High Wycombe South Residential Precinct Development Contribution Plan Report

September 2024

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Contents

1. Introduction 4
1.1 Development Contribution Area 4
1.2 Background 4
1.3 Purpose 6
1.4 Status 6
1.5 Principles 6
1.6 Application Requirements 7
1.7 Strategic Basis 7
1.8 Period of Operation (lifespan) 8
1.9 Contribution Summary 9
2 Needs Analysis 14
3 Items Included in the Development Contribution Plan 16
3.1 Roads 16
3.2 Intersections 21
3.3 Public Open Space Improvement 24
3.3.1 Drainage 29
3.4 Administration Costs 32
3.5 Land Costs 33
3.5.1 Methodology for Establishing Land Estimates 33
3.5.2 Methodology for Apportioning Acquisition for New Roads 34
3.5.3 LOS Acquisition Estimates (Excluding the Green Link) 34
3.5.4 Timing of Acquisition 35
3.6 Apportionment of Costs 36
4 Priority and Timing of Infrastructure Delivery 37
4.1 Delivery of Infrastructure 38
5 Method for Calculating Contributions 39
5.1 Cost Inputs 39
5.2 Area Inputs 40
5.2.1 Land Area Deductions (NCA) 40
6 Payment of Contributions 41

DRAFT

6.1 Credits 41
7 Review 42
8 Appendices 43
Appendix A – Traffic Modelling Report 44
Appendix B – Bill of Quantities: Road Infrastructure 45
8.1.1 RD01 – Milner Road (SRW to Stewart) 45
8.1.2 RD01 – Milner Road (SRW to Stewart) - Services 50
8.1.3 RD02 – Milner Road (Stewart to MV) 52
8.1.4 RD02 – Milner Road (Stewart to MV) - Services 56
8.1.5 RD03 – Raven Street Connector 58
8.1.6 RD04 – TOD Connector 62
8.1.7 RD05 – Stewart Road – Services 71
8.1.8 RD06 – Brae Road 73
8.1.9 RD06 – Brae Road - Services 78
8.1.10 RD08 – Brand Road 80
8.1.11 RD08 – Brand Road - Services 84
8.1.12 RD09 – SRW 86
8.1.13 RD09 – SRW - Services 90
Appendix C – Bill of Quantities: Intersection Infrastructure 92
8.1.14 INT01– Milner Rd / Stewart Road 92
8.1.15 INT01– Milner Rd / Stewart Road – Services 99
8.1.16 INT02– Milner Rd / Raven Street 101
8.1.17 INT02– Milner Rd / Raven Street – Services 107
8.1.18 INT03– TOD Connector / Brand Road 109
8.1.19 INT04– TOD Connector / Brae Road 116
8.1.20 INT05– Brae Rd / Brand Rd 122
8.1.21 INT05– Brae Rd / Brand Rd – Services 128
8.1.22 INT06– TOD Connector / Brae Road/ Raven Street 130
8.1.23 INT07– Brae Rd / Stewart Rd 136
8.1.24 INT07– Brae Rd / Stewart Rd – Services 142
Appendix D - Road Infrastructure Designs 144
Appendix E – POS Designs 145

DRAFT

Appendix F – Bill of Quantities: POS Improvements 146
8.1.25 POS02 – Smokebush Place 146
8.1.26 POS03 – Ecological Corridor (SRW – TOD Connector) 149
8.1.27 POS04 – Ecological Corridor (TOD Connector – BF01 & EC08) 152
8.1.28 POS05 – Ecological Corridor (BF01 & BC08 – Brae Road) 155
8.1.29 POS06 – Poison Gully Creek (Brae Road) 158
8.1.30 POS07 – Poison Gully Creek (Milner Road) 161
8.1.31 POS08 – Residential Precinct Town Park 163
8.1.32 POS09 – SRW 166
8.1.33 DB02 – Poison Gully Creek Drainage / POS (Brae Road) 168
8.1.34 DB03 - Littlefield POS / Drainage 170
8.1.35 DB04 - Poison Gully Creek POS (Stewart Road) 172
8.1.36 DB06 - Sultana Road West POS 174
Appendix G – Catchment Layout Plan 177
Appendix H – Bill of Quantities: Drainage Infrastructure 178
8.1.37 DB01- Drainage Ecological Corridor 178
8.1.38 DB02 – Drainage Poison Gully East 180
8.1.39 DB03- Drainage Poison Gully Central 182
8.1.40 DB04 – Drainage Poison Gully West 184
8.1.41 DB05 – Drainage Residential Precinct Town Park 186
8.1.42 DB06 – Drainage Sultana Road West 188
Appendix I – Bill of Quantities: Administration Costs 190
Appendix J – Land Valuation 2023 191
Appendix K –Land Details 192
Appendix L – Cost Apportionment Schedule 193
Appendix M – Summary of Lands Costs 196
Appendix N – Population Yield Analysis Report 197

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1. Introduction

This Development Contribution Plan Report (DCPR) has been prepared to provide detail and guidance regarding the infrastructure and administration costs identified for inclusion in Development Contribution Area 2 (DCA2) under Schedule 12 of the City of Kalamunda – Local Planning Scheme No. 3 (LPS3). The DCPR details the key operational aspects of the Development Contribution Plan (DCP) associated with the High Wycombe South (HWS) Residential Precinct (Residential Precinct). The DCPR outlines the parameters for:

a) The provision of civil Infrastructure (Roads and Drainage).
b) The provision of Public Open space (POS).
c) The apportionment of the costs.

Note: It is important to note that 'Forrestfield North' and 'High Wycombe South' refer to the same project area. The subject area was renamed following the naming of the train station in 2022; formerly referred as Forrestfield North and now known a High Wycombe South. Appendixes published prior to this renaming will still address the subject area as Forrestfield North.

The cost estimates and assumptions in this documentation are based on the best available information at the time of publication.

1.1 Development Contribution Area

The HWS DCP applies to the HWS Residential Precinct LSP area; shown on the LPS3 map as DCA2 (Figure 1).

1.2 Background

The DCA2 is located within the City of Kalamunda and is generally bounded by Poison Gully to the north, Milner Road to the west, Sultana Road West to the south and Roe Highway to the east.

The Forrestfield North District Structure Plan (DSP) (Figure 2) was prepared to guide the preparation of more detailed local structure plans (LSPs).

The High Wycombe South Residential Precinct LSP (Figure 3) and Transit Oriented Development (TOD) Precinct Activity Centre Structure Plan (ACSP) (Figure 4) have been prepared to inform and facilitate the subdivision and development of the High Wycombe South area. This DCP only applies to the Residential Precinct. The TOD Precinct falls within the Metropolitan Redevelopment Authority and is outside of the City's planning jurisdiction.

Table 1 - DCA2: Relevant Planning History

February 2016	Minister Approved MRS amendment from 'Rural' to 'Urban'
September 2016	District Structure Plan (DSP) approved by WAPC
September 2018	Minister Approved LPS3 amendment from 'Special Rural' to 'Urban Development'
27 July 2020	Initial Residential Precinct LSP approved by the WAPC
May 2021	Metronet Redevelopment Scheme Amendment Adopted and DevelopmentWA become planning authority for the TOD Precinct.
25 August 2023	Residential Precinct LSP Amendment endorsed by the WAPC
18 April 2023	Amendment 113 to LPS 3 (DCP) Initiated for the purpose of public consultation (OCM 46/2023).
27 April 2023	Amendment 113 Referred to the Department of Planning, Lands and Heritage (DPLH) for examination prior to advertising as a complex amendment.
25 July 2023	Council provided a status update at the July 2023 OCM, noting an extended assessment by the DPLH to enable an extensive assessment and a subsequent peer review (OCM 103/2023).
10 October 2023	Considered by the Western Australian Planning Commission (WAPC) at the Statutory Planning Committee (SPC).
17 October 2023	Correspondence issued by the DPLH noting Amendment 113 is suitable for advertising, subject to encouraged modifications.
10 November 2023	City issued correspondence to the DPLH requesting an extended advertising period; from 60 to 90 days.
15 November 2023	DPLH approved the extended advertising period.
12 December 2023	Council provided a status update at the December 2023 Ordinary Council Meeting; report outlined the findings and advice of the DPLH review, and justified consequential modifications made by the City (OCM 179/2023).
31 January 2024	Advertising period commenced for an extended period of 97 days (31 January 2024 to 6 May 2024).
6 May 2024	Advertising period concluded.
17 June 2024	City issued correspondence to the DPLH requesting an extension to the consideration period.
2 August 2024	DPLH approved the extended consideration period by 64 days; concluding 7 October 2024.

1.3 Purpose

Land within DCA2 has historically been used for rural-residential land uses, and therefore requires the provision of new infrastructure and upgrades to existing infrastructure to facilitate the residential development envisaged by the LSP. Due to the fragmented nature of landownership, and the need to achieve the coordinated delivery of infrastructure, the City has prepared the DCP to facilitate infrastructure provision in an equitable and coordinated manner.

The purpose of this DCP is to:

a) Enable the application of infrastructure contributions for the development of new, and the upgrade of existing infrastructure which is required as a result of demand generated by the LSP;
b) Provide for the equitable sharing of costs of infrastructure and administrative items between landowners;
c) Ensure that cost contributions are reasonably required as a result of the subdivision and development of land in the DCA; and
d) Coordinate the timely provision of infrastructure.

1.4 Status

The DCP has been prepared in accordance with State Planning Policy 3.6 Infrastructure Contributions (SPP3.6). It comes into effect on the date of gazettal of Amendment 113 to LSP3.

The DCP will operate in accordance with the provisions of Clause 6.5 and Schedule 12 of LSP3.

1.5 Principles

The DCP report has been prepared pursuant to the guiding principles for development contribution plans, set out in clause 6.5.5 of LSP3 and SPP3.6 and detailed below:

a) **Need and the nexus:** The need for the infrastructure must be clearly demonstrated (need) and the connection between the development and the demand created should be clearly established (nexus).

b) **Transparency:** Both the method for calculating the infrastructure contribution and the manner in which it is applied should be clear, transparent, and simple to understand and administer.

c) **Equity:** Infrastructure contributions should be levied equitably from identified stakeholders within a contribution area, based on the relative contribution to need.

d) **Certainty:** The scope, timing, and priority for delivering infrastructure items, and the cost of infrastructure contributions and methods of accounting for escalation, should be clearly identified.

e) **Efficiency:** Contribution should be justified on a whole-of-life capital cost basis consistent with maintaining financial discipline on service providers by precluding the over-recovery of costs.

f) **Consistency:** The system for infrastructure contributions for apportioning, collecting and spending contributions should be consistent, efficient and transparent.

g) **Accountable:** That there is accountability in the manner in which infrastructure contributions are determined, collected and expended.

h) **Right of consultation and review:** Landowners and developers have the right to be consulted on the manner in which development contributions are determined, and the opportunity to seek a review by an independent third party regarding the calculation of costs, and return of funds.

1.6 Application Requirements

Where an application for subdivision, strata subdivision, development or an extension of land use is applied for within the DCA, the local government shall take the provisions of the DCP into account in making a recommendation on or determining that application.

1.7 Strategic Basis

The DSP was prepared to guide the preparation of more detailed LSPs. The High Wycombe South Residential Precinct LSP and TOD Precinct LSP have been prepared to facilitate the subdivision and development of the High Wycombe South area. Infrastructure and land will be required to cater for this development. This subdivision and development necessitates the provision of new and upgraded infrastructure and land. In this context, the High Wycombe South LSPs form the strategic basis for the DCP and DCA for the High Wycombe South Residential Precinct.

1.8 Period of Operation (lifespan)

The DCP will operate for a period of 30 years from date of gazettal of the related scheme amendment (Amendment 113) to incorporate the Scheme DCP into LPS3.

The selected timeframe of 30 years has been considered to correspond to, and balance, the projected and desired build out rates for future development in the Residential Precinct LSP. It also meets the SPP 3.6 requirements for a longer lifespan given that it is for a specific strategic urban precinct that has a minimum anticipated lifespan of 30 years.

Justification for a proposed 30-year DCP lifespan is a consequence of:

a) *Scale of the Precinct*
There are projected to be over 2,417 dwellings that could be developed across the precinct with only 50% of these being single residential lots. This is more supply than could be created or sold out in 10 years and may take a number of years before any lots are initially created. The Population Yield Analysis Report (Appendix N) estimates that 77% of DCA2 will be developed in the proposed 30 year lifespan; representing a critical mass demand for DCP infrastructure and a strong base for contributions.

b) *Fragmented land ownership*
Development will take a period of time to begin while developers contend with fragmented ownership and try to amalgamate a large enough land parcel for viable development. The rate of future development will be somewhat dependent on the ability of developers to be able to amalgamate viable developable land parcels.

c) *Needs Analysis*
The infrastructure proposed to be delivered through the DCP is triggered over the 30-year lifespan, in line with the needs and demand assessment, TMR (Appendix A) and Yields Analysis Report (Appendix N). Accordingly, the DCP is required to have sufficient timeframe to capture and distribute those costs in a fair and equitable manner.

d) *Certainty*
A period of less than 30 years does not reflect the anticipated development growth rate for the area and will not provide the required certainty for which the identified infrastructure items can be delivered. This would be inconsistent with SPP 3.6.

1.9 Contribution Summary

The DCP facilitates they levying of $45,463,300.17 to coordinate the delivery of necessary infrastructure upgrades, summarised in the following categories and detailed further in this report:

Table 2 - Summary of DCP estimates

ITEM		TOTAL DCP ($)	RATE (/m^2)
Roads		$15,787,084.54	$26.57
Intersections		$3,922,019.07	$6.60
Local Open Space	Improvements	$11,723,341.37	$19.73
	Drainage	$2,124,424.19	$3.58
Land		$9,346,431.00	$15.73
Administration		$2,560,000.00	$4.31
TOTAL		$45,463,300.17	$76.52

The adopted contribution rate applicable to the Net Contribution Area (NCA) is contained in the table below.

Table 3 – Contribution rate history

Adoption Date	Development Contribution Rate
April 2023	$70.41/$m^2$
December 2023	$72.07/$m^2$
September 2024	$76.52/$m^2$

Figure 1 - DCA2 Map

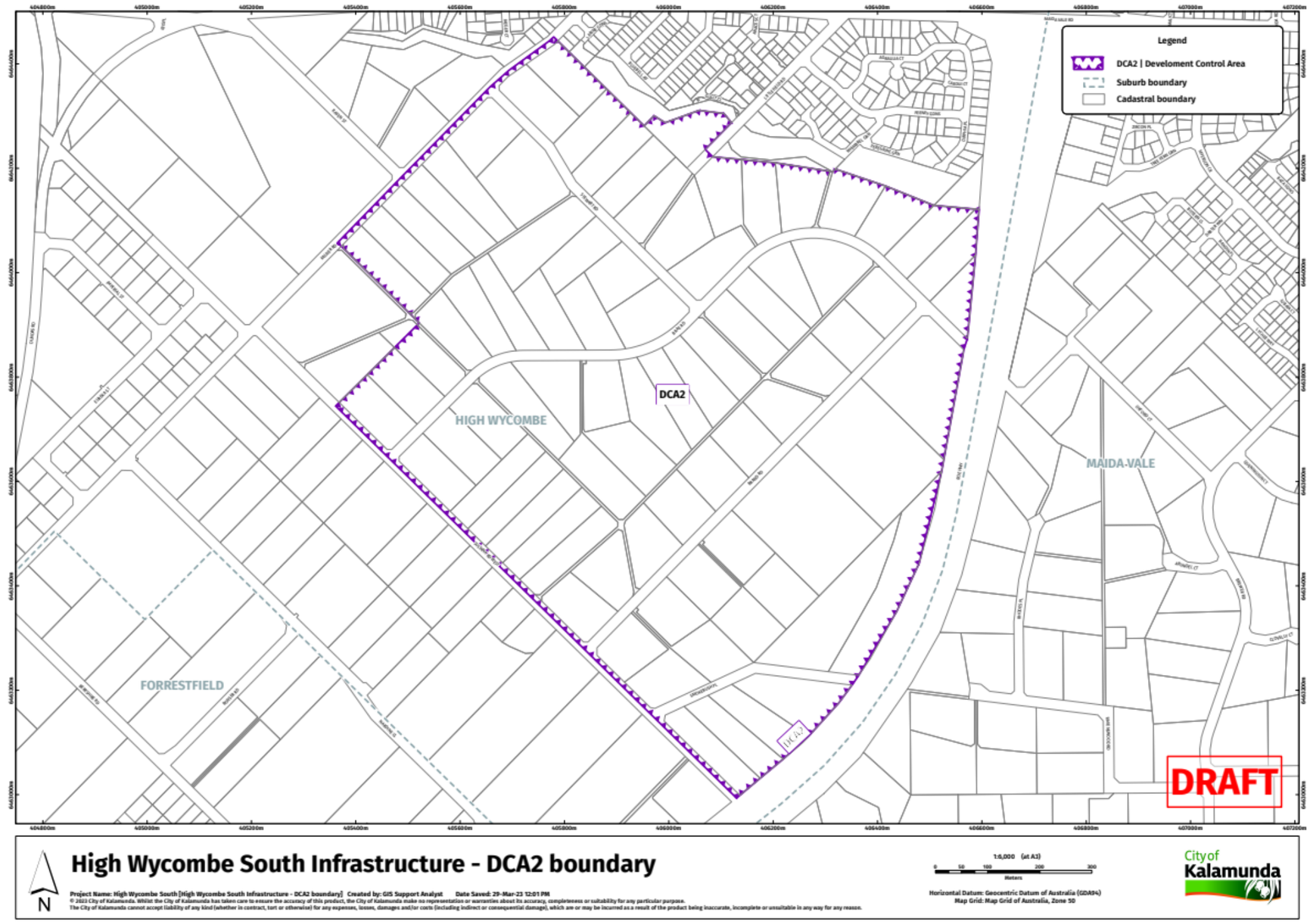


Figure 2 - Forrestfield North District Structure Plan

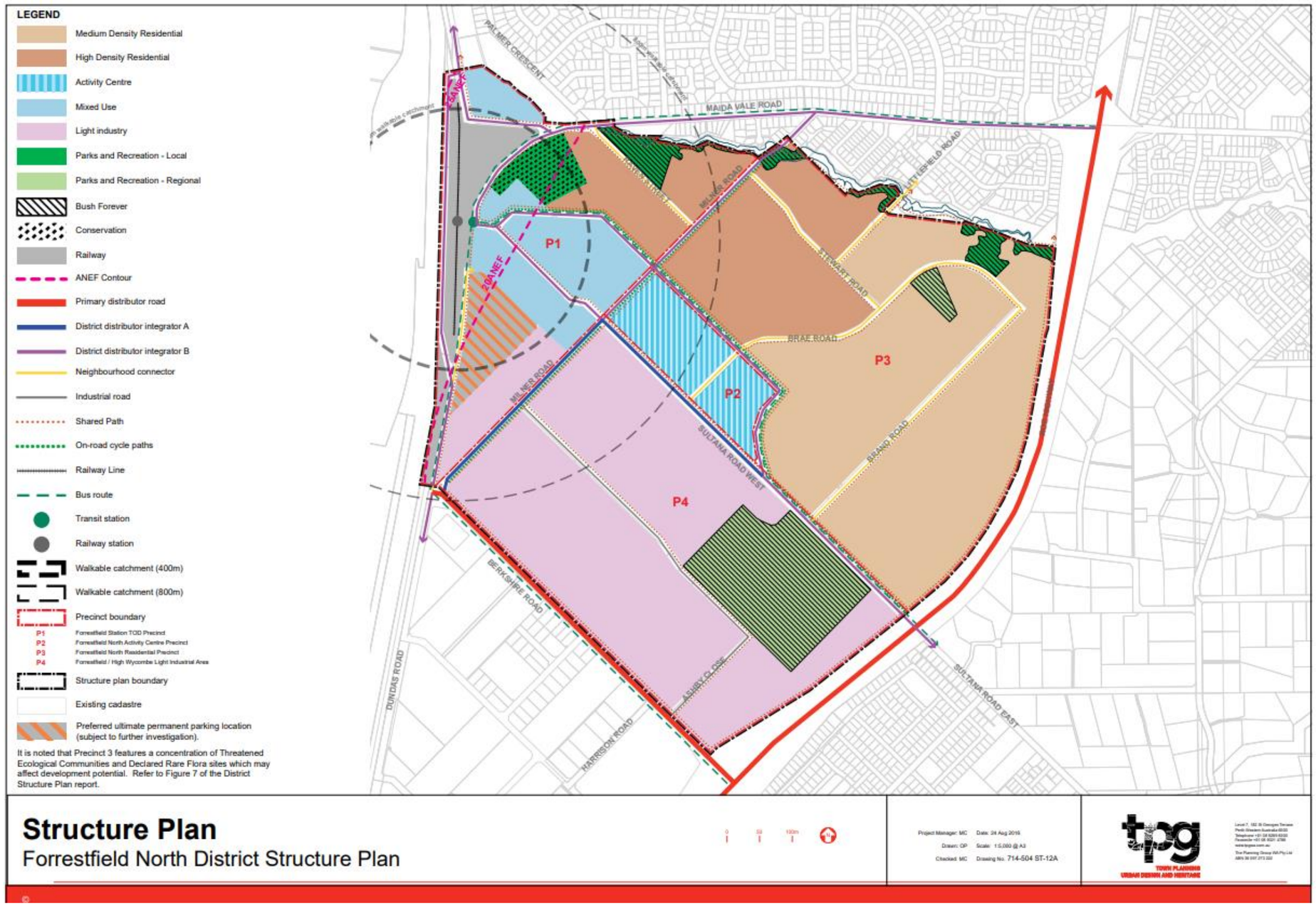
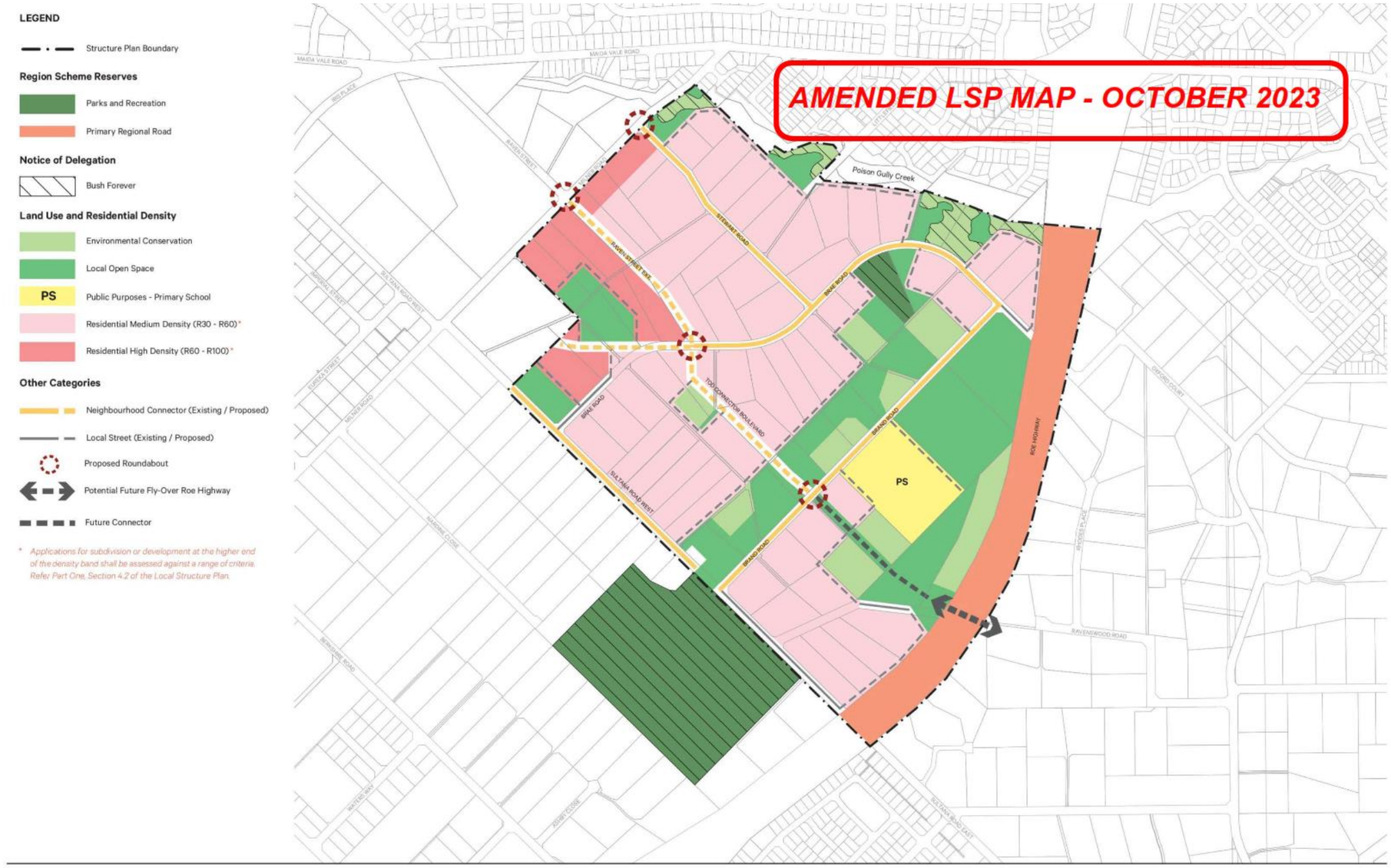


Figure 3 - High Wycombe South Residential Precinct Local Structure Plan



Plan 1: Local Structure Plan

High Wycombe South Residential Precinct

Date: 18 Oct 2023 Scale: 1:8000@ A3 1:4000 @ A1 File: **17-527 ST-1 A** Staff: MC GW Checked: MC

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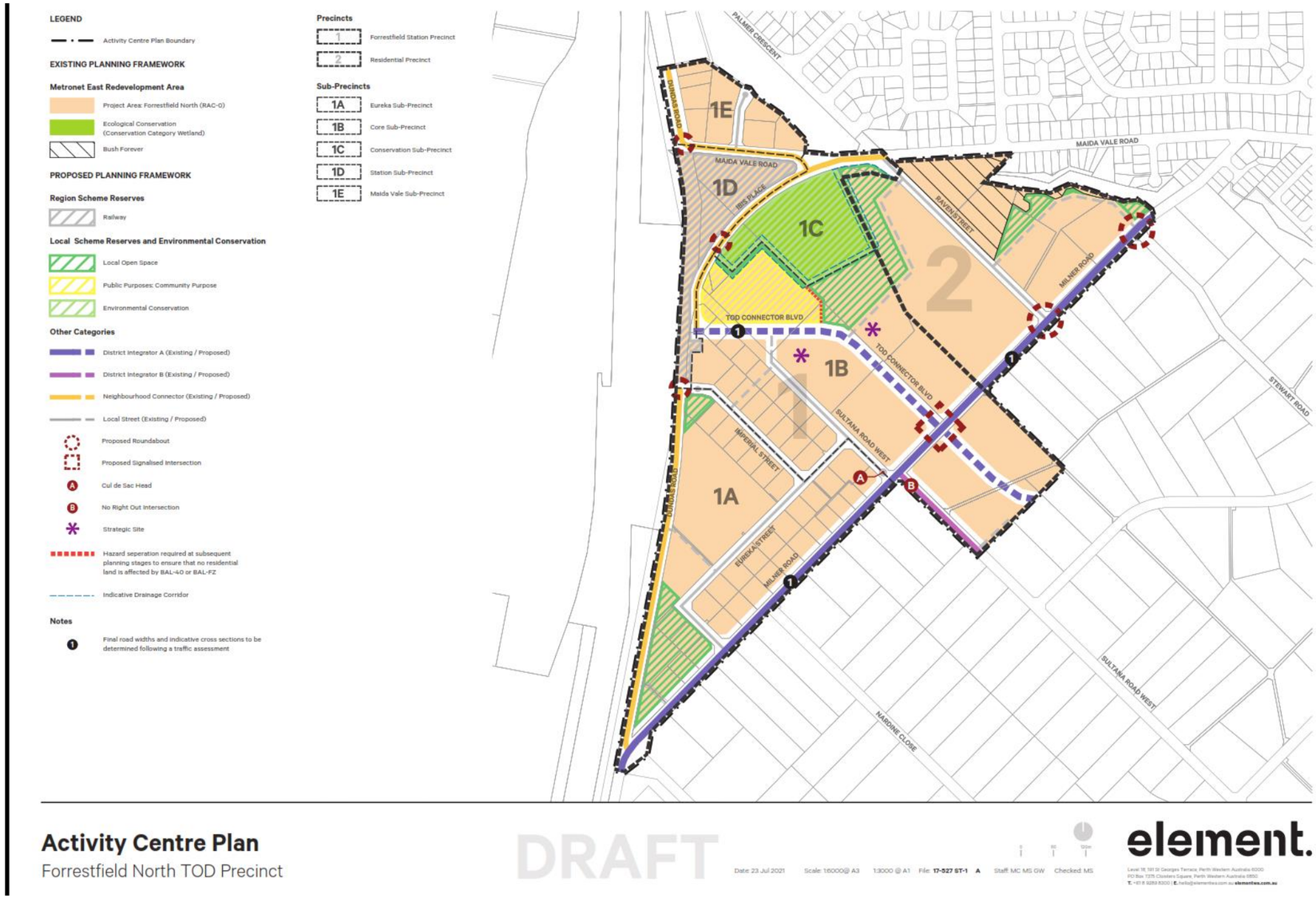
Figure 4 - High Wycombe South Transit Oriented Development Precinct Activity Centre Structure Plan



2 Needs Analysis

DCA2 is currently improved by rural lifestyle lots and limited infrastructure. The LSP facilitates the development of the area from a rural to urban outcome; expected to house 2,417 dwellings or 5,923 people by 2064. Consequently, infrastructure in the area requires upgrading to accommodate such growth.

The below table summarises the investigations undertaken to establish the need of all infrastructure proposed to be delivered through the DCP.

Table 4 - Needs Analysis

INFRASTRUCTURE	ESTABLISHED NEED	SOURCE
ROADS & INTERSECTIONS	New roads and upgrades to existing roads and intersections is required to service the future development envisaged by the LSP. District level road infrastructure will be provided through the DCP, with the remaining local road infrastructure the responsibility of the landowners abutting the infrastructure, as a condition of development or subdivision approval.	Population Yield Analysis Report Infrastructure Servicing Report Traffic Modelling Report Liveable Neighbourhoods
DISTRICT DRAINAGE	The acquisition and construction of various drainage basins throughout DCA2 is required to provide for overflow drainage in accordance with the Local Water Management Strategy and Infrastructure Servicing Report, adopted as part of the LSP. The DCP will coordinate the delivery of six (6) drainage basins, integrated within POS. Local stormwater management will be the responsibility of individual developers.	Local Water Management Strategy Infrastructure Servicing Report

INFRASTRUCTURE	ESTABLISHED NEED	SOURCE
LOCAL OPEN SPACE IMRPOVEMENT	WAPC Liveable Neighbourhoods Policy requires that a minimum contribution of 10% of redevelopment area is comprised of POS, or 9.32 hectares for DCA2.	WAPC Liveable Neighbourhoods Policy
		City of Kalamunda Local Planning Policy 32 (Public Open Space)

3 Items Included in the Development Contribution Plan

This section of the DCP report identifies the infrastructure, land and other items for which development contributions will be collected in the High Wycombe South Residential Precinct. These items include:

a) Upgrade to existing road infrastructure and delivery of new road infrastructure.
b) Improvements to Local Open Space (LOS).
c) Coordinated drainage infrastructure.
d) Land required to facilitate the delivery of the infrastructure (roads, public open space, and drainage).
e) Administration costs.

There will be other costs associated with the development of land within DCA2 (i.e. localised site drainage, local roads etc.), however, unless specified in the DCPR, these are excluded from the DCP and are the responsibility of individual developments to be delivered through subdivision and development.

3.1 Roads

Road infrastructure upgrades are required to service the future development envisaged by the LSP. This includes the provision of new roads and the upgrading of existing roads.

The following items are included in the DCP for the works associated with road upgrades/construction:
a) Earthworks;
b) The construction and upgrade of the road;
c) Associated drainage work;
d) Traffic control devices;
e) Shared paths;
f) Utility removal, relocation and insertion; and
g) Other associated costs including but not limited to design, administration and project management.

To inform the DCP and to ensure compliance with the need and nexus principles outlined SPP3.6, road infrastructure costs contained within the DCP have been apportioned, where appropriate, in accordance with the percentage of demand informed by the Traffic Modelling Report (TMR) (Appendix A). The TMR determines the origin of demand or generator for upgrades to, or the provision of, the various infrastructure items.

Table 5 below provides a summary of all roads provided for through the DCP and is to be read in conjunction with the Road Infrastructure Map (Figure 5). For further detail please refer to the TMR (Appendix A), Bill of Quantities: Roads Infrastructure (Appendix B) and the 15% Road Designs (Appendix D).

Note:
For the purposes of the draft DCPR, the City will rely on the 15% Road Designs and Cost Estimates. As the DCPR progresses through the statutory planning approval process and more certainty is provided as to the list of roads to be included, the City will commission 85% detailed designs and cost estimates.

This detailed design process will contribute to later phases of the statutory consideration process of the DCP where infrastructure items are identified for inclusion in the DCPR with higher degrees of finality.

Land requirements for road reserve is presented and estimated as a separate item in Land Costs section of this report.

Table 5 - Road Infrastructure Summary

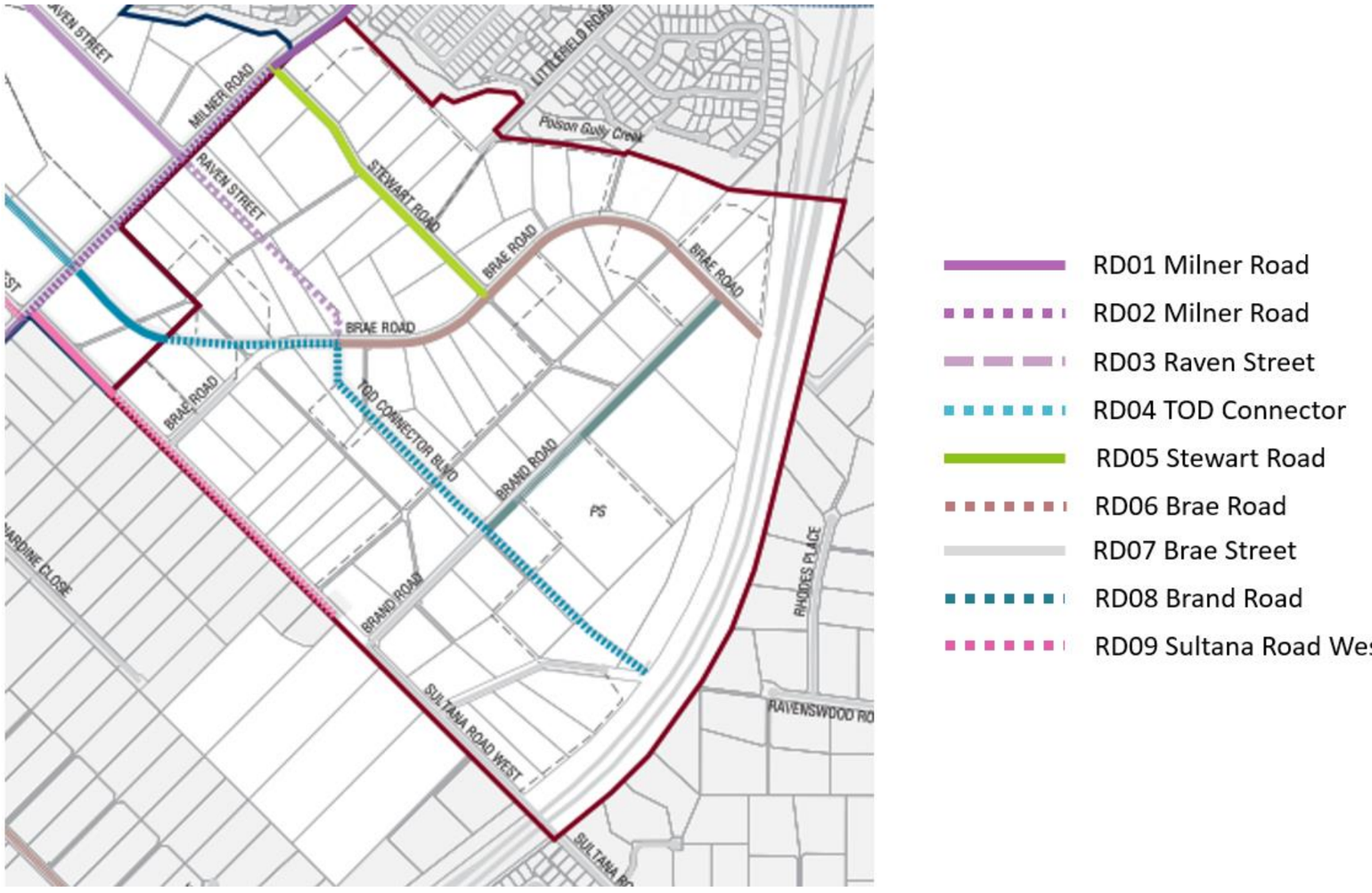
Infrastructure		Summary of works	Proposed configuration	Associated acquisition	Forecast delivery	TOTAL Forecast cost	DCP contribution
RD01	Milner Road (Sultana Road West – Stewart Road)	Milner Road is an existing road and forms a main traffic route from Berkshire Road to Maida Vale Road. For the purposes of the DCP, only the portion from Sultana Road West to Maida Vale Road is included (73%).	The road requires upgrading from a two-way, one-lane undivided carriageway to an Integrator B (two-way, one-lane divided carriageway) .	YES (Acquisition on northern side of Milner Road, outside of DCA2)	2041	$2,718,856.25 for total road segment costed in the BoQ or $1,984,765.06[1] for the section bordering DCA2.	$1,075,147.23 (54.17% of road section adjoining DCA2)
RD02	Milner Road (Stewart Road – Maida Vale Road)	Milner Road is an existing road and forms a main traffic route from Berkshire Road to Maida Vale Road. For the purposes of the DCP, only the portion from Sultana Road West to Maida Vale Road is included (73%).	The road requires upgrading from a two-way, one-lane undivided carriageway to an Integrator B modified (two-way, one-lane divided carriageway).	NO	2041	$1,005,138.24 for total road segment costed in the BoQ or $733,750.91[2] for the section bordering DCA2.	$386,466.61 (52.67% of road section adjoining DCA2)
RD03	Raven Street Connector	The Raven Street connector is a proposed new road identified by the LSP to connect existing Raven Street at Milner Road to the TOD Connector and Brae Road.	The road will be constructed to specifications of a Neighbourhood Connector A (two-way, one-lane divided carriageway).	YES	2031	$1,461,635.52	$1,461,635.52 (100%)
RD04	TOD Connector (Edge of TOD Precinct – Brand Road)	The TOD Connector is a proposed new road and will form a route from Milner Road to Brand Road and potentially further across Roe Highway to connect the future development of Maida Vale South. For the purpose of the DCP only the portion from Brand Road to Milner Road is to be included.	The road will be constructed to specifications of a Neighbourhood Connector A (two-way, one-lane divided carriageway).	YES	2031	$2,653,933.27	$2,653,933.27 (100%)
RD05	Stewart Road (Mil03ner Road - Brae Road)	Stewart Road is an existing road and forms a traffic route from Brae Road to Milner Road.	The road requires upgrading from a two-way, one-lane undivided carriageway to an Neighbourhood Connector A (two-way, one-lane divided carriageway).	YES	2041	$2,409,607.88	$2,409,607.88 (100%)

Infrastructure		Summary of works	Proposed configuration	Associated acquisition	Forecast delivery	TOTAL Forecast cost	DCP contribution
RD06	Brae Road (TOD Connector – Roe Highway)	Brae Road is an existing road and forms a traffic route from Brand Road to Sultana Road West. A portion of Brae Road forms part of the TOD Connector and another portion is to be removed from being a road reserve. For the purpose of the DCP, the funded portion of Brae Road is from Brand Road to where the road becomes the TOD Connector.	The road requires upgrading from a two-way, one-lane undivided carriageway to a Neighbourhood Connector B (Two-way, one-lane undivided carriageway).	NO	2050	$3,732,265.29	$3,732,265.29 (100%)
RD07	Brae Street – Removed through WAPC Modification October 2023	N/A	N/A	N/A	N/A	N/A	N/A
RD08	Brand Road (TOD Connector – Brae Road)	Brand Road is an existing road and forms a traffic route from Sultana Road West to Brae Road.	The road requires upgrading from a Two-way, one-lane undivided carriageway to a Two-way, one-lane undivided carriageway.	NO	2041	$3,023,516.88	$3,023,516.88 (100%)
RD09	Sultana Road West (Edge of TOD Precinct – Cul-de-sac)	Sultana Road West is an existing road and forms a traffic route from the ecological corridor POS to Milner Road. The DCP is to fund 50% of the item with the balance funded through the FFS1 DCP.	No changes are required to the current configuration of two-way, one-lane undivided carriageway.	YES – cul-de-sac	2041	$2,089,023.72	$1,044,511.86[3] (50%)
TOTAL						$15,787,084.54	

NOTES

1. DCA2 only provides for the proportionate section RD01 (547m length) within DCA2 - 398m, or 73% of the total road length. DCP is only providing for funds within the boundaries of DCA2.
2. DCA2 only provides for the proportionate section RD02 (195.6m length) within DCA2 -142m, or 73% of the total road length. DCP is only providing for funds within the boundaries of DCA2.
3. DCA2 provides for a proportionate share of RD20 (50%). The balance will be provided for through DCA1 (Forrestfield North Stage 1 Industrial Area DCP).
4. Land requirements for road reserve is presented and estimated as a separate item in part 2.6 of this report.

Figure 5 - Road infrastructure Map



3.2 Intersections

Intersection infrastructure upgrades are required to service the future development envisaged by the LSP.

The following items are included in the DCP for the works associated with intersection upgrades/construction:

a) Earthworks
b) The construction and upgrade of the intersection
c) Associated drainage work
d) Traffic control devices
e) Shared paths
f) Utility removal, relocation and insertion
g) Associated costs including design, administration and management

To inform the DCP and to ensure compliance with the need and nexus principles outlined in SPP3.6, intersection upgrade costs contained within the DCP have been apportioned, where appropriate, in accordance with the percentage of demand informed by the TMR (Appendix A). The TMR determines the origin of demand or generator for upgrades to, or the provision of, the various infrastructure items.

Table 6 below provides a summary of all roads provided for through the DCP and is to be read in conjunction with the Road Intersection Map (Figure 6). For further detail please refer to the TMR (Appendix A), Bill of Quantities: Roads Infrastructure (Appendix C) and the 15% Road Designs (Appendix D).

Note:
For the purposes of the draft DCPR, the City will rely on the 15% Intersection Designs and Cost Estimates. As the DCPR progresses through the statutory planning approval process and more certainty is provided as to the list of roads to be included, the City will commission 85% detailed designs.

This detailed design process will contribute to later phases of the statutory consideration process of the DCP where infrastructure items are identified for inclusion in the DCPR with higher degrees of finality.

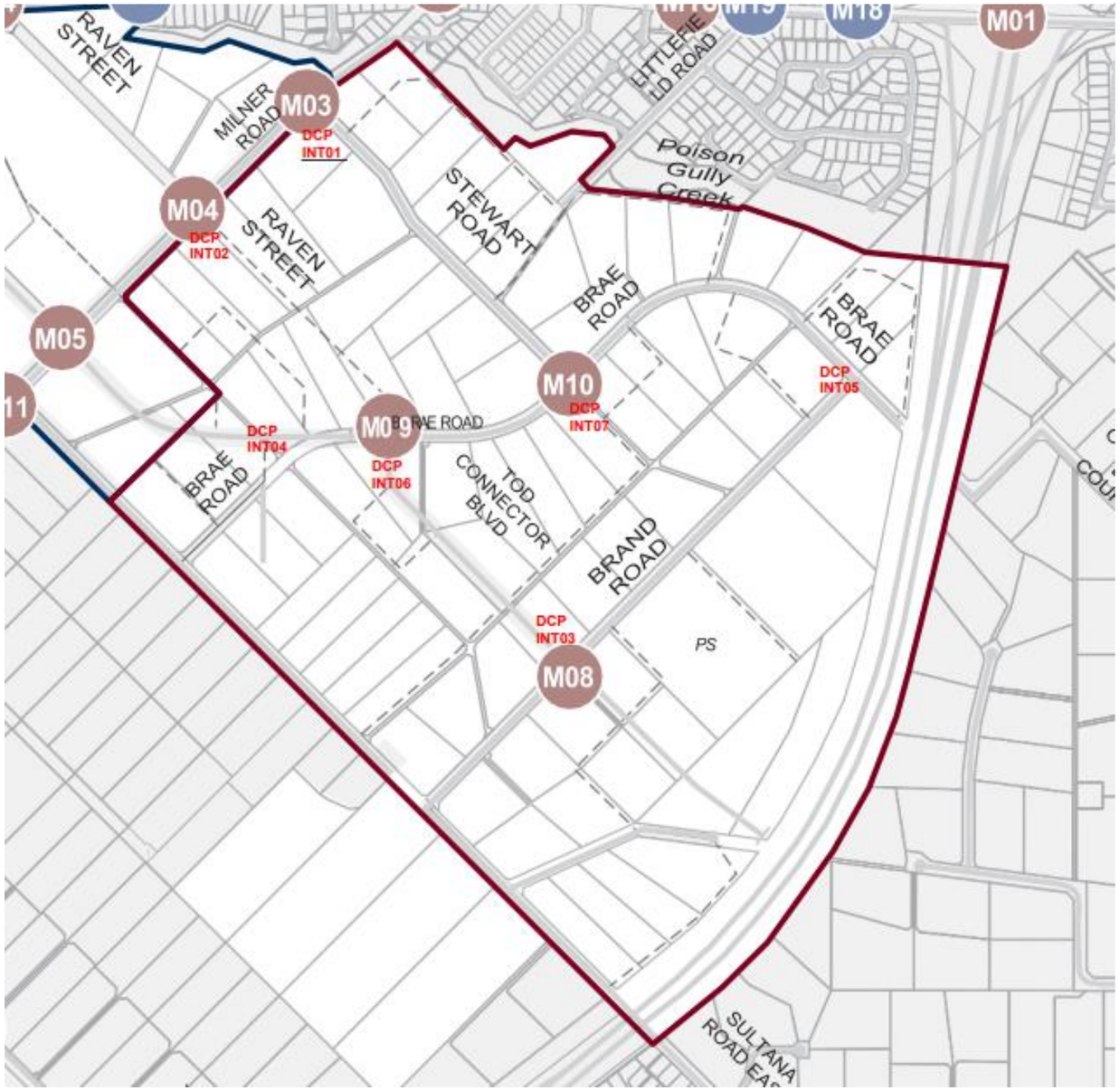
Land requirements for road reserve is presented and estimated as a separate item in the Land Costs section this report.

Table 6 - Intersection Infrastructure Summary

INFRASTRUCTURE		EXISTING CONFIGURATION	PROPOSED CONFIGURATION	ASSOCIATED ACQUISITION	FORECAST DELIVERY	ESTIMATED COST	DCP CONTRIBUTION
INT01	Milner Road / Stewart Road	T-intersection (full movement)	Four-way (roundabout)	YES	2041	$917,319.09	$593,688.92 (64.72%)
INT02	Milner Rd / Raven Street	T-intersection (full movement)	Four-way (roundabout)	YES	2041	$1,141,940.83	$701,494.25 (61.43%)
INT03	TOD Connector / Brand Road	N/A	Four-way (sign-controlled)	YES[1]	2041	$531,856.94	$531,856.94 (100%)
INT04	TOD Connector / Brae Road	N/A	T-intersection (full movement)	YES[2]	2031	$388,540.83	$388,540.83 (100%)
INT05	Brae Rd / Brand Rd	N/A	T-intersection (full movement)	YES[3]	2041/2051	$638,995.68	$638,995.68 (100%)
INT06	TOD Connector / Brae Road, Raven Street	N/A	Four-way (roundabout)	Yes (1005m^2)	2031	$639,942.77	$639,942.77 (100%)
INT07	Brae Rd / Stewart Rd	T-intersection (full movement)	T-intersection (full movement)	NO	2041	$427,499.68	$427,499.68 (100%)
TOTAL						$4,686,095.83	$3,922,019.07

1. Acquisition captured through reservation acquired for RD04 (TOD Connector) and RD08 (Brand Road)
2. Acquisition captured through reservation acquired for RD04 (TOD Connector) and RD06 (Brae Road)
3. Acquisition captured through reservation acquired for RD06 (Brae Road) and RD08 (Brand Road)
4. Land requirements for road reserve is presented and estimated as a separate item in part 2.6 of this report.

Figure 6 - Road Intersection Map



3.3 Public Open Space Improvement

The WAPC Liveable Neighbourhoods Policy requires that a minimum contribution of 10% of the gross subdividable area must be given up free of costs by the subdivider for Public Open Space (POS). In areas of highly fragmented landownership such as HWS, this would result in uncoordinated and smaller parcels of dispersed POS. To avoid this undesirable outcome, the establishment of POS is coordinated and planned through the LSP, with the DCP collecting the necessary funds required to deliver the coordinated POS in lieu of contributions provided through the subdivision process.

When subdividing land in Western Australia, and where POS land is directly vested to the crown, the planning framework requires the entire POS be developed to a minimum 'basic development' standard in accordance with SPP 3.6 and Liveable Neighbourhoods and maintained for a minimum of two summer periods. The same methodology has been applied in the DCP; with POS improvement costs representing $11.72 million or $19.73/m^2.

The District Open Space / Sporting Precinct has been excluded from the concepts and estimates. Environmental Conservation, Bush Forever and Conservation Category Wetland lots have also been excluded, with the exception of a critical pedestrian connection through the Residential Precinct's Bush Forever Lot 01.

Table7 outlines all LOS identified on the LSP & establishes any associated funding through the DCP.

The POS will be delivered in accordance with the minimum requirements outlined in Liveable Neighbourhoods 2009 and further described in the City's Local Planning Policy 32 – Public Open Space. The estimated costs for POS therefore have several exclusions:

a) Land acquisition – see Land Costs section of this report.
b) Headworks required for a potable water supply. The POS requiring potable water supply is a desirable improvement and beyond minimum standard.
c) Hard digging or rock breaking. However, geological mapping by Strategen JBS&G indicates the site is generally sandy (Forrestfield North Residential Precinct LSP, 2.2.1, figure 19) making the likelihood of this occurrence low.
d) Management actions pertaining to Acid Sulphate Soils (ASS) have not been allowed for. However, the risk of ASS occurring within 3 metres of natural ground level has been assessed as low to moderate by Strategen JBS& G (Forrestfield North Residential Precinct LSP, 2.2.1.1, figure 20). Only fine grading (trimming) has been allowed for so as not to disturb natural overland drainage flows or result in tree removal.

The following items are included in the DCP for the works associated with the POS construction:

a) Earthworks
b) Landscaping (including turf, tree planting, furniture, reticulation etc.)
c) Construction of facilities
d) Utility removal, relocation and insertion
e) Associated costs including design, administration and management
f) Drainage – see 2.3.2

The Table 6 below provides a summary of all POS improvements provided for through the DCP and is to be read in conjunction with the POS Overview Map (Figure 7). For further detail please refer to the POS Designs (Appendix E) and Bill of Quantities: POS Improvements (Appendix F).

Further details regarding the land requirements for POS are included in the land costs and apportionment sections of this report.

Table 7 - LOS funded by the DCP

SITE	DCP FUNDED	
	ACQUISITION COSTS	IMPROVEMENT COSTS
POS01	✗[1]	✗[3]
POS02	✗[1]	✓[4]
POS03	✗[2]	✓
POS04	✗[2]	✓
POS05	✗[2]	✓
POS06	✗[2]	✓
POS07	✓	✓
POS08	✓	✓
POS09	✓	✓
DB02	✓	✓
DB03	✓	✓
DB04	✓	✓
DB06	✓	✓
TOD BOULEVARD	✓	✗[5]

Notes:

1. Existing under private Tenure, owned by the City of Kalamunda. The City intends to contribute this site to be used as for future District Open Space.
2. Assumed to be reclassified to 'Parks & Recreation' under the MRS, pursuant to the City's current MRS amendment request, and& consequently funded through the MRIF.
3. District Open Space is generally funded through alternative funding mechanisms (i.e. grant funding). Former land fill site; further environmental investigations required to determine remediation.
4. Partial improvement to 17% of site; balance to remain unimproved until the outcome of the future flyover is known.
5. Improvement costs initially proposed, however proposed to be removed from the 2024 DCP.

Table 8 - Summary of POS costs

INFRASTRUCTURE ITEM		ESTIMATED CONSTRUCTION COSTS*
POS02	Smokebush Place	$444,541.67
POS03	Ecological Corridor (Sultana Road West – TOD Connector)	$1,841,526.42
POS04	Ecological Corridor (TOD Connector – BF01 & EC08)	$4,139,011.52
POS05	Ecological Corridor (BF01 & EC08 – Brae Road)	$585,919.03
POS06	Poison Gully Creek POS (Brae Road)	$675,517.86
POS07	Poison Gully Creek POS (Milner Road)	$80,206.33
POS08	Residential Precinct Town Park	$2,226,302.90
POS09	Littlefield POS / Drainage	$44,564.90
DB-02	Poison Gully Creek Drainage / POS (Brae Road)	$205,149.89
DB-03	Littlefield POS / Drainage	$272,439.37
DB-04	Poison Gully Creek POS (Stewart Road)	$222,925.15
DB-06	Sultana Road West POS	$985,236.33
TOD BLVD	TOD Boulevard POS – Removed through September 2024 DCPR	N/A
TOTALS		$11,723,341.37

*Note: Land costs associated with public open space are outlined in the Land Costs section of the DCPR.

Figure 7 - POS Overview Map



3.3.1 Drainage

The acquisition and construction of various drainage basins throughout the DCA is required to provide for coordinated drainage throughout DCA2.

The management of stormwater is planned to be integrated with POS throughout the precinct, in accordance with Liveable Neighbourhoods:

a) Drainage detained in Local Open Space (LOS) where the area is subject to a greater than 5-year average recurrence;
b) Dedicated drainage sites where the area is subject to a greater than 1-year average recurrence (0.87Ha).

The construction and delivery of coordinated drainage is estimated to cost $2,124,424.19.

The following items are included in the DCP for the works associated with the construction of the drainage basins:

a) Earthworks
b) Landscaping (including turf, tree planting, furniture, reticulation etc.)
c) Construction of facilities
d) Utility removal, relocation and insertion
e) Associated costs including design, administration and management.

Where drainage infrastructure is integrated within road infrastructure, these costs will be assimilated into road items in the DCP.

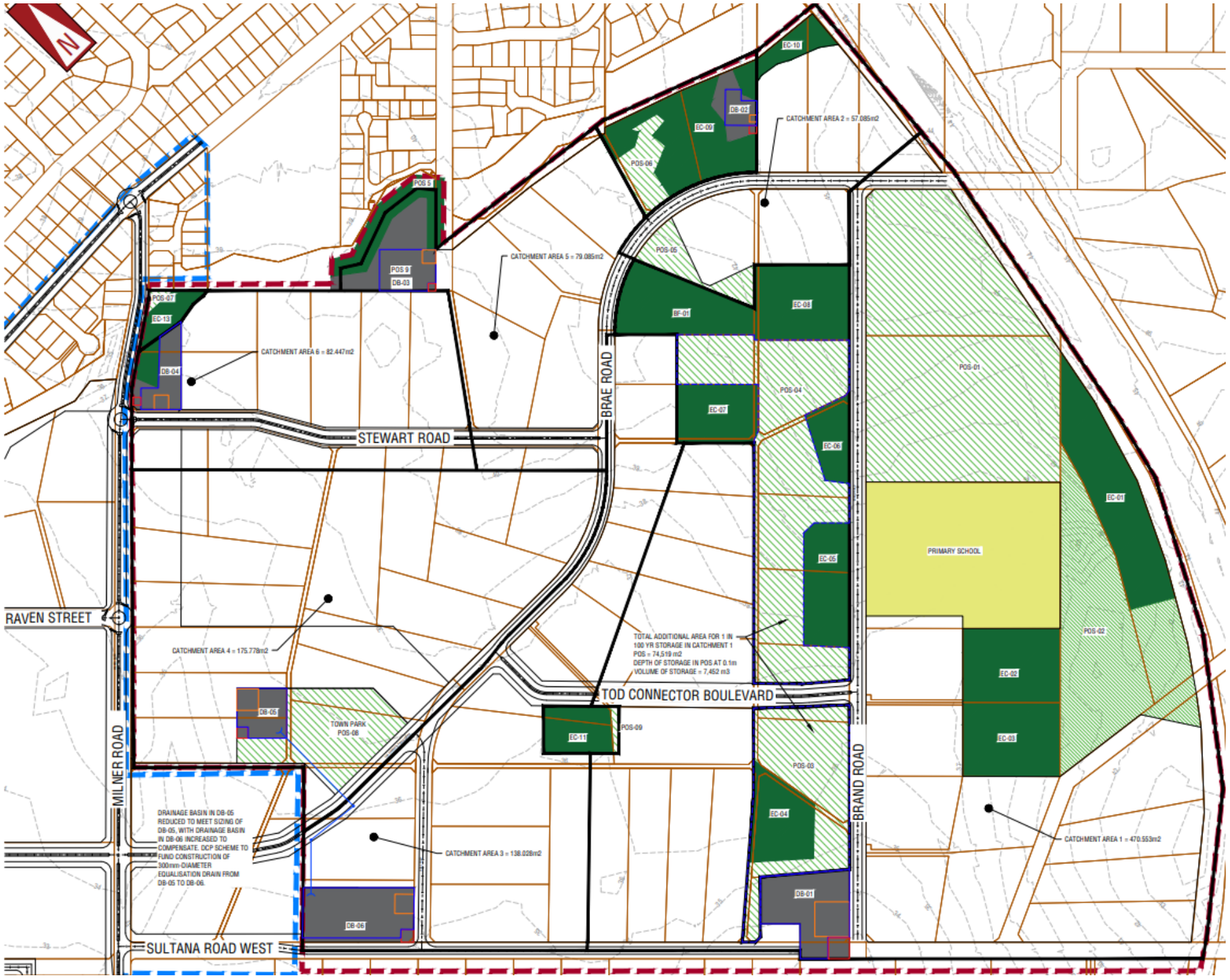
The Table 5 below provides a summary of all drainage infrastructure provided for through the DCP and is to be read in conjunction with the Drainage Layout Map (Figure 8). For further detail please refer to the Catchment Layout Plan (Appendix G) and Bill of Quantities: Drainage Infrastructure (Appendix H).

Further details regarding the land requirements for POS are included in the Land Costs section of this report.

Table 9 - Summary of Drainage Infrastructure Construction Costs

DRAINAGE INFRASTRUCTURE ITEM		ESTIMATED CONSTRUCTION COSTS
DB01	Drainage Ecological Corridor	$910,459.58
DB02	Drainage Poison Gully East	$101,593.23
DB03	Drainage Poison Gully Central	$174,210.09
DB04	Drainage Poison Gully West	$141,716.98
DB05	Drainage Residential Precinct Town Park	$543,560.70
DB06	Drainage Sultana Road West	$252,883.61
TOTAL		$2,124,424.19

Figure 8 - Drainage Layout Map



3.4 Administration Costs

Administrative items include all expended and estimated future costs associated with administrative, planning and development of the LSPs, DCP and any technical documents necessary for the implementation of the above including:

a) Legal and land administration costs;
b) Planning studies;
c) Traffic studies;
d) Drainage studies;
e) Road design costs;
f) Other related technical and professional studies;
g) Borrowing costs (including interest and principal loan repayments); and
h) Scheme Management Costs (including administration and management of the DCA).

The estimated costs for future administrative items is estimated at $2,560,000.00.

A detailed breakdown of the costs is provided in Appendix I.

3.5 Land Costs

The provision of land for certain public purposes is required to facilitate the coordinated and equitable development of the DCA. The DCP provides for the costs associated with land acquisition.

The DCP identifies land currently in private tenure, that will, over the lifespan of the DCP, be required to be transferred to public tenure to facilitate:
a) New or upgraded roads, including road widening;
b) New or upgraded intersections; and
c) LOS and drainage areas identified outside of the Green Link, and which is not already in public ownership (eg. Brand Road).

The Cost Apportionment Schedule (CAS) (Appendix L) categorises and quantifies any land acquisition required to facilitate infrastructure delivery in the DCP.

Appendix K (Land Details) details and illustrates all land requiring acquisition to facilitate infrastructure provided for through the DCP.

An outline of the estimated lands costs is provided in Appendix M.

The total estimated cost for acquisition of land is estimated at $9,346,431.00.

It is important to note that while land acquisition is also required within the LSP to provide for land reserved for regional open space and conservation purposes, these costs will not be funded through the DCP.

3.5.1 Methodology for Establishing Land Estimates

For the purposes of the High Wycombe South Residential Precinct DCA, the englobo land value based on a hypothetical lot will apply to the entire High Wycombe South Residential Precinct DCA.

The DCP imbeds estimates for the cost of land, estimated using:
a) The quantities outlined in the CAS; applied to
b) The land rates established by the land valuation.

The land estimates are reviewed and updated annually, informed by independent land valuations and pursuant to the City's statutory obligations. The following rates have informed the 2024 Land Estimates (Appendix J):
a) $\$150/m^2$ for the Residential Medium Density lots (R30-R60)
b) $\$155/m^2$ for the Residential High Density (R60-R100)

3.5.2 Methodology for Apportioning Acquisition for New Roads

The DCP will provide for Neighbourhood Connector Roads and above, or existing roads that require upgrading as recommended through the TMR and road concept designs.

It is a longstanding practice and policy position of the WAPC to require, where access streets (also referred to as local roads) are needed, subdividers to dedicate, construct and drain these roads at their cost as part of the subdivision process. In this regard, it is not proposed to include access streets as DCP funded infrastructure.

A similar methodology is applied to the acquisition of land associated with road infrastructure. The draft DCP assumes the land, that would have otherwise been provided as an access street (15m width), is to be ceded free of cost, with acquisition beyond this reservation width acquired through the DCP. Therefore, only apportioning costs in the DCP for land required, over and above what otherwise should have been provided for, by the subdivider.

In calculating the estimated costs for road land, this methodology has been applied to the new roads RD03 (Raven Street) and RD04 (TOD Connector). For example, Raven Street requires a 24.4m road reserve width, however 15m of that road reserve width, calculated proportionately for each lot, will be ceded free of cost and will not form a cost to the DCP, however the balance of road area will be acquired by the DCP.

3.5.3 LOS Acquisition Estimates (Excluding the Green Link)

The 'Green Link' contains approx. 7.35ha zoned Urban Development under the LPS3 which are classified as LOS under the LSP, and 3.93ha reserved for Parks and Recreation under the MRS which are classified as Environmental Conservation and Bush Forever under the LSP.

The City is currently seeking for all remaining portions of LOS within the "Green Link" being reserved under the MRS as Parks and Recreation given the significant environmental values that exist throughout the Green Link.

Based on the City's understanding of the environmental values within the green link, the status of land tenure, the overprovision of LOS identified in the LSP, and the unduly high infrastructure costs to facilitate development in the precinct, there is insufficient justification for the purchase of LOS land within the green link to be developer (DCP) funded. Should the MRS Amendment request be supported and approved by the Minister, the entire Green Link would be eligible for acquisition through the MRIF. For this reason, land costs for the Green Link have not been included in the DCP.

The DCP does not include the land acquisition costs for the LOS land within the 'Green Link' (7.35ha) for the following reasons:

a) *Certainty*
The City has initiated an MRS Amendment Request to reclassify the entire Green Link to 'Parks and Recreation'. Whilst the MRS Amendment Request is yet to be determined by the Minister, given the regionally significant biodiversity values that exist within the sites identified as POS within the Green Link, there is no certainty these sites will remain LOS.

b) *Need and nexus*
The DCP, as currently drafted, provides 14 per cent of POS to DCA2, which is surplus to the statutory requirement of 10 per cent. There is no established need and nexus for additional contributions.

c) *Equity*
Subdividers should be levied equitably, based on the relative contribution to need. It would be inequitable to levy landowners within DCA2 surplus to any statutory obligation.

3.5.4 Timing of Acquisition

Landowners can only seek reimbursement for public purpose land at the time land is ceded to the Crown, generally linked to the City's clearance of relevant conditions of subdivision approval and on the basis that funds are available in the form of developer contributions paid into the DCP.

The City may offset the reimbursement for public purpose land ceded against part or all required developer contributions payable on a subject lot, provided the offset does not disadvantage the operational requirements of the DCP.

3.6 Apportionment of Costs

While upgraded infrastructure is necessary to service the development envisaged by the LSP, the infrastructure also services areas and development outside of the LSP. This is particularly relevant for arterial roads and major intersections. It is important that the DCP analysis differentiates the demand and only includes the portion of infrastructure contributions that are attributed to the demand generated by the development envisaged by the LSPs.

Infrastructure costs have been apportioned in accordance with the following principles:

a) Infrastructure upgrades which are a benefit to all landowners will be funded by the DCP as the cost of the provision of this infrastructure is to be equally shared amongst those landowners that receive a benefit from its provision.
b) Traffic modelling was undertaken (Appendix A) to inform the appointment of road infrastructure. The Traffic Modelling Report (TMR) modelled the origin of demand or generator for upgrades to, or the provision of, the various road infrastructure items. The DCP has been drafted using this information and only includes the portion of infrastructure contributions that are attributed to the demand generated by the developed envisaged by the LSP. Three Roads (RD01, RD02 & RD08) and two intersections (INT01 & INT02) have been apportioned in the DCP, based on the findings of the TMR. The apportionment percentage applied is representative of the demand expected to be generated by traffic to and from DCA2. Funds for the balance of the cost will be provided for through other funding mechanisms. Where apportionment is identified for a particular item, it has been applied to both construction and land costs under the DCP.
c) All other road infrastructure in the DCP has been wholly apportioned in the DCP, meaning 100% of cost estimates associated with those infrastructure items is a DCP cost.
d) All POS and drainage improvement costs are established as a requirement through LSPs and fulfill the principles of ‘need and nexus’, and are proposed to be 100% apportioned to the DCP.
e) Local infrastructure, including local road upgrades and the provision of site catchment drainage infrastructure, is to be provided by individual landowners in accordance with a condition of subdivision or development, and in accordance with the relevant planning framework.

The full breakdown of the apportionment of costs is outlined in Tables 5 & 6.

4 Priority and Timing of Infrastructure Delivery

The fragmented land ownership throughout the DCA means that land will be developed in an ad-hoc manner which cannot be accurately forecast.

The unpredictable nature of the timing of development means it is not possible for the City to accurately forecast the implementation of works. Consequently, this is likely to result in the staggered acquisition of public purpose land and the completion of CIW's, both on the basis of availability of funds and the assembly of land needed to contain the works.

The priority and timing of provision will be guided by the following key principles:

a) Ensuring a constant turnover of funds – by managing the cash flow of the DCP, the City can optimise the use of funds between land acquisition and civil works and recoupment for developer pre-funding.
b) Prioritising the purchase of land identified for public purposes that encompassed all of, or a substantial portion of, one landholding.
c) Constructing infrastructure on an "as needs" basis to facilitate development – this is especially apparent in the context of road upgrades/drainage works.
d) Undertaking works and land acquisition in areas of fragmented ownership – this assists in the successful and coordinated development of these areas. In areas of consolidated ownership, most infrastructure and land is provided by the developer as offsets to cost contributions.
e) Grant funding opportunities – the City will actively seek grant funding to assist in the provision of DCP infrastructure. In most instances, the use of grant funding is reliant on the City providing matching or partial contribution. The City may utilise DCP funds to elevate the priority and timing of an infrastructure item to capitalise on grant funding opportunities. This approach is beneficial to the long-term financial viability of the DCP.

Tables 5 and 6 provide a forecast to the delivery of road infrastructure informed by the Traffic Modelling Report (Appendix A) prepared by KCTT in 2022.

The assessment of the priority and timing of infrastructure will constantly evolve over the life of the DCP and will be assessed at each annual DCP review as a minimum, in parallel with forward financial planning and annual budgeting processes.

4.1 Delivery of Infrastructure

The infrastructure included in the DCP will be delivered via one or a combination of the following methods:

a) Delivered by the City as part of its capital works program utilising funds from the DCP and alternative funding from grants and municipal sources;
b) Delivered by a develop under agreement with an offset against the developer's cost contribution liability, and where necessary under a pre-funding agreement.

5 Method for Calculating Contributions

This section sets out the methodology for determining the development contributions applicable within for the purposes of Clause 6.5 and Schedule 12 of LPS3. The DCA2 is characterised by a single precinct and development contributions are made on a 'per square metre' basis.

Schedule 12 of LPS3 sets out the method for calculating contributions as follows:

$$\text{Contribution rate} = \frac{\text{Cost of infrastructure items + cost of administrative items (\$)}}{\text{Net lot area of DCA (m}^2\text{)}}$$

5.1 Cost Inputs

Cost Input	DCP Total $	$/m^2
Cost of infrastructure & land estimates	$42,903,300.17	$72.32
Cost of administrative estimates	$2,560,000.00	$4.31
Total	$45,463,300.17	$76.52

$$Contribution\ rate\ (\$76.52)$$

=

$$\frac{\text{Infrastructure estimates (\$42,903,300.17)} + \text{Administration estimates (\$2,560,000.00)}}{NCA\ (594{,}129sqm)}$$

5.2 Area Inputs

The transformation of the DCA from Rural to Medium-High Density Residential requires the coordination of upgrades to existing infrastructure and the delivery of new infrastructure. This DCP facilitates the required coordination, with the total cost of the DCP equally distributed among landowners in the NCA.

Contributions are payable for all developable land within the DCA. Developable land is considered to be all land within the DCA, exclusive of land excluded as detailed below. This figure is referred to as the Net Contribution Area (NCA), discussed further under 5.2.1 Land Area Deductions below.

5.2.1 Land Area Deductions (NCA)

Development Contributions are payable for all developable land within the DCA. Developable land is all land within the DCA, exclusive of land excluded as detailed below. This figure is referred to as the Net Contribution Area (NCA).

In calculating a landowners NCA and the total area of land in the DCA that is liable to this DCP, the following land is identified as unavailable for development and therefore excluded from the NCA due to:

a) Classification as 'Environmental Conservation';
b) Classification as 'Local Open Space';
c) All roads identified on the HWS LSP Map, inclusive of widening and realignment requirements;
d) Drainage basins required in accordance with the approved Local Water Management Strategy;
e) Land identified for other public purposes (i.e. Primary School site); and
f) Portions of land which are otherwise constrained for development due to their size, shape, tenure and access limitations.

The DCP has a total NCA of 594,129m^2.

Appendix L outlines the NCA applicable to each lot contained within DCA2.

6 Payment of Contributions

Pursuant to LPS3, conditions relating to development contribution requirements can, to the satisfaction of the City, be satisfied by:

a) The ceding of land;
b) The construction of infrastructure works which are transferred to public authorities on completion;
c) The provision of monetary contributions to acquire land or undertake works by the City, public authorities or others; or
d) A combination of the above.

6.1 Credits

There may be instances in which DCP infrastructure and land is required upfront during subdivision and development within the High Wycombe Residential Precinct DCA.

Subdivision and development approvals may also require that work be undertaken creating a contribution or provision of infrastructure prior to the delivery of that infrastructure item being priorities or identified for delivery in the DCP.

In this instance, the landowner and the City will negotiate in relation to a credit. Appropriate negotiated outcomes may include:

a) Where a landowner has other land holdings in the area, the credit is held until it is required to be used by the landowner to offset future contributions;
b) Where a landowner has no further holdings in the area, the amount is held as a credit to the landowner until payments into the DCP are received from subsequent landowners. The credit is then reimbursed to the landowner at an appropriate time and in accordance with the Schedule of Priority and Timing of Infrastructure identified in this DCPR. If other infrastructure works are prioritised over the infrastructure making up the credit, the landowner will be required to hold the credit until such time as the infrastructure is identified in the Schedule of Priority and Timing of Infrastructure;
c) Where the DCA is in credit from development contributions already received, the credit can be reimbursed on completion of the works/ceding of land in accordance with the Schedule of Priority and Timing of Infrastructure; or
d) Another arrangement as agreed to by the landowner and City.

Indexing of the development contribution rate will be equally applied to credits as annual reviews are undertaken.

Interest is not paid on DCP credits.

7 Review

The estimated infrastructure costs as shown in the CAS will be reviewed at least annually to reflect changes in funding and revenue sources and indexed based on the Building Cost Index or other appropriate index as approved by the qualified person undertaking the certification of cost.

Schedule 12 within LPS3 will be reviewed every five years from the date of gazettal of the local planning scheme amendment to LPS3 to incorporate the plan, or earlier should the local government consider it appropriate, having regard to the rate of development in the area and the degree of development potential existing.

8 Appendices

Appendix A – Traffic Modelling Report

Transport Modelling to Inform Development Contribution Plan Apportionment

High Wycombe South DCP

March 2023

Rev 2

Transport Modelling Report DCP
KC00604.000 High Wycombe South

HISTORY AND STATUS OF THE DOCUMENT

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Rev 2	24.03.2023	City of Kalamunda	City of Kalamunda	24.03.2023	DCP Finalisation

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Rev B	09.11.2021	1 (PDF)	
Final	01.02.2022	1 (PDF)	
Rev 1	25.03.2022	1 (PDF)	
Rev 2	24.03.2023	1 (PDF)	**City of Kalamunda**

Disclaimer: *The Transport Modelling Report (TMR) has been developed for the purpose of being a 'point-in-time' guiding document with respect to, the High Wycombe South Residential Precinct Development Contribution Plan. Without limiting the purpose of the TMR, the City does not represent, warrant, undertake or guarantee that the contents of this TMR will lead to any particular outcome or result. All recommendations contained within this TMR are subject to State Planning Policy 3.6 and any other relevant legislation and/or Policy and final consideration by the City, the Council, the Department of Planning, Lands and Heritage, Western Australian Planning Commission and any other relevant party.*

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Table of Contents

1 Executive Summary 5

2 Background 7

2.1 Background of the project 7
2.2 Purpose of Modelling and This Report 7
2.3 General Structure of This Report 7
2.4 Scope of Works and Literature 7
2.4.1 General Scope of Works 7
2.4.2 Additional Literature and Sources Used 8
2.4.3 Glossary of Abbreviations 8

3 Methodology of the Modelling 9

3.1 Overview 9
3.2 Methodology of Data Collation 9
3.3 Methodology of Traffic Modelling 9
3.4 Consultation With External Stakeholders 9

4 Input Analysis 10

4.1 Overview 10
4.2 Existing Traffic on Network and Network Configuration 10
4.2.1 Currently Available Traffic Count Data 10
4.2.2 Existing Bus Routes 10
4.3 Traffic Generation / Attraction Rates 11
4.4 Anticipated Changes in High Wycombe South Project Area and Vicinity 12
4.4.1 High Wycombe South Project Area – Residential Land Use 12
4.4.2 Non-Residential Land Use 12
4.4.3 Traffic Generation / Attraction – Non-Residential Uses 13
4.5 Regional Operational Model (ROM) and Metropolitan Land Use Forecasting System MLUFS) Data 14

5 Findings of Network and Intersection Modelling 15

5.1 Network Configuration 15
5.2 Intersection Configuration 17

6 Impact on Cost Apportionment 18

6.1 Basis of the Apportionment (State Planning Policy 3.6) 18
6.2 Addressing Key Principles of SPP 3.6 19
6.3 Key Network Links 21
6.4 Key Intersections 32

Tables

Table 1 – Status Liaison Activities (State Government Agencies) 9
Table 2 - Current Traffic Counts 10
Table 3 - Current public transport availability 10
Table 4 – Vehicular traffic generation / attraction rates per land use 11
Table 5 - Population and Dwelling Forecasts - High Wycombe South Project Area (source: element WA) 12
Table 6 - Estimated Rate of Build-Out (source: City of Kalamunda/Development WA) 12
Table 7 - Dwelling Forecasts – High Wycombe South Project Area (source: element WA) 12
Table 8 - Traffic Generation - Residential Land Use 12
Table 9 – Commercial Land Use in TOD Precinct (source: City of Kalamunda/Development WA) 12
Table 10 - Distribution of Non-Residential Land Uses Across TOD Development Cells 13
Table 11 - Retail Land Use - Traffic Attraction / Generation 13
Table 12 – Medical and Childcare Use Land Use - Traffic Attraction / Generation 13
Table 13 – High Wycombe Railway Station - Traffic Attraction / Generation 13
Table 14 - Commercial Use Land Use - Traffic Attraction / Generation 13
Table 15 – Community Land Use - Traffic Attraction/Generation 14
Table 16 – Primary School - Traffic Attraction / Generation 14
Table 17 - High Wycombe South Industrial Zone - Vehicular Traffic Attraction / Generation 14
Table 18 - Timing of Upgrades - Road Network 15
Table 19 - Timing of Upgrades - Intersections 17
Table 20 - Addressing SPP 3.6 Principles 19

Figures

Figure 1 - High Wycombe South Project Area Precincts (TOD and Residential) (source: element WA) 7
Figure 2 - Transport Modelling Methodology - Process Overview 9
Figure 3 - TOD Precinct Plan (source: element WA) 12
Figure 4 - Residential Precinct Plan (source: element WA) 12

Appendices

Appendix 1 – Methodology for Transport Modelling to Inform Development Contribution Plan Apportionment Analysis

Appendix 2 – Development Contribution Plan Modelling – Input Analysis Report

Appendix 3 – Transport Network Modelling to Inform Development Contribution Plan Apportionment Analysis

Appendix 4 – Intersection Modelling to Inform Development Contribution Plan Apportionment Analysis

1 Executive Summary

This report was prepared to summarise findings of a transport model for High Wycombe South Project Area comprising Residential Precinct and TOD Precinct. The transport model was prepared specifically to assist in preparation of Development Contribution Plan for the Residential Precinct. Key road corridors and intersections were assessed. Triggers for infrastructure upgrades were determined based on the preliminary assumption of Structure Plan build-out; however, practically they will depend on the uptake in particular areas of the structure plan.

The table below summarises the upgrade requirements, land acquisition requirements and impact split per precinct. As discussed further in the report, if the precinct generates 10% or more of projected daily traffic on a road link or an intersection, contributions could be considered. Infrastructure items outside the Residential Precinct are not recommended to be included within the Residential Precinct DCP. Items within the Residential Precinct are subject to the principles of State Planning Policy 3.6 and consideration by the City and WAPC.

	Upgrades triggered in 2031									
Year	**Infrastructure Element**		**DCP ref**	**TMR ref**	**Current Configuration**	**Proposed Configuration**	**Land Acquisition Required**	**Residential Precinct %**	**TOD Precinct %**	**DCP Item**
2031	R	Dundas Road (Maida Vale Road - Sorensen Road)		**[RD8]**	Two-way, one-lane undivided carriageway	Integrator B modified (two-way, one-lane divided carriageway)	No	15.25%	10.16%	No
	R	Dundas Road (Berkshire Road - Dundas Road Old)		**[RD7]**	Two-way, one-lane undivided carriageway	Integrator B modified (two-way, one-lane divided carriageway)	No	0.00%	2.00%	No
	R	Dundas Road (Berkshire Road - Harrison Road)		**[RD6]**	Two-way, one-lane undivided carriageway	Integrator B modified (two-way, one-lane divided carriageway)	No	7.73%	3.22%	No
	R	TOD Connector (Milner Road - Enterprise Boulevard)		**[RD14]**	The road doesn't exist at present	* Neighbourhood Connector A (two-way, one-lane divided carriageway)	Yes	0.00%	60.82%	No
	R	TOD Connector (Milner Road - Edge of TOD Precinct)		**[RD15]**	The road doesn't exist at present	* Neighbourhood Connector A (two-way, one-lane divided carriageway)	Yes	69.40%	17.51%	No
	R	TOD Connector (Edge of TOD Precinct – Roe Highway)	**RD04**	**[RD16]**	The road doesn't exist at present	* Neighbourhood Connector A (two-way, one-lane divided carriageway)	Yes	100.00%	0.00%	Yes
	R	Raven Street (Milner Road - Brae Road)	**RD03**	**[RD13]**	The road doesn't exist at present	* Neighbourhood Connector A (two-way, one-lane divided carriageway)	Yes	100.00%	0.00%	Yes
	I	M01 - Roe Highway / Maida Vale Road		**[INT02]**	Half - Interchange	Half - Interchange	No	18.85%	14.36%	No
	I	M15 - Dundas Road / Old Dundas Road (North)		**[INT06]**	T-intersection, full movement	Signalised Intersection	No	16.46%	7.85%	No
	I	M25 - Dundas Road / Dundas Road (South)*		**[-]**	T-intersection, full movement	T-intersection, full movement	No	0.00%	2.32%	No

Notes 2031:

- Berkshire Road will trigger the requirement for upgrade to Integrator B carriageway in 2031; however, given that by 2041 it will require more substantial upgrade, it is assigned to a trigger year 2041.
- TOD Connector and Raven Street (south of Milner Road) don't exist at present. Although in 2031 both roads will carry traffic volumes appropriate for an Access Street, we have recommended the construction of the ultimate geometry to avoid unnecessary re-work and disruption to residents and businesses.
- The intersection Dundas Road / Dundas Road (South) does not require upgrading per se; however, the adjustment of the intersection is required once Dundas Road is upgraded.

	Upgrades triggered in 2041									
Year	**Infrastructure Element**		**DCP ref**	**TMR ref**	**Current Configuration**	**Proposed Configuration**	**Land Acquisition Required**	**Residential Precinct %**	**TOD Precinct %**	**DCP Item**
2041	R	Berkshire Road (Roe Highway – Milner Road)		**[RD1]**	Two-way, one-lane undivided carriageway	Integrator A modified (two-way, two-lane divided carriageway)	Yes	15.96%	8.62%	No
	R	Maida Vale Road (Dundas Road - Raven Street)		**[RD5]**	Two-way, one-lane undivided carriageway	Integrator B modified (two-way, one-lane divided carriageway)	No	47.24%	11.88%	No
	R	Maida Vale (Raven Street - Milner Road)		**[RD4]**	Two-way, one-lane undivided carriageway	Integrator B modified (two-way, one-lane divided carriageway)	No	0.72%	24.06%	No
	R	Maida Vale (Milner Road – Roe Highway)		**[RD3/3A]**	Two-way, one-lane undivided carriageway	Integrator B modified (two-way, one-lane divided carriageway)	No	37.42%	17.25%	No
	R	Milner Road (Stewart Road - Maida Vale Road)	**RD02**	**[RD10]**	Two-way, one-lane undivided carriageway	Integrator B modified (two-way, one-lane divided carriageway)	No	52.67%	17.75%	Yes
	R	Milner Road (Sultana Road West - Stewart Road)	**RD01**	**[RD2]**	Two-way, one-lane undivided carriageway	Integrator B (two-way, one-lane divided carriageway)	Yes	54.17%	11.34%	Yes
	R	Milner Road (Berkshire Road - Sultana Road West)		**[RD9]**	Two-way, one-lane undivided carriageway	Integrator B modified (two-way, one-lane divided carriageway)	No	42.06%	14.81%	No
	R	Sultana Road West (TOD Connector – Milner Road)		**[-]**	Two-way, one-lane undivided carriageway	Two-way, one-lane undivided carriageway	No	0.00%	100.00%	No
	R	Sultana Road West (Milner Road – Edge of TOD Precinct)		**[RD20]**	Two-way, one-lane undivided carriageway	Two-way, one-lane undivided carriageway	No	57.75%	12.98%	No
	R	Sultana Road West (Edge of TOD Precinct – Cul-de-sac)	**RD09**	**[RD20]**	Two-way, one-lane undivided carriageway	Two-way, one-lane undivided carriageway	No	100.00%	0.00%	Yes
	R	Stewart Road (Milner Road - Brae Road)	**RD05**	**[RD17]**	Two-way, one-lane undivided carriageway	Neighbourhood Connector A (two-way, one-lane divided carriageway)	Yes	100.0%	0.00%	Yes
	R	Raven Street (Maida Vale Road - Milner Road)		**[RD12]**	Two-way, one-lane undivided carriageway	Neighbourhood Connector A (two-way, one-lane divided	Yes	64.83%	18.64%	No

					carriageway)				
R	Enterprise Boulevard(TOD Connector – Maida Vale Road)*		**[RD11]**	Under construction.	Neighbourhood Connector A (two-way, one-lane divided carriageway)	No	0.00%	100.00%	No
R	Brand Road(TOD Connector – Brae Road)**	**RD08**	**[RD19]**	Two-way, one-lane undivided carriageway	Two-way, one-lane undivided carriageway	No	100.00%	0.00%	Yes
I	M02 - Maida Vale Road / Milner Road		**[INT01]**	T-intersection, full movement	Roundabout	Yes	33.35%	23.20%	No
I	M03 - Milner Road / Stewart Road	**INT01**	**[INT18]**	T-intersection, full movement	Roundabout	Yes	64.72%	14.74%	Yes
I	M04 - Milner Road / Raven Street	**INT02**	**[INT17]**	T-intersection, full movement	Roundabout	Yes	61.43%	17.89%	Yes
I	M05 - Milner Road / TOD Connector		**[INT05]**	The intersection doesn't exist at present	Signalised Intersection	Yes	41.24%	16.36%	No

			Upgrades triggered in 2041							
Year	**Infrastructure Element**		**DCP ref**	**TMR ref**	**Current Configuration**	**Proposed Configuration**	**Land Acquisition Required**	**Residential Precinct %**	**TOD Precinct %**	**DCP Item**
	I	M06 - Milner Road / Berkshire Road /Dundas Road		**[INT15]**	T-intersection, full movement	Roundabout	Yes	17.23%	7.70%	No
	I	M07 - Berkshire Road / Roe Highway*		**[-]**	Interchange	Interchange	n/a	2.00%	1.20%	No
	I	M08 - TOD Connector / Brand Road	**INT03**	**[INT16]**	The intersection doesn't exist at present	Four-way, sign controlled	Yes	100.00%	0.00	Yes
	I	M09 - TOD Connector / Brae Road / Raven Street	**INT06**	**[INT14]**	The intersection doesn't exist at present	Four-way, sign controlled, full movement* (roundabout)	Yes	100.00%	0.00%	Yes
	I	M10 - Brae Road / Stewart Road	**INT07**	**[INT09]**	T-intersection, full movement	T-intersection, full movement	No	100.00%	0.00%	Yes
	I	M11 - Milner Road / Sultana Road West		**[INT07]**	Two staggered T-intersection, full movement	Intersection east of Milner Rd to be configured as Left In Left Out Right In	Yes	54.60%	11.53%	No
						Sultana Rd West (west of Milner Rd) to be converted to Cul-De-Sac;		0.00%	100.00%	No
	I	M12 - Maida Vale Road / Dundas Road / Parking Access*		**[INT14]**	Roundabout	Roundabout	No	21.87%	8.75%	No
	I	M13 - Maida Vale Road / Enterprise Boulevard*		**[INT12]**	T-intersection, full movement	T-intersection, full movement	No	36.91%	17.55%	No
	I	M14 - Maida Vale Road / Raven Street		**[INT13]**	The intersection doesn't exist at present	T-intersection, full movement	Yes	37.82%	19.60%	No
	I	M16 - Maida Vale Road / Newburn Road		**[INT03]**	T-intersection, full movement	Roundabout	Yes	37.72%	22.47%	No
	I	M17 - Maida Vale Road / Butcher Road*		**[-]**	T-intersection, full movement	T-intersection, full movement	No	0.63%	20.91%	No
	I	M18 - Maida Vale Road / Plover Road*		**[-]**	T-intersection, full movement	T-intersection, full movement	No	37.13%	26.04%	No
	I	M19 - Maida Vale Road / Littlefield Road*		**[-]**	T-intersection, full movement	T-intersection, full movement	No	36.52%	25.62%	No
	I	M20 - Milner Road / Nardine Close		**[INT08]**	T-intersection, full movement	Left in Left Out Right In	No	41.57%	11.73%	No
	I	M21 - Berkshire Road / Bonser Road*		**[-]**	T-intersection, full movement	Left in Left Out	No	15.80%	8.50%	No
	I	M22 - Berkshire Road / Ashby Close*		**[-]**	T-intersection, full movement	Left in Left Out	No	13.33%	8.10%	No
	I	M23 - Berkshire Road / Walters Way*		**[-]**	T-intersection, full movement	Left in Left Out	No	14.78%	8.44%	No
	I	M24 - Berkshire Road / Harrison Road*		**[-]**	T-intersection, full movement	Left in Left Out	No	13.65%	8.30%	No

Notes 2041:

- Sections of Maida Vale Road may trigger Neighbourhood Connector A requirement by 2031; however, the upgrade is recommended by 2041. The cross-section was modified to minimise disturbance to the existing residences. Intersection along Maida Vale Road denoted with "*" do not require an upgrade per se, however adjustments will be required to accommodate Maida Vale Road upgrade. The intersection Maida Vale Road / Dundas Road / Parking Access will not require an upgrade; however, adjustment will be required to accommodate upgrade of Maida Vale Road and Dundas Road.
- Similarly, sections of Milner Road may trigger Neighbourhood Connector A requirement by 2031; however, the upgrade is recommended by 2041 in its ultimate configuration – Integrator B. Sections of Milner Road are modified Integrator B to minimise the impact on the existing operating businesses and Poison Gully Creek heritage area.
- Enterprise Boulevard will be constructed as a part of railway works, and no further major upgrades are likely to be required by the end of 2050. In 2041, Enterprise Boulevard is expected to reach the traffic warranting its configuration.
- The Berkshire Road / Roe Highway interchange may require an upgrade as a result of growing passing traffic.
- The intersection TOD Connector / Brae Road / Raven Street was modelled as a four-way, sign controlled intersection as the traffic demand was fairly low and this configuration retained LOS A for the lifetime of the DCP. Subsequently, preliminary engineering design revealed this configuration cannot be implemented appropriately due to the existing road alignments, therefore the intersection is proposed to be configured as a roundabout. The percentage of traffic and therefore proportional costs remain the same.
- Berkshire Road is likely to require an upgrade to Integrator B in 2031; however, the upgrade is recommended in 2041 to a modified Integrator A configuration. The modification pertains to landtake required to facilitate two lane divided carriageway suitable for RAV vehicles. Intersections along Berkshire Road should be reconfigured as Left In Left Out and will not require land to be acquired in addition to the requirement associated with the road widening.
- Brand Road will require an upgrade at the time when primary school is constructed.

			Upgrades triggered in 2050							
Year	**Infrastructure Element**		**DCP ref**	**TMR ref**	**Current Configuration**	**Proposed Configuration**	**Land Acquisition Required**	**Residential Precinct %**	**TOD Precinct %**	**DCP Item**
2050	R	Brae Road (TOD Connector – Roe Highway)	**RD06**	**R18**	Two-way, one-lane undivided carriageway	Neighbourhood Connector B (Two-way, one-lane undivided carriageway)	No	100.00%	0.00%	Yes

	Notes 2050: Brae Road is expected to reach the traffic volume warranting Neighbourhood Connector B configuration in 2050. Practically, it is likely that Brae Road will be progressively upgraded as adjacent land is developed.

2 Background

2.1 Background of the project

The High Wycombe South Project Area (formerly known as Forrestfield North) is within the City of Kalamunda, near the under-construction High Wycombe Railway Station, which opened in 2022. West Australian Planning Commission (WAPC) approved District Structure Plan (DSP) for High Wycombe South Project Area on 29 September 2016.

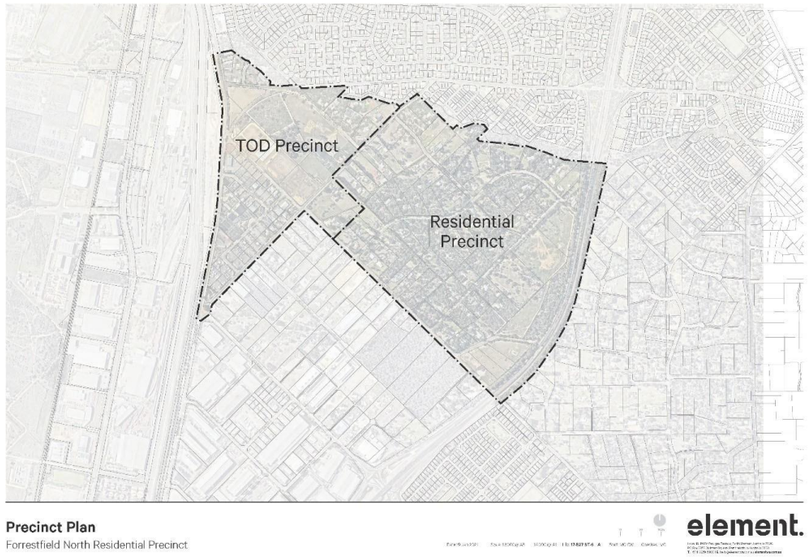


Figure 1 - High Wycombe South Project Area Precincts (TOD and Residential) (source: element WA)

This area includes two major precincts with separate structure plans – Residential Precinct Local Structure Plan (LSP) and Transit-Oriented Development (TOD) Precinct Activity Centre Structure Plan (ACSP). While the Residential Precinct will feature a Primary School, District Open Space, and various residential dwellings, the TOD Precinct will likely feature a mix of commercial and residential uses and a community hub following detailed planning by Development WA. Given that the DSP area is over 200ha, the traffic impact on the surrounding network will be exceptionally high.

The High Wycombe South Residential Precinct LSP was endorsed by WAPC on 27 July 2020. In collaboration with Development WA, the City of Kalamunda and their consultant team are currently preparing the High Wycombe South ACSP. An amendment to the High Wycombe South Residential Precinct Local Structure Plan is being progressed by the City of Kalamunda. The DCP has been prepared to reflect the proposed amendments in the draft LSP.

2.2 Purpose of Modelling and This Report

As major infrastructure upgrades are required to cater for developments of this scale, a robust traffic model must be prepared to assess road network requirements adequately. While KCTT has prepared transport modelling for the Residential Precinct and the District Structure Plan in the past, the purpose of this model is first and foremost to quantify and apportion the impact on the existing network, determine the extent of required upgrades, and allow for the preparation of the Development Contribution Plan.

Modelling prepared for High Wycombe South Residential Precinct LSP focused on the maximum possible build-out. However, to appropriately assess development demand and estimate required infrastructure, modelling for Development Contribution Plan focuses on the most realistic outcome. This model builds on models developed throughout the project, and therefore network and intersection modelling are developed in microsimulation packages.

Modelling is prepared for 2031 (15% of the development completed), 2041 (65% of development completed) and 2050+ (100% of development completed) horizon years. Further to this, the network model was finetuned and developed down to the individual cell level to assess the impact on all internal roads.

This report will outline network and intersection modelling findings and the apportionment of impact for each precinct on each infrastructure element.

2.3 General Structure of This Report

This report will have five (5) main sections.

Section 1 – Background – provides a brief overview of the past activity on this project and the purpose of this modelling and reporting exercise.

Section 2 – Methodology of the Modelling – summarises approaches and methods for data collection and preparation of network and intersection models, as documented in Appendix 1 of this report.

Section 3 – Input Analysis – Outlines key information used for modelling. Appendix 2 of this report provides full documentation on the consideration and selection of data for modelling.

Section 4 – Findings of Network and Intersection Modelling – provides an overview of the anticipated development impact on the infrastructure. A very condensed section provides basic upgrade requirements, estimated timeframe for the upgrade, and land acquisition impact.

Section 5 – Impact on the Cost Apportionment – discusses elements of the SPP 3.6 applicable to this process. Further on, this section provides a summary of each precinct's impact on each road and intersection. Spatial plans are also provided to enable easier correlation of the proposed upgrades and location of the infrastructure elements.

2.4 Scope of Works and Literature

2.4.1 General Scope of Works

The scope of works for this project was defined in a document titled "*Scope of Works: Forrestfield North Development Contribution Plan (DCP) – Work Required to Prepare DCP*", prepared by the City of Kalamunda in July 2020. Development WA reviewed this document.

2.4.2 Additional Literature and Sources Used

Documents:

- Forrestfield North – District Structure Plan
- Forrestfield North – Residential Precinct Structure Plan, July 2020
- Transport Impact Assessment Guidelines (set), WAPC 2016
- Operational Modelling Guidelines, MRWA 2021
- Transport Modelling Guidelines for Activity Centre Structure Plans, DoT 2016
- Australian Transport Assessment and Planning Guidelines, ATAP 2016
- NSW RTA Guidelines to Traffic Generating Developments, NSW RTA 2002 (updated in 2013)
- Forrestfield North Development Contribution Plan - Yield Analysis, Surrounding Development Projections, City of Kalamunda, April 2021
- Forrestfield Station Multi-Storey Car Park, Traffic Impact Assessment, Aurecon (PTA), September 2019
- ROM24 Model Plots provided by MRWA in December 2020 and in 2016 for purposes of DSP modelling
- ROM24 Model Link volume plots provided by MRWA in July 2021
- MLUFS population projections, provided to KCTT in December 2020
- High Wycombe Station Precinct Retail & Commercial Assessment, Urbis (development WA), April 2021
- High Wycombe Station Access Strategy, GHD (PTA), April 2021
- State Planning Policy 3.6 – Infrastructure Contributions, WAPC, April 2021

Sources

- City of Kalamunda Community ID
- Australian Bureau of Statistics
- Main Roads WA Portal

2.4.3 Glossary of Abbreviations

- AADT (Average Annual Daily Traffic)
- Precinct Activity Centre Structure Plan (ACSP)
- AS (Access Street – Liveable Neighbourhoods)
- DOS (District Open Space)
- DoT (Department of Transport)
- DPLH (Department of Planning, Lands and Heritage)
- DSP (District Structure Plan)
- FFN (Forrestfield North)
- GEH (Goodness of fit measure)
- HWS (High Wycombe South)
- IA (Integrator A – Liveable Neighbourhoods)
- IB (Integrator B – Liveable Neighbourhoods)
- LSP (Local Structure Plan)
- MLUFS (Metropolitan Land Use Forecasting System)
- MRWA (Main Roads Western Australia)
- NCA / NCB (Neighbourhood Connector A /B – Liveable Neighbourhoods)
- OMG (Operational Modelling Guidelines)
- PTA (Public Transportation Authority)
- ROM24 (Regional Operational Model)
- TOD (Transit Oriented Development)
- STEM (Strategic Transport Evaluation Model)
- VPD (Vehicles Per Day)
- VPH (Vehicles Per Hour)

3 Methodology of the Modelling

3.1 Overview

KCTT prepared a document "*Methodology for Transport Modelling to Inform Development Contribution Plan Apportionment Analysis*" in February 2021 for the City of Kalamunda and the stakeholder group outlining the process and the sequence of all actions related to the transport modelling. This document is provided as in Appendix 1 of this report.

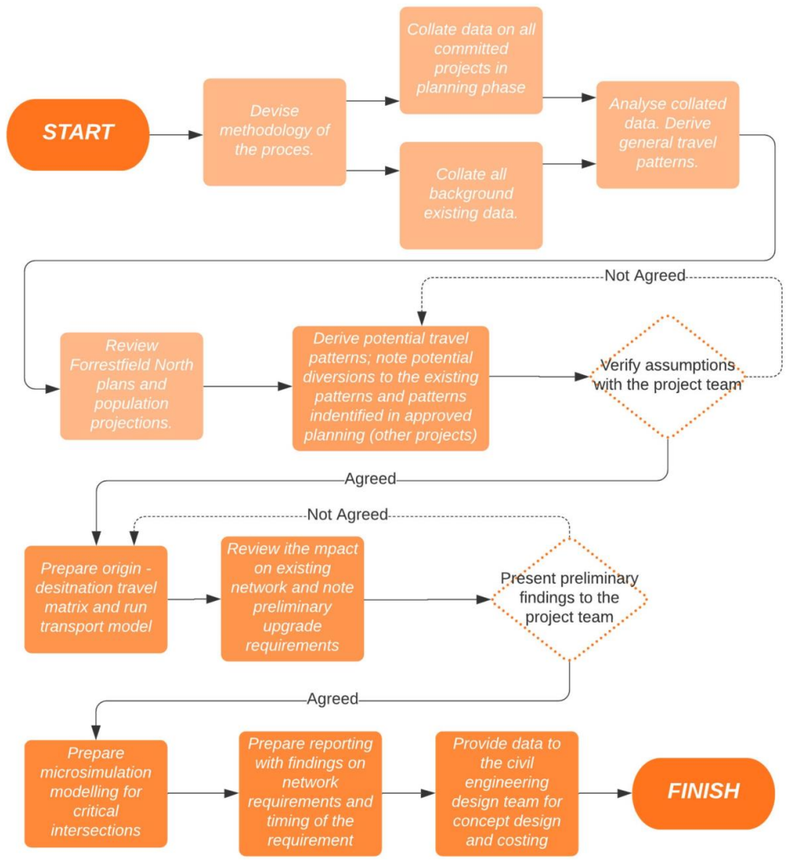


Figure 2 - Transport Modelling Methodology - Process Overview

This document was peer-reviewed by an independent entity. The City of Kalamunda endorsed the subsequent revision of the report.

3.2 Methodology of Data Collation

Data intended to be used as input are collated from various sources. Main Roads Western Australia (MRWA) have provided Regional Operational Model (ROM) plots for various horizon years showing forecasted traffic for main transport routes.

This was supplemented by projections of dwelling yields from the Metropolitan Land Use Forecasting System (MLUFS).

Current traffic counts were obtained (where available) from the City of Kalamunda for local roads and from the MRWA traffic map and traffic portal for State infrastructure. Current road classification and speed limits were obtained from the MRWA portal, while various population data were obtained from the City of Kalamunda's Community ID website.

Current intersection and road configuration were obtained from aerial imagery supplied by Nearmaps.

3.3 Methodology of Traffic Modelling

Network models were prepared in Q-Paramics as this is the software used for modelling High Wycombe South since District Structure Plan preparation. Intersection modelling was completed in SIDRA Intersection software.

Models were generally prepared in accordance with Operational Modelling Guidelines, prepared by MRWA. Where guidelines could not be followed, MRWA were informed, and instruction was received on how to proceed.

3.4 Consultation With External Stakeholders

KCTT contacted various State authorities to confirm basic assumptions and methodology on essential modelling items in establishing methodology. The status of responses is provided in the table below:

Table 1 – Status Liaison Activities (State Government Agencies)

	Traffic Generation Rates	Transport Mode Share	ROM Model Calibration	Model Validation
Main Roads WA				
Department of Planning, Lands and Heritage				
Public Transport Authority				
Department of Transport				

Legend:

Response still outstanding	Authority has no comment / information	Authority not contacted as it has no jurisdiction	Authority provided appropriate comments

Department of Planning, Lands and Heritage (DPLH) and Public Transportation Authority (PTA) confirmed they have no comment to make on assumptions they were presented with.

4 Input Analysis

4.1 Overview

Given the scope of the model, input for modelling was analysed in a separate technical report. The Input Analysis Report is provided as an appendix of this report. This section will outline only the most important parameters used in the modelling. For further detail please refer to Appendix 2 of this report.

4.2 Existing Traffic on Network and Network Configuration

Data on the existing traffic on the network was collated via Main Roads WA and the City of Kalamunda, inclusive of current daily volumes, peak volumes, the composition of vehicles on the network (Austroads classification). In addition to this, data was collected on road hierarchy, speed limit, RAV networks and general network configuration.

There is no meaningful data on pedestrian and cycling traffic; however, given that the existing infrastructure is poorly developed at present, minimal activity is anticipated.

Data on bus traffic was collated from PTA schedules and referenced against other data collected.

4.2.1 Currently Available Traffic Count Data

The table below outlines currently available traffic count data on key roads within and in the vicinity of the High Wycombe South Project Area.

Table 2 - Current Traffic Counts

Road	Location	VPD	Heavy Vehicles	Year	Source
Roe Highway	North of Berkshire Road	43,557	16.6%	2016	MRWA
	South of Berkshire Road	58,806	15.5%	2018	MRWA
	North of Maida Vale Road	44,657	12.7%	2019	MRWA
Milner Road	South of Raven Street	1,537	9.2%	2018	City of Kalamunda
	Northeast from Stewart Road	1,807	9.4%	2018	City of Kalamunda
	Southwest of Sultana Road West	2,397	14.1%	2018	City of Kalamunda
	South of Eureka Street	3,864	19.3%	2019	City of Kalamunda
	East from Milner Road	3,711	8.0%	2018	City of Kalamunda
Maida Vale Road	West from Milner Road	3,062	7.3%	2018	City of Kalamunda
	East of Dundas Road	2,430	7.0%	2018	City of Kalamunda
	West of Butcher Road	1,994	9.1%	2019	City of Kalamunda
	East of Plover Road	8,851	7.6%	2019	City of Kalamunda
	West of Jaeger Court	3,870	8.3	2020	City of Kalamunda
	South of Maida Vale Road	4,770	19.4%	2017	MRWA
	North of Maida Vale Road	5,697	12.3%	2018	City of Kalamunda
Dundas Road	North of Berkshire Road	4,267	19.4%	2018	City of Kalamunda
	South of Kapok Court	5,953	11.5%	2020	City of Kalamunda
	North of Daddow Road	3,794	36.7%	2020	MRWA
	West of Roe Highway	4,199	23.0%	2016	MRWA
Berkshire Road	West of Roe Highway	6,531	26%	2020	MRWA
	East of Milner Road	5,054	15.9%	2016	City of Kalamunda

Most roads in the vicinity of High Wycombe South Project Area have a high percentage of heavy vehicles. This is not surprising given the industrial land use near the subject area.

4.2.2 Existing Bus Routes

The table below outlines currently available bus routes in the vicinity of the High Wycombe South Project Area. Lack of connection and inaccessibility are the main reasons that High Wycombe South Project Area residents are not using public transportation services.

Table 3 - Current public transport availability

Route	Road	Peak frequency	Approximate daily (workday) number of vehicles per direction
294	Maida Vale Road	40 minutes	28
296	Maida Vale Road	15 minutes	15
298	Maida Vale Road	30 minutes	3

It is anticipated that bus feeder routes will be introduced, enhancing the availability of public transport for residents.

4.3 Traffic Generation / Attraction Rates

There is a limited source of West Australian based traffic generation rates. We have used rates from WAPC Transport Assessment Guidelines for Developments where applicable. Unavailable rates were supplemented by the rates provided in the NSW RTA Guide to Traffic Generating Developments as the most relevant, Australian based reference document. Rates that were not available in either of these documents were referenced from ITE Trip Generation Rates Handbook. Some of the traffic generation rates were adjusted to suit local conditions. Where these adjustments were applied, an explanation was provided. In many instances, the WAPC Guidelines Volume 5 (Technical Handbook) offers an hourly traffic generation rate without a daily traffic generation rate. In those instances, daily rates were sourced from the other two reference documents.

Table 4 – Vehicular traffic generation / attraction rates per land use

Land Use	Value (vehicular trips per unit)	Period	Split (In / Out)	Source	Note
Residential – Low density (R20 and less)	10 / dwelling	daily	50/50		
	0.8 / dwelling	AM / PM peak	AM 25/75 PM 67/33	WAPC TAGD	
Residential Medium density (R30-R40)	8 / dwelling	daily	50/50	NSW RTA GTGD	
	0.8 / dwelling	AM / PM peak	AM 25/75 PM 67/33	WAPC TAGD	
Residential Medium Density (R50-R60)	6.5 / dwelling	daily	50/50	NSW RTA GTGD	
	0.65 / dwelling	AM / PM peak	AM 25/75 PM 67/33	WAPC TAGD	
Residential High Density (R80)	5.5 / dwelling	daily	50/50	NSW RTA GTGD	
	0.55 / dwelling	AM / PM peak	AM 25/75 PM 67/33	WAPC TAGD	
Residential High Density (R100 and more)	5 / dwelling	daily	50/50	NSW RTA GTGD	
	0.5 / dwelling	AM / PM peak	AM 25/75 PM 67/33	WAPC TAGD	
Shopping	121/100m2	Daily	50/50	NSW RTA GTGD	
	AM – 2.5/100m^2 PM – 10/100m^2	AM / PM peak	AM 80/20 PM 50/50		
Showroom Shopping	17/100m^2	Daily	50/50	NSW RTA GTGD	
	2.7/100m^2	AM / PM peak	PM 50/50		
Primary School	2 / person	daily	50/50	Derived from hourly peak rate and the nature of the use	
	1/ person	AM / PM peak	50/50	WAPC TAGD	
Childcare Centre	4 / child + 1/employee	Daily	50/50	Derived from experience	
	0.8 / child 0.7 / child	AM / PM peak	50/50	Adjusted rate from NSW RTA GTGD	
Office and Commercial	10 / 100m^2 GFA	daily	50/50	NSW RTA GTGD	
	2 / 100m^2 GFA	AM / PM peak	AM 80/20 PM 20/80	WAPC TAGD	
Warehouse	4 / 100m^{2}GFA	daily	50/50	NSW RTA GTGD	
	0.5 / 100m^{2}GFA	AM / PM peak	AM 80/20 PM 20/80		
Factory	5 / 100m^2 GFA	daily	50/50	NSW RTA GTGD	
	1 / 100m^2 GFA	AM / PM peak	AM 80/20 PM 20/80		
Light Industry	4.6 / 100m^2 GFA	daily	50/50	This rate was derived as an average of Warehouse and Factory Rates	
	0.7 / 100m^2 GFA	AM / PM peak	AM 80/20 PM 20/80		
District Open Space	71.33 / playing field	Daily	50/50	ITE CTGR	
Aquatic Facility	1.5 / person	Daily	50/50	This rate was derived as per the description below.	
	0.15 / person	AM/PM peak	AM 70/30 PM 30/70		
Railway Station – Kiss and Ride	4,000	Daily	50/50	PTA Transport Assessment for High Wycombe Station	
	1,000 (ultra-peak hour)	AM/PM peak	50/50		
Railway Station – Public parking	2 / bay	Daily	50/50	This rate was derived based on the nature of parking (all day transit parking) and under the assumption that peak hour distribution will be like kiss and drop off facility	

4.4 Anticipated Changes in High Wycombe South Project Area and Vicinity

High Wycombe South Project Area comprises two distinct areas whose development will be guided by separate structure plans: Residential Precinct and Transit-Oriented Development (TOD) precinct. At present, Residential Precinct features larger residential lots intended for rural residential use. At the same time, the TOD precinct has been a worksite for the construction of the High Wycombe Railway Station.

Given that the latest Census (2016) recorded 313 dwellings in the High Wycombe South Project Area, by 2050 population will increase significantly as projected in the schedule below:

Table 5 - Population and Dwelling Forecasts - High Wycombe South Project Area (source: element WA)

		Year 2031	Year 2041	Year 2050+
TOD Precinct	Dwellings	69	508	508
	Population	151	1,359	1,359
Residential Precinct	Dwellings	340	1,594	2,417
	Population	850	3,948	5,998

Many different factors will dictate the rate of development in the coming years. For purposes of modelling, the following rates were assumed:

Table 6 - Estimated Rate of Build-Out (source: City of Kalamunda/Development WA)

	2031	2041	2050+
Rate of Buildout	15%	65%	100%

The rate of development may vary over the development cells depending on the interest. For purposes of this report, a uniform build-out is assumed across all cells.

4.4.1 High Wycombe South Project Area – Residential Land Use

The residential Precinct of the High Wycombe South Project Area will be developed over seven (7) development cells. Transit-Oriented Development (TOD) Precinct will be developed over six (6) development cells; however, residential land use will feature only in two (2) cells.

The anticipated number of dwellings for each cell is shown in the table below:

Table 7 - Dwelling Forecasts – High Wycombe South Project Area (source: element WA)

Residential Precinct		TOD Precinct	
Cell Number	**No Dwellings**	**Cell Number**	**No Dwellings**
1	55	1A	0
2	44	1B	301
3	261	1C	0
4	226	1D	0
5	352	1E	0
6&7	842	2	207
8	637		
Total	**2,417**	**Total**	**508**



Figure 3 - TOD Precinct Plan (source: element WA)



Figure 4 - Residential Precinct Plan (source: element WA)

Following traffic generation was developed for the residential component.

Table 8 - Traffic Generation - Residential Land Use

	2031		2041		2050+	
Zone	**Daily Traffic (VPD)**	**Peak Traffic (VPH)**	**Daily Traffic (VPD)**	**Peak Traffic (VPH)**	**Daily Traffic (VPD)**	**Peak Traffic (VPH)**
9 (Cell 1)	66	7	288	29	440	44
10 (Cell 2)	53	5	232	23	352	35
11 (Cell 3)	313	31	1,360	136	2,088	209
12 (Cell 4)	270	27	1,168	117	1,800	180
13 (Cell 5)	422	42	1,832	183	2,816	282
14 (Cell 6)	774	77	3,353	335	5,158	516
15 (Cell 7)	606	61	2,625	263	4,039	404
16 (TOD Residential)	171	17	1,139	74	1,139	114
18 (1B HWS station)	226	23	1,505	98	1,505	151
	2,900	**290**	**13,502**	**1,257**	**19,336**	**1,934**

4.4.2 Non-Residential Land Use

Besides residential land use, High Wycombe South Project Area will feature a number of non-residential uses. TOD Precinct will have a number of non-residential land uses to support new transit node. Current estimates are as follows:

Table 9 – Commercial Land Use in TOD Precinct (source: City of Kalamunda/Development WA)

Year	2030	2040	2050
Retail	1,100 m^2 (32)	5,160 m^2 (152)	5,160 m^2 (152)
Commercial		450 m^2 (18)	1,200 m^2 (48)
Medical		450 m^2 (5)	1,200 m^2 (14)
Childcare	400 m^2 (12)	1,250 m^2 (36)	1,250 m^2 (36)
Showroom Retail	-	2,500 m^2 (32)	2,500 m^2 (32)
Total	**1,500 m^2 (44)**	**9,810 m^2 (243)**	**11,310 m^2 (282)**

As we weren't provided with the breakdown per development cell, the following breakdown was assumed:

Table 10 - Distribution of Non-Residential Land Uses Across TOD Development Cells

Cell Number	Food Retail	Non-Food Retail	Showroom Retail	Medical	Childcare	Commercial
1A	0	0	100%	0	0	0
1B	100%	50%	0	100%	70%	0
1C	0	0	0	0	0	0
1D	0	0	0	0	0	0
1E	0	50%	0	0	0	100%
2	0	0	0	0	30%	0

For purposes of this report, it was assumed that the nominated Retail floor space would comprise 70% "Food Retail" and 30% of "Non-food Retail". It was assumed that the Showroom Retail would be predominantly situated in Cell 1A, gradually replacing light industry activities. The majority of other non-residential land uses will be situated in Cell 1B, abutting main internal transit corridors. Cell 2 is expected to be a predominantly residential cell.

Community facilities in TOD Precinct may feature an aquatic centre with two areas (indoor and outdoor), a water-play recreational area and a gym if constructed at this scale. If constructed at the aforementioned scale, the community facility is anticipated to attract approximately 450,000 visitors per annum when fully established.

The Residential Precinct will feature a District Open Space and a Primary School.

4.4.3 Traffic Generation / Attraction – Non-Residential Uses

Retail land use is expected to start developing in 2031 and be fully developed by 2041. While no further development is expected for retail land use between 2041 and 2050, the population in the area is expected to grow significantly, and therefore the proportion of internal trips will increase.

The table below focuses on the PM peak as the higher peak. For a full detailed analysis, please see Network Modelling Report.

Table 11 - Retail Land Use - Traffic Attraction / Generation

Zone	2031				2041				2050+			
	Total VPD	Total PM VPH	External VPD	External PM VPH	Total VPD	Total PM VPH	External VPD	External PM VPH	Total VPD	Total PM VPH	External VPD	External PM VPH
17 (1a)	0	0	0	0	500	100	425	85	500	100	400	80
18 (1b)	551	46	385	32	4,371	361	2,841	235	4,371	361	2,404	199
19 (1c)	0	0	0	0	0	0	0	0	0	0	0	0
20 (1d)	0	0	0	0	0	0	0	0	0	0	0	0
21 (1e)	39	0	35	8	310	100	263	62	310	100	248	62
Total	**590**	**46**	**420**	**40**	**5,181**	**561**	**3,529**	**382**	**5,181**	**561**	**3,052**	**341**

Childcare and Medical land uses are expected to increase in the period 2031-2050 iteratively; however, the percentage of external trips is expected to be higher than the percentage of internal trips on a daily basis throughout the period.

Table 12 – Medical and Childcare Use Land Use - Traffic Attraction / Generation

Zone 18 (1b)	2031				2041				2050+			
	Total VPD	Total AM VPH	External VPD	External AM VPH	Total VPD	Total AM VPH	External VPD	External AM VPH	Total VPD	Total AM VPH	External VPD	External AM VPH
Medical	234	35	211	32	234	35	176	26	528	79	396	59
Childcare	176	32	158	29	550	100	413	75	550	100	413	75
Total	**410**	**67**	**369**	**61**	**784**	**135**	**589**	**101**	**1,078**	**179**	**809**	**134**

High Wycombe Railway Station opened in 2022. For modelling purposes, it is assumed that it will reach its full capacity when it comes to vehicular attraction by 2041. While the patronage is expected to grow to 2050, the growth in the High Wycombe South Project Area population will increase the percentage of walking and cycling arrivals.

Table 13 – High Wycombe Railway Station - Traffic Attraction / Generation

20 (1C HWS station)	2031				2041				2050+			
	Total VPD	Total AM VPH	External VPD	External AM VPH	Total VPD	Total AM VPH	External VPD	External AM VPH	Total VPD	Total AM VPH	External VPD	External AM VPH
Kiss'n'Ride	2,948	643	2,358	590	4,000	1,000	3,200	800	4,000	1,000	3,200	800
Park and Ride	1,170	541	1,416	496	2,400	840	1,920	672	2,400	840	1,920	672
Total	**4,118**	**1,184**	**3,774**	**1,086**	**6,400**	**1,840**	**5,120**	**1,472**	**6,400**	**1,840**	**5,120**	**1,472**

Commercial land use is expected to be fully developed in 2050, and throughout the study period, it is anticipated that vehicular traffic attracted to this land use will be mostly external.

Table 14 - Commercial Use Land Use - Traffic Attraction / Generation

Zone	2041				2050+			
	TOTAL VPD	TOTAL VPH	External VPD	External AM VPH	TOTAL VPD	TOTAL VPH	External VPD	External AM VPH
21 (1E)	45	9	43	9	120	24	114	23

Should the community site be constructed at the envisioned scale, the facility is not expected to become operational before 2041 and is not likely to reach operational peak immediately. The facility is expected become operational by 2041; however, it is not likely to reach an operational peak immediately.

Table 15 – Community Land Use - Traffic Attraction/Generation

Zone	2041				2050+			
	TOTAL VPD	TOTAL VPH	External VPD	External AM VPH	TOTAL VPD	TOTAL VPH	External VPD	External AM VPH
18 (1B)	942	94	754	75	1884	188	1507	150

Primary School is expected to open by 2041; however, it will reach its full capacity by 2050. Most of the trips associated with this land use will be internal to the project area.

Table 16 – Primary School - Traffic Attraction / Generation

Zone	2041				2050+			
	TOTAL VPD	TOTAL VPH	External VPD	External AM VPH	TOTAL VPD	TOTAL VPH	External VPD	External AM VPH
22 (Primary School)	600	300	120	60	1080	540	216	108

Forrestfield/High Wycombe Industrial is expected to be fully operational by 2031.

Table 17 – Forrestfield/High Wycombe Industrial - Vehicular Traffic Attraction / Generation

Zone	Total Area (m^2)	Equivalent Area (m^2)	VPD	VPH
23	241,366	48,273	2,414	483
24	154,967	30,993	1,550	310
25	174,543	34,909	1,745	349
26	83,945	16,789	839	168
	654,821	**130,964**	**6,548**	**1,310**

As the City of Kalamunda is looking to meet its projected population targets and associated physical and social infrastructure requirements, changes in the vicinity of the High Wycombe South Project Area are inevitable. These were reviewed, and the impact on the subject area was assessed.

4.5 Regional Operational Model (ROM) and Metropolitan Land Use Forecasting System MLUFS) Data

In December 2020, KCTT received the following ROM plots from MRWA:

- 41696_LVP_All Day_Y16 Forrestfield DCP_MLUFS140
- 41696_LVP_All Day_Y16 Forrestfield DCP_TUE
- 41696_LVP_All Day_Y21 Forrestfield DCP_MLUFS140
- 41696_LVP_All Day_Y21 Forrestfield DCP_TUE
- 41696_LVP_All Day_Y26 Forrestfield DCP_MLUFS140
- 41696_LVP_All Day_Y31 Forrestfield DCP_MLUFS140
- 41696_LVP_All Day_Y36 Forrestfield DCP_MLUFS140
- 41696_LVP_All Day_Y36 Forrestfield DCP_TUE
- 41696_LVP_All Day_Y41 Forrestfield DCP_MLUFS140
- 41696_LVP_All Day_Y41 Forrestfield DCP_TUE
- 41696_Validation_Y16 Forrestfield DCP_MLUFS140
- 41696_Validation_Y16 Forrestfield DCP_TUE
- 41696_ZBP_Forrestfield DCP_MLUFS140 (*schedule of zones*)
- 41696_ZBP_Forrestfield DCP_TUE (*schedule of zones*)

KCTT have been supplied with two distinct sets of ROM plots based on different population scenarios.

One set is based on the MLUFS land-use model and hereon will be referred to as "ROM Scenario 1". The other scenario was prepared to examine the impact of the Tonkin Highway extension and hereon will be referred to as "ROM Scenario 2". ROM Scenario 2 also shows slight variations in population assumptions to ROM Scenario 1.

The map of zones for each scenario was used to correlate existing statistical data and the number of dwellings to determine the population growth anticipated by the State Government.

KCTT received population scenarios for the 2041 horizon year only as a part of this package.

In-network modelling, KCTT relied predominantly on the "ROM Scenario 1".

In July 2021, KCTT received additional link volume plots for sections of Dundas Road and Berkshire Road. We only received link plots for 2041. These plots were used to derive passing traffic on Dundas Road and Berkshire Road.

5 Findings of Network and Intersection Modelling

5.1 Network Configuration

The table below outlines the requirement for upgrades on each section of the network. The table shows anticipated vehicles per day (VPD) on the link, Liveable Neighbourhoods classification (LN), applicable road reservation width required (RR) and whether the land acquisition is necessary. The current size of the road reservation was sourced from Nearmap in June 2021. The critical information in the table below is when the upgrade of a particular link is required and whether this upgrade requires additional land acquisition. Details of modelling, conclusions and apportionment are provided in Appendix 3 of this report.

Liveable Neighbourhoods classify streets based on the function and volume of vehicular traffic. This classification is generally used as a reference for planning purposes. Once the road is constructed and functional, the Liveable Neighbourhoods classification is replaced by the Main Road WA classification. However, for comparison purposes, the table below will outline Liveable Neighbourhoods equivalent road class on existing roads, based on the current traffic counts.
The reference in the brackets pertains to the infrastructure element in the associated Transport Modelling Report (TMR) reference. The DCP infrastructure item reference number is also included.

Table 18 - Timing of Upgrades - Road Network

Road	DCP Ref	TMR Ref	Section	RR Current	LN category Current	2031				2041				2050			
						VPD	LN	RR	Land Acquisition	VPD	LN	RR	Land Acquisition	VPD	LN	RR	Land Acquisition
Berkshire Road		[RD1]	W of Roe Hwy	20m	NCA	16,500	IB	25.2m (20m)	No	21,900	IA	35.6m*(25m)	Yes	25,843	IA	35.6m*(25m)	No
		[-]	E of Roe Hwy	20m	NCA	17,900		25.2m (20m)	No	25,600		35.6m	Yes	31,805		35.6m	No
		[RD1]	S of Milner Rd	30m	NCA	15,700		25.2m (20m)	No	21,000		35.6m*(25m)	Yes	24,915		35.6m*(25m)	No
Dundas Road		[RD6]	S of Berkshire Rd	Varies	NCA	11,100	IB	25.2m (20m)	No	13,400	IB	25.2m (20m)	No	15,200	IB	25.2m (20m)	No
		[RD7]	SW of Old Dundas Rd	Varies	NCA	10,500		25.2m (20m)	No	11,700		25.2m (20m)	No	13,700		25.2m (20m)	No
		[RD8]	N of Old Dundas Rd	Varies	NCA	12,500		25.2m (20m)	No	16,600		25.2m (20m)	No	20,000	IA (IB)	25.2m (20m)	No
Maida Vale Road		[RD5]	E of Enterprise Blvd	25m	AS/NCB	3,400	NCA	24.4m (20m)	No	6,200	NCA	25.2m (20m)	No	7,700	IB	25.2m (20m)	No
		[RD4]	E of Raven St	20m	AS/NCB	2,900	NCB	19.4m	No	4,300	NCA	24.4m (20m)	No	4,500	NCA	24.4m (20m)	No
		[RD3/3A]	E of Milner Rd	20m	AS/NCB	6,600	NCA	24.4m (20m)	No	11,400	IB	25.2m (20m)	No	13,100	IB	25.2m (20m)	No
Milner Road	RD02	[RD10]	S of Maida Vale Rd	20m	AS	4,000	NCA	24.4m (20m)	No	7,800	IB	25.2m (20m)	No	9,300	IB	25.2m (20m)	No
	RD01	[RD2]	S of Stewart	20m	AS	4,100		24.4m	Yes	7,000		25.2m	Yes	8,200		25.2m	No
		[RD9]	N of Berkshire Rd	20m	AS	7,000		24.4m (20m)	No	11,500		25.2m (20m)	No	13,000		25.2m (20m)	No
TOD Connector		[RD15]	E of Milner Rd	n.a.	n.a.	1,500	AS	<20m	Yes	5,200	NCA	24.4m	Yes	6,500	NCA	24.4m	No
		[RD14]	S of Enterprise Blvd	n.a.	n.a.	700		<20m	Yes	2,000	AS	<20m (24.4m)	Yes	2,400	AS	<20m (24.4m)	No
	RD04	[RD16]	S of TOD Precinct	n.a.	n.a.	800		<20m	Yes	3,100	NCA	24.4m	Yes	4,600	NCA	24.4m	No

Transport Modelling Report DCP
KC00604.000 High Wycombe South

Road	DCP Ref	TMR ref	Section	RR Current	LN category Current	2031				2041				2050			
						VPD	LN	RR	Land Acquisition	VPD	LN	RR	Land Acquisition	VPD	LN	RR	Land Acquisition
Sultana Road West		[-]	W of Milner Rd	20m	AS	500	AS	<20m	No	1,400	AS	<20m	No	1,600	AS	<20m	No
		[RD20]	E of Milner Rd	20m	AS	800	AS	<20m	No	1,600	AS	<20m	No	1,900	AS	<20m	No
	RD09		E of TOD Precinct	20m	AS	452	AS	<20m	No	1,300	AS	<20m	No	1,700	AS	<20m	No
Stewart Road	RD05	[RD17]	E of Milner Rd	20m	AS	800	AS	<20m	No	3,400	NCA	24.4m	Yes	4,800	NCA	24.4m	No
Raven Street		[RD12]	S of Maida Vale Rd	20m	AS	700	AS	<20m	No	4,400	NCA	24.4m	Yes	5,700	NCA	24.4m	No
	RD03	[RD13]	S of Milner Rd	n.a.	n.a.	1,100	AS	<20m	Yes	4,100	NCA	24.4m	Yes	6,000	NCA	24.4m	No
Enterprise Boulevard		[RD11]	W of Maida Vale Rd	20m	AS	1,900	AS	<20m	No	3,500	NCA*	24.4m (20m)	No	3,700	NCA	24.4m (20m)	No
			N of TOD Connector	20m	n.a	700	AS	<20m	No	1,700	NCA*	20m	No	2,000	NCA*	20m	No
Brand Road	RD08	[RD19]	N of TOD Connector	20m	AS	300	AS	<20m	No	1,400	AS	<20m	No	2,100	AS	20m	No
Brae Road	RD06	[R18]	E of TOD Connector	20m	AS	500	AS	<20m	No	1,900	AS	<20m	No	2,600	NCB	19.4m	No
Newburn Road		[-]	N of Maida Vale Rd	25.5m	AS	4,200	NCA	24.4m	No	5,700	NCA	24.4m	No	6,600	NCA	24.4m	No

The anticipated traffic volumes indicate that Berkshire Road should be upgraded to an Integrator A configuration. Given that the Liveable Neighbourhoods guideline generally applies to the residential areas, the nominal cross-section should be modified to cater for industrial traffic. On-street parking is not deemed appropriate on Berkshire Road west of Roe Highway, given this road will carry RAV vehicles. Further to this, a generously sized shared path is a safer cycling option than on-road cycle paths, given the quantum of RAV vehicles and the possible presence of Over-Size Over Mass vehicles on this route. Therefore, we believe that a road reservation of 25m is appropriate for this section of Berkshire Road.

Dundas Road is servicing an industrial area for most of its length; therefore, an adjusted Integrator B cross-section is suggested.

Milner Road and Maida Vale Road require Integrator B as an ultimate configuration. Although the interim Neighbourhood Connector A configuration will suffice, it is recommended that both roads are upgraded to the ultimate configuration when traffic volumes meet warrants. These two configurations have only minor differences; however, reconstruction of the road will cause unnecessary disturbance and cost.

TOD Connector is a new local distributor servicing the High Wycombe South Project Area. The ultimate configuration for this road is Neighbourhood Connector A; therefore, the land for the ultimate road configuration will be acquired initially.

Enterprise Boulevard is under construction as a part of Railway Station works. It will be constructed to a Neighbourhood Connector A standard. Actual future traffic counts on this road will depend on the design of the access points for commercial and community facilities in TOD Precinct.

Brand Road will be upgraded by 2041 to an urban standard, although its formal classification will not change (Access Street). This upgrade is directly related to the construction of the Primary School and District Open Space and is likely to occur concurrently to construction of these two community facilities.

Portions of existing roads (Brae Road and Brand Road west of TOD Connector and Sultana Road West south of Brand Road) will become subdivisional roads, and the responsibility for upgrade will be with a developer.

5.2 Intersection Configuration

The table below outlines the requirement for upgrades on some of the key intersections on the network. The table below shows starting and the ultimate configuration of the intersection, expected contribution per precinct, the timing of the upgrade and whether the land acquisition is necessary. The current size of the road reservation was sourced from Nearmap in July 2021. The requirement for land acquisition was assessed for intersections independently of the adjoining road link; therefore, it reflects the requirement for the land acquisition in addition to land acquisition for the widening of road links. The impact of each precinct was assessed for AM and PM peaks independently. The values below reflect the average impact of both peak times. Details of modelling, conclusions and apportionment are provided in Appendix 4 of this report. The reference in the brackets pertains to the infrastructure element in the associated TMR reference. The DCP Infrastructure item reference number is also included.

Table 19 - Timing of Upgrades - Intersections

Intersection	DCP ref	TMR ref	Starting Configuration	Ultimate Configuration	Residential Precinct %	TOD Precinct %	Year of Upgrade	Land Acquisition Required?
M01. Roe Highway / Maida Vale Road		[INT02]	Half interchange	Half Interchange	18.85%	14.36%	2031	No
M02. Maida Vale Road / Milner Road		[INT01]	T-intersection full movement	Roundabout	33.35%	23.20%	2041	Yes
M03. Milner Road / Stewart Road	INT01	[INT18]	T-intersection full movement	Roundabout	64.72%	14.74%	2041	Yes
M04. Milner Road / Raven Street	INT02	[INT17]	T-intersection full movement	Roundabout	61.43%	17.89%	2041	Yes
M05. Milner Road / TOD Connector		[INT05]	The intersection doesn't exist	Signals	41.24%	16.36%	2041	Yes
M06. Milner Road / Berkshire Road / Dundas Road		[INT15]	T-intersection full movement	Roundabout	17.23%	7.70%	2031/2041	Yes
M07. Berkshire Road / Roe Highway		[-]	Grade separated interchange	Grade separated interchange	2.00%	1.20%	2041	No
M08. TOD Connector / Brand Road	INT03	[INT16]	The intersection doesn't exist	Four-way, sign controlled	100.00%	0.00%	2041	Yes
M09. TOD Connector / Brae Road / Raven Street	INT06	[INT14]	The intersection doesn't exist	Full movement 4-way intersection	100.00%	0.00%	2041	Yes
M10. Brae Road / Stewart Road	INT07	[INT09]	T-intersection full movement	T-intersection full movement	100.00%	0.00%	2041	Yes
M11. Milner Road / Sultana Road West		[INT07]	Two staggered T-intersections - full movement	Section east of Milner Rd to be converted to a LILORI Section west of Milner Rd to be converted to Cul-de-Sac	54.60% 0.00%	11.53% 100.00%	2041	No *
M12. Maida Vale Road / Dundas Road / Parking Access		[INT14]	Roundabout	Roundabout	21.87%	8.75%	2041	No
M13. Maida Vale Road / Enterprise Boulevard*		[INT12]	T-intersection full movement	T-intersection full movement	36.91%	17.55%	2041	No
M14. Maida Vale Road / Raven Street		[INT13]	The intersection doesn't exist	T-intersection full movement	37.82%	19.60%	2041	Yes
M15. (old Dundas Road) / Dundas Road		[INT06]	T-intersection full movement	Signals	16.46%	7.85%	2031	No
M16. Maida Vale Road / Newburn Road		[INT03]	T-intersection full movement	Roundabout	37.72%	22.47%	2041	Yes
M17. Maida Vale Road / Butcher Road		[-]	T-intersection full movement	T-intersection full movement	0.63%	20.91%	2041	No
M18. Maida Vale Road / Plover Road		[-]	T-intersection full movement	T-intersection full movement	37.13%	26.04%	2041	No
M19. Maida Vale Road / Littlefield Road		[-]	T-intersection full movement	T-intersection full movement	36.52%	25.62%	2041	No
M20. Milner Road / Nardine Close		[INT08]	T-intersection	Left in Left Out Right In	41.57%	11.73%	2041	No
M21. Berkshire Road / Bonser Road		[-]	T-intersection full movement	Left In Left Out	15.80%	8.50%	2041	No *
M22. Berkshire Road / Ashby Close		[-]	T-intersection full movement	Left In Left Out	13.33%	8.10%	2041*	No *
M23. Berkshire Road / Walters Way		[-]	T-intersection full movement	Left In Left Out	14.78%	8.44%	2041*	No *
M24. Berkshire Road / Harrison Road		[-]	T-intersection full movement	Left In Left Out	13.65%	8.30%	2041*	No *
M25. Dundas Road / Dundas Road (south)*		[-]	T-intersection full movement	T-intersection full movement	0.00%	2.32%	2041*	No

6 Impact on Cost Apportionment

6.1 Basis of the Apportionment (State Planning Policy 3.6)

In April 2021 Department of Planning, Lands and Heritage adopted the revised State Planning Policy 3.6: Infrastructure Contributions. Section 6 of this document outlines the following fundamental principles for application:

a) Need and the nexus: The need for the infrastructure must be clearly demonstrated (need), and the connection between the development and the demand created should be clearly established (nexus).

b) Transparency: Both the method for calculating the infrastructure contribution and the manner in which it is applied should be clear, transparent, and simple to understand and administer.

c) Equity: Infrastructure contributions should be levied equitably from identified stakeholders within a contribution area, based on the relative contribution to need.

d) Certainty: The scope, timing, and priority for delivering infrastructure items, and the cost of infrastructure contributions and methods of accounting for escalation, should be clearly identified.

e) Efficiency: Contribution should be justified on a whole-of-life capital cost basis consistent with maintaining financial discipline on service providers by precluding the over-recovery of costs.

f) Consistency: The system for infrastructure contributions for apportioning, collecting and spending contributions should be consistent, efficient and transparent.

g) Accountable: That there is accountability in the manner in which infrastructure contributions are determined, collected and expended

h) Right of consultation and review: Landowners and developers have the right to be consulted on the manner in which development contributions are determined and the opportunity to seek a review by an independent third party regarding the calculation of costs, and return of funds.

This report considers the road infrastructure required to cater for the estimated vehicular volumes. Appropriate cycling and pedestrian infrastructure were considered in developing appropriate road cross-sections.

The infrastructure items discussed in this report can be considered "Development Infrastructure" as defined in Section 6.3, clause a) of SPP 3.6. and are listed as items 8-12 in Schedule 1 of the SPP 3.6.

Findings of this report will be utilised to consider appropriate apportion of the construction cost of all movement infrastructure (inclusive of roads, intersections, cycling paths and shared paths).

Items included in the DCP are subject to detailed consideration by the City and WAPC.

6.2 Addressing Key Principles of SPP 3.6

The table below outlines how relevant SPP 3.6 principles were addressed in deriving cost apportionment for road infrastructure.

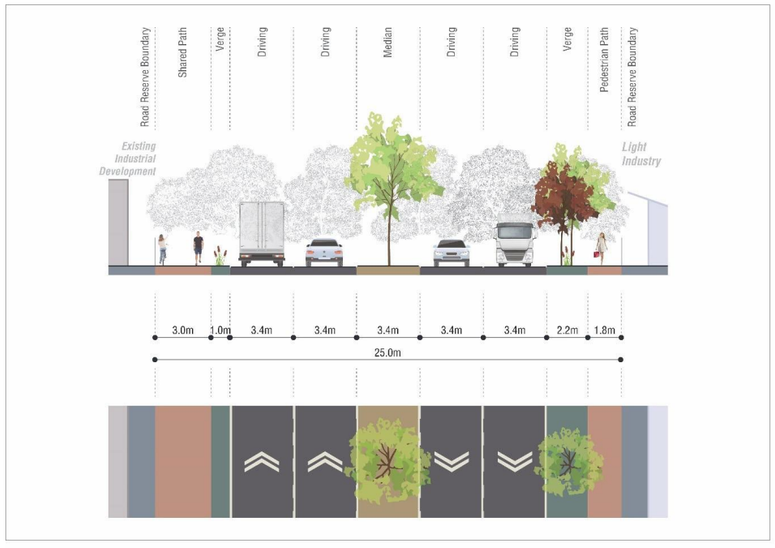
Table 20 - Addressing SPP 3.6 Principles

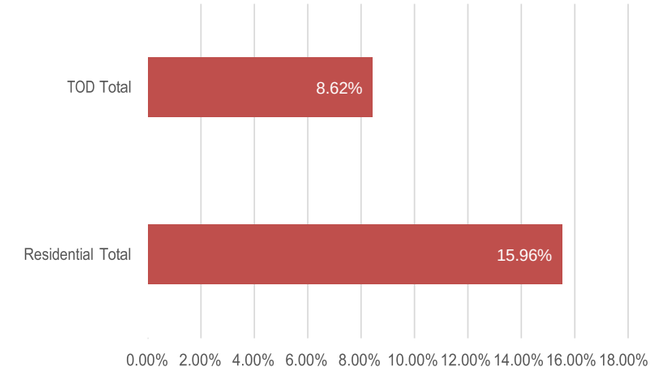
Principles	Addressing the principle
a) Need and the nexus	A significant increase in population and commercial floor space will generate and attract high vehicular traffic. Current infrastructure may not have sufficient capacity to service the increase in traffic without significant delays and/or safety risk; therefore, it is essential to determine where upgrades may be required to accommodate the increase in traffic. A minimum threshold for establishing the need and nexus was set at 10% of traffic contribution; therefore, if a precinct contributes 10% or more of projected daily traffic in the ultimate scenario, it is deemed sufficient to trigger the consideration for cost apportionment. This threshold ensures that only the roads that are likely to have significant traffic increases due to this development will be considered to be included as a DCP item, funded and considered for apportionment according to traffic modelling. Noting other factors will be considered when determining whether an item should appropriately be included in the DCP, such as whether the location of the item, timing of when the infrastructure item is needed, impact on feasibility of the DCP and other appropriate factors. Extensive network and intersection modelling clearly delineated where the introduction of the new infrastructure or upgrade of the existing infrastructure is a consequence of development within the Residential and Transit-Oriented Development Precincts.
b) Transparency	While the method of modelling and apportionment was quite complex, the basic principles will be set out in this report in a straightforward and easy-to-follow manner. The model was set up so the volume of traffic generated or attracted by each precinct is clearly identifiable on every intersection and road link. Passing traffic is also identified, as the cost proportional to the impact of this traffic component cannot be attributed to the DCP. Traffic associated with the High Wycombe Railway Station, originating outside of the High Wycombe South Project Area, was deemed "passing traffic" in this assessment, as the road network surrounding the station will be constructed to cater for the traffic attracted by the railway station. Key terminology: - Passing traffic – traffic not originating nor terminating in the High Wycombe South Project Area. ***Example One:*** *Resident of High Wycombe (North) travelling to work in Forrestfield Industrial Area via Maida Vale Road, Milner Road or Dundas Road.* ***Example Two:*** *Resident of Forrestfield accessing Railway Station via Berkshire Road > Milner Road > TOD Connector.* - Reciprocal traffic / reciprocity in traffic generation and attraction – traffic originating in one precinct and terminating in the other precinct within the High Wycombe South Project Area. ***Example One:*** *Residents of the Residential Precinct travelling for shopping or recreation to TOD Precinct.* ***Example Two:*** *Residents of TOD Precinct taking their children to the primary school in the Residential Precinct.*
c) Equity *(Continued on the following page)*	The cost for the infrastructure will be apportioned according to: - the results of traffic modelling in the precinct, - the need generated by the future development, - the party benefiting from the infrastructure. - Any other consideration deemed appropriate by the City and WAPC. Two key categories have been adopted in this report for the purposes of apportionment within the High Wycombe South Project Area: TOD Precinct and Residential Precinct. While there is some reciprocity in the traffic generation and attraction between two precincts, this portion of traffic is minor. Reciprocal traffic has been apportioned according to the location of the infrastructure and the key beneficiary. - If the precinct (TOD Precinct or Residential Precinct) contributes more than 10% of daily traffic on an intersection or a road section, the DCP contribution can be considered. If the precinct contributes less than 10% of daily traffic, it is not deemed sufficient to trigger the upgrade requirement; therefore, the contribution is not required.

Principles	Addressing the principle
	- If a road or an intersection is deemed necessary for functioning of one of the Precincts, regardless of the presence of the other Precinct, the cost will be apportioned to the Precinct where the access is necessary.
d) Certainty	It is envisaged that both precincts will be substantially developed by 2050. Modelling was completed for 2031, 2041 and 2050+ horizon years to determine when infrastructure upgrades might be required. Each of the horizon years is associated with the proportional build out of the Project Area, so 2031 corresponds with an approximate 15% build out, 2041 corresponds with 65% buildout while 2050 corresponds with the completion of structure plans (100% buildout). Although general assumptions on the build-out rate are discussed in this report, the actual build-out rate will depend on many factors (such as the general real estate market, the interest of developers in this particular area, other opportunities in the Perth Metro area etc.)
e) Efficiency	The proposed upgrades have been designed to accommodate increased traffic demand but also to provide an appropriate balance between vehicular traffic, public transport, cycling and walking. Furthermore, the proposed infrastructure upgrades seek to minimally disrupt existing residences and businesses as land acquisition requirements are minimised wherever possible. Some of the infrastructure elements are proposed to be modified compared to Liveable Neighbourhoods to be accommodated within the existing road reservation and/or for vehicular and pedestrian safety. The modelling shows that some road links may trigger iterative upgrades (Maida Vale Road, Berkshire Road, Milner Road). Iterative upgrades would add unnecessary cost to DCP and the disruption to the community may cause angst which could be avoided. Therefore, to minimise abortive road upgrades and costs. it is proposed to construct the ultimate configuration once it is close to trigger, rather than iterative road upgrades every several years.
f) Consistency	The advice on potential upgrades predominantly relies on Liveable Neighbourhoods 2009. General recommendations by the guideline are, on occasion, locally modified to take into account site constraints and vehicular/pedestrian safety.
g) Accountable **h) Right of consultation and review**	These two principles pertain to the administration of the DCP, which is outside the scope of this report.

6.3 Key Network Links

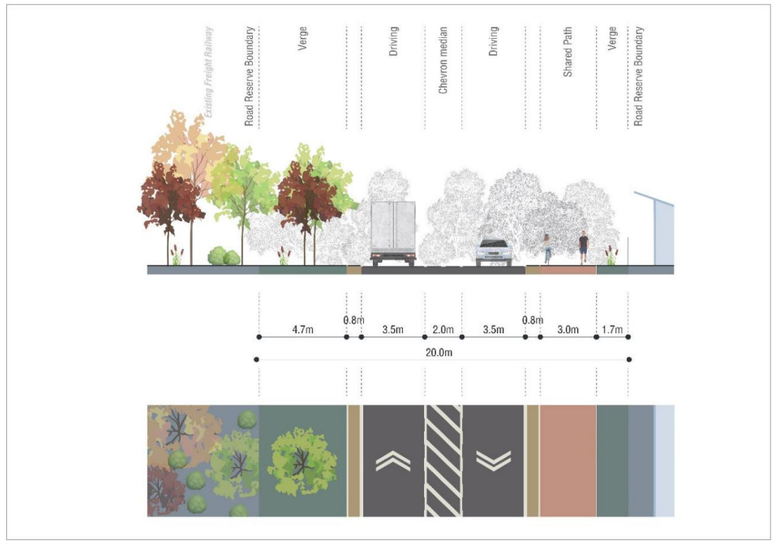
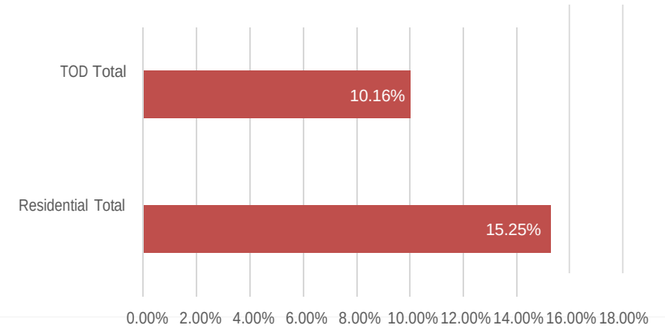
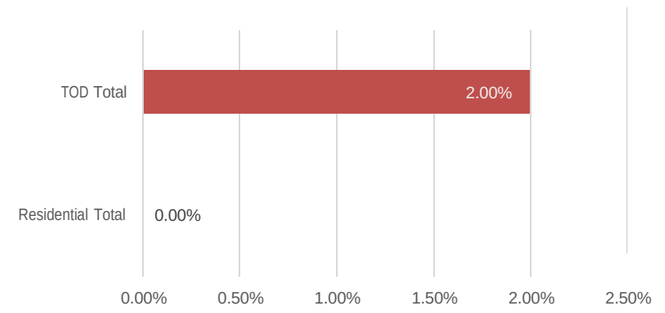
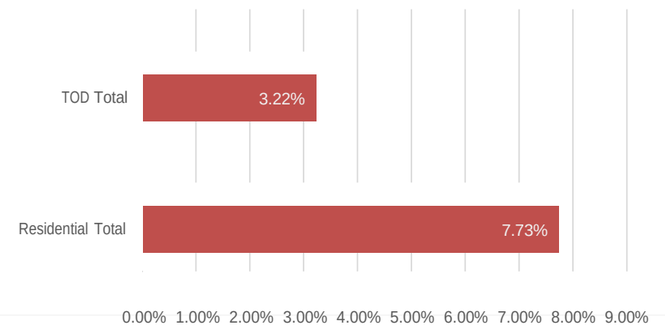
The table below shows the summary of proposed upgrades and the modelled traffic per precinct. For purposes of this report, traffic attracted by the railway station precinct was assessed as “passing traffic”. For details, please refer the Appendix 3 of this report (Network Modelling Report).

<table>
<tr><th>Road</th><th>Section
DCP ref /
[TMR ref]</th><th>2050
Volumes
(VPD)</th><th>Configuration</th><th>Modelling</th></tr>
<tr><td rowspan="2">Berkshire Road</td><td>Roe Highway – Walters Way
[RD1]</td><td>25,900</td><td rowspan="2"> 

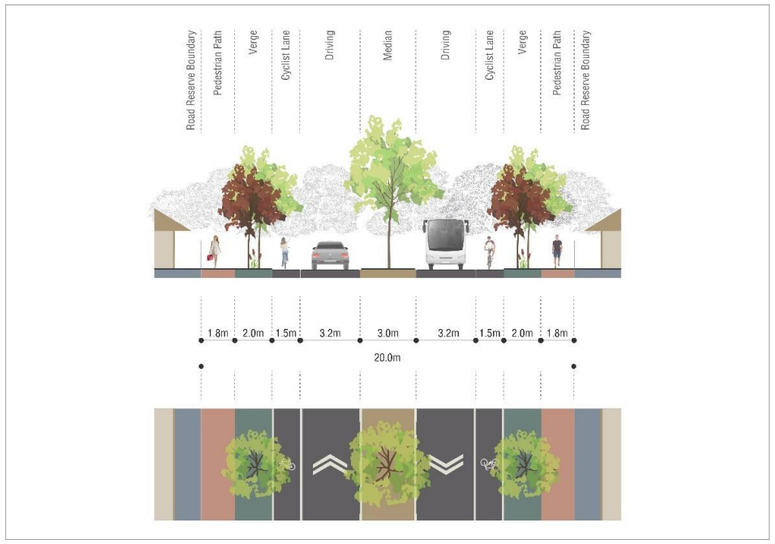
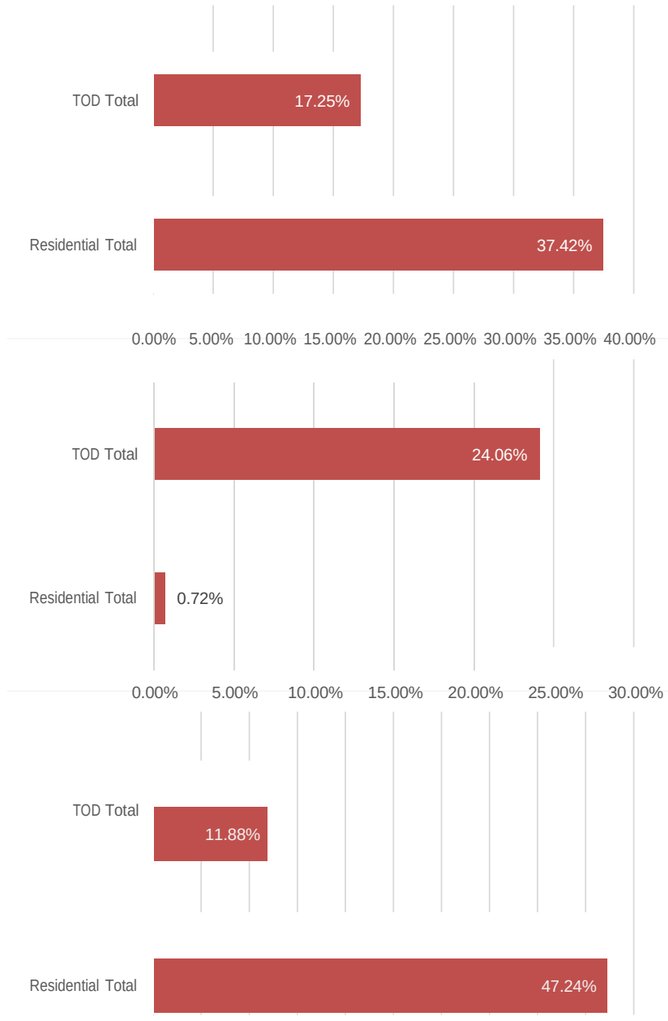
Berkshire Road will trigger a requirement for an upgrade to Integrator B configuration by 2031. To minimise cost and disturbance for the existing businesses, it is recommended that the road is upgraded straight to Integrator A closer to 2041. Alternatively, the Integrator B configuration can be implemented in 2031 within the existing road reservation, with additional traffic lanes added in 2041 once the land is acquired for widening.</td><td rowspan="2"> 

Note: The modelling showed negligible difference in distribution for each precinct in these two segments of Berkshire Road. For simplicity, the values were averaged for the entire length, as per table below:
<table>
<tr><th></th><th>Roe Hwy-
Walters Way</th><th>Walters Wy-
Milner Road</th><th>Average
Berkshire Road</th></tr>
<tr><td>Residential Precinct</td><td>15.54%</td><td>16.37%</td><td>15.96%</td></tr>
<tr><td>TOD Precinct</td><td>8.44%</td><td>8.79%</td><td>8.62%</td></tr>
</table></td></tr>
<tr><td>Walters Way – Milner Road
[RD1]</td><td>25,000</td></tr>
</table>

Transport Modelling Report DCP
KC00604.000 High Wycombe South

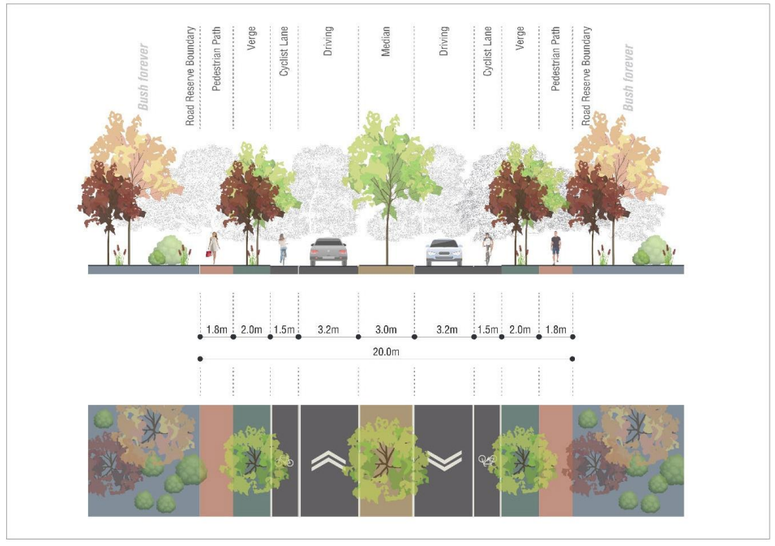
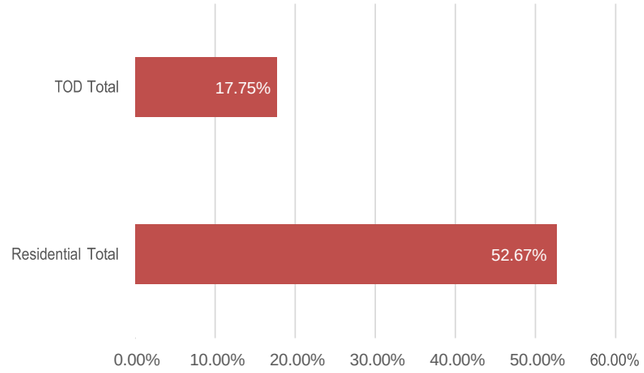
Road	Section DCP ref / [TMR ref]	2050 Volumes (VPD)	Configuration	Modelling
Dundas Road	Maida Vale Road - Sorensen Road [RD8]	20,000		
	Berkshire Road - Dundas Road Old (north of the railway station)) [RD7]	13,700		
	Berkshire Road - Harrison Road [RD6]	15,200	Dundas Road, north of the realignment, in 2050, may carry traffic volumes approaching the threshold for an Integrator A upgrade (dual lanes in each direction).	

Transport Modelling Report DCP
KC00604.000 High Wycombe South

Road	Section DCP ref / [TMR ref]	2050 Volumes (VPD)	Configuration	Modelling
Maida Vale Road	Milner Road – Roe Highway [RD3/3A]	13,000		
	Raven Street - Milner Road [RD4]	4,200		
	Dundas Road - Raven Street [RD5]	7,800		

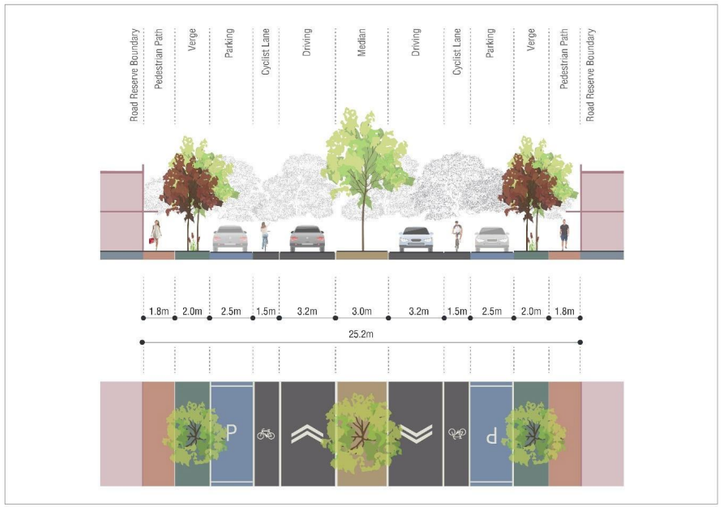
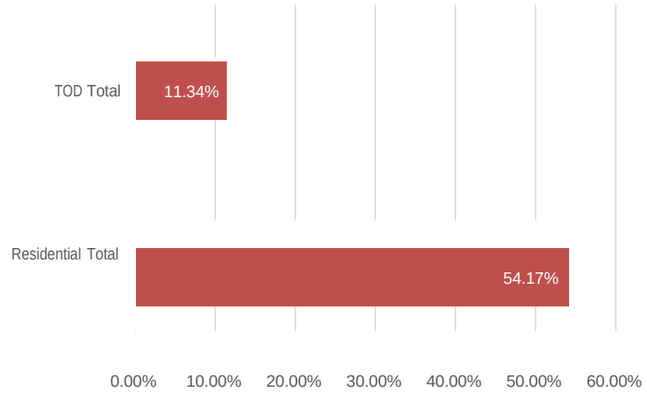
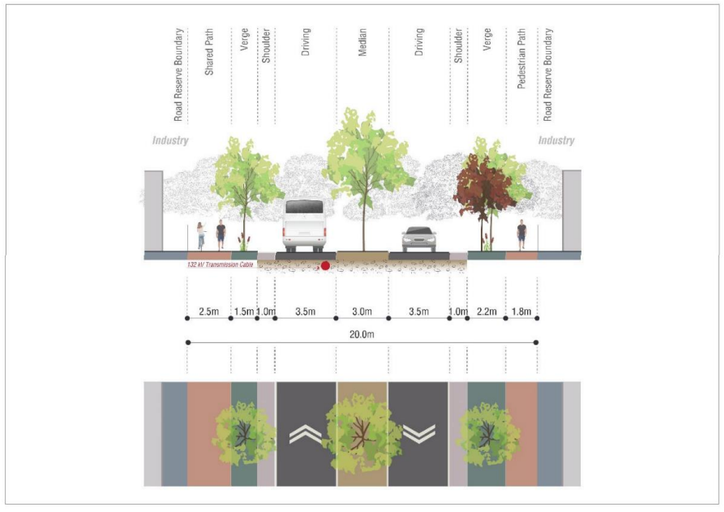
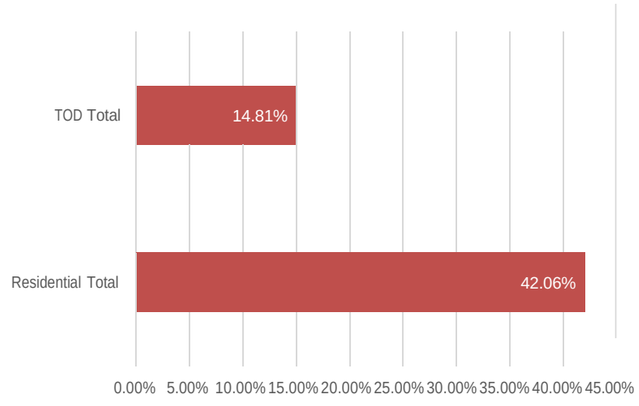
As previously discussed, Maida Vale Road proposed upgrade was developed to minimise the impact on the existing residences.

Transport Modelling Report DCP
KC00604.000 High Wycombe South

Road	Section DCP ref / [TMR ref]	2050 Volumes (VPD)	Configuration	Modelling
Milner Road	Stewart Road - Maida Vale Road **RD02/** [RD10]	10,000		

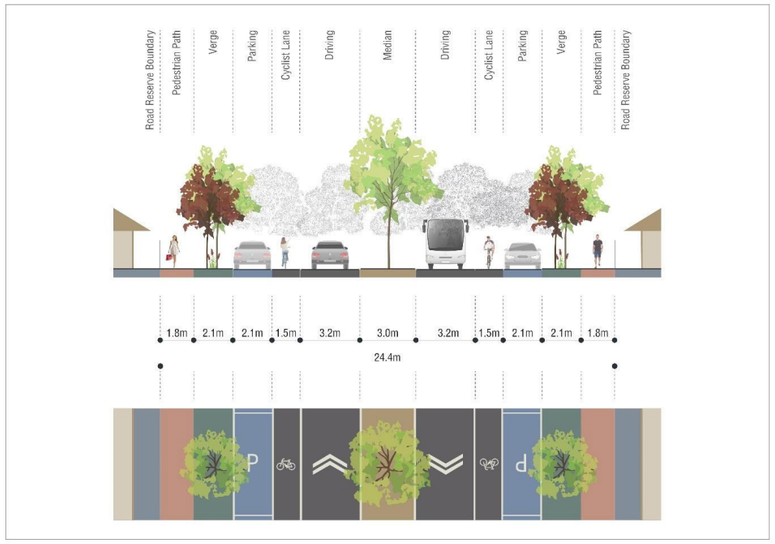
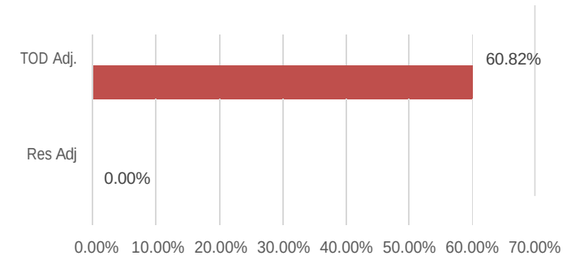
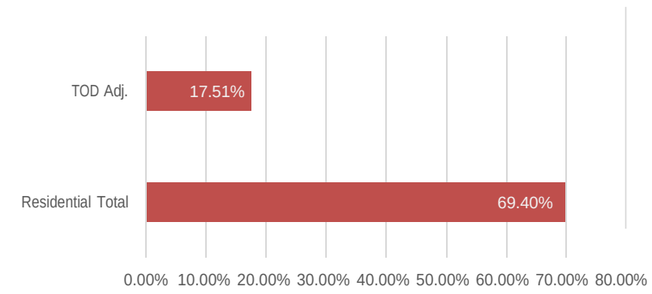
Milner Road traverses Poison Gully Creek at this point. This cross-section was derived to minimise the impact on heritage areas and the existing residences.

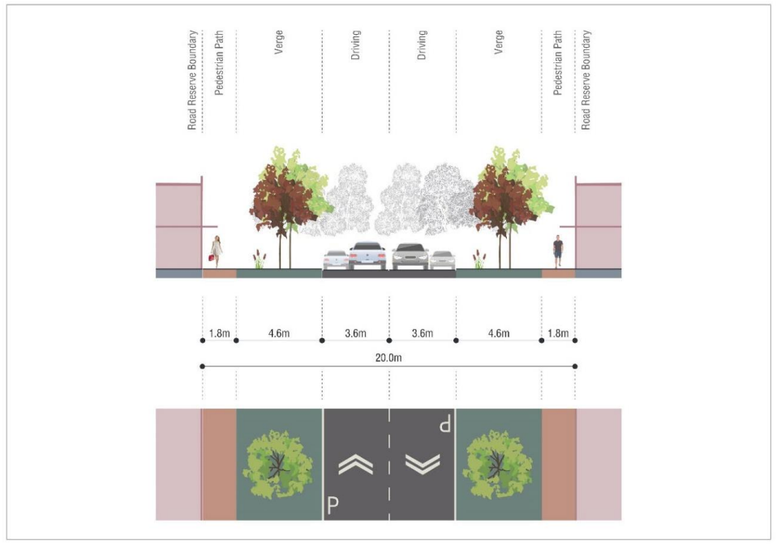
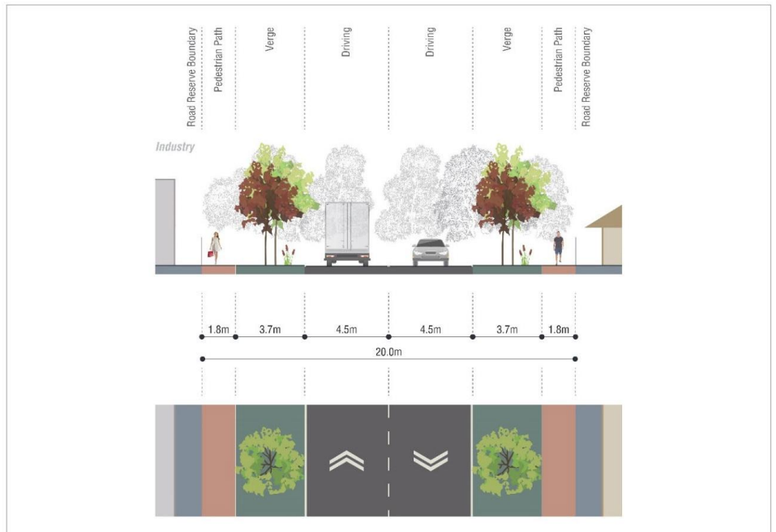
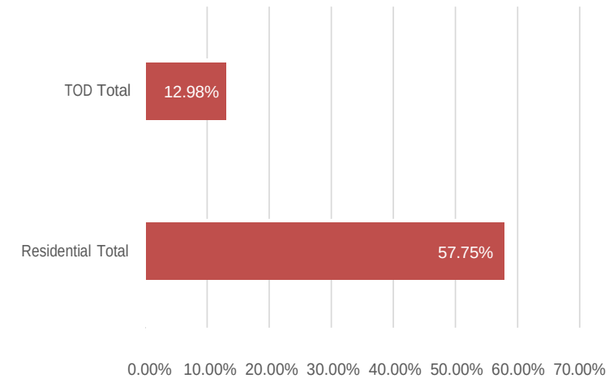
Transport Modelling Report DCP
KC00604.000 High Wycombe South

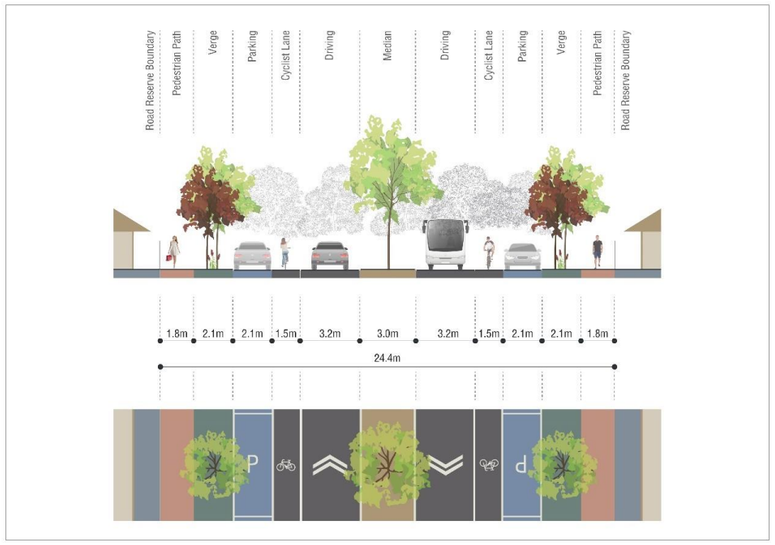
Road	Section DCP ref / [TMR ref]	2050 Volumes (VPD)	Configuration	Modelling
Milner Road	Sultana Road West - Stewart Road **RD01**/[RD2]	9,700		
	Berkshire Road - Sultana Road West [RD9]	13,000		

This section of Milner Road is modified to minimise the disturbance to the existing businesses. The presence of an HV underground transmission line dictates the options for upgrade.

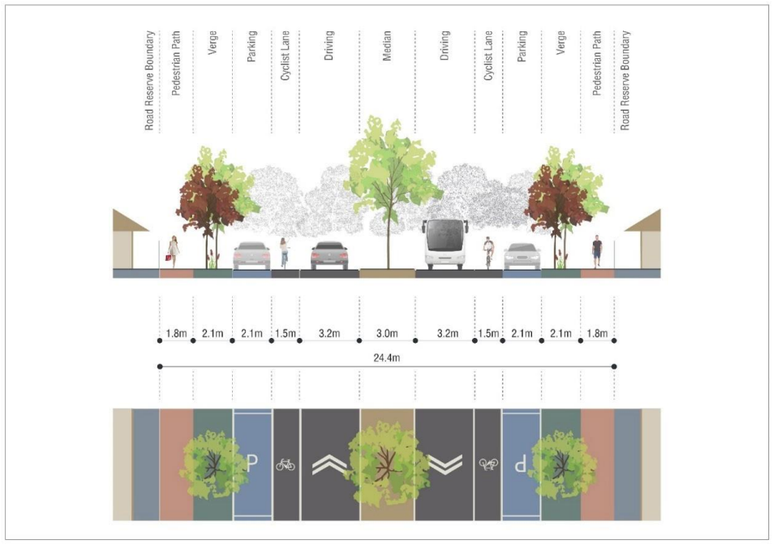
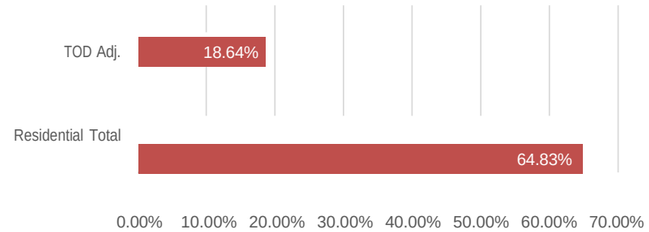
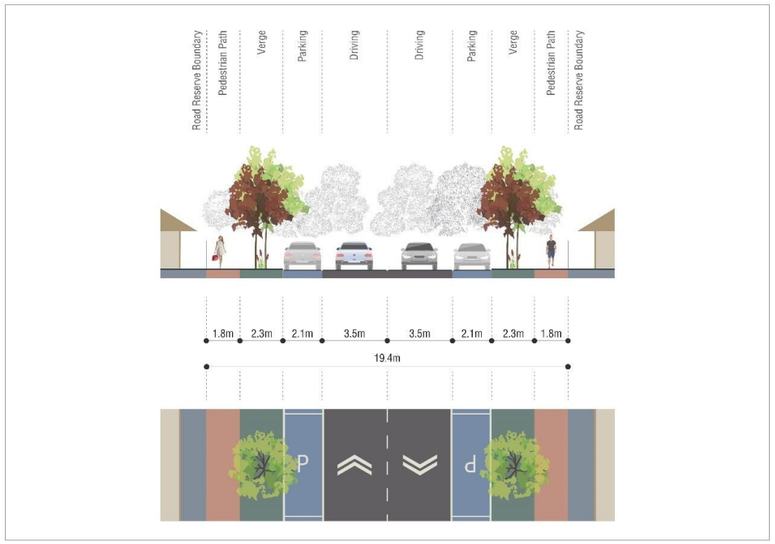
Transport Modelling Report DCP
KC00604.000 High Wycombe South

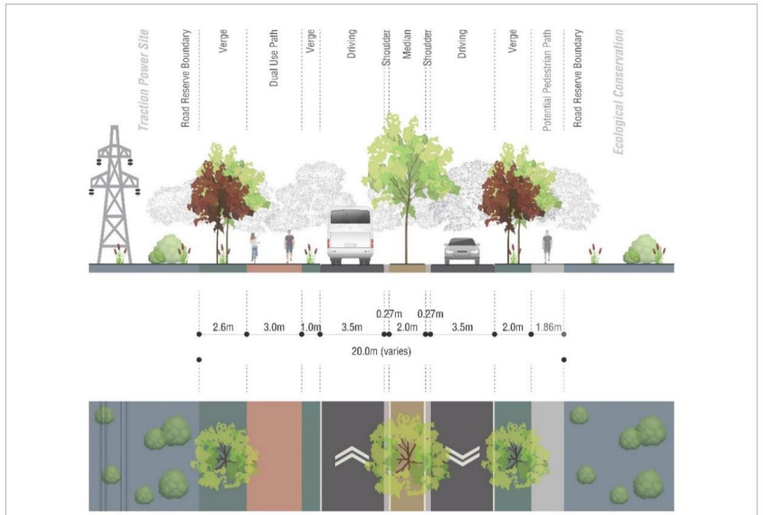
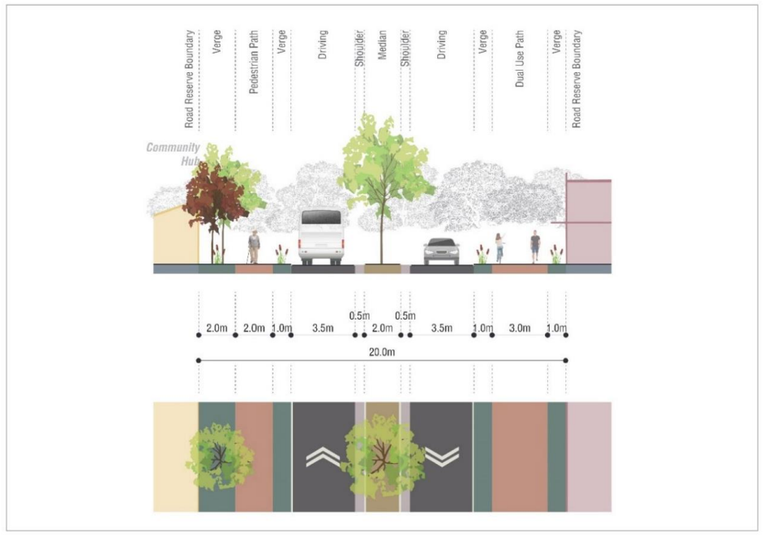
Road	Section DCP ref / [TMR ref]	2050 Volumes (VPD)	Configuration	Modelling
TOD Connector	Milner Road - Enterprise Boulevard/Ibis Place [RD14]	2,400		 Traffic attracted by the railway station, originating outside of the project area, was assessed as passing traffic.
	Milner Road - Edge of TOD Precinct [RD15]	6,400		 The percentage of traffic for TOD Precinct was recalculated to exclude reciprocal traffic.
	Edge of TOD Precinct – Roe Highway **RD04**/[RD16]	3,700		100% Residential Precinct

Road	Section DCP ref / [TMR ref]	2050 Volumes (VPD)	Configuration	Modelling
Sultana Road West	TOD Connector – Milner Road [-]	<1,500		100% TOD Precinct (this road is constructed as a part of railway station works and is not likely to require an upgrade)
	Milner Road – Edge of TOD Precinct & Edge of TOD Precinct – Cul-de-sac **RD09**/[RD20]	1,900		Milner Road – Edge of TOD Precinct:  It is expected that this road will be brought to an urban standard as the development progresses.

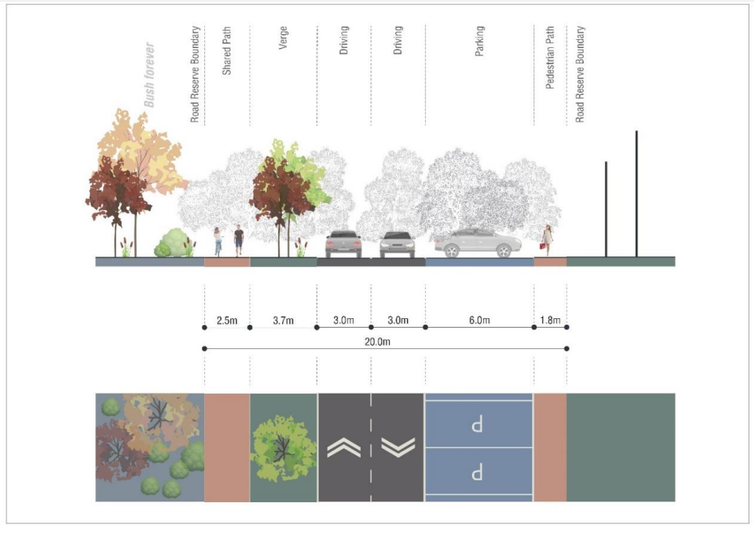
Road	Section DCP ref / [TMR ref]	2050 Volumes (VPD)	Configuration	Modelling
Stewart Road	Milner Road – Brae Road **RD05**/[RD17]	4,700		100% Residential Precinct

Transport Modelling Report DCP
KC00604.000 High Wycombe South

Road	Section DCP ref / [TMR ref]	2050 Volumes (VPD)	Configuration	Modelling
Raven Street	Maida Vale Road - Milner Road [RD12]	5,700		 The percentage of traffic for TOD Precinct was recalculated to exclude reciprocal traffic.
	Milner Road - Brae Road **RD03**/[RD13]	6,000		100% Residential Precinct
Brae Road	TOD Connector – Brand Road **RD06**/[RD18]	2,600		100% Residential Precinct *NOTE: Section of Brae Road southwest of TOD Connector (to be renamed as Brae Street – RD07 DCP ref) will be an Access Street..

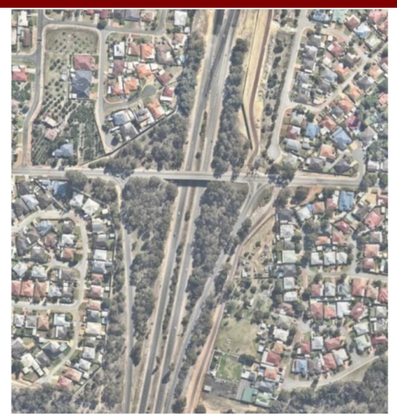
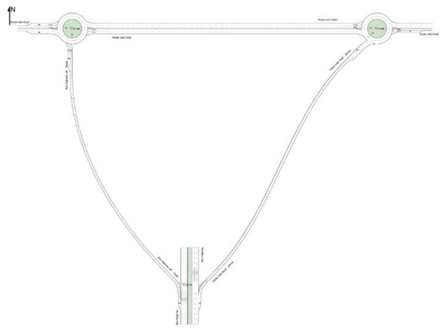
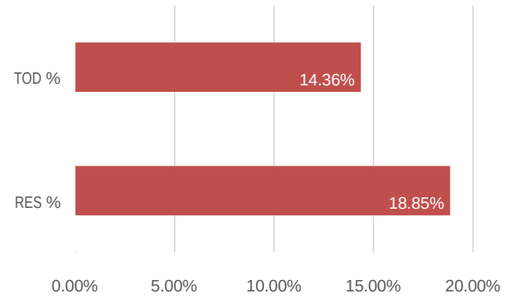
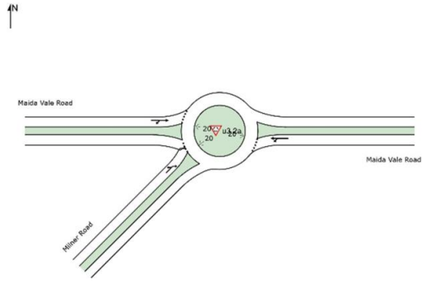
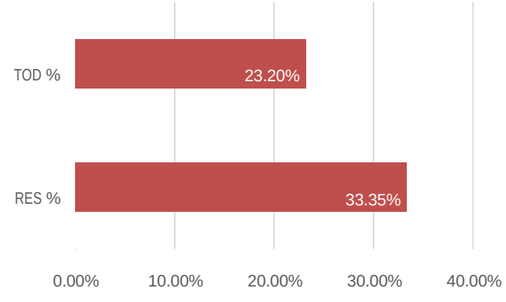
Road	Section DCP ref / [TMR ref]	2050 Volumes (VPD)	Configuration	Modelling
Enterprise Boulevard (former Ibis Place)	TOD Connector – Maida Vale Road (East of Maida Vale Road, abutting TEC) [RD11]	3,600		100% TOD Precinct This road will be constructed mainly as a part of railway station works. Once community facility is in place, a shared path will be required on the south side of road reservation.
	TOD Connector – Maida Vale Road (North of TOD Connector, abutting Community Facility) [RD11]	2,000		

Transport Modelling Report DCP
KC00604.000 High Wycombe South

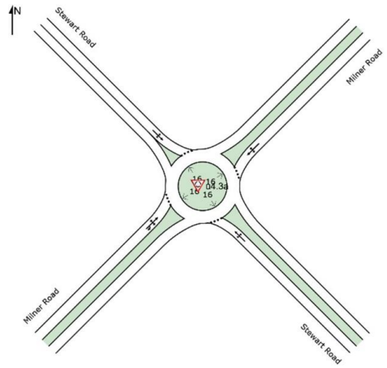
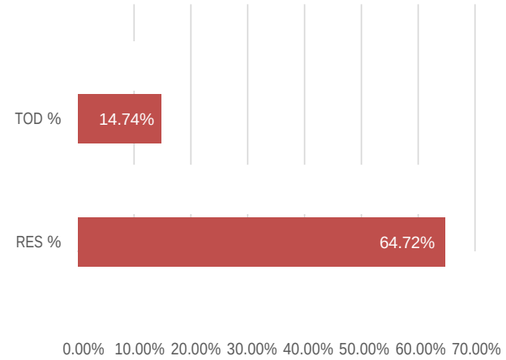
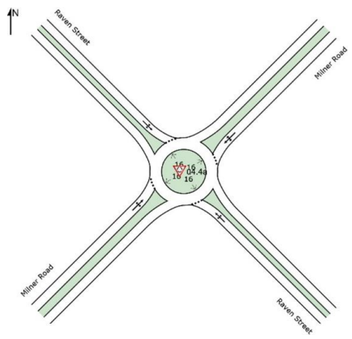
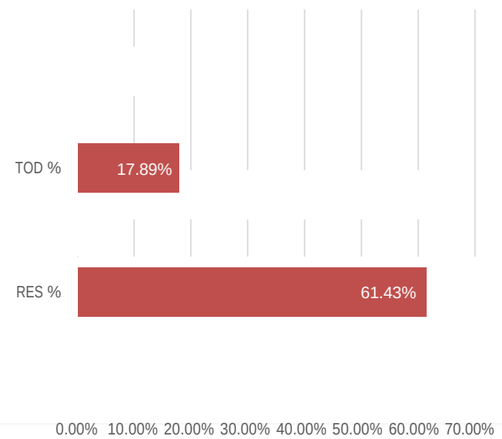
Road	Section DCP ref / [TMR ref]	2050 Volumes (VPD)	Configuration	Modelling
Brand Road	TOD Connector – Brae Road **RD08**/[RD19]	2,000		100% Residential Precinct This road is expected to be upgraded at the time when the primary school and the district open space are constructed. Two cross-sections show possible options for road configuration which would cater the best for the adjoining facilities.
	TOD Connector – Brae Road (Variation along the Primary School Site) **RD08**/[RD19]	2,000		

6.4 Key Intersections

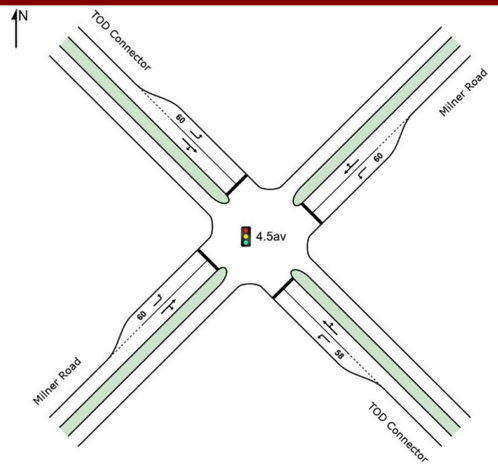
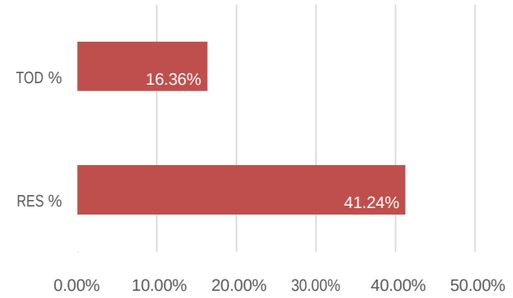
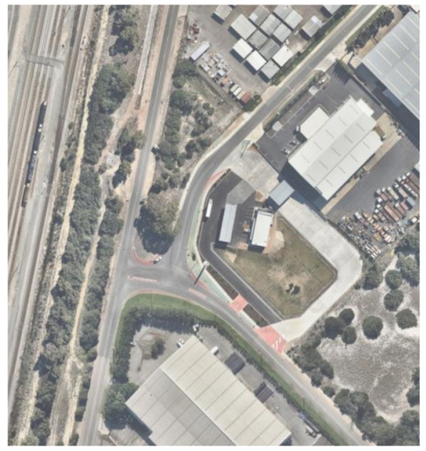
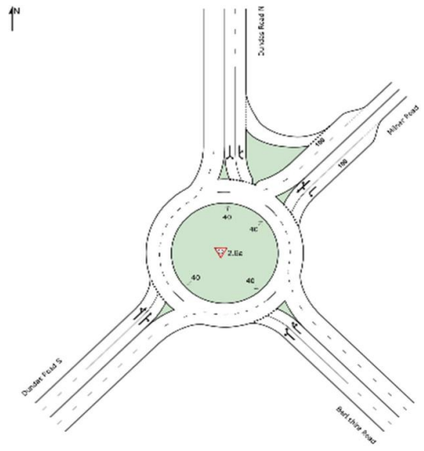
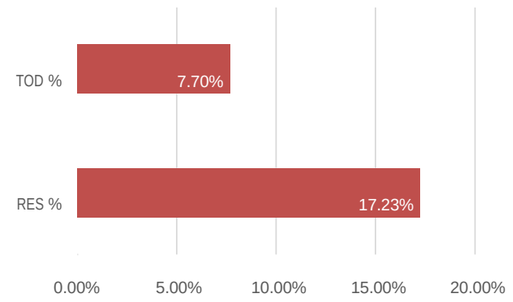
The table below shows the summary of proposed upgrades and the modelling. For details, please refer the Appendix 4 of this report (Intersection Modelling Report)

Intersection DCP ref/ [TMR ref]	Current Configuration	Upgrade Requirements (Ultimate Configuration)	Modelling
M01. Roe Highway / Maida Vale Road [INT 02]	 Half interchange	 Half Interchange	
M02. Maida Vale Road / Milner Road [INT 01]	 T-intersection full movement	 Roundabout after upgrade	

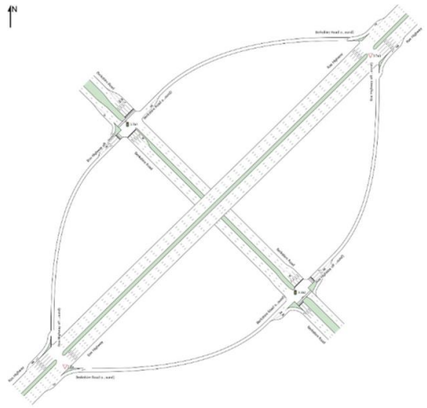
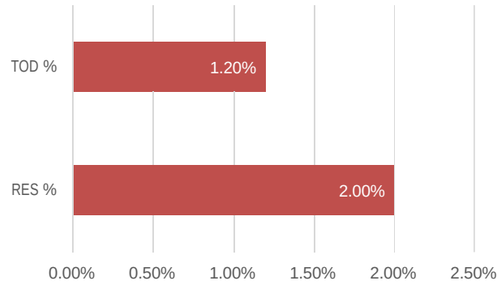
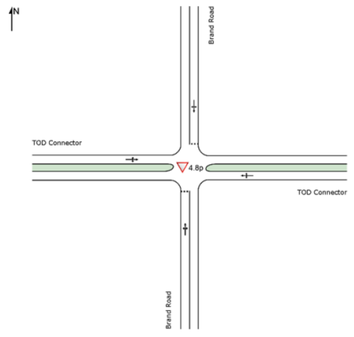
Transport Modelling Report DCP
KC00604.000 High Wycombe South

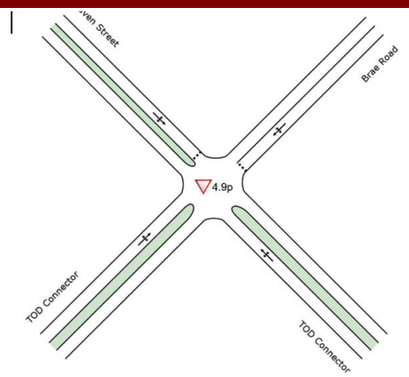
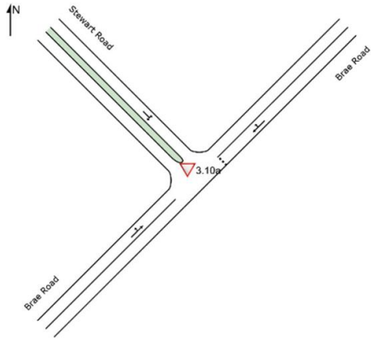
Intersection DCP ref/ [TMR ref]	Current Configuration	Upgrade Requirements (Ultimate Configuration)	Modelling
M03. Milner Road / Stewart Road **INT01** / [INT 16]	 T-intersection full movement	 Roundabout	
M04. Milner Road / Raven Street **INT02** / [INT 12]	 T-intersection full movement	 Roundabout	

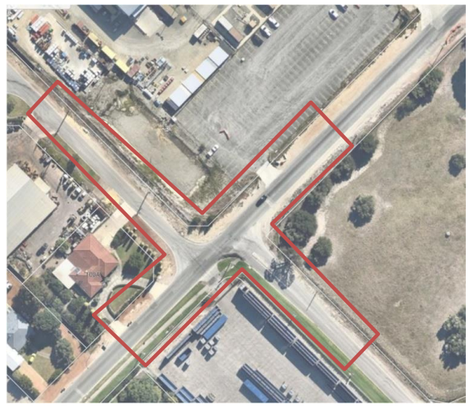
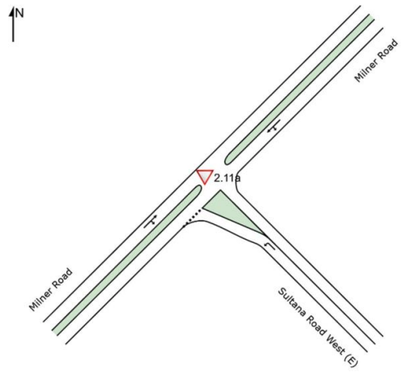
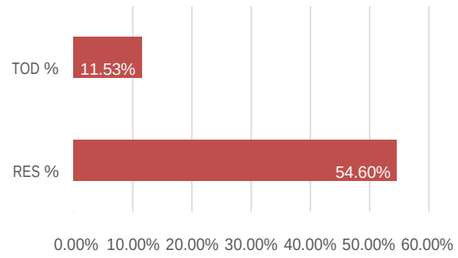
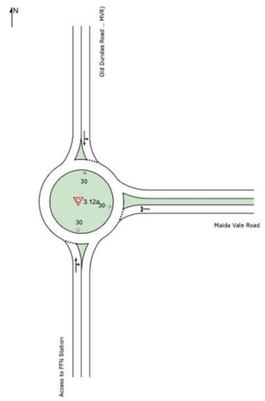
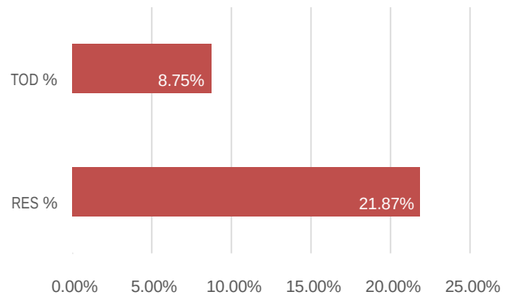
Transport Modelling Report DCP
KC00604.000 High Wycombe South

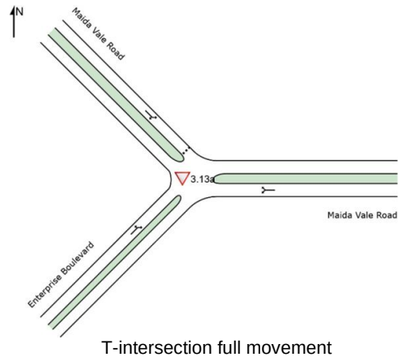
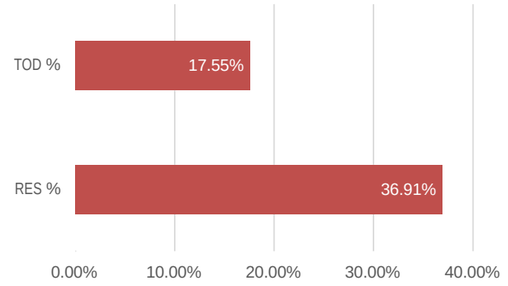
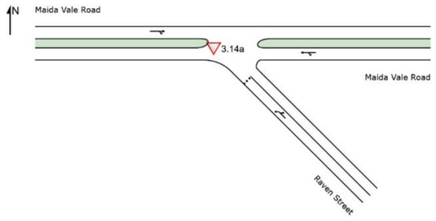
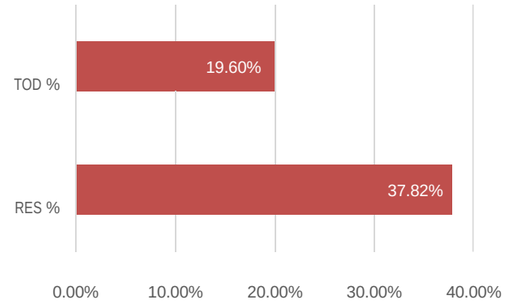
Intersection DCP ref/ [TMR ref]	Current Configuration	Upgrade Requirements (Ultimate Configuration)	Modelling
M05. Milner Road / TOD Connector [INT 05]	Intersection doesn't exist at present. Possibly it might be constructed as a sign-controlled intersection initially.	 Signalised intersection	
M06. Milner Road / Berkshire Road / Dundas Road [INT 15]	 T-intersection full movement	 Roundabout	

PAGE 34

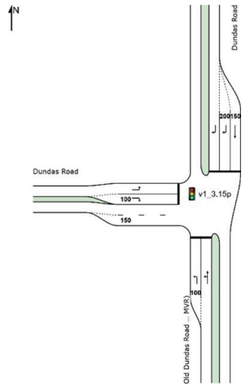
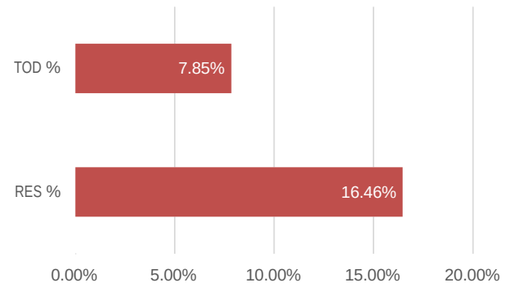
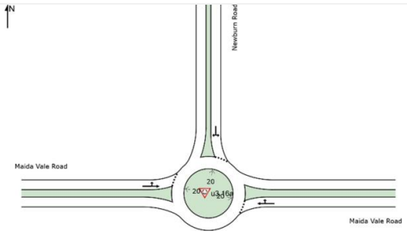
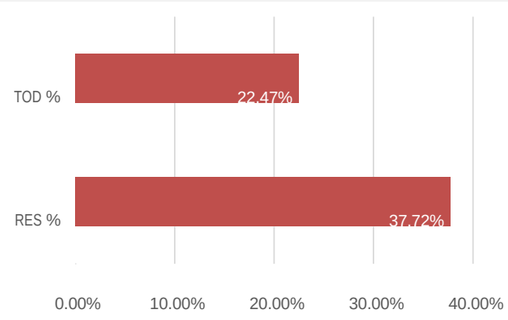
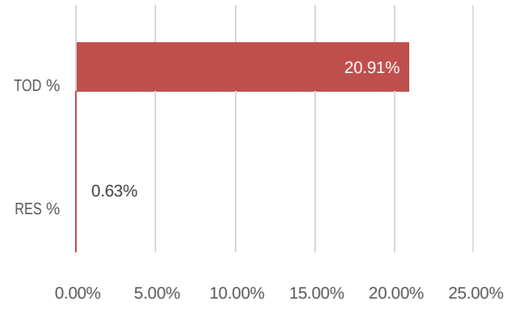
Intersection DCP ref/ [TMR ref]	Current Configuration	Upgrade Requirements (Ultimate Configuration)	Modelling
M07. Berkshire Road / Roe Highway [-]	 Grade separated interchange	 Grade separated interchange	 While this interchange may require an upgrade in future, this will be due to the growth of passing traffic, not due to the traffic from the Project Area.
M08. TOD Connector / Brand Road **INT03** / [INT 16]	Intersection doesn't exist at present.	 Four-way, sign controlled	100% Residential Precinct

Intersection DCP ref/ [TMR ref]	Current Configuration	Upgrade Requirements (Ultimate Configuration)	Modelling
M09. TOD Connector / Brae Road / Raven Street **INT06** / [INT 14]	Intersection doesn't exist at present.	 T-intersection full movement Note: civil design investigation showed that due to the geometry of existing roads, safer intersection configuration is a roundabout. This does not change traffic distribution on precinct apportionment. As sign controlled intersection had a LOS A, roundabout will maintain LOS A.	100% Residential Precinct
M10. Brae Road / Stewart Road **INT07** / [INT 09]	 T-intersection full movement	 T-intersection full movement	100% Residential Precinct

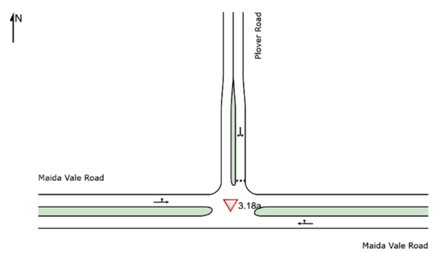
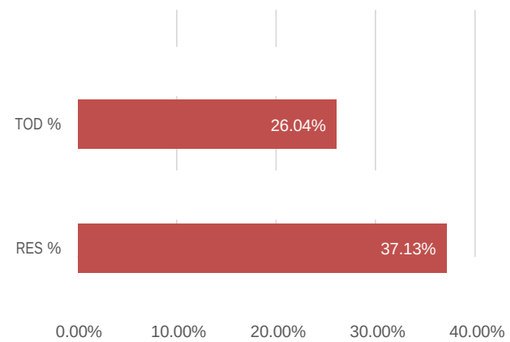
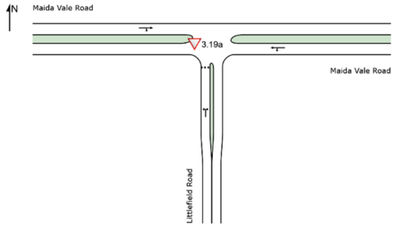
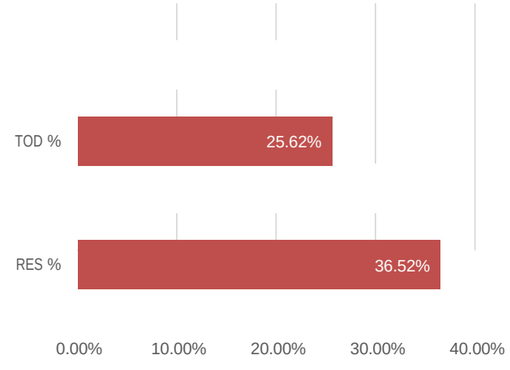
Intersection DCP ref/ [TMR ref]	Current Configuration	Upgrade Requirements (Ultimate Configuration)	Modelling
M11. Milner Road / Sultana Road West [INT 07]	 T-intersection	 Left In Left Out Right In	
M12. Maida Vale Road / Dundas Road / Parking Access [INT 14]	Intersection is in construction.	 Roundabout	 This intersection is constructed as a part of the railway works and will not require an upgrade by 2050.

Intersection DCP ref/ [TMR ref]	Current Configuration	Upgrade Requirements (Ultimate Configuration)	Modelling
M13. Maida Vale Road / Enterprise Boulevard [INT 12]	 T-intersection full movement	 T-intersection full movement	 This intersection is constructed as a part of the railway works. Adjustment may be required when Maida Vale Road is upgraded.
M14. Maida Vale Road / Raven Street [INT 13]	 Intersection doesn't exist at present	 T-intersection full movement	

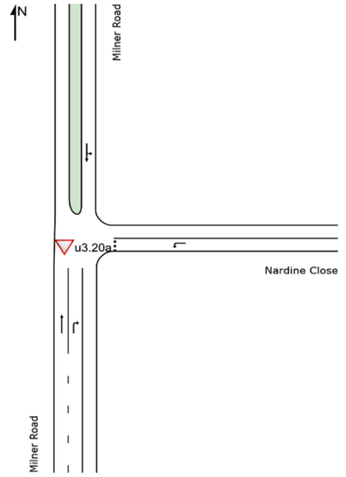
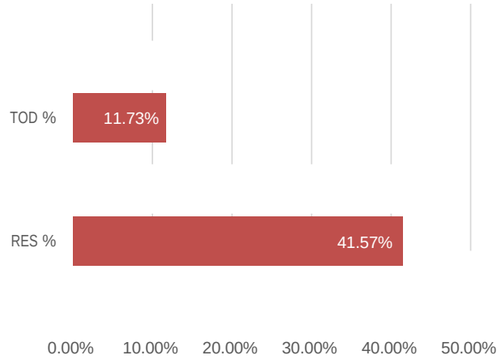
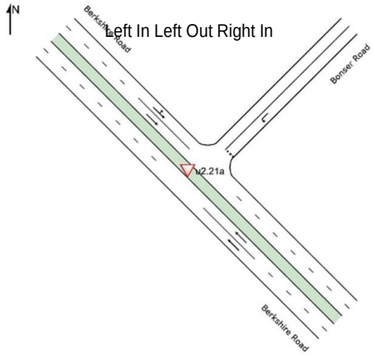
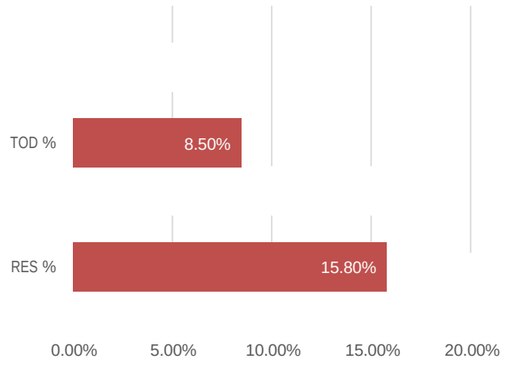
Transport Modelling Report DCP
KC00604.000 High Wycombe South

Intersection DCP ref/ [TMR ref]	Current Configuration	Upgrade Requirements (Ultimate Configuration)	Modelling
M15. Maida Vale Road (old Dundas Road) / Dundas Road [INT06]	 T-intersection full movement	 Signals	
M16. Maida Vale Road / Newburn Road [INT 03]	 T-intersection full movement	 Roundabout	
M17. Maida Vale Road / Butcher Road [-]	 T-intersection full movement	 T-intersection full movement	

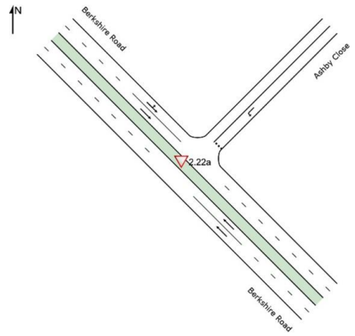
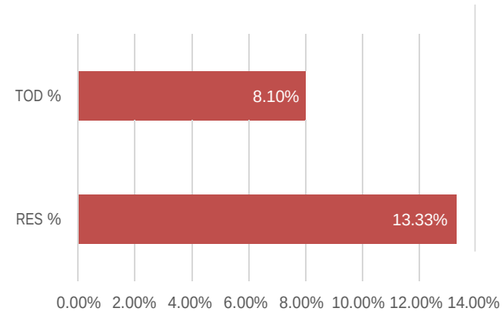
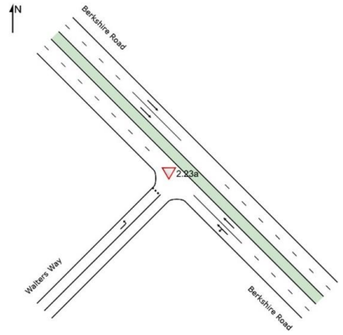
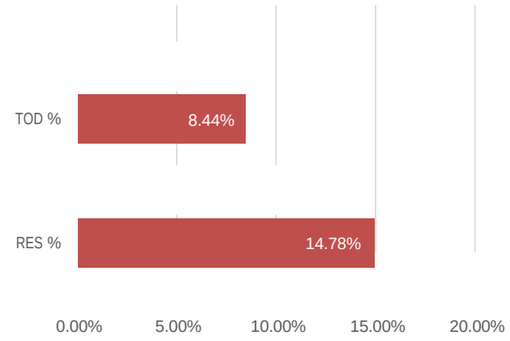
Transport Modelling Report DCP
KC00604.000 High Wycombe South

Intersection DCP ref/ [TMR ref]	Current Configuration	Upgrade Requirements (Ultimate Configuration)	Modelling
M18. Maida Vale Road / Plover Road [-]	 T-intersection full movement	 T-intersection full movement	
M19, Maida Vale Road / Littlefield Road [-]	 T-intersection full movement	 T-intersection full movement	

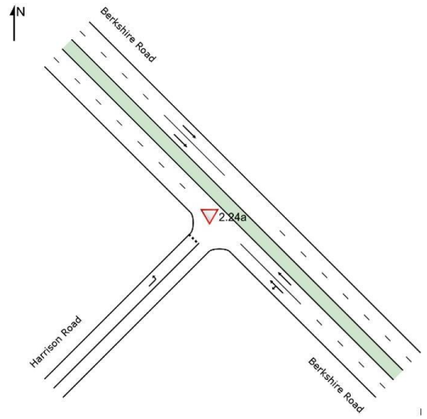
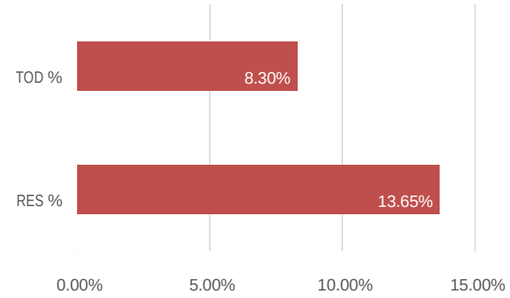
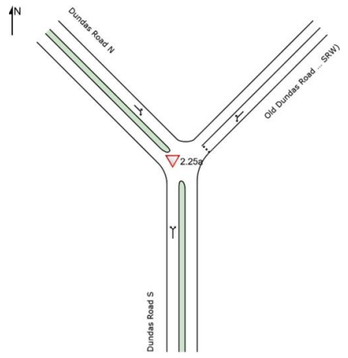
Transport Modelling Report DCP
KC00604.000 High Wycombe South

Intersection DCP ref/ [TMR ref]	Current Configuration	Upgrade Requirements (Ultimate Configuration)	Modelling
M20. Milner Road / Nardine Close [INT 08]	 T-intersection	 T-intersection full movement	
M21. Berkshire Road / Bonser Road [-]	 T-intersection	 Left In Left Out Only	

Transport Modelling Report DCP
KC00604.000 High Wycombe South

Intersection DCP ref/ [TMR ref]	Current Configuration	Upgrade Requirements (Ultimate Configuration)	Modelling
M22. Berkshire Road / Ashby Close [-]	 T-intersection full movement	 Left In Left Out Only	
M23. Berkshire Road / Walters Way [-]	 T-intersection full movement	 Left In Left Out Only	

Transport Modelling Report DCP
KC00604.000 High Wycombe South

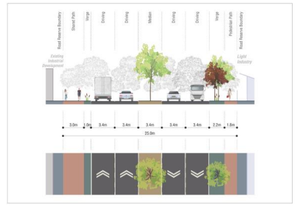
Intersection DCP ref/ [TMR ref]	Current Configuration	Upgrade Requirements (Ultimate Configuration)	Modelling
M24. Berkshire Road / Harrison Road [-]	 T-intersection full movement	 Left In Left Out Only	
M25. Dundas Road / Dundas Road (old alignment) [-]	 T-intersection full movement	 T-intersection full movement	This intersection is being constructed as a part of the railway works. It will not require an upgrade by 2050, apart for adjustment to accommodate the upgrade of Dundas Road.

Berkshire Road

Distributor B > Integrator A (modified)

segment : **[RD1] Milner Road - Roe Highway**

Modelling:		RR widening required	Year of Upgrade
• Residential Precinct	15.96%	✓	2041
• TOD Precinct	8.62%		



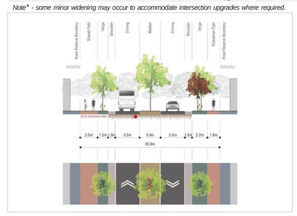
Milner Road

Local Distributor > Integrator B (modified)

segment : **[RD9] Berkshire Road - Sultana Road West**

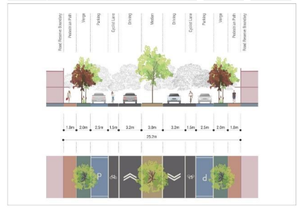
Modelling:		RR widening required	Year of Upgrade
• Residential Precinct	42.06%	✗*	2041
• TOD Precinct	14.81%		

Note* - some minor widening may occur to accommodate intersection upgrades where required.



segment : **RD01/[RD2] Sultana Road West - Stewart Road**

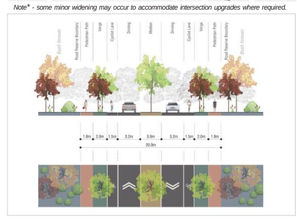
Modelling:		RR widening required	Year of Upgrade
• Residential Precinct	54.17%		2041
• TOD Precinct	11.34%		



segment : **RD02/[RD16] Stewart Road - Maida Vale Road**

Modelling:		RR widening required	Year of Upgrade
• Residential Precinct	52.67%	✗*	2041
• TOD Precinct	17.75%		

Note* - some minor widening may occur to accommodate intersection upgrades where required.



Dundas Road

Distributor B > Integrator B (modified)

segment : **RD6] Berkshire Road - Harrison Road**

Modelling:		RR widening required	Year of Upgrade
• Residential Precinct	7.73%	✗*	2031
• TOD Precinct	3.22%		

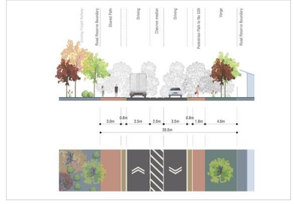
segment : **RD7] Berkshire Road - Dundas Road Old**

Modelling:		RR widening required	Year of Upgrade
• Residential Precinct	0.00%	✗*	2031
• TOD Precinct	2.00%		

segment : **RD8] Maida Vale Road - Sorensen Road**

Modelling:		RR widening required	Year of Upgrade
• Residential Precinct	15.25%	✗*	2031
• TOD Precinct	10.16%		

Note* - some minor widening may occur to accommodate intersection upgrades where required.



Enterprise Boulevard (former Ibis Place)

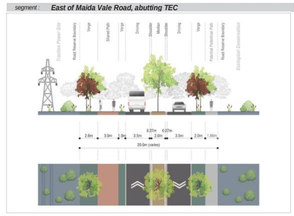
Access Street >Neighbourhood Connector A

segment : **[RD11] TOD Connector – Maida Vale Road**

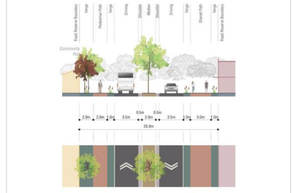
Modelling:		RR widening required	Year of Upgrade
• Residential Precinct	0.00%	✗*	2041
• TOD Precinct	100.00%		

Note* - some minor widening may occur to accommodate intersection upgrades where required.

segment : **East of Maida Vale Road, abutting TEC**



segment : **North of TOD Connector, abutting Community Facility**



Note: Enterprise Boulevard is constructed to an appropriate standard as a part of railway station works. In future shared path will be added on the southern side of road reservation.

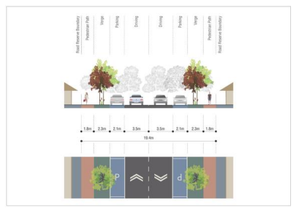
Brae Road

Access Street > Neighbourhood Connector B

segment : R D 0 6 / **[RD18] TOD Connector – Brand Road**

Modelling:		RR widening required	Year of Upgrade
• Residential Precinct	100.00%	✗*	2050
• TOD Precinct	0.00%		

Note* - some minor widening may occur to accommodate intersection upgrades where required.



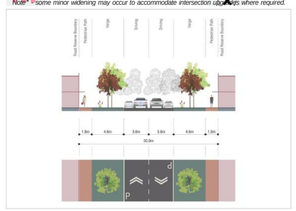
Sultana Road West

Access Street > Access Street (urban standard)

segment : **[-] TOD Connector – Milner Road**

Modelling:		RR widening required	Year of Upgrade
• Residential Precinct	0.00%	✗*	2041
• TOD Precinct	100.00%		

Note* - some minor widening may occur to accommodate intersection upgrades where required.



Note: Sultana Road West in this section is constructed to an appropriate standard as a part of railway station works.

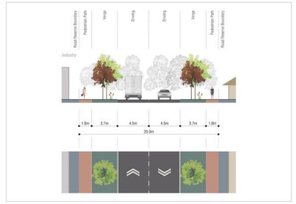
segment : **[RD20] Milner Road – Edge of TOD Precinct**

Modelling:		RR widening required	Year of Upgrade
• Residential Precinct	57.75%	✗*	2041
• TOD Precinct	12.98%		

segment : **RD09/ [RD20] Edge of TOD Precinct – Cul-de-sac**

Modelling:		RR widening required	Year of Upgrade
• Residential Precinct	100.00%	✗*	2041
• TOD Precinct	0.00 %		

Note* - some minor widening may occur to accommodate intersection upgrades where required.



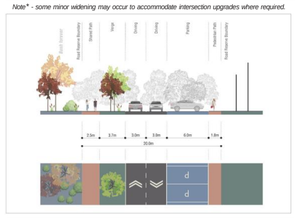
Brand Road

Access Street > Access Street (urban standard)

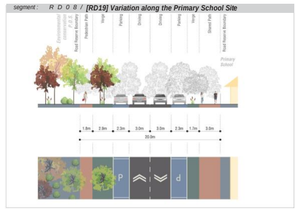
segment : R D 0 8 / **[RD19] TOD Connector – Brae Road**

Modelling:		RR widening required	Year of Upgrade
• Residential Precinct	100.00%	✗*	2041
• TOD Precinct	0.00%		

Note* - some minor widening may occur to accommodate intersection upgrades where required.



segment : R D 0 8 / **[RD19] Variation along the Primary School Site**



Maida Vale Road

Distributor B > Integrator B (modified)

segment : **[RD3/3A] Milner Road – Roe Highway**

Modelling:		RR widening required	Year of Upgrade
• Residential Precinct	37.42%	✗*	2041
• TOD Precinct	17.25%		

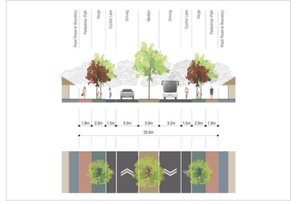
segment : **[RD4] Raven Street - Milner Road**

Modelling:		RR widening required	Year of Upgrade
• Residential Precinct	0.72%	✗*	2041
• TOD Precinct	24.06%		

segment : **[RD5] Dundas Road - Raven Street**

Modelling:		RR widening required	Year of Upgrade
• Residential Precinct	47.24%	✗*	2041
• TOD Precinct	11.88%		

Note* - some minor widening may occur to accommodate intersection upgrades where required.



Stewart Road

Access Street > Neighbourhood Connector A

segment : **RD05/[RD17] Milner Road - Brae Road**

Modelling:		RR widening required	Year of Upgrade
• Residential Precinct	100.00%	✓	2041
• TOD Precinct	0.00%		



Raven Street

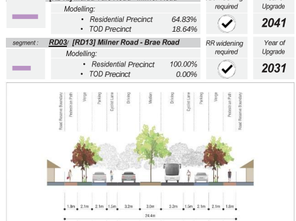
Access Street / New road > Neighbourhood Connector A

segment : **[RD12] Maida Vale Road - Milner Road**

Modelling:		RR widening required	Year of Upgrade
• Residential Precinct	64.83%	✓	2041
• TOD Precinct	18.64%		

segment : **RD03/ [RD13] Milner Road - Brae Road**

Modelling:		RR widening required	Year of Upgrade
• Residential Precinct	100.00%	✓	2031
• TOD Precinct	0.00%		



TOD Connector

New road > Neighbourhood Connector A

segment : **[RD14] Milner Road - Enterprise Boulevard**

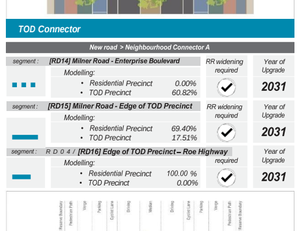
Modelling:		RR widening required	Year of Upgrade
• Residential Precinct	0.00%	✓	2031
• TOD Precinct	60.82%		

segment : **[RD15] Milner Road - Edge of TOD Precinct**

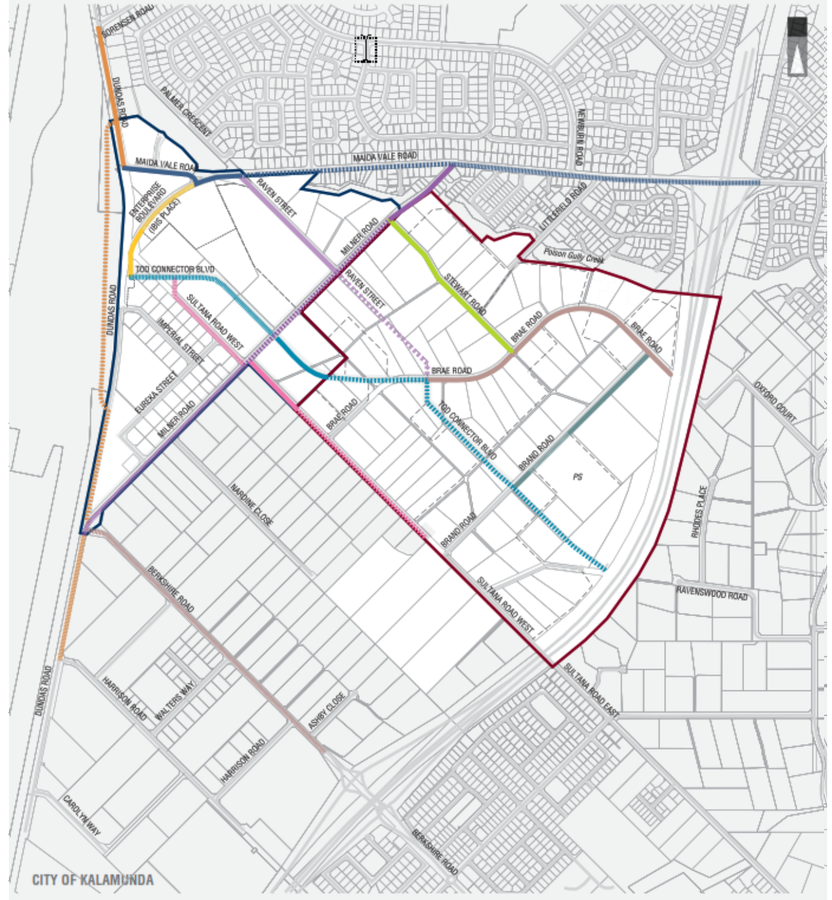
Modelling:		RR widening required	Year of Upgrade
• Residential Precinct	69.40%	✓	2031
• TOD Precinct	17.51%		

segment : R D 0 4 / **[RD16] Edge of TOD Precinct – Roe Highway**

Modelling:		RR widening required	Year of Upgrade
• Residential Precinct	100.00 %	✓	2031
• TOD Precinct	0.00%		



HIGH WYCOMBE SOUTH - TOD & RESIDENTIAL PRECINCTS



Plan of upgrades and apportionment

- Roads

kctt

www.kctt.com.au

M01. Roe Highway / Maida Vale Road [INT 02]

Current Configuration	Modelling:		Year of Upgrade
Half interchange	• Residential Precinct	18.85%	2031
	• TOD Precinct	14.36%	

Upgrade Requirements (Ultimate Configuration)

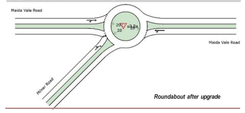


Half Interchange

M02. Maida Vale Road / Milner Road [INT 01]

Current Configuration	Modelling:		Year of Upgrade
T-intersection full movement (Roundabout after upgrade)	• Residential Precinct	33.35%	2041
	• TOD Precinct	23.20%	

Upgrade Requirements (Ultimate Configuration)

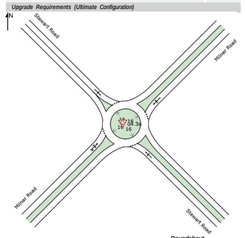


Roundabout after upgrade

DCP – INT 01 - M03. Milner Road / Stewart Road [INT 18]

Current Configuration	Modelling:		Year of Upgrade
T-intersection full movement (Roundabout after upgrade)	• Residential Precinct	64.72%	2041
	• TOD Precinct	14.74%	

Upgrade Requirements (Ultimate Configuration)

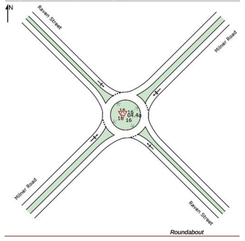


Roundabout

DCP – INT03 - M04. Milner Road / Raven Street [INT 17]

Current Configuration	Modelling:		Year of Upgrade
T-intersection full movement (Roundabout after upgrade)	• Residential Precinct	61.43%	2041
	• TOD Precinct	17.89%	

Upgrade Requirements (Ultimate Configuration)

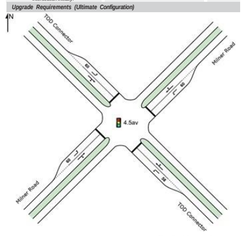


Roundabout

M05. Milner Road / TOD Connector [INT 05]

Current Configuration	Modelling:		Year of Upgrade
Intersection doesn't exist at present. Possibly it might be constructed as a sign-controlled intersection initially.	• Residential Precinct	41.24%	2041
	• TOD Precinct	16.36%	

Upgrade Requirements (Ultimate Configuration)

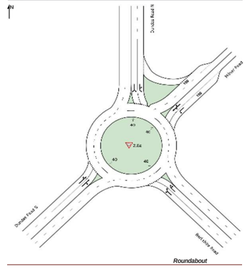


Signalised intersection

M06. Milner Road / Berkshire Road / Dundas Road [INT 15]

Current Configuration	Modelling:		Year of Upgrade
T-intersection full movement	• Residential Precinct	17.23%	2031/41
	• TOD Precinct	12.58%	

Upgrade Requirements (Ultimate Configuration)

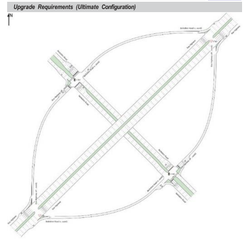


Roundabout

M07. Berkshire Road / Roe Highway

Current Configuration	Modelling:		Year of Upgrade
Grade separated interchange	• Residential Precinct	2.00%	-
	• TOD Precinct	1.20%	

Upgrade Requirements (Ultimate Configuration)



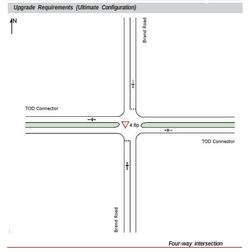
Note: While this interchange may require an upgrade in future, this will be due to the growth of passing traffic, not due to the traffic from the Project Area. Therefore, it is excluded from DCP.

Grade separated interchange

DCP – INT03 - M08. TOD Connector / Brand Road [INT 16]

Current Configuration	Modelling:		Year of Upgrade
Intersection doesn't exist at present.	• Residential Precinct	100.00%	2041
	• TOD Precinct	0.00%	

Upgrade Requirements (Ultimate Configuration)

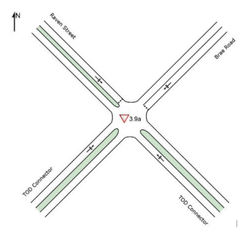


Four-way intersection

DCP – INT06 - M09. TOD Connector / Brae Road / Raven Street [INT 14]

Current Configuration	Modelling:		Year of Upgrade
Intersection doesn't exist at present.	• Residential Precinct	100.00%	2031
	• TOD Precinct	0.00%	

Upgrade Requirements (Ultimate Configuration)

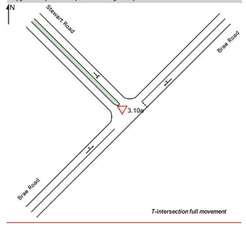


Four-way intersection

DCP – INT07 - M10. Brae Road / Stewart Road [INT 09]

Current Configuration	Modelling:		Year of Upgrade
T-intersection full movement	• Residential Precinct	100.00%	2041
	• TOD Precinct	0.00%	

Upgrade Requirements (Ultimate Configuration)

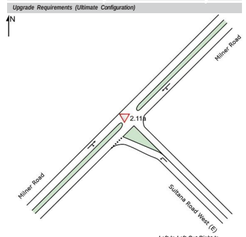


T-intersection full movement

M11. Milner Road / Sultana Road West [INT 07]

Current Configuration	Modelling:		Year of Upgrade
T-intersection	• Residential Precinct	54.60%	2041
	• TOD Precinct	11.53%	

Upgrade Requirements (Ultimate Configuration)

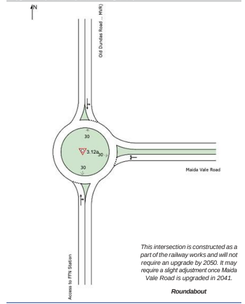


Left In Left Out Right In

M12. Maida Vale Road / Dundas Road / Parking Access [INT 04]

Current Configuration	Modelling:		Year of Upgrade
Intersection is in construction.	• Residential Precinct	16.46%	2041*
	• TOD Precinct	7.85%	

Upgrade Requirements (Ultimate Configuration)



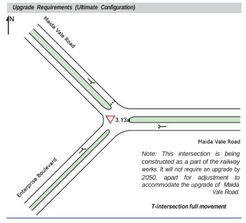
This intersection is constructed as a part of the railway works and will not require an upgrade by 2050. It may require a slight adjustment once Maida Vale Road is upgraded in 2041.

Roundabout

M13. Maida Vale Road / Enterprise Boulevard [INT 12]

Current Configuration	Modelling:		Year of Upgrade
T-intersection full movement	• Residential Precinct	36.91%	2041*
	• TOD Precinct	17.55%	

Upgrade Requirements (Ultimate Configuration)



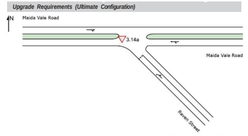
Note: This intersection is being constructed as a part of the railway works. It will not require an upgrade by 2050, apart for adjustment to accommodate the upgrade of Maida Vale Road.

T-intersection full movement

M14. Maida Vale Road / Raven Street [INT 13]

Current Configuration	Modelling:		Year of Upgrade
Intersection doesn't exist at present	• Residential Precinct	37.82%	2041
	• TOD Precinct	19.60%	

Upgrade Requirements (Ultimate Configuration)

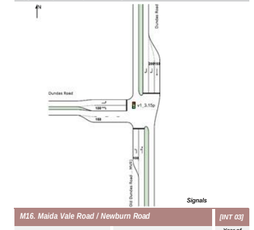


T-intersection full movement

M15. Maida Vale Road (old Dundas Road) / Dundas Road

Current Configuration	Modelling:		Year of Upgrade
T-intersection full movement	• Residential Precinct	16.46%	2031
	• TOD Precinct	7.85%	

Upgrade Requirements (Ultimate Configuration)

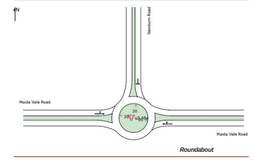


Signals

M16. Maida Vale Road / Newburn Road [INT 03]

Current Configuration	Modelling:		Year of Upgrade
T-intersection full movement	• Residential Precinct	37.72%	2041
	• TOD Precinct	22.47%	

Upgrade Requirements (Ultimate Configuration)

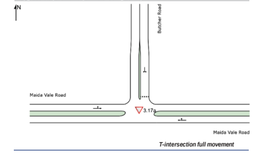


Roundabout

M17. Maida Vale Road / Butcher Road

Current Configuration	Modelling:		Year of Upgrade
T-intersection full movement	• Residential Precinct	n/a (0.63%)	2041
	• TOD Precinct	20.91%	

Upgrade Requirements (Ultimate Configuration)

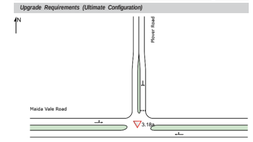


T-intersection full movement

M18. Maida Vale Road / Plover Road

Current Configuration	Modelling:		Year of Upgrade
T-intersection full movement	• Residential Precinct	37.13%	2041
	• TOD Precinct	26.04%	

Upgrade Requirements (Ultimate Configuration)

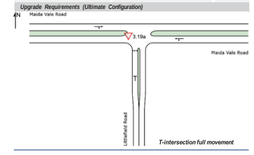


T-intersection full movement

M19. Maida Vale Road / Littlefield Road

Current Configuration	Modelling:		Year of Upgrade
T-intersection full movement	• Residential Precinct	36.52%	2041
	• TOD Precinct	25.62%	

Upgrade Requirements (Ultimate Configuration)

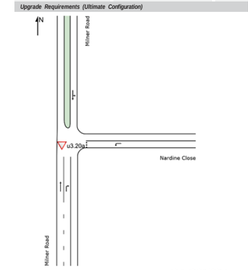


T-intersection full movement

M20. Milner Road / Nardine Close [INT 08]

Current Configuration	Modelling:		Year of Upgrade
T-intersection	• Residential Precinct	41.57%	2041
	• TOD Precinct	11.73%	

Upgrade Requirements (Ultimate Configuration)



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M21. Berkshire Road / Bonser Road

Current Configuration	Modelling:		Year of Upgrade
T-intersection full movement	• Residential Precinct	15.80%	2041
	• TOD Precinct	8.50%	

Upgrade Requirements (Ultimate Configuration)



Left In Left Out Only

M22. Berkshire Road / Ashby Close

Current Configuration	Modelling:		Year of Upgrade
T-intersection full movement	• Residential Precinct	13.33%	2041*
	• TOD Precinct	8.10%	

Upgrade Requirements (Ultimate Configuration)

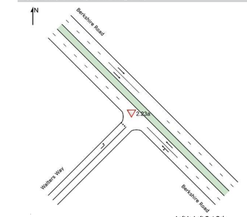


Left In Left Out Only

M23. Berkshire Road / Walters Way

Current Configuration	Modelling:		Year of Upgrade
T-intersection full movement	• Residential Precinct	14.78%	2041*
	• TOD Precinct	8.44%	

Upgrade Requirements (Ultimate Configuration)



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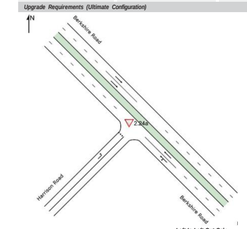
M24. Berkshire Road / Harrison Road

Current Configuration	Modelling:		Year of Upgrade
T-intersection full movement	• Residential Precinct	13.65%	2041*
	• TOD Precinct	8.30%	

Upgrade Requirements (Ultimate Configuration)



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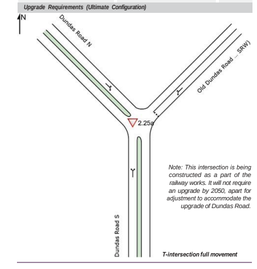
M25. Dundas Road / Dundas Road (old alignment) [INT 06]

Current Configuration	Modelling:		Year of Upgrade
T-intersection full movement	• Residential Precinct	n/a	2041*
	• TOD Precinct	2.32%	

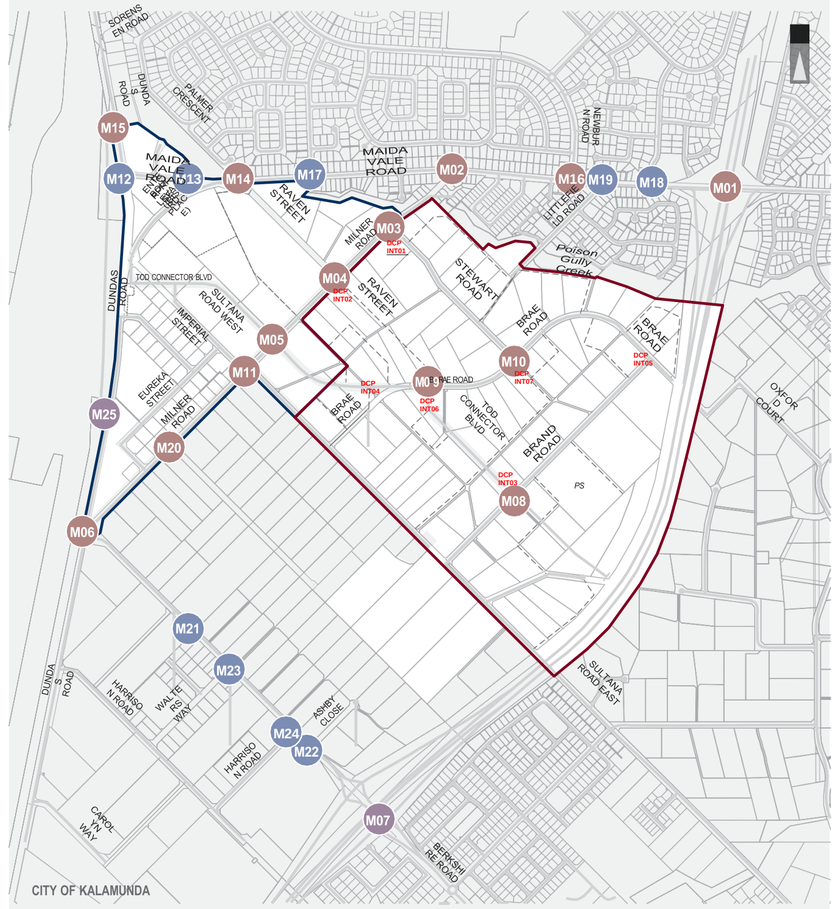
Upgrade Requirements (Ultimate Configuration)



Note: This intersection is being constructed as a part of the railway works. It will not require an upgrade by 2050, apart for adjustment to accommodate the upgrade of Dundas Road.

T-intersection full movement

HIGH WYCOMBE SOUTH - TOD & RESIDENTIAL PRECINCTS



RESIDENTIAL PRECINCT BOUNDARY

TOD PRECINCT BOUNDARY

INTERSECTIONS MAY REQUIRE KERB ADJUSTMENT ONCE ADJACENT ROADS ARE UPGRADED. INCLUDED IN INTERSECTIONS

REQUIRING UPGRADE

INTERSECTIONS MAY REQUIRE UPGRADE OR ADJUSTMENT IN FUTURE.

Plan of upgrades and apportionment - Intersections

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Appendix B – Bill of Quantities: Road Infrastructure

8.1.1 RD01 – Milner Road (SRW to Stewart)

RD01 Milner Road 2 - Between Sultana Road West and Stewart Road - Integrator B 25.2m wide

Item No	Item	Qty	Unit	Rate	Amount
	RD01 Milner Road 2 - Between Sultana Road West and Stewart Road - Integrator B 25.2m wide (Configuration: 1.8m footpath, 2m verge, 2.5m parking, 1.5m cycling lane, 3.2m traffic lane, 3m median, 3.2m traffic lane, 1.5m cycling lane, 2.5m parking, 2m verge, 1.8m footpath), 547m long				
	Existing Length of Road	419.4	m		
	Existing Lane Width	7.4	m		
	Existing Pavement Width	8.6	m		
	Existing Asphalt Depth	30	mm		
	Existing Flexible Pavement Depth	300	mm		
	Road Reserve	25.2	m		
	Road Reserve Area	10568.88	m2		
	Proposed Road Cross Section	16.4	m		
	Proposed Median Width	3	m		
	Proposed Footpath Width	3.6	m		
	Proposed Verge Works	7.6	m		
1	Footpath and Verge Works				
1.1	Earthworks and Site Preparation				
1.1.1	Site Clearance (rate based on existing road surface. Includes trees)	2097.0	m2	$1.00	$2,097.00
1.1.2	Cut to stockpile topsoil 150mm thick and stockpile for later re-use	2097.0	m2	$3.85	$8,073.45
1.1.3	Cut to Fill (General Earthworks)	629.1	m3	$5.00	$3,145.50
1.1.4	Cut to Fill (From Topsoil Stockpile)	629.1	m3	$5.00	$3,145.50
1.1.5	Imported Fill to make up levels	419	m3	$35.00	$14,679.00
1.2	Subgrade Preparation				
1.2.1	Preparation, Trim and Compact	2097.0	m2	$5.25	$11,009.25

Item No	Item	Qty	Unit	Rate	Amount
1.3	Concrete Cycleways and Footpaths				
1.3.1	Footpath - General 100mm thickness	754.92	m2	$55.00	$41,520.60
1.3.2	Sand Fill Below Concrete (100mm)	754.92	m2	$2.80	$2,113.78
1.3.3	Pram Ramps	6	ea	1,000.00	$6,000.00
1.4	3.0m Wide DUP				
1.4.1	25mm AC7 Asphalt Mix	1258.2	m2	$15.50	$19,502.10
1.4.2	100mm Crushed Limestone Base	1258.2	m2	$13.75	$17,300.25
1.4.3	Edge and Centre Linemarking	1258.2	m	$14.72	$18,520.70
1.5	Planting and Vegetation				
1.5.1	Landscaping, Mulch and Shrubs	167.76	m2	$15.72	$2,637.19
1.5.2	Trees	42	ea	$317.59	$13,319.72
Total Footpath and Verge Works					$163,064.04

2	Milner Road - Traffic Lanes	6878.16	m2		
2.1	Earthworks and Site Preparation	3103.6	m2		
2.1.1	Site Clearance (rate based on existing road surface. Includes trees)	3774.6	m2	$1.00	$3,774.60
2.1.2	Removal of topsoil 150mm thick and stockpile for later re-use	3774.6	m2	$3.85	$14,532.21
2.1.3	Detailed Excavation and Cartaway / Dispurse Surplus Material	3104	m2	$14.65	$45,467.15
2.1.4	Cut to Fill (general earthworks)	1132	m3	$5.00	$5,661.90
2.1.5	Cut to Fill (From Topsoil Stockpile)	377.5	m3	$5.00	$1,887.30
2.1.6	Imported Fill to make up levels	2063.4	m3	$35.00	$72,220.68
2.2	Subgrade Preparation				
2.2.1	Preparation, Trim and Compact	6878.2	m2	$5.25	$36,110.34
2.3	Sub Base and Road Base				$ -
2.3.1	200mm compacted thickness limestone subbase course	6878.2	m2	$14.00	$96,294.24
2.3.2	Base Course, fine crushed rock, 200mm thick	6878.2	m2	$14.00	$96,294.24
2.4	Asphalt Wearing Course				$ -
2.4.1	30mm AC10 High Fatigue Asphalt	6878.2	m2	$17.00	$116,928.72
2.4.2	Primer Seal (Coat)	6878.2	m2	$5.65	$38,861.60
2.5	Kerbing				
2.5.1	Standard Semi Mountable Kerb	838.8	m	$30.00	$25,164.00
2.6	Linemarking and Furniture				

Item No	Item	Qty	Unit	Rate	Amount
2.6.1	Linemarking and Furniture	838.8	m	$14.72	$12,347.14
2.6.2	Street Signs	10	ea	$1,048.26	$10,482.60
Total Traffic Lanes					$576,026.72

3	Milner Road Median				
3.1	Earthworks and Site Preparation	1258.2	m2		
3.1.1	Site clearance (rate based on existing road surface)	0	m2	$1.00	$ -
3.1.2	Removal of topsoil 150mm thick and stockpile for later re-use	0	m2	$3.85	
3.1.3	Detailed Excavation & Cartaway / Dispurse Surplus Material	1258.2	m2	$14.65	$18,432.63
3.1.4	Imported fill material to make up levels	377.46	m3	$35.00	$13,211.10
3.2	Subgrade Preparation				
3.2.1	Preparation, Trim and Compact	1258.2	m2	$5.25	$6,605.55
3.3	Kerbing				
3.3.1	Semi Mountable Kerb (Median)	838.8	m	$30.00	$25,164.00
3.4	Linemarking and Furniture				
3.4.1	Linemarking and Furniture	838.8	m	$14.72	$12,347.14
3.5	Paved Median Area				
3.5.1	Block Paving on Sand Bed	1258.2	m2	$75.00	$94,365.00
3.6	Planting and Vegetation				
3.6.1	Mulch to Planter Areas	83.88	m2	$15.72	$1,318.59
3.6.2	Trees	21	ea	$317.59	$6,659.86
Total Median					$178,103.87

4	Milner Road - Street Lighting	419.4	m		
4.1	Street Lighting				
4.1.1	Provide new street lighting.	17	ea	$2,721.60	$46,220.54
Total Street Lighting					$46,220.54

Item No	Item	Qty	Unit	Rate	Amount
5	Milner Road - Road Drainage				
5.1	General Road Drainage				
5.1.1	450mm SW Pipework - Supply and Install including trenching	461.3	m	$200.00	$92,268.00
5.1.2	Demolish and remove existing drainage structures	30.0	ea	$2,000.00	$60,000.00
5.1.3	Precast concrete manholes for up to 450mm pipe (1050 manhole) (assume 1 per 30m)	2	ea	$2,500.00	$5,766.75
5.1.4	Subsoil Drainage (includes risers at 50m centres)	461.3	m	$117.50	$54,207.45
5.1.5	Gully (Side Entry) Pits - Supply and Install (1050mm dia) (assume 1 per 30m)	23	ea	$2,500.00	$57,667.50
Total Road Drainage					$269,909.70

TOTAL (excl. preliminaries)	$1,233,324.88

6	Traffic Management, Project Overheads, Project Owners Costs and Risk / Contingency				
6.1	Traffic Management	7.5%	%		$92,499.37
6.2	Project Overheads and Preliminaries (Indirect Construction Costs)	12.5%	%		$154,165.61
6.3	Project Owner's Cost (Planning and Design Costs)	12.5%	%		$154,165.61
6.4	Risk Contingency Allowance	12.5%	%		$204,269.43
Total Preliminaries					$605,100.02

TOTAL (incl. preliminaries)	$1,838,424.90

Item No	Item	Qty	Unit	Rate	Amount
TOTAL DCP SHARE*		73%	%		$1,342,050.18
* Above estimates calculated on the full length of RD01. DCA2 only provides for the proportionate section RD01 (547m length) DCA2 adjoins - 398m, or 73% of the total road length. This cost is further apportioned per TMR trip generation (54.17%).					
2024 % of ESCALATION		***2.13%***	***%***		***$1,370,635.85***

8.1.2 RD01 – Milner Road (SRW to Stewart) - Services

RD01 Milner Road 2 - Between Sultana Road West and Stewart Road - Integrator B 25.2m wide

Item No	Item	Qty	Unit	Rate	Amount
	RD02 Milner Road 2 - Between Sultana Road West and Stewart Road - Integrator B 25.2m wide Existing Length of Road	419.4	m		
1	Western Power	419.4	m		
1.1	Removal of overhead power	10	ea	$30,000.00	$300,000.00
1.2	LV / HV Underground Cables	419.4	m	$171.60	$71,969.04
1.3	Western Power HV Works Supervision	2	wk	$4,000.00	$8,000.00
1.4	Terminations / reconnections etc	2.0	PS	$1,000.00	$2,000.00
Total Western Power					$381,969.04
2	Telstra				
2.1	Telstra - Relocate Telstra Cables	419.4	m	$50.00	$20,970.00
2.2	Remove existing and install new pits	14	Item	$1,197.60	$16,742.45
Total Telstra					$37,712.45
3	ATCO Gas				
3.1	ATCO Gas - High Pressure Gas Pipeline	419.4	m	$78.50	$32,922.90
3.2	ATCO Gas - Supervision	2.5	wks	$4,000.00	$10,000.00
3.3	Connect to existing	2	Item	$5,000.00	$10,000.00
Total ATCO Gas					$52,922.90
4	Water Mains				
4.1	Water pipeline	419.4	m	$75.00	$31,455.00
4.2	Allowance for valves / hydrants	5.0	ea	$975.00	$4,875.00
4.3	Connect to existing	2.0	ea	$6,000.00	$12,000.00
Total Water Mains					$48,330.00
TOTAL (excl. preliminaries)					$520,934.39

Item No	Item	Qty	Unit	Rate	Amount
5	Traffic Management, Project Overheads, Project Owners Costs and Risk / Contingency				
5.1	Traffic Management	7.5%	%		$39,070.08
5.2	Project Overheads and Preliminaries (Indirect Construction Costs)	15%	%		$78,140.16
5.3	Project Owner's Cost (Planning and Design Costs)	15%	%		$78,140.16
5.4	Risk Contingency Allowance	15%	%		$107,442.72
Total Preliminaries					$302,793.11
TOTAL (incl. preliminaries)					$823,727.50
TOTAL DCP PORTION*		73%	%		$601,321.08
* Above estimates calculated on the full length of RD01. DCA2 only provides for the proportionate section RD01 (547m length) DCA2 adjoins - 398m, or 73% of the total road length. This cost is further apportioned per TMR trip generation (54.17%).					
2024 % of ESCALATION		***2.13***	***%***	***$614,129.21***	

8.1.3 RD02 – Milner Road (Stewart to MV)

Item No	Item	Qty	Unit	Rate	Amount
	RD10 Milner Road 1 (between Stewart Road and Maida Vale Road), Integrator B- 20m wide (Configuration: 1.8m footpath, 2m verge, 1.5m cycling lane, 3.2m traffic lane, 3m median, 3.2m traffic lane, 1.5m cycling lane, 2.0m verge, 1.8m footpath)				
	Existing Length of Road	195.6	m		
	Existing Lane Width	7.4	m		
	Existing Pavement Width	8.6	m		
	Existing Asphalt Depth	30	mm		
	Existing Flexible Pavement Depth	300	mm		
	Road Reserve	20	m		
	Road Reserve Area	3912	m2		
	Proposed Road Cross Section	9	m		
	Proposed Median Width	3	m		

1	Footpath and Verge Works				
1.1	Earthworks and Site Preparation	10	m		
1.1.1	Site Clearance (rate based on existing road surface. Includes trees)	1956	m2	$1.00	$1,956.00
1.1.2	Cut to stockpile topsoil 150mm thick and stockpile for later re-use	1956	m2	$3.85	$7,530.60
1.1.3	Cut to Fill (General Earthworks)	587	m3	$5.00	$2,934.00
1.1.4	Cut to Fill (From Topsoil Stockpile)	587	m3	$5.00	$2,934.00
1.1.5	Imported Fill to make up levels	391	m3	$35.00	$13,692.00
1.2	Subgrade Preparation				
1.2.1	Preparation, Trim and Compact	1956	m2	$5.25	$10,269.00
1.3	Concrete Cycleways and Footpaths				
1.3.1	Footpath - General 100mm thickness	704	m2	$55.00	38,728.80
1.3.2	Sand Fill Below Concrete (100mm)	704	m2	$2.80	$1,971.65
1.3.3	Pram Ramps	0	ea	$1,000.00	$ -
1.4	Planting and Vegetation				
1.4.1	Landscaping, Mulch and Shrubs	78	m2	$15.72	$1,229.93
1.4.2	Trees	20	ea	$317.59	$6,212.06
Total Footpath and Verge Works					$87,458.04

Item No	Item	Qty	Unit	Rate	Amount
2	Traffic Lanes	1760.4	m2		
2.1	Earthworks and Site Preparation	391.2	m2		
2.1.1	Site Clearance (rate based on existing road surface. Includes trees)	1369.2	m2	$1.00	$1,369.20
2.1.2	Removal of topsoil 150mm thick and stockpile for later re-use	1369.2	m2	$3.85	$5,271.42
2.1.3	Detailed Excavation and Cartaway / Dispurse Surplus Material	391	m2	$14.65	$5,731.08
2.1.4	Cut to Fill (general earthworks)	411	m3	$5.00	$2,053.80
2.1.5	Cut to Fill (From Topsoil Stockpile)	136.9	m3	$5.00	$684.60
2.1.6	Imported Fill to make up levels	0.0	m3	$35.00	$ -
2.2	Subgrade Preparation				
2.2.1	Preparation, Trim and Compact	1760.4	m2	$5.25	$9,242.10
2.3	Sub Base and Road Base				$ -
2.3.1	200mm compacted thickness limestone subbase course	391.2	m2	$14.00	$5,476.80
2.3.2	Base Course, fine crushed rock, 200mm thick	1760.4	m2	$14.00	$24,645.60
2.4	Asphalt Wearing Course				$ -
2.4.1	30mm AC10 High Fatigue Asphalt	1760.4	m2	$17.00	$29,926.80
2.4.2	Primer Seal (Coat)	1760.4	m2	$5.65	$9,946.26
2.5	Kerbing				
2.5.1	Standard Semi Mountable Kerb	391.2	m	$30.00	$11,736.00
2.6	Linemarking and Furniture				
2.6.1	Linemarking and Furniture	391.2	m	$14.72	$5,758.46
2.6.2	Street Signs	2	ea	$1,048.26	$2,096.52
Total Traffic Lanes					$113,938.64

3	Median				
3.1	Earthworks and Site Preparation	586.8	m2		
3.1.1	Detailed Excavation & Cartaway / Dispurse Surplus Material	586.8	m2	$14.65	$8,596.62
3.1.2	Imported fill material to make up levels (500mm)	58.68	m3	$35.00	$2,053.80
3.2	Subgrade Preparation				
3.2.1	Preparation, Trim and Compact	586.8	m2	$5.25	$3,080.70
3.3	Kerbing				
3.3.1	Semi Mountable Kerb (Median)	391.2	m	$30.00	$11,736.00

Item No	Item	Qty	Unit	Rate	Amount
3.4	Linemarking and Furniture				
3.4.1	Linemarking and Furniture	391.2	m	$14.72	$5,758.46
3.5	Paved Median Area				
3.5.1	Block Paving on Sand Bed	586.8	m2	$75.00	$44,010.00
3.6	Planting and Vegetation				
3.6.1	Mulch to Planter Areas	39.12	m2	$15.72	$614.97
3.6.2	Trees	10	ea	$317.59	$3,106.03
Total Median					$78,956.58

4	Street Lighting	195.6	m		
4.1	Street Lighting				
4.1.1	Provide new street lighting.	6	ea	$2,721.60	$15,209.86
Total Street Lighting					$15,209.86

5	Road Drainage				
5.1	General Road Drainage				
5.1.1	450mm SW Pipework - Supply and Install including trenching	215.2	m	$200.00	$43,032.00
5.1.2	Demolish and remove existing manholes	6.0	ea	$2,000.00	$12,000.00
5.1.3	Precast concrete manholes for up to 450mm pipe (1050 manhole) (assume 1 per 30m)	1	ea	$2,500.00	$2,689.50
5.1.4	Gully (Side Entry) Pits - Supply and Install (1050mm dia) (assume 1 per 30m)	11	ea	$2,500.00	$26,895.00
5.1.5	1500mm x 600mm RCBC Units	6	ea	$790.00	$4,740.00
5.1.6	1500mm x 600mm RCBC Base Slabs	6	ea	$314.00	$1,884.00
5.1.7	2 x 1500 x 600 Headwalls	2	ea	$6,304.00	$12,608.00
Total Road Drainage					$103,848.50
TOTAL (excl. preliminaries)					$399,411.62

6	Traffic Management, Project Overheads, Project Owners Costs and Risk / Contingency				
6.1	Traffic Management	7.5%	%		$29,955.87
6.2	Project Overheads and Preliminaries (Indirect Construction Costs)	12.5%	%		$49,926.45

Item No	Item	Qty	Unit	Rate	Amount
6.3	Project Owner's Cost (Planning and Design Costs)	12.5%	%		$49,926.45
6.4	Risk Contingency Allowance	12.5%	%		$66,152.55
Total Preliminaries					$195,961.33
TOTAL (incl. preliminaries)					$595,372.95
TOTAL DCP SHARE*		73%	%		$434,622.25
* Estimates calculated on the full length of RD02. DCA2 only provides for the proportionate section RD02 (195.6m length) the DCA adjoins -142m, or 73% of the total road length. This cost is further apportioned per TMR trip generation (52.67%).					
2024 % of ESCALATION		***2.13%***	***%***		***$443,879.71***

8.1.4 RD02 – Milner Road (Stewart to MV) - Services

Item No	Item	Qty	Unit	Rate	Amount
	RD10 Milner Road 1 (between Stewart Road and Maida Vale Road), Integrator B- 20m wide (Configuration: 1.8m footpath, 2m verge, 1.5m cycling lane, 3.2m traffic lane, 3m median, 3.2m traffic lane, 1.5m cycling lane, 2.0m verge, 1.8m footpath)				
	Existing Length of Road	195.6	m		

1	Western Power	195.6	m		
1.1	Removal of overhead power	4	ea	$30,000.00	$120,000.00
1.2	LV / HV Underground Cables	195.6	m	$171.60	$33,564.96
1.3	Western Power HV Works Supervision	1	wk	$4,000.00	$4,000.00
1.4	Terminations / reconnections etc	2.0	PS	$1,000.00	$2,000.00
Total Western Power					$159,564.96

2	Telstra				
2.1	Telstra - Relocate Telstra Cables	195.6	m	$100.00	$19,560.00
2.2	Remove existing and install new pits	7	Item	$1,197.60	$7,808.35
Total Telstra					$27,368.35

3	ATCO Gas				
3.1	ATCO Gas - High Pressure Gas Pipeline	195.6	m	$78.50	$15,354.60
3.2	ATCO Gas - Supervision	1	wks	$4,000.00	$4,000.00
3.3	Connect to existing	2	Item	$5,000.00	$10,000.00
Total ATCO Gas					$29,354.60

4	Water Mains				
4.1	Water pipeline	195.6	m	$75.00	$14,670.00
4.2	Allowance for valves / hydrants	3.0	ea	$975.00	$2,925.00

Item No	Item	Qty	Unit	Rate	Amount
4.3	Connect to existing	2.0	ea	$6,000.00	$12,000.00
Total Water Mains					$29,595.00

TOTAL (excl. preliminaries)					$245,882.91
5	Traffic Management, Project Overheads, Project Owners Costs and Risk / Contingency				
5.1	Traffic Management	7.5%	%		$18,441.22
5.2	Project Overheads and Preliminaries (Indirect Construction Costs)	15%	%		$36,882.44
5.3	Project Owner's Cost (Planning and Design Costs)	15%	%		$36,882.44
5.4	Risk Contingency Allowance	15%	%		$50,713.35
Total Preliminaries					$142,919.44

TOTAL (excl. preliminaries)					$388,802.35

TOTAL DCP SHARE*	73%	%		$283,825.72
* Estimates calculated on the full length of RD02. The DCP is only contributing funds for the proportionate section RD02 (195.6m length) the DCA adjoins -142m, or 73% of the total road length. This cost is further apportioned per TMR trip generation (52.67%).				
2024 % of ESCALATION (2.13%)				***$289,871.21***

8.1.5 RD03 – Raven Street Connector

Item No	Item	Qty	Unit	Rate	Amount
	RD13 Raven Street 2 (between Milner Road and Brae Road) Neighbourhood Connector A, 24.5m wide (Configuration: 1.8m footpath, 2.1m verge, 2.1m parking, 1.5m cycling lane, 3.2m traffic lane, 3m median, 3.2m traffic lane, 1.5m cycling lane, 2.1m parking, 2.1m verge, 1.8m footpath)				
	Existing Length of Road	382	m		
	Existing Lane Width	6	m		
	Existing Pavement Width	7.2	m		
	Existing Asphalt Depth	30	mm		
	Existing Flexible Pavement Depth	200	mm		
	Road Reserve	24.5	m		
	Road Reserve Area	9359	m2		
	Proposed Road Cross Section	13.6	m		
	Proposed Median Width	3	m		
1	Footpath and Verge Works				
1.1	Earthworks and Site Preparation	18.5	m		
1.1.1	Site Clearance (rate based on existing road surface. Includes trees)	7067	m2	$1.00	$7,067.00
1.1.2	Cut to stockpile topsoil 150mm thick and stockpile for later re-use	7067	m2	$3.85	$27,207.95
1.1.3	Cut to Fill (General Earthworks)	2120	m3	$5.00	$10,600.50
1.1.4	Cut to Fill (From Topsoil Stockpile)	2120	m3	$5.00	$10,600.50
1.1.5	Imported Fill to make up levels	2120	m3	$35.00	$74,203.50
1.2	Subgrade Preparation				
1.2.1	Preparation, Trim and Compact	7067	m2	$5.25	$37,101.75
1.3	Concrete Cycleways and Footpaths				
1.3.1	Footpath - General 100mm thickness	1375	m2	$55.00	$75,636.00
1.3.2	Sand Fill Below Concrete (100mm)	1375	m2	$2.80	$3,850.56
1.3.3	Pram Ramps	0	ea	$1,000.00	$ -
1.4	Planting and Vegetation				
1.4.1	Landscaping, Mulch and Shrubs	153	m2	$15.72	$2,402.02
1.4.2	Trees	38	ea	$317.59	$12,131.94
Total Footpath and Verge Works					$260,801.71

Item No	Item	Qty	Unit	Rate	Amount
2	Traffic Lanes	5195.2	m2		
2.1	Earthworks and Site Preparation	1146.0	m2		
2.1.1	Site Clearance (rate based on existing road surface. Includes trees)	4049.2	m2	$1.00	$4,049.20
2.1.2	Removal of topsoil 150mm thick and stockpile for later re-use	4049.2	m2	$3.85	$15,589.42
2.1.3	Detailed Excavation and Cartaway / Dispurse Surplus Material	1146.0	m2	$14.65	$16,788.90
2.1.4	Cut to Fill (general earthworks)	1214.8	m3	$5.00	$6,073.80
2.1.5	Cut to Fill (From Topsoil Stockpile)	404.9	m3	$5.00	$2,024.60
2.1.6	Imported Fill to make up levels	1558.6	m3	$35.00	$54,549.60
2.2	Subgrade Preparation				
2.2.1	Preparation, Trim and Compact	5195.2	m2	$5.25	$27,274.80
2.3	Sub Base and Road Base				$ -
2.3.1	200mm compacted thickness limestone subbase course	1146.0	m2	$14.00	$16,044.00
2.3.2	Base Course, fine crushed rock, 200mm thick	5195.2	m2	$14.00	$72,732.80
2.4	Asphalt Wearing Course				$ -
2.4.1	30mm AC10 High Fatigue Asphalt	5195.2	m2	$17.00	$88,318.40
2.4.2	Primer Seal (Coat)	5195.2	m2	$5.65	$29,352.88
2.5	Kerbing				
2.5.1	Standard Semi Mountable Kerb	802.2	m	$30.00	$24,066.00
2.6	Linemarking and Furniture				
2.6.1	Linemarking and Furniture	802.2	m	$14.72	$11,808.38
2.6.2	Street Signs	2.0	ea	$1,048.26	$2,096.52
Total Traffic Lanes					$370,769.30

3	Median				
3.1	Earthworks and Site Preparation	1146	m2		
3.1.1	Detailed Excavation & Cartaway / Dispurse Surplus Material	1146	m2	$14.65	$16,788.90
3.1.2.	Imported fill material to make up levels (500mm)	114.6	m3	$35.00	$4,011.00
3.2	Subgrade Preparation				
3.2.1	Preparation, Trim and Compact	1146	m2	$5.25	$6,016.50
3.3	Kerbing				
3.3.1	Semi Mountable Kerb (Median)	764	m	$30.00	$22,920.00

Item No	Item	Qty	Unit	Rate	Amount
3.4	Linemarking and Furniture				
3.4.1	Linemarking and Furniture	764	m	$14.72	$11,246.08
3.5	Paved Median Area				
3.5.1	Block Paving on Sand Bed	1146	m2	$75.00	$85,950.00
3.6	Planting and Vegetation				
3.6.1	Mulch to Planter Areas	76.4	m2	$15.72	$1,201.01
3.6.2	Trees	19	ea	$317.59	$6,065.97
Total Median					$154,199.46

4	Street Lighting	382	m		
4.1	Street Lighting				
4.1.1	Provide new street lighting.	11	ea	$2,721.60	$29,704.32
Total Street Lighting					$29,704.32

5	Road Drainage	382	m		
5.1	General Road Drainage				
5.1.1	450mm SW Pipework - Supply and Install including trenching	420.2	m	$200.00	$84,040.00
5.1.2	Demolish and remove existing manholes	0.0	ea	$2,000.00	$ -
5.1.3	Precast concrete manholes for up to 450mm pipe (1050 manhole) (assume 1 per 30m)	2	ea	$2,500.00	$5,252.50
5.1.4	Gully (Side Entry) Pits - Supply and Install (1050mm dia) (assume 1 per 30m)	21	ea	$2,500.00	$52,525.00
Total Road Drainage					$141,817.50

TOTAL (excl. preliminaries)	$957,292.30

6	Traffic Management, Project Overheads, Project Owners Costs and Risk / Contingency				
6.1	Traffic Management	5%	%		$47,864.61
6.2	Project Overheads and Preliminaries (Indirect Construction Costs)	15%	%		$143,593.84
6.3	Project Owner's Cost (Planning and Design Costs)	10%	%		$95,729.23
6.4	Risk Contingency Allowance	15%	%		$186,672.00

Item No	Item	Qty	Unit	Rate	Amount
Total Preliminaries					$473,859.69

TOTAL (incl. preliminaries)			$1,431,151.98
2024 % of ESCALATION	***2.13%***	***%***	***$1,461,635.52***

8.1.6 RD04 – TOD Connector

Item No	Item	Qty	Unit	Rate	Amount
	RD16 TOD Connector 3 (east of TOD Precinct Edge) Neighbourhood Connector A, 24.5m wide (Configuration: 1.8m footpath, 2.1m verge, 2.1m parking, 1.5m cycling lane, 3.2m traffic lane, 3m median, 3.2m traffic lane, 1.5m cycling lane, 2.1m parking, 2.1m verge, 1.8m footpath)				
	Existing Length of Road	627	m		
	Existing Lane Width	0	m		
	Existing Pavement Width	0	m		
	Existing Asphalt Depth	0	mm		
	Existing Flexible Pavement Depth	0	mm		
	Road Reserve	24.5	m		
	Road Reserve Area	15371.3	m2		
	Proposed Road Cross Section	13.6	m		
	Proposed Median Width	3	m		
1	Footpath and Verge Works				
1.1	Earthworks and Site Preparation	24.5	m		
1.1.1	Site Clearance (rate based on existing road surface. Includes trees)	15371	m2	$1.00	$15,371.30
1.1.2	Cut to stockpile topsoil 150mm thick and stockpile for later re-use	15371	m2	$3.85	$59,179.51
1.1.3	Cut to Fill (General Earthworks)	4611	m3	$5.00	$23,056.95
1.1.4	Cut to Fill (From Topsoil Stockpile)	4611	m3	$5.00	$23,056.95
1.1.5	Imported Fill to make up levels	4611	m3	$35.00	$161,398.65
1.2	Subgrade Preparation				

Item No	Item	Qty	Unit	Rate	Amount
1.2.1	Preparation, Trim and Compact	15371	m2	$5.25	$80,699.33
1.3	Concrete Cycleways and Footpaths				
1.3.1	Footpath - General 100mm thickness	2259	m2	$55.00	$124,225.20
1.3.2	Sand Fill Below Concrete (100mm)	2259	m2	$2.80	$6,324.19
1.3.3	Pram Ramps	0	ea	$1,000.00	$-
1.4	Planting and Vegetation				
1.4.1	Landscaping, Mulch and Shrubs	251	m2	$15.72	$3,945.09
1.4.2	Trees	63	ea	$317.59	$19,925.60
Total Footpath and Verge Works					$51,7182.7598

2	Traffic Lanes	8532.6	m2		
2.1	Earthworks and Site Preparation	0.0	m2		
2.1.1	Site Clearance (rate based on existing road surface. Includes trees)	8532.6	m2	$1.00	$8,532.64
2.1.2	Removal of topsoil 150mm thick and stockpile for later re-use	8532.6	m2	$3.85	$32,850.66
2.1.3	Detailed Excavation and Cartaway / Dispurse Surplus Material	0.0	m2	$14.65	$ -
2.1.4	Cut to Fill (general earthworks)	2559.8	m3	$5.00	$12,798.96
2.1.5	Cut to Fill (From Topsoil Stockpile)	853.3	m3	$5.00	$4,266.32
2.1.6	Imported Fill to make up levels	2559.8	m3	$35.00	$89,592.72

Item No	Item	Qty	Unit	Rate	Amount
2.2	Subgrade Preparation				
2.2.1	Preparation, Trim and Compact	8532.6	m2	$5.25	$44,796.36
2.3	Sub Base and Road Base				$ -
2.3.1	200mm compacted thickness limestone subbase course	8532.6	m2	$14.00	$119,456.96
2.3.2	Base Course, fine crushed rock, 200mm thick	8532.6	m2	$14.00	$119,456.96
2.4	Asphalt Wearing Course				$ -
2.4.1	30mm AC10 High Fatigue Asphalt	8532.6	m2	$17.00	$145,054.88
2.4.2	Primer Seal (Coat)	8532.6	m2	$5.65	$48,209.42
2.5	Kerbing				
2.5.1	Standard Semi Mountable Kerb	1317.5	m	$30.00	$39,526.20
2.6	Linemarking and Furniture				
2.6.1	Linemarking and Furniture	1317.5	m	$14.72	$19,394.19
2.6.2	Street Signs	2.0	ea	$1,048.26	$2,096.52
Total Traffic Lanes					$686,032.79

3	Median				
3.1	Earthworks and Site Preparation	1882.2	m2		
3.1.1	Detailed Excavation & Cartaway / Dispurse Surplus Material	1882.2	m2	$14.65	$27,574.23
3.1.2.	Imported fill material to make up levels (500mm)	188.22	m3	$35.00	$6,587.70
3.2	Subgrade Preparation				
3.2.1	Preparation, Trim and Compact	1882.2	m2	$5.25	$9,881.55
3.3	Kerbing				
3.3.1	Semi Mountable Kerb (Median)	1254.8	m	$30.00	$37,644.00
3.4	Linemarking and Furniture				
3.4.1	Linemarking and Furniture	1254.8	m	$14.72	$18,470.66

Item No	Item	Qty	Unit	Rate	Amount
3.5	Paved Median Area				
3.5.1	Block Paving on Sand Bed	1882.2	m2	$75.00	$141,165.00
3.6	Planting and Vegetation				
3.6.1	Mulch to Planter Areas	125.48	m2	$15.72	$1,972.55
3.6.2	Trees	31	ea	$317.59	$9,962.80
Total Median					$253,258.48

4	Street Lighting	627	m		
4.1	Street Lighting				
4.1.1	Provide new street lighting.	18	ea	$2,721.60	$48,786.62
	Total Street Lighting				$48,786.62

5	Road Drainage	627.4	m		
5.1	General Road Drainage				
5.1.1	450mm SW Pipework - Supply and Install including trenching	690.1	m	$200.00	$138,028.00
5.1.2	Demolish and remove existing manholes	0.0	ea	$2,000.00	$-
5.1.3	Precast concrete manholes for up to 450mm pipe (1050 manhole) (assume 1 per 30m)	3	ea	$2,500.00	$8,626.75
5.1.4	Gully (Side Entry) Pits - Supply and Install (1050mm dia) (assume 1 per 30m)	35	ea	$2,500.00	$86,267.50
Total Road Drainage					$232,922.25

TOTAL (excl. preliminaries)	$1,738,182.90

6	Traffic Management, Project Overheads, Project Owners Costs and Risk / Contingency				
6.1	Traffic Management	5%	%		$86,909.15

Item No	Item	Qty	Unit	Rate	Amount
6.2	Project Overheads and Preliminaries (Indirect Construction Costs)	15%	%		$260,727.44
6.3	Project Owner's Cost (Planning and Design Costs)	10%	%		$173,818.29
6.4	Risk Contingency Allowance	15%	%		$338,945.67
Total Preliminaries					$860,400.54

TOTAL (incl. preliminaries)	$2,598,583.44
2024 % of ESCALATION (2.13%)	***$2,653,933.27***

RD05 – Stewart Road

Item No	Item	Qty	Unit	Rate	Amount
	RD17 Stewart Road (east of Milner Road) Neighbourhood Connector A, 24.5m wide (Configuration: 1.8m footpath, 2.1m verge, 2.1m parking, 1.5m cycling lane, 3.2m traffic lane, 3m median, 3.2m traffic lane, 1.5m cycling lane, 2.1m parking, 2.1m verge, 1.8m footpath)				
	Existing Length of Road	532.1	m		$3,831.12
	Existing Lane Width	6	m		$ 9,205.33
	Existing Pavement Width	7.2	m		
	Existing Asphalt Depth	30	mm		
	Existing Flexible Pavement Depth	300	mm		
	Road Reserve	24.5	m		
	Road Reserve Area	13036.5	m2		
	Proposed Road Cross Section	13.6	m		
	Proposed Median Width	3	m		
1	Footpath and Verge Works				
1.1	Earthworks and Site Preparation	11	m		
1.1.1	Site Clearance (rate based on existing road surface. Includes trees)	5853	m2	$1.00	$5,853.10
1.1.2	Cut to stockpile topsoil 150mm thick and stockpile for later re-use	5853	m2	$3.85	$22,534.44
1.1.3	Cut to Fill (General Earthworks)	1756	m3	$5.00	$8,779.65
1.1.4	Cut to Fill (From Topsoil Stockpile)	1756	m3	$5.00	$8,779.65
1.1.5	Imported Fill to make up levels	1171	m3	$35.00	$40,971.70
1.2	Subgrade Preparation				
1.2.1	Preparation, Trim and Compact	5853	m2	$5.25	$30,728.78
1.3	Concrete Cycleways and Footpaths				
1.3.1	Footpath - General 100mm thickness	0	m2	$55.00	$-
1.3.2	Sand Fill Below Concrete (100mm)	0	m2	$2.80	$-

Item No	Item	Qty	Unit	Rate	Amount
1.3.3	Pram Ramps	0	ea	$1,000.00	$-
1.4	3.0m Wide DUP				
1.4.1	25mm AC7 Asphalt Mix	1596	m2	$15.50	$24,742.65
1.4.2	100mm Crushed Limestone Base	1596	m2	$13.75	$21,949.13
1.4.3	Edge and Centre Linemarking	1596	m	$14.72	$23,497.54
1.5	Planting and Vegetation				
1.5.1	Landscaping, Mulch and Shrubs	213	m2	$15.72	$3,345.84
1.5.2	Trees	53	ea	$317.59	$16,898.96
Total Footpath and Verge Works					$208,081.43

2	Traffic Lanes	7236.56	m2		
2.1	Earthworks and Site Preparation		m2		
2.1.1	Site Clearance (rate based on existing road surface. Includes trees)	7236.6	m2	$1.00	$7,236.56
2.1.2	Removal of topsoil 150mm thick and stockpile for later re-use	7236.6	m2	$3.85	$27,860.76
2.1.3	Detailed Excavation and Cartaway / Dispurse Surplus Material	0	m2	$14.65	$-
2.1.4	Cut to Fill (general earthworks)	2171	m3	$5.00	$10,854.84
2.1.5	Cut to Fill (From Topsoil Stockpile)	723.7	m3	$5.00	$3,618.28
2.1.6	Imported Fill to make up levels	0.0	m3	$35.00	$-
2.2	Subgrade Preparation				
2.2.1	Preparation, Trim and Compact	7236.6	m2	$5.25	$37,991.94
2.3	Sub Base and Road Base				$ -
2.3.1	200mm compacted thickness limestone subbase course	7236.6	m2	$14.00	$101,311.84
2.3.2	Base Course, fine crushed rock, 200mm thick	7236.6	m2	$14.00	$101,311.84
2.4	Asphalt Wearing Course				$ -
2.4.1	30mm AC10 High Fatigue Asphalt	7236.6	m2	$17.00	$123,021.52
2.4.2	Primer Seal (Coat)	7236.6	m2	$5.65	$40,886.56
2.5	Kerbing				
2.5.1	Standard Semi Mountable Kerb	1064.2	m	$30.00	$31,926.00
2.6	Linemarking and Furniture				
2.6.1	Linemarking and Furniture	1064.2	m	$14.72	$15,665.02

Item No	Item	Qty	Unit	Rate	Amount
2.6.2	Street Signs	2	ea	$1,048.26	$2,096.52
Total Traffic Lanes					$503,781.68

3	Median				
3.1	Earthworks and Site Preparation	1596.3	m2		
3.1.1	Detailed Excavation & Cartaway / Dispurse Surplus Material	1596.3	m2	$14.65	$23,385.80
3.1.2	Imported fill material to make up levels (500mm)	159.63	m3	$35.00	$5,587.05
3.2	Subgrade Preparation				
3.2.1	Preparation, Trim and Compact	1596.3	m2	$5.25	$8,380.58
3.3	Kerbing				
3.3.1	Semi Mountable Kerb (Median)	1064.2	m	$30.00	$31,926.00
3.4	Linemarking and Furniture				
3.4.1	Linemarking and Furniture	1064.2	m	$14.72	$15,665.02
3.5	Paved Median Area				
3.5.1	Block Paving on Sand Bed	1596.3	m2	$75.00	$119,722.50
3.6	Planting and Vegetation				
3.6.1	Mulch to Planter Areas	106.42	m2	$15.72	$1,672.92
3.6.2	Trees	27	ea	$317.59	$8,449.48
Total Median					$214,789.35

4	Street Lighting	532.1	m		
4.1	Street Lighting				
4.1.1	Provide new street lighting.	15	ea	$2,721.60	$41,376.10
Total Street Lighting					$41,376.10

5	Road Drainage				
5.1	General Road Drainage				
5.1.1	450mm SW Pipework - Supply and Install including trenching	585.3	m	$200.00	$117,062.00
5.1.2	Demolish and remove existing manholes	0.0	ea	$2,000.00	$ -

Item No	Item	Qty	Unit	Rate	Amount
5.1.3	Precast concrete manholes for up to 450mm pipe (1050 manhole) (assume 1 per 30m)	3	ea	$2,500.00	$7,316.38
5.1.4	Gully (Side Entry) Pits - Supply and Install (1050mm dia) (assume 1 per 30m)	29	ea	$2,500.00	$73,163.75
Total Road Drainage					$197,542.13
TOTAL (excl. preliminaries)					$1,165,570.68
6	Traffic Management, Project Overheads, Project Owners Costs and Risk / Contingency				
6.1	Traffic Management	5%	%		$58,278.53
6.2	Project Overheads and Preliminaries (Indirect Construction Costs)	15%	%		$174,835.60
6.3	Project Owner's Cost (Planning and Design Costs)	10%	%		$116,557.07
6.4	Risk Contingency Allowance	15%	%		$227,286.28
Total Preliminaries					$576,957.49
TOTAL (incl. preliminaries)					$1,742,528.17
2024 % of ESCALATION (2.13%)					***$1,779,644.02***

8.1.7 RD05 – Stewart Road – Services

Item No	Item	Qty	Unit	Rate	Amount
	RD17 Stewart Road (east of Milner Road)				
	Existing Length of Road	532	m		
1	Western Power	532	m		
1.1	Removal of overhead power	6	ea	$30,000.00	$180,000.00
1.2	LV / HV Underground Cables	532.1	m	$171.60	$91,308.36
1.3	Western Power HV Works Supervision	2.5	wk	$4,000.00	$10,000.00
1.4	Terminations / reconnections etc	2.0	PS	$1,000.00	$2,000.00
Total Western Power					$283,308.36
2	Telstra				
2.1	Telstra - Relocate Telstra Cables	532.1	m	$100.00	$53,210.00
2.2	Remove existing and install new pits	18	Item	$1,197.60	$21,241.43
Total Telstra					$74,451.43
3	ATCO Gas				
3.1	ATCO Gas - High Pressure Gas Pipeline	0	m	$78.50	$ -
3.2	ATCO Gas - Supervision	0	wks	$4,000.00	$ -
3.3	Connect to existing	0	Item	$5,000.00	$ -
Total ATCO Gas					$ -
4	Water Mains				
4.1	Water pipeline	532.1	m	$75.00	$39,907.50
4.2	Allowance for valves / hydrants	3.0	ea	$975.00	$2,925.00
4.3	Connect to existing	2.0	ea	$6,000.00	$12,000.00
Total Water Mains					$54,832.50

Item No	Item	Qty	Unit	Rate	Amount
TOTAL (excl. preliminaries)					$412,592.29
5	Traffic Management, Project Overheads, Project Owners Costs and Risk / Contingency				
5.1	Traffic Management	5%	%		$20,629.61
5.2	Project Overheads and Preliminaries (Indirect Construction Costs)	15%	%		$61,888.84
5.3	Project Owner's Cost (Planning and Design Costs)	10%	%		$41,259.23
5.4	Risk Contingency Allowance	15%	%		$80,455.50
Total Preliminaries					$204,233.18
TOTAL (incl. preliminaries)					$616,825.48
2024 % of ESCALATION		***2.13%***	***%***		***$629,963.86***

8.1.8 RD06 – Brae Road

Item No	Item	Qty	Unit	Rate	Amount
	RD18 Brae Road (east of TOD Connector), Neighbourhood Connector B, 19.4m (Configuration: 1.8m footpath, 2.3m verge, 2.1m parking, 2 x 3.5m traffic lane, 2.1m parking, 2.3m verge, 1.8m footpath)				
	Existing Length of Road	751	m		
	Existing Lane Width	6	m		
	Existing Pavement Width	7.2	m		
	Existing Asphalt Depth	30	mm		
	Existing Flexible Pavement Depth	300	mm		
	Road Reserve	19.4	m		
	Road Reserve Area	14569.4	m2		
	Proposed Road Cross Section	13.6	m		
	Proposed Median Width	0	m		
1	Footpath and Verge Works				
1.1	Earthworks and Site Preparation	13.4	m		
1.1.1	Site Clearance (rate based on existing road surface. Includes trees)	10063	m2	$1.00	$10,063.40
1.1.2	Cut to stockpile topsoil 150mm thick and stockpile for later re-use	10063	m2	$3.85	$38,744.09
1.1.3	Cut to Fill (General Earthworks)	3019	m3	$5.00	$15,095.10
1.1.4	Cut to Fill (From Topsoil Stockpile)	3019	m3	$5.00	$15,095.10
1.1.5	Imported Fill to make up levels	3019	m3	$35.00	$105,665.70
1.2	Subgrade Preparation				

Item No	Item	Qty	Unit	Rate	Amount
1.2.1	Preparation, Trim and Compact	10063	m2	$5.25	$52,832.85
1.3	Concrete Cycleways and Footpaths				
1.3.1	Footpath - General 100mm thickness	2704	m2	$55.00	$148,698.00
1.3.2	Sand Fill Below Concrete (100mm)	2704	m2	$2.80	$7,570.08
1.3.3	Pram Ramps	4	ea	$1,000.00	$4,000.00
1.4	Planting and Vegetation				
1.4.1	Landscaping, Mulch and Shrubs	300	m2	$15.72	$4,722.29
1.4.2	Trees	75	ea	$317.59	$23,851.01
Total Footpath and Verge Works					$426,337.62

2	Traffic Lanes	10213.6	m2		
2.1	Earthworks and Site Preparation	5707.6	m2		
2.1.1	Site Clearance (rate based on existing road surface. Includes trees)	4506.0	m2	$1.00	$4,506.00
2.1.2	Removal of topsoil 150mm thick and stockpile for later re-use	4506.0	m2	$3.85	$17,348.10
2.1.3	Detailed Excavation and Cartaway / Dispurse Surplus Material	4506.0	m2	$14.65	$66,012.90
2.1.4	Cut to Fill (general earthworks)	1351.8	m3	$5.00	$6,759.00
2.1.5	Cut to Fill (From Topsoil Stockpile)	450.6	m3	$5.00	$2,253.00
2.1.6	Imported Fill to make up levels	3064.1	m3	$35.00	$107,242.80
2.2	Subgrade Preparation				
2.2.1	Preparation, Trim and Compact	10213.6	m2	$5.25	$53,621.40
2.3	Sub Base and Road Base				$ -

Item No	Item	Qty	Unit	Rate	Amount
2.3.1	200mm compacted thickness limestone subbase course	10213.6	m2	$14.00	$142,990.40
2.3.2	Base Course, fine crushed rock, 200mm thick	10213.6	m2	$14.00	$142,990.40
2.4	Asphalt Wearing Course				$ -
2.4.1	30mm AC10 High Fatigue Asphalt	10213.6	m2	$17.00	$173,631.20
2.4.2	Primer Seal (Coat)	10213.6	m2	$5.65	$57,706.84
2.5	Kerbing				
2.5.1	Standard Semi Mountable Kerb	1577.1	m	$30.00	$47,313.00
2.6	Linemarking and Furniture				
2.6.1	Linemarking and Furniture	1577.1	m	$14.72	$23,214.91
2.6.2	Street Signs	2.0	ea	$1,048.26	$2,096.52
Total Traffic Lanes					$847,686.47

3	Median				
3.1	Earthworks and Site Preparation	0	m2		
3.1.1	Detailed Excavation & Cartaway / Dispurse Surplus Material	0	m2	$14.65	$ -
3.1.2.	Imported fill material to make up levels (500mm)	0	m3	$35.00	$ -
3.2	Subgrade Preparation				
3.2.1	Preparation, Trim and Compact	0	m2	$5.25	$ -
3.3	Kerbing				
3.3.1	Semi Mountable Kerb (Median)	0	m	$30.00	$ -
3.4	Linemarking and Furniture				
3.4.1	Linemarking and Furniture	0	m	$14.72	$ -
3.5	Paved Median Area				
3.5.1	Block Paving on Sand Bed	0	m2	$75.00	$ -
3.6	Planting and Vegetation				
3.6.1	Mulch to Planter Areas	0	m2	$15.72	$ -

Item No	Item	Qty	Unit	Rate	Amount
3.6.2	Trees	0	ea	$317.59	$ -
Total Median					$ -

4	Street Lighting	751	m		
4.1	Street Lighting				
4.1.1	Provide new street lighting.	21	ea	$2,721.60	$58,397.76
Total Street Lighting					$58,397.76

5	Road Drainage	751	m		
5.1	General Road Drainage				
5.1.1	450mm SW Pipework - Supply and Install including trenching	826.1	m	$200.00	$165,220.00
5.1.2	Demolish and remove existing manholes	0.0	ea	$2,000.00	$-
5.1.3	Precast concrete manholes for up to 450mm pipe (1050 manhole) (assume 1 per 30m)	4	ea	$2,500.00	$10,326.25
5.1.4	Gully (Side Entry) Pits - Supply and Install (1050mm dia) (assume 1 per 30m)	41	ea	$2,500.00	$103,262.50
Total Road Drainage					$278,808.75

TOTAL (excl. preliminaries)	$1,611,230.60

6	Traffic Management, Project Overheads, Project Owners Costs and Risk / Contingency				
6.1	Traffic Management	5%	%		$80,561.53
6.2	Project Overheads and Preliminaries (Indirect Construction Costs)	15%	%		$241,684.59
6.3	Project Owner's Cost (Planning and Design Costs)	10%	%		$161,123.06
6.4	Risk Contingency Allowance	15%	%		$314,189.97

Item No	Item	Qty	Unit	Rate	Amount
Total Preliminaries					$797,559.15
TOTAL (incl. preliminaries)					$2,408,789.75
2024 % of ESCALATION		***2.13%***	***%***		***$2,460,096.97***

8.1.9 RD06 – Brae Road - Services

	Item	Qty	Unit	Rate	Amount
	RD18 Brae Road (east of TOD Connector), 875m long				
	Existing Length of Road	751	m		
1	Western Power	751	m		
1.1	Removal of overhead power	17	ea	$30,000.00	$510,000.00
1.2	LV / HV Underground Cables	751.0	m	$171.60	$128,871.60
1.3	Western Power HV Works Supervision	4	wk	$4,000.00	$16,000.00
1.4	Terminations / reconnections etc	2.0	PS	$1,000.00	$2,000.00
Total Western Power					$656,871.60
2	Telstra				
2.1	Telstra - Relocate Telstra Cables	751.0	m	$100.00	$75,100.00
2.2	Remove existing and install new pits	25	Item	$1,197.60	$29,979.92
Total Telstra					$105,079.92
3	ATCO Gas				
3.1	ATCO Gas - High Pressure Gas Pipeline	0	m	$78.50	$ -
3.2	ATCO Gas - Supervision	0	wks	$4,000.00	$ -
3.3	Connect to existing	0	Item	$5,000.00	$ -
Total ATCO Gas					$ -
4	Water Mains				
4.1	Water pipeline	751.0	m	$75.00	$56,325.00
4.2	Allowance for valves / hydrants	3.0	ea	$975.00	$2,925.00
4.3	Connect to existing	2.0	ea	$6,000.00	$12,000.00
Total Water Mains					$71,250.00
TOTAL (excl. preliminaries)					$833,201.52

5	Traffic Management, Project Overheads, Project Owners Costs and Risk / Contingency				
5.1	Traffic Management	5%	%		$41,660.08
5.2	Project Overheads and Preliminaries (Indirect Construction Costs)	15%	%		$124,980.23
5.3	Project Owner's Cost (Planning and Design Costs)	10%	%		$83,320.15
5.4	Risk Contingency Allowance	15%	%		$162,474.30
Total Preliminaries					$412,434.75
TOTAL (incl. preliminaries)					$1,245,636.27

2024 % of ESCALATION	***2.13%***	***%***	***$2,460,096.97***

8.1.10 RD08 – Brand Road

Item No	Item	Qty	Unit	Rate	Amount
	RD19 Brand Road, Access Street, 20m wide (Configuration: (in front of PS) - 1.8m footpath, 2.9m verge, 2.3m parking, 2 x 3m traffic lanes, 2.3m parking, 1.7m verge, 3.0m shared path | 344m (in front of DOS) 2.5m shared path, 3.7m verge, 2 x 3m traffic lanes, 6m parking, 1.8m footpath)				
	Existing Length of Road	565	m		
	Existing Lane Width	6	m		
	Existing Pavement Width	7.2	m		
	Existing Asphalt Depth	30	mm		
	Existing Flexible Pavement Depth	300	mm		
	Road Reserve	20	m		
	Road Reserve Area	11296	m2		
	Proposed Road Cross Section (outside of DOS)	10.6	m		
	Proposed Road Cross Section (DOS)	12	m		
	Proposed Median Width	0	m		
1	Footpath and Verge Works				
1.1	Earthworks and Site Preparation	14	m		
1.1.1	Site Clearance (rate based on existing road surface. Includes trees)	7907	m2	$1.00	$7,907.20
1.1.2	Cut to stockpile topsoil 150mm thick and stockpile for later re-use	7907	m2	$3.85	$30,442.72
1.1.3	Cut to Fill (General Earthworks)	2372	m3	$5.00	$11,860.80
1.1.4	Cut to Fill (From Topsoil Stockpile)	2372	m3	$5.00	$11,860.80
1.1.5	Imported Fill to make up levels	2372	m3	$35.00	$83,025.60
1.2	Subgrade Preparation				
1.2.1	Preparation, Trim and Compact	7907	m2	$5.25	$41,512.80
1.3	Asphalt DUP				
1.3.1	25mm AC7 Asphalt Mix	1694.4	m2	$15.50	$26,263.20
1.3.2	100mm Crushed Limestone Base	1694.4	m2	$13.75	$23,298.00
1.3.3	Edge and Centre Linemarking	1694.4	m	$14.72	$24,941.57
1.4	Concrete Cycleways and Footpaths				
1.4.1	Footpath - General 100mm thickness	1017	m2	$55.00	$55,915.20
1.4.2	Sand Fill Below Concrete (100mm)	1017	m2	$2.80	$2,846.59
1.4.3	Pram Ramps	4	ea	$1,000.00	$4,000.00

Item No	Item	Qty	Unit	Rate	Amount
1.5	Planting and Vegetation				
1.5.1	Landscaping, Mulch and Shrubs	226	m2	$15.72	$3,551.46
1.5.2	Trees	56	ea	$317.59	$17,937.48
Total Footpath and Verge Works					$345,363.43

2	Traffic Lanes	6468.5	m2		
2.1	Earthworks and Site Preparation	3079.7	m2		
2.1.1	Site Clearance (rate based on existing road surface. Includes trees)	3388.8	m2	$1.00	$3,388.80
2.1.2	Removal of topsoil 150mm thick and stockpile for later re-use	3388.8	m2	$3.85	$13,046.88
2.1.3	Detailed Excavation and Cartaway / Dispurse Surplus Material	3388.8	m2	$14.65	$49,645.92
2.1.4	Cut to Fill (general earthworks)	1016.6	m3	$5.00	$5,083.20
2.1.5	Cut to Fill (From Topsoil Stockpile)	338.9	m3	$5.00	$1,694.40
2.1.6	Imported Fill to make up levels	1940.5	m3	$35.00	$67,919.04
2.2	Subgrade Preparation				
2.2.1	Preparation, Trim and Compact	6468.5	m2	$5.25	$33,959.52
2.3	Sub Base and Road Base				$ -
2.3.1	200mm compacted thickness limestone subbase course	6468.5	m2	$14.00	$90,558.72
2.3.2	Base Course, fine crushed rock, 200mm thick	6468.5	m2	$14.00	$90,558.72
2.4	Asphalt Wearing Course				$ -
2.4.1	30mm AC10 High Fatigue Asphalt	6468.5	m2	$ 17.00	$109,964.16
2.4.2	Primer Seal (Coat)	6468.5	m2	$5.65	$36,546.91
2.5	Kerbing				
2.5.1	Standard Semi Mountable Kerb	1530.1	m	$30.00	$45,902.40
2.6	Linemarking and Furniture				
2.6.1	Linemarking and Furniture	1186.1	m	$14.72	$17,459.10
2.6.2	Street Signs	2.0	ea	$1,048.26	$2,096.52
Total Traffic Lanes					$567,824.29

3	Median				
3.1	Earthworks and Site Preparation	0	m2		
3.1.1	Detailed Excavation & Cartaway / Dispurse Surplus Material	0	m2	$14.65	$ -

Item No	Item	Qty	Unit	Rate	Amount
3.1.2	Imported fill material to make up levels (500mm)	0	m3	$35.00	$ -
3.2	Subgrade Preparation				
3.2.1	Preparation, Trim and Compact	0	m2	$5.25	$ -
3.3	Kerbing				
3.3.1	Semi Mountable Kerb (Median)	0	m	$30.00	$ -
3.4	Linemarking and Furniture				
3.4.1	Linemarking and Furniture	0	m	$14.72	$ -
3.5	Paved Median Area				
3.5.1	Block Paving on Sand Bed	0	m2	$75.00	$ -
3.6	Planting and Vegetation				
3.6.1	Mulch to Planter Areas	0	m2	$15.72	$ -
3.6.2	Trees	0	ea	$317.59	$ -
Total Median					$ -

4	Street Lighting	564.8	m		
4.1	Street Lighting				
4.1.1	Provide new street lighting.	16	ea	$2,721.60	$43,918.85
Total Street Lighting					$43,918.85

5	Road Drainage	564.8	m		
5.1	General Road Drainage				
5.1.1	450mm SW Pipework - Supply and Install including trenching	621.3	m	$200.00	$124,256.00
5.1.2	Demolish and remove existing manholes	0.0	ea	$2,000.00	$ -
5.1.3	Swale Drain (Assume 3m wide, 300mm depth)	564.8	m	$30.00	$16,944.00
5.1.4	Precast concrete manholes for up to 450mm pipe (1050 manhole) (assume 1 per 30m)	3	ea	$2,500.00	$7,500.00
5.1.5	Gully (Side Entry) Pits - Supply and Install (1050mm dia) (assume 1 per 30m)	18	ea	$2,500.00	$44,377.14
Total Road Drainage					$193,077.14

TOTAL (excl. preliminaries)	$1,150,183.71

6	Traffic Management, Project Overheads, Project Owners Costs and Risk / Contingency				

Item No	Item	Qty	Unit	Rate	Amount
6.1	Traffic Management	5%	%		$57,509.19
6.2	Project Overheads and Preliminaries (Indirect Construction Costs)	15%	%		$172,527.56
6.3	Project Owner's Cost (Planning and Design Costs)	10%	%		$115,018.37
6.4	Risk Contingency Allowance	15%	%		$224,285.82
Total Preliminaries					$569,340.93
TOTAL (incl. preliminaries)					$1,719,524.64

2024 % of ESCALATION	***2.13%***	***%***	***$1,756,150.52***

8.1.11 RD08 – Brand Road - Services

Item No	Item	Qty	Unit	Rate	Amount
	RD19 Brand Road Existing Length of Road	564.8	m		
1	Western Power	564.8	m		
1.1	Removal of overhead power	19	ea	$30,000.00	$570,000.00
1.2	LV / HV Underground Cables	564.8	m	$171.60	$96,919.68
1.3	Western Power HV Works Supervision	4	wk	$4,000.00	$16,000.00
1.4	Terminations / reconnections etc	4.0	PS	$1,000.00	$4,000.00
Total Western Power					$686,919.68
2	Telstra				
2.1	Telstra - Relocate Telstra Cables	564.8	m	$100.00	$56,480.00
2.2	Remove existing and install new pits	19	Item	$1,197.60	$22,546.82
Total Telstra					$79,026.82
3	ATCO Gas				
3.1	ATCO Gas - High Pressure Gas Pipeline	0	m	$78.50	$ -
3.2	ATCO Gas - Supervision	0	wks	$4,000.00	$ -
3.3	Connect to existing	0	Item	$5,000.00	$ -
Total ATCO Gas					$ -
4	Water Mains				
4.1	Water pipeline	564.8	m	$75.00	$42,360.00
4.2	Allowance for valves / hydrants	10.0	ea	$975.00	$9,750.00
4.3	Connect to existing	2.0	ea	$6,000.00	$12,000.00
Total Water Mains					$64,110.00
TOTAL (excl. preliminaries)					$830,056.50

5	Traffic Management, Project Overheads, Project Owners Costs and Risk / Contingency				
5.1	Traffic Management	5%	%		$41,502.82
5.2	Project Overheads and Preliminaries (Indirect Construction Costs)	15%	%		$124,508.47
5.3	Project Owner's Cost (Planning and Design Costs)	10%	%		$83,005.65
5.4	Risk Contingency Allowance	15%	%		$161,861.02
Total Preliminaries					$410,877.97
TOTAL (incl. preliminaries)					$1,240,934.46

2024 % of ESCALATION	***2.13%***	***%***	***$1,267,366.37***

8.1.12 RD09 – SRW

Item No	Item	Qty	Unit	Rate	Amount
	RD20 Sultana Road West (east of Milner Road), Access Street 20m reservation (Configuration: 1.8m footpath, 3.7m verge, 2 x 4.5m traffic lane, 3.7m verge, 1.8m footpath)				
	Existing Length of Road	779	m		
	Existing Lane Width	9	m		
	Existing Pavement Width	10.2	m		
	Existing Asphalt Depth	30	mm		
	Existing Flexible Pavement Depth	400	mm		
	Road Reserve	20	m		
	Road Reserve Area	15578	m2		
	Proposed Road Cross Section (Industrial)	10.6	m		
	Proposed Road Cross Section (Residential)	12	m		
	Proposed Median Width	0	m		
1	Footpath and Verge Works				
1.1	Earthworks and Site Preparation	4448.4	m		
1.1.1	Site Clearance (rate based on existing road surface. Includes trees)	4448	m2	$1.00	$4,448.40
1.1.2	Cut to stockpile topsoil 150mm thick and stockpile for later re-use	4448	m2	$3.85	$17,126.34
1.1.3	Cut to Fill (General Earthworks)	1335	m3	$5.00	$6,672.60
1.1.4	Cut to Fill (From Topsoil Stockpile)	1335	m3	$5.00	$6,672.60
1.1.5	Imported Fill to make up levels	1335	m3	$35.00	$46,708.20
1.2	Subgrade Preparation				
1.2.1	Preparation, Trim and Compact	4448	m2	$5.25	$23,354.10
1.3	Asphalt DUP				
1.3.1	25mm AC7 Asphalt Mix	2336.7	m2	$15.50	$36,218.85
1.3.2	100mm Crushed Limestone Base	2336.7	m2	$13.75	$32,129.63
1.3.3	Edge and Centre Linemarking	2336.7	m	$14.72	$34,396.22
1.4	Concrete Cycleways and Footpaths				

Item No	Item	Qty	Unit	Rate	Amount
1.4.1	Footpath - General 100mm thickness	1402	m2	$55.00	$77,111.10
1.4.2	Sand Fill Below Concrete (100mm)	1402	m2	$2.80	$3,925.66
1.4.3	Pram Ramps	4	ea	$1,000.00	$4,000.00
1.5	Planting and Vegetation				
1.5.1	Landscaping, Mulch and Shrubs	312	m2	$15.72	$4,897.72
1.5.2	Trees	78	ea	$317.59	$24,737.09
Total Footpath and Verge Works					$322,398.50

2	Traffic Lanes	6039.2	m2		
2.1	Earthworks and Site Preparation	0.0	m2		
2.1.1	Site Clearance (rate based on existing road surface. Includes trees)	6039.2	m2	$1.00	$6,039.20
2.1.2	Removal of topsoil 150mm thick and stockpile for later re-use	6039.2	m2	$3.85	$23,250.92
2.1.3	Detailed Excavation and Cartaway / Dispurse Surplus Material	7010.1	m2	$14.65	$102,697.97
2.1.4	Cut to Fill (general earthworks)	1811.8	m3	$5.00	$9,058.80
2.1.5	Cut to Fill (From Topsoil Stockpile)	603.9	m3	$5.00	$3,019.60
2.1.6	Imported Fill to make up levels	1811.8	m3	$35.00	$63,411.60
2.2	Subgrade Preparation				
2.2.1	Preparation, Trim and Compact	6039.2	m2	$5.25	$31,705.80
2.3	Sub Base and Road Base				$ -
2.3.1	200mm compacted thickness limestone subbase course	6039.2	m2	$14.00	$84,548.80
2.3.2	Base Course, fine crushed rock, 200mm thick	6039.2	m2	$14.00	$84,548.80
2.4	Asphalt Wearing Course				$ -
2.4.1	30mm AC10 High Fatigue Asphalt	6039.2	m2	$17.00	$102,666.40
2.4.2	Primer Seal (Coat)	6039.2	m2	$5.65	$34,121.48
2.5	Kerbing				
2.5.1	Standard Semi Mountable Kerb	1635.7	m	$30.00	$49,070.70
2.6	Linemarking and Furniture				
2.6.1	Linemarking and Furniture	1635.7	m	$14.72	$24,077.36
2.6.2	Street Signs	4.0	ea	$1,048.26	$4,193.04
Total Traffic Lanes					$622,410.46

Item No	Item	Qty	Unit	Rate	Amount
3	Median				
3.1	Earthworks and Site Preparation	0	m2		
3.1.1	Detailed Excavation & Cartaway / Dispurse Surplus Material	0	m2	$14.65	$ -
3.1.2	Imported fill material to make up levels (500mm)	0	m3	$35.00	$ -
3.2	Subgrade Preparation				
3.2.1	Preparation, Trim and Compact	0	m2	$5.25	$ -
3.3	Kerbing				
3.3.1	Semi Mountable Kerb (Median)	0	m	$30.00	$ -
3.4	Linemarking and Furniture				
3.4.1	Linemarking and Furniture	0	m	$14.72	$ -
3.5	Paved Median Area				
3.5.1	Block Paving on Sand Bed	0	m2	$75.00	$ -
3.6	Planting and Vegetation				
3.6.1	Mulch to Planter Areas	0	m2	$15.72	$ -
3.6.2	Trees	0	ea	$317.59	$ -
Total Median					$ -

4	Street Lighting	399	m		
4.1	Street Lighting				
4.1.1	Provide new street lighting.	11	ea	$2,721.60	$30,995.14
Total Street Lighting					$30,995.14

5	Road Drainage	399	m		
5.1	General Road Drainage				
5.1.1	450mm SW Pipework - Supply and Install including trenching	438.5	m	$200.00	$87,692.00
5.1.2	Demolish and remove existing manholes	0.0	ea	$2,000.00	$ -
5.1.3	Swale Drain (Assume 3m wide, 300mm depth)	398.6	m	$30.00	$11,958.00
5.1.4	Precast concrete manholes for up to 450mm pipe (1050 manhole) (assume 1 per 30m)	1	ea	$2,500.00	$2,500.00

Item No	Item	Qty	Unit	Rate	Amount
5.1.5	Gully (Side Entry) Pits - Supply and Install (1050mm dia)	13	ea	$2,500.00	$31,318.57
Total Road Drainage					$133,468.57
TOTAL (excl. preliminaries)					$1,109,272.67
6	Traffic Management, Project Overheads, Project Owners Costs and Risk / Contingency				
6.1	Traffic Management	5%	%		$55,463.63
6.2	Project Overheads and Preliminaries (Indirect Construction Costs)	15%	%		$166,390.90
6.3	Project Owner's Cost (Planning and Design Costs)	10%	%		$110,927.27
6.4	Risk Contingency Allowance	15%	%		$216,308.17
Total Preliminaries					$549,089.97
TOTAL (incl. preliminaries)					$1,658,362.65
2024 % of ESCALATION		***2.13%***	***%***		***$1,693,685.77***

8.1.13 RD09 – SRW - Services

Item No	Item	Qty	Unit	Rate	Amount
	RD20 Sultana Road West (east of Milner Road) Existing Length of Road	778.9	m		
1	Western Power	0	m		
1.1	Removal of overhead power	8	ea	$30,000.00	$240,000.00
1.2	LV / HV Underground Cables	0.0	m	$171.60	$ -
1.3	Western Power HV Works Supervision	2	wk	$4,000.00	$8,000.00
1.4	Terminations / reconnections etc	2.0	PS	$1,000.00	$2,000.00
Total Western Power					$250,000.00
2	Telstra				
2.1	Telstra - Relocate Telstra Cables	0.0	m	$100.00	$ -
2.2	Remove existing and install new pits	0	Item	$1,197.60	$ -
Total Telstra					$ -
3	ATCO Gas				
3.1	ATCO Gas - High Pressure Gas Pipeline	0	m	$78.50	$ -
3.2	ATCO Gas - Supervision	0	wks	$4,000.00	$ -
3.3	Connect to existing	0	Item	$5,000.00	$ -
Total ATCO Gas					$ -
4	Water Mains				
4.1	Water pipeline	0.0	m	$75.00	$ -
4.2	Allowance for valves / hydrants	3.0	ea	$975.00	$2,925.00
4.3	Connect to existing	1.0	ea	$6,000.00	$6,000.00
Total Water Mains					$ 8,925.00

TOTAL (excl. preliminaries)					$258,925.00
5	Traffic Management, Project Overheads, Project Owners Costs and Risk / Contingency				
5.1	Traffic Management	5%	%		$12,946.25
5.2	Project Overheads and Preliminaries (Indirect Construction Costs)	15%	%		$38,838.75
5.3	Project Owner's Cost (Planning and Design Costs)	10%	%		$25,892.50
5.4	Risk Contingency Allowance	15%	%		$50,490.38
	Total Preliminaries				$128,167.88
TOTAL (incl. preliminaries)					$387,092.88
2024 % OF ESCALATION					$395,337.95

Appendix C – Bill of Quantities: Intersection Infrastructure

8.1.14 INT01– Milner Rd / Stewart Road

Item No	Item	Qty	Unit	Rate	Amount
	I18 Roundabout - Milner Road (IB 25.2-20m), Stewart Road (NCA , 24.5m)	3044	m2		
	Milner Road Northern Approach	39.3	m		
	Milner Road Southern Approach	39.6	m		
	Stewart Road Western Approach	0	m		
	Stewart Road Eastern Approach	40.4	m		
1.1	Milner Road - Earthworks and Site Preparation in Verge	789	m2		
1.1.1	Site Clearance (rate based on existing road surface. Includes trees)	394.5	m2	$1.00	$394.50
1.1.2	Detailed Excavation in existing pavement	394.5	m2	$14.65	$5,779.43
1.1.3	Removal of topsoil 150mm thick and stockpile for later re-use	394.5	m2	$3.85	$1,518.83
1.1.4	Cut to fill within verge to make good levels	236.7	m3	$5.00	$1,183.50
1.1.5	Place topsoil from stockpile in verges, trim and compact	394.5	m2	$5.00	$1,972.50
1.1.6	Imported Fill to make up levels	395	m3	$35.00	$13,807.50
1.2	Subgrade Preparation				
1.2.1	Preparation, Trim and Compact	378.7	m2	$5.25	$1,988.28
1.3	Concrete Footpaths				
1.3.1	Footpath - General 100mm thickness	378.7	m2	$55.00	$20,829.60
1.3.2	Extra-over reinforcement at kerb radii in footpaths	0.0	m2	$30.00	$ -
1.3.3	Pram Ramps	4	ea	$1,000.00	$4,000.00
1.3.4	Sand Fill Below Concrete (100mm)	378.72	m2	$2.80	$1,060.42
1.4	Planting and Vegetation				
1.4.1	Landscaping, Mulch and Shrubs	32.0	m2	$15.72	$503.04
1.4.2	Trees	8	ea	$317.59	$2,540.72
Total Verge					$55,578.31

Item No	Item	Qty	Unit	Rate	Amount
2	Milner Road - Traffic Lane	1086	m2		
2.1	Earthworks and Site Preparation				
2.1.1	Site Clearance (rate based on existing road surface. Includes trees)	543.0	m2	$1.00	$543.00
2.1.2	Detailed Excavation & Cartaway / Dispurse Surplus Material	543	m2	$14.65	$7,954.95
2.1.3	Removal of topsoil 150mm thick and stockpile for later re-use	543.0	m2	$3.85	$2,090.55
2.1.4	Cut to fill from stockpile	326	m3	$5.00	$1,629.00
2.1.5	Place topsoil from stockpile in verges, trim and compact	543.0	m2	$5.00	$2,715.00
2.1.6	Imported Fill to make up levels	326	m3	$35.00	$11,403.00
2.2	Subgrade Preparation				
2.2.1	Preparation, Trim and Compact	1194.6	m2	$5.25	$6,271.65
2.3	Sub Base and Base Course				$ -
2.3.1	200mm compacted thickness limestone subbase course	1140.3	m2	$14.00	$15,964.20
2.3.2	Base Course, fine crushed rock, 200mm thick	1140.3	m2	$14.00	$15,964.20
2.4	Asphalt Wearing Surface				$ -
2.4.1	40mm High Fatigue Asphalt	1086.0	m2	$23.00	$24,978.00
2.4.2	Primer Seal (Coat)	1086.0	m2	$5.65	$6,135.90
2.5	Kerbing				$ -
2.5.1	Standard Semi Mountable Kerb	165.7	m	$30.00	$4,970.70
2.6	Linemarking and Furniture				$ -
2.6.1	Linemarking and Furniture	165.7	m	$14.72	$2,438.96
2.6.2	Street Signs	4	ea	$1,048.26	$4,193.04
Total Traffic Lane					$107,252.15

3	Milner Road - Median Islands and RAB Annuli				
3.1	Earthworks and Site Preparation	469.0	m2		

Item No	Item	Qty	Unit	Rate	Amount
3.1.1	Detailed Excavation & Cartaway / Dispurse Surplus Material	469.0	m2	$14.65	$6,870.85
3.1.2	Imported Fill to make up levels	141	m3	$35.00	$4,924.50
3.2	Subgrade Preparation				
3.2.1	Preparation, Trim and Compact	469.0	m2	$5.25	$2,462.25
3.3	Sub Base and Base Course				
3.3.1	200mm compacted thickness limestone subbase course	469.0	m2	$14.00	$6,566.00
3.3.2	Base Course, fine crushed rock, 200mm thick				
3.4	Kerbing				
3.4.1	Semi Mountable Kerbing	173.6	m	$30.00	$5,207.40
3.4.2	Reinforced Mountable Kerb	62.8	m	$60.00	$3,768.00
3.4.3	Barrier Kerbing	37.7	m	$30.00	$1,130.40
3.5	Linemarking and Furniture				
3.5.1	Linemarking and Furniture	173.58	m	$14.72	$2,555.10
3.5.2	Street Signs	2	ea	$1,048.26	$2,096.52
3.6	Paved Median Area				
3.6.1	Block Paving on Sand Bed	356.0	m2	$75.00	$26,697.00
3.7	Planting and Vegetation				
3.7.1	Mulch to Planter Areas	129	m2	$15.72	$2,028.51
3.7.2	Trees	4	ea	$317.59	$1,270.36
Total Median and Splitter Islands					$65,576.89

4	Milner Road - Street Lighting				
4.1	Street Lighting				
4.1.1	Provide new street lighting	6.0	ea	$2,721.60	$16,329.60
Total Street Lighting					$16,329.60

5	Milner Road - Road Drainage				
5.1	General Road Drainage				
5.1.1	450mm SW Pipework - Supply and Install including trenching	98.6	m	$200.00	$19,725.00
5.1.2	Demolish and remove existing pits	4.0	ea	$2,000.00	$8,000.00

Item No	Item	Qty	Unit	Rate	Amount
5.1.3	Gully (Side Entry) Pits - Supply and Install (1050mm dia) (assume 1 per 30m)	6.0	ea	$2,500.00	$15,000.00
Total Road Drainage					$42,725.00
6	Stewart Road - Verge Works				
6.1	Earthworks and Site Preparation	404.0	m2		
6.1.1	Site Clearance (based on light shrubs)	121.2	m2	$1.00	$121.20
6.1.2	Detailed Excavation & Cartaway / Dispurse Surplus Material	283	m2	$14.65	$4,143.02
6.1.3	Removal of topsoil 150mm thick and stockpile for later re-use	121.2	m2	$3.85	$466.62
6.1.4	Cut to fill within verge to make good levels	121.2	m3	$5.00	$606.00
6.1.5	Place topsoil from stockpile in verges, trim and compact	404.0	m2	$5.00	$2,020.00
6.1.6	Imported fill material to make up levels (500mm)	36.36	m3	$35.00	$1,272.60
6.2	Subgrade Preparation				
6.2.1	Preparation, Trim and Compact	145	m2	$5.25	$763.56
6.3	Concrete Footpaths				
6.3.1	Footpath - General (m2)	145	m2	$55.00	$7,999.20
6.3.2	Extra-over reinforcement at kerb radii in footpaths	0	m2	$30.00	$ -
6.3.3	Pram Ramps	4	ea	$1,000.00	$4,000.00
6.3.4	Sand Fill Below Concrete (100mm)	145	m2	$2.80	$407.23
Total Verge Works					$21,799.43
7	Stewart Road - Traffic Lane				
7.1	Earthworks and Site Preparation	238.0	m2		
7.1.1	Site Clearance (rate based on existing road surface)	119.0	m2	$1.00	$119.00
7.1.2	Removal of topsoil 150mm thick and stockpile for later re-use	119.0	m2	$3.85	$458.15
7.1.3	Detailed Excavation & Cartaway / Dispurse Surplus Material	119.0	m2	$14.65	$1,743.35

Item No	Item	Qty	Unit	Rate	Amount
7.1.4	Cut to fill from stockpile	71	m3	$5.00	$357.00
7.1.5	Place topsoil from stockpile in verges, trim and compact	119.0	m2	$5.00	$595.00
7.1.6	Cut to fill within verge to make good levels	71.4	m3	$5.00	$357.00
7.1.7	Imported fill material to make up levels behind kerbs	71.4	m3	$35.00	$2,499.00
7.2	Subgrade Preparation				
7.2.1	Preparation, Trim and Compact	261.8	m2	$5.25	$1,374.45
7.3	Sub Base and Base Course				
7.3.1	200mm thickness compacted limestone sub base	261.8	m2	$14.00	$3,665.20
7.3.2	Basecourse. Fine crushed rock 200mm thick	261.8	m2	$14.00	$3,665.20
7.4	Asphalt Works				$ -
7.4.1	40mm High Fatigue Asphalt	238.0	m2	$23.00	$5,474.00
7.4.2	Primer Seal (Coat)	238.0	m2	$5.65	$1,344.70
7.5	Kerbing				
7.5.1	Standard Semi-Mountable Kerb (SMK)	88.9	m	$30.00	$2,666.40
7.6	Linemarking and Furniture				
7.6.1	Linemarking and Furniture	88.9	m	$14.72	$1,308.31
7.6.2	Street Signs	2	No	$1,048.26	$2,096.52
7.7	Planting and Vegetation				
7.7.1	Mulch to Planter Areas	8	m2	$15.72	$125.76
7.7.2	Trees	2	No	$317.59	$635.18
Total Traffic Lane					$28,484.22

8	Stewart Road - Median and Splitter Islands				
8.1	Earthworks and Site Preparation	75.5	m2		
8.1.1	Detailed Excavation & Cartaway / Dispurse Surplus Material	75.5	m2	$14.65	$1,106.08
8.1.2	Imported fill material to make up levels	37.75	m3	$35.00	$1,321.25
8.1.3	Subgrade Preparation				
8.1.4	Preparation, Trim and Compact	75.5	m2	$5.25	$396.38
8.2	Kerbing				

Item No	Item	Qty	Unit	Rate	Amount
8.2.1	Standard Semi Mountable Kerb (SMK)	84.8	m	$30.00	$2,545.20
8.3	Linemarking and Furniture				
8.3.1	Linemarking and Furniture	84.8	m	$14.72	$1,248.84
8.3.2	Street Signs	1	ea	$1,048.26	$1,048.26
8.4	Paved Median Area				
8.4.1	Block Paving on Sand Bed	75.5	m2	$75.00	$5,662.50
8.5	Planting and Vegetation				
8.5.1	Mulch to Planter Areas	8	m2	$15.72	$125.76
8.5.2	Trees	2	No	$317.59	$635.18
Total Median					$14,089.44

9	Stewart Road - Street Lighting				
9.1	Street Lighting				
9.1.1	Provide new lighting	3	No	$2,721.60	$8,164.80
Total Street Lighting					$8,164.80

10	Stewart Road - Road Drainage				
10.1	General Road Drainage				
10.1.1	450mm SW Pipework - Supply and Install including trenching	101.0	m	$200.00	$20,200.00
10.1.2	Demolish and remove existing manholes	0.0	ea	$2,000.00	$ -
10.1.3	Gully (Side Entry) Pits - Supply and Install (1050mm dia) (assume 1 per 30m)	4	No	$2,500.00	$10,000.00
Total Road Drainage					$30,200.00

TOTAL (excl. preliminaries)	$390,199.84

11	Preliminaries				
11.1	Traffic Management	7.5%	%		$29,264.99
11.2	Project Overheads and Preliminaries (Indirect Construction Costs)	12.5%	%		$48,774.98
11.3	Project Owner's Cost (Planning and Design Costs)	12.5%	%		$48,774.98

Item No	Item	Qty	Unit	Rate	Amount
11.4	Risk Contingency Allowance	12.5%	%		$64,626.85
Total Preliminaries					$191,441.80
TOTAL (incl. preliminaries)					$581,641.64

2024 % of ESCALATION	***2.13%***	***%***	***$594,030.60***

8.1.15 INT01– Milner Rd / Stewart Road – Services

Item No	Item	Qty	Unit	Rate	Amount
	I18 Roundabout - Milner Road (IB 25.2-20m), Stewart Road (NCA , 24.5m)	119.3	m		
1	Western Power				
1.1	Provisional Sum for Undergrounding of overhead poles	3.0	ea	$30,000.00	$90,000.00
1.2	LV/HV underground cables	119.3	m	$171.60	$20,471.88
1.3	Western Power HV Works Supervision	1.5	wk	$4,000.00	$6,000.00
1.4	Terminations / reconnections etc	3.0	ea	$1,000.00	$3,000.00
Total Western Power					$119,471.88

2	Telstra				
2.1	Telstra - Relocate Telstra Cables	119.3	m	$100.00	$11,930.00
2.2	Allowance to remove existing and install new pits	3.0	ea	$1,197.60	$3,592.80
Total Telstra					$15,522.80

3	ATCO Gas				
3.1	ATCO Gas pipeline to 150mm-dia (includes excavate, backfill, supply and intsall)	119.3	m	$78.50	$9,365.05
3.2	ATCO Gas - Supervision	0	wks	$4,000.00	$ -
3.3	ATCO Gas - Connect to existing	3	ea	$5,000.00	$15,000.00
Total ATCO Gas					$24,365.05

4	Water Mains				
4.1	Water main (to 150mm-dia) Supply, lay, excavate and backfill in common trench	119.3	m	$75.00	$8,947.50
4.2	Allowance for Valves, Hydrants	2.0	ea	$975.00	$1,950.00

Item No	Item	Qty	Unit	Rate	Amount
4.3	Connect to existing (Water Corp PROV SUM)	3.0	ea	$6,000.00	$18,000.00
Total Water					$28,897.50
5	Optus				
5.1	Relocate Cables	0.0	m	$100.00	$ -
Total Optus					$ -
6	NBN Telecommunications				
6.1	Relocate Telecommunications Cables	119.3	m	$100.00	$11,930.00
Total NBN Telecommunications					$11,930.00
TOTAL (excl. preliminaries)					$200,187.23
7	Preliminaries				
7.1	Traffic Management	7.5%	%		$15,014.04
7.2	Project Overheads and Preliminaries (Indirect Construction Costs)	15%	%		$30,028.08
7.3	Project Owner's Cost (Planning and Design Costs)	15%	%		$30,028.08
7.4	Risk Contingency Allowance	15%	%		$41,288.62
Total Preliminaries					$116,358.83
TOTAL (incl. preliminaries)					$316,546.06
2024 % of ESCALATION		***2.13%***	***%***		***$323,288.49***

8.1.16 INT02– Milner Rd / Raven Street

Item No	Item	Qty	Unit	Rate	Amount
	I17 Roundabout - Milner Road (IB 25.2m), Raven Street (NCA , 24.5m)	3854	m2		
	Milner Road Northern Approach	41.3	m		
	Milner Road Southern Approach	40.3	m		
	Raven Street Western Approach	39.6	m		
	Raven Street Eastern Approach	44.7	m		
1.1	Milner Road - Earthworks and Site Preparation in Verge	816	m2		
1.1.1	Site Clearance (rate based on existing road surface. Includes trees)	408.0	m2	$1.00	$408.00
1.1.2	Detailed Excavation in existing pavement	408.0	m2	$14.65	$5,977.20
1.1.3	Removal of topsoil 150mm thick and stockpile for later re-use	408.0	m2	$3.85	$1,570.80
1.1.4	Cut to fill within verge to make good levels	244.8	m3	$5.00	$1,224.00
1.1.5	Place topsoil from stockpile in verges, trim and compact	408.0	m2	$5.00	$2,040.00
1.1.6	Imported Fill to make up levels	408	m3	$35.00	$14,280.00
1.2	Subgrade Preparation				
1.2.1	Preparation, Trim and Compact	391.7	m2	$5.25	$2,056.32
1.3	Concrete Footpaths				
1.3.1	Footpath - General 100mm thickness	391.7	m2	$55.00	$21,542.40
1.3.2	Extra-over reinforcement at kerb radii in footpaths	0.0	m2	$30.00	$ -
1.3.3	Pram Ramps	4	ea	$1,000.00	$4,000.00
1.3.4	Sand Fill Below Concrete (100mm)	391.68	m2	$2.80	$1,096.70
1.4	Planting and Vegetation				
1.4.1	Landscaping, Mulch and Shrubs	32.0	m2	$15.72	$503.04
1.4.2	Trees	8	ea	$317.59	$2,540.72
Total Verge					$57,239.18

2	Milner Road - Traffic Lane	1126	m2		
2.1	Earthworks and Site Preparation				

Item No	Item	Qty	Unit	Rate	Amount
2.1.1	Site Clearance (rate based on existing road surface. Includes trees)	563.0	m2	$1.00	$563.00
2.1.2	Detailed Excavation & Cartaway / Dispurse Surplus Material	563	m2	$14.65	$8,247.95
2.1.3	Removal of topsoil 150mm thick and stockpile for later re-use	563.0	m2	$3.85	$2,167.55
2.1.4	Cut to fill from stockpile	338	m3	$5.00	$1,689.00
2.1.5	Place topsoil from stockpile in verges, trim and compact	563.0	m2	$5.00	$2,815.00
2.1.6	Imported Fill to make up levels	338	m3	$35.00	$11,823.00
2.2	Subgrade Preparation				
2.2.1	Preparation, Trim and Compact	1126.0	m2	$5.25	$5,911.50
2.3	Sub Base and Base Course				$ -
2.3.1	200mm compacted thickness limestone subbase course	1126.0	m2	$14.00	$15,764.00
2.3.2	Base Course, fine crushed rock, 200mm thick	1126.0	m2	$14.00	$15,764.00
2.4	Asphalt Wearing Surface				$ -
2.4.1	40mm High Fatigue Asphalt	1126.0	m2	$23.00	$25,898.00
2.4.2	Primer Seal (Coat)	1126.0	m2	$5.65	$6,361.90
2.5	Kerbing				$ -
2.5.1	Standard Semi Mountable Kerb	171.4	m	$30.00	$5,140.80
2.6	Linemarking and Furniture				$ -
2.6.1	Linemarking and Furniture	171.4	m	$14.72	$2,522.42
2.6.2	Street Signs	4	ea	$1,048.26	$4,193.04
Total Traffic Lane					$108,861.16

3	Milner Road - Median Islands and RAB Annuli				
3.1	Earthworks and Site Preparation	469.0	m2		
3.1.1	Detailed Excavation & Cartaway / Dispurse Surplus Material	469.0	m2	$14.65	$6,870.85
3.1.2	Imported Fill to make up levels	141	m3	$35.00	$4,924.50
3.2	Subgrade Preparation				

Item No	Item	Qty	Unit	Rate	Amount
3.2.1	Preparation, Trim and Compact	469.0	m2	$5.25	$2,462.25
3.3	Sub Base and Base Course				
3.3.1	200mm compacted thickness limestone subbase course	469.0	m2	$14.00	$6,566.00
3.3.2	Base Course, fine crushed rock, 200mm thick				
3.4	Kerbing				
3.4.1	Semi Mountable Kerbing	179.5	m	$30.00	$5,385.60
3.4.2	Reinforced Mountable Kerb	62.8	m	$60.00	$3,768.00
3.4.3	Barrier Kerbing	37.7	m	$30.00	$1,130.40
3.5	Linemarking and Furniture				
3.5.1	Linemarking and Furniture	179.52	m	$14.72	$2,642.53
3.5.2	Street Signs	2	ea	$1,048.26	$2,096.52
3.6	Paved Median Area				
3.6.1	Block Paving on Sand Bed	356.0	m2	$75.00	$26,697.00
3.7	Planting and Vegetation				
3.7.1	Mulch to Planter Areas	129	m2	$15.72	$2,028.51
3.7.2	Trees	4	ea	$317.59	$1,270.36
Total Median and Splitter Islands					$65,842.52

4	Milner Road - Street Lighting				
4.1	Street Lighting				
4.1.1	Provide new street lighting	6.0	ea	$2,721.60	$16,329.60
Total Street Lighting					$16,329.60

5	Milner Road - Road Drainage				
5.1	General Road Drainage				
5.1.1	450mm SW Pipework - Supply and Install including trenching	102.0	m	$200.00	$20,400.00
5.1.2	Demolish and remove existing pits	4.0	ea	$2,000.00	$8,000.00
5.1.3	Gully (Side Entry) Pits - Supply and Install (1050mm dia) (assume 1 per 30m)	6.0	ea	$2,500.00	$15,000.00
Total Road Drainage					$43,400.00

6	Raven Street - Verge Works				

Item No	Item	Qty	Unit	Rate	Amount
6.1	Earthworks and Site Preparation	843.0	m2		
6.1.1	Site Clearance (based on light shrubs)	252.9	m2	$1.00	$252.90
6.1.2	Detailed Excavation & Cartaway / Dispurse Surplus Material	590	m2	$14.65	$8,644.97
6.1.3	Removal of topsoil 150mm thick and stockpile for later re-use	252.9	m2	$3.85	$973.67
6.1.4	Cut to fill within verge to make good levels	252.9	m3	$5.00	$1,264.50
6.1.5	Place topsoil from stockpile in verges, trim and compact	843.0	m2	$5.00	$4,215.00
6.1.6	Imported fill material to make up levels (500mm)	75.87	m3	$35.00	$2,655.45
6.2	Subgrade Preparation				
6.2.1	Preparation, Trim and Compact	303	m2	$5.25	$1,593.27
6.3	Concrete Footpaths				
6.3.1	Footpath - General (m2)	303	m2	$55.00	$16,691.40
6.3.2	Extra-over reinforcement at kerb radii in footpaths	0	m2	$30.00	$ -
6.3.3	Pram Ramps	4	ea	$1,000.00	$4,000.00
6.3.4	Sand Fill Below Concrete (100mm)	303	m2	$2.80	$849.74
Total Verge Works					$41,140.89
7	Raven Street - Traffic Lane				
7.1	Earthworks and Site Preparation	476.0	m2		
7.1.1	Site Clearance (rate based on existing road surface)	238.0	m2	$1.00	$238.00
7.1.2	Removal of topsoil 150mm thick and stockpile for later re-use	238.0	m2	$3.85	$916.30
7.1.3	Detailed Excavation & Cartaway / Dispurse Surplus Material	238.0	m2	$14.65	$3,486.70
7.1.4	Cut to fill from stockpile	143	m3	$5.00	$714.00
7.1.5	Place topsoil from stockpile in verges, trim and compact	238.0	m2	$5.00	$1,190.00
7.1.6	Cut to fill within verge to make good levels	142.8	m3	$5.00	$714.00

Item No	Item	Qty	Unit	Rate	Amount
7.1.7	Imported fill material to make up levels behind kerbs	142.8	m3	$35.00	$4,998.00
7.2	Subgrade Preparation				
7.2.1	Preparation, Trim and Compact	523.6	m2	$5.25	$2,748.90
7.3	Sub Base and Base Course				
7.3.1	200mm thickness compacted limestone sub base	523.6	m2	$14.00	$7,330.40
7.3.2	Basecourse. Fine crushed rock 200mm thick	523.6	m2	$14.00	$7,330.40
7.4	Asphalt Works				$ -
7.4.1	40mm High Fatigue Asphalt	476.0	m2	$23.00	$10,948.00
7.4.2	Primer Seal (Coat)	476.0	m2	$5.65	$2,689.40
7.5	Kerbing				
7.5.1	Standard Semi-Mountable Kerb (SMK)	185.5	m	$30.00	$5,563.80
7.6	Linemarking and Furniture				
7.6.1	Linemarking and Furniture	185.5	m	$14.72	$2,729.97
7.6.2	Street Signs	2	No	$1,048.26	$2,096.52
7.7	Planting and Vegetation				
7.7.1	Mulch to Planter Areas	8	m2	$15.72	$125.76
7.7.2	Trees	2	No	$317.59	$635.18
Total Traffic Lane					$54,455.33

8	Raven Street - Median and Splitter Islands				
8.1	Earthworks and Site Preparation	151.0	m2		
8.1.1	Detailed Excavation & Cartaway / Dispurse Surplus Material	151.0	m2	$14.65	$2,212.15
8.1.2	Imported fill material to make up levels	75.5	m3	$35.00	$2,642.50
8.1.3	Subgrade Preparation				
8.1.4	Preparation, Trim and Compact	151	m2	$5.25	$792.75
8.2	Kerbing				
8.2.1	Standard Semi Mountable Kerb (SMK)	177.0	m	$30.00	$5,310.90
8.3	Linemarking and Furniture				
8.3.1	Linemarking and Furniture	177.0	m	$14.72	$2,605.88
8.3.2	Street Signs	1	ea	$1,048.26	$1,048.26
8.4	Paved Median Area				
8.4.1	Block Paving on Sand Bed	151	m2	$75.00	$11,325.00
8.5	Planting and Vegetation				

Item No	Item	Qty	Unit	Rate	Amount
8.5.1	Mulch to Planter Areas	8	m2	$15.72	$125.76
8.5.2	Trees	2	No	$317.59	$635.18
Total Median					$26,698.38

9	Raven Street - Street Lighting				
9.1	Street Lighting				
9.1.1	Provide new lighting	6	No	$2,721.60	$16,329.60
Total Street Lighting					$16,329.60

10	Raven Street - Road Drainage				
10.1	General Road Drainage				
10.1.1	450mm SW Pipework - Supply and Install including trenching	210.8	m	$200.00	$42,150.00
10.1.2	Demolish and remove existing manholes	0.0	ea	$2,000.00	$ -
10.1.3	Gully (Side Entry) Pits - Supply and Install (1050mm dia) (assume 1 per 30m)	4	No	$2,500.00	$10,000.00
Total Road Drainage					$52,150.00

TOTAL (excl. preliminaries)	$482,446.67

11	Preliminaries				
11.1	Traffic Management	7.5%	%		$36,183.50
11.2	Project Overheads and Preliminaries (Indirect Construction Costs)	12.5%	%		$60,305.83
11.3	Project Owner's Cost (Planning and Design Costs)	12.5%	%		$60,305.83
11.4	Risk Contingency Allowance	12.5%	%		$79,905.23
Total Preliminaries					$236,700.40

TOTAL (incl. preliminaries)	$719,147.07

2024 % of ESCALATION	***2.13%***	***%***	***$734,464.90***

8.1.17 INT02– Milner Rd / Raven Street – Services

Item No	Item	Qty	Unit	Rate	Amount
	I17 Roundabout - Milner Road (IB 25.2m), Raven Street (NCA , 24.5m)	165.9	m		
1	Western Power				
1.1	Provisional Sum for Undergrounding of overhead poles	4.0	ea	$30,000.00	$120,000.00
1.2	LV/HV underground cables	165.9	m	$171.60	$28,468.44
1.3	Western Power HV Works Supervision	1.5	wk	$4,000.00	$6,000.00
1.4	Terminations / reconnections etc	4.0	ea	$1,000.00	$4,000.00
Total Western Power					$158,468.44
2	Telstra				
2.1	Telstra - Relocate Telstra Cables	165.9	m	$100.00	$16,590.00
2.2	Allowance to remove existing and install new pits	4.0	ea	$1,197.60	$4,790.40
Total Telstra					$21,380.40
3	ATCO Gas				
3.1	ATCO Gas pipeline to 150mm-dia (includes excavate, backfill, supply and intsall)	82.95	m	$78.50	$6,511.58
3.2	ATCO Gas - Supervision	0	wks	$4,000.00	$ -
3.3	ATCO Gas - Connect to existing	2	ea	$5,000.00	$10,000.00
Total ATCO Gas					$16,511.58
4	Water Mains				
4.1	Water main (to 150mm-dia) Supply, lay, excavate and backfill in common trench	165.9	m	$75.00	$12,442.50
4.2	Allowance for Valves, Hydrants	3.0	ea	$975.00	$2,925.00
4.3	Connect to existing (Water Corp PROV SUM)	4.0	ea	$6,000.00	$24,000.00
Total Water					$39,367.50

Item No	Item	Qty	Unit	Rate	Amount
5	Optus				
5.1	Relocate Cables	0.0	m	$100.00	$ -
Total Optus					$ -
6	NBN Telecommunications				
6.1	Relocate Telecommunications Cables	165.9	m	$100.00	$16,590.00
Total NBN Telecommunications					$16,590.00
TOTAL (excl. preliminaries)					$252,317.92
7	Preliminaries				
7.1	Traffic Management	7.5%	%		$18,923.84
7.2	Project Overheads and Preliminaries (Indirect Construction Costs)	15%	%		$37,847.69
7.3	Project Owner's Cost (Planning and Design Costs)	15%	%		$37,847.69
7.4	Risk Contingency Allowance	15%	%		$52,040.57
Total Preliminaries					$146,659.79
TOTAL (incl. preliminaries)					$398,977.70
2024 % of ESCALATION		***2.13%***	***%***		***$407,475.93***

8.1.18 INT03– TOD Connector / Brand Road

Item No	Item	Qty	Unit	Rate	Amount
	I16 Roundabout - TOD Connector (NCA , 24.5m), Brand Road (AS 20m)	2718	m2		
	Brand Road Northern Approach	35.5	m		
	Brand Road Southern Approach	40.2	m		
	TOD Connector Boulevard Western Approach	39.2	m		
	TOD Connector Boulevard Eastern Approach	0	m		
1.1	Brand Road - Earthworks and Site Preparation in Verge	1095	m2		
1.1.1	Site Clearance (rate based on existing road surface. Includes trees)	547.5	m2	$1.00	$547.50
1.1.2	Detailed Excavation in existing pavement	209.5	m2	$14.65	$3,069.18
1.1.3	Removal of topsoil 150mm thick and stockpile for later re-use	547.5	m2	$3.85	$2,107.88
1.1.4	Cut to fill within verge to make good levels	328.5	m3	$5.00	$1,642.50
1.1.5	Place topsoil from stockpile in verges, trim and compact	547.5	m2	$5.00	$2,737.50
1.1.6	Imported Fill to make up levels	329	m3	$35.00	$11,497.50
1.2	Subgrade Preparation				
1.2.1	Preparation, Trim and Compact	363.4	m2	$5.25	$1,907.64
1.3	Concrete Footpaths				
1.3.1	Footpath - General 100mm thickness	363.4	m2	$55.00	$19,984.80
1.3.2	Extra-over reinforcement at kerb radii in footpaths	0.0	m2	$30.00	$ -
1.3.3	Pram Ramps	4	ea	$1,000.00	$4,000.00
1.3.4	Sand Fill Below Concrete (100mm)	363.36	m2	$2.80	$1,017.41
1.4	Planting and Vegetation				
1.4.1	Landscaping, Mulch and Shrubs	32.0	m2	$15.72	$503.04
1.4.2	Trees	8	ea	$317.59	$2,540.72
Total Verge					$51,555.66

Item No	Item	Qty	Unit	Rate	Amount
2	Brand Road - Traffic Lane	1032	m2		
2.1	Earthworks and Site Preparation				
2.1.1	Site Clearance (rate based on existing road surface. Includes trees)	515.9	m2	$1.00	$515.85
2.1.2	Detailed Excavation & Cartaway / Dispurse Surplus Material	516	m2	$14.65	$7,557.20
2.1.3	Removal of topsoil 150mm thick and stockpile for later re-use	515.9	m2	$3.85	$1,986.02
2.1.4	Cut to fill from stockpile	310	m3	$5.00	$1,547.55
2.1.5	Place topsoil from stockpile in verges, trim and compact	515.9	m2	$5.00	$2,579.25
2.1.6	Imported Fill to make up levels	310	m3	$35.00	$10,832.85
2.2	Subgrade Preparation				
2.2.1	Preparation, Trim and Compact	1031.7	m2	$5.25	$5,416.43
2.3	Sub Base and Base Course				$ -
2.3.1	200mm compacted thickness limestone subbase course	1031.7	m2	$14.00	$14,443.80
2.3.2	Base Course, fine crushed rock, 200mm thick	1031.7	m2	$14.00	$14,443.80
2.4	Asphalt Wearing Surface				$ -
2.4.1	40mm High Fatigue Asphalt	1031.7	m2	$23.00	$23,729.10
2.4.2	Primer Seal (Coat)	1031.7	m2	$5.65	$5,829.11
2.5	Kerbing				$ -
2.5.1	Standard Semi Mountable Kerb	151.4	m	$30.00	$4,542.00
2.6	Linemarking and Furniture				$ -
2.6.1	Linemarking and Furniture	151.4	m	$14.72	$2,228.61
2.6.2	Street Signs	4	ea	$1,048.26	$4,193.04
Total Traffic Lane					$99,844.60

3	Brand Road - Median Islands and RAB Annuli				
3.1	Earthworks and Site Preparation	390.0	m2		

Item No	Item	Qty	Unit	Rate	Amount
3.1.1	Detailed Excavation & Cartaway / Dispurse Surplus Material	390.0	m2	$14.65	$5,713.50
3.1.2	Imported Fill to make up levels	117	m3	$35.00	$4,095.00
3.2	Subgrade Preparation				
3.2.1	Preparation, Trim and Compact	390.0	m2	$5.25	$2,047.50
3.3	Sub Base and Base Course				
3.3.1	200mm compacted thickness limestone subbase course	390.0	m2	$14.00	$5,460.00
3.3.2	Base Course, fine crushed rock, 200mm thick				
3.4	Kerbing				
3.4.1	Semi Mountable Kerbing	166.5	m	$30.00	$4,996.20
3.4.2	Reinforced Mountable Kerb	62.8	m	$60.00	$3,768.00
3.4.3	Barrier Kerbing	37.7	m	$30.00	$1,130.40
3.5	Linemarking and Furniture				
3.5.1	Linemarking and Furniture	166.54	m	$14.72	$2,451.47
3.5.2	Street Signs	2	ea	$1,048.26	$2,096.52
3.6	Paved Median Area				
3.6.1	Block Paving on Sand Bed	277.0	m2	$75.00	$20,772.00
3.7	Planting and Vegetation				
3.7.1	Mulch to Planter Areas	129	m2	$15.72	$2,028.51
3.7.2	Trees	4	ea	$317.59	$1,270.36
Total Median and Splitter Islands					$55,829.46

4	Brand Road - Street Lighting				
4.1	Street Lighting				
4.1.1	Provide new street lighting	6.0	ea	$2,721.60	$16,329.60
Total Street Lighting					$16,329.60

5	Brand Road - Road Drainage				
5.1	General Road Drainage				
5.1.1	450mm SW Pipework - Supply and Install including trenching	94.6	m	$200.00	$18,925.00
5.1.2	Demolish and remove existing pits	0.0	ea	$2,000.00	$ -

Item No	Item	Qty	Unit	Rate	Amount
5.1.3	Gully (Side Entry) Pits - Supply and Install (1050mm dia) (assume 1 per 30m)	4.0	ea	$2,500.00	$10,000.00
Total Road Drainage					$28,925.00
6	TOD Connector Boulevard Road - Verge Works				
6.1	Earthworks and Site Preparation	392.0	m2		
6.1.1	Site Clearance (based on light shrubs)	117.6	m2	$1.00	$117.60
6.1.2	Detailed Excavation & Cartaway / Dispurse Surplus Material	0	m2	$14.65	$ -
6.1.3	Removal of topsoil 150mm thick and stockpile for later re-use	117.6	m2	$3.85	$452.76
6.1.4	Cut to fill within verge to make good levels	117.6	m3	$5.00	$588.00
6.1.5	Place topsoil from stockpile in verges, trim and compact	392.0	m2	$5.00	$1,960.00
6.1.6	Imported fill material to make up levels (500mm)	35.28	m3	$35.00	$1,234.80
6.2	Subgrade Preparation				
6.2.1	Preparation, Trim and Compact	188	m2	$5.25	$987.84
6.3	Concrete Footpaths				
6.3.1	Footpath - General (m2)	188	m2	$55.00	$10,348.80
6.3.2	Extra-over reinforcement at kerb radii in footpaths	0	m2	$30.00	$ -
6.3.3	Pram Ramps	2	ea	$1,000.00	$2,000.00
6.3.4	Sand Fill Below Concrete (100mm)	188	m2	$2.80	$526.85
Total Verge Works					$18,216.65
7	TOD Connector Boulevard - Traffic Lane				
7.1	Earthworks and Site Preparation	216.0	m2		
7.1.1	Site Clearance (rate based on existing road surface)	216.0	m2	$1.00	$216.00
7.1.2	Removal of topsoil 150mm thick and stockpile for later re-use	216.0	m2	$3.85	$831.60

Item No	Item	Qty	Unit	Rate	Amount
7.1.3	Detailed Excavation & Cartaway / Dispurse Surplus Material	0.0	m2	$14.65	$ -
7.1.4	Cut to fill from stockpile	65	m3	$5.00	$324.00
7.1.5	Place topsoil from stockpile in verges, trim and compact	216.0	m2	$5.00	$1,080.00
7.1.6	Cut to fill within verge to make good levels	64.8	m3	$5.00	$324.00
7.1.7	Imported fill material to make up levels behind kerbs	64.8	m3	$35.00	$2,268.00
7.2	Subgrade Preparation				
7.2.1	Preparation, Trim and Compact	237.6	m2	$5.25	$1,247.40
7.3	Sub Base and Base Course				
7.3.1	200mm thickness compacted limestone sub base	237.6	m2	$14.00	$3,326.40
7.3.2	Basecourse. Fine crushed rock 200mm thick	237.6	m2	$14.00	$3,326.40
7.4	Asphalt Works				$ -
7.4.1	40mm High Fatigue Asphalt	216.0	m2	$23.00	$4,968.00
7.4.2	Primer Seal (Coat)	216.0	m2	$5.65	$1,220.40
7.5	Kerbing				
7.5.1	Standard Semi-Mountable Kerb (SMK)	137.2	m	$30.00	$4,116.00
7.6	Linemarking and Furniture				
7.6.1	Linemarking and Furniture	137.2	m	$14.72	$2,019.58
7.6.2	Street Signs	2	No	$1,048.26	$2,096.52
7.7	Planting and Vegetation				
7.7.1	Mulch to Planter Areas	8	m2	$15.72	$125.76
7.7.2	Trees	2	No	$317.59	$635.18
Total Traffic Lane					$28,125.24

8	TOD Connector Boulevard - Median and Splitter Islands				
8.1	Earthworks and Site Preparation	64.0	m2		
8.1.1	Detailed Excavation & Cartaway / Dispurse Surplus Material	0	m2	$14.65	$ -

Item No	Item	Qty	Unit	Rate	Amount
8.1.2	Imported fill material to make up levels	32	m3	$35.00	$1,120.00
8.1.3	Subgrade Preparation				
8.1.4	Preparation, Trim and Compact	64	m2	$5.25	$336.00
8.2	Kerbing				
8.2.1	Standard Semi Mountable Kerb (SMK)	82.3	m	$30.00	$2,469.60
8.3	Linemarking and Furniture				
8.3.1	Linemarking and Furniture	82.3	m	$14.72	$1,211.75
8.3.2	Street Signs	1	ea	$1,048.26	$1,048.26
8.4	Paved Median Area				
8.4.1	Block Paving on Sand Bed	64	m2	$75.00	$4,800.00
8.5	Planting and Vegetation				
8.5.1	Mulch to Planter Areas	8	m2	$15.72	$125.76
8.5.2	Trees	2	No	$317.59	$635.18
Total Median					$11,746.55

9	TOD Connector Boulevard - Street Lighting				
9.1	Street Lighting				
9.1.1	Provide new lighting	3	No	$2,721.60	$8,164.80
Total Street Lighting					$8,164.80
10	TOD Connector Boulevard - Road Drainage				
10.1	General Road Drainage				
10.1.1	450mm SW Pipework - Supply and Install including trenching	98.0	m	$200.00	$19,600.00
10.1.2	Demolish and remove existing manholes	0.0	ea	$2,000.00	$ -
10.1.3	Gully (Side Entry) Pits - Supply and Install (1050mm dia) (assume 1 per 30m)	4	No	$2,500.00	$10,000.00
Total Road Drainage					$29,600.00
TOTAL (excl. preliminaries)					$348,337.56

Item No	Item	Qty	Unit	Rate	Amount
11	Preliminaries				
11.1	Traffic Management	5%	%		$17,416.88
11.2	Project Overheads and Preliminaries (Indirect Construction Costs)	15%	%		$52,250.63
11.3	Project Owner's Cost (Planning and Design Costs)	10%	%		$34,833.76
11.4	Risk Contingency Allowance	15%	%		$67,925.82
	Total Preliminaries				$172,427.09
TOTAL (incl. preliminaries)					$520,764.65

2024 % of ESCALATION	***2.13%***	***%***	***$531,856.94***

8.1.19 INT04– TOD Connector / Brae Road

Item No	Item	Qty	Unit	Rate	Amount
	INT10 Brae Road (AS, 20m) and TOD Connector (NCA, 24.5m) GWY	1355	m2		
	TOD Connector Boulevard Western Approach	15.3	m		
	TOD Connector Boulevard Eastern Approach	17.1	m		
	Brae Road - Southern Approach	29.6	m		
1.1	TOD Connector Boulevard - Earthworks and Site Preparation in Verge	324	m2		
1.1.1	Site Clearance (rate based on existing road surface. Includes trees)	324	m2	$1.00	$324.00
1.1.2	Removal of topsoil 150mm thick and stockpile for later re-use	324	m2	$3.85	$1,247.40
1.1.3	Cut to fill within verge to make good levels	97.2	m3	$5.00	$486.00
1.1.4	Place topsoil from stockpile in verges, trim and compact	324	m2	$5.00	$1,620.00
1.1.5	Imported Fill to make up levels	162	m3	$35.00	$5,670.00
1.2	Subgrade Preparation				
1.2.1	Preparation, Trim and Compact	93.6	m2	$5.25	$491.40
1.3	Concrete Footpaths				
1.3.1	Footpath - General 100mm thickness	93.6	m2	$55.00	$5,148.00
1.3.2	Extra-over reinforcement at kerb radii in footpaths	0	m2	$30.00	$0.00
1.3.3	Pram Ramps	0	ea	$1,000.00	$0.00
1.3.4	Sand Fill Below Concrete (100mm)	93.6	m2	$2.80	$262.08
1.4	Planting and Vegetation				
1.4.1	Landscaping, Mulch and Shrubs	16	m2	$15.72	$251.52
1.4.2	Trees	4	ea	$317.59	$1,270.36
Total Verge					$16,770.76

2	TOD Connector Boulevard - Traffic Lane	411	m2		
2.1	Earthworks and Site Preparation				
2.1.1	Site Clearance (rate based on existing road surface. Includes trees)	123.4	m2	$1.00	$123.40

Item No	Item	Qty	Unit	Rate	Amount
2.1.2	Detailed Excavation & Cartaway / Dispurse Surplus Material	411	m2	$14.65	$6,021.15
2.1.3	Removal of topsoil 150mm thick and stockpile for later re-use	123.4	m2	$3.85	$475.09
2.1.4	Cut to fill from stockpile	123	m3	$5.00	$615.00
2.1.5	Place topsoil from stockpile in verges, trim and compact	123.4	m2	$5.00	$617.00
2.1.6	Imported Fill to make up levels	123	m3	$35.00	$4,305.00
2.2	Subgrade Preparation				
2.2.1	Preparation, Trim and Compact	411.5	m2	$5.25	$2,160.38
2.3	Sub Base and Base Course				
2.3.1	200mm compacted thickness limestone subbase course	411.5	m2	$14.00	$5,761.00
2.3.2	Base Course, fine crushed rock, 200mm thick	411.5	m2	$14.00	$5,761.00
2.4	Asphalt Wearing Surface				
2.4.1	40mm High Fatigue Asphalt	411.5	m2	$23.00	$9,464.50
2.4.2	Primer Seal (Coat)	411.5	m2	$5.65	$2,324.98
2.5	Kerbing				
2.5.1	Standard Semi Mountable Kerb	64.8	m	$30.00	$1,944.00
2.6	Linemarking and Furniture				
2.6.1	Linemarking and Furniture	64.8	m	$14.72	$953.86
2.6.2	Street Signs	2	ea	$1,048.26	$2,096.52
	Total Traffic Lane				$42,622.87

3	TOD Connector Boulevard - Median Islands				
3.1	Earthworks and Site Preparation	0	m2		
3.1.1	Detailed Excavation & Cartaway / Dispurse Surplus Material	0	m2	$14.65	$0.00
3.1.2	Imported Fill to make up levels	0	m3	$28.00	$0.00
3.2	Subgrade Preparation				
3.2.1	Preparation, Trim and Compact	0	m2	$5.25	$0.00
3.3	Sub Base and Base Course				

Item No	Item	Qty	Unit	Rate	Amount
3.3.1	200mm compacted thickness limestone subbase course	0	m2	$18.00	$0.00
3.3.2	Base Course, fine crushed rock, 200mm thick				
3.4	Kerbing				
3.4.1	Semi Mountable Kerbing	0	m	$37.50	$0.00
3.5	Linemarking and Furniture				
3.5.1	Linemarking and Furniture	0	m	$14.72	$0.00
3.5.2	Street Signs	0	ea	$1,048.26	$0.00
3.6	Paved Median Area				
3.6.1	Block Paving on Sand Bed	0	m2	$66.84	$0.00
3.7	Planting and Vegetation				
3.7.1	Mulch to Planter Areas	0	m2	$15.72	$0.00
3.7.2	Trees	0	ea	$317.59	$0.00
Total Median and Splitter Islands					$0.00
4	TOD Connector Boulevard - Street Lighting				
4.1	Street Lighting				
4.1.1	Provide new street lighting	3	ea	$2,721.60	$8,164.80
	Total Street Lighting				$8,164.80
5	TOD Connector Boulevard - Road Drainage				
5.1	General Road Drainage				
5.1.1	450mm SW Pipework - Supply and Install including trenching	40.5	m	$200.00	$8,100.00
5.1.2	Demolish and remove existing pits	0	ea	$2,000.00	$0.00
5.1.3	Gully (Side Entry) Pits - Supply and Install (1050mm dia) (assume 1 per 30m)	4	ea	$2,500.00	$10,000.00
	Total Road Drainage				$18,100.00
6	Brae Road - Verge Works				
6.1	Earthworks and Site Preparation	296	m2		
6.1.1	Site Clearance (based on light shrubs)	296	m2	$1.00	$296.00
6.1.2	Removal of topsoil 150mm thick and stockpile for later re-use	296	m2	$3.85	$1,139.60
6.1.3	Cut to fill within verge to make good levels	88.8	m3	$5.00	$444.00

Item No	Item	Qty	Unit	Rate	Amount
6.1.4	Place topsoil from stockpile in verges, trim and compact	296	m2	$5.00	$1,480.00
6.1.5	Imported fill material to make up levels (500mm)	148	m3	$35.00	$5,180.00
6.2	Subgrade Preparation				
6.2.1	Preparation, Trim and Compact	90	m2	$5.25	$472.50
6.3	Concrete Footpaths				
6.3.1	Footpath - General (m2)	90	m2	$55.00	$4,950.00
6.3.2	Extra-over reinforcement at kerb radii in footpaths	0	m2	$30.00	$0.00
6.3.3	Pram Ramps	2	ea	$1,000.00	$2,000.00
6.3.4	Sand Fill Below Concrete (100mm)	90	m2	$2.80	$252.00
	Total Verge Works				$16,214.10
7	Brae Road - Traffic Lane				
7.1	Earthworks and Site Preparation	246	m2		
7.1.1	Site Clearance (rate based on existing road surface)	246	m2	$1.00	$246.00
7.1.2	Removal of topsoil 150mm thick and stockpile for later re-use	246	m2	$3.85	$947.10
7.1.3	Cut to fill from stockpile	74	m3	$5.00	$370.00
7.1.4	Place topsoil from stockpile in verges, trim and compact	246	m2	$5.00	$1,230.00
7.1.5	Cut to fill within verge to make good levels	73.8	m3	$5.00	$369.00
7.1.6	Imported fill material to make up levels behind kerbs	73.8	m3	$35.00	$2,583.00
7.2	Subgrade Preparation				
7.2.1	Preparation, Trim and Compact	246	m2	$5.25	$1,291.50
7.3	Sub Base and Base Course				
7.3.1	200mm thickness compacted limestone sub base	270.6	m2	$14.00	$3,788.40
7.3.2	Basecourse. Fine crushed rock 200mm thick	270.6	m2	$14.00	$3,788.40
7.4	Asphalt Works				
7.4.1	40mm High Fatigue Asphalt	246	m2	$23.00	$5,658.00

Item No	Item	Qty	Unit	Rate	Amount
7.4.2	Primer Seal (Coat)	246	m2	$5.65	$1,389.90
7.5	Kerbing				
7.5.1	Standard Semi-Mountable Kerb (SMK)	67	m	$30.00	$2,010.00
7.6	Linemarking and Furniture				
7.6.1	Linemarking and Furniture	39.6	m	$14.72	$582.91
7.6.2	Street Signs	2	No	$1,048.26	$2,096.52
7.7	Planting and Vegetation				
7.7.1	Mulch to Planter Areas	8	m2	$15.72	$125.76
7.7.2	Trees	2	No	$317.59	$635.18
	Total Traffic Lane				$27,111.67

	Brae Road - Median and Splitter Islands				
8.1	Earthworks and Site Preparation	0	m2		
8.1.1	Detailed Excavation & Cartaway / Dispurse Surplus Material	0	m2	$14.65	$ -
8.1.2	Imported fill material to make up levels	0	m3	$28.00	$ -
8.2	Subgrade Preparation				
8.2.1	Preparation, Trim and Compact	0	m2	$5.25	$ -
8.3	Kerbing				
8.3.1	Standard Semi Mountable Kerb (SMK)	0	m	$33.11	$ -
8.4	Linemarking and Furniture				
8.4.1	Linemarking and Furniture	0	m	$14.72	$ -
8.4.2	Street Signs	0	ea	$1,048.26	$ -
8.5	Paved Median Area				
8.5.1	Block Paving on Sand Bed	0	m2	$66.84	$ -
8.6	Planting and Vegetation				
8.6.1	Mulch to Planter Areas	0	m2	$15.72	$ -
8.6.2	Trees	0	No	$317.59	$ -
	Total Median				$ -

9	Brae Road - Street Lighting				
9.1	Street Lighting				
9.1.1	Provide new lighting	2	No	$2,721.60	$5,443.20
	Total Street Lighting				$5,443.20

10	Brae Road - Road Drainage				
10.1	General Road Drainage				

Item No	Item	Qty	Unit	Rate	Amount
10.1.1	450mm SW Pipework - Supply and Install including trenching	59.2	m	$200.00	$11,840.00
10.1.2	Demolish and remove existing manholes	0	ea	$2,000.00	$0.00
10.1.3	Gully (Side Entry) Pits - Supply and Install (1050mm dia) (assume 1 per 30m)	2	No	$2,500.00	$5,000.00
	Total Road Drainage				$16,840.00
TOTAL (excl. preliminaries)					$151,267.40
11	Preliminaries				
11.1	Traffic Management	5%	%		$7,563.37
11.2	Project Overheads and Preliminaries (Indirect Construction Costs)	15%	%		$22,690.11
11.3	Project Owner's Cost (Planning and Design Costs)	10%	%		$15,126.74
11.4	Risk Contingency Allowance	15%	%		$183,789.89
Total Preliminaries					$229,170.11
TOTAL (incl. preliminaries)					$380,437.51
2024 % of ESCALATION		***2.13%***	***%***		***$388,540.82***

8.1.20 INT05– Brae Rd / Brand Rd

Item No	Item	Qty	Unit	Rate	Amount
	INT11 Brae Road (NCB, 19.2-20m) and Brand Road (AS, 20m) GWY	812	m2		
	TOD Brae Road Western Approach	14.9	m		
	TOD Brae Road Eastern Approach	15.1	m		
	Brand Road - Southern Approach	15.5	m		
1.1	Brae Road - Earthworks and Site Preparation in Verge	300	m2		
1.1.1	Site Clearance (rate based on existing road surface. Includes trees)	300	m2	$1.00	$300.00
1.1.2	Removal of topsoil 150mm thick and stockpile for later re-use	300	m2	$3.85	$1,155.00
1.1.3	Cut to fill within verge to make good levels	90	m3	$5.00	$450.00
1.1.4	Place topsoil from stockpile in verges, trim and compact	300	m2	$5.00	$1,500.00
1.1.5	Imported Fill to make up levels	150	m3	$35.00	$5,250.00
1.2	Subgrade Preparation				
1.2.1	Preparation, Trim and Compact	90	m2	$5.25	$472.50
1.3	Concrete Footpaths				
1.3.1	Footpath - General 100mm thickness	90	m2	$55.00	$4,950.00
1.3.2	Extra-over reinforcement at kerb radii in footpaths	0	m2	$30.00	$0.00
1.3.3	Pram Ramps	0	ea	$1,000.00	$0.00
1.3.4	Sand Fill Below Concrete (100mm)	90	m2	$2.80	$252.00
1.4	Planting and Vegetation				
1.4.1	Landscaping, Mulch and Shrubs	16	m2	$15.72	$251.52
1.4.2	Trees	4	ea	$317.59	$1,270.36
Total Verge					$15,851.38

2	Brae Road - Traffic Lane	217	m2		
2.1	Earthworks and Site Preparation				
2.1.1	Site Clearance (rate based on existing road surface. Includes trees)	65.1	m2	$1.00	$65.10

Item No	Item	Qty	Unit	Rate	Amount
2.1.2	Detailed Excavation & Cartaway / Dispurse Surplus Material	217	m2	$14.65	$3,179.05
2.1.3	Removal of topsoil 150mm thick and stockpile for later re-use	65.1	m2	$3.85	$250.64
2.1.4	Cut to fill from stockpile	65	m3	$5.00	$325.00
2.1.5	Place topsoil from stockpile in verges, trim and compact	65.1	m2	$5.00	$325.50
2.1.6	Imported Fill to make up levels	65	m3	$35.00	$2,275.00
2.2	Subgrade Preparation				
2.2.1	Preparation, Trim and Compact	217	m2	$5.25	$1,139.25
2.3	Sub Base and Base Course				
2.3.1	200mm compacted thickness limestone subbase course	217	m2	$14.00	$3,038.00
2.3.2	Base Course, fine crushed rock, 200mm thick	217	m2	$14.00	$3,038.00
2.4	Asphalt Wearing Surface				
2.4.1	40mm High Fatigue Asphalt	217	m2	$23.00	$4,991.00
2.4.2	Primer Seal (Coat)	217	m2	$5.65	$1,226.05
2.5	Kerbing				
2.5.1	Standard Semi Mountable Kerb	44.9	m	$30.00	$1,347.00
2.6	Linemarking and Furniture				
2.6.1	Linemarking and Furniture	30	m	$14.72	$441.60
2.6.2	Street Signs	2	ea	$1,048.26	$2,096.52
Total Traffic Lane					$23,737.71

3	Brae Road - Median Islands				
3.1	Earthworks and Site Preparation	0	m2		
3.1.1	Detailed Excavation & Cartaway / Dispurse Surplus Material	0	m2	$14.65	$ -
3.1.2	Imported Fill to make up levels	0	m3	$28.00	$ -
3.2	Subgrade Preparation				
3.2.1	Preparation, Trim and Compact	0	m2	$5.25	$ -
3.3	Sub Base and Base Course				
3.3.1	200mm compacted thickness limestone subbase course	0	m2	$18.00	$ -

Item No	Item	Qty	Unit	Rate	Amount
3.3.2	Base Course, fine crushed rock, 200mm thick				
3.4	Kerbing				
3.4.1	Semi Mountable Kerbing	0	m	$37.50	$ -
3.5	Linemarking and Furniture				
3.5.1	Linemarking and Furniture	0	m	$14.72	$ -
3.5.2	Street Signs	0	ea	$1,048.26	$ -
3.6	Paved Median Area				
3.6.1	Block Paving on Sand Bed	0	m2	$66.84	$ -
3.7	Planting and Vegetation				
3.7.1	Mulch to Planter Areas	0	m2	$15.72	$ -
3.7.2	Trees	0	ea	$317.59	$ -
Total Median and Splitter Islands					$ -

4	Brae Road - Street Lighting				
4.1	Street Lighting				
4.1.1	Provide new street lighting	3	ea	$2,721.60	$8,164.80
	Total Street Lighting				$8,164.80

5	Brae Road - Road Drainage				
5.1	General Road Drainage				
5.1.1	450mm SW Pipework - Supply and Install including trenching	37.5	m	$200.00	$7,500.00
5.1.2	Demolish and remove existing pits	0	ea	$2,000.00	$0.00
5.1.3	Gully (Side Entry) Pits - Supply and Install (1050mm dia) (assume 1 per 30m)	4	ea	$2,500.00	$10,000.00
	Total Road Drainage				$17,500.00

6	Brand Road - Verge Works				
6.1	Earthworks and Site Preparation	155	m2		
6.1.1	Site Clearance (based on light shrubs)	46.5	m2	$1.00	$46.50
6.1.2	Detailed Excavation & Cartaway / Dispurse Surplus Material	155	m2	$14.65	$2,270.75
6.1.3	Removal of topsoil 150mm thick and stockpile for later re-use	46.5	m2	$3.85	$179.03
6.1.4	Cut to fill within verge to make good levels	46.5	m3	$5.00	$232.50

Item No	Item	Qty	Unit	Rate	Amount
6.1.5	Place topsoil from stockpile in verges, trim and compact	155	m2	$5.00	$775.00
6.1.6	Imported fill material to make up levels (500mm)	23.25	m3	$35.00	$813.75
6.2	Subgrade Preparation				
6.2.1	Preparation, Trim and Compact	90	m2	$5.25	$472.50
6.3	Concrete Footpaths				
6.3.1	Footpath - General (m2)	90	m2	$55.00	$4,950.00
6.3.2	Extra-over reinforcement at kerb radii in footpaths	0	m2	$30.00	$0.00
6.3.3	Pram Ramps	2	ea	$1,000.00	$2,000.00
6.3.4	Sand Fill Below Concrete (100mm)	90	m2	$2.80	$252.00
	Total Verge Works				$11,992.03
7	Brand Road - Traffic Lane				
7.1	Earthworks and Site Preparation	132	m2		
7.1.1	Site Clearance (rate based on existing road surface)	132	m2	$1.00	$132.00
7.1.2	Removal of topsoil 150mm thick and stockpile for later re-use	132	m2	$3.85	$508.20
7.1.3	Cut to fill from stockpile	40	m3	$5.00	$200.00
7.1.4	Place topsoil from stockpile in verges, trim and compact	132	m2	$5.00	$660.00
7.1.5	Cut to fill within verge to make good levels	39.6	m3	$5.00	$198.00
7.1.6	Imported fill material to make up levels behind kerbs	39.6	m3	$35.00	$1,386.00
7.2	Subgrade Preparation				
7.2.1	Preparation, Trim and Compact	145.2	m2	$5.25	$762.30
7.3	Sub Base and Base Course				
7.3.1	200mm thickness compacted limestone sub base	145.2	m2	$14.00	$2,032.80
7.3.2	Basecourse. Fine crushed rock 200mm thick	145.2	m2	$14.00	$2,032.80
7.4	Asphalt Works				
7.4.1	40mm High Fatigue Asphalt	132	m2	$23.00	$3,036.00

Item No	Item	Qty	Unit	Rate	Amount
7.4.2	Primer Seal (Coat)	132	m2	$5.65	$745.80
7.5	Kerbing				
7.5.1	Standard Semi-Mountable Kerb (SMK)	32	m	$30.00	$960.00
7.6	Linemarking and Furniture				
7.6.1	Linemarking and Furniture	25.5	m	$14.72	$375.36
7.6.2	Street Signs	1	No	$1,048.26	$1,048.26
7.7	Planting and Vegetation				
7.7.1	Mulch to Planter Areas	8	m2	$15.72	$125.76
7.7.2	Trees	2	No	$317.59	$635.18
	Total Traffic Lane				$14,838.46

8	Brand Road - Median and Splitter Islands				
8.1	Earthworks and Site Preparation	0	m2		
8.1.1	Detailed Excavation & Cartaway / Dispurse Surplus Material	0	m2	$14.65	$ -
8.1.2	Imported fill material to make up levels	0	m3	$28.00	$ -
8.2	Subgrade Preparation				
8.2.1	Preparation, Trim and Compact	0	m2	$5.25	$ -
8.3	Kerbing				
8.3.1	Standard Semi Mountable Kerb (SMK)	0	m	$33.11	$ -
8.4	Linemarking and Furniture				
8.4.1	Linemarking and Furniture	0	m	$14.72	$ -
8.4.2	Street Signs	0	ea	$1,048.26	$ -
8.5	Paved Median Area				
8.5.1	Block Paving on Sand Bed	0	m2	$66.84	$ -
8.6	Planting and Vegetation				
8.6.1	Mulch to Planter Areas	0	m2	$15.72	$ -
8.6.2	Trees	0	No	$317.59	$ -
Total Median					$ -

9	Brand Road - Street Lighting				
9.1	Street Lighting				
9.1.1	Provide new lighting	2	No	$2,721.60	$5,443.20
Total Street Lighting					$5,443.20

10	Brand Road - Road Drainage				
10.1	General Road Drainage				

Item No	Item	Qty	Unit	Rate	Amount
10.1.1	450mm SW Pipework - Supply and Install including trenching	31	m	$200.00	$6,200.00
10.1.2	Demolish and remove existing manholes	0	ea	$2,000.00	$0.00
10.1.3	Gully (Side Entry) Pits - Supply and Install (1050mm dia) (assume 1 per 30m)	2	No	$2,500.00	$5,000.00
	Total Road Drainage				$11,200.00
TOTAL (excl. preliminaries)					$108,727.57
11	Preliminaries				
11.1	Traffic Management	5%	%		$5,436.38
11.2	Project Overheads and Preliminaries (Indirect Construction Costs)	15%	%		$16,309.14
11.3	Project Owner's Cost (Planning and Design Costs)	10%	%		$10,872.76
11.4	Risk Contingency Allowance	15%	%		$132,104.00
	Total Preliminaries				$48,927.41
TOTAL (incl. preliminaries)					$273,449.84
2024 % of ESCALATION		***2.13%***	***%***		***$279,274.32***

8.1.21 INT05– Brae Rd / Brand Rd – Services

Item No	Item	Qty	Unit	Rate	Amount
	I11 Brae Road (NCB, 19.2-20m) and Brand Road (AS, 20m) GWY	45.5	m		
1	Western Power				
1.1	Provisional Sum for Undergrounding of overhead poles	3	ea	$30,000.00	$90,000.00
1.2	LV/HV underground cables	45.5	m	$171.60	$7,807.80
1.3	Western Power HV Works Supervision	0.5	wk	$4,000.00	$2,000.00
1.4	Terminations / reconnections etc	5	ea	$1,000.00	$5,000.00
	Total Western Power				$104,807.80

2	Telstra				
2.1	Telstra - Relocate Telstra Cables	45.5	m	$100.00	$4,550.00
2.2	Allowance to remove existing and install new pits	3	ea	$1,197.60	$3,592.80
	Total Telstra				$8,142.80

3	ATCO Gas				
3.1	ATCO Gas pipeline to 150mm-dia (includes excavate, backfill, supply and intsall)	0	m	$78.50	$ -
3.2	ATCO Gas - Supervision	0	wks	$4,000.00	$ -
3.3	ATCO Gas - Connect to existing	0	ea	$5,000.00	$ -
	Total ATCO Gas				$ -

4	Water Mains				
4.1	Water main (to 150mm-dia) Supply, lay, excavate and backfill in common trench	45.5	m	$78.50	$3,571.75
4.2	Allowance for Valves, Hydrants	1	ea	$975.00	$975.00
4.3	Connect to existing (Water Corp PROV SUM)	3	ea	$6,000.00	$18,000.00
	Total Water				$22,546.75

5	Optus				
5.1	Relocate Cables	0	m	$67.50	$ -
	Total Optus				$ -

6	NBN Telecommunications				
6.1	Relocate Telecommunications Cables	45.5	m	$100.00	$4,550.00

Item No	Item	Qty	Unit	Rate	Amount
	Total NBN Telecommunications				$4,550.00
TOTAL (excl. preliminaries)					$140,047.35
7	Preliminaries				
7.1	Traffic Management	5%	%		$7,002.37
7.2	Project Overheads and Preliminaries (Indirect Construction Costs)	15%	%		$21,007.10
7.3	Project Owner's Cost (Planning and Design Costs)	10%	%		$14,004.74
7.4	Risk Contingency Allowance	15%	%		$170,157.53
	Total Preliminaries				$212,171.74
TOTAL (incl. preliminaries)					$352,219.09
2024 % of ESCALATION		***2.13%***	***%***		***$359,721.35***

8.1.22 INT06– TOD Connector / Brae Road/ Raven Street

Item No	Item	Qty	Unit	Rate	Amount
	I14 Roundabout - TOD Connector (NCA , 24.5m), Brae Road (NCB 19.2m), Raven Street (NCA 24.5m)	3256	m2		
	TOD Connector Boulevard Southern Approach	40	m		
	TOD Connector Boulevard Eastern Approach	33.4	m		
	Brae Road North Approach	39.4	m		
	Raven Street Western Approach	40	m		
1.1	TOD Connector Boulevard - Earthworks and Site Preparation in Verge	734	m2		
1.1.1	Site Clearance (rate based on existing road surface. Includes trees)	734.0	m2	$1.00	$734.00
1.1.2	Removal of topsoil 150mm thick and stockpile for later re-use	734.0	m2	$3.85	$2,825.90
1.1.3	Cut to fill within verge to make good levels	220.2	m3	$5.00	$1,101.00
1.1.4	Place topsoil from stockpile in verges, trim and compact	734.0	m2	$5.00	$3,670.00
1.1.5	Imported Fill to make up levels	220	m3	$35.00	$7,707.00
1.2	Subgrade Preparation				
1.2.1	Preparation, Trim and Compact	264.2	m2	$5.25	$1,387.26
1.3	Concrete Footpaths				
1.3.1	Footpath - General 100mm thickness	264.2	m2	$55.00	$14,533.20
1.3.2	Extra-over reinforcement at kerb radii in footpaths	0.0	m2	$30.00	$ -
1.3.3	Pram Ramps	4	ea	$1,000.00	$4,000.00
1.3.4	Sand Fill Below Concrete (100mm)	264.24	m2	$2.80	$739.87
1.4	Planting and Vegetation				
1.4.1	Landscaping, Mulch and Shrubs	16.0	m2	$15.72	$251.52
1.4.2	Trees	4	ea	$317.59	$1,270.36
Total Verge					$38,220.11

2	TOD Connector Boulevard - Traffic Lane	1031	m2		
2.1	Earthworks and Site Preparation				
2.1.1	Site Clearance (rate based on existing road surface. Includes trees)	515.5	m2	$1.00	$515.50
2.1.2	Detailed Excavation & Cartaway / Dispurse Surplus Material	516	m2	$14.65	$7,552.08
2.1.3	Removal of topsoil 150mm thick and stockpile for later re-use	515.5	m2	$3.85	$1,984.68
2.1.4	Cut to fill from stockpile	309	m3	$5.00	$1,546.50
2.1.5	Place topsoil from stockpile in verges, trim and compact	515.5	m2	$5.00	$2,577.50
2.1.6	Imported Fill to make up levels	309	m3	$35.00	$10,825.50
2.2	Subgrade Preparation				
2.2.1	Preparation, Trim and Compact	1031.0	m2	$5.25	$5,412.75
2.3	Sub Base and Base Course				$ -
2.3.1	200mm compacted thickness limestone subbase course	1031.0	m2	$14.00	$14,434.00
2.3.2	Base Course, fine crushed rock, 200mm thick	1031.0	m2	$14.00	$14,434.00
2.4	Asphalt Wearing Surface				$ -
2.4.1	40mm High Fatigue Asphalt	1031.0	m2	$23.00	$23,713.00
2.4.2	Primer Seal (Coat)	1031.0	m2	$5.65	$5,825.15
2.5	Kerbing				$ -
2.5.1	Standard Semi Mountable Kerb	113.4	m	$30.00	$3,402.00
2.6	Linemarking and Furniture				$ -
2.6.1	Linemarking and Furniture	146.8	m	$14.72	$2,160.90
2.6.2	Street Signs	2	ea	$1,048.26	$2,096.52
Total Traffic Lane					$96,480.07

3	TOD Connector Boulevard - Median Islands and RAB Annuli				
3.1	Earthworks and Site Preparation	566.0	m2		
3.1.1	Detailed Excavation & Cartaway / Dispurse Surplus Material	566.0	m2	$14.65	$8,291.90

3.1.2	Imported Fill to make up levels	170	m3	$35.00	$5,943.00
3.2	Subgrade Preparation				
3.2.1	Preparation, Trim and Compact	566.0	m2	$5.25	$2,971.50
3.3	Sub Base and Base Course				
3.3.1	200mm compacted thickness limestone subbase course	566.0	m2	$14.00	$7,924.00
3.3.2	Base Course, fine crushed rock, 200mm thick				
3.4	Kerbing				
3.4.1	Semi Mountable Kerbing	110.0	m	$30.00	$3,300.00
3.4.2	Reinforced Mountable Kerb	62.8	m	$60.00	$3,768.00
3.4.3	Barrier Kerbing	37.7	m	$30.00	$1,130.40
3.5	Linemarking and Furniture				
3.5.1	Linemarking and Furniture	0	m	$14.72	$ -
3.5.2	Street Signs	2	ea	$1,048.26	$2,096.52
3.6	Paved Median Area				
3.6.1	Block Paving on Sand Bed	566.0	m2	$75.00	$42,450.00
3.7	Planting and Vegetation				
3.7.1	Mulch to Planter Areas	8	m2	$15.72	$125.76
3.7.2	Trees	2	ea	$317.59	$635.18
Total Median and Splitter Islands					$78,636.26

4	TOD Connector Boulevard - Street Lighting				
4.1	Street Lighting				
4.1.1	Provide new street lighting	6.0	ea	$2,721.60	$16,329.60
Total Street Lighting					$16,329.60

5	TOD Connector Boulevard - Road Drainage				
5.1	General Road Drainage				
5.1.1	450mm SW Pipework - Supply and Install including trenching	91.8	m	$200.00	$18,350.00
5.1.2	Demolish and remove existing pits	0.0	ea	$2,000.00	$ -
5.1.3	Gully (Side Entry) Pits - Supply and Install (1050mm dia) (assume 1 per 30m)	4.0	ea	$2,500.00	$10,000.00
Total Road Drainage					$28,350.00

6	Raven Street and Brae Road - Verge Works				
6.1	Earthworks and Site Preparation	794.0	m2		
6.1.1	Site Clearance (based on light shrubs)	238.2	m2	$1.00	$238.20
6.1.2	Detailed Excavation & Cartaway / Dispurse Surplus Material	0	m2	$14.65	$ -
6.1.3	Removal of topsoil 150mm thick and stockpile for later re-use	238.2	m2	$3.85	$917.07
6.1.4	Cut to fill within verge to make good levels	238.2	m3	$5.00	$1,191.00
6.1.5	Place topsoil from stockpile in verges, trim and compact	794.0	m2	$5.00	$3,970.00
6.1.6	Imported fill material to make up levels (500mm)	119.1	m3	$35.00	$4,168.50
6.2	Subgrade Preparation				
6.2.1	Preparation, Trim and Compact	286	m2	$5.25	$1,500.66
6.3	Concrete Footpaths				
6.3.1	Footpath - General (m2)	286	m2	$55.00	$15,721.20
6.3.2	Extra-over reinforcement at kerb radii in footpaths	0	m2	$30.00	$ -
6.3.3	Pram Ramps	4	ea	$1,000.00	$4,000.00
6.3.4	Sand Fill Below Concrete (100mm)	286	m2	$2.80	$800.35
Total Verge Works					$32,506.98

7	Raven Street and Brae Road - Traffic Lane				
7.1	Earthworks and Site Preparation	419.0	m2		
7.1.1	Site Clearance (rate based on existing road surface)	419.0	m2	$1.00	$419.00
7.1.2	Removal of topsoil 150mm thick and stockpile for later re-use	419.0	m2	$3.85	$1,613.15
7.1.3	Cut to fill from stockpile	126	m3	$5.00	$628.50
7.1.4	Place topsoil from stockpile in verges, trim and compact	419.0	m2	$5.00	$2,095.00
7.1.5	Cut to fill within verge to make good levels	125.7	m3	$5.00	$628.50

7.1.6	Imported fill material to make up levels behind kerbs	125.7	m3	$35.00	$4,399.50
7.1.7	Subgrade Preparation				
7.2	Preparation, Trim and Compact	460.9	m2	$5.25	$2,419.73
7.2.1	Sub Base and Base Course				
7.3	200mm thickness compacted limestone sub base	460.9	m2	$14.00	$6,452.60
7.3.1	Basecourse. Fine crushed rock 200mm thick	460.9	m2	$14.00	$6,452.60
7.3.2	Asphalt Works				$ -
7.4	40mm High Fatigue Asphalt	419.0	m2	$23.00	$9,637.00
7.4.1	Primer Seal (Coat)	419.0	m2	$5.65	$2,367.35
7.4.2	Kerbing				
7.5	Standard Semi-Mountable Kerb (SMK)	198.5	m	$30.00	$5,955.00
7.5.1	Linemarking and Furniture				
7.6	Linemarking and Furniture	198.5	m	$14.72	$2,921.92
7.6.1	Street Signs	2	No	$1,048.26	$2,096.52
7.6.2	Planting and Vegetation				
7.7	Mulch to Planter Areas	8	m2	$15.72	$125.76
7.7.1	Trees	2	No	$317.59	$635.18
Total Traffic Lane					$48,847.31

8	Raven Street and Brae Road - Median and Splitter Islands				
8.1	Earthworks and Site Preparation	91.0	m2		
8.1.1	Detailed Excavation & Cartaway / Dispurse Surplus Material	91	m2	$14.65	$1,333.15
8.1.2	Imported fill material to make up levels	45.5	m3	$35.00	$1,592.50
8.1.3	Subgrade Preparation				
8.1.4	Preparation, Trim and Compact	91	m2	$5.25	$477.75
8.2	Kerbing				
8.2.1	Standard Semi Mountable Kerb (SMK)	37.8	m	$30.00	$1,134.00
8.3	Linemarking and Furniture				
8.3.1	Linemarking and Furniture	37.8	m	$14.72	$556.42
8.3.2	Street Signs	1	ea	$1,048.26	$1,048.26
8.4	Paved Median Area				
8.4.1	Block Paving on Sand Bed	91	m2	$75.00	$6,825.00

8.5	Planting and Vegetation				
8.5.1	Mulch to Planter Areas	8	m2	$15.72	$125.76
8.5.2	Trees	2	No	$317.59	$635.18
Total Median					$13,728.02

9	Raven Street and Brae Road - Street Lighting				
9.1	Street Lighting				
9.1.1	Provide new lighting	6	No	$2,721.60	$16,329.60
Total Street Lighting					$16,329.60

10	Raven Street and Brae Road- Road Drainage				
10.1	General Road Drainage				
10.1.1	450mm SW Pipework - Supply and Install including trenching	198.5	m	$200.00	$39,700.00
10.1.2	Demolish and remove existing manholes	0.0	ea	$2,000.00	$ -
10.1.3	Gully (Side Entry) Pits - Supply and Install (1050mm dia) (assume 1 per 30m)	4	No	$2,500.00	$10,000.00
Total Road Drainage					$49,700.00

TOTAL (excl. preliminaries)	$419,127.94

11	Preliminaries				
11.1	Traffic Management	5%	%		$20,956.40
11.2	Project Overheads and Preliminaries (Indirect Construction Costs)	15%	%		$62,869.19
11.3	Project Owner's Cost (Planning and Design Costs)	10%	%		$41,912.79
11.4	Risk Contingency Allowance	15%	%		$81,729.95
	Total Preliminaries				$207,468.33

TOTAL (incl. preliminaries)	$626,596.27

2024 % of ESCALATION	***2.13%***	***%***	***$639,942.77***

8.1.23 INT07– Brae Rd / Stewart Rd

Item No	Item	Qty	Unit	Rate	Amount
	INT09 Brae Road (NCB, 19.2m) and Stewart Road (NCA, 24.5m) GWY	991	m2		
	Brae Road, Northern Approach	18.2	m		
	Brae Road, Southern Approach	18.3	m		
	Stewart Road, Western Approach	15.5	m		
1.1	Brae Road - Earthworks and Site Preparation in Verge	365	m2		
1.1.1	Site Clearance (rate based on existing road surface. Includes trees)	365.0	m2	$1.00	$365.00
1.1.2	Removal of topsoil 150mm thick and stockpile for later re-use	365.0	m2	$3.85	$1,405.25
1.1.3	Cut to fill within verge to make good levels	109.5	m3	$5.00	$547.50
1.1.4	Place topsoil from stockpile in verges, trim and compact	365.0	m2	$5.00	$1,825.00
1.1.5	Imported Fill to make up levels	183	m3	$35.00	$6,387.50
1.2	Subgrade Preparation				
1.2.1	Preparation, Trim and Compact	113.4	m2	$5.25	$595.35
1.3	Concrete Footpaths				
1.3.1	Footpath - General 100mm thickness	113.4	m2	$55.00	$6,237.00
1.3.2	Extra-over reinforcement at kerb radii in footpaths	0.0	m2	$30.00	$ -
1.3.3	Pram Ramps	4	ea	$1,000.00	$4,000.00
1.3.4	Sand Fill Below Concrete (100mm)	113.4	m2	$2.80	$317.52
1.4	Planting and Vegetation				
1.4.1	Landscaping, Mulch and Shrubs	16.0	m2	$15.72	$251.52
1.4.2	Trees	4	ea	$317.59	$1,270.36
Total Verge					$23,202.00

2	Brae Road - Traffic Lane	270	m2		

Item No	Item	Qty	Unit	Rate	Amount
2.1	Earthworks and Site Preparation				
2.1.1	Site Clearance (rate based on existing road surface. Includes trees)	81.0	m2	$1.00	$81.03
2.1.2	Detailed Excavation & Cartaway / Dispurse Surplus Material	270	m2	$14.65	$3,956.97
2.1.3	Removal of topsoil 150mm thick and stockpile for later re-use	81.0	m2	$3.85	$311.97
2.1.4	Cut to fill from stockpile	81	m3	$5.00	$405.15
2.1.5	Place topsoil from stockpile in verges, trim and compact	81.0	m2	$5.00	$405.15
2.1.6	Imported Fill to make up levels	81	m3	$35.00	$2,836.05
2.2	Subgrade Preparation				
2.2.1	Preparation, Trim and Compact	270.1	m2	$5.25	$1,418.03
2.3	Sub Base and Base Course				$ -
2.3.1	200mm compacted thickness limestone subbase course	270.1	m2	$14.00	$3,781.40
2.3.2	Base Course, fine crushed rock, 200mm thick	270.1	m2	$14.00	$3,781.40
2.4	Asphalt Wearing Surface				$ -
2.4.1	40mm High Fatigue Asphalt	270.1	m2	$23.00	$6,212.30
2.4.2	Primer Seal (Coat)	270.1	m2	$5.65	$1,526.07
2.5	Kerbing				$ -
2.5.1	Standard Semi Mountable Kerb	73.0	m	$30.00	$2,190.00
2.6	Linemarking and Furniture				$ -
2.6.1	Linemarking and Furniture	73	m	$14.72	$1,074.56
2.6.2	Street Signs	2	ea	$1,048.26	$2,096.52
Total Traffic Lane					$30,076.58

3	Brae Road - Median Islands				
3.1	Earthworks and Site Preparation	0.0	m2		
3.1.1	Detailed Excavation & Cartaway / Dispurse Surplus Material	0.0	m2	$14.65	$ -
3.1.2	Imported Fill to make up levels	0	m3	$35.00	$ -

Item No	Item	Qty	Unit	Rate	Amount
3.2	Subgrade Preparation				
3.2.1	Preparation, Trim and Compact	0.0	m2	$5.25	$ -
3.3	Sub Base and Base Course				
3.3.1	200mm compacted thickness limestone subbase course	0.0	m2	$14.00	$ -
3.3.2	Base Course, fine crushed rock, 200mm thick				
3.4	Kerbing				
3.4.1	Semi Mountable Kerbing	0.0	m	$60.00	$ -
3.5	Linemarking and Furniture				
3.5.1	Linemarking and Furniture	0	m	$14.72	$ -
3.5.2	Street Signs	0	ea	$1,048.26	$ -
3.6	Paved Median Area				
3.6.1	Block Paving on Sand Bed	0.0	m2	$75.00	$ -
3.7	Planting and Vegetation				
3.7.1	Mulch to Planter Areas	0	m2	$15.72	$ -
3.7.2	Trees	0	ea	$317.59	$ -
Total Median and Splitter Islands					$ -

4	Brae Road - Street Lighting				
4.1	Street Lighting				
4.1.1	Provide new street lighting	4.0	ea	$2,721.60	$10,886.40
Total Street Lighting					$10,886.40

5	Brae Road - Road Drainage				
5.1	General Road Drainage				
5.1.1	450mm SW Pipework - Supply and Install including trenching	45.6	m	$200.00	$9,125.00
5.1.2	Demolish and remove existing pits	0.0	ea	$2,000.00	$ -
5.1.3	Gully (Side Entry) Pits - Supply and Install (1050mm dia) (assume 1 per 30m)	4.0	ea	$2,500.00	$10,000.00
Total Road Drainage					$19,125.00

6	Stewart Road - Verge Works				

Item No	Item	Qty	Unit	Rate	Amount
6.1	Earthworks and Site Preparation	155.0	m2		
6.1.1	Site Clearance (based on light shrubs)	155.0	m2	$1.00	$155.00
6.1.2	Removal of topsoil 150mm thick and stockpile for later re-use	155.0	m2	$3.85	$596.75
6.1.3	Cut to fill within verge to make good levels	46.5	m3	$5.00	$232.50
6.1.4	Place topsoil from stockpile in verges, trim and compact	155.0	m2	$5.00	$775.00
6.1.5	Imported fill material to make up levels (500mm)	77.5	m3	$35.00	$2,712.50
6.2	Subgrade Preparation				
6.2.1	Preparation, Trim and Compact	36	m2	$5.25	$189.00
6.3	Concrete Footpaths				
6.3.1	Footpath - General (m2)	36	m2	$55.00	$1,980.00
6.3.2	Extra-over reinforcement at kerb radii in footpaths	0	m2	$30.00	$ -
6.3.3	Pram Ramps	2	ea	$1,000.00	$2,000.00
6.3.4	Sand Fill Below Concrete (100mm)	36	m2	$2.80	$100.80
Total Verge Works					$8,741.55

7	Stewart Road - Traffic Lane				
7.1	Earthworks and Site Preparation	232.9	m2		
7.1.1	Site Clearance (rate based on existing road surface)	232.9	m2	$1.00	$232.90
7.1.2	Removal of topsoil 150mm thick and stockpile for later re-use	232.9	m2	$3.85	$896.67
7.1.3	Cut to fill from stockpile	70	m3	$5.00	$349.35
7.1.4	Place topsoil from stockpile in verges, trim and compact	232.9	m2	$5.00	$1,164.50
7.1.5	Cut to fill within verge to make good levels	69.9	m3	$5.00	$349.35

Item No	Item	Qty	Unit	Rate	Amount
7.1.6	Imported fill material to make up levels behind kerbs	69.87	m3	$35.00	$2,445.45
7.2	Subgrade Preparation				
7.2.1	Preparation, Trim and Compact	232.9	m2	$5.25	$1,222.73
7.3	Sub Base and Base Course				
7.3.1	200mm thickness compacted limestone sub base	256.19	m2	$14.00	$3,586.66
7.3.2	Basecourse. Fine crushed rock 200mm thick	256.2	m2	$14.00	$3,586.66
7.4	Asphalt Works				$ -
7.4.1	40mm High Fatigue Asphalt	232.9	m2	$23.00	$5,356.70
7.4.2	Primer Seal (Coat)	232.9	m2	$5.65	$1,315.89
7.5	Kerbing				
7.5.1	Standard Semi-Mountable Kerb (SMK)	46.5	m	$30.00	$1,395.00
7.6	Linemarking and Furniture				
7.6.1	Linemarking and Furniture	93.0	m	$14.72	$1,368.96
7.6.2	Street Signs	2	No	$1,048.26	$2,096.52
7.7	Planting and Vegetation				
7.7.1	Mulch to Planter Areas	8	m2	$15.72	$125.76
7.7.2	Trees	2	No	$317.59	$635.18
Total Traffic Lane					$26,128.27

8	Stewart Road - Median and Splitter Islands				
8.1	Earthworks and Site Preparation	0.0	m2		
8.1.1	Detailed Excavation & Cartaway / Dispurse Surplus Material	0	m2	$14.65	$ -
8.1.2	Imported fill material to make up levels	0	m3	$35.00	$ -
8.2	Subgrade Preparation				
8.2.1	Preparation, Trim and Compact	0	m2	$ 5.25	$ -
8.3	Kerbing				
8.3.1	Standard Semi Mountable Kerb (SMK)	0.0	m	$30.00	$ -
8.4	Linemarking and Furniture				
8.4.1	Linemarking and Furniture	0	m	$14.72	$ -
8.4.2	Street Signs	0	ea	$1,048.26	$ -

Item No	Item	Qty	Unit	Rate	Amount
8.5	Paved Median Area				
8.5.1	Block Paving on Sand Bed	0	m2	$75.00	$ -
8.6	Planting and Vegetation				
8.6.1	Mulch to Planter Areas	0	m2	$15.72	$ -
8.6.2	Trees	0	No	$317.59	$ -
Total Median					$ -

9	Stewart Road - Street Lighting				
9.1	Street Lighting				
9.1.1	Provide new lighting	2	No	$2,721.60	$5,443.20
Total Street Lighting					$5,443.20

10	Stewart Road - Road Drainage				
10.1	General Road Drainage				
10.1.1	450mm SW Pipework - Supply and Install including trenching	31.0	m	$200.00	$6,200.00
10.1.2	Demolish and remove existing manholes	0.0	ea	$2,000.00	$ -
10.1.3	Gully (Side Entry) Pits - Supply and Install (1050mm dia) (assume 1 per 30m)	2	No	$2,500.00	$5,000.00
Total Road Drainage					$11,200.00

TOTAL (excl. preliminaries)	$134,803.00

11	Preliminaries				
11.1	Traffic Management	5%	%		$6,740.15
11.2	Project Overheads and Preliminaries (Indirect Construction Costs)	15%	%		$20,220.45
11.3	Project Owner's Cost (Planning and Design Costs)	10%	%		$13,480.30
11.4	Risk Contingency Allowance	15%	%		$26,286.58
Total Preliminaries					$66,727.48

TOTAL (incl. preliminaries)	$201,530.48

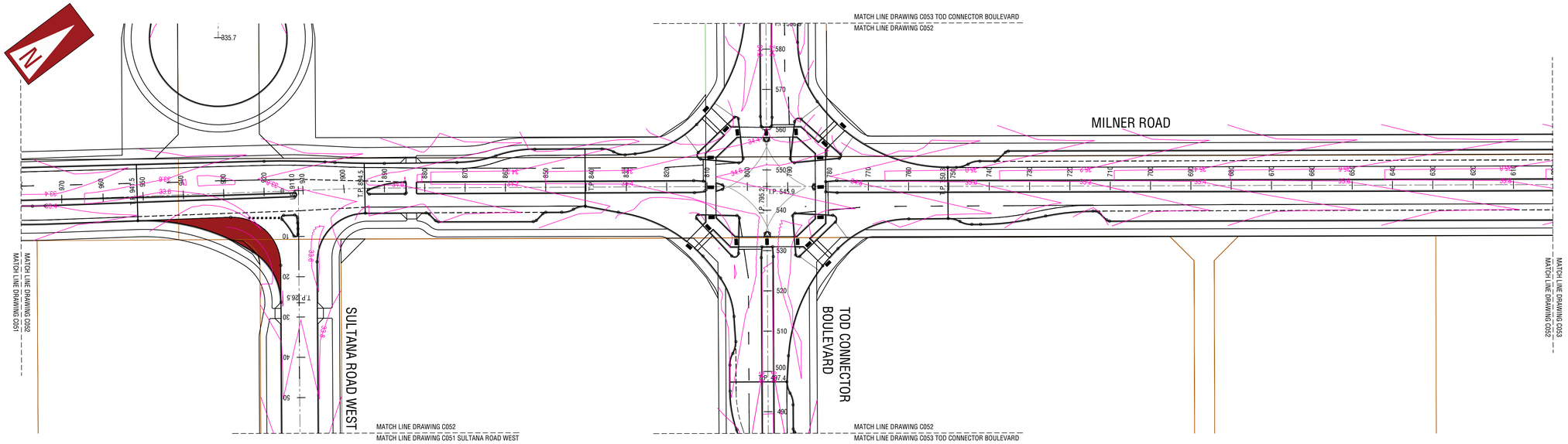
2024 % of ESCALATION	***2.13%***	***%***	***$205,823.08***

8.1.24 INT07– Brae Rd / Stewart Rd – Services

Item No	Item	Qty	Unit	Rate	Amount
	I09 Brae Road (NCB, 19.2m) and Stewart Road (NCA, 24.5m) GWY	52	m		
1	Western Power				
1.1	Provisional Sum for Undergrounding of overhead poles	3.0	ea	$30,000.00	$90,000.00
1.2	LV/HV underground cables	52.0	m	$171.60	$8,923.20
1.3	Western Power HV Works Supervision	0.5	wk	$4,000.00	$2,000.00
1.4	Terminations / reconnections etc	5.0	ea	$1,000.00	$5,000.00
Total Western Power					$105,923.20
2	Telstra				
2.1	Telstra - Relocate Telstra Cables	52.0	m	$100.00	$5,200.00
2.2	Allowance to remove existing and install new pits	5.0	ea	$1,197.60	$5,988.00
Total Telstra					$11,188.00
3	ATCO Gas				
3.1	ATCO Gas pipeline to 150mm-dia (includes excavate, backfill, supply and intsall)	0	m	$78.50	$ -
3.2	ATCO Gas - Supervision	0	wks	$ -	$ -
3.3	ATCO Gas - Connect to existing	0	ea	$5,000.00	$ -
Total ATCO Gas					$ -
4	Water Mains				
4.1	Water main (to 150mm-dia) Supply, lay, excavate and backfill in common trench	52.0	m	$75.00	$3,900.00
4.2	Allowance for Valves, Hydrants	1.0	ea	$975.00	$975.00

4.30	Connect to existing (Water Corp PROV SUM)	3.0	ea	$6,000.00	$18,000.00
Total Water					$22,875.00
5	Optus				
5.1	Relocate Cables	0.0	m	$100.00	$ -
Total Optus					$ -
6	NBN Telecommunications				
6.1	Relocate Telecommunications Cables	52.0	m	$100.00	$5,200.00
Total NBN Telecommunications					$5,200.00
TOTAL (excl. preliminaries)					$145,186.20
7	Preliminaries				
7.1	Traffic Management	5%	%		$7,259.31
7.2	Project Overheads and Preliminaries (Indirect Construction Costs)	15%	%		$21,777.93
7.3	Project Owner's Cost (Planning and Design Costs)	10%	%		$14,518.62
7.4	Risk Contingency Allowance	15%	%		$28,311.31
Total Preliminaries					$71,867.17
TOTAL (incl. preliminaries)					$217,053.37
2024 % of ESCALATION		***2.13%***	***%***		***$221,676.61***

Appendix D - Road Infrastructure Designs



MILNER ROAD
SCALE 1:500

LEGEND

- PROPOSED REINFORCED MOUNTABLE KERB
- PROPOSED SEMI-MOUNTABLE KERB
- PROPOSED CENTRELINE
- EXISTING ROAD AND EXISTING CENTRELINE
- PROPOSED SEWER MAIN LAYOUT
- PROPOSED DRAINAGE MAIN LAYOUT
- EXISTING DRAINAGE PIT
- PROPOSED SUBSOIL DRAINAGE
- EXISTING DRAINAGE MAIN LAYOUT
- EXISTING WATER MAIN LAYOUT
- EXISTING SEWER MAIN LAYOUT
- EXISTING LOW VOLTAGE POWER LINE
- CONTOURS DESIGN
- EXISTING DRAINAGE MAIN LAYOUT
- EXISTING DRAINAGE PIT
- EXISTING OVERHEAD POWER
- EXISTING OVERHEAD POWER POLE
- EXISTING FIBRE OPTIC / COMMUNICATIONS CABLE
- DBNGP GAS MAIN
- EXISTING TELSTRA PIT

WARNING
BEWARE OF UNDERGROUND SERVICES
The location of underground cables are approximate only and their exact position should be checked on site. No guarantee is given that all existing cables and services are shown. Locate all underground cables and services before commencement of work. Refer to Worksafe Regulation 3.21.

DIAL 1100
BEFORE YOU DIG

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1:500

REV No.	DATE	DRAFTING CHECK	DESIGN REVIEW	REV'D P.MGR	APP'D P.DIR	AMENDMENT
C	25/03/22	CK	CK			ISSUED FOR 100% REVIEW
B	23/11/21	CK	CK			COMMENTS FROM CITY OF KALAMUNDA
A	17/10/21	CK	CK			ISSUED FOR 15% REVIEW

REV No.	DATE	DRAFTING CHECK	DESIGN REVIEW	REV'D P.MGR	APP'D P.DIR	AMENDMENT

KC Traffic and Transport Pty Ltd
ABN 35 148 970 727
7/10 Whipple Street, Balcatta WA 6021
Phone: 08 9441 2700
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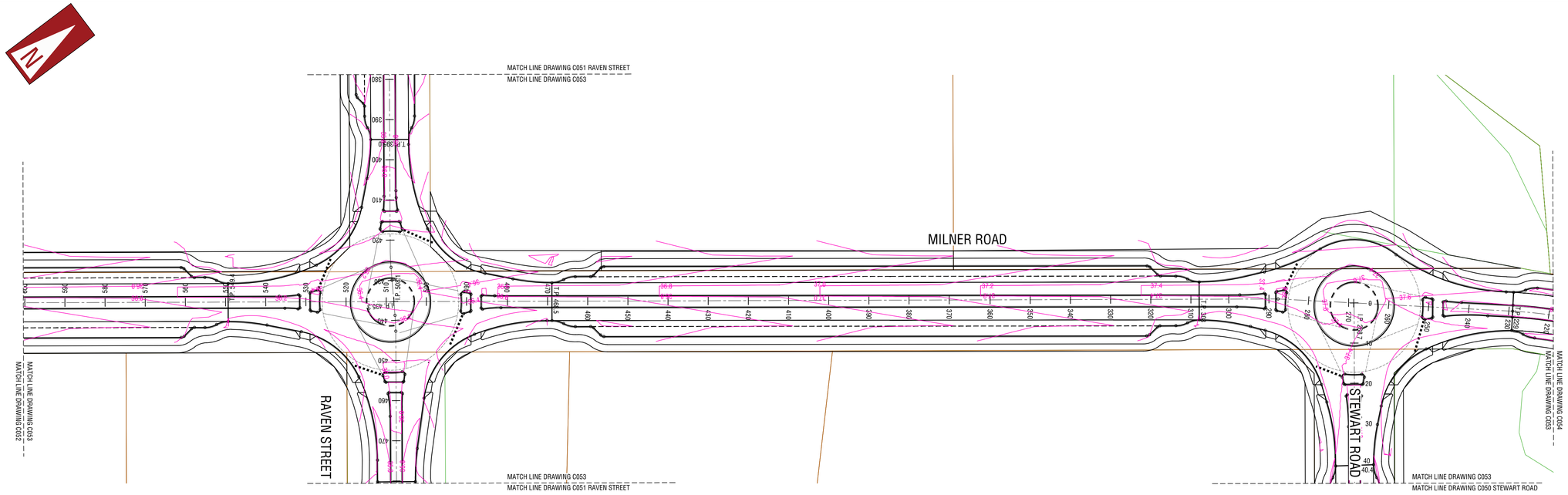
CLIENT: ELEMENTWA & CITY OF KALAMUNDA
PROJECT: FORRESTFIELD NORTH DCP

DRAFTER	DRAFTING CHECK	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
D. CENGAJ	C. KLEYWEG		
DESIGNED	DESIGN REVIEW		
F. BOROVIC	C. KLEYWEG		

TITLE
COMBINED SERVICES PLAN
MILNER ROAD
SHEET 3 OF 5

SHEET	DATUM	WAPC No.	PROJECT No.	DRAWING No.	REVISION
A1	PCG94	SCALE 1:500	KC00604.000	C052	C

C:\Users\GigabyteBox\KCTT Projects\KC00000 Current Projects\KC00604.000 Forrestfield North - Structure Plan Preparation\Outgoing\Drawings\KC00604.000-C-050 Milner Road 19.4.2022 09:42:58 Gigabyte



MILNER ROAD
SCALE 1:500

LEGEND

- PROPOSED REINFORCED MOUNTABLE KERB
- PROPOSED SEMI-MOUNTABLE KERB
- PROPOSED CENTRELINE
- EXISTING ROAD AND EXISTING CENTRELINE
- PROPOSED SEWER MAIN LAYOUT
- PROPOSED DRAINAGE MAIN LAYOUT
- EXISTING DRAINAGE PIT
- PROPOSED SUBSOIL DRAINAGE
- EXISTING DRAINAGE MAIN LAYOUT
- EXISTING WATER MAIN LAYOUT
- EXISTING SEWER MAIN LAYOUT
- EXISTING LOW VOLTAGE POWER LINE
- CONTOURS DESIGN
- EXISTING DRAINAGE MAIN LAYOUT
- EXISTING DRAINAGE PIT
- EXISTING OVERHEAD POWER
- EXISTING OVERHEAD POWER POLE
- EXISTING FIBRE OPTIC / COMMUNICATIONS CABLE
- DBNGP GAS MAIN
- EXISTING TELSTRA PIT

WARNING
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REV No.	DATE	DRAFTING CHECK	DESIGN REVIEW	REV'D P.MGR	APP'D P.DIR	AMENDMENT
C	25/03/22	CK	CK			ISSUED FOR 100% REVIEW
B	23/11/21	CK	CK			COMMENTS FROM CITY OF KALAMUNDA
A	17/10/21	CK	CK			ISSUED FOR 15% REVIEW

KC Traffic and Transport Pty Ltd
ABN 35 148 970 727
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CLIENT	ELEMENTWA & CITY OF KALAMUNDA		
PROJECT	FORRESTFIELD NORTH DCP		
DRAFTER D. CENGAJ	DRAFTING CHECK C. KLEYWEG	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
DESIGNED F. BOROVIC	DESIGN REVIEW C. KLEYWEG		

TITLE
COMBINED SERVICES PLAN
MILNER ROAD
SHEET 4 OF 5

SHEET	DATUM	WAPC No.	PROJECT No.	DRAWING No.	REVISION
A1	PCG94	SCALE 1:500	KC00604.000	C053	C

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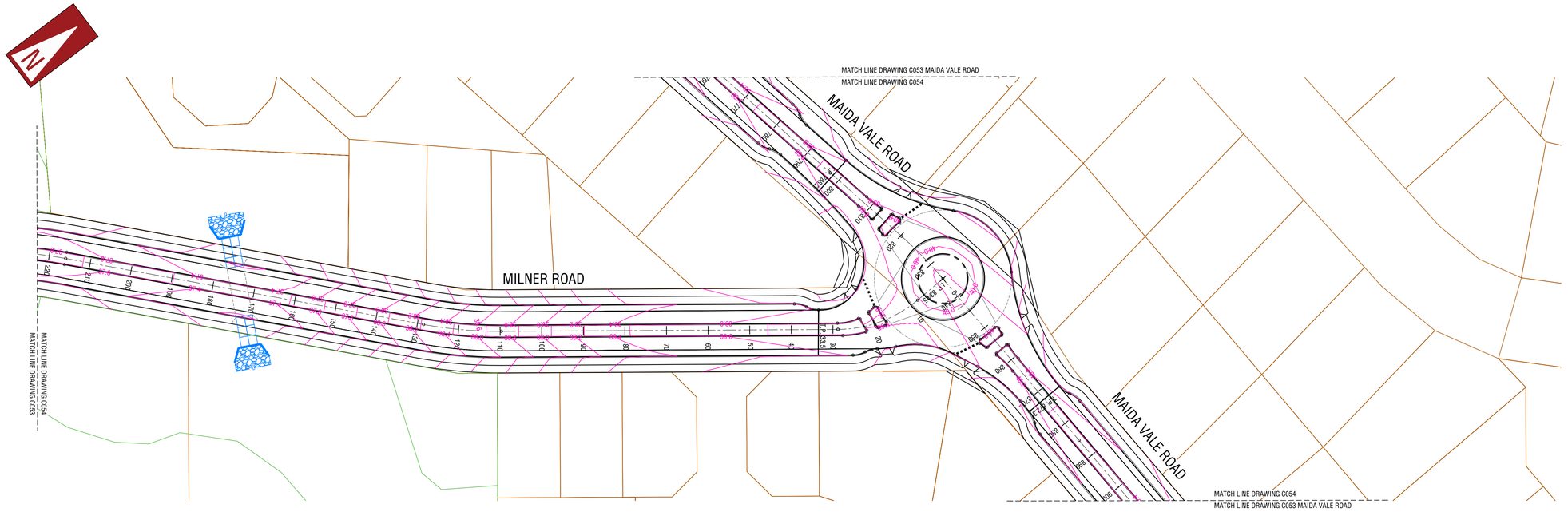

MILNER ROAD
SCALE 1:500

LEGEND

- PROPOSED REINFORCED MOUNTABLE KERB
- PROPOSED SEMI-MOUNTABLE KERB
- PROPOSED CENTRELINE
- EXISTING ROAD AND EXISTING CENTRELINE
- PROPOSED SEWER MAIN LAYOUT
- PROPOSED DRAINAGE MAIN LAYOUT
- EXISTING DRAINAGE PIT
- PROPOSED SUBSOIL DRAINAGE
- EXISTING DRAINAGE MAIN LAYOUT
- EXISTING WATER MAIN LAYOUT
- EXISTING SEWER MAIN LAYOUT
- EXISTING LOW VOLTAGE POWER LINE
- CONTOURS DESIGN
- EXISTING DRAINAGE MAIN LAYOUT
- EXISTING DRAINAGE PIT
- EXISTING OVERHEAD POWER
- EXISTING OVERHEAD POWER POLE
- EXISTING FIBRE OPTIC / COMMUNICATIONS CABLE
- DBNGP GAS MAIN
- EXISTING TELSTRA PIT

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CLIENT	ELEMENTWA & CITY OF KALAMUNDA
PROJECT	FORRESTFIELD NORTH DCP
DRAFTER	D. CENGAJ
DRAFTING CHECK	C. KLEYWEG
REVIEWED PROJECT MANAGER	
APPROVED PROJECT DIRECTOR	
DESIGNED	F. BOROVIC
DESIGN REVIEW	C. KLEYWEG

TITLE
COMBINED SERVICES PLAN
MILNER ROAD
SHEET 5 OF 5

SHEET	DATUM	WAPC No.	PROJECT No.	DRAWING No.	REVISION
A1	PCG94	SCALE 1:500	KC00604.000	C054	C

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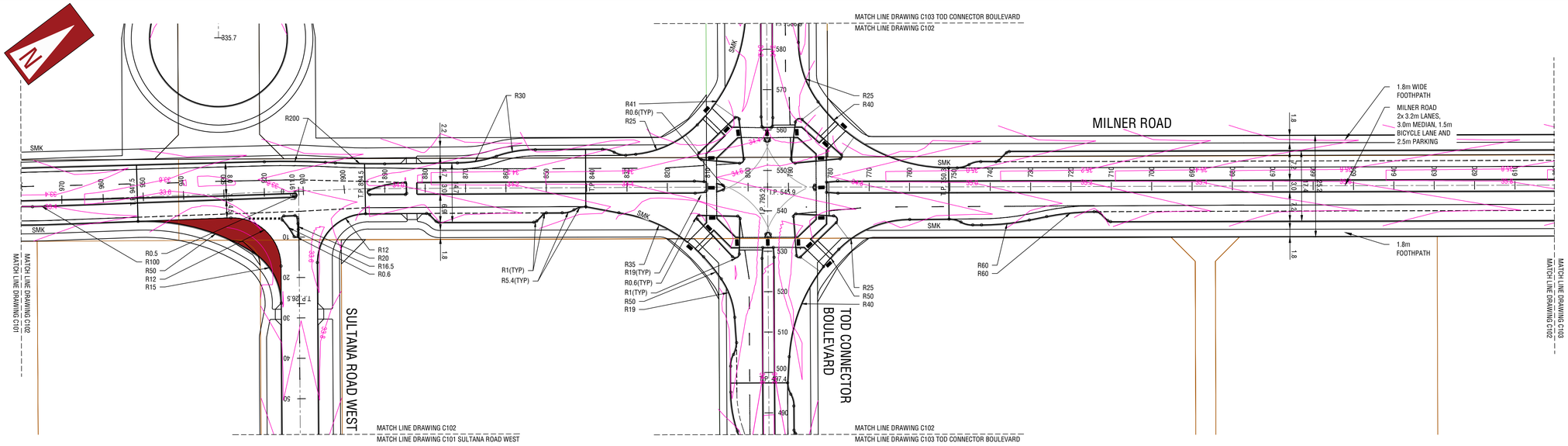
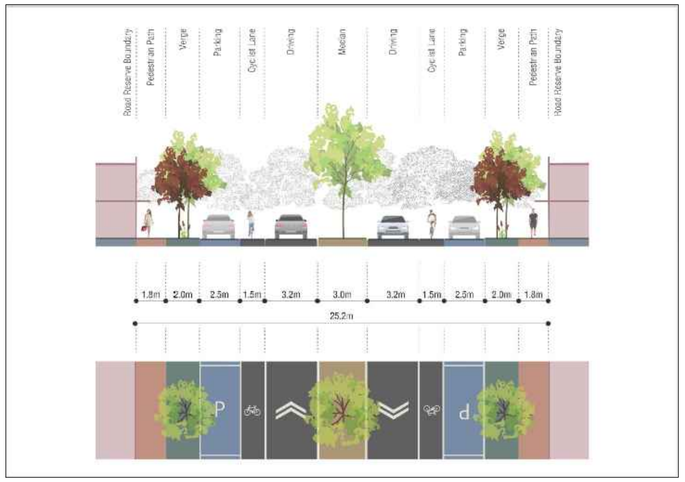


MILNER ROAD
SCALE 1:500



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PROJECT: FORRESTFIELD NORTH DCP

DRAFTER	DRAFTING CHECK	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
D. CENGAJ	C. KLEYWEG		
DESIGNED	DESIGN REVIEW		
F. BOROVIC	C. KLEYWEG		

TITLE
ROAD LAYOUT PLAN
MILNER ROAD
SHEET 3 OF 5

SHEET	DATUM	WAPC No.	PROJECT No.	DRAWING No.	REVISION
A1	PCG94	SCALE 1:500	KC00604.000	C102	C

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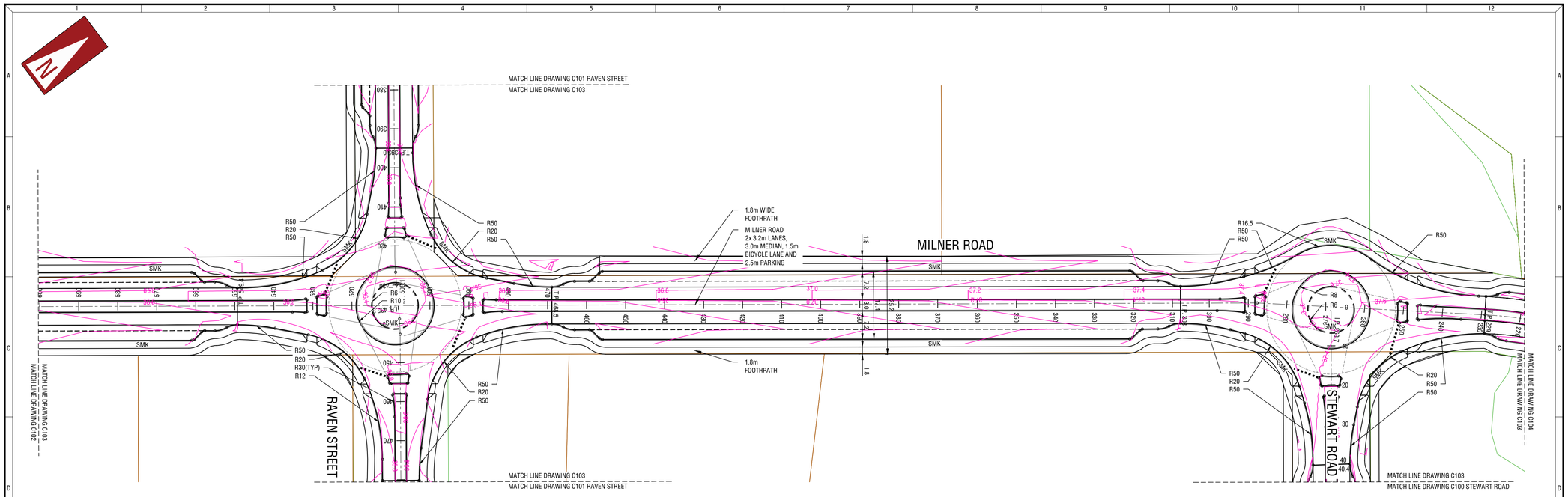
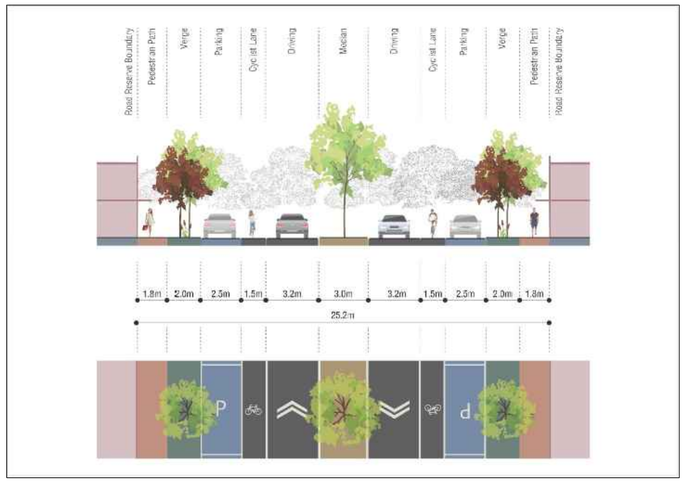


MILNER ROAD
SCALE 1:500



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PROJECT: FORRESTFIELD NORTH DCP

DRAFTER	DRAFTING CHECK	REVIEWED	APPROVED
D. CENGAJ	C. KLEYWEG	PROJECT MANAGER	PROJECT DIRECTOR
DESIGNED	DESIGN REVIEW		
F. BOROVIC	C. KLEYWEG		

TITLE
ROAD LAYOUT PLAN
MILNER ROAD
SHEET 4 OF 5

SHEET	DATUM	WAPC No.	PROJECT No.	DRAWING No.	REVISION
A1	PCG94	SCALE 1:500	KC00604.000	C103	C

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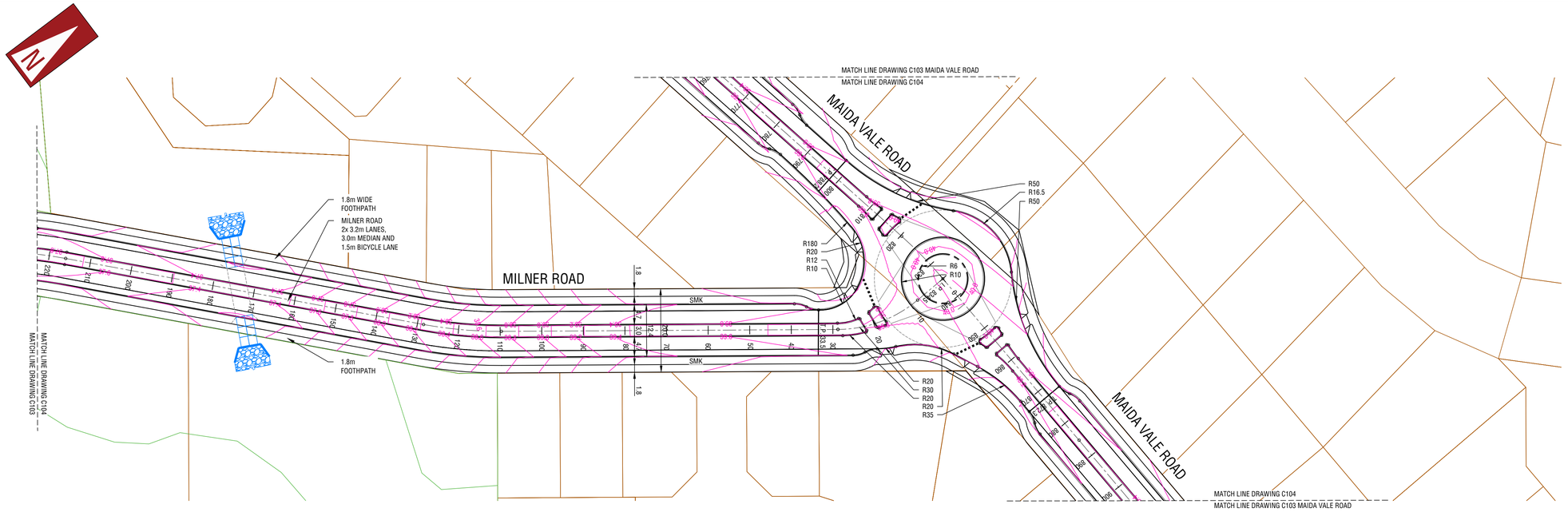
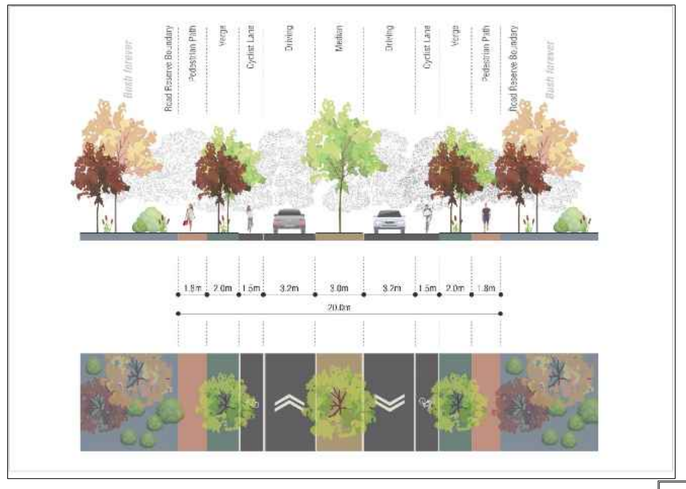


MILNER ROAD
SCALE 1:500



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CLIENT	ELEMENTWA & CITY OF KALAMUNDA
PROJECT	FORRESTFIELD NORTH DCP

DRAFTER	DRAFTING CHECK	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
D. CENGAJ	C. KLEYWEG		
DESIGNED	DESIGN REVIEW		
F. BOROVIC	C. KLEYWEG		

TITLE
ROAD LAYOUT PLAN
MILNER ROAD
SHEET 5 OF 5

SHEET	DATUM	WAPC No.	PROJECT No.	DRAWING No.	REVISION
A1	PCG94	SCALE 1:500	KC00604.000	C104	C

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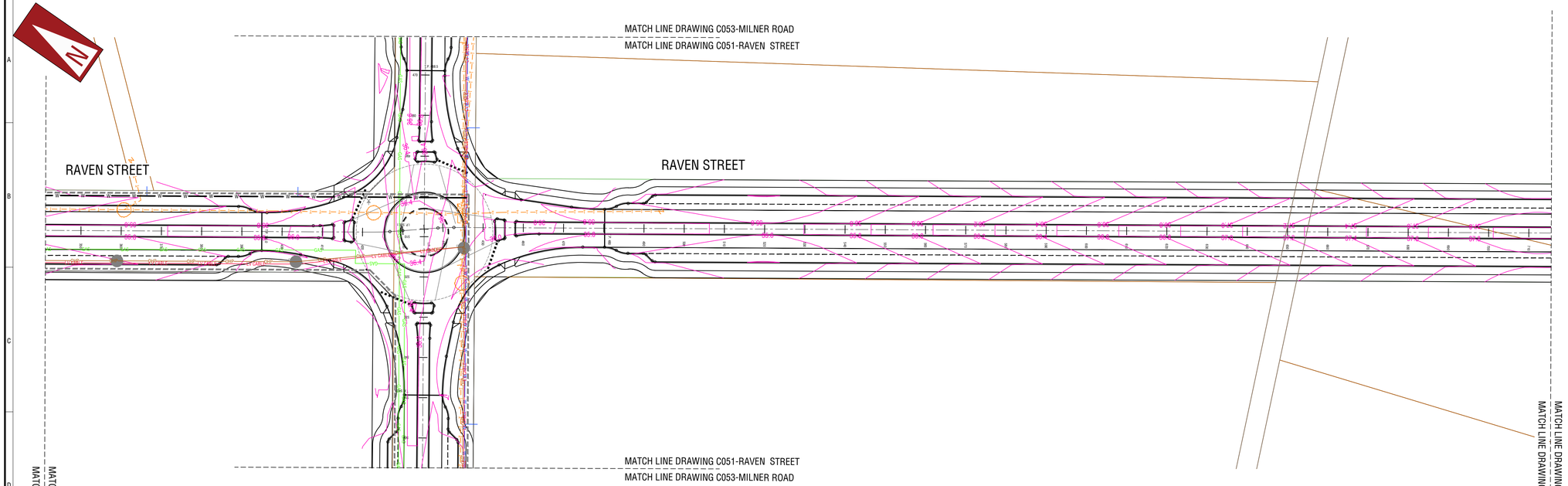

PLAN
SCALE 1:500

LEGEND

- PROPOSED REINFORCED MOUNTABLE KERB
- PROPOSED SEMI-MOUNTABLE KERB
- PROPOSED CENTRELINE
- EXISTING ROAD AND EXISTING CENTRELINE
- PROPOSED SEWER MAIN LAYOUT
- PROPOSED DRAINAGE MAIN LAYOUT
- EXISTING DRAINAGE PIT
- PROPOSED SUBSOIL DRAINAGE
- EXISTING DRAINAGE MAIN LAYOUT
- EXISTING WATER MAIN LAYOUT
- EXISTING SEWER MAIN LAYOUT
- EXISTING LOW VOLTAGE POWER LINE
- CONTOURS DESIGN
- EXISTING DRAINAGE MAIN LAYOUT
- EXISTING DRAINAGE PIT
- EXISTING OVERHEAD POWER
- EXISTING OVERHEAD POWER POLE
- EXISTING FIBRE OPTIC / COMMUNICATIONS CABLE
- DBNGP GAS MAIN
- EXISTING TELSTRA PIT

1:500

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CLIENT: ELEMENTWA & CITY OF KALAMUNDA
PROJECT: FORRESTFIELD NORTH DCP

DRAFTER	DRAFTING CHECK	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
D. CENGAJ	C. KLEYWEG		
DESIGNED	DESIGN REVIEW		
F. BOROVIC	C. KLEYWEG		

TITLE
COMBINED SERVICES PLAN
RAVEN STREET
SHEET 1 OF 3

SHEET	DATUM	WAPC No.	PROJECT No.	DRAWING No.	REVISION
A1	PCG94	SCALE 1:500	KC00604.000	C051	C

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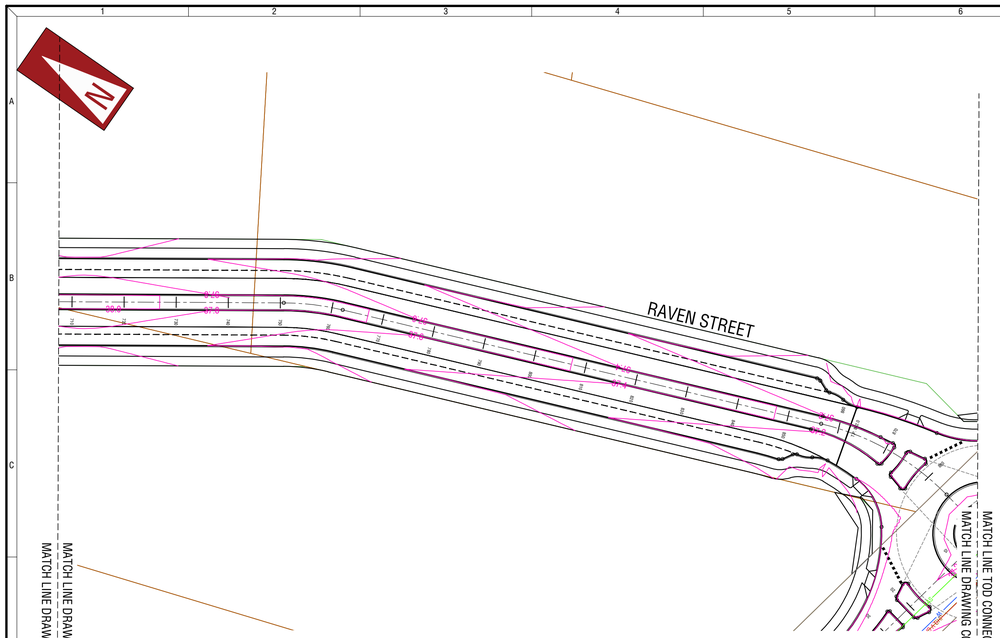

PLAN
SCALE 1:500

LEGEND

- PROPOSED REINFORCED MOUNTABLE KERB
- PROPOSED SEMI-MOUNTABLE KERB
- PROPOSED CENTRELINE
- EXISTING ROAD AND EXISTING CENTRELINE
- PROPOSED SEWER MAIN LAYOUT
- PROPOSED DRAINAGE MAIN LAYOUT
- EXISTING DRAINAGE PIT
- PROPOSED SUBSOIL DRAINAGE
- EXISTING DRAINAGE MAIN LAYOUT
- EXISTING WATER MAIN LAYOUT
- EXISTING SEWER MAIN LAYOUT
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PROJECT: FORRESTFIELD NORTH DCP

DRAFTER	DRAFTING CHECK	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
D. CENGAJ	C. KLEYWEG		
DESIGNED	DESIGN REVIEW		
F. BOROVIC	C. KLEYWEG		

TITLE: COMBINED SERVICES PLAN
RAVEN STREET
SHEET 3 OF 3

SHEET	DATUM	WAPC No.	PROJECT No.	DRAWING No.	REVISION
A1	PCG94	SCALE 1:500	KC00604.000	C052	C

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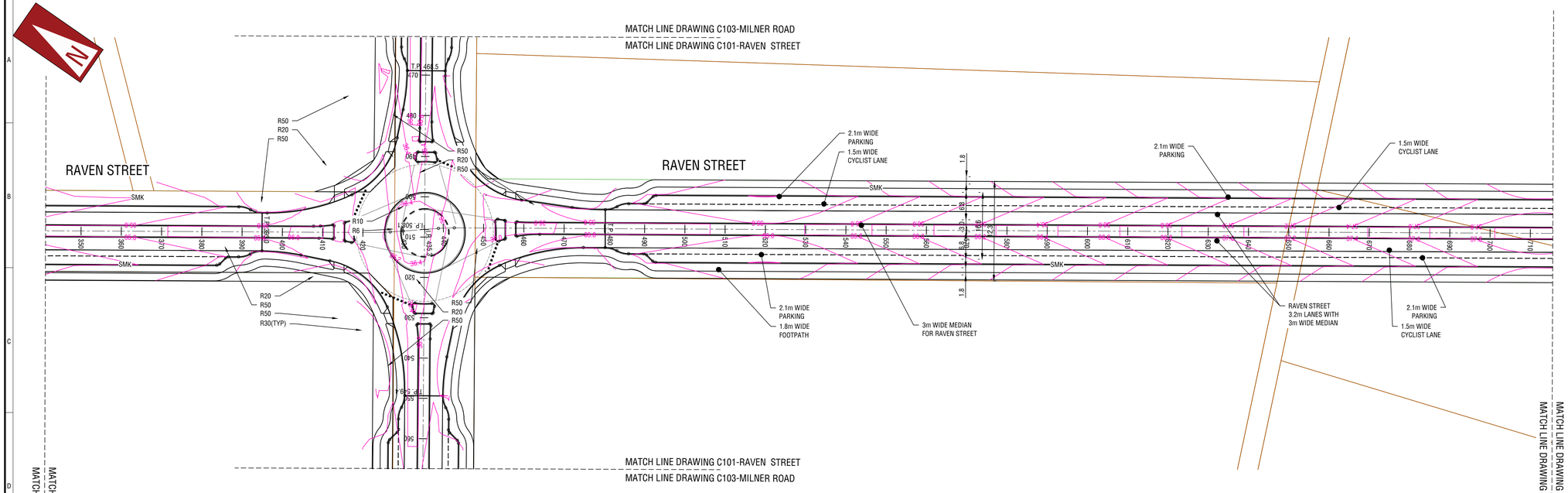
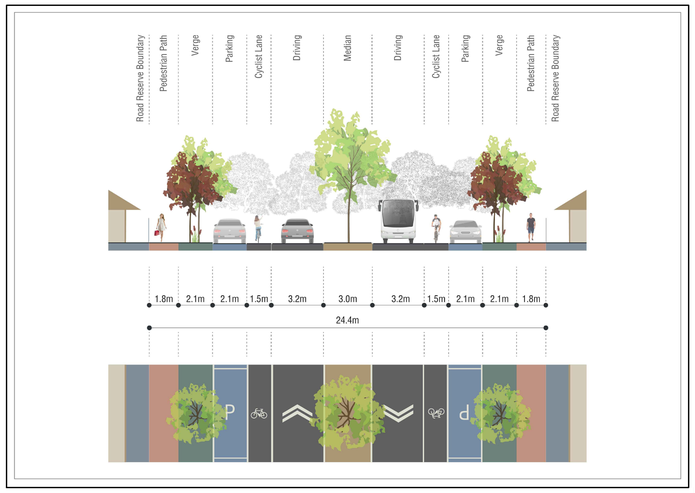


PLAN

SCALE 1:500



LEGEND

- CENTRELINE
- (MK) PROPOSED MOUNTABLE KERB
- (SMK) PROPOSED SEMI-MOUNTABLE KERB
- EXISTING ROAD
- GIVE WAY LINE
- PARKING ALIGNMENT (2.1m WIDTH U.N.O.)
- LANE LINE / SEPARATION LINE / EDGE LINE
- BROKEN LANE LINE (3m LINE WITH 6m SPACINGS)
- FOOTPATH (VARYING WIDTHS - REFER PLAN)
- TANGENT POINT
- PRAM RAMP (2.5m WIDE U.N.O.)
- ROAD WIDENING AND PAINT MARKING TO SUIT LARGER VEHICLE TURNING RADIUS
- ROUNDABOUT DESIGN GEOMETRY

1:500

WARNING

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CLIENT: ELEMENTWA & CITY OF KALAMUNDA

PROJECT: FORRESTFIELD NORTH DCP

DRAFTER	DRAFTING CHECK	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
D. CENGAJ	C. KLEYWEG		
DESIGNED	DESIGN REVIEW		
F. BOROVIC	C. KLEYWEG		

TITLE: ROAD LAYOUT PLAN
RAVEN STREET
SHEET 1 OF 3

SHEET	DATUM	WAPC No.	PROJECT No.	DRAWING No.	REVISION
A1	PCG94	SCALE 1:500	KC00604.000	C101	C

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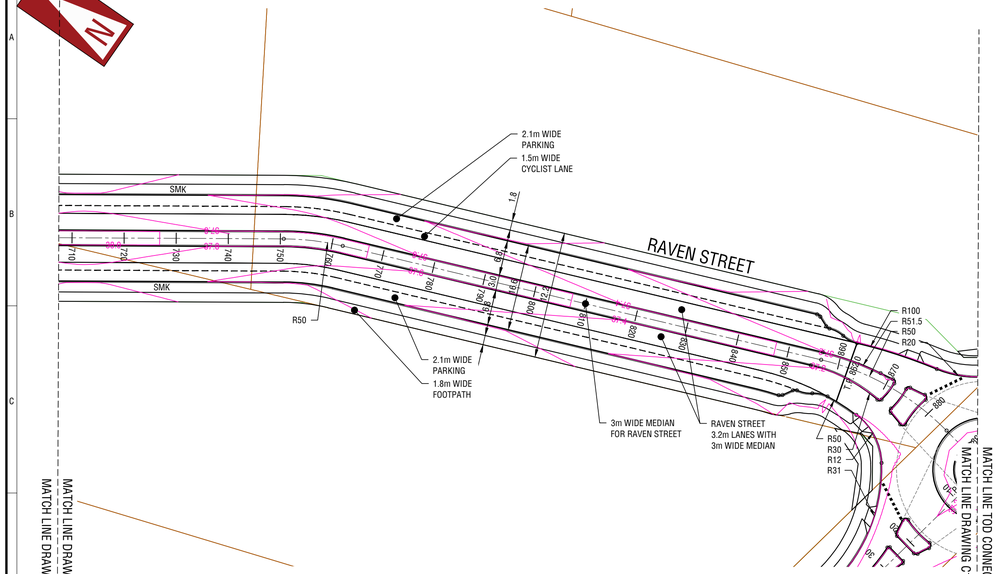
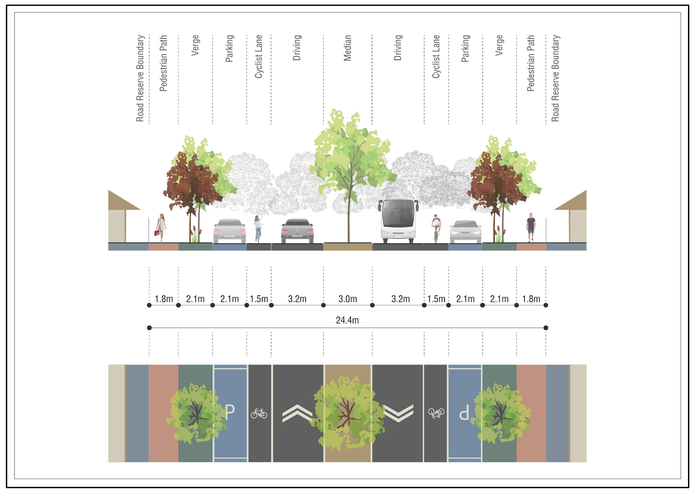


PLAN
SCALE 1:500



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C	25/03/22	CK	CK			ISSUED FOR 100% REVIEW
B	23/11/21	CK	CK			COMMENTS FROM CITY OF KALAMUNDA
A	17/10/21	CK	CK			ISSUED FOR 15% REVIEW

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7/10 Whipple Street, Balcatta WA 6021
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CLIENT: ELEMENTWA & CITY OF KALAMUNDA
PROJECT: FORRESTFIELD NORTH DCP

DRAFTER	DRAFTING CHECK	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
D. CENGAJ	C. KLEYWEG		
DESIGNED	DESIGN REVIEW		
F. BOROVIC	C. KLEYWEG		

TITLE
ROAD LAYOUT PLAN
RAVEN STREET
SHEET 3 OF 3

SHEET	DATUM	WAPC No.	PROJECT No.	DRAWING No.	REVISION
A1	PCG94	SCALE 1:500	KC00604.000	C102	C

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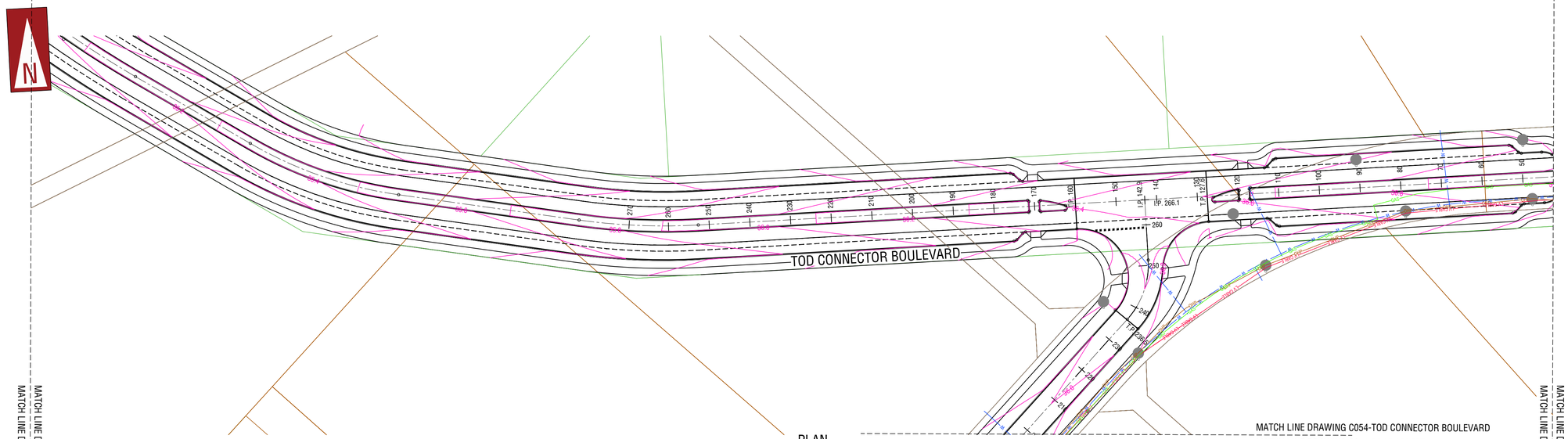

PLAN
SCALE 1:500

LEGEND

- PROPOSED REINFORCED MOUNTABLE KERB
- PROPOSED SEMI-MOUNTABLE KERB
- PROPOSED CENTRELINE
- EXISTING ROAD AND EXISTING CENTRELINE
- PROPOSED SEWER MAIN LAYOUT
- PROPOSED DRAINAGE MAIN LAYOUT
- EXISTING DRAINAGE PIT
- PROPOSED SUBSOIL DRAINAGE
- EXISTING DRAINAGE MAIN LAYOUT
- EXISTING WATER MAIN LAYOUT
- EXISTING SEWER MAIN LAYOUT
- EXISTING LOW VOLTAGE POWER LINE
- CONTOURS DESIGN
- EXISTING DRAINAGE MAIN LAYOUT
- EXISTING DRAINAGE PIT
- EXISTING OVERHEAD POWER
- EXISTING OVERHEAD POWER POLE
- EXISTING FIBRE OPTIC / COMMUNICATIONS CABLE
- DBNGP GAS MAIN
- EXISTING TELSTRA PIT

1:500

WARNING
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PROJECT: FORRESTFIELD NORTH DCP

DRAFTER	DRAFTING CHECK	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
D. CENGAJ	C. KLEYWEG		
DESIGNED	DESIGN REVIEW		
F. BOROVIC	C. KLEYWEG		

TITLE
COMBINED SERVICES PLAN
TOD CONNECTOR BOULEVARD
SHEET 4 OF 6

SHEET	DATUM	WAPC No.	PROJECT No.	DRAWING No.	REVISION
A1	PCG94	SCALE 1:500	KC00604.000	C053	C

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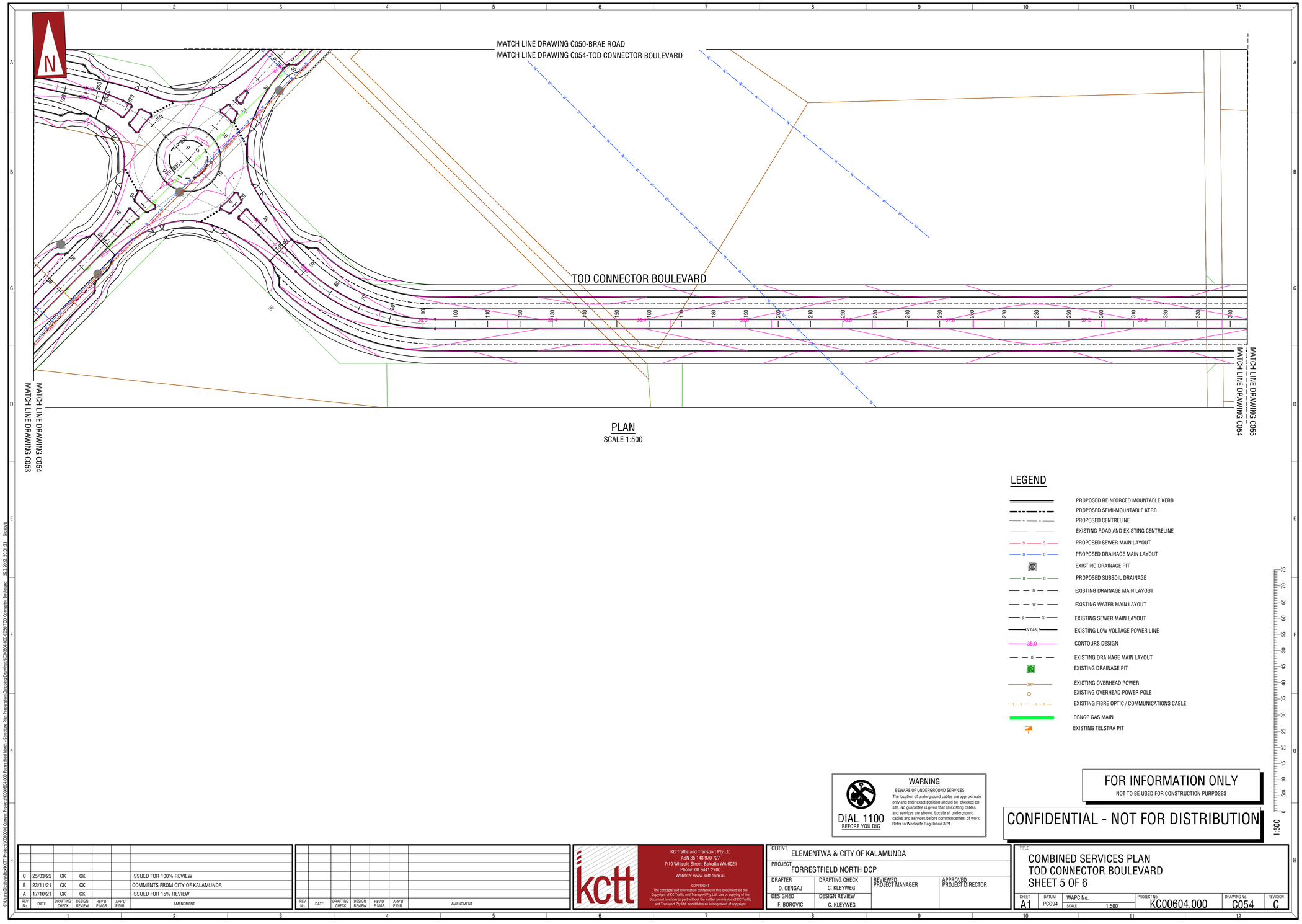

PLAN
SCALE 1:500

LEGEND

- PROPOSED REINFORCED MOUNTABLE KERB
- PROPOSED SEMI-MOUNTABLE KERB
- PROPOSED CENTRELINE
- EXISTING ROAD AND EXISTING CENTRELINE
- PROPOSED SEWER MAIN LAYOUT
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- EXISTING OVERHEAD POWER POLE
- EXISTING FIBRE OPTIC / COMMUNICATIONS CABLE
- DBNGP GAS MAIN
- EXISTING TELSTRA PIT

0 5m 10 15 20 25 30 35 40 45 50 55 60 65 70 75
1:500

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CLIENT	ELEMENTWA & CITY OF KALAMUNDA		
PROJECT	FORRESTFIELD NORTH DCP		
DRAFTER D. CENGAJ	DRAFTING CHECK C. KLEYWEG	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
DESIGNED F. BOROVIC	DESIGN REVIEW C. KLEYWEG		

TITLE
COMBINED SERVICES PLAN
TOD CONNECTOR BOULEVARD
SHEET 5 OF 6

SHEET	DATUM	WAPC No.	PROJECT No.	DRAWING No.	REVISION
A1	PCG94	SCALE 1:500	KC00604.000	C054	C

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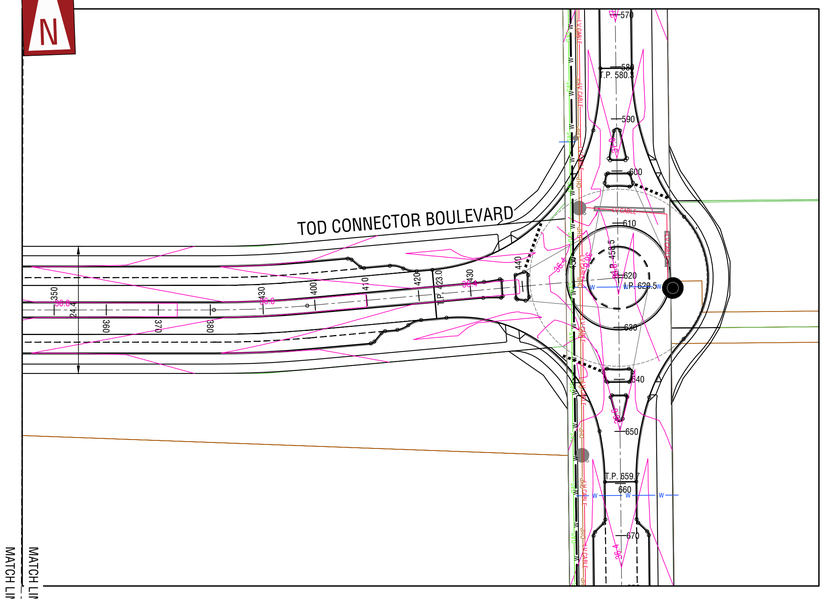

PLAN
SCALE 1:500

MATCH LINE DRAWING C050
MATCH LINE DRAWING C054

LEGEND

- PROPOSED REINFORCED MOUNTABLE KERB
- PROPOSED SEMI-MOUNTABLE KERB
- PROPOSED CENTRELINE
- EXISTING ROAD AND EXISTING CENTRELINE
- PROPOSED SEWER MAIN LAYOUT
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- EXISTING DRAINAGE PIT
- PROPOSED SUBSOIL DRAINAGE
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- EXISTING WATER MAIN LAYOUT
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- EXISTING DRAINAGE PIT
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- EXISTING OVERHEAD POWER POLE
- EXISTING FIBRE OPTIC / COMMUNICATIONS CABLE
- DBNGP GAS MAIN
- EXISTING TELSTRA PIT

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PROJECT: FORRESTFIELD NORTH DCP

DRAFTER	DRAFTING CHECK	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
D. CENGAJ	C. KLEYWEG		
DESIGNED	DESIGN REVIEW		
F. BOROVIC	C. KLEYWEG		

TITLE
COMBINED SERVICES PLAN
TOD CONNECTOR BOULEVARD
SHEET 6 OF 6

SHEET	DATUM	WAPC No.	PROJECT No.	DRAWING No.	REVISION
A1	PCG94	SCALE 1:500	KC00604.000	C055	C

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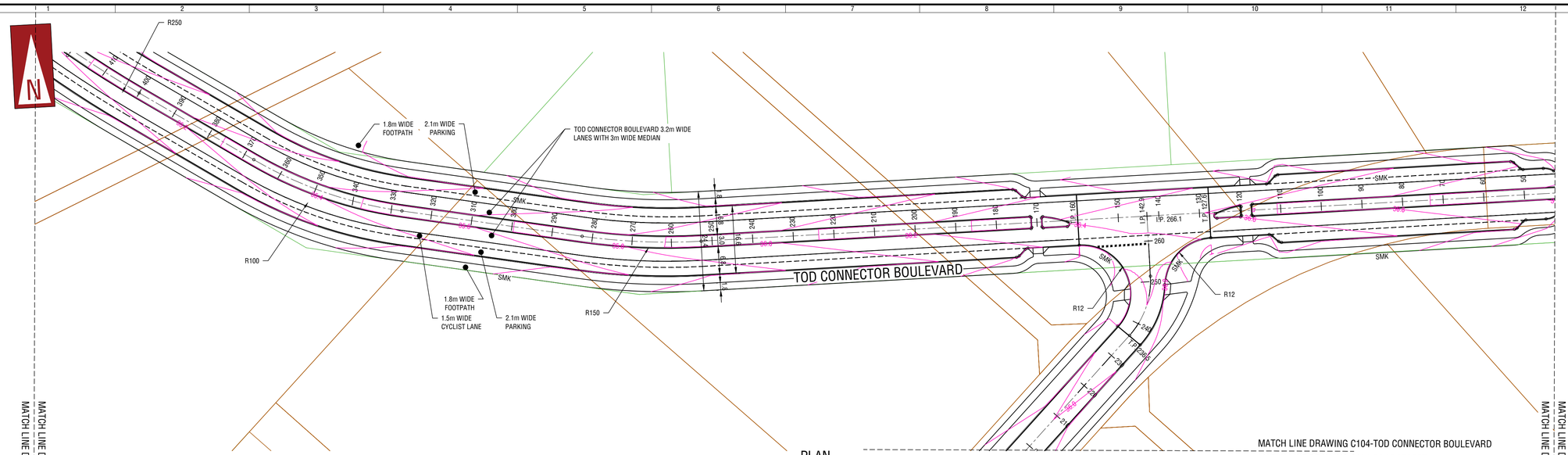

PLAN
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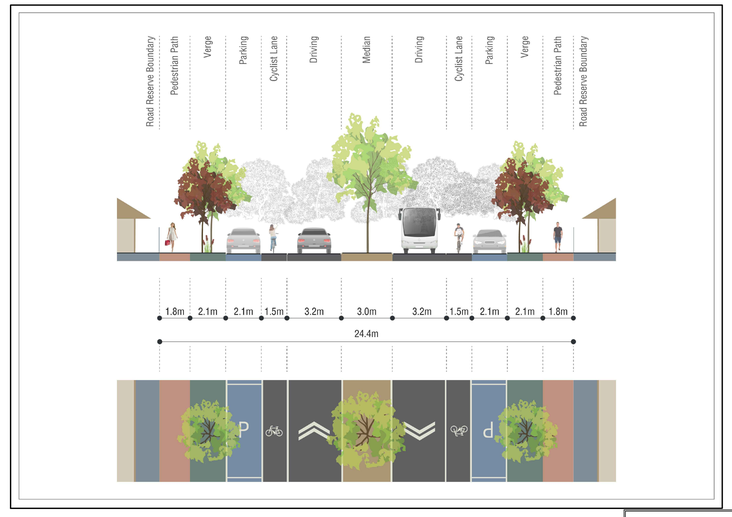

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D. CENGAJ	C. KLEYWEG		
DESIGNED	DESIGN REVIEW		
F. BOROVIC	C. KLEYWEG		

TITLE
ROAD LAYOUT PLAN
TOD CONNECTOR BOULEVARD
SHEET 4 OF 6

SHEET	DATUM	WAPC No.	PROJECT No.	DRAWING No.	REVISION
A1	PCG94	SCALE 1:500	KC00604.000	C103	C

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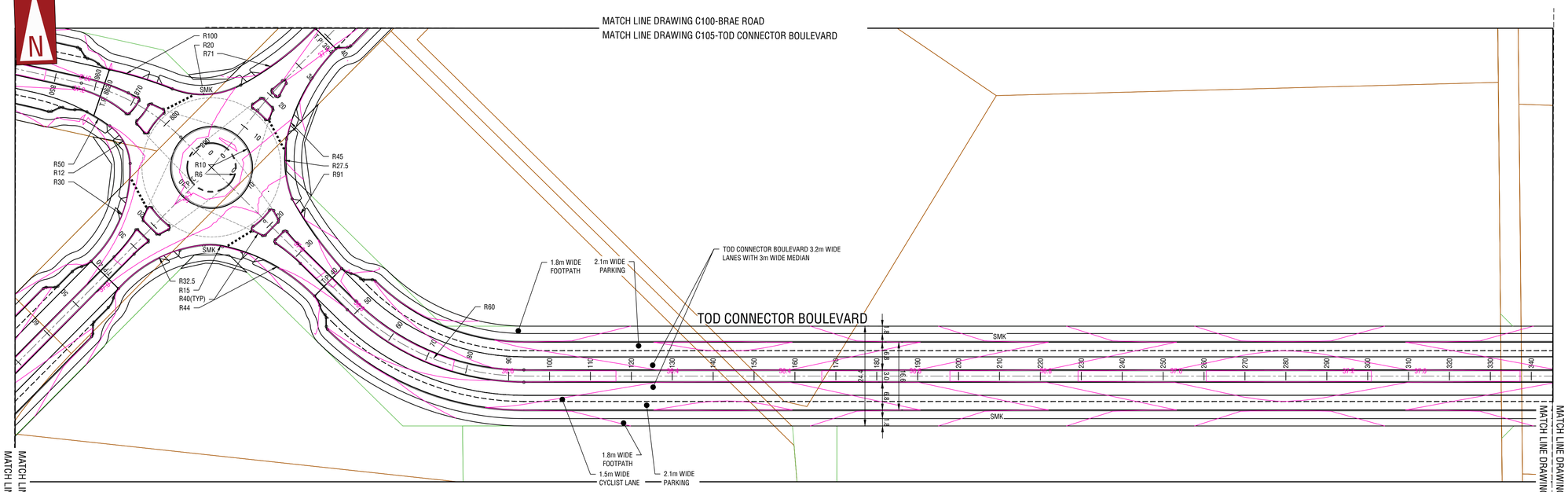

PLAN
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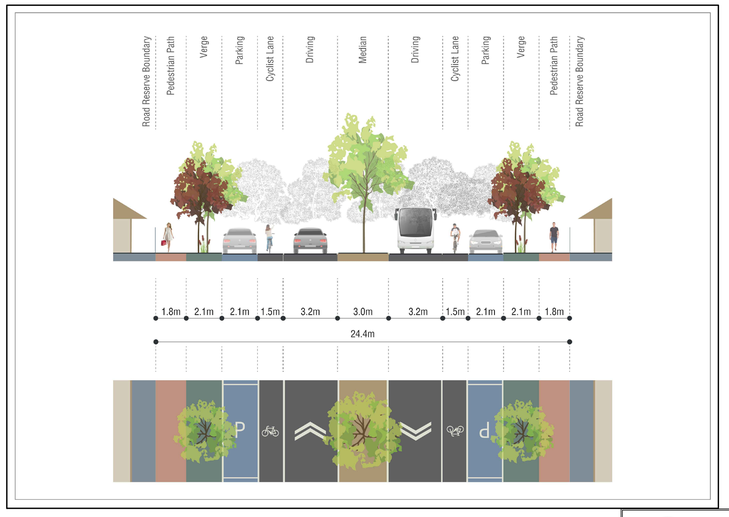

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D. CENGAJ	C. KLEYWEG		
DESIGNED	DESIGN REVIEW		
F. BOROVIC	C. KLEYWEG		

TITLE
ROAD LAYOUT PLAN
TOD CONNECTOR BOULEVARD
SHEET 5 OF 6

SHEET	DATUM	WAPC No.	PROJECT No.	DRAWING No.	REVISION
A1	PCG94	SCALE 1:500	KC00604.000	C104	C

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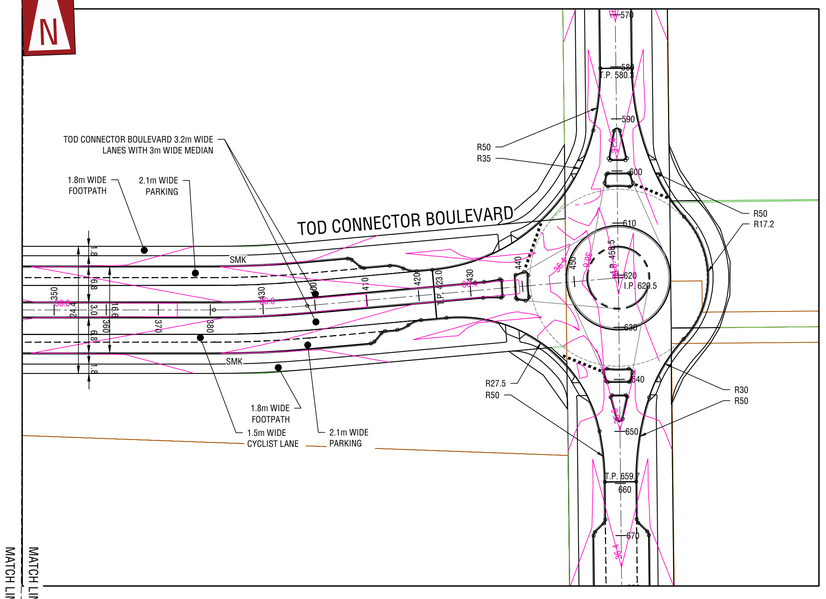

PLAN
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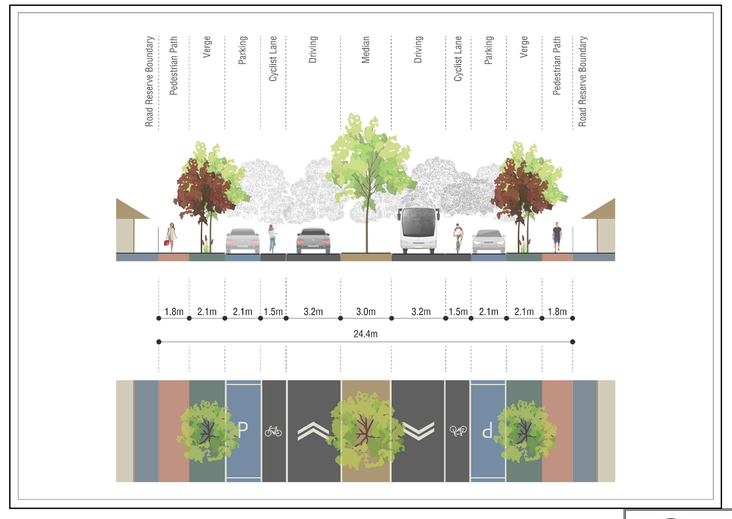

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DESIGNED	DESIGN REVIEW		
F. BOROVIC	C. KLEYWEG		

TITLE
ROAD LAYOUT PLAN
TOD CONNECTOR BOULEVARD
SHEET 6 OF 6

SHEET	DATUM	WAPC No.	PROJECT No.	DRAWING No.	REVISION
A1	PCG94	SCALE 1:500	KC00604.000	C105	C

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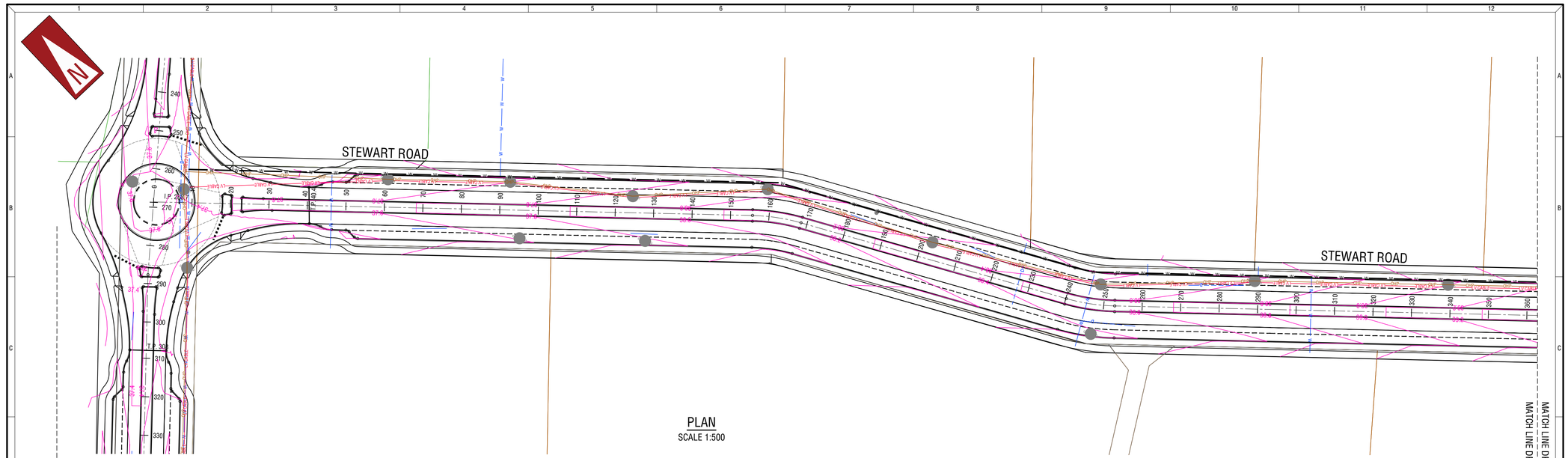

PLAN
SCALE 1:500

MATCH LINE DRAWING C050-STEWART ROAD
MATCH LINE DRAWING C053-MILNER ROAD

NOTES

1. GENERAL
   - 1.1. LEVELS ARE REDUCED FROM A.H.D.
   - 1.2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL KC00604.000 DRAWINGS AND THE SPECIFICATION.
   - 1.3. THE CONTRACTOR SHALL LIMIT THE MOVEMENT OF EQUIPMENT AND MANPOWER TO THE MINIMUM AREA NECESSARY AND PROTECT ALL VEGETATION ON SITE.
   - 1.4. THE CONTRACTOR SHALL ENSURE THAT ALL LEVELS ARE SET-OUT BY LICENSED SURVEYOR.
   - 1.5. THE CONTRACTOR SHALL MAINTAIN ACCESS TO EXISTING RESIDENCES AT ALL TIMES THROUGHOUT THE ENTIRE CONSTRUCTION PROCESS.
   - 1.6. THE CONTRACTOR SHALL REPORT ANY DISCREPANCIES IN THE DESIGN DRAWINGS OR CLASHES WITH OTHER SERVICES AS SOON AS PRACTICALLY POSSIBLE TO THE SUPERINTENDENT.

2. ROADWORKS
   - 2.1. ALL CORNER SWEEPS SHALL BE 12.0m RADIUS KEYED UNLESS OTHERWISE SHOWN
   - 2.2. ALL KERBS WITH A RADIUS LESS THAN R40 NEED TO BE KEYED.
   - 2.3. ALL KERBS SHALL BE MOUNTABLE UNLESS OTHERWISE SHOWN.
   - 2.4. ALL SWEEPS SHALL BE SEMI-MOUNTABLE UNLESS OTHERWISE SHOWN.
   - 2.5. ALL PARKING BAY KERBING SHALL BE BARRIER UNLESS OTHERWISE SHOWN.
   - 2.6. PAVEMENT WIDTH SHALL BE AS SHOWN ON THE DRAWINGS AND SHALL BE MEASURED BETWEEN KERBS.
   - 2.7. ALL ROAD VERGES & DISTURBED AREAS SHALL BE STABILISED BY APPLICATION OF SEEDED HYDRO MULCH.
   - 2.8. THE CONTRACTOR SHALL SAW-CUT EXISTING PAVEMENT IN A STRAIGHT LINE REMOVE EXISTING KERB BETWEEN INTERSECTION SWEEPS AND MAKE SMOOTH CONNECTION.
   - 2.9. THE CONTRACTOR SHALL ENSURE IRRIGATION DUCTS ARE NOT TERMINATED UNDER FOOTPATHS.
   - 2.10. FOR ROAD PAVEMENTS AND KERB DETAILS, THE CONTRACTOR SHALL REFER TO STANDARD DRAWINGS.
   - 2.11. THE CONTRACTOR SHALL REINSTATE ALL PUBLIC OR PRIVATE WORKS OF ADJOINING LAND THAT HAS BEEN AFFECTED BY THE WORKS TO THE ORIGINAL OR SUPERIOR CONDITION OF ITS ORIGINAL STATE.
   - 2.12. EXISTING TEMPORARY TURNAROUND ON LOT 241 VIVID CHASE IS ASSUMED TO BE REMOVED BY OTHERS.

1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE CONTRACT DRAWINGS IN THEIR ENTIRETY AND THE SPECIFICATION.
2. PRIOR TO ANY ROAD CONSTRUCTION, ALL SITE AREAS SHALL BE CLEARED, AND ANY TOPSOIL SHALL BE STOCKPILED FOR USE IN SWALES AND BATTERS.
3. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SHOWN.
4. ALL LEVELS SHOWN ARE FINISHED SURFACE LEVELS AFTER FINAL WORKS.
5. SOIL STABILISATION TO BE AS DIRECTED.
6. DUST CONTROL TO BE THE RESPONSIBILITY OF THE CONTRACTOR.
7. VERGES SHALL BE GRADED TO SUIT THE EXISTING SURFACE LEVELS AT BOUNDARIES AND THE REQUIREMENTS FOR SWALES.
8. ALL DESIGN LEVELS AND SETOUT POINTS SHALL BE LOCATED FROM BENCH MARKS ESTABLISHED BY A LICENSED SURVEYOR.
9. THE CONTRACTOR SHALL CERTIFY THAT EARTHWORKS HAVE BEEN PLACED AND COMPACTED IN ACCORDANCE WITH THE DRAWINGS AND THE SPECIFICATIONS.
10. LEVELS ARE RELATIVE TO AHD.
11. THE CONTRACTOR SHALL OBTAIN UP-TO-DATE DBYD PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION.
12. FOR ANY SERVICES THAT WILL BE IMPACTED BY THE PROPOSED WIDENING, THE CONTRACTOR SHALL CONFIRM THE EXISTING DEPTH OF THE SERVICE AND THE ALIGNMENT IS SUITABLE FOR THE PROPOSED WORKS.
13. THE CONTRACTOR SHALL REINSTATE ALL EXISTING CROSSOVER THAT CONNECT AN EXISTING HABITED PROPERTY, OR ANY PROPERTY CAPABLE OF HABITATION.
14. BUS EMBAYMENTS AND BUS SHELTERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH TRANSPERTH / PUBLIC TRANSPORT AUTHORITY STANDARDS AND REQUIREMENTS.
15. THE CONTRACTOR SHALL CONFIRM THE LOCATION OF ALL ROAD RESERVE BOUNDARIES, AS THE LOCATION OF SOME BOUNDARIES ARE REQUIRED TO CHANGE AS A RESULT OF FUTURE LAND DEVELOPMENT CONDITIONS.

LEGEND

- PROPOSED REINFORCED MOUNTABLE KERB
- PROPOSED SEMI-MOUNTABLE KERB
- PROPOSED CENTRELINE
- EXISTING ROAD AND EXISTING CENTRELINE
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- PROPOSED DRAINAGE MAIN LAYOUT
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- PROPOSED SUBSOIL DRAINAGE
- EXISTING DRAINAGE MAIN LAYOUT
- EXISTING WATER MAIN LAYOUT
- EXISTING SEWER MAIN LAYOUT
- LV CABLE — EXISTING LOW VOLTAGE POWER LINE
- 35.0 — CONTOURS DESIGN
- EXISTING DRAINAGE MAIN LAYOUT
- EXISTING DRAINAGE PIT
- OHP — EXISTING OVERHEAD POWER
- EXISTING OVERHEAD POWER POLE
- EXISTING FIBRE OPTIC / COMMUNICATIONS CABLE
- DBNGP GAS MAIN
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C	25/03/22	CK	CK			ISSUED FOR 100% REVIEW
B	23/11/21	CK	CK			COMMENTS FROM CITY OF KALAMUNDA
A	17/10/21	CK	CK			ISSUED FOR 15% REVIEW

KC Traffic and Transport Pty Ltd
ABN 35 148 970 727
7/10 Whipple Street, Balcatta WA 6021
Phone: 08 9441 2700
Website: www.kctt.com.au

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CLIENT: ELEMENTWA & CITY OF KALAMUNDA
PROJECT: FORRESTFIELD NORTH DCP

DRAFTER	DRAFTING CHECK	REVIEWED	APPROVED
M.JANKOVIC	C. KLEYWEG	PROJECT MANAGER	PROJECT DIRECTOR
DESIGNED	DESIGN REVIEW		
F. BOROVIC	C. KLEYWEG		

TITLE: COMBINED SERVICES PLAN
STEWART ROAD
SHEET 1 OF 2

SHEET	DATUM	WAPC No.	PROJECT No.	DRAWING No.	REVISION
A1	PCG94	SCALE 1:500	KC00604.000	C050	C

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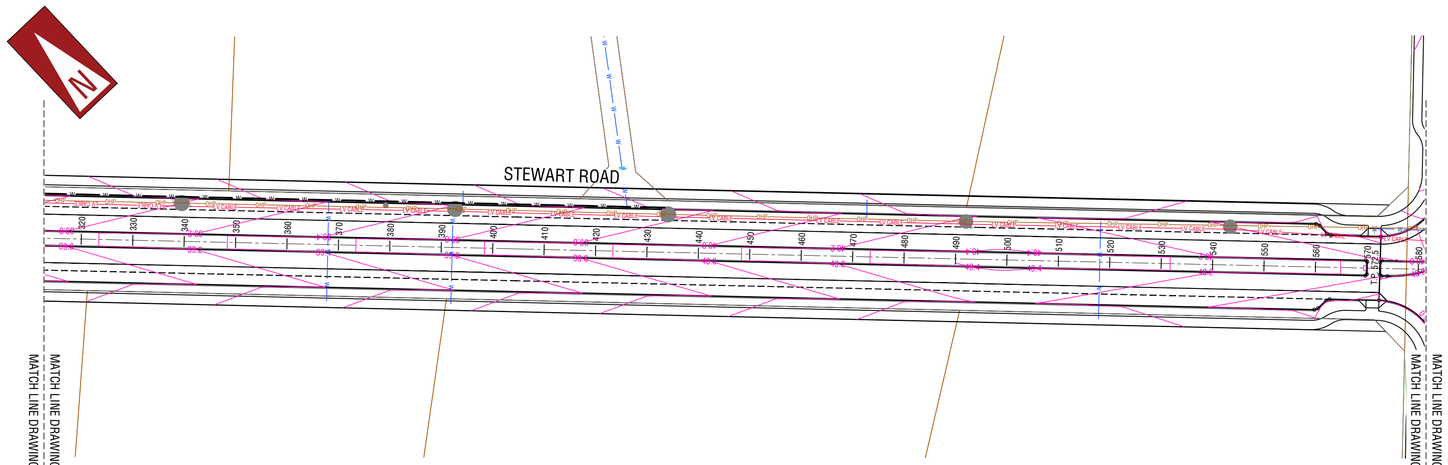

PLAN
SCALE 1:500

LEGEND

- PROPOSED REINFORCED MOUNTABLE KERB
- PROPOSED SEMI-MOUNTABLE KERB
- PROPOSED CENTRELINE
- EXISTING ROAD AND EXISTING CENTRELINE
- PROPOSED SEWER MAIN LAYOUT
- PROPOSED DRAINAGE MAIN LAYOUT
- EXISTING DRAINAGE PIT
- PROPOSED SUBSOIL DRAINAGE
- EXISTING DRAINAGE MAIN LAYOUT
- EXISTING WATER MAIN LAYOUT
- EXISTING SEWER MAIN LAYOUT
- EXISTING LOW VOLTAGE POWER LINE
- CONTOURS DESIGN
- EXISTING DRAINAGE MAIN LAYOUT
- EXISTING DRAINAGE PIT
- EXISTING OVERHEAD POWER
- EXISTING OVERHEAD POWER POLE
- EXISTING FIBRE OPTIC / COMMUNICATIONS CABLE
- DBNGP GAS MAIN
- EXISTING TELSTRA PIT

WARNING
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DIAL 1100
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REV No.	DATE	DRAFTING CHECK	DESIGN REVIEW	REV'D P.MGR	APP'D P.DIR	AMENDMENT

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PROJECT: FORRESTFIELD NORTH DCP

DRAFTER	DRAFTING CHECK	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
M.JANKOVIC	C. KLEYWEG		
DESIGNED	DESIGN REVIEW		
F. BOROVIC	C. KLEYWEG		

TITLE
COMBINED SERVICES PLAN
STEWART ROAD
SHEET 2 OF 2

SHEET	DATUM	WAPC No.	PROJECT No.	DRAWING No.	REVISION
A1	PCG94	SCALE 1:500	KC00604.000	C051	C

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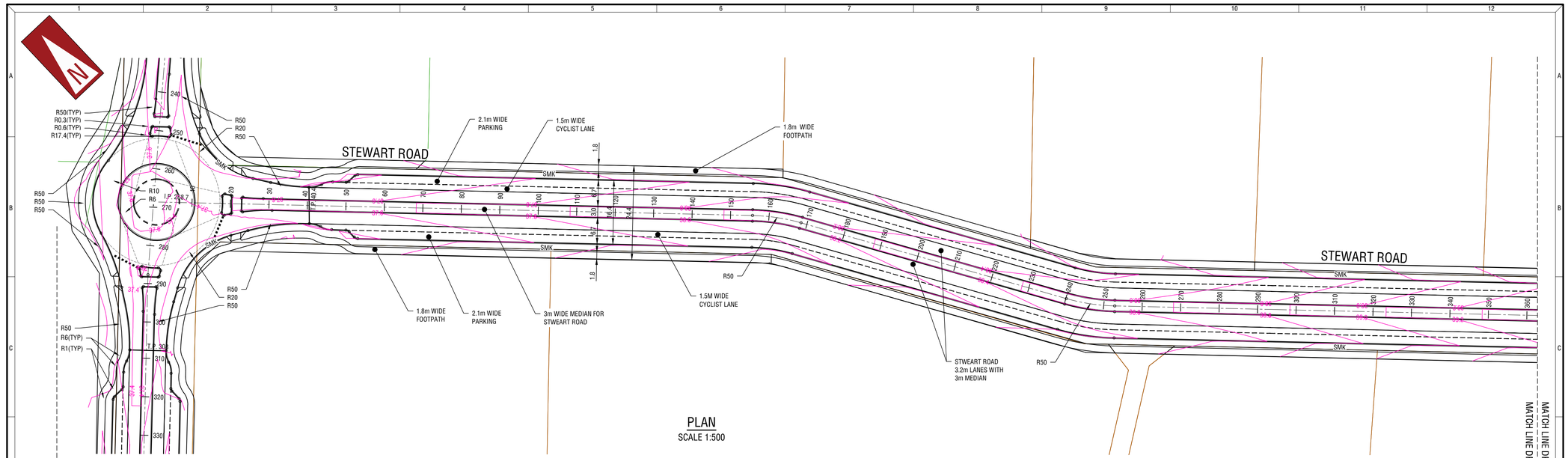

PLAN
SCALE 1:500

NOTES

1. GENERAL
   - 1.1. LEVELS ARE REDUCED FROM A.H.D.
   - 1.2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL KC00604.000 DRAWINGS AND THE SPECIFICATION.
   - 1.3. THE CONTRACTOR SHALL LIMIT THE MOVEMENT OF EQUIPMENT AND MANPOWER TO THE MINIMUM AREA NECESSARY AND PROTECT ALL VEGETATION ON SITE.
   - 1.4. THE CONTRACTOR SHALL ENSURE THAT ALL LEVELS ARE SET-OUT BY LICENSED SURVEYOR.
   - 1.5. THE CONTRACTOR SHALL MAINTAIN ACCESS TO EXISTING RESIDENCES AT ALL TIMES THROUGHOUT THE ENTIRE CONSTRUCTION PROCESS.
   - 1.6. THE CONTRACTOR SHALL REPORT ANY DISCREPANCIES IN THE DESIGN DRAWINGS OR CLASHES WITH OTHER SERVICES AS SOON AS PRACTICALLY POSSIBLE TO THE SUPERINTENDENT.
2. ROADWORKS
   - 2.1. ALL CORNER SWEEPS SHALL BE 12.0m RADIUS KEYED UNLESS OTHERWISE SHOWN
   - 2.2. ALL KERBS WITH A RADIUS LESS THAN R40 NEED TO BE KEYED.
   - 2.3. ALL KERBS SHALL BE MOUNTABLE UNLESS OTHERWISE SHOWN.
   - 2.4. ALL SWEEPS SHALL BE SEMI-MOUNTABLE UNLESS OTHERWISE SHOWN.
   - 2.5. ALL PARKING BAY KERBING SHALL BE BARRIER UNLESS OTHERWISE SHOWN.
   - 2.6. PAVEMENT WIDTH SHALL BE AS SHOWN ON THE DRAWINGS AND SHALL BE MEASURED BETWEEN KERBS.
   - 2.7. ALL ROAD VERGES & DISTURBED AREAS SHALL BE STABILISED BY APPLICATION OF SEEDED HYDRO MULCH.
   - 2.8. THE CONTRACTOR SHALL SAW-CUT EXISTING PAVEMENT IN A STRAIGHT LINE REMOVE EXISTING KERB BETWEEN INTERSECTION SWEEPS AND MAKE SMOOTH CONNECTION.
   - 2.9. THE CONTRACTOR SHALL ENSURE IRRIGATION DUCTS ARE NOT TERMINATED UNDER FOOTPATHS.
   - 2.10. FOR ROAD PAVEMENTS AND KERB DETAILS, THE CONTRACTOR SHALL REFER TO STANDARD DRAWINGS.
   - 2.11. THE CONTRACTOR SHALL REINSTATE ALL PUBLIC OR PRIVATE WORKS OF ADJOINING LAND THAT HAS BEEN AFFECTED BY THE WORKS TO THE ORIGINAL OR SUPERIOR CONDITION OF ITS ORIGINAL STATE.
   - 2.12. EXISTING TEMPORARY TURNAROUND ON LOT 241 VIVID CHASE IS ASSUMED TO BE REMOVED BY OTHERS.

1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE CONTRACT DRAWINGS IN THEIR ENTIRETY AND THE SPECIFICATION.
2. PRIOR TO ANY ROAD CONSTRUCTION, ALL SITE AREAS SHALL BE CLEARED, AND ANY TOPSOIL SHALL BE STOCKPILED FOR USE IN SWALES AND BATTERS.
3. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SHOWN.
4. ALL LEVELS SHOWN ARE FINISHED SURFACE LEVELS AFTER FINAL WORKS.
5. SOIL STABILISATION TO BE AS DIRECTED.
6. DUST CONTROL TO BE THE RESPONSIBILITY OF THE CONTRACTOR.
7. VERGES SHALL BE GRADED TO SUIT THE EXISTING SURFACE LEVELS AT BOUNDARIES AND THE REQUIREMENTS FOR SWALES.
8. ALL DESIGN LEVELS AND SETOUT POINTS SHALL BE LOCATED FROM BENCH MARKS ESTABLISHED BY A LICENSED SURVEYOR.
9. THE CONTRACTOR SHALL CERTIFY THAT EARTHWORKS HAVE BEEN PLACED AND COMPACTED IN ACCORDANCE WITH THE DRAWINGS AND THE SPECIFICATIONS.
10. LEVELS ARE RELATIVE TO AHD.
11. THE CONTRACTOR SHALL OBTAIN UP-TO-DATE DBYD PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION.
12. FOR ANY SERVICES THAT WILL BE IMPACTED BY THE PROPOSED WIDENING, THE CONTRACTOR SHALL CONFIRM THE EXISTING DEPTH OF THE SERVICE AND THE ALIGNMENT IS SUITABLE FOR THE PROPOSED WORKS.
13. THE CONTRACTOR SHALL REINSTATE ALL EXISTING CROSSOVER THAT CONNECT AN EXISTING HABITED PROPERTY, OR ANY PROPERTY CAPABLE OF HABITATION.
14. BUS EMBAYMENTS AND BUS SHELTERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH TRANSPERTH / PUBLIC TRANSPORT AUTHORITY STANDARDS AND REQUIREMENTS.
15. THE CONTRACTOR SHALL CONFIRM THE LOCATION OF ALL ROAD RESERVE BOUNDARIES, AS THE LOCATION OF SOME BOUNDARIES ARE REQUIRED TO CHANGE AS A RESULT OF FUTURE LAND DEVELOPMENT CONDITIONS.

LEGEND

- CENTRELINE
- (MK) PROPOSED MOUNTABLE KERB
- (SMK) PROPOSED SEMI-MOUNTABLE KERB
- EXISTING ROAD
- GIVE WAY LINE
- PARKING ALIGNMENT (2.1m WIDTH U.N.O.)
- LANE LINE / SEPARATION LINE / EDGE LINE
- BROKEN LANE LINE (3m LINE WITH 6m SPACINGS)
- FOOTPATH (VARYING WIDTHS - REFER PLAN)
- TANGENT POINT
- PRAM RAMP (2.5m WIDE U.N.O.)
- ROAD WIDENING AND PAINT MARKING TO SUIT LARGER VEHICLE TURNING RADIUS
- ROUNDABOUT DESIGN GEOMETRY

1:500 — 0, 5m, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75

WARNING
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CLIENT: ELEMENTWA & CITY OF KALAMUNDA
PROJECT: FORRESTFIELD NORTH DCP

DRAFTER	DRAFTING CHECK	REVIEWED	APPROVED
M.JANKOVIC	C. KLEYWEG	PROJECT MANAGER	PROJECT DIRECTOR
DESIGNED	DESIGN REVIEW		
F. BOROVIC	C. KLEYWEG		

TITLE: ROAD LAYOUT PLAN
STEWART ROAD
SHEET 1 OF 2

SHEET	DATUM	WAPC No.	PROJECT No.	DRAWING No.	REVISION
A1	PCG94	SCALE 1:500	KC00604.000	C100	C

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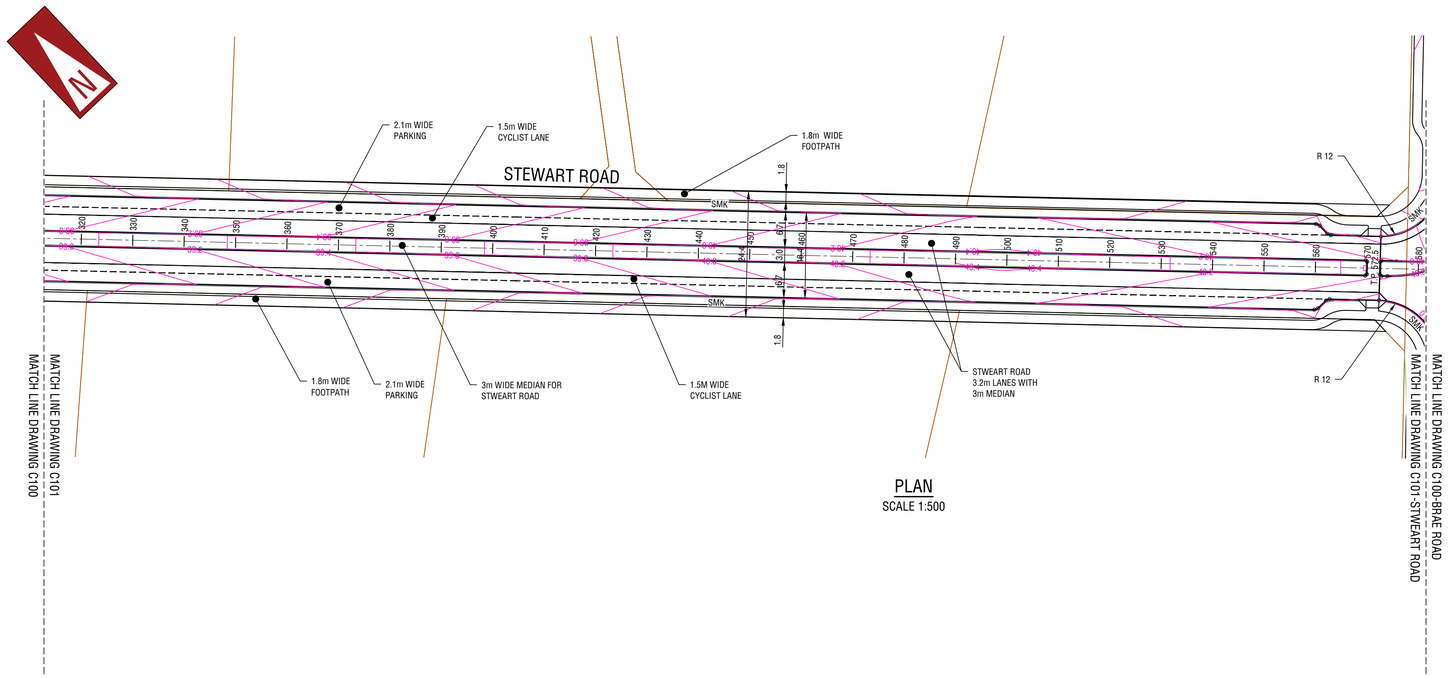

PLAN
SCALE 1:500

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M.JANKOVIC	C. KLEYWEG		
DESIGNED	DESIGN REVIEW		
F. BOROVIC	C. KLEYWEG		

TITLE
ROAD LAYOUT PLAN
STEWART ROAD
SHEET 2 OF 2

SHEET	DATUM	WAPC No.	PROJECT No.	DRAWING No.	REVISION
A1	PCG94	SCALE 1:500	KC00604.000	C101	C

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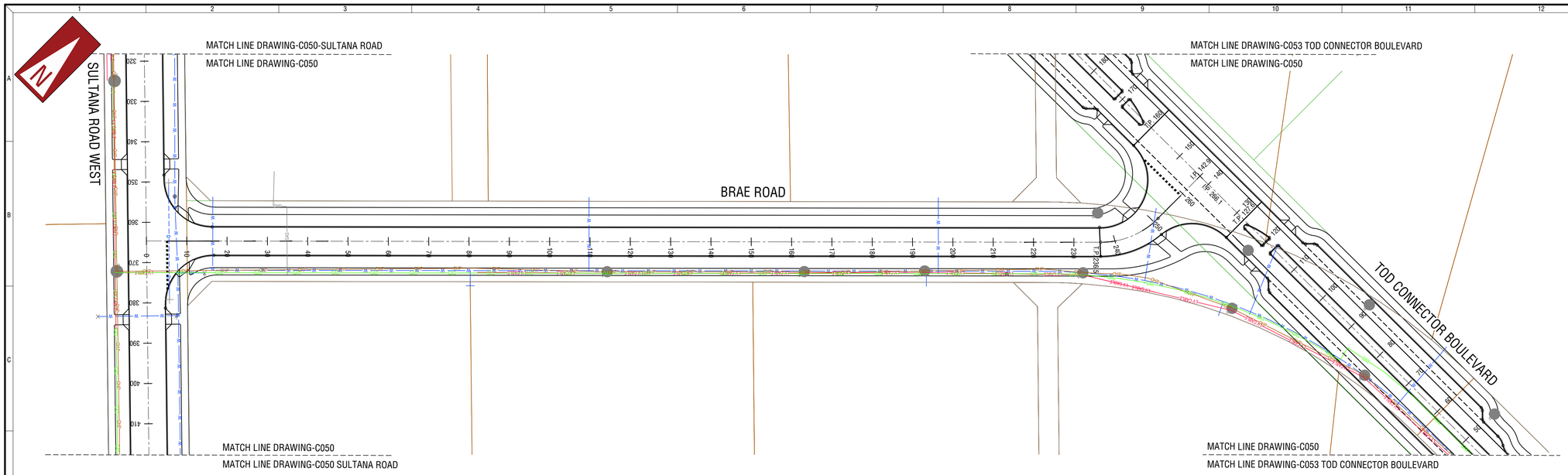

BRAE ROAD
SCALE 1:500

LEGEND

- PROPOSED REINFORCED MOUNTABLE KERB
- PROPOSED SEMI-MOUNTABLE KERB
- PROPOSED CENTRELINE
- EXISTING ROAD AND EXISTING CENTRELINE
- PROPOSED SEWER MAIN LAYOUT
- PROPOSED DRAINAGE MAIN LAYOUT
- EXISTING DRAINAGE PIT
- PROPOSED SUBSOIL DRAINAGE
- EXISTING DRAINAGE MAIN LAYOUT
- EXISTING WATER MAIN LAYOUT
- EXISTING SEWER MAIN LAYOUT
- EXISTING LOW VOLTAGE POWER LINE
- CONTOURS DESIGN
- EXISTING DRAINAGE MAIN LAYOUT
- EXISTING DRAINAGE PIT
- EXISTING OVERHEAD POWER
- EXISTING OVERHEAD POWER POLE
- EXISTING FIBRE OPTIC / COMMUNICATIONS CABLE
- DBNGP GAS MAIN
- EXISTING TELSTRA PIT

NOTES:

1. THE EXISTING SERVICES ON THIS PLAN HAVE BEEN DOWNLOADED FROM DIAL BEFORE YOU DIG AND DRAWN GENERALLY IN LOCATION. THE CONTRACTOR SHALL ACCURATELY LOCATE AND CONFIRM THE LOCATION OF ALL SERVICES PRIOR TO THE COMMENCEMENT OF WORKS.
2. THIS PLAN IS PROVIDED FOR INFORMATION PURPOSES ONLY AND IS NOT TO BE RELIED UPON FOR THE ACCURACY OF SERVICES LOCATIONS.
3. SHOULD THE CONTRACTOR FINDS EXISTING SERVICES THEY BELIEVE WILL IMPACT THE PROPOSED WORKS, THE CONTRACTOR SHALL NOTIFY THE SUPERINTENDENT SO THAT THE DRAWINGS CAN BE UPDATED / AMENDED TO INCLUDE THE EXACT LOCATION OF ANY SUCH SERVICES IMPACTING THE WORKS.

DIAL 1100
BEFORE YOU DIG

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M.JANKOVIC	C. KLEYWEG		
DESIGNED	DESIGN REVIEW		
F. BOROVIC	C. KLEYWEG		

TITLE
COMBINED SERVICES PLAN
BRAE ROAD
SHEET 1 OF 4

SHEET	DATUM	WAPC No.	PROJECT No.	DRAWING No.	REVISION
A1	PCG94	SCALE 1:500	KC00604.000	C050	C

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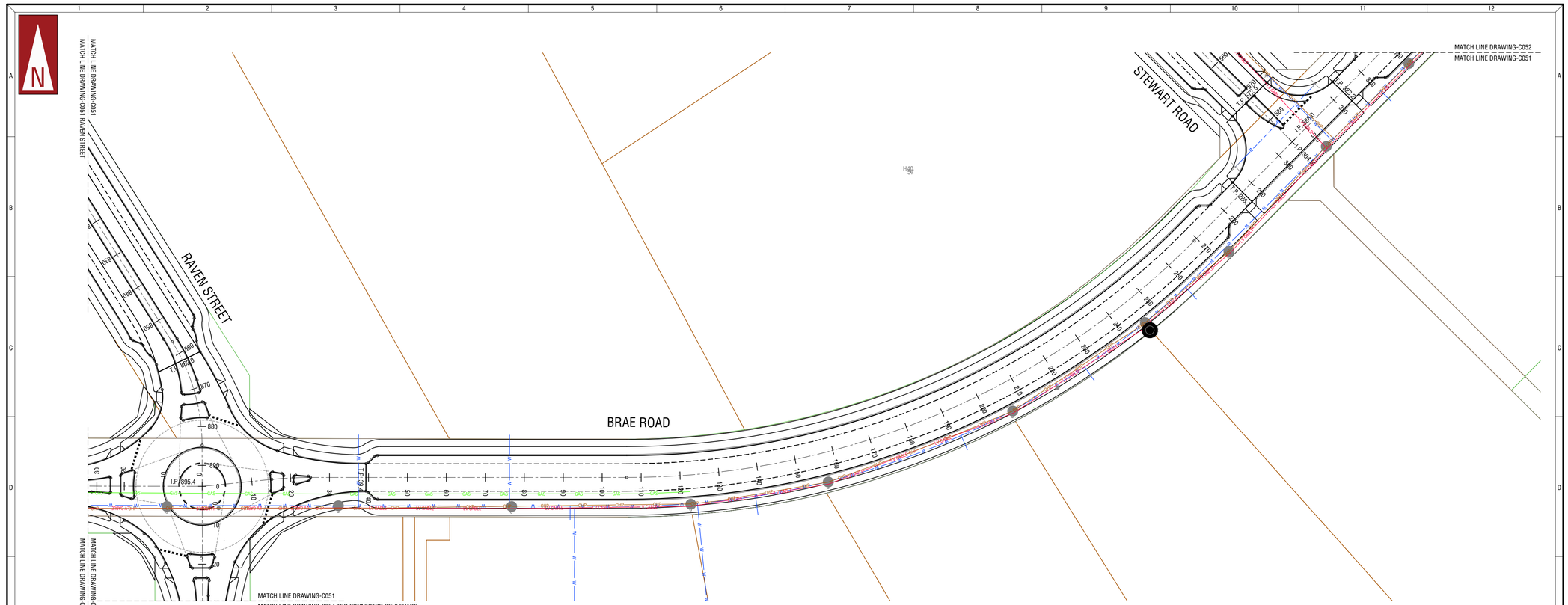
MATCH LINE DRAWING-C051
MATCH LINE DRAWING-C051 RAVEN STREET
RAVEN STREET
BRAE ROAD
STEWART ROAD
MATCH LINE DRAWING-C052
MATCH LINE DRAWING-C051
MATCH LINE DRAWING-C051
MATCH LINE DRAWING-C054 TOD CONNECTOR BOULEVARD
MATCH LINE DRAWING-C051
MATCH LINE DRAWING-C053 TOD CONNECTOR BOULEVARD
I.P. 895.4
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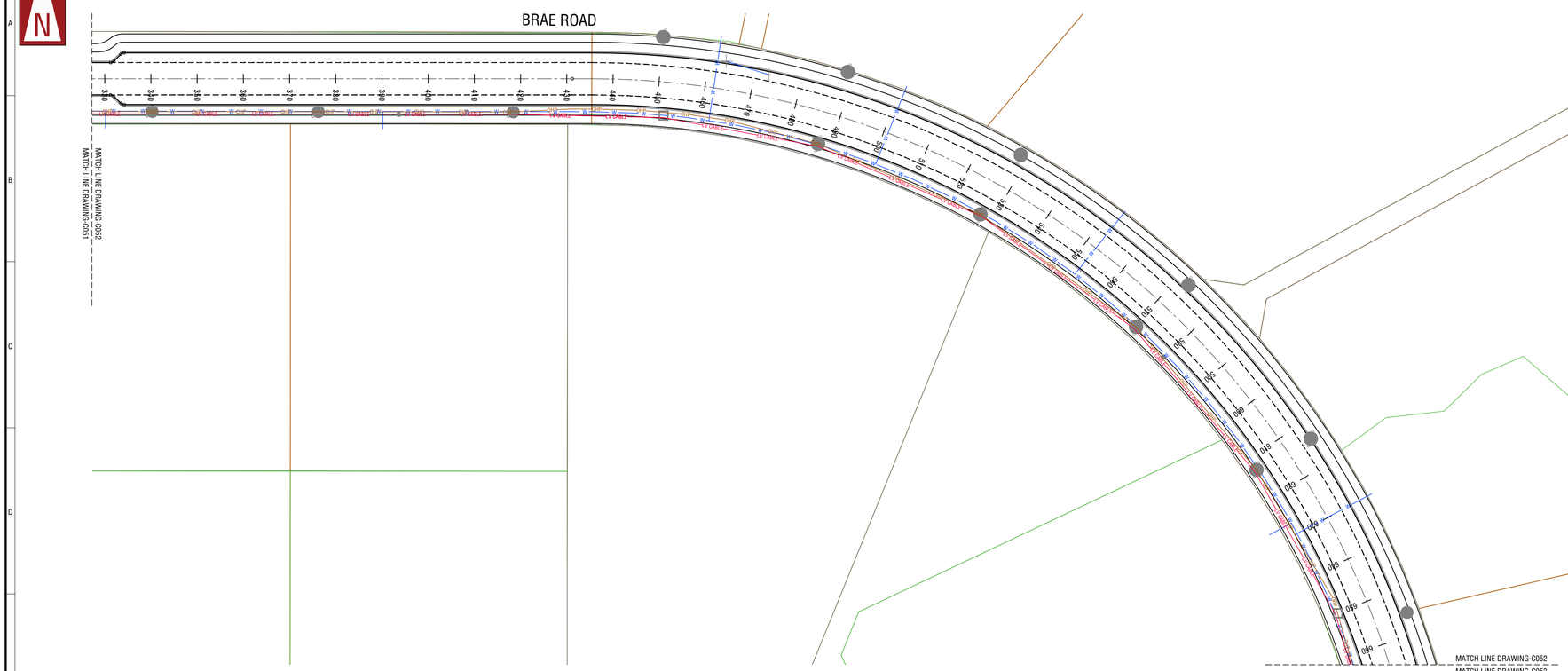

BRAE ROAD
SCALE 1:500

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PROJECT: FORRESTFIELD NORTH DCP

DRAFTER	DRAFTING CHECK	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
M.JANKOVIC	C. KLEYWEG		
DESIGNED	DESIGN REVIEW		
F. BOROVIC	C. KLEYWEG		

TITLE
COMBINED SERVICES PLAN
BRAE ROAD
SHEET 3 OF 4

SHEET	DATUM	WAPC No.	PROJECT No.	DRAWING No.	REVISION
A1	PCG94	SCALE 1:500	KC00604.000	C052	C

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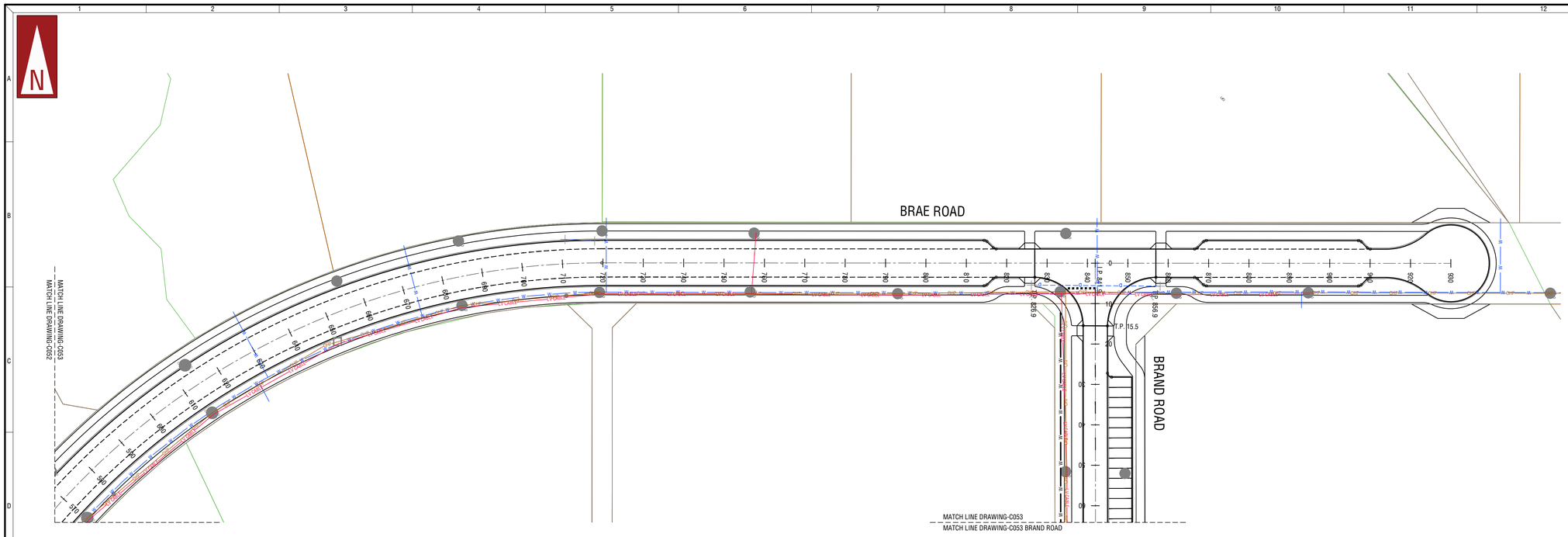

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CLIENT: ELEMENTWA & CITY OF KALAMUNDA
PROJECT: FORRESTFIELD NORTH DCP
DRAFTER: M.JANKOVIC
DRAFTING CHECK: C. KLEYWEG
DESIGNED: F. BOROVIC
DESIGN REVIEW: C. KLEYWEG
REVIEWED PROJECT MANAGER
APPROVED PROJECT DIRECTOR

TITLE: COMBINED SERVICES PLAN
BRAE ROAD
SHEET 4 OF 4

SHEET: A1 | DATUM: PCG94 | WAPC No. | SCALE: 1:500 | PROJECT No.: KC00604.000 | DRAWING No.: C053 | REVISION: C

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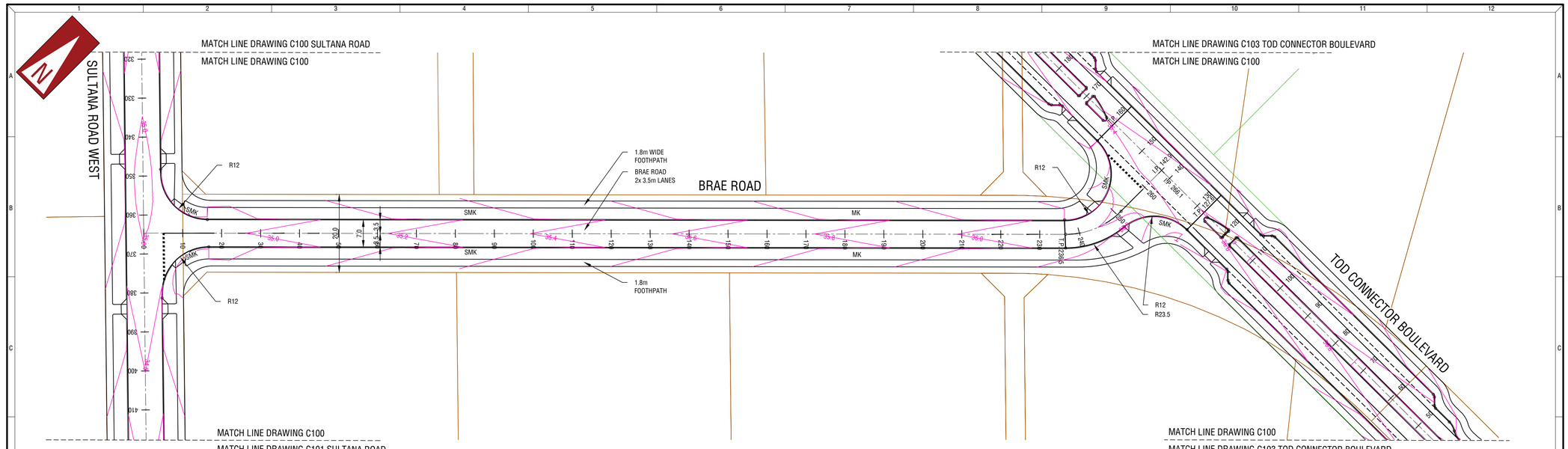

BRAE ROAD
SCALE 1:500

NOTES

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2. ROADWORKS
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   - 2.2. ALL KERBS WITH A RADIUS LESS THAN R40 NEED TO BE KEYED.
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   - 2.4. ALL SWEEPS SHALL BE SEMI-MOUNTABLE UNLESS OTHERWISE SHOWN.
   - 2.5. ALL PARKING BAY KERBING SHALL BE BARRIER UNLESS OTHERWISE SHOWN.
   - 2.6. PAVEMENT WIDTH SHALL BE AS SHOWN ON THE DRAWINGS AND SHALL BE MEASURED BETWEEN KERBS.
   - 2.7. ALL ROAD VERGES & DISTURBED AREAS SHALL BE STABILISED BY APPLICATION OF SEEDED HYDRO MULCH.
   - 2.8. THE CONTRACTOR SHALL SAW-CUT EXISTING PAVEMENT IN A STRAIGHT LINE REMOVE EXISTING KERB BETWEEN INTERSECTION SWEEPS AND MAKE SMOOTH CONNECTION.
   - 2.9. THE CONTRACTOR SHALL ENSURE IRRIGATION DUCTS ARE NOT TERMINATED UNDER FOOTPATHS.
   - 2.10. FOR ROAD PAVEMENTS AND KERB DETAILS, THE CONTRACTOR SHALL REFER TO STANDARD DRAWINGS.
   - 2.11. THE CONTRACTOR SHALL REINSTATE ALL PUBLIC OR PRIVATE WORKS OF ADJOINING LAND THAT HAS BEEN AFFECTED BY THE WORKS TO THE ORIGINAL OR SUPERIOR CONDITION OF ITS ORIGINAL STATE.
   - 2.12. EXISTING TEMPORARY TURNAROUND ON LOT 241 VIVID CHASE IS ASSUMED TO BE REMOVED BY OTHERS.

1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE CONTRACT DRAWINGS IN THEIR ENTIRETY AND THE SPECIFICATION.
2. PRIOR TO ANY ROAD CONSTRUCTION, ALL SITE AREAS SHALL BE CLEARED, AND ANY TOPSOIL SHALL BE STOCKPILED FOR USE IN SWALES AND BATTERS.
3. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SHOWN.
4. ALL LEVELS SHOWN ARE FINISHED SURFACE LEVELS AFTER FINAL WORKS.
5. SOIL STABILISATION TO BE AS DIRECTED.
6. DUST CONTROL TO BE THE RESPONSIBILITY OF THE CONTRACTOR.
7. VERGES SHALL BE GRADED TO SUIT THE EXISTING SURFACE LEVELS AT BOUNDARIES AND THE REQUIREMENTS FOR SWALES.
8. ALL DESIGN LEVELS AND SETOUT POINTS SHALL BE LOCATED FROM BENCH MARKS ESTABLISHED BY A LICENSED SURVEYOR.
9. THE CONTRACTOR SHALL CERTIFY THAT EARTHWORKS HAVE BEEN PLACED AND COMPACTED IN ACCORDANCE WITH THE DRAWINGS AND THE SPECIFICATIONS.
10. LEVELS ARE RELATIVE TO AHD.
11. THE CONTRACTOR SHALL OBTAIN UP-TO-DATE DBYD PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION.
12. FOR ANY SERVICES THAT WILL BE IMPACTED BY THE PROPOSED WIDENING, THE CONTRACTOR SHALL CONFIRM THE EXISTING DEPTH OF THE SERVICE AND THE ALIGNMENT IS SUITABLE FOR THE PROPOSED WORKS.
13. THE CONTRACTOR SHALL REINSTATE ALL EXISTING CROSSOVER THAT CONNECT AN EXISTING HABITED PROPERTY, OR ANY PROPERTY CAPABLE OF HABITATION.
14. BUS EMBAYMENTS AND BUS SHELTERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH TRANSPERTH / PUBLIC TRANSPORT AUTHORITY STANDARDS AND REQUIREMENTS.
15. THE CONTRACTOR SHALL CONFIRM THE LOCATION OF ALL ROAD RESERVE BOUNDARIES, AS THE LOCATION OF SOME BOUNDARIES ARE REQUIRED TO CHANGE AS A RESULT OF FUTURE LAND DEVELOPMENT CONDITIONS.

LEGEND

- CENTRELINE
- (MK) PROPOSED MOUNTABLE KERB
- (SMK) PROPOSED SEMI-MOUNTABLE KERB
- EXISTING ROAD
- GIVE WAY LINE
- PARKING ALIGNMENT (2.1m WIDTH U.N.O.)
- LANE LINE / SEPARATION LINE / EDGE LINE
- BROKEN LANE LINE (3m LINE WITH 6m SPACINGS)
- FOOTPATH (VARYING WIDTHS - REFER PLAN)
- TANGENT POINT
- PRAM RAMP (2.5m WIDE U.N.O.)
- ROAD WIDENING AND PAINT MARKING TO SUIT LARGER VEHICLE TURNING RADIUS
- ROUNDABOUT DESIGN GEOMETRY

1:500 (0 5m 10 15 20 25 30 35 40 45 50 55 60 65 70 75)

WARNING
BEWARE OF UNDERGROUND SERVICES
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C	25/03/22	CK	CK			ISSUED FOR 100% REVIEW
B	23/11/21	CK	CK			COMMENTS FROM CITY OF KALAMUNDA
A	17/10/21	CK	CK			ISSUED FOR 15% REVIEW

KC Traffic and Transport Pty Ltd
ABN 35 148 970 727
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CLIENT: ELEMENTWA & CITY OF KALAMUNDA
PROJECT: FORRESTFIELD NORTH DCP

DRAFTER	DRAFTING CHECK	REVIEWED	APPROVED
M.JANKOVIC	C. KLEYWEG	PROJECT MANAGER	PROJECT DIRECTOR
DESIGNED	DESIGN REVIEW		
F. BOROVIC	C. KLEYWEG		

TITLE
ROAD LAYOUT PLAN
BRAE ROAD
SHEET 1 OF 4

SHEET	DATUM	WAPC No.	PROJECT No.	DRAWING No.	REVISION
A1	PCG94	SCALE 1:500	KC00604.000	C100	C

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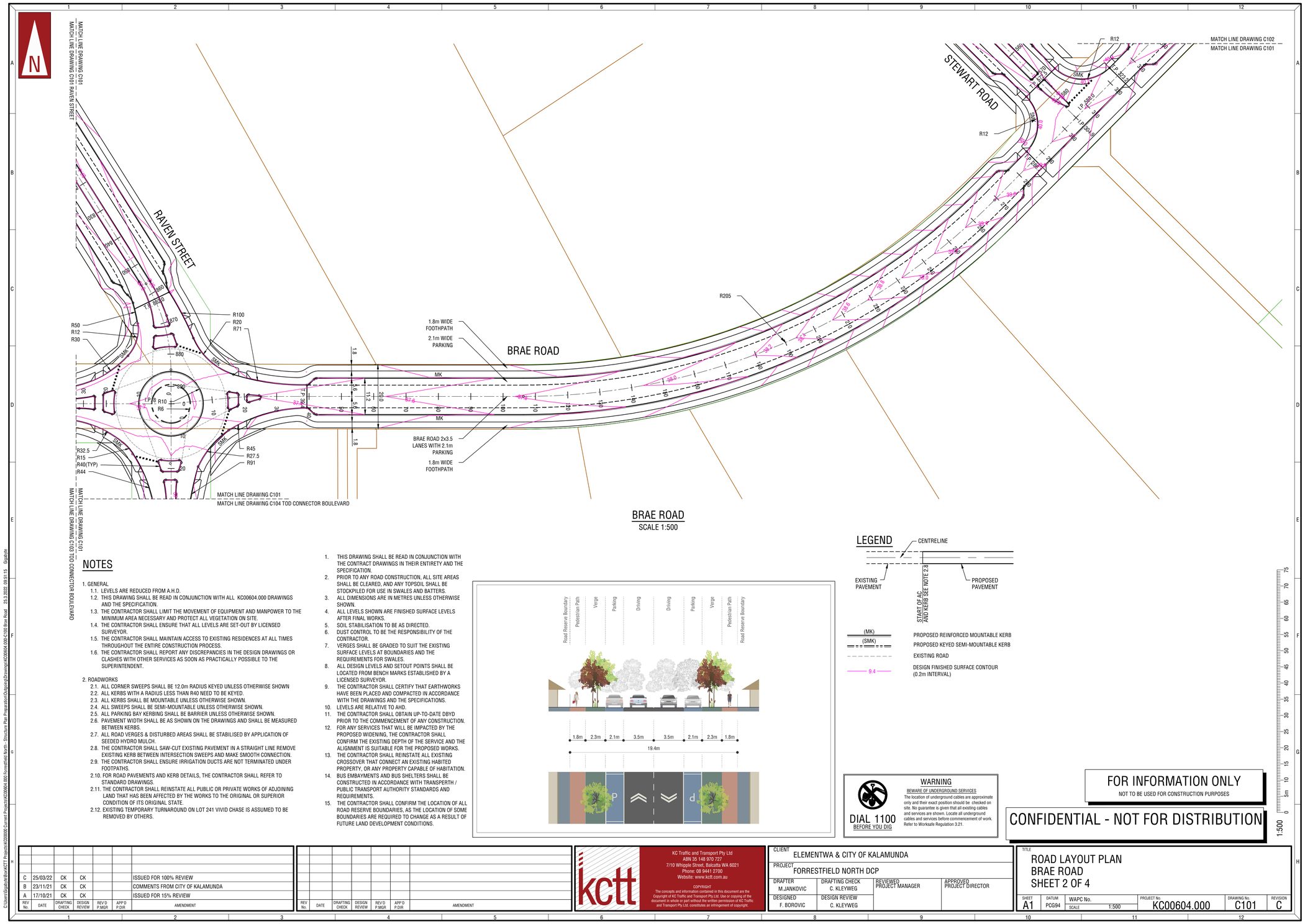

NOTES

1. GENERAL
   - 1.1. LEVELS ARE REDUCED FROM A.H.D.
   - 1.2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL KC00604.000 DRAWINGS AND THE SPECIFICATION.
   - 1.3. THE CONTRACTOR SHALL LIMIT THE MOVEMENT OF EQUIPMENT AND MANPOWER TO THE MINIMUM AREA NECESSARY AND PROTECT ALL VEGETATION ON SITE.
   - 1.4. THE CONTRACTOR SHALL ENSURE THAT ALL LEVELS ARE SET-OUT BY LICENSED SURVEYOR.
   - 1.5. THE CONTRACTOR SHALL MAINTAIN ACCESS TO EXISTING RESIDENCES AT ALL TIMES THROUGHOUT THE ENTIRE CONSTRUCTION PROCESS.
   - 1.6. THE CONTRACTOR SHALL REPORT ANY DISCREPANCIES IN THE DESIGN DRAWINGS OR CLASHES WITH OTHER SERVICES AS SOON AS PRACTICALLY POSSIBLE TO THE SUPERINTENDENT.
2. ROADWORKS
   - 2.1. ALL CORNER SWEEPS SHALL BE 12.0m RADIUS KEYED UNLESS OTHERWISE SHOWN
   - 2.2. ALL KERBS WITH A RADIUS LESS THAN R40 NEED TO BE KEYED.
   - 2.3. ALL KERBS SHALL BE MOUNTABLE UNLESS OTHERWISE SHOWN.
   - 2.4. ALL SWEEPS SHALL BE SEMI-MOUNTABLE UNLESS OTHERWISE SHOWN.
   - 2.5. ALL PARKING BAY KERBING SHALL BE BARRIER UNLESS OTHERWISE SHOWN.
   - 2.6. PAVEMENT WIDTH SHALL BE AS SHOWN ON THE DRAWINGS AND SHALL BE MEASURED BETWEEN KERBS.
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LEGEND

(MK) PROPOSED REINFORCED MOUNTABLE KERB

(SMK) PROPOSED KEYED SEMI-MOUNTABLE KERB

EXISTING ROAD

9.4 DESIGN FINISHED SURFACE CONTOUR (0.2m INTERVAL)

WARNING

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PROJECT: FORRESTFIELD NORTH DCP

DRAFTER	DRAFTING CHECK	REVIEWER	APPROVED
M.JANKOVIC	C. KLEYWEG	PROJECT MANAGER	PROJECT DIRECTOR
DESIGNED	DESIGN REVIEW		
F. BOROVIC	C. KLEYWEG		

TITLE: ROAD LAYOUT PLAN
BRAE ROAD
SHEET 2 OF 4

SHEET	DATUM	WAPC No.	PROJECT No.	DRAWING No.	REVISION
A1	PCG94	SCALE 1:500	KC00604.000	C101	C

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1.8m WIDE FOOTPATH

2.1m WIDE PARKING

BRAE ROAD 2x3.5 LANES WITH 2.1m PARKING

1.8m WIDE FOOTPATH

MATCH LINE DRAWING C103
MATCH LINE DRAWING C102

BRAE ROAD

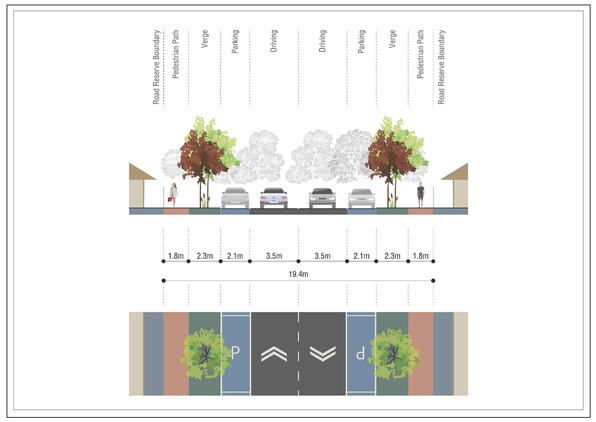
MK

MK

R181

MATCH LINE DRAWING C102
MATCH LINE DRAWING C103

BRAE ROAD
SCALE 1:500



DIAL 1100
BEFORE YOU DIG

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CLIENT	ELEMENTWA & CITY OF KALAMUNDA		
PROJECT	FORRESTFIELD NORTH DCP		
DRAFTER M.JANKOVIC	DRAFTING CHECK C. KLEYWEG	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
DESIGNED F. BOROVIC	DESIGN REVIEW C. KLEYWEG		

TITLE
ROAD LAYOUT PLAN
BRAE ROAD
SHEET 3 OF 4

SHEET	DATUM	WAPC No.	PROJECT No.	DRAWING No.	REVISION
A1	PCG94	SCALE 1:500	KC00604.000	C102	C

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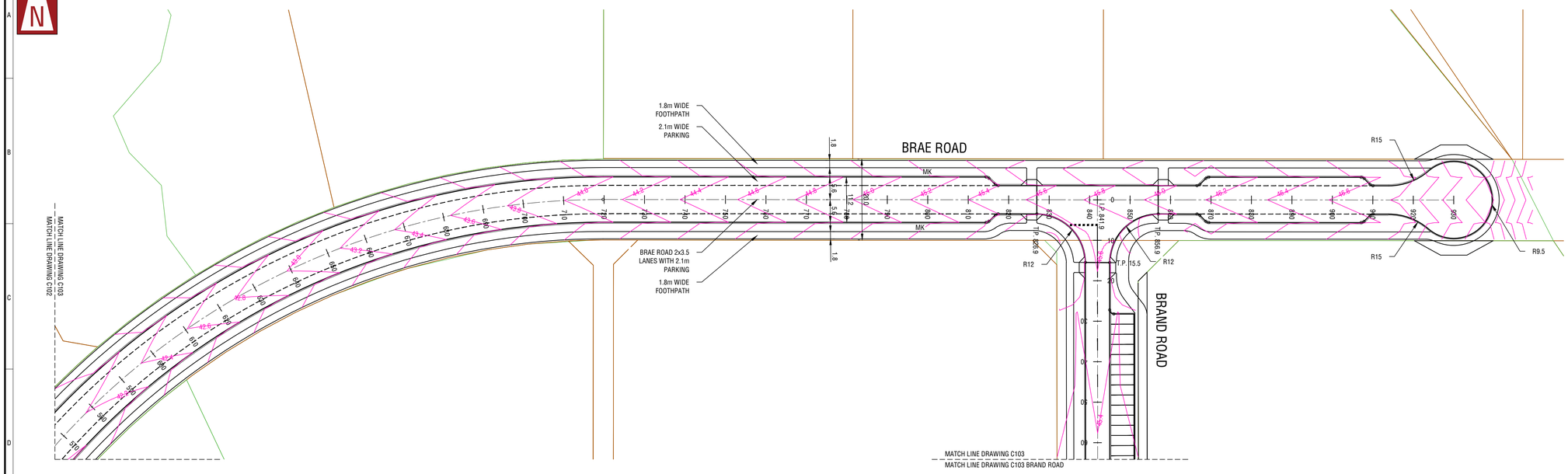
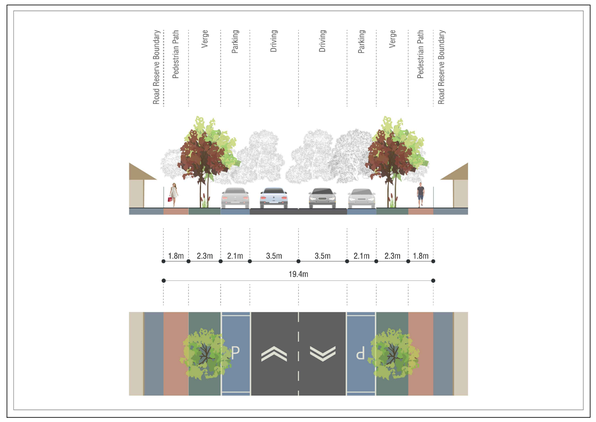


BRAE ROAD
SCALE 1:500



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PROJECT: FORRESTFIELD NORTH DCP

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M.JANKOVIC	C. KLEYWEG		
DESIGNED	DESIGN REVIEW		
F. BOROVIC	C. KLEYWEG		

TITLE
ROAD LAYOUT PLAN
BRAE ROAD
SHEET 4 OF 4

SHEET	DATUM	WAPC No.	PROJECT No.	DRAWING No.	REVISION
A1	PCG94	SCALE 1:500	KC00604.000	C103	C

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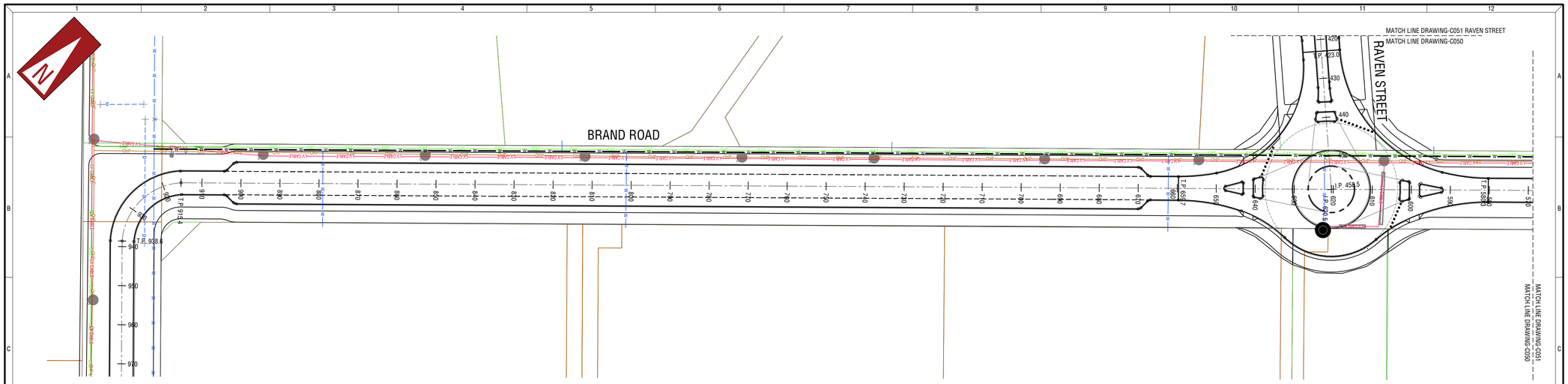

BRAND ROAD
SCALE 1:500

LEGEND

- PROPOSED REINFORCED MOUNTABLE KERB
- PROPOSED SEMI-MOUNTABLE KERB
- PROPOSED CENTRELINE
- EXISTING ROAD AND EXISTING CENTRELINE
- PROPOSED SEWER MAIN LAYOUT
- PROPOSED DRAINAGE MAIN LAYOUT
- EXISTING DRAINAGE PIT
- PROPOSED SUBSOIL DRAINAGE
- EXISTING DRAINAGE MAIN LAYOUT
- EXISTING WATER MAIN LAYOUT
- EXISTING SEWER MAIN LAYOUT
- EXISTING LOW VOLTAGE POWER LINE
- CONTOURS DESIGN
- EXISTING DRAINAGE MAIN LAYOUT
- EXISTING DRAINAGE PIT
- EXISTING OVERHEAD POWER
- EXISTING OVERHEAD POWER POLE
- EXISTING FIBRE OPTIC / COMMUNICATIONS CABLE
- DBNGP GAS MAIN
- EXISTING TELSTRA PIT

NOTES:

1. THE EXISTING SERVICES ON THIS PLAN HAVE BEEN DOWNLOADED FROM DIAL BEFORE YOU DIG AND DRAWN GENERALLY IN LOCATION. THE CONTRACTOR SHALL ACCURATELY LOCATE AND CONFIRM THE LOCATION OF ALL SERVICES PRIOR TO THE COMMENCEMENT OF WORKS.
2. THIS PLAN IS PROVIDED FOR INFORMATION PURPOSES ONLY AND IS NOT TO BE RELIED UPON FOR THE ACCURACY OF SERVICES LOCATIONS.
3. SHOULD THE CONTRACTOR FINDS EXISTING SERVICES THEY BELIEVE WILL IMPACT THE PROPOSED WORKS, THE CONTRACTOR SHALL NOTIFY THE SUPERINTENDENT SO THAT THE DRAWINGS CAN BE UPDATED / AMENDED TO INCLUDE THE EXACT LOCATION OF ANY SUCH SERVICES IMPACTING THE WORKS.

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PROJECT: FORRESTFIELD NORTH DCP

DRAFTER	DRAFTING CHECK	REVIEWED	APPROVED
D. CENGAJ	C. KLEYWEG	PROJECT MANAGER	PROJECT DIRECTOR
DESIGNED	DESIGN REVIEW		
F. BOROVIC	C. KLEYWEG		

TITLE
COMBINED SERVICES PLAN
BRAND ROAD
SHEET 1 OF 4

SHEET	DATUM	WAPC No.	PROJECT No.	DRAWING No.	REVISION
A1	PCG94	SCALE 1:500	KC00604.000	C050	C

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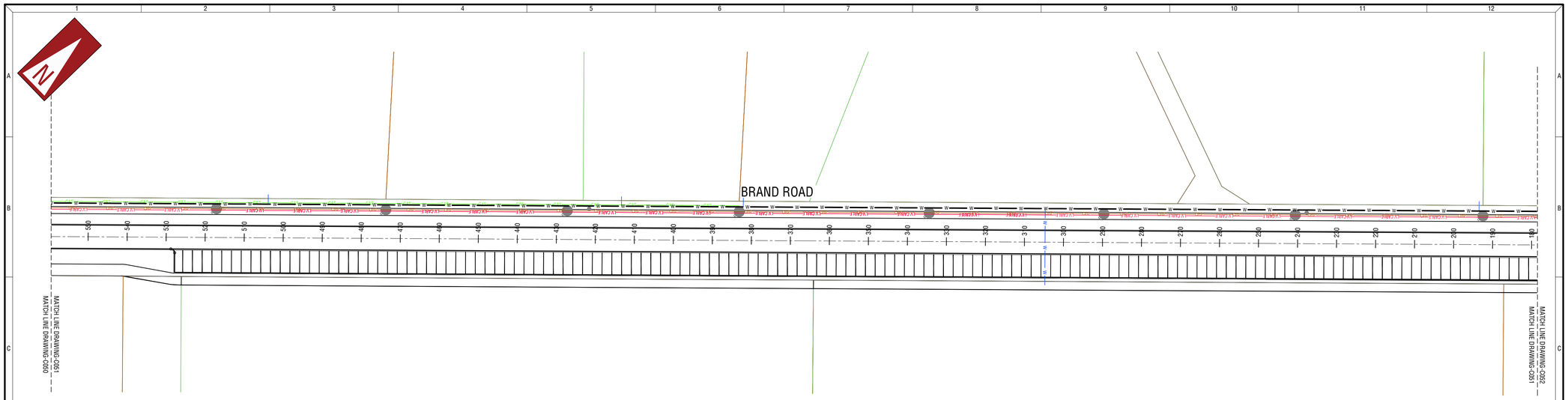

BRAND ROAD
SCALE 1:500

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DRAFTER	DRAFTING CHECK	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
D. CENGAJ	C. KLEYWEG		
DESIGNED	DESIGN REVIEW		
F. BOROVIC	C. KLEYWEG		

TITLE
COMBINED SERVICES PLAN
BRAND ROAD
SHEET 2 OF 4

SHEET	DATUM	WAPC No.	PROJECT No.	DRAWING No.	REVISION
A1	PCG94	SCALE 1:500	KC00604.000	C051	C

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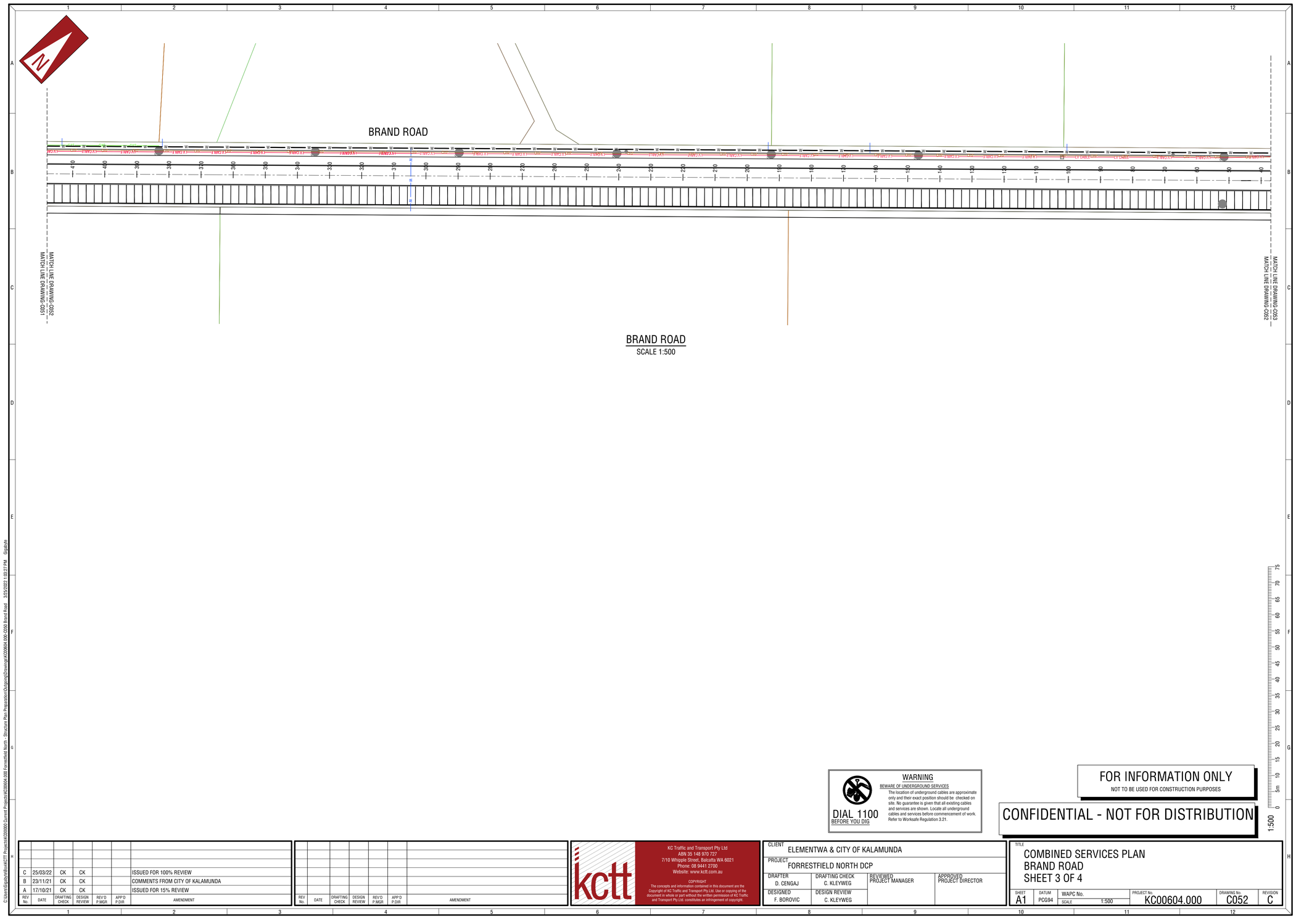

BRAND ROAD
SCALE 1:500

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PROJECT	FORRESTFIELD NORTH DCP
DRAFTER	D. CENGAJ
DRAFTING CHECK	C. KLEYWEG
REVIEWED	PROJECT MANAGER
APPROVED	PROJECT DIRECTOR
DESIGNED	F. BOROVIC
DESIGN REVIEW	C. KLEYWEG

TITLE
COMBINED SERVICES PLAN
BRAND ROAD
SHEET 3 OF 4

SHEET	DATUM	WAPC No.	PROJECT No.	DRAWING No.	REVISION
A1	PCG94	SCALE 1:500	KC00604.000	C052	C

1:500

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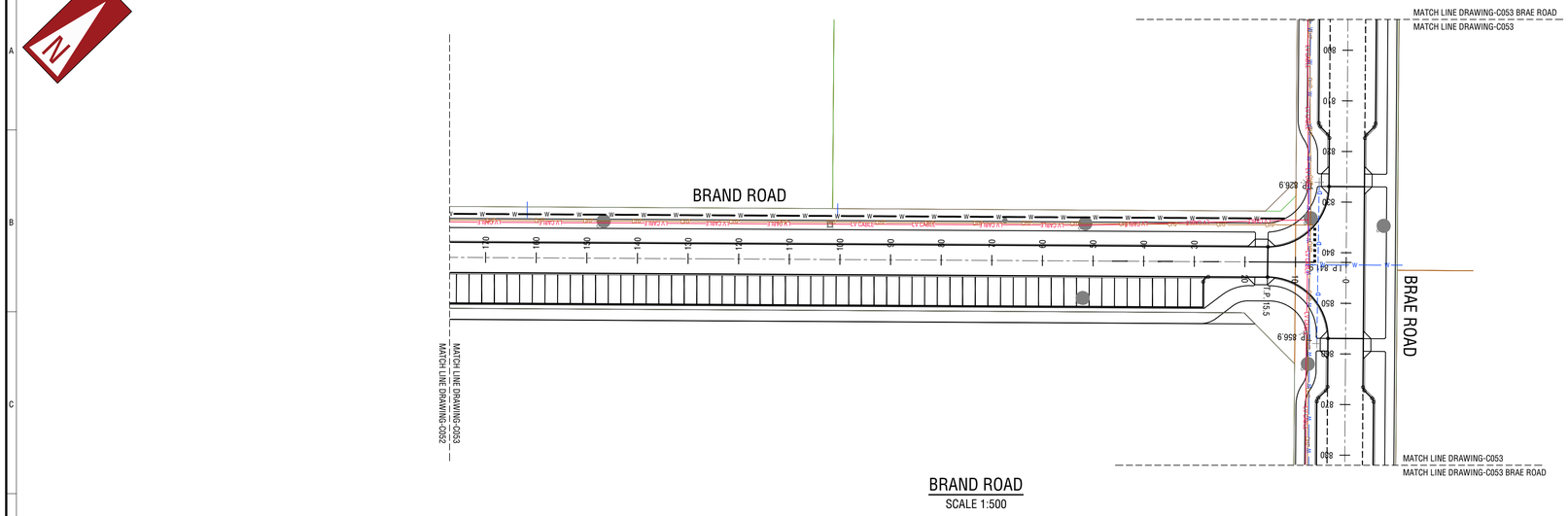

BRAND ROAD
SCALE 1:500

WARNING
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REV No.	DATE	DRAFTING CHECK	DESIGN REVIEW	REV'D P.MGR	APP'D P.DIR	AMENDMENT
C	25/03/22	CK	CK			ISSUED FOR 100% REVIEW
B	23/11/21	CK	CK			COMMENTS FROM CITY OF KALAMUNDA
A	17/10/21	CK	CK			ISSUED FOR 15% REVIEW

REV No.	DATE	DRAFTING CHECK	DESIGN REVIEW	REV'D P.MGR	APP'D P.DIR	AMENDMENT

KC Traffic and Transport Pty Ltd
ABN 35 148 970 727
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Phone: 08 9441 2700
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CLIENT: ELEMENTWA & CITY OF KALAMUNDA
PROJECT: FORRESTFIELD NORTH DCP

DRAFTER	DRAFTING CHECK	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
D. CENGAJ	C. KLEYWEG		
DESIGNED	DESIGN REVIEW		
F. BOROVIC	C. KLEYWEG		

TITLE
COMBINED SERVICES PLAN
BRAND ROAD
SHEET 4 OF 4

SHEET	DATUM	WAPC No.	PROJECT No.	DRAWING No.	REVISION
A1	PCG94	SCALE 1:500	KC00604.000	C053	C

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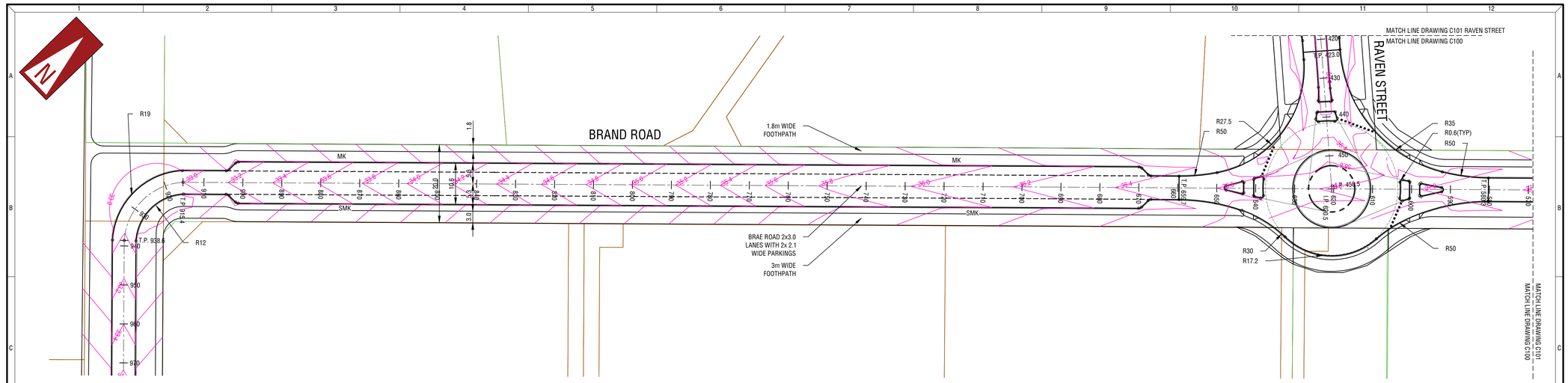

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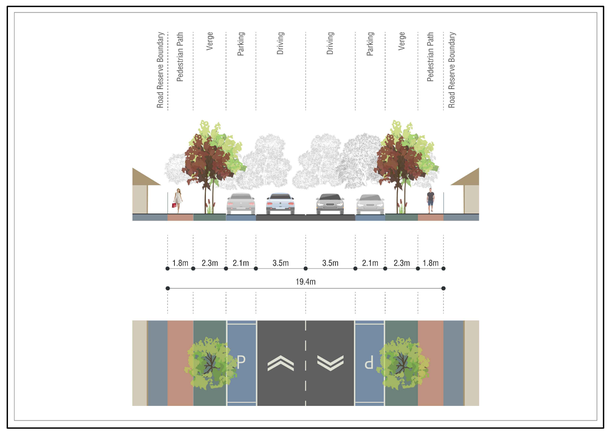
SCALE 1:500



NOTES

1. GENERAL
   - 1.1. LEVELS ARE REDUCED FROM A.H.D.
   - 1.2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL KC00604.000 DRAWINGS AND THE SPECIFICATION.
   - 1.3. THE CONTRACTOR SHALL LIMIT THE MOVEMENT OF EQUIPMENT AND MANPOWER TO THE MINIMUM AREA NECESSARY AND PROTECT ALL VEGETATION ON SITE.
   - 1.4. THE CONTRACTOR SHALL ENSURE THAT ALL LEVELS ARE SET-OUT BY LICENSED SURVEYOR.
   - 1.5. THE CONTRACTOR SHALL MAINTAIN ACCESS TO EXISTING RESIDENCES AT ALL TIMES THROUGHOUT THE ENTIRE CONSTRUCTION PROCESS.
   - 1.6. THE CONTRACTOR SHALL REPORT ANY DISCREPANCIES IN THE DESIGN DRAWINGS OR CLASHES WITH OTHER SERVICES AS SOON AS PRACTICALLY POSSIBLE TO THE SUPERINTENDENT.
2. ROADWORKS
   - 2.1. ALL CORNER SWEEPS SHALL BE 12.0m RADIUS KEYED UNLESS OTHERWISE SHOWN
   - 2.2. ALL KERBS WITH A RADIUS LESS THAN R40 NEED TO BE KEYED.
   - 2.3. ALL KERBS SHALL BE MOUNTABLE UNLESS OTHERWISE SHOWN.
   - 2.4. ALL SWEEPS SHALL BE SEMI-MOUNTABLE UNLESS OTHERWISE SHOWN.
   - 2.5. ALL PARKING BAY KERBING SHALL BE BARRIER UNLESS OTHERWISE SHOWN.
   - 2.6. PAVEMENT WIDTH SHALL BE AS SHOWN ON THE DRAWINGS AND SHALL BE MEASURED BETWEEN KERBS.
   - 2.7. ALL ROAD VERGES & DISTURBED AREAS SHALL BE STABILISED BY APPLICATION OF SEEDED HYDRO MULCH.
   - 2.8. THE CONTRACTOR SHALL SAW-CUT EXISTING PAVEMENT IN A STRAIGHT LINE REMOVE EXISTING KERB BETWEEN INTERSECTION SWEEPS AND MAKE SMOOTH CONNECTION.
   - 2.9. THE CONTRACTOR SHALL ENSURE IRRIGATION DUCTS ARE NOT TERMINATED UNDER FOOTPATHS.
   - 2.10. FOR ROAD PAVEMENTS AND KERB DETAILS, THE CONTRACTOR SHALL REFER TO STANDARD DRAWINGS.
   - 2.11. THE CONTRACTOR SHALL REINSTATE ALL PUBLIC OR PRIVATE WORKS OF ADJOINING LAND THAT HAS BEEN AFFECTED BY THE WORKS TO THE ORIGINAL OR SUPERIOR CONDITION OF ITS ORIGINAL STATE.
   - 2.12. EXISTING TEMPORARY TURNAROUND ON LOT 241 VIVID CHASE IS ASSUMED TO BE REMOVED BY OTHERS.

1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE CONTRACT DRAWINGS IN THEIR ENTIRETY AND THE SPECIFICATION.
2. PRIOR TO ANY ROAD CONSTRUCTION, ALL SITE AREAS SHALL BE CLEARED, AND ANY TOPSOIL SHALL BE STOCKPILED FOR USE IN SWALES AND BATTERS.
3. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SHOWN.
4. ALL LEVELS SHOWN ARE FINISHED SURFACE LEVELS AFTER FINAL WORKS.
5. SOIL STABILISATION TO BE AS DIRECTED.
6. DUST CONTROL TO BE THE RESPONSIBILITY OF THE CONTRACTOR.
7. VERGES SHALL BE GRADED TO SUIT THE EXISTING SURFACE LEVELS AT BOUNDARIES AND THE REQUIREMENTS FOR SWALES.
8. ALL DESIGN LEVELS AND SETOUT POINTS SHALL BE LOCATED FROM BENCH MARKS ESTABLISHED BY A LICENSED SURVEYOR.
9. THE CONTRACTOR SHALL CERTIFY THAT EARTHWORKS HAVE BEEN PLACED AND COMPACTED IN ACCORDANCE WITH THE DRAWINGS AND THE SPECIFICATIONS.
10. LEVELS ARE RELATIVE TO AHD.
11. THE CONTRACTOR SHALL OBTAIN UP-TO-DATE DBYD PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION.
12. FOR ANY SERVICES THAT WILL BE IMPACTED BY THE PROPOSED WIDENING, THE CONTRACTOR SHALL CONFIRM THE EXISTING DEPTH OF THE SERVICE AND THE ALIGNMENT IS SUITABLE FOR THE PROPOSED WORKS.
13. THE CONTRACTOR SHALL REINSTATE ALL EXISTING CROSSOVER THAT CONNECT AN EXISTING HABITED PROPERTY, OR ANY PROPERTY CAPABLE OF HABITATION.
14. BUS EMBAYMENTS AND BUS SHELTERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH TRANSPERTH / PUBLIC TRANSPORT AUTHORITY STANDARDS AND REQUIREMENTS.
15. THE CONTRACTOR SHALL CONFIRM THE LOCATION OF ALL ROAD RESERVE BOUNDARIES, AS THE LOCATION OF SOME BOUNDARIES ARE REQUIRED TO CHANGE AS A RESULT OF FUTURE LAND DEVELOPMENT CONDITIONS.

LEGEND

- CENTRELINE
- (MK) PROPOSED MOUNTABLE KERB
- (SMK) PROPOSED SEMI-MOUNTABLE KERB
- EXISTING ROAD
- GIVE WAY LINE
- PARKING ALIGNMENT (2.1m WIDTH U.N.O.)
- LANE LINE / SEPARATION LINE / EDGE LINE
- BROKEN LANE LINE (3m LINE WITH 6m SPACINGS)
- FOOTPATH (VARYING WIDTHS - REFER PLAN)
- TANGENT POINT
- PRAM RAMP (2.5m WIDE U.N.O.)
- ROAD WIDENING AND PAINT MARKING TO SUIT LARGER VEHICLE TURNING RADIUS
- ROUNDABOUT DESIGN GEOMETRY

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PROJECT: FORRESTFIELD NORTH DCP

DRAFTER	DRAFTING CHECK	REVIEWED	APPROVED
D. CENGAJ	C. KLEYWEG	PROJECT MANAGER	PROJECT DIRECTOR
DESIGNED	DESIGN REVIEW		
F. BOROVIC	C. KLEYWEG		

TITLE
ROAD LAYOUT PLAN
BRAND ROAD
SHEET 1 OF 4

SHEET	DATUM	WAPC No.	PROJECT No.	DRAWING No.	REVISION
A1	PCG94	SCALE 1:500	KC00604.000	C100	C

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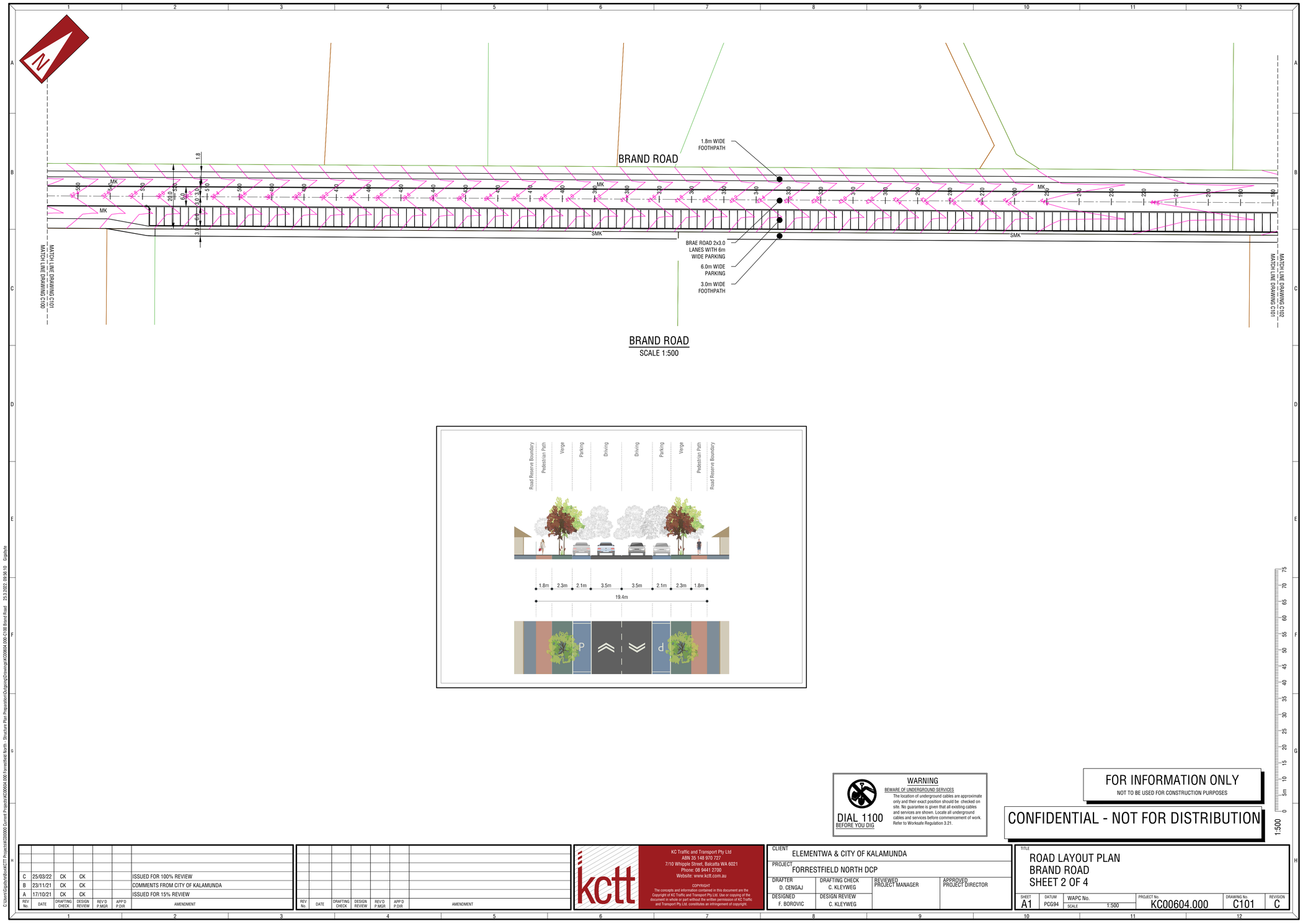

BRAND ROAD
SCALE 1:500

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CLIENT: ELEMENTWA & CITY OF KALAMUNDA			
PROJECT: FORRESTFIELD NORTH DCP			
DRAFTER: D. CENGAJ	DRAFTING CHECK: C. KLEYWEG	REVIEWED: PROJECT MANAGER	APPROVED: PROJECT DIRECTOR
DESIGNED: F. BOROVIC	DESIGN REVIEW: C. KLEYWEG		

TITLE
ROAD LAYOUT PLAN
BRAND ROAD
SHEET 2 OF 4

SHEET	DATUM		PROJECT No.	DRAWING No.	REVISION
A1	PCG94	WAPC No.	KC00604.000	C101	C
		SCALE 1:500			

1:500

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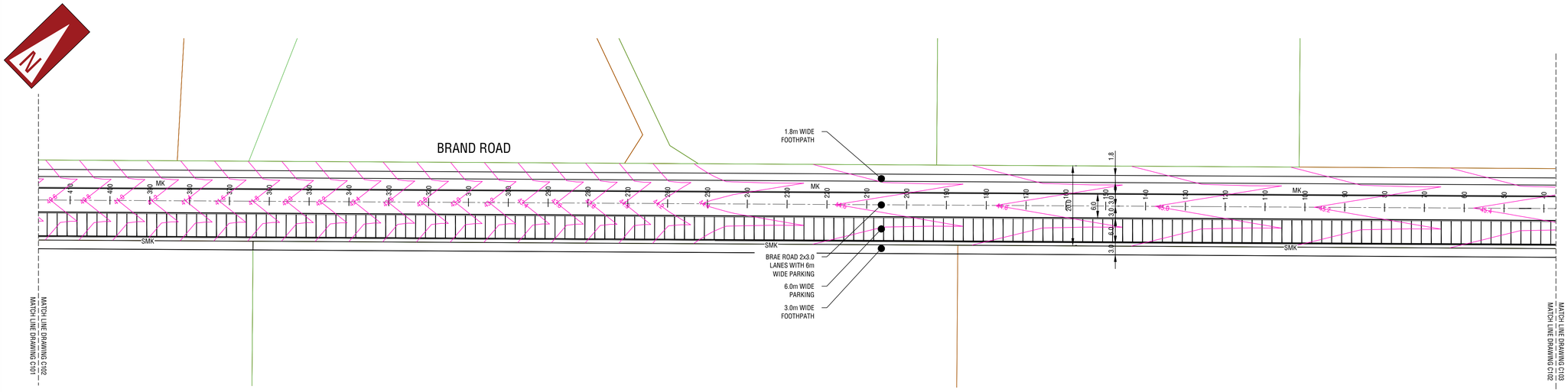

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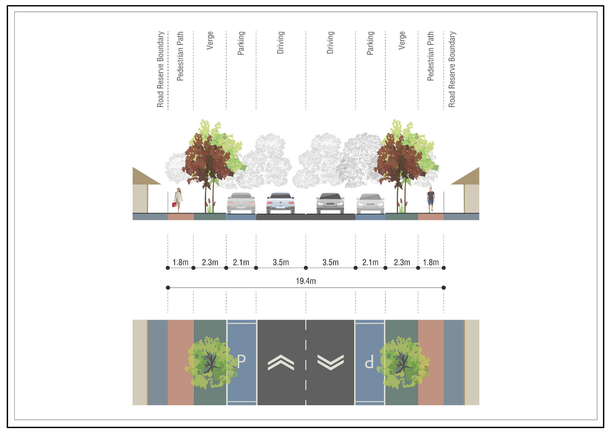

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PROJECT: FORRESTFIELD NORTH DCP

DRAFTER	DRAFTING CHECK	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
D. CENGAJ	C. KLEYWEG		
DESIGNED	DESIGN REVIEW		
F. BOROVIC	C. KLEYWEG		

TITLE
ROAD LAYOUT PLAN
BRAND ROAD
SHEET 3 OF 4

SHEET	DATUM	WAPC No.	PROJECT No.	DRAWING No.	REVISION
A1	PCG94	SCALE 1:500	KC00604.000	C102	C

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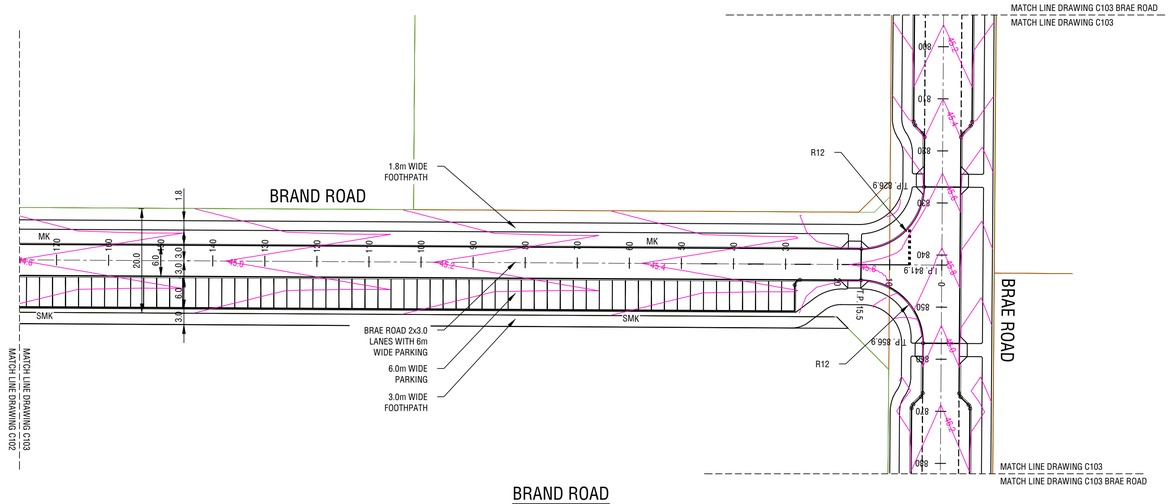
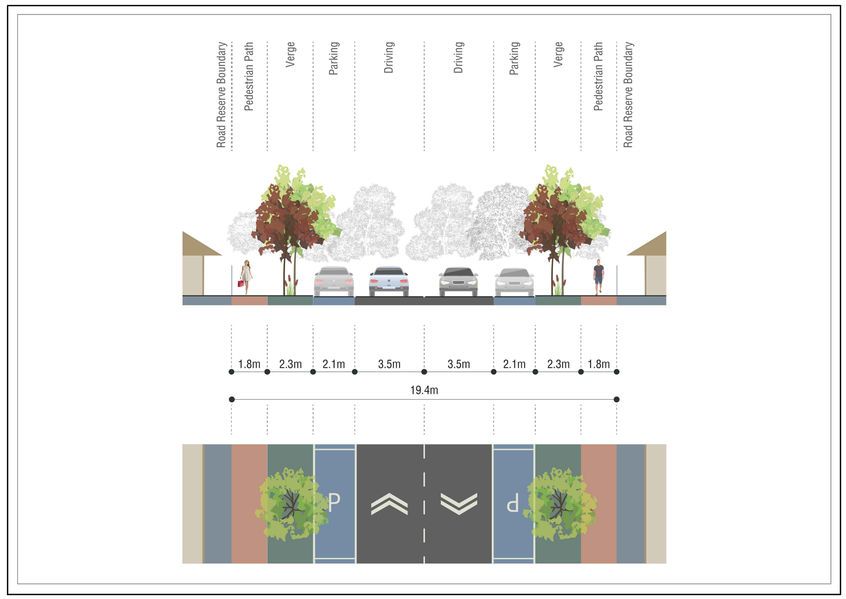


BRAND ROAD
SCALE 1:500



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PROJECT: FORRESTFIELD NORTH DCP

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D. CENGAJ	C. KLEYWEG		
DESIGNED	DESIGN REVIEW		
F. BOROVIC	C. KLEYWEG		

TITLE
ROAD LAYOUT PLAN
BRAND ROAD
SHEET 4 OF 4

SHEET	DATUM	WAPC No.	PROJECT No.	DRAWING No.	REVISION
A1	PCG94	SCALE 1:500	KC00604.000	C103	C

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SULTANA ROAD WEST

MATCH LINE DRAWING C051-SULTANA ROAD WEST
MATCH LINE DRAWING C052-MILNER ROAD

MATCH LINE DRAWING C052
MATCH LINE DRAWING C051

PLAN
SCALE 1:500

LEGEND

- PROPOSED REINFORCED MOUNTABLE KERB
- PROPOSED SEMI-MOUNTABLE KERB
- PROPOSED CENTRELINE
- EXISTING ROAD AND EXISTING CENTRELINE
- PROPOSED SEWER MAIN LAYOUT
- PROPOSED DRAINAGE MAIN LAYOUT
- EXISTING DRAINAGE PIT
- PROPOSED SUBSOIL DRAINAGE
- EXISTING DRAINAGE MAIN LAYOUT
- EXISTING WATER MAIN LAYOUT
- EXISTING SEWER MAIN LAYOUT
- EXISTING LOW VOLTAGE POWER LINE
- CONTOURS DESIGN
- EXISTING DRAINAGE MAIN LAYOUT
- EXISTING DRAINAGE PIT
- EXISTING OVERHEAD POWER
- EXISTING OVERHEAD POWER POLE
- EXISTING FIBRE OPTIC / COMMUNICATIONS CABLE
- DBNGP GAS MAIN
- EXISTING TELSTRA PIT

1:500

WARNING

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CLIENT	ELEMENTWA & CITY OF KALAMUNDA		
PROJECT	FORRESTFIELD NORTH DCP		
DRAFTER D. CENGAJ	DRAFTING CHECK C. KLEYWEG	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
DESIGNED F. BOROVIC	DESIGN REVIEW C. KLEYWEG		

TITLE
COMBINED SERVICES PLAN
SULTANA ROAD WEST
SHEET 2 OF 4

SHEET	DATUM	WAPC No.	PROJECT No.	DRAWING No.	REVISION
A1	PCG94	SCALE 1:500	KC00604.000	C051	C

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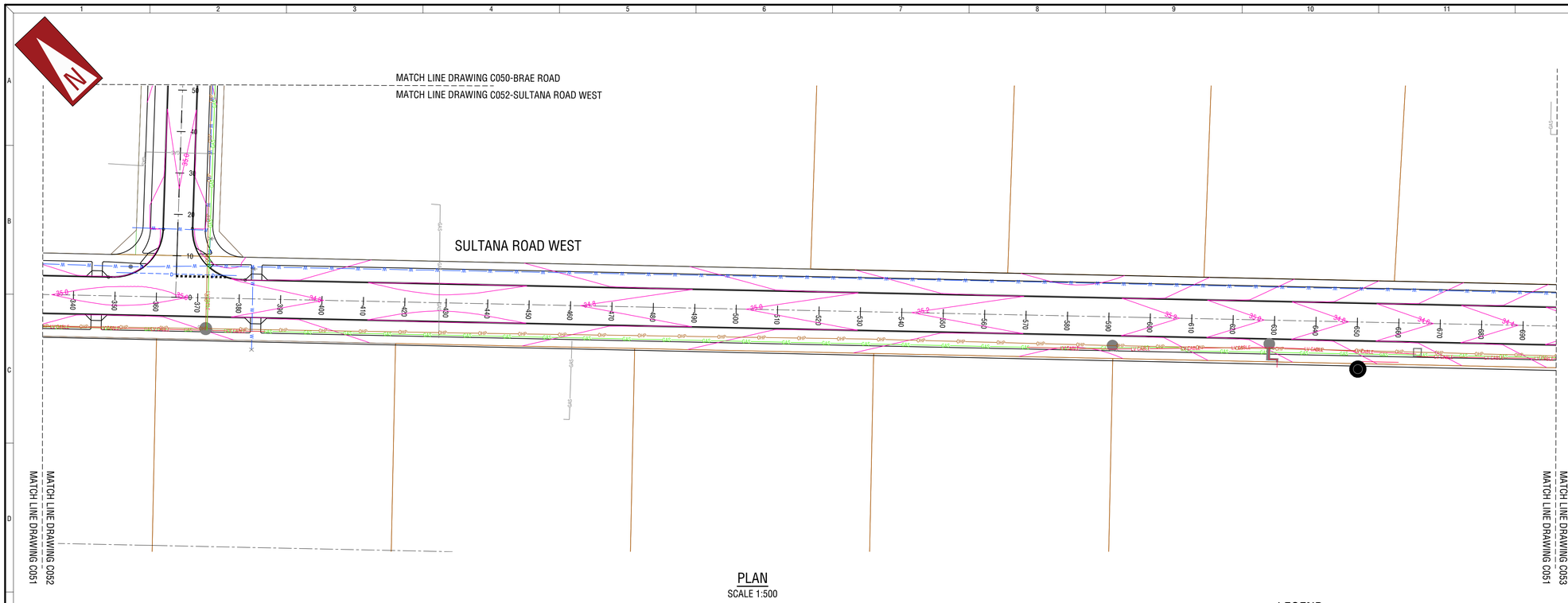

PLAN
SCALE 1:500

LEGEND

- PROPOSED REINFORCED MOUNTABLE KERB
- PROPOSED SEMI-MOUNTABLE KERB
- PROPOSED CENTRELINE
- EXISTING ROAD AND EXISTING CENTRELINE
- PROPOSED SEWER MAIN LAYOUT
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- EXISTING DRAINAGE MAIN LAYOUT
- EXISTING WATER MAIN LAYOUT
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DESIGNED	DESIGN REVIEW		
F. BOROVIC	C. KLEYWEG		

TITLE
COMBINED SERVICES PLAN
SULTANA ROAD WEST
SHEET 3 OF 4

SHEET	DATUM	WAPC No.	PROJECT No.	DRAWING No.	REVISION
A1	PCG94	SCALE 1:500	KC00604.000	C052	C

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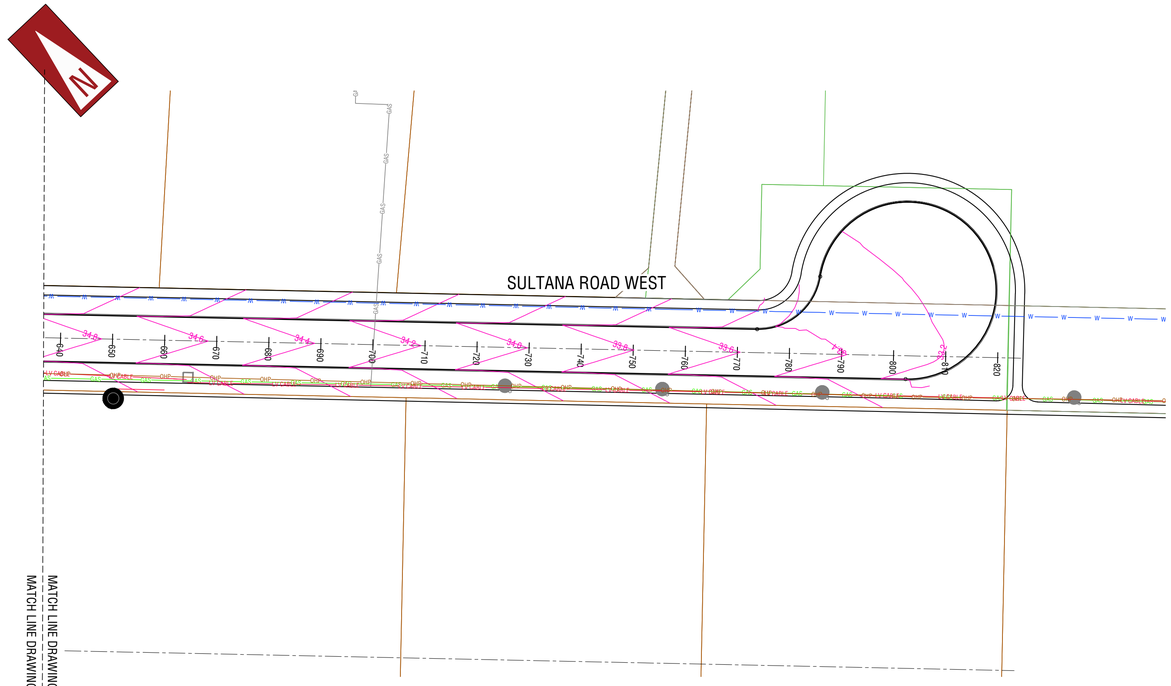

PLAN
SCALE 1:500

LEGEND

- PROPOSED REINFORCED MOUNTABLE KERB
- PROPOSED SEMI-MOUNTABLE KERB
- PROPOSED CENTRELINE
- EXISTING ROAD AND EXISTING CENTRELINE
- PROPOSED SEWER MAIN LAYOUT
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- CONTOURS DESIGN
- EXISTING DRAINAGE MAIN LAYOUT
- EXISTING DRAINAGE PIT
- EXISTING OVERHEAD POWER
- EXISTING OVERHEAD POWER POLE
- EXISTING FIBRE OPTIC / COMMUNICATIONS CABLE
- DBNGP GAS MAIN
- EXISTING TELSTRA PIT

WARNING
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C	25/03/22	CK	CK			ISSUED FOR 100% REVIEW
B	23/11/21	CK	CK			COMMENTS FROM CITY OF KALAMUNDA
A	17/10/21	CK	CK			ISSUED FOR 15% REVIEW

REV No.	DATE	DRAFTING CHECK	DESIGN REVIEW	REV'D P.MGR	APP'D P.DIR	AMENDMENT

KC Traffic and Transport Pty Ltd
ABN 35 148 970 727
7/10 Whipple Street, Balcatta WA 6021
Phone: 08 9441 2700
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CLIENT: ELEMENTWA & CITY OF KALAMUNDA
PROJECT: FORRESTFIELD NORTH DCP

DRAFTER	DRAFTING CHECK	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
D. CENGAJ	C. KLEYWEG		
DESIGNED	DESIGN REVIEW		
F. BOROVIC	C. KLEYWEG		

TITLE
COMBINED SERVICES PLAN
SULTANA ROAD WEST
SHEET 4 OF 4

SHEET	DATUM	WAPC No.	PROJECT No.	DRAWING No.	REVISION
A1	PCG94	SCALE 1:500	KC00604.000	C053	C

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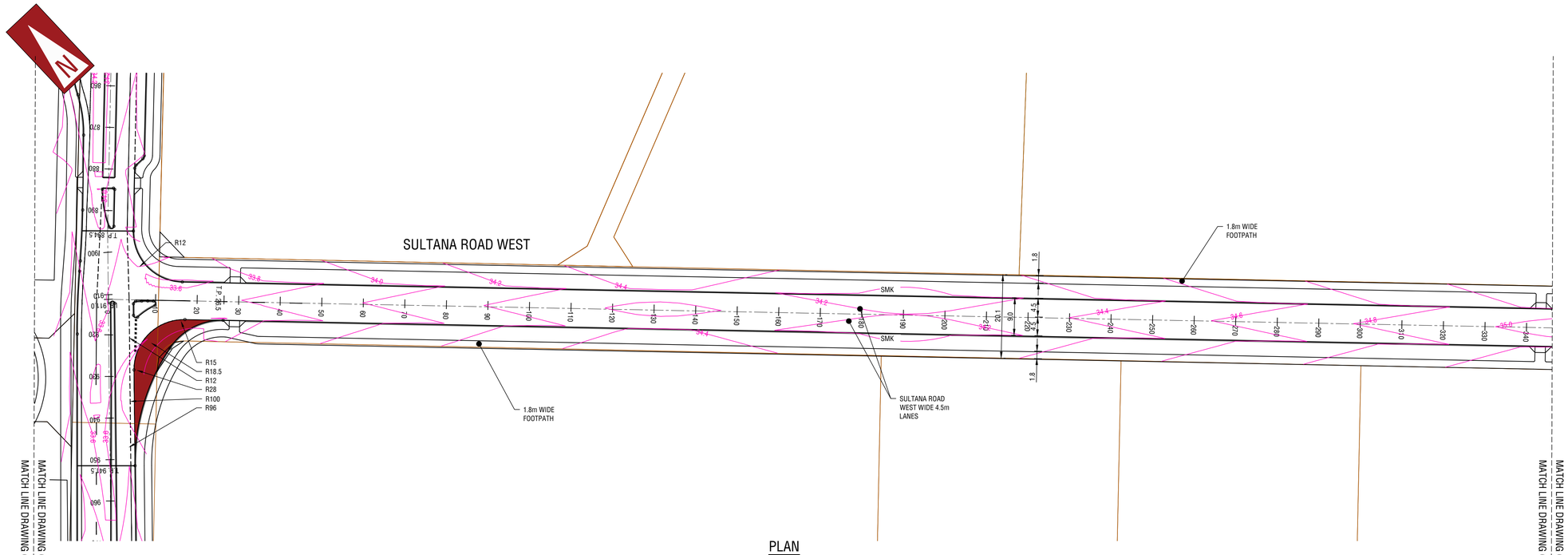

PLAN
SCALE 1:500

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PROJECT: FORRESTFIELD NORTH DCP

DRAFTER	DRAFTING CHECK	REVIEWED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
D. CENGAJ	C. KLEYWEG		
DESIGNED	DESIGN REVIEW		
F. BOROVIC	C. KLEYWEG		

TITLE
ROAD LAYOUT PLAN
SULTANA ROAD WEST
SHEET 2 OF 4

SHEET	DATUM	WAPC No.	PROJECT No.	DRAWING No.	REVISION
A1	PCG94	SCALE 1:500	KC00604.000	C101	C

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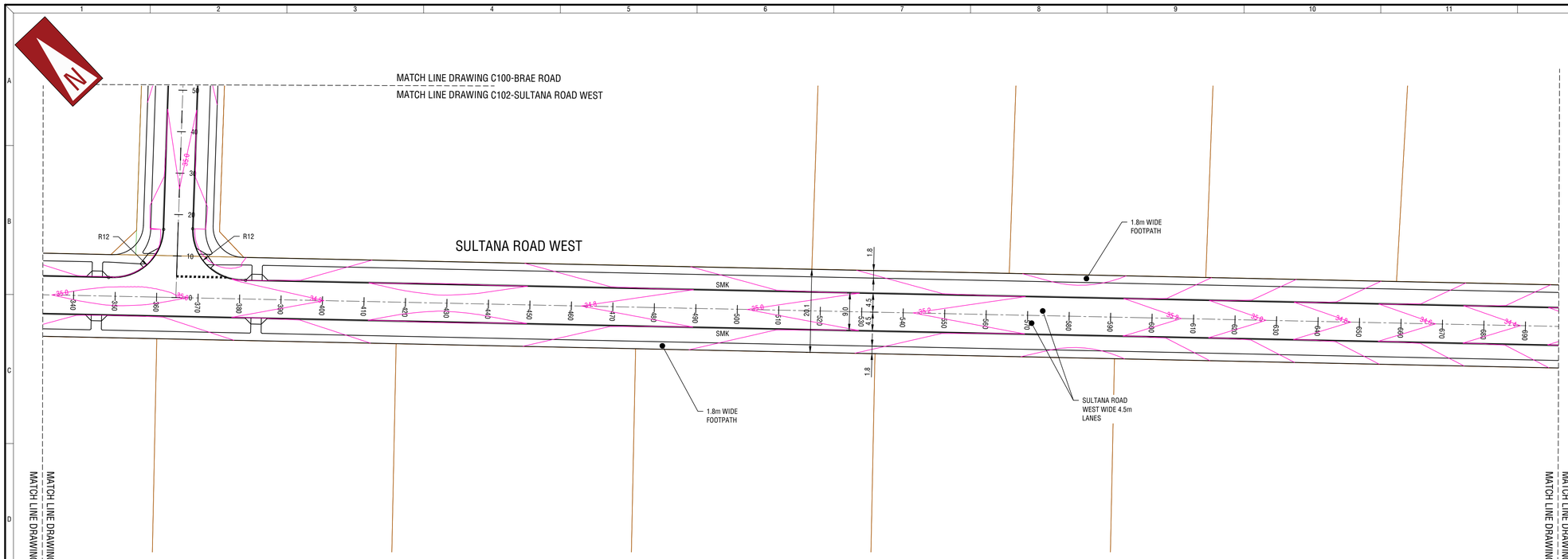

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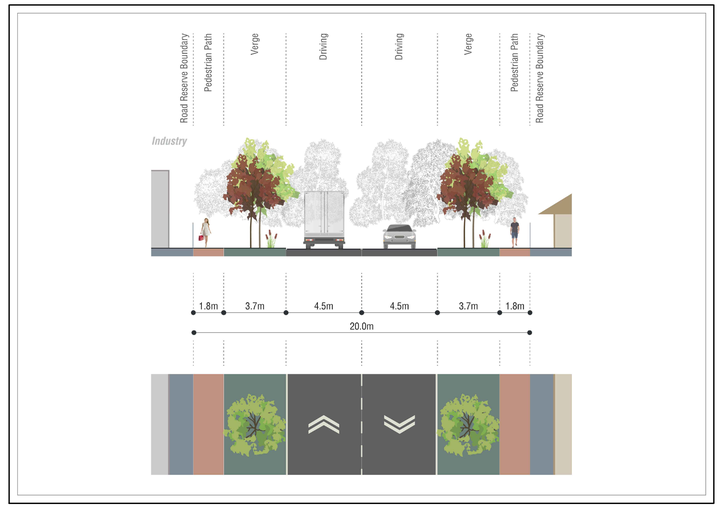

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D. CENGAJ	C. KLEYWEG		
DESIGNED	DESIGN REVIEW		
F. BOROVIC	C. KLEYWEG		

TITLE
ROAD LAYOUT PLAN
SULTANA ROAD WEST
SHEET 3 OF 4

SHEET	DATUM	WAPC No.	PROJECT No.	DRAWING No.	REVISION
A1	PCG94	SCALE 1:500	KC00604.000	C102	C

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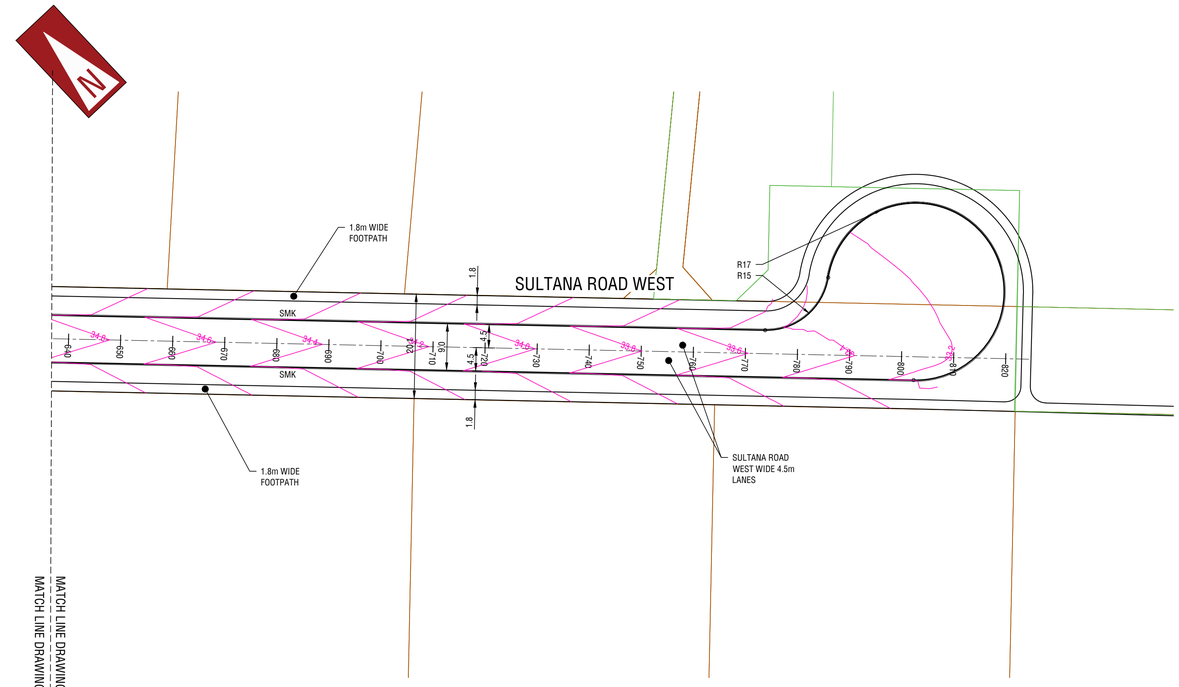

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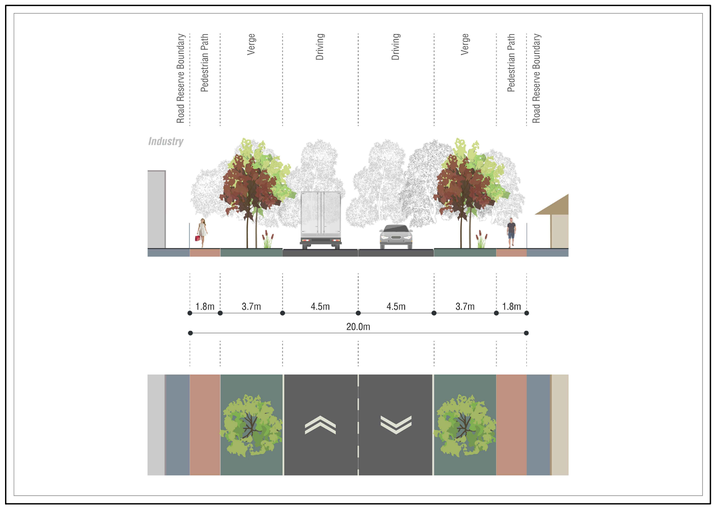

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PROJECT: FORRESTFIELD NORTH DCP

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DESIGNED	DESIGN REVIEW		
F. BOROVIC	C. KLEYWEG		

TITLE
ROAD LAYOUT PLAN
SULTANA ROAD WEST
SHEET 4 OF 4

SHEET	DATUM	WAPC No.	PROJECT No.	DRAWING No.	REVISION
A1	PCG94	SCALE 1:500	KC00604.000	C103	C

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Appendix E – POS Designs

LEGEND

LAND USE

- LSP Boundary
- Subject POS Site Boundary
- Existing contours
- Built form
- Existing tree canopy
- Bush Forever Lot
- Environmental Conservation Lot
- Conservation Category Wetland 50m Buffer

DRAINAGE

To be read in conjunction with the accompanying cost plan summary

- Drainage basin 1:100 year average recurrence interval (ARI)
- Drainage basin 1:10 year ARI
- Drainage basin 1:5 year ARI
- Drainage basin 1:1 year ARI

SURFACE TREATMENTS

To be read in conjunction with the accompanying cost plan summary

- Turf
- Irrigated planting
- Nutrient-stripping vegetation (estimated by others)
- Revegetation
- Supplementary planting to existing vegetation
- Concrete unit paving
- Gravel path
- Concrete path
- Concrete maintenance edge

ELEMENTS

To be read in conjunction with the accompanying cost plan summary

- Proposed tree
- Shelter (small)
- Shelter (large)
- Nature play elements
- Play elements
- Photovoltaic lighting
- Drink fountain
- Interpretive signage
- Universally accessible electric barbeque and picnic table
- Bin enclosure (Litter, recycling and FOGO)
- Bench seating
- Bollards (removeable to paths)
- Black chainwire fencing to Env. Conservation lots and dog exercise areas
- Water hose cock
- Electricity supply box
- Lookout
- Dog exercise area with bag dispenser
- Accessible self-cleaning WC



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FFN DCP POS COSTINGS | POS Masterplan | N | Client: The City of Kalamunda | Date: 2/11/2021 | Scale: NOT TO SCALE | **L01A**

Forrestfield represents an opportunity to plan for open space of quality in both design and resilience. To achieve this requires an open space network that works harder, with more complexity and adaptability, whilst maintaining expectations of open space functionality and provision.

Design principles

Through site analysis, baseline research and benchmarking a series of themes have been established shown in the diagram above. The themes inform a set of design principles that guide the development of each new open space.

Urban Forest

Trees have always been an important component of open space, however, as urban areas grapple with the impacts of increasing temperatures, they are needed now more than ever for urban cooling. The open space design will identify where open space can support the growth of an urban forest.

Creating a cool environment

1. Support tree canopy cover targets across open space
2. Protect and enhance existing tree planting in, around and between open space
3. Ensure a net gain of trees across open space.

Growing a healthy and resilient forest

4. Support tree planting through passive irrigation using stormwater
5. Provide quality soil volumes and median for healthy tree growth or provide appropriate species for existing soil conditions
6. Integrate future-proofing research into species selection that can adapted to forecast climatic changes.
7. Protect trees against pest or disease attack or extreme heat events.
8. Improve understorey to increase insect/bird diversity and reduce risk of pest and insect attack.

Growing a diversity of tree species

9. Optimise cooling through a mix of tree species with different canopy habit, height and form
10. Diversify tree species, genus, age and growth rate
11. Plant trees communally with under story planting where possible
12. Consider tree origin. Broad leaf exotics often provide greater shade and benefit to daily thermal comfort, however native trees support greater biodiversity, increase carbon capture and reduce leaf litter.

Integrating trees into the urban setting

13. Ensure tree planting avoids infrastructure clashes. If clashes are unavoidable, investigate whether infrastructure can be removed, relocated or reconfigured to create sufficient space for trees.
14. Ensure appropriate area for root zone establishment and protection is planned, designed and implemented.
15. Understand how tree planting will integrate with the surrounding context, build on the character of open space and adds value for the community.

Providing connected cool routes

16. Improve sun safety, health and wellbeing through the provision of shaded walking and cycling routes to, through and between open space
17. Align tree planting with ecological connections between habitat areas
18. Route orientation - trees on the south side of east-west routes and the east side on north-south routes will provide the greatest shade benefit.

Ecological

Successful urban ecology is often defined by two main spatial typologies; healthy habitat areas, and a strong network of ecological connections. In urban areas most habitat areas are found in open space. Open Space will deliver a net increase in ecological values (this could be species diversity, lifeforms, landscape types, size of patch, habitats) and develop a more ecologically connected open space network.

Liveable Neighbourhoods Objective

- *To ensure the provision of adequate land to protect, and to provide public access to, river, creek, lake and ocean foreshores.*

Increasing healthy habitat area

1. Maintain habitat and habitat health in all open space
2. Integrate green infrastructure in place of hard infrastructure where possible
3. Expand on existing core habitat by providing buffer areas

Developing habitat complexity

4. Include a multi layered habitat complexity in all open space
5. Manage open space with ecological complexity in mind e.g. natural mulch, rocks, logs, native plants of many lifeforms, retaining dead trees, allowing seasonal standing water or fine branches and leaf litter to accumulate.

Protecting and enhancing ecology

6. Restore, protect and enhance natural assets within open space
7. Exclusively native planting apart from turfed areas
8. Ensure compatibility between human open space uses and nature, such as lighting, noise and human activity

Improving ecological connectivity

9. Understand where links to and between open space should be improved or created for ecological connectivity
10. Increase tree and understorey planting along ecological corridors.

Encouraging community participation

11. Provide greater community access to and encounters with nature to improve social resilience and wellbeing
12. Provide a balance between conservation and active and passive recreational uses in open space;

Social

Open Space is where we meet, celebrate, gather, play, meditate, stay active and is an important part of our shared living experience. Providing a range of social and recreational experiences and settings in open space is critical in supporting a tolerant, diverse and inclusive community.

Liveable Neighbourhoods Objective

- *To ensure that public open space of appropriate quality and quantity is provided in a timely manner to contribute towards the recreational and social needs of the community in appropriate locations.*
- *To facilitate the provision of land for community facilities where appropriate, as part of land ceded for public open space.*
- *To provide public open space that is safe and overlooked by nearby buildings.*
- *To facilitate the provision of the public open space contribution and its development as part of the subdivision process and to enhance local amenity.*
  To provide a practical cash-in-lieu mechanism for open space allocation and improvements
- *To provide for regional variations that best reflect local community requirements.*

Providing open space appropriate to its context

1. Develop a network of integrated open space that support community hubs
2. Celebrate reconciliation, belonging and coexistence through socially inclusive open space
3. Deliver unique open space, in line with neighbourhood character
4. Ensure open space is universal in design and inclusive
5. Provide safe open space that responds to safety by design standards.
6. Maintain clear sight lines for overlooking nearby buildings for visual surveillance.

Creating a network of open space settings and uses

7. Provide flexible open space appropriate for multi-use that works harder for the community
8. Provide divers open space uses.

Incorporating open space amenity

9. Provide local children's play that is reflective of the development structure, including small local parks or special purpose parks
10. Develop facilities for teenagers and young adults
11. Incorporate shade, seating, and drinking water in open spaces where possible.
12. Provide resting places for the elderly or disabled people in appropriate circumstances

Enhancing sport and recreation facilities

13. Prepare for new and emerging open space trends in sports, recreation and leisure
14. Develop the multipurpose nature and shared use of sport, recreation and leisure assets to maximise usage
15. Provide for district parks for a combination of passive (informal play areas) and active (formal playing fields)
16. Provide for neighbourhood parks for active (informal play areas) and passive use

Hydrological

In understanding the influence of urban development on the natural hydrological systems there is growing need for open space to play a role in supporting stormwater and flood water management with the additional of improved water quality, urban greening and cooling outcomes. Open space has the capacity to become a blue-green network.

Liveable Neighbourhoods Objective

- *To integrate urban water management functions with public open space.*
- *To protect and conserve margins of watercourses, water bodies and wetlands and establish public foreshores along the coast and watercourses adjacent to urban development.*

Harvesting stormwater in open space

1. Incorporate drainage wherever practicable using contemporary urban water management principles
2. Ensure open space is identified within a catchment and opportunities for stormwater harvesting integrated appropriately
3. Improve water security by harvesting and irrigating open space through passive irrigation using stormwater run-off
4. Accommodate water-sensitive urban design in open space where usability for recreation purposes has not been compromised or where conservation values are enhanced.
5. Use sports grounds and passive recreational areas as part of the urban water management system to provide temporary detention areas during storm events.
6. Use open space for the detention of storm water during and immediately following a greater than five year average recurrence interval
7. Use restricted open space for the detention of stormwater for a greater than one year average recurrence interval.

Improving water quality through open space

8. Cleanse stormwater on the surface through natural filtration processes
9. Identify adjacent catchment stormwater that can be cleansed in open space before being released into the wider stormwater network.

Using water for urban cooling

10. Increase evapo-transpiration by managing water on the surface, exploring soil capillary rise systems and enabling irrigation during the peak summer periods
11. Use stormwater to irrigate trees supporting healthy canopy shade

Improving permeability open space

12. Reduce the use of impermeable surfaces
13. Naturalise stormwater drains and increase surface permeability to retain more water in open space.

Movement & Access

A network of well distributed, accessible and functional open space also needs to be well-connected. The public and active transport systems provide sustainable connections to and between open space. Networks can occur along street, laneways, drainage lines, environmental corridors and through open space.

Liveable Neighbourhoods Objective

- *To ensure that public open space is integrated into the urban structure to produce both land use efficiency and long-term sustainability.*

Ensuring safe travel through and to open space

1. Provide cool routes for thermal comfort and sun protection
2. Safely connect pedestrians to open space across vehicular routes Link bike lanes to open space
3. Provide a clear path hierarchy within open space for cyclists and pedestrians.
4. Support legibility of the urban environment and the establishment of neighbourhood identity by incorporating natural and cultural features and landmarks;

Prioritising sustainable transport and infrastructure

5. Make walking and cycling and other modes of active transport the easiest, most desirable option to travel to open space
6. Allow the use of open space to produce seamless connections and incorporate land for connected or linear open space for walking and cycling;
7. Provide bicycle parking in all open space
8. Provide high quality, sustainable pathways for cyclist and pedestrians in open space.

Sustainability

While materials choice needs careful thought, it is important to also consider the bigger picture. Materials are just one piece of the sustainability puzzle and need to be balanced with many other issues such as energy performance, water use, asset upkeep, sense of place and social and ecological impacts. Making the 'right' material choice for public open space is no longer based purely on structural efficiency but a balance across a number of different factors.

SPP 7.0 Design of the Built Environment - Measure 5

- *Good design optimises the sustainability of the built environment, delivering positive environmental, social and economic outcomes*

Materials, furniture and assets

1. Ensure efficient design and material specification to reduce the demand for excess material use thus equating to a lower environmental impact.
2. Select materials that are fit for purpose and durable - In addition to meeting the necessary structural performance criteria (eg strength and deflection), materials selection should consider materials that require minimal maintenance, and which can accommodate future adaptation, significantly reducing its environmental impact during its lifetime.
3. Use lifecycle analysis and environmental product declarations to assess the likely cradle to grave impact of a building material to ensure low environmental impact, low embodied energy, capacity to store carbon and use of recycled content. This will include issues such as consumption of raw resources, embodied carbon, water consumption, pollution impacts, etc.
4. Thought should be given to specification of materials that are appropriate given the environmental conditions and skills of the local labour force.
5. As well as selecting the most appropriate material it is important to consider the chain of custody and responsible sourcing of materials and the environmental credentials of the product supplier. This includes certification of timber to ensure that it has come from a legal source and responsibly managed forests.
6. Consideration should be given to how the structure will be constructed to ensure that construction waste is minimised eg through use of pre-fabrication and standard material units.
7. Consider the end of life (deconstruction) management of materials, first to whether materials can be reused in their original form, repurposed or, where this is not possible, how they can be recycled in a manner that limits future waste going to landfill to an absolute minimum.
8. Source materials as locally as possible to reduce transportation and reference the existing site reinforcing the sense of place tied to the local area.

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FFN DCP POS COSTINGS | POS Concept Plan | N | Client: The City of Kalamunda | Date: 2/11/2021 | Scale: N/A | **L02A**

LEGEND

LAND USE

- LSP Boundary
- Subject POS Site Boundary
- Existing contours
- Built form
- Existing tree canopy
- Bush Forever Lot
- Environmental Conservation Lot
- Conservation Category Wetland 50m Buffer

DRAINAGE

To be read in conjunction with the accompanying cost plan summary

- Drainage basin 1:100 year ARI
- Drainage basin 1:5 year ARI

SURFACE TREATMENTS

To be read in conjunction with the accompanying cost plan summary

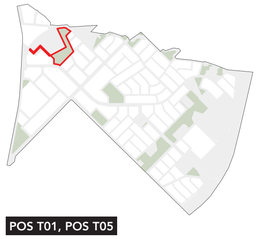
- Turf
- Irrigated planting
- Nutrient-stripping vegetation (estimated by others)
- Revegetation
- Supplementary planting to existing vegetation
- Gravel path
- Concrete path
- Concrete maintenance edge

ELEMENTS

To be read in conjunction with the accompanying cost plan summary

- Proposed tree
- Shelter (large)
- Nature play elements
- Play elements
- Photovoltaic lighting
- Drink fountain
- Interpretive signage
- Universally accessible electric barbeque and picnic table
- Bin enclosure (Litter, recycling and FOGO)
- Bench seating
- Bollards (removable to paths)
- Fencing
- Water hose cock
- Lookout
- Directional signage





POS T01, POS T05

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FFN DCP POS COSTINGS | POS Concept Plan | N | Client: The City of Kalamunda | Date: 2/11/2021 | Scale: 1:750 @ A1 | **L03A**

LEGEND

LAND USE

- LSP Boundary
- Subject POS Site Boundary
- Existing contours
- Built form
- Existing tree canopy

DRAINAGE

To be read in conjunction with the accompanying cost plan summary

- Drainage basin 1:100 year average recurrence interval (ARI)
- Drainage basin 1:10 year ARI
- Drainage basin 1:5 year ARI

SURFACE TREATMENTS

To be read in conjunction with the accompanying cost plan summary

- Turf
- Irrigated planting
- Nutrient-stripping vegetation (estimated by others)
- Revegetation
- Supplementary planting to existing vegetation
- Concrete path
- Concrete maintenance edge

ELEMENTS

To be read in conjunction with the accompanying cost plan summary

- Proposed tree
- Photovoltaic lighting
- Bin enclosure (Litter, recycling and FOGO)
- Bench seating
- Bollards (removeable to paths)
- Directional signage





POS T07

Road network, building footprints & public open space: concept only

VREALM studios

FFN DCP POS COSTINGS | POS Concept Plan | N | Client: The City of Kalamunda | Date: 2/11/2021 | Scale: 1:500 @ A1 | **L04A**

LEGEND

LAND USE

- LSP Boundary
- Subject POS Site Boundary
- Existing contours
- Built form

DRAINAGE

To be read in conjunction with the accompanying cost plan summary

- Drainage basin 1:100 year average recurrence interval (ARI)
- Drainage basin 1:10 year ARI
- Drainage basin 1:5 year ARI
- Drainage basin 1:1 year ARI

SURFACE TREATMENTS

To be read in conjunction with the accompanying cost plan summary

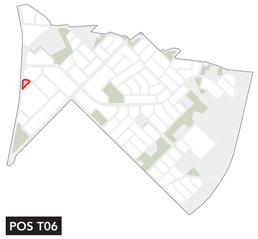
- Nutrient-stripping vegetation (estimated by others)
- Revegetation
- Gravel path

ELEMENTS

To be read in conjunction with the accompanying cost plan summary

- Photovoltaic lighting
- Bin enclosure (Litter, recycling and FOGO)
- Bench seating
- Bollards (removeable to paths)





POS T06

Road network, building footprints & public open space: concept only

REALM studios

FFN DCP POS COSTINGS | POS Concept Plan | N | Client: The City of Kalamunda | Date: 2/11/2021 | Scale: 1:250 @ A1 | **L05A**

LEGEND

LAND USE

- Subject POS Site Boundary
- Existing contours
- Built form
- Existing tree canopy

DRAINAGE

To be read in conjunction with the accompanying cost plan summary

- Drainage basin 1:100 year average recurrence interval (ARI)
- Drainage basin 1:5 year ARI
- Drainage basin 1:1 year ARI

SURFACE TREATMENTS

To be read in conjunction with the accompanying cost plan summary

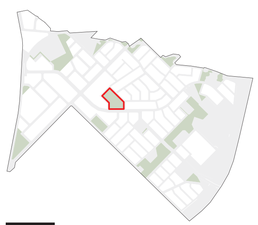
- Turf
- Irrigated planting
- Nutrient-stripping vegetation (estimated by others)
- Revegetation
- Supplementary planting to existing vegetation
- Concrete unit paving
- Concrete path
- Concrete maintenance edge

ELEMENTS

To be read in conjunction with the accompanying cost plan summary

- Proposed tree
- Shelter (large)
- Play elements
- Photovoltaic lighting
- Drink fountain
- Interpretive signage
- Universally accessible electric barbeque and picnic table
- Bin enclosure (Litter, recycling and FOGO)
- Bench seating
- Bollards (removeable to paths)
- Fencing
- Water hose cock
- Electricity supply box
- Directional signage
- Accessible self-cleaning WC





POS 08

Road network, building footprints & public open space: concept only

REALM studios

FFN DCP POS COSTINGS | POS Concept Plan | N | Client: The City of Kalamunda | Date: 2/11/2021 | Scale: 1:500 @ A1 | **L06A**

LEGEND

LAND USE

- LSP Boundary
- Subject POS Site Boundary
- Existing contours
- Built form
- Existing tree canopy

DRAINAGE

To be read in conjunction with the accompanying cost plan summary

- Drainage basin 1:100 year average recurrence interval (ARI)
- Drainage basin 1:5 year ARI
- Drainage basin 1:1 year ARI

SURFACE TREATMENTS

To be read in conjunction with the accompanying cost plan summary

- Turf
- Irrigated planting
- Nutrient-stripping vegetation (estimated by others)
- Revegetation
- Supplementary planting to existing vegetation
- Concrete path
- Concrete maintenance edge

ELEMENTS

To be read in conjunction with the accompanying cost plan summary

- Proposed tree
- Photovoltaic lighting
- Bench seating
- Bollards (removeable to paths)
- Fencing
- Dog exercise area with bag dispenser
- Directional signage





DB 06

REALM studios

FFN DCP POS COSTINGS | POS Concept Plan | N | Client: The City of Kalamunda | Date: 2/11/2021 | Scale: 1:500 @ A1 | **L07A**

LEGEND

LAND USE

- LSP Boundary
- Subject POS Site Boundary
- Existing contours
- Built form
- Existing tree canopy
- Environmental Conservation Lot

SURFACE TREATMENTS

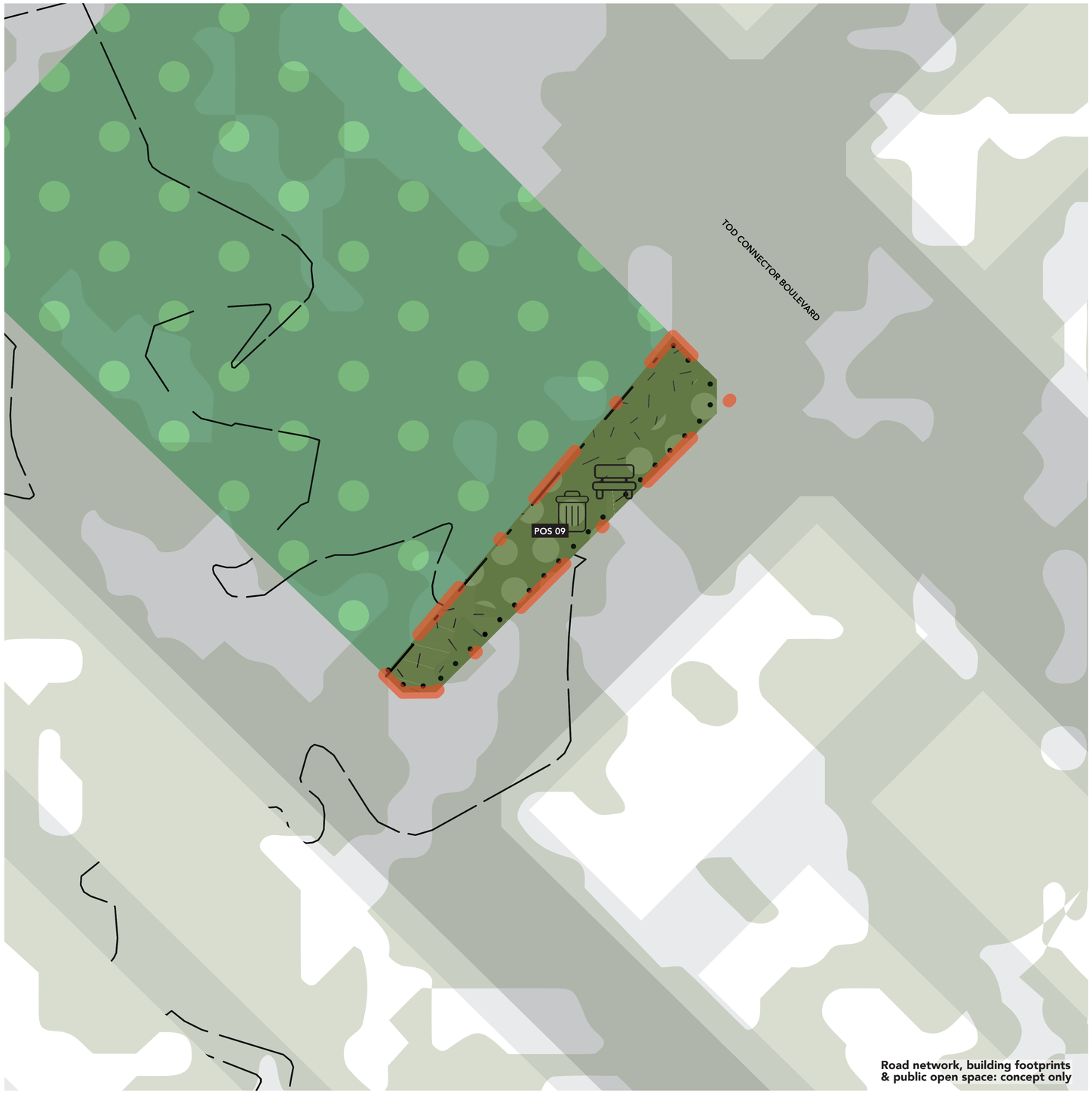
To be read in conjunction with the accompanying cost plan summary

- Revegetation
- Supplementary planting to existing vegetation

ELEMENTS

To be read in conjunction with the accompanying cost plan summary

- Bin enclosure (Litter, recycling and FOGO)
- Bench seating
- Bollards (removeable to paths)
- Fencing





POS 09

Road network, building footprints & public open space: concept only

REALM studios

FFN DCP POS COSTINGS | POS Concept Plan | N | Client: The City of Kalamunda | Date: 2/11/2021 | Scale: 1:250 @ A1 | **L08A**

LEGEND

LAND USE

- LSP Boundary
- Subject POS Site Boundary
- Existing contours
- Built form
- Existing tree canopy
- Bush Forever Lot
- Environmental Conservation Lot

DRAINAGE

To be read in conjunction with the accompanying cost plan summary

- Drainage basin 1:100 year average recurrence interval (ARI)
- Drainage basin 1:5 year ARI

SURFACE TREATMENTS

To be read in conjunction with the accompanying cost plan summary

- Turf
- Irrigated planting
- Nutrient-stripping vegetation (estimated by others)
- Revegetation
- Supplementary planting to existing vegetation
- Gravel path
- Concrete path
- Concrete maintenance edge

ELEMENTS

To be read in conjunction with the accompanying cost plan summary

- Proposed tree
- Shelter (small)
- Nature play elements
- Play elements
- Photovoltaic lighting
- Universally accessible electric barbeque and picnic table
- Bin enclosure (Litter, recycling and FOGO)
- Bench seating
- Bollards (removeable to paths)
- Water hose cock





POS T02, POS T03

REALM studios

FFN DCP POS COSTINGS | POS Concept Plan | N | Client: The City of Kalamunda | Date: 2/11/2021 | Scale: 1:500 @ A1 | **L09A**

LEGEND

LAND USE

- LSP Boundary
- Subject POS Site Boundary
- Existing contours
- Built form
- Existing tree canopy
- Bush Forever Lot
- Environmental Conservation Lot

DRAINAGE

To be read in conjunction with the accompanying cost plan summary

- Drainage basin 1:100 year average recurrence interval (ARI)
- Drainage basin 1:5 year ARI
- Drainage basin 1:1 year ARI

SURFACE TREATMENTS

To be read in conjunction with the accompanying cost plan summary

- Turf
- Irrigated planting
- Nutrient-stripping vegetation (estimated by others)
- Revegetation
- Supplementary planting to existing vegetation
- Gravel path
- Concrete path
- Concrete maintenance edge

ELEMENTS

To be read in conjunction with the accompanying cost plan summary

- Proposed tree
- Photovoltaic lighting
- Bin enclosure (Litter, recycling and FOGO)
- Bench seating
- Bollards (removeable to paths)
- Directional signage





POS T04, POS 07, DB 04

Road network, building footprints & public open space: concept only

REALM studios

FFN DCP POS COSTINGS | POS Concept Plan | N | Client: The City of Kalamunda | Date: 2/11/2021 | Scale: 1:500 @ A1 | **L10A**

LEGEND

LAND USE

- LSP Boundary
- Subject POS Site Boundary
- Existing contours
- Built form
- Existing tree canopy
- Bush Forever Lot
- Environmental Conservation Lot

DRAINAGE

To be read in conjunction with the accompanying cost plan summary

- Drainage basin 1:100 year average recurrence interval (ARI)
- Drainage basin 1:5 year ARI
- Drainage basin 1:1 year ARI

SURFACE TREATMENTS

To be read in conjunction with the accompanying cost plan summary

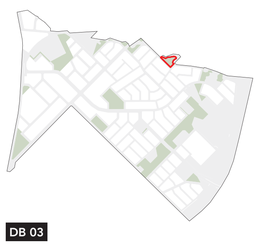
- Nutrient-stripping vegetation (estimated by others)
- Revegetation
- Supplementary planting to existing vegetation
- Gravel path

ELEMENTS

To be read in conjunction with the accompanying cost plan summary

- Photovoltaic lighting
- Bin enclosure (Litter, recycling and FOGO)
- Bench seating
- Bollards (removeable to paths)





DB 03

REALM studios

FFN DCP POS COSTINGS | POS Concept Plan | N | Client: The City of Kalamunda | Date: 2/11/2021 | Scale: 1:500 @ A1 | **L11A**

LEGEND

LAND USE

- LSP Boundary
- Subject POS Site Boundary
- Existing contours
- Built form
- Existing tree canopy
- Bush Forever Lot
- Environmental Conservation Lot

DRAINAGE

To be read in conjunction with the accompanying cost plan summary

- Drainage basin 1:100 year average recurrence interval (ARI)
- Drainage basin 1:5 year ARI
- Drainage basin 1:1 year ARI

SURFACE TREATMENTS

To be read in conjunction with the accompanying cost plan summary

- Turf
- Irrigated planting
- Nutrient-stripping vegetation (estimated by others)
- Revegetation
- Supplementary planting to existing vegetation
- Gravel path
- Concrete path
- Concrete maintenance edge

ELEMENTS

To be read in conjunction with the accompanying cost plan summary

- Proposed tree
- Nature play elements
- Photovoltaic lighting
- Bin enclosure (Litter, recycling and FOGO)
- Bench seating
- Bollards (removeable to paths)
- Directional signage





POS 06, DB 02

REALM studios

FFN DCP POS COSTINGS | POS Concept Plan | N | Client: The City of Kalamunda | Date: 2/11/2021 | Scale: 1:500 @ A1 | **L12A**

LEGEND

LAND USE

- LSP Boundary
- Subject POS Site Boundary
- Existing contours
- Built form
- Existing tree canopy
- Bush Forever Lot
- Environmental Conservation Lot

SURFACE TREATMENTS

To be read in conjunction with the accompanying cost plan summary

- Turf
- Irrigated planting
- Nutrient-stripping vegetation (estimated by others)
- Revegetation
- Supplementary planting to existing vegetation
- Concrete path
- Concrete maintenance edge

ELEMENTS

To be read in conjunction with the accompanying cost plan summary

- Proposed tree
- Photovoltaic lighting
- Bin enclosure (Litter, recycling and FOGO)
- Bench seating
- Bollards (removeable to paths)
- Fencing
- Directional signage





REALM studios

FFN DCP POS COSTINGS | POS Concept Plan | N | Client: The City of Kalamunda | Date: 2/11/2021 | Scale: 1:500@ A1 | **L13A**

LEGEND

LAND USE

- Subject POS Site Boundary
- Existing contours
- Built form
- Existing tree canopy
- Bush Forever Lot
- Environmental Conservation Lot

SURFACE TREATMENTS

To be read in conjunction with the accompanying cost plan summary

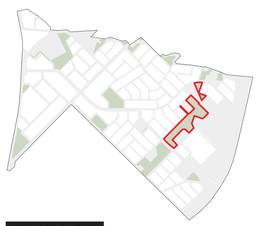
- Turf
- Irrigated planting
- Nutrient-stripping vegetation (estimated by others)
- Revegetation
- Supplementary planting to existing vegetation
- Gravel path
- Concrete path
- Concrete maintenance edge

ELEMENTS

To be read in conjunction with the accompanying cost plan summary

- Proposed tree
- Shelter (small)
- Nature play elements
- Photovoltaic lighting
- Interpretive signage
- Universally accessible electric barbeque and picnic table
- Bin enclosure (Litter, recycling and FOGO)
- Bench seating
- Bollards (removeable to paths)
- Fencing
- Water hose cock
- Dog exercise area with bag dispenser
- Directional signage





POS 04, POS 05

REALM studios

FFN DCP POS COSTINGS | POS Concept Plan | N | Client: The City of Kalamunda | Date: 2/11/2021 | Scale: 1:750 @ A1 | **L14A**

LEGEND

LAND USE

- LSP Boundary
- Subject POS Site Boundary
- Existing contours
- Built form
- Existing tree canopy
- Bush Forever Lot
- Environmental Conservation Lot

DRAINAGE

To be read in conjunction with the accompanying cost plan summary

- Drainage basin 1:100 year average recurrence interval (ARI)
- Drainage basin 1:5 year ARI
- Drainage basin 1:1 year ARI

SURFACE TREATMENTS

To be read in conjunction with the accompanying cost plan summary

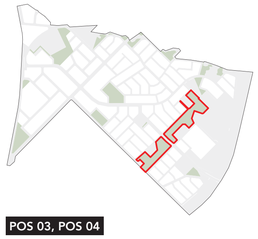
- Turf
- Irrigated planting
- Nutrient-stripping vegetation (estimated by others)
- Revegetation
- Supplementary planting to existing vegetation
- Gravel path
- Concrete path
- Concrete maintenance edge

ELEMENTS

To be read in conjunction with the accompanying cost plan summary

- Proposed tree
- Nature play elements
- Photovoltaic lighting
- Interpretive signage
- Bin enclosure (Litter, recycling and FOGO)
- Bench seating
- Bollards (removable to paths)
- Fencing
- Directional signage





POS 03, POS 04

REALM studios

FFN DCP POS COSTINGS	POS Concept Plan	N	Client: The City of Kalamunda	Date: 2/11/2021 Scale: 1:750 @ A1	L15A

Appendix F – Bill of Quantities: POS Improvements

8.1.25 POS02 – Smokebush Place

POS-02				
Description	**Quantity**	**Unit**	**Rate**	**Total**
MINIMUM IMPROVEMENTS REQUIRED UNDER SPP 3.6/LN2009				
PRELIMINARIES				
Allow for contractor's preliminaries	15%	%	$211,972	$31,795.80
EARTHWORKS				
Demolish existing structures including driveway, pavement and hardscapes etc.	3,031	m2	$12	$36,372.00
DEMOLITION				
Site clearing and earthworks	1	Prov Sum	$20,000	$20,000
PLANTING				
Irrigated Planting				
Irrigated planting including all the associated works	62	m2	$50	$3,100.00
Undertake initial weed control using non-residual glyphosate herbicide at the recommended maximum rate				Incl.
Trimming and final grading				Incl.
Native plant species at rate of 4 plants per sqm at 120mm pot size and irrigated using hydrozoning				Incl.
Soil amelioration cultivated to a depth of 150mm. Eclipse “Aquamor Soil Improver” or similar at 75mm depth application rate				Incl.
75mm “Aquamor Mulch”				Incl.
Initial application of slow release native plant fertilizer				Incl.
Revegetation				
Revegetation including all the associated works	1,424	m2	$20	$28,480.00
Native plant tubestock species at a rate of 4 plants per sqm				Incl.
Allow for initial application of fertilizer				Incl.
Supplementary Planting				

POS-02				
Description	**Quantity**	**Unit**	**Rate**	**Total**
Supplementary planting to existing vegetation	1,418	m2	$15	$21,270.00
Proposed Trees				
Proposed tree with unrestrained mulch ring	10	No	$120	$1,200.00
SURFACE FINISHES				
Turf				
Turf (irrigated) including all the associated works	1,488	m2	$51	$75,888.00
Undertake initial weed control using non-residual glyphosate herbicide at the recommended maximum rate				Incl.
Trimming and final grading				Incl.
Village Green Kikuyu roll on turf, fully irrigated				Incl.
Soil amelioration to depth of 150mm. Eclipse “Aquamor Soil Improver” or similar at 75mm depth application rate				Incl.
Initial application of fertilizer				Incl.
Gravel Path				
Gravel path on compacted base	174	m2	$18	$3,132.00
FURNITURE				
3 Person Seat	1	No	$1,900	$1,900.00
Solar lighting pole, 5m pole including footings	1	No	$7,500	$7,500.00
Bins		No		
ACCESS CONTROL				
Fencing	89	m	$50	$4,450.00
Bollard (fixed) - Replas 125mm square bollard (1500 long) including 600mm x 225 dia concrete footing (allowed 1500 ctc per no)	144	No	$55	$7,920.00
Bollard (removeable) - Replas 125mm bollard sleeve (fixed style) set within concrete path including padlock with standardised keying	2	No	$380	$760.00
Sub-Total				***$ 243,767.80***
MAINTENANCE FOR TWO SUMMERS				

POS-02				
Description	**Quantity**	**Unit**	**Rate**	**Total**
Maintenances cost	10%	%	$243,768	$24,377
Sub-Total				***$ 268,144.58***
DESIGN CONTINGENCY				
Design contingency	20%	%	$268,145	$ 53,628.92
Sub-Total				***$ 321,773.50***
CONSTRUCTION CONTINGENCY				
Construction contingency	20%	%	$321,773	$ 64,354.70
Sub-Total				***$ 386,128.20***
PROFESSIONAL FEES				
Landscape detailed design / professional fees	8%	%	$386,128	$30,890
Site area (m2)				
Sub-Total for Minimum Improvements required under SPP 3.6/LN2009	*4,566*	*m2*	*$91*	***$ 417,018.45***
2024 % of escalation	***6.60%***	***%***	***$ 97.36***	***$ 444,541.67***

8.1.26 POS03 – Ecological Corridor (SRW – TOD Connector)

POS-03				
Description	**Quantity**	**Unit**	**Rate**	**Total**
MINIMUM IMPROVEMENTS REQUIRED UNDER SPP 3.6/LN2009				
PRELIMINARIES				
Allow for contractor's preliminaries	15%	%	$878,100	$ 131,715.00
DEMOLITION				
Demolish existing structures including driveway, pavement and hardscapes etc.	1	Prov Sum	$185,000	$185,000.00
EARTHWORKS				
Demolish existing structures including driveway, pavement and hardscapes etc.	10,129	m2	$12	$121,548.00
PLANTING				
Irrigated Planting				
Irrigated planting including all the associated works	608	m2	$50	$30,400.00
Undertake initial weed control using non-residual glyphosate herbicide at the recommended maximum rate				Incl.
Trimming and final grading				Incl.
Native plant species at rate of 4 plants per sqm at 120mm pot size and irrigated using hydrozoning				Incl.
Soil amelioration cultivated to a depth of 150mm. Eclipse “Aquamor Soil Improver” or similar at 75mm depth application rate				Incl.
75mm “Aquamor Mulch”				Incl.
Initial application of slow release native plant fertilizer				Incl.
Revegetation				
Revegetation including all the associated works	7,175	m2	$20	$143,500.00
Native plant tubestock species at a rate of 4 plants per sqm				Incl.
Allow for initial application of fertilizer				Incl.
Supplementary Planting				
Supplementary planting to existing vegetation	5,168	m2	$15	$77,520.00
Proposed Tree				
Proposed tree with unrestrained mulch ring	30	No	$120	$3,600.00
SURFACE FINISHES				

POS-03				
Description	**Quantity**	**Unit**	**Rate**	**Total**
Turf				
Turf (irrigated) including all the associated works	3,551	m2	$51	$181,101.00
Undertake initial weed control using non-residual glyphosate herbicide at the recommended maximum rate				Incl.
Trimming and final grading				Incl.
Village Green Kikuyu roll on turf, fully irrigated				Incl.
Soil amelioration to depth of 150mm. Eclipse "Aquamor Soil Improver" or similar at 75mm depth application rate				Incl.
Initial application of fertilizer				Incl.
Gravel Path				
Gravel path on compacted base	927	m2	$18	$16,686.00
Insitu Concrete Path				
Coloured concrete with thickened edges on compacted base SL82 mesh including concrete edge, lockjoints, broom finish	324	m2	$60	$19,440.00
Insitu Concrete Edge / Kerb				
150 wide x 200 deep coloured concrete on compacted base, broom finish	126	m	$35	$4,410.00
FURNITURE				
3 Person Seat	2	No	$1,900	$3,800.00
Solar lighting pole, 5m pole including footings	7	No	$7,500	$52,500.00
ACCESS CONTROL				
Fencing	217	m	$50	$10,850.00
Bollard (fixed) - Replas 125mm square bollard (1500 long) including 600mm x 225 dia concrete footing (allowed 1500 ctc per no)	463	No	$55	$25,465.00
Bollard (removeable) - Replas 125mm bollard sleeve (fixed style) set within concrete path including padlock with standardised keying	6	No	$380	$2,280.00
Sub-Total				***$1,009,815.00***
MAINTENANCE FOR TWO SUMMERS				
Maintenances cost	10%	%	$1,009,815	$100,981.50
Sub-Total				***$1,110,796.50***
DESIGN CONTINGENCY				

POS-03				
Description	**Quantity**	**Unit**	**Rate**	**Total**
Design contingency	20%	%	$1,110,797	$222,159.30
Sub-Total				***$1,332,955.80***
CONSTRUCTION CONTINGENCY				
Construction contingency	20%	%	$1,332,956	$266,591.16
Sub-Total				***$1,599,546.96***
PROFESSIONAL FEES				
Landscape detailed design / professional fees	8%	%	$1,599,547	$127,963.76
Site area (m2)				
Sub-Total for Minimum Improvements required under SPP 3.6/LN2009	***28,077***	***m2***	***$62***	***$1,727,510.72***
2024 % of escalation	***6.60%***	***%***	***$ 65.59***	***$1,841,526.42***

8.1.27 POS04 – Ecological Corridor (TOD Connector – BF01 & EC08)

POS-04				
Description	**Quantity**	**Unit**	**Rate**	**Total**
MINIMUM IMPROVEMENTS REQUIRED UNDER SPP 3.6/LN2009				
PRELIMINARIES				
Allow for contractor's preliminaries	15%	%	$1,973,616	$296,042.40
DEMOLITION				
Demolish existing structures including driveway, pavement and hardscapes etc.	1	Prov Sum	$250,000	$250,000.00
EARTHWORKS				
Demolish existing structures including driveway, pavement and hardscapes etc.	26,422	m2	$12	$317,064.00
PLANTING				
Irrigated Planting				
Irrigated planting including all the associated works	420	m2	$50	$21,000.00
Undertake initial weed control using non-residual glyphosate herbicide at the recommended maximum rate				Incl.
Trimming and final grading				Incl.
Native plant species at rate of 4 plants per sqm at 120mm pot size and irrigated using hydrozoning				Incl.
Soil amelioration cultivated to a depth of 150mm. Eclipse “Aquamor Soil Improver” or similar at 75mm depth application rate				Incl.
75mm “Aquamor Mulch”				Incl.
Initial application of slow release native plant fertilizer				Incl.
Revegetation				
Revegetation including all the associated works	13,630	m2	$20	$272,600.00
Native plant tubestock species at a rate of 4 plants per sqm				Incl.
Allow for initial application of fertilizer				Incl.
Supplementary Planting				
Supplementary planting to existing vegetation	12,533	m2	$15	$187,995.00
Proposed Tree				
Proposed tree with unrestrained mulch ring	81	No	$120	$9,720.00

POS-04				
Description	**Quantity**	**Unit**	**Rate**	**Total**
SURFACE FINISHES				
Turf				
Turf (irrigated) including all the associated works	12,270	m2	$51	$625,770.00
Undertake initial weed control using non-residual glyphosate herbicide at the recommended maximum rate				Incl.
Trimming and final grading				Incl.
Village Green Kikuyu roll on turf, fully irrigated				Incl.
Soil amelioration to depth of 150mm. Eclipse "Aquamor Soil Improver" or similar at 75mm depth application rate				Incl.
Initial application of fertilizer				Incl.
Gravel Path				
Gravel path on compacted base	644	m2	$18	$11,592.00
Insitu Concrete Path				
Coloured concrete with thicened edges on compacted base SL82 mesh including concrete edge, lockjoints, broom finish	1,175	m2	$60	$70,500.00
Insitu Concrete Edge / Kerb				
150 wide x 200 deep coloured concrete on compacted base, broom finish	781	m	$35	$27,335.00
FURNITURE				
3 Person Seat	8	No	$1,900	$15,200.00
Solar lighting pole, 5m pole including footings	13	No	$7,500	$97,500.00
ACCESS CONTROL				
Fencing	817	m	$50	$40,850.00
Gates	2	No	$750	$1,500.00
Bollard (fixed) - Replas 125mm square bollard (1500 long) including 600mm x 225 dia concrete footing (allowed 1500 ctc per no)	406	No	$55	$22,330.00
Bollard (removeable) - Replas 125mm bollard sleeve (fixed style) set within concrete path including padlock with standardised keying	7	No	$380	$2,660.00
Sub-Total				***$ 2,269,658.40***

POS-04				
Description	**Quantity**	**Unit**	**Rate**	**Total**
MAINTENANCE FOR TWO SUMMERS				
Maintenances cost	10%	%	$2,269,658	$226,965.84
Sub-Total				*$2,496,624.24*
DESIGN CONTINGENCY				
Design contingency	20%	%	$2,496,624	$499,324.85
Sub-Total				*$2,995,949.09*
CONSTRUCTION CONTINGENCY				
Construction contingency	20%	%	$2,995,949	$599,189.82
Sub-Total				*$3,595,138.91*
PROFESSIONAL FEES				
Landscape detailed design / professional fees	8%	%	$3,595,139	$287,611.11
Site area (m2)				
Sub-Total for Minimum Improvements required under SPP 3.6/LN2009	*40,803*	*m2*	*$95*	*$3,882,750.02*
2024 % of escalation	*6.60%*	*%*	*$101.44*	*$4,139,011.52*

8.1.28 POS05 – Ecological Corridor (BF01 & BC08 – Brae Road)

POS-05				
Description	**Quantity**	**Unit**	**Rate**	**Total**
MINIMUM IMPROVEMENTS REQUIRED UNDER SPP 3.6/LN2009				
PRELIMINARIES				
Allow for contractor's preliminaries	15%	%	$243,761	$36,564
EARTHWORKS				
Demolish existing structures including driveway, pavement and hardscapes etc.	3,414	m2	$12	$40,968.00
DEMOLITION				
Demolish existing structures including driveway, pavement and hardscapes etc.	1	Prov Sum	$45,000	$45,000
PLANTING				
Irrigated Planting				
Irrigated planting including all the associated works	167	m2	$50	$8,350
Undertake initial weed control using non-residual glyphosate herbicide at the recommended maximum rate				Incl.
Trimming and final grading				Incl.
Native plant species at rate of 4 plants per sqm at 120mm pot size and irrigated using hydrozoning				Incl.
Soil amelioration cultivated to a depth of 150mm. Eclipse “Aquamor Soil Improver” or similar at 75mm depth application rate				Incl.
'75mm “Aquamor Mulch”				Incl.
Initial application of slow release native plant fertilizer				Incl.
Revegetation				
Revegetation including all the associated works	1,183	m2	$20	$23,660
Native plant tubestock species at a rate of 4 plants per sqm				Incl.
Allow for initial application of fertilizer				Incl.
Supplementary Planting				
Supplementary planting to existing vegetation	1,120	m2	$15	$16,800
Proposed Tree				

POS-05				
Description	**Quantity**	**Unit**	**Rate**	**Total**
Proposed tree with unrestrained mulch ring	19	No	$120	$2,280
SURFACE FINISHES				
Turf				
Turf (irrigated) including all the associated works	1,806	m2	$51	$92,106
Undertake initial weed control using non-residual glyphosate herbicide at the recommended maximum rate				Incl.
Trimming and final grading				Incl.
Village Green Kikuyu roll on turf, fully irrigated				Incl.
Soil amelioration to depth of 150mm. Eclipse “Aquamor Soil Improver” or similar at 75mm depth application rate				Incl.
Initial application of fertilizer				Incl.
Gravel Path				
Gravel path on compacted base	140	m2	$18	$2,520
Insitu Concrete Path				
Coloured concrete with thickened edges on compacted base SL82 mesh including concrete edge, lockjoints, broom finish	267	m2	$60	$16,020
Insitu Concrete Edge / Kerb				
'150 wide x 200 deep coloured concrete on compacted base, broom finish	144	m	$35	$5,040
FURNITURE				
'3 Person Seat	4	No	$1,900	$7,600
Solar lighting pole, 5m pole including footings	2	No	$7,500	$15,000
ACCESS CONTROL				
Fencing		m	$50	$0
Bollard (fixed) - Replas 125mm square bollard (1500 long) including 600mm x 225 dia concrete footing (allowed 1500 ctc per no)	143	No	$55	$7,865
Bollard (removeable) - Replas 125mm bollard sleeve (fixed style) set within concrete path including padlock with standardised keying	4	No	$380	$1,520

POS-05				
Description	**Quantity**	**Unit**	**Rate**	**Total**
Sub-Total				***$321,293***
MAINTENANCE FOR TWO SUMMERS				
Maintenances cost	10%	%	$321,293	32,129
Sub-Total				***$353,422***
DESIGN CONTINGENCY				
Design contingency	20%	%	$353,422	70,684
Sub-Total				***$424,107***
CONSTRUCTION CONTINGENCY				
Construction contingency	20%	%	$424,107	84,821
Sub-Total				***$508,928***
PROFESSIONAL FEES				
Landscape detailed design / professional fees	8%	%	$508,928	40,714
Site area (m2)				
Sub-Total for Minimum Improvements required under SPP 3.6/LN2009	***4,684***	***m2***	***$117***	***$549,643***
2024 % of escalation	***6.60%***	***%***	***$ 125.09***	***$585,919.03***

8.1.29 POS06 – Poison Gully Creek (Brae Road)

POS-06				
Description	**Quantity**	**Unit**	**Rate**	**Total**
MINIMUM IMPROVEMENTS REQUIRED UNDER SPP 3.6/LN2009				
PRELIMINARIES				
Allow for contractor's preliminaries	15%	%	$322,109	$48,316
DEMOLITION				
Demolish existing structures including driveway, pavement and hardscapes etc.	1	Prov Sum	$75,000	$75,000
EARTHWORKS				
Demolish existing structures including driveway, pavement and hardscapes etc.	2,799	m2	$12	$33,588.00
PLANTING				
Irrigated Planting				
Irrigated planting including all the associated works	156	m2	$50	$7,800
Undertake initial weed control using non-residual glyphosate herbicide at the recommended maximum rate				Incl.
Trimming and final grading				Incl.
Native plant species at rate of 4 plants per sqm at 120mm pot size and irrigated using hydrozoning				Incl.
Soil amelioration cultivated to a depth of 150mm. Eclipse “Aquamor Soil Improver” or similar at 75mm depth application rate				Incl.
75mm “Aquamor Mulch”				Incl.
Initial application of slow release native plant fertilizer				Incl.
Revegetation				
Revegetation including all the associated works	1,807	m2	$20	$36,140
Native plant tubestock species at a rate of 4 plants per sqm				Incl.
Allow for initial application of fertilizer				Incl.
Supplementary Planting				
Supplementary planting to existing vegetation	142	m2	$15	$2,130
Proposed Tree				
Proposed tree with unrestrained mulch ring	15	No	$120	$1,800

POS-06				
Description	**Quantity**	**Unit**	**Rate**	**Total**
SURFACE FINISHES				
Turf				
Turf (irrigated) including all the associated works	2,296	m2	$51	$117,096
Undertake initial weed control using non-residual glyphosate herbicide at the recommended maximum rate				Incl.
Trimming and final grading				Incl.
Village Green Kikuyu roll on turf, fully irrigated				Incl.
Soil amelioration to depth of 150mm. Eclipse "Aquamor Soil Improver" or similar at 75mm depth application rate				Incl.
Initial application of fertilizer				Incl.
Insitu Concrete Path				
Coloured concrete with thickened edges on compacted base SL82 mesh including concrete edge, lockjoints, broom finish	327	m2	$60	$19,620
Insitu Concrete Edge / Kerb				
150 wide x 200 deep coloured concrete on compacted base, broom finish	41	m	$35	$1,435
FURNITURE				
3 Person Seat	3	No	$1,900	$5,700
Solar lighting pole, 5m pole including footings	2	No	$7,500	$15,000
ACCESS CONTROL				
Bollard (fixed) - Replas 125mm square bollard (1500 long) including 600mm x 225 dia concrete footing (allowed 1500 ctc per no)	96	No	$55	$5,280
Bollard (removeable) - Replas 125mm bollard sleeve (fixed style) set within concrete path including padlock with standardised keying	4	No	$380	$1,520
Sub-Total				***$370,425***
MAINTENANCE FOR TWO SUMMERS				
Maintenances cost	10%	%	$370,425	37,043
Sub-Total				***$407,468***
DESIGN CONTINGENCY				

POS-06				
Description	**Quantity**	**Unit**	**Rate**	**Total**
Design contingency	20%	%	$407,468	81,494
Sub-Total				***$488,961***
CONSTRUCTION CONTINGENCY				
Construction contingency	20%	%	$488,961	97,792
Sub-Total				***$586,754***
PROFESSIONAL FEES				
Landscape detailed design / professional fees	8%	%	$586,754	46,940
Site area (m2)				
Sub-Total for Minimum Improvements required under SPP 3.6/LN2009	***4,839***	***m2***	***$131***	***$633,694***
2024 % of escalation	***6.60%***	***%***	***$ 139.60***	***$ 675,517.86***

8.1.30 POS07 – Poison Gully Creek (Milner Road)

POS-07				
Description	**Quantity**	**Unit**	**Rate**	**Total**
MINIMUM IMPROVEMENTS REQUIRED UNDER SPP 3.6/LN2009				
PRELIMINARIES				
Allow for contractor's preliminaries	15%	%	$38,245	$5,737
DEMOLITION				
Demolish existing structures including driveway, pavement and hardscapes etc.	1	Prov Sum	$25,000	$25,000
PLANTING				
Revegetation				
Revegetation including all the associated works	610	m2	$20	$12,200
Native plant tubestock species at a rate of 4 plants per sqm				Incl.
Allow for initial application of fertilizer				Incl.
ACCESS CONTROL				
Bollard (fixed) - Replas 125mm square bollard (1500 long) including 600mm x 225 dia concrete footing (allowed 1500 ctc per no)	19	No	$55	$1,045
Sub-Total				***$43,982***
MAINTENANCE FOR TWO SUMMERS				
Maintenances cost	10%	%	$43,982	4,398
Sub-Total				***$48,380***
DESIGN CONTINGENCY				
Design contingency	20%	%	$48,380	9,676
Sub-Total				***$58,056***
CONSTRUCTION CONTINGENCY				
Construction contingency	20%	%	$58,056	11,611
Sub-Total				***$69,667***

POS-07				
Description	**Quantity**	**Unit**	**Rate**	**Total**
PROFESSIONAL FEES				
Landscape detailed design / professional fees	8%	%	$69,667	5,573
Site area (m2)				
Sub-Total for Minimum Improvements required under SPP 3.6/LN2009	*610*	*m2*	*$123*	*$75,240*
2024 % of escalation	*6.60%*	*%*	*$ 131.49*	*$ 80,206.33*

8.1.31 POS08 – Residential Precinct Town Park

POS-08				
Description	**Quantity**	**Unit**	**Rate**	**Total**
MINIMUM IMPROVEMENTS REQUIRED UNDER SPP 3.6/LN2009				
PRELIMINARIES				
Allow for contractor's preliminaries	15%	%	$1,061,574	$159,236
DEMOLITION				
Demolish existing structures including driveway, pavement and hardscapes etc.	1	Prov Sum	$185,000	$185,000
EARTHWORKS				
Demolish existing structures including driveway, pavement and hardscapes etc.	10,227	m2	$12	$122,724.00
PLANTING				
Irrigated Planting				
Irrigated planting including all the associated works	465	m2	$50	$23,250
Undertake initial weed control using non-residual glyphosate herbicide at the recommended maximum rate				Incl.
Trimming and final grading				Incl.
Native plant species at rate of 4 plants per sqm at 120mm pot size and irrigated using hydrozoning				Incl.
Soil amelioration cultivated to a depth of 150mm. Eclipse “Aquamor Soil Improver” or similar at 75mm depth application rate				Incl.
75mm “Aquamor Mulch”				Incl.
Initial application of slow release native plant fertilizer				Incl.
Revegetation				
Revegetation including all the associated works	4,194	m2	$20	$83,880
Native plant tubestock species at a rate of 4 plants per sqm				Incl.
Allow for initial application of fertilizer				Incl.
Supplementary Planting				
Supplementary planting to existing vegetation	2,458	m2	$15	$36,870
Proposed Tree				
Proposed tree with unrestrained mulch ring	81	No	$120	$9,720
SURFACE FINISHES				

POS-08				
Description	**Quantity**	**Unit**	**Rate**	**Total**
Turf				
Turf (irrigated) including all the associated works	5,495	m2	$51	$280,245
Undertake initial weed control using non-residual glyphosate herbicide at the recommended maximum rate				Incl.
Trimming and final grading				Incl.
Village Green Kikuyu roll on turf, fully irrigated				Incl.
Soil amelioration to depth of 150mm. Eclipse "Aquamor Soil Improver" or similar at 75mm depth application rate				Incl.
Initial application of fertilizer				Incl.
Concrete Unit Paving				
Concrete Unit Paving with thickened edges on compacted base	684	m2	$150	$102,600
Insitu Concrete Path				
Coloured concrete with thickened edges on compacted base SL82 mesh including concrete edge, lockjoints, broom finish	1,344	m2	$60	$80,640
Insitu Concrete Edge / Kerb				
150 wide x 200 deep coloured concrete on compacted base, broom finish	356	m	$35	$12,460
FURNITURE				
3 Person Seat	5	No	$1,900	$9,500
Solar lighting pole, 5m pole including footings	12	No	$7,500	$90,000
ACCESS CONTROL				
Bollard (fixed) - Replas 125mm square bollard (1500 long) including 600mm x 225 dia concrete footing (allowed 1500 ctc per no)	359	No	$55	$19,745
Bollard (removeable) - Replas 125mm bollard sleeve (fixed style) set within concrete path including padlock with standardised keying	13	No	$380	$4,940
Sub-Total				***$1,220,810***
MAINTENANCE FOR TWO SUMMERS				
Maintenances cost	10%	%	$1,220,810	122,081
Sub-Total				***$1,342,891***

POS-08				
Description	**Quantity**	**Unit**	**Rate**	**Total**
DESIGN CONTINGENCY				
Design contingency	20%	%	$1,342,891	268,578
Sub-Total				***$1,611,469***
CONSTRUCTION CONTINGENCY				
Construction contingency	20%	%	$1,611,469	322,294
Sub-Total				***$1,933,763***
PROFESSIONAL FEES				
Landscape detailed design / professional fees	8%	%	$1,933,763	154,701
Site area (m2)				
Sub-Total for Minimum Improvements required under SPP 3.6/LN2009	*18,059*	*m2*	*$116*	***$2,088,464***
2024 % of escalation	***6.60%***	***%***	***$123.28***	***$2,226,302.90***

8.1.32 POS09 – SRW

POS-09				
Description	**Quantity**	**Unit**	**Rate**	**Total**
MINIMUM IMPROVEMENTS REQUIRED UNDER SPP 3.6/LN2009				
PRELIMINARIES				
Allow for contractor's preliminaries	15%	%	$21,250	$3,188
DEMOLITION				
Demolish existing structures including driveway, pavement and hardscapes etc.	1	Prov Sum	$5,000	$5,000
EARTHWORKS				
Demolish existing structures including driveway, pavement and hardscapes etc.	225	m2	$12	$ 2,700.00
PLANTING				
Revegetation				
Revegetation including all the associated works	248	m2	$20	$4,960
Native plant tubestock species at a rate of 4 plants per sqm				Incl.
Allow for initial application of fertilizer				Incl.
Supplementary Planting				
Supplementary planting to existing vegetation	225	m2	$15	$3,375
ACCESS CONTROL				
Fencing	57	m	$50	$2,850
Bollard (fixed) - Replas 125mm square bollard (1500 long) including 600mm x 225 dia concrete footing (allowed 1500 ctc per no)	43	No	$55	$2,365
Sub-Total				***$24,438***
MAINTENANCE FOR TWO SUMMERS				
Maintenances cost	10%	%	$24,438	2,444
Sub-Total				***$26,881***
DESIGN CONTINGENCY				

POS-09				
Description	**Quantity**	**Unit**	**Rate**	**Total**
Design contingency	20%	%	$26,881	5,376
Sub-Total				***$32,258***
CONSTRUCTION CONTINGENCY				
Construction contingency	20%	%	$32,258	6,452
Sub-Total				***$38,709***
PROFESSIONAL FEES				
Landscape detailed design / professional fees	8%	%	$38,709	3,097
Site area (m2)				
Sub-Total for Minimum Improvements required under SPP 3.6/LN2009	*474*	*m2*	*$88*	***$41,806***
2024 % of escalation	***6.60%***	***%***	***$ 94.02***	***$44,564.90***

8.1.33 DB02 – Poison Gully Creek Drainage / POS (Brae Road)

DB-02				
Description	**Quantity**	**Unit**	**Rate**	**Total**
MINIMUM IMPROVEMENTS REQUIRED UNDER SPP 3.6/LN2009				
PRELIMINARIES				
Allow for contractor's preliminaries	15%	%	$122,365	$12,237
DEMOLITION				
Demolish existing structures including driveway, pavement and hardscapes etc.	1	Prov Sum	$75,000	$75,000
EARTHWORKS				
Demolish existing structures including driveway, pavement and hardscapes etc.	89	m2	$12	$1,068.00
PLANTING				
Revegetation				
Revegetation including all the associated works	936	m2	$20	$18,720
Native plant tubestock species at a rate of 4 plants per sqm				Incl.
Allow for initial application of fertilizer				Incl.
SURFACE FINISHES				
Gravel Path				
Gravel path on compacted base	92	m2	$18	$1,656
FURNITURE				
3 Person Seat	1	No	$1,900	$1,900
ACCESS CONTROL				
Bollard (fixed) - Replas 125mm square bollard (1500 long) including 600mm x 225 dia concrete footing (allowed 1500 ctc per no)	21	No	$55	$1,155
Bollard (removeable) - Replas 125mm bollard sleeve (fixed style) set within concrete path including padlock with standardised keying	2	No	$380	$760
Sub-Total				***$112,496***
MAINTENANCE FOR TWO SUMMERS				
Maintenances cost	10%	%	$112,496	$11,250

DB-02				
Description	**Quantity**	**Unit**	**Rate**	**Total**
Sub-Total				***$123,745***
DESIGN CONTINGENCY				
Design contingency	20%	%	$123,745	$24,749
Sub-Total				***$148,494***
CONSTRUCTION CONTINGENCY				
Construction contingency	20%	%	$148,494	$29,699
Sub-Total				***$178,193***
PROFESSIONAL FEES				
Landscape detailed design / professional fees	8%	%	$178,193	$14,255
Site area (m2)				
Sub-Total for Minimum Improvements required under SPP 3.6/LN2009	*2,821*	*m2*	*$68*	***$192,448***
2024 % of escalation	***6.60%***	***%***	***$72.72***	***$205,149.89***

8.1.34 DB03 - Littlefield POS / Drainage

DB-03				
Description	**Quantity**	**Unit**	**Rate**	**Total**
MINIMUM IMPROVEMENTS REQUIRED UNDER SPP 3.6/LN2009				
PRELIMINARIES				
Allow for contractor's preliminaries	15%	%	$129,908	$19,486
DEMOLITION				
Demolish existing structures including driveway, pavement and hardscapes etc.	1	Prov Sum	$75,000	$75,000
EARTHWORKS				
Demolish existing structures including driveway, pavement and hardscapes etc.	280	m2	$12	$3,360.00
PLANTING				
Revegetation				
Revegetation including all the associated works	1,784	m2	$20	$35,680
Native plant tubestock species at a rate of 4 plants per sqm				Incl.
Allow for initial application of fertilizer				Incl.
Proposed Tree				
Proposed tree with unrestrained mulch ring	2	No	$120	$240
SURFACE FINISHES				
Gravel Path				
Gravel path on compacted base	291	m2	$18	$5,238
FURNITURE				
3 Person Seat	2	No	$1,900	$3,800
ACCESS CONTROL				
Bollard (fixed) - Replas 125mm square bollard (1500 long) including 600mm x 225 dia concrete footing (allowed 1500 ctc per no)	106	No	$55	$5,830
Bollard (removeable) - Replas 125mm bollard sleeve (fixed style) set within concrete path including padlock with standardised keying	2	No	$380	$760

DB-03				
Description	**Quantity**	**Unit**	**Rate**	**Total**
Sub-Total				***$149,394***
MAINTENANCE FOR TWO SUMMERS				
Maintenances cost	10%	%	$149,394	$14,939
Sub-Total				***$164,334***
DESIGN CONTINGENCY				
Design contingency	20%	%	$164,334	$32,867
Sub-Total				***$197,200***
CONSTRUCTION CONTINGENCY				
Construction contingency	20%	%	$197,200	$39,440
Sub-Total				***$236,640***
PROFESSIONAL FEES				
Landscape detailed design / professional fees	8%	%	$236,640	$18,931
Site area (m2)				
Sub-Total for Minimum Improvements required under SPP 3.6/LN2009	*5,616*	*m2*	*$46*	***$255,572***
2024 % of escalation	***6.60%***	***%***	***$48.51***	***$272,439.37***

8.1.35 DB04 - Poison Gully Creek POS (Stewart Road)

DB-04				
Description	**Quantity**	**Unit**	**Rate**	**Total**
MINIMUM IMPROVEMENTS REQUIRED UNDER SPP 3.6/LN2009				
PRELIMINARIES				
Allow for contractor's preliminaries	15%	%	$106,298	$15,945
DEMOLITION				
Demolish existing structures including driveway, pavement and hardscapes etc.	1	Prov Sum	$35,000	$35,000
EARTHWORKS				
Demolish existing structures including driveway, pavement and hardscapes etc.	235	m2	$12	$ 2,820.00
PLANTING				
Revegetation				
Revegetation including all the associated works	1,454	m2	$20	$29,080
Native plant tubestock species at a rate of 4 plants per sqm				Incl.
Allow for initial application of fertilizer				Incl.
SURFACE FINISHES				
Gravel Path				
Gravel path on compacted base	246	m2	$18	$4,428
FURNITURE				
3 Person Seat	2	No	$1,900	$3,800
Solar lighting pole, 5m pole including footings	1	No	$7,500	$7,500
ACCESS CONTROL				
Fencing	312	m	$50	$15,600
Bollard (fixed) - Replas 125mm square bollard (1500 long) including 600mm x 225 dia concrete footing (allowed 1500 ctc per no)	126	No	$55	$6,930
Bollard (removeable) - Replas 125mm bollard sleeve (fixed style) set within concrete path including padlock with standardised keying	3	No	$380	$1,140
Sub-Total				***$122,243***
MAINTENANCE FOR TWO SUMMERS				

DB-04				
Description	**Quantity**	**Unit**	**Rate**	**Total**
Maintenances cost	10%	%	$122,243	$12,224
Sub-Total				***$134,467***
DESIGN CONTINGENCY				
Design contingency	20%	%	$134,467	26,893
Sub-Total				***$161,360***
CONSTRUCTION CONTINGENCY				
Construction contingency	20%	%	$161,360	$32,272
Sub-Total				***$193,632***
PROFESSIONAL FEES				
Landscape detailed design / professional fees	8%	%	$193,632	$15,491
Site area (m2)				
Sub-Total for Minimum Improvements required under SPP 3.6/LN2009	*3,484*	*m2*	*$60*	***$209,123***
2024 % of escalation	***6.60%***	***%***	***$63.99***	***$ 222,925.15***

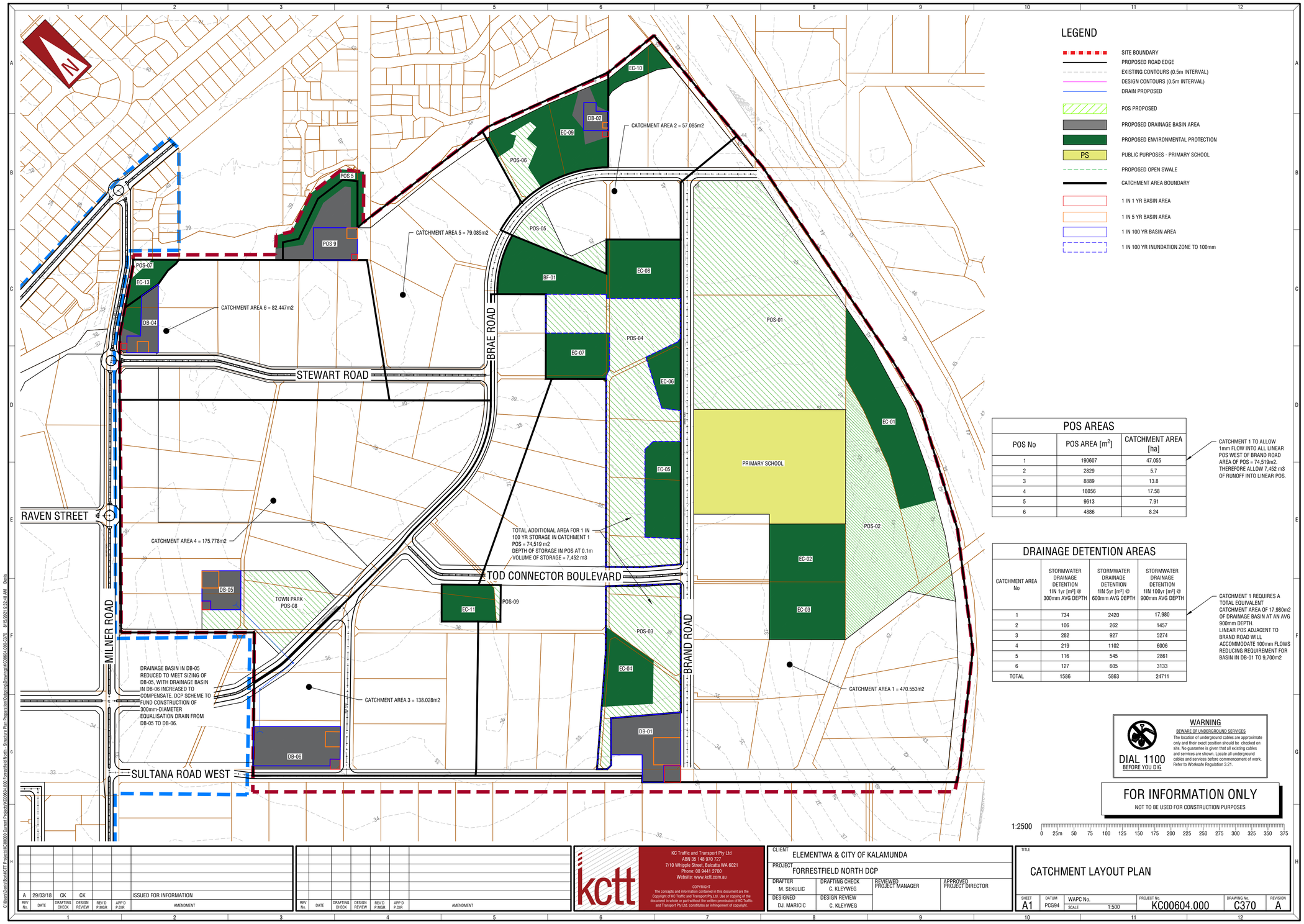
8.1.36 DB06 - Sultana Road West POS

DB-06				
Description	**Quantity**	**Unit**	**Rate**	**Total**
MINIMUM IMPROVEMENTS REQUIRED UNDER SPP 3.6/LN2009				
PRELIMINARIES				
Allow for contractor's preliminaries	15%	%	$534,784	$80,217.60
DEMOLITION				
Demolish existing structures including driveway, pavement and hardscapes etc.	1	Prov Sum	$85,000	$85,000.00
EARTHWORKS				
Demolish existing structures including driveway, pavement and hardscapes etc.	5,907	m2	$12	$70,884
PLANTING				
Irrigated Planting				
Irrigated planting including all the associated works	42	m2	$50	$2,100.00
Undertake initial weed control using non-residual glyphosate herbicide at the recommended maximum rate				Incl.
Trimming and final grading				Incl.
Native plant species at rate of 4 plants per sqm at 120mm pot size and irrigated using hydrozoning				Incl.
Soil amelioration cultivated to a depth of 150mm. Eclipse “Aquamor Soil Improver” or similar at 75mm depth application rate				Incl.
75mm “Aquamor Mulch”				Incl.
Initial application of slow release native plant fertilizer				Incl.
Revegetation				
Revegetation including all the associated works	620	m2	$20	$12,400.00
Native plant tubestock species at a rate of 4 plants per sqm				Incl.
Allow for initial application of fertilizer				Incl.
Proposed Tree				
Proposed tree with unrestrained mulch ring	35	No	$120	$4,200.00
SURFACE FINISHES				
Turf				
Turf (irrigated) including all the associated works	5,920	m2	$51	$301,920.00
Undertake initial weed control using non-residual glyphosate herbicide at the recommended maximum rate				Incl.
Trimming and final grading				Incl.
Village Green Kikuyu roll on turf, fully irrigated				Incl.

DB-06				
Description	**Quantity**	**Unit**	**Rate**	**Total**
Soil amelioration to depth of 150mm. Eclipse "Aquamor Soil Improver" or similar at 75mm depth application rate				Incl.
Initial application of fertilizer				Incl.
Insitu Concrete Path				
Coloured concrete with thickened edges on compacted base SL82 mesh including concrete edge, lockjoints, broom finish	202	m2	$60	$12,120.00
Insitu Concrete Edge / Kerb				
150 wide x 200 deep coloured concrete on compacted base, broom finish	170	m	$35	$5,950
FURNITURE				
3 Person Seat	2	No	$1,900	$3,800.00
Solar lighting pole, 5m pole including footings	2	No	$7,500	$15,000.00
ACCESS CONTROL				
Fencing	127	m	$50	$6,350.00
Bollard (fixed) - Replas 125mm square bollard (1500 long) including 600mm x 225 dia concrete footing (allowed 1500 ctc per no)	260	No	$55	$14,300.00
Bollard (removeable) - Replas 125mm bollard sleeve (fixed style) set within concrete path including padlock with standardised keying	2	No	$380	$760.00
Sub-Total				***$615,001.60***
MAINTENANCE FOR TWO SUMMERS				
Maintenances cost	10%	%	$615,002	$61,500.16
Sub-Total				***$676,501.76***
DESIGN CONTINGENCY				
Design contingency	10%	%	$676,502	$67,650.18
Sub-Total				***$744,151.94***
CONSTRUCTION CONTINGENCY				
Construction contingency	15%	%	$744,152	111,622.79
Sub-Total				***$855,774.73***
PROFESSIONAL FEES				

DB-06				
Description	**Quantity**	**Unit**	**Rate**	**Total**
Landscape detailed design / professional fees	8%	%	$855,775	$68,461.98
Site area (m2)				
Sub-Total for Minimum Improvements required under SPP 3.6/LN2009	*8,870*	*m2*	*$104*	***$924,236.70***
2024 % of escalation	***6.60%***	***%***	***$ 111.08***	***$985,236.33***

Appendix G – Catchment Layout Plan



LEGEND

- SITE BOUNDARY
- PROPOSED ROAD EDGE
- EXISTING CONTOURS (0.5m INTERVAL)
- DESIGN CONTOURS (0.5m INTERVAL)
- DRAIN PROPOSED
- POS PROPOSED
- PROPOSED DRAINAGE BASIN AREA
- PROPOSED ENVIRONMENTAL PROTECTION
- PS — PUBLIC PURPOSES - PRIMARY SCHOOL
- PROPOSED OPEN SWALE
- CATCHMENT AREA BOUNDARY
- 1 IN 1 YR BASIN AREA
- 1 IN 5 YR BASIN AREA
- 1 IN 100 YR BASIN AREA
- 1 IN 100 YR INUNDATION ZONE TO 100mm

POS AREAS

POS No	POS AREA [m^2]	CATCHMENT AREA [ha]
1	190607	47.055
2	2829	5.7
3	8889	13.8
4	18056	17.58
5	9613	7.91
6	4886	8.24

CATCHMENT 1 TO ALLOW 1mm FLOW INTO ALL LINEAR POS WEST OF BRAND ROAD AREA OF POS = 74,519m2 THEREFORE ALLOW 7,452 m3 OF RUNOFF INTO LINEAR POS.

DRAINAGE DETENTION AREAS

CATCHMENT AREA No	STORMWATER DRAINAGE DETENTION 1IN 1yr [m^3] @ 300mm AVG DEPTH	STORMWATER DRAINAGE DETENTION 1IN 5yr [m^3] @ 600mm AVG DEPTH	STORMWATER DRAINAGE DETENTION 1IN 100yr [m^3] @ 900mm AVG DEPTH
1	734	2420	17,980
2	106	262	1457
3	282	927	5274
4	219	1102	6006
5	116	545	2861
6	127	605	3133
TOTAL	1586	5863	24711

CATCHMENT 1 REQUIRES A TOTAL EQUIVALENT CATCHMENT AREA OF 17,980m2 OF DRAINAGE BASIN AT AN AVG 900mm DEPTH.
LINEAR POS ADJACENT TO BRAND ROAD WILL ACCOMMODATE 100mm FLOWS REDUCING REQUIREMENT FOR BASIN IN DB-01 TO 9,700m2

WARNING
BEWARE OF UNDERGROUND SERVICES
The location of underground cables are approximate only and their exact position should be checked on site. No guarantee is given that all existing cables and services are shown. Locate all underground cables and services before commencement of work. Refer to Worksafe Regulation 3.21.

DIAL 1100 BEFORE YOU DIG

FOR INFORMATION ONLY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

1:2500
0 25m 50 75 100 125 150 175 200 225 250 275 300 325 350 375

REV No.	DATE	DRAFTING CHECK	DESIGN REVIEW	REV'D P.MGR	APP'D P.DIR	AMENDMENT
A	29/03/18	CK	CK			ISSUED FOR INFORMATION

KC Traffic and Transport Pty Ltd
ABN 35 148 970 727
7/10 Whipple Street, Balcatta WA 6021
Phone: 08 9441 2700
Website: www.kctt.com.au

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CLIENT: ELEMENTWA & CITY OF KALAMUNDA
PROJECT: FORRESTFIELD NORTH DCP

DRAFTER	DRAFTING CHECK	REVIEWED	APPROVED
M. SEKULIC	C. KLEYWEG	PROJECT MANAGER	PROJECT DIRECTOR
DESIGNED	DESIGN REVIEW		
DJ. MARICIC	C. KLEYWEG		

TITLE: CATCHMENT LAYOUT PLAN

SHEET	DATUM	WAPC No.	PROJECT No.	DRAWING No.	REVISION
A1	PCG94	SCALE 1:500	KC00604.000	C370	A

C:\Users\DenisB\AppData\Roaming\Autodesk\ACCT Projects\#200000 Current Projects\#200604.000 Forrestfield North - Structure Plan Preparation\Outputs\Drawings\#200604.000-C370 - 8/15/2024 9:33:48 AM - Denis

Appendix H – Bill of Quantities: Drainage Infrastructure

8.1.37 DB01- Drainage Ecological Corridor

Item No	Item	Qty	Unit	Rate	Amount
2	**Stormwater Drainage**				
2.01	Outlet Headwall BUP's and associated infra (up to 450mm)	0	ea	$ 6,750.00	$ -
2.02	Outlet Headwall Bubble Up Pits and associated infrastructure (450 to 600mm)	1	ea	$ 10,000.00	$10,000.00
2.03	Outlet Headwall BUP's and associated infra (900mm)	1	ea	$ 12,500.00	$12,500.00
2.04	EO connection to existing	1	ea	$ 398.30	$398.30
2.05	D-Spec ascon	1	item	$ 2,000.00	$2,000.00
Total Stormwater Drainage					**$24,898.30**
3	**Urban Stormwater Technologies (Catch Basin Inserts)**				
3.01	Supply and Install Catch Basin Inserts (CBI)	225	ea	$ 225.00	$50,625.00
Total Catch Basin Inserts					**$50,625.00**
4	**Underground Storage (Ecoaid)**				
4.01	Supply and install ecoAID underground chambers	500	m3	$ 500.00	$250,000.00
Total Stormwater Drainage					**$250,000.00**
5	**POS Earthworks and Landscaping for Drainage Basins**				
5.01	Clearing	10839	m2	$ 2.00	$21,678.00
5.02	Strip topsoil	10839	m2	$ 3.85	$41,730.15
5.03	Cut to Fill Earthworks (general across 1% AEP areas)	10839	m3	$ 5.00	$54,195.00
5.04	Detailed Cut to Fill works for 63.2% AEP 1yr Basins	367	m3	$ 7.75	$2,844.25
5.05	Mix elevated clay / PRI base to 500mm depth in 1yr Basins	367	m3	$ 27.50	$10,092.50
5.06	Mulch to base of 63.2% AEP basins, (includes mulching, stockpile and application to finished works).	734	m2	$ 16.85	$12,367.90
5.07	Tubestock to 63.2% AEP, 3 per m2	2202	ea	$ 27.50	$60,555.00
5.08	Trees and shrubs, supply and install	242	ea	$ 179.50	$43,439.00
Total POS Earthworks & Landscaping for Drainage Basins					**$246,901.80**
TOTAL (excl. preliminaries)					**$572,425.10**

	Traffic Management, Project Overheads, Project Owners Costs and Risk / Contingency				
	Traffic Management	0%	%		$-
	Project Overheads and Preliminaries (Indirect Construction Costs)	15%	%		$85,863.77
	Project Owner's Cost (Planning and Design Costs)	15%	%		$85,863.77
	Risk Contingency Allowance	15%	%		$111,622.89
Total Preliminaries					**$283,350.42**
TOTAL (incl. preliminaries)					**$855,775.52**
2024 % of escalation		**6.39%**	**%**		**$910,459.58**

8.1.38 DB02 – Drainage Poison Gully East

Item No	Item	Qty	Unit	Rate	Amount
2	**Stormwater Drainage**				
2.01	Outlet Headwall BUP's and associated infra (up to 450mm)	2	ea	$ 6,750.00	$13,500.00
2.02	Outlet Headwall Bubble Up Pits and associated infrastructure (450 to 600mm)	0	ea	$10,000.00	$-
2.03	Outlet Headwall BUP's and associated infra (900mm)	0	ea	$12,500.00	$-
2.04	EO connection to existing	1	ea	$398.30	$398.30
2.05	D-Spec ascon	1	item	$2,000.00	$2,000.00
Total Stormwater Drainage					**$15,898.30**

3	**Urban Stormwater Technologies (Catch Basin Inserts)**				
3.01	Supply and Install Catch Basin Inserts (CBI)	50	ea	$225.00	$11,250.00
Total Catch Basin Inserts					**$11,250.00**

4	**Underground Storage (Ecoaid)**				
4.01	Supply and install ecoAID underground chambers	0	m3	$500.00	$ -
Total Stormwater Drainage					**$ -**

5	**POS Earthworks and Landscaping for Drainage Basins**				
5.01	Clearing	1843	m2	$ 2.00	$3,686.00
5.02	Strip topsoil	1843	m2	$ 3.85	$7,095.55
5.03	Cut to Fill Earthworks (general across 1% AEP areas)	1843	m3	$ 5.00	$9,215.00
5.04	Detailed Cut to Fill works for 63.2% AEP 1yr Basins	61	m3	$ 7.75	$472.75
5.05	Mix elevated clay / PRI base to 500mm depth in 1yr Basins	61	m3	$ 27.50	$1,677.50
5.06	Mulch to base of 63.2% AEP basins, (includes mulching, stockpile and application to finished works).	122	m2	$ 16.85	$2,055.70
5.07	Tubestock to 63.2% AEP, 3 per m2	364	ea	$ 27.50	$10,010.00
5.08	Trees and shrubs, supply and install	14	ea	$ 179.50	$2,513.00
Total Stormwater Drainage					**$36,725.50**

TOTAL (excl. preliminaries)	**$63,873.80**

$61,610.55

	Traffic Management, Project Overheads, Project Owners Costs and Risk / Contingency				
	Traffic Management	0%	%		$ -
	Project Overheads and Preliminaries (Indirect Construction Costs)	15%	%		$9,581.07
	Project Owner's Cost (Planning and Design Costs)	15%	%		$9,581.07
	Risk Contingency Allowance	15%	%		$12,455.39
Total Preliminaries					**$31,617.53**
TOTAL (incl. preliminaries)					**$95,491.33**
2024 % of escalation		**6.39%**	**%**		**$101,593.23**

8.1.39 DB03- Drainage Poison Gully Central

Item No	Item	Qty	Unit	Rate	Amount
2	**Stormwater Drainage**				
2.01	Outlet Headwall BUP's and associated infra (up to 450mm)	1	ea	$6,750.00	$6,750.00
2.02	Outlet Headwall Bubble Up Pits and associated infrastructure (450 to 600mm)	1	ea	$10,000.00	$10,000.00
2.03	Outlet Headwall BUP's and associated infra (900mm)	0	ea	$12,500.00	$ -
2.04	EO connection to existing	1	ea	$ 398.30	$398.30
2.05	D-Spec ascon	1	item	$ 2,000.00	$2,000.00
	Total Stormwater Drainage				**$19,148.30**

3	**Urban Stormwater Technologies (Catch Basin Inserts)**				
3.01	Supply and Install Catch Basin Inserts (CBI)	100	ea	$225.00	$22,500.00
Total Catch Basin Inserts					**$22,500.00**

4	**Underground Storage (Ecoaid)**				
4.01	Supply and install ecoAID underground chambers	0	m3	$ 500.00	$ -
Total Stormwater Drainage					**$ -**

5	**POS Earthworks and Landscaping for Drainage Basins**				
5.01	Clearing	3578	m2	$ 2.00	$7,156.00
5.02	Strip topsoil	3578	m2	$ 3.85	$13,775.30
5.03	Cut to Fill Earthworks (general across 1% AEP areas)	3578	m3	$ 5.00	$17,890.00
5.04	Detailed Cut to Fill works for 63.2% AEP 1yr Basins	74	m3	$ 7.75	$573.50
5.05	Mix elevated clay / PRI base to 500mm depth in 1yr Basins	74	m3	$27.50	$2,035.00
5.06	Mulch to base of 63.2% AEP basins, (includes mulching, stockpile and application to finished works).	147	m2	$16.85	$2,476.95
5.07	Tubestock to 63.2% AEP, 3 per m2	441	ea	$27.50	$12,127.50
5.08	Trees and shrubs, supply and install	66	ea	$179.50	$11,847.00

					$67,881.25
TOTAL (excl. preliminaries)					**$109,529.55**
	Traffic Management, Project Overheads, Project Owners Costs and Risk / Contingency				
	Traffic Management	0%	%		$ -
	Project Overheads and Preliminaries (Indirect Construction Costs)	15%	%		$16,429.43
	Project Owner's Cost (Planning and Design Costs)	15%	%		$16,429.43
	Risk Contingency Allowance	15%	%		$21,358.26
Total Preliminaries					**$54,217.13**
TOTAL (incl. preliminaries)					**$163,746.68**
2024 % of escalation		**6.39%**	**%**		**$174,210.09**

8.1.40 DB04 – Drainage Poison Gully West

Item No	Item	Qty	Unit	Rate	Amount
2	**Stormwater Drainage**				
2.01	Outlet Headwall BUP's and associated infra (up to 450mm)	1	ea	$6,750.00	$6,750.00
2.02	Outlet Headwall Bubble Up Pits and associated infrastructure (450 to 600mm)	1	ea	$10,000.00	$10,000.00
2.03	Outlet Headwall BUP's and associated infra (900mm)	0	ea	$12,500.00	$ -
2.04	EO connection to existing	1	ea	$398.30	$398.30
2.05	D-Spec ascon	1	item	$2,000.00	$2,000.00
Total Stormwater Drainage					**$19,148.30**

3	**Urban Stormwater Technologies (Catch Basin Inserts)**				
3.01	Supply and Install Catch Basin Inserts (CBI)	100	ea	$225.00	$22,500.00
Total Catch Basin Inserts					**$22,500.00**

4	**Underground Storage (Ecoaid)**				
4.01	Supply and install ecoAID underground chambers	0	m3	$500.00	$ -
Total Stormwater Drainage					**$ -**

5	**POS Earthworks and Landscaping for Drainage Basins**				
5.01	Clearing	2019	m2	$ 2.00	$4,038.00
5.02	Strip topsoil	2019	m2	$ 3.85	$7,773.15
5.03	Cut to Fill Earthworks (general across 1% AEP areas)	2019	m3	$ 5.00	$10,095.00
5.04	Detailed Cut to Fill works for 63.2% AEP 1yr Basins	83	m3	$ 7.75	$643.25
5.05	Mix elevated clay / PRI base to 500mm depth in 1yr Basins	83	m3	$ 27.50	$2,282.50
5.06	Mulch to base of 63.2% AEP basins, (includes mulching, stockpile and application to finished works).	165	m2	$ 16.85	$2,780.25
5.07	Tubestock to 63.2% AEP, 3 per m2	493	ea	$ 27.50	$13,557.50
5.08	Trees and shrubs, supply and install	35	ea	$ 179.50	$6,282.50
					$47,452.15

TOTAL (excl. preliminaries)	**$89,100.45**

	Traffic Management, Project Overheads, Project Owners Costs and Risk / Contingency				
	Traffic Management	0%	%		$ -
	Project Overheads and Preliminaries (Indirect Construction Costs)	15%	%		$ 13,365.07
	Project Owner's Cost (Planning and Design Costs)	15%	%		$ 13,365.07
	Risk Contingency Allowance	15%	%		$ 17,374.59
Total Preliminaries					**$ 44,104.72**
TOTAL (incl. preliminaries)					**$133,205.17**
2024 % of escalation		**6.39%**	**%**		**$141,716.98**

8.1.41 DB05 – Drainage Residential Precinct Town Park

Item No	Item	Qty	Unit	Rate	Amount
2	**Stormwater Drainage**				
2.01	Outlet Headwall BUP's and associated infra (up to 450mm)	2	ea	$6,750.00	$13,500.00
2.02	Outlet Headwall Bubble Up Pits and associated infrastructure (450 to 600mm)	0	ea	$10,000.00	$ -
2.03	Outlet Headwall BUP's and associated infra (900mm)	0	ea	$12,500.00	$ -
2.04	EO connection to existing	1	ea	$398.30	$398.30
2.05	D-Spec ascon	1	item	$2,000.00	$2,000.00
Total Stormwater Drainage					**$15,898.30**

3	**Urban Stormwater Technologies (Catch Basin Inserts)**				
3.01	Supply and Install Catch Basin Inserts (CBI)	75	ea	$225.00	$16,875.00
Total Catch Basin Inserts					**$16,875.00**

4	**Underground Storage (Ecoaid)**				
4.01	Supply and install ecoAID underground chambers	500	m3	$500.00	$250,000.00
Total Stormwater Drainage					**$250,000.00**

5	**POS Earthworks and Landscaping for Drainage Basins**				
5.01	Clearing	3145	m2	$ 0.85	$2,673.25
5.02	Strip topsoil	3145	m2	$ 3.85	$12,108.25
5.03	Cut to Fill Earthworks (general across 1% AEP areas)	3145	m3	$ 5.00	$15,725.00
5.04	Detailed Cut to Fill works for 63.2% AEP 1yr Basins	75	m3	$ 7.75	$581.25
5.05	Mix elevated clay / PRI base to 500mm depth in 1yr Basins	75	m3	$ 27.50	$2,062.50
5.06	Mulch to base of 63.2% AEP basins, (includes mulching, stockpile and application to finished works).	150	m2	$ 16.85	$2,527.50
5.07	Tubestock to 63.2% AEP, 3 per m2	449	ea	$ 27.50	$12,347.50
5.08	Trees and shrubs, supply and install	61	ea	$ 179.50	$10,949.50
					$58,974.75

TOTAL (excl. preliminaries)					**$341,748.05**

	Traffic Management, Project Overheads, Project Owners Costs and Risk / Contingency				
	Traffic Management	0%	%		$ -
	Project Overheads and Preliminaries (Indirect Construction Costs)	15%	%		$51,262.21
	Project Owner's Cost (Planning and Design Costs)	15%	%		$51,262.21
	Risk Contingency Allowance	15%	%		$66,640.87
Total Preliminaries					**$169,165.28**
TOTAL (incl. preliminaries)					**$510,913.33**
2024 % of escalation		**6.39%**	**%**		**$543,560.70**

8.1.42 DB06 – Drainage Sultana Road West

Item No	Item	Qty	Unit	Rate	Amount
2	**Stormwater Drainage**				
2.01	Outlet Headwall BUP's and associated infra (up to 450mm)	2	ea	$6,750.00	$13,500.00
2.02	Outlet Headwall Bubble Up Pits and associated infrastructure (450 to 600mm)	0	ea	$10,000.00	$ -
2.03	Outlet Headwall BUP's and associated infra (900mm)	0	ea	$12,500.00	$ -
2.04	EO connection to existing	1	ea	$398.30	$398.30
2.05	D-Spec ascon	1	item	$2,000.00	$2,000.00
Total Stormwater Drainage					**$15,898.30**

3	**Urban Stormwater Technologies (Catch Basin Inserts)**				
3.01	Supply and Install Catch Basin Inserts (CBI)	75	ea	$225.00	$16,875.00
Total Catch Basin Inserts					**$16,875.00**

4	**Underground Storage (Ecoaid)**				
4.01	Supply and install ecoAID underground chambers	0	m3	$500.00	$ -
Total Stormwater Drainage					**$ -**

5	**POS Earthworks and Landscaping for Drainage Basins**				
5.01	Clearing	8050	m2	$ 0.85	$6,842.50
5.02	Strip topsoil	8050	m2	$ 3.85	$30,992.50
5.03	Cut to Fill Earthworks (general across 1% AEP areas)	8050	m3	$ 5.00	$40,250.00
5.04	Detailed Cut to Fill works for 63.2% AEP 1yr Basins	154	m3	$ 7.75	$1,193.50
5.05	Mix elevated clay / PRI base to 500mm depth in 1yr Basins	154	m3	$ 27.50	$4,235.00
5.06	Mulch to base of 63.2% AEP basins, (includes mulching, stockpile and application to finished works).	307	m2	$ 16.85	$5,172.95
5.07	Tubestock to 63.2% AEP, 3 per m2	921	ea	$ 27.50	$25,327.50
5.08	Trees and shrubs, supply and install	68	ea	$ 179.50	$12,206.00
					$126,219.95

TOTAL (excl. preliminaries)	**$158,993.25**

	Traffic Management, Project Overheads, Project Owners Costs and Risk / Contingency				
	Traffic Management	0%	%		$ -
	Project Overheads and Preliminaries (Indirect Construction Costs)	15%	%		$23,848.99

	Project Owner's Cost (Planning and Design Costs)	15%	%		$23,848.99
	Risk Contingency Allowance	15%	%		$31,003.68
Total Preliminaries					**$78,701.66**
TOTAL (incl. preliminaries)					**$237,694.91**
2024 % of escalation		**6.39%**	**%**		**$252,883.61**

Appendix I – Bill of Quantities: Administration Costs

Review Costs	RATE	DESCRIPTION
Land Valuation	$2,000.00	Annual estimate for land valuations required to inform the annual audit of costs.
Legal	$10,000.00	Annual estimate for miscellaneous legal costs.
POS Cost Review	$5,000.00	Audit of POS BOQ required to inform the annual audit of costs.
Infrastructure Estimates	$30,000.00	Audit of Road & Drainage Infrastructure BOQ's required to inform the annual audit of costs.
DCP Management	$30,000.00	Management of the DCP.
Annual estimate	$77,000.00	Total of annual estimates.
Lifetime estimate	$2,310,000.00	Estimate for the 30-year operation period.
DCP Preparation	$250,000.00	Estimated future preparation costs.
Total incl. preparation costs	$2,560,000.00	

Appendix J – Land Valuation 2023

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26 Clive Street
West Perth WA 6005
PO Box 1285
West Perth WA 6872
T 08 9476 2000
F 08 9321 9203
perth@mcgees.com.au
www.mcgees.com.au

Our Ref: V187-24

27 June 2024

City of Kalamunda
2 Railway Road
KALAMUNDA WA 6076
Attention: **Ivana Lazarus**
Coordinator Development Contributions

Dear Ivana

Re: **Market Valuation**
High Wycombe South Development Contribution Plan Area – 2024 Review

We refer to your recent instructions and Valuation Brief that we prepare a market valuation of the above DCP Areas assuming a valuation date of 18 May 2024 (being the date of inspection), and confirm we have completed our inspection and investigations and submit the following report which we trust will be satisfactory for your requirements.

Yours faithfully
McGees Property

Wayne Srhoy AAPI, Masters (Property)
Certified Practising Valuer
Licensed Valuer No. 45093
Western Australia

Directors Peter A Duffield, Damian Molony AAPI, Victor J Sankey AAPI
Liability limited by a scheme approved under Professional Standards Legislation
Sullivan Commercial Pty Ltd - Licensee
ACN 051 442 070 ABN 20 051 442 070
Licensed Real Estate Agents
Associated Offices: Adelaide ▪ Brisbane ▪ Darwin ▪ Melbourne ▪ Perth ▪ Sydney ▪ Victor Harbor

A Market Valuation Report prepared for

High Wycombe South Development Contribution Plan Area – 2024 Review
Under instructions from the City of Kalamunda

Table of Contents

EXECUTIVE SUMMARY **1**

VALUATION REPORT **4**

1.0 VALUATION INSTRUCTIONS **4**
2.0 DATE OF VALUATION **4**
3.0 PROPERTY ADDRESS **4**
4.0 LEGAL DESCRIPTION **4**
5.0 LOCATION **4**
6.0 ACCESS **6**
7.0 SITE DESCRIPTION **6**
7.1 Dimensions 6
7.2 Topography 6
8.0 PLANNING AND DEVELOPMENT **7**
8.1 Local Planning Scheme 7
8.2 Metropolitan Region Scheme 7
8.3 High Wycombe South Residential Precinct Local Structure Plan 8
9.0 ENVIRONMENTAL, HERITAGE AND CULTURAL ISSUES **9**
9.1 Soil Contamination 9
9.2 Asbestos 9
9.3 Heritage Consideration 9
9.4 Aboriginal Sites 9
9.5 Flooding 9
9.6 Climate Shift 9
9.7 Bushfire Risk 10
10.0 SERVICES **10**
11.0 IMPROVEMENTS **10**
12.0 SITE SURVEY **10**
13.0 LEASE DETAILS **10**
14.0 GENERAL COMMENTS **11**
15.0 MARKET COMMENTARY **11**
15.1 General Market 11
15.2 Broader Perth Metropolitan Area Residential Market 12
15.3 Local High Wycombe Residential Market 13
15.4 Residential Englobo Market 14
16.0 MARKET EVIDENCE **15**
16.1 High Wycombe South DCP Area Sales Evidence 15
16.2 South of the River Perth Metropolitan Area Residential Englobo Sales Evidence 19
16.3 North of the River Perth Metropolitan Area Residential Englobo Sales Evidence 23
17.0 VALUATION METHODOLOGY **29**
18.0 VALUATION **31**
19.0 LIMITATIONS **33**

Appendices:
(1) Valuation Instruction
(2) Valuation Brief

Executive Summary

Property Address:	High Wycombe South Development Contribution Plan Area.
General Description:	Our valuation has assumed a hypothetical 1ha to 2ha vacant parcel of land zoned "Urban Development" in accordance with the City of Kalamunda's LPS3, "Urban" under the MRS, and two separate zoning assumptions in relation to the High Wycombe South Residential Precinct Local Structure Plan.
Purpose of Valuation:	To assess the current market value of hypothetical 1ha to 2ha lot assuming two separate zoning scenarios for Scheme Contribution purposes.
Market Valuation:	Residential Medium Density R30 – R60 **$150.00/m²** Hypothetical Lot Range 1ha to 2ha

The above value assumes that the hypothetical lot is transacted GST free and has considered the following assumptions:

- The land comprises an unencumbered freehold parcel of land that is not negatively impacted by any Western Power, Dampier Bunbury Natural Gas Pipeline or Water Corporation easements.
- The land is unimproved.
- The landholding is zoned "Urban Development" in accordance with the City of Kalamunda's Local Planning Scheme No. 3 and "Urban" under the MRS.
- The landholding has a "Residential Medium Density" land use classification with a density mix of residential 'R30' to 'R60'.
- Although it is assumed that the hypothetical landholding is capable of being subdivided, a developer will still need to lodge a subdivision application with the Western Australian Planning Commission to gain a relevant conditional approval.
- It is assumed that the hypothetical landholding will not be required to pay a 10% cash-in-lieu contribution as the provision of public open space will be addressed within the DCP or other infrastructure funding mechanism.
- It is assumed that the hypothetical landholding is generally level to its street frontage with good draining sandy based soils that provide no risk of flooding.
- The hypothetical landholding will require some fill to accommodate eventual residential built form development.
- The hypothetical landholding is un-serviced, with scheme contributions payable over and above the purchase price.
- It is assumed that essential services will be located proximate to the hypothetical landholding with the development site considered to be "ripe" for residential subdivision.
- It is to be assumed that the hypothetical landholding will be unencumbered by any contamination, environmental, heritage or geotechnical constraints.
- Although the hypothetical landholding is located within a bushfire prone area, it is assumed that the BAL rating will not stop the land from being developed for urban development.

Market Valuation (cont'd):

Residential Medium Density R60 – R100 **$155.00/m²**
Hypothetical Lot Range 1ha to 2ha

The above value assumes that the hypothetical lot is transacted GST free and has considered the following assumptions:

- The land comprises an unencumbered freehold parcel of land that is not negatively impacted by any Western Power, Dampier Bunbury Natural Gas Pipeline or Water Corporation easements.
- The land is unimproved.
- The landholding is zoned "Urban Development" in accordance with the City of Kalamunda's Local Planning Scheme No. 3 and "Urban" under the MRS.
- The landholding has a "Residential High Density" land use classification with a density mix of residential R60' to 'R100'.
- Although it is assumed that the hypothetical landholding is capable of being subdivided, a developer will still need to lodge a subdivision application with the Western Australian Planning Commission to gain a relevant conditional approval.
- It is assumed that the hypothetical landholding will not be required to pay a 10% cash-in-lieu contribution as the provision of public open space will be addressed within the DCP or other infrastructure funding mechanism.
- It is assumed that the hypothetical landholding is generally level to its street frontage with good draining sandy based soils that provide no risk of flooding.
- The hypothetical landholding will require some fill to accommodate eventual residential built form development.
- The hypothetical landholding is un-serviced, with scheme contributions payable over and above the purchase price.
- It is assumed that essential services will be located proximate to the hypothetical landholding with the development site considered to be "ripe" for residential subdivision.
- It is to be assumed that the hypothetical landholding will be unencumbered by any contamination, environmental, heritage or geotechnical constraints.
- Although the hypothetical landholding is located within a bushfire prone area, it is assumed that the BAL rating will not stop the land from being developed for urban development.

Date of Inspection: 18 May 2024.

Date of Valuation: 18 May 2024.

Senior Valuer:

Wayne Srhoy AAPI, Masters (Property)
Certified Practising Valuer
Licensed Valuer No. 45093
Western Australia

This Executive Summary is a brief synopsis of the property and our assessment of market value.

It is designed to provide a brief overview and must not be read in isolation, separate from our formal valuation report.

Definition of "Market Value":

The International Valuation Standards Council (and as adopted by the Australian Property Institute) defines **Market Value** in the *International Valuation Standards 2022* as:

> *"The estimated amount for which an asset or liability should exchange on the valuation date between a willing buyer and a willing seller in an arm's length transaction, after proper marketing and where the parties had each acted knowledgeably, prudently and without compulsion."*

As per our appended Valuation Brief, our valuation has had strong regard to State Planning Policy 3.6.

Assumptions, Conditions and Limitations:

- The market is being impacted by the uncertainty caused by the COVID-19 pandemic. As at the date of valuation we consider that there is market uncertainty resulting in significant valuation uncertainty.

  This valuation is therefore reported on the basis of 'significant valuation uncertainty'. As a result, less certainty exists than normal and a higher degree of caution should be attached to our valuation than normally would be the case. Given the unknown future impact that COVID-19 might have on markets, we recommend that the user(s) of this report review this valuation periodically.

  This valuation is current at the date of valuation only. The value assessed herein may change significantly and unexpectedly over a relatively short period of time (including as a result of factors that the valuer could not reasonably have been aware of as at the date of valuation). We do not accept responsibility or liability for any losses arising from such subsequent changes in value.

- The planning and cadastral details obtained from the Department of Planning, Lands & Heritage, Main Roads Western Australia, Landgate and Local Authority websites are current and correct.

- Adjoining land owners or community groups do not impede or restrain development as foreseen.

- We are not aware of any Notices currently issued against the hypothetical landholding and we have made no enquiries in this regard.

- This valuation is made on the assumption that there are no actual or potential asbestos contamination issues affecting the hypothetical landholding.

- The value and utility of land can be adversely affected by the presence of Aboriginal sacred sites and/or sites of Aboriginal heritage significance. We have made no investigations in this regard, as Aboriginal requirements can only be determined by the appointment of an appropriate expert.

  Under these circumstances, we cannot warrant that there are no such sites on the land and if it is subsequently determined that the realty is so affected, we reserve the right to review this valuation.

- Our valuation assumes the hypothetical landholding is generally level to its street frontage with good draining soils that will provide no risk of flooding.

- This market valuation assumes there is no environmental contamination of the hypothetical landholding.

- This market valuation assumes there is no encroachment of adjoining buildings onto the hypothetical landholding.

- This market valuation assumes an unencumbered fee simple title to the hypothetical landholding.

- If there are any encumbrances, encroachments, restrictions, leases or covenants which are not noted in this report, they may affect the assessment of market value. If any such matters are known or discovered, we should be advised and asked as to whether they affect our assessment of market value.

- We have assumed that all information supplied in conducting this market valuation consists of a full and accurate disclosure of all information that is relevant.

- It is assumed that no significant event occurs between the date of inspection and the date of valuation that would impact on the market value of the hypothetical landholding.

- We have not obtained a Property Interest Report in providing our advice. A property-specific report will provide detailed information of property interests not listed on the Certificate of Title that may affect the use and enjoyment of the hypothetical landholding.

  A report can be obtained from Landgate for a charge of $54.95 (incl. GST). If a subsequent Property Interest Report reveals any aspects of the hypothetical landholding that may impact on its value, we reserve the right to review our market valuation.

If there is any variance/contradiction in any of the above assumptions, then we reserve the right to review this market valuation accordingly.

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Valuation Report

1.0 VALUATION INSTRUCTIONS

We have received instructions from Ivana Lazarus – Coordinator Development Contributions at the City of Kalamunda to undertake a market valuation of a hypothetical 1ha to 2ha parcel of land assuming two separate zoning scenarios located within the High Wycombe South Development Contribution Plan Area, to determine the amount needed to be paid for Scheme Contribution purposes.

2.0 DATE OF VALUATION

18 May 2024, being the Date of Inspection.

3.0 PROPERTY ADDRESS

High Wycombe South Development Contribution Plan Area.

4.0 LEGAL DESCRIPTION

Our valuation advice has been based on a hypothetical 1ha to 2ha parcel of land located within the High Wycombe South Development Contribution Plan Area.

As the subject represents a hypothetical parcel of land, we are unable to provide a legal description of the site.

In our two separate zoning scenarios, our valuation has assumed the hypothetical parcel of land is encumbrance free and is suitable for residential subdivision.

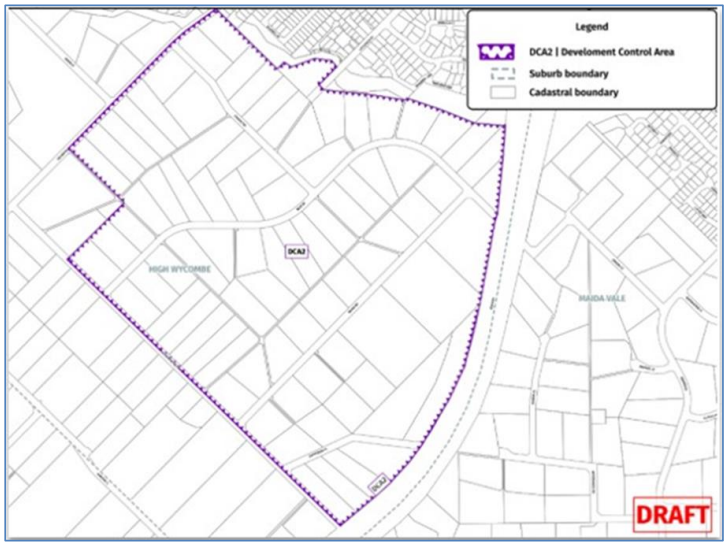
5.0 LOCATION

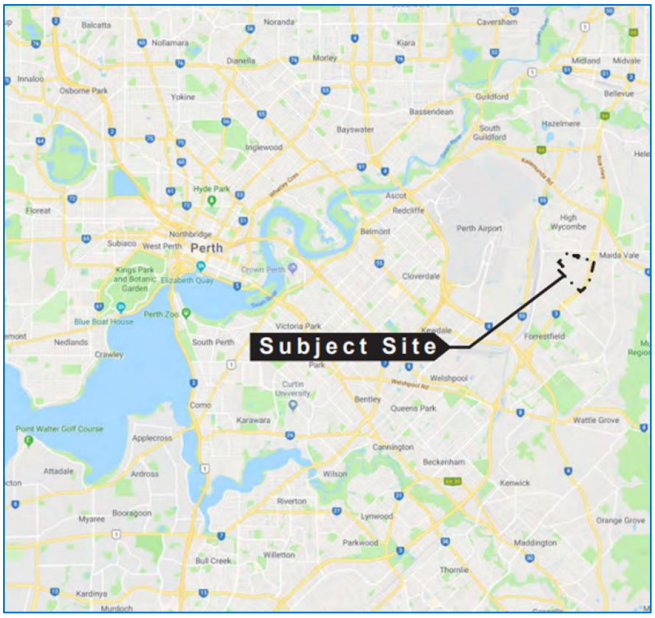
The High Wycombe South Development Contribution Plan (DCP) Area is situated approximately 13kms east of Perth within the suburb of High Wycombe.

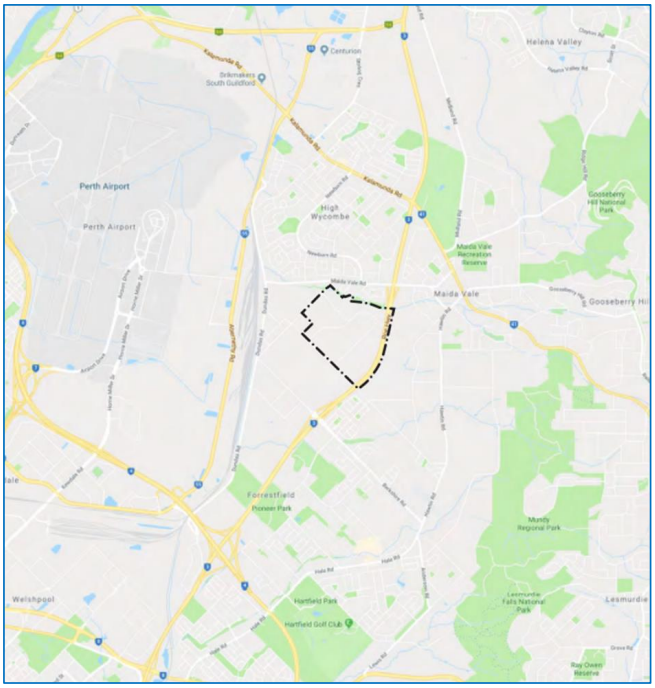
The High Wycombe South DCP Area is bounded to its east by Roe Highway, to the south-west by Sultana Road West, to the north-west by Milner Road, and to the north by Poison Gully Creek.

The High Wycombe Train Station TOD Redevelopment Precinct is located to the immediate west of the High Wycombe South DCP Area, whilst the High Wycombe and Forrestfield Industrial Areas are located to the site's immediate south.

The location of the High Wycombe South DCP Area is best shown in the following Aerial Maps and Location Plans:




Subject Site
Perth
Perth Airport
Victoria Park
Kenwick
Forrestfield
Maida Vale
Welshpool
Queens Park
Bentley
Cannington
Beckenham
Wilson
Riverton
Lynwood
Parkwood
Maddington
Thornlie
Willetton
Bull Creek
Kardinya
Murdoch
Wattle Grove
Orange Grove
Cloverdale
Belmont
Redcliffe
Ascot
Bayswater
Inglewood
Yokine
Osborne Park
Innaloo
Noranda
Morley
Kiara
Caversham
Midland
Midvale
Bellevue
Guildford
Bassendean
South Guildford
Hazelmere
High Wycombe
Hyde Park
Floreat
Northbridge
Subiaco
West Perth
Kings Park and Botanic Garden
Elizabeth Quay
Crown Perth
Perth Zoo
Blue Boat House
Nedlands
Crawley
South Perth
Curtin University
Como
Karawara
Point Walter Golf Course
Applecross
Attadale
Ardross
Myaree
Booragoon
Kenwick
Orange Grove
Maddington
Thornlie
Kardinya
Murdoch


Perth Airport
Perth Airport
High Wycombe
Maida Vale
Helena Valley
Forrestfield
Welshpool
Hartfield Park
Hartfield Golf Club
Lesmurdie
Lesmurdie Falls National Park
Mundy Regional Park
Gooseberry Hill National Park
Maida Vale Recreation Reserve
Centurion
Brikmakers South Guildford



The High Wycombe South Residential Precinct Local Structure Plan Amendment No. 1 was approved by the WAPC in August 2023.

Development at the date of valuation mainly comprised rural lifestyle properties ranging in area between 1ha to 2ha that was predominantly improved with single and two level homes which were constructed in the 1980s and 1990s.

As a residential location, the High Wycombe South DCP Area benefits from its close proximity to the High Wycombe train station, Perth Airport, and numerous major arterial roads.

6.0 ACCESS

Our valuation has assumed that the hypothetical landholding assuming two separate zoning scenarios will have direct street fronting access.

The subject Scheme Contribution Area benefits from being located in close proximity to Roe Highway, Tonkin Highway, and Orrong Road.

These thoroughfares provide excellent access into the Perth CBD as well as the northern and southern suburbs of the Perth metropolitan area.

7.0 SITE DESCRIPTION

7.1 Dimensions

As instructed our market valuation has assumed the subject property comprises a hypothetical 1ha to 2ha vacant parcel of land.

7.2 Topography

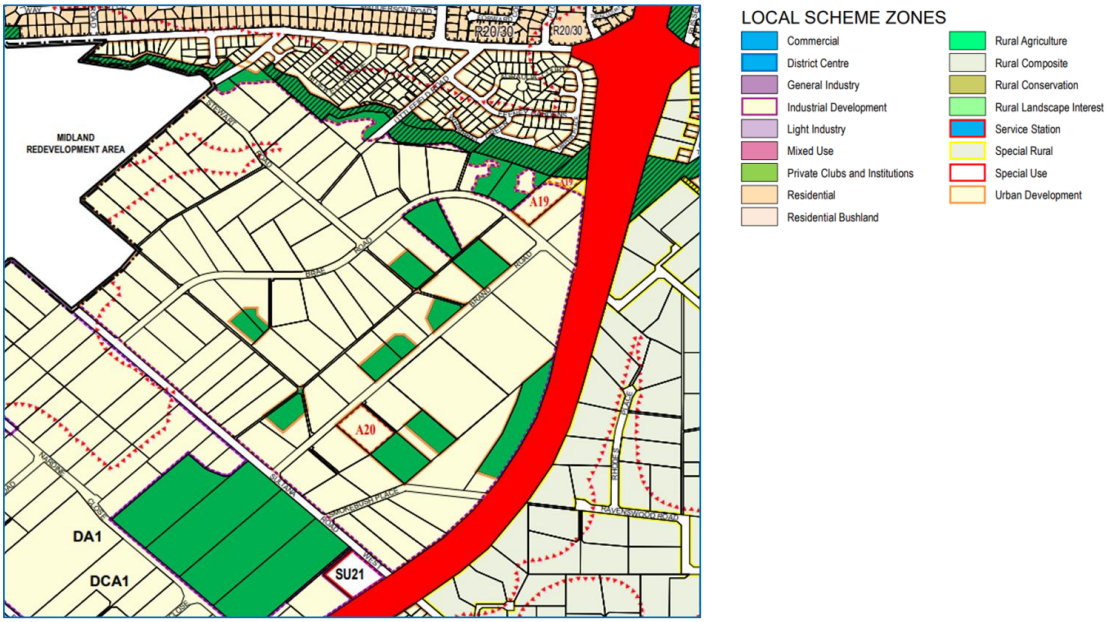
Our valuation has assumed that the subject property is generally level to its street frontage with good draining sandy soils that will provide no risk of flooding.

Despite the above, our valuation has also assumed that the hypothetical landholding will require some clean fill to accommodate eventual residential built-form development.

8.0 PLANNING AND DEVELOPMENT

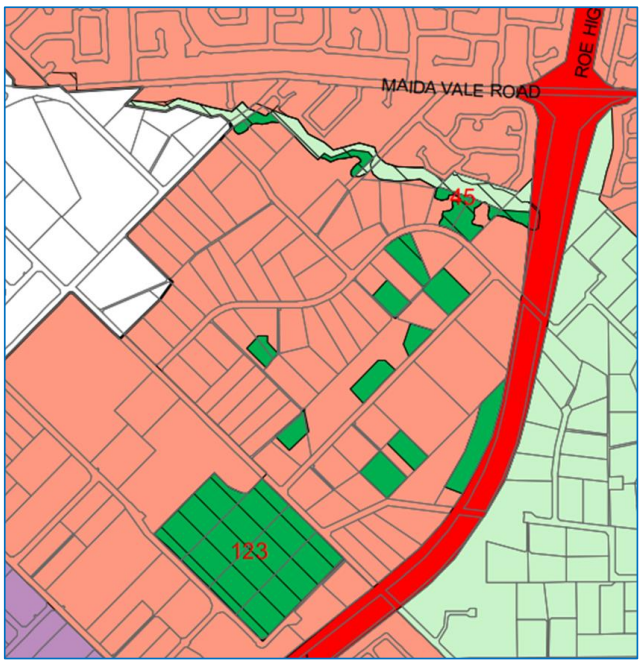
8.1 Local Planning Scheme

At the date of valuation, land located with the High Wycombe South DCP Area was zoned "Urban Development" in accordance with the City of Kalamunda's Local Planning Scheme No. 3 (LPS3), as depicted on the following LPS Zoning Map:



8.2 Metropolitan Region Scheme

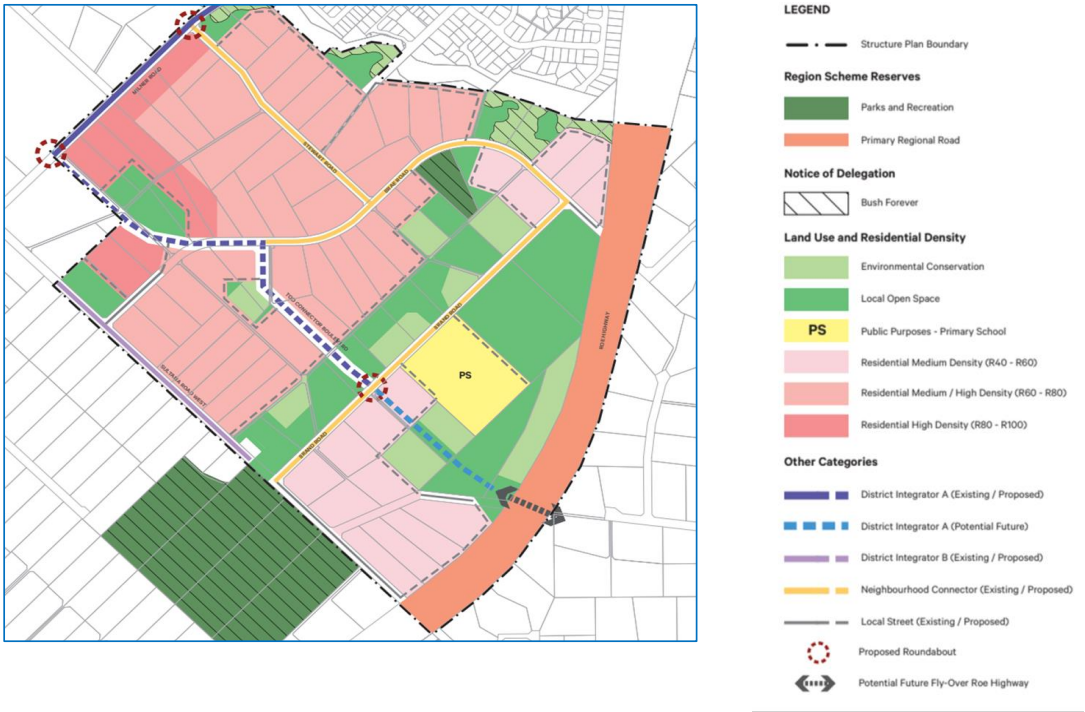
At the date of valuation, land located within the High Wycombe South DCP Area was zoned "Urban" in accordance wit the Metropolitan Region Scheme (MRS), as depicted on the following MRS Zoning Map:



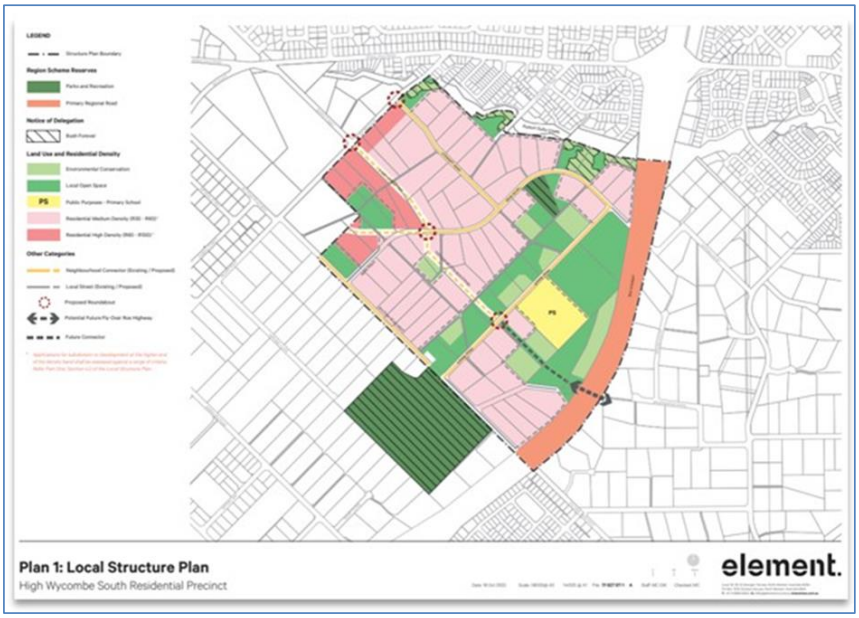
8.3 High Wycombe South Residential Precinct Local Structure Plan

We are aware that the Forrestfield North Residential Precinct Local Structure Plan (now known as the High Wycombe South Residential Precinct Local Structure Plan) was approved by the WA Planning Commission in July 2020.

In accordance with the original Forrestfield North Residential Precinct LSP, the DCP Area had the following zoning:



The High Wycombe South Residential Precinct Local Structure Plan Amendment No. 1 was approved by the WAPC in August 2023.



As instructed, and in accordance with the appended Valuation Brief, our valuation has assumed that the hypothetical landholding will have the following zoning densities:

- Residential Medium Density land use classification with a density mix of R30 to R60
- Residential High Density land use classification with a density mix of R60 to R100

9.0 ENVIRONMENTAL, HERITAGE AND CULTURAL ISSUES

9.1 Soil Contamination

As the subject property comprises a hypothetical parcel of land, we have been unable to search the *Contaminated Sites Act 2003* Public Register database.

As per the appended Valuation Brief, our valuation has assumed the hypothetical landholding will be contaminant free.

9.2 Asbestos

Our valuation has assumed the hypothetical landholding is not negatively impacted by the presence of asbestos fibre.

9.3 Heritage Consideration

Our valuation has assumed the hypothetical landholding is not negatively impacted by the presence of a heritage listed building.

9.4 Aboriginal Sites

Our valuation has assumed the hypothetical landholding is not negatively impacted by the presence of Aboriginal sacred sites.

9.5 Flooding

As we have assumed the hypothetical landholding is generally level to its street frontage and will comprise free draining sandy based soils, our valuation has also assumed that flooding will not occur on the site.

9.6 Climate Shift

Although not conclusive, current thinking from a variety of scientific authorities around the world indicates that various issues are contributing to climate shift, whereby changing weather patterns have the potential to alter the traditionally understood cycles and ranges, including but not limited to ambient temperatures, rainfall, sea levels, and storm activity.

Whilst the full implications of this theory are not fully quantifiable, we consider it appropriate to highlight that over a protracted period a variety of peripheral environmental factors have the potential to impact upon the development potential and/or market value of the hypothetical landholding at a future date.

In light of these potential environmentally based externalities, we recommend the valuation advice contained herein be reviewed if and when these factors become evident or more definite.

9.7 Bushfire Risk

As per the following map sourced from the Department of Fire and Emergency Services (DCA) mapping system, the majority of the High Wycombe South DCP Area appears to fall within a Bushfire Prone Area:



As per the appended Valuation Brief, it is assumed that the BAL Rating for the hypothetical landholding will not stop the land from being developed for urban development.

10.0 SERVICES

Our valuation has assumed that the hypothetical landholding is unserviced with scheme contributions payable over and above the purchase price.

Scheme Contributions within the High Wycombe South DCP Area help facilitate urban development within the Scheme Contribution Area by providing for POS, roads, and community infrastructure. Without them, the subject Scheme Contribution Area would not be suitable for, and would revert to rural, urban development.

At the date of valuation, the Scheme Contribution rate was unknown. It is also assumed that essential services will be located proximate the hypothetical landholding, with the development site considered to be "ripe" for residential subdivision.

11.0 IMPROVEMENTS

Our valuation has assumed that the hypothetical landholding comprises a vacant parcel land.

12.0 SITE SURVEY

The High Wycombe South DCP Area has been valued in accordance with the appended Valuation Brief and has assumed that the hypothetical landholding has a land area ranging between 1ha to 2ha.

13.0 LEASE DETAILS

Our valuation has assumed that the hypothetical landholding will be unencumbered by any lease agreement.

14.0 GENERAL COMMENTS

Our valuation has assumed that the subject property comprises a hypothetical 1ha to 2ha vacant parcel of land zoned "Urban Development" in accordance with the City of Kalamunda's LPS3, "Urban" in the MRS, and with two separate zoning scenarios of both medium density residential (R30-R60) and high density residential (R60-R100).

After considering High Wycombe's median house price of $580,000 and the high cost to construct high density residential development throughout the Perth metropolitan area, we believe a prudent purchaser would only pay a marginally higher value for a high density residential (R60-R100) hypothetical landholding in comparison to a medium density residential (R30-R60) hypothetical landholding.

At the date of valuation, the High Wycombe South DCP Area was still considered to be in its early stages of development with no residential subdivision within the area.

The only active purchaser of land within the subject DCP Area has been the Western Australian Planning Commission.

In recent years the local area has benefited from the announcement and construction of the High Wycombe train station which has significantly improved the locales access to public transport.

Demand for residential development sites within the High Wycombe South DCP Area is slightly inhibited by the fact that the majority of rural landholdings within the area range in land area between 1ha to 1.2ha.

Due to economies of scale issues, a developer would likely need to acquire multiple landholdings within the Scheme Contribution Area to make residential subdivision feasible.

At the date of valuation, private developers were finding it too difficult to make development sites within the subject DCP Area feasible.

15.0 MARKET COMMENTARY

15.1 General Market

As at the date of preparing this advice, whilst the COVID-19 pandemic is all but over, the implications of the pandemic were continuing to have a significant impact on the local and global economies. It is widely accepted that the nation has successfully navigated through the challenges posed by the pandemic, with a concerted focus now set on sustaining its economic recovery.

It is difficult at this point in time to ascertain its true long-term impact on the Western Australian property market, given there is still much to play out with the pandemic periods influence on virtually all sectors of the economy.

The initial anticipated retraction in property values did not materialise; rather, the pandemic and associated fiscal and monetary policy strategies actually had the opposite (positive) effect on a vast majority of property sectors both locally and interstate.

Both domestic and international share markets have exhibited volatility over recent years, with share prices dropping significantly in the early stages of the pandemic, followed by a complete about-face and recovery since. Many stocks remain volatile depending on the day-to-day news cycle and commodity prices.

Since May 2022, the RBA has increased the cash rate by a total of 4.25%, with the official cash rate now sitting at 4.35%. The RBA increased the cash rate on 10 consecutive occasions in a concerted effort to stymie inflation, followed by a decision in April 2023 to keep cash rate on hold, then three more increases in May, June and November 2023.

In its recent December 2023, February 2024, March 2024 and May 2024 meetings, the RBA has elected to adopt a 'wait and see' approach and kept the cash rate on hold.

Returning inflation to target within a reasonable timeframe remains the RBA's highest priority.

The RBA has commented that inflation in Australia has now passed its peak and continues to moderate, but is declining more slowly than expected. Inflation is still weighing on people's real incomes and output growth has been subdued, reflecting weak household consumption growth.

The national CPI in the year to March 2024 is recorded at 3.60%. The Perth CPI in the year to March 2024 is recorded as being slightly lower at 3.38%.

The RBA expects national inflation will return to the target range of 2–3% in the second half of 2025, however has stated the economic outlook remains uncertain and recent data demonstrating that the process of returning inflation to target is unlikely to be smooth.

The market remains divided on what the future holds for the cash rate, with any further increases expected to have ramifications on how many Australians can service their levels of debt.

Australia's GDP growth remains steady, supported by strong domestic demand, particularly in the housing sector and infrastructure investments.

We again highlight the high level of uncertainty in the marketplace remains, and ultimately the performance of property as an asset class will hinge largely on the timing of future interest rate increases, other unpredictable market events, and arguably most importantly impending inflation statistics.

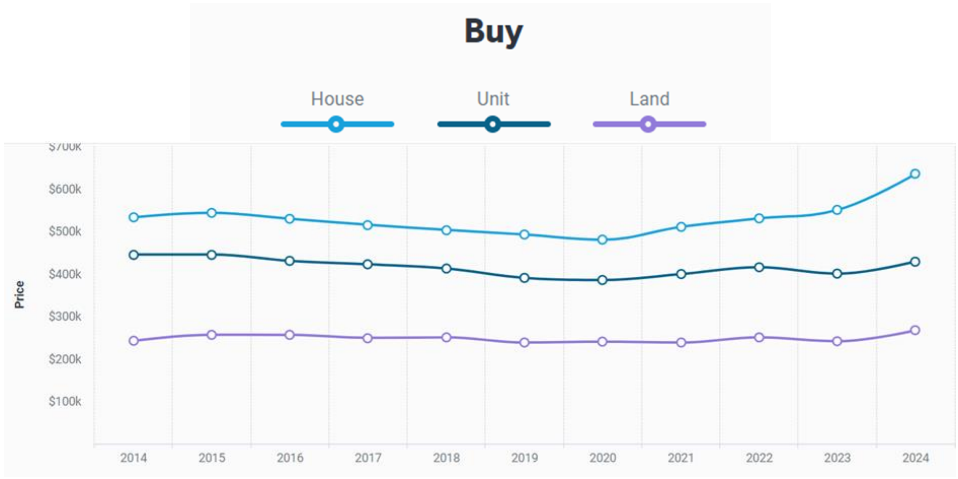
15.2 Broader Perth Metropolitan Area Residential Market

Based on sales to the end of April 2024, the Perth metropolitan area median house price increased by 15.45% from the previous 12 months to sit at $635,000.

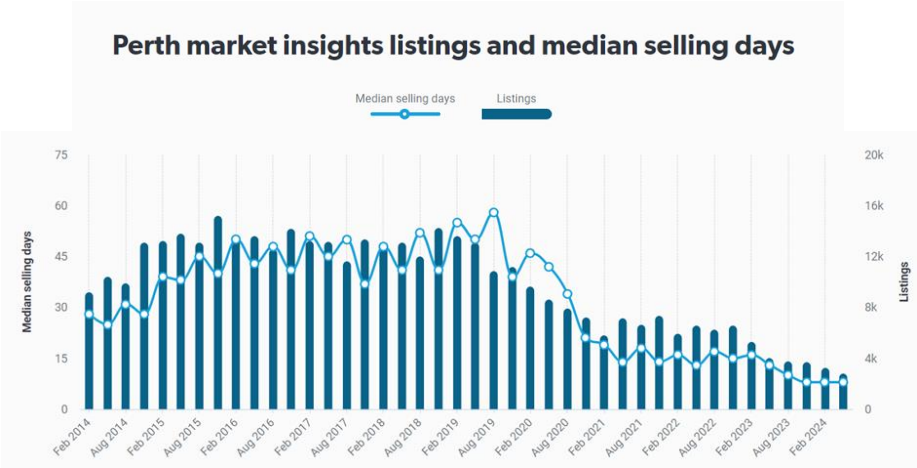
Based on sales to the end of April 2024, the Perth metropolitan area median unit price increased by 7.20% from the previous 12 months to sit at $429,000.

Based on sales to the end of April 2024, the Perth metropolitan area median land price increased by 10.79% from the previous 12 months to sit at $267,000.

The movement of the broader Perth metropolitan area median house price, median unit price and median land price over the past 10 years is shown in the following graph sourced from the REIWA website:



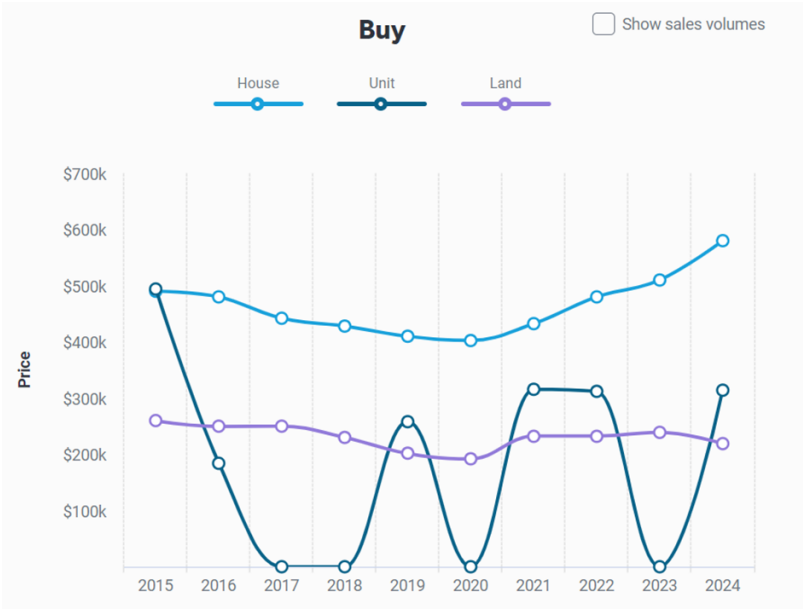
The Perth Market Insights Listings and Median Selling Days over the past 10 years is shown in the following graph sourced from the REIWA website:



15.3 Local High Wycombe Residential Market

In accordance with REIWA statistics, the High Wycombe median house price increased by 13.7% in the 12 months preceding April 2024 to sit at $580,000.

The trends of the High Wycombe residential market over the past 10 years is best shown in the following graph sourced from the REIWA website:



15.4 Residential Englobo Market

Over recent years the Perth residential development site market has experienced reasonably balanced conditions, despite strong market conditions amongst various other sectors of the property market.

Despite some improvement in finished unit (apartment) values, the apartment sector remains fiercely competitive and there is an increasing trend of density within many sections of the metropolitan region as local authorities attempt to meet their infill targets.

There is anecdotal evidence of middle to older-aged Australians gradually selling out of their high-value single residential dwellings on large lots in order to downsize into more age-appropriate places of residence. This is particularly evident within highly regarded and priced locations, and not so much in lower priced areas.

The biggest issue over recent years has been the significant escalation in construction costs, coupled with extended construction timeframes given construction material supply shortages, and a general lack of tradespeople (both skilled and unskilled) available for deployment.

The highly publicised demise of various significantly scaled builders (including Pindan, Jaxon, Probuild and Firm) has made it challenging for many mixed use and apartment developers to secure workable construction costs and terms.

Furthermore, in more recent times there has been growing publicity over the quality of workmanship in some developments, both large and small.

The challenges faced in the relationship between developers and builders was highlighted by builder BGC recently walking off the Shenton Quarter development after facing irreconcilable differences with developer Iris.

Non-core locations have been particularly impacted by significant development costs, with many projects in the area rendered unviable as a result.

With rents increasing and consumer confidence still relatively healthy, there are good indicators for growth, tempered however by the ongoing global pandemic and unusual market disruptors. To a large extent the future direction of land values is intrinsically linked to whatever the future holds for construction costs.

It has been our observation in the local area that developers are preferring to deliver medium density products, mainly due to a better buyer pool for finished products, together with less challenges with construction costs relative to more complex apartment developments.

Furthermore, medium density developments are more conducive to owner-developers who are prepared to take on and fund less expensive and complex developments.

16.0 MARKET EVIDENCE

In adopting market values for the hypothetical landholding located within the High Wycombe South DCP Area assuming two separate zoning scenarios, we have investigated the following market evidence which we consider relevant:

16.1 High Wycombe South DCP Area Sales Evidence

Address:	**32 (Lot 13) Littlefield Road, High Wycombe**
Sale Price:	**$1,617,500** in February 2023.
Land Area:	0.9620 hectares.
Zoning:	Part "Urban Development" and partly reserved for "Parks and Recreation" under the City of Kalamunda LPS3. Under the MRS the land is zoned part "Urban" and partly reserved for "Parks and Recreation". Under the Forrestfield North – High Wycombe South Residential Precinct Local Structure Plan the land is denoted as "Parks and Recreation" ("Local Open Space") and "Environmental Conservation" being partly within Bush Forever.
Improvements:	Circa 1982 built 4 x 2 primary residence plus various sheds, ancillary buildings and below ground swimming pool.
Analysis:	The sale price reflects an improved land rate of **$168/m²** exclusive of GST.
Comments:	Irregular shaped site backing onto Poison Gully Creek and improved with a primary residence, pool and various ancillary structures and sheds. The land is partly within Bush Forever. This transaction reflects a negotiated WAPC acquisition and not an open market transaction.

Address:	**86 (Lot 81) Brae Road, High Wycombe**
Sale Price:	**$1,412,500** in February 2023.
Land Area:	1.0 hectares.
Zoning:	Part "Urban Development" and partly reserved for "Parks and Recreation" under the City of Kalamunda LPS3. Under the MRS the land is zoned part "Urban" and partly reserved for "Parks and Recreation". Under the Forrestfield North – High Wycombe South Residential Precinct Local Structure Plan the land is denoted as "Local Open Space" and "Environmental Conservation" being partly within Bush Forever.
Improvements:	Circa 1981 built 3 x 2 residence plus shed.
Analysis:	The sale price reflects an improved land rate of **$141/m²** exclusive of GST.
Comments:	Broadly regular shaped lot backing onto Poison Gully Creek. The land is partly within Bush Forever. This transaction reflects a negotiated WAPC acquisition and not an open market transaction.

Address:	80 (Lot 82) Brae Road, High Wycombe
Sale Price:	**$1,675,000** in April 2023.
Land Area:	1.0 hectares.
Zoning:	Part "Urban Development" and partly reserved for "Parks and Recreation" under the City of Kalamunda LPS3. Under the MRS the land is zoned part "Urban" and partly reserved for "Parks and Recreation". Under the Forrestfield North – High Wycombe South Residential Precinct Local Structure Plan the land is denoted as "Local Open Space" and "Environmental Conservation" being partly within Bush Forever.
Improvements:	Substantial circa 1988 built 4 x 3 brick and iron residence plus large metaldeck shed.
Analysis:	The sale price reflects an improved land rate of **$167/m²** exclusive of GST.
Comments:	Broadly regular shaped lot backing onto Poison Gully Creek. The land is partly within Bush Forever. This transaction reflects a negotiated WAPC acquisition and not an open market transaction.

Address:	12 (Lot 33) Brand Road, High Wycombe
Sale Price:	**$1,743,000** in March 2023.
Land Area:	1.0130 hectares.
Zoning:	Part "Urban Development" and partly reserved for "Parks and Recreation" under the City of Kalamunda LPS3. Under the MRS the land is zoned part "Urban" and partly reserved for "Parks and Recreation". Under the Forrestfield North – High Wycombe South Residential Precinct Local Structure Plan the land is denoted as "Local Open Space" and "Environmental Conservation".
Improvements:	Circa 1995 built brick and iron 5 x 2 residence with bullnose veranda and double garage UMR plus shed.
Analysis:	The sale price reflects an improved land rate of **$172/m²** exclusive of GST.
Comments:	Slightly irregular shaped lot with cleared moiety fronting Brand Road and the balance uncleared. At the Structure Plan level, the land is denoted as "Local Open Space". This transaction reflects a negotiated WAPC acquisition and not an open market transaction.

Address:	**42 (Lot 30) Brand Road, High Wycombe**
Sale Price:	**$1,370,000** in February 2023.
Land Area:	1.0 hectares.
Zoning:	Part "Urban Development" and partly reserved for "Parks and Recreation" under the City of Kalamunda LPS3. Under the MRS the land is zoned part "Urban" and partly reserved for "Parks and Recreation". Under the Forrestfield North – High Wycombe South Residential Precinct Local Structure Plan the land is denoted as "Local Open Space" and "Environmental Conservation".
Improvements:	Circa 1985 built brick and tile 4 x 2 residence plus old metaldeck sheds.
Analysis:	The sale price reflects an improved land rate of **$137/m²** exclusive of GST.
Comments:	Regular shaped lot with cleared central moiety and the balance uncleared. At the Structure Plan level, the land is denoted as "Local Open Space" and "Environmental Conservation". This transaction reflects a negotiated WAPC acquisition and not an open market transaction.

Address:	**52 (Lot 29) Brand Road, High Wycombe**
Sale Price:	**$1,554,000** in March 2023.
Land Area:	1.0 hectares.
Zoning:	Part "Urban Development" and partly reserved for "Parks and Recreation" under the City of Kalamunda LPS3. Under the MRS the land is zoned part "Urban" and partly reserved for "Parks and Recreation". Under the Forrestfield North – High Wycombe South Residential Precinct Local Structure Plan the land is denoted as "Local Open Space" and "Environmental Conservation".
Improvements:	Substantial circa 1984 built brick and iron 4 x 2 residence plus sheds and below ground swimming pool.
Analysis:	The sale price reflects an improved land rate of **$155/m²** exclusive of GST.
Comments:	Regular shaped lot with cleared moiety around the residence and shed and the balance uncleared. At the Structure Plan level, the land is denoted as "Local Open Space" and "Environmental Conservation". This transaction reflects a negotiated WAPC acquisition and not an open market transaction.

Address:	**4 (Lot 41) Brae Road, High Wycombe**
Sale Price:	$1,400,000 GST free in September 2022.
Land Area:	1.013 hectares.
Zoning:	"Urban Development" in accordance with the City of Kalamunda's LPS3, "Urban" in the MRS, and "Local Open Space" in accordance with the then Forrestfield North Residential Precinct Local Structure Plan (July 2020).
Improvements:	The property is improved with a two level 1995 built 5 bedroom, 3 bathroom residence with a main building area of approximately 292m².
	The property features an attractive Bali-style gazebo area and below-ground pool, a powered workshop, a stable, and various paddock areas.
Analysis:	The sale price reflects an improved land rate of **$138/m²** exclusive of GST.
Comments:	A development site which is situated on the corner of Brae Road and Sultana Road West directly opposite the High Wycombe Industrial Area.
	The property was fully marketed and sold by an independent selling agent.
	The property was purchased by two private individuals.
Address:	**22 (Lot 32) Brand Road, High Wycombe**
Sale Price:	$1,425,000 GST free in June 2022.
Land Area:	1.0 hectares.
Zoning:	"Urban Development" in accordance with the City of Kalamunda's LPS3, "Urban" in the MRS, and "Local Open Space" in accordance with the then Forrestfield North Residential Precinct Local Structure Plan (July 2020).
Improvements:	The property is improved with a 1982 built 4 bedroom, 2 bathroom brick and tile residence with a main building area of approximately 202m².
	The property features a large workshop and a below-ground pool.
Analysis:	The sale price reflects an improved land rate of **$143/m²** exclusive of GST.
Comments:	An improved urban development site which had been identified at Structure Plan level for "Local Open Space".
	The property was purchased by the WAPC and was likely based upon independent valuation advice.

Address:	70 (Lot 27) Brand Road, High Wycombe
Sale Price:	$1,325,000 GST free in April 2021.
Land Area:	1.002 hectares.
Zoning:	"Urban Development" in accordance with the City of Kalamunda's LPS3, "Urban" in the MRS, and "Local Open Space" in accordance with the then Forrestfield North Residential Precinct Local Structure Plan (July 2020).
Improvements:	The property is improved with a 1988 built 4 bedroom, 2 bathroom brick and iron residence with a main building area of approximately 174m².
Analysis:	The sale price reflects an improved land rate of **$132/m²** exclusive of GST.
Comments:	An improved urban development site which had been identified at Structure Plan level for "Local Open Space". The property was purchased by the WAPC and was likely based upon independent valuation advice.

Address:	3 (Lot 40) Brae Road, High Wycombe
Sale Price:	$1,450,000 GST free in March 2021.
Land Area:	1.0 hectare.
Zoning:	"Urban Development" in accordance with the City of Kalamunda's LPS3, "Urban" in the MRS, and "Residential Medium/High Density (R60-R80)" in accordance with the then Forrestfield North Residential Precinct Local Structure Plan (July 2020).
Improvements:	The property is improved with a 1985 built 4 bedroom, 3 bathroom brick and tile residence with a main building area of approximately 250m². The property also includes a very large gable patio area with a modern outdoor kitchen plus a large workshop.
Analysis:	The sale price reflects an improved land rate of **$145/m²** exclusive of GST.
Comments:	A rectangular shaped urban development site which is situated on the corner of Brae Road and Sultana Road West directly opposite the High Wycombe Industrial Area. The property which was fully marketed and sold by an independent selling agent was purchased by a private developer.

16.2 South of the River Perth Metropolitan Area Residential Englobo Sales Evidence

Address:	343 (Lot 80) Wattleup Road, Hammond Park
Sale Price:	**$3,250,000** exclusive of GST in September 2023.
Site Area:	2.6735 hectares.
Zoning:	"Development" in accordance with the City of Cockburn TPS3 and "Urban" in the MRS.
Improvements:	Vacant land.
Analysis:	The sale price reflects a land rate of **$122/m²** exclusive of GST.
Comments:	A rectangular shaped development site which is situated on the southern side of Wattleup Road in close proximity to the residential development front and essential services. The property which was sold in an off-market transaction was contracted by prominent developer Qube Developments who are an active developer within both Hammond Park and the adjoining suburb of Mandogalup.

Address:	**357 (Lot 815) Wattleup Road, Hammond Park**
Sale Price:	**$2,777,500** exclusive of GST in September 2023.
Site Area:	2.0408 hectares.
Zoning:	"Development" in accordance with the City of Cockburn TPS3 and "Urban" in the MRS.
Improvements:	Vacant land.
Analysis:	The sale price reflects a land rate of **$136/m²** exclusive of GST.
Comments:	A rectangular shaped development site which is situated on the southern side of Wattleup Road in close proximity to the residential development front and essential services. The property which was sold in an off-market transaction was contracted by prominent developer Qube Developments who are an active developer within both Hammond Park and the adjoining suburb of Mandogalup.
Address:	**Lot 16 Barfield Road, Hammond Park**
Sale Price:	**$3,000,000** GST free in November 2022.
Land Area:	1.8606 hectares.
Zoning:	"Development" in accordance with the City of Cockburn's TPS3 and "Urban" in the MRS.
Improvements:	Vacant land.
Analysis:	The sale price reflects a land rate of **$161/m²** GST free.
Comments:	A rectangular shaped uncleared vacant parcel of land which was purchased in an off-market transaction by adjoining owner Gold Estates. We are aware that Gold Estates paid a slight premium to acquire the landholding as they had a public open space credit with the City of Cockburn and could gain three extra lots from Lot 16 as they were not required to provide public open space. As they were an adjoining owner, Gold Estates also could reduce their civil costs as they owned adjoining land and were likely to incur savings on retaining wall costs.
Address:	**34 (Lot 37) Verna Court, Cockburn Central**
Sale Price:	**$1,860,000** inclusive of GST in June 2022.
Land Area:	8,269m^2.
Zoning:	"Development" under the City of Cockburn's TPS3 and forming part of Development Area 19. In accordance with the Muriel Court Local Structure Plan, the land has a density coding including a mixture of "Residential R40", "Residential R60" and "Public Open Space".
Improvements:	The property is improved with a 1985 built four bedroom, two bathroom single level residence which adds minimal to no value.
Analysis:	The November 2022 asking price reflects an improved land rate of **$225/m²** inclusive of GST.
Comments:	A rectangular shaped lot with narrow frontage located near the northern perimeter of DCA11. The property was originally listed at the abovementioned asking price in January 2022.

Address:	**Lot 805 Wattleup Road, Hammond Park**
Sale Price:	$4,290,000 inclusive of GST in May 2022.
Site Area:	3.18 hectares.
Zoning:	"Development" in accordance with the City of Cockburn TPS3 and "Urban" in the MRS.
Improvements:	Vacant land.
Analysis:	The sale price reflects a land rate of **$135/m²** inclusive of GST.
Comments:	A regular shaped lot situated approximately 50m from the residential development front and essential services. The property was fully marketed and sold by an independent selling agent. The development site was acquired by Qube Developments who are an active developer within both Hammond Park and the adjoining suburb of Mandogalup.
Address:	**713 (Lot 9101) Warton Road, Piara Waters**
Sale Price:	$18,459,090 inclusive of GST in July 2022.
Land Area:	10.0232 hectares.
Zoning:	"General Rural" in accordance with the City of Armadale's TPS4 and "Urban" in the MRS.
Improvements:	Vacant land.
Analysis:	The sale price reflects a land rate of **$181/m²** inclusive of GST.
Comments:	A large regular shaped residential development site which adjoins established residential development and essential services. The residential development site was fully market and sold by an independent selling agent.
Address:	**44 (Lot 201) Skeet Road, Harrisdale**
Sale Price:	$6,760,220 GST free in September 2022.
Land Area:	5.1694 hectares.
Zoning:	"General Rural" in accordance with the City of Armadale's TPS4 and "Urban Deferred" in the MRS.
Improvements:	The property is improved with remnant sheds which add no value.
Analysis:	The sale price reflects a land rate of **$131/m²** exclusive of GST.
Comments:	A rectangular shaped lot which has an "Urban Deferred" MRS zoning but is situated approximately 275m from established residential development and essential services. The residential development site was fully marketed and sold by an independent selling agent, and was purchased by a company related to Yoke Property who are an active developer within the adjoining suburb of Forrestdale.

Address:	**Lot 1516 Leslie Street, Southern River**
Sale Price:	$2,800,000 GST free in November 2021.
Land Area:	1.9369 hectares.
Zoning:	"Residential Development" under the City of Gosnells TPS6 and "Urban" in the MRS. In accordance with the Southern River Sub-Precinct 3D Structure Plan, the land was zoned "Residential R20", "Residential R30" and "Public Open Space". The property was fully marketed as having a conditional WAPC subdivision approval.
Improvements:	Vacant land.
Analysis:	The sale price reflects a land rate of **$145/m²** exclusive of GST.
Comments:	A rectangular shaped residential englobo site which is situated on the corner of Leslie Street and Matison Street within Southern River Precinct 3. The residential englobo lot which adjoined the residential development front had a small area of public open space traversing near its south-western perimeter. The property was fully marketed and sold by an independent selling agent after being originally listed at an asking price of over $2,999,990 in August 2021.
Address:	**Lot 9012 Southampton Drive, Piara Waters**
Sale Price:	$8,800,000 (GST free) in October 2021.
Land Area:	5.6767 hectares
Zoning:	"General Rural" in accordance with the City of Armadale's TPS4 and "Urban" in the MRS.
Improvements:	Vacant land.
Analysis:	The sale price reflects a land rate of **$155/m²** exclusive of GST.
Comments:	A residential englobo site that enjoys frontages to Warton Road, Southampton Drive and Jayes Road. The residential englobo property is bounded to its immediate east by established residential development and essential services.
Address:	**12 (Lot 42) Bruce Road, Wattle Grove**
Sale Price:	$6,481,250 GST free in May 2021.
Land Area:	3.8125 hectares.
Zoning:	Part reserved "Primary Regional Roads" and part zoned "Residential Development" in accordance with the City of Kalamunda's LPS3, and part reserved "Primary Regional Roads" and part zoned "Urban" in the MRS. 70% of the site is zoned "Residential R20" and 30% of the site is zoned "Public Open Space/Parks & Recreation" in accordance with the Wattle Grove Cell 9 ODP.
Improvements:	Vacant land.
Analysis:	The sale price reflects an improved land rate of **$170/m²** exclusive of GST.
Comments:	A regular shaped improved property situated on the north-eastern corner of the intersection of Welshpool Road East and Bruce Road. The development site is considered to be ripe for residential development as it adjoins the urban development front and essential services. The property was sold in an off-market transaction.

16.3 North of the River Perth Metropolitan Area Residential Englobo Sales Evidence

Address:	**103 (Lot 55) Victoria Road, Dayton**
Sale Price:	$2,032,590 net of GST in December 2023.
Land Area:	1.6541 hectares.
Zoning:	"Residential – Special Use 11" (DCA2) in accordance with the City of Swan LPS17 and "Urban" in the MRS. Under the Local Structure Plan, the site is zoned "R20" and "R30".
Improvements:	Basic improvements of no added value as confirmed by agent. The improvements have since been demolished.
Analysis:	The sale price reflects a land rate of **$123.00/m²** net of GST.
Comments:	A regular shaped development site backing onto Reid Highway. Arms length transaction facilitated by Aydin Palermo of Oradin Property. Discussions with the agent indicated the buyer is a local developer. The price was reportedly discounted due to noise issues and a required noise wall associated with the property's southern boundary to Reid Highway.
Address:	**52 (Lot 10) Kemp Street, Pearsall**
Sale Price:	$2,000,000 GST free in July 2023.
Land Area:	1.0743 hectares.
Zoning:	"Residential R20/R40".
Improvements:	Vacant land.
Analysis:	The sale price reflects a vacant land rate of **$186.00/m²** exclusive of GST.
Comments:	A vacant residential englobo site which benefits from directly adjoining essential services and the residential development front. The property is negatively impacted by the fact that 3,446m² of the site was allocated towards POS. We are aware that a purchaser is likely to be reimbursed by the City of Wanneroo in relation to the portion of the site that has been dedicated to POS. The property was fully marketed and sold by an independent selling agent.
Address:	**16 (Lot 64) Anthea Street, Hazelmere**
Sale Price:	**$1,315,000** GST free in June 2023.
Land Area:	1.1875 hectares.
Zoning:	"Residential R5/R20".
Improvements:	Vacant land.
Analysis:	The sale price reflects a vacant land rate of **$111/m²** exclusive of GST.
Comments:	An extremely irregular shaped vacant site which backs onto an existing rail line and directly adjoins established residential development and essential services. The vacant lot was fully marketed and sold by an independent selling agent.

Address:	**11 (Lot 132) Asturian Drive, Henley Brook**
Sale Price:	$2,780,000 GST free in February 2024.
Land Area:	2.0104 hectares.
Zoning:	"Residential Development" in accordance with the City of Swan's LPS 17 and "Urban" in the MRS. In accordance with the Henley Brook Local Structure Plan, the landholding is partially zoned "Public Open Space" and "Residential R30/R60". Despite the POS designation, the purchase price was based on the assumption the whole of the land was zoned "Residential R30/R60".
Improvements:	The property is improved with a 1991 built four bedroom two bathroom residence. The improvements on the property are considered to add minimal to no value.
Analysis:	The sale price reflects an improved land rate of **$138/m²** exclusive of GST.
Comments:	The property comprises a regular shaped landholding situated on the north-western corner of the intersection of Asturian Drive and Henley Street. The property was purchased by the WA Planning Commission. We are aware that they paid an above market value as the eventual acquisition price was well-above the independent valuation advice they had received on the property.
Address:	**50 (Lot 120) Starflower Road, Henley Brook**
Sale Price:	$2,500,000 GST free in September 2023.
Land Area:	2.0002 hectares.
Zoning:	"Residential Development" in accordance with the City of Swan's LPS 17 and "Urban" in the MRS. In accordance with the Henley Brook Local Structure Plan, the landholding is wholly zoned "Residential R30-R60".
Improvements:	The property is improved with a 1980s built four bedroom one bathroom residence which adds minimal to no value.
Analysis:	The sale price reflects an improved land rate of **$125/m²** exclusive of GST.
Comments:	The property comprises a regular shaped future development site which has direct exposure to Drumpellier Drive. The property was purchased by prominent developer, Mirvac in an off-market transaction.

Address:	**Lot 9000 Coast Road, Dayton**
Sale Price:	$2,500,000 net of GST in February 2024.
Land Area:	1.8773 hectares.
Zoning:	"Residential – Special Use 11" (DCA2) in accordance with the City of Swan LPS17 and "Urban" in the MRS. Under the Local Structure Plan, the site is mostly zoned "R30" with a small north-eastern pocket zoned "R20".
Improvements:	Vacant land.
Analysis:	The sale price reflects a land rate of **$133.00/m²** net of GST.
Comments:	Slightly irregular shaped site with five (5) lots having already been created and excised from the north-western corner, leaving a partial north-eastern frontage to Coast Road. The site also sides onto Garrido Way and Alberello Way which will eventually extent eastwards into the land. Arms length but off market transaction between local developers.
Address:	**151 (Lot 111) Brooklands Drive, Henley Brook**
Sale Price:	$2,310,000 in May 2023.
Land Area:	2.0076 hectares.
Zoning:	"Residential Development" in accordance with the City of Swan's LPS 17 and "Urban" in the MRS. In accordance with the Henley Brook Local Structure Plan, the landholding is partially zoned "Public Open Space" and "Residential R30/R60". Despite the POS designation, the purchase price was based on the assumption the whole of the land was zoned "Residential R30/R60".
Improvements:	The property is improved with a circa 1980s built 4x1 residence which added minimal to no value.
Analysis:	The sale price reflects an improved land rate of **$115/m²** exclusive of GST.
Comments:	A slightly irregular shaped future development site that was purchased by the WAPC and likely based on independent valuation advice.
Address:	**6 (Lot 151) Petrana Place, Henley Brook**
Sale Price:	$2,702,050 GST free in March 2023.
Land Area:	2.0782 hectares.
Zoning:	"Residential Development" in accordance with the City of Swan's LPS 17 and "Urban" in the MRS. In accordance with the Henley Brook Local Structure Plan, the landholding is wholly zoned "Residential R30-R60".
Improvements:	The property is improved with basic transportable style improvements.
Analysis:	The sale price reflects an improved land rate of **$130/m²** exclusive of GST.
Comments:	A regular shaped future development site with cul-de-sac frontage. The property was purchased by a private developer in an off-market transaction.

Address:	**137 (Lot 110) Brooklands Drive, Henley Brook**
Sale Price:	$2,300,000 GST free in March 2023.
Land Area:	2.0011 hectares.
Zoning:	"Residential Development" in accordance with the City of Swan's LPS 17 and "Urban" in the MRS. In accordance with the Henley Brook Local Structure Plan, the landholding is mostly identified for POS, with an eastern area zoned "Residential R30/R60". Despite the POS designation, the purchase price was based on an assumption the whole of the land was zoned for residential development.
Improvements:	The property is improved with a 1988 built 5 bedroom, 2 bathroom single level brick and tile residence with a living area of 209m². Ancillary improvements include a detached workshop of 59m², garage of 45m², and patio of 51m². The improvements were in fair condition.
Analysis:	The sale price reflects an improved land rate of **$115/m²** exclusive of GST.
Comments:	A regular shaped future development site. Acquired by the WAPC following negotiations with the owner. The acquisition price was based on independent valuation advice, which assumed the POS area was alternatively zoned for residential development.
Address:	**342 (Lot 50) Park Street, Henley Brook**
Sale Price:	$2,850,000 GST free in December 2022.
Land Area:	2.0 hectares.
Zoning:	"Residential Development" in accordance with the City of Swan's LPS17 and "Urban" in the MRS. In accordance with the Henley Brook Local Structure Plan, the landholding is zoned "Residential R30/R60".
Improvements:	Vacant land.
Analysis:	The sale price reflects a vacant land rate of **$143/m²** exclusive of GST.
Comments:	A vacant rectangular shaped residential englobo site that is situated on the corner of Park Street and Starflower Road directly opposite the suburb of Brabham and essential services. We are aware that the property was purchased by a company who previously acquired adjoining 112 (Lot 16) Victoria Road, Dayton for $2,300,000 in October 2022, reflecting an overall land rate of $105/m² for the 2.1849ha site with the same zoning. Based on comparable sales within Henley Brook, it appears the purchaser paid a significant premium to acquire Lot 50.

Address:	10 (Lot 124) Starflower Road, Henley Brook
Sale Price:	$2,300,000 GST free in September 2022.
Land Area:	2.0523 hectares.
Zoning:	"Residential Development" in accordance with the City of Swan's LPS17 and "Urban" in the MRS. In accordance with the Henley Brook Local Structure Plan, the landholding is zoned "Residential R30/R60".
Improvements:	The property is improved with a 1986 built 4 bedroom, 2 bathroom residence. The improvements on the property are considered to add minimal to no value.
Analysis:	The sale price reflects an improved land rate of **$112/m²** exclusive of GST.
Comments:	A rectangular shaped development site which was purchased by a private developer who subsequently also acquired 342 (Lot 50) Park Street, Henley Brook two months later in December 2022.

Address:	21 (Lot 133) Asturian Drive, Henley Brook
Sale Price:	$2,300,000 GST free in September 2022. We were advised by DPLH that the property settled in September 2022, but the transfer has not yet been lodged at Landgate.
Land Area:	2.0 hectares.
Zoning:	The property is zoned "Residential Development" in accordance with the City of Swan's LPS17 and "Urban" under the MRS. In accordance with the Henley Brook Local Structure Plan, the landholding is zoned "Public Open Space".
Improvements:	The property is improved with a 1990 built 4 bedroom, 2 bathroom residence plus ancillary improvements including a shed. The improvements on the property are considered to add minimal to no value.
Analysis:	The sale price reflects an improved land rate of **$115/m²** exclusive of GST.
Comments:	A rectangular shaped allotment that was purchased by the WAPC. The residential englobo site is situated directly opposite the residential development front and essential services.

Address:	**148 (Lot 144) Starflower Road, Henley Brook**
Sale Price:	$2,320,000 GST free in September 2022.
Land Area:	2.0175 hectares.
Zoning:	The property is zoned "Residential Development" in accordance with the City of Swan's LPS17 and "Urban" in the MRS. In accordance with the Henley Brook Local Structure Plan, the landholding is zoned a combination of "Public Open Space" and "Residential R30/R60".
Improvements:	The property is improved with a single level residence plus associated ancillary improvements. The improvements on the property are considered to add minimal to no value.
Analysis:	We were advised by the WAPC that the above contract price included the value of a 60,000kL water licence. After deducting the added value of the water licence the above sale price reflects an underlying land value of $2,178,000 or **$108/m²** exclusive of GST.
Comments:	A rectangular shaped improved property that was purchased by the WAPC.
Address:	**335 (Lot 113) Henley Street, Henley Brook**
Sale Price:	$2,300,000 GST free in June 2022.
Land Area:	2.0171 hectares.
Zoning:	The property is zoned "Residential Development" in accordance with the City of Swan's LPS17 and "Urban" in the MRS. In accordance with the Henley Brook Local Structure Plan, the landholding is zoned a combination of "Public Open Space" and "Primary School".
Improvements:	The property is improved with a 1996 built 4 bedroom, 2 bathroom residence plus various ancillary improvements including sheds. The improvements on the property are considered to add minimal to no value.
Analysis:	The sale price reflects an improved land rate of **$114/m²** exclusive of GST.
Comments:	The slightly irregular shaped allotment was purchased by the WAPC. We are aware that the WAPC also paid an additional $100,000 on top of the above sale price for Water Licence 155616.

Address:	8 (Lot 8654) High Road, Wanneroo
Sale Price:	$2,832,000 inclusive of GST in May 2022.
Land Area:	1.5083 hectares.
Zoning:	"Residential R20/R40" in accordance with the City of Wanneroo's DPS2 and "Urban" in the MRS.
Improvements:	Vacant land.
Analysis:	The sale price reflects a land rate of **$188/m²** inclusive of GST.
Comments:	A rectangular shaped infill development site which directly adjoins established residential development and essential services. The elevated development site which has glimpses of Lake Joondalup also is bounded to its immediate south by Wanneroo Secondary College and East Wanneroo Primary School. The property previously sold for $2,640,000 inclusive of GST in May 2015 reflecting an overall land rate of $175/m^2. The transaction incorporated DevelopmentWA selling the landholding to the Education Department. The negotiation was based upon independent valuation advice received by both DevelopmentWA and the Education Department.

17.0 VALUATION METHODOLOGY

As instructed we have utilised the Direct Comparison approach as our primary and only method of valuation in establishing a market value on the hypothetical parcel of land located within the High Wycombe South DCP Area assuming two separate zoning scenarios. We have analysed sales on a rate per square metre basis.

Our adopted land rates have considered the various key assumptions stated in the Executive Summary section of this report and identified in the appended Valuation Brief.

After taking into account the various key assumptions, our valuation has considered that the hypothetical landholding will comprise a 1ha to 2ha vacant parcel of land that will be capable of urban development.

Although we have assumed that the vacant hypothetical parcel of land will be proximate to the residential development front and considered to be ripe for development, we have considered that a potential purchaser will be required to pay Scheme Contributions over and above the purchase price.

Although we have considered the 1ha to 2ha hypothetical vacant parcel of land will be generally level to its street frontage, we have still considered that a developer will be required to import clean fill to enable the site to accommodate further more intensive residential/urban development.

In adopting a market value on the hypothetical landholding, we have also taken into consideration the various comments raised in **Section 14.0** of this report.

As mentioned previously we do not believe that a prospective purchaser would pay a significant premium for a high density residential (R60-R100) landholding in comparison to a medium density residential (R30-R60) landholding.

In adopting a market value on the hypothetical landholding, we have primarily relied on the Local High Wycombe South DCP Area sales evidence that is highlighted in **Section 16.1** of this report.

The various sales that occurred within the subject Scheme Contribution Area attracted improved land rates ranging between $132/m² to $172/m² for lots ranging in land area from 9,620m² up to 1.013ha between March 2021 and April 2023.

We are aware that the majority of sales to occur within the subject Scheme Contribution Area are WAPC acquisitions that have been based upon independent valuation advice. Although we have had regard to these sales, we have given sales between private parties that have been fully marketed greater weighting.

As mentioned previously in **Section 14.0** of this report, private developers were finding it difficult to make development sites feasible within the subject Scheme Contribution Area.

As supporting evidence we have also considered Residential Englobo Sales highlighted in **Sections 16.2** and **16.3** of this report. The identified residential englobo sales indicated a wide value range of between $108/m² to $225/m².

Although we have considered all of the sales highlighted in these sections of our report, we have given the strongest consideration to the various residential englobo sales that have occurred within the suburb of Henley Brook. The various residential englobo sales evidence within Henley Brook indicated a tighter range of between $108/m² to $143/m².

Henley Brook, like High Wycombe, is a former rural lifestyle area that had been rezoned from "Rural" to "Urban Development" over the past 5 years and has also benefited from major government infrastructure expenditure in relation to nearby new or proposed Metronet stations and train lines.

Although Henley Brook has some comparability to High Wycombe, lots within this former rural lifestyle area are significantly larger and generally range in land area between 2ha to 2.5ha.

In our opinion a 2ha to 2.5ha urban development site is more conducive to the private sector in comparison to a smaller 1ha to 1.2ha development site. A developer within the High Wycombe DCP Area may be deterred by having to negotiate with so many landholders to create a sizeable landholding for development.

Despite the above and have regard to the recent WAPC acquisitions within the High Wycombe South DCP Area, we have adopted land rates slightly above the Henley Brook sales range.

Based on the above comments and the identified sales evidence, we have adopted the following land rates:

- Medium Density Residential (R30-R60)
  Hypothetical Lot Range – 1ha to 2ha **$150.00/m²**

- High Density Residential (R60-R100)
  Hypothetical Lot Range – 1ha to 2ha **$155.00/m²**

18.0 VALUATION

After consideration of the factors outlined above and the analysis of relevant market evidence, we are of the opinion the market value of the hypothetical landholding forming the High Wycombe South DCP Area applying as at 18 May 2024, can be stated as follows:

Residential Medium Density R30 – R60 **$150.00/m²**
Hypothetical Lot Range 1ha to 2ha

The above value assumes that the hypothetical lot is transacted GST free and has considered the following assumptions:

- The land comprises an unencumbered freehold parcel of land that is not negatively impacted by any Western Power, Dampier Bunbury Natural Gas Pipeline or Water Corporation easements.
- The land is unimproved.
- The landholding is zoned "Urban Development" in accordance with the City of Kalamunda's Local Planning Scheme No. 3 and "Urban" under the MRS.
- The landholding has a "Residential Medium Density" land use classification with a density mix of residential 'R30' to 'R60'.
- Although it is assumed that the hypothetical landholding is capable of being subdivided, a developer will still need to lodge a subdivision application with the Western Australian Planning Commission to gain a relevant conditional approval.
- It is assumed that the hypothetical landholding will not be required to pay a 10% cash-in-lieu contribution as the provision of public open space will be addressed within the DCP or other infrastructure funding mechanism.
- It is assumed that the hypothetical landholding is generally level to its street frontage with good draining sandy based soils that provide no risk of flooding.
- The hypothetical landholding will require some fill to accommodate eventual residential built form development.
- The hypothetical landholding is un-serviced, with scheme contributions payable over and above the purchase price.
- It is assumed that essential services will be located proximate to the hypothetical landholding with the development site considered to be "ripe" for residential subdivision.
- It is to be assumed that the hypothetical landholding will be unencumbered by any contamination, environmental, heritage or geotechnical constraints.
- Although the hypothetical landholding is located within a bushfire prone area, it is assumed that the BAL rating will not stop the land from being developed for urban development.



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18.0 VALUATION (Cont'd)

Residential Medium Density R60 – R100 **$155.00/m²**
Hypothetical Lot Range 1ha to 2ha

The above value assumes that the hypothetical lot is transacted GST free and has considered the following assumptions:

- The land comprises an unencumbered freehold parcel of land that is not negatively impacted by any Western Power, Dampier Bunbury Natural Gas Pipeline or Water Corporation easements.
- The land is unimproved.
- The landholding is zoned "Urban Development" in accordance with the City of Kalamunda's Local Planning Scheme No. 3 and "Urban" under the MRS.
- The landholding has a "Residential High Density" land use classification with a density mix of residential R60' to 'R100'.
- Although it is assumed that the hypothetical landholding is capable of being subdivided, a developer will still need to lodge a subdivision application with the Western Australian Planning Commission to gain a relevant conditional approval.
- It is assumed that the hypothetical landholding will not be required to pay a 10% cash-in-lieu contribution as the provision of public open space will be addressed within the DCP or other infrastructure funding mechanism.
- It is assumed that the hypothetical landholding is generally level to its street frontage with good draining sandy based soils that provide no risk of flooding.
- The hypothetical landholding will require some fill to accommodate eventual residential built form development.
- The hypothetical landholding is un-serviced, with scheme contributions payable over and above the purchase price.
- It is assumed that essential services will be located proximate to the hypothetical landholding with the development site considered to be "ripe" for residential subdivision.
- It is to be assumed that the hypothetical landholding will be unencumbered by any contamination, environmental, heritage or geotechnical constraints.
- Although the hypothetical landholding is located within a bushfire prone area, it is assumed that the BAL rating will not stop the land from being developed for urban development.



Wayne Srhoy AAPI, Masters (Property)
Certified Practising Valuer
Licensed Valuer No. 45093
Western Australia

19.0 LIMITATIONS

The market is being impacted by the uncertainty caused by the COVID-19 pandemic. As at the date of valuation we consider that there is market uncertainty resulting in significant valuation uncertainty.

This valuation is therefore reported on the basis of 'significant valuation uncertainty'. As a result, less certainty exists than normal and a higher degree of caution should be attached to our valuation than normally would be the case. Given the unknown future impact that COVID-19 might have on markets, we recommend that the user(s) of this report review this valuation periodically.

This valuation is current at the date of valuation only. The value assessed herein may change significantly and unexpectedly over a relatively short period of time (including as a result of factors that the valuer could not reasonably have been aware of as at the date of valuation). We do not accept responsibility or liability for any losses arising from such subsequent changes in value.

This valuation is current as at the date of valuation only. The value assessed herein may change significantly and unexpectedly over a relatively short period of time (including as a result of general market movements or factors specific to the particular property).

Liability for losses arising from such subsequent changes in value is excluded as is liability where the valuation is relied upon after the expiration of 3 months from the date of valuation or such earlier date if you become aware of any factors that have an effect on the valuation.

Neither the whole nor any part of this report or any reference thereto may be included in any document, circular or statement without our written approval of the form and context in which it will appear.

In accordance with the Code of Conduct laid down under the provisions of the *Land Valuers Licensing Act 1978*, we are required to hold this valuation confidential unless directed by our client in writing or required by law to disclose the valuation; and we are not permitted to allow the use of confidential information contained in the valuation for the benefit of any party other than our client. Therefore, use of confidential information contained in this report by an unauthorised third party is not permitted unless express permission in writing is provided.

This valuation is for the use only of the party to whom it is addressed and for no other purpose. No responsibility is accepted to any other party who may rely on the whole or any part of the content of this valuation.

Liability limited by a scheme approved under Professional Standards Legislation.

Yours faithfully
McGees Property



Wayne Srhoy AAPI, Masters (Property)
Certified Practising Valuer
Licensed Valuer No. 45093
Western Australia

Appendix 1:
Valuation Instruction

Justine Mitchell

From: Ivana Lazarus <Ivana.Lazarus@kalamunda.wa.gov.au>
Sent: Wednesday, 8 May 2024 12:24 PM
To: Wayne Srhoy
Subject: Appointment -2024 Land Valuations - HWS, FFHW Industrial Area, Cell 9

Morning Wayne,

I am pleased to advise McGees have been successfully appointed to undertake the 2024 land valuations for the City's 3 DCP project areas:

1. High Wycombe South Development Contribution Area
2. Forrestfield High Wycombe Industrial Area Development Contribution Area
3. Cell 9 Wattle Grove Infrastructure Cost Sharing Arrangement

Please prioritise your valuations in the order listed above. Due to statutory obligations, the final report for HWS needs to be finalised no later than close of business 14 June 2024.

Please advise on your preference with availability for a commencement meeting next week:

- Monday 13 May at 12pm
- Wednesday 15 May at 12pm
- Thursday 16 May at 12pm

Kind regards,

City of Kalamunda
Ivana Lazarus Coordinator Development Contributions
City of Kalamunda | 2 Railway Road Kalamunda WA 6076 | PO Box 42 Kalamunda WA 6076
T (08) 9257 9999 | **kalamunda.wa.gov.au**

We acknowledge the Whadjuk people of the Noongar nation, and pay our respects to leaders past, present and emerging.

Please consider the environment before you print this e-mail.

From: Wayne Srhoy <WSrhoy@per.mcgees.com.au>
Sent: Tuesday, April 23, 2024 6:33 AM
To: Ivana Lazarus <Ivana.Lazarus@kalamunda.wa.gov.au>
Subject: RE: Request for Quote - High Wycombe South - 2024 Land Valuations

Hi Ivana,

Yes, I will be able to complete the work before that date.

As I did the reports last year and you understand my format, I probably will not have to send you draft reports.

McGEES PROPERTY
Wayne Srhoy Senior Valuer
D 08 9476 2057 F 08 9321 9203 M 0412 678 114 E wsrhoy@per.mcgees.com.au
Level 2, 26 Clive Street, West Perth, WA 6005 W per.mcgees.com.au

1

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From: Ivana Lazarus <Ivana.Lazarus@kalamunda.wa.gov.au>
Sent: Tuesday, April 23, 2024 3:26 AM
To: Wayne Srhoy <WSrhoy@per.mcgees.com.au>
Subject: RE: Request for Quote - High Wycombe South - 2024 Land Valuations

Morning Wayne,

Thank you for taking the time to review & submit a quote.

RE all project areas - I am currently finalising a review of the submissions. Are you able to please confirm that despite being able to finalise the reports within 10 bds, the final report can be issued & dated 30 June 2024?

Thank you,

City of Kalamunda
Ivana Lazarus Coordinator Development Contributions
City of Kalamunda | 2 Railway Road Kalamunda WA 6076 | PO Box 42 Kalamunda WA 6076
T (08) 9257 9999 | **kalamunda.wa.gov.au**

We acknowledge the Whadjuk people of the Noongar nation, and pay our respects to leaders past, present and emerging.

Please consider the environment before you print this e-mail.

From: Wayne Srhoy <WSrhoy@per.mcgees.com.au>
Sent: Tuesday, April 16, 2024 5:32 PM
To: Ivana Lazarus <Ivana.Lazarus@kalamunda.wa.gov.au>
Cc: Justine Mitchell <JMitchell@per.mcgees.com.au>
Subject: RE: Request for Quote - High Wycombe South - 2024 Land Valuations

Hi Ivana,

Our quote to value the abovementioned DCP area in accordance with your brief is $2250+GST and we would require 10 working days from instruction to complete the work.

Please forward us a written instruction and PO number should you want our firm to go ahead with the work.

McGEES PROPERTY
there is a difference…
Wayne Srhoy Senior Valuer
D 08 9476 2057 F 08 9321 9203 M 0412 678 114 E wsrhoy@per.mcgees.com.au
Level 2, 26 Clive Street, West Perth, WA 6005 W per.mcgees.com.au
■ Sales ■ Leasing ■ Property Management ■ Valuation ■ Advisory

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From: Ivana Lazarus <Ivana.Lazarus@kalamunda.wa.gov.au>
Sent: Monday, April 15, 2024 7:30 PM

To: Wayne Srhoy <WSrhoy@per.mcgees.com.au>
Subject: Request for Quote - High Wycombe South - 2024 Land Valuations

Good Evening Wayne,

Please use this link to access a Request for Quote and Scope of Works for preparing a 2024 Land Valuation to support the future High Wycombe South Development Contribution Plan.

It is requested that you please provide your proposal and quotation by 5pm Monday 22 April 2024.

Should you have any questions, please do not hesitate to contact me.

Kind Regards,

City of Kalamunda
Ivana Lazarus Coordinator Development Contributions
City of Kalamunda | 2 Railway Road Kalamunda WA 6076 | PO Box 42 Kalamunda WA 6076
T (08) 9257 9999 | **kalamunda.wa.gov.au**

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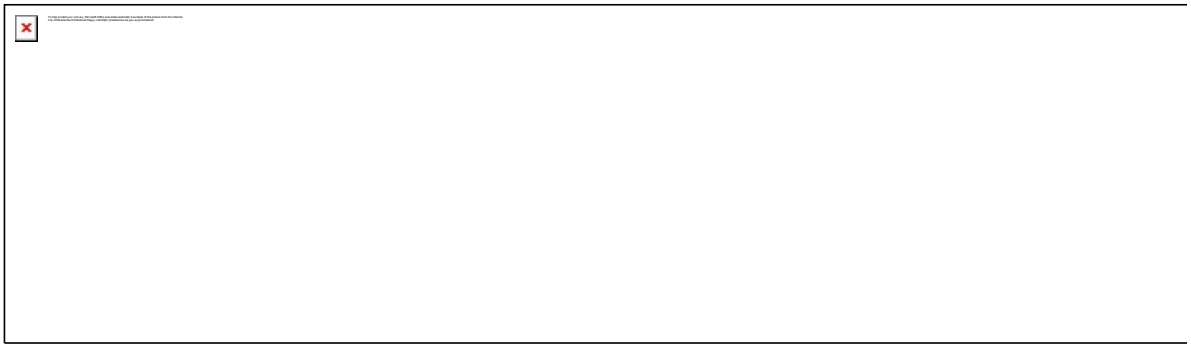

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Appendix K –Land Details

Appendix L – Cost Apportionment Schedule

Property Description			Gross Area		Reservation (sqm)						NCA		Developer Contribution
Lot No.	House No.	Street	ha	sqm	Road	LOS	P&R	BF	Other	Total	sqm	ha	
5	100	BRAE ROAD	0.75	7,530	0.00	0.00	0.00	0.00	0.00	0.00	7,530.00	0.75	$576,202.40
13	101	BRAE ROAD	2.87	28,734	0.00	28,734.00	0.00	0.00	0.00	28,734.00	0.00	0.00	$0
40	3	BRAE ROAD	1.00	10,003	0.00	0.00	0.00	0.00	0.00	0.00	10,003.00	1.00	$765,438.60
41	4	BRAE ROAD	1.01	10,127	0.00	8,852.14	0.00	0.00	0.00	8,852.14	1,274.86	0.13	$97,553.44
58	44	BRAE ROAD	1.00	10,023	0.00	0.00	0.00	0.00	0.00	0.00	10,023.00	1.00	$766,969.02
59	38	BRAE ROAD	1.00	10,006	3,384.25	0.00	0.00	0.00	0.00	3,384.25	6,621.75	0.66	$506,702.29
60	32	BRAE ROAD	1.03	10,349	1,331.70	0.00	0.00	0.00	0.00	1,331.70	9,017.30	0.90	$690,011.94
61	28	BRAE ROAD	1.00	10,002	306.40	2,703.36	0.00	0.00	0.00	3,009.76	6,992.24	0.70	$535,052.52
62	24	BRAE ROAD	1.00	10,002	1,665.75	8,042.23	0.00	0.00	0.00	9,707.98	294.02	0.03	$22,498.68
63	16	BRAE ROAD	1.01	10,078	2,277.49	1,058.10	0.00	0.00	1,535.00	4,870.59	5,207.41	0.52	$398,475.72
64	10	BRAE ROAD	1.00	10,010	541.15	0.00	0.00	0.00	0.00	541.15	9,468.85	0.95	$724,564.96
65	9	BRAE ROAD	1.00	10,017	0.00	0.00	0.00	0.00	0.00	0.00	10,017.00	1.00	$766,509.89
66	15	BRAE ROAD	1.01	10,052	0.00	0.00	0.00	0.00	0.00	0.00	10,052.00	1.01	$769,188.12
67	23	BRAE ROAD	1.24	12,398	10.47	0.00	3,223.05	0.00	0.00	3,233.52	9,164.48	0.92	$701,274.29
68	35	BRAE ROAD	1.13	11,262	3,802.31	0.00	1,450.54	0.00		5,252.85	6,009.15	0.60	$459,825.59
69	39	BRAE ROAD	1.17	11,732	104.26	481.15	0.00	0.00	0.00	585.41	11,146.59	1.11	$852,947.14
70	41	BRAE ROAD	1.21	12,128	4,138.20	0.00	0.00	0.00	0.00	4,138.20	7,989.80	0.80	$611,386.72
71	43	BRAE ROAD	1.01	10,099	395.10	0.00	0.00	0.00	0.00	395.10	9,703.90	0.97	$742,551.20
72	47	BRAE ROAD	1.22	12,151	0.00	0.00	0.00	0.00	0.00	0.00	12,151.00	1.22	$929,805.50
73	49	BRAE ROAD	1.04	10,369	0.00	0.00	0.00	0.00	0.00	0.00	10,369.00	1.04	$793,445.25
74	53	BRAE ROAD	1.00	10,014	0.00	0.00	0.00	0.00	0.00	0.00	10,014.00	1.00	$766,280.33
75	55	BRAE ROAD	1.00	10,008	0.00	0.00	0.00	0.00	0.00	0.00	10,008.00	1.00	$765,821.20
76	59	BRAE ROAD	1.11	11,099	0.00	0.00	6,159.55	0.00	0.00	6,159.55	4,939.45	0.49	$377,971.18
77	63	BRAE ROAD	1.00	10,037	0.00	5,609.71	0.00	0.00	0.00	5,609.71	4,427.29	0.44	$338,780.23
78	67	BRAE ROAD	1.01	10,108	0.00	0.00	0.00	10,108.00	0.00	10,108.00	0.00	0.00	$0
79	79	BRAE ROAD	1.30	13,013	0.00	4,699.17	0.00	0.00	0.00	4,699.17	8,313.83	0.83	$636,181.78
81	86	BRAE ROAD	1.00	10,000	0.00	2,822.13	6,160.73	0.00	0.00	8,982.86	1,017.14	0.10	$77,832.47
82	80	BRAE ROAD	1.01	10,060	0.00	4,259.56	5,800.44	0.00	0.00	10,060.00	0.00	0.00	$0
83	76	BRAE ROAD	1.00	10,027	0.00	0.00	0.00	0.00	0.00	0.00	10,027.00	1.00	$767,275.10
84	70	BRAE ROAD	1.00	10,005	0.00	0.00	0.00	0.00	0.00	0.00	10,005.00	1.00	$765,591.64
85	60	BRAE ROAD	1.09	10,930	189.24	0.00	0.00	0.00	0.00	189.24	10,740.76	1.07	$821,892.66
86	66	BRAE ROAD	1.08	10,796	0.00	0.00	0.00	0.00	0.00	0.00	10,796.00	1.08	$826,119.68
200	94	BRAE ROAD	1.00	10,000	0.00	0.00	1,916.40	0.00	0.00	1,916.40	8,083.60	0.81	$618,564.38
201	98	BRAE ROAD	1.00	10,000	0.00	0.00	913.34	0.00	0.00	913.34	9,086.66	0.91	$695,319.43
3	3	BRAND ROAD	0.95	9,501	0.00	0.00	0.00	0.00	0.00	0.00	9,501.00	0.95	$727,025.11
4	11	BRAND ROAD	0.96	9,580	0.00	0.00	0.00	0.00	0.00	0.00	9,580.00	0.96	$733,070.26

Property Description			Gross Area		Reservation (sqm)						NCA		Developer Contribution
Lot No.	House No.	Street	ha	sqm	Road	LOS	P&R	BF	Other	Total	sqm	ha	
7	23	BRAND ROAD	1.01	10,102	0.00	0.00	0.00	0.00	0.00	0.00	10,102.00	1.01	$773,014.17
8	29	BRAND ROAD	1.09	10,855	0.00	0.00	10,354.88	0.00	0.00	10,354.88	500.12	0.05	$38,269.63
9	31	BRAND ROAD	1.09	10,923	0.00	3,256.95	7,666.05	0.00	0.00	10,923.00	0.00	0.00	$0
10	37	BRAND ROAD	1.01	10,072	0.00	2,467.06	0.00	0.00	0.00	2,467.06	7,604.94	0.76	$581,936.88
14	65	BRAND ROAD	4.16	41,632	0.00	41,632.00	0.00	0.00	0.00	41,632.00	0.00	0.00	$0
15	51	BRAND ROAD	4.16	41,581	0.00	0.00	0.00	0.00	41,581.00	41,581.00	0.00	0.00	$0
25	86	BRAND ROAD	1.00	10,002	0.00	0.00	0.00	0.00	0.00	0.00	10,002.00	1.00	$765,362.08
26	78	BRAND ROAD	1.00	10,001	0.00	0.00	10,001.00	0.00	0.00	10,001.00	0.00	0.00	$0
27	70	BRAND ROAD	1.00	10,034	0.00	10,034.00	0.00	0.00	0.00	10,034.00	0.00	0.00	$0
28	62	BRAND ROAD	0.99	9,910	0.00	5,798.60	4,111.40	0.00	0.00	9,910.00	0.00	0.00	$0
29	52	BRAND ROAD	1.00	10,001	0.00	7,222.30	2,778.70	0.00	0.00	10,001.00	0.00	0.00	$0
30	42	BRAND ROAD	1.00	10,001	0.00	4,687.64	5,313.36	0.00	0.00	10,001.00	0.00	0.00	$0
32	22	BRAND ROAD	1.00	10,002	0.00	10,002.00	0.00	0.00	0.00	10,002.00	0.00	0.00	$0
31	32	BRAND ROAD	1.00	10,000	2,763.42	7,236.58	0.00	0.00	0.00	10,000.00	0.00	0.00	$0
33	12	BRAND ROAD	1.01	10,132	0.00	5,008.33	5,123.67	0.00	0.00	10,132.00	0.00	0.00	$0
34	4	BRAND ROAD	1.00	10,043	1,072.94	8,970.06	0.00	0.00	0.00	10,043.00	0.00	0.00	$0
13	32	LITTLEFIELD ROAD	0.96	9,620	0.00	5,604.66	4,015.34	0.00	0.00	9,620.00	0.00	0.00	$0
2	15	MILNER ROAD	1.01	10,142	0.00	1,195.00	2,676.05	0.00	0.00	3,871.05	6,270.95	0.63	$479,858.76
46	69	MILNER ROAD	1.03	10,301	0.00	3,282.87	0.00	0.00	0.00	3,282.87	7,018.13	0.70	$537,033.65
47	63	MILNER ROAD	1.02	10,246	0.00	2,147.65	0.00	0.00	0.00	2,147.65	8,098.35	0.81	$619,693.06
48	55	MILNER ROAD	1.07	10,650	28.44	0.00	0.00	0.00	0.00	28.44	10,621.56	1.06	$812,771.37
49	51	MILNER ROAD	1.08	10,790	4,985.76	0.00	0.00	0.00	0.00	4,985.76	5,804.24	0.58	$444,145.69
50	45	MILNER ROAD	1.19	11,904	0.00	0.00	0.00	0.00	0.00	0.00	11,904.00	1.19	$910,904.84
92	21	MILNER ROAD	1.07	10,715	204.17	2,924.94	1,159.73	0.00	0.00	4,288.84	6,426.16	0.64	$491,735.57
5	15	SMOKEBUSH PLACE	1.01	10,110	0.00	0.00	0.00	0.00	0.00	0.00	10,110.00	1.01	$773,626.34
6	3	SMOKEBUSH PLACE	1.00	10,013	0.00	0.00	0.00	0.00	0.00	0.00	10,013.00	1.00	$766,203.81
18	29	SMOKEBUSH PLACE	2.61	26,100	0.00	26,100.00	0.00	0.00	0.00	26,100.00	0.00	0.00	$0
50	39	SMOKEBUSH PLACE	2.21	22,114	0.00	3,059.60	19,054.40	0.00	0.00	22,114.00	0.00	0.00	$0
100	20	SMOKEBUSH PLACE	1.40	14,002	0.00	949.01	0.00	0.00	0.00	949.01	13,052.99	1.31	$998,826.59
101	14	SMOKEBUSH PLACE	1.00	10,017	0.00	0.00	0.00	0.00	0.00	0.00	10,017.00	1.00	$766,509.89
102	8	SMOKEBUSH PLACE	1.00	10,018	0.00	0.00	0.00	0.00	0.00	0.00	10,018.00	1.00	$766,586.41
103	2	SMOKEBUSH PLACE	1.00	10,018	0.00	0.00	0.00	0.00	0.00	0.00	10,018.00	1.00	$766,586.41
51	4	STEWART ROAD	1.16	11,553	217.10	0.00	0.00	0.00	0.00	217.10	11,335.90	1.13	$867,433.31
52	12	STEWART ROAD	1.85	18,454	330.00	0.00	0.00	0.00	0.00	330.00	18,124.00	1.81	$1,386,864.86
54	22	STEWART ROAD	1.53	15,263	1,166.11	0.00	0.00	0.00	0.00	1,166.11	14,096.89	1.41	$1,078,706.76
55	28	STEWART ROAD	1.00	10,017	156.73	0.00	0.00	0.00	0.00	156.73	9,860.27	0.99	$754,516.77
56	34	STEWART ROAD	1.01	10,059	224.11	0.00	0.00	0.00	0.00	224.11	9,834.89	0.98	$752,574.67
57	40	STEWART ROAD	1.21	12,102	184.54	0.00	0.00	0.00	0.00	184.54	11,917.46	1.19	$911,934.81

Property Description			Gross Area		Reservation (sqm)						NCA		Developer Contribution
Lot No.	House No.	Street	ha	sqm	Road	LOS	P&R	BF	Other	Total	sqm	ha	
87	35	STEWART ROAD	1.21	12,079	138.00	0.00	0.00	0.00	0.00	138.00	11,941.00	1.19	$913,736.11
88	31	STEWART ROAD	1.00	10,038	158.45	0.00	0.00	0.00	0.00	158.45	9,879.55	0.99	$755,992.09
89	25	STEWART ROAD	1.00	10,000	134.59	0.00	0.00	0.00	0.00	134.59	9,865.41	0.99	$754,910.09
90	19	STEWART ROAD	1.00	10,004	135.73	0.00	0.00	0.00	0.00	135.73	9,868.27	0.99	$755,128.94
91	15	STEWART ROAD	0.97	9,731	147.00	0.00	0.00	0.00	0.00	147.00	9,584.00	0.96	$733,376.34
35	129	SULTANA ROAD WEST	1.02	10,240	0.00	0.00	0.00	0.00	0.00	0.00	10,240.00	1.02	$783,574.05
36	123	SULTANA ROAD WEST	1.03	10,260	0.00	0.00	0.00	0.00	0.00	0.00	10,260.00	1.03	$785,104.47
37	117	SULTANA ROAD WEST	1.01	10,092	0.00	0.00	0.00	0.00	0.00	0.00	10,092.00	1.01	$772,248.96
38	111	SULTANA ROAD WEST	1.00	10,013	0.00	0.00	0.00	0.00	0.00	0.00	10,013.00	1.00	$766,203.81
39	105	SULTANA ROAD WEST	1.01	10,060	0.00	0.00	0.00	0.00	0.00	0.00	10,060.00	1.01	$769,800.29
TOTALS			99.43	994,266	30,193.41	218,840.80	97,878.63	10,108.00	43,116.00	400,136.84	594,129.16	59.41	$45,463,300.17

Appendix M – Summary of Lands Costs

	INFRASTRUCTURE ITEM		Area (sqm)	Rate ($/sqm)	TOTAL Land Cost $
POS	POS07	Poison Gully Creek POS (Milner Road)	610	155.00	$94,550.00
	POS08	Residential Precinct Town Park	17,234	$155.00	$2,671,270.00
	POS09	Littlefield POS / Drainage	481	$150.00	$72,150.00
	DB-02	Poison Gully Creek Drainage / POS (Brae Road)	2,822	$150.00	$423,300.00
	DB-03	Littlefield POS / Drainage	5,605	$150.00	$840,750.00
	DB-04	Poison Gully Creek POS (Stewart Road)	3,502	$155.00	$542,810.00
	DB-06	Sultana Road West POS	8,852	$155.00	$1,372,060.00
	TOD BLVD	TOD Connector Boulevard	5,724	$150.00	$858,600.00
	TOTAL POS LANDS (EXCL GREEN LINK)		**44,830**	VARIABLE	**$6,875,490.00**
ROADS	Total road reserve identified for acq.		30,193.41	N/A	N/A
	Deduction - Local RR component of RD03		5730	N/A	N/A
	Deduction - Local RR component of RD04 (excl. of Lot 31 RR)		7755	N/A	N/A
	Deduction - SRW, 50% preportionate share		536.47	N/A	N/A
	Total deductions		14021.47	N/A	N/A
	Medium Density Land for RR		7,141.94	$150.00	$1,071,291.00
	High Density Land for RR		9030	$155.00	$1,399,650.00
	TOTAL ROAD LANDS (RR - deductions)		**16,171.94**	**VARIABLE**	**$2,470,941.00**
TOTAL DCP LAND			**61,001.94**	**VARIABLE**	**$9,346,431.00**

1. The DCP only provides for land costs outside of what would have been expected to be ceded free of cost by the developer for a local road. Refer to part 2.6 of the DCPR for further information in this regard.
2. DCA2 only provides for 50% of the costs associated with RD09 (SRW).
3. DVA2 only provides for lands costs outside of the 'Green Link'. Refer to part 2.3 of the DCPR for further information in this regard.

Appendix N – Population Yield Analysis Report


URBIS
HIGH WYCOMBE
SOUTH
YIELDS ANALYSIS
Prepared for City of Kalamunda
29 March 2023

EXECUTIVE SUMMARY

The High Wycombe South Residential Precinct is a precinct within the Forrestfield North District Structure Plan. The area is expected to undergo a significant transformation by leveraging State Government investment in METRONET, with the new High Wycombe Station operational as of 2022.

Urbis has been engaged to prepare a dwelling and population forecast to inform the preparation of the High Wycombe South Development Contribution Plan (DCP). The precinct has undergone an extensive planning process, with previous yields analysis and scenario testing undertaken along the way. This contemporary yields analysis is intended to explain the forecasting process for this important input to the DCP.

Given the long-term nature of the forecasts, and the fact that the yields for the precinct have been developed with regard for the established visionary targets, it is important to consider the factors that will influence the density and timing of development. These factors include:

- Fragmented land ownership may increase development timeframes.
- Government investment is required to improve the connectivity and amenity of the area to support medium and high-density development.
- The currently relatively low median house prices in surrounding areas affects development viability.

Urbis employed three methodologies to forecast each of the three densities that are included in the adopted yield scenario for the precinct. The methodologies have regard to Greater Perth dwelling activity, resident dwelling preferences, corridor and precinct market shares, historical sales trends and other market factors. The results of the forecast show the precinct estimated to sell out by 2064. The results of Urbis' modelling over the thirty-year life of the DCP (to 2053) are presented to the right. Based on these forecasts, the precinct could be significantly sold and built out by 2053.

Given the results of the yield forecasts, Urbis recommends that a DCP lifespan of 30 years be adopted to ensure that it is appropriately aligned to the forecast period of development. The modelling shows that within 30 years the critical mass generated by the development will generate a need for infrastructure supported by a DCP. The DCP horizon recognises potential changes to development rates and market factors.

Urbis also recommends that a per square metre rate be applied to provide certainty of funding for the DCP and to costs for developers and incentivise the visionary density targets for the precinct.

By 2053, the Residential Precinct is forecast to accommodate:

938
Single lot dwellings

783
Medium density dwellings

150
Apartments

INTRODUCTION

REPORT BACKGROUND

Urbis was engaged by the City of Kalamunda (the City) to undertake an analysis of the High Wycombe South Local Structure Plan (LSP) area, with particular regard for the Residential Precinct. The key outputs of this report are dwelling and population forecasts, including consideration of the different dwellings types that may be viable in the area.

This work is one of the inputs to the High Wycombe South Development Contribution Plan (DCP) that the City is currently working to finalise for release for public comment. The dwelling and population forecasts inform traffic modelling and community infrastructure needs assessments that inform the DCP.

In line with State Planning Policy 3.6 Infrastructure Contributions (SPP 3.6), projected growth figures for new dwellings are an important input to the DCP.

As such, the City is undertaking to refine and confirm such inputs to ensure that the most up-to-date and reliable data and information is factored into the development of the DCP.

Therefore, Urbis has been engaged to update previous forecasts produced for the City throughout the planning process for the LSP area.

REPORT STRUCTURE

This report is structured with the following sections:

- **Project overview** outlining the planning context and work-to-date that has led to this reporting.
- **Local context** outlining the competitive context and demographic features of the area.
- **Dwelling yield forecasts** and population forecasts for the LSP area.
- **Monitoring and evaluation** considerations for the future use of the findings of this report.

Detailed assumptions and methodologies are appended to this report.

CONTENTS

Project Overview	5
Local Context	11
Dwelling Yield Forecasts	17
Recommendation	22
Appendix	26

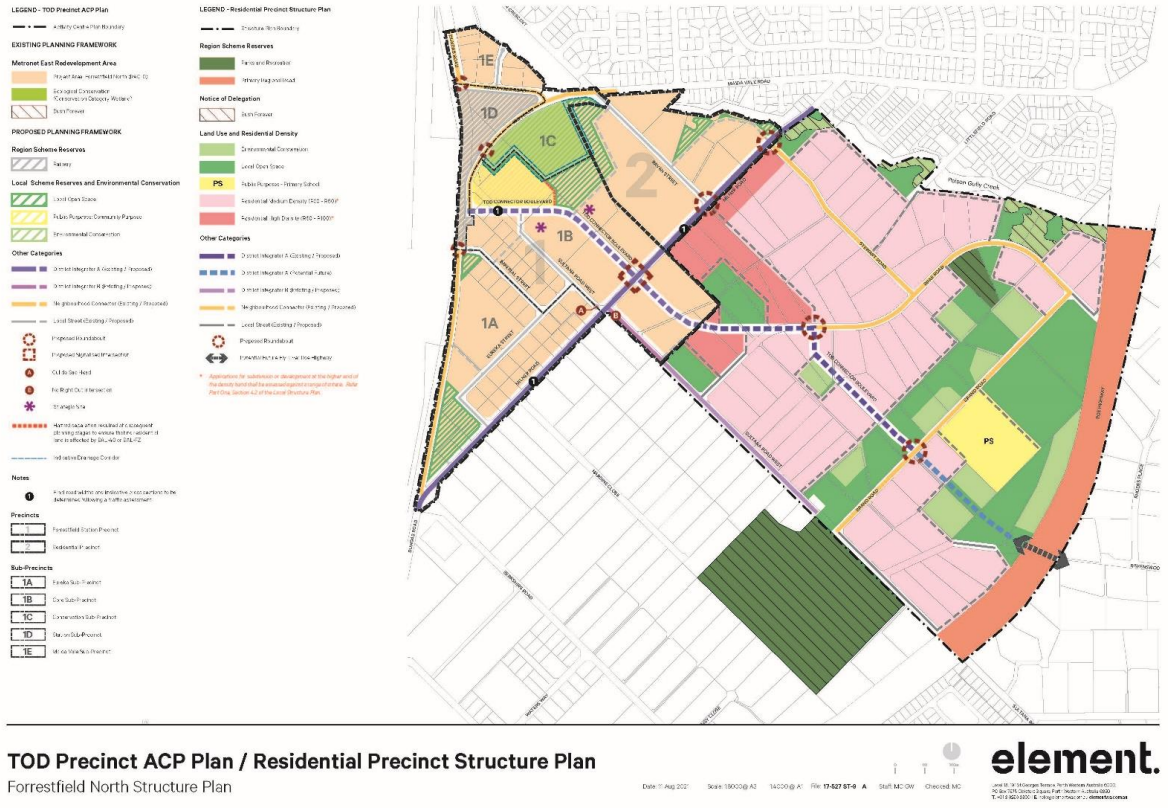
01

PROJECT OVERVIEW



PROJECT OVERVIEW

High Wycombe South comprises two distinct precincts, the High Wycombe South Residential Precinct Local Structure Plan (HWS Residential Precinct LSP) are ('Residentil Precinct') as well as the Transit Orientated Development Precinct area ('TOD Precinct') which also encompasses the Activity Centre Precinct as identified under the Forrestfield North District Structure Plan. This report has particular regard for the Residential Precinct. It is acknowledged that while the areas are under the control of different planning authorities (TOD by DevelopmentWA), the proximity, characteristics and likely timing of development mean that the TOD Precinct should be considered in the process of forecasting the Residential Precinct.



HIGH WYCOMBE SOUTH CONTEXT

Project Overview

The TOD Precinct is a 60 ha redevelopment area located directly east of the new High Wycombe Train Station, which commenced operation in October 2023 with the completion of the Forrestfield-Airport Link.

Current land uses in the TOD Precinct and Forrestfield North DSP area are comprised of light industrial and rural residential land uses. These uses are expected to be replaced by residential and retail / commercial land uses as development in this precinct progresses.

The Residential Precinct is to the east of the TOD precinct and comprises a total area of 123.1 ha (including the adjacent Roe Highway Reserve) with 47.5 ha of land designated for residential development.

Future residential land use in the precincts will remain dependent on the outlook for infrastructure and investment in the area that has been kick-started by the Forrestfield-Airport Link.

HWS Residential Precinct LSP Area and TOD Precinct (METRONET East Redevelopment Scheme)



DEVELOPMENT YIELDS

Key Insights

The long-term planning for residential land uses in the High Wycombe South LSP area, and at a larger scale the Forrestfield North District Structure Plan (DSP) area, was catalysed by the Forrestfield-Airport Link project. The DSP area is directly impacted with the new High Wycombe Station adjacent to the area, connecting it to the metropolitan rail network for the first time. This fundamental change to the amenity and connectivity of the area was recognised as having important implications for other land uses and a significant programme of planning was initiated.

The City of Kalamunda has been part of a collaborative process with DevelopmentWA through multiple stages of the planning process over the proceeding years. The process has occurred in line with the requirements of the relevant State Planning Policies and has led to the current focus of work by the City on the HWS DCP (as required under SPP 3.6).

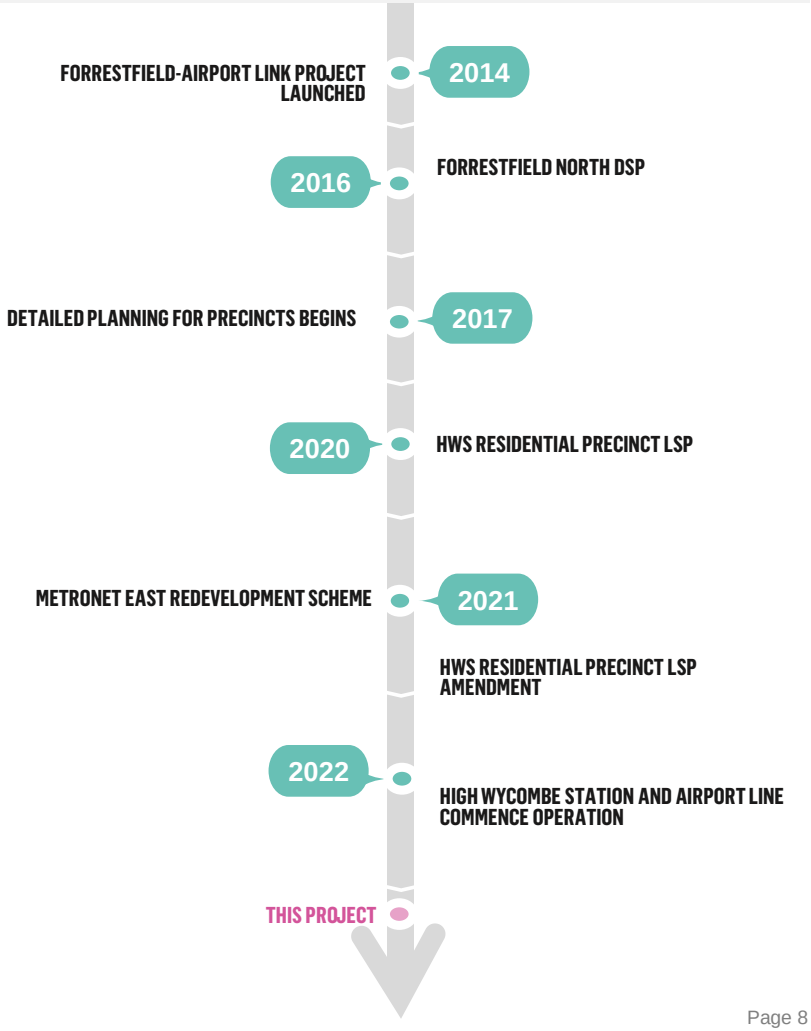
The diagram to the right highlights the work that has been done by DevelopmentWA and the City. The diagram identifies those pieces of work that are public documents, as well as the substantial amount of work hat has occurred to refine the assumptions and outputs, in particular the land use and yield analysis, as the project has moved from inception through to more detailed planning stages.

Where appropriate, plans, reports or studies have been through various iterations to ensure that new information and data is relied on where relevant.

As the process for the DCP is at a more detailed level compared to the high-level work of, for example, the DSP, it is appropriate to assess new information that has become available.

Therefore, this report's aim is to take into account previous work carried out and reassess the development outlook for residential uses in the Residential Precinct and provide confidence in the current market setting that the most appropriate forecasts available are utilised.

The Journey



DEVELOPMENT YIELDS CONT.

Key Insights

The City of Kalamunda (with element) previously prepared yields for the Residential Precinct as part of the Forrestfield North Residential Precinct Local Structure Plan (FNRPLSP). The FNRPLSP has since been amended to the High Wycombe South Residential Precinct Local Structure Plan (referred to as such for the remainder of this report) to reflect the name of the station and neighbourhood (pending WAPC endorsement).

The original yields proposed were aligned to the visionary targets, and were adopted for a number of reasons. These include:

- The consideration of TOD Precinct yields available at the time; and
- A need to plan for a positive development outlook to maintain flexibility for infrastructure to be delivered at an appropriate scale.

Urbis previously prepared a dwelling and population forecast for the Residential Precinct in line with these yields. The Urbis work resulted in a process for a downward revision of density bandings and, by extension, the yield of the precinct (the amendment to the HWS Residential Precinct LSP). The considerations that led to this decision include the need for the Residential Precinct to develop in a complementary way to the TOD Precinct and the market depth for medium to high density product in the area being assessed as low. This has resulted in the moderation of the established vision for density in the area, which would be considered a positive outcome, but is seeming less likely in the current context.

Urbis has thus been engaged to provide a review of the dwelling and population growth based on the updated yields to assist with preparation for the DCP for the precinct.

The challenges to achieving higher order density in this area include the fragmented ownership of land in the precinct and the relatively low median house price in High Wycombe. The fact that these factors have not been mitigated since the previous yields analysis was undertaken form part of the basis for a new analysis that can increase the credibility with the inclusion of more up-to-date information and data.

Residential Precinct Yield Scenario for the DCP

DENSITY	TOTAL DWELLINGS AT FULL BUILD OUT
Single lot	938
Medium density	1,329
Apartments	150
Total dwellings	2,417

Source: City of Kalamunda, element

PRECINCT OVERVIEW

Key Insights

Based on previous work prepared by the City of Kalamunda, DevelopmentWA, element and Urbis, key expected development scale and timeframe outcomes identified are:

- Due to land tenure, planning and environmental constraints, the TOD Precinct is likely to see an extended development timeframe**.**
- The Residential Precinct has a significant yield and also allows for a significant proportion of medium density product that will be challenging to make commercially viable in the short to medium term and will be more financially viable in the medium to longer term.
- Based on the scenario analysed there is potential for around **2,417 new dwellings** within the Residential Precinct. The will be dependent on the density that the development takes place at and ultimate yield plan.
- The TOD Precinct is expected to have a greater focus on medium density product and in the longer term some higher density. This precinct has the potential for around **649 new dwellings and 1,570 new residents**.
- The residents in the TOD and Residential Precincts and surrounding areas will support a total of **11,310 sq.m of retail and commercial floorspace,** with 5,160 sq.m of this being in the form of shop retail, comprised of a supermarket and associated specialties. Although, located in the TOD precinct, this will become important in providing amenity to the Residential Precinct and provide local jobs.

RESIDENTIAL PRECINCT

+2,417 DWELLINGS
Potential for over 2,000 new dwellings to be developed with a focus on medium density product.

+5,923 NEW RESIDENTS
To live in the Residential Precinct at final build out.

TOD PRECINCT

+5,160 SQ.M OF SHOP RETAIL FLOORSPACE
Accommodated within a neighbourhood shopping centre within the TOD Precinct.

+6,150 SQ.M OF NON-RETAIL FLOORSPACE
Accommodated within the TOD Precinc.

+649 DWELLINGS
To be Built in High Wycombe TOD Precinct, with densities ranging from R30 to R80.

+1,570 NEW RESIDENTS
To live in the TOD Precinct.

Source: City of Kalamunda, DevelopmentWA, element, Urbis

02

LOCAL CONTEXT



SURROUNDING DEVELOPMENT AREA ANALYSIS

Review of Surrounding Development Area Assessment

The City of Kalamunda has made assessments for the area surrounding the Forrestfield North DSP area, to assist with the planning process. These assessments are largely based on the assumption that these areas will develop in line with comparable areas.

We have commented on the overall yields and uptake rates provided by the City in their report in the table below.

The map on the following page illustrates the proximity and scale of the development areas with relation to the study area.

City of Kalamunda - Surrounding Area Analysis – New Dwelling Forecast

AREA	2031	2041	2050
Maida Vale South	817	1,905	2,722
Cell-9 Wattle Grove	339	339	339
Dual Density R20/40	554	1,058	1,511

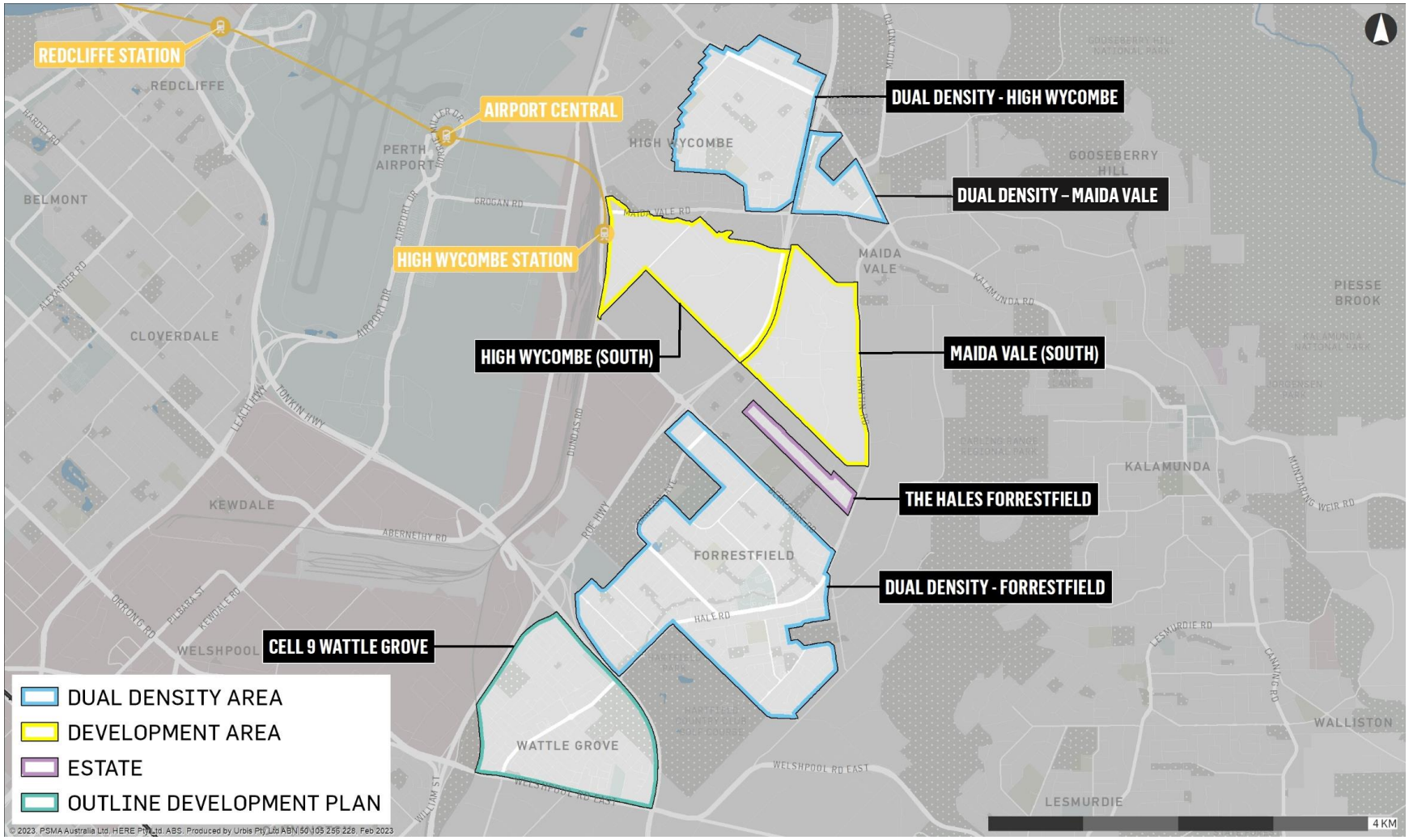
Source: City of Kalamunda
Note: this yield assessment was accurate as of 2021.

Kalamunda Yield Analysis – Surrounding Development Area Yields

AREA	URBIS COMMENTS ON YIELD	URBIS COMMENTS ON TIMING
Maida Vale South	The medium yield scenario which excludes 30% of land for roads and POS and selects an average lot size of 450sq.m per lot, yielding a total of 2,722 lots at build-out is a reasonable scenario.	The City comments that there is a planning process ahead for the development area, which is an urban expansion area, that will need a planning scheme amendment. However, things are well progressed with land amalgamation and the planning process.
Cell-9 Wattle Grove	339 lots are estimated to be remaining, based on the Infrastructure Cost Sharing Arrangement (ICSA) This may be above the final realised number of lots, with the 2020/21 Urban Land Development Outlook (ULDO) for the region stating 150 lots remain in active and planned developments within the region. However, given the longer timeframe of this analysis, the ICSA yield assumption is a reasonable one.	This development timeframe is likely to be brought forward from 2031 completion, given historical sales data available since 2021.
Dual Density R20/40	The 2% annual take-up of subdivisions, based on historical take-up rates is reasonable.	As the yields are estimated based on historical take-up rates, the timeframes applied to yields are reasonable.

Source: Urbis

SURROUNDING DEVELOPMENT AREAS



DEMOGRAPHIC REVIEW

Demographic Profile, High Wycombe and Surrounding Areas, 2021

	HIGH WYCOMBE (SUBURB)	FORRESTFIELD (SUBURB)	CITY OF KALAMUNDA	GREATER PERTH
Population	12,198	13,181	58,762	2,116,647
Aged 15-24	12%	11%	12%	12%
Aged 25-39	21%	22%	18%	22%
Aged 55-64	12%	11%	12%	11%
Retirees (65+)	16%	17%	19%	16%
White Collar Workers	58%	57%	65%	69%
Owned Outright	30%	29%	36%	29%
Owned with a Mortgage	47%	48%	47%	43%
Renting	23%	23%	17%	27%
Live in Semi-Detached and Units	3%	9%	5%	13%
Live in Apartments	0%	0%	0%	7%
Born Overseas	25%	30%	30%	38%
Average Household Income	$111,200	$104,700	$122,800	$125,900
Family Households	73%	70%	76%	72%
Couples with Children	30%	29%	35%	33%
One Parent Family	14%	13%	11%	11%

Source: Based on ABS Census 2021

DEMOGRAPHIC REVIEW CONT.

The Residential Precinct is currently characterised by rural residential dwellings, with a small population base that is expected to change significantly over time as the precinct develops in line with the structure plan. As such, we have presented the demographic profile for the surroundings suburbs and the City of Kalamunda (study areas) to highlight potential future characteristics of the precinct. The previous page highlighted demographic characteristics as reported in the ABS Census 2021.

The population of High Wycombe is categorised by a middle-aged, family-oriented demographic.

The **age** composition of the study areas is similar to Greater Perth with:

- Similar proportions of 15-24 year olds;
- Similar proportions of 55-64 year olds; but
- A higher proportion of retirees across the City of Kalamunda as a whole.

The study areas are home to relatively fewer white collar **workers** than the Greater Perth benchmark. Particularly across the High Wycombe and Forrestfield suburbs, residents are more likely to be working in blue collar occupations. With the new connection to Perth CBD and the greater metropolitan area unlocked with the new station, there is potential that this characteristic will change over time as the area develops.

In terms of **tenure**, the study areas vary from Greater Perth in the following ways:

- All of the study areas see fewer renters, proportionally; and
- Across the study areas, those who own their own home are more likely to do so with a mortgage.

If the area develops as expected, it is likely that these trends would continue.

A much smaller proportion of residents across the study areas live in **apartments and medium density dwellings** compared to Greater Perth. This is indicative of the lack of housing diversity in the area at present. It also highlights the substantial gap between the current residential landscape and the vision for the precinct that is underpinned by the transformational METRONET project.

The study area is broadly less **diverse** than the Greater Perth average, with proportionally less people born overseas. However, it is noted that there is a relatively larger Aboriginal and/or Torres Strait Islander population in the study area.

Where **income** is concerned, there is some variability across the study area, although overall household incomes are below the Greater Perth benchmark. This is another metric that is susceptible to change as the area develops given the new connectivity of the area.

The proportion of one parent **families** in High Wycombe is 14%, which is higher than the City of Kalamunda (11%) and Greater Perth (11%). 30% of the demographic in High Wycombe accounts for couples with children, which is more than neighbouring suburb Forrestfield at 29%.

Given that it is expected that the demographic characteristics of High Wycombe will change significantly as residential development occurs in line with the vision for the area, new data should be assessed as it becomes available (see section 4 for details).

MOVERS REVIEW

Key Findings

The suburb of High Wycombe has experienced movement from nearby Statistical Areas 2s (SA2s*) in the last five years. There have been some movers from the outer urban areas of Greater Perth but the majority of movers are from nearby areas. There is limited movement to High Wycombe from inner city locations or the Peel region.

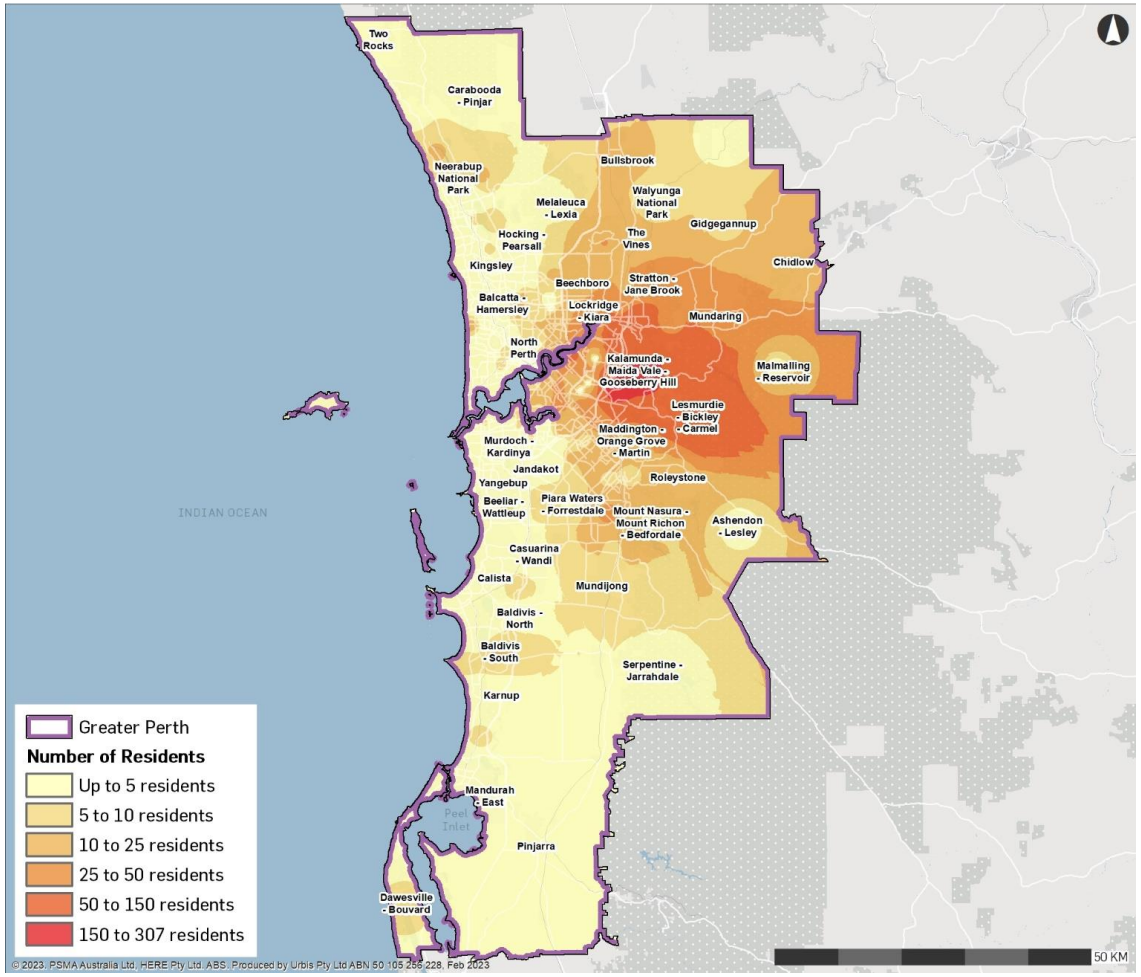
There have been 307 movers from the Kalamunda – Maida Vale – Gooseberry Hill SA2 to High Wycombe in the last five years. Similarly, 265 movers have been recorded from Forrestfield – Wattle Grove. These areas are the only two SA2s in the 105-307 residents range that are moving to High Wycombe. 78 residents moved from Lesmurdie – Bickley – Carmel to High Wycombe, which is also nearby.

There were 67 movers from Belmont – Ascot – Redcliff and 66 movers from Swan View – Greemount – Midvale. These areas are further from High Wycombe but represent a smaller amount of residents compared to the top three movers areas. It is indicative that the main movers to the suburb of High Wycombe are from nearby areas.

Place of Residence 2016 (SA2)	No.
Kalamunda – Maida Vale – Gooseberry Hill	307
Forrestfield – Wattle Grove	265
Lesmurdie – Bickley - Carmel	78
Belmont – Ascot - Redcliffe	67
Swan View – Greenmount - Midvale	66

**Note: Statistical Areas are geographical areas defined by the ABS.*

Place of Residence Five Years Ago for High Wycombe (suburb) Residents, 2021



03

DWELLING YIELD FORECASTS



YIELD ASSUMPTIONS

Yield Assumptions

Dwelling yield scenarios have previously been developed and tested for the TOD and Residential Precincts.

Three dwelling yield scenarios were tested for the TOD Precinct (Low Yield, Medium Yield and High Yield).

The 'Medium' yield scenario was adopted and formed the basis for population projections.

Analysis of market viability previously carried out by Urbis indicated that in the short and medium term low and medium density development was most likely to be financially viable in the High Wycombe South area and the yields adopted reflected this.

Yields for the Residential Precinct have been based on work carried out by element for the City of Kalamunda in the preparation of the HWS Residential Precinct LSP amendment.

The medium yield scenario has been adopted, with an allowance for apartment development included to recognise the need for alignment with the established vision for the area.

TOD Precinct Yield Assumptions

DENSITY	SINGLE LOT / MEDIUM DENSITY	APARTMENTS	TOTAL
Medium yield scenario	531	118	649

Source: Urbis, DevelopmentWA, 'High Wycombe Station METRONET Precinct Precinct Implementation Plan'

Residential Precinct Yield Assumptions

DENSITY	SINGLE LOT	MEDIUM DENSITY	APARTMENTS	TOTAL
Medium yield scenario	938	1,329	150	2,417

Source: Urbis, City of Kalamunda (element)

INDICATIVE DEVELOPMENT TIMEFRAMES

Staging Considerations

Staging considerations have been guided by the following:

- Observed staging in similar other developed TOD Precincts in Perth, such as Clarkson and Atwell, and;
- Fundamental market factors, such as the median house price, that will influence the viability of different types of dwelling typologies.

The potential development stage timing has been staggered to provide a guide as to potential ultimate build-out timing. However, ultimately build-out will be determined by market forces and there is potential that a shorter ultimate build-out timeframe in advance of this scenario could take place.

It is likely that single lot dwellings would commence first in the Residential Precinct, with terrace and townhouse product commencing after this. Apartment dwellings are unlikely to be viable in the area in the short- to medium-term and have been forecast to be commence in the long-term. As previously noted, the viability of the higher density product will be dependent on investment to improve the connectivity and amenity of the area.

While the TOD precinct is not the focus of this report, it is important to note that the two precincts while be developing concurrently and therefore will be influenced by each other.

Development Timeframe, Residential Precinct

STAGES	COMMENCES	2021-2026	2026-2031	2031-2036	2036-2041	2041-2046	2046+
Single Lot Detached Homes	**2026**						
Terrace/ Townhouse	**2029**						
Apartments	**2042**						

Source: Urbis

LOT SALES FORECAST

Forecast Insights

The medium yield scenario for the Residential Precinct has been reviewed to look at expected sales rates for each product type. The review is based on looking at the market share that the broader area could achieve of all Perth sales, as well as of sales that the Residential Precinct will get compared to surrounding competition.

The modelling carried out is based on looking at historical and forecast lot sales across all of Perth and based on historical trends and future supply. Then forecasting market shares for the corridor, local area and the Residential Precinct and taking current and future supply into account. Whilst COVID-19 and the subsequent building grant incentives have had a significant impact on the market over the last three years, the market shares and demand forecasts have taken these influences into account and also considered longer term historical trends.

This modelling indicated that the Residential Precinct would be sold out by 2064. It is important to note that long term forecasting for when the project will sell out by is dependent on many factors including; overall economic conditions and Perth population growth, take up rates for single dwellings and medium density, the proportion of medium density vs other housing types sold in Perth in the future, the market share that this area gets of the overall Perth new dwelling sales and the developers involved and their marketing strategies. All of these factors are subject to change and can very greatly over a 30 year time frame and the selling period is an indication only based on the modelling carried out and assumptions made and could and probably will vary from this as the project develops over the next 30 years.

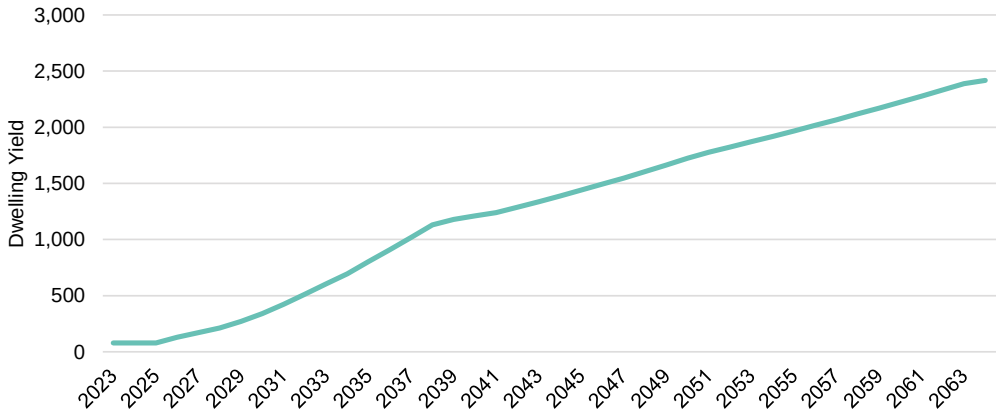
In the adopted scenario the dwelling types in the Residential Precinct will be focused on single residential lots and medium density terrace/townhouse product. Apartment development is expected to be difficult to make financially viable in the Residential Precinct in the short to medium term. The modelling shows that within 30 years the critical mass generated by the development will generate a need for infrastructure supported by a DCP.

Residential Precinct Dwelling Forecast by Density, 2028-64

DWELLING TYPE	2028	2033	2043	2053	2064
Single lot	175	516	938	938	938
Medium density	-	87	368	783	1,329
Apartment	-	-	31	150	150
Total	**175**	**604**	**1,337**	**1,871**	**2,417**

Source: Urbis

Dwelling Forecast Chart, Residential Precinct, 2023-64



Source: Urbis

POPULATION FORECAST

Forecast Insights

In addition to reviewing dwelling forecasts for the medium scenario, the population outlook for the Residential Precinct has been reviewed.

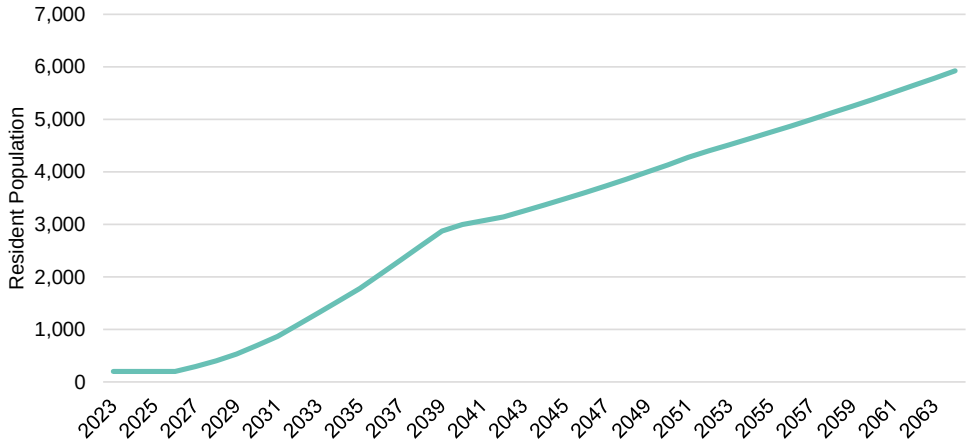
The Residential Precinct population is anticipated to increase from the existing rural residential base of approximately 200 residents, to 5,923 at build out.

Residential Precinct Population Forecast by Density, 2028-64

DWELLING TYPE	2028	2033	2043	2053	2064
Single lot	401	1,147	2,372	2,345	2,345
Medium density	-	167	846	1,841	3,248
Apartment	-	-	35	330	330
Total	**401**	**1,314**	**3,252**	**4,516**	**5,923**

Source: Urbis

Population Forecast Chart, Residential Precinct, 2023-64



Source: Urbis

04

RECOMMENDATIONS



DCP CONSIDERATIONS

Given the intent of this report is to provide information as an input to the High Wycombe South DCP, Urbis has provided additional recommendations below. These recommendations relate to aspects of the DCP that are impacted by the timing of development, and are therefore relevant to the content of this report. In particular, the considerations outlined below pertain to the previously discussed uncertainties surrounding development in the HWS DCP area. These uncertainties and what they mean for the development timeframe will ultimately impact the ability of the HWS DCP to fulfil its intended purpose to support the development of critical infrastructure for the precinct.

CONSIDERATION	URBIS RECOMMENDATION
DCP timeframe	Urbis recommends that a lifespan of 30 years is appropriate for the HWS DCP. The reasons for our support of a timeframe beyond the 10 years suggested by SPP3.6 are outlined below. SPP3.6 states that 'the lifespan of a DCP should be linked to competition of development or subdivision, and generally a maximum lifespan of 10 years applies'. **The dwelling yields forecast provided in this report clearly highlight that in the case of the Residential Precinct, the expected development lifespan is expected to be well in excess of 10 years.** Urbis' forecasts indicate that only 25% of dwellings will be developed by 2033. The timeframe of the development in the residential precinct is influenced by several factors: ▪ **Scale of the precinct** – there is a total of 1,871 dwelling that could be developed across the precinct with only 50% of these being single residential lots. This is far more supply than could be created or sold out in 10 years and it will take a number of years before any lots are initially created. ▪ **Fragmented landownership** – development will take a period of time to begin while developers contend with fragmented ownership and try to amalgamate a large enough land parcel to be viable. The rate of future development will be somewhat dependent on the ability of developers to be able to amalgamate viable developable land parcels. ▪ **Viability of medium and high density typologies** – as indicated in Urbis' forecasts (Section 3), current market conditions are less conducive to medium and high density dwellings in this precinct in the short term, as discussed further in the example below. ▪ **State Government and private sector investment** – the nature of the High Wycombe area as a focus for State Government investment may result in more favourable market conditions for development as new amenity is brought to the area. As an example, the Cell 9 ICSA has a total lot yield of approximately 1,800 dwellings. This development area is similar to the Residential Precinct, with fragmented ownership meaning that development has occurred slowly. Cell 9 has been active since 2001 and as of 2021 had an estimated 339 dwellings remaining. Based on our forecasts Cell 9 will be fully developed over a 23 year period. Importantly, Cell 9 differs from the Residential Precinct in that all development has been planned and delivered in the form of single lot dwellings. The timeline of development in the Residential Precinct is likely to occur over a longer timeframe than that of Cell 9. In summary, development in a comparable area such as Cell 9 with a similar total dwelling yield and a typology that is more aligned with Urbis' analysis regarding market viability in current market conditions than the vision for the Residential Precinct, has taken well over the 10 year timeframe that is recommended in SPP3.6. Urbis' forecasts, estimate sell out of the Residential Precinct in 2063 (40 years). However, market conditions are likely to change over the long-term span of these forecasts. Therefore, a 30 year DCP lifespan is recommended, with a requirement to review actual dwelling up-take carefully over time (refer to Monitoring & Evaluation on p. 24). Ultimately, number of lots and the vision for medium and high density dwellings in the Residential Precinct mean that this is a long term project and a 10-year DCP lifespan would not be suitable for this precinct.

DCP CONSIDERATIONS CONT.

CONSIDERATION	URBIS RECOMMENDATION
DCP rate	Having regard to the analysis presented in this report, Urbis recommends that a per square metre DCP rate should be adopted in the HWS DCP. Key reasons why we believe that a square meter rate would be more appropriate for this precinct than a per dwelling rate are: ▪ A per square metre rate provides certainty to the HWS DCP. The LSP has been well researched and the developable area is a known quantum with certainty. The targets for density and split between single residential and medium/higher density residential have been deliberately set at an aspirational level. However, there is a lot of uncertainty as to what the final dwelling yield will be and this will be determined market conditions at the time that the various parcels of land are being developed. ▪ A square meter rate will mean that a lower rate per dwelling can be achieved by developing more density which is seen as desirable in this precinct. This will act as a form of incentive for more density, where as a per dwelling rate could act to disincentivise density. ▪ A per square metre rate provides certainty for developers as to the DCP amounts that they will be charged. Providing certainty for developers is particularly important in this development scenario where fragmented ownership of the land already presents an additional challenge to development. It will be important to incentivise developers to move into the area and not disincentivise the density targets that are the vision for the Residential Precinct. Finding ways that incentivise density in this precinct is considered important as it maximises the opportunity to leverage from the very significant amount of State Government investment into the area and the long-term plan for the Residential Precinct as it relates to the High Wycombe Station.

MONITORING & EVALUATION

Overview

A systematic approach to monitoring and evaluation of the results of this report is crucial given the long-term nature of the forecasts and the number of market and non-market factors that will influence the outcomes.

The forecasts provided in section 3 of this report are based on the most up-to-date data and information available. However, given that these forecasts have a timeframe of over 30 years, there is every likelihood that factors and influences that are not currently known will impact the actual timing and take up of lots in the area. Some of the variables that will effect the yield and timing include:

- Fragmented land ownership;
- Government investment;
- Private sector investment timing; and
- Other market factors.

To ensure confidence in the forecasts over time as they relate to the DCP, it will be critical to review relevant data and information that has fed into the forecasts as they become available. This could result in the need to adjust the adopted forecasts.

A recommended plan to maintain confidence in the forecasts over time, including allowing for revisions, is proposed to the right.

This monitoring and evaluation plan relates to this report's yield analysis findings only. It is separate to the annual status report required under SPP 3.6 that reviews the delivery of infrastructure under the DCP (6.10.18).

Key Milestones

MILESTONE	KEY CONSIDERATIONS	TIMEFRAME
Monitoring	Continuous monitoring of the many variables that may effect yield and timing that could trigger the need for additional evaluation include: ▪ Major government intervention ▪ Significant consolidation of tenure by a private developer ▪ Sub-division of lot ▪ Planning approvals for built form	Ongoing
Check	▪ Assessment of any shifts in variables that are likely to impact the yield outcomes ▪ If any potential impacts are identified, a more formal review should be undertaken	2.5 years
Full review	▪ Analysis of new ABS Census data and possible implications for demographic and housing preference changes ▪ Formal review of dwelling and population forecasts ▪ When development in the area has commenced, this task will include assessment of actual lot sales and population against forecast	5 year

APPENDIX A

METHODOLOGY & ASSUMPTIONS



METHODOLOGY

Overview

Urbis has adopted different methodologies for forecasting each of the densities that are expected to develop in High Wycombe South. This approach was taken to account for the different factors of influence for each density.

These methodologies are broadly consistent with previous forecasting completed for the City of Kalamunda by Urbis.

Methodologies

DENSITY TYPE	METHODOLOGY	KEY INPUTS AND SOURCES
Single lot forecasts	The single lot forecasts draw on Urbis' internal growth corridor forecasts and apply a market share approach to apportion growth at a corridor and sub-corridor level. The methodology takes into account historical sales rates from existing estates in the area to project future growth rates.	Landgate sales records Urbis Perth growth corridor lot forecasts UDIA Urban Development Index
Medium density	The medium density forecasting approach also adopts a market share methodology. This approach utilises dwelling forecasts from HIFG for the short-term horizon, and a long-term growth rate for total new dwellings in Greater Perth aligned to Perth and Peel@3.5. Historical market shares at a corridor and sub-corridor level for medium density dwellings as a share of total dwellings are used to inform future growth rates. An increase in the preference for higher density dwellings is assumed based on household characteristics of areas that have developed in a similar trajectory to that forecast for the study area.	ABS Building Approvals Perth and Peel@3.5million Housing Industry Forecasting Group ABS Census
Apartments	The apartment forecast methodology employs an average sales rate for comparable projects based on data from Urbis Apartment Essentials.	Urbis Apartment Essentials

KEY ASSUMPTIONS FOR POPULATION CONVERSION

Assumption Discussion

Key assumptions that have been made to convert the dwelling forecast into population forecast are listed in the table on the right.

Key Assumptions for Population Forecasting

ASSUMPTION	DESCRIPTION
People Per Household	Based on the historical trends within the City of Kalamunda, we have assumed an initial persons per household ratio of 2.6, that trends downwards to 2.5 over the study period for single lot and medium density dwellings. This is in line with informed decision's (.id) assumptions. .id developed forecasts for residential development for the City of Kalamunda in 2021, which were considered in previous work. For apartments, we have assumed a static ratio of 2.2 persons per household, which is aligned with the rate for apartments across Perth, adjusted upwards for the demographics of the region (higher proportions of couples with children).
Lag Between Dwelling Approval/Sale and Population	We have assumed a 12 month gap between dwelling approval or sale, and the resident occupying the home to account for build time.
Existing Population within Development Area	We have assumed the existing resident population figure based on 2021 ABS Census data at a Statistical Area 1 level, in conjunction with a review of aerial imagery from Nearmaps. The existing resident number will decline as lots are consolidated and these residents move elsewhere, and this will occur prior to residential development.

This report is dated **March 2023** and incorporates information and events up to that date only and excludes any information arising, or event occurring, after that date which may affect the validity of Urbis Pty Ltd's (Urbis) opinion in this report. Urbis prepared this report on the instructions, and for the benefit only, of **City of Kalamunda** (Instructing Party) for the purpose of a High Wycombe Yields Analysis (Purpose) and not for any other purpose or use. Urbis expressly disclaims any liability to the Instructing Party who relies or purports to rely on this report for any purpose other than the Purpose and to any party other than the Instructing Party who relies or purports to rely on this report for any purpose whatsoever (including the Purpose).

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All surveys, forecasts, projections and recommendations contained in or made in relation to or associated with this report are made in good faith and on the basis of information supplied to Urbis at the date of this report. Achievement of the projections and budgets set out in this report will depend, among other things, on the actions of others over which Urbis has no control.

Urbis has made all reasonable inquiries that it believes is necessary in preparing this report but it cannot be certain that all information material to the preparation of this report has been provided to it as there may be information that is not publicly available at the time of its inquiry.

In preparing this report, Urbis may rely on or refer to documents in a language other than English which Urbis will procure the translation of into English. Urbis is not responsible for the accuracy or completeness of such translations and to the extent that the inaccurate or incomplete translation of any document results in any statement or opinion made in this report being inaccurate or incomplete, Urbis expressly disclaims any liability for that inaccuracy or incompleteness.

This report has been prepared with due care and diligence by Urbis and the statements and opinions given by Urbis in this report are given in good faith and in the belief on reasonable grounds that such statements and opinions are correct and not misleading bearing in mind the necessary limitations noted in the previous paragraphs. Further, no responsibility is accepted by Urbis or any of its officers or employees for any errors, including errors in data which is either supplied by the Instructing Party, supplied by a third party to Urbis, or which Urbis is required to estimate, or omissions howsoever arising in the preparation of this report, provided that this will not absolve Urbis from liability arising from an opinion expressed recklessly or in bad faith.

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Urbis acknowledges the important contribution that Aboriginal and Torres Strait Islander people make in creating a strong and vibrant Australian society.

We acknowledge, in each of our offices, the Traditional Owners on whose land we stand.

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COVID-19 AND THE POTENTIAL IMPACT ON DATA INFORMATION

The data and information that informs and supports our opinions, estimates, surveys, forecasts, projections, conclusion, judgments, assumptions and recommendations contained in this report (Report Content) are predominantly generated over long periods, and is reflective of the circumstances applying in the past. Significant economic, health and other local and world events can, however, take a period of time for the market to absorb and to be reflected in such data and information. In many instances a change in market thinking and actual market conditions as at the date of this report may not be reflected in the data and information used to support the Report Content.

The recent international outbreak of the Novel Coronavirus (COVID-19), which the World Health Organisation declared a global health emergency in January 2020 and pandemic on 11 March 2020, has and continues to cause considerable business uncertainty which in turn materially impacts market conditions and the Australian and world economies more broadly.

The uncertainty has and is continuing to impact the Australian real estate market and business operations. The full extent of the impact on the real estate market and more broadly on the Australian economy and how long that impact will last is not known and it is not possible to accurately and definitively predict. Some business sectors, such as the retail, hotel and tourism sectors, have reported material impacts on trading performance. For example, Shopping Centre operators are reporting material reductions in foot traffic numbers, particularly in centres that ordinarily experience a high proportion of international visitors.

The data and information that informs and supports the Report Content is current as at the date of this report and (unless otherwise specifically stated in the Report) does not necessarily reflect the full impact of the COVID-19 Outbreak on the Australian economy, the asset(s) and any associated business operations to which the report relates. It is not possible to ascertain with certainty at this time how the market and the Australian economy more broadly will respond to this unprecedented event and the various programs and initiatives governments have adopted in attempting to address its impact. It is possible that the market conditions applying to the asset(s) and any associated business operations to which the report relates and the business sector to which they belong has been, and may be further, materially impacted by the COVID-19 Outbreak within a short space of time and that it will have a longer lasting impact than we have assumed. Clearly, the COVID-19 Outbreak is an important risk factor you must carefully consider when relying on the report and the Report Content.

Where we have sought to address the impact of the COVID-19 Outbreak in the Report, we have had to make estimates, assumptions, conclusions and judgements that (unless otherwise specifically stated in the Report) are not directly supported by available and reliable data and information. Any Report Content addressing the impact of the COVID-19 Outbreak on the asset(s) and any associated business operations to which the report relates or the Australian economy more broadly is (unless otherwise specifically stated in the Report) unsupported by specific and reliable data and information and must not be relied on.

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