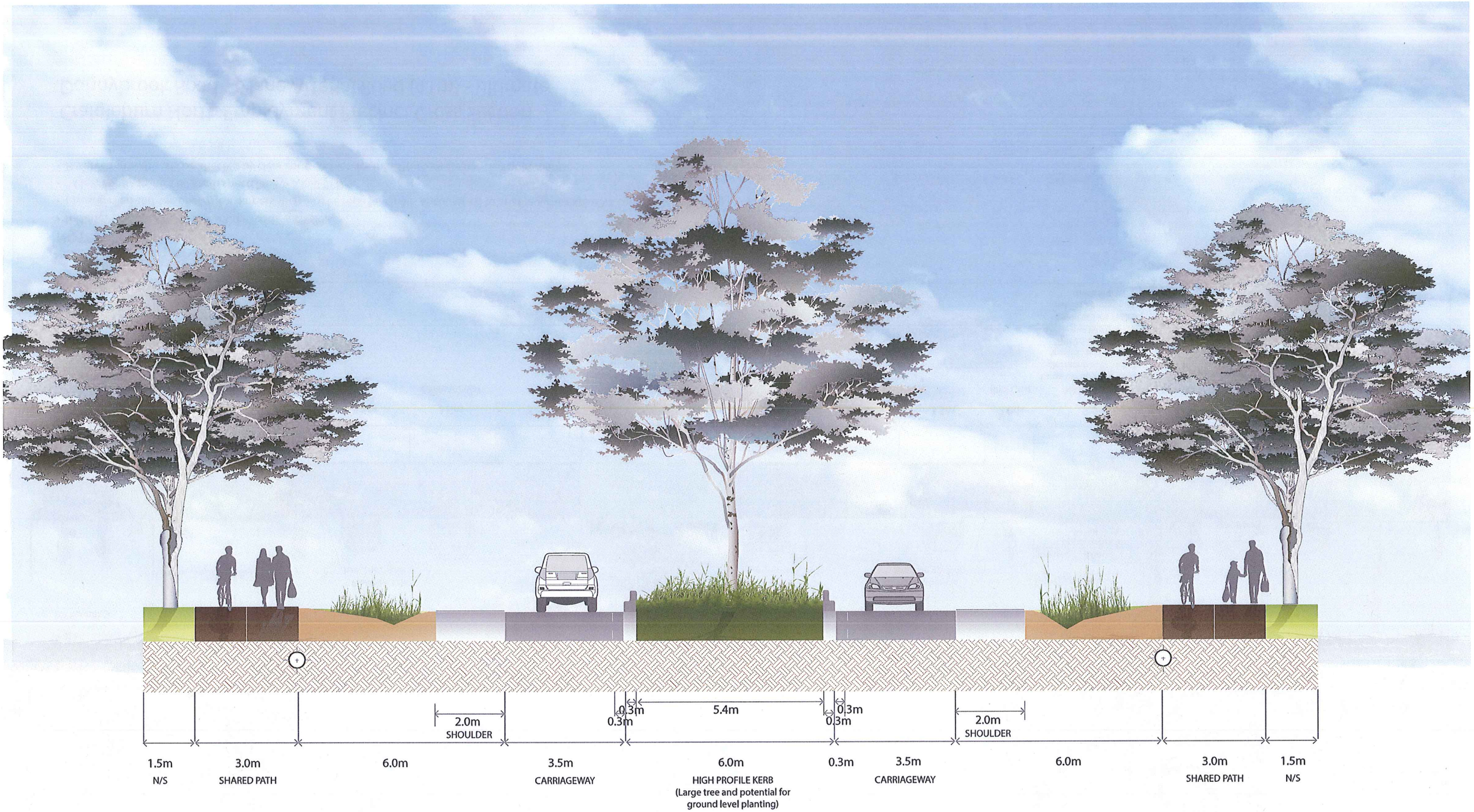
Appendix B. **Typical cross sections**



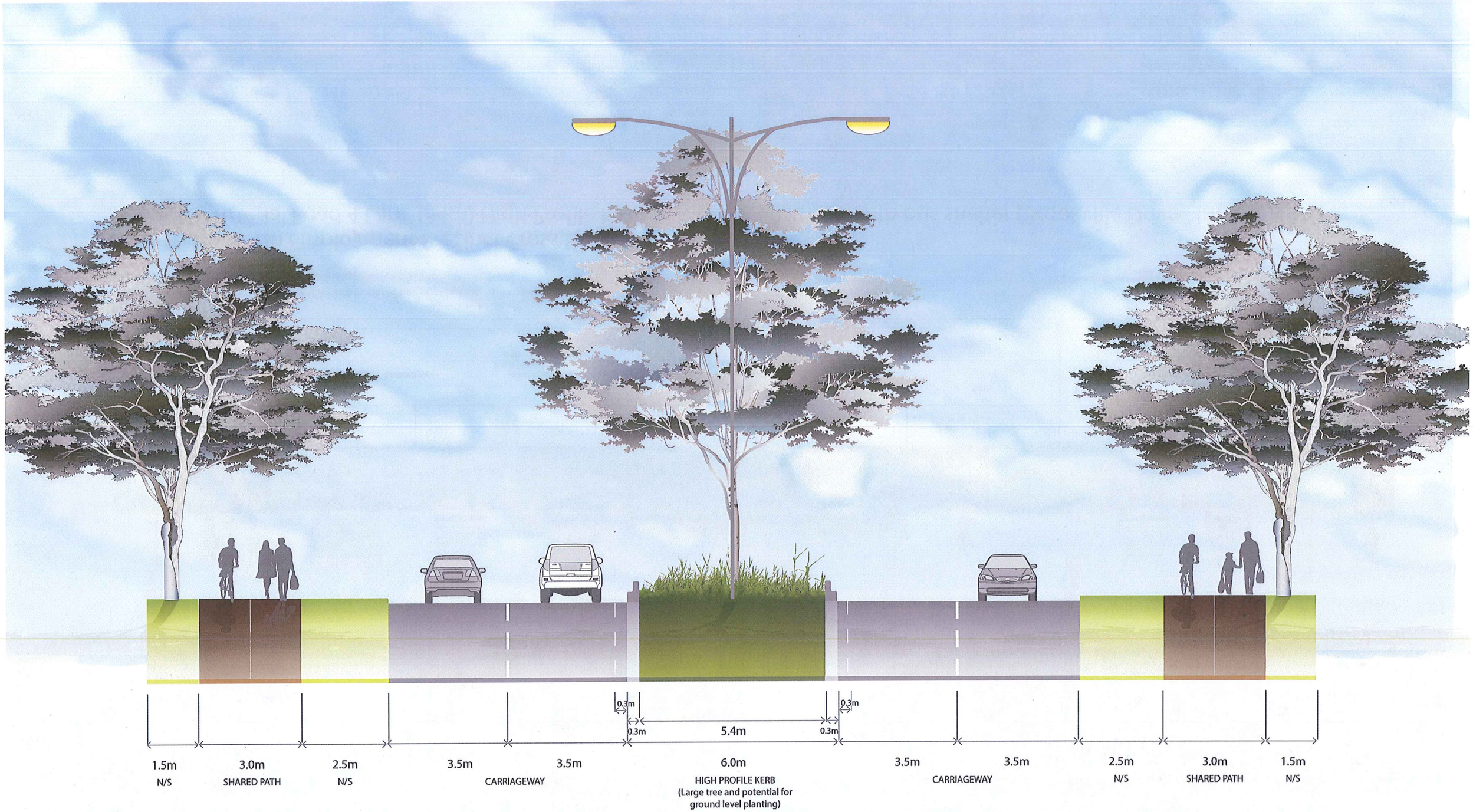
NOTES:

- Includes typical residential frontage roads each side.
- Investigation and use of physical barriers such as wire rope fencing is encouraged to enable more extensive canopy tree planting.
- * Clear zone assumes 80 Km/h speed limit > 5,000 VPD.
- Reservation width will be affected by clear zone and service infrastructure clearance requirements.

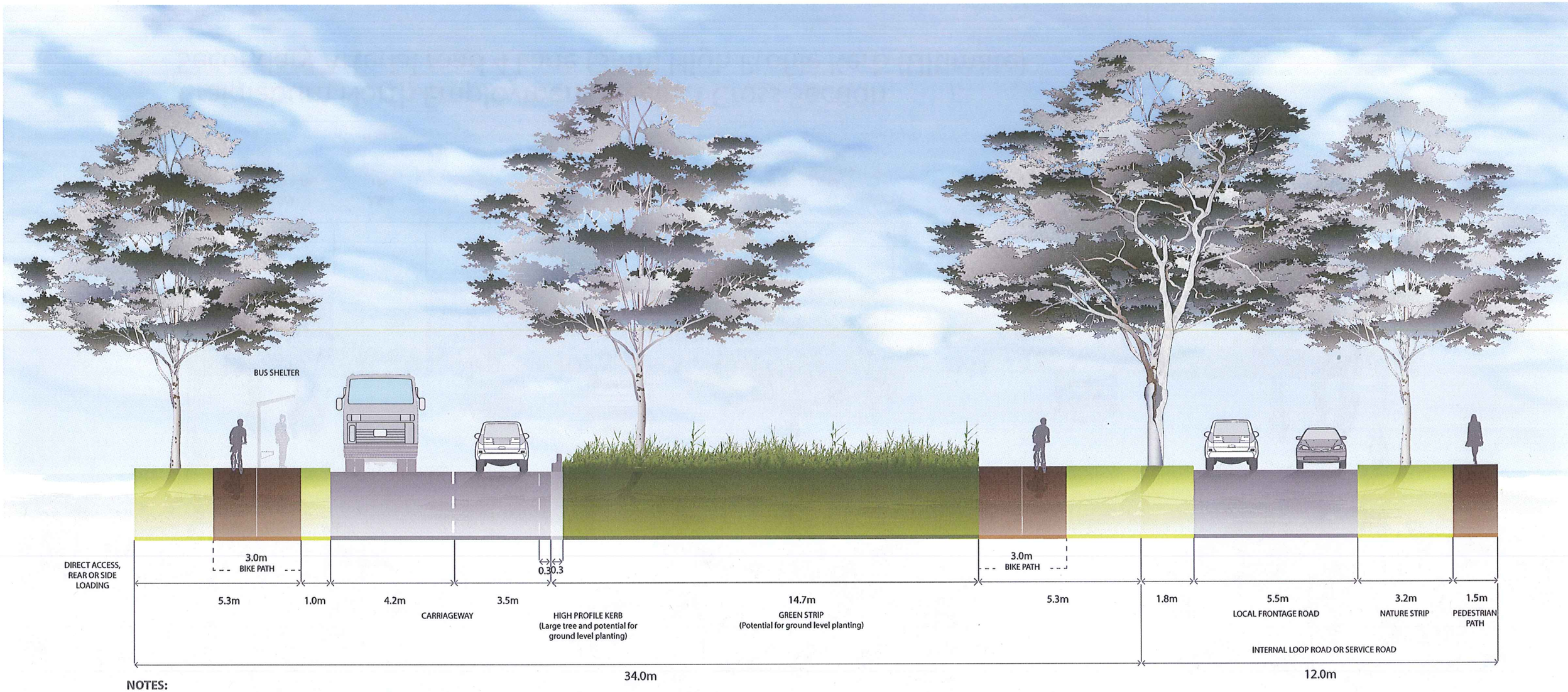
Craigieburn North Employment Precinct Cross Section
Donnybrook Road - 6 lane Arterial Road (41m) - ultimate



Craigieburn North Employment Precinct Cross Section
Secondary Arterial road 4 Lane (34m) High Profile Kerb (Interim - with Table Drain)



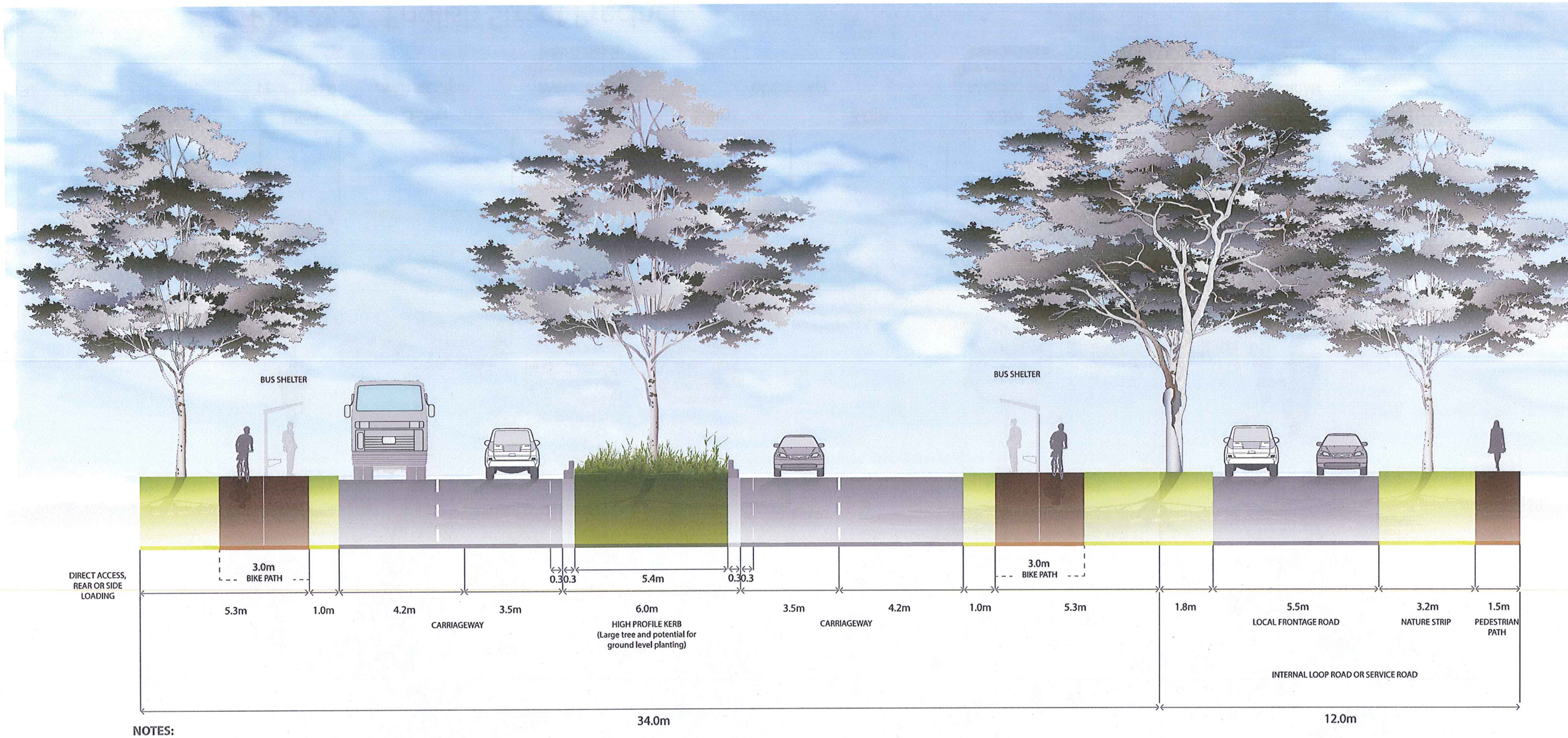
Craigieburn North Employment Precinct Cross Section
Secondary Arterial road 4 Lane (34m) High Profile Kerb (Ultimate)



NOTES:

- 60km/hr – enables large canopy trees to median and increased tree planting to verge if no frontage road
- Cross section treatment subject to detailed design approval by the Responsible Authority

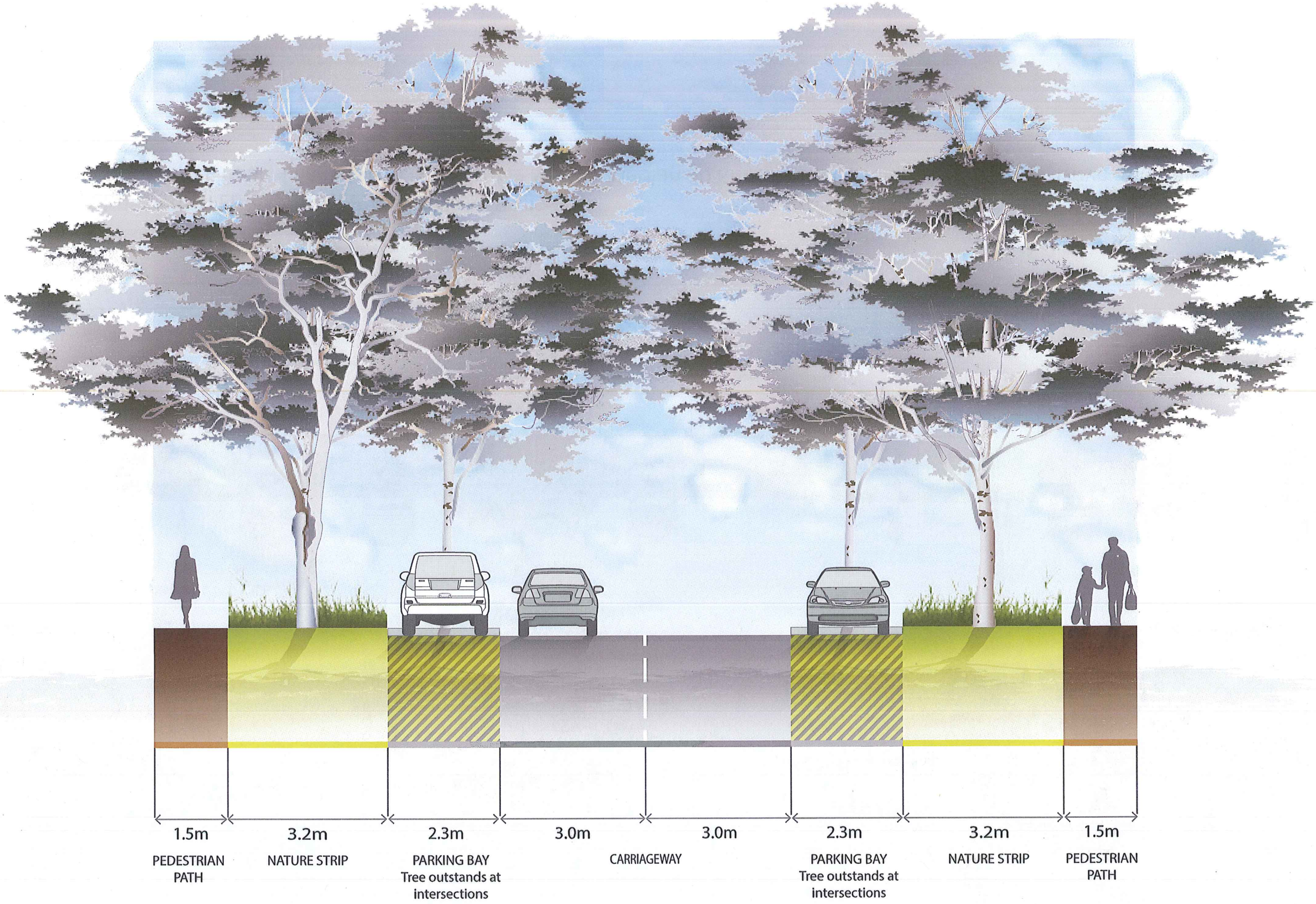
Craigieburn North Employment Precinct Cross Section
Secondary Arterial Road 4 Lane (34m) High Profile Kerb to Median 60 Km/hr with bus shelter (Brookville Drive - interim)



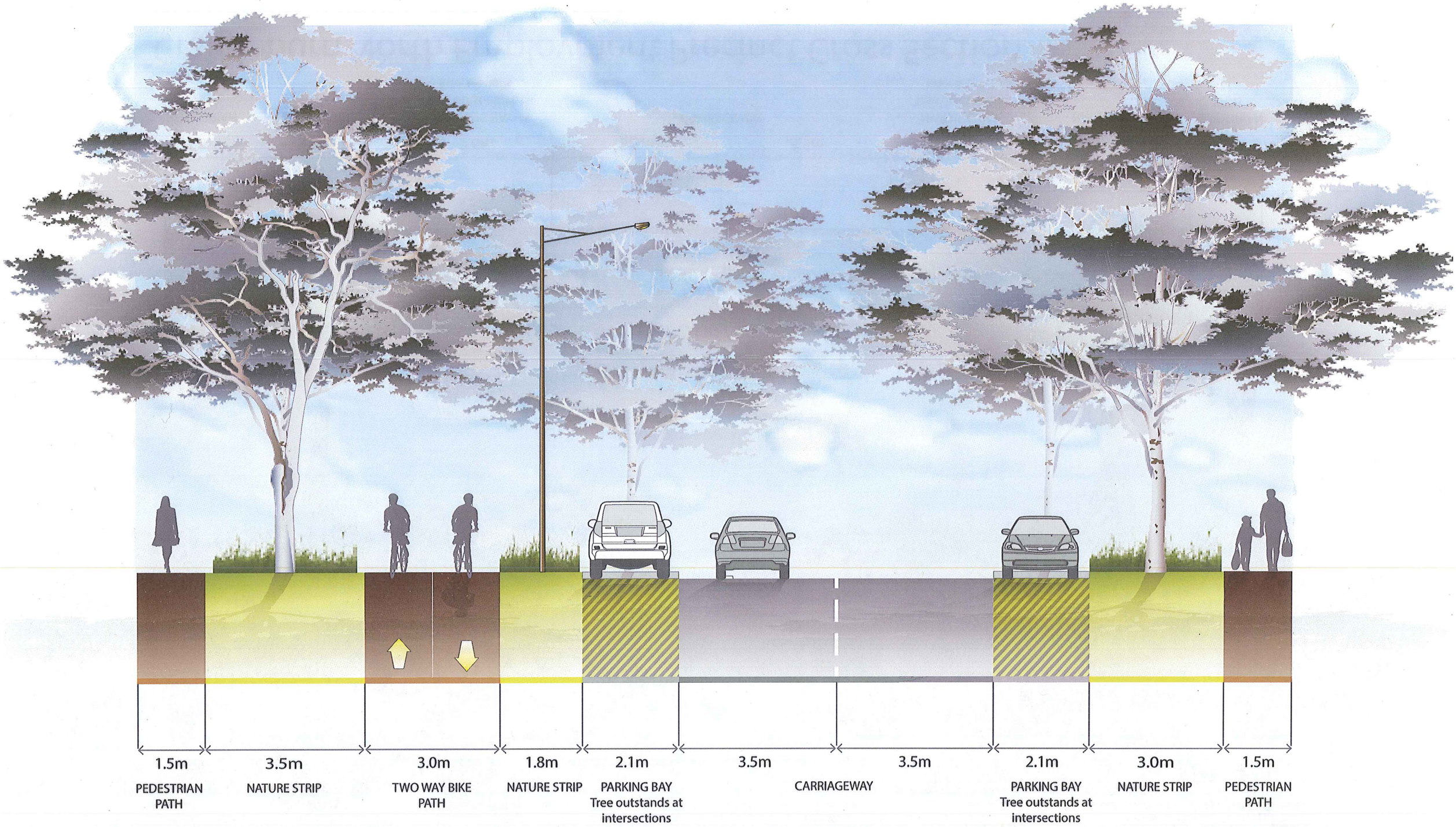
NOTES:

- 60km/hr – enables large canopy trees to median and increased tree planting to verge if no frontage road
- Cross section treatment subject to detailed design approval by the Responsible Authority

Craigieburn North Employment Precinct Cross Section
Secondary Arterial Road 4 Lane (34m) High Profile Kerb to Median 60 Km/hr with bus shelter (Brookville Drive -ultimate)

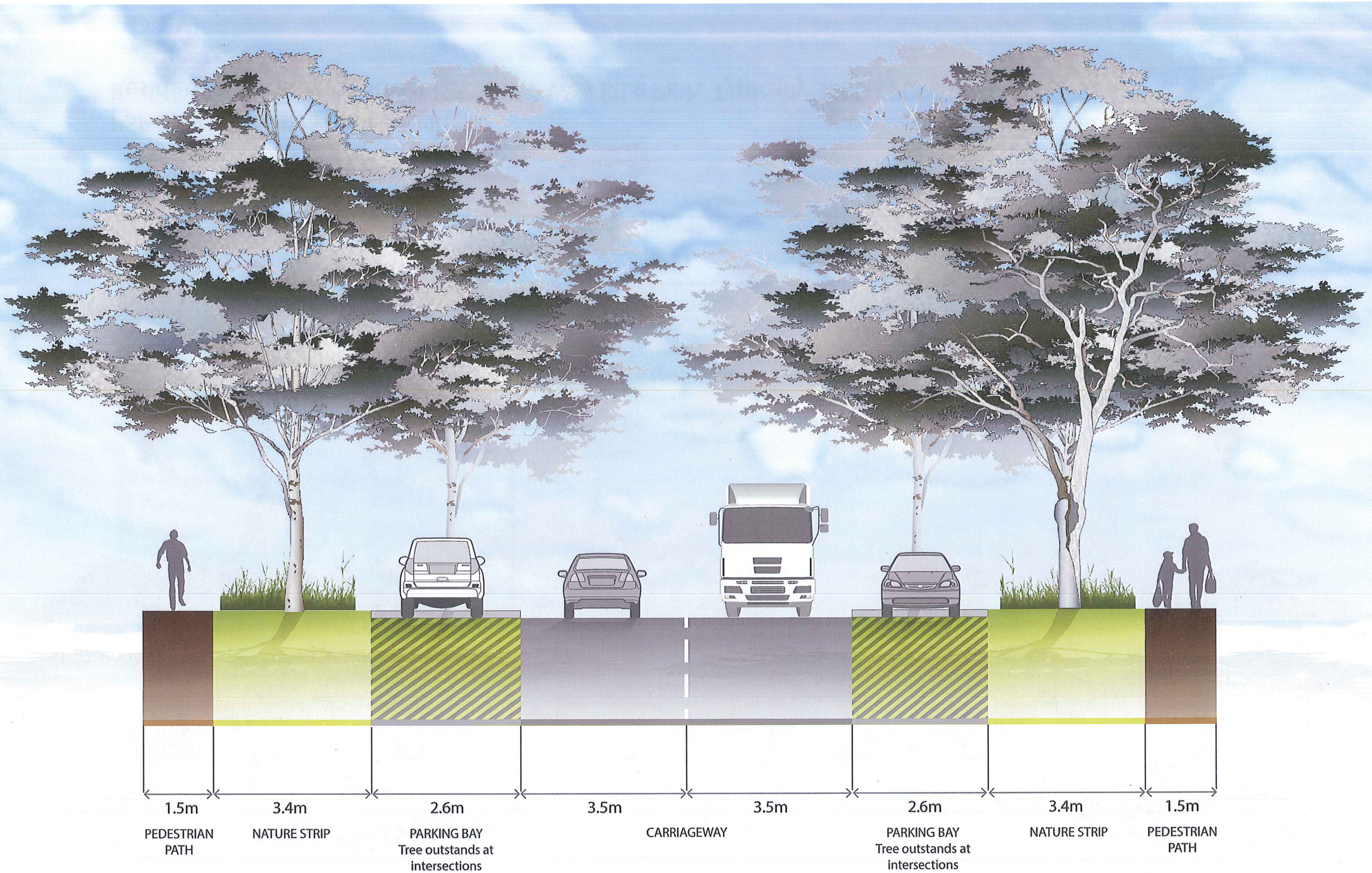


PSP 25.2 English Street Precinct
Demonstration Example
Access Street Level 2 (20m) 2000 - 3000 VPD

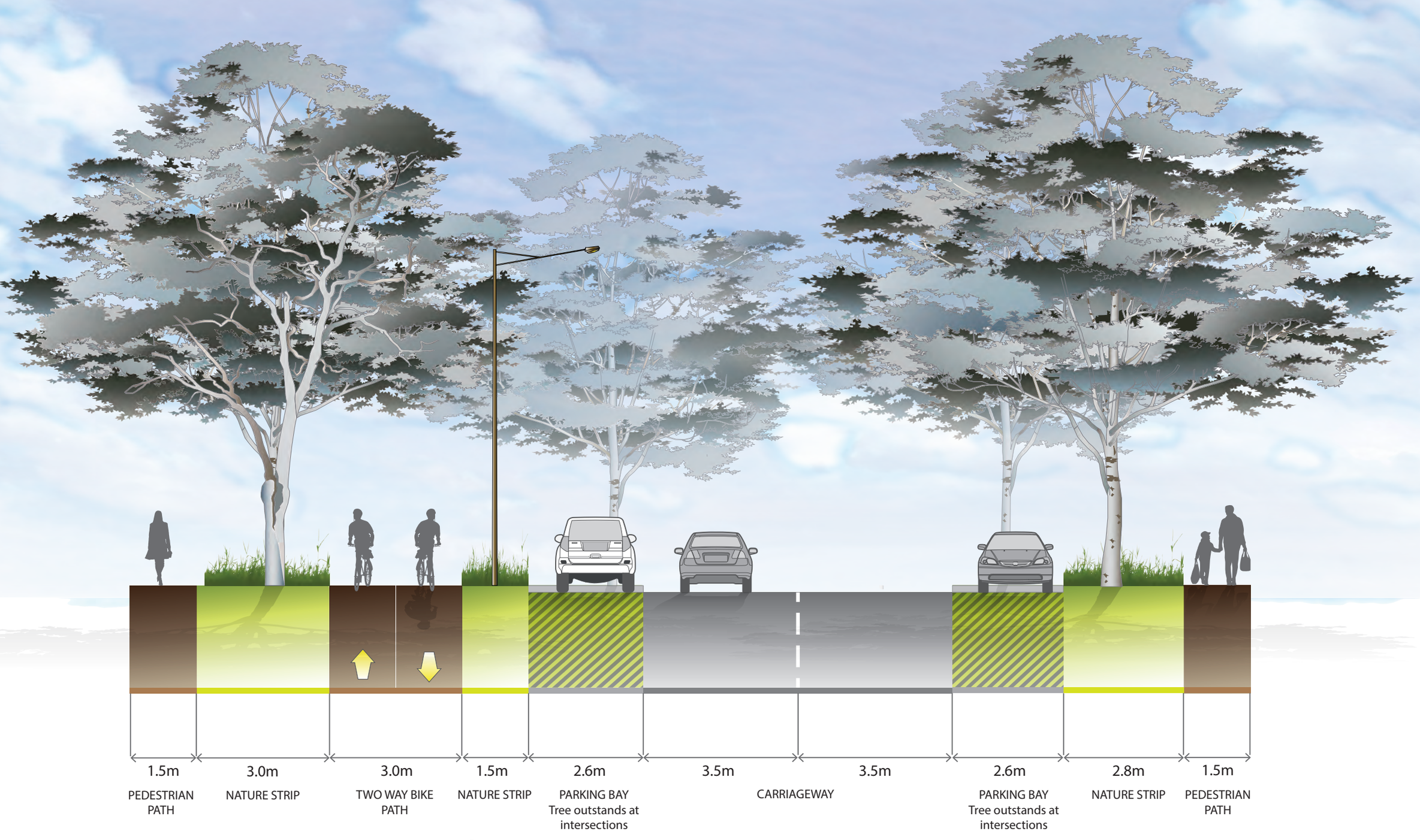


PSP 25.2 English Street Precinct

Residential Connector Street (25.5m) 2 Way Bike Path Typically 3000 - 7000 VPD



Craigieburn North Employment Precinct Cross Section
Industrial Access Street (22m)

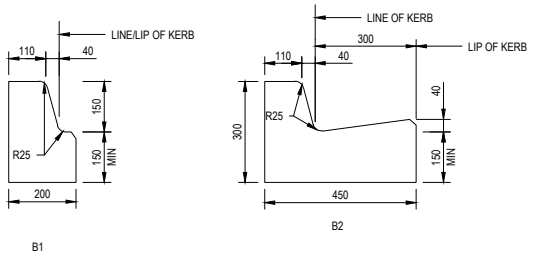


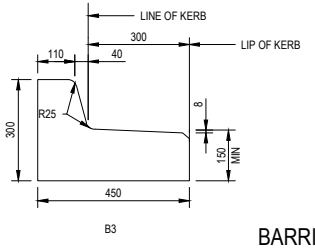
Craigieburn North Employment Precinct Cross Section

Industrial Connector Street (25.5m) 2 Way Bike Path Typically 3000 - 7000 VPD

Appendix C. **Standard drawings**

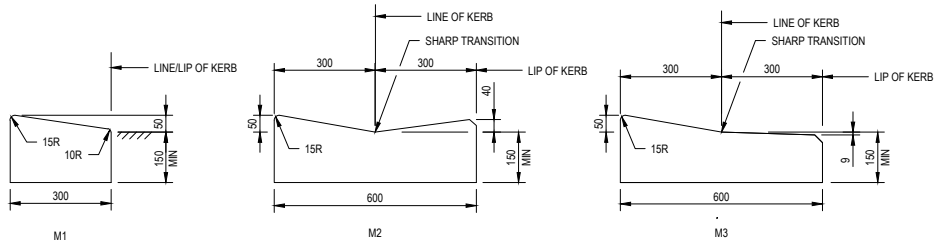
C.1 **Shoulder edge strip**

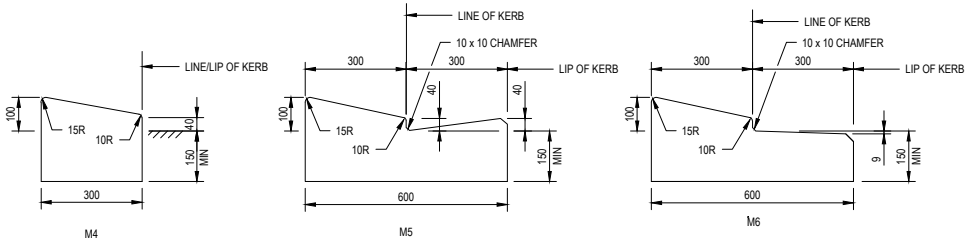




BARRIER KERBS

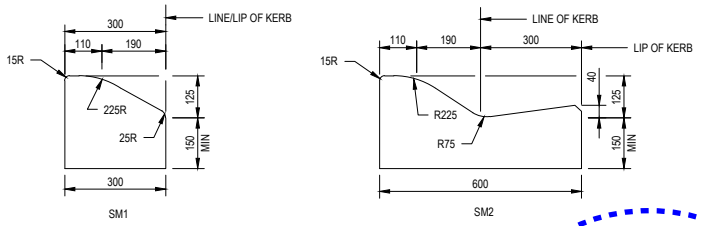
NOT TO SCALE

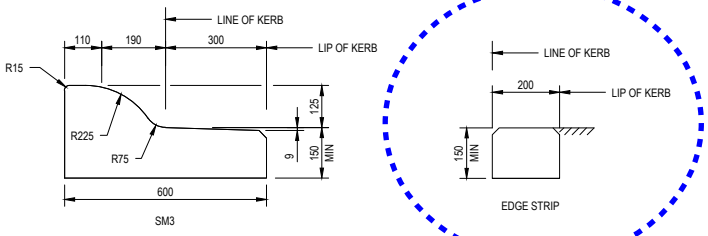


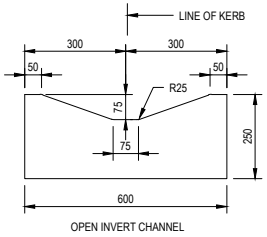


MOUNTABLE KERBS (REFER TO NOTE 2)

NOT TO SCALE







SEMI-MOUNTABLE KERBS

NOT TO SCALE

NOTES:

1. CONCRETE SHALL BE NORMAL CLASS N25 STANDARD STRENGTH GRADE COMPLYING WITH THE REQUIREMENTS OF AS. 1379. REFER TO VICROADS STANDARD SPECIFICATION 703 FOR REQUIREMENTS OF CONCRETE TO BE USED IN EXTRUSION MACHINES.
2. REFER TO AUSTROADS GUIDE TO ROAD DESIGN PART 3: GEOMETRIC DESIGN FOR THE RECOMMENDED USE OF KERBS AND CHANNELS.
3. MOUNTABLE KERBS M4, M5 AND M6 ARE DESIGNED TO DISCOURAGE MOST TRAFFIC FROM MOUNTING A TRAFFIC ISLAND OR MEDIAN EXCEPT FOR LONG OR OVER DIMENSIONAL VEHICLES, EG. THE KERB ON THE OUTER EDGE OF THE MOUNTABLE APRON OF A ROUNDABOUT'S CENTRAL ISLAND. THESE KERBS SHALL NOT BE USED WHERE THERE IS A LIKELIHOOD THAT CYCLISTS, PEDESTRIANS OR PRAMS WILL CROSS THE KERB.

No	Revision	Drawn	Checked	Approved	Date
1	GAA REVISED	GM	CB	CB	12.04.11
0	FINAL ISSUE	BJL	AHM*	PMW*	21.12.10*

Note: * indicates signatures on original issue of drawing or last revision of drawing

CARDINIA

growth areas AUTHORITY

STANDARD DRAWINGS FOR SUBDIVISIONS IN GROWTH AREAS

KERB PROFILES B, M, & SM SERIES

Revision 1

Date APR 2011

Figure 008

Plot Date: 12 April 2011 - 3:14 PM Plotted by: Gary Magno Cad File No: X:\Drawings & Graphics\Library\Engineering Design and Construction Manual\31-24931-FIG008 REV_1.dwg

Appendix D. **Cost report**

CONCEPT DESIGN

Cost Estimate

VERSION 2

For

INFRASTRUCTURE COSTING STUDY

CRAIGIEBURN NORTH AND ENGLISH STREET

Prepared For

By

JACOBS

REPORT DATE: 19/08/2014

PROJECT NO SB20434

PROJECT NO SB20434 REPORT DATE: 19/08/2014

CRAIGIEBURN NORTH AND ENGLISH STREET - CONCEPT DESIGN

Cost Estimate

INFRASTRUCTURE COSTING STUDY

VERSION 2

BASIS OF COST

The costs are based on documents which are concept design options only. The cost details are based on current market rates, for Melbourne, (August 2014). They have been summarised and the resultant summary figure has then been used to calculate additional allowances such as traffic management, VicRoads fees, survey & design, contingency, etc.

Rates used are based on those supplied by VicRoads representatives through the MPA review process and do not allow for factors such as escalation / fluctuation in market rates. Jacobs have reviewed the rates and agree that they are reasonable in the current market for this stage of design.

ASSUMPTIONS:

- Assumed 200mm excavation across site.
- Flat site assumed, pavement is to follow existing levels.
- Cost estimate allows for removal of existing pavement across width of existing cadastral boundary.
- Detail of existing road base conditions, widths and location required to include cost allowance for resurfacing of existing pavements (which may provide a cost saving).
- Drainage assumed to be 300mm dia max network.
- Kerb and channel assumed to be barrier kerb profile.
- Pedestrian and vehicle crossing kerb assumed SM2 / barrier / high kerb profile.
- Subsurface drainage to all kerb lengths.
- Pedestrian crossings allows for additional pedestrian pavements, linemarking and kerb profiles. Road costs are included within the road elements, Brookville drive profile assumed.
- Lighting locally to intersections, allowance 8 poles per intersection.
- Lighting locally to pedestrian crossing, 2 poles allowed.
- All trees assumed installed as young established to maximum trunk diameter of 30mm in readily available species.
- Hydroseeding allowed to site extents not covered by pavements (total area, less road pavement, shoulders, pedestrian pavements, traffic islands).
- Traffic signals - Allowance for conduits to be installed within the intersection area.
- Traffic barriers - Assumed no barriers required on approach to pedestrian crossings, bus shelters etc.
- Auxiliary buildings and street furniture excluded.
- No allowance for signage as not required in breakdown provided.
- No allowance for remediation of pavement at new/existing paving interface.
- No allowance for intersection works to English St. / Hume Hwy. junction.
- Future service clashes have been excluded from cost estimate for this stage.
- VicRoads - a nominal allowance has been included for VicRoads approvals and 10yr maintenance fee. These cost allowances should be revisited at later design stages.
- Services - Relocation of existing services is excluded from the cost estimate. Further information required from relevant services authorities.
- Services - No existing gas services assumed.
- Services - No modifications to existing water or sewer services assumed at this stage.
- No staging of works assumed.
- Land acquisition excluded as rates/prices may fluctuate.
- No allowance for adverse ground conditions eg. rock, soft spots etc.
- Cultural Heritage Management Plan (CHMP) estimate based on immediate area surrounding bridge crossings of Merri Creek.
- GST excluded.

RATES SUMMARY

Ref	DESCRIPTION	DETAIL						Unit	Rate	
1	Bulk Earthworks	Cut, Place & Compact						m3	55.00	*
	Bulk Earthworks	Strip topsoil, stockpile & respread						m2	4.50	*
3	Bulk Earthworks	Form swale drain						m3	45.00	*
4	Pavement (urban)	Construct deep strength pavement (Arterial Pavement), including wearing course (420mm depth)						m2	200.00	
5	Pavement Shoulder	550mm deep granular shoulder pavement						m2	83.00	
6	Pavement profiling & re-sheeting							m2	25.00	
7	Kerb & pavement Removal							m	30.00	
	Kerb & Channel	Barrier kerb						m	110.00	*
9	Kerb & Channel	Concrete edge strip						m	60.00	
10	Kerb & Channel Out Flow							m		N/A
11	Kerb & Channel Rollover	SM2						m	110.00	
12	Side Entry Pits std drw S305							unit	2,500.00	
	Bike Path 3.0m Wide	Reinforced concrete						m2	150.00	
14	Shared Pathway 3.0m Wide	Reinforced concrete						m2	150.00	
	Pedestrian Footpath	1.5m wide reinforced concrete						m2	150.00	
16	Pedestrian Footpath 1.5m gravel							m2		N/A
17	Drainage, sub grade drain							m2	30.00	
18	Line marking							m2	2.50	
19	Landscaping	Hydroseeding						m2	4.00	
20	Landscaping	Groundcover & mulch					-	m2	5.00	
21	Concrete Island Infill							m2	75.00	
22	Level / Trim Nature Strip							m2	10.00	
23	Tree Planting (2 - 2.5m tall)							unit	600.00	
24	Tube Stock Plantings							unit	40.00	
	Root Barriers							Note		INCLUDED
26	300mm dia conc drain Stormwater Cr BF							m	180.00	
	375mm dia conc drain Stormwater Cr Bk fill							m		N/A
28	450mm dia conc drain Stormwater Cr BF							m		N/A
29	525mm dia conc drain Stormwater Cr BF							m		N/A
30	Traffic Signals	Pole and lanterns, incl control						Item	400,000.00	
31	Traffic Signals Conduit subset	Signal conduit, trenching & backfill						m	65.00	
	Street Lighting	Lighting pole & luminaire						Unit	15,000.00	
33	Lighting Conduit	Conduit, trenching & backfill (unpaved)						m	65.00	*
	Relocation of existing overhead electrical service							m	150	
35	Relocation of existing communications service							m	150	
		Sub-Total								
	Sub-Total									
	Service Relocation									
	VicRoads Approvals Fee								Varies, refer to individual estimates	
	10 Year Maintenance Fee								Varies, refer to individual estimates	
	Traffic Management								Varies, refer to individual estimates	
	Survey & Design						5	%		
	Supervision & Project Management						10	%		
	Site Establishment						3	%		
	Contingency						20	%		
	TOTAL ESTIMATED COST (ex GST)									

Rates used are based on those supplied by VicRoads representative through the MPA review process and do not allow for factors such as escalation / fluctuation in market rates.
Rates noted with * are rates developed by Jacobs (not VicRoads adopted).
See basis of cost for further details, assumptions, and exclusions.

PROJECT NO SB20434 REPORT DATE: 19/08/2014

CRAIGIEBURN NORTH AND ENGLISH STREET - CONCEPT DESIGN

Cost Estimate

INFRASTRUCTURE COSTING STUDY

VERSION 2

COST SUMMARY

REPORT SECTION: 3.1		
IN-25.1-1 INTERSECTION (ROUNDABOUT)	$	4,159,301
IN-25.1-2 ENGLISH / BROOKVILLE INTERSECTION	$	4,440,077
IN-25.1-3 BROOKVILLE / KINLOCH INTERSECTION (ROUNDABOUT)	$	3,617,477
IN-25.1-4 BROOKVILLE / ACCESS ROAD INTERSECTION (ROUNDABOUT)	$	3,609,423
IN-25.1-5 BROOKVILLE / SUMMERHILL INTERSECTION	$	4,099,792
IN-25.1-6 INTERSECTION (ROUNDABOUT) - OPTION A	$	4,159,301
IN-25.1-6 INTERSECTION (ROUNDABOUT) - OPTION B	$	4,849,601
IN-25.1-7 AMAROO / ACCESS ROAD INTERSECTION (ROUNDABOUT)	$	4,159,301
REPORT SECTION: 3.2		
IN-25.2-1 DONNYBROOK / ENGLISH INTERSECTION	$	6,173,420
IN-25.2-2 ENGLISH / EAST-WEST ACCESS INTERSECTION	$	4,082,118
IN-25.2-3 ENGLISH / NORMAN INTERSECTION	$	4,209,959
REPORT SECTION: 3.3		
PEDESTRIAN CROSSING (per crossing)	$	253,105
REPORT SECTION: 4.1		
DONNYBROOK ROAD		EXCLUDED
RD-25.2-1 ENGLISH STREET	$	1,265,482
RD-25.2-2 ENGLISH STREET	$	3,471,235
REPORT SECTION: 4.2		
RD-25.1-1 ENGLISH STREET	$	5,416,711
RD-25.1-3 BROOKVILLE DRIVE	$	16,908,943
SOUTHERN CULVERT - AMAROO ROAD	$	37,020
REPORT SECTION: 4.3		
RD-25.1-4 SUMMERHILL ROAD	$	6,116,388
REPORT SECTION: 5.1		
BR-25.1-1 MERRI CREEK - ROAD BRIDGE	$	5,052,608
REPORT SECTION: 5.2		
BR-25.1-2 MERRI CREEK - PEDESTRIAN BRIDGE	$	1,813,878
TOTAL (ex. GST)	**$**	**87,895,140**

COST SUMMARY BY PRECINCT

CRAIGIEBURN NORTH EMPLOYMENT AREA (PSP 25.1)	$	61,573,335.14
ENGLISH STREET PRECINCT (PSP 25.2)	$	19,202,213.84
BR-25.1-1 MERRI CREEK - ROAD BRIDGE	$	5,052,607.80
BR-25.1-2 MERRI CREEK - PEDESTRIAN BRIDGE	$	1,813,878.30
PEDESTRIAN CROSSINGS (per crossing)	$	253,105
TOTAL (ex. GST)	**$**	**87,895,140**

IN-25.1-1 INTERSECTION (ROUNDABOUT)

Ref	DESCRIPTION	DETAIL	Qty	Unit	Rate	$
1	Bulk Earthworks	Cut, Place & Compact	4,040	m3	55.00	222,200
	Bulk Earthworks	Strip topsoil, stockpile & respread	20,200	m2	4.50	90,900
3	Bulk Earthworks	Form swale drain	-	m3	45.00	-
4	Pavement (urban)	Arterial Pavement	6,560	m2	200.00	1,312,000
5	Pavement (urban)	Shoulder	-	m2	83.00	-
6	Pavement profiling & re-sheeting		-	m2	25.00	-
	Kerb & pavement Removal		-	m2	30.00	-
8	Kerb & Channel	Type SM1	1,620	m	110.00	178,200
	Kerb & Channel		-	m	60.00	-
10	Kerb & Channel Out Flow		-	m	0.00	-
11	Kerb & Channel Rollover		24	m	110.00	2,640
	Side Entry Pits std drw S305		20	unit	2,500.00	50,000
13	Bike Path 3.0m Wide		-	m2	150.00	-
	Shared Pathway 3.0m Wide		1,830	m2	150.00	274,500
15	Pedestrian Footpath	1.5m wide reinforced concrete	450	m2	150.00	67,500
	Pedestrian Footpath 1.5m gravel		-	m2	0.00	-
17	Drainage, sub grade drain		1,620	m2	30.00	48,600
18	Line marking		6,560	m2	2.50	16,400
	Landscaping	Hydroseeding	9,625	m2	4.00	38,500
20	Landscaping	Groundcover & mulch	2,100	m2	5.00	10,500
	Concrete Island Infill		1,735	m2	75.00	130,130
22	Level / Trim Nature Strip		9,625	m2	10.00	96,250
23	Tree Planting (2 - 2.5m tall)		10	unit	600.00	6,000
	Tube Stock Plantings		-	unit	40.00	-
25	Root Barriers		-		0.00	
	300mm dia conc drain Stormwater Cr BF		1,020	m	180.00	183,600
27	375mm dia conc drain Stormwater Cr Bk fill		-	m	0.00	-
	450mm dia conc drain Stormwater Cr BF		-	m	0.00	-
29	525mm dia conc drain Stormwater Cr BF		-	m	0.00	-
30	Traffic Signals	Pole and lanterns, incl control	-	unit	400,000.00	-
	Traffic Signals Conduit subset		-	m	65.00	-
32	Street Lighting	Lighting pole & luminaire	13	Unit	15,000.00	195,000
	Lighting Conduit		620	m	65.00	40,300
		Sub-Total				**$ 2,963,220**
	Sub-Total					**2,963,220**
	Service Relocation					-
	VicRoads Approvals Fee					20,000
	10 Year Maintenance Fee					40,000
	Traffic Management					75,000
	Survey & Design		10	%		296,322
	Supervision & Project Management		5	%		148,161
	Site Establishment		2.5	%		74,081
	Contingency		15	%		542,518
	TOTAL ESTIMATED COST (ex GST)					**4,159,301**

IN-25.1-2 ENGLISH / BROOKVILLE INTERSECTION

Ref	DESCRIPTION	DETAIL	Qty	Unit	Rate	$
1	Bulk Earthworks	Cut, Place & Compact	3,180	m3	55.00	174,900
	Bulk Earthworks	Strip topsoil, stockpile & respread	15,900	m2	4.50	71,550
3	Bulk Earthworks	Form swale drain	360	m3	45.00	16,200
4	Pavement (urban)	Arterial Pavement	6,350	m2	200.00	1,270,000
5	Pavement (urban)	Shoulder	-	m2	83.00	-
6	Pavement profiling & re-sheeting		-	m2	25.00	-
	Kerb & pavement Removal		-	m2	30.00	-
8	Kerb & Channel	Type SM1 / high profile	2,580	m	110.00	283,800
	Kerb & Channel	Concrete edge strip	800	m	60.00	48,000
10	Kerb & Channel Out Flow		-	m	0.00	-
11	Kerb & Channel Rollover		27	m	110.00	2,970
	Side Entry Pits std drw S305		16	unit	2,500.00	40,000
13	Bike Path 3.0m Wide		-	m2	150.00	-
	Shared Pathway 3.0m Wide		1,800	m2	150.00	270,000
15	Pedestrian Footpath	1.5m wide reinforced concrete	300	m2	150.00	45,000
	Pedestrian Footpath 1.5m gravel		-	m2	0.00	-
17	Drainage, sub grade drain		2,580	m2	30.00	77,400
18	Line marking		6,350	m2	2.50	15,880
	Landscaping	Hydroseeding	6,445	m2	4.00	25,780
20	Landscaping	Groundcover & mulch	-	m2	5.00	-
	Concrete Island Infill		1,005	m2	75.00	75,380
22	Level / Trim Nature Strip		5,245	m2	10.00	52,450
23	Tree Planting (2 - 2.5m tall)		-	unit	600.00	-
	Tube Stock Plantings		-	unit	40.00	-
25	Root Barriers		-		0.00	
	300mm dia conc drain Stormwater Cr BF		800	m	180.00	144,000
27	375mm dia conc drain Stormwater Cr Bk fill		-	m	0.00	-
	450mm dia conc drain Stormwater Cr BF		-	m	0.00	-
29	525mm dia conc drain Stormwater Cr BF		-	m	0.00	-
30	Traffic Signals	Pole and lanterns, incl control	1	Item	400,000.00	400,000
	Traffic Signals Conduit subset		180	m	65.00	11,700
32	Street Lighting	Lighting pole & luminaire	8	Unit	15,000.00	120,000
	Lighting Conduit		400	m	65.00	26,000
		Sub-Total				**$ 3,171,010**
	Sub-Total					**3,171,010**
	Service Relocation					-
	VicRoads Approvals Fee					20,000
	10 Year Maintenance Fee					40,000
	Traffic Management					75,000
	Survey & Design		10	%		317,101
	Supervision & Project Management		5	%		158,551
	Site Establishment		2.5	%		79,275
	Contingency		15	%		579,141
	TOTAL ESTIMATED COST (ex GST)					**4,440,077**

IN-25.1-3 BROOKVILLE / KINLOCH INTERSECTION (ROUNDABOUT)

Ref	DESCRIPTION	DETAIL	Qty	Unit	Rate	$
1	Bulk Earthworks	Cut, Place & Compact	3,460	m3	55.00	190,300
	Bulk Earthworks	Strip topsoil, stockpile & respread	17,300	m2	4.50	77,850
3	Bulk Earthworks	Form swale drain	-	m3	45.00	-
4	Pavement (urban)	Arterial Pavement	5,530	m2	200.00	1,106,000
5	Pavement (urban)	Shoulder	-	m2	83.00	-
6	Pavement profiling & re-sheeting		-	m2	25.00	-
	Kerb & pavement Removal		-	m2	30.00	-
8	Kerb & Channel	Type SM1 / high profile	1,370	m	110.00	150,700
	Kerb & Channel		-	m	60.00	-
10	Kerb & Channel Out Flow		-	m	0.00	-
11	Kerb & Channel Rollover		24	m	110.00	2,640
	Side Entry Pits std drw S305		20	unit	2,500.00	50,000
13	Bike Path 3.0m Wide		-	m2	150.00	-
	Shared Pathway 3.0m Wide		2,040	m2	150.00	306,000
15	Pedestrian Footpath	1.5m wide reinforced concrete	450	m2	150.00	67,500
	Pedestrian Footpath 1.5m gravel		-	m2	0.00	-
17	Drainage, sub grade drain		1,370	m2	30.00	41,100
18	Line marking		5,530	m2	2.50	13,830
	Landscaping	Hydroseeding	8,280	m2	4.00	33,120
20	Landscaping	Groundcover & mulch	2,100	m2	5.00	10,500
	Concrete Island Infill		1,000	m2	5.00	5,000
22	Level / Trim Nature Strip		8,280	m2	10.00	82,800
23	Tree Planting (2 - 2.5m tall)		10	unit	600.00	6,000
	Tube Stock Plantings		-	unit	40.00	-
25	Root Barriers		-		0.00	
	300mm dia conc drain Stormwater Cr BF		1,020	m	180.00	183,600
27	375mm dia conc drain Stormwater Cr Bk fill		-	m	0.00	-
	450mm dia conc drain Stormwater Cr BF		-	m	0.00	-
29	525mm dia conc drain Stormwater Cr BF		-	m	0.00	-
30	Traffic Signals	Pole and lanterns, incl control	-	unit	400,000.00	-
	Traffic Signals Conduit subset		-	m	65.00	-
32	Street Lighting	Lighting pole & luminaire	13	Unit	15,000.00	195,000
	Lighting Conduit		620	m	65.00	40,300
		Sub-Total				**$ 2,562,240**
	Sub-Total					**2,562,240**
	Service Relocation					-
	VicRoads Approvals Fee					20,000
	10 Year Maintenance Fee					40,000
	Traffic Management					75,000
	Survey & Design		10	%		256,224
	Supervision & Project Management		5	%		128,112
	Site Establishment		2.5	%		64,056
	Contingency		15	%		471,845
	TOTAL ESTIMATED COST (ex GST)					**3,617,477**

IN-25.1-4 BROOKVILLE / ACCESS ROAD INTERSECTION (ROUNDABOUT)

Ref	DESCRIPTION	DETAIL	Qty	Unit	Rate	$
1	Bulk Earthworks	Cut, Place & Compact	3,120	m3	55.00	171,600
	Bulk Earthworks	Strip topsoil, stockpile & respread	15,600	m2	4.50	70,200
3	Bulk Earthworks	Form swale drain	-	m3	45.00	-
4	Pavement (urban)	Arterial Pavement	5,530	m2	200.00	1,106,000
5	Pavement (urban)	Shoulder	-	m2	83.00	-
6	Pavement profiling & re-sheeting		-	m2	25.00	-
	Kerb & pavement Removal		-	m2	30.00	-
8	Kerb & Channel	Type SM1 / high profile	1,370	m	110.00	150,700
	Kerb & Channel		-	m	60.00	-
10	Kerb & Channel Out Flow		-	m	0.00	-
11	Kerb & Channel Rollover		24	m	110.00	2,640
	Side Entry Pits std drw S305		20	unit	2,500.00	50,000
13	Bike Path 3.0m Wide		-	m2	150.00	-
	Shared Pathway 3.0m Wide		1,830	m2	150.00	274,500
15	Pedestrian Footpath	1.5m wide reinforced concrete	450	m2	150.00	67,500
	Pedestrian Footpath 1.5m gravel		-	m2	0.00	-
17	Drainage, sub grade drain		1,370	m2	30.00	41,100
18	Line marking		5,530	m2	2.50	13,830
	Landscaping	Hydroseeding	6,745	m2	4.00	26,980
20	Landscaping	Groundcover & mulch	2,100	m2	5.00	10,500
	Concrete Island Infill		1,045	m2	75.00	78,380
22	Level / Trim Nature Strip		6,745	m2	10.00	67,450
23	Tree Planting (2 - 2.5m tall)		10	unit	600.00	6,000
	Tube Stock Plantings		-	unit	40.00	-
25	Root Barriers		-		0.00	
	300mm dia conc drain Stormwater Cr BF		1,020	m	180.00	183,600
27	375mm dia conc drain Stormwater Cr Bk fill		-	m	0.00	-
	450mm dia conc drain Stormwater Cr BF		-	m	0.00	-
29	525mm dia conc drain Stormwater Cr BF		-	m	0.00	-
30	Traffic Signals	Pole and lanterns, incl control	-	unit	400,000.00	-
	Traffic Signals Conduit subset		-	m	65.00	-
32	Street Lighting	Lighting pole & luminaire	13	Unit	15,000.00	195,000
	Lighting Conduit		620	m	65.00	40,300
		Sub-Total				**$ 2,556,280**
	Sub-Total					**2,556,280**
	Service Relocation					-
	VicRoads Approvals Fee					20,000
	10 Year Maintenance Fee					40,000
	Traffic Management					75,000
	Survey & Design		10	%		255,628
	Supervision & Project Management		5	%		127,814
	Site Establishment		2.5	%		63,907
	Contingency		15	%		470,794
	TOTAL ESTIMATED COST (ex GST)					**3,609,423**

IN-25.1-5 BROOKVILLE / SUMMERHILL INTERSECTION

Ref	DESCRIPTION	DETAIL	Qty	Unit	Rate	$
1	Bulk Earthworks	Cut, Place & Compact	3,030	m3	55.00	166,650
	Bulk Earthworks	Strip topsoil, stockpile & respread	15,150	m2	4.50	68,180
3	Bulk Earthworks	Form swale drain	-	m3	45.00	-
4	Pavement (urban)	Arterial Pavement	4,950	m2	200.00	990,000
5	Pavement (urban)	Shoulder	1,280	m2	83.00	106,240
6	Pavement profiling & re-sheeting		-	m2	25.00	-
	Kerb & pavement Removal		7,000	m2	30.00	210,000
8	Kerb & Channel	Type SM1 / high profile	1,200	m	110.00	132,000
	Kerb & Channel	Concrete edge strip	-	m	60.00	-
10	Kerb & Channel Out Flow		-	m	0.00	-
11	Kerb & Channel Rollover		15	m	110.00	1,650
	Side Entry Pits std drw S305		10	unit	2,500.00	25,000
13	Bike Path 3.0m Wide		-	m2	150.00	-
	Shared Pathway 3.0m Wide		2,400	m2	150.00	360,000
15	Pedestrian Footpath	1.5m wide reinforced concrete	-	m2	150.00	-
	Pedestrian Footpath 1.5m gravel		-	m2	0.00	-
17	Drainage, sub grade drain		1,200	m2	30.00	36,000
18	Line marking		4,950	m2	2.50	12,380
	Landscaping	Hydroseeding	6,270	m2	4.00	25,080
20	Landscaping	Groundcover & mulch	-	m2	5.00	-
	Concrete Island Infill		250	m2	75.00	18,750
22	Level / Trim Nature Strip		6,270	m2	10.00	62,700
23	Tree Planting (2 - 2.5m tall)		8	unit	600.00	4,800
	Tube Stock Plantings		-	unit	40.00	-
25	Root Barriers		-		0.00	
	300mm dia conc drain Stormwater Cr BF		800	m	180.00	144,000
27	375mm dia conc drain Stormwater Cr Bk fill		-	m	0.00	-
	450mm dia conc drain Stormwater Cr BF		-	m	0.00	-
29	525mm dia conc drain Stormwater Cr BF		-	m	0.00	-
30	Traffic Signals	Pole and lanterns, incl control	1	Item	400,000.00	400,000
	Traffic Signals Conduit subset		150	m	65.00	9,750
32	Street Lighting	Lighting pole & luminaire	8	Unit	15,000.00	120,000
	Lighting Conduit		400	m	65.00	26,000
		Sub-Total				**$ 2,919,180**
	Sub-Total					**2,919,180**
	Service Relocation					-
	VicRoads Approvals Fee					20,000
	10 Year Maintenance Fee					40,000
	Traffic Management					75,000
	Survey & Design		10	%		291,918
	Supervision & Project Management		5	%		145,959
	Site Establishment		2.5	%		72,980
	Contingency		15	%		534,755
	TOTAL ESTIMATED COST (ex GST)					**4,099,792**

IN-25.1-6 INTERSECTION (ROUNDABOUT) - OPTION A

Ref	DESCRIPTION	DETAIL	Qty	Unit	Rate	$
1	Bulk Earthworks	Cut, Place & Compact	4,040	m3	55.00	222,200
	Bulk Earthworks	Strip topsoil, stockpile & respread	20,200	m2	4.50	90,900
3	Bulk Earthworks	Form swale drain	-	m3	45.00	-
4	Pavement (urban)	Arterial Pavement	6,560	m2	200.00	1,312,000
5	Pavement (urban)	Shoulder	-	m2	83.00	-
6	Pavement profiling & re-sheeting		-	m2	25.00	-
	Kerb & pavement Removal		-	m2	30.00	-
8	Kerb & Channel	Type SM1 / high profile	1,620	m	110.00	178,200
	Kerb & Channel		-	m	60.00	-
10	Kerb & Channel Out Flow		-	m	0.00	-
11	Kerb & Channel Rollover		24	m	110.00	2,640
	Side Entry Pits std drw S305		20	unit	2,500.00	50,000
13	Bike Path 3.0m Wide		-	m2	150.00	-
	Shared Pathway 3.0m Wide		1,830	m2	150.00	274,500
15	Pedestrian Footpath	1.5m wide reinforced concrete	450	m2	150.00	67,500
	Pedestrian Footpath 1.5m gravel		-	m2	0.00	-
17	Drainage, sub grade drain		1,620	m2	30.00	48,600
18	Line marking		6,560	m2	2.50	16,400
	Landscaping	Hydroseeding	9,625	m2	4.00	38,500
20	Landscaping	Groundcover & mulch	2,100	m2	5.00	10,500
	Concrete Island Infill		1,735	m2	75.00	130,130
22	Level / Trim Nature Strip		9,625	m2	10.00	96,250
23	Tree Planting (2 - 2.5m tall)		10	unit	600.00	6,000
	Tube Stock Plantings		-	unit	40.00	-
25	Root Barriers		-		0.00	
	300mm dia conc drain Stormwater Cr BF		1,020	m	180.00	183,600
27	375mm dia conc drain Stormwater Cr Bk fill		-	m	0.00	-
	450mm dia conc drain Stormwater Cr BF		-	m	0.00	-
29	525mm dia conc drain Stormwater Cr BF		-	m	0.00	-
30	Traffic Signals	Pole and lanterns, incl control	-	unit	400,000.00	-
	Traffic Signals Conduit subset		-	m	65.00	-
32	Street Lighting	Lighting pole & luminaire	13	Unit	15,000.00	195,000
	Lighting Conduit		620	m	65.00	40,300
		Sub-Total				**$ 2,963,220**
	Sub-Total					**2,963,220**
	Service Relocation					-
	VicRoads Approvals Fee					20,000
	10 Year Maintenance Fee					40,000
	Traffic Management					75,000
	Survey & Design		10	%		296,322
	Supervision & Project Management		5	%		148,161
	Site Establishment		2.5	%		74,081
	Contingency		15	%		542,518
	TOTAL ESTIMATED COST (ex GST)					**4,159,301**

IN-25.1-6 INTERSECTION (ROUNDABOUT) - OPTION B

Ref	DESCRIPTION	DETAIL	Qty	Unit	Rate	$
1	Bulk Earthworks	Cut, Place & Compact	4,800	m3	45.00	216,000
	Bulk Earthworks	Strip topsoil, stockpile & respread	24,000	m2	4.50	108,000
3	Bulk Earthworks	Form swale drain	-	m3	45.00	-
4	Pavement (urban)	Arterial Pavement	7,760	m2	200.00	1,552,000
5	Pavement (urban)	Shoulder	-	m2	83.00	-
6	Pavement profiling & re-sheeting		-	m2	25.00	-
	Kerb & pavement Removal		-	m2	30.00	-
8	Kerb & Channel	Type SM1 / high profile	1,900	m	110.00	209,000
	Kerb & Channel		-	m	60.00	-
10	Kerb & Channel Out Flow		-	m	0.00	-
11	Kerb & Channel Rollover		24	m	110.00	2,640
	Side Entry Pits std drw S305		24	unit	2,500.00	60,000
13	Bike Path 3.0m Wide		-	m2	150.00	-
	Shared Pathway 3.0m Wide		2,670	m2	150.00	400,500
15	Pedestrian Footpath	1.5m wide reinforced concrete	870	m2	150.00	130,500
	Pedestrian Footpath 1.5m gravel		-	m2	0.00	-
17	Drainage, sub grade drain		1,900	m2	30.00	57,000
18	Line marking		7,760	m2	2.50	19,400
	Landscaping	Hydroseeding	10,965	m2	4.00	43,860
20	Landscaping	Groundcover & mulch	2,100	m2	5.00	10,500
	Concrete Island Infill		1,735	m2	75.00	130,130
22	Level / Trim Nature Strip		10,965	m2	10.00	109,650
23	Tree Planting (2 - 2.5m tall)		10	unit	600.00	6,000
	Tube Stock Plantings		-	unit	40.00	-
25	Root Barriers		-		0.00	
	300mm dia conc drain Stormwater Cr BF		1,020	m	180.00	183,600
27	375mm dia conc drain Stormwater Cr Bk fill		-	m	0.00	-
	450mm dia conc drain Stormwater Cr BF		-	m	0.00	-
29	525mm dia conc drain Stormwater Cr BF		-	m	0.00	-
30	Traffic Signals	Pole and lanterns, incl control	-	unit	400,000.00	-
	Traffic Signals Conduit subset		-	m	65.00	-
32	Street Lighting	Lighting pole & luminaire	13	Unit	15,000.00	195,000
	Lighting Conduit		620	m	65.00	40,300
		Sub-Total				**$ 3,474,080**
	Sub-Total					**3,474,080**
	Service Relocation					-
	VicRoads Approvals Fee					20,000
	10 Year Maintenance Fee					40,000
	Traffic Management					75,000
	Survey & Design		10	%		347,408
	Supervision & Project Management		5	%		173,704
	Site Establishment		2.5	%		86,852
	Contingency		15	%		632,557
	TOTAL ESTIMATED COST (ex GST)					**4,849,601**

IN-25.1-7 AMAROO / ACCESS ROAD INTERSECTION (ROUNDABOUT)

Ref	DESCRIPTION	DETAIL	Qty	Unit	Rate	$
1	Bulk Earthworks	Cut, Place & Compact	4,040	m3	55.00	222,200
	Bulk Earthworks	Strip topsoil, stockpile & respread	20,200	m2	4.50	90,900
3	Bulk Earthworks	Form swale drain	-	m3	45.00	-
4	Pavement (urban)	Arterial Pavement	6,560	m2	200.00	1,312,000
5	Pavement (urban)	Shoulder	-	m2	83.00	-
6	Pavement profiling & re-sheeting		-	m2	25.00	-
	Kerb & pavement Removal		-	m2	30.00	-
8	Kerb & Channel	Type SM1 / high profile	1,620	m	110.00	178,200
	Kerb & Channel		-	m	60.00	-
10	Kerb & Channel Out Flow		-	m	0.00	-
11	Kerb & Channel Rollover		24	m	110.00	2,640
	Side Entry Pits std drw S305		20	unit	2,500.00	50,000
13	Bike Path 3.0m Wide		-	m2	150.00	-
	Shared Pathway 3.0m Wide		1,830	m2	150.00	274,500
15	Pedestrian Footpath	1.5m wide reinforced concrete	450	m2	150.00	67,500
	Pedestrian Footpath 1.5m gravel		-	m2	0.00	-
17	Drainage, sub grade drain		1,620	m2	30.00	48,600
18	Line marking		6,560	m2	2.50	16,400
	Landscaping	Hydroseeding	9,625	m2	4.00	38,500
20	Landscaping	Groundcover & mulch	2,100	m2	5.00	10,500
	Concrete Island Infill		1,735	m2	75.00	130,130
22	Level / Trim Nature Strip		9,625	m2	10.00	96,250
23	Tree Planting (2 - 2.5m tall)		10	unit	600.00	6,000
	Tube Stock Plantings		-	unit	40.00	-
25	Root Barriers		-		0.00	
	300mm dia conc drain Stormwater Cr BF		1,020	m	180.00	183,600
27	375mm dia conc drain Stormwater Cr Bk fill		-	m	0.00	-
	450mm dia conc drain Stormwater Cr BF		-	m	0.00	-
29	525mm dia conc drain Stormwater Cr BF		-	m	0.00	-
30	Traffic Signals	Pole and lanterns, incl control	-	unit	400,000.00	-
	Traffic Signals Conduit subset		-	m	65.00	-
32	Street Lighting	Lighting pole & luminaire	13	Unit	15,000.00	195,000
	Lighting Conduit		620	m	65.00	40,300
		Sub-Total				**$ 2,963,220**
	Sub-Total					**2,963,220**
	Service Relocation					-
	VicRoads Approvals Fee					20,000
	10 Year Maintenance Fee					40,000
	Traffic Management					75,000
	Survey & Design		10	%		296,322
	Supervision & Project Management		5	%		148,161
	Site Establishment		2.5	%		74,081
	Contingency		15	%		542,518
	TOTAL ESTIMATED COST (ex GST)					**4,159,301**

IN-25.2-1 DONNYBROOK / ENGLISH INTERSECTION

Ref	DESCRIPTION	DETAIL	Qty	Unit	Rate	$
1	Bulk Earthworks	Cut, Place & Compact	5,159	m3	55.00	283,750
	Bulk Earthworks	Strip topsoil, stockpile & respread	25,791	m2	4.50	116,060
3	Bulk Earthworks	Form swale drain	405	m3	45.00	18,230
4	Pavement (urban)	Arterial Pavement	9,442	m2	200.00	1,888,400
5	Pavement (urban)	Shoulder	600	m2	83.00	49,800
6	Pavement profiling & re-sheeting		7,800	m2	25.00	195,000
	Kerb & pavement Removal		-	m2	30.00	-
8	Kerb & Channel	Barrier kerb	3,036	m	110.00	333,960
	Kerb & Channel	Concrete edge strip	1,261	m	60.00	75,660
10	Kerb & Channel Out Flow		-	m	0.00	-
11	Kerb & Channel Rollover		27	m	110.00	2,970
	Side Entry Pits std drw S305		16	unit	2,500.00	40,000
13	Bike Path 3.0m Wide		-	m2	150.00	-
	Shared Pathway 3.0m Wide		2,282	m2	150.00	342,300
15	Pedestrian Footpath	1.5m wide reinforced concrete	-	m2	150.00	-
	Pedestrian Footpath 1.5m gravel		-	m2	0.00	-
17	Drainage, sub grade drain		3,036	m2	30.00	91,080
18	Line marking		9,442	m2	2.50	23,610
	Landscaping	Hydroseeding	13,065	m2	4.00	52,260
20	Landscaping	Groundcover & mulch	-	m2	5.00	-
	Concrete Island Infill		402	m2	75.00	30,150
22	Level / Trim Nature Strip		11,715	m2	10.00	117,150
23	Tree Planting (2 - 2.5m tall)		14	unit	600.00	8,400
	Tube Stock Plantings		-	unit	40.00	-
25	Root Barriers		-		0.00	
	300mm dia conc drain Stormwater Cr BF		1,192	m	180.00	214,560
27	375mm dia conc drain Stormwater Cr Bk fill		-	m	0.00	-
	450mm dia conc drain Stormwater Cr BF		-	m	0.00	-
29	525mm dia conc drain Stormwater Cr BF		-	m	0.00	-
30	Traffic Signals	Pole and lanterns, incl control	1	Item	400,000.00	400,000
	Traffic Signals Conduit subset		376	m	65.00	24,440
32	Street Lighting	Lighting pole & luminaire	8	Unit	15,000.00	120,000
	Lighting Conduit		400	m	65.00	26,000
		Sub-Total				**$ 4,453,780**
	Sub-Total					**4,453,780**
	Service Relocation					-
	VicRoads Approvals Fee					20,000
	10 Year Maintenance Fee					40,000
	Traffic Management					75,000
	Survey & Design		10	%		445,378
	Supervision & Project Management		5	%		222,689
	Site Establishment		2.5	%		111,345
	Contingency		15	%		805,229
	TOTAL ESTIMATED COST (ex GST)					**6,173,420**

IN-25.2-2 ENGLISH / EAST-WEST ACCESS INTERSECTION

Ref	DESCRIPTION	DETAIL	Qty	Unit	Rate	$
1	Bulk Earthworks	Cut, Place & Compact	2,468	m3	55.00	135,740
	Bulk Earthworks	Strip topsoil, stockpile & respread	12,340	m2	4.50	55,530
3	Bulk Earthworks	Form swale drain	360	m3	45.00	16,200
4	Pavement (urban)	Arterial Pavement	5,510	m2	200.00	1,102,000
5	Pavement (urban)	Shoulder	-	m2	83.00	-
6	Pavement profiling & re-sheeting		-	m2	25.00	-
	Kerb & pavement Removal		4,000	m2	30.00	120,000
8	Kerb & Channel	Barrier kerb	1,990	m	110.00	218,900
	Kerb & Channel	Concrete edge strip	400	m	60.00	24,000
10	Kerb & Channel Out Flow		-	m	0.00	-
11	Kerb & Channel Rollover		18	m	110.00	1,980
	Side Entry Pits std drw S305		10	unit	2,500.00	25,000
13	Bike Path 3.0m Wide		-	m2	150.00	-
	Shared Pathway 3.0m Wide		1,673	m2	150.00	250,950
15	Pedestrian Footpath	1.5m wide reinforced concrete	576	m2	150.00	86,400
	Pedestrian Footpath 1.5m gravel		-	m2	0.00	-
17	Drainage, sub grade drain		1,990	m2	30.00	59,700
18	Line marking		5,510	m2	2.50	13,780
	Landscaping	Hydroseeding	3,938	m2	4.00	15,760
20	Landscaping	Groundcover & mulch	-	m2	5.00	-
	Concrete Island Infill		643	m2	75.00	48,230
22	Level / Trim Nature Strip		2,738	m2	10.00	27,380
23	Tree Planting (2 - 2.5m tall)		8	unit	600.00	4,800
	Tube Stock Plantings		-	unit	40.00	-
25	Root Barriers		-		0.00	
	300mm dia conc drain Stormwater Cr BF		800	m	180.00	144,000
27	375mm dia conc drain Stormwater Cr Bk fill		-	m	0.00	-
	450mm dia conc drain Stormwater Cr BF		-	m	0.00	-
29	525mm dia conc drain Stormwater Cr BF		-	m	0.00	-
30	Traffic Signals	Pole and lanterns, incl control	1	Item	400,000.00	400,000
	Traffic Signals Conduit subset		150	m	65.00	9,750
32	Street Lighting	Lighting pole & luminaire	8	Unit	15,000.00	120,000
	Lighting Conduit		400	m	65.00	26,000
		Sub-Total				**$ 2,906,100**
	Sub-Total					**2,906,100**
	Service Relocation					-
	VicRoads Approvals Fee					20,000
	10 Year Maintenance Fee					40,000
	Traffic Management					75,000
	Survey & Design		10	%		290,610
	Supervision & Project Management		5	%		145,305
	Site Establishment		2.5	%		72,653
	Contingency		15	%		532,450
	TOTAL ESTIMATED COST (ex GST)					**4,082,118**

IN-25.2-3 ENGLISH / NORMAN INTERSECTION

Ref	DESCRIPTION	DETAIL	Qty	Unit	Rate	$
1	Bulk Earthworks	Cut, Place & Compact	2,920	m3	55.00	160,600
	Bulk Earthworks	Strip topsoil, stockpile & respread	14,600	m2	4.50	65,700
3	Bulk Earthworks	Form swale drain	360	m3	45.00	16,200
4	Pavement (urban)	Arterial Pavement	5,855	m2	200.00	1,171,000
5	Pavement (urban)	Shoulder	-	m2	83.00	-
6	Pavement profiling & re-sheeting		-	m2	25.00	-
	Kerb & pavement Removal		4,200	m2	30.00	126,000
8	Kerb & Channel	Barrier kerb	2,170	m	110.00	238,700
	Kerb & Channel	Concrete edge strip	800	m	60.00	48,000
10	Kerb & Channel Out Flow		-	m	0.00	-
11	Kerb & Channel Rollover		24	m	110.00	2,640
	Side Entry Pits std drw S305		10	unit	2,500.00	25,000
13	Bike Path 3.0m Wide		-	m2	150.00	-
	Shared Pathway 3.0m Wide		933	m2	150.00	139,950
15	Pedestrian Footpath	1.5m wide reinforced concrete	735	m2	150.00	110,250
	Pedestrian Footpath 1.5m gravel		-	m2	0.00	-
17	Drainage, sub grade drain		2,170	m2	30.00	65,100
18	Line marking		5,855	m2	2.50	14,640
	Landscaping	Hydroseeding	6,682	m2	4.00	26,730
20	Landscaping	Groundcover & mulch	-	m2	5.00	-
	Concrete Island Infill		395	m2	75.00	29,630
22	Level / Trim Nature Strip		5,482	m2	10.00	54,820
23	Tree Planting (2 - 2.5m tall)		10	unit	600.00	6,000
	Tube Stock Plantings		-	unit	40.00	-
25	Root Barriers		-		0.00	
	300mm dia conc drain Stormwater Cr BF		800	m	180.00	144,000
27	Line marking		-	m	0.00	-
	450mm dia conc drain Stormwater Cr BF		-	m	0.00	-
29	525mm dia conc drain Stormwater Cr BF		-	m	0.00	-
30	Traffic Signals	Pole and lanterns, incl control	1	Item	400,000.00	400,000
	Traffic Signals Conduit subset		150	m	65.00	9,750
32	Street Lighting	Lighting pole & luminaire	8	Unit	15,000.00	120,000
	Lighting Conduit		400	m	65.00	26,000
		Sub-Total				**$ 3,000,710**
	Sub-Total					**3,000,710**
	Service Relocation					-
	VicRoads Approvals Fee					20,000
	10 Year Maintenance Fee					40,000
	Traffic Management					75,000
	Survey & Design		10	%		300,071
	Supervision & Project Management		5	%		150,036
	Site Establishment		2.5	%		75,018
	Contingency		15	%		549,125
	TOTAL ESTIMATED COST (ex GST)					**4,209,959**

PEDESTRIAN CROSSING (per crossing)

Ref	DESCRIPTION	DETAIL	Qty	Unit	Rate	$
1	Bulk Earthworks	Cut, Place & Compact	100	m3	55.00	5,500
	Bulk Earthworks	Strip topsoil, stockpile & respread	500	m2	4.50	2,250
3	Bulk Earthworks	Form swale drain	-	m3	45.00	-
4	Pavement (urban)	Arterial Pavement	-	m2	200.00	-
5	Pavement (urban)	Shoulder	-	m2	83.00	-
6	Pavement profiling & re-sheeting		-	m2	25.00	-
	Kerb & pavement Removal	Saw cut & remove kerb	12	m	100.00	1,200
8	Kerb & Channel	Type SM1	-	m	110.00	-
9	Kerb & Channel	Concrete edge strip	-	m	60.00	-
10	Kerb & Channel Out Flow		-	m	0.00	-
11	Kerb & Channel Rollover		12	m	110.00	1,320
	Side Entry Pits std drw S305		-	unit	2,500.00	-
13	Bike Path 3.0m Wide		-	m2	150.00	-
	Shared Pathway 3.0m Wide		60	m2	150.00	9,000
15	Pedestrian Footpath	1.5m wide reinforced concrete	-	m2	150.00	-
16	Pedestrian Footpath 1.5m gravel		-	m2	0.00	-
17	Drainage, sub grade drain		-	m2	30.00	-
	Line marking	Pedestrian crossing	1	Item	2,000.00	2,000
	Landscaping	Hydroseeding	422	m2	4.00	1,690
20	Landscaping	Groundcover & mulch	-	m2	5.00	-
	Concrete Island Infill		18	m2	75.00	1,350
22	Level / Trim Nature Strip		422	m2	10.00	4,220
23	Tree Planting (2 - 2.5m tall)		-	unit	600.00	-
	Tube Stock Plantings		-	unit	40.00	-
25	Root Barriers		-		0.00	
26	300mm dia conc drain Stormwater Cr BF		-	m	180.00	-
27	375mm dia conc drain Stormwater Cr Bk fill		-	m	0.00	-
28	450mm dia conc drain Stormwater Cr BF		-	m	0.00	-
29	525mm dia conc drain Stormwater Cr BF		-	m	0.00	-
	Traffic Signals	Pedestrian crossing	1	unit	100,000.00	100,000
	Traffic Signals Conduit subset		50	m	65.00	3,250
32	Street Lighting	Lighting pole & luminaire	2	Unit	15,000.00	30,000
	Lighting Conduit		-	m	65.00	-
		Sub-Total				**$ 161,780**
	Sub-Total					**161,780**
	Service Relocation					-
	VicRoads Approvals Fee					Excluded
	10 Year Maintenance Fee					20,000
	Traffic Management					10,000
	Survey & Design		10	%		16,178
	Supervision & Project Management		5	%		8,089
	Site Establishment		2.5	%		4,045
	Contingency		15	%		33,014
	TOTAL ESTIMATED COST (ex GST)					**253,105**

RD-25.2-1 ENGLISH STREET

Ref	DESCRIPTION	DETAIL	Qty	Unit	Rate	$
1	Bulk Earthworks	Cut, Place & Compact	1,196	m3	55.00	65,780
	Bulk Earthworks	Strip topsoil, stockpile & respread	5,978	m2	4.50	26,910
3	Bulk Earthworks	Form swale drain	135	m3	45.00	6,080
4	Pavement (urban)	Arterial Pavement	1,796	m2	200.00	359,200
5	Pavement (urban)	Shoulder	450	m2	83.00	37,350
6	Pavement profiling & re-sheeting		-	m2	25.00	-
	Kerb & pavement Removal		1,600	m2	30.00	48,000
8	Kerb & Channel	Barrier kerb	300	m	110.00	33,000
	Kerb & Channel	Concrete edge strip	600	m	60.00	36,000
10	Kerb & Channel Out Flow		-	m	0.00	-
11	Kerb & Channel Rollover		-	m	110.00	-
	Side Entry Pits std drw S305		4	unit	2,500.00	10,000
13	Bike Path 3.0m Wide	Reinforced concrete	1,089	m2	150.00	163,350
	Shared Pathway 3.0m Wide	Reinforced concrete	-	m2	150.00	-
15	Pedestrian Footpath	1.5m wide reinforced concrete	-	m2	150.00	-
16	Pedestrian Footpath 1.5m gravel		-	m2	0.00	-
17	Drainage, sub grade drain		300	m2	30.00	9,000
18	Line marking		1,796	m2	2.50	4,490
19	Landscaping	Hydroseeding	2,643	m2	4.00	10,580
20	Landscaping	Groundcover & mulch	-	m2	10	-
21	Concrete Island Infill		-	m2	75.00	-
22	Level / Trim Nature Strip		2,193	m2	10.00	21,930
23	Tree Planting (2 - 2.5m tall)		7	unit	600.00	4,200
	Tube Stock Plantings		-	unit	40.00	-
25	Root Barriers		-			-
26	300mm dia conc drain Stormwater Cr BF		372	m	180.00	66,960
27	375mm dia conc drain Stormwater Cr Bk fill		-	m	0.00	-
28	450mm dia conc drain Stormwater Cr BF		-	m	0.00	-
29	525mm dia conc drain Stormwater Cr BF		-	m	0.00	-
30	Traffic Signals		-	unit	400,000.00	-
	Traffic Signals Conduit subset		-	m	65.00	-
32	Street Lighting	Lighting pole & luminaire	-	m	15,000.00	-
	Lighting Conduit		191	m	65.00	12,420
		Sub-Total				**$ 915,250**
	Sub-Total					**915,250**
	Service Relocation					-
	VicRoads Approvals Fee					Excluded
	10 Year Maintenance Fee					Excluded
	Traffic Management					25,000
	Survey & Design		10	%		91,525
	Supervision & Project Management		5	%		45,763
	Site Establishment		3	%		22,881
	Contingency		15	%		165,063
	TOTAL ESTIMATED COST (ex GST)					**1,265,482**

RD-25.2-2 ENGLISH STREET

Ref	DESCRIPTION	DETAIL	Qty	Unit	Rate	$
1	Bulk Earthworks	Cut, Place & Compact	2,834	m3	55.00	155,870
	Bulk Earthworks	Strip topsoil, stockpile & respread	14,170	m2	4.50	63,770
3	Bulk Earthworks	Form swale drain	468	m3	45.00	21,060
4	Pavement (urban)	Arterial Pavement	5,440	m2	200.00	1,088,000
5	Pavement (urban)	Shoulder	510	m2	83.00	42,330
6	Pavement profiling & re-sheeting		-	m2	25.00	-
	Kerb & pavement Removal		-	m2	30.00	-
8	Kerb & Channel	Barrier kerb	1,928	m	110.00	212,080
	Kerb & Channel	Concrete edge strip	964	m	60.00	57,840
10	Kerb & Channel Out Flow		-	m	0.00	-
11	Kerb & Channel Rollover		-	m	110.00	-
	Side Entry Pits std drw S305		22	unit	2,500.00	55,000
13	Bike Path 3.0m Wide	Reinforced concrete	3,090	m2	150.00	463,500
	Shared Pathway 3.0m Wide	Reinforced concrete	-	m2	150.00	-
15	Pedestrian Footpath	1.5m wide reinforced concrete	-	m2	150.00	-
	Pedestrian Footpath 1.5m gravel		-	m2	0.00	-
17	Drainage, sub grade drain		1,928	m2	30.00	57,840
18	Line marking		5,440	m2	2.50	13,600
	Landscaping	Hydroseeding	4,610	m2	4.00	18,440
20	Landscaping	Groundcover & mulch	-	m2	10	-
	Concrete Island Infill		520	m2	75.00	39,000
22	Level / Trim Nature Strip		3,050	m2	10.00	30,500
23	Tree Planting (2 - 2.5m tall)		13	unit	600.00	7,800
	Tube Stock Plantings		-	unit	40.00	-
25	Root Barriers		-			-
	300mm dia conc drain Stormwater Cr BF		1,040	m	180.00	187,200
27	Line marking		-	m	0.00	-
	450mm dia conc drain Stormwater Cr BF		-	m	0.00	-
29	525mm dia conc drain Stormwater Cr BF		-	m	0.00	-
30	Traffic Signals		-	unit	400,000.00	-
	Traffic Signals Conduit subset		-	m	65.00	-
32	Street Lighting	Lighting pole & luminaire	-	m	15,000.00	-
	Lighting Conduit		520	m	65.00	33,800
		Sub-Total				**$ 2,547,630**
	Sub-Total					**2,547,630**
	Service Relocation					-
	VicRoads Approvals Fee					Excluded
	10 Year Maintenance Fee					Excluded
	Traffic Management					25,000
	Survey & Design		10	%		254,763
	Supervision & Project Management		5	%		127,382
	Site Establishment		3	%		63,691
	Contingency		15	%		452,770
	TOTAL ESTIMATED COST (ex GST)					**3,471,235**

RD-25.1-1 ENGLISH STREET

Ref	DESCRIPTION	DETAIL	Qty	Unit	Rate	$
1	Bulk Earthworks	Cut, Place & Compact	4,990	m3	55.00	274,450
	Bulk Earthworks	Strip topsoil, stockpile & respread	24,950	m2	4.50	112,280
3	Bulk Earthworks	Form swale drain	747	m3	45.00	33,620
4	Pavement (urban)	Arterial Pavement	8,460	m2	200.00	1,692,000
5	Pavement (urban)	Shoulder	1,440	m2	83.00	119,520
6	Pavement profiling & re-sheeting		-	m2	25.00	-
	Kerb & pavement Removal		-	m2	30.00	-
8	Kerb & Channel	Barrier kerb	1,700	m	110.00	187,000
	Kerb & Channel	Concrete edge strip	3,060	m	60.00	183,600
10	Kerb & Channel Out Flow		-	m	0.00	-
11	Kerb & Channel Rollover		-	m	110.00	-
	Side Entry Pits std drw S305		19	unit	2,500.00	47,500
13	Bike Path 3.0m Wide	Reinforced concrete	4,590	m2	150.00	688,500
	Shared Pathway 3.0m Wide	Reinforced concrete	-	m2	150.00	-
15	Pedestrian Footpath	1.5m wide reinforced concrete	-	m2	150.00	-
	Pedestrian Footpath 1.5m gravel		-	m2	0.00	-
17	Drainage, sub grade drain		1,700	m2	30.00	51,000
18	Line marking		8,460	m2	2.50	21,150
	Landscaping	Hydroseeding	9,930	m2	4.00	39,720
21	Concrete Island Infill		530	m2	75.00	39,750
	Level / Trim Nature Strip		7,440	m2	10.00	74,400
23	Tree Planting (2 - 2.5m tall)		22	unit	600.00	13,200
24	Tube Stock Plantings		-	unit	40.00	-
	Root Barriers		-		0.00	
26	300mm dia conc drain Stormwater Cr BF		1,980	m	180.00	356,400
	375mm dia conc drain Stormwater Cr Bk fill		-	m	0.00	-
28	450mm dia conc drain Stormwater Cr BF		-	m	0.00	-
	525mm dia conc drain Stormwater Cr BF		-	m	0.00	-
30	Traffic Signals		-	unit	400,000.00	-
31	Traffic Signals Conduit subset		-	m	65.00	-
	Street Lighting	Lighting pole & luminaire	-	m	15,000.00	-
33	Lighting Conduit		820	m	65.00	53,300
	Relocation of existing overhead electrical service					Excluded
35	Relocation of existing communications service					Excluded
		Sub-Total				**$ 3,987,390**
	Sub-Total					**3,987,390**
	Service Relocation					Excluded
	VicRoads Approvals Fee					Excluded
	10 Year Maintenance Fee					Excluded
	Traffic Management					25,000
	Survey & Design		10	%		398,739
	Supervision & Project Management		5	%		199,370
	Site Establishment		3	%		99,685
	Contingency		15	%		706,527
	TOTAL ESTIMATED COST (ex GST)					**5,416,711**

SOUTHERN CULVERT - AMAROO ROAD

Ref	DESCRIPTION	DETAIL	Qty	Unit	Rate	$
	Clearing & grubbing		1	Item	2,000	2,000
	Culvert	600 dia RCP culvert incl. excavation & backfilling	10	m	1,000	10,000
	Headwalls	To suit culverts	2	No.	2,500	5,000
	Beaching and geotextile		1	Item	5,000	5,000
		Sub-Total				**$ 22,000**
	Sub-Total					**22,000**
	Service Relocation					-
	VicRoads Approvals Fee					Excluded
	10 Year Maintenance Fee					Excluded
	Traffic Management					5,000
	Survey & Design		5	%		1,100
	Cultural Heritage Management Plan					-
	Supervision & Project Management		10	%		2,200
	Site Establishment		3	%		550
	Contingency		20	%		6,170
	TOTAL ESTIMATED COST (ex GST)					**37,020**

RD-25.1-3 BROOKVILLE DRIVE

Ref	DESCRIPTION	DETAIL	Qty	Unit	Rate	$
1	Bulk Earthworks	Cut, Place & Compact	15,210	m3	55.00	836,550
	Bulk Earthworks	Strip topsoil, stockpile & respread	76,050	m2	4.50	342,230
3	Bulk Earthworks	Form swale drain	-	m3	45.00	-
4	Pavement (urban)	Arterial Pavement	20,820	m2	200.00	4,164,000
5	Pavement (urban)	Shoulder	8,055	m2	83.00	668,570
6	Pavement profiling & re-sheeting		-	m2	25.00	-
	Kerb & pavement Removal		63,800	m2	30.00	1,914,000
8	Kerb & Channel	Type SM1 / high profile	6,710	m	110.00	738,100
	Kerb & Channel	Concrete edge strip	-	m	60.00	-
10	Kerb & Channel Out Flow		-	m	0.00	-
11	Kerb & Channel Rollover		-	m	110.00	-
	Side Entry Pits std drw S305		75	unit	2,500.00	187,500
13	Bike Path 3.0m Wide	Reinforced concrete	12,240	m2	150.00	1,836,000
	Shared Pathway 3.0m Wide	Reinforced concrete	-	m2	150.00	-
15	Pedestrian Footpath	1.5m wide reinforced concrete	600	m2	150.00	90,000
	Pedestrian Footpath 1.5m gravel		-	m2	0.00	-
17	Drainage, sub grade drain		6,710	m2	30.00	201,300
18	Line marking		-	m2	2.50	-
	Landscaping	Hydroseeding	33,395	m2	4.00	133,580
21	Concrete Island Infill		940	m2	75.00	70,500
	Level / Trim Nature Strip		33,395	m2	10.00	333,950
23	Tree Planting (2 - 2.5m tall)		40	unit	600.00	24,000
24	Tube Stock Plantings		-	unit	40.00	-
	Root Barriers		-		0.00	
26	300mm dia conc drain Stormwater Cr BF		4,480	m	180.00	806,400
	375mm dia conc drain Stormwater Cr Bk fill		-	m	0.00	-
28	450mm dia conc drain Stormwater Cr BF		-	m	0.00	-
	525mm dia conc drain Stormwater Cr BF		-	m	0.00	-
30	Traffic Signals		-	unit	400,000.00	-
31	Traffic Signals Conduit subset		-	m	65.00	-
	Street Lighting	Lighting pole & luminaire	-	m	15,000.00	-
33	Lighting Conduit		2,240	m	65.00	145,600
	Relocation of existing overhead electrical service					Excluded
35	Relocation of existing communications service					Excluded
		Sub-Total				**$ 12,492,280**
	Sub-Total					**12,492,280**
	Service Relocation					Excluded
	VicRoads Approvals Fee					Excluded
	10 Year Maintenance Fee					Excluded
	Traffic Management					25,000
	Survey & Design		10	%		1,249,228
	Supervision & Project Management		5	%		624,614
	Site Establishment		3	%		312,307
	Contingency		15	%		2,205,514
	TOTAL ESTIMATED COST (ex GST)					**16,908,943**

RD-25.1-4 SUMMERHILL ROAD

Ref	DESCRIPTION	DETAIL	Qty	Unit	Rate	$
1	Bulk Earthworks	Cut, Place & Compact	6,720	m3	55.00	369,600
	Bulk Earthworks	Strip topsoil, stockpile & respread	33,600	m2	4.50	151,200
3	Bulk Earthworks	Form swale drain	-	m3	45.00	-
4	Pavement (urban)	Arterial Pavement	7,300	m2	200.00	1,460,000
5	Pavement (urban)	Shoulder	-	m2	83.00	-
6	Pavement profiling & re-sheeting		-	m2	25.00	-
	Kerb & pavement Removal		19,700	m2	30.00	591,000
8	Kerb & Channel	Type SM1	1,970	m	110.00	216,700
	Kerb & Channel	Concrete edge strip	-	m	60.00	-
10	Kerb & Channel Out Flow		-	m	0.00	-
11	Kerb & Channel Rollover		-	m	110.00	-
	Side Entry Pits std drw S305		22	unit	2,500.00	55,000
13	Bike Path 3.0m Wide	Reinforced concrete	5,910	m2	150.00	886,500
	Shared Pathway 3.0m Wide	Reinforced concrete	-	m2	150.00	-
15	Pedestrian Footpath	1.5m wide reinforced concrete	-	m2	150.00	-
	Pedestrian Footpath 1.5m gravel		-	m2	0.00	-
17	Drainage, sub grade drain		1,970	m2	30.00	59,100
18	Line marking		-	m2	2.50	-
	Landscaping	Hydroseeding	20,390	m2	4.00	81,560
20	Landscaping	Groundcover & mulch	-	m2	5.00	-
	Concrete Island Infill		-	m2	75.00	-
22	Level / Trim Nature Strip		20,390	m2	10.00	203,900
23	Tree Planting (2 - 2.5m tall)		20	unit	600.00	12,000
	Tube Stock Plantings		-	unit	40.00	-
25	Root Barriers		-		0.00	
	300mm dia conc drain Stormwater Cr BF		1,970	m	180.00	354,600
27	375mm dia conc drain Stormwater Cr Bk fill		-	m		-
	450mm dia conc drain Stormwater Cr BF		-	m		-
29	525mm dia conc drain Stormwater Cr BF		-	m		-
30	Traffic Signals		-	unit	400,000.00	-
	Traffic Signals Conduit subset		-	m	65.00	-
32	Street Lighting	Lighting pole & luminaire	-	m	15,000.00	-
	Lighting Conduit		985	m	65.00	64,030
		Sub-Total				**$ 4,505,190**
	Sub-Total					**4,505,190**
	Service Relocation					-
	VicRoads Approvals Fee					Excluded
	10 Year Maintenance Fee					Excluded
	Traffic Management					25,000
	Survey & Design		10	%		450,519
	Supervision & Project Management		5	%		225,260
	Site Establishment		3	%		112,630
	Contingency		15	%		797,790
	TOTAL ESTIMATED COST (ex GST)					**6,116,388**

BR-25.1-1 MERRI CREEK - ROAD BRIDGE

Ref	DESCRIPTION	DETAIL	Qty	Unit	Rate	$
	Clearing & grubbing		1	Item	10,000	10,000
	Structure Costs	2 span structure with 1500mm deep, 25m long Super-T beams	704	m2	4,500	3,168,000
	Structure Costs	Piles 900 dia, 8m depth	15	No.	6,105	91,580
		Off structure bridge approach barrier	1	Item	250,000	250,000
		Sub-Total				**$ 3,519,580**
	Sub-Total					**3,519,580**
	Service Relocation					-
	VicRoads Approvals Fee					Excluded
	10 Year Maintenance Fee					Excluded
	Traffic Management					25,000
	Survey & Design		10	%		351,958
	Cultural Heritage Management Plan					50,000
	Supervision & Project Management		5	%		175,979
	Site Establishment		3	%		87,990
	Contingency		20	%		842,101
	TOTAL ESTIMATED COST (ex GST)					**5,052,608**

BR-25.1-2 MERRI CREEK - PEDESTRIAN BRIDGE

Ref	DESCRIPTION	DETAIL	Qty	Unit	Rate	$
	Clearing & grubbing		1	Item	10,000	10,000
	Structure Costs	2 span structure with 1500mm deep, 25m long Super-T beams	260	m2	4,300	1,118,000
	Structure Costs	Piles 900 dia, 8m depth	6	No.	6,105	36,630
	Embankment & wall		1	Item	75,000	75,000
		Sub-Total				**$ 1,239,630**
	Sub-Total					**1,239,630**
	Service Relocation					-
	VicRoads Approvals Fee					Excluded
	10 Year Maintenance Fee					Excluded
	Traffic Management					5,000
	Survey & Design		10	%		123,963
	Cultural Heritage Management Plan					50,000
	Supervision & Project Management		5	%		61,982
	Site Establishment		3	%		30,991
	Contingency		20	%		302,313
	TOTAL ESTIMATED COST (ex GST)					**1,813,878**

Appendix E. **Land parcel areas (ha)**

E.1 PSP 25.1 Craigieburn North Employment Precinct - Intersection projects

Project ID	Property Number/Description	Area Affected (ha)	Total (ha)
IN-25.1-1	25.1-39	0.65	1.59
	25.1-40	0.24	
	25.1-41	0.70	
IN-25.1-2	25.1-5	0.45	2.55
	25.1-6	0.04	
	25.1-39	0.89	
	25.1-40	0.07	
	25.1-41	0.22	
	25.1-42	0.02	
	25.1 - RR2	0.86	
IN-25.1-3	25.1-7	0.10	1.56
	25.1-10	0.17	
	25.1-31	0.28	
	25.1-38	0.17	
	25.1 - RR2	0.44	
	25.1 - RR4	0.27	
	Existing road reserve (western side of Kinloch Court)	0.13	
IN-25.1-4	25.1-11	0.42	1.67
	25.1-12	0.01	
	25.1-29	0.17	
	25.1-31	0.58	
	25.1 - RR2	0.49	
IN-25.1-5	25.1-17	0.06	2.14
	25.1-18	0.54	
	25.1-24	0.13	
	25.1-27	0.27	
	25.1-29	0.26	
	25.1 - RR2	0.32	
	25.1 - RR3	0.55	
IN-25.1-6 - OPTION A	DEPI Conservation Area	0.08	1.46
	25.1-25	0.66	
	25.1-26	0.01	

Project ID	Property Number/Description	Area Affected (ha)	Total (ha)
	25.1-28	0.33	
	25.1 - RR3	0.39	
IN-25.1-6 - OPTION B	DEPI Conservation Area	0.00	1.90
	25.1-24	0.06	
	25.1-25	0.60	
	25.1-28	0.84	
	25.1 - RR3	0.39	
IN-25.1-7	25.1-19	0.15	2.35
	25.1-20	0.65	
	25.1-23	0.12	
	25.1-24	0.74	
	25.1 - RR2	0.69	

E.2 PSP 25.1 Craigieburn North Employment Precinct - Road projects

Project ID	Property Number/Description	Area Affected (ha)	Additional impacts caused by the VicRoads PAO	Total (ha)
RD-25.1-1	25.1-5	1.17		1.63
	25.1-39	0.09		
	25.1-41	0.32		
	CL-1	0.05		
RD-25.1-2	25.1-5	-	0.58	3.40
	25.1-6	-	2.83	
RD-25.1-3	25.1-18	0.14		6.54
	25.1-19	0.15		
	25.1-22	0.25		
	25.1-23	0.17		
	25.1-27	0.25		
	25.1-29	0.31		
	25.1-31	0.45		
	25.1-38	0.51		
	25.1-39	0.46		
	25.1 - RR2	3.83		
	Existing road reserve (east-west)	0.02		
RD-25.1-4	25.1-18	0.45		2.46
	25.1-24	0.16		
	25.1-25	0.03		
	25.1-26	0.35		
	25.1 - RR3	1.47		
RD-25.1-5	25.1-15	0.13		0.98
	25.1-16	0.34		
	25.1-17	0.03		
	25.1-18	0.48		
RD-25.1-6	Indicative 3:1 batters removed and replaced with assumed retaining walls (western side of grade separation only)	-		0.00

E.3 PSP 25.1 Craigieburn North Employment Precinct – Bridge projects

Project ID	Property Number/Description	Area Affected (ha)	Total (ha)
BR-25.1-1 (interim structure only)	25.2-9	0.02	0.09
	CL-1	0.07	
BR-25.1-2	25.2-1	0.01	0.03
	CL-1	0.02	

E.4 PSP 25.2 English Street Precinct - Intersection projects

Project ID	Property Number/Description	Area Affected (ha)	Additional impacts caused by the VicRoads PAO	Total (ha)
IN-25.2-1	25.2-1	1.27	0.14	4.68 (5.21 including PAO)
	25.2-2	0.76	0.22	
	25.2-3	0.32	0.17	
	Existing Donnybrook Road road reserve	1.33		
	Existing English Street road reserve	0.45		
	Future Stewart Street road reserve	0.55		
IN-25.2-2	25.2-1	0.18		1.36
	25.2-6	0.39		
	25.2-7	0.20		
	Existing English Street road reserve	0.59		
IN-25.2-3	25.2-6	0.60		1.61
	25.2-8	0.05		
	25.2-9	0.41		
	Existing English Street road reserve	0.55		

E.5 PSP 25.2 English Street Precinct – Road projects

Project ID	Property Number/Description	Area Affected (ha)	Total (ha)
RD-25.2-1	25.2-1	0.03	0.53
	25.2-6	0.13	
	Existing English Street road reserve	0.37	
RD-25.2-2	25.2-6	0.34	1.70
	25.2-9	1.36	

E.6 PSP 25.2 English Street Precinct – Bridge projects

Project ID	Property Number/Description	Area Affected (ha)	Total (ha)
BR-25.1-1 (interim structure only)	25.2-9	0.02	0.09
	CL-1	0.07	
BR-25.1-2	25.2-1	0.01	0.03
	CL-1	0.02	