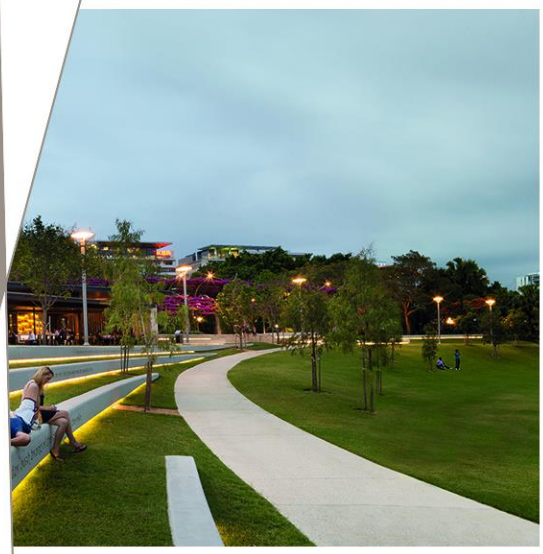
Benchmark Infrastructure Report



Victorian Planning Authority Benchmark Infrastructure Report

V181544

Prepared for

Victorian Planning Authority

1 March 2019

Cardno

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Document History

Version	Effective Date	Description of Revision	Prepared by	Reviewed by
D0	13/12/2017	Initial Draft for comment	M. Ampstead	
D1	19/03/2018	Address VPA comments	V. Abeykoon	M. Ampstead
D2	11/07/2018	Address VPA comments	C. Mendoza	C. Pascual
D3	04/02/2019	Address Stakeholder Comments	V. Abeykoon	S. Howe
D4	27/02/2019	Address Stakeholder Comments V2	V. Abeykoon	S. Howe
D5	01/03/2019	Address minor comments	V. Abeykoon	S. Howe

Disclaimer

Cardno have made a number of assumptions for the extraction and use of the underlying data as outlined within this document. Cardno as far as practicable have included sufficient units and rates to provide budget-costing data only, Cardno assumes no liability for losses incurred through changes to quantities or increases in construction costs or overheads. The values and quantities included within this document are not intended for use in construction pricing and do not constitute a Bill of Quantities.

Functional layouts provided for all civil components are for information only and shall not be used for space proofing / boundary extents. The final arrangement of all civil components is subject to detailed design by qualified people or organisations.

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Glossary

Table 1-1 Abbreviations Table

DCP	Development Contributions Plan
AGRD	AustRoads Guide to Road Design
ARI	Average Rainfall Intensity
AS	Australian Standard
CBR	California Bearing Ratio
CTCR	Cement Treated Crushed Rock
ESD	Environmentally Sustainable Design
FCR	Fine Crushed Rock
ICP	Infrastructure Contribution Plan
PSP	Precinct Structure Plan
RCP	Reinforced Concrete Pipe
RDN	Road Design Notice
RRJ	Rubber Ring Joint
TGSIs	Tactile Ground Surface Indicators
VPA	Victorian Planning Authority

Report Status

Table 1-2 Report Status Table

Revision / Date	Status	Outstanding issues
D0 / 14/12/2017	Draft For comment	▪ Stakeholder consultation to be undertaken ▪ Presentation of Appendix B cost data (titles, formatting, presentation) ▪ Comparison cost estimation to be undertaken ▪ Missing culvert data / Alternative culvert arrangements ▪ Estimation confidence value, P50, P85 provided
D1 / 19/03/2018	Address VPA Comments	▪ Stakeholder consultation to be undertaken
D2 / 11/07/2018	Address VPA Comments	▪ Stakeholder consultation to be undertaken
D3 / 04/02/2019	Address stakeholder consultation comments	▪ Cost indexing database and finalising benchmark estimates
D4 / 27/02/2019	Address stakeholder consultation comments V2	▪ VPA final review
D5 / 01/03/2019	Address minor VPA comments	

1 Introduction

1.1 VPA Planning and Precinct Structure Plan

With Victoria expected to grow to 10 million people by 2050, the VPA has been tasked to prepare land use plans in Melbourne's growth areas, as well as in specific urban renewal sites and regional areas across Victoria. Essentially the approach is to produce integrated land use plans, ensuring access to affordable housing, employment and public spaces, while creating great places to live. This document relates to cost estimates for infrastructure within Melbourne's growth areas.

In Melbourne's growth areas, Precinct Structure Plans (PSPs) are the key tool for planning land use and infrastructure provision. They set the framework for large scale, fully serviced urban development and investment that will occur over many years

PSPs are developed taking into account the unique characteristics and requirements of each location, and as a result there is no "one size fits all" plan. Infrastructure plans form an essential component of PSPs and these define infrastructure needs of communities including transport, community and recreation facilities". The aim is to identify funding required to deliver basic and essential infrastructure in a timely manner for the future growing community.

The VPA has detailed guidelines for the creation of PSPs. At the "check the plan" stage the PSP should identify the critical infrastructure projects within the development as well as the funding sources that will create this space.

1.2 Infrastructure levy

Infrastructure Contributions Plans (ICPs) are the funding component required to implement a PSP and they identify contributions from developers to fund basic and essential infrastructure. The Legislative framework for the infrastructure contributions system is set out in the Part 3AB of the Planning and Environment Act 1987 (Act) and in the Ministerial Direction on the Preparation and Content of Infrastructure Contributions Plans. These combined documents set the framework for infrastructure levies through an amendment to the planning scheme.

The infrastructure contribution levy is made up of either the standard levy, a supplementary levy, or a combination of both.

The standard levy is a monetary rate & is used to fund basic and essential infrastructure. The amount of levy paid is dependent on the class of development and is set by Ministerial Direction.

The overall standard levy must not exceed the levy identified in the Ministerial Direction. In addition to this, the amount of the total standard levy rate for residential development that may be used for community and recreation construction must not exceed the levy amount set in the Ministerial Direction.

Any of the total standard levy rate for residential development that may be used for the community and recreation construction (up to the capped rate) that is not used for community and recreation construction may be applied to transport infrastructure construction.

A supplementary levy is an additional levy that may be used to provide extra funding for specific infrastructure projects, in accordance with specific criteria set out in the Ministerial Direction and may fund supplementary items that cannot be funded through a standard levy.

1.3 Infrastructure Contributions plans - Cost estimating

The VPA engages various consultants to provide specialist advice for the preparation of PSP infrastructure Plans and ICPs. To achieve reasonable confidence levels in estimated costs, infrastructure proposals in PSPs need to be developed to a sufficient concept level to facilitate preparation of cost estimates by consultancies or quantity surveyors. Estimating is not an exact science: no two projects are alike. Variances due to geographic location, market conditions and project timing and duration, create many variables that need to be factored in to every case. Often estimating requires experienced judgement and personal intuition based on the available data.

While variability across PSPs is unavoidable, a consistent approach to cost estimating can underpin the provision of sufficient funding when works are ultimately constructed.

1.4 Role of this document

This document has been commissioned to assess the background data currently available to the VPA in order to provide baseline infrastructure cost data and therefore to standardise the cost estimation of ICP projects. Where information from background data was insufficient, the process was supplemented using Cardno's internal resources and databases. It is intended to remove pricing variances in future ICP project estimates by having this baseline infrastructure cost data available.

This document is split into two parts; part A contains a guide on how to apply both the cost data provided and the standard details. Part B explains how the data has been extracted and how the source information was processed.

2 Part A: Application of baseline data

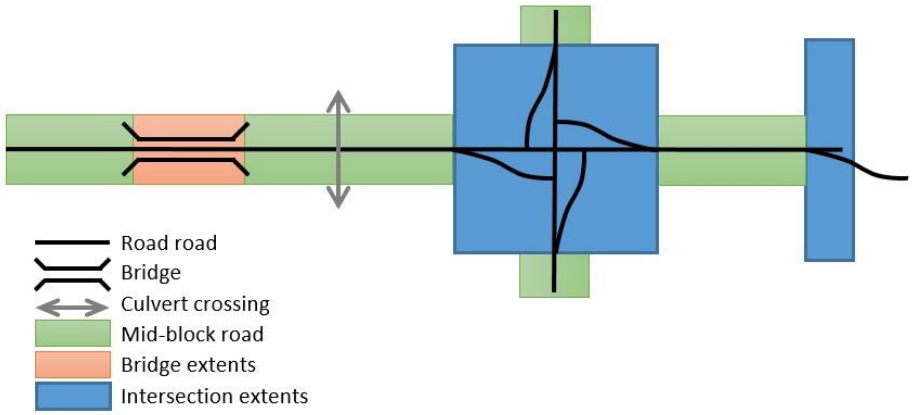
This report is designed to sit within the overall PSP development process and in particular to provide cost data for ICP infrastructure elements that will assist in determining whether standard or supplementary ICP levies may apply. It will also provide the basis for supplementary levy ICP project cost estimates. Part A provides an overview of this report and how the infrastructure cost data can be used to prepare cost estimates for PSPs.

This report does not provide design advice. The civil elements are provided for high level costing purposes only and should not be used to select and position infrastructure elements.

2.1 Infrastructure elements

The infrastructure elements included provide a range of scenarios that are commonly used in the development of PSPs. The majority of transport infrastructure components are for interim configurations only. Interim configurations allow for the future expansion of the transport infrastructure item to its ultimate state once usage requirements are justified. Construction of the interim infrastructure item is usually the responsibility of the developer. Reduction of 'doubled up' work when constructing the ultimate configuration has been a focus when designing the standardised infrastructure items. Ultimate configurations have been requested by the VPA for cost comparison purposes and to determine land requirements for the long-term ultimate intersection. Upon completion of the layout within the PSP, the PSP is divided into infrastructure elements. Convention adopted for road, intersection, bridge and culvert cost estimating purposes is shown in the diagram below.

Figure 2-1 PSP element Breakdown (road infrastructure)



Key infrastructure elements are described in sections 2.1.1 to 2.1.7, including transport/ community and recreation infrastructure. These elements form the basis of the standard details in Appendix A and the detailed cost sheets in Appendix C. The detailed cost sheets in Appendix C were based on the quantities extracted from the standard details in Appendix A via hatching of areas, summing linear meters and calculating items. For a detailed analysis of the costed elements and the statistical results of the Monte-Carlo analysis refer to Part B of this report. Note: Public transport items such as new railway stations are outside the scope of this document.

2.1.1 Intersections

Intersections are a 'total estimated cost' element; the intersections are an interim / ultimate treatment; they are configured to tie back into the equivalent interim / ultimate carriageway section. The extents shown within the standard details should be used to cutback the connecting road to mid-block portions. Different combinations of intersections are provided for costing purposes.

The total estimated cost per intersection accounts for the following items:

- Earthworks for pavement boxing
- Differing pavement types within the intersection
- Kerbing, bike paths, footways and paved areas
- Drainage pits and pipes
- Traffic signal hardware (allowance for maintenance cost)
- Lighting
- Street trees and minor landscaping
- Ancillaries (such as TGSIs, top soil and seeding, sub-surface drains allowance for both no fines concrete and screenings, line marking, signage, this is not an exhaustive list)
- Bus stops, shelters and bays are excluded from the scope of this assignment.

2.1.2 Mid-block roads

Connecting roads have been costed on an 800m length; this is considered a typical length between major / minor intersections. The mid-block length is measured between tie-in positions from intersections.

For mid-block lengths that differ from 800m, the rate should be pro-rated accordingly and no cost factor should be applied for shorter or longer lengths of mid-block.

The total estimated cost for an 800m length of road accounts for the following items:

- Earthworks for pavement boxing
- Singular pavement type
- Kerbing, bike paths, footways and paved areas
- Drainage pits and pipes, with an increase in pipe diameter over length
- Lighting
- Street trees and minor landscaping
- Ancillaries (such as top soil and seeding, sub-surface drains allowance for both no fines concrete and screenings, line marking, signage, this is not an exhaustive list)

2.1.3 Culverts

Culverts are considered stand-alone 'total estimated cost' items; culverts can be included at any mid-block location and no adjustment in price to the mid-block roads is required. Due to insufficient background information being available and the resulting inability to conduct a statistical analysis, rates from Cardno's internal database has been used to cost culverts. Following the inclusion of stakeholder data (discussed in section3.6 of the report) this database was expanded to include additional rates.

The total estimated cost of culverts account for the following items:

- Culvert units and slab
- Headwalls
- Minor earthworks
- Ancillaries (such as bedding and backfill, rip-rap, this is not an exhaustive list)

2.1.4 Bridges

Bridges are priced as a 'total estimated cost' item; the bridge extents should be removed from the mid-block road length as pavement, footway and kerbing are accounted within the lump sum. The bridge total estimated cost includes the approach and the departure earthworks and guardrail.

The total estimated bridge cost accounts for the following items:

- Earthworks for approach ramps
- Abutments and mid piers
- Run-on slabs
- Parapet and approach / departure guard rails

- Footway and kerbing

2.1.5 Community Facilities

Community facilities are a stand-alone object and are priced on set building size and internal fit out. The community facility is considered adjacent to a road for connectivity with minimal internal road connections.

The total estimated cost for a community facility accounts for the following items:

- Kindergarten facility
- Extra kindergarten facility / multipurpose space
- Maternal and child health consulting
- Multipurpose community spaces
- Allowance for Environmentally Sustainable Design (ESD) (no allowance for ongoing maintenance expenses)
- Ancillaries (such as car parking, covered walkways, connections, this is not an exhaustive list)

2.1.6 Sports Pavilions

Sports facilities are a stand-alone object and are priced on set building sizes and internal fit out. The sports facilities are considered adjacent to a road for connectivity with minimal internal road connections.

The total estimated cost of a sports facility accounts for the following items:

- Change rooms / umpire change rooms
- Storage
- Office / first aid room
- Kitchen and canteen
- Public toilets
- Allowance for Environmentally Sustainable Design (ESD) (no allowance for ongoing maintenance expenses)
- Multipurpose community room / social room

2.1.7 Sports and Recreation facilities

Recreation facilities are a stand-alone object and are priced based on the standard drawings for the overall site area.

The total estimated cost of recreation facilities accounts for the following items

- Sporting fields (natural turf sporting fields, synthetic cricket wickets, tennis courts etc.)
- Car parking
- District playground
- Internal accesses
- Landscape construction, establishment and maintenance
- Sporting pavilion
- Allowance for Environmentally Sustainable Design (ESD) (no allowance for ongoing maintenance expenses)
- Ancillaries

2.2 Infrastructure costings

Following the extraction of quantities from the standard details, cost estimates for each infrastructure element was conducted using Monte-Carlo Analysis (refer to section 3.2.3 for details of the analysis). The Department of Infrastructure, Transport, Regional Development and Local Government require cost estimates produced at a P90 level (P90 cost estimate denotes that there is a 90% probability level of meeting project cost). Due to a lack of consistency in the culvert estimate data by previous consultants a different approach was utilised to cost culverts (see section 3.5.5.4). Contingencies and other delivery rates as guided by the VPA have been included in the total cost estimates. Based on the above, Table 2-1 summarises the cost estimates and rate per unit for each infrastructure typology outlined in the project brief at a P90 level inclusive of all delivery fees and contingencies. A detailed cost sheet for each typology is included in Appendix C.

In addition, a P75 analysis was undertaken. This analysis showed that only a minor difference of 6%-7% existed between the P90 project totals and P75 project totals. In order to minimise the potential for shortfall in PSP project funding the default cost estimates are derived using the P90 probability.

Table 2-1 Infrastructure Costings (Indexed to July 2018)

Item	Category	Description	Standard	Cost Application	Cost estimate P90	Unit	Rate per Unit
1	Road	Primary Arterial	Interim – first carriageway	Per 800m of road	$3,860,000	m of road	$4,825
2	Road	Secondary Arterial	Interim – first carriageway	Per 800m of road	$3,500,000	m of road	$4,375
3	Road	Connector –Boulevard	Ultimate	Per 800m of road	$4,140,000	m of road	$5,175
4	Road	Connector Street	Ultimate	Per 800m of road	$3,793,000	m of road	$4,742
5	Intersection	Primary/ Primary	Cross – Signalised (Interim)	Per intersection	$7,012,000	m2 of Pavement	$583
6	Intersection	Primary/ Secondary	Cross – Signalised (Interim)	Per intersection	$6,930,000	m2 of Pavement	$496
7	Intersection	Primary/ Conn. Blvd.	Cross – Signalised (Interim)	Per Intersection	$4,700,000	m2 of Pavement	$551
8	Intersection	Secondary/ Secondary	Cross – Signalised (Interim)	Per intersection	$6,317,000	m2 of Pavement	$458
9	Intersection	Secondary/ Conn. Blvd	Cross – Signalised (Interim)	Per intersection	$4,389,000	m2 of Pavement	$422
10	Intersection	Conn. Blvd/ Conn. Blvd	Cross– Roundabout (Ultimate)	Per intersection	$2,124,000	m2 of Pavement	$579
11	Intersection	Primary/ Primary	T – Signalised (Interim)	Per intersection	$5,518,000	m2 of Pavement	$635
12	Intersection	Primary/ Secondary	T – Signalised (Interim)	Per intersection	$4,990,000	m2 of Pavement	$591
13	Intersection	Primary/ Conn. Blvd.	T – Signalised (Interim)	Per intersection	$3,967,000	m2 of Pavement	$564
14	Intersection	Secondary/ Secondary	T – Signalised (Interim)	Per intersection	$4,564,000	m2 of Pavement	$499
15	Intersection	Secondary/ Conn. Blvd	T – Signalised (Interim)	Per intersection	$3,604,000	m2 of Pavement	$464
16	Intersection	Conn. Blvd/ Conn. Blvd	T – Roundabout (Ultimate)	Per intersection	$1,690,000	m2 of Pavement	$625
17	Bridge	Interim Primary Arterial Road Bridge 50 m span	Super-T – 15.80m wide (Interim)	Per Bridge	$8,201,000	m of Bridge	$164,020

Item	Category	Description	Standard	Cost Application	Cost estimate P90	Unit	Rate per Unit
18	Bridge	Interim Primary Arterial Road Bridge 100 m length	Super-T – 15.80m wide (Interim)	Per Bridge	$14,646,000	m of Bridge	$146,640
19	Bridge	Interim Secondary Arterial Road Bridge 50m length	Super-T – 14.90m wide (Interim)	Per bridge	$7,368,000	m of Bridge	$147,360
20	Bridge	Interim Secondary Arterial Road Bridge 100m length	Super-T – 14.90m wide (Interim)	Per bridge	$13,419,000	m of Bridge	$134,190
21	Bridge	Ultimate Connector Road Bridge 50m length	Super-T – 14.30m wide (Ultimate)	Per bridge	$7,368,000	m of Bridge	$147,360
22	Bridge	Ultimate Connector Road Bridge 100m length	Super-T – 14.30m wide (Ultimate)	Per bridge	$13,419,000	m of Bridge	$134,190
23	Bridge	Pedestrian Bridge 20m length	Super-T – 4m wide (Ultimate)	Per bridge	$1,131,000	m of Bridge	$56,550
24	Bridge	Pedestrian Bridge 80m length	Super-T – 4m wide (Ultimate)	Per bridge	$3,364,000	m of Bridge	$42,050
25	Major Culvert	Box culverts 1200 x 2100 (4 side by side)	Secondary Arterial Interim – 17.0m	Per structure	$452,000	m2 of Box Culvert	$3,165
26	Major Culvert	Box culverts 1200 x 2100 (4 side by side)	Connector Boulevard Ultimate – 31.0m	Per structure	$ 643,000	m2 of Box Culvert	$2,470
27	Major Culvert	Box culverts 1800 x 3000 (6 side by side)	Secondary Arterial Interim – 17.0m	Per structure	$914,000	m2 of Box Culvert	$2,987
28	Major Culvert	Box culverts	Connector Boulevard	Per structure	$1,382,000	m2 of Box Culvert	$2,477

Item	Category	Description	Standard	Cost Application	Cost estimate P90	Unit	Rate per Unit
		1800 x 3000 (6 side by side)	Ultimate – 31.0m				
29	Major Culvert	Box culverts 2100 x 2100 (16 side by side)	Secondary Arterial Interim – 17.0m	Per structure	$1,625,000	m2 of Box Culvert	$2,845
30	Major Culvert	Box culverts 2100 x 2100 (16 side by side)	Connector Boulevard Ultimate – 31.0 m	Per structure	$2,463,000	m2 of Box Culvert	$2,365
31	Major Culvert	Circular Pipes (RCP) 1200 dia. (2 side by side)	Secondary Arterial Interim – 17.0m	Per structure	$287,000	m of Pipe	$8,442
32	Major Culvert	Circular Pipes (RCP) 1200 dia. (2 side by side)	Connector Boulevard Ultimate – 31.0 m	Per structure	$405,000	m of Pipe	$6,533
33	Major Culvert	Circular Pipes (RCP) 1800 dia. (3 side by side)	Secondary Arterial Interim – 17.0m	Per structure	$545,000	m of Pipe	$10,687
34	Major Culvert	Circular Pipes (RCP) 1800 dia. (3 side by side)	Connector Boulevard Ultimate – 31.0 m	Per structure	$865,000	m of Pipe	$9,302
35	Major Culvert	Circular Pipes (RCP) 2100 dia. (4 side by side)	Secondary Arterial Interim – 17.0m	Per structure	$816,000	m of Pipe	$12,000
36	Major Culvert	Circular Pipes (RCP) 2100 dia. (4 side by side)	Connector Boulevard Ultimate – 31.0m	Per structure	$1,316,000	m of Pipe	$10,613
37	Community Facilities	Level 1 Facility	Contemporary standard	Bldg. floor area	$7,606,000	m2 of Floor space	$6,338
38	Community Facilities	Level 2 Facility	Contemporary standard	Bldg. floor area	$8,928,000	m2 of Floor space	$5,952

Item	Category	Description	Standard	Cost Application	Cost estimate P90	Unit	Rate per Unit
39	Community Facilities	Level 3 Facility	Above contemporary standard allowing for place making architectural features	Bldg. floor area	$11,830,000	m2 of Floor space	$4,930
40	Sports and Recreation Facilities	Sports Pavilion 2 playing areas	Contemporary standard multi-purpose facility	Bldg. floor area	$1,656,000	m2 of Floor space	$3,943
41	Sports and Recreation Facilities	Sports Pavilion 3 playing areas	Contemporary standard multi-purpose facility	Bldg. floor area	$2,753,000	m2 of Floor space	$3,933
42	Sports and recreation Facilities	Sports and Recreation Facility 5 to 6 hectare site	Contemporary senior and junior sporting competition standard	Per Reserve	$8,021,000	ha	$1,604,200
43	Sports and recreation Facilities	Sports and Recreation Facility 8 to 10 hectare site	Contemporary senior and junior sporting competition standard	Per Reserve	$10,355,000	ha	$1,294,375

3 Part B: Benchmark Infrastructure Baseline

Part B of this report describes;

- How the cost pricing was derived from previous PSP source data and subsequent data from stakeholders, where relevant and in usable format.
- How the source data was assessed for viability
- How the cost data was extracted and how the typical sections were developed to include engineering elements for overall cost estimation.

These items provide the input variables for the cost estimation technique.

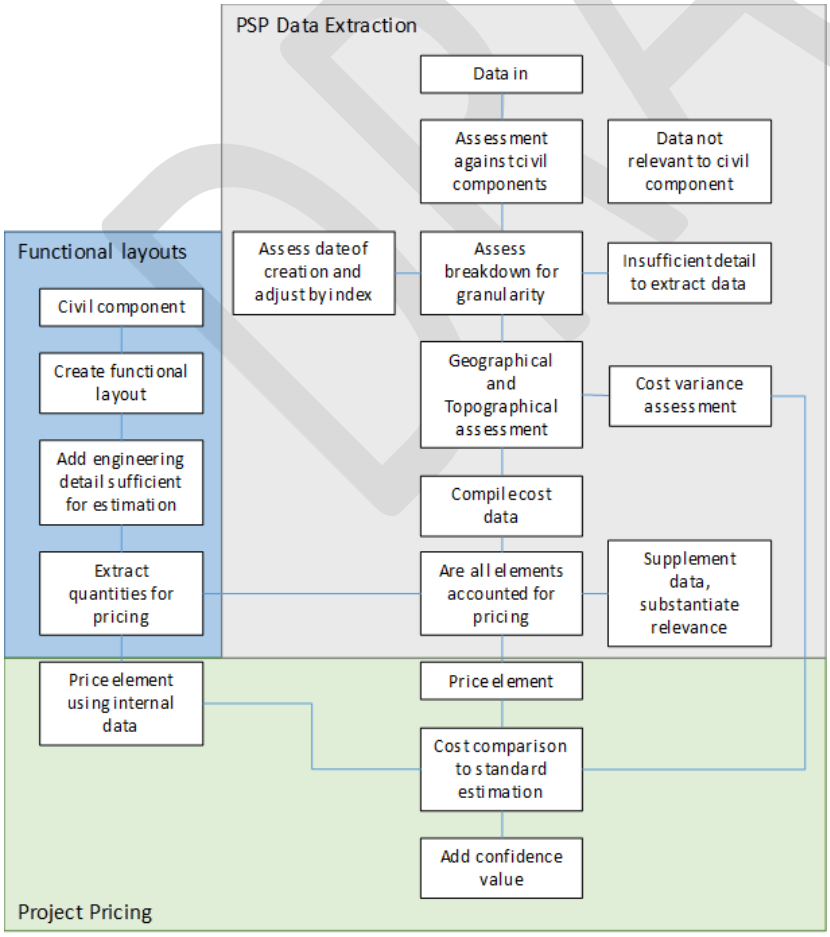
3.1 Study objectives

This study addresses the review of PSP data currently available to the VPA in order to obtain baseline rates with which to undertake future PSP costings. Rates that were used as source data for the project were extracted from twenty-six DCPs provided by the VPA. The study summarises the methodology used to extract the costing data, the Monte-Carlo assessment used to process the extracted data, subsequent findings and comparisons to traditional methods of estimation and recommendations to improve future cost estimations. The above database was subsequently calibrated and tested for validity by including construction costs submitted by several stakeholders through the stakeholder engagement process. Further details of the feedback received from stakeholders are outlined in section 3.6 and within Cardno's report 'V170524 Stakeholder Comment Review D02 (12.12.18)'.

3.2 Methodology

A methodology has been developed to process the incoming data for validity and in tandem develop civil details to inform price estimates. Figure 3.1 shows the methodology adopted, these items are described in sections 3.2.1 to 3.2.3.

Figure 3-1 Proposed methodology workflow



3.2.1 PSP data extraction and analysis

3.2.1.1 Assessment against civil components

Following receipt of the initial DCP cost estimates from VPA, the initial step taken was collating applicable data. Not all PSPs contained the desired civil components required for the cost estimation, due to the variety of PSP locations, size and arrangement. If the desired civil components were present, they were passed onto the next stage.

3.2.1.2 Assess breakdown for granularity

Following the assessment of the civil component, extraction of the relevant pricing data was undertaken. Elements priced by consultants for each infrastructure project were summarised along with their individual rates. Cost items that were deemed specific to a particular site were classified under a general category (e.g.- site specific guard rail type classified under guard rails).

3.2.1.3 Geographical and topographical assessment

The subsequent step of the data extraction process was to maintain regional and topographical variances in the estimations. In order to observe the variances, the proposed methodology was to classify source data into the regions East Melbourne, West Melbourne and North Melbourne. The proposed methodology to observe topographical variances was to classify the data into flat / undulating and steep / hilly topography.

3.2.1.4 Compile cost data

The extracted data from each of the DCPs was subsequently processed to ensure coherence in units to enable rates comparison and subsequent processing (e.g.- $\$/m^2$ rate for road pavements and $\$/m$ rate for kerbs). Refer to data extraction assumptions in section 3.4 for processing of data.

3.2.1.5 All elements accounted

The compiled cost data was compared to the civil typical details and quantities; the comparison was made to ensure that the civil details could be comprehensively priced with no omitted elements. If gaps were found within the compiled cost data, these were supplemented from Cardno construction cost data. Assumptions were made during this stage for items not included in the data provided, as outlined in section 3.4 baseline assumptions.

3.2.1.6 Element pricing

Pricing was undertaking using a Monte-Carlo estimation, based on the compiled cost data. Refer to Section 3.2.3 Pricing projects and adding confidence data for additional information.

3.2.1.7 Confidence value

Based on the Monte-Carlo estimation technique, confidence values are assigned to the estimation data to reflect the certainty associated with specific values. In consultation with the VPA, agreed confidence values were obtained.

3.2.2 Producing functional layouts and quantity extraction

3.2.2.1 Standards and specifications

The functional plans created comply with the design brief and the use of the following standards and specifications. The standards noted are in no order of hierarchy.

Design

> Victorian Planning Authority Standards (supplied as part of the project brief)

> Austroads Guide to Road Design – Full Set (Fourth edition)

> VicRoads supplement to Austroads Guide to Road Design – Full Set

> VicRoads Road Design Notes (RDNs)

> VicRoads Standard Drawings for Roadworks

> Austroads Guide to Traffic Management – Parts 1 to 13 (Third edition)

> VicRoads supplement to Austroads Guide to Traffic Management – Parts 1 to 13

> Austroads Design Vehicles and Turning Path Templates

> VicRoads Guidance for Planning Road Networks in Growth Areas (2015)

Drainage

> Victorian Planning Authority Standards (supplied as part of the project brief)

> Austroads guide to Road design – Part 5 and 5A (Third and First editions respectively)

> VicRoads supplement to Austroads Guide to Road Design

> Australian Runoff Quality Guidelines

General

> VicRoads Traffic Engineering Manual Volume 1, Traffic Management

> VicRoads Traffic Engineering Manual Volume 2, Signs and Markings

> VicRoads Manual of Standard Drawings for Road Signs

> AS 1743 Road Signs Specifications (2007)

Functional plans were created representing the range of typical repeated elements used with PSPs (see Appendix A). In total 43 infrastructure typologies were created, providing road, intersections, bridges, culverts, community facilities and sports and recreation facilities (see Table 3-1 below).

Quantities required to develop each of the standardised infrastructure typologies were extracted from the above functional plans to be priced in the next stage (see cost sheets in Appendix C). Rates for elements that were not captured during the source data extraction process were also identified at this stage. Cardno's internal database of construction costs were used to provide estimates for typologies where costs could not be calculated from the supplied PSPs.

Table 3-1 Infrastructure Typology

Item	Category	Description	Standard	Cost Application
1	Road	Primary Arterial	Interim – first carriageway	Per km of road
2	Road	Secondary Arterial	Interim – first carriageway	Per km of road
3	Road	Connector – Boulevard	Ultimate	Per km of road
4	Road	Connector Street	Ultimate	Per km of road
5	Intersection	Primary/Primary	Cross – Signalised (Interim)	Per intersection
6	Intersection	Primary/Secondary	Cross – Signalised (Interim)	Per intersection
7	Intersection	Primary/Conn. Blvd.	Cross – Signalised (Interim)	Per Intersection
8	Intersection	Secondary/Secondary	Cross – Signalised (Interim)	Per intersection
9	Intersection	Secondary/Conn. Blvd	Cross – Signalised (Interim)	Per intersection
10	Intersection	Conn. Blvd/Conn. Blvd	Cross–Roundabout (Ultimate)	Per intersection
11	Intersection	Primary/Primary	T – Signalised (Interim)	Per intersection
12	Intersection	Primary/Secondary	T – Signalised (Interim)	Per intersection
13	Intersection	Primary/Conn. Blvd.	T – Signalised (Interim)	Per intersection
14	Intersection	Secondary/Secondary	T – Signalised (Interim)	Per intersection
15	Intersection	Secondary/Conn. Blvd	T – Signalised (Interim)	Per intersection
16	Intersection	Conn. Blvd/Conn. Blvd	T – Roundabout (Ultimate)	Per intersection
17	Bridge	Interim Primary Arterial Road Bridge 50 m span	Super-T – 15.80m wide (Interim)	Per Bridge
18	Bridge	Interim Primary Arterial Road Bridge 100 m length	Super-T – 15.80m wide (Interim)	Per Bridge

Item	Category	Description	Standard	Cost Application
19	Bridge	Interim Secondary Arterial Road Bridge 50m length	Super-T – 14.90m wide (Interim)	Per bridge
20	Bridge	Interim Secondary Arterial Road Bridge 100m length	Super-T – 14.90m wide (Interim)	Per bridge
21	Bridge	Ultimate Connector Road Bridge 50m length	Super-T – 14.30m wide (Ultimate)	Per bridge
22	Bridge	Ultimate Connector Road Bridge 100m length	Super-T – 14.30m wide (Ultimate)	Per bridge
23	Bridge	Pedestrian Bridge 20m length	Super-T – 4m wide (Ultimate)	Per bridge
24	Bridge	Pedestrian Bridge 80m length	Super-T – 4m wide (Ultimate)	Per bridge
25	Major Culvert	Box culverts 1200 x 2100 (4 side by side)	Secondary Arterial Interim – 17.0 m	Per structure
26	Major Culvert	Box culverts 1200 x 2100 (4 side by side)	Connector Boulevard Ultimate – 31.0 m	Per structure
27	Major Culvert	Box culverts 1800 x 3000 (6 side by side)	Secondary Arterial Interim – 17.0 m	Per structure
28	Major Culvert	Box culverts 1800 x 3000 (6 side by side)	Connector Boulevard Ultimate – 31.0 m	Per structure
29	Major Culvert	Box culverts 2100 x 4200 (8 side by side)	Secondary Arterial Interim – 17.0 m	Per structure
30	Major Culvert	Box culverts 2100 x 4200 (8 side by side)	Connector Boulevard Ultimate – 31.0 m	Per structure
31	Major Culvert	Circular Pipes (RCP) 1200 dia. (2 side by side)	Secondary Arterial Interim – 17.0 m	Per structure
32	Major Culvert	Circular Pipes (RCP) 1200 dia. (2 side by side)	Connector Boulevard Ultimate – 31.0 m	Per structure
33	Major Culvert	Circular Pipes (RCP) 1800 dia. (3 side by side)	Secondary Arterial Interim – 17.0 m	Per structure
34	Major Culvert	Circular Pipes (RCP) 1800 dia. (3 side by side)	Connector Boulevard Ultimate – 31.0 m	Per structure
35	Major Culvert	Circular Pipes (RCP) 2100 dia. (4 side by side)	Secondary Arterial Interim – 17.0 m	Per structure
36	Major Culvert	Circular Pipes (RCP) 2100 dia. (4 side by side)	Connector Boulevard Ultimate – 31.0 m	Per structure
37	Community Facilities	Level 1 Facility	Contemporary standard	Bldg. floor area
38	Community Facilities	Level 2 Facility	Contemporary standard	Bldg. floor area
39	Community Facilities	Level 3 Facility	Above contemporary standard allowing for place making architectural features	Bldg. floor area
40	Sports and Recreation Facilities	Sports Pavilion 2 playing areas	Contemporary standard multi-purpose facility	Bldg. floor area

Item	Category	Description	Standard	Cost Application
41	Sports and Recreation Facilities	Sports Pavilion 3 playing areas	Contemporary standard multi-purpose facility	Bldg. floor area
42	Sports and recreation Facilities	Sports and Recreation Facility 5 to 6 hectare site	Contemporary senior and junior sporting competition standard	Per Reserve
43	Sports and recreation Facilities	Sports and Recreation Facility 8 to 10 hectare site	Contemporary senior and junior sporting competition standard	Per Reserve

3.2.3 Pricing projects and adding confidence data

The pricing of elements is a significant part of the above methodology. The following section outlines the theory behind the Monte-Carlo method and its application in the context of this project.

Cost estimation of major projects require risk analysis in order to handle the associated uncertainty and variability. This uncertainty and variability dictates whether the project estimation costs result in being an under- or over-estimation. Traditional cost estimation methods have several fall backs (Tan & Makwasha, 'Best practice' cost estimation in land transport infrastructure projects, 2010). These include relying on subjective estimation of risks and the resulting variation of values between a judged percentage above and below an approximate figure. Traditional methods do not allow for the estimation of the likelihood of costs being higher or lower. Upon obtaining rates, traditional methods are also limited by the number of inputs tested and testing of their possible combinations.

In this project, a probabilistic risk analysis method based on a Monte-Carlo Analysis was proposed to negate the above fall-backs. As outlined in Austroads 2005 Guide to Project Evaluation, Part 2: Project Evaluation Methodology, a probabilistic risk analysis involves allowing for a range of possible values and includes a probability factor of the cost being higher or lower. The Monte-Carlo method involves running thousands of iterations using random numbers in a probability function model to produce numerous possibilities instead of a few discrete scenarios (Mun, 2006). The basis of the method is provided in the equation below (Jeges, n.d.).

$$\Pr\left\{\left|\frac{1}{N}\sum_{i=1}^{N}\xi-\mu\right|<\frac{3\sigma}{\sqrt{N}}\right\}\approx 99.8\%$$

N= Number of iterations

δ = Standard deviation

μ = unknown value

ξ = Discrete random variables

The resulting output distribution indicates the possible costs and their likelihood.

In order to create the inputs for the probability functions of each element in a project, collation of data was initially conducted following the process described in section 3.2. Cost estimates for previous DCPs were provided by VPA at the start-up meeting for this project. This data included cost estimation for various elements of several road construction projects, bridges, major culverts, community centres and sporting field constructions. The data collected was processed to ensure coherence of units of the element being costed (e.g.- $/linear m of Kerb). Each element of cost was assumed to be part of a normal distribution. Collating various cost estimations for the individual elements of the project thus allowed for the identification of a mean cost for the element and its normal distribution properties.

Following the production of element normal distribution functions, 200,000 samples of cost were used to extract the unit cost that lies on the normal distribution curve for each element. The cost for the individual component as a whole is found by multiplying this extracted instance of unit rate by the quantity of the element required for the project at large. Subsequent addition of all the costs extracted in the above manner for each of the elements that make up a project provides one possible instance of the total cost of the project. Repeating this process over several thousands of iterations thus provides several thousands of possible cost outcomes of the project.

Assessing the total project cost data can subsequently provide an indication of the most likely cost outcome for the project along with other significant values such as the 75th percentile and 90th percentile cost of the project.

3.3 Source data

VPA initially provided 26 DCPs that included pricing data. Table 3-2 below outlines the classification of the estimates prepared for these DCPs based on their applicability under each infrastructure category. Consultants' estimates with insufficient granularity were excluded and classified as being unsuitable for the purpose of this project. The data set was later expanded using results selected from the stakeholder consultation process (see section 3.6).

Table 3-2 Source data classification

	Roads and Intersections	Road Bridges	Pedestrian Bridges	Major Culverts	Community Facilities	Sporting Pavilions	Sporting and recreation Facilities
Berwick Waterways	✓						
Brompton Lodge	✓						
Botanic Ridge	✓				✓	✓	✓
Cardinia Road	G	G	G	G	G	G	G
Clyde	✓			✓	✓	✓	✓
Clyde North	✓				✓	✓	✓
Craigieburn North Employment	✓		✓		✓		
Cranbourne East	✓				✓	✓	✓
Cranbourne North	✓				✓	✓	✓
Diggers Rest	✓				✓		✓
East Werribee	G	G	G	G	G	G	G
English Street	✓		✓		✓	✓	✓
Greenvale Central	✓						
Lockerbie	✓	✓		✓	✓	✓	✓
Lockerbie North							
Manor Lakes	✓						
Merrifield West					✓	✓	✓
Officer	G	G	G	G	G	G	G
Point Cook West	✓		✓				
Rockbank	✓	✓	✓	✓	✓		
Rockbank North	✓	✓			✓		✓
Taylor's Hill West	G	G	G	G	G	G	G
Toolern	G	G	G	G	G	G	G
Toolern Park	✓				✓		
Wyndham North	✓	✓		✓	✓		
Wyndham West	✓	✓		✓	✓	✓	✓
Notes ✓ : Suitable for use			G : Insufficiently granularity to price				

3.4 Baseline assumptions

In the drawing production and estimation/data extraction stages, the following assumptions were made when ambiguity and unknown factors were faced.

3.4.1 Civil components

3.4.1.1 Roads and Intersections

1. Road design surface - Grade of surface

The following assumptions have been taken for finished surface grades

- Cross falls for the design surface were assumed to be 1 in 30 for areas with vehicular traffic.
- Cross falls for pedestrian sections were assumed to be 1 in 40.
- Cross falls for pedestrian paths are based on the requirements of AS 1428.1:2009, which specifies a maximum cross, fall of 2.5% (1 in 40).
- Minimum 1% long-falls were assumed for all road surfaces.

2. Road design surface – Pavement depth

The following assumptions have been taken for the pavement depth.

- Pavement depths have been noted as per VPA standards and no alternative pavement compositions were considered.

Table 3-3 Pavement makeup

Pavement course	Primary Arterial	Secondary Arterial	Connector Boulevard	Connector Street	Industrial street
Asphalt wearing course	40	40	40	40	40
Asphalt intermediate course	75	60	60	60	75
Asphalt base course	90	75	75	75	90
Prime	10	10	10	10	10
CTCR base	150	150	150	150	150
FCR Base	150	150	N/A	N/A	150
Select sub-base course	200	150	200	200	200
Total Depth (mm)	715	635	535	535	715

- Circly analysis has not been undertaken on the pavement formations
- A sub-grade CBR 3% has been adopted
- Additional capping / ground improvements of 20% of the area is allowed for with the line item ‘Subgrade Improvement’.

3. Road design surface – Excavation depth

The following assumptions have been taken for the overall excavation and depths.

- Excavation depths have been assumed to be for pavement formation only
- The design has been assumed to be following existing ground level, and as such no significant cut and fill has been included in the results.
- Minor rock removal allowance has been included

4. Road design surface – Demolitions

- No allowance has been made in the cost estimation for demolition: the sites are assumed to be greenfield only.
- Brownfield sites will incur additional costs for demolition.

5. Utility Relocation and protection works

- No allowance has been included to utility relocation works;
- Potential costs for connections into existing infrastructure should be assessed separately.

6. Geotechnical testing

- No allowance has been included for geotechnical testing,
- The provided costing assumes suitable sub-grade and no excessive cut or fill.
- No allowance has been included for specific soil types such as dispersive or expansive soils, acid sulphate soils or significant rock excavation.

7. Drainage design – Drainage

The following assumptions have been used for pit spacing and drainage network

- Drainage pit spacing was determined following the conduction of an analysis using the 'Rational Method Equation'. Cross-falls of 3%, Long-falls of 1%.
- A rational method runoff coefficient of 0.9 was assumed.
- The 10 year ARI was assumed to be 55mm/hour as an average value for the greater Melbourne area.
- Spread widths were restricted to 1m.
- The above values resulted in a pit spacing of 63m, however, for future proofing reasons this value was rounded down to 50m.
- Intersection drainage reticulation is a standalone network with two outfall locations, along the westbound traffic direction and southbound traffic direction.
- No allowance for external catchment connectivity through the intersection, detailed design to consider the overall connectivity.
- Pipe long falls are minimum of 1in100, with cross carriageway connections 1 in 50
- No allowance for WSUD items in drainage (landscaping features, Gross Pollutant Traps etc.)
- Minimum 300mm diameter pipes with subsequent diameter increases based on pavement extents.
- The table below shows the documented pipe diameter based on capture areas.

Table 3-4 Pipe diameter for given area

Pipe Diameter (mm)	Pipe Capacity m3/s	Area capture (Ha)	Area Volume m3/s
300	0.097	0.7	0.09
375	0.175	1.27	0.175
450	0.285	2.04	0.280
525	0.430	3.1	0.426

- Costs for drainage connections to existing networks are not included; consideration should be made to overall connectivity of the drainage network.

8. Lighting design – Street lighting units

The following assumptions have been made for lighting layouts

- Lighting columns are set at 50m spacing with 12m height columns for straight lengths of road.
- Provision for joint use poles at intersections, with separate poles for turn movements to reduce overall numbers.
- Luminosity plotting has not been undertaken.
- Point of supply

9. Intersection design – traffic light units

- The intersection functional layout has noted the number of traffic signal hardware units for a given layout.
- The pricing undertaken by others has not split traffic signal hardware into sub-components, the priced intersection may differ.
- Point of supply

10. Intersection design – intersection layout geometry

The following assumptions were made for drawing production of intersections and intersection cost estimations.

- High entry angle of left turn lanes 70° based on Austroads guide to road design Part 4A.
- Set back from edge of median to trafficable lane fixed to 1m.

- Separation between pedestrian crossing and intersection stop line set to 1.2m.
- Minimum island width for pedestrian refuge set to 2m.
- Swept path analysis for 19m semi only.
- 60km/h design speed adopted (VPA is currently discussing the design speed requirements with VicRoads based on the stakeholder feedback received)
- Turn lane lengths (including taper length) for Primary, Secondary and Collector intersection legs have been set to 100m, 50m and 40m respectively, based on a 60km/h design speed.
- Increased capacity for Primary and Secondary intersection legs has been provided for by including an additional through lane. The through lane on the approach side of the intersection has been set to 120m including the taper length. The departure side length of the through lane has been set to 180m (70m of Parallel departure lane and 110m of taper) following Austroads Guide to Road Design Part 4A.

11. Vehicle data and typical turn lane lengths

- Sidra analysis has not been undertaken as typical turn lane requirements are subject to many factors which are not definable in this analysis.
- Typical turn lane lengths are in accordance with VicRoads Guidance for Planning Road Networks in Growth Areas.
- Single and double right turn lanes are or have been provided based on the major/minor road layout.

12. Intersection design – tactile pavers

- Pram crossing tactile paving is accounted within the pricing schedule
- Directional tactile paving is not included.
- Omission of tactile paving from the drawings is for presentation only.

13. Road and Intersection design – regulatory signage

- Regulatory signage for intersections (signalised and roundabouts) is based on AS 1742.2-2009.
- Large directional signage is not included in the drawings or costing data.

3.4.1.2 Road and Pedestrian Bridges

1. Bridge design – selection of super Tees

For cost estimation and drawing production purposes,

- Open Flange Super T depths were assumed 1200mm for road bridges and 750mm for pedestrian bridges.
- These depths were based on typical loadings expected for a bridge with the assumption of 25m spans for road bridges and 20m spans for pedestrian bridges.
- Uniform deck thickness and spans are provided to avoid complex headstock arrangements.

2. Bridge design – reconfiguration of lanes

- The nominal total bridge widths for interim primary arterial road bridges, interim secondary arterial road bridges and ultimate connector road bridges were assessed. Typical kerb widths, clearances, shoulder width requirements, containment fences and future ultimate arrangements were factored into the determination of new proposed bridge deck widths. This resulted in a 16.5m width for primary arterial bridges and a width of 15.0m for secondary arterials and connector road bridges.
- The increased deck width caters for lane / footway reallocation on deck, negating the need for parapet and bridge widening in the future.

3. Bridge design – pier height and clearance

- Due to the varied nature of bridge clearances from object to deck soffit, a standard road bridge clearance of 5.4m based on Austroads Guide to Road Design Part 3 was adopted.
- Subsequent pier heights were determined to be 4.0m based the assumption of using 1.2m tall crossheads and 0.2m tall bearing pads for Super Ts.
- Approach ramps were determined with a 5% grade, adhering to recommendations in Austroads Guide to Road Design Part 3, resulting in approximately 110m in length of approach ramp to the bridge on each side. Required earthworks beneath the road and 1:1.5 batters around the perimeter of the approach ramp are quantified in the earthworks quantities.

4. Bridge – Costing bridges outside standard dimensions

- The background data used to cost the nominated bridges are based on a variety of previous PSP data with varying bridge sizes. Therefore, the rates specified in cost the sheets (see Appendix C) can be utilised to price bridges outside the nominated standard sizes. This is achieved by accounting for the changes in the dimensions within the following limits.
  - Super T depth is either 1200mm or 1500mm

  - Span variation for 1200mm is between 23m and 28m
  - Span variation for 1500mm is between 28m and 33m
  - Bridge width using 9 Super Ts is 15m to 21m, and using 10 Super Ts is between 16.5m to 24m.
  - Bridge maximum clearance of 6m
- Site-specific conditions that could impact bridge costing such as non-standard rock beaching (extra-large boulder requirements in high stream velocity locations), cultural heritage management plan requirements, flora and fauna plans and irregular span placements outside the span specified above have not been accounted for in the costings.

3.4.1.3 Culverts

1. Major Culverts – pipe layout

- Pipes for major culverts were spaced at a distance equal to half the width of a pipe based on VicRoads standard drawing SD1821.

2. Major Culverts – box units

- To achieve the required culvert arrangement box units and crown units were documented.
- Due to the size of units, cast insitu, reinforced slab is nominated.
- The slab is based on standard bearing capacities, due to the variable nature of material within creeks increased slab / remediation may be required to obtain bearing capacities.

3. Guard fence

- Guard fence was not included, it is assumed that the headwalls are outside the nominated clear zone and do not require protection.

3.4.1.4 Community Facilities

For community facilities, there are many combinations of facilities and sizes. Three levels of facilities are specified in the project brief and have been costed. Level 3 facilities represent a higher function facility designed beyond the more basic and essential contemporary standards provided within level 1 and 2 facilities. All facilities are costed as single storey buildings.

Minor allowances for rock excavation have been allowed. Large rock excavation requirement are not covered

Table 3-5 Community facilities fit out

Description / Facility	Unit	Level 1	Level 2	Level 3
Kindergarten Facility Two kindergarten rooms to accommodate 99 licensed places, including children's toilets and amenities, storage space, office, staff room and staff toilets and amenities display and circulation space	m2	750	750	
Extra 33-place kindergarten room / multipurpose meeting space	m2	150	150	
Maternal and child health consulting facility (two consulting rooms plus waiting space / program room	m2	100	100	
Multipurpose community spaces (A combination of small (50-80m2) and medium (100-125m2) community meeting spaces, plus public toilets and amenities, office, staff room and staff toilets and amenities, reception and circulation space)	m2	200	500	
Multipurpose and specialist community spaces (A combination of small (50-80m2), medium (100-125m2) and large (180m2+) community meeting spaces and classrooms plus public toilets and amenities, reception and circulation space)	m2			450
Library	m2			1500
Specialist community space (adult reception / neighbourhood house, arts and cultural facility, youth facility, planned activity group space etc)	m2			250
Total building floor space	**m2**	**1200**	**1500**	**2500**

Description / Facility	Unit	Level 1	Level 2	Level 3
Small commercial kitchen	No	1		
Medium commercial kitchen	No		1	
Large commercial kitchen	No			1
Kindergarten outdoor play spaces	m2	700	700	
Car parking spaces	Spaces	60	75	125
Playground	m2	800	800	800
Landscaping	m2	500	500	500

The following additional elements are included

- Service connections
- Site works
- Car park and site access
- Kitchen fit out
- ESD provisions

3.4.1.5 Sporting pavilions

Sporting pavilions typologies servicing two or three sporting/play areas have been costed, below is noted the floor space and description

Table 3-6 Sporting pavilions fit out

Description / Facility	Unit	Two playing areas	Three playing areas
Four changes rooms with toilets and showers	m2	120	
Six change rooms with toilets and showers	m2		240
Two umpire change rooms with toilets	m2	40	
Three umpire change rooms with toilets	m2		60
Storage	m2	80	120
Office / first aid room	m2	20	30
Canteen and kitchen	m2	20	40
Public Toilets	m2	40	60
Multipurpose community room / social room (A small (50-80m2) community meeting space, entry foyer and circulation space)	m2	100	
Multipurpose community room / social room (A small (100-125m2) community meeting space, entry foyer and circulation space)	m2		150
Total Building floor space	**m2**	**420**	**700**
Covered spectator area	m2	80	120

The following additional elements are included

- Service connections
- Site works
- ESD provisions

3.4.1.6 Sporting and recreation facilities

There are many possible combinations for multi-purpose or specialist facilities to any particular site. For the costing purposes, a multi-purpose site consisting of the following elements is adopted:

Table 3-7 Sporting and recreation facilities fitout

Component	Unit	5 to 6 Hectares	8 to 10 Hectares
Combination of two ovals & three soccer fields	No	1 Ovals 1 soccer	2 Ovals
Car park	Spaces	120	175
Netball / basketball court	No	2	2
Tennis Courts	No	2	
Cricket pitch and practice nets	No	1 /1	2 / 1
Goals	No	2 sets	4 sets
Internal access road	m2	1350	1980
Landscaping	m2	30430	55435
Lighting – training & site	No	6	14
Signage	No	15	24
Site boundary fencing	m	1000	1300
Driveway crossing access from street	No	1	1
Utility service connections	Item	1	1
Interchange shelters	No	5	8
Turf surface and irrigation system	m2	21340	55440
Score Board	No	2	2

1. Sporting facilities – layout

- The general sport precinct layout is considered rectangular in form with sporting elements placed within, and separation from adjacent elements has been considered.
- Element position would be subject to overall PSP layout.
- Sporting facilities are to cater for local requirements (no allowance for regional facilities, premier sports, major events etc.)
- ESD provisions are included within the deliverables section
- Minor allowances for rock excavation have been allowed. Large rock excavation requirement are not covered

3.4.2 Pricing and data extraction

1. Pricing – supplementary gap data

- Pricing data for identified gaps were extracted from internal tendered construction rates. These rates were either for sub-divisional works or similar construction elements.

2. Road surface – pavement depth

- For data extraction purposes, where pavement depths were not specific or specified pavement depth did not correlate with VPA suggested pavement depth for various road categories, the pavements were classified based on the arrangement and number of lanes portrayed in their respective concept layout plans

3. Road surface – excavation depth

- For data extraction purposes, where excavation depths was unspecified or were provided at a 'per m^2' rate, excavation depths correlating to the pavement depth were assumed. For subsequent estimation purposes, excavation depths were assumed to be to the extent of the pavement depth.

4. Road surface – demolitions

- Cost data for demolitions have not been extracted. Demolition costs have not been factored in for project costing based on PSP's being greenfield developments in growth area councils.

5. Drainage– drainage pits

- Cost estimate data extraction for drainage pits was conducted at a 'per drainage pit' rate.
- Subsequent estimations and drawings were produced under the estimation that 1No. drainage pit per direction of vehicular travel will be required at a spacing of 50m.

6. Drainage – Pipes

- Pipe rates were extracted for crushed rock bedding and backfill; it is assumed that the pipe rate includes excavation, placement and backfill of trenches.

7. Lighting design – street lighting units

- During the data extraction phase, it was observed that previous consultants had not specified lighting costs in very high detail. Therefore, provisions could not be made to account for joint pole use at intersections etc. and data was extracted at a high level 'per intersection arm' rate or a 'per meter of road' rate. Subsequent pricing of lighting units was thus based on a 50m spacing of lighting units for roads and the number of arms of intersections.
- Several PSP based rates on column unit cost and linear length of conduit, for continuity conversion of these rates to a linear meter was undertaken. A conversion rate based on 50m column spacing based on individual elements provided a unified liner meter rate.

8. Intersection – traffic light units

- Traffic lighting costs were extracted at a rate of 'per intersection arm' rate. The number of intersections was identified based on the respective concept layout plan drawings. Where consultants had varied amounts of intersection arms which subsequently produced varied cost for traffic lights per intersection arm, these values were averaged.

3.5 Results of estimations

3.5.1 Cost estimation results

The outcome of costs from the estimation (rounded to the nearest thousand) and cross checking with standard estimation, techniques are outlined in the table below. Comparison estimates are not provided as the Monte-Carlo estimates include Cardno's internal pricing rates. Due to this, the estimates from standard techniques using Cardno's internal rates will not provide additional value for comparison purposes. Refer to appendix B for full price extraction data and quantities.

Table 3-8 Pricing Results

Item	Category	Description	Standard	Cost Application	Estimate P50	Estimate P90
1	Road	Primary Arterial	Interim – first carriageway	Per 800m of road	$3,395,000	$3,860,000
2	Road	Secondary Arterial	Interim – first carriageway	Per 800m of road	$3,145,000	$3,500,000
3	Road	Connector – Boulevard	Ultimate	Per 800m of road	$3,657,000	$4,140,000
4	Road	Connector Street	Ultimate	Per 800m of road	$3,360,000	$3,793,000
5	Intersection	Primary/Primary	Cross – Signalised (Interim)	Per intersection	$6,132,000	$7,012,000

Item	Category	Description	Standard	Cost Application	Estimate P50	Estimate P90
6	Intersection	Primary/Secondary	Cross – Signalised (Interim)	Per intersection	$6,118,000	$6,930,000
7	Intersection	Primary/Conn. Blvd.	Cross – Signalised (Interim)	Per Intersection	$4,090,000	$4,700,000
8	Intersection	Secondary/Secondary	Cross – Signalised (Interim)	Per intersection	$5,621,000	$6,317,000
9	Intersection	Secondary/Conn. Blvd	Cross – Signalised (Interim)	Per intersection	$3,868,000	$4,389,000
10	Intersection	Conn. Blvd/Conn. Blvd	Cross– Roundabout (Ultimate)	Per intersection	$1,842,000	$2,124,000
11	Intersection	Primary/Primary	T – Signalised (Interim)	Per intersection	$4,825,000	$5,518,000
12	Intersection	Primary/Secondary	T – Signalised (Interim)	Per intersection	$4,370,000	$4,990,000
13	Intersection	Primary/Conn. Blvd.	T – Signalised (Interim)	Per intersection	$3,447,000	$3,967,000
14	Intersection	Secondary/Secondary	T – Signalised (Interim)	Per intersection	$4,045,000	$4,564,000
15	Intersection	Secondary/Conn. Blvd	T – Signalised)interim)	Per intersection	$3,171,000	$3,604,000
16	Intersection	Conn. Blvd/Conn. Blvd	T – Roundabout (Ultimate)	Per intersection	$1,460,000	$1,690,000
17	Bridge	Interim Primary Arterial Road Bridge 50 m span	Super-T – 15.80m wide (Interim)	Per Bridge	$6,828,000	$8,021,000
18	Bridge	Interim Primary Arterial Road Bridge 100 m length	Super-T – 15.80m wide (Interim)	Per Bridge	$12,434,000	$14,646,000
19	Bridge	Interim Secondary Arterial Road Bridge 50m length	Super-T – 14.90m wide (Interim)	Per bridge	$6,270,000	$7,368,000
20	Bridge	Interim Secondary Arterial Road Bridge 100m length	Super-T – 14.90m wide (Interim)	Per bridge	$11,391,000	$13,419,000
21	Bridge	Ultimate Connector Road Bridge 50m length	Super-T – 14.30m wide (Ultimate)	Per bridge	$6,270,000	$7,368,000
22	Bridge	Ultimate Connector Road	Super-T – 14.30m wide (Ultimate)	Per bridge	$11,391,000	$13,419,000

Item	Category	Description	Standard	Cost Application	Estimate P50	Estimate P90
		Bridge 100m length				
23	Bridge	Pedestrian Bridge 20m length	Super-T – 4m wide (Ultimate)	Per bridge	$966,000	$1,131,000
24	Bridge	Pedestrian Bridge 80m length	Super-T – 4m wide (Ultimate)	Per bridge	$2,853,000	$3,364,000
25	Major Culvert	Box culverts 1200 x 2100 (4 side by side)	Secondary Arterial Interim – 17.0 m	Per structure	$393,000	$452,000
26	Major Culvert	Box culverts 1200 x 2100 (4 side by side)	Connector Boulevard Ultimate – 31.0 m	Per structure	$559,000	$643,000
27	Major Culvert	Box culverts 1800 x 3000 (6 side by side)	Secondary Arterial Interim – 17.0 m	Per structure	$795,000	$914,000
28	Major Culvert	Box culverts 1800 x 3000 (6 side by side)	Connector Boulevard Ultimate – 31.0 m	Per structure	$1,202,000	$1,382,000
29	Major Culvert	Box culverts 2100 x 2100 (16 side by side)	Secondary Arterial Interim – 17.0 m	Per structure	$1,413,000	$1,625,000
30	Major Culvert	Box culverts 2100 x 2100 (16 side by side)	Connector Boulevard Ultimate – 31.0 m	Per structure	$2,142,000	$2,463,000
31	Major Culvert	Circular Pipes (RCP) 1200 dia. (2 side by side)	Secondary Arterial Interim – 17.0 m	Per structure	$250,000	$287,000
32	Major Culvert	Circular Pipes (RCP) 1200 dia. (2 side by side)	Connector Boulevard Ultimate – 31.0 m	Per structure	$352,000	$405,000
33	Major Culvert	Circular Pipes (RCP) 1800 dia. (3 side by side)	Secondary Arterial Interim – 17.0 m	Per structure	$474,000	$545,000
34	Major Culvert	Circular Pipes (RCP) 1800 dia. (3 side by side)	Connector Boulevard Ultimate – 31.0 m	Per structure	$752,000	$865,000
35	Major Culvert	Circular Pipes (RCP) 2100 dia. (4 side by side)	Secondary Arterial	Per structure	$709,000	$816,000

Item	Category	Description	Standard	Cost Application	Estimate P50	Estimate P90
			Interim – 17.0 m			
36	Major Culvert	Circular Pipes (RCP) 2100 dia. (4 side by side)	Connector Boulevard Ultimate – 31.0 m	Per structure	$1,145,000	$1,316,000
37	Community Facilities	Level 1 Facility	Contemporary standard	Bldg. floor area	$6,825,000	$7,606,000
38	Community Facilities	Level 2 Facility	Contemporary standard	Bldg. floor area	$8,064,000	$8,928,000
39	Community Facilities	Level 3 Facility	Above contemporary standard allowing for place making architectural features	Bldg. floor area	$10,761,000	$11,830,000
40	Sports and Recreation Facilities	Sports Pavilion 2 playing areas	Contemporary standard multi-purpose facility	Bldg. floor area	$1,614,000	$1,656,000
41	Sports and Recreation Facilities	Sports Pavilion 3 playing areas	Contemporary standard multi-purpose facility	Bldg. floor area	$2,687,000	$2,753,000
42	Sports and recreation Facilities	Sports and Recreation Facility 5 to 6 hectare site	Contemporary senior and junior sporting competition standard	Per Reserve	$6,942,000	$8,021,000
43	Sports and recreation Facilities	Sports and Recreation Facility 8 to 10 hectare site	Contemporary senior and junior sporting competition standard	Per Reserve	$9,011,000	$10,355,000

3.5.2 Source data

The review of the available pricing information from the 26 DCPs showed a significant variance in the quality and depth of information provided within a PSP. It was noted that several PSPs contained detailed in-depth unit rates that were extracted, however the majority of DCPs contained consolidated elements and total estimated cost (lump sum) pricing. As a result, there was little or no information to substantiate the costed element of the DCP. Dependent on the total estimated cost used, these were often not included in the assessment due to lack of granularity.

Comparison of the 26 PSPs highlighted trends of cost data and granularity. Cross-referencing this information to the different consultants from which the data was sourced showed a definable trend to the data. Based on the restricted number of underlying consultants the quantity of truly independent cost data was limited, and *the only variances appeared to be attributed to the different consultants*.

Of the 26 PSPs, several PSPs were developed by one consultant; the cost data used was replicated for each PSP. As such based on the information provided, only seven unique data sets were available for cost estimation purposes (essentially one from each consultant). Based on the cost data available, it was noted that there is a similarity in rates between consultancies and the anticipated spread of data was evident.

The only areas in which a marked variance in cost data was identified, were the specialist sectors, such as lighting and traffic signals. Unfortunately, an in-depth review of the cost breakdowns of these elements was not possible due to total estimates (lump sum) being provided.

It should be noted that if any one consultant provides similar rates for multiple projects, it is not bad practice: consultant cost data is usually an amalgamation of construction tenders and industry pricing rates and as such is a valid source of cost estimation.

Noted below are key aspects of the source data review:

- Often assumptions were not provided to substantiate the cost pricing data. This is particularly relevant to drainage and street lighting;
- Pavement formation descriptions were not consistent with VPA standard terminology and formation makeup;
- High variance in ground improvement and treatment between different projects;
- Lack of standardised documentation of costings;
- Frequent use of total estimated cost (lump sum) elements;
- Requirement to use post processing to provide rates in similar units and inclusions.

3.5.3 Monte-Carlo estimation

Due to the consultant pricing rates being generated from a number of sources and dates (range of dates 2011-2016) and constantly being refined, the distribution of data was limited. The Monte-Carlo estimation did however produce a range of cost data that was used to provide cost certainty.

3.5.4 Variances and overheads

It has not been possible to extract geographic, topographical or other forms of variances from the source data. . Consultants had estimated elements using company specific rates with no apparent identification of site specific challenges and features. As a result, company specific repetition of rates was observed throughout DCP estimations. Due to the aforementioned reason, variances were only observed in the form of 'company variances'.

3.5.5 Civil component pricing

Observations regarding each typology are discussed in Section 3.5.5.1 to 3.5.5.7. For the entire extracted pricing data for each civil element refer to Appendix B. Civil components were priced using the data available. For example, if traffic signals at intersections were priced on an arm basis this report has priced in a similar fashion. Based on the data provided it was not possible to extract elements into sub-components that fit into the current VPA pricing schedule.

3.5.5.1 Intersections

Based on the intersection layouts and pricing, the following observations were made (including assumptions made in data extraction):

- Traffic signal hardware was often priced as a total estimated cost (lump sum), or if sub-components were priced little detail was provided;
- Apart from increased volumes of civil components (pavement and kerbing) no variance was noted for the various sizes of intersections (minor / major) for increase Traffic signal hardware.

3.5.5.2 Mid-block roads

As the majority of PSPs contain road elements, the amount of information available for this element was high. The majority of consultants also provided unit rate cost data. The estimation of road elements used these rates for pricing purposes. Noted below are the source data observations:

- Variance in pavement formation makeups;
- No information provided for stormwater layouts and there is a lack of pipe pricing data. Several layouts estimated 300mm diameter pipes only;
- Variance in reporting rates with respect to inclusions and exclusions, specifically in relation to remediation and earthwork allowances.

3.5.5.3 Bridges

Only a limited number of the PSPs provided bridge components. From the consultants that provided cost data, it was often in the form of total estimated pricing per square meter. For conceptual works this square metre rate is sufficient for pricing:

- Square meter rates provided a better cost estimate than separate rates for abutments/piers and deck;
- Individually priced elements were for specific situations and it was not possible to back calculate overall rates.

3.5.5.4 Culverts

Based on the 26 PSPs provided no cost data could be extracted for large diameter pipes or box culverts. Of the observed culverts that were documented, these were conventional sizes (<1200mm high). Due to the above, Cardno's internal resources were utilised to supplement the lack of data (P50 data). As only one data set was produced from the above exercise, it was not possible to create a normal distribution curve. To overcome the above, the P90 cost estimate was obtained by a 15% increase of the estimated P50 costs of the culverts. (%15 was a typical difference between P50 & P90 estimates for bridges)

Key points:

- Observed culverts were small sizes and were priced on a square metre rate;
- No allowance was included for diverting of water ways/ drainage lines during works.

3.5.5.5 Community facilities

Based on the PSP information available sufficient cost data was available to price targeted community facilities. Square meter rates were used for estimation purposes of these facilities. The arrangement of community facilities will vary from the typical drawings created based on individual site conditions and developer/ council aspirations & master planning processes.

3.5.5.6 Sports pavilions

Based on the PSP information available sufficient cost data was available to price targeted sports pavilions. Square meter rates were used for estimation purposes of pavilions. The arrangement of pavilions will vary from the typical drawings created based on individual site conditions, and developer/ council aspirations & master planning processes.

3.5.5.7 Sports and recreation facilities

Based on the PSP information available sufficient cost data was available to price the desired sports and recreations facilities. Typical drawings have been created, however due to site conditions, developer/ council aspirations & master planning processes layouts will vary.

3.6 Stakeholder engagement

3.6.1 Stakeholder feedback received

Cardno presented the findings and recommendations of this report to industry stakeholders over the course of two workshops held on 27 August 2018 (transport infrastructure) and 31 August 2018 (community and recreation infrastructure). Following the presentation, the VPA requested submissions from the attendees outlining their comments and infrastructure costing data that could be used to calibrate the findings of the benchmark project further.

The following section has been extracted from the Cardno report V170524 Stakeholder Comment Review D02 (12.12.18)' outlining the key information from the stakeholder engagement process.

Submissions were received form the following stakeholders over the period of mid-late October 2018.

- Cardinia Shire Council
- City of Casey
- Melton City Council
- City of Whittlesea
- UDIA (Urban Development Institute of Australia)

The following table summarises the variety of feedback received from the above stakeholders. For confidentiality purposes, details of submissions have not been outlined, nor have references been made to project specifics.

Table 3-9 Stakeholder Feedback

		As-built costs with supporting evidence	Project cost estimates & supporting evidence	Peer review of Benchmark estimates	Comments on Benchmark project
Cardinia Shire Council	CSC Project A community centre		✓ (Low granularity)		
	Seven intersection projects CSC Project B - H		✓		
	Two intersection projects CSC Project I - J	✓			
	CSC Project K recreation reserve	✓			
	CSC Project L pavilion		✓ (Low granularity)		
	Additional comments				✓
City of Casey	CC Project A community centre		✓		
	CC Project B community centre		✓		
	Four recreational reserves CC Project C - F		✓		
	Three intersection projects CC Project G - I	✓			
	CC Project J	✓ (Low granularity)			
	Additional comments				✓
Melton City Council	Peer review by WTP			✓	
	Peer review by T&T			✓	
City of Whittle-sea	Peer review by WTP			✓	
	Additional comments				✓
UDIA	Comments				✓

A summary of this feedback and commentary on the merits of points raised from the submissions is provided below:

Cardinia Shire Council (CSC) has provided data on a variety of transport road projects and community infrastructure projects. These include;

- Functional layouts and estimates for a variety of intersection projects – however, scope differences exist due to the CSC projects being brownfield developments. The overall cost per metre of pavement is higher for the current benchmark estimates;
- Construction drawings and estimates for two intersection projects – similar to above, scope differences exist due to these being brownfield developments and cost per metre of pavement is again higher for the current benchmark estimates;

- Rates of line items from the functional layout estimates and construction estimates above which have similar scope to the benchmark project will be utilised to improve the statistical analysis and adjust rates;
- Construction estimates and functional drawings for CSC Project K recreational reserve – the drawings show that components allowed for are generally the same as those allowed for in the benchmark project. Several items not considered to be 'basic and essential' were included however, overall project cost is less than the benchmark estimates. Rates from the above reserve will be utilised in the improvement of the benchmark project's statistical analysis;
- Estimates and drawings of various other community facilities and a pavilion – these items were not considered for benchmark rate improvement purposes due to a variety of reasons including significant differences in scope (double story vs single story buildings) and low granularity in the provided documents.

Similar to CSC, City of Casey has provided cost estimates for a variety of transport road projects and community infrastructure projects;

- As constructed plans and concept plans for various intersection and road projects were submitted along with their estimates. However, similar to CSC's transport submissions these were brownfield developments and had a variety of scope differences. The overall cost per metre of pavement is higher for the current benchmark estimates. Rates of line items which have similar scope will be utilised to improve the statistical analysis;
- Functional plans and estimates for recreation fields were submitted by council. These submissions included several items that were not considered to be 'basic and essential'. The benchmark layouts generally allowed for more sporting fields (generally more tennis courts, netball fields and cricket nets). Overall, benchmark estimates were higher than council submitted estimates. Rates of line items which have similar scope will be utilised to improve the statistical analysis;
- Several community facilities and respective estimates – similar to the CSC's submission these items were not considered for benchmark rate improvement purposes due to a variety of reasons including significant differences in scope (double story vs single story buildings) and low granularity in the provided documents

City of Melton together with City of Whittlesea engaged WT Partnership (WTP) to undertake a peer review of the transport projects. City of Melton also engaged Turner & Townsend (T&T) to undertake a peer review of the community infrastructure projects.

In addition to council submissions, the UDIA has submitted comments regarding the application of the benchmark project, the inputs used for the benchmarking project and comments surrounding comparison of the benchmark estimates against actual projects.

3.6.2 Changes to the benchmark project

Analysis of the submitted documents and consultation with the VPA resulted in the following list of major updates to the pre-stakeholder engagement benchmark project:

- Revise rates for the line item site preparation;
- Include/ revise rates and quantities against the line item for subgrade preparation and adjust current rates for pavements as required;
- Allocate costs against the line item for landscape maintenance which currently has no costs against it but typically forms part of construction projects & contracts;
- Allocate costs against the line item for street lighting which currently has no costs against it;
- Include a 2% ESD deliverable in community and recreation infrastructure projects;
- Make a variety of minor changes to the cost sheets and project drawings as specified in subsequent sections of the report;

1. Make minor adjustments to the cost sheet descriptions to avoid confusion
2. Make minor adjustments to community facility concept drawings/ quantities/ cost sheets as per council comments, specifically;

- Relocate disabled parking locations closer to the sporting pavilion and adjust paths to suit. Adjust quantities as required;

- Make minor changes to car park lighting to address CPTED factor. Add car park lighting as a cost item within cost sheets for sporting fields;
- Review the landscape maintenance line item for active open spaces;
- Discuss with the VPA on including a deliverable for ESD.

3. Make minor adjustments to transport infrastructure concept drawings/ quantities/ cost sheets as per council comments

- Revise rates for roads and intersections to include subgrade preparation, and street lighting;
- Revisit bridge quantities and adjust the limit of works to include bridge approach earthworks and pavement costs;
- Add regulatory signage for road sections;
- Add rates for pedestrian bridge barriers.
- Revise quantities for culverts (to VicRoads standards)

4. Calibrate the estimates by including construction rates from a variety of relevant infrastructure projects
5. Include base rates from quantity surveyors WTP and T&T in the statistical analysis.
6. Cost index all relevant data utilised in the statistical analysis as per relevant ABS data to July 2018;
7. Re-run the Monte-Carlo analysis following the completion of the above tasks and update the P50 and P90 rates.

The final iteration of the benchmark report reflects the changes aforementioned. For detailed information on stakeholder comments, cost submissions and Cardno responses to submissions refer to Cardno report V170524 Stakeholder Comment Review D02 (12.12.18)'.

3.7 Conclusions

The results of the price extraction and assessment of the civil components has provided a set of baseline cost estimations that can be applied to future PSPs to provide a more accurate outline costings to the overall PSP and its eventual monetary contributions.

The use of consultant data, which is an amalgamation of a variety of sources, has already removed pricing anomalies. The use on Monte-Carlo method is effective, but due to the data sources being closely aligned, variances are not as pronounced compared to that of tendered rates.

Due to the lack of detailed cost estimations using unit rates, the values extracted have been taken at face value. Where lump sums have been provided, these have been re-used to provide costing to the civil components.

The initial cost data rates provided have been sourced from consultancies. These rates are based on consultants' construction tender results and as such are a reflection of a general trend in cost pricing data. Often these rates do not reflect market conditions or current cost data. This was identified as an issue with this costing exercise. Rectification of this has been achieved by including actual construction costs from stakeholders within the database for the Monte Carlo analysis.

With PSPs not being a one size fits all, the use of standard civil components will not fit every scenario encountered. At the time of writing of this report, the VPA is in the process of formalising a flowchart-based methodology to address non-standard infrastructure costing requirements.

4 References

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Tan, F., Makwasha, T., & Tsolakis, D. (2011). *Austroads Research Report Improving Practice in Cost Estimation of Road Projects.* Sydney.

VicRoads. (2015). *Guidance for Planning Road Networks in Growth Areas.*

Victorian Planning Authority Benchmark Infrastructure Report

APPENDIX A

INFRASTRUCTURE ELEMENTS STANDARD DETAILS

VPA BENCHMARK INFRASTRUCTURE COSTING
FOR
VICTORIAN PLANNING AUTHORITY

GENERAL NOTES

ITEM	ASPECT	REMARKS
GENERAL	FUNCTIONAL LAYOUT	THESE PLANS WERE PREPARED USING AUSTROADS GUIDE TO ROAD DESIGN (AGRD) 3, 4A & 4B.
		TYPICAL TURN LANE LENGTHS AND DESIGN SPEEDS FOR INTERSECTIONS HAVE BEEN DESIGNED IN ACCORDANCE WITH VICROADS GUIDANCE FOR PLANNING ROAD NETWORKS IN GROWTH AREAS.
		LANE CONFIGURATIONS HAVE BEEN ADOPTED AS PER VICROADS "GUIDANCE FOR PLANNING ROAD NETWORKS IN GROWTH AREAS" DOCUMENT AND VPA SUPPLIED DATA.
		NO SWEPT PATH TEMPLATES HAVE BEEN ADOPTED AT THE INTERSECTIONS.
		DESIRABLE SETBACK CLEARANCES HAVE BEEN APPLIED FOR ISLAND/STOP LINE CONFIGURATIONS.

SCHEDULE OF DRAWINGS

Rev	Date	Description	Des.	Verif.	Appd.
5	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
4	05/07/2018	ADDRESS VPA COMMENTS	CM		
3	29/06/2018	ADDRESS VPA COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	RVR		

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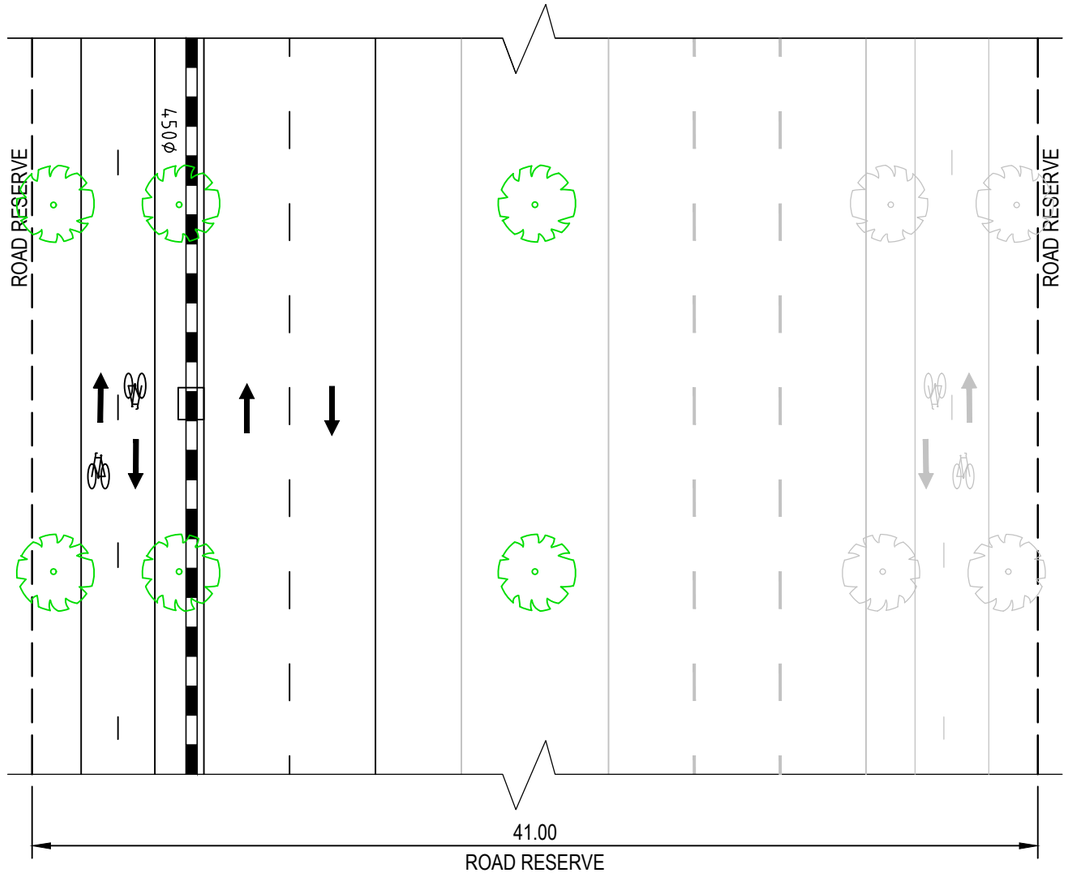
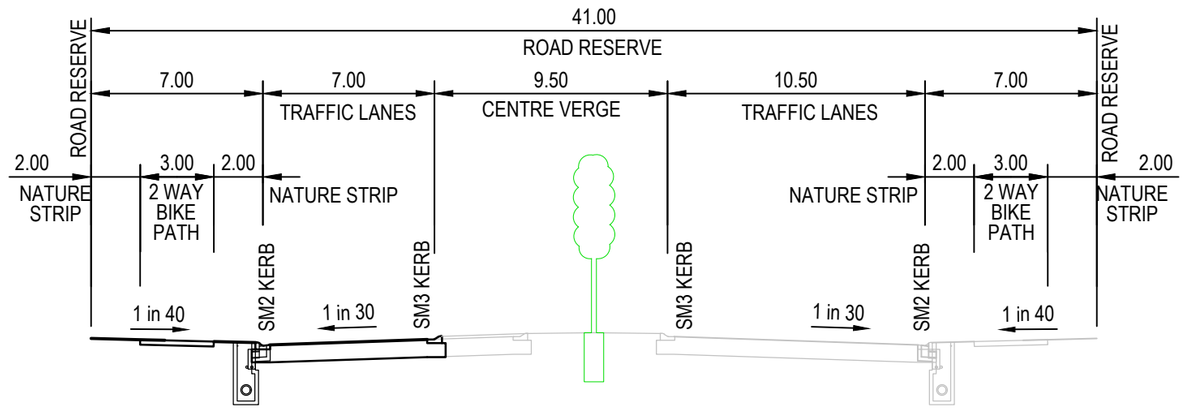
Drawn	RVR	Date 27/09/2017
Checked	MEA	Date 28/09/2017
Designed	RVR	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY
Project: BENCH MARK INFRASTRUCTURE COSTING
Title: GENERAL NOTES & SCHEDULE OF DRAWINGS
Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES
Scale:
Size: A3
Drawing Number: V181544-CI-DG-2000
Revision: 5





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3	29/06/2018	ADDRESS VPA COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	RVR		

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Designed	RVR	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY

Project: BENCH MARK INFRASTRUCTURE COSTING

Title: ITEM 1
PRIMARY ARTERIAL ROAD
INTERIM

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

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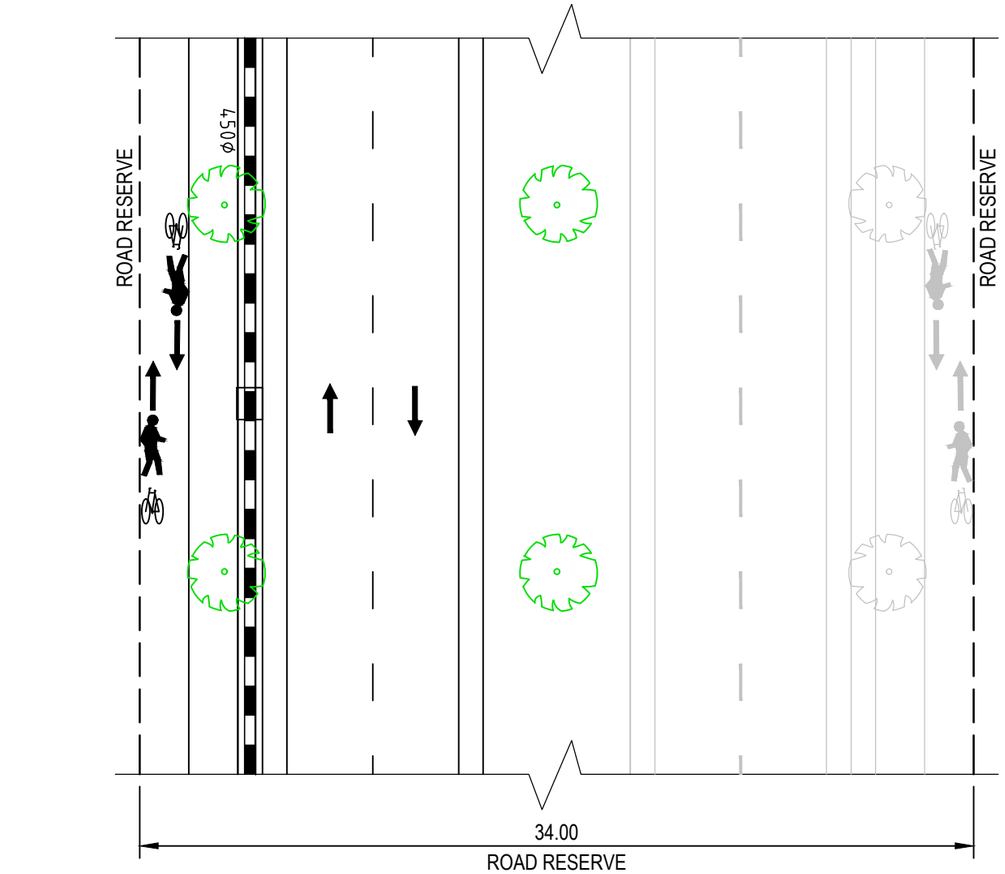
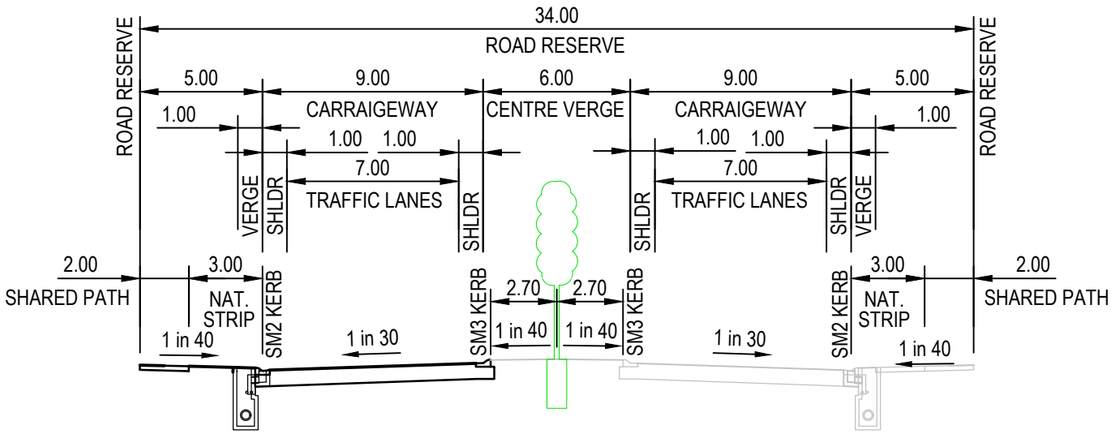
Size: A3

Drawing Number: V181544-CI-DG-2001

Revision: 6





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3	29/06/2018	ADDRESS VPA COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
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Client: VICTORIAN PLANNING AUTHORITY

Project: BENCH MARK INFRASTRUCTURE COSTING

Title: ITEM 2
SECONDARY ARTERIAL ROAD
INTERIM

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

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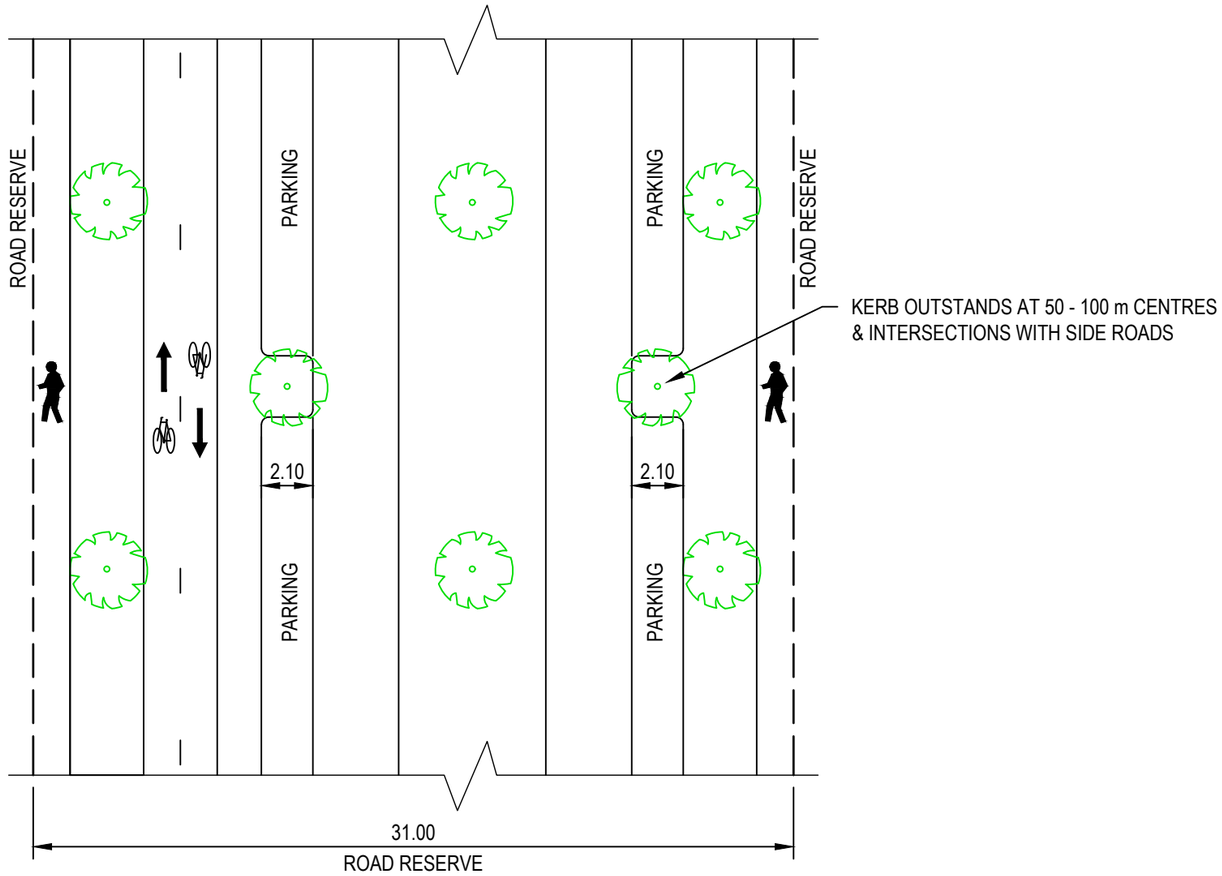

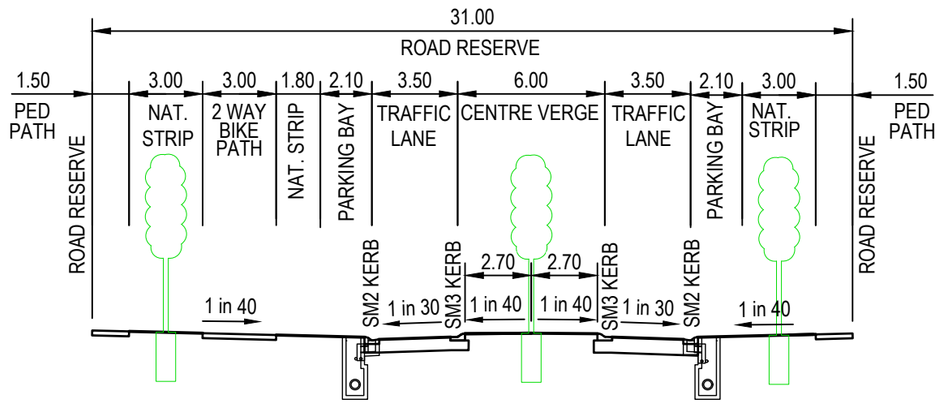

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2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	RVR		

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Checked	MEA	Date 28/09/2017
Designed	RVR	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY

Project: BENCH MARK INFRASTRUCTURE COSTING

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

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CONNECTOR BOULEVARD
ULTIMATE

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Revision: 5

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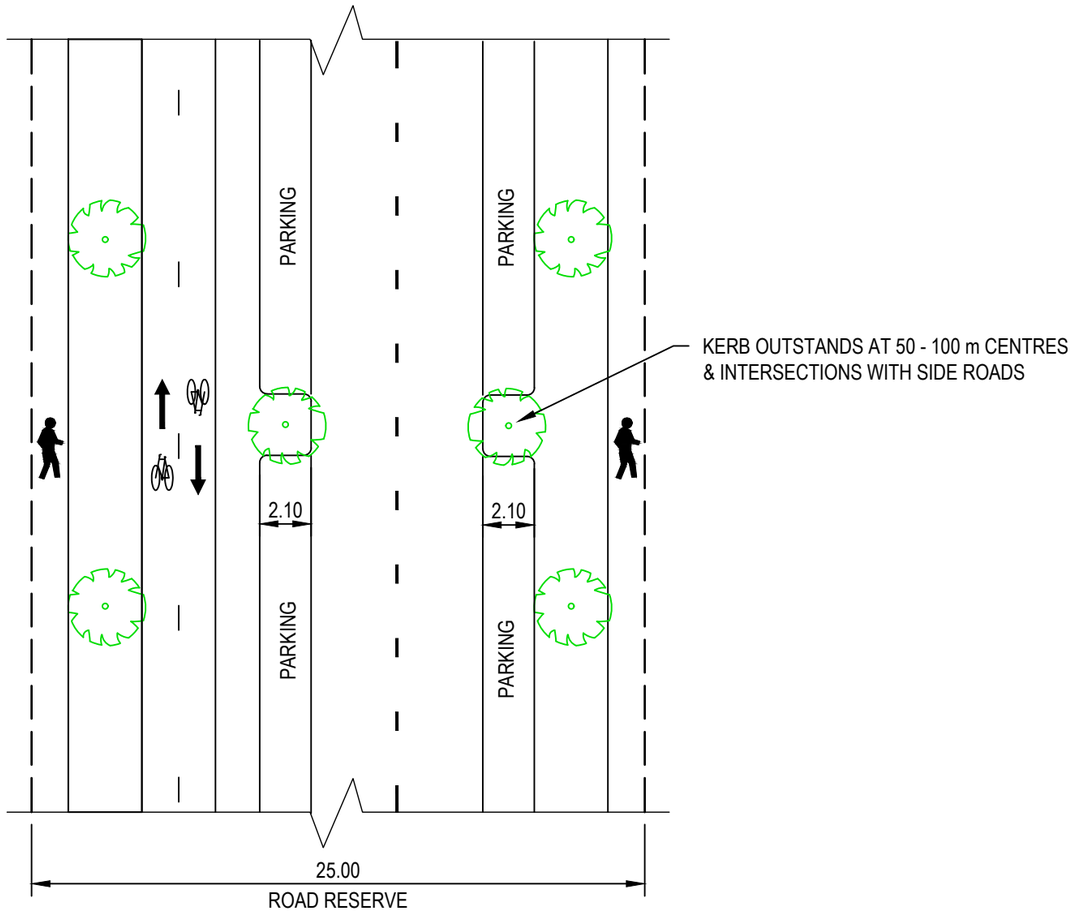

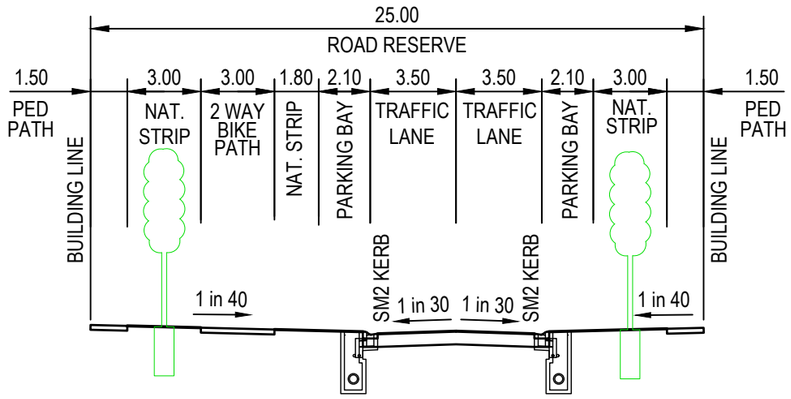

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1	14/12/2017	PRELIMINARY ISSUE	RVR		

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Designed	RVR	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY

Project: BENCH MARK INFRASTRUCTURE COSTING

Title: ITEM 4
CONNECTOR STREET
ULTIMATE

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

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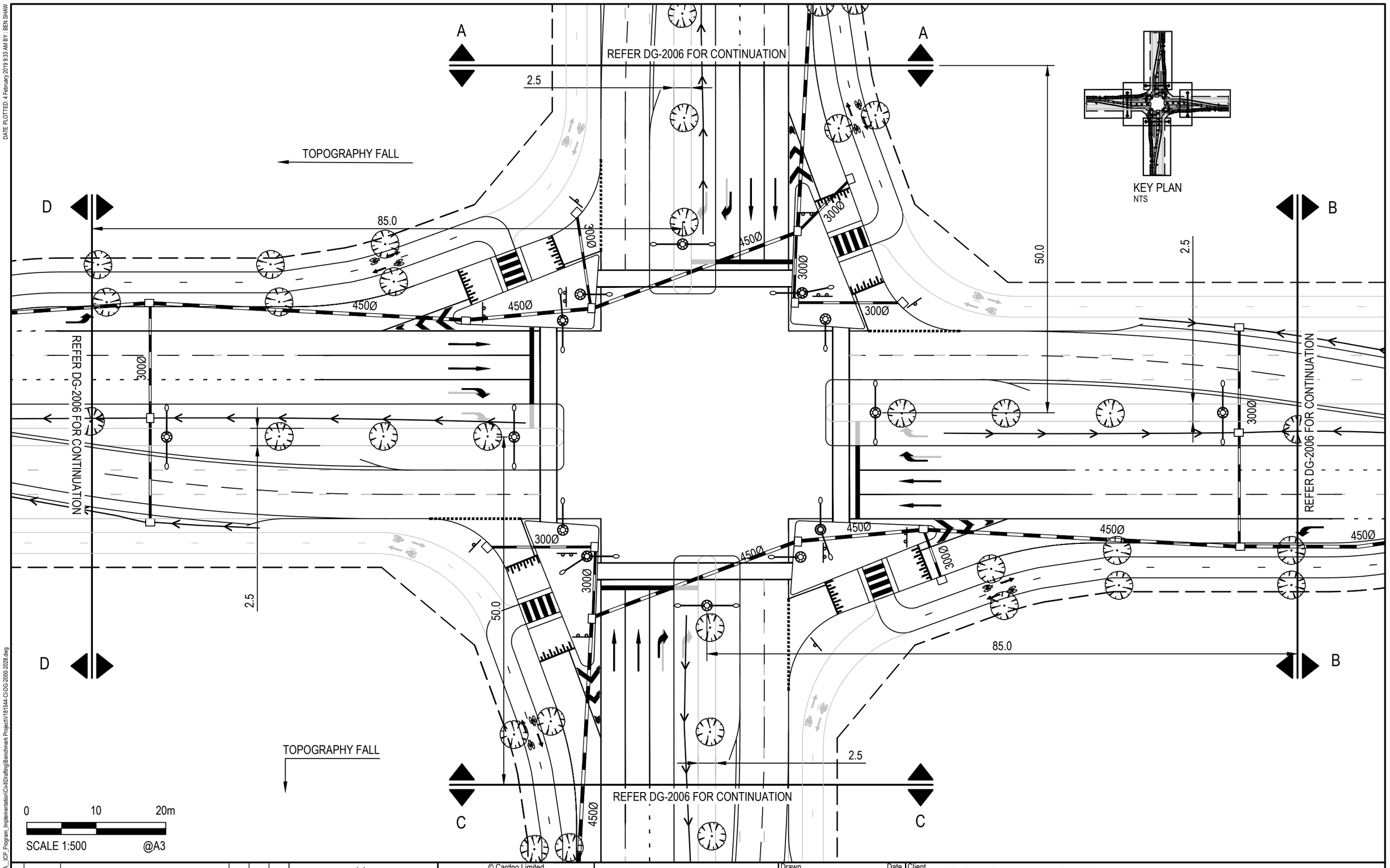

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1	14/12/2017	PRELIMINARY ISSUE	RVR		

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Drawn	NPV	Date 14/12/2017
Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY

Project: BENCH MARK INFRASTRUCTURE COSTING

Title: ITEM 5
PRIMARY TO PRIMARY INTERSECTION
INTERIM

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

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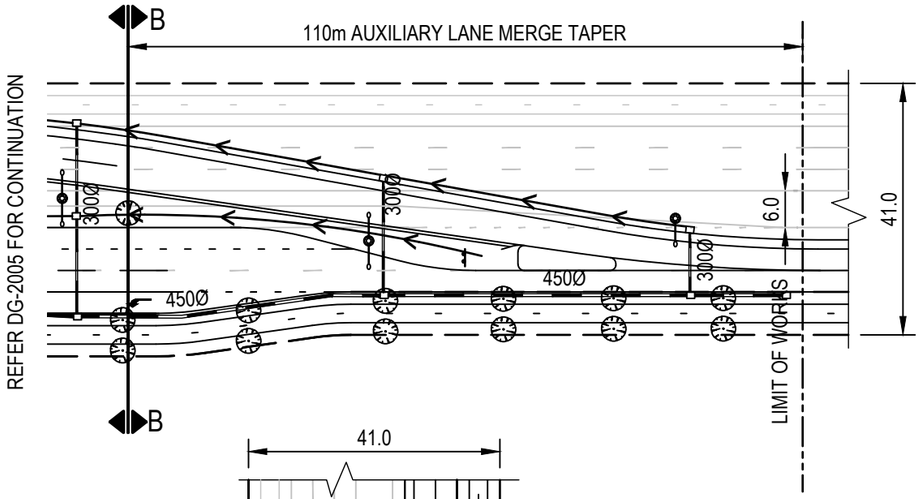
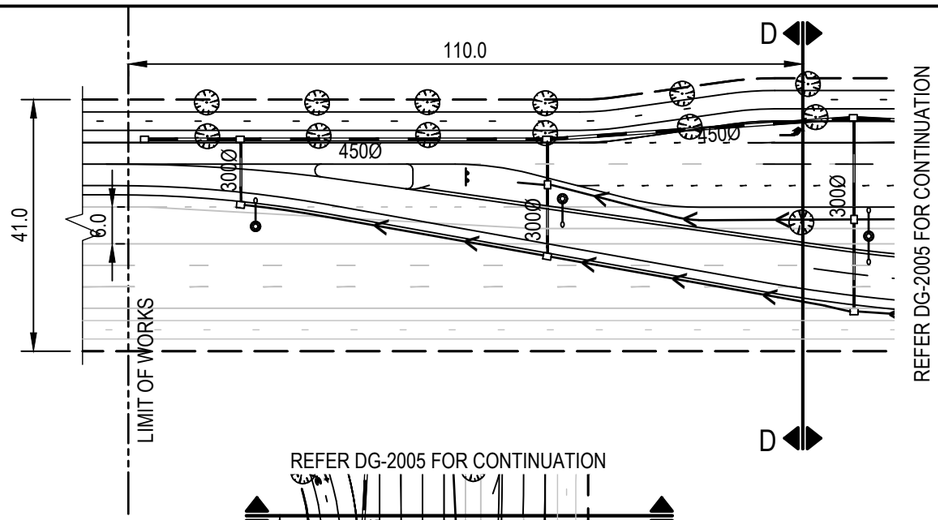
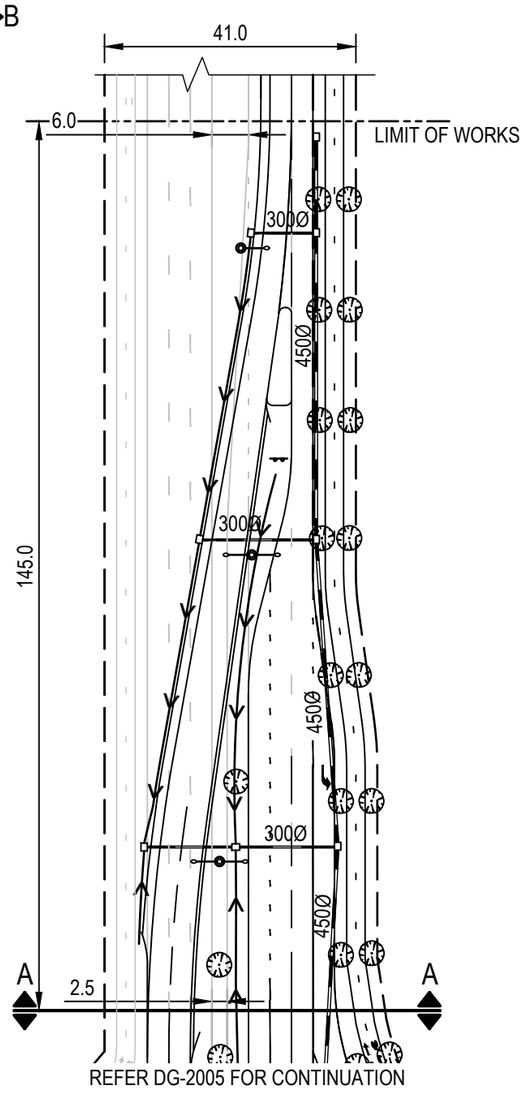
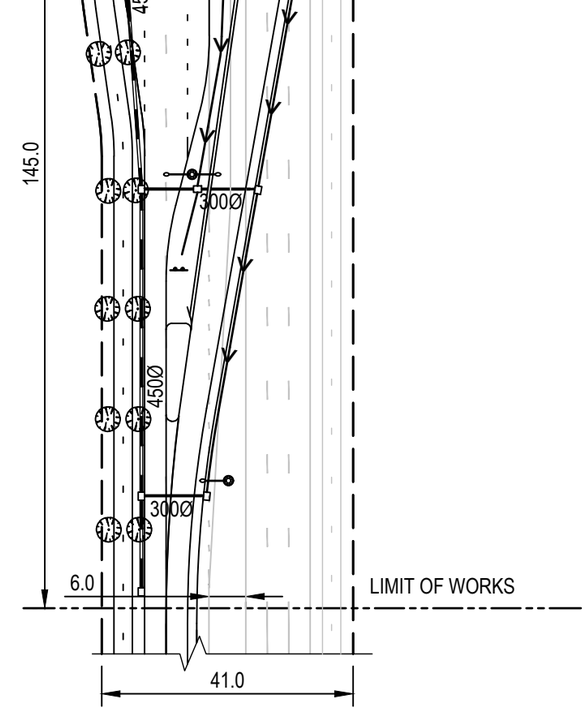
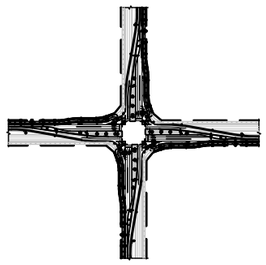
Drawing Number: V181544-CI-DG-2005 | Revision: 5











KEY PLAN
NTS

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SCALE 1:1000 @A3

Rev	Date	Description	Des.	Verif.	Appd.
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4	05/07/2018	ADDRESS VPA COMMENTS	CM		
3	29/06/2018	ADDRESS VPA COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	RVR		

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Drawn	NPV	Date 14/12/2017
Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY

Project: BENCH MARK INFRASTRUCTURE COSTING

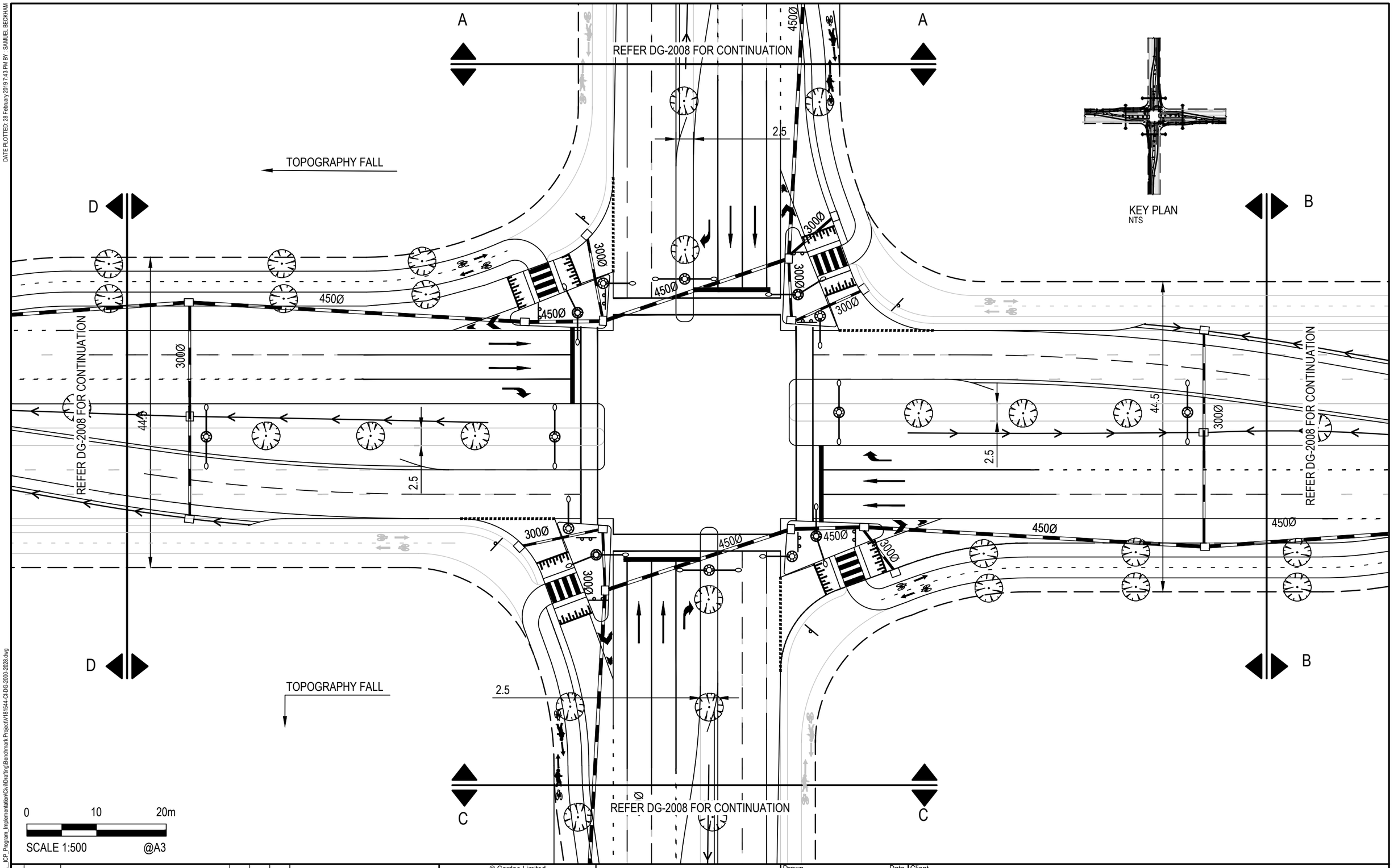
Title: ITEM 5
PRIMARY TO PRIMARY INTERSECTION
INTERIM

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Scale: 1:1000 Size: A3

Drawing Number: V181544-CI-DG-2006 Revision: 5

DATE PLOTTED: 28 February 2019 7:43 PM BY: SAMUEL BECKHAM



Rev	Date	Description	Des.	Verif.	Appd.
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4	05/07/2018	ADDRESS VPA COMMENTS	CM		
3	29/06/2018	ADDRESS VPA COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	RVR		

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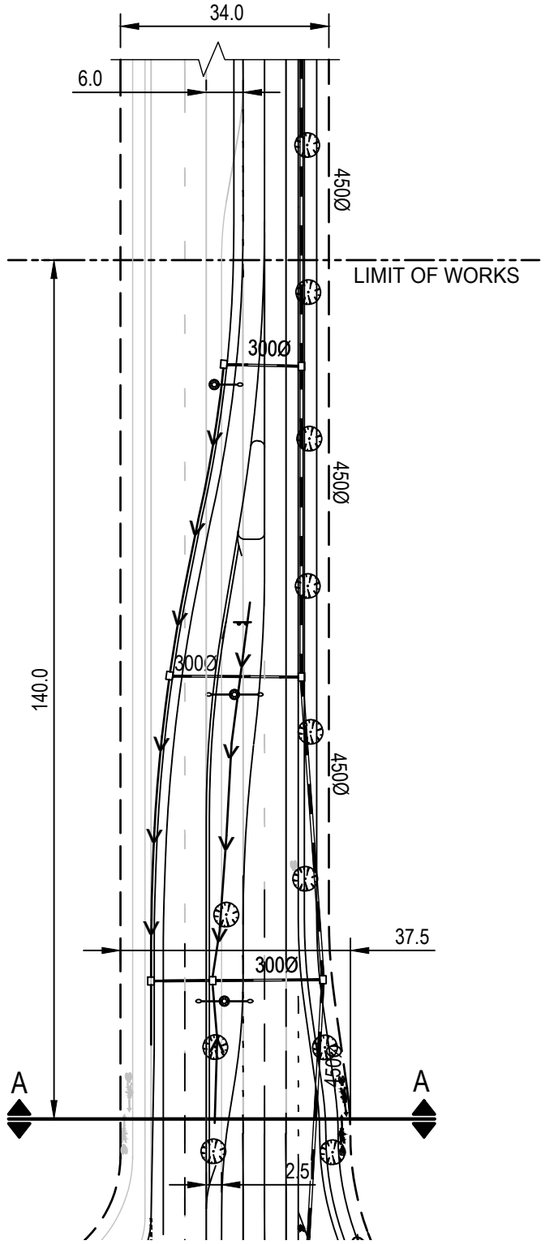
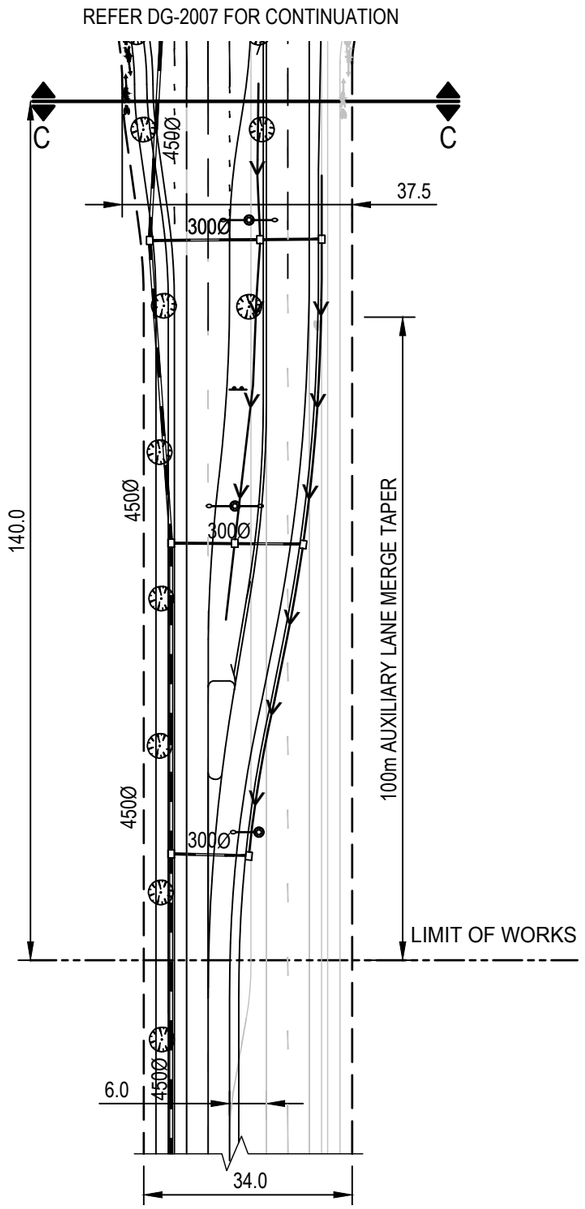
Drawn	NPV	Date 14/12/2017
Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

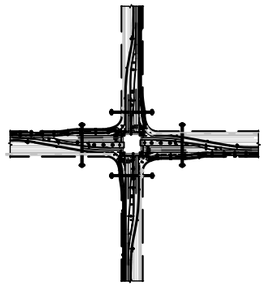
Client: VICTORIAN PLANNING AUTHORITY
Project: BENCH MARK INFRASTRUCTURE COSTING
Title: ITEM 6
PRIMARY TO SECONDARY INTERSECTION
INTERIM

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES
Scale: 1:500
Size: A3
Drawing Number: V181544-CI-DG-2007
Revision: 5

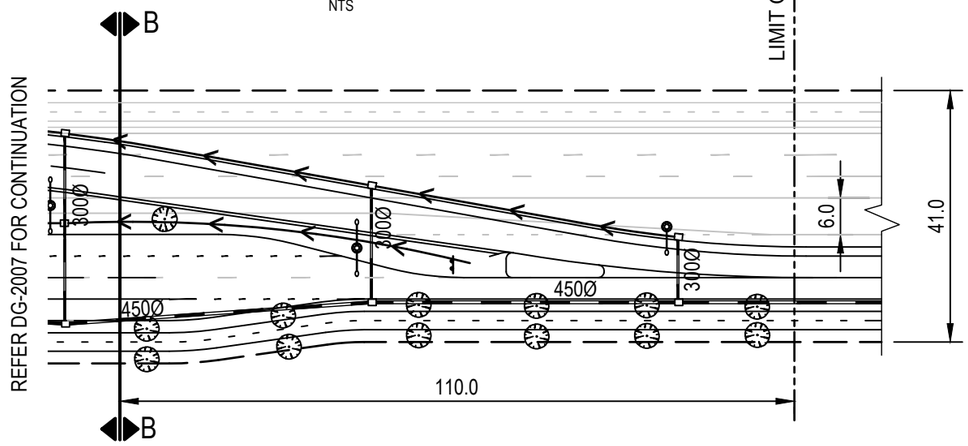
XREF's:
CAD File: M:\2018\181501_2000\V181544_VPA_ICP_Program_Implementation\Civil\Drafting\Benchmark Project\V181544-CI-DG-2000-2028.dwg

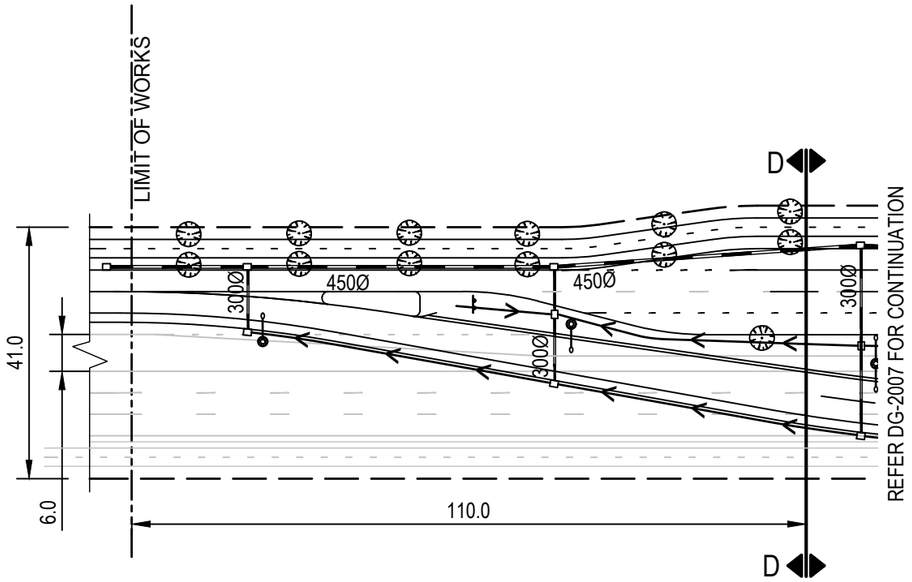






KEY PLAN
NTS





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SCALE 1:1000 @A3

Rev	Date	Description	Des.	Verif.	Appd.
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4	05/07/2018	ADDRESS VPA COMMENTS	CM		
3	29/06/2018	ADDRESS VPA COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	RVR		

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Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY

Project: BENCH MARK INFRASTRUCTURE COSTING

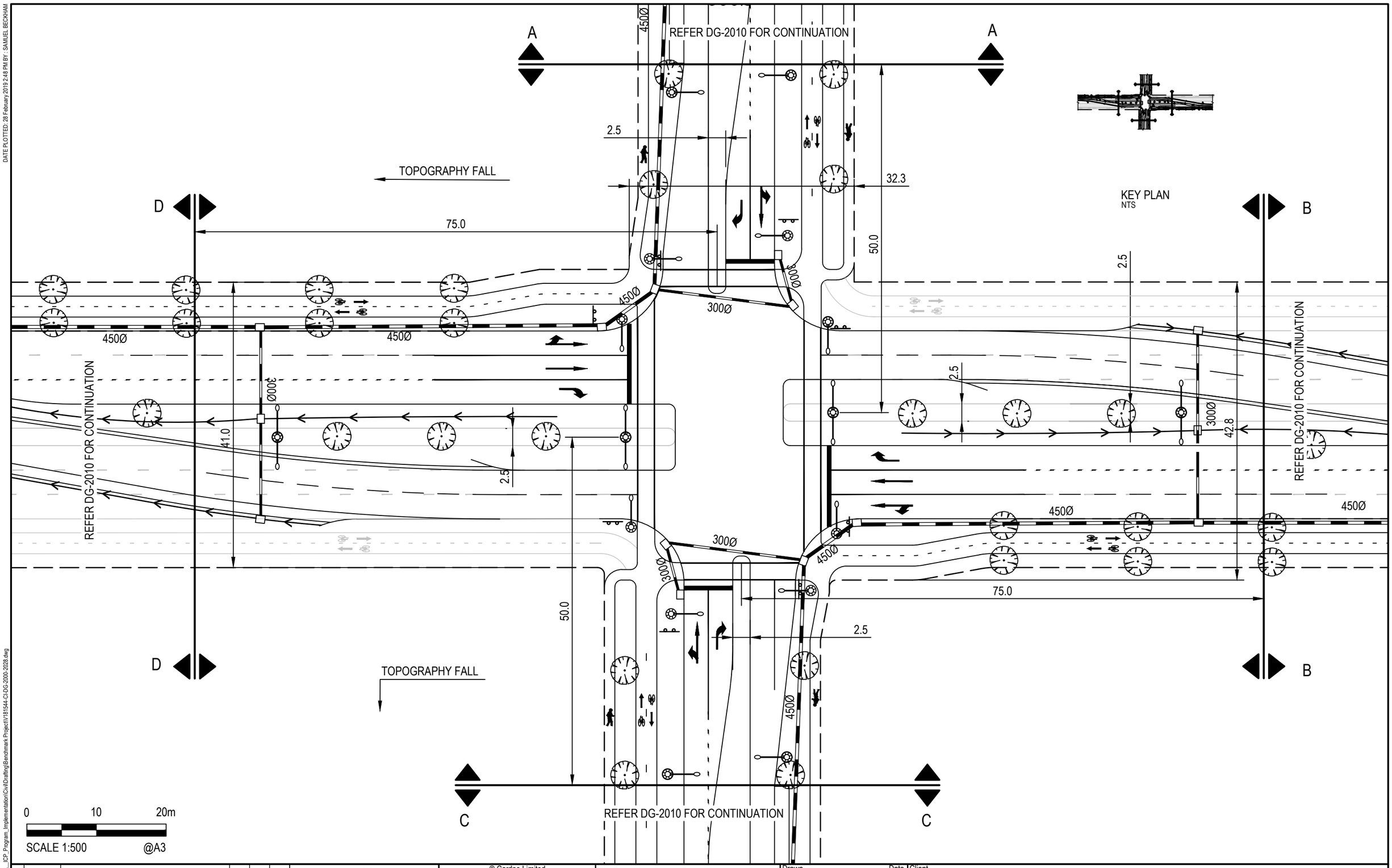
Title: ITEM 6
PRIMARY TO SECONDARY INTERSECTION
INTERIM

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Scale 1:1000 | Size A3

Drawing Number: V181544-CI-DG-2008

Revision: 5



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4	05/07/2018	ADDRESS VPA COMMENTS	CM		
3	29/06/2018	ADDRESS VPA COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	RVR		

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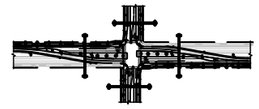
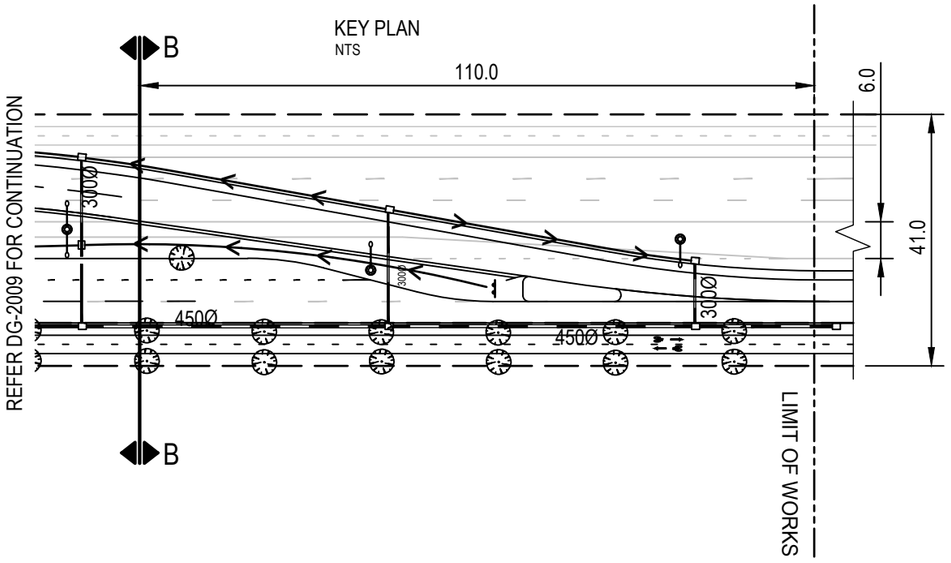
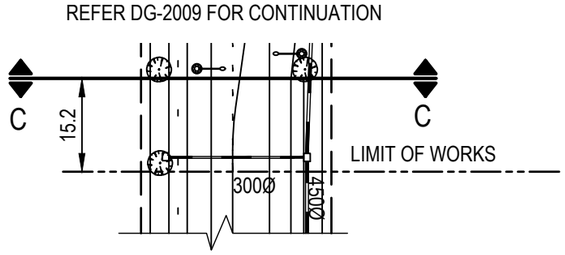
Drawn	NPV	Date 14/12/2017
Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

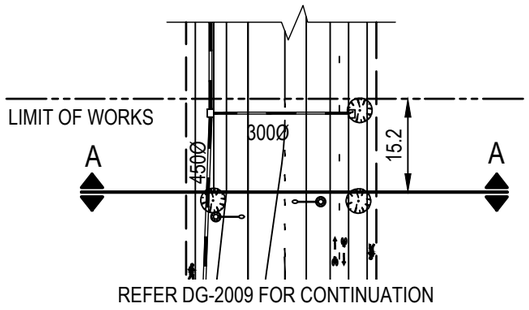
Client: VICTORIAN PLANNING AUTHORITY
Project: BENCH MARK INFRASTRUCTURE COSTING
Title: ITEM 7
PRIMARY TO CONNECTOR BLVD INTERSECTION
INTERIM

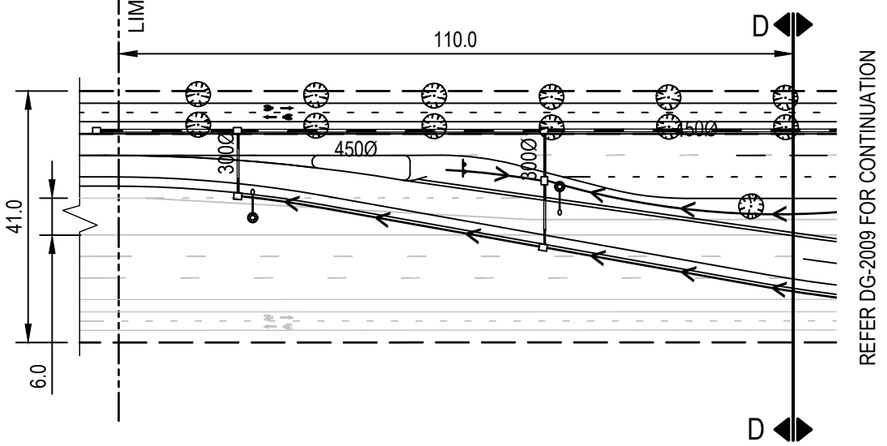
Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES
Scale: 1:500
Size: A3
Drawing Number: V181544-CI-DG-2009
Revision: 6











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SCALE 1:1000 @A3

Rev	Date	Description	Des.	Verif.	Appd.
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5	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
4	05/07/2018	ADDRESS VPA COMMENTS	CM		
3	29/06/2018	ADDRESS VPA COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	RVR		

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Drawn	NPV	Date 14/12/2017
Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY

Project: BENCH MARK INFRASTRUCTURE COSTING

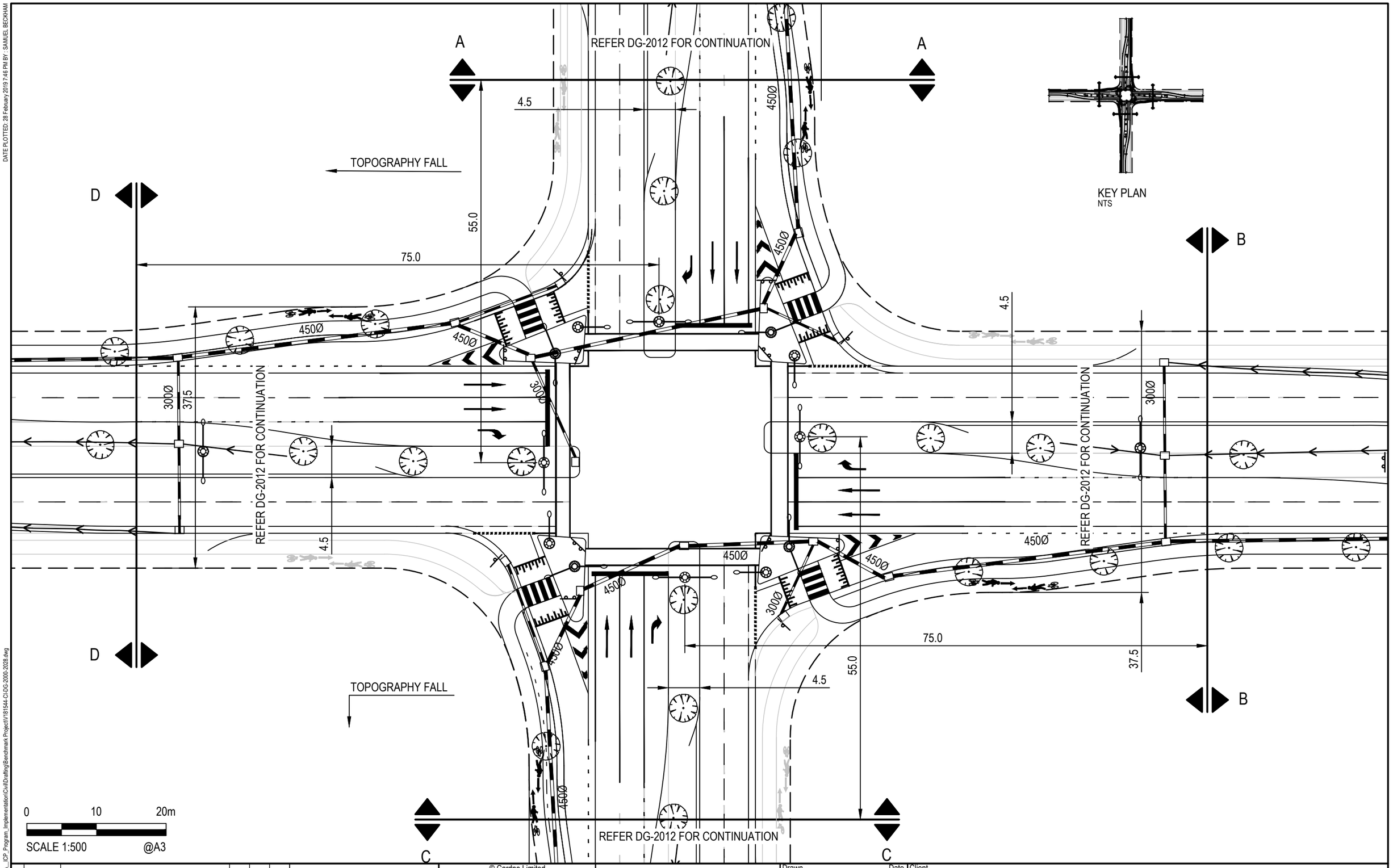
Title: ITEM 7
PRIMARY TO CONNECTOR BLVD INTERSECTION
INTERIM

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Scale: 1:1000 Size: A3

Drawing Number: V181544-CI-DG-2010 Revision: 6

DATE PLOTTED: 28 February 2019 7:46 PM BY: SAMUEL BECKHAM



KEY PLAN
NTS

Rev	Date	Description	Des.	Verif.	Appd.
5	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
4	05/07/2018	ADDRESS VPA COMMENTS	CM		
3	29/06/2018	ADDRESS VPA COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	RVR		

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Drawn	NPV	Date 14/12/2017
Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY

Project: BENCH MARK INFRASTRUCTURE COSTING

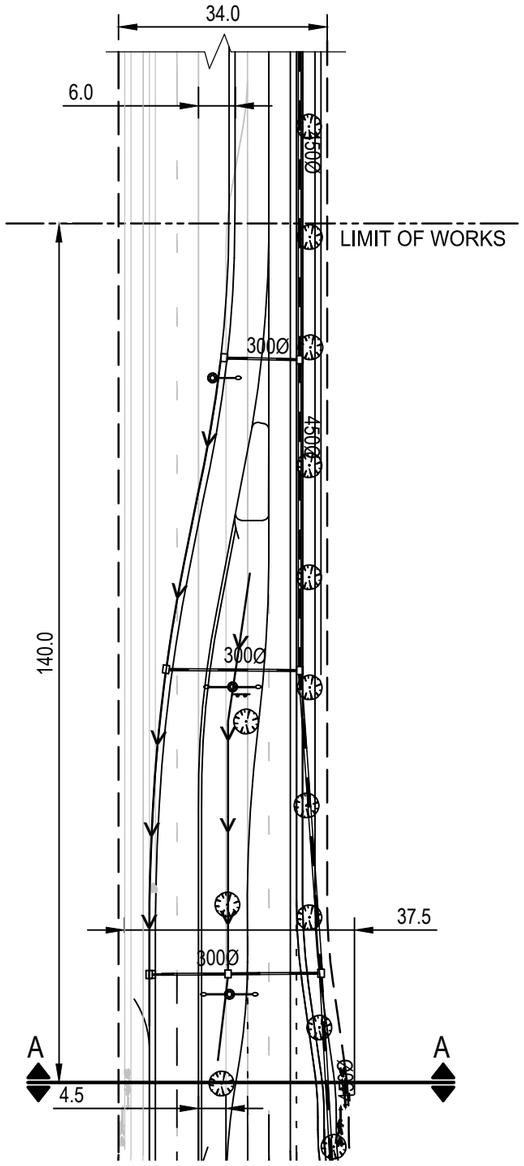
Title: ITEM 8
SECONDARY TO SECONDARY INTERSECTION
INTERIM

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

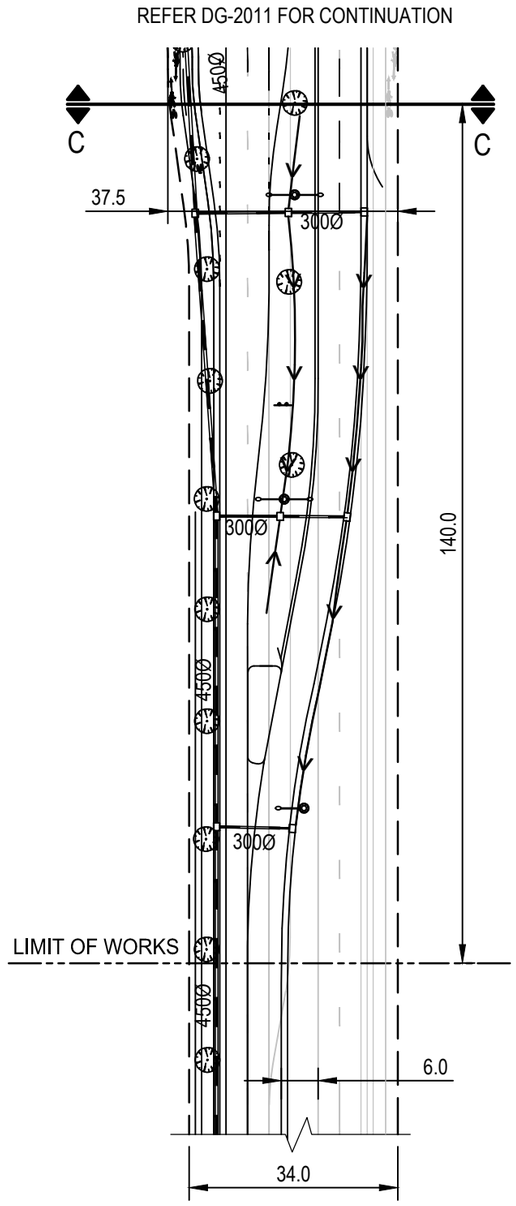
Scale: 1:500 | Size: A3

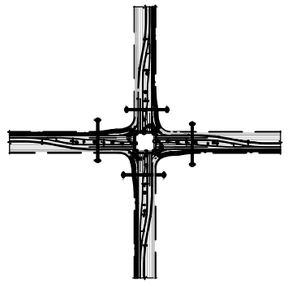
Drawing Number: V181544-CI-DG-2011 | Revision: 5

XREF's:
CAD File: M:\2018\181501_2000\V181544_VPA_ICP_Program_Implementation\Civil\Drafting\Benchmark Project\V181544-CI-DG-2000-2028.dwg



REFER DG-2011 FOR CONTINUATION





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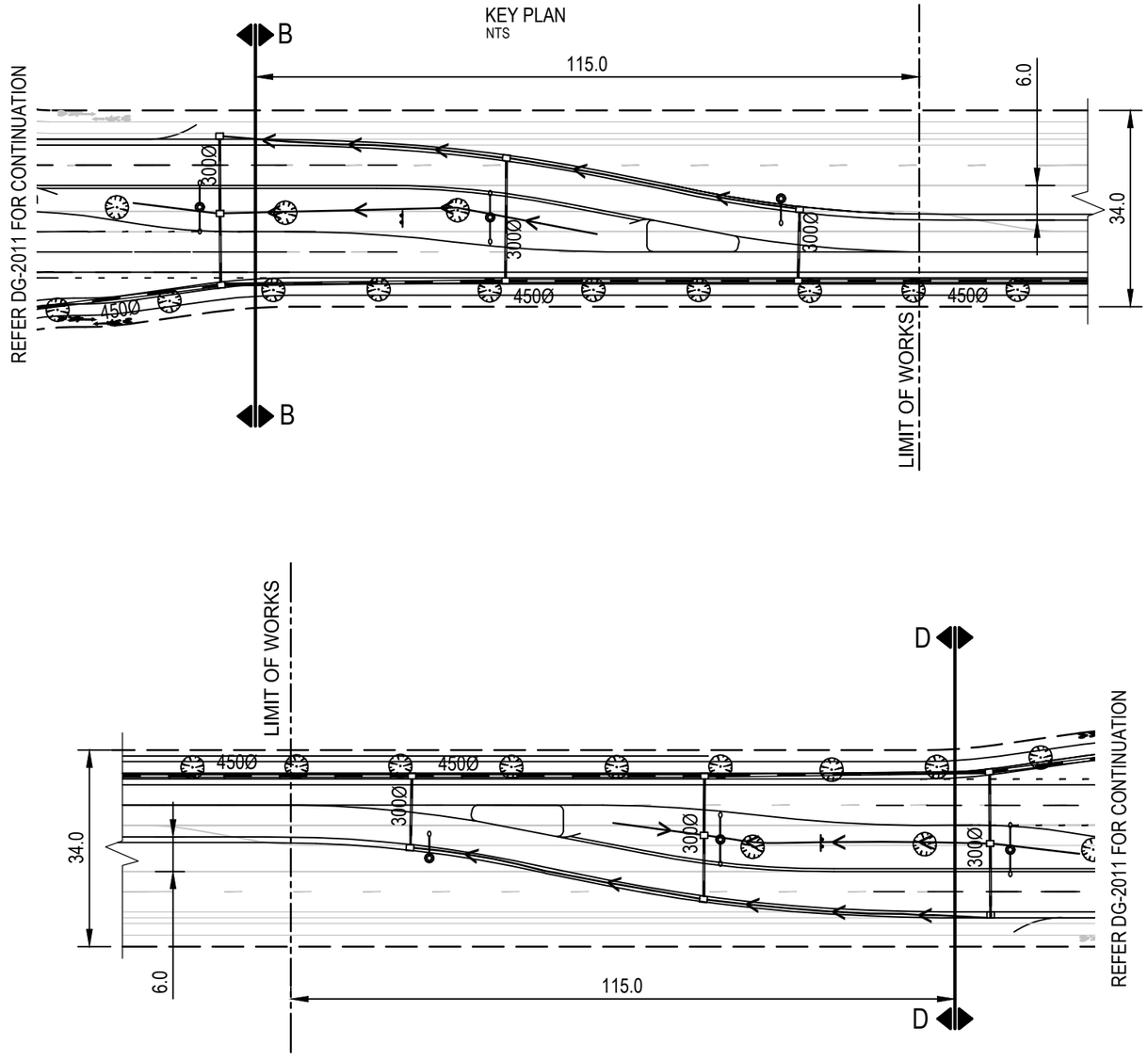

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SCALE 1:1000 @A3

Rev	Date	Description	Des.	Verif.	Appd.
5	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
4	05/07/2018	ADDRESS VPA COMMENTS	CM		
3	29/06/2018	ADDRESS VPA COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	RVR		

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Drawn	NPV	Date 14/12/2017
Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY

Project: BENCH MARK INFRASTRUCTURE COSTING

Title: ITEM 8
SECONDARY TO SECONDARY INTERSECTION
INTERIM

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

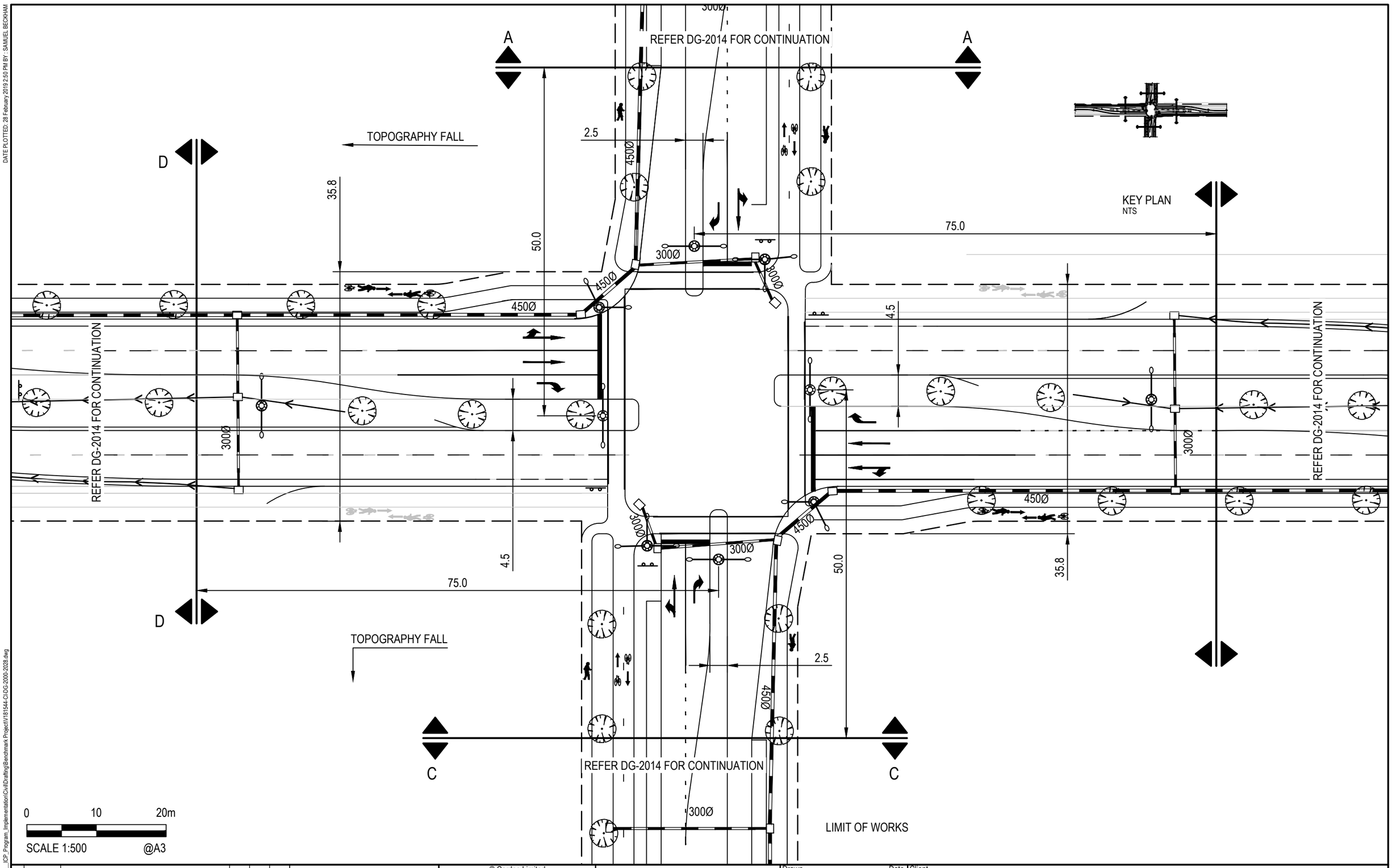
Scale 1:1000 | Size A3

Drawing Number: V181544-CI-DG-2012

Revision: 5

XREFs:
CAD File: N:\2018\1501_2000\V181544_VPA_ ICP_Program_Implementation\Civil\Drafting\Benchmark Project\V181544-CI-DG-2000-2028.dwg

DATE PLOTTED: 28 February 2019 2:50 PM BY: SAMUEL BECKHAM



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4	05/07/2018	ADDRESS VPA COMMENTS	CM		
3	29/06/2018	ADDRESS VPA COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	RVR		

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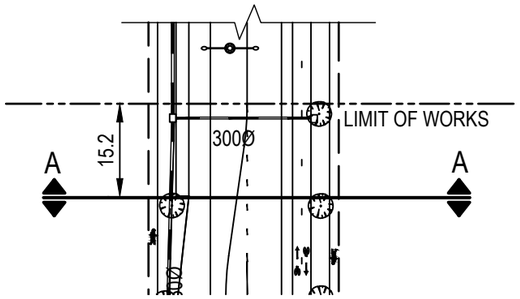
Drawn	NPV	Date 14/12/2017
Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY
Project: BENCH MARK INFRASTRUCTURE COSTING
Title: ITEM 9
SECONDARY TO CONNECTOR BLVD INTERSECTION
INTERIM

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

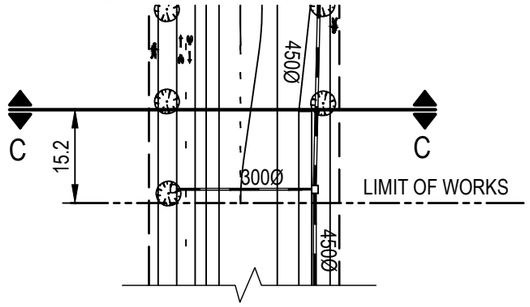
Scale: 1:500
Size: A3
Drawing Number: V181544-CI-DG-2013
Revision: 6

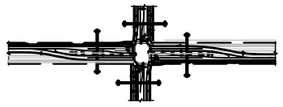
XREF's:
CAD File: M:\2018\181501_2000\V181544_VPA_ICP_Program_Implementation\Civil\Drafting\Benchmark Project\V181544-CI-DG-2000-2028.dwg



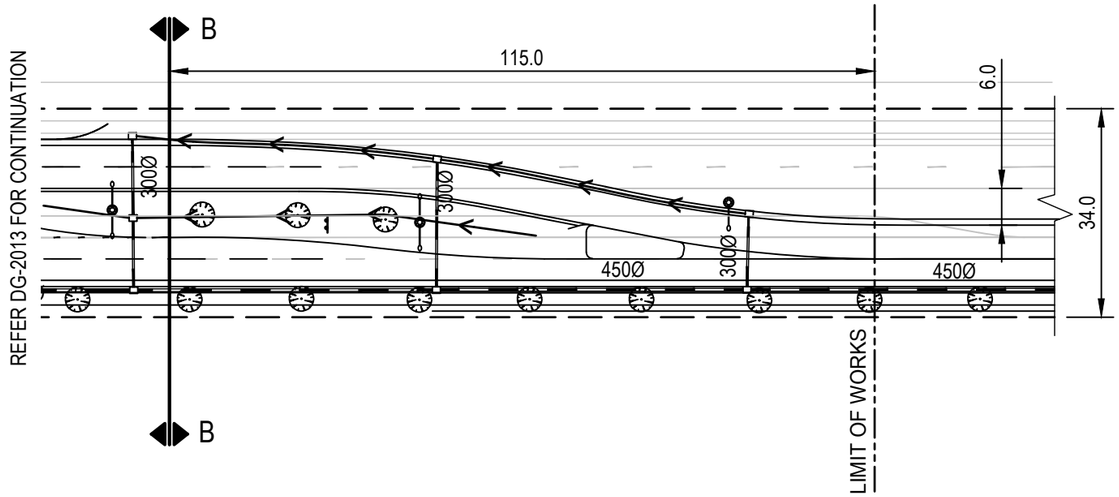
REFER DG-2013 FOR CONTINUATION

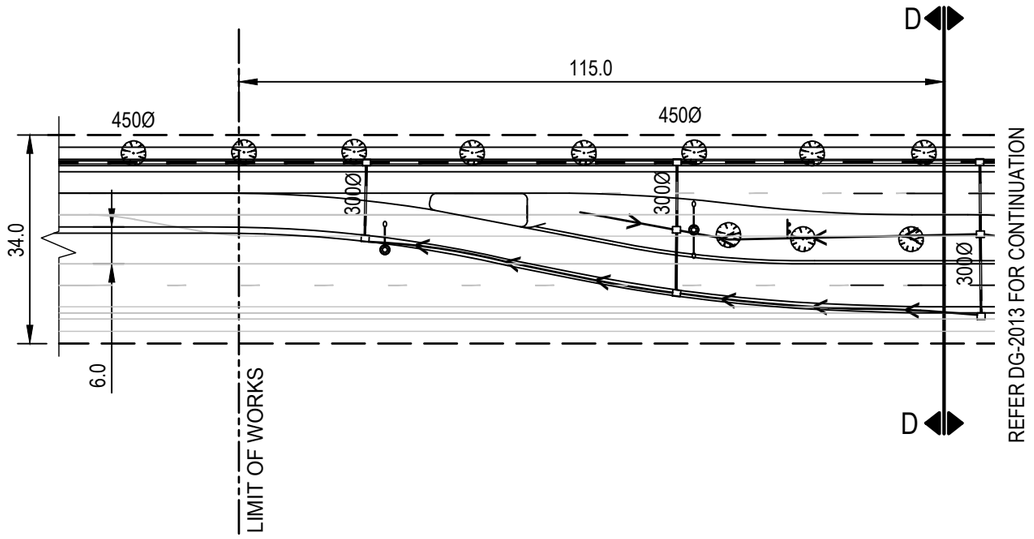
REFER DG-2013 FOR CONTINUATION





KEY PLAN
NTS





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SCALE 1:1000 @A3

Rev	Date	Description	Des.	Verif.	Appd.
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5	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
4	05/07/2018	ADDRESS VPA COMMENTS	CM		
3	29/06/2018	ADDRESS VPA COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	RVR		

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Drawn	NPV	Date 14/12/2017
Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY

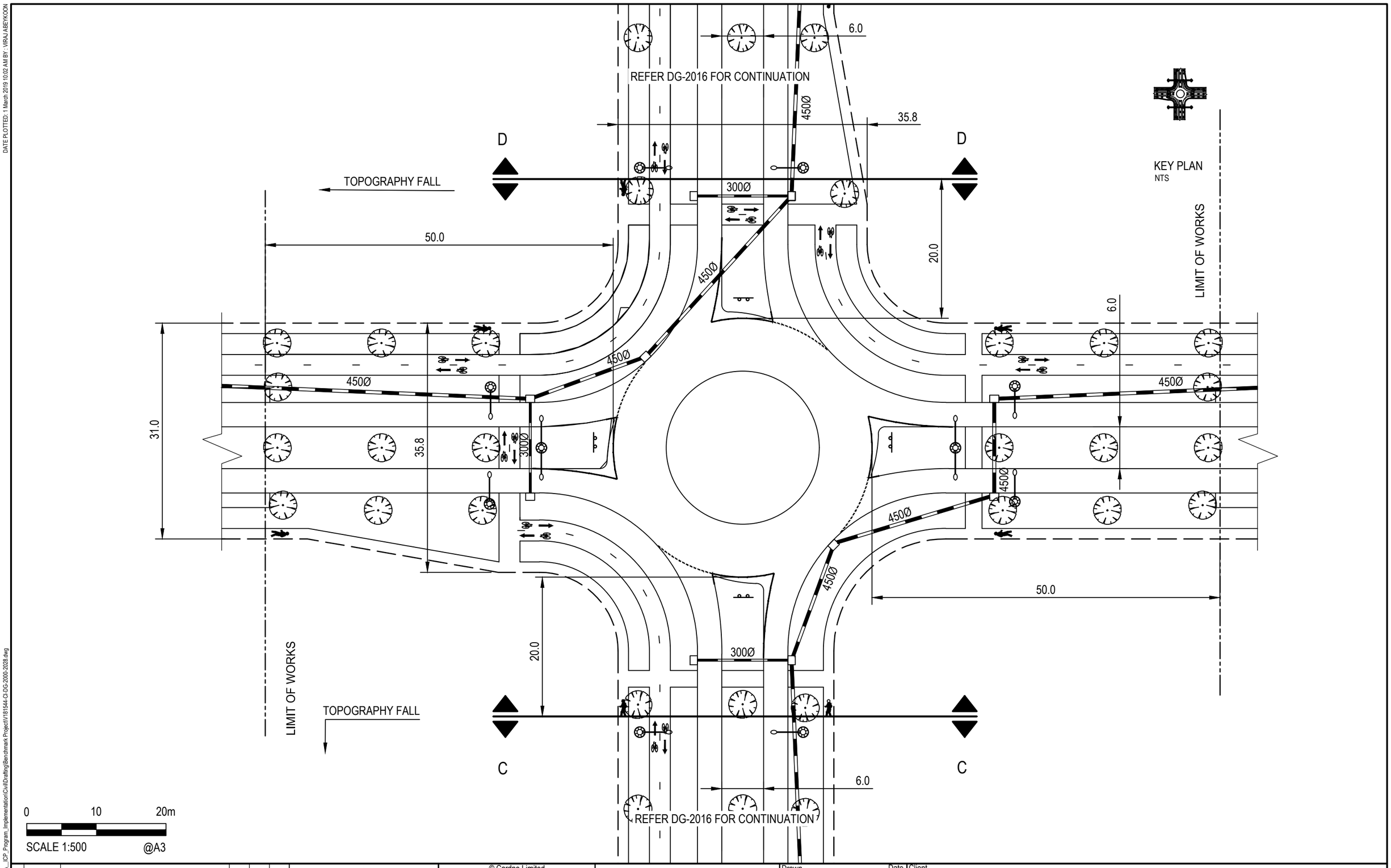
Project: BENCH MARK INFRASTRUCTURE COSTING

Title: ITEM 9
SECONDARY TO CONNECTOR BLVD INTERSECTION
INTERIM

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Scale: 1:1000 Size: A3

Drawing Number: V181544-CI-DG-2014 Revision: 6



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3	29/06/2018	ADDRESS VPA COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	RVR		

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Drawn	NPV	Date 14/12/2017
Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY

Project: BENCH MARK INFRASTRUCTURE COSTING

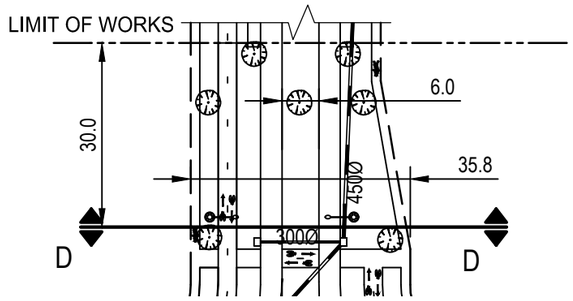
Title: ITEM 10
CONNECTOR BLVD TO CONNECTOR BLVD ROUNDABOUT
ULTIMATE

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Scale: 1:500
Size: A3

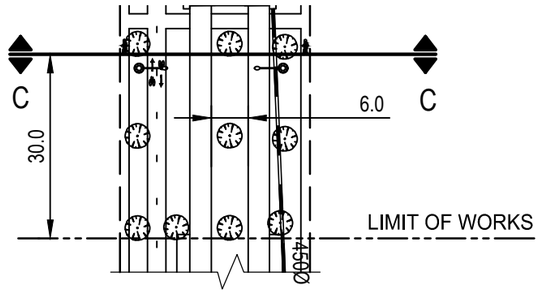
Drawing Number: V181544-CI-DG-2015
Revision: 6

KEY PLAN
NTS



REFER DG-2015 FOR CONTINUATION

REFER DG-2015 FOR CONTINUATION



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SCALE 1:1000 @A3

Rev	Date	Description	Des.	Verif.	Appd.
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3	29/06/2018	ADDRESS VPA COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	RVR		

NORTH

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Tel: 03 8415 7777 Fax: 03 8415 7788
Web: www.cardno.com.au

Drawn	NPV	Date 14/12/2017
Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY

Project: BENCH MARK INFRASTRUCTURE COSTING

Title: ITEM 10
CONNECTOR BLVD TO CONNECTOR BLVD ROUNDABOUT
ULTIMATE

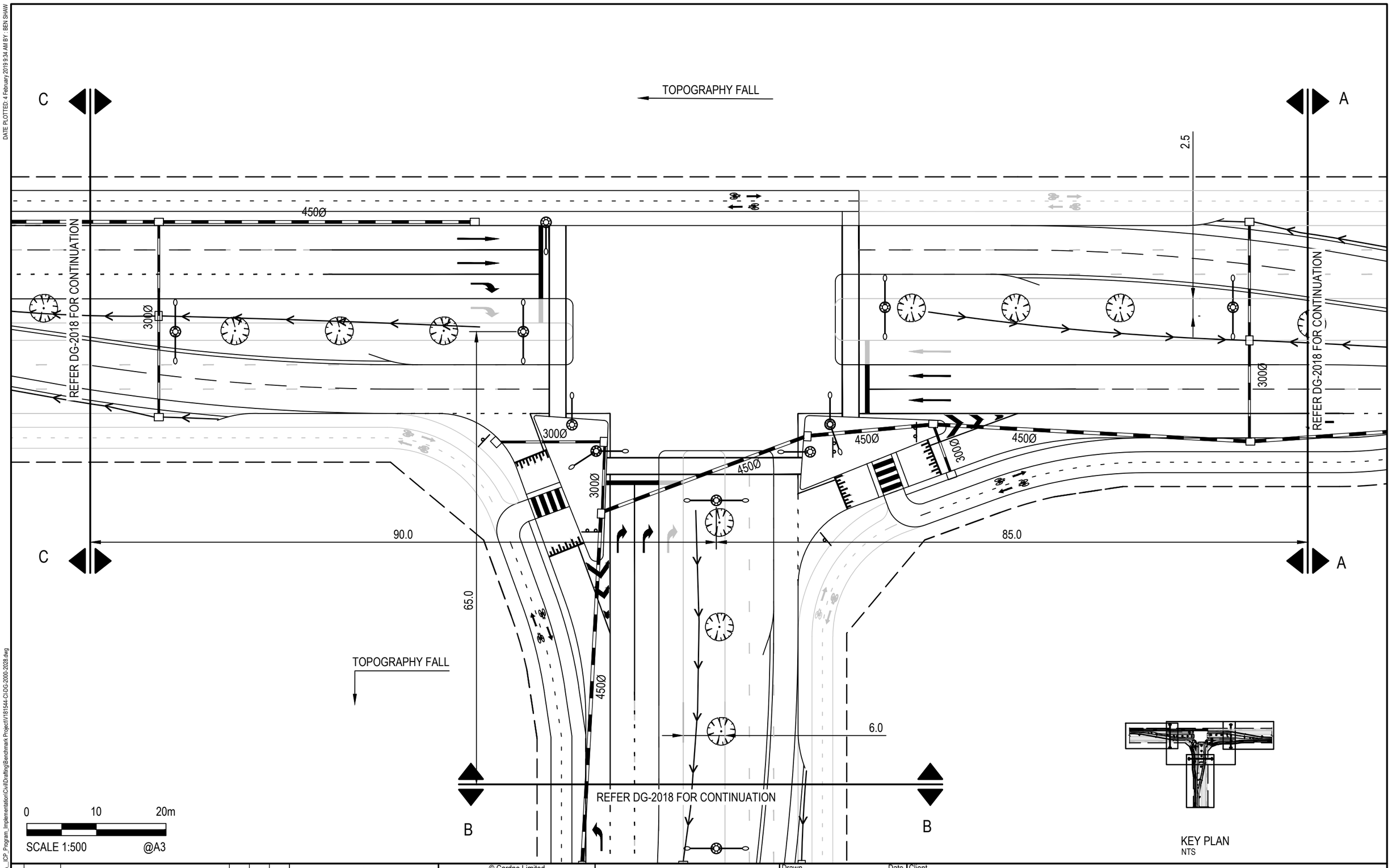
Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Scale: 1:1000

Size: A3

Drawing Number: V181544-CI-DG-2016

Revision: 6



KEY PLAN
NTS

Rev	Date	Description	Des.	Verif.	Appd.
5	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
4	05/07/2018	ADDRESS VPA COMMENTS	CM		
3	29/06/2018	ADDRESS VPA COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	RVR		

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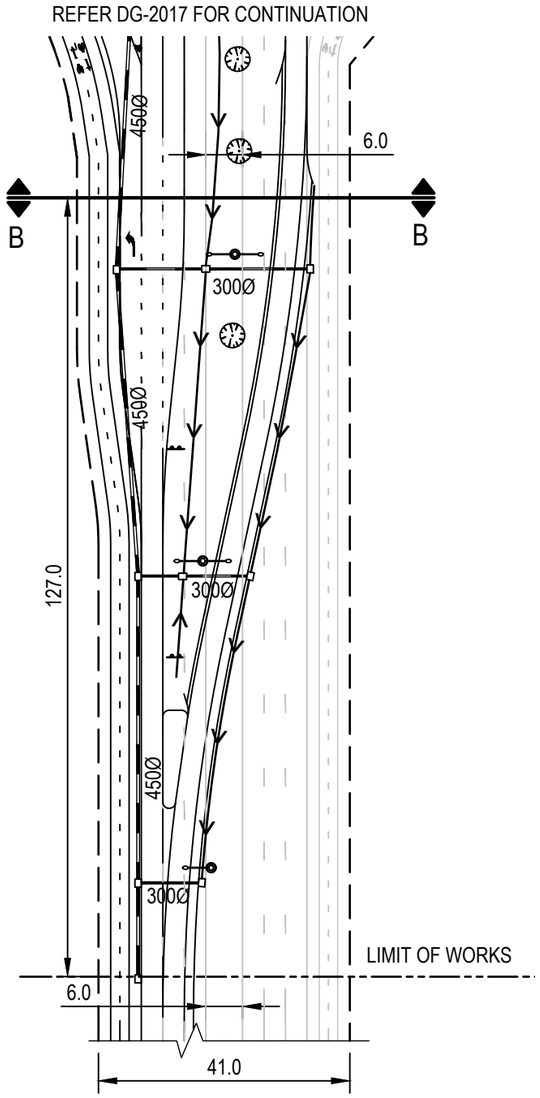
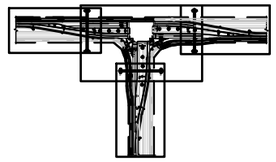
Drawn	NPV	Date 14/12/2017
Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

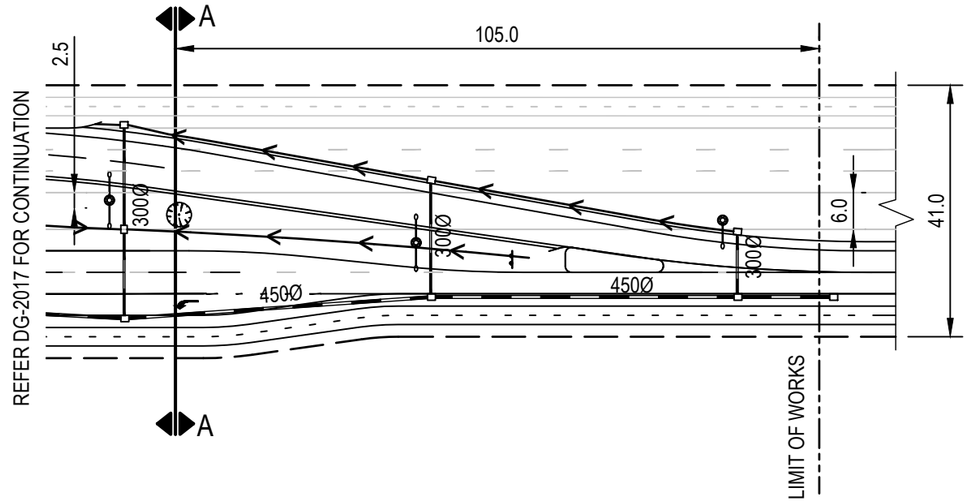
Client: VICTORIAN PLANNING AUTHORITY
Project: BENCH MARK INFRASTRUCTURE COSTING
Title: ITEM 11
PRIMARY TO PRIMARY T INTERSECTION
INTERIM

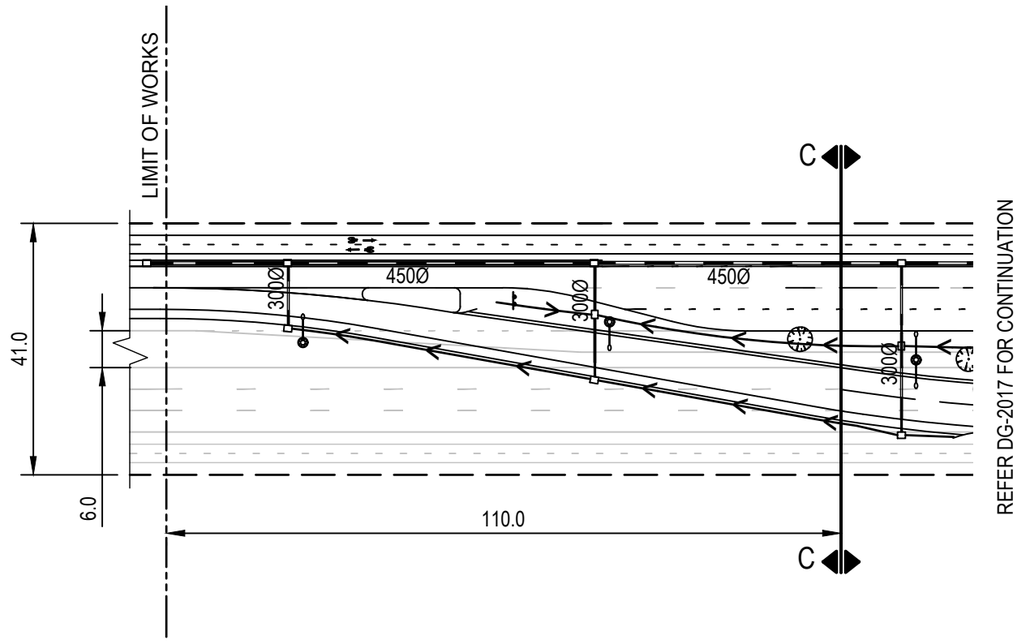
Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES
Scale: 1:500
Size: A3
Drawing Number: V181544-CI-DG-2017
Revision: 5





KEY PLAN
NTS





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SCALE 1:1000 @A3

Rev	Date	Description	Des.	Verif.	Appd.
5	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
4	05/07/2018	ADDRESS VPA COMMENTS	CM		
3	29/06/2018	ADDRESS VPA COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	RVR		

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Drawn	NPV	Date 14/12/2017
Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY

Project: BENCH MARK INFRASTRUCTURE COSTING

Title: ITEM 11
PRIMARY TO PRIMARY T INTERSECTION
INTERIM

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Scale: 1:1000 Size: A3

Drawing Number: V181544-CI-DG-2018 Revision: 5

DATE PLOTTED: 4 February 2019 9:34 AM BY : BEN SHAW

TOPOGRAPHY FALL

C

A

450Ø

450Ø

300Ø

41.0

REFER DG-2020 FOR CONTINUATION

300Ø

300Ø

450Ø

450Ø

450Ø

44.5

300Ø

REFER DG-2020 FOR CONTINUATION

450

85.0

85.0

C

A

2.5

65.0

TOPOGRAPHY FALL

450Ø

B

B

REFER DG-2020 FOR CONTINUATION

300Ø

37.5

0 10 20m

SCALE 1:500 @A3

KEY PLAN
NTS

XREF's:
CAD File: M:\2018\181501_2000\V181544_VPA_ICP_Program_Implementation\Civil\Drafting\Benchmark Project\V181544-CI-DG-2000-2028.dwg

Rev	Date	Description	Des.	Verif.	Appd.
5	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
4	05/07/2018	ADDRESS VPA COMMENTS	CM		
3	29/06/2018	ADDRESS VPA COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	RVR		

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Drawn	NPV	Date 14/12/2017
Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY

Project: BENCH MARK INFRASTRUCTURE COSTING

Title: ITEM 12
PRIMARY TO SECONDARY INTERSECTION
INTERIM

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

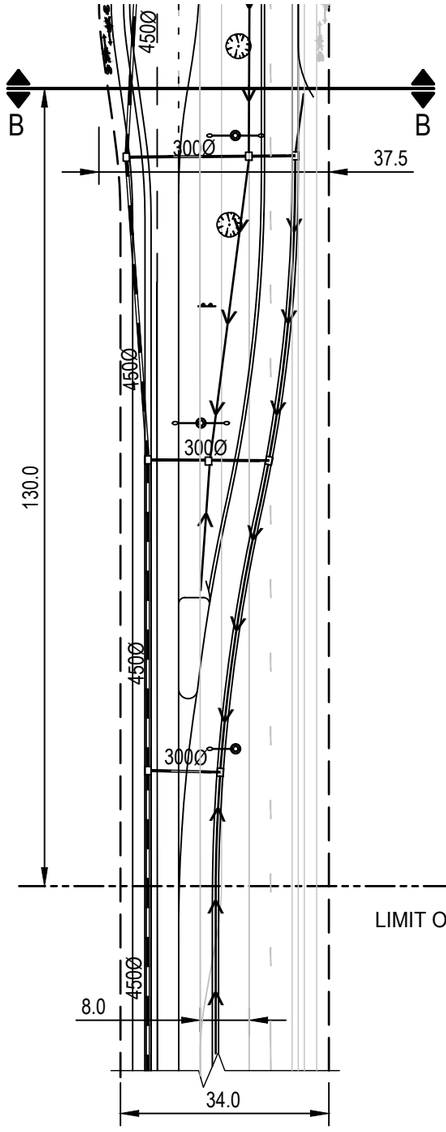
Scale: 1:500

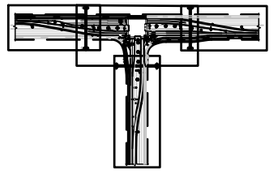
Size: A3

Drawing Number: V181544-CI-DG-2019

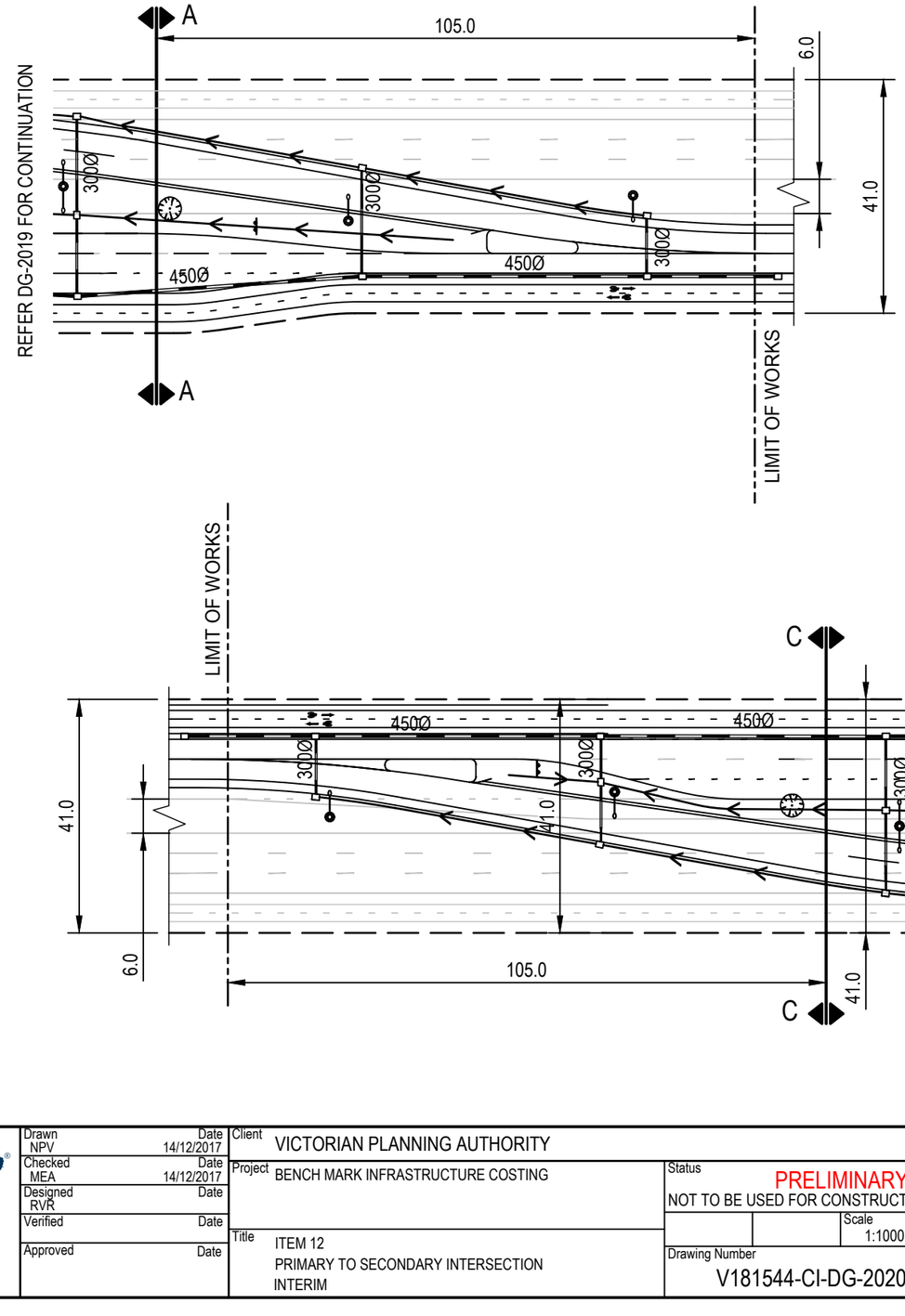
Revision: 5

REFER DG-2019 FOR CONTINUATION





KEY PLAN
NTS



0 20 40m

SCALE 1:1000 @A3

Rev	Date	Description	Des.	Verif.	Appd.
5	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
4	05/07/2018	ADDRESS VPA COMMENTS	CM		
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2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	RVR		

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Drawn	NPV	Date 14/12/2017
Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY

Project: BENCH MARK INFRASTRUCTURE COSTING

Title: ITEM 12
PRIMARY TO SECONDARY INTERSECTION
INTERIM

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Scale: 1:1000 Size: A3

Drawing Number: V181544-CI-DG-2020 Revision: 5

XREF's:
CAD File: M:\2018\181501_2000\V181544_VPA_ICP_Program_Implementation\Civil\Drafting\Benchmark Project\V181544-CI-DG-2000-2028.dwg

B

A

TOPOGRAPHY FALL

42.8

6.0

450Ø

450Ø

450Ø

REFER DG-2022 FOR CONTINUATION

300Ø

2.5

2.5

300Ø

300Ø

450Ø

450Ø

300Ø

2.5

95.0

75.0

62.0

31.0

450Ø

TOPOGRAPHY FALL

LIMIT OF WORKS

300Ø

B

A

0 10 20m

SCALE 1:500 @A3

KEY PLAN
NTS

Rev	Date	Description	Des.	Verif.	Appd.
6	28/02/2019	ADDRESS STAKEHOLDER COMMENTS V.2.	CM		
5	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
4	05/07/2018	ADDRESS VPA COMMENTS	CM		
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2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	RVR		

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Drawn	NPV	Date 14/12/2017
Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY

Project: BENCH MARK INFRASTRUCTURE COSTING

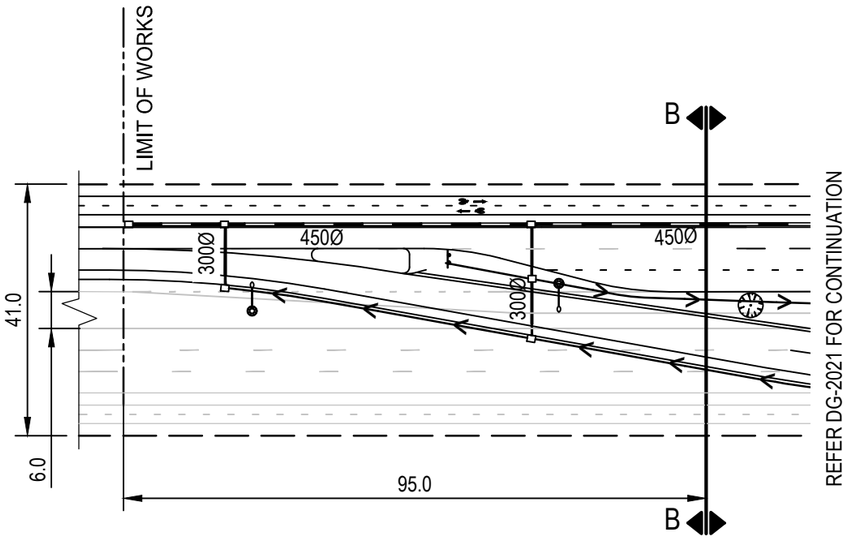
Title: ITEM 13
PRIMARY TO CONNECTOR BLVD INTERSECTION
INTERIM

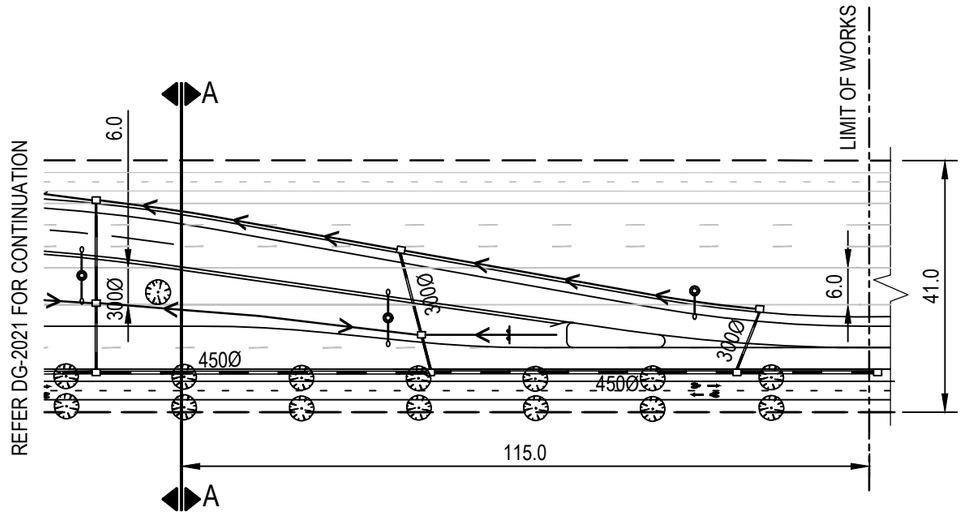
Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Scale: 1:500 | Size: A3

Drawing Number: V181544-CI-DG-2021 | Revision: 6

KEY PLAN
NTS





0 20 40m

SCALE 1:1000 @A3

Rev	Date	Description	Des.	Verif.	Appd.
6	28/02/2019	ADDRESS STAKEHOLDER COMMENTS V.2.	CM		
5	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
4	05/07/2018	ADDRESS VPA COMMENTS	CM		
3	29/06/2018	ADDRESS VPA COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	RVR		

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Drawn	NPV	Date 14/12/2017
Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY

Project: BENCH MARK INFRASTRUCTURE COSTING

Title: ITEM 13
PRIMARY TO CONNECTOR BLVD INTERSECTION
INTERIM

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Scale: 1:1000 | Size: A3

Drawing Number: V181544-CI-DG-2022 | Revision: 6

XREF's:
CAD File: M:\2018\181501_2000\V181544_VPA_ICP_Program_Implementation\Civil\Drafting\Benchmark Project\V181544-CI-DG-2000-2028.dwg

DATE PLOTTED: 4 February 2019 9:34 AM BY : BEN SHAW

C

A

TOPOGRAPHY FALL

34.0

8.0

450Ø

450Ø

450Ø

300Ø

300Ø

REFER DG-2024 FOR CONTINUATION

REFER DG-2024 FOR CONTINUATION

450Ø

450Ø

450Ø

300Ø

450Ø

85.0

85.0

450Ø

3.5

65.0

8.0

C

A

TOPOGRAPHY FALL

REFER DG-2024 FOR CONTINUATION

B

B

300Ø

0 10 20m

SCALE 1:500 @A3

KEY PLAN
NTS

Rev	Date	Description	Des.	Verif.	Appd.
5	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
4	05/07/2018	ADDRESS VPA COMMENTS	CM		
3	29/06/2018	ADDRESS VPA COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	RVR		

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Drawn	NPV	Date 14/12/2017
Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY

Project: BENCH MARK INFRASTRUCTURE COSTING

Title: ITEM 14
SECONDARY TO SECONDARY INTERSECTION
INTERIM

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

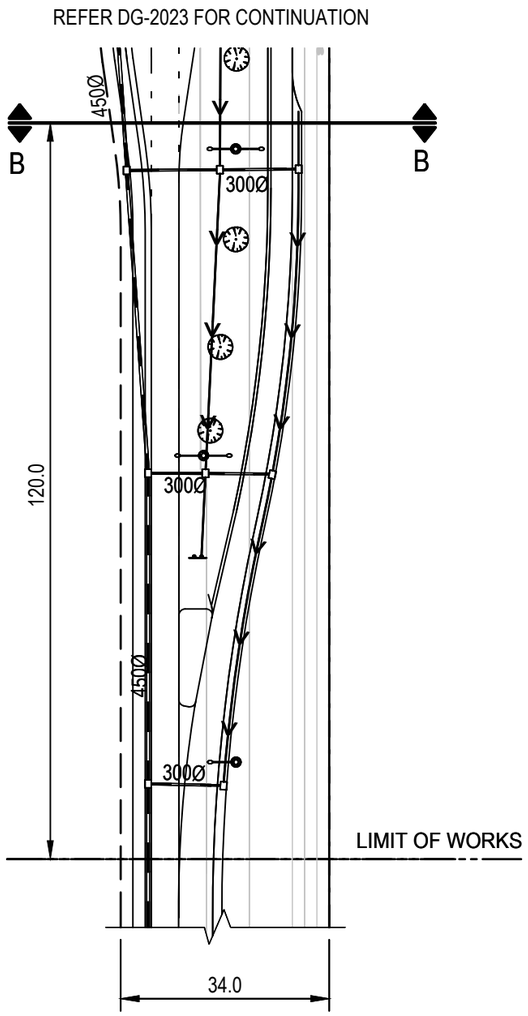
Scale: 1:500

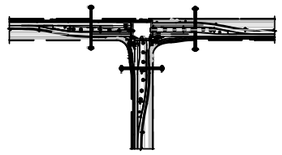
Size: A3

Drawing Number: V181544-CI-DG-2023

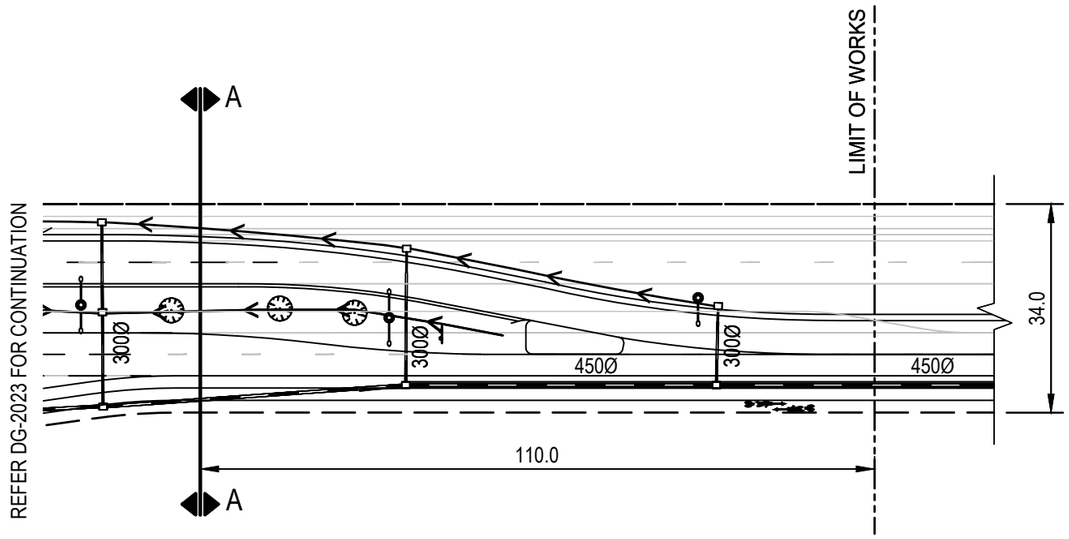
Revision: 5

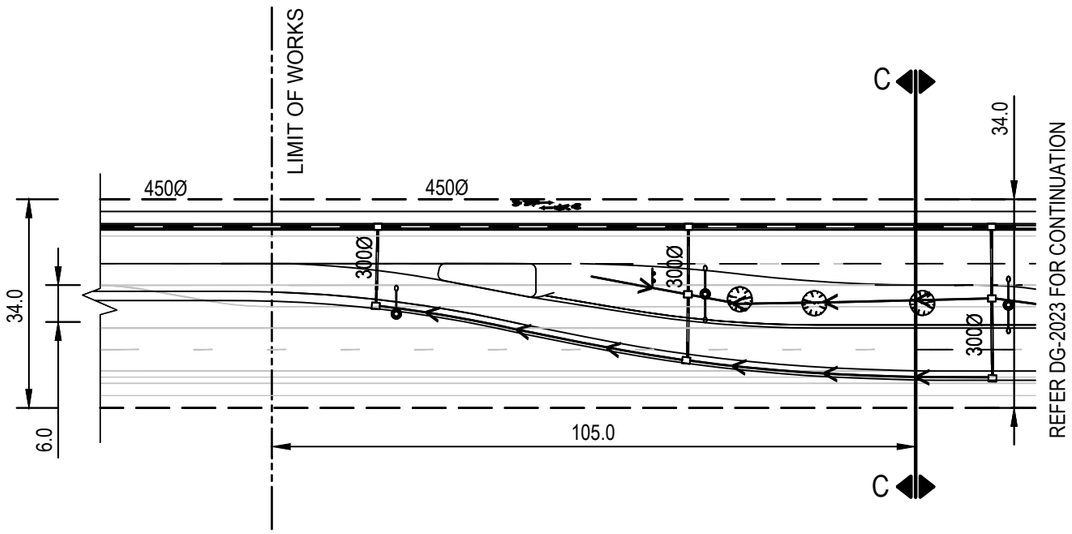
XREF's:
CAD File: M:\2018\181501_2000\V181544_VPA_ICP_Program_Implementation\Civil\Drafting\Benchmark Project\V181544-CI-DG-2000-2028.dwg





KEY PLAN
NTS





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SCALE 1:1000 @A3

Rev	Date	Description	Des.	Verif.	Appd.
5	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
4	05/07/2018	ADDRESS VPA COMMENTS	CM		
3	29/06/2018	ADDRESS VPA COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	RVR		

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Drawn	NPV	Date 14/12/2017
Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY

Project: BENCH MARK INFRASTRUCTURE COSTING

Title: ITEM 14
SECONDARY TO SECONDARY INTERSECTION
INTERIM

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Scale: 1:1000 Size: A3

Drawing Number: V181544-CI-DG-2024 Revision: 5

B

A

TOPOGRAPHY FALL

450Ø

450Ø

300Ø

REFER DG-2026 FOR CONTINUATION

REFER DG-2026 FOR CONTINUATION

3.5

300Ø

300Ø

450Ø

450Ø

300Ø

85.0

85.0

62.0

2.5

450Ø

B

A

TOPOGRAPHY FALL

31.0

LIMIT OF WORKS

300Ø

0 10 20m

SCALE 1:500 @A3

KEY PLAN
NTS

Rev	Date	Description	Des.	Verif.	Appd.
6	28/02/2019	ADDRESS STAKEHOLDER COMMENTS V.2.	CM		
5	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
4	05/07/2018	ADDRESS VPA COMMENTS	CM		
3	29/06/2018	ADDRESS VPA COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	RVR		

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Drawn NPV	Date 14/12/2017	
Checked MEA	Date 14/12/2017	
Designed RVR	Date	
Verified	Date	
Approved	Date	

Client: VICTORIAN PLANNING AUTHORITY

Project: BENCH MARK INFRASTRUCTURE COSTING

Title: ITEM 15
SECONDARY TO CONNECTOR BLVD INTERSECTION
INTERIM

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

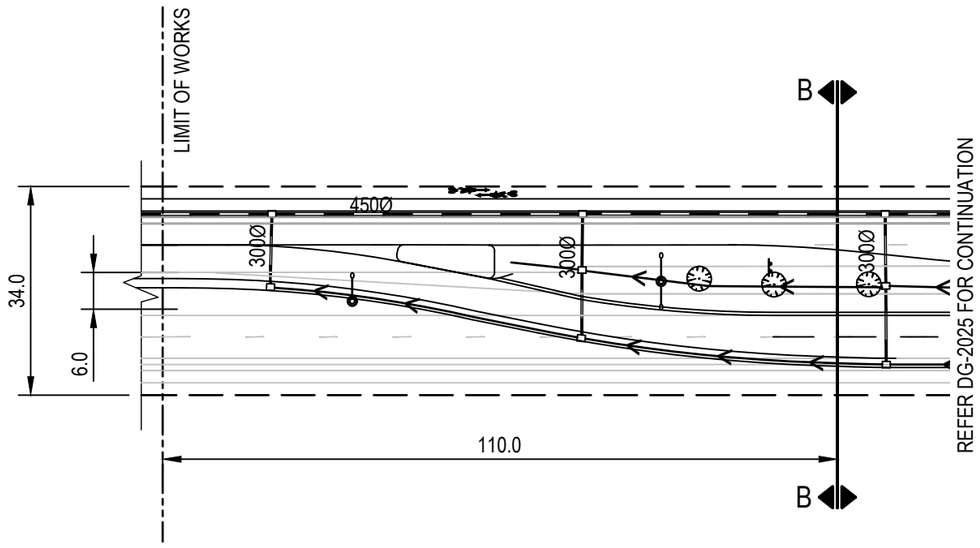
Scale: 1:500

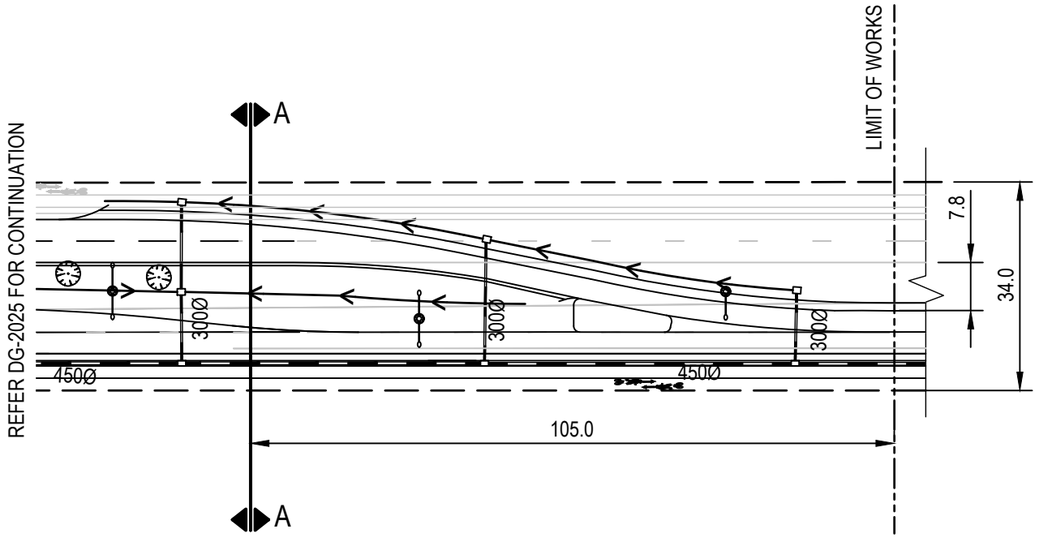
Size: A3

Drawing Number: V181544-CI-DG-2025

Revision: 6

KEY PLAN
NTS





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SCALE 1:1000 @A3

Rev	Date	Description	Des.	Verif.	Appd.
6	28/02/2019	ADDRESS STAKEHOLDER COMMENTS V.2.	CM		
5	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
4	05/07/2018	ADDRESS VPA COMMENTS	CM		
3	29/06/2018	ADDRESS VPA COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	RVR		

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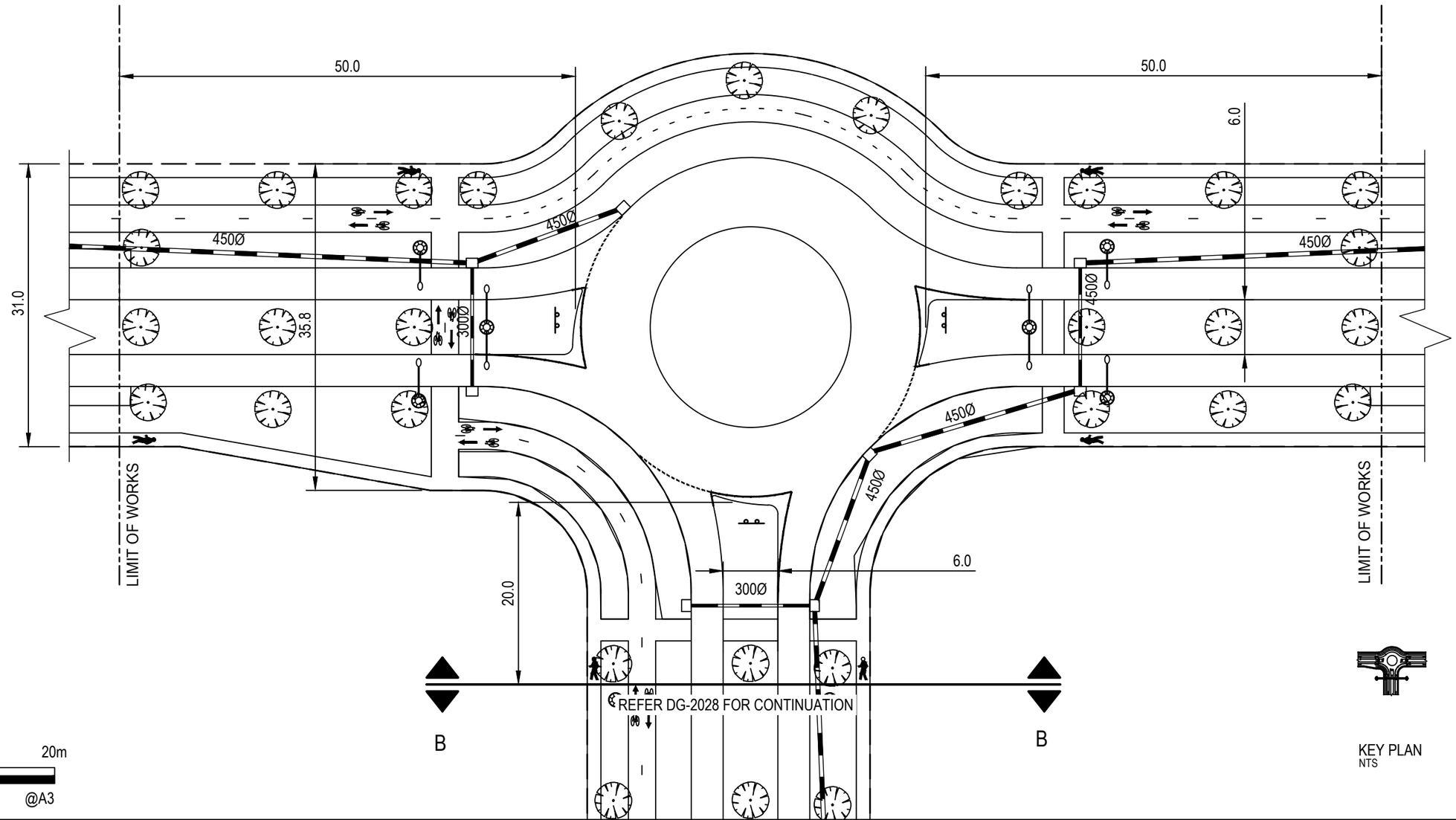
Web: www.cardno.com.au

Drawn NPV	Date 14/12/2017	
Checked MEA	Date 14/12/2017	
Designed RVR	Date	
Verified	Date	
Approved	Date	

Client: VICTORIAN PLANNING AUTHORITY
Project: BENCH MARK INFRASTRUCTURE COSTING
Title: ITEM 15
SECONDARY TO CONNECTOR BLVD INTERSECTION
INTERIM

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES
Scale: 1:1000
Size: A3
Drawing Number: V181544-CI-DG-2026
Revision: 6



Rev	Date	Description	Des.	Verif.	Appd.
6	28/02/2019	ADDRESS STAKEHOLDER COMMENTS V.2.	CM		
5	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
4	05/07/2018	ADDRESS VPA COMMENTS	CM		
3	29/06/2018	ADDRESS VPA COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	RVR		

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Drawn	NPV	Date 14/12/2017
Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY

Project: BENCH MARK INFRASTRUCTURE COSTING

Title: ITEM 16
CONNECTOR BLVD TO CONNECTOR BLVD ROUNDABOUT
ULTIMATE

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

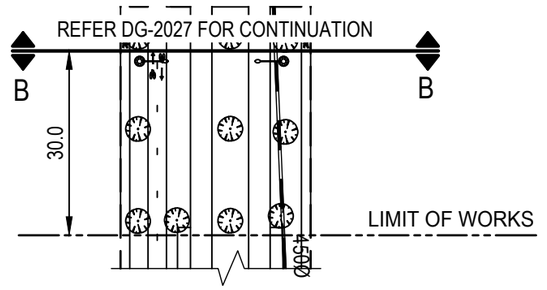
Scale: 1:500

Size: A3

Drawing Number: V181544-CI-DG-2027

Revision: 6

KEY PLAN
NTS



0 20 40m

SCALE 1:1000 @A3

Rev	Date	Description	Des.	Verif.	Appd.
6	28/02/2019	ADDRESS STAKEHOLDER COMMENTS V.2.	CM		
5	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
4	05/07/2018	ADDRESS VPA COMMENTS	CM		
3	29/06/2018	ADDRESS VPA COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	RVR		

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Drawn	NPV	Date 14/12/2017
Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY

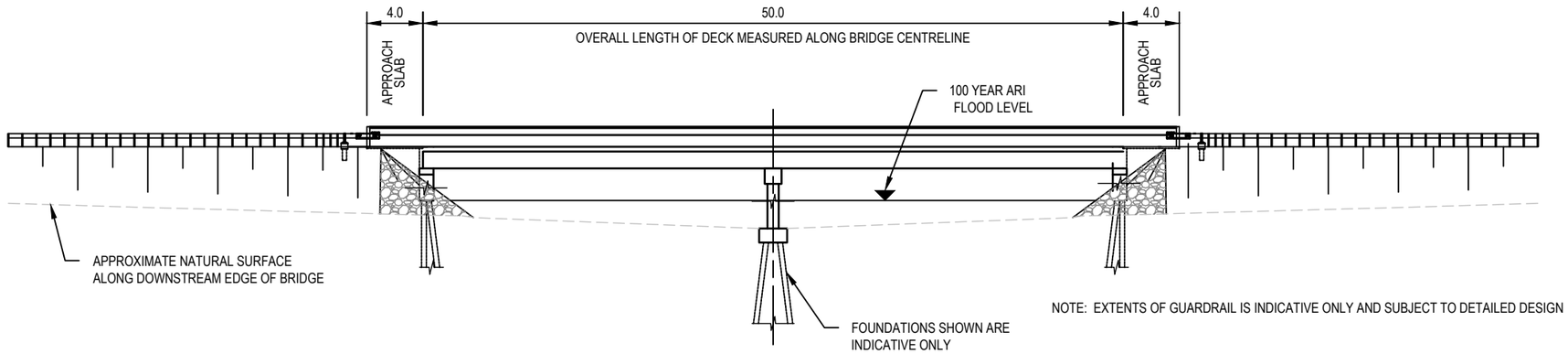
Project: BENCH MARK INFRASTRUCTURE COSTING

Title: ITEM 16
CONNECTOR BLVD TO CONNECTOR BLVD ROUNDABOUT
ULTIMATE

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

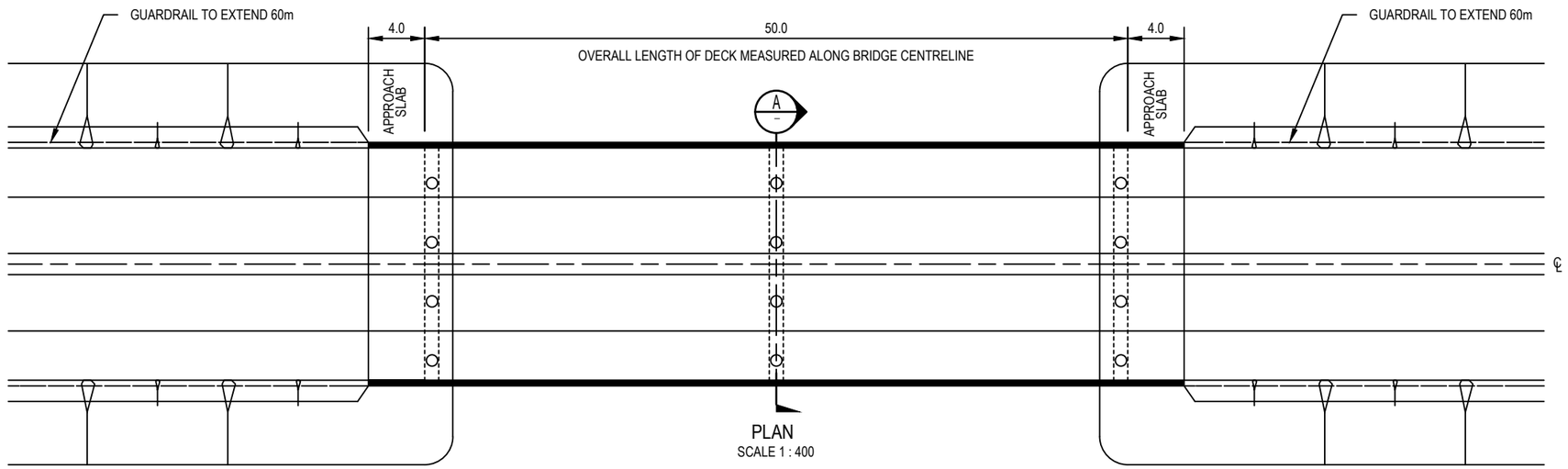
Scale: 1:1000
Size: A3

Drawing Number: V181544-CI-DG-2028
Revision: 6

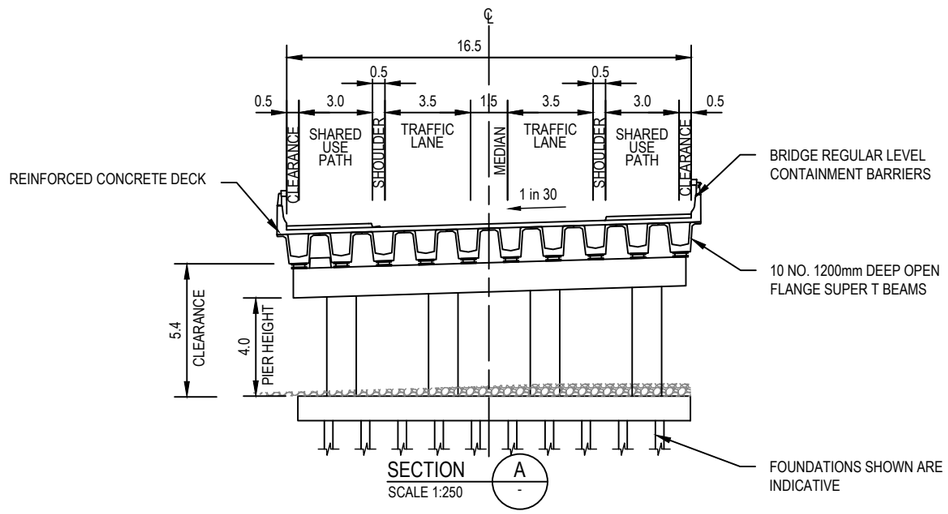


NOTE: EXTENTS OF GUARDRAIL IS INDICATIVE ONLY AND SUBJECT TO DETAILED DESIGN

ELEVATION
SCALE 1 : 400



PLAN
SCALE 1 : 400



0 10 16m
SCALE 1:400 @A3

0 5 10m
SCALE 1:250 @A3

Rev	Date	Description	Des.	Verif.	Appd.
3	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	VA		

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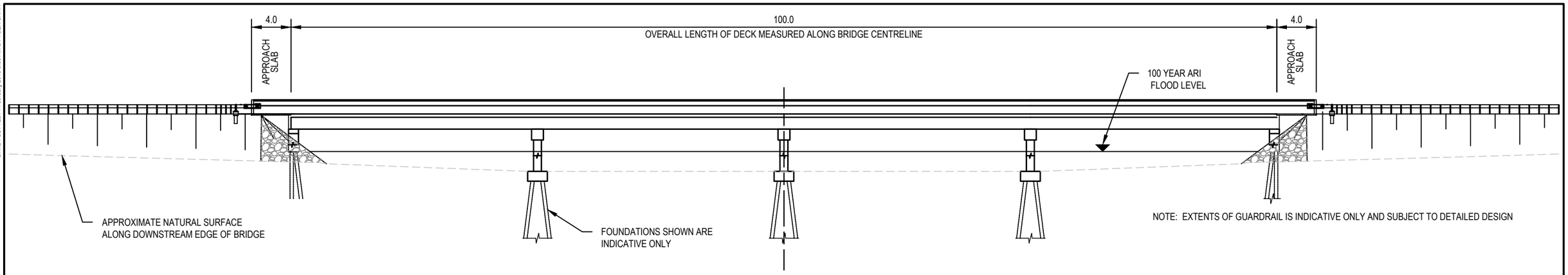
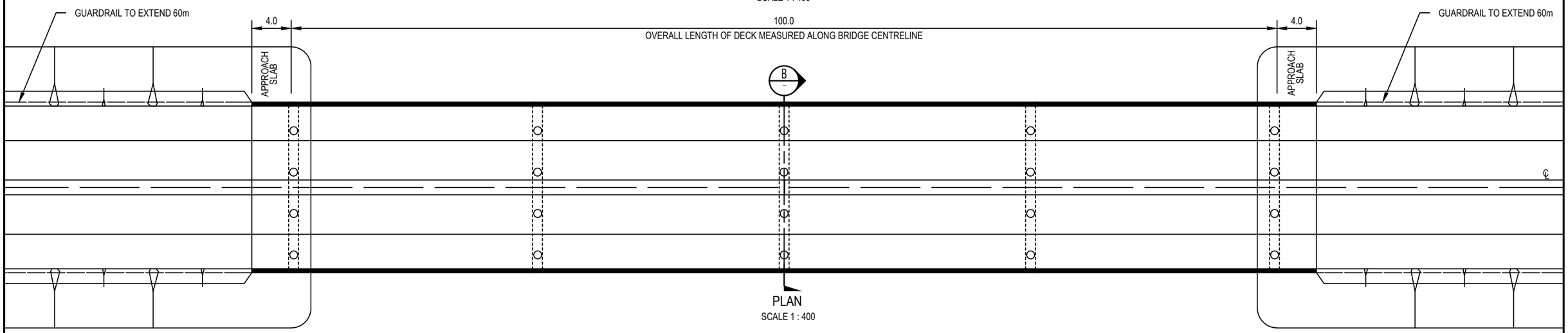
Drawn	NPV	Date 14/12/2017
Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY
Project: BENCH MARK INFRASTRUCTURE COSTING
Title: ITEM 17
PRIMARY ARTERIAL 50m LONG SUPER T BRIDGE
INTERIM

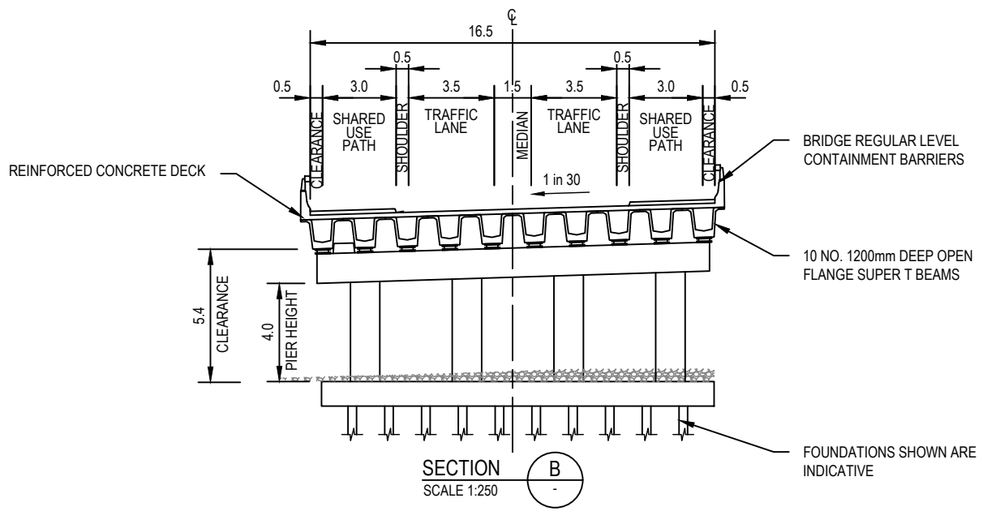
Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES
Scale: AS SHOWN
Size: A3
Drawing Number: V181544-CI-DG-2029
Revision: 3



ELEVATION
SCALE 1 : 400



PLAN
SCALE 1 : 400



SECTION B
SCALE 1:250

0 10 16m
SCALE 1:400 @A3

0 5 10m
SCALE 1:250 @A3

Rev	Date	Description	Des.	Verif.	Appd.
3	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	VA		

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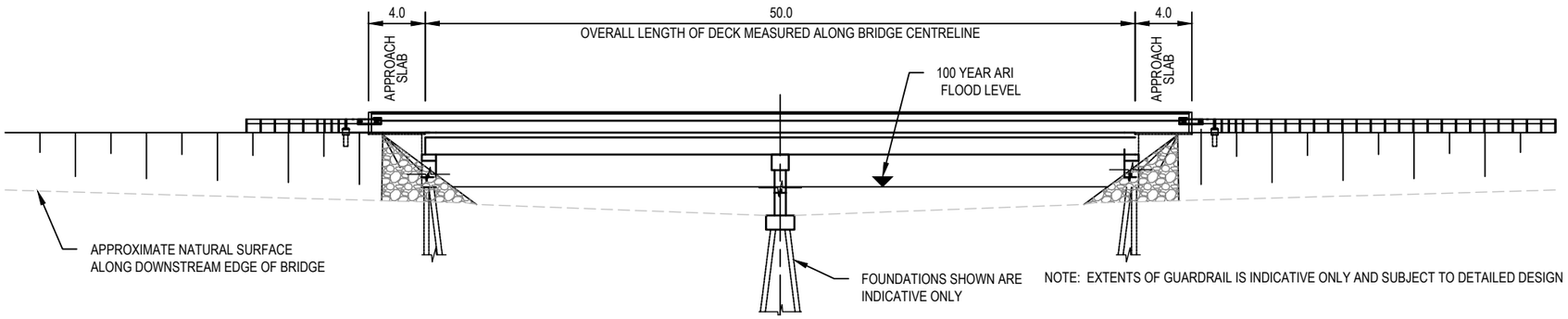
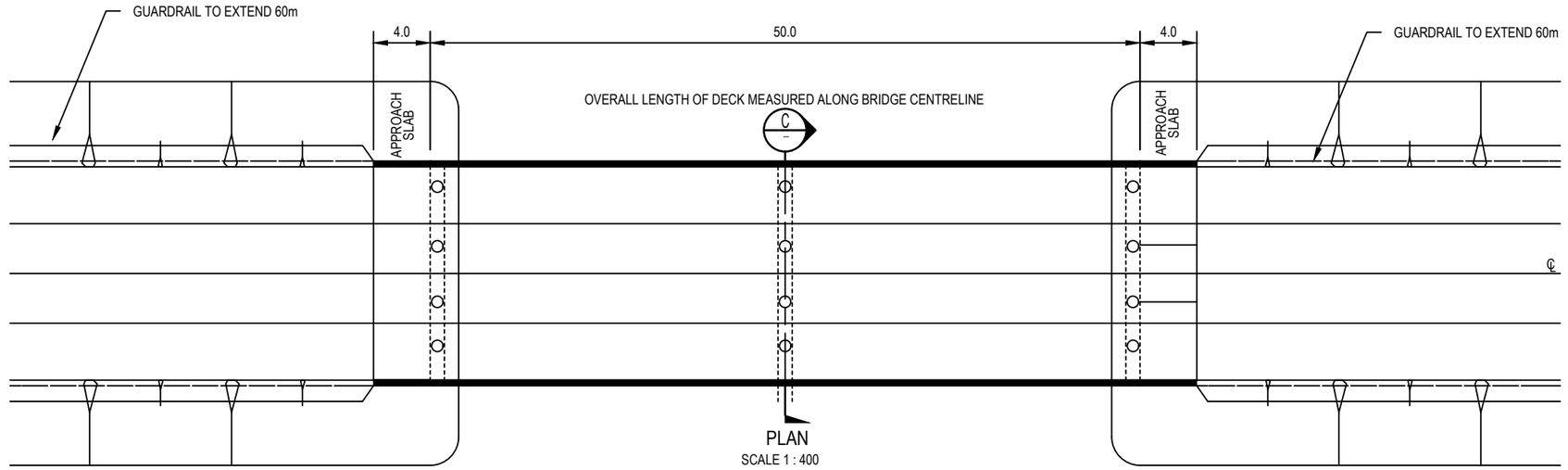
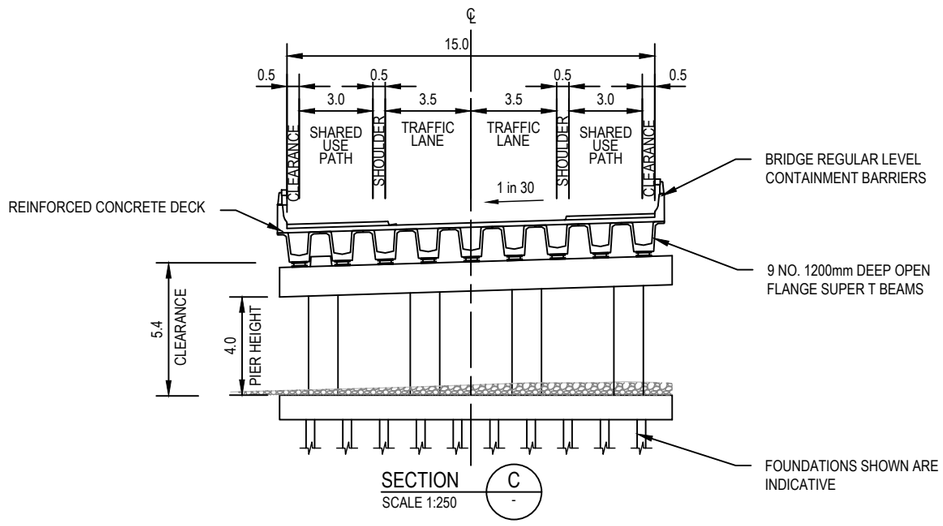
Drawn	NPV	Date 14/12/2017
Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY
Project: BENCH MARK INFRASTRUCTURE COSTING
Title: ITEM 18
PRIMARY ARTERIAL 100m LONG SUPER T BRIDGE
INTERIM

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES
Scale: AS SHOWN
Size: A3
Drawing Number: V181544-CI-DG-2030
Revision: 3







0 10 16m

SCALE 1:400 @A3

0 5 10m

SCALE 1:250 @A3

Rev	Date	Description	Des.	Verif.	Appd.
3	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	VA		

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Drawn	NPV	Date 14/12/2017
Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY

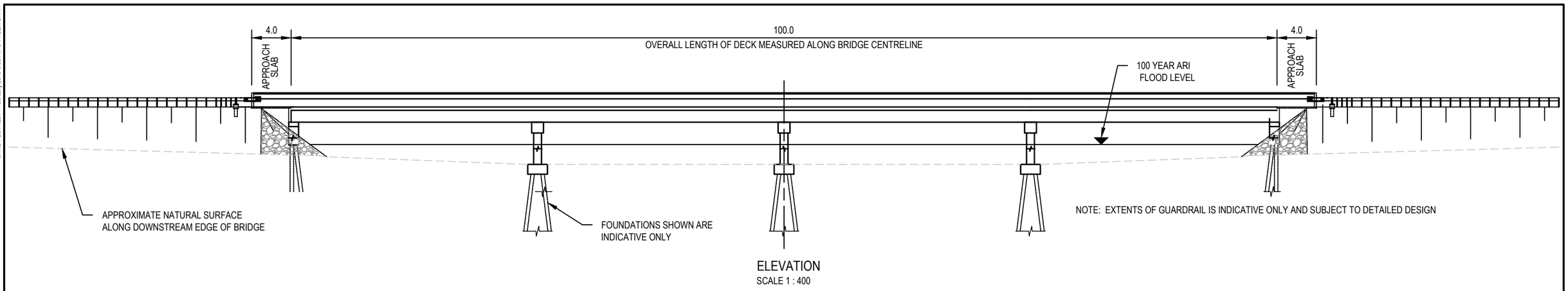
Project: BENCH MARK INFRASTRUCTURE COSTING

Title: ITEM 19
SECONDARY ARTERIAL 50m LONG SUPER T BRIDGE
INTERIM

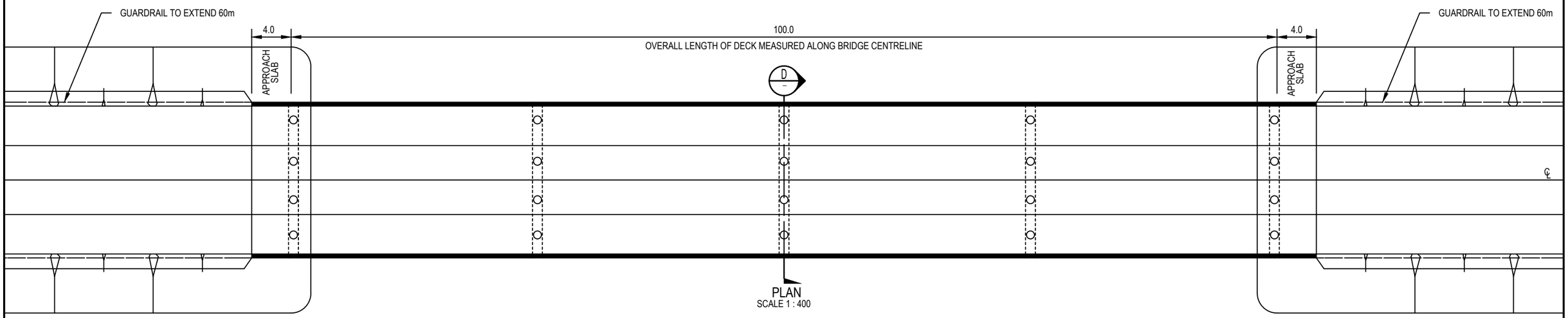
Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Scale: AS SHOWN | Size: A3

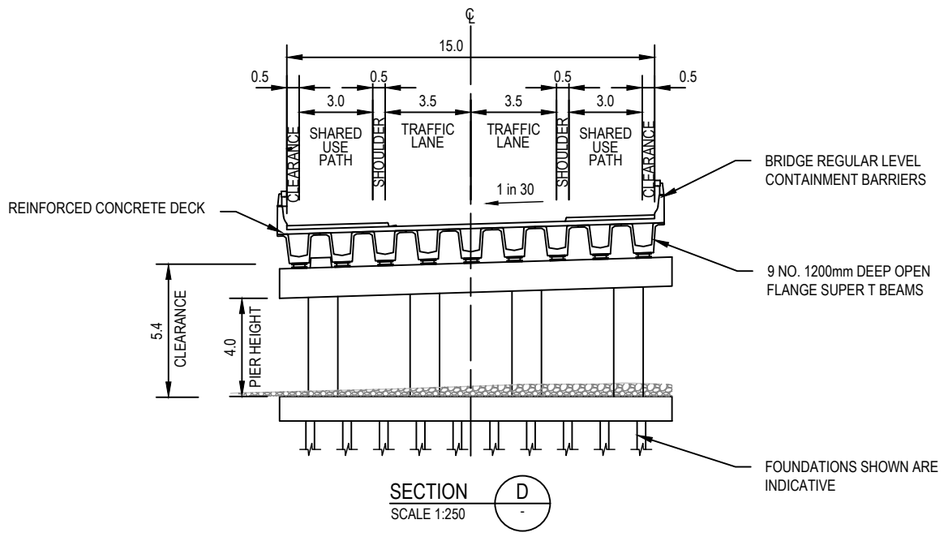
Drawing Number: V181544-CI-DG-2031 | Revision: 3



ELEVATION
SCALE 1 : 400



PLAN
SCALE 1 : 400



SECTION D
SCALE 1:250

0 10 16m
SCALE 1:400 @A3

0 5 10m
SCALE 1:250 @A3

Rev	Date	Description	Des.	Verif.	Appd.
3	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	VA		

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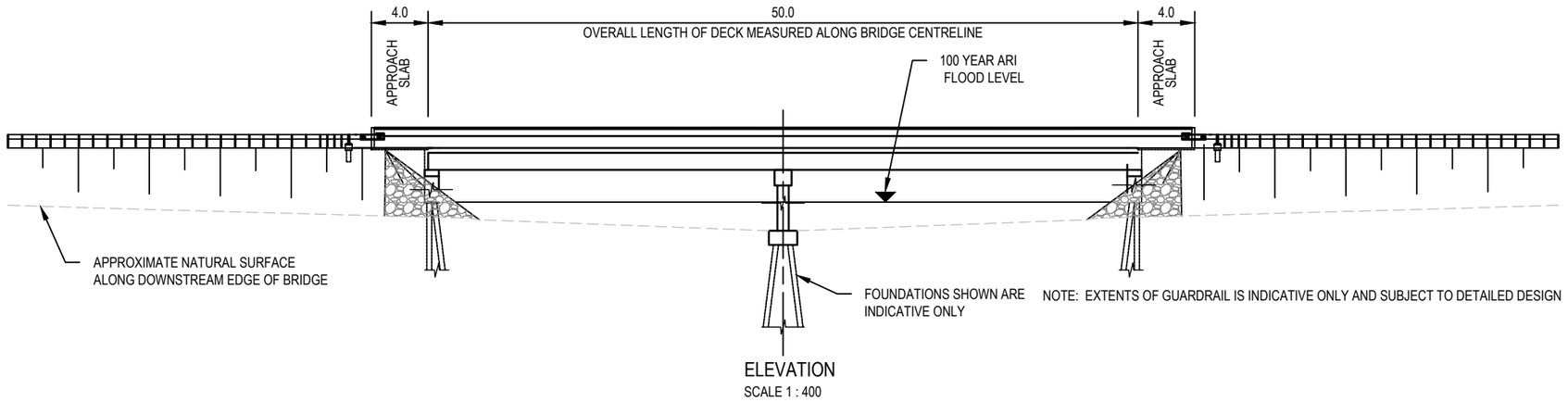
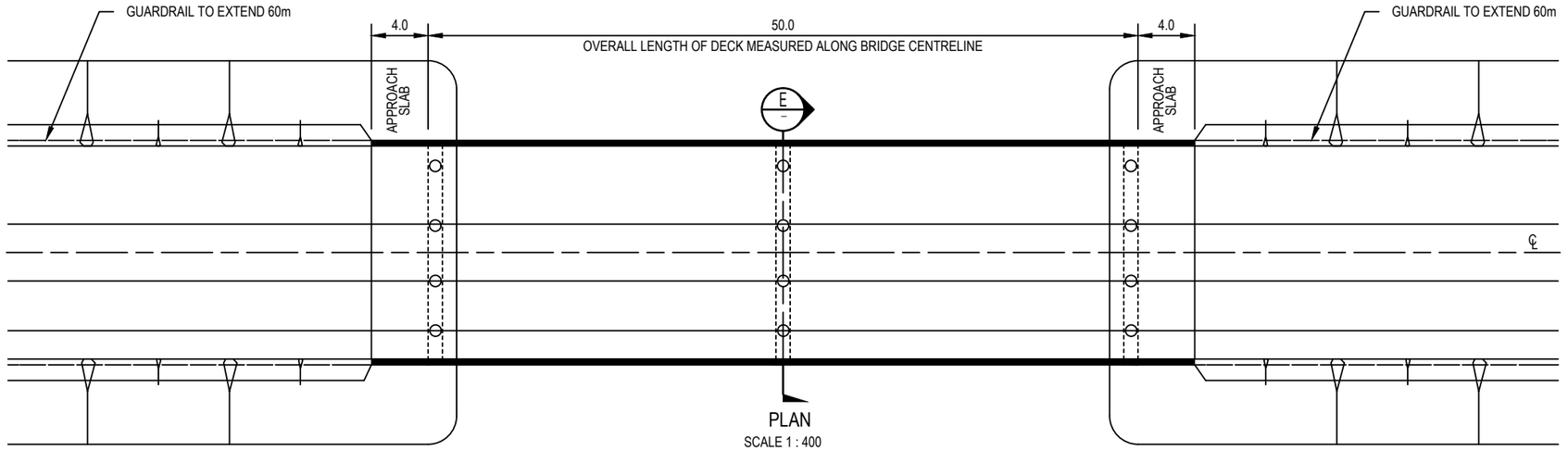
Drawn	NPV	Date 14/12/2017
Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY
Project: BENCH MARK INFRASTRUCTURE COSTING
Title: ITEM 20
SECONDARY ARTERIAL 100m LONG SUPER T BRIDGE
INTERIM

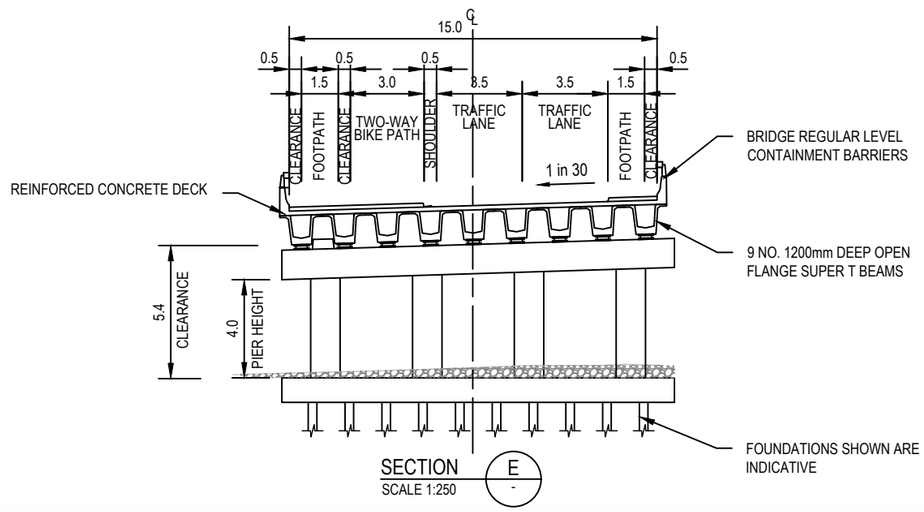
Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES
Scale: AS SHOWN
Size: A3
Drawing Number: V181544-CI-DG-2032
Revision: 3



ELEVATION
SCALE 1 : 400



PLAN
SCALE 1 : 400



SECTION E -
SCALE 1:250

0 10 16m
SCALE 1:400 @A3

0 5 10m
SCALE 1:250 @A3

Rev	Date	Description	Des.	Verif.	Appd.
4	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
3	05/07/2018	ADDRESS VPA COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	VA		

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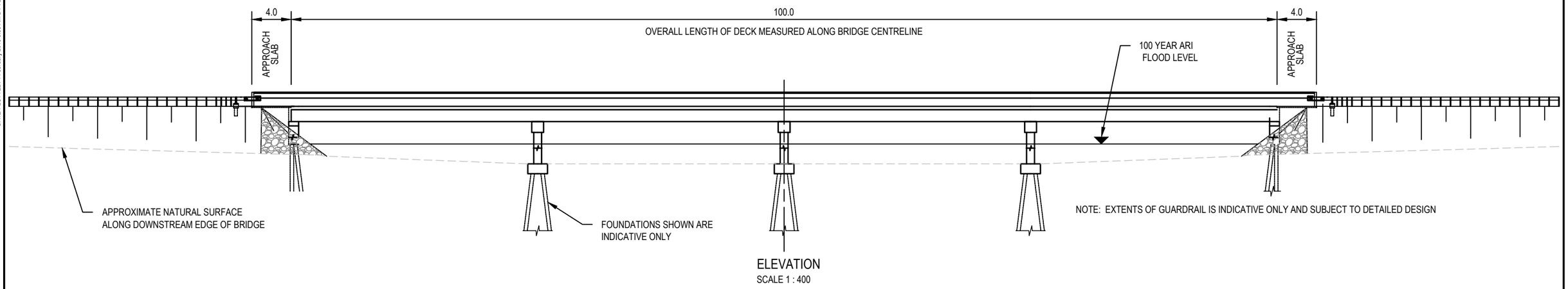
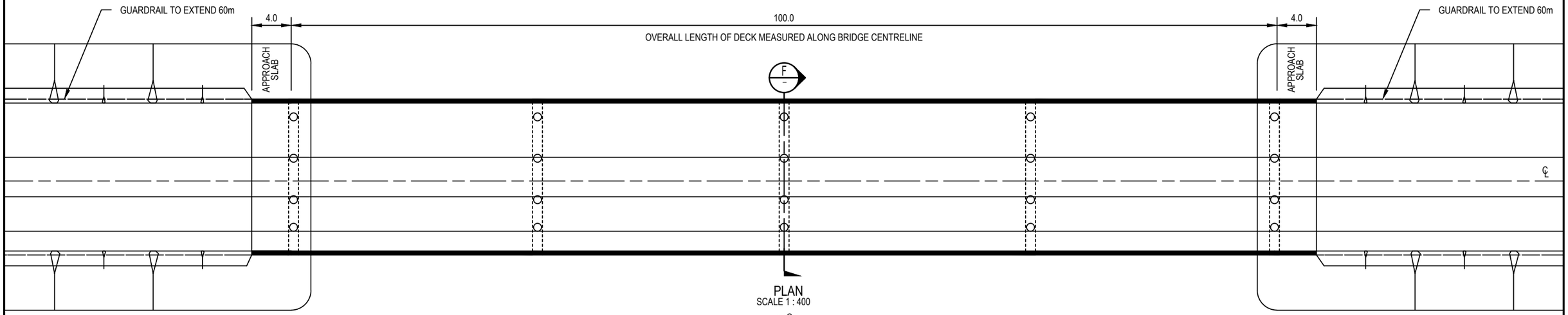
Drawn	NPV	Date 14/12/2017
Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY
Project: BENCH MARK INFRASTRUCTURE COSTING
Title: ITEM 21
CONNECTOR 50m LONG SUPER T BRIDGE
INTERIM

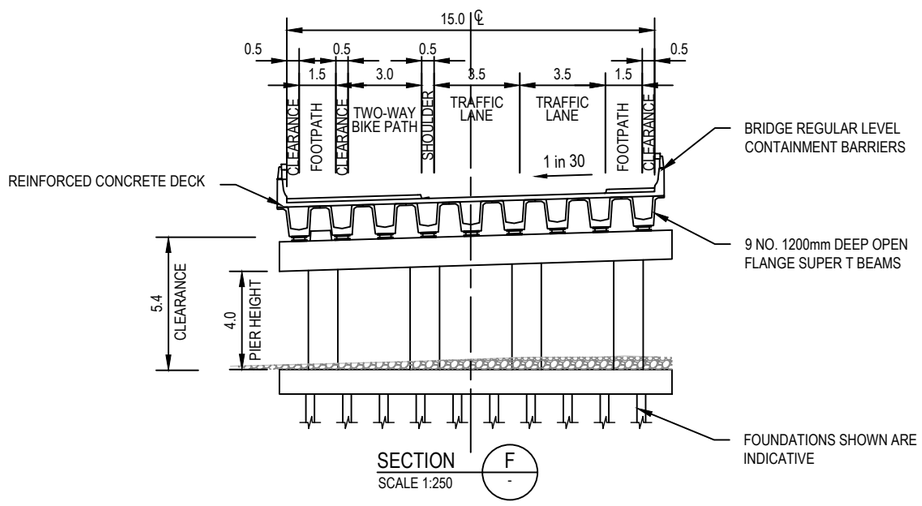
Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES
Scale: AS SHOWN
Size: A3
Drawing Number: V181544-CI-DG-2033
Revision: 4



ELEVATION
SCALE 1 : 400



PLAN
SCALE 1 : 400



SECTION F -
SCALE 1:250

0 10 16m
SCALE 1:400 @A3

0 5 10m
SCALE 1:250 @A3

Rev	Date	Description	Des.	Verif.	Appd.
4	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
3	05/07/2018	ADDRESS VPA COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	VA		

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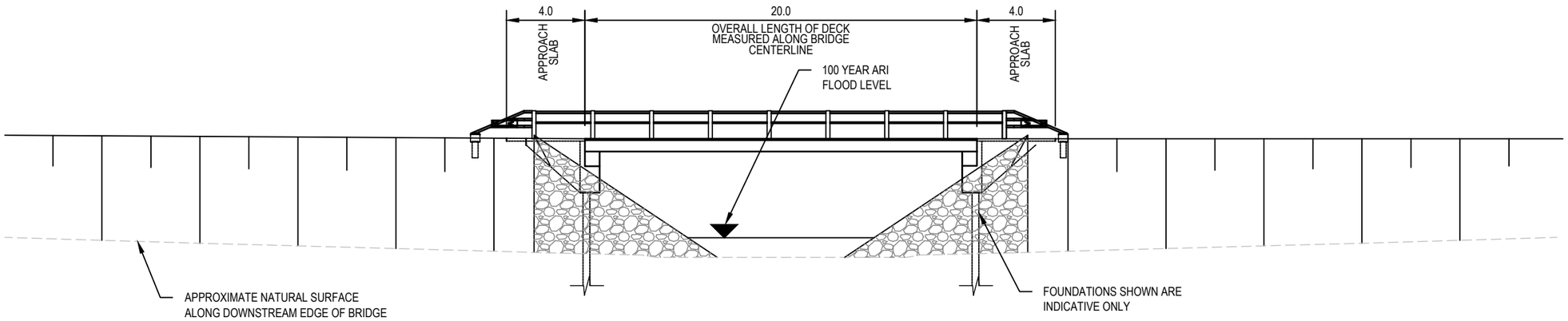
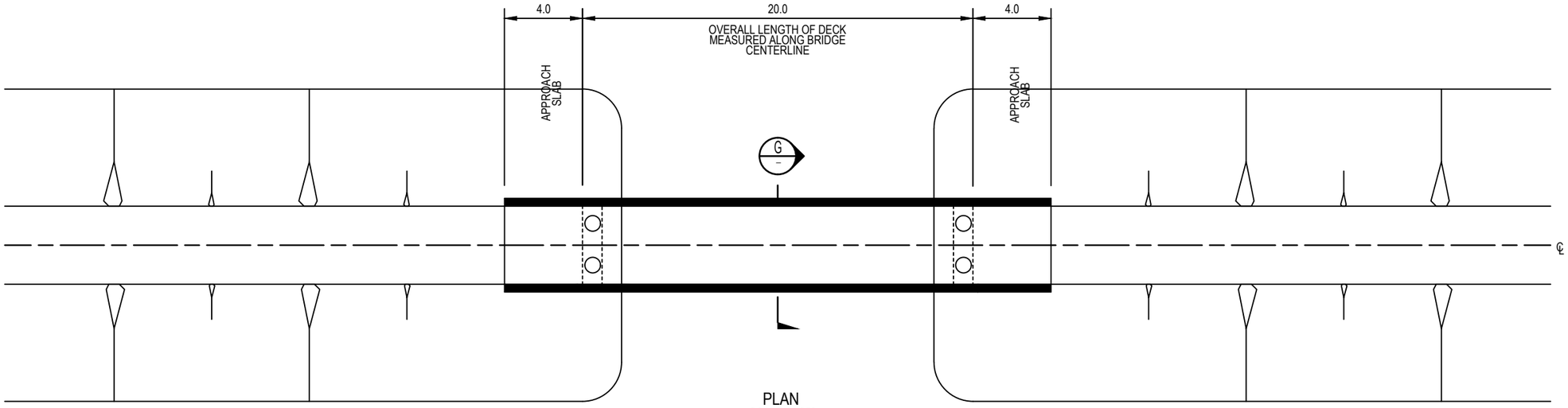
Drawn	NPV	Date 14/12/2017
Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY
Project: BENCH MARK INFRASTRUCTURE COSTING
Title: ITEM 22
CONNECTOR 100m LONG SUPER T BRIDGE
INTERIM

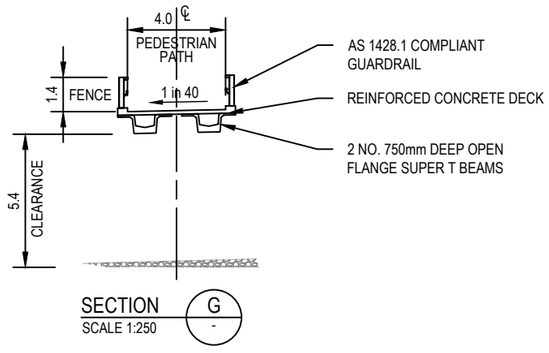
Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES
Scale: AS SHOWN
Size: A3
Drawing Number: V181544-CI-DG-2034
Revision: 4



ELEVATION
SCALE 1 : 250



PLAN
SCALE 1 : 250



SECTION G
SCALE 1:250

0 5 10m
SCALE 1:250 @A3

Rev	Date	Description	Des.	Verif.	Appd.
3	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	VA		

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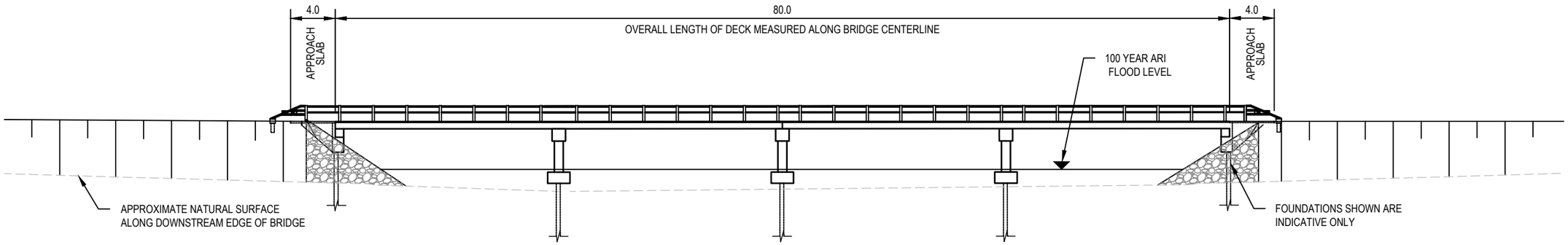
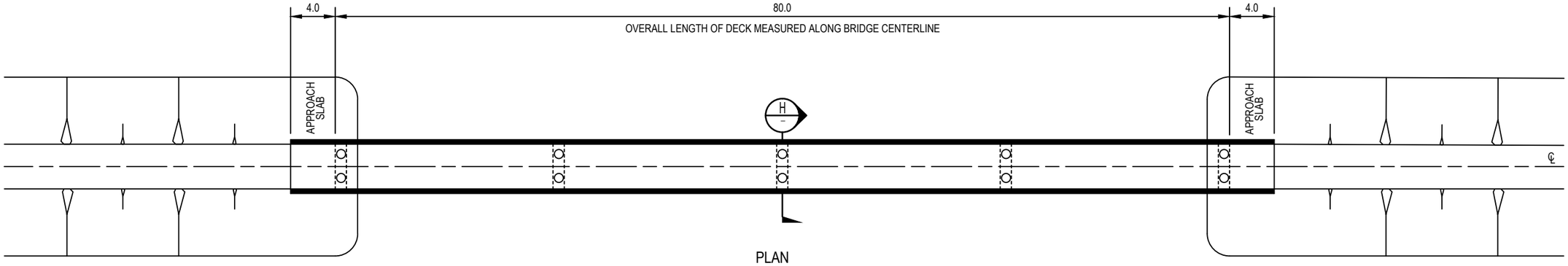
Drawn	NPV	Date 14/12/2017
Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY
Project: BENCH MARK INFRASTRUCTURE COSTING
Title: ITEM 23
PEDESTRIAN 20m LONG SUPER T BRIDGE
ULTIMATE

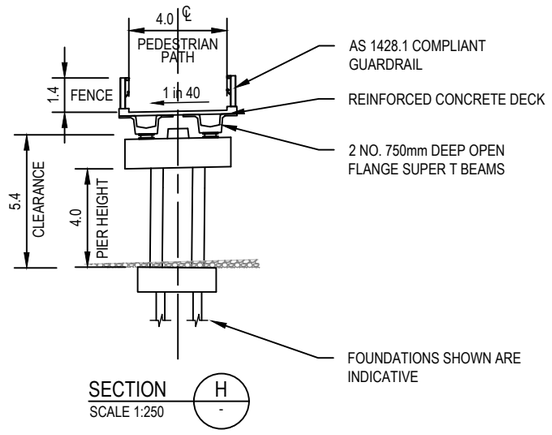
Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES
Scale: AS SHOWN
Size: A3
Drawing Number: V181544-CI-DG-2035
Revision: 3



ELEVATION
SCALE 1 : 400



PLAN
SCALE 1 : 400



SECTION H
SCALE 1:250

0 10 16m
SCALE 1:400 @A3

0 5 10m
SCALE 1:250 @A3

Rev	Date	Description	Des.	Verif.	Appd.
3	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	VA		

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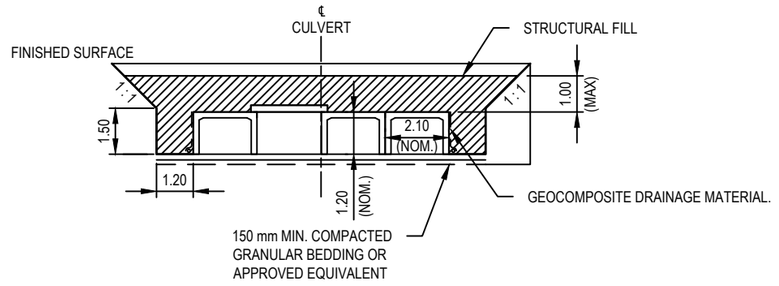
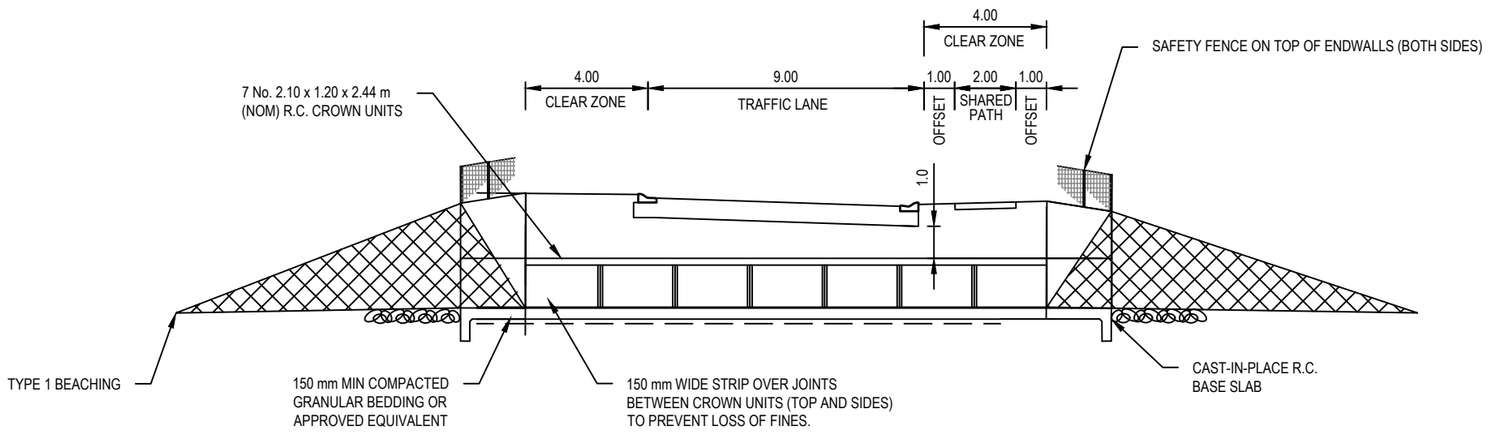
Drawn	NPV	Date 14/12/2017
Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY
Project: BENCH MARK INFRASTRUCTURE COSTING
Title: ITEM 24
PEDESTRIAN 80m LONG SUPER T BRIDGE
ULTIMATE

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES
Scale: AS SHOWN
Size: A3
Drawing Number: V181544-CI-DG-2036
Revision: 3



SECTION ELEVATION
SCALE 1:200



SIDE ELEVATION
SCALE 1:200

NOTE: REFER TO DRAWING NO.V170524-CI-DG-2002 FOR SECTION DETAILS

0 5 8m
SCALE 1:200 @A3

Rev	Date	Description	Des.	Verif.	Appd.
5	28/02/2019	ADDRESS STAKEHOLDER COMMENTS V.2.	CM		
4	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
3	05/07/2018	ADDRESS VPA COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	RVR		

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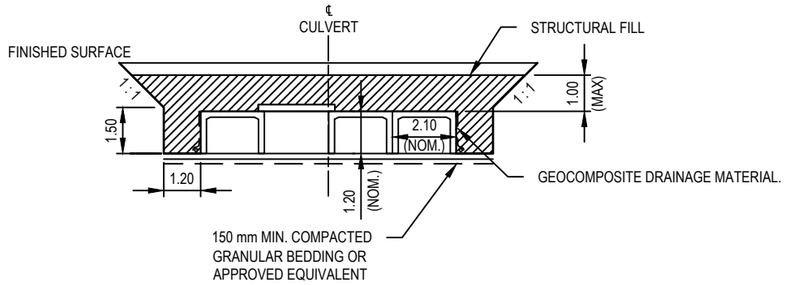
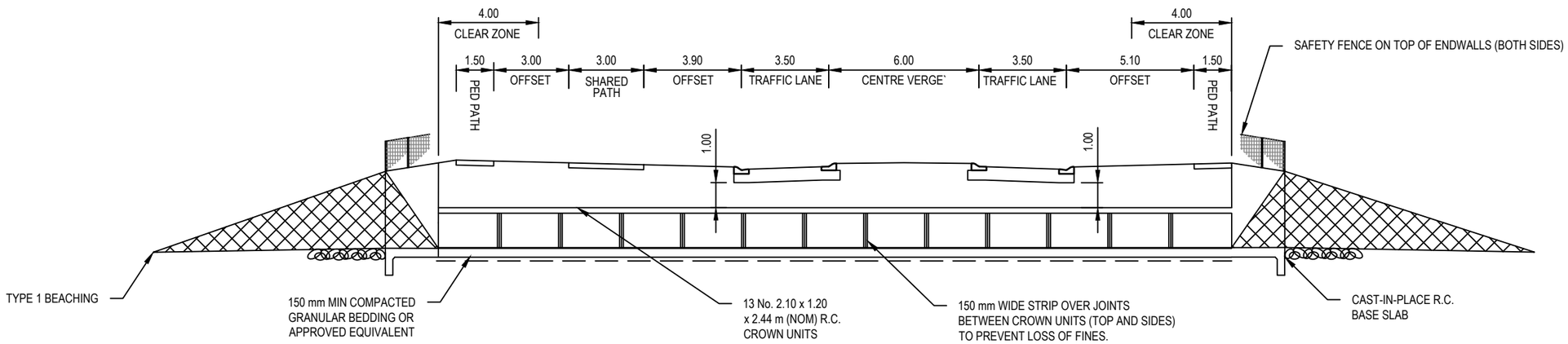
Drawn	NPV	Date 14/12/2017
Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY
Project: BENCH MARK INFRASTRUCTURE COSTING
Title: ITEM 25
BOX CULVERT 1200X2100 SECONDARY ARTERIAL
INTERIM

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES
Scale: 1:200
Size: A3
Drawing Number: V181544-CI-DG-2037
Revision: 5



SECTION ELEVATION
SCALE 1:200



NOTE: REFER TO DRAWING NO.V170524-CI-DG-2003 FOR SECTION DETAILS

SIDE ELEVATION
SCALE 1:200

0 5 8m
SCALE 1:200 @A3

Rev	Date	Description	Des.	Verif.	Appd.
5	28/02/2019	ADDRESS STAKEHOLDER COMMENTS V.2.	CM		
4	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
3	05/07/2018	ADDRESS VPA COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	RVR		

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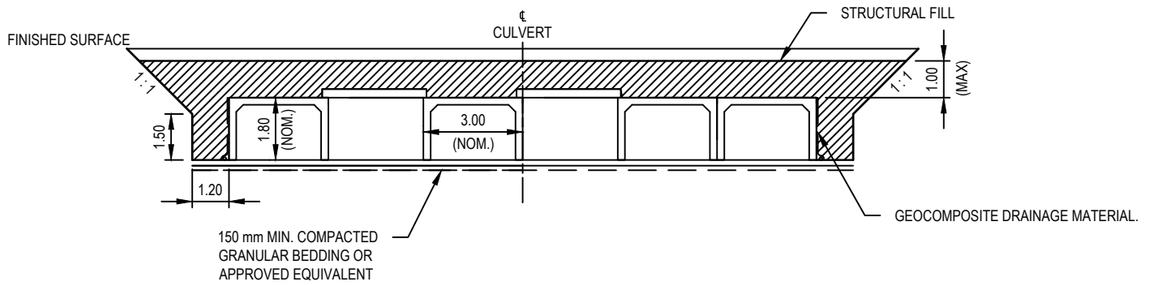
Drawn	NPV	Date 14/12/2017
Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

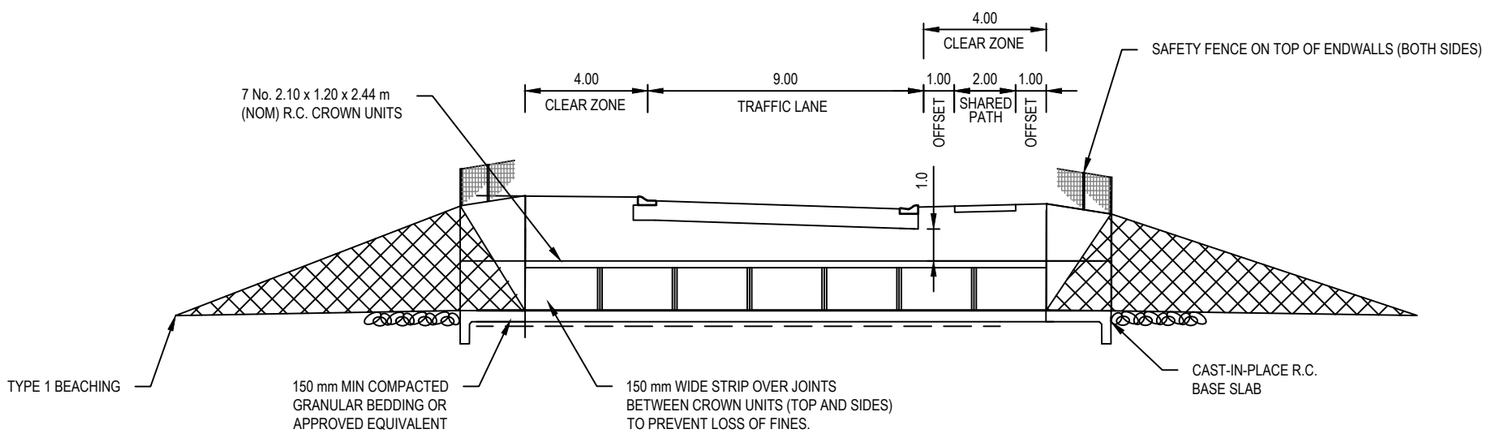
Client: VICTORIAN PLANNING AUTHORITY
Project: BENCH MARK INFRASTRUCTURE COSTING
Title: ITEM 26
BOX CULVERT 1200X2100 CONNECTOR BOULEVARD
ULTIMATE

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES
Scale: 1:200
Size: A3
Drawing Number: V181544-CI-DG-2038
Revision: 5



SECTION ELEVATION
SCALE 1:200

SCALE 1:200



SIDE ELEVATION
SCALE 1:200

NOTE: REFER TO DRAWING NO.V170524-CI-DG-2002 FOR SECTION DETAILS

0 5 8m

SCALE 1:200 @A3

Rev	Date	Description	Des.	Verif.	Appd.
5	28/02/2019	ADDRESS STAKEHOLDER COMMENTS V.2.	CM		
4	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
3	05/07/2018	ADDRESS VPA COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	RVR		

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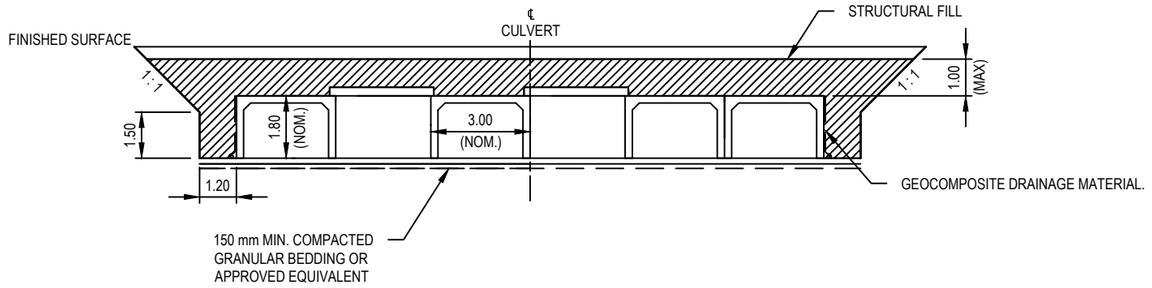
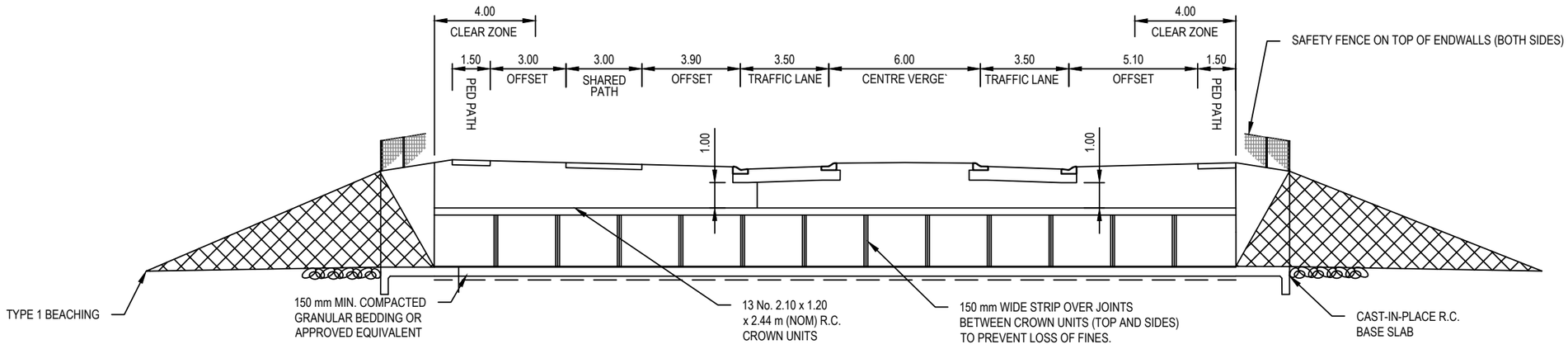
Drawn	NPV	Date 14/12/2017
Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY
Project: BENCH MARK INFRASTRUCTURE COSTING
Title: ITEM 27
BOX CULVERT 1800X3000 SECONDARY ARTERIAL
INTERIM

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES
Scale: 1:200
Size: A3
Drawing Number: V181544-CI-DG-2039
Revision: 5



SECTION ELEVATION
SCALE 1:200



NOTE: REFER TO DRAWING NO.V170524-CI-DG-2003 FOR SECTION DETAILS

SIDE ELEVATION
SCALE 1:200

0 5 8m

SCALE 1:200 @A3

Rev	Date	Description	Des.	Verif.	Appd.
5	28/02/2019	ADDRESS STAKEHOLDER COMMENTS V.2.	CM		
4	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
3	05/07/2018	ADDRESS VPA COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	RVR		

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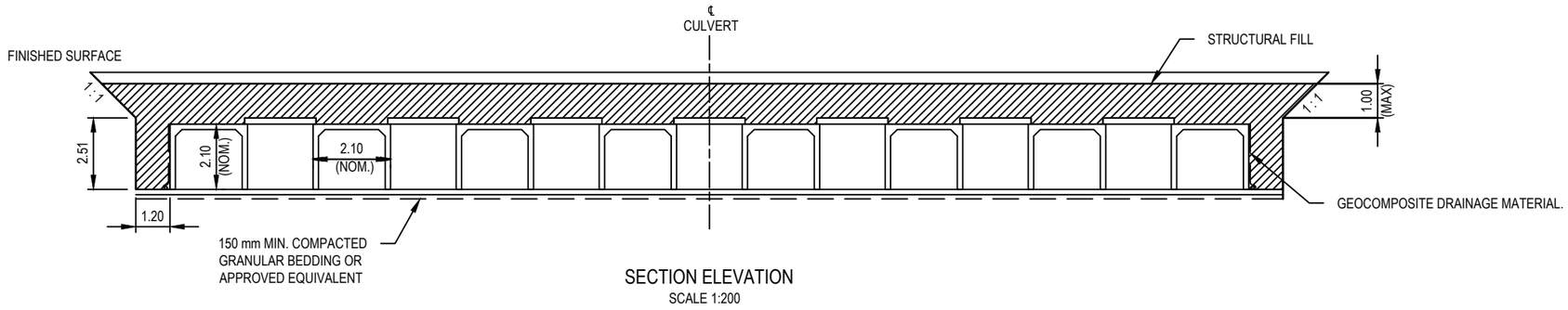
Drawn	NPV	Date 14/12/2017
Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

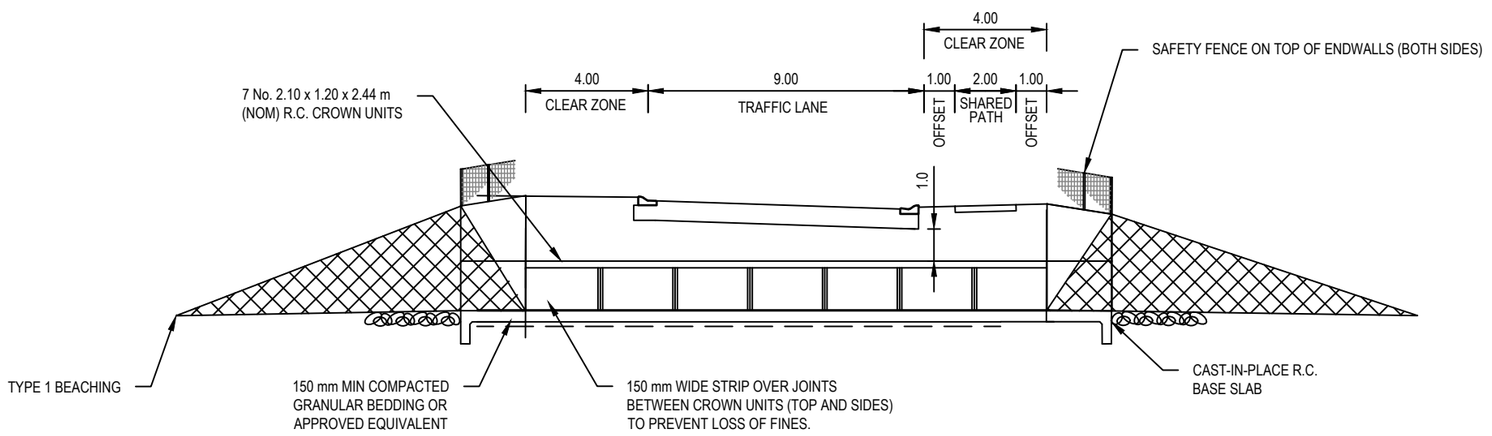
Client: VICTORIAN PLANNING AUTHORITY
Project: BENCH MARK INFRASTRUCTURE COSTING
Title: ITEM 28
BOX CULVERT 1800X3000 CONNECTOR BOULEVARD
ULTIMATE

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES
Scale: 1:200
Size: A3
Drawing Number: V181544-CI-DG-2040
Revision: 5



SECTION ELEVATION
SCALE 1:200

SCALE 1:200



SIDE ELEVATION
SCALE 1:200

NOTE: REFER TO DRAWING NO.V170524-CI-DG-2002 FOR SECTION DETAILS

0 5 8m

SCALE 1:200 @A3

Rev	Date	Description	Des.	Verif.	Appd.
5	28/02/2019	ADDRESS STAKEHOLDER COMMENTS V.2.	CM		
4	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
3	05/07/2018	ADDRESS VPA COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	RVR		

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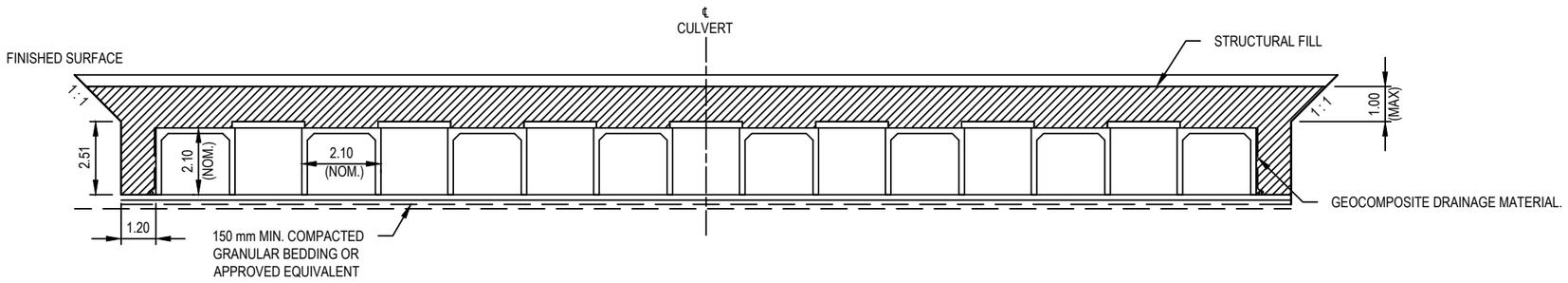
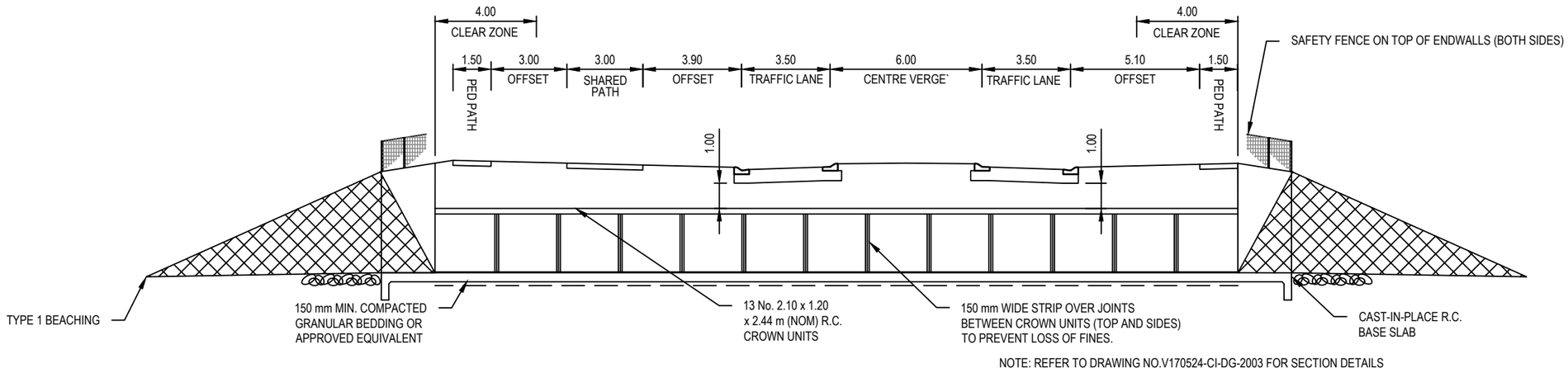
Drawn	NPV	Date 14/12/2017
Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY
Project: BENCH MARK INFRASTRUCTURE COSTING
Title: ITEM 29
BOX CULVERT 2100X2100 SECONDARY ARTERIAL
INTERIM

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES
Scale: 1:200
Size: A3
Drawing Number: V181544-CI-DG-2041
Revision: 5



SECTION ELEVATION
SCALE 1:200



NOTE: REFER TO DRAWING NO.V170524-CI-DG-2003 FOR SECTION DETAILS

SIDE ELEVATION
SCALE 1:200

0 5 8m

SCALE 1:200 @A3

Rev	Date	Description	Des.	Verif.	Appd.
5	28/02/2019	ADDRESS STAKEHOLDER COMMENTS V.2.	CM		
4	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
3	05/07/2018	ADDRESS VPA COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	RVR		

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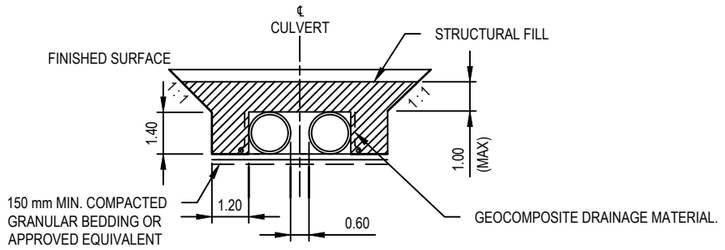
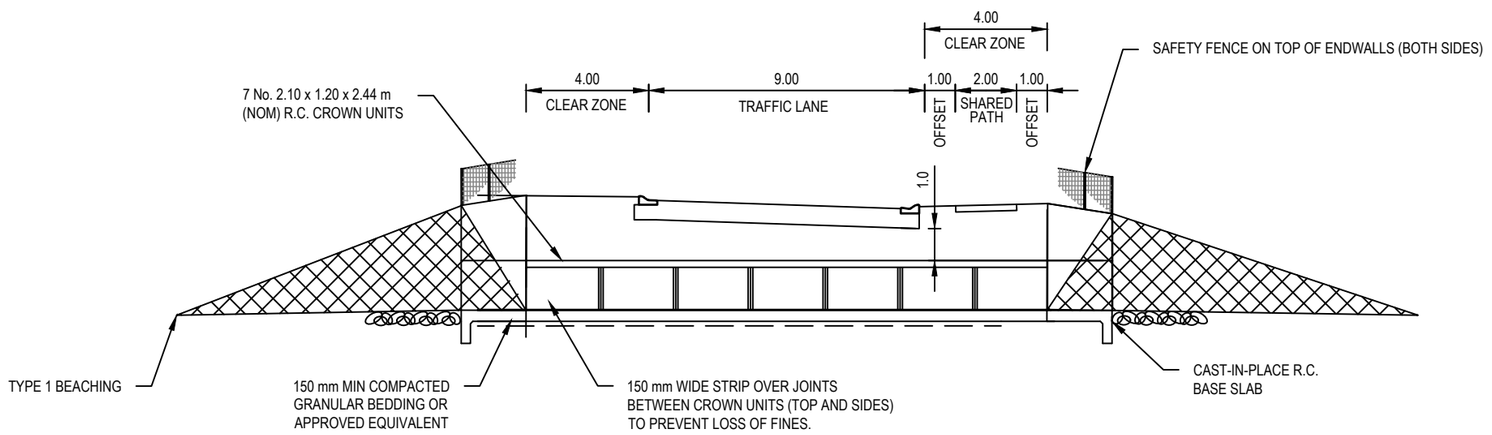
Drawn	NPV	Date 14/12/2017
Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY
Project: BENCH MARK INFRASTRUCTURE COSTING
Title: ITEM 30 BOX CULVERT 2100X2100 CONNECTOR BOULEVARD ULTIMATE

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES
Scale: 1:200
Size: A3
Drawing Number: V181544-CI-DG-2042
Revision: 5



SECTION ELEVATION
SCALE 1:200



SIDE ELEVATION
SCALE 1:200

NOTE: REFER TO DRAWING NO.V170524-CI-DG-2002 FOR SECTION DETAILS

0 5 8m
SCALE 1:200 @A3

Rev	Date	Description	Des.	Verif.	Appd.
5	28/02/2019	ADDRESS STAKEHOLDER COMMENTS V.2.	CM		
4	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
3	05/07/2018	ADDRESS VPA COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	RVR		

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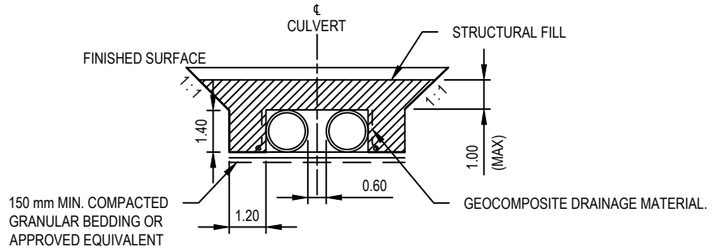
Drawn	NPV	Date 14/12/2017
Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY
Project: BENCH MARK INFRASTRUCTURE COSTING
Title: ITEM 31
RCP 1200DN SECONDARY ARTERIAL
INTERIM

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES
Scale: 1:200
Size: A3
Drawing Number: V181544-CI-DG-2043
Revision: 5



SECTION ELEVATION
SCALE 1:200

SIDE ELEVATION
SCALE 1:200

NOTE: REFER TO DRAWING NO.V170524-CI-DG-2003 FOR SECTION DETAILS

0 5 8m
SCALE 1:200 @A3

Rev	Date	Description	Des.	Verif.	Appd.
5	28/02/2019	ADDRESS STAKEHOLDER COMMENTS V.2.	CM		
4	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
3	05/07/2018	ADDRESS VPA COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	RVR		

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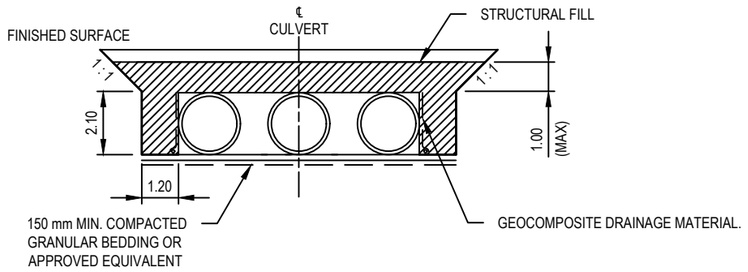
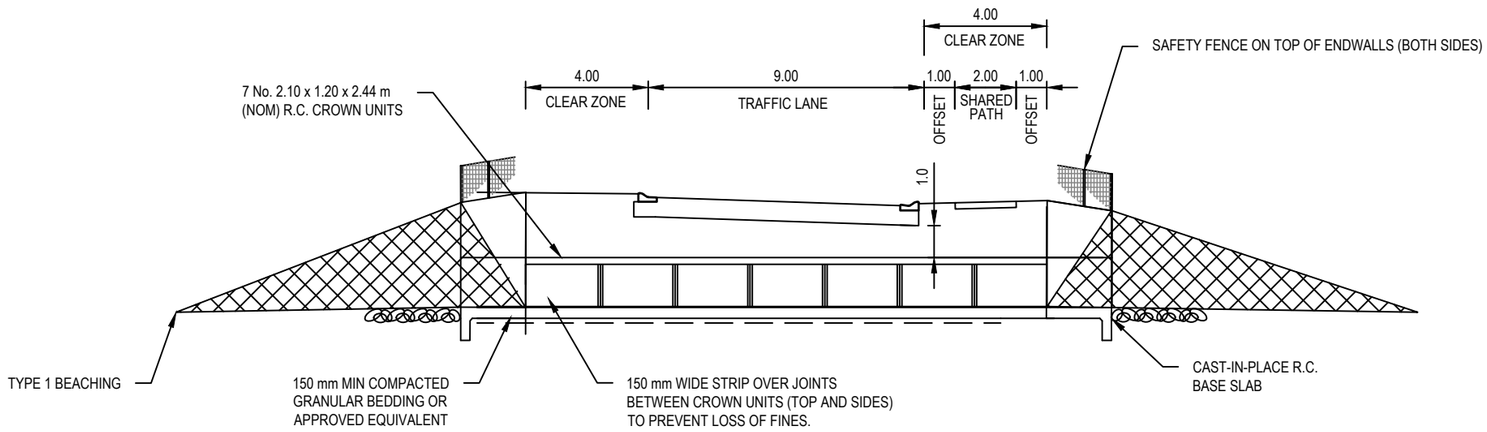
Drawn	NPV	Date 14/12/2017
Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY
Project: BENCH MARK INFRASTRUCTURE COSTING
Title: ITEM 32
RCP 1200DN CONNECTOR BOULEVARD
ULTIMATE

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES
Scale: 1:200
Size: A3
Drawing Number: V181544-CI-DG-2044
Revision: 5



SECTION ELEVATION
SCALE 1:200
SCALE 1:200



SIDE ELEVATION
SCALE 1:200

NOTE: REFER TO DRAWING NO.V170524-CI-DG-2002 FOR SECTION DETAILS

0 5 8m
SCALE 1:200 @A3

Rev	Date	Description	Des.	Verif.	Appd.
5	28/02/2019	ADDRESS STAKEHOLDER COMMENTS V.2.	CM		
4	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
3	05/07/2018	ADDRESS VPA COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	RVR		

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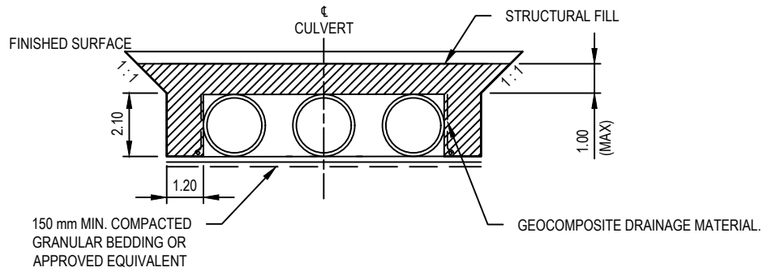
Drawn	NPV	Date 14/12/2017
Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY
Project: BENCH MARK INFRASTRUCTURE COSTING
Title: ITEM 33
RCP 1800DN SECONDARY ARTERIAL
INTERIM

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES
Scale: 1:200
Size: A3
Drawing Number: V181544-CI-DG-2045
Revision: 4



SECTION ELEVATION
SCALE 1:200

SIDE ELEVATION
SCALE 1:200

NOTE: REFER TO DRAWING NO.V170524-CI-DG-2003 FOR SECTION DETAILS

0 5 8m
SCALE 1:200 @A3

Rev	Date	Description	Des.	Verif.	Appd.
5	28/02/2019	ADDRESS STAKEHOLDER COMMENTS V.2.	CM		
4	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
3	05/07/2018	ADDRESS VPA COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	RVR		

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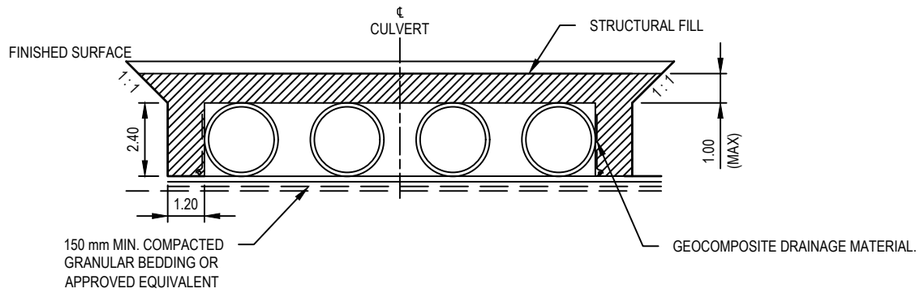
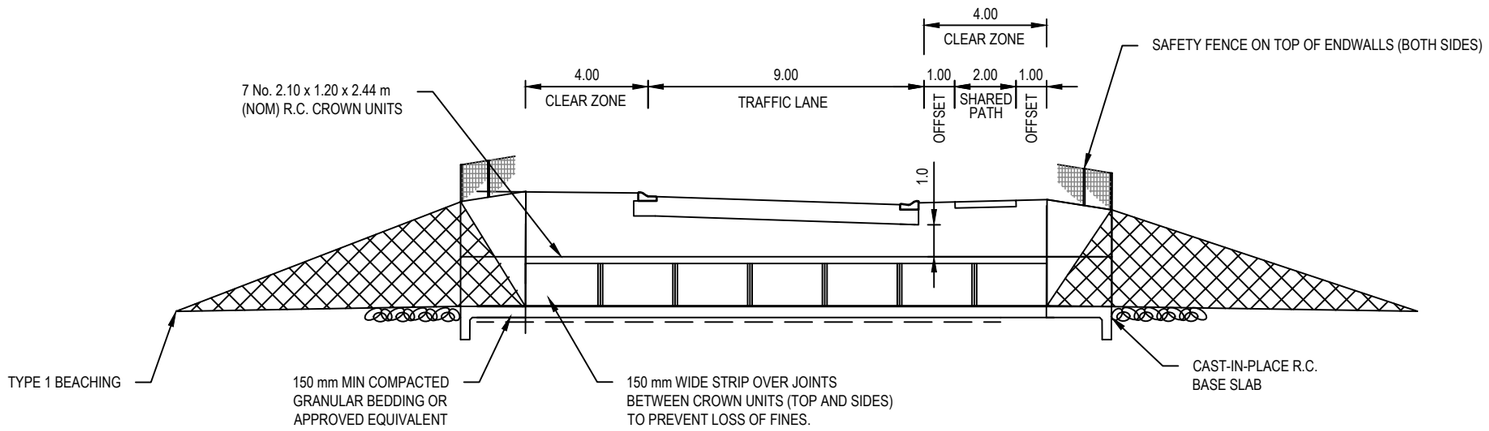
Drawn	NPV	Date 14/12/2017
Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY
Project: BENCH MARK INFRASTRUCTURE COSTING
Title: ITEM 34
RCP 1800DN CONNECTOR BOULEVARD
ULTIMATE

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES
Scale: 1:200
Size: A3
Drawing Number: V181544-CI-DG-2046
Revision: 5



SECTION ELEVATION
SCALE 1:200



SIDE ELEVATION
SCALE 1:200

NOTE: REFER TO DRAWING NO.V170524-CI-DG-2002 FOR SECTION DETAILS

0 5 8m
SCALE 1:200 @A3

Rev	Date	Description	Des.	Verif.	Appd.
5	28/02/2019	ADDRESS STAKEHOLDER COMMENTS V.2.	CM		
4	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
3	05/07/2018	ADDRESS VPA COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	RVR		

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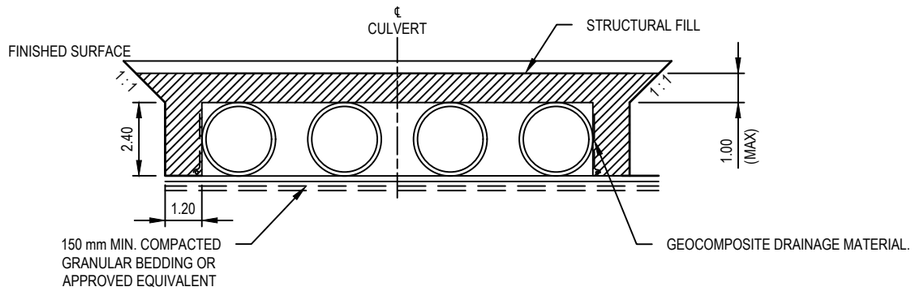
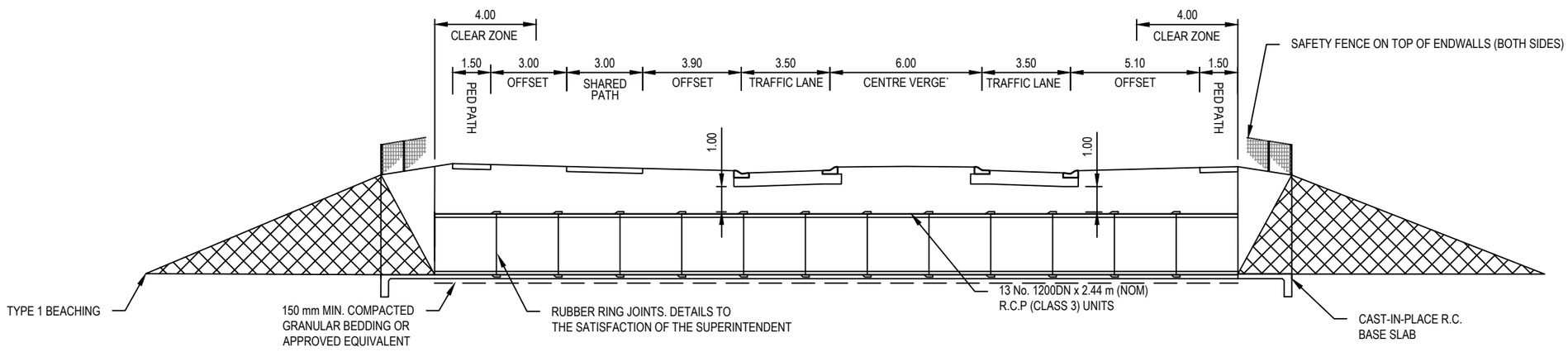
Drawn	NPV	Date 14/12/2017
Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY
Project: BENCH MARK INFRASTRUCTURE COSTING
Title: ITEM 35
RCP 2100DN SECONDARY ARTERIAL
INTERIM

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES
Scale: 1:200
Size: A3
Drawing Number: V181544-CI-DG-2047
Revision: 5



SECTION ELEVATION
SCALE 1:200



SIDE ELEVATION
SCALE 1:200

NOTE: REFER TO DRAWING NO.V170524-CI-DG-2003 FOR SECTION DETAILS

0 5 8m
SCALE 1:200 @A3

Rev	Date	Description	Des.	Verif.	Appd.
5	28/02/2019	ADDRESS STAKEHOLDER COMMENTS V.2.	CM		
4	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
3	05/07/2018	ADDRESS VPA COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1	14/12/2017	PRELIMINARY ISSUE	RVR		

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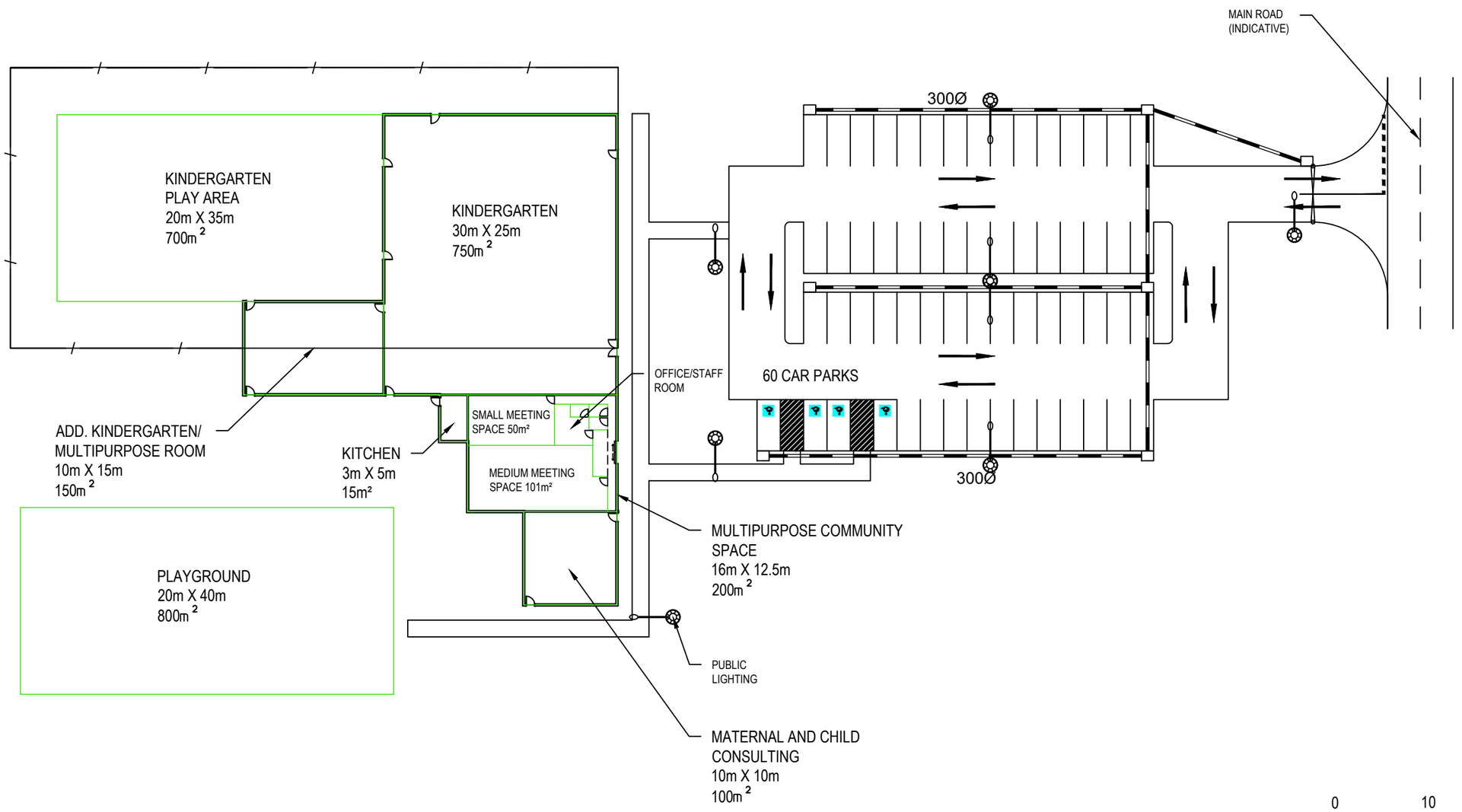
Drawn	NPV	Date 14/12/2017
Checked	MEA	Date 14/12/2017
Designed	RVR	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY
Project: BENCH MARK INFRASTRUCTURE COSTING
Title: ITEM 36
RCP 2100DN CONNECTOR BOULEVARD
ULTIMATE

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES
Scale: 1:200
Size: A3
Drawing Number: V181544-CI-DG-2048
Revision: 5



Rev	Date	Description	Des.	Verif.	Appd.
3	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1		NOT ISSUED			

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Drawn	VA	Date 5/03/2018
Checked	CP	Date 5/03/2018
Designed	VA	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY

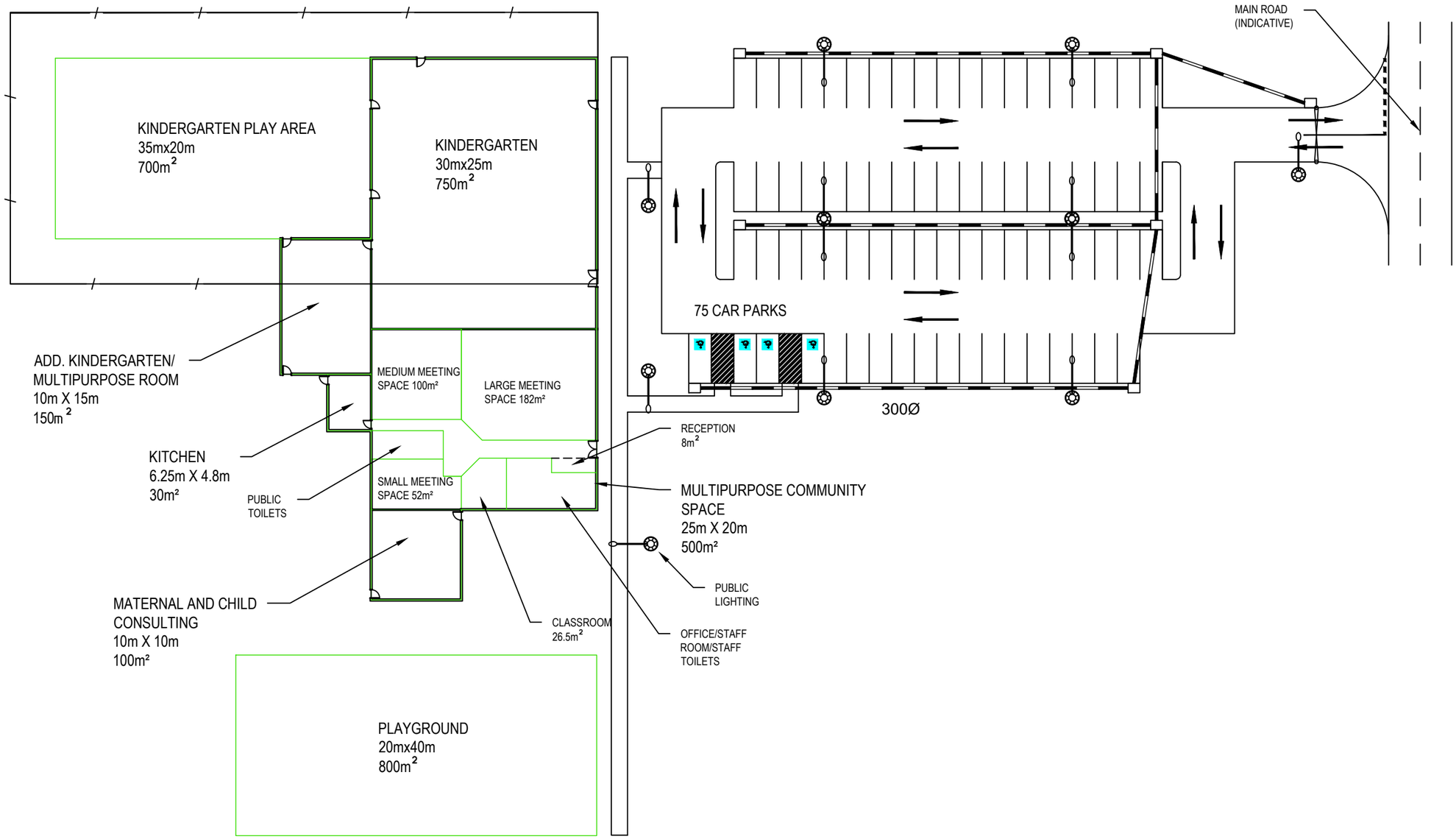
Project: BENCH MARK INFRASTRUCTURE COSTING

Title: ITEM 37
COMMUNITY FACILITIES - LEVEL 1
ULTIMATE

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Scale: 1:500 | Size: A3

Drawing Number: V181544-CI-DG-2049 | Revision: 3



0 10 20m

SCALE 1:500 @A3

Rev	Date	Description	Des.	Verif.	Appd.
3	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1		NOT ISSUED			

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Drawn	VA	Date 5/03/2018
Checked	CP	Date 5/03/2018
Designed	VA	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY

Project: BENCH MARK INFRASTRUCTURE COSTING

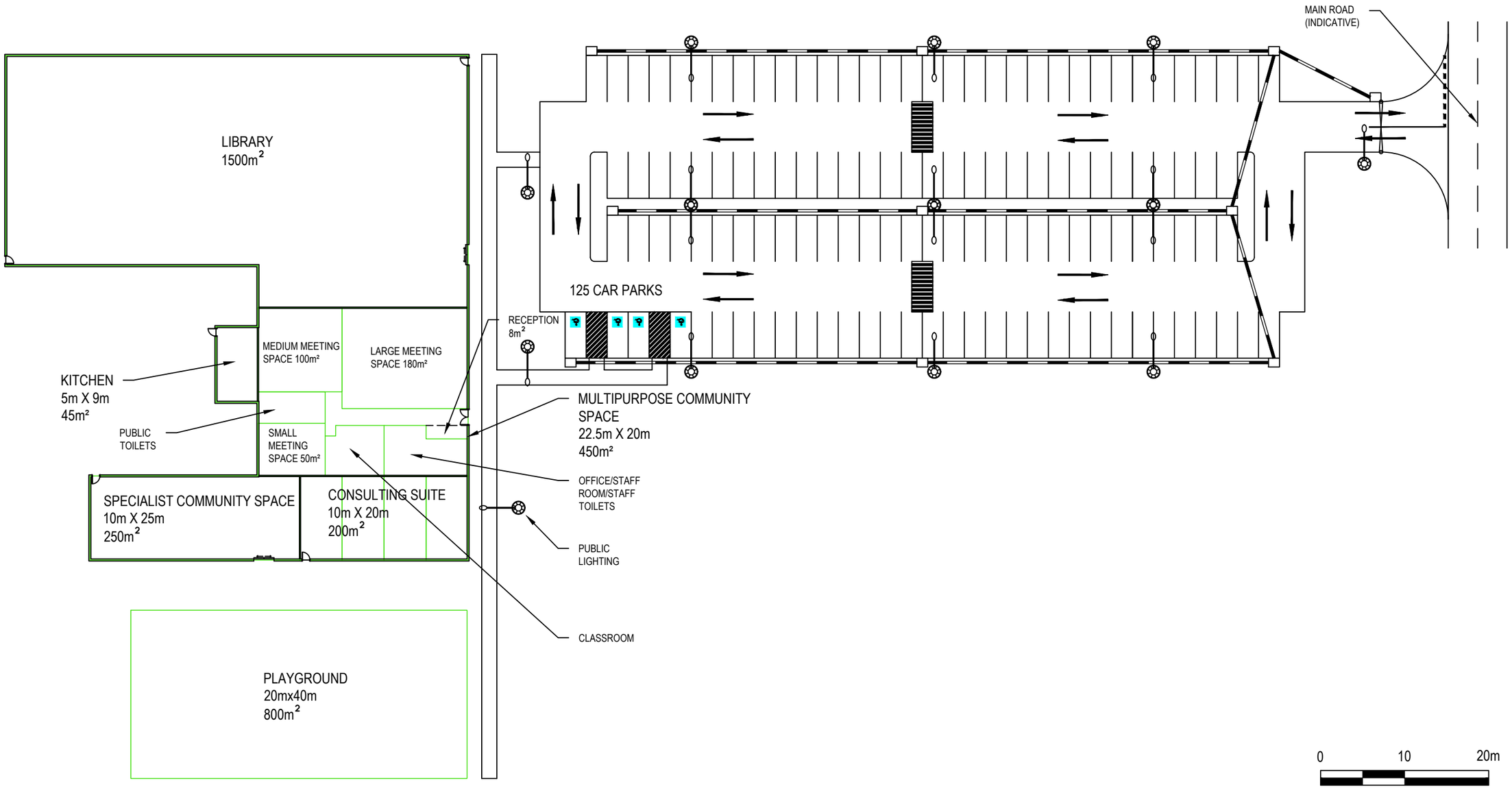
Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Scale: 1:500 | Size: A3

Title: ITEM 38
COMMUNITY FACILITIES - LEVEL 2
ULTIMATE

Drawing Number: V181544-CI-DG-2050

Revision: 3



0 10 20m

SCALE 1:500 @A3

Rev	Date	Description	Des.	Verif.	Appd.
3	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1		NOT ISSUED			

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Drawn	VA	Date 5/03/2018
Checked	CP	Date 5/03/2018
Designed	VA	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY

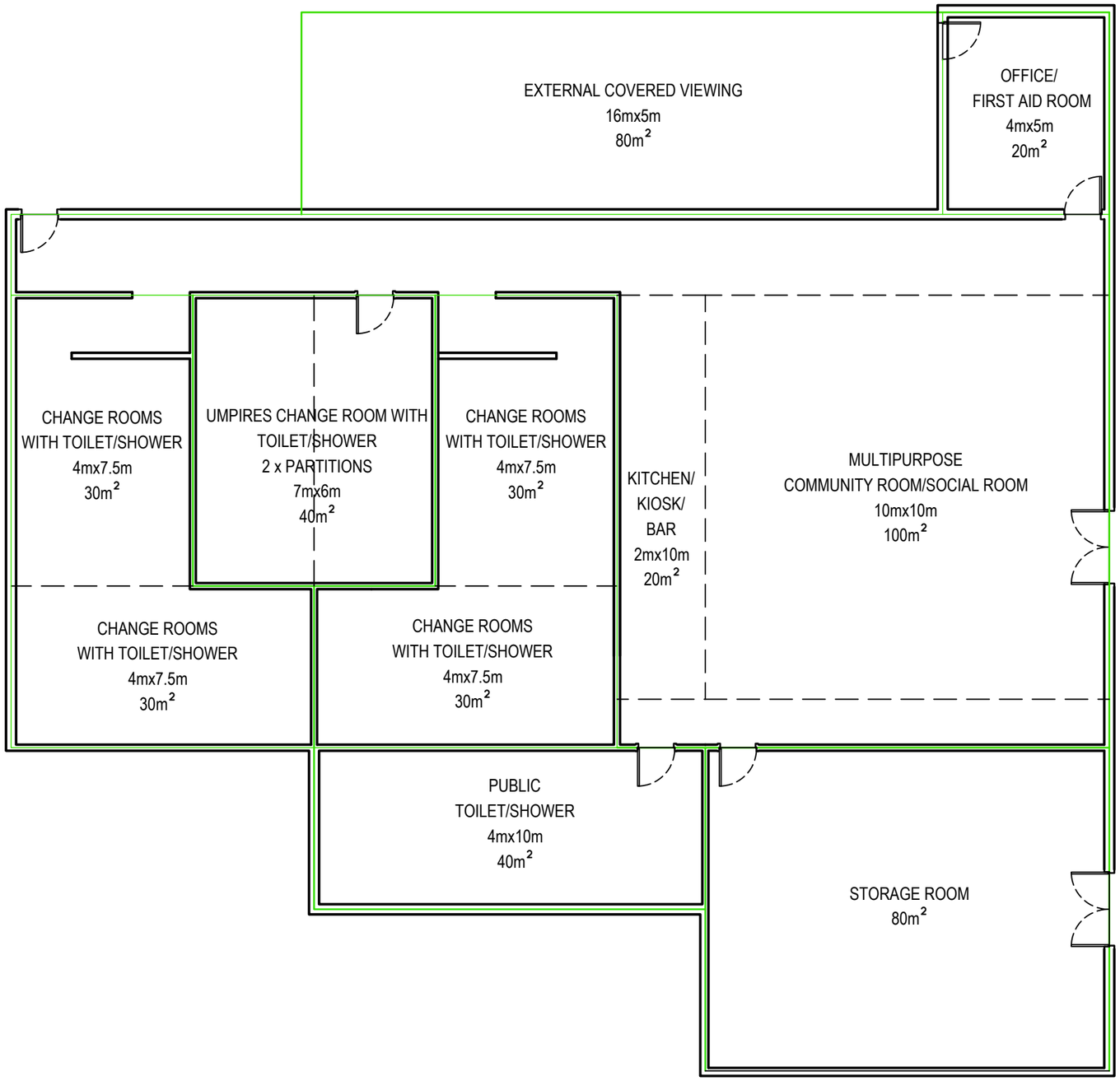
Project: BENCH MARK INFRASTRUCTURE COSTING

Title: ITEM 39
COMMUNITY FACILITIES - LEVEL 3
ULTIMATE

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Scale: 1:500 Size: A3

Drawing Number: V181544-CI-DG-2051 Revision: 3



0 2.5 5m

SCALE 1:125 @A3

Rev	Date	Description	Des.	Verif.	Appd.
3	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1		NOT ISSUED			

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Drawn	VA	Date 5/03/2018
Checked	MEA	Date 5/03/2018
Designed	VA	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY

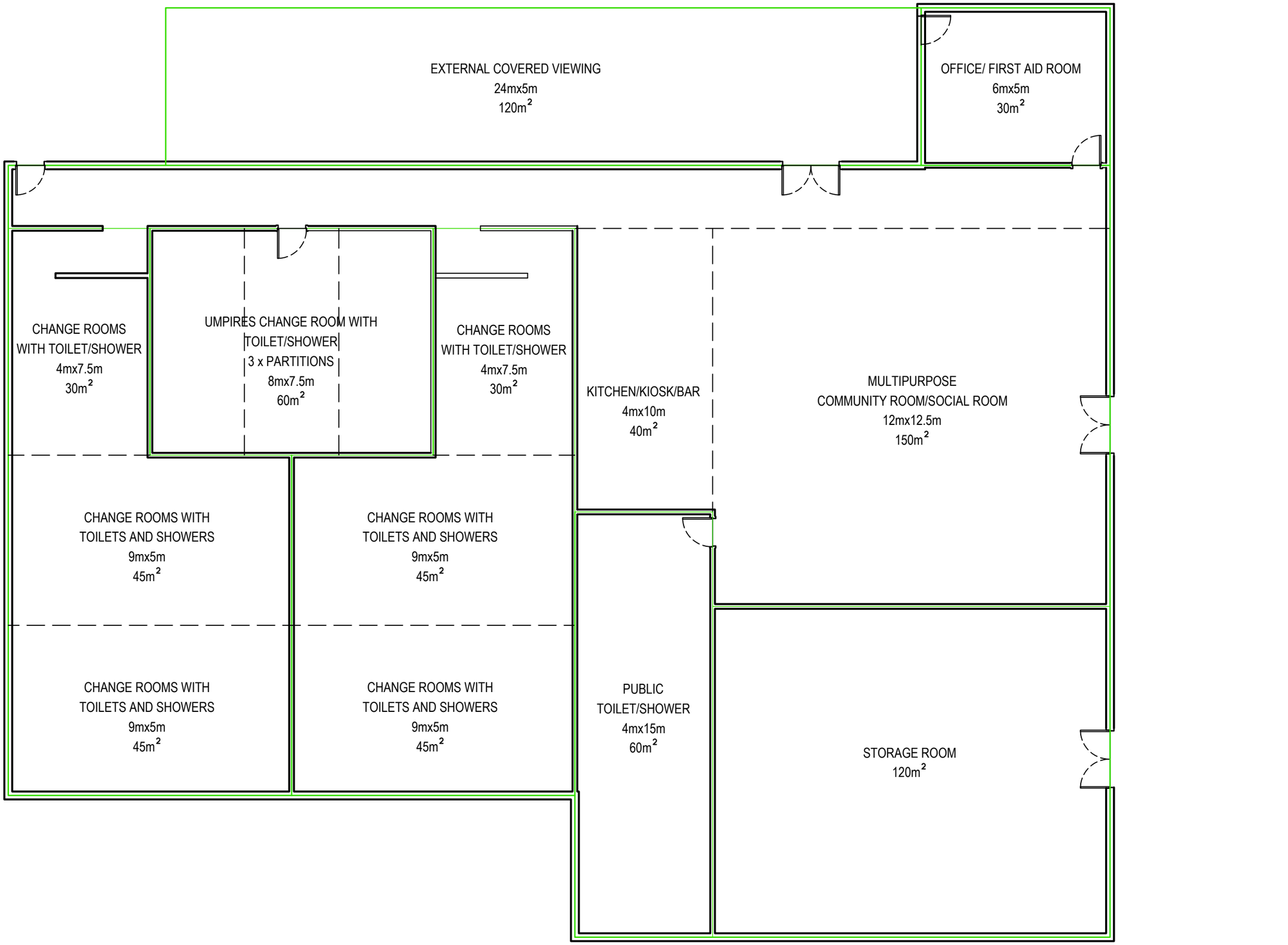
Project: BENCH MARK INFRASTRUCTURE COSTING

Title: ITEM 40
SPORTING PAVILION - SERVICING TWO PLAYING AREAS
ULTIMATE

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Scale 1:1000 | Size A3

Drawing Number V181544-CI-DG-2052 | Revision 3



0 2.5 5m

SCALE 1:125 @A3

Rev	Date	Description	Des.	Verif.	Appd.
3	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1		NOT ISSUED			

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Drawn	YG	Date 5/03/2018
Checked	MEA	Date 5/03/2018
Designed	VA	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY

Project: BENCH MARK INFRASTRUCTURE COSTING

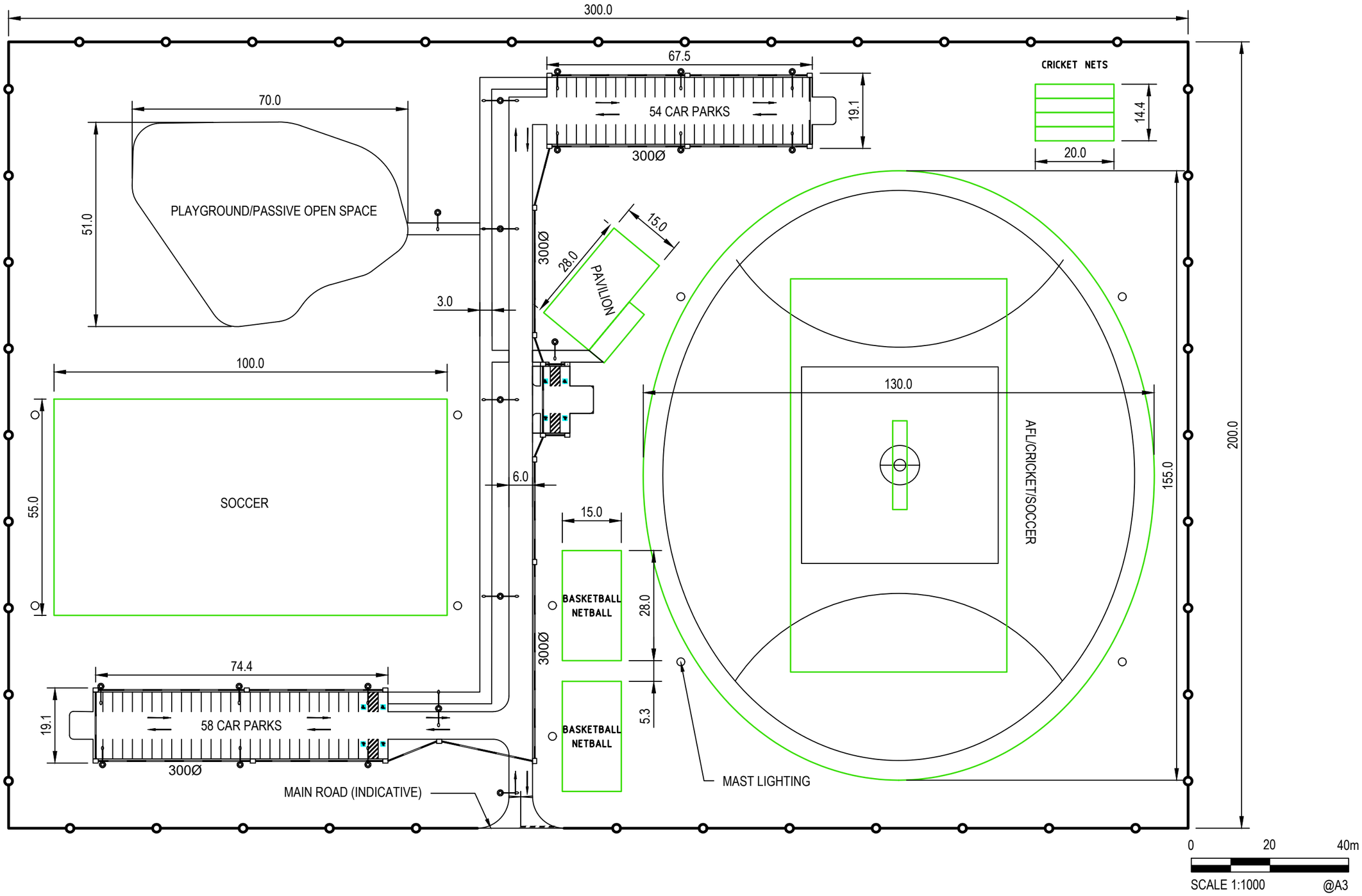
Title: ITEM 41
SPORTING PAVILION - SERVICING THREE PLAYING AREAS
ULTIMATE

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Scale 1:1000 | Size A3

Drawing Number: V181544-CI-DG-2053

Revision: 3



Rev	Date	Description	Des.	Verif.	Appd.
4	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
3	29/06/2018	ADDRESS VPA COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1		NOT ISSUED			

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Web: www.cardno.com.au

Drawn	NPV	Date 5/03/2018
Checked	MEA	Date 5/03/2018
Designed	VA	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY

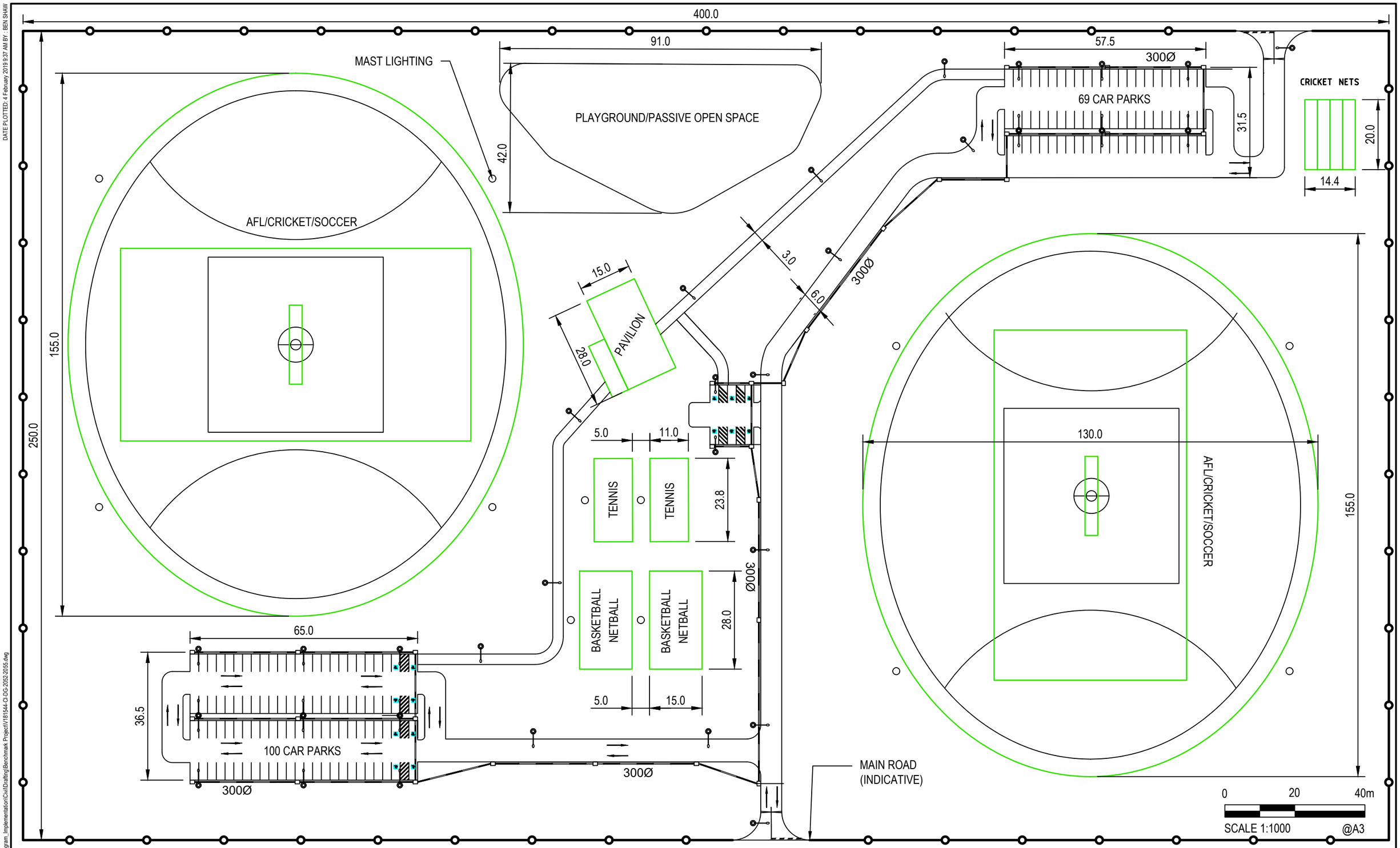
Project: BENCH MARK INFRASTRUCTURE COSTING

Title: ITEM 42
MULTIPURPOSE SPORTS & RECREATION:5-6Ha
ULTIMATE

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Scale: 1:1000 | Size: A3

Drawing Number: V181544-CI-DG-2054 | Revision: 4



Rev	Date	Description	Des.	Verif.	Appd.
4	4/02/2019	ADDRESS STAKEHOLDER COMMENTS	CM		
3	29/06/2018	ADDRESS VPA COMMENTS	CM		
2	19/03/2018	ADDRESS VPA COMMENTS	VA		
1		NOT ISSUED			

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Drawn	NPV	Date 5/03/2018
Checked	MEA	Date 5/03/2018
Designed	VA	Date
Verified		Date
Approved		Date

Client: VICTORIAN PLANNING AUTHORITY

Project: BENCH MARK INFRASTRUCTURE COSTING

Title: ITEM 43
MULTIPURPOSE SPORTS & RECREATION:8-10Ha
ULTIMATE

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Scale: 1:1000 | Size: A3

Drawing Number: V181544-CI-DG-2055 | Revision: 4

DATE PLOTTED: 4 February 2019 9:37 AM BY : BEN SHAW
XREFs: V170524-CI-DG-2000-2010
CAD File: M:\2018\181501_2000\181544_VPA_ICP_Program_Implementation\Civil\Drafting\Benchmark Project\V181544-CI-DG-2052-2055.dwg

Victorian Planning Authority Benchmark Infrastructure Report

APPENDIX B

CIVIL COMPONENT PRICING DATA

MONTE CARLO ASSESMENT TEMPLATE

Description: 800m ROAD Primary Arterial
Civil Component Number: 1
Date run: 26/02/2019
File name: Item 01 - Primary Arterial Interim.xlsm

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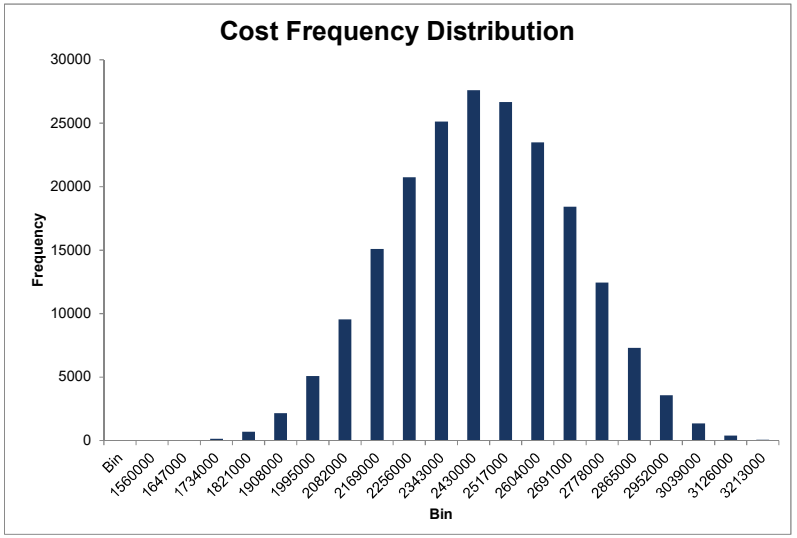
	Sub Item	MonteCarlo Value	Qty	Rate	Average	STD deviation
Sitework s and Earth works	Site Preperation	35137.62951	32800	m2	3.68	3.10
	Earthworks	157201.9609	4004	m3	34.07	15.63
Road Pavement	Primary Arterial Pavement	1024831.564	5600	m2	169.62	40.33
	Secondary Arterial Pavement	0	0	m2	127.01	16.41
	Collector Arterial Pavement	0	0	m2	105.15	17.69
	Subgrade Preparation	18992.16241	1120	m2	14.22	4.70
	Pavement Rehab	0	0	m2	51.58	0.00
	Pavement Other	0	0	m2	0.00	0.00
Concrete Works	Kerb and Channel	87107.57839	1600	m	54.81	14.76
	Cycle Path	280290.6195	2400	m2	76.59	37.21
	SUP/ Footpath	0	0	m2	63.51	24.55
	Concrete Traffic Island/ paving	0	0	m2	77.60	15.71
Drainage	Drainage Pipe 300mm CR Bfilled	24152.62459	100	m	179.85	43.89
	Drainage Pipe 375mm CR Bfilled	72912.63465	350	m	259.10	57.84
	Drainage Pipe 450mm CR Bfilled	100331.3024	350	m	299.43	84.60
	Drainage Pipe 525mm CR Bfilled	0	0	m	403.86	107.07
	Drainage - pits	38438.26553	16	No.	2565.39	583.57
	Drainage – Sub-soil drainage	103728.1473	1600	m	33.88	23.09
	Drainage Culvert	0	0	No.	0.00	0.00
Traffic	Traffic Signals	0	0	Item	109730.28	46200.63
Landsc ape	Tree Planting	48534.69727	160	No.	303.34	144.65
	Landscaping	222623.3626	11200	m2	21.61	8.60
	Topsoil Seeding	38182.26827	11200	m2	7.21	2.97
Street Lighting	Street Lighting (all Inclusive)	172166.0162	800	m	216.34	22.62
	Intersection	0	0	Item/ Per Leg	48468.93	17332.00
Misc	Regulatory Signage	4344.182105	18	Item	338.43	101.75
	Linemarking	29565.41379	5600	m2 of Pavement	3.11	2.37
	Landscape maintenance (intersection)	0	0	Item	71344.66	40698.86
	Landscape maintenance (road)	31738.02632	11200	m2	2.90	0.15
	Tactile Pavers	0	0	Item	292.43	66.31
Other		0	0			
		0	0		0	0
		0	0		0	0
Delivery	Council Fees	3.25	1	%	3.250	0.000
	VicRoads Fees	1.000	1	%	1.000	0.000
	Traffic Management	5.000	1	%	5.000	0.000
	Environmental Management	0.500	1	%	0.500	0.000
	Surveying and Design	5	1	%	5	0
	Supervision and Project management	9	1	%	9	0
	Site Establishment	2.500	1	%	2.500	0.000
	Contingency	15	1	%	15	0

Inputs		
Iterations	200000	
Last row Number with Data	42	
Outputs	**Excl. Delivery**	**Incl Delivery**
Median (50th Percentile)	2410454.888	3404767.5
Standard Deviation	238970.2717	
90th Percentile	2716707.613	3837349.5
65th Percentile	2502535.024	3534830.7
75th Percentile	2571637.886	3632438.5
Range of costs produced	1723406.425	2434311.6



MONTE CARLO ASSESMENT TEMPLATE

Description: 800m ROAD Secondary Arterial
Civil Component Number: 2
Date run: 26/02/2019
File name: Item 02 - Secondary Arterial.xlsm

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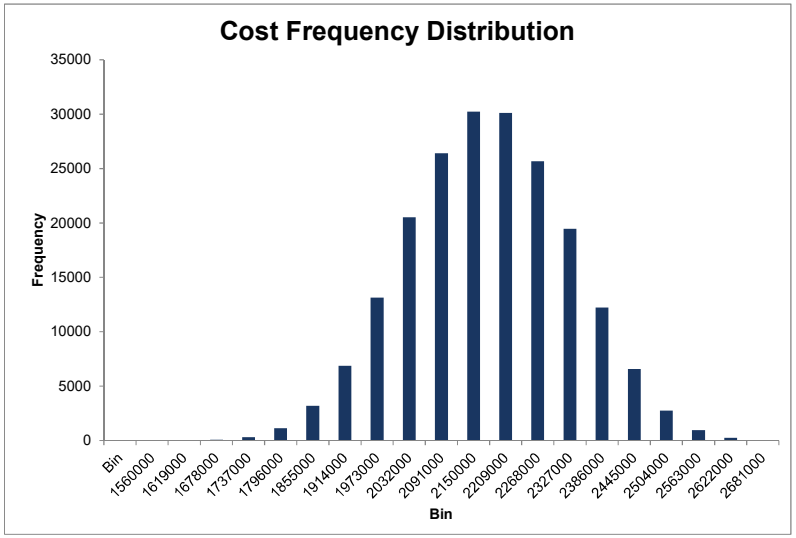
	Sub Item	MonteCarlo Value	Qty	Rate	Average	STD deviation
Site Works and Earth Works	Site Preperation	93802.06067	27200	m2	3.68	3.10
	Earthworks	168388.2969	4572	m3	34.07	15.63
Road Pavement	Primary Arterial Pavement	0	0	m2	169.62	40.33
	Secondary Arterial Pavement	845603.8857	7200	m2	127.01	16.41
	Collector Arterial Pavement	0	0	m2	105.15	17.69
	Subgrade Preparation	26171.06255	1440	m2	14.22	4.70
	Pavement Rehab	0	0	m2	51.58	0.00
	Pavement Other	0	0	m2	0.00	0.00
Concrete Works	Kerb and Channel	105147.4117	1600	m	54.81	14.76
	Cycle Path	0	0	m2	76.59	37.21
	SUP/ Footpath	93683.74106	1600	m2	63.51	24.55
	Concrete Traffic Island/ paving	0	0	m2	77.60	15.71
Drainage	Drainage Pipe 300mm CR Bfilled	19097.47027	100	m	179.85	43.89
	Drainage Pipe 375mm CR Bfilled	123984.4124	350	m	259.10	57.84
	Drainage Pipe 450mm CR Bfilled	90119.74707	350	m	299.43	84.60
	Drainage Pipe 525mm CR Bfilled	0	0	m	403.86	107.07
	Drainage - pits	44393.29713	16	No.	2565.39	583.57
	Drainage – Sub-soil drainage	17470.77423	1600	m	33.88	23.09
	Drainage Culvert	0	0	No.	0.00	0.00
Traffic	Traffic Signals	0	0	Item	109730.28	46200.63
Landscape	Tree Planting	36718.81738	108	No.	303.34	144.65
	Landscaping	106204.9089	9600	m2	21.61	8.60
	Topsoil Seeding	44229.99182	9600	m2	7.21	2.97
Street Lighting	Street Lighting (all Inclusive)	151812.8755	800	m	216.34	22.62
	Intersection	0	0	Item/ Per Leg	48468.93	17332.00
Misc	Regulatory Signage	6097.093362	14	Item	338.43	101.75
	Linemarking	26285.68367	7200	m2 of Pavement	3.11	2.37
	Landscape maintenance (intersection)	0	0	Item	71344.66	40698.86
	Landscape maintenance (road)	27467.62843	9600	m2	2.90	0.15
	Tactile Pavers	0	0	Item	292.43	66.31
Other		0	0			
		0	0		0	0
		0	0		0	0
Delivery	Council Fees	3.25	1	%	3.250	0.000
	VicRoads Fees	1.000	1	%	1.000	0.000
	Traffic Management	5.000	1	%	5.000	0.000
	Environmental Management	0.500	1	%	0.500	0.000
	Surveying and Design	5	1	%	5	0
	Supervision and Project management	9	1	%	9	0
	Site Establishment	2.500	1	%	2.500	0.000
	Contingency	15	1	%	15	0

Inputs		
Iterations	200000	
Last row Number with Data	42	
Outputs	**Excl. Delivery**	**Incl Delivery**
Median (50th Percentile)	2146156.402	3031445.9
Standard Deviation	148001.7013	
90th Percentile	2335828.214	3299357.4
65th Percentile	2203184.486	3111998.1
75th Percentile	2245982.032	3172449.6
Range of costs produced	1163948.598	1644077.4



MONTE CARLO ASSESMENT TEMPLATE

Description: 800m ROAD - Conncector Street.xlam
Civil Component Number: 3
Date run: 26/02/2019
File name: Item 03 - Connector Bvd.xlsm

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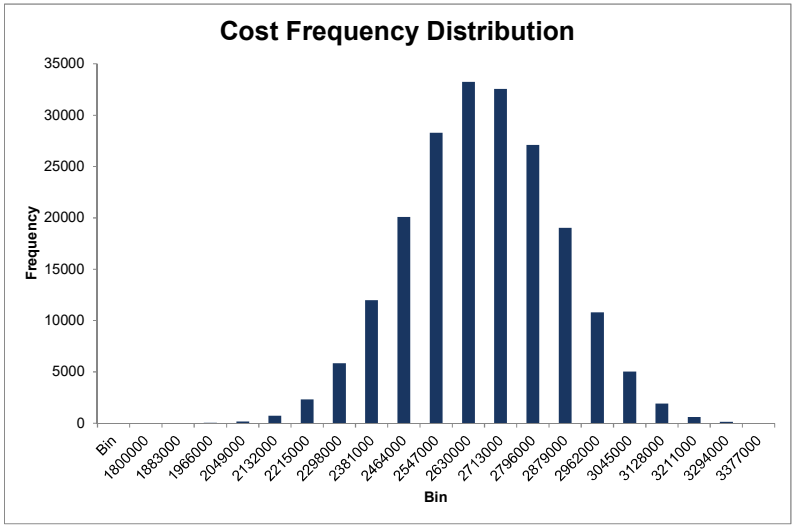
	Sub Item	MonteCarlo Value	Qty	Rate	Average	STD deviation
Sitework s and Earth works	Site Preperation	131660.0231	24800	m2	3.68	3.10
	Earthworks	93820.25178	2996	m3	34.07	15.63
Road Pavement	Primary Arterial Pavement	0	0	m2	169.62	40.33
	Secondary Arterial Pavement	0	0	m2	127.01	16.41
	Collector Arterial Pavement	668708.5684	5600	m2	105.15	17.69
	Subgrade Preparation	8148.424853	1120	m2	14.22	4.70
	Pavement Rehab	0	0	m2	51.58	0.00
	Pavement Other	0	0	m2	0.00	0.00
Concrete Works	Kerb and Channel	119904.6474	3200	m	54.81	14.76
	Cycle Path	276371.2369	2400	m2	76.59	37.21
	SUP/ Footpath	76912.10586	2400	m2	63.51	24.55
	Concrete Traffic Island/ paving	0	0	m2	77.60	15.71
Drainage	Drainage Pipe 300mm CR Bfilled	30854.5347	200	m	179.85	43.89
	Drainage Pipe 375mm CR Bfilled	231310.1332	908	m	259.10	57.84
	Drainage Pipe 450mm CR Bfilled	215550.14	700	m	299.43	84.60
	Drainage Pipe 525mm CR Bfilled	0	0	m	403.86	107.07
	Drainage - pits	63521.80388	32	No.	2565.39	583.57
	Drainage – Sub-soil drainage	162990.0975	3200	m	33.88	23.09
	Drainage Culvert	0	0	No.	0.00	0.00
Traffic	Traffic Signals	0	0	Item	109730.28	46200.63
Landscape	Tree Planting	78761.78115	192	No.	303.34	144.65
	Landscaping	346404.4247	11208	m2	21.61	8.60
	Topsoil Seeding	43371.48429	11208	m2	7.21	2.97
Street Lighting	Street Lighting (all Inclusive)	172619.9074	800	m	216.34	22.62
	Intersection	0	0	Item/ Per Leg	48468.93	17332.00
Misc	Regulatory Signage	3307.667222	10	Item	338.43	101.75
	Linemarking	-3190.415322	5600	m2 of Pavement	3.11	2.37
	Landscape maintenance (intersection)	0	0	Item	71344.66	40698.86
	Landscape maintenance (road)	33417.18492	11208	m2	2.90	0.15
	Tactile Pavers	0	0	Item	292.43	66.31
Other		0	0			
		0	0		0	0
		0	0		0	0
Delivery	Council Fees	3.25	1	%	3.250	0.000
	VicRoads Fees	1.000	1	%	1.000	0.000
	Traffic Management	5.000	1	%	5.000	0.000
	Environmental Management	0.500	1	%	0.500	0.000
	Surveying and Design	5	1	%	5	0
	Supervision and Project management	9	1	%	9	0
	Site Establishment	2.500	1	%	2.500	0.000
	Contingency	15	1	%	15	0

Inputs		
Iterations	200000	
Last row Number with Data	42	
Outputs	Excl. Delivery	Incl Delivery
Median (50th Percentile)	2623354.562	3311985.1
Standard Deviation	192523.5643	
90th Percentile	2870083.438	4053992.9
65th Percentile	2697537.832	3405641.5
75th Percentile	2753209.733	3475927.3
Range of costs produced	1646759.5	2079033.9



MONTE CARLO ASSESMENT TEMPLATE

Description: 800m ROAD - Conncector Street.xlam
Civil Component Number: 4
Date run: 26/02/2019
File name: Item 04- Connector Street.xlsm

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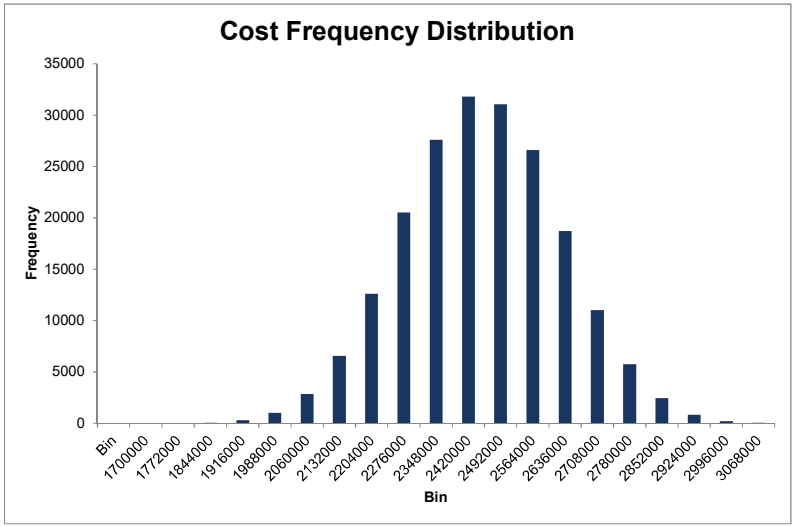
	Sub Item	MonteCarlo Value	Qty	Rate	Average	STD deviation
Site Works and Earth Works	Site Preperation	-28409.54409	20000	m2	3.68	3.10
	Earthworks	111539.0627	2996	m3	34.07	15.63
Road Pavement	Primary Arterial Pavement	0	0	m2	169.62	40.33
	Secondary Arterial Pavement	0	0	m2	127.01	16.41
	Collector Arterial Pavement	576387.4133	5600	m2	105.15	17.69
	Subgrade Preparation	7732.388379	1120	m2	14.22	4.70
	Pavement Rehab	0	0	m2	51.58	0.00
	Pavement Other	0	0	m2	0.00	0.00
Concrete Works	Kerb and Channel	122199.8158	3200	m	54.81	14.76
	Cycle Path	284405.2156	2400	m2	76.59	37.21
	SUP/ Footpath	213487.8895	2400	m2	63.51	24.55
	Concrete Traffic Island/ paving	0	0	m2	77.60	15.71
Drainage	Drainage Pipe 300mm CR Bfilled	36411.22466	200	m	179.85	43.89
	Drainage Pipe 375mm CR Bfilled	222288.6582	812	m	259.10	57.84
	Drainage Pipe 450mm CR Bfilled	199158.179	700	m	299.43	84.60
	Drainage Pipe 525mm CR Bfilled	0	0	m	403.86	107.07
	Drainage - pits	95282.33793	32	No.	2565.39	583.57
	Drainage – Sub-soil drainage	21604.90638	3200	m	33.88	23.09
	Drainage Culvert	0	0	No.	0.00	0.00
Traffic	Traffic Signals	0	0	Item	109730.28	46200.63
Landscape	Tree Planting	56127.15084	140	No.	303.34	144.65
	Landscaping	95935.92663	6408	m2	21.61	8.60
	Topsoil Seeding	52533.80955	6408	m2	7.21	2.97
Street Lighting	Street Lighting (all Inclusive)	175805.2052	800	m	216.34	22.62
	Intersection	0	0	Item/ Per Leg	48468.93	17332.00
Misc	Regulatory Signage	3126.482411	10	Item	338.43	101.75
	Linemarking	18425.14225	5600	m2 of Pavement	3.11	2.37
	Landscape maintenance (intersection)	0	0	Item	71344.66	40698.86
	Landscape maintenance (road)	19285.93231	6408	m2	2.90	0.15
	Tactile Pavers	0	0	Item	292.43	66.31
Other		0	0			
		0	0		0	0
		0	0		0	0
Delivery	Council Fees	3.25	1	%	3.250	0.000
	VicRoads Fees	1.000	1	%	1.000	0.000
	Traffic Management	5.000	1	%	5.000	0.000
	Environmental Management	0.500	1	%	0.500	0.000
	Surveying and Design	5	1	%	5	0
	Supervision and Project management	9	1	%	9	0
	Site Establishment	2.500	1	%	2.500	0.000
	Contingency	15	1	%	15	0

Inputs		
Iterations	200000	
Last row Number with Data	42	
Outputs	Excl. Delivery	Incl Delivery
Median (50th Percentile)	2412795.87	3408074.2
Standard Deviation	174720.8848	
90th Percentile	2636709.693	3724352.4
65th Percentile	2480119.403	3503168.7
75th Percentile	2530643.316	3574533.7
Range of costs produced	1429615.804	2019332.3



MONTE CARLO ASSESMENT TEMPLATE

Description: INTERSECTION
Civil Component Number: 5
Date run: 26/02/2019
File name: Item 05 - Primary - Primary Intersection.xlsm

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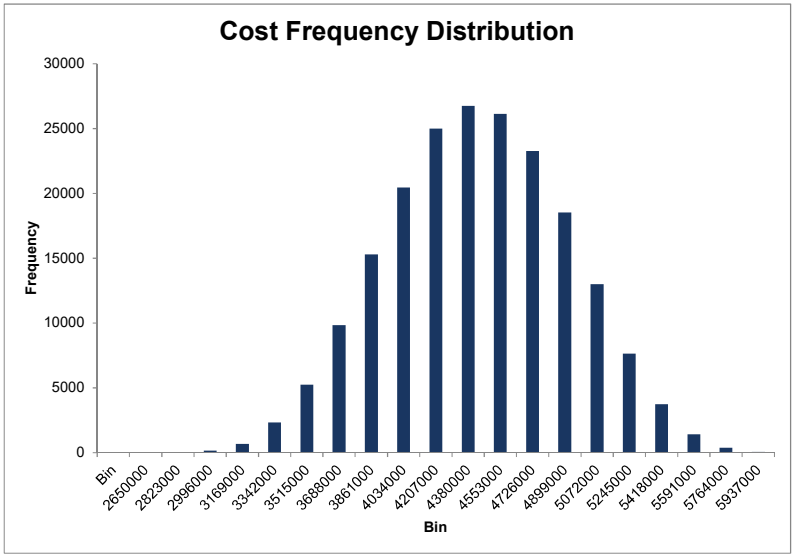
	Sub Item	MonteCarlo Value	Qty	Rate	Average	STD deviation
Siteworks and Earth works	Site Preperation	539058.2168	67040	m2	3.68	3.10
	Earthworks	164893.6697	8608.6	m3	34.07	15.63
Road Pavement	Primary Arterial Pavement	2269350.474	12040	m2	169.62	40.33
	Secondary Arterial Pavement	0	0	m2	127.01	16.41
	Collector Arterial Pavement	0	0	m2	105.15	17.69
	Subgrade Preparation	26593.85908	2408	m2	14.22	4.70
	Pavement Rehab	0	0	m2	51.58	0.00
	Pavement Other	0	0	m2	0.00	0.00
Concrete Works	Kerb and Channel	106061.0988	2195	m	54.81	14.76
	Cycle Path	169162.9039	2236	m2	76.59	37.21
	SUP/ Footpath	0	0	m2	63.51	24.55
	Concrete Traffic Island/ paving	103096.8564	1220	m2	77.60	15.71
Drainage	Drainage Pipe 300mm CR Bfilled	47434.46877	392	m	179.85	43.89
	Drainage Pipe 375mm CR Bfilled	0	0	m	259.10	57.84
	Drainage Pipe 450mm CR Bfilled	237274.9772	760	m	299.43	84.60
	Drainage Pipe 525mm CR Bfilled	0	0	m	403.86	107.07
	Drainage - pits	86103.17663	39	No.	2565.39	583.57
	Drainage – Sub-soil drainage	13710.93618	3195	m	33.88	23.09
	Drainage Culvert	0	0	No.	0.00	0.00
Traffic	Traffic Signals	686696.041	4	Item	109730.28	46200.63
Landscape	Tree Planting	32440.80085	80	No.	303.34	144.65
	Landscaping	34982.05224	1800	m2	21.61	8.60
	Topsoil Seeding	6430.420433	1800	m2	7.21	2.97
Street Lighting	Street Lighting (all Inclusive)	0	0	m	216.34	22.62
	Intersection	209650.952	4	Item/ Per Leg	48468.93	17332.00
Misc	Regulatory Signage	6717.488434	20	Item	338.43	101.75
	Linemarking	22517.11874	12040	m2 of Pavement	3.11	2.37
	Landscape maintenance (intersection)	48822.53057	1	Item	71344.66	40698.86
	Landscape maintenance (road)	0	0	m2	2.90	0.15
	Tactile Pavers	9367.026615	24	Item	292.43	66.31
		0	0		0	0
		0	0		0	0
Delivery	Council Fees	3.25	1	%	3.25	0
	VicRoads Fees	1	1	%	1	0
	Traffic Management	5	1	%	5	0
	Environmental Management	0.5	1	%	0.5	0
	Surveying and Design	5	1	%	5	0
	Supervision and Project management	9	1	%	9	0
	Site Establishment	2.5	1	%	2.5	0
	Contingency	15	1	%	15	0

Inputs		
Iterations	200000	
Last row Number with Data	42	
Outputs	Excl. Delivery	Incl Delivery
Median (50th Percentile)	4342502.681	6133785
Standard Deviation	481483.0894	
90th Percentile	4959548.088	7005361.7
65th Percentile	4528027.969	6395839.5
75th Percentile	4667258.09	6592502.1
Range of costs produced	3448157.253	4870522.1



MONTE CARLO ASSESMENT TEMPLATE

Description: INTERSECTION
Civil Component Number: 6
Date run: 26/02/2019
File name: Item 06 - Primary - Secondary Intersection.xlsm

Cardno
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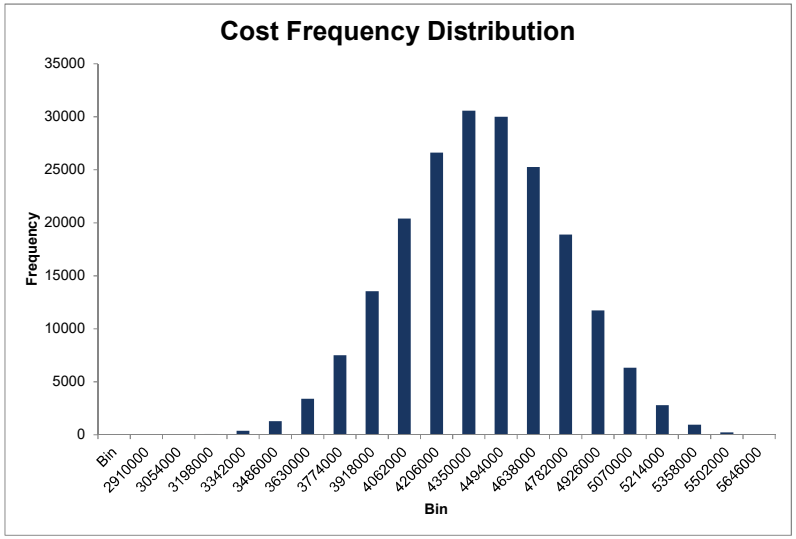
	Sub Item	MonteCarlo Value	Qty	Rate	Average	STD deviation
Sitework and Earth works	Site Preperation	-17273.65161	58862	m2	3.68	3.10
	Earthworks	284764.1941	10002.85	m3	34.07	15.63
Road Pavement	Primary Arterial Pavement	1392381.057	6840	m2	169.62	40.33
	Secondary Arterial Pavement	809364.7018	7150	m2	127.01	16.41
	Collector Arterial Pavement	0	0	m2	105.15	17.69
	Subgrade Preparation	32876.05999	2798	m2	14.22	4.70
	Pavement Rehab	0	0	m2	51.58	0.00
	Pavement Other	0	0	m2	0.00	0.00
Concrete Works	Kerb and Channel	137093.1168	1900	m	54.81	14.76
	Cycle Path	76294.11728	1120	m2	76.59	37.21
	SUP/ Footpath	16998.81391	735	m2	63.51	24.55
	Concrete Traffic Island/ paving	72576.61315	850	m2	77.60	15.71
Drainage	Drainage Pipe 300mm CR Bfilled	49653.4227	260	m	179.85	43.89
	Drainage Pipe 375mm CR Bfilled	0	0	m	259.10	57.84
	Drainage Pipe 450mm CR Bfilled	290863.1764	870	m	299.43	84.60
	Drainage Pipe 525mm CR Bfilled	0	0	m	403.86	107.07
	Drainage - pits	116866.0352	39	No.	2565.39	583.57
	Drainage – Sub-soil drainage	76805.83511	3000	m	33.88	23.09
	Drainage Culvert	0	0	No.	0.00	0.00
Traffic	Traffic Signals	239275.402	4	Item	109730.28	46200.63
Landscape	Tree Planting	24303.16593	62	No.	303.34	144.65
	Landscaping	81388.33869	2600	m2	21.61	8.60
	Topsoil Seeding	10061.19372	2600	m2	7.21	2.97
Street Lighting	Street Lighting (all Inclusive)	0	0	m	216.34	22.62
	Intersection	236360.8117	4	Item/ Per Leg	48468.93	17332.00
Misc	Regulatory Signage	6130.944876	16	Item	338.43	101.75
	Linemarking	30771.45642	13990	m2 of Pavement	3.11	2.37
	Landscape maintenance (intersection)	48822.53057	1	Item	71344.66	40698.86
	Landscape maintenance (road)	0	0	m2	2.90	0.15
	Tactile Pavers	6978.333544	24	Item	292.43	66.31
		0	0		0	0
		0	0		0	0
Delivery	Surveying and Design	3.25	1	%	3.250	0.000
	Contingency	1.000	1	%	1.000	0.000
	Traffic Management	5.000	1	%	5.000	0.000
	Supervision and Project management	0.500	1	%	0.500	0.000
	Council Fees	5	1	%	5	0
	VicRoads Fees	9	1	%	9	0
	Environmental Management	2.500	1	%	2.500	0.000
	Site Establishment	15	1	%	15	0

Inputs		
Iterations	200000	
Last row Number with Data	42	
Outputs	Excl. Delivery	Incl Delivery
Median (50th Percentile)	4332471.602	6119616.1
Standard Deviation	363486.0273	
90th Percentile	4798297.69	6777595.5
65th Percentile	4472530.208	6317448.9
75th Percentile	4577639.202	6465915.4
Range of costs produced	2864206.327	4045691.4



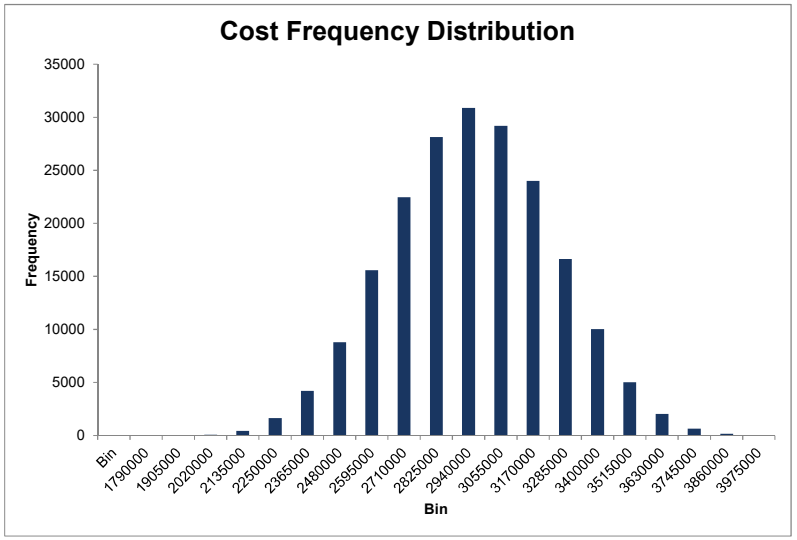
MONTE CARLO ASSESMENT TEMPLATE

Description:	INTERSECTION
Civil Component Number:	7
Date run:	26/02/2019
File name:	Item 07 - Primary - Connector Intersection.xlsm

Cardno
Shaping the Future

	Sub Item	MonteCarlo Value	Qty	Rate	Average	STD deviation
Siteworks and Earth works	Site Preperation	428234.9398	51843	m2	3.68	3.10
	Earthworks	150797.7293	4278	m3	34.07	15.63
Road Pavement	Primary Arterial Pavement	922480.7158	5250	m2	169.62	40.33
	Secondary Arterial Pavement	0	0	m2	127.01	16.41
	Collector Arterial Pavement	111696.3079	963	m2	105.15	17.69
	Subgrade Preparation	21071.1259	1242.6	m2	14.22	4.70
	Pavement Rehab	0	0	m2	51.58	0.00
	Pavement Other	0	0	m2	0.00	0.00
Concrete Works	Kerb and Channel	87358.79968	1492	m	54.81	14.76
	Cycle Path	124261.8956	1547	m2	76.59	37.21
	SUP/ Footpath	15451.96325	297	m2	63.51	24.55
	Concrete Traffic Island/ paving	269394.5468	2890	m2	77.60	15.71
Drainage	Drainage Pipe 300mm CR Bfilled	29136.21774	220	m	179.85	43.89
	Drainage Pipe 375mm CR Bfilled	0	0	m	259.10	57.84
	Drainage Pipe 450mm CR Bfilled	162203.9184	455	m	299.43	84.60
	Drainage Pipe 525mm CR Bfilled	0	0	m	403.86	107.07
	Drainage - pits	56900.74797	25	No.	2565.39	583.57
	Drainage – Sub-soil drainage	151832.0755	2342	m	33.88	23.09
	Drainage Culvert	0	0	No.	0.00	0.00
Traffic	Traffic Signals	462143.6689	4	Item	109730.28	46200.63
Landscape	Tree Planting	6802.254782	51	No.	303.34	144.65
	Landscaping	42268.44432	1232	m2	21.61	8.60
	Topsoil Seeding	7575.720765	1232	m2	7.21	2.97
Street Lighting	Street Lighting (all Inclusive)	0	0	m	216.34	22.62
	Intersection	115785.2737	4	Item/ Per Leg	48468.93	17332.00
Misc	Regulatory Signage	5955.032017	16	Item	338.43	101.75
	Linemarking	15607.32575	6213	m2 of Pavement	3.11	2.37
	Landscape maintenance (intersection)	92687.1582	1	Item	71344.66	40698.86
	Landscape maintenance (road)	0	0	m2	2.90	0.15
	Tactile Pavers	6183.622515	24	Item	292.43	66.31
Other		0	0			
		0	0		0	0
		0	0		0	0
Delivery	Council Fees	3.25	1	%	3.250	0.000
	VicRoads Fees	1.000	1	%	1.000	0.000
	Traffic Management	5.000	1	%	5.000	0.000
	Environmental Management	0.500	1	%	0.500	0.000
	Surveying and Design	5	1	%	5	0
	Supervision and Project management	9	1	%	9	0
	Site Establishment	2.500	1	%	2.500	0.000
	Contingency	15	1	%	15	0

Inputs		
Iterations	200000	
Last row Number with Data	42	
Outputs	Excl. Delivery	Incl Delivery
Median (50th Percentile)	2894516.02	4088503.9
Standard Deviation	287559.4137	
90th Percentile	3263038.236	4609041.5
65th Percentile	3005318.547	4245012.4
75th Percentile	3088471.897	4362466.6
Range of costs produced	2285645.625	3228474.4



MONTE CARLO ASSESMENT TEMPLATE

Description:	INTERSECTION
Civil Component Number:	8
Date run:	26/02/2019
File name:	Item 08 - Secondary - Secondary Intersection.xlsm

Cardno
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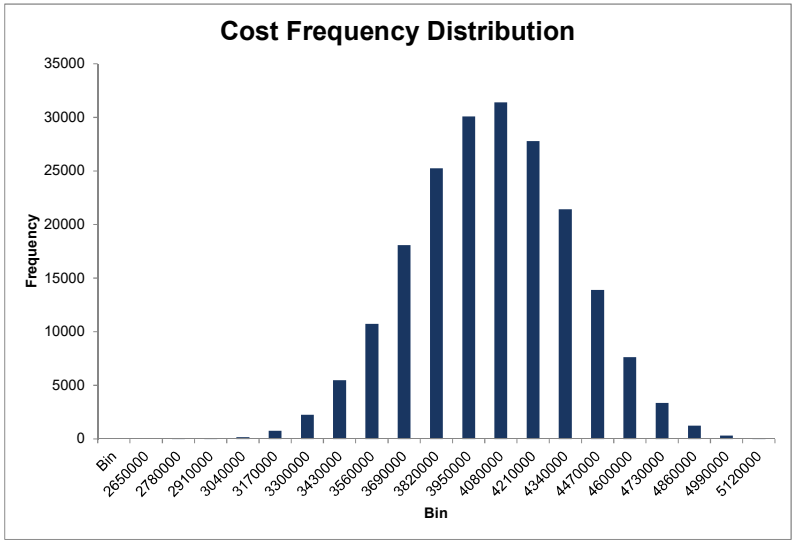
	Sub Item	MonteCarlo Value	Qty	Rate	Average	STD deviation
Siteworks and Earth works	Site Preperation	147301.6766	52316	m2	3.68	3.10
	Earthworks	404060.8281	9867	m3	34.07	15.63
Road Pavement	Primary Arterial Pavement	0	0	m2	169.62	40.33
	Secondary Arterial Pavement	1508068.396	13800	m2	127.01	16.41
	Collector Arterial Pavement	0	0	m2	105.15	17.69
	Subgrade Preparation	24615.4303	2760	m2	14.22	4.70
	Pavement Rehab	0	0	m2	51.58	0.00
	Pavement Other	0	0	m2	0.00	0.00
Concrete Works	Kerb and Channel	101379.3426	2000	m	54.81	14.76
	Cycle Path	0	0	m2	76.59	37.21
	SUP/ Footpath	60955.03435	1700	m2	63.51	24.55
	Concrete Traffic Island/ paving	41694.86165	680	m2	77.60	15.71
Drainage	Drainage Pipe 300mm CR Bfilled	36743.74992	260	m	179.85	43.89
	Drainage Pipe 375mm CR Bfilled	0	0	m	259.10	57.84
	Drainage Pipe 450mm CR Bfilled	205410.4639	900	m	299.43	84.60
	Drainage Pipe 525mm CR Bfilled	0	0	m	403.86	107.07
	Drainage - pits	103786.5076	40	No.	2565.39	583.57
	Drainage – Sub-soil drainage	128769.444	3100	m	33.88	23.09
	Drainage Culvert	0	0	No.	0.00	0.00
Traffic	Traffic Signals	314273.732	4	Item	109730.28	46200.63
Landscape	Tree Planting	23003.40736	60	No.	303.34	144.65
	Landscaping	50560.5026	3000	m2	21.61	8.60
	Topsoil Seeding	32102.4351	3000	m2	7.21	2.97
Street Lighting	Street Lighting (all Inclusive)	0	0	m	216.34	22.62
	Intersection	218726.9446	4	Item/ Per Leg	48468.93	17332.00
Misc	Regulatory Signage	3127.455313	16	Item	338.43	101.75
	Linemarking	64986.25088	13800	m2 of Pavement	3.11	2.37
	Landscape maintenance (intersection)	108598.9697	1	Item	71344.66	40698.86
	Landscape maintenance (road)	0	0	m2	2.90	0.15
	Tactile Pavers	6573.68185	24	Item	292.43	66.31
		0	0		0	0
		0	0		0	0
Delivery	Surveying and Design	5	1	%	5	0
	Contingency	15	1	%	15	0
	Traffic Management	5	1	%	5	0
	Supervision and Project management	9	1	%	9	0
	Council Fees	3.25	1	%	3.25	0
	VicRoads Fees	1	1	%	1	0
	Environmental Management	0.5	1	%	0.5	0
	Site Establishment	2.5	1	%	2.5	0

Inputs		
Iterations	200000	
Last row Number with Data	42	
Outputs	Excl. Delivery	Incl Delivery
Median (50th Percentile)	3978806.522	5620064.2
Standard Deviation	320281.8694	
90th Percentile	4389264.253	6199835.8
65th Percentile	4102217.682	5794382.5
75th Percentile	4194833.36	5925202.1
Range of costs produced	2577047.151	3640079.1



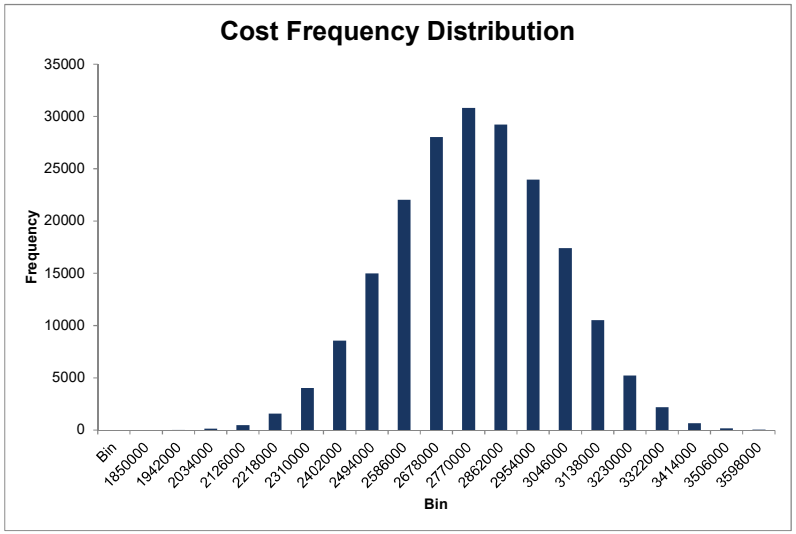
MONTE CARLO ASSESMENT TEMPLATE

Description:	INTERSECTION
Civil Component Number:	9
Date run:	26/02/2019
File name:	Item 09 - Secondary - Connector Intersection.xlsm

Cardno
Shaping the Future

	Sub Item	MonteCarlo Value	Qty	Rate	Average	STD deviation
Site Works and Earth Works	Site Preperation	208933.7691	36798	m2	3.68	3.10
	Earthworks	219361.2967	5025	m3	34.07	15.63
Road Pavement	Primary Arterial Pavement	0	0	m2	169.62	40.33
	Secondary Arterial Pavement	994413.5414	6970	m2	127.01	16.41
	Collector Arterial Pavement	78340.21286	962	m2	105.15	17.69
	Subgrade Preparation	44381.26791	3966	m2	14.22	4.70
	Pavement Rehab	0	0	m2	51.58	0.00
	Pavement Other	0	0	m2	0.00	0.00
Concrete Works	Kerb and Channel	107832.2171	2008	m	54.81	14.76
	Cycle Path	36441.35124	346	m2	76.59	37.21
	SUP/ Footpath	65306.80611	1166	m2	63.51	24.55
	Concrete Traffic Island/ paving	6365.796823	105	m2	77.60	15.71
Drainage	Drainage Pipe 300mm CR Bfilled	33199.08763	210	m	179.85	43.89
	Drainage Pipe 375mm CR Bfilled	0	0	m	259.10	57.84
	Drainage Pipe 450mm CR Bfilled	225880.4231	540	m	299.43	84.60
	Drainage Pipe 525mm CR Bfilled	0	0	m	403.86	107.07
	Drainage - pits	51221.37338	24	No.	2565.39	583.57
	Drainage – Sub-soil drainage	3668.567609	2548	m	33.88	23.09
	Drainage Culvert	0	0	No.	0.00	0.00
Traffic	Traffic Signals	615253.2764	4	Item	109730.28	46200.63
Landscape	Tree Planting	18844.10532	41	No.	303.34	144.65
	Landscaping	56547.97227	2468	m2	21.61	8.60
	Topsoil Seeding	25716.09775	2468	m2	7.21	2.97
Street Lighting	Street Lighting (all Inclusive)	0	0	m	216.34	22.62
	Intersection	192137.7373	4	Item/ Per Leg	48468.93	17332.00
Misc	Regulatory Signage	3977.263087	10	Item	338.43	101.75
	Linemarking	35078.26684	7932	m2 of Pavement	3.11	2.37
	Landscape maintenance (intersection)	58911.93736	1	Item	71344.66	40698.86
	Landscape maintenance (road)	0	0	m2	2.90	0.15
	Tactile Pavers	6696.908464	24	Item	292.43	66.31
		0	0		0	0
		0	0		0	0
Delivery	Council Fees	3.25	1	%	3.250	0.000
	VicRoads Fees	1.000	1	%	1.000	0.000
	Traffic Management	5.000	1	%	5.000	0.000
	Environmental Management	0.500	1	%	0.500	0.000
	Surveying and Design	5	1	%	5	0
	Supervision and Project management	9	1	%	9	0
	Site Establishment	2.500	1	%	2.500	0.000
	Contingency	15	1	%	15	0

Inputs		
Iterations	200000	
Last row Number with Data	42	
Outputs	Excl. Delivery	Incl Delivery
Median (50th Percentile)	2738455.169	3868067.9
Standard Deviation	230921.8223	
90th Percentile	3034393.392	4286080.7
65th Percentile	2827434.073	3993750.6
75th Percentile	2894209.571	4088071
Range of costs produced	1814275.743	2562664.5



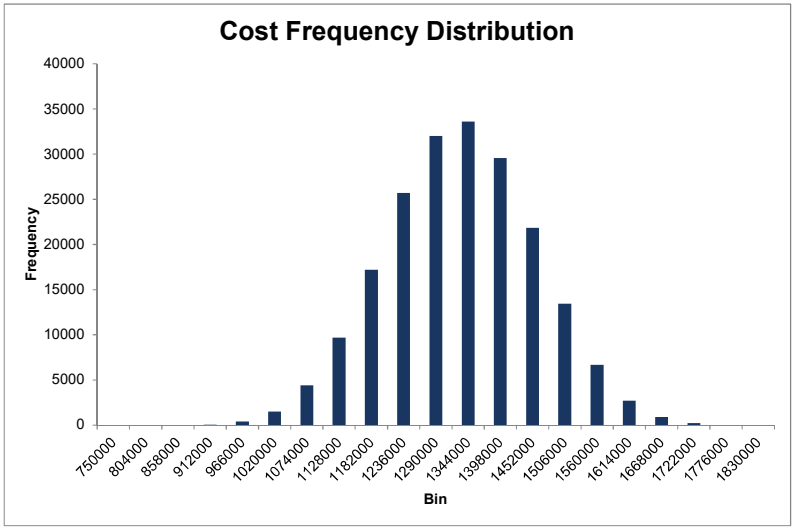
MONTE CARLO ASSESMENT TEMPLATE

Description:	INTERSECTION
Civil Component Number:	10
Date run:	26/02/2019
File name:	Item 10 - Connector - Connector Intersection.xlsm

Cardno
Shaping the Future

	Sub Item	MonteCarlo Value	Qty	Rate	Average	STD deviation
Siteworks and Earth works	Site Preperation	57421.76171	29216	m2	3.68	3.10
	Earthworks	60438.27968	1930	m3	34.07	15.63
Road Pavement	Primary Arterial Pavement	0	0	m2	169.62	40.33
	Secondary Arterial Pavement	0	0	m2	127.01	16.41
	Collector Arterial Pavement	364451.937	3604	m2	105.15	17.69
	Subgrade Preparation	5703.44461	721	m2	14.22	4.70
	Pavement Rehab	0	0	m2	51.58	0.00
	Pavement Other	0	0	m2	0.00	0.00
Concrete Works	Kerb and Channel	58752.83693	952	m	54.81	14.76
	Cycle Path	44822.15982	913	m2	76.59	37.21
	SUP/ Footpath	53940.99066	810	m2	63.51	24.55
	Concrete Traffic Island/ paving	0	0	m2	77.60	15.71
Drainage	Drainage Pipe 300mm CR Bfilled	7911.999869	39	m	179.85	43.89
	Drainage Pipe 375mm CR Bfilled	0	0	m	259.10	57.84
	Drainage Pipe 450mm CR Bfilled	65931.43313	245	m	299.43	84.60
	Drainage Pipe 525mm CR Bfilled	0	0	m	403.86	107.07
	Drainage - pits	24772.92995	10	No.	2565.39	583.57
	Drainage – Sub-soil drainage	21353.47025	952	m	33.88	23.09
	Drainage Culvert	0	0	No.	0.00	0.00
Traffic	Traffic Signals	0	0	Item	109730.28	46200.63
Landscape	Tree Planting	8644.47635	38	No.	303.34	144.65
	Landscaping	99883.60098	4198	m2	21.61	8.60
	Topsoil Seeding	49654.4614	4198	m2	7.21	2.97
Street Lighting	Street Lighting (all Inclusive)	0	0	m	216.34	22.62
	Intersection	176311.6673	4	Item/ Per Leg	48468.93	17332.00
Misc	Regulatory Signage	9060.596046	20	Item	338.43	101.75
	Linemarking	2728.599398	3604	m2 of Pavement	3.11	2.37
	Landscape maintenance (intersection)	78522.88344	1	Item	71344.66	40698.86
	Landscape maintenance (road)	0	0	m2	2.90	0.15
	Tactile Pavers	15987.10848	48	Item	292.43	66.31
		0	0		0	0
		0	0		0	0
Delivery	Council Fees	3.25	1	%	3.250	0.000
	VicRoads Fees	1.000	1	%	1.000	0.000
	Traffic Management	5.000	1	%	5.000	0.000
	Environmental Management	0.500	1	%	0.500	0.000
	Surveying and Design	5	1	%	5	0
	Supervision and Project management	9	1	%	9	0
	Site Establishment	2.500	1	%	2.500	0.000
	Contingency	15	1	%	15	0

Inputs		
Iterations	200000	
Last row Number with Data	42	
Outputs	Excl. Delivery	Incl Delivery
Median (50th Percentile)	1304225.686	1842218.8
Standard Deviation	124575.1934	
90th Percentile	1463875.22	2067723.7
65th Percentile	1352227.058	1910020.7
75th Percentile	1388250.377	1960903.7
Range of costs produced	1063565.078	1502285.7



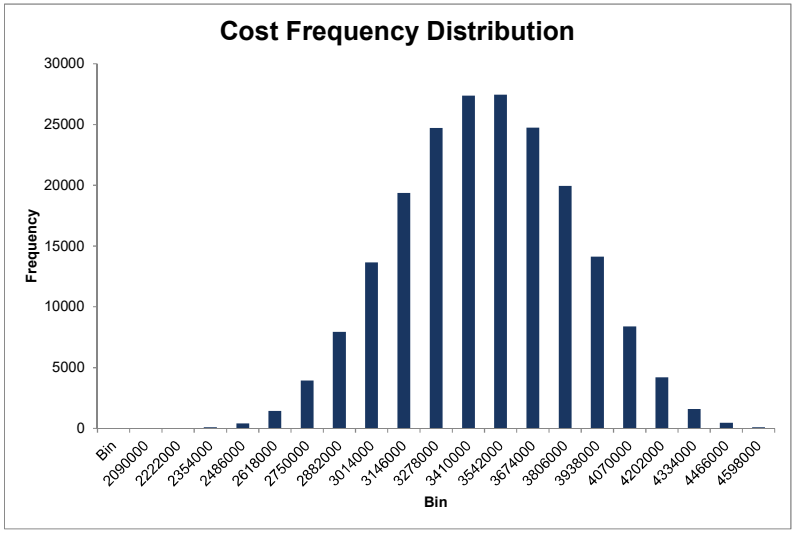
MONTE CARLO ASSESMENT TEMPLATE

Description: INTERSECTION
Civil Component Number: 11
Date run: 26/02/2019
File name: Item 11 - Primary - Primary T Intersection.xlsm

Cardno
Shaping the Future

	Sub Item	MonteCarlo Value	Qty	Rate	Average	STD deviation
Sitework s and Earth works	Site Preperation	73963.94195	53208	m2	3.68	3.10
	Earthworks	371794.1047	6218.355	m3	34.07	15.63
Road Pavement	Primary Arterial Pavement	1564064.079	8697	m2	169.62	40.33
	Secondary Arterial Pavement	0	0	m2	127.01	16.41
	Collector Arterial Pavement	0	0	m2	105.15	17.69
	Subgrade Preparation	28326.27648	1739.4	m2	14.22	4.70
	Pavement Rehab	0	0	m2	51.58	0.00
	Pavement Other	0	0	m2	0.00	0.00
Concrete Works	Kerb and Channel	82346.89655	1637	m	54.81	14.76
	Cycle Path	140119.8881	1765	m2	76.59	37.21
	SUP/ Footpath	0	0	m2	63.51	24.55
	Concrete Traffic Island/ paving	253761.9933	2972	m2	77.60	15.71
Drainage	Drainage Pipe 300mm CR Bfilled	50410.1543	200	m	179.85	43.89
	Drainage Pipe 375mm CR Bfilled	0	0	m	259.10	57.84
	Drainage Pipe 450mm CR Bfilled	154100.5359	550	m	299.43	84.60
	Drainage Pipe 525mm CR Bfilled	0	0	m	403.86	107.07
	Drainage - pits	66084.52514	27	No.	2565.39	583.57
	Drainage – Sub-soil drainage	21180.76443	2370	m	33.88	23.09
	Drainage Culvert	0	0	No.	0.00	0.00
Traffic	Traffic Signals	357173.6692	3	Item	109730.28	46200.63
Landscape	Tree Planting	7458.843032	83	No.	303.34	144.65
	Landscaping	88669.59007	3330	m2	21.61	8.60
	Topsoil Seeding	25012.43928	3330	m2	7.21	2.97
Street Lighting	Street Lighting (all Inclusive)	0	0	m	216.34	22.62
	Intersection	187337.4632	3	Item/ Per Leg	48468.93	17332.00
Misc	Regulatory Signage	3474.099954	9	Item	338.43	101.75
	Linemarking	40955.4655	8697	m2 of Pavement	3.11	2.37
	Landscape maintenance (intersection)	62083.83585	1	Item	71344.66	40698.86
	Landscape maintenance (road)	0	0	m2	2.90	0.15
	Tactile Pavers	3300.274335	18	Item	292.43	66.31
		0			0	0
		0	0		0	0
Delivery	Surveying and Design	5	1	%	5	2.929976286
	Contingency	15	1	%	15	4.238557298
	Traffic Management	5	1	%	5	1.79318485
	Supervision and Project management	9	1	%	9	7.305959964
	Council Fees	3.25	1	%	3.25	0
	VicRoads Fees	1	1	%	1	0
	Environmental Management	0.5	1	%	0.5	1.171409408
	Site Establishment	2.5	1	%	2.5	0

Inputs		
Iterations	200000	
Last row Number with Data	42	
Outputs	**Excl. Delivery**	**Incl Delivery**
Median (50th Percentile)	3415677.234	4824644.1
Standard Deviation	356897.9232	
90th Percentile	3873060.326	5470697.7
65th Percentile	3553197.308	5018891.2
75th Percentile	3656401.225	5164666.7
Range of costs produced	2614698.461	3693261.6



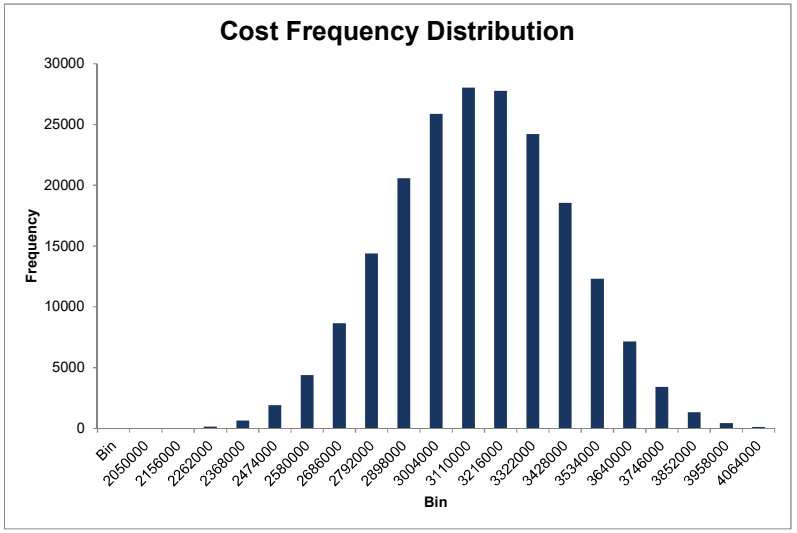
MONTE CARLO ASSESMENT TEMPLATE

Description: INTERSECTION
Civil Component Number: 12
Date run: 26/02/2019
File name: Item 12 - Primary - Secondary T Intersection.xlsm

Cardno
Shaping the Future

	Sub Item	MonteCarlo Value	Qty	Rate	Average	STD deviation
Site Works and Earth Works	Site Preperation	154719.907	49353	m2	3.68	3.10
	Earthworks	132758.9826	6034.6	m3	34.07	15.63
Road Pavement	Primary Arterial Pavement	865676.9032	5974	m2	169.62	40.33
	Secondary Arterial Pavement	331012.5507	2466	m2	127.01	16.41
	Collector Arterial Pavement	0	0	m2	105.15	17.69
	Subgrade Preparation	17315.38429	1688	m2	14.22	4.70
	Pavement Rehab	0	0	m2	51.58	0.00
	Pavement Other	0	0	m2	0.00	0.00
Concrete Works	Kerb and Channel	89173.13709	1543	m	54.81	14.76
	Cycle Path	91138.66102	1190	m2	76.59	37.21
	SUP/ Footpath	20468.52071	410	m2	63.51	24.55
	Concrete Traffic Island/ paving	58757.4552	1105	m2	77.60	15.71
Drainage	Drainage Pipe 300mm CR Bfilled	42275.07533	195	m	179.85	43.89
	Drainage Pipe 375mm CR Bfilled	0	0	m	259.10	57.84
	Drainage Pipe 450mm CR Bfilled	107885.0343	580	m	299.43	84.60
	Drainage Pipe 525mm CR Bfilled	0	0	m	403.86	107.07
	Drainage - pits	72065.46408	31	No.	2565.39	583.57
	Drainage – Sub-soil drainage	-9432.71771	2303	m	33.88	23.09
	Drainage Culvert	0	0	No.	0.00	0.00
Traffic	Traffic Signals	244253.8143	3	Item	109730.28	46200.63
Landscape	Tree Planting	23149.37061	72	No.	303.34	144.65
	Landscaping	77548.25102	3450	m2	21.61	8.60
	Topsoil Seeding	15114.11741	3450	m2	7.21	2.97
Street Lighting	Street Lighting (all Inclusive)	0	0	m	216.34	22.62
	Intersection	153256.5809	3	Item/ Per Leg	48468.93	17332.00
Misc	Regulatory Signage	4397.215672	9	Item	338.43	101.75
	Linemarking	11498.54243	8440	m2 of Pavement	3.11	2.37
	Landscape maintenance (intersection)	84850.70851	1	Item	71344.66	40698.86
	Landscape maintenance (road)	0	0	m2	2.90	0.15
	Tactile Pavers	4567.958079	18	Item	292.43	66.31
		0	0		0	0
		0	0		0	0
Delivery	Council Fees	3.25	1	%	3.25	0
	VicRoads Fees	1	1	%	1	0
	Traffic Management	5	1	%	5	0
	Environmental Management	0.5	1	%	0.5	0
	Surveying and Design	5	1	%	5	0
	Supervision and Project management	9	1	%	9	0
	Site Establishment	2.5	1	%	2.5	0
	Contingency	15	1	%	15	0

Inputs		
Iterations	200000	
Last row Number with Data	42	
Outputs	Excl. Delivery	Incl Delivery
Median (50th Percentile)	3092554.335	4368233
Standard Deviation	285623.1354	
90th Percentile	3458595.111	4885265.6
65th Percentile	3202610.774	4523687.7
75th Percentile	3285204.212	4640350.9
Range of costs produced	2117551.04	2991040.8



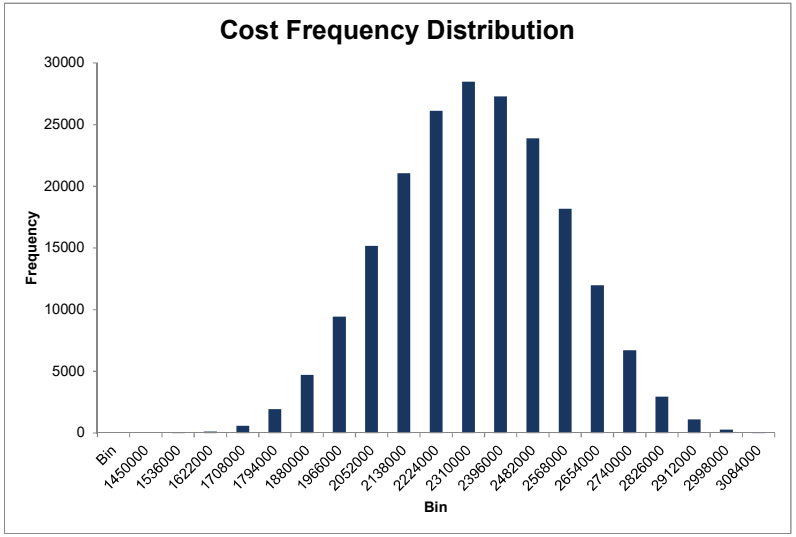
MONTE CARLO ASSESMENT TEMPLATE

Description: INTERSECTION
Civil Component Number: 13
Date run: 26/02/2019
File name: Item 13 - Primary - Connector T Intersection.xlsm

Cardno
Shaping the Future

	Sub Item	MonteCarlo Value	Qty	Rate	Average	STD deviation
Siteworks and Earthworks	Site Preperation	24841.9192	41601	m2	3.68	3.10
	Earthworks	142393.3993	4381	m3	34.07	15.63
Road Pavement	Primary Arterial Pavement	1249401.302	5295	m2	169.62	40.33
	Secondary Arterial Pavement	0	0	m2	127.01	16.41
	Collector Arterial Pavement	58166.04263	482	m2	105.15	17.69
	Subgrade Preparation	20998.64283	1155.4	m2	14.22	4.70
	Pavement Rehab	0	0	m2	51.58	0.00
	Pavement Other	0	0	m2	0.00	0.00
Concrete Works	Kerb and Channel	58992.14415	1607	m	54.81	14.76
	Cycle Path	154936.8289	1225	m2	76.59	37.21
	SUP/ Footpath	6485.90424	120	m2	63.51	24.55
	Concrete Traffic Island/ paving	43069.17642	675	m2	77.60	15.71
Drainage	Drainage Pipe 300mm CR Bfilled	25016.81054	165	m	179.85	43.89
	Drainage Pipe 375mm CR Bfilled	0	0	m	259.10	57.84
	Drainage Pipe 450mm CR Bfilled	128003.6061	410	m	299.43	84.60
	Drainage Pipe 525mm CR Bfilled	0	0	m	403.86	107.07
	Drainage - pits	46219.50453	19	No.	2565.39	583.57
	Drainage – Sub-soil drainage	61558.99858	2107	m	33.88	23.09
	Drainage Culvert	0	0	No.	0.00	0.00
Traffic	Traffic Signals	414127.8893	3	Item	109730.28	46200.63
Landscape	Tree Planting	20097.46729	53	No.	303.34	144.65
	Landscaping	62964.5411	2456	m2	21.61	8.60
	Topsoil Seeding	5724.323931	2456	m2	7.21	2.97
Street Lighting	Street Lighting (all Inclusive)	0	0	m	216.34	22.62
	Intersection	89234.50388	3	Item/ Per Leg	48468.93	17332.00
Misc	Regulatory Signage	1618.794321	6	Item	338.43	101.75
	Linemarking	13074.16179	5777	m2 of Pavement	3.11	2.37
	Landscape maintenance (intersection)	95065.63991	1	Item	71344.66	40698.86
	Landscape maintenance (road)	0	0	m2	2.90	0.15
	Tactile Pavers	7119.548467	18	Item	292.43	66.31
		0			0	0
		0	0		0	0
Delivery	Council Fees	3.25	1	%	3.25	0
	VicRoads Fees	1	1	%	1	0
	Traffic Management	5	1	%	5	0
	Environmental Management	0.5	1	%	0.5	0
	Surveying and Design	5	1	%	5	0
	Supervision and Project management	9	1	%	9	0
	Site Establishment	2.5	1	%	2.5	0
	Contingency	15	1	%	15	0

Inputs		
Iterations	200000	
Last row Number with Data	42	
Outputs	Excl. Delivery	Incl Delivery
Median (50th Percentile)	2287358.042	3230893.2
Standard Deviation	229249.4	
90th Percentile	2581152.969	3645878.6
65th Percentile	2375692.527	3355665.7
75th Percentile	2441984.412	3449303
Range of costs produced	1711243.331	2417131.2



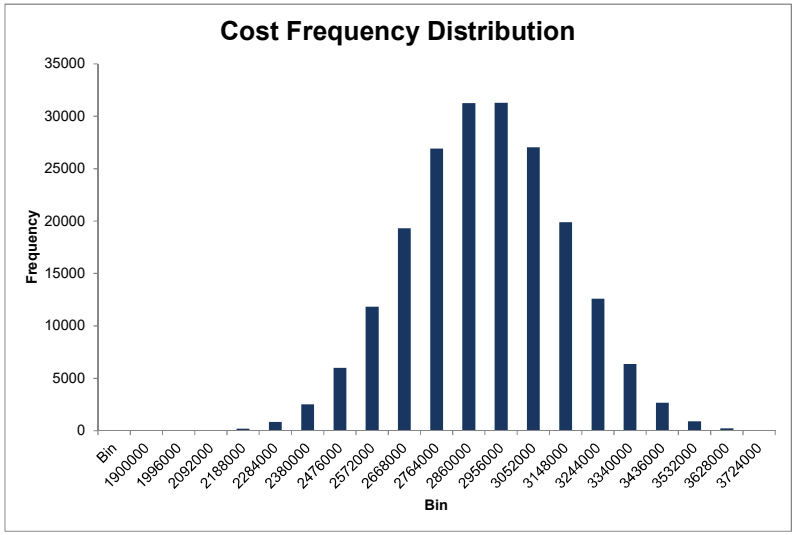
MONTE CARLO ASSESMENT TEMPLATE

Description: INTERSECTION
Civil Component Number: 14
Date run: 26/02/2019
File name: Item 14 - Secondary Arterial - Secondary Arterial T Intersection.xlsm

Cardno
Shaping the Future

	Sub Item	MonteCarlo Value	Qty	Rate	Average	STD deviation
Siteworks and Earthworks	Site Preperation	36278.256	43060	m2	3.68	3.10
	Earthworks	241032.2677	6544.395	m3	34.07	15.63
Road Pavement	Primary Arterial Pavement	0	0	m2	169.62	40.33
	Secondary Arterial Pavement	1363936.858	9153	m2	127.01	16.41
	Collector Arterial Pavement	0	0	m2	105.15	17.69
	Subgrade Preparation	39409.81559	1830.6	m2	14.22	4.70
	Pavement Rehab	0	0	m2	51.58	0.00
	Pavement Other	0	0	m2	0.00	0.00
Concrete Works	Kerb and Channel	113676.8999	1650	m	54.81	14.76
	Cycle Path	0	0	m2	76.59	37.21
	SUP/ Footpath	99033.7571	1100	m2	63.51	24.55
	Concrete Traffic Island/ paving	54743.83232	688	m2	77.60	15.71
Drainage	Drainage Pipe 300mm CR Bfilled	51411.71397	220	m	179.85	43.89
	Drainage Pipe 375mm CR Bfilled	0	0	m	259.10	57.84
	Drainage Pipe 450mm CR Bfilled	163409.6081	660	m	299.43	84.60
	Drainage Pipe 525mm CR Bfilled	0	0	m	403.86	107.07
	Drainage - pits	64698.50074	33	No.	2565.39	583.57
	Drainage – Sub-soil drainage	39002.59029	2430	m	33.88	23.09
	Drainage Culvert	0	0	No.	0.00	0.00
Traffic	Traffic Signals	533738.2745	3	Item	109730.28	46200.63
Landscape	Tree Planting	17957.49344	54	No.	303.34	144.65
	Landscaping	78729.26704	2640	m2	21.61	8.60
	Topsoil Seeding	26835.4741	2640	m2	7.21	2.97
Street Lighting	Street Lighting (all Inclusive)	0	0	m	216.34	22.62
	Intersection	130883.314	3	Item/ Per Leg	48468.93	17332.00
Misc	Regulatory Signage	3091.751454	9	Item	338.43	101.75
	Linemarking	38620.81277	9153	m2 of Pavement	3.11	2.37
	Landscape maintenance (intersection)	84850.70851	1	Item	71344.66	40698.86
	Landscape maintenance (road)	0	0	m2	2.90	0.15
	Tactile Pavers	6185.411833	18	Item	292.43	66.31
		0	0		0	0
		0	0		0	0
Delivery	Council Fees	3.25	1	%	3.25	0
	VicRoads Fees	1	1	%	1	0
	Traffic Management	5	1	%	5	0
	Environmental Management	0.5	1	%	0.5	0
	Surveying and Design	5	1	%	5	0
	Supervision and Project management	9	1	%	9	0
	Site Establishment	2.5	1	%	2.5	0
	Contingency	15	1	%	15	0

Inputs		
Iterations	200000	
Last row Number with Data	42	
Outputs	Excl. Delivery	Incl Delivery
Median (50th Percentile)	2863545.858	4044758.5
Standard Deviation	232851.5965	
90th Percentile	3161957.186	4466264.5
65th Percentile	2953268.344	4171491.5
75th Percentile	3020601.873	4266600.1
Range of costs produced	1912346.495	2701189.4



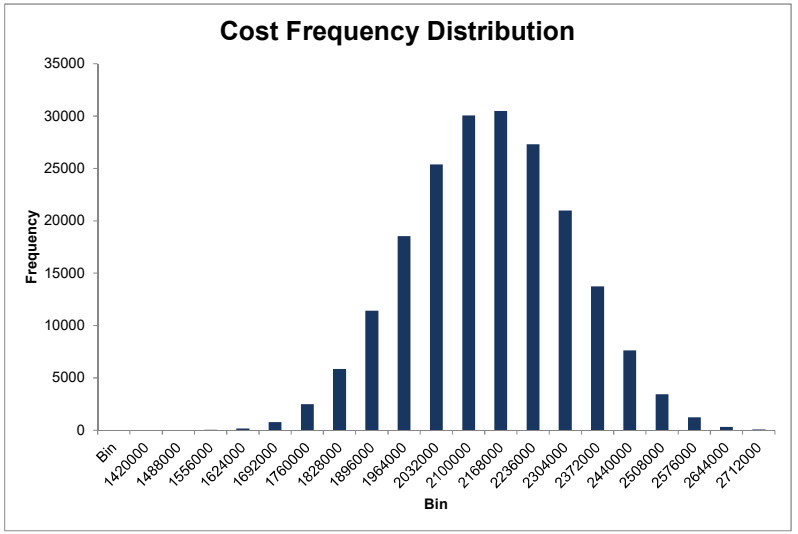
MONTE CARLO ASSESMENT TEMPLATE

Description: INTERSECTION
Civil Component Number: 15
Date run: 26/02/2019
File name: Item 15 - Secondary - Connector T Intersection.xlsm

Cardno
Shaping the Future

	Sub Item	MonteCarlo Value	Qty	Rate	Average	STD deviation
Siteworks and Earthworks	Site Preperation	215725.3411	36110	m2	3.68	3.10
	Earthworks	129100.6317	4905	m3	34.07	15.63
Road Pavement	Primary Arterial Pavement	0	0	m2	169.62	40.33
	Secondary Arterial Pavement	708562.2337	5915	m2	127.01	16.41
	Collector Arterial Pavement	56980.61484	482	m2	105.15	17.69
	Subgrade Preparation	13123.99446	1279.4	m2	14.22	4.70
	Pavement Rehab	0	0	m2	51.58	0.00
	Pavement Other	0	0	m2	0.00	0.00
Concrete Works	Kerb and Channel	86044.81238	1460	m	54.81	14.76
	Cycle Path	22355.67644	170	m2	76.59	37.21
	SUP/ Footpath	62598.18669	940	m2	63.51	24.55
	Concrete Traffic Island/ paving	33418.16754	485	m2	77.60	15.71
Drainage	Drainage Pipe 300mm CR Bfilled	24251.9805	140	m	179.85	43.89
	Drainage Pipe 375mm CR Bfilled	0	0	m	259.10	57.84
	Drainage Pipe 450mm CR Bfilled	125100.0057	450	m	299.43	84.60
	Drainage Pipe 525mm CR Bfilled	0	0	m	403.86	107.07
	Drainage - pits	63755.99058	21	No.	2565.39	583.57
	Drainage – Sub-soil drainage	61855.10401	1960	m	33.88	23.09
	Drainage Culvert	0	0	No.	0.00	0.00
Traffic	Traffic Signals	378873.9173	3	Item	109730.28	46200.63
Landscape	Tree Planting	10934.48131	41	No.	303.34	144.65
	Landscaping	60036.25017	2386	m2	21.61	8.60
	Topsoil Seeding	8523.879529	2386	m2	7.21	2.97
Street Lighting	Street Lighting (all Inclusive)	0	0	m	216.34	22.62
	Intersection	133575.3578	3	Item/ Per Leg	48468.93	17332.00
Misc	Regulatory Signage	1425.349467	5	Item	338.43	101.75
	Linemarking	29190.14352	6397	m2 of Pavement	3.11	2.37
	Landscape maintenance (intersection)	53440.69318	1	Item	71344.66	40698.86
	Landscape maintenance (road)	0	0	m2	2.90	0.15
	Tactile Pavers	4171.037244	18	Item	292.43	66.31
		0	0		0	0
		0	0		0	0
Delivery	Surveying and Design	5	1	%	5	2.929976286
	Contingency	15	1	%	15	4.238557298
	Traffic Management	5	1	%	5	1.79318485
	Supervision and Project management	9	1	%	9	7.305959964
	Council Fees	3.25	1	%	3.25	0
	VicRoads Fees	1	1	%	1	0
	Environmental Management	0.5	1	%	0.5	1.171409408
	Site Establishment	2.5	1	%	2.5	0

Inputs		
Iterations	200000	
Last row Number with Data	42	
Outputs	Excl. Delivery	Incl Delivery
Median (50th Percentile)	2112132.231	2983386.8
Standard Deviation	169375.3397	
90th Percentile	2329195.463	3289988.6
65th Percentile	2177396.016	3075571.9
75th Percentile	2226374.162	3144753.5
Range of costs produced	1352999.385	1911111.6



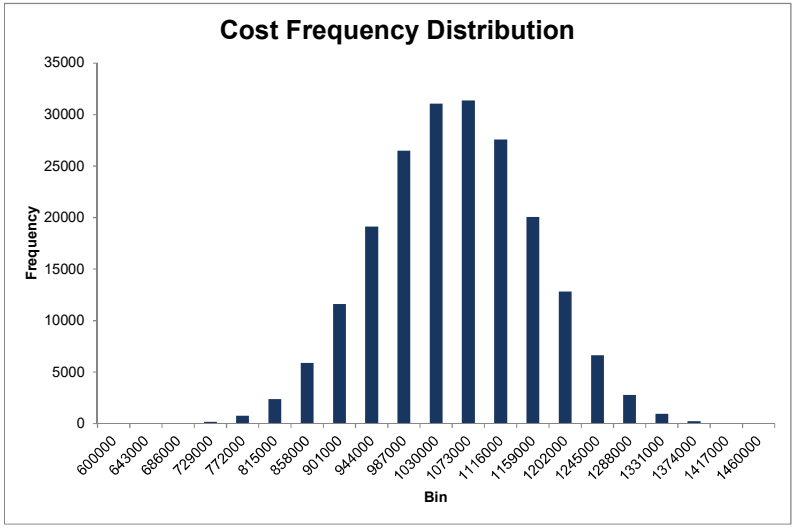
MONTE CARLO ASSESMENT TEMPLATE

Description:	INTERSECTION
Civil Component Number:	16
Date run:	26/02/2019
File name:	Item 16 - Connector - Connector T Intersection.xlsm

Cardno
Shaping the Future

	Sub Item	MonteCarlo Value	Qty	Rate	Average	STD deviation
Siteworks and Earthworks	Site Preperation	127117.9411	26980	m2	3.68	3.10
	Earthworks	31855.46793	1448	m3	34.07	15.63
Road Pavement	Primary Arterial Pavement	0	0	m2	169.62	40.33
	Secondary Arterial Pavement	0	0	m2	127.01	16.41
	Collector Arterial Pavement	338443.782	2706	m2	105.15	17.69
	Subgrade Preparation	9041.879951	542	m2	14.22	4.70
	Pavement Rehab	0	0	m2	51.58	0.00
	Pavement Other	0	0	m2	0.00	0.00
Concrete Works	Kerb and Channel	47950.98321	696	m	54.81	14.76
	Cycle Path	13205.46511	705	m2	76.59	37.21
	SUP/ Footpath	66848.94181	851	m2	63.51	24.55
	Concrete Traffic Island/ paving	0	0	m2	77.60	15.71
Drainage	Drainage Pipe 300mm CR Bfilled	6279.682394	26	m	179.85	43.89
	Drainage Pipe 375mm CR Bfilled	0	0	m	259.10	57.84
	Drainage Pipe 450mm CR Bfilled	65594.5516	184	m	299.43	84.60
	Drainage Pipe 525mm CR Bfilled	0	0	m	403.86	107.07
	Drainage - pits	25165.86019	8	No.	2565.39	583.57
	Drainage – Sub-soil drainage	17818.95375	696	m	33.88	23.09
	Drainage Culvert	0	0	No.	0.00	0.00
Traffic	Traffic Signals	0	0	Item	109730.28	46200.63
Landscape	Tree Planting	6355.985112	35	No.	303.34	144.65
	Landscaping	90672.24676	2970	m2	21.61	8.60
	Topsoil Seeding	17544.81479	2970	m2	7.21	2.97
Street Lighting	Street Lighting (all Inclusive)	0	0	m	216.34	22.62
	Intersection	72348.68821	3	Item/ Per Leg	48468.93	17332.00
Misc	Regulatory Signage	4040.19693	20	Item	338.43	101.75
	Linemarking	12155.69514	2706	m2 of Pavement	3.11	2.37
	Landscape maintenance (intersection)	88131.43458	1	Item	71344.66	40698.86
	Landscape maintenance (road)	0	0	m2	2.90	0.15
	Tactile Pavers	12274.98542	48	Item	292.43	66.31
		0	0		0	0
		0	0		0	0
Delivery	Council Fees	3.25	1	%	3.25	0.00
	VicRoads Fees	1.00	1	%	1.00	0.00
	Traffic Management	5.00	1	%	5.00	0.00
	Environmental Management	0.50	1	%	0.50	0.00
	Surveying and Design	5.00	1	%	5.00	0.00
	Supervision and Project management	9.00	1	%	9.00	0.00
	Site Establishment	2.50	1	%	2.50	0.00
	Contingency	15.00	1	%	15.00	0.00

Inputs		
Iterations	200000	
Last row Number with Data	42	
Outputs	Excl. Delivery	Incl Delivery
Median (50th Percentile)	1033408.397	1459689.4
Standard Deviation	104142.4165	
90th Percentile	1166872.274	1648207.1
65th Percentile	1073536.601	1516370.4
75th Percentile	1103651.389	1558907.6
Range of costs produced	853188.4124	1205128.6



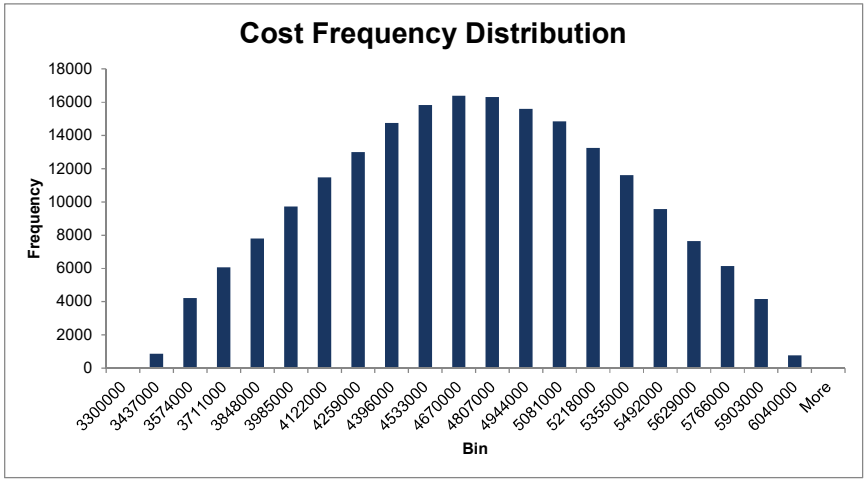
MONTE CARLO ASSESMENT TEMPLATE

Description:	BRIDGE - 50m - Primary
Civil Component Number:	17
Date run:	26/02/2019
File name:	Item 17 - BRIDGE - 50m - Primary.xlsm

Cardno
Shaping the Future

	Sub Item	MonteCarlo Value	Qty	Rate	Average	STD deviation
Site work and Earth work	Site Preperation	25462.73548	7923	m2	3.68	3.10
	Earthworks	690347.5386	13262	m3	50.07	4.81
On-Structure Works	Retaining Walls, abutments, footings	0	0	No.	369439.34	49128.25
	Bridge Deck	0	0	m2	1258.48	847.16
	Guard Rails/ Balustrade	0	0	Item.	2355.21	715.69
	Transition Slab	66850.61846	2	No.	33425.31	0.00
	Overall Super T Cost	3212017.565	865	m2	4425.57	846.28
Off Structure	Guard Rails/ Balustrade	47804.52671	240	m	187.10	39.57
	GREAT Terminal	-447.0901928	4	No.	8767.42	5398.17
	Off structure barrier	0	0	Item.	1565.45	788.88
Other		0	0		0	0
		0	0		0	0
		0	0		0	0
Delivery	Council Fees	3.25	1	%	3.250	0.000
	VicRoads Fees	1	1	%	1.000	0.000
	Traffic Management	5	1	%	5.000	0.000
	Environmental Management	0.5	1	%	0.500	0.000
	Surveying and Design	5	1	%	5.000	0.000
	Supervision and Project management	9	1	%	9.000	0.000
	Site Establishment	2.5	1	%	2.500	0.000
	Contingency	20	1	%	20.000	0.000

Inputs		
Iterations	200000	
Last row Number with Data	22	
Outputs	Excl. Delivery	Incl Delivery
Median	4669346.428	6828919.2
Standard Deviation	590025.3465	
90th Percentile	5425494.334	7934785.5
75th Percentile	5067312.477	7410944.5
50th Percentile	4669346.428	6828919.2
Range of costs produced	2729249.889	



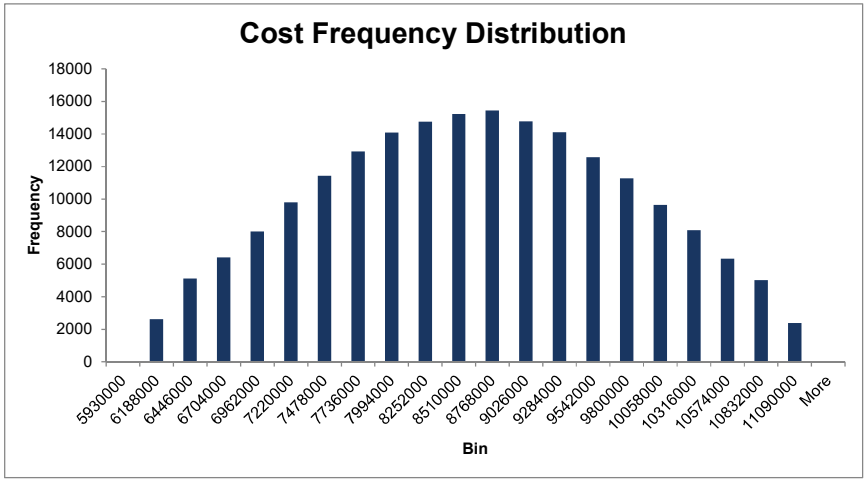
MONTE CARLO ASSESMENT TEMPLATE

Description:	BRIDGE - 100m - Primary
Civil Component Number:	18
Date run:	26/02/2019
File name:	Item 18 - BRIDGE - 100m - Primary.xlsm

Cardno
Shaping the Future

	Sub Item	MonteCarlo Value	Qty	Rate	Average	STD deviation
Site work and Earth work	Site Preperation	6750.573117	9348	m2	3.68	3.10
	Earthworks	616950.2221	13262	m3	50.07	4.81
On-Structure Works	Retaining Walls, abutments, footings	0	0	No.	369439.34	49128.25
	Bridge Deck	0	0	m2	1258.48	847.16
	Guard Rails/ Balustrade	0	0	Item.	2355.21	715.69
	Transition Slab	66850.61846	2	No.	33425.31	0.00
	Overall Super T Cost	8300293.249	1730	m2	4425.57	846.28
Off Structure	Guard Rails/ Balustrade	46578.31256	240	m	187.10	39.57
	GREAT Terminal	20505.65544	4	No.	8767.42	5398.17
	Off structure barrier	0	0	Item.	1565.45	788.88
Other		0	0		0	0
		0	0		0	0
		0	0		0	0
Delivery	Council Fees	3.25	1	%	3.250	0.000
	VicRoads Fees	1	1	%	1.000	0.000
	Traffic Management	5	1	%	5.000	0.000
	Environmental Management	0.5	1	%	0.500	0.000
	Surveying and Design	5	1	%	5.000	0.000
	Supervision and Project management	9	1	%	9.000	0.000
	Site Establishment	2.5	1	%	2.500	0.000
	Contingency	20	1	%	20.000	0.000

Inputs		
Iterations	200000	
Last row Number with Data	22	
Outputs	Excl. Delivery	Incl Delivery
Median	8502451.65	12434836
Standard Deviation	1177583.947	
90th Percentile	10011586.2	14641945
75th Percentile	9296719.952	13596453
50th Percentile	8502451.65	10734345
Range of costs produced	5150829.691	



MONTE CARLO ASSESMENT TEMPLATE

Description:	BRIDGE - 50m - Secondary
Civil Component Number:	19
Date run:	26/02/2019
File name:	Item 19 - BRIDGE - 50m - Secondary.xlsm

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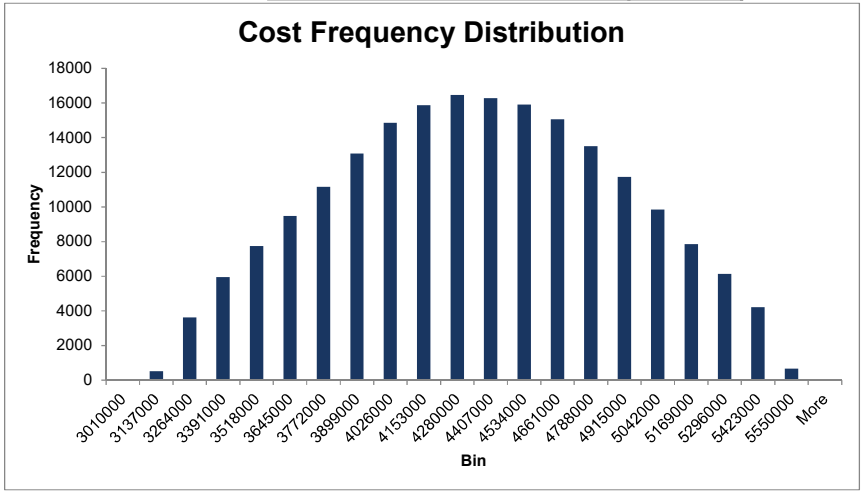
	Sub Item	MonteCarlo Value	Qty	Rate	Average	STD deviation
Site work and Earth work	Site Preperation	-8564.612771	7506	m2	3.68	3.10
	Earthworks	695892.6568	12313	m3	50.07	4.81
On-Structure Works	Retaining Walls, abutments, footings	0	0	No.	369439.34	49128.25
	Bridge Deck	0	0	m2	1258.48	847.16
	Guard Rails/ Balustrade	0	0	Item.	2355.21	715.69
	Transition Slab	66850.61846	2	No.	33425.31	0.00
	Overall Super T Cost	2858275.997	790	m2	4425.57	846.28
Off Structure	Guard Rails/ Balustrade	45379.50913	240	m	187.10	39.57
	GREAT Terminal	13596.68958	4	No.	8767.42	5398.17
	Off structure barrier	0	0	Item.	1565.45	788.88
Other		0	0		0	0
		0	0		0	0
		0	0		0	0
Delivery	Council Fees	3.25	1	%	3.250	0.000
	VicRoads Fees	1	1	%	1.000	0.000
	Traffic Management	5	1	%	5.000	0.000
	Environmental Management	0.5	1	%	0.500	0.000
	Surveying and Design	5	1	%	5.000	0.000
	Supervision and Project management	9	1	%	9.000	0.000
	Site Establishment	2.5	1	%	2.500	0.000
	Contingency	20	1	%	20.000	0.000

Inputs		
Iterations	200000	
Last row Number with Data	22	
Outputs	Excl. Delivery	Incl Delivery
Median	4289877.698	6273946.133
Standard Deviation	541359.4192	
90th Percentile	4,983,657.71	7288599.399
75th Percentile	4655019.077	6807965.4
50th Percentile	4289877.698	6273946.133
Range of costs produced	2527865.567	3697003.392



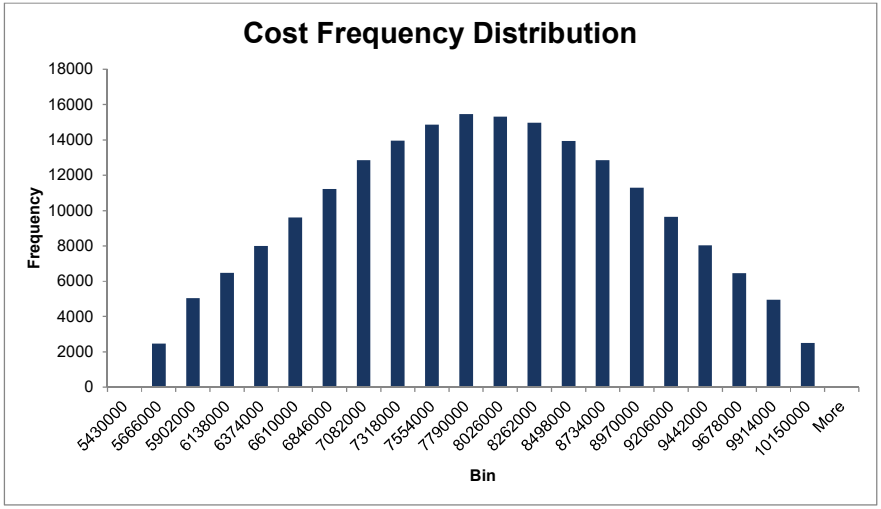
MONTE CARLO ASSESMENT TEMPLATE

Description:	BRIDGE - 100m - Secondary
Civil Component Number:	20
Date run:	26/02/2019
File name:	Item 20 - BRIDGE - 100m - Secondary.xlsm

Cardno
Shaping the Future

	Sub Item	MonteCarlo Value	Qty	Rate	Average	STD deviation
Site work and Earth work	Site Preperation	34676.56949	8856	m2	3.68	3.10
	Earthworks	616534.3843	12313	m3	50.07	4.81
On-Structure Works	Retaining Walls, abutments, footings	0	0	No.	369439.34	49128.25
	Bridge Deck	0	0	m2	1258.48	847.16
	Guard Rails/ Balustrade	0	0	Item.	2355.21	715.69
	Transition Slab	66850.61846	2	No.	33425.31	0.00
	Overall Super T Cost	5768432.82	1580	m2	4425.57	846.28
Off Structure	Guard Rails/ Balustrade	53965.52799	240	m	187.10	39.57
	GREAT Terminal	7397.570829	4	No.	8767.42	5398.17
	Off structure barrier	0	0	Item.	1565.45	788.88
Other		0	0		0	0
		0	0		0	0
		0	0		0	0
Delivery	Council Fees	3.25	1	%	3.250	0.000
	VicRoads Fees	1	1	%	1.000	0.000
	Traffic Management	5	1	%	5.000	0.000
	Environmental Management	0.5	1	%	0.500	0.000
	Surveying and Design	5	1	%	5.000	0.000
	Supervision and Project management	9	1	%	9.000	0.000
	Site Establishment	2.5	1	%	2.500	0.000
	Contingency	20	1	%	20.000	0.000

Inputs		
Iterations	200000	
Last row Number with Data	22	
Outputs	Excl. Delivery	Incl Delivery
Median	7790059.187	11392961.6
Standard Deviation	1076174.714	
90th Percentile	9169232.576	13410002.6
75th Percentile	8515928.001	12454544.7
50th Percentile	7790059.187	11392961.6
Range of costs produced	4705438.67	



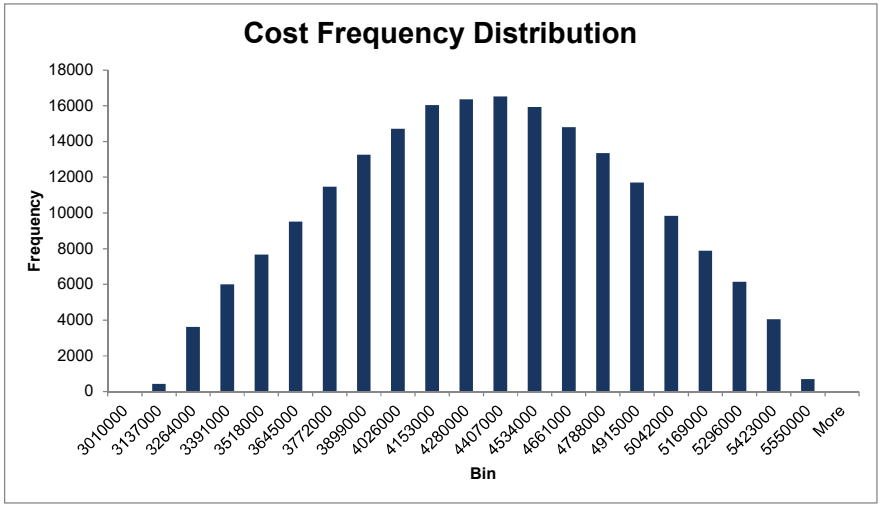
MONTE CARLO ASSESMENT TEMPLATE

Description:	BRIDGE - 50m - Connector
Civil Component Number:	21
Date run:	26/02/2019
File name:	Item 21 - BRIDGE - 50m - Connector.xlsm

Cardno
Shaping the Future

	Sub Item	MonteCarlo Value	Qty	Rate	Average	STD deviation
Site work and Earth work	Site Preperation	35364.98392	7506	m2	3.68	3.10
	Earthworks	634615.5602	12313	m3	50.07	4.81
On-Structure Works	Retaining Walls, abutments, footings	0	0	No.	369439.34	49128.25
	Bridge Deck	0	0	m2	1258.48	847.16
	Guard Rails/ Balustrade	0	0	Item.	2355.21	715.69
	Transition Slab	66850.61846	2	No.	33425.31	0.00
	Overall Super T Cost	3614114.505	790	m2	4425.57	846.28
Off Structure	Guard Rails/ Balustrade	35059.44738	240	m	187.10	39.57
	GREAT Terminal	31809.86086	4	No.	8767.42	5398.17
	Off structure barrier	0	0	Item.	1565.45	788.88
Other		0	0		0	0
		0	0		0	0
		0	0		0	0
Delivery	Council Fees	3.25	1	%	3.250	0.000
	VicRoads Fees	1	1	%	1.000	0.000
	Traffic Management	5	1	%	5.000	0.000
	Environmental Management	0.5	1	%	0.500	0.000
	Surveying and Design	5	1	%	5.000	0.000
	Supervision and Project management	9	1	%	9.000	0.000
	Site Establishment	2.5	1	%	2.500	0.000
	Contingency	20	1	%	20.000	0.000

Inputs		
Iterations	200000	
Last row Number with Data	22	
Outputs	Excl. Delivery	Incl Delivery
Median	4287446.72	6270390.83
Standard Deviation	540611.0442	
90th Percentile	4980267.65	7283641.44
75th Percentile	4652083.329	6803671.87
50th Percentile	4287446.72	6270390.83
Range of costs produced	2513775.42	



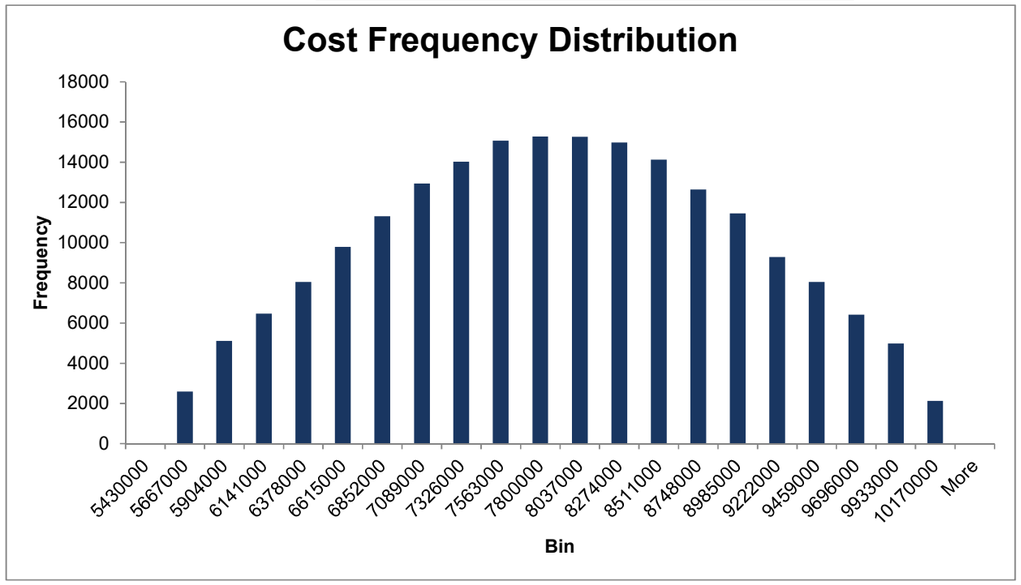
MONTE CARLO ASSESMENT TEMPLATE

Description:	BRIDGE - 100m - Connector
Civil Component Number:	22
Date run:	26/02/2019
File name:	Item 22 - BRIDGE - 100m - Connector.xlsm

Cardno
Shaping the Future

	Sub Item	MonteCarlo Value	Qty	Rate	Average	STD deviation
Site work and Earth work	Site Preperation	22760.90277	8856	m2	3.68	3.10
	Earthworks	630002.5987	12313	m3	50.07	4.81
On-Structure Works	Retaining Walls, abutments, footings	0	0	No.	369439.34	49128.25
	Bridge Deck	0	0	m2	1258.48	847.16
	Guard Rails/ Balustrade	0	0	Item.	2355.21	715.69
	Transition Slab	66850.61846	2	No.	33425.31	0.00
	Overall Super T Cost	7693585.124	1580	m2	4425.57	846.28
Off Structure	Guard Rails/ Balustrade	34642.6324	240	m	187.10	39.57
	GREAT Terminal	26749.59196	4	No.	8767.42	5398.17
	Off structure barrier	0	0	Item.	1565.45	788.88
Other		0	0		0	0
		0	0		0	0
		0	0		0	0
Delivery	Council Fees	3.25	1	%	3.250	0.000
	VicRoads Fees	1	1	%	1.000	0.000
	Traffic Management	5	1	%	5.000	0.000
	Environmental Management	0.5	1	%	0.500	0.000
	Surveying and Design	5	1	%	5.000	0.000
	Supervision and Project management	9	1	%	9.000	0.000
	Site Establishment	2.5	1	%	2.500	0.000
	Contingency	20	1	%	20.000	0.000

Inputs		
Iterations	200000	
Last row Number with Data	22	
Outputs	Excl. Delivery	Incl Delivery
Median	7789522.329	11392176
Standard Deviation	1078631.881	
90th Percentile	9171844.705	13413823
75th Percentile	8517048.477	12456183
50th Percentile	7789522.329	11392176
Range of costs produced	4729902.61	



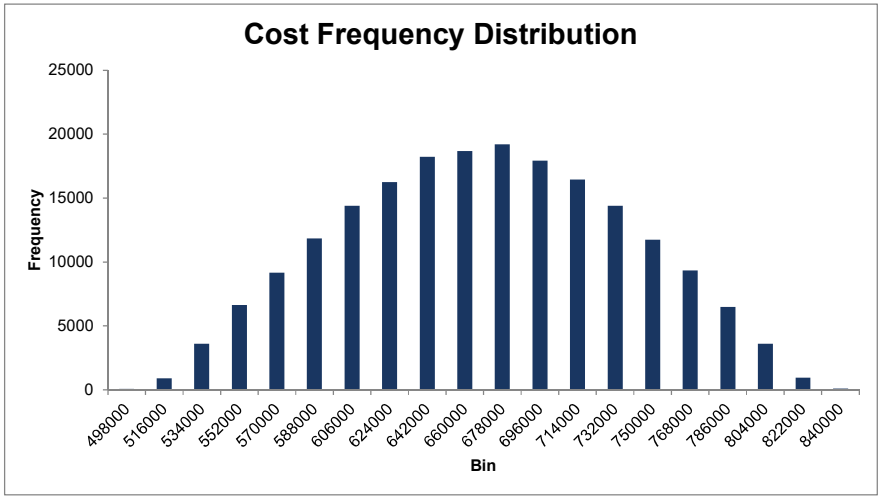
MONTE CARLO ASSESMENT TEMPLATE

Description:	BRIDGE - 20m - Pedestrian
Civil Component Number:	23
Date run:	26/02/2019
File name:	Item 23 - BRIDGE - 20m - Pedestrian.xlsm

Cardno
Shaping the Future

	Sub Item	MonteCarlo Value	Qty	Rate	Average	STD deviation
Site work and Earth work	Site Preperation	-3555.406837	3968	m2	3.68	3.10
	Earthworks	162550.0057	2994	m3	50.07	4.81
On-Structure Works	Retaining Walls, abutments, footings	0	0	No.	369439.34	49128.25
	Bridge Deck	0	0	m2	1258.48	847.16
	Guard Rails/ Balustrade	0	0	Item.	2355.21	715.69
	Transition Slab	66850.61846	2	No.	33425.31	0.00
	Overall Super T Cost	420779.6776	96	m2	4425.57	846.28
Off Structure	Guard Rails/ Balustrade	4756.245029	20	m	187.10	39.57
	GREAT Terminal	0	0	No.	8767.42	5398.17
	Off structure barrier	0	0	Item.	1565.45	788.88
Other		0	0		0	0
		0	0		0	0
		0	0		0	0
Delivery	Council Fees	3.25	1	%	3.250	0.000
	VicRoads Fees	1	1	%	1.000	0.000
	Traffic Management	5	1	%	5.000	0.000
	Environmental Management	0.5	1	%	0.500	0.000
	Surveying and Design	5	1	%	5.000	0.000
	Supervision and Project management	9	1	%	9.000	0.000
	Site Establishment	2.5	1	%	2.500	0.000
	Contingency	20	1	%	20.000	0.000

Inputs		
Iterations	200000	
Last row Number with Data	22	
Outputs	Excl. Delivery	Incl Delivery
Median	660063.5442	965342.933
Standard Deviation	67086.55778	
90th Percentile	746038.4274	1091081.2
75th Percentile	705312.7398	1031519.88
50th Percentile	660063.5442	965342.933
Range of costs produced	350541.4566	



MONTE CARLO ASSESMENT TEMPLATE

Description:	BRIDGE - 80m - Pedestrian
Civil Component Number:	24
Date run:	26/02/2019
File name:	Item 24 - BRIDGE - 80m - Pedestrian.xlsm

Cardno
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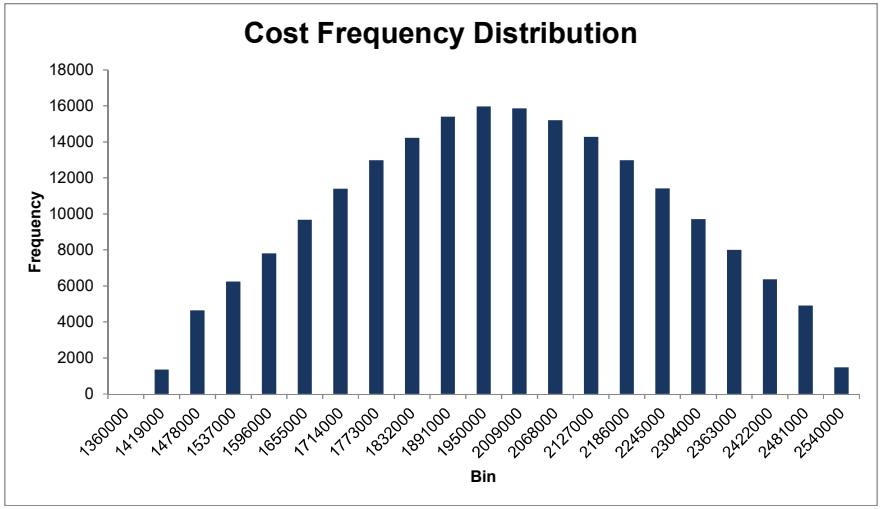
	Sub Item	MonteCarlo Value	Qty	Rate	Average	STD deviation
Site work and Earth work	Site Preperation	17277.9027	5248	m2	3.68	3.10
	Earthworks	154311.6208	2994	m3	50.07	4.81
On-Structure Works	Retaining Walls, abutments, footings	0	0	No.	369439.34	49128.25
	Bridge Deck	0	0	m2	1258.48	847.16
	Guard Rails/ Balustrade	0	0	Item.	2355.21	715.69
	Transition Slab	66850.61846	2	No.	33425.31	0.00
	Overall Super T Cost	1658580.717	384	m2	4425.57	846.28
Off Structure	Guard Rails/ Balustrade	16627.91916	80	m	187.10	39.57
	GREAT Terminal	0	0	No.	8767.42	5398.17
	Off structure barrier	0	0	Item.	1565.45	788.88
Other		0	0		0	0
		0	0		0	0
		0	0		0	0
Delivery	Council Fees	3.25	1	%	3.250	0.000
	VicRoads Fees	1	1	%	1.000	0.000
	Traffic Management	5	1	%	5.000	0.000
	Environmental Management	0.5	1	%	0.500	0.000
	Surveying and Design	5	1	%	5.000	0.000
	Supervision and Project management	9	1	%	9.000	0.000
	Site Establishment	2.5	1	%	2.500	0.000
	Contingency	20	1	%	20.000	0.000

Inputs		
Iterations	200000	
Last row Number with Data	22	
Outputs	Excl. Delivery	Incl Delivery
Median	1951592.66	2854204.26
Standard Deviation	261572.7341	
90th Percentile	2286811.606	3344461.97
75th Percentile	2128020.788	3112230.4
50th Percentile	1951592.66	2854204.26
Range of costs produced	1169751.264	



MONTE CARLO ASSESMENT TEMPLATE

Description:	Community Facility
Civil Component Number:	37
Date run:	26/02/2019
File name:	Item 37 - Community Facilities - Level 1.xlsm

Group	Sub Item	MonteCarlo Value	Qty	Rate	Average	STD deviation
Building	Kindergarten	1814800.90	750.00	m2	2544.60	161.70
	Small commercial Kitchen	34751.80	15.00	m2	2854.70	519.00
	Maternal And Child Health Consulting	234705.36	100.00	m2	2464.03	211.38
	Multipurpose community Spaces	521631.06	200.00	m2	2301.97	283.42
	Storage External	0.00	0.00	m2	1830.21	427.99
	Extra 33-place Kindergarten Room/ multipurpoes meeting space	279197.55	150.00	m2	2301.97	283.42
	Disabled toilet/ Parent's Change room	0.00	0.00	m2	3039.66	861.03
	Toilets/ Change Rooms	0.00	0.00	m2	2852.57	522.61
	Administration	0.00	0.00	m2	2245.34	91.15
	Cleaners	0.00	0.00	m2	2148.82	359.08
Canopy & Veranda	Canopy & Veranda	0.00	0.00	m2	1105.52	394.48
Car Park	Pavement	193317.58	1910.00	m2	97.15	17.85753809
	Kerb and Channel	12674.08	220.00	m	47.9253125	13.10708747
	Drainage Pipes	29489.02	159.00	m	155.105	39.31729879
	Drainage Pits	5755.38	7.00	Item	2319.913143	910.547001
	Linemarking/Signage	4028.71	1910.00	Item	2.968421053	2.08296867
	Car Park Lighting	37245.88	2047.00	m2	15.08	6.66
	Other	0.00	0.00		15.08	6.66
Outdoor Play	Kindergarten outdoor playspaces	378425.85	700.00	m2	543.22	4.73
	Playground	137990.78	800.00	m3	800.28	557.35
Site Works	Site Preperation	7281.42	6797.00	m2	3.68	3.10
	Paths	10454.35	210.00	m2	67.64	27.76
	Landscaping	12055.45	500.00	m2	26.18	7.40
	Lighting	0.00	0.00	Item	0.00	0.00
	Boundary Fencing	14101.42	125.00	m	88.98	54.17
	Gates	614.85	1.00	Item	614.85	0.00
	Other	0.00	0.00		0.00	0.00
Services	Stormwater	2.95	1.00	%	3.30	0.28
	Sewer	2.04	1.00	%	2.03	0.67
	Water	2.02	1.00	%	1.98	1.73
	Gas	0.82	1.00	%	0.88	0.31
	Fire Protection	0.66	1.00	%	0.66	0.00
	Light & Power	2.27	1.00	%	2.38	0.18
	Communication	0.50	1.00	%	0.50	0.00
Miscellaneous						
Delivery	Council Fees	3.25	1	%	3.25	0
	Authority Fees	1	1	%	1	0
	Traffic Management	2	1	%	2	0
	Environmental Management	0.5	1	%	0.5	0
	Survey/ Design Fees	5	1	%	5	0
	Supervision and Project Management	9	1	%	9	0
	Site Establishment	2.5	1	%	2.5	0
	Environmentally Sustainable Design	2	1	%	2	0
	Contingency	15	1	%	15	0

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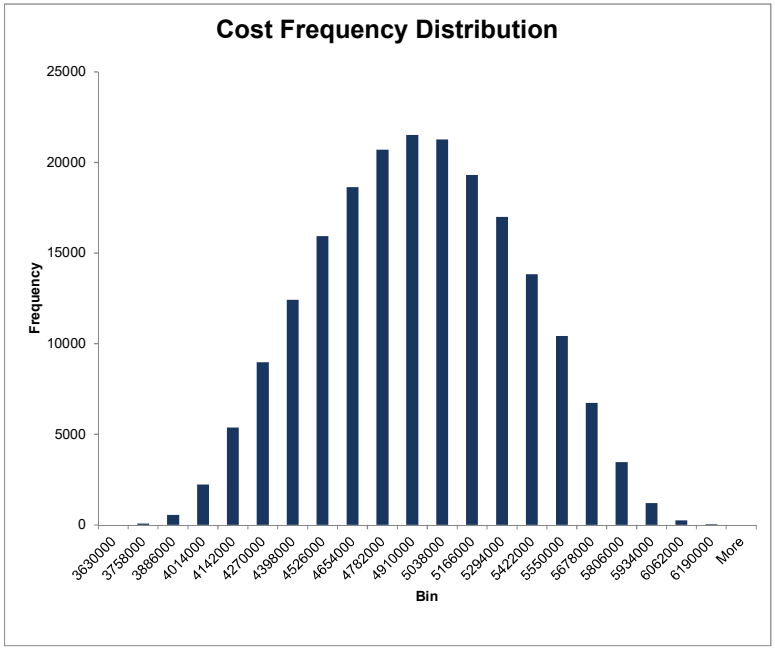
Inputs		
Iterations	200000	
Last row Number with Data	46	
Outputs	Excl. Delivery	Incl Delivery
Median	4872737.148	6834013.85
Standard Deviation	427125.442	
90th Percentile	5420120.427	7601718.899
75th Percentile	5160828.881	7238062.505
50th Percentile	4872737.148	6834013.85
Range of costs produced	2548743.997	



MONTE CARLO ASSESMENT TEMPLATE

Description:	Community Facility
Civil Component Number:	38
Date run:	26/02/2019
File name:	Item 38 - Community Facilities - Level 2.xlsm

Group	Sub Item	MonteCarlo Value	Qty	Rate	Average	STD deviation
Building	Kindergarten	1834130.25	750.00	m2	2544.60	161.70
	Small commercial Kitchen	91640.48	30.00	m2	2854.70	519.00
	Maternal And Child Health Consulting	255121.41	100.00	m2	2464.03	211.38
	Multipurpose community Spaces	1125991.55	500.00	m2	2301.97	283.42
	Storage External	0.00	0.00	m2	1830.21	427.99
	Extra 33-place Kindergarten Room/ multipurpoes meeting space	395247.89	150.00	m2	2301.97	283.42
	Disabled toilet/ Parent's Change room	0.00	0.00	m2	3039.66	861.03
	Toilets/ Change Rooms	0.00	0.00	m2	2852.57	522.61
	Administration	0.00	0.00	m2	2245.34	91.15
	Cleaners	0.00	0.00	m2	2148.82	359.08
Canopy & Veranda	Canopy & Veranda	0.00	0.00	m2	1105.52	394.48
Car Park	Pavement	178868.89	2253.00	m2	97.15	17.85753809
	Kerb and Channel	19392.37	398.00	m	54.81223714	14.75934449
	Drainage Pipes	45128.33	195.00	m	179.8547799	43.89204632
	Drainage Pits	12218.04	7.00	Item	2565.394448	583.5723021
	Linemarking/Signage	11313.58	2253.00	Item	3.111965952	2.367986559
	Car Park Lighting	31047.54	2380.00	m2	15.08	6.66
	Other	0.00	0.00		15.08	6.66
Outdoor Play	Kindergarten outdoor playspaces	378616.27	700.00	m2	543.22	4.73
	Playground	295920.83	800.00	m3	800.28	557.35
Site Works	Site Preperation	22926.00	7313.00	m2	3.68	3.10
	Paths	56648.48	500.00	m2	67.64	27.76
	Landscaping	0.00	0.00	m2	26.18	7.40
	Lighting	0.00	130.00	Item	0.00	0.00
	Boundary Fencing	0.00	0.00	m	88.98	54.17
	Gates	614.85	1.00	Item	614.85	0.00
	Other	0.00	0.00		0.00	0.00
Services	Stormwater	3.25	1.00	%	3.30	0.28
	Sewer	1.77	1.00	%	2.03	0.67
	Water	0.10	1.00	%	1.98	1.73
	Gas	0.57	1.00	%	0.88	0.31
	Fire Protection	0.66	1.00	%	0.66	0.00
	Light & Power	2.58	1.00	%	2.38	0.18
	Communication	0.50	1.00	%	0.50	0.00
Delivery	Council Fees	3.25	1	%	3.25	0
	Authority Fees	1	1	%	1	0
	Traffic Management	2	1	%	2	0
	Environmental Management	0.5	1	%	0.5	0
	Survey/ Design Fees	5	1	%	5	0
	Supervision and Project Management	9	1	%	9	0
	Site Establishment	2.5	1	%	2.5	0
	Environmentally Sustainable Design	2	1	%	2	0
	Contingency	15	1	%	15	0

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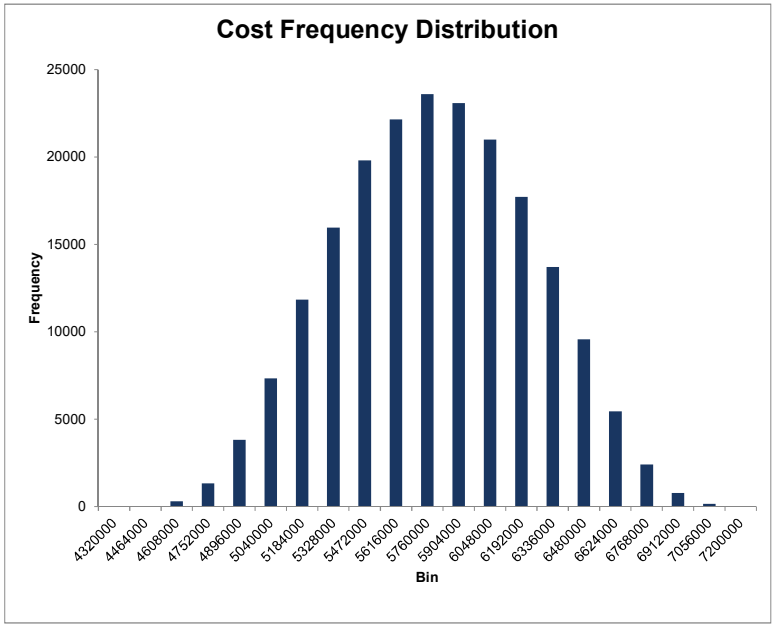
Inputs		
Iterations	200000	
Last row Number with Data	46	
Outputs	Excl. Delivery	Incl Delivery
Median	5723786.088	8027609.989
Standard Deviation	445473.4557	
90th Percentile	6294683.293	8828293.318
75th Percentile	6024253.368	8449015.349
50th Percentile	5723786.088	8027609.989
Range of costs produced	2871867.27	



MONTE CARLO ASSESMENT TEMPLATE

Description: Community Facility
Civil Component Number: 39
Date run: 26/02/2019
File name: Item 39 - Community Facilities - Level 3.xlsm

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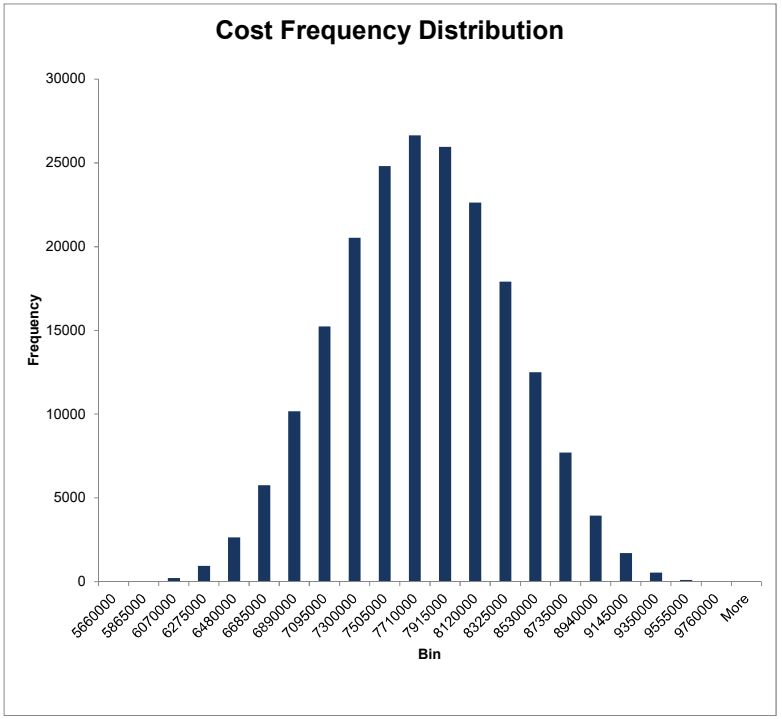
Group	Sub Item	MonteCarlo Value	Qty	Rate	Average	STD deviation
Pre-Construction	Library	3858601.031	1500	m2	2301.97	283.4200906
Building	Small commercial Kitchen	152667.5868	45	m2	2854.70	519.0042207
	Consulting Suite	484270.3311	200	m2	2464.027807	211.3795425
	Multipurpose community Spaces	914193.6672	450	m2	2301.971085	283.4200906
	Storage External	0	0	m2	1830.21	427.9945775
	Specialist community space	571939.138	250	m2	2301.971085	283.4200906
	Disabled toilet/ Parent's Change room	0	0	m2	3039.661126	861.0336385
	Toilets/ Change Rooms	0	0	m2	2852.565063	522.6135165
	Administration	0	0	m2	2245.343508	91.14657726
	Cleaners	0	0	m2	2148.82194	359.0754898
Canopy & Veranda	Canopy & Veranda	0	0	m2	1105.522682	394.4773176
Car Park	Pavement	387402.0143	3327	m2	97.15	17.85753809
	Kerb and Channel	29953.18246	473	m	47.9253125	13.10708747
	Drainage Pipes	47126.6216	282	m	155.105	39.31729879
	Drainage Pits	22513.76396	10	Item	2319.913143	910.547001
	Linemarking/Signage	7017.552191	3327	m2/pavement	2.968421053	2.08296867
	Car Park Lighting	74081.83012	3456	m2	15.08	6.661020943
	Other	0	0		2.4	0.989
Outdoor Play	Kindergarten outdoor playspaces	0	0	m2	543.22	4.72810549
	Playground	812033.973	800	m3	800.28	557.3510134
Site Works	Site Preperation	19583.07895	8776.8	m2	3.682103483	3.102148789
	Paths	16069.12026	180	m2	58.44	21.944
	Landscaping	10993.2848	500	m2	20.7167	6.2898
	Lighting	0	0	Item	0	0
	Boundary Fencing	0	0	m	87	52.63078947
	Gate	600	1	Item	600	0
	Other	0	0		0	0
Services	Stormwater	3.257299458	1	%	3.3	0.282842712
	Sewer	1.957533503	1	%	2.025	0.671751442
	Water	2.324762608	1	%	1.975	1.732411614
	Gas	1.317155676	1	%	0.88	0.311126984
	Fire Protection	0.66	1	%	0.66	0
	Light & Power	2.424377096	1	%	2.375	0.176776695
	Communication	0.5	1	%	0.5	0
Miscellaneous						
Delivery	Council Fees	3.25	1	%	3.25	0
	Authority Fees	1	1	%	1	0
	Traffic Management	2	1	%	2	0
	Environmental Management	0.5	1	%	0.5	0
	Survey/ Design Fees	5	1	%	5	0
	Supervision and Project Management	9	1	%	9	0
	Site Establishment	2.5	1	%	2.5	0
	Environmentally Sustainable Design	2	1	%	2	0
	Contingency	15	1	%	15	0

Inputs		
Iterations	200000	
Last row Number with Data	46	
Outputs	Excl. Delivery	Incl Delivery
Median	7657607.88	10739795
Standard Deviation	583418.5954	
90th Percentile	8405288.895	11788418
75th Percentile	8051117.743	11291693
50th Percentile	7657607.88	10739795
Range of costs produced	4080083.805	



MONTE CARLO ASSESMENT TEMPLATE

Description:	SPORTING PAVILLIONS
Civil Component Number:	40
Date run:	26/02/2019
File name:	Item 40 - Sports Pavilion 2 Areas.xlsm

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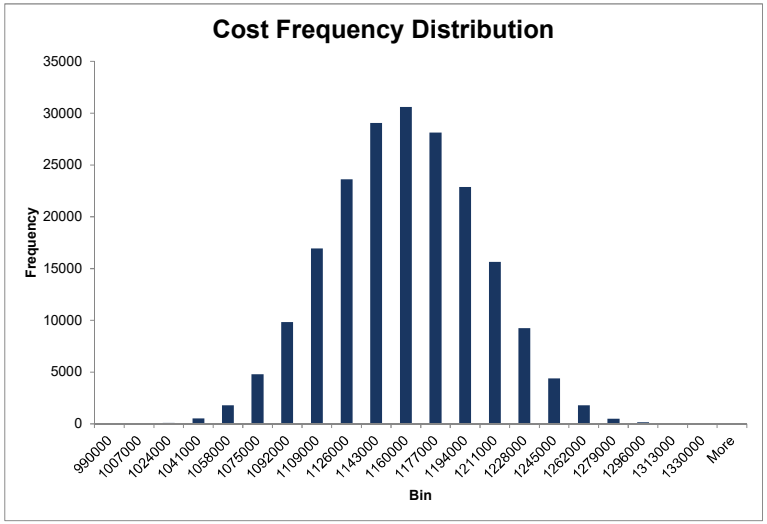
Group	Sub Item	MonteCarlo Value	Qty	Rate	Average	STD deviation
Building	Site Preperation	851.115	721	m2	3.682	3.102
	Change Rooms With Toilets and Showers X 4	316843.898	120	m2	2408.049	173.273
	Umpire Change Rooms with Toilets X 2	99422.084	40	m2	2519.244	110.292
	Storage Rooms	192011.849	80	m2	2414.148	186.001
	Multipurpose Room/ Social Room	238972.131	100	m2	2365.429	137.730
	Office/ First Aid Room	46509.326	20	m2	2351.617	260.377
	Canteen and Kitchen	49865.707	20	m2	2514.881	122.443
	Public Toilet	33605.038	40	m2	1238.626	803.670
Canopy & Veranda	Canopy & Veranda	60946.746	80	m2	761.834	0.000
Site Works	Concrete Paths	0.000	0	m2	0.000	0.000
	Lighting	0.000	0	m2	0.000	0.000
	Gates/entrances	0.000	0	m2	0.000	0.000
	Other-Miscellaneous	0.000	0	m2	0.000	0.000
Services	Stormwater	3.228	1	%	3.300	0.283
	Sewer	2.814	1	%	2.025	0.672
	Water	3.090	1	%	1.975	1.732
	Gas	0.558	1	%	0.880	0.311
	Fire Protection	0.660	1	%	0.660	0.000
	Light & Power	2.158	1	%	2.375	0.177
	Communication	0.500	1	%	0.500	0.000
Miscellaneous						
Delivery	Council Fees	3.25	1	%	3.25	0
	Authority Fees	1	1	%	1	0
	Traffic Management	2	1	%	2	0
	Environmental Management	0.5	1	%	0.5	0
	Survey/Design	5	1	%	5	0
	Supervision & Project Management	9	1	%	9	0
	Site Establishment	2.5	1	%	2.5	0
	Envioronmentally Sustainable Design	2	1	%	2	0
	Contingency	15	1	%	15	0

Inputs		
Iterations	200000	
Last row Number with Data	35	
Outputs	Excl. Delivery	Incl Delivery
Median	1150621.761	1613747.02
Standard Deviation	42542.75122	
	1205142.49	
90th Percentile	1179316.41	1653991.27
75th Percentile	1150621.761	1613747.02
50th Percentile	321647.8391	451111.094
Range of costs produced	318023.2199	



MONTE CARLO ASSESMENT TEMPLATE

Description:	SPORTING PAVILLIONS
Civil Component Number:	41
Date run:	26/02/2019
File name:	Item 41 - Sports Pavilion 3 Areas.xlsm

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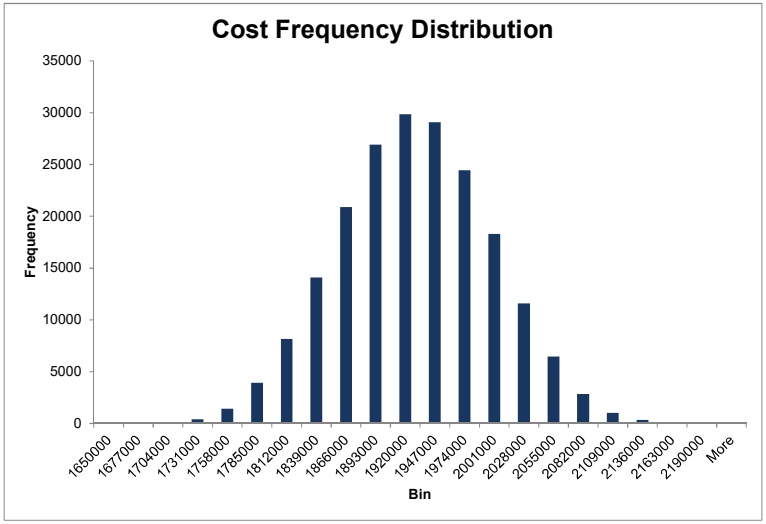
Group	Sub Item	MonteCarlo Value	Qty	Rate	Average	STD deviation
Building	Site Preperation	5289.025	1048	m2	3.682	3.102
	Change Rooms With Toilets and Showers X 4	614439.568	240	m2	2408.049	173.273
	Umpire Change Rooms with Toilets X 2	148425.170	60	m2	2519.244	110.292
	Storage Rooms	271698.376	120	m2	2414.148	186.001
	Multipurpose Room/ Social Room	333402.228	150	m2	2365.429	137.730
	Office/ First Aid Room	65523.142	30	m2	2351.617	260.377
	Canteen and Kitchen	94840.490	40	m2	2514.881	122.443
	Public Toilet	50407.557	60	m2	1238.626	803.670
Canopy & Veranda	Canopy & Veranda	91420.118	120	m2	761.834	0.000
Site Works	Concrete Paths	0.000	0	m2	0.000	0.000
	Lighting	0.000	0	m2	0.000	0.000
	Gates/entrances	0.000	0	m2	0.000	0.000
	Other-Miscellaneous	0.000	0	m2	0.000	0.000
Services	Stormwater	3.409	1	%	3.300	0.283
	Sewer	0.981	1	%	2.025	0.672
	Water	1.067	1	%	1.975	1.732
	Gas	1.317	1	%	0.880	0.311
	Fire Protection	0.660	1	%	0.660	0.000
	Light & Power	2.362	1	%	2.375	0.177
	Communication	0.500	1	%	0.500	0.000
Miscellaneous						
Delivery	Council Fees	3.25	1	%	3.25	0
	Authority Fees	1	1	%	1	0
	Traffic Management	2	1	%	2	0
	Environmental Management	0.5	1	%	0.5	0
	Survey/Design	5	1	%	5	0
	Supervision & Project Management	9	1	%	9	0
	Site Establishment	2.5	1	%	2.5	0
	Envioronmentally Sustainable Design	2	1	%	2	0
	Contingency	15	1	%	15	0

Inputs		
Iterations	200000	
Last row Number with Data	35	
Outputs	Excl. Delivery	Incl Delivery
Median	1915120.031	2685955.84
Standard Deviation	69526.14396	
	2004221.369	
90th Percentile	1962014.702	2751725.62
75th Percentile	1915120.031	2685955.84
50th Percentile	527698.1836	740096.702
Range of costs produced	398535.2348	



MONTE CARLO ASSESMENT TEMPLATE

Description:	Sporting & Recreation Facilities (5-6 Ha)
Civil Component Number:	42
Date run:	26/02/2019
File name:	Item 42 - Sporting and Recreational Facilities (5-6)Ha.xlsm

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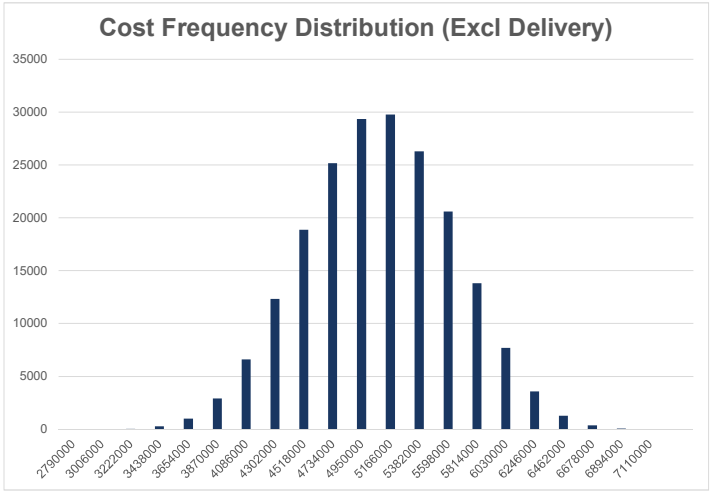
Group	Sub Item	MonteCarlo Value	Qty	Rate	Average	STD deviation
Playing Fields	Football Field	887386.123	1	No	805074.2415	166001.4597
	Cricket Pitch	29175.08654	1	No	24049.93971	12425.70903
	Cricket Nets	48626.61166	1	No	49791.29841	23222.40338
	Soccer Field	332117.9066	1	No	526667.5044	212537.7081
	Netball Court	96789.93914	2	No	83143.12938	44999.30739
	Tennis Court	0	0	No	65422.94456	21633.22654
Lighting	Lighting Netball Court	40571.11861	2	No	22802.94826	4800.508178
	Lighting Tennis	0	0	No	21415.84158	9273.331428
	Lighting Soccer	113702.8961	1	No	73003.05042	73547.10796
	Lighting Football	15895.32924	1	No	163494.2807	115172.0738
Landscaping	Landscaping Construction	720126.6465	28000	m2	20.28120871	17.80013769
	Landscaping Establishment (12wk)	46926.54751	28000	m2	1.116210138	0.518122713
	Landscape maintenance-1 year/2 summers	83240.34609	28000	m2	2.895	0.148492424
Car Parking	Pavement	340367.0193	2740	m2	94.7330216	43.71974264
	Kerb and Channel	33235.46374	440	m	55.03520612	15.28984656
	Drainage Pipes	91587.87391	500	m	177.487573	45.2659066
	Drainage Pits	60667.7774	22	No	2611.953326	574.9934291
	Car Park Lighting	31936.33582	2572	m2	15.12950495	6.576534775
	Linemarking/ Signage	16513.98218	2740	m2/pavement	3.255602136	2.460423018
Site Works	Site Preperation	173770.9844	60000	m2	3.68	3.10
	Footpaths and paved areas	64227.47158	750	m2	63.65	25.05
Services	Stormwater Drainage	240645.4338	1	Item	251068.3852	103779.4008
	Sewer	11984.6837	1	Item	52065.66757	31275.3579
	Water	59724.81202	1	Item	75629.58401	38560.46965
	Gas	1617.336472	1	Item	16727.48788	10238.67954
	Light & power	9835.315008	1	Item	231657.5285	165445.7436
	Communications	43582.67714	1	Item	46504.08696	58249.27393
	Fire	15745.78089	1	Item	25236.68639	7405.792915
Miscellaneous	Gates	720.2373691	1	Item	689.2739274	153.3652394
	Interchange shelter	20877.37188	10	Item	8443.472722	4523.424794
	Fencing	109767.1611	1000	m	91.8670776	43.3980208
	Signage	0	10	No	0	0
Irrigation	Irrigation Soccer	39185.2763	1	Item	40441.04481	9993.275916
	Irrigation Football	115108.0889	1	Item	72462.96392	28896.45222
Other	Access Road	334604.2801	1350	m2	217.5	24.74873734
	Playground	351633.623	1	No	415857.1429	145991.3566
	Tree Planting	6000	30	No	200	0
Delivery	Council Fees	3.25	1	%	3.25	0.00
	Authority Fees	0.00	1	%	0.00	0.00
	Traffic Management	2.00	1	%	2.00	0.00
	Environmental Management	0.50	1	%	0.50	0.00
	Survey/Design	5.00	1	%	5.00	0.00
	Supervision & Project Management	9.00	1	%	9.00	0.00
	Site Establishment	2.50	1	%	2.50	0.00
	Environmentally sustainable design	2.00	1	%	2.00	0.00
	Contingency	15.00	1	%	15.00	0.00

Inputs	
Iterations	200000
Last row Number with	49

Outputs	Excl. Delivery	Incl Delivery
Median	4974728.059	6927308.822
Standard Deviation	552098.006	
90th Percentile	5682270.123	7912561.146
75th Percentile	5347112.505	7445854.163
50th Percentile	4974728.059	6927308.822
Range of costs produ	4310824.224	



MONTE CARLO ASSESMENT TEMPLATE

Description:	Sporting & Recreation Facilities (8-10 Ha)
Civil Component Number:	43
Date run:	26/02/2019
File name:	Item 43 - Sporting and Recreational Facilities (8-10)Ha

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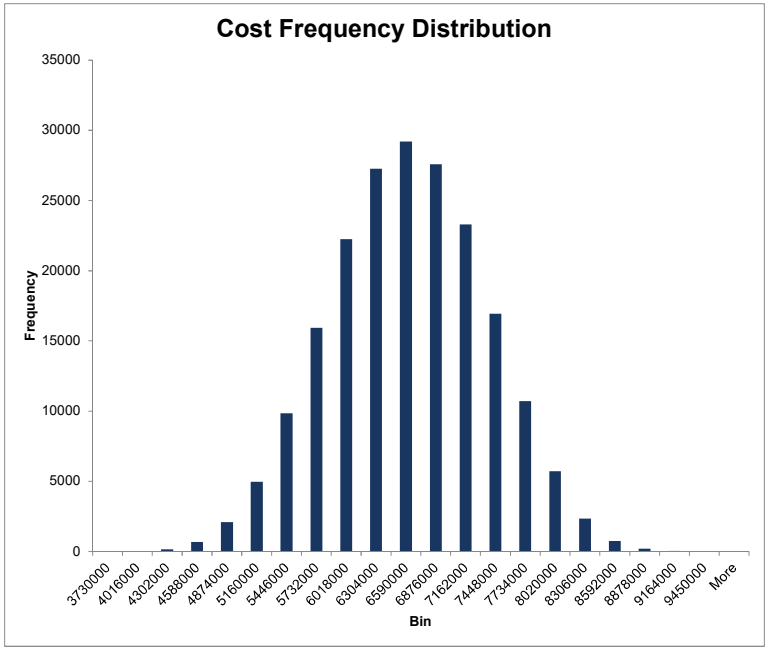
Group	Sub Item	MonteCarlo Value	Qty	Rate	Average	STD deviation
Playing Fields	Football Field	1747087.446	2	No	805074.2415	166001.4597
	Cricket Pitch	78580.84249	2	No	24049.93971	12425.70903
	Cricket Nets	52709.4569	1	No	49791.29841	23222.40338
	Soccer Field	0	0	No	526667.5044	212537.7081
	Netball Court	182159.6893	2	No	83143.12938	44999.30739
	Tennis Court	139581.1039	2	No	65422.94456	21633.22654
Lighting	Lighting Netball Court	38192.05683	2	No	22802.94826	4800.508178
	Lighting Tennis	58440.94844	2	No	21415.84158	9273.331428
	Lighting Soccer	0	0	No	73003.05042	73547.10796
	Lighting Football	385345.584	2	No	163494.2807	115172.0738
Landscaping	Landscaping Construction	736761.7848	38000	m2	20.28120871	17.80013769
	Landscaping Establishment (12wk)	40438.57954	38000	m2	1.116210138	0.518122713
	Landscape maintenance-1 year/2 summers	117938.4143	38000	m2	2.895	0.148492424
Car Parking	Pavement	432069.9794	5465	m2	94.7330216	43.71974264
	Kerb and Channel	27284.79087	510	m	55.03520612	15.28984656
	Drainage Pipes	113420.7391	560	m	177.487573	45.2659066
	Drainage Pits	72327.22966	28	No	2611.953326	574.9934291
	Car Park Lighting	46506.14663	4190	m2	15.12950495	6.576534775
	Linemarking/ Signage	11876.70007	5465	m2/pavement	3.255602136	2.460423018
Site Works	Site Preperation	549016.4559	100000	m2	3.68	3.10
	Footpaths and paved areas	56792.14386	875	m2	63.65	25.05
Services	Stormwater Drainage	338411.3325	1	Item	251068.3852	103779.4008
	Sewer	8121.551653	1	Item	52065.66757	31275.3579
	Water	91534.35599	1	Item	75629.58401	38560.46965
	Gas	12223.35795	1	Item	16727.48788	10238.67954
	Light & power	73794.94872	1	Item	231657.5285	165445.7436
	Communications	102083.5202	1	Item	46504.08696	58249.27393
	Fire	32912.29744	1	Item	25236.68639	7405.792915
Miscellaneous	Gates	1047.180986	2	Item	689.2739274	153.3652394
	Interchange shelter	17678.42994	10	Item	8443.472722	4523.424794
	Fencing	198697.7231	1300	m	91.8670776	43.3980208
	Signage	0	20	No	0	0
Irrigation	Irrigation Soccer	0	0	Item	40441.04481	9993.275916
	Irrigation Football	222412.0554	2	Item	72462.96392	28896.45222
Other	Access Road	511251.9397	1980	m2	217.5	24.74873734
	Playground	298126.611	1	No	415857.1429	145991.3566
	Tree Planting	8000	40	No	200	0
Delivery	Council Fees	3.25	1	%	3.25	0.00
	Authority Fees	0.00	1	%	0.00	0.00
	Traffic Management	2.00	1	%	2.00	0.00
	Environmental Management	0.50	1	%	0.50	0.00
	Survey/Design	5.00	1	%	5.00	0.00
	Supervision & Project Management	9.00	1	%	9.00	0.00
	Site Establishment	2.50	1	%	2.50	0.00
	Environmentally sustainable design	2.00	1	%	2.00	0.00
	Contingency	15.00	1	%	15.00	0.00

Inputs	
Iterations	200000
Last row Number with	49

Outputs	Excl. Delivery	Incl Delivery
Median	6469077.788	9008190.82
Standard Deviation	748000.7014	
90th Percentile	7427679.258	10343043.37
75th Percentile	6973596.594	9710733.258
50th Percentile	6469077.788	9008190.82
Range of costs produ	5710125.375	



Victorian Planning Authority Benchmark Infrastructure Report

APPENDIX C

DETAILED COST SHEETS

Appendix C	
Description:	Road - Primary - 800m
Civil Component Number:	Item 1

Group	Sub Item	Qty	Unit	Rate (P50)	Amount (P50)	Rate (P90)	Amount (P90)
Siteworks/ Earthworks	Site Preperation	32800	m2	3.68	120704.00	4.96	162688.00
	Earthworks	4004	m3	34.07	136416.28	40.52	162242.08
Road Pavement	Primary Arterial Pavement	5600	m2	169.62	949872.00	186.26	1043056.00
	Secondary Arterial Pavement	0	m2	127.01	0.00	133.78	0.00
	Collector Arterial Pavement	0	m2	105.15	0.00	112.44	0.00
	Subgrade Preparation	1120	m2	14.22	15926.40	16.16	18099.20
	Pavement Rehab	0	m2	51.58	0.00	59.32	0.00
	Pavement Other	0	m2	0.00	0.00	0.00	0.00
Concrete Works	Kerb and Channel	1600	m	54.81	87696.00	60.90	97440.00
	Cycle Path	2400	m2	76.59	183816.00	91.94	220656.00
	SUP/ Footpath	0	m2	63.51	0.00	73.63	0.00
	Traffic Island	0	m2	77.60	0.00	84.07	0.00
Drainage	Drainage Pipe 300mm CR Bfilled	100	m	179.85	17985.00	197.96	19796.00
	Drainage Pipe 375mm CR Bfilled	350	m	259.10	90685.00	282.96	99036.00
	Drainage Pipe 450mm CR Bfilled	350	m	299.43	104800.50	334.33	117015.50
	Drainage Pipe 525mm CR Bfilled	0	m	403.86	0.00	448.03	0.00
	Drainage - pits	16	No.	2565.39	41046.24	2806.10	44897.60
	Drainage – Sub-soil drainage	1600	m	33.88	54208.00	43.40	69440.00
	Drainage Culvert	0	No.	0.00	0.00	0.00	0.00
Traffic signals	Traffic Signals (all inclusive)	0	Item/ Per Leg	109730.28	0.00	128786.34	0.00
Landscape	Tree Planting	160	No.	303.34	48534.40	363.01	58081.60
	Landscaping	11200	m2	21.61	242032.00	25.16	281792.00
	Topsoil Seeding	11200	m2	7.21	80752.00	8.44	94528.00
Street Lighting	Street Lighting - Road	800	m	216.34	173072.00	225.67	180536.00
	Street Lighting - Intersections	0	Item/ Per Leg	48468.93	0.00	55617.74	0.00
Misc	Regulatory Signage	18	Item	338.43	6091.74	380.39	6847.02
	Linemarking	5600	m2 of Pavement	3.11	17416.00	4.09	22904.00
	Landscape maintenance (intersection)	0	Item	71344.66	0.00	88131.43	0.00
	Landscape maintenance (road)	11200	m2	2.90	32480.00	2.96	33152.00
	Tactile Pavers (Hazard only)	0	Item	292.43	0.00	319.78	0.00
Other	Sub-standard site conditions	0	% of area	0.00	0.00	0.00	0.00
Delivery	Council Fees	1	%	3.25	78114.84	3.25	88796.73
	VicRoads Fees	1	%	1.00	24035.34	1.00	27322.07
	Traffic Management	1	%	5.00	120176.68	5.00	136610.35
	Environmental Management	1	%	0.50	12017.67	0.50	13661.04
	Surveying and Design	1	%	5.00	120176.68	5.00	136610.35
	Supervision and Project management	1	%	9.00	216318.02	9.00	245898.63
	Site Establishment	1	%	2.50	60088.34	2.50	68305.18
	Contingency	1	%	15.00	360530.03	15.00	409831.05
Total	Excluding Delivery				**2,403,534**		**2,732,207**
	Including Delivery				**3,394,991**		**3,859,242**

Appendix C	
Description:	Road - Secondary - 800m
Civil Component Number:	Item 2

Group	Sub Item	Qty	Unit	Rate (P50)	Amount (P50)	Rate (P90)	Amount (P90)
Siteworks/ Earthworks	Site Preperation	27200	m2	3.68	100096.00	4.96	134912.00
	Earthworks	4572	m3	34.07	155768.04	40.52	185257.44
Road Pavement	Primary Arterial Pavement	0	m2	169.62	0.00	186.26	0.00
	Secondary Arterial Pavement	7200	m2	127.01	914472.00	133.78	963216.00
	Collector Arterial Pavement	0	m2	105.15	0.00	112.44	0.00
	Subgrade Preparation	1440	m2	14.22	20476.80	16.16	23270.40
	Pavement Rehab	0	m2	51.58	0.00	59.32	0.00
	Pavement Other	0	m2	0.00	0.00	0.00	0.00
Concrete Works	Kerb and Channel	1600	m	54.81	87696.00	60.90	97440.00
	Cycle Path	0	m2	76.59	0.00	91.94	0.00
	SUP/ Footpath	1600	m2	63.51	101616.00	73.63	117808.00
	Traffic Island	0	m2	77.60	0.00	84.07	0.00
Drainage	Drainage Pipe 300mm CR Bfilled	100	m	179.85	17985.00	197.96	19796.00
	Drainage Pipe 375mm CR Bfilled	350	m	259.10	90685.00	282.96	99036.00
	Drainage Pipe 450mm CR Bfilled	350	m	299.43	104800.50	334.33	117015.50
	Drainage Pipe 525mm CR Bfilled	0	m	403.86	0.00	448.03	0.00
	Drainage - pits	16	No.	2565.39	41046.24	2806.10	44897.60
	Drainage – Sub-soil drainage	1600	m	33.88	54208.00	43.40	69440.00
	Drainage Culvert	0	No.	0.00	0.00	0.00	0.00
Traffic signals	Traffic Signals (all inclusive)	0	Item/ Per Leg	109730.28	0.00	128786.34	0.00
Landscape	Tree Planting	108	No.	303.34	32760.72	363.01	39205.08
	Landscaping	9600	m2	21.61	207456.00	25.16	241536.00
	Topsoil Seeding	9600	m2	7.21	69216.00	8.44	81024.00
Street Lighting	Street Lighting - Road	800	m	216.34	173072.00	225.67	180536.00
	Street Lighting - Intersections	0	Item/ Per Leg	48468.93	0.00	55617.74	0.00
Misc	Regulatory Signage	14	Item	338.43	4738.02	380.39	5325.46
	Linemarking	7200	m2 of Pavement	3.11	22392.00	4.09	29448.00
	Landscape maintenance (intersections)	0	Item	71344.66	0.00	88131.43	0.00
	Landscape maintenance (roads)	9600	m2	2.90	27840.00	2.96	28416.00
	Tactile Pavers (Hazard only)	0	Item	292.43	0.00	319.78	0.00
Other	Sub-standard site conditions	0	% of area	0.00	0.00	0.00	0.00
Delivery	Council Fees	1	%	3.25	72355.54	3.25	80521.33
	VicRoads Fees	1	%	1.00	22263.24	1.00	24775.79
	Traffic Management	1	%	5.00	111316.22	5.00	123878.97
	Environmental Management	1	%	0.50	11131.62	0.50	12387.90
	Surveying and Design	1	%	5.00	111316.22	5.00	123878.97
	Supervision and Project management	1	%	9.00	200369.19	9.00	222982.15
	Site Establishment	1	%	2.50	55658.11	2.50	61939.49
	Contingency	1	%	15.00	333948.65	15.00	371636.92
Total	Excluding Delivery				**2,226,324**		**2,477,579**
	Including Delivery				**3,144,683**		**3,499,581**

Appendix C	
Description:	Road - Connector Boulevard - 800m
Civil Component Number:	Item 3

Group	Sub Item	Qty	Unit	Rate (P50)	Amount (P50)	Rate (P90)	Amount (P90)
Siteworks/ Earthworks	Site Preperation	24800	m2	3.68	91264.00	4.96	123008.00
	Earthworks	2996	m3	34.07	102073.72	40.52	121397.92
Road Pavement	Primary Arterial Pavement	0	m2	169.62	0.00	186.26	0.00
	Secondary Arterial Pavement	0	m2	127.01	0.00	133.78	0.00
	Collector Arterial Pavement	5600	m2	105.15	588840.00	112.44	629664.00
	Subgrade Preparation	1120	m2	14.22	15926.40	16.16	18099.20
	Pavement Rehab	0	m2	51.58	0.00	59.32	0.00
	Pavement Other	0	m2	0.00	0.00	0.00	0.00
Concrete Works	Kerb and Channel	3200	m	54.81	175392.00	60.90	194880.00
	Cycle Path	2400	m2	76.59	183816.00	91.94	220656.00
	SUP/ Footpath	2400	m2	63.51	152424.00	73.63	176712.00
	Traffic Island	0	m2	77.60	0.00	84.07	0.00
Drainage	Drainage Pipe 300mm CR Bfilled	200	m	179.85	35970.00	197.96	39592.00
	Drainage Pipe 375mm CR Bfilled	908	m	259.10	235262.80	282.96	256927.68
	Drainage Pipe 450mm CR Bfilled	700	m	299.43	209601.00	334.33	234031.00
	Drainage Pipe 525mm CR Bfilled	0	m	403.86	0.00	448.03	0.00
	Drainage - pits	32	No.	2565.39	82092.48	2806.10	89795.20
	Drainage – Sub-soil drainage	3200	m	33.88	108416.00	43.40	138880.00
	Drainage Culvert	0	No.	0.00	0.00	0.00	0.00
Traffic signals	Traffic Signals (all inclusive)	0	Item/ Per Leg	109730.28	0.00	128786.34	0.00
Landscape	Tree Planting	192	No.	303.34	58241.28	363.01	69697.92
	Landscaping	11208	m2	21.61	242204.88	25.16	281993.28
	Topsoil Seeding	11208	m2	7.21	80809.68	8.44	94595.52
Street Lighting	Street Lighting - Road	800	m	216.34	173072.00	225.67	180536.00
	Street Lighting - Intersections	0	Item/ Per Leg	48468.93	0.00	55617.74	0.00
Misc	Regulatory Signage	10	Item	338.43	3384.30	380.39	3803.90
	Linemarking	5600	m2 of Pavement	3.11	17416.00	4.09	22904.00
	Landscape maintenance (intersection)	0	Item	71344.66	0.00	88131.43	0.00
	Landscape maintenance (road)	11208	m2	2.90	32503.20	2.96	33175.68
	Tactile Pavers (Hazard only)	0	Item	292.43	0.00	319.78	0.00
Other	Sub-standard site conditions	0	% of area	0.00	0.00	0.00	0.00
Delivery	Council Fees	1	%	3.25	84133.07	3.25	95236.35
	VicRoads Fees	1	%	1.00	25887.10	1.00	29303.49
	Traffic Management	1	%	5.00	129435.49	5.00	146517.47
	Environmental Management	1	%	0.50	12943.55	0.50	14651.75
	Surveying and Design	1	%	5.00	129435.49	5.00	146517.47
	Supervision and Project management	1	%	9.00	232983.88	9.00	263731.44
	Site Establishment	1	%	2.50	64717.74	2.50	73258.73
	Contingency	1	%	15.00	388306.46	15.00	439552.40
Total	Excluding Delivery				**2,588,710**		**2,930,349**
	Including Delivery				**3,656,553**		**4,139,118**

Appendix C	
Description:	Road - Connector Street - 800m
Civil Component Number:	Item 4

Group	Sub Item	Qty	Unit	Rate (P50)	Amount (P50)	Rate (P90)	Amount (P90)
Siteworks/ Earthworks	Site Preperation	20000	m2	3.68	73600.00	4.96	99200.00
	Earthworks	2996	m3	34.07	102073.72	40.52	121397.92
Road Pavement	Primary Arterial Pavement	0	m2	169.62	0.00	186.26	0.00
	Secondary Arterial Pavement	0	m2	127.01	0.00	133.78	0.00
	Collector Arterial Pavement	5600	m2	105.15	588840.00	112.44	629664.00
	Subgrade Preparation	1120	m2	14.22	15926.40	16.16	18099.20
	Pavement Rehab	0	m2	51.58	0.00	59.32	0.00
	Pavement Other	0	m2	0.00	0.00	0.00	0.00
Concrete Works	Kerb and Channel	3200	m	54.81	175392.00	60.90	194880.00
	Cycle Path	2400	m2	76.59	183816.00	91.94	220656.00
	SUP/ Footpath	2400	m2	63.51	152424.00	73.63	176712.00
	Traffic Island	0	m2	77.60	0.00	84.07	0.00
Drainage	Drainage Pipe 300mm CR Bfilled	200	m	179.85	35970.00	197.96	39592.00
	Drainage Pipe 375mm CR Bfilled	812	m	259.10	210389.20	282.96	229763.52
	Drainage Pipe 450mm CR Bfilled	700	m	299.43	209601.00	334.33	234031.00
	Drainage Pipe 525mm CR Bfilled	0	m	403.86	0.00	448.03	0.00
	Drainage - pits	32	No.	2565.39	82092.48	2806.10	89795.20
	Drainage – Sub-soil drainage	3200	m	33.88	108416.00	43.40	138880.00
	Drainage Culvert	0	No.	0.00	0.00	0.00	0.00
Traffic signals	Traffic Signals (all inclusive)	0	Item/ Per Leg	109730.28	0.00	128786.34	0.00
Landscape	Tree Planting	140	No.	303.34	42467.60	363.01	50821.40
	Landscaping	6408	m2	21.61	138476.88	25.16	161225.28
	Topsoil Seeding	6408	m2	7.21	46201.68	8.44	54083.52
Street Lighting	Street Lighting - Road	800	m	216.34	173072.00	225.67	180536.00
	Street Lighting - Intersections	0	Item/ Per Leg	48468.93	0.00	55617.74	0.00
Misc	Regulatory Signage	10	Item	338.43	3384.30	380.39	3803.90
	Linemarking	5600	m2 of Pavement	3.11	17416.00	4.09	22904.00
	Landscape maintenance (intersection)	0	Item	71344.66	0.00	88131.43	0.00
	Landscape maintenance (road)	6408	m2	2.90	18583.20	2.96	18967.68
	Tactile Pavers (Hazard only)	0	Item	292.43	0.00	319.78	0.00
Other	Sub-standard site conditions	0	% of area	0.00	0.00	0.00	0.00
Delivery	Council Fees	1	%	3.25	77289.63	3.25	87262.91
	VicRoads Fees	1	%	1.00	23781.42	1.00	26850.13
	Traffic Management	1	%	5.00	118907.12	5.00	134250.63
	Environmental Management	1	%	0.50	11890.71	0.50	13425.06
	Surveying and Design	1	%	5.00	118907.12	5.00	134250.63
	Supervision and Project management	1	%	9.00	214032.82	9.00	241651.14
	Site Establishment	1	%	2.50	59453.56	2.50	67125.32
	Contingency	1	%	15.00	356721.37	15.00	402751.89
Total	Excluding Delivery				**2,378,142**		**2,685,013**
	Including Delivery				**3,359,126**		**3,792,580**

Appendix C	
Description:	INTERSECTION - Primary - Primary Intersection
Civil Component Number:	Item 5

Group	Sub Item	Qty	Unit	Rate (P50)	Amount (P50)	Rate (P90)	Amount (P90)
Siteworks/ Earthworks	Site Preperation	67040	m2	3.68	246707.20	4.96	332518.40
	Earthworks	8608.6	m3	34.07	293295.00	40.52	348820.47
Road Pavement	Primary Arterial Pavement	12040	m2	169.62	2042224.80	186.26	2242570.40
	Secondary Arterial Pavement	0	m2	127.01	0.00	133.78	0.00
	Collector Arterial Pavement	0	m2	105.15	0.00	112.44	0.00
	Subgrade Preparation	2408	m2	14.22	34241.76	16.16	38913.28
	Pavement Rehab	0	m2	51.58	0.00	59.32	0.00
	Pavement Other	0	m2	0.00	0.00	0.00	0.00
Concrete Works	Kerb and Channel	2195	m	54.81	120307.95	60.90	133675.50
	Cycle Path	2236	m2	76.59	171255.24	91.94	205577.84
	SUP/ Footpath	0	m2	63.51	0.00	73.63	0.00
	Traffic Island	1220	m2	77.60	94672.00	84.07	102565.40
Drainage	Drainage Pipe 300mm CR Bfilled	392	m	179.85	70501.20	197.96	77600.32
	Drainage Pipe 375mm CR Bfilled	0	m	259.10	0.00	282.96	0.00
	Drainage Pipe 450mm CR Bfilled	760	m	299.43	227566.80	334.33	254090.80
	Drainage Pipe 525mm CR Bfilled	0	m	403.86	0.00	448.03	0.00
	Drainage - pits	39	No.	2565.39	100050.21	2806.10	109437.90
	Drainage – Sub-soil drainage	3195	m	33.88	108246.60	43.40	138663.00
	Drainage Culvert	0	No.	0.00	0.00	0.00	0.00
Traffic signals	Traffic Signals (all inclusive)	4	Item/ Per Leg	109730.28	438921.12	128786.34	515145.36
Landscape	Tree Planting	80	No.	303.34	24267.20	363.01	29040.80
	Landscaping	1800	m2	21.61	38898.00	25.16	45288.00
	Topsoil Seeding	1800	m2	7.21	12978.00	8.44	15192.00
Street Lighting	Street Lighting - Road	0	m	216.34	0.00	225.67	0.00
	Street Lighting - Intersections	4	Item/ Per Leg	48468.93	193875.72	55617.74	222470.96
Misc.	Regulatory Signage	20	Item	338.43	6768.60	380.39	7607.80
	Line marking	12040	m2 of Pavement	3.11	37444.40	4.09	49243.60
	Landscape maintenance (intersections)	1	Item	71344.66	71344.66	88131.43	88131.43
	Landscape maintenance (roads)	0	m2 of l'scape	2.90	0.00	2.96	0.00
	Tactile Pavers (Hazard only)	24	Item	292.43	7018.32	319.78	7674.72
Other	Sub-standard site conditions	0	% of area	0.00	0.00	0.00	0.00
Delivery	Council Fees	1	%	3.25	141069.01	3.25	161337.41
	VicRoads Fees	1	%	1.00	43405.85	1.00	49642.28
	Traffic Management	1	%	5.00	217029.24	5.00	248211.40
	Environmental Management	1	%	0.50	21702.92	0.50	24821.14
	Surveying and Design	1	%	5.00	217029.24	5.00	248211.40
	Supervision and Project management	1	%	9.00	390652.63	9.00	446780.52
	Site Establishment	1	%	2.50	108514.62	2.50	124105.70
	Contingency	1	%	15.00	651087.72	15.00	744634.20
Total	Excluding Delivery				**4,340,585**		**4,964,228**
	Including Delivery				**6,131,076**		**7,011,972**

Appendix C	
Description:	INTERSECTION - Primary - Secondary Intersection
Civil Component Number:	Item 6

Group	Sub Item	Qty	Unit	Rate (P50)	Amount (P50)	Rate (P90)	Amount (P90)
Siteworks/ Earthworks	Site Preperation	58862	m2	3.68	216612.16	4.96	291955.52
	Earthworks	10003	m3	34.07	340797.10	40.52	405315.48
Road Pavement	Primary Arterial Pavement	6840	m2	169.62	1160200.80	186.26	1274018.40
	Secondary Arterial Pavement	7150	m2	127.01	908121.50	133.78	956527.00
	Collector Arterial Pavement	0	m2	105.15	0.00	112.44	0.00
	Subgrade Preparation	2798	m2	14.22	39787.56	16.16	45215.68
	Pavement Rehab	0	m2	51.58	0.00	59.32	0.00
	Pavement Other	0	m2	0.00	0.00	0.00	0.00
Concrete Works	Kerb and Channel	1900	m	54.81	104139.00	60.90	115710.00
	Cycle Path	1120	m2	76.59	85780.80	91.94	102972.80
	SUP/ Footpath	735	m2	63.51	46679.85	73.63	54118.05
	Traffic Island	850	m2	77.60	65960.00	84.07	71459.50
Drainage	Drainage Pipe 300mm CR Bfilled	260	m	179.85	46761.00	197.96	51469.60
	Drainage Pipe 375mm CR Bfilled	0	m	259.10	0.00	282.96	0.00
	Drainage Pipe 450mm CR Bfilled	870	m	299.43	260504.10	334.33	290867.10
	Drainage Pipe 525mm CR Bfilled	0	m	403.86	0.00	448.03	0.00
	Drainage - pits	39	No.	2565.39	100050.21	2806.10	109437.90
	Drainage – Sub-soil drainage	3000	m	33.88	101640.00	43.40	130200.00
	Drainage Culvert	0	No.	0.00	0.00	0.00	0.00
Traffic signals	Traffic Signals (all inclusive)	4	Item/ Per Leg	109730.28	438921.12	128786.34	515145.36
Landscape	Tree Planting	62	No.	303.34	18807.08	363.01	22506.62
	Landscaping	2600	m2	21.61	56186.00	25.16	65416.00
	Topsoil Seeding	2600	m2	7.21	18746.00	8.44	21944.00
Street Lighting	Street Lighting - Road	0	m	216.34	0.00	225.67	0.00
	Street Lighting - Intersections	4	Item/ Per Leg	48468.93	193875.72	55617.74	222470.96
Misc.	Regulatory Signage	16	Item	338.43	5414.88	380.39	6086.24
	Line marking	13990	m2 of Pavement	3.11	43508.90	4.09	57219.10
	Landscape maintenance (intersections)	1	Item	71344.66	71344.66	88131.43	88131.43
	Landscape maintenance (roads)	0	m2 of l'scape	2.90	0.00	2.96	0.00
	Tactile Pavers (Hazard only)	24	Item	292.43	7018.32	319.78	7674.72
Other	Sub-standard site conditions	0	% of area	0.00	0.00	0.00	0.00
Delivery	Council Fees	1	%	3.25	140752.84	3.25	159440.50
	VicRoads Fees	1	%	1.00	43308.57	1.00	49058.61
	Traffic Management	1	%	5.00	216542.84	5.00	245293.07
	Environmental Management	1	%	0.50	21654.28	0.50	24529.31
	Surveying and Design	1	%	5.00	216542.84	5.00	245293.07
	Supervision and Project management	1	%	9.00	389777.11	9.00	441527.53
	Site Establishment	1	%	2.50	108271.42	2.50	122646.54
	Contingency	1	%	15.00	649628.51	15.00	735879.22
Total	Excluding Delivery				**4,330,857**		**4,905,861**
	Including Delivery				**6,117,335**		**6,929,529**

Appendix C	
Description:	INTERSECTION - Primary - Connector Intersection
Civil Component Number:	Item 7

Group	Sub Item	Qty	Unit	Rate (P50)	Amount (P50)	Rate (P90)	Amount (P90)
Siteworks/ Earthworks	Site Preperation	51843	m2	3.68	190782.24	4.96	257141.28
	Earthworks	4278	m3	34.07	145751.46	40.52	173344.56
Road Pavement	Primary Arterial Pavement	5250	m2	169.62	890505.00	186.26	977865.00
	Secondary Arterial Pavement	0	m2	127.01	0.00	133.78	0.00
	Collector Arterial Pavement	963	m2	105.15	101259.45	112.44	108279.72
	Subgrade Preparation	1242.6	m2	14.22	17669.77	16.16	20080.42
	Pavement Rehab	0	m2	51.58	0.00	59.32	0.00
	Pavement Other	0	m2	0.00	0.00	0.00	0.00
Concrete Works	Kerb and Channel	1492	m	54.81	81776.52	60.90	90862.80
	Cycle Path	1547	m2	76.59	118484.73	91.94	142231.18
	SUP/ Footpath	297	m2	63.51	18862.47	73.63	21868.11
	Traffic Island	2890	m2	77.60	224264.00	84.07	242962.30
Drainage	Drainage Pipe 300mm CR Bfilled	220	m	179.85	39567.00	197.96	43551.20
	Drainage Pipe 375mm CR Bfilled	0	m	259.10	0.00	282.96	0.00
	Drainage Pipe 450mm CR Bfilled	455	m	299.43	136240.65	334.33	152120.15
	Drainage Pipe 525mm CR Bfilled	0	m	403.86	0.00	448.03	0.00
	Drainage - pits	25	No.	2565.39	64134.75	2806.10	70152.50
	Drainage – Sub-soil drainage	2342	m	33.88	79346.96	43.40	101642.80
	Drainage Culvert	0	No.	0.00	0.00	0.00	0.00
Traffic signals	Traffic Signals (all inclusive)	4	Item/ Per Leg	109730.28	438921.12	128786.34	515145.36
Landscape	Tree Planting	51	No.	303.34	15470.34	363.01	18513.51
	Landscaping	1232	m2	21.61	26623.52	25.16	30997.12
	Topsoil Seeding	1232	m2	7.21	8882.72	8.44	10398.08
Street Lighting	Street Lighting - Road	0	m	216.34	0.00	225.67	0.00
	Street Lighting - Intersections	4	Item/ Per Leg	48468.93	193875.72	55617.74	222470.96
Misc	Regulatory Signage	16	Item	338.43	5414.88	380.39	6086.24
	Line marking	6213	m2 of Pavement	3.11	19322.43	4.09	25411.17
	Landscape maintenance (intersections)	1	Item	71344.66	71344.66	88131.43	88131.43
	Landscape maintenance (roads)	0	m2 of l'scape	2.90	0.00	2.96	0.00
	Tactile Pavers (Hazard only)	24	Item	292.43	7018.32	319.78	7674.72
Other	Sub-standard site conditions	0	% of area	0.00	0.00	0.00	0.00
Delivery	Council Fees	1	%	3.25	94104.36	3.25	108125.24
	VicRoads Fees	1	%	1.00	28955.19	1.00	33269.31
	Traffic Management	1	%	5.00	144775.94	5.00	166346.53
	Environmental Management	1	%	0.50	14477.59	0.50	16634.65
	Surveying and Design	1	%	5.00	144775.94	5.00	166346.53
	Supervision and Project management	1	%	9.00	260596.68	9.00	299423.75
	Site Establishment	1	%	2.50	72387.97	2.50	83173.27
	Contingency	1	%	15.00	434327.81	15.00	499039.59
Total	Excluding Delivery				**2,895,519**		**3,326,931**
	Including Delivery				**4,089,920**		**4,699,289**

Appendix C	
Description:	INTERSECTION - Secondary - Secondary Intersection
Civil Component Number:	Item 8

Group	Sub Item	Qty	Unit	Rate (P50)	Amount (P50)	Rate (P90)	Amount (P90)
Siteworks/ Earthworks	Site Preperation	52316	m2	3.68	192522.88	4.96	259487.36
	Earthworks	9867	m3	34.07	336168.69	40.52	399810.84
Road Pavement	Primary Arterial Pavement	0	m2	169.62	0.00	186.26	0.00
	Secondary Arterial Pavement	13800	m2	127.01	1752738.00	133.78	1846164.00
	Collector Arterial Pavement	0	m2	105.15	0.00	112.44	0.00
	Subgrade Preparation	2760	m2	14.22	39247.20	16.16	44601.60
	Pavement Rehab	0	m2	51.58	0.00	59.32	0.00
	Pavement Other	0	m2	0.00	0.00	0.00	0.00
Concrete Works	Kerb and Channel	2000	m	54.81	109620.00	60.90	121800.00
	Cycle Path	0	m2	76.59	0.00	91.94	0.00
	SUP/ Footpath	1700	m2	63.51	107967.00	73.63	125171.00
	Traffic Island	680	m2	77.60	52768.00	84.07	57167.60
Drainage	Drainage Pipe 300mm CR Bfilled	260	m	179.85	46761.00	197.96	51469.60
	Drainage Pipe 375mm CR Bfilled	0	m	259.10	0.00	282.96	0.00
	Drainage Pipe 450mm CR Bfilled	900	m	299.43	269487.00	334.33	300897.00
	Drainage Pipe 525mm CR Bfilled	0	m	403.86	0.00	448.03	0.00
	Drainage - pits	40	No.	2565.39	102615.60	2806.10	112244.00
	Drainage – Sub-soil drainage	3100	m	33.88	105028.00	43.40	134540.00
	Drainage Culvert	0	No.	0.00	0.00	0.00	0.00
Traffic signals	Traffic Signals (all inclusive)	4	Item/ Per Leg	109730.28	438921.12	128786.34	515145.36
Landscape	Tree Planting	60	No.	303.34	18200.40	363.01	21780.60
	Landscaping	3000	m2	21.61	64830.00	25.16	75480.00
	Topsoil Seeding	3000	m2	7.21	21630.00	8.44	25320.00
Street Lighting	Street Lighting - Road	0	m	216.34	0.00	225.67	0.00
	Street Lighting - Intersections	4	Item/ Per Leg	48468.93	193875.72	55617.74	222470.96
Misc	Regulatory Signage	16	Item	338.43	5414.88	380.39	6086.24
	Line marking	13800	m2 of Pavement	3.11	42918.00	4.09	56442.00
	Landscape maintenance (intersections)	1	Item	71344.66	71344.66	88131.43	88131.43
	Landscape maintenance (roads)	0	m2 of l'scape	2.90	0.00	2.96	0.00
	Tactile Pavers (Hazard only)	24	Item	292.43	7018.32	319.78	7674.72
Other	Sub-standard site conditions	0	% of area	0.00	0.00	0.00	0.00
Delivery	Council Fees	1	%	3.25	129319.99	3.25	145336.24
	VicRoads Fees	1	%	1.00	39790.76	1.00	44718.84
	Traffic Management	1	%	5.00	198953.82	5.00	223594.22
	Environmental Management	1	%	0.50	19895.38	0.50	22359.42
	Surveying and Design	1	%	5.00	198953.82	5.00	223594.22
	Supervision and Project management	1	%	9.00	358116.88	9.00	402469.59
	Site Establishment	1	%	2.50	99476.91	2.50	111797.11
	Contingency	1	%	15.00	596861.47	15.00	670782.65
Total	Excluding Delivery				**3,979,076**		**4,471,884**
	Including Delivery				**5,620,446**		**6,316,537**

Appendix C	
Description:	INTERSECTION - Secondary - Connector Intersection
Civil Component Number:	Item 9

Group	Sub Item	Qty	Unit	Rate (P50)	Amount (P50)	Rate (P90)	Amount (P90)
Siteworks/ Earthworks	Site Preperation	36798	m2	3.68	135416.64	4.96	182518.08
	Earthworks	5025	m3	34.07	171201.75	40.52	203613.00
Road Pavement	Primary Arterial Pavement	0	m2	169.62	0.00	186.26	0.00
	Secondary Arterial Pavement	6970	m2	127.01	885259.70	133.78	932446.60
	Collector Arterial Pavement	962	m2	105.15	101154.30	112.44	108167.28
	Subgrade Preparation	3966	m2	14.22	56396.52	16.16	64090.56
	Pavement Rehab	0	m2	51.58	0.00	59.32	0.00
	Pavement Other	0	m2	0.00	0.00	0.00	0.00
Concrete Works	Kerb and Channel	2008	m	54.81	110058.48	60.90	122287.20
	Cycle Path	346	m2	76.59	26500.14	91.94	31811.24
	SUP/ Footpath	1166	m2	63.51	74052.66	73.63	85852.58
	Traffic Island	105	m2	77.60	8148.00	84.07	8827.35
Drainage	Drainage Pipe 300mm CR Bfilled	210	m	179.85	37768.50	197.96	41571.60
	Drainage Pipe 375mm CR Bfilled	0	m	259.10	0.00	282.96	0.00
	Drainage Pipe 450mm CR Bfilled	540	m	299.43	161692.20	334.33	180538.20
	Drainage Pipe 525mm CR Bfilled	0	m	403.86	0.00	448.03	0.00
	Drainage - pits	24	No.	2565.39	61569.36	2806.10	67346.40
	Drainage – Sub-soil drainage	2548	m	33.88	86326.24	43.40	110583.20
	Drainage Culvert	0	No.	0.00	0.00	0.00	0.00
Traffic signals	Traffic Signals (all inclusive)	4	Item/ Per Leg	109730.28	438921.12	128786.34	515145.36
Landscape	Tree Planting	41	No.	303.34	12436.94	363.01	14883.41
	Landscaping	2468	m2	21.61	53333.48	25.16	62094.88
	Topsoil Seeding	2468	m2	7.21	17794.28	8.44	20829.92
Street Lighting	Street Lighting - Road	0	m	216.34	0.00	225.67	0.00
	Street Lighting - Intersections	4	Item/ Per Leg	48468.93	193875.72	55617.74	222470.96
Misc.	Regulatory Signage	10	Item	338.43	3384.30	380.39	3803.90
	Line marking	7932	m2 of Pavement	3.11	24668.52	4.09	32441.88
	Landscape maintenance (intersections)	1	Item	71344.66	71344.66	88131.43	88131.43
	Landscape maintenance (roads)	0	m2 of l'scape	2.90	0.00	2.96	0.00
	Tactile Pavers (Hazard only)	24	Item	292.43	7018.32	319.78	7674.72
Other	Sub-standard site conditions	0	% of area	0.00	0.00	0.00	0.00
Delivery	Council Fees	1	%	3.25	88995.46	3.25	100981.72
	VicRoads Fees	1	%	1.00	27383.22	1.00	31071.30
	Traffic Management	1	%	5.00	136916.09	5.00	155356.49
	Environmental Management	1	%	0.50	13691.61	0.50	15535.65
	Surveying and Design	1	%	5.00	136916.09	5.00	155356.49
	Supervision and Project management	1	%	9.00	246448.96	9.00	279641.68
	Site Establishment	1	%	2.50	68458.05	2.50	77678.24
	Contingency	1	%	15.00	410748.27	15.00	466069.46
Total	Excluding Delivery				**2,738,322**		**3,107,130**
	Including Delivery				**3,867,880**		**4,388,821**

Appendix C	
Description:	INTERSECTION - Connector - Connector Intersection
Civil Component Number:	Item 10

Group	Sub Item	Qty	Unit	Rate (P50)	Amount (P50)	Rate (P90)	Amount (P90)
Siteworks/ Earthworks	Site Preperation	29216	m2	3.68	107514.88	4.96	144911.36
	Earthworks	1930	m3	34.07	65755.10	40.52	78203.60
Road Pavement	Primary Arterial Pavement	0	m2	169.62	0.00	186.26	0.00
	Secondary Arterial Pavement	0	m2	127.01	0.00	133.78	0.00
	Collector Arterial Pavement	3604	m2	105.15	378960.60	112.44	405233.76
	Subgrade Preparation	721	m2	14.22	10252.62	16.16	11651.36
	Pavement Rehab	0	m2	51.58	0.00	59.32	0.00
	Pavement Other	0	m2	0.00	0.00	0.00	0.00
Concrete Works	Kerb and Channel	952	m	54.81	52179.12	60.90	57976.80
	Cycle Path	913	m2	76.59	69926.67	91.94	83941.22
	SUP/ Footpath	810	m2	63.51	51443.10	73.63	59640.30
	Traffic Island	0	m2	77.60	0.00	84.07	0.00
Drainage	Drainage Pipe 300mm CR Bfilled	39	m	179.85	7014.15	197.96	7720.44
	Drainage Pipe 375mm CR Bfilled	0	m	259.10	0.00	282.96	0.00
	Drainage Pipe 450mm CR Bfilled	245	m	299.43	73360.35	334.33	81910.85
	Drainage Pipe 525mm CR Bfilled	0	m	403.86	0.00	448.03	0.00
	Drainage - pits	10	No.	2565.39	25653.90	2806.10	28061.00
	Drainage – Sub-soil drainage	952	m	33.88	32253.76	43.40	41316.80
	Drainage Culvert	0	No.	0.00	0.00	0.00	0.00
Traffic signals	Traffic Signals (all inclusive)	0	Item/ Per Leg	109730.28	0.00	128786.34	0.00
Landscape	Tree Planting	38	No.	303.34	11526.92	363.01	13794.38
	Landscaping	4198	m2	21.61	90718.78	25.16	105621.68
	Topsoil Seeding	4198	m2	7.21	30267.58	8.44	35431.12
Street Lighting	Street Lighting - Road	0	m	216.34	0.00	225.67	0.00
	Street Lighting - Intersections	4	Item/ Per Leg	48468.93	193875.72	55617.74	222470.96
Misc.	Regulatory Signage	20	Item	338.43	6768.60	380.39	7607.80
	Line marking	3604	m2 of Pavement	3.11	11208.44	4.09	14740.36
	Landscape maintenance (intersections)	1	Item	71344.66	71344.66	88131.43	88131.43
	Landscape maintenance (roads)	0	m2 of l'scape	2.90	0.00	2.96	0.00
	Tactile Pavers (Hazard only)	48	Item	292.43	14036.64	319.78	15349.44
Other	Sub-standard site conditions	0	% of area	0.00	0.00	0.00	0.00
Delivery	Council Fees	1	%	3.25	42382.00	3.25	48870.73
	VicRoads Fees	1	%	1.00	13040.62	1.00	15037.15
	Traffic Management	1	%	5.00	65203.08	5.00	75185.73
	Environmental Management	1	%	0.50	6520.31	0.50	7518.57
	Surveying and Design	1	%	5.00	65203.08	5.00	75185.73
	Supervision and Project management	1	%	9.00	117365.54	9.00	135334.32
	Site Establishment	1	%	2.50	32601.54	2.50	37592.87
	Contingency	1	%	15.00	195609.24	15.00	225557.20
Total	Excluding Delivery				**1,304,062**		**1,503,715**
	Including Delivery				**1,841,987**		**2,123,997**

Appendix C	
Description:	INTERSECTION - Primary - Primary T Intersection
Civil Component Number:	Item 11

Group	Sub Item	Qty	Unit	Rate (P50)	Amount (P50)	Rate (P90)	Amount (P90)
Siteworks/ Earthworks	Site Preperation	53208	m2	3.68	195805.44	4.96	263911.68
	Earthworks	6218.355	m3	34.07	211859.35	40.52	251967.74
Road Pavement	Primary Arterial Pavement	8697	m2	169.62	1475185.14	186.26	1619903.22
	Secondary Arterial Pavement	0	m2	127.01	0.00	133.78	0.00
	Collector Arterial Pavement	0	m2	105.15	0.00	112.44	0.00
	Subgrade Preparation	1739.4	m2	14.22	24734.27	16.16	28108.70
	Pavement Rehab	0	m2	51.58	0.00	59.32	0.00
	Pavement Other	0	m2	0.00	0.00	0.00	0.00
Concrete Works	Kerb and Channel	1637	m	54.81	89723.97	60.90	99693.30
	Cycle Path	1765	m2	76.59	135181.35	91.94	162274.10
	SUP/ Footpath	0	m2	63.51	0.00	73.63	0.00
	Traffic Island	2972	m2	77.60	230627.20	84.07	249856.04
Drainage	Drainage Pipe 300mm CR Bfilled	200	m	179.85	35970.00	197.96	39592.00
	Drainage Pipe 375mm CR Bfilled	0	m	259.10	0.00	282.96	0.00
	Drainage Pipe 450mm CR Bfilled	550	m	299.43	164686.50	334.33	183881.50
	Drainage Pipe 525mm CR Bfilled	0	m	403.86	0.00	448.03	0.00
	Drainage - pits	27	No.	2565.39	69265.53	2806.10	75764.70
	Drainage – Sub-soil drainage	2370	m	33.88	80295.60	43.40	102858.00
	Drainage Culvert	0	No.	0.00	0.00	0.00	0.00
Traffic signals	Traffic Signals (all inclusive)	3	Item/ Per Leg	109730.28	329190.84	128786.34	386359.02
Landscape	Tree Planting	83	No.	303.34	25177.22	363.01	30129.83
	Landscaping	3330	m2	21.61	71961.30	25.16	83782.80
	Topsoil Seeding	3330	m2	7.21	24009.30	8.44	28105.20
Street Lighting	Street Lighting - Road	0	m	216.34	0.00	225.67	0.00
	Street Lighting - Intersections	3	Item/ Per Leg	48468.93	145406.79	55617.74	166853.22
Misc.	Regulatory Signage	9	Item	338.43	3045.87	380.39	3423.51
	Line marking	8697	m2 of Pavement	3.11	27047.67	4.09	35570.73
	Landscape maintenance (intersections)	1	Item	71344.66	71344.66	88131.43	88131.43
	Landscape maintenance (roads)	0	m2 of l'scape	2.90	0.00	2.96	0.00
	Tactile Pavers (Hazard only)	18	Item	292.43	5263.74	319.78	5756.04
Other	Sub-standard site conditions	1	% of area	0.00	0.00	0.00	0.00
Delivery	Council Fees	1	%	3.25	111012.91	3.25	126942.49
	VicRoads Fees	1	%	1.00	34157.82	1.00	39059.23
	Traffic Management	1	%	5.00	170789.09	5.00	195296.14
	Environmental Management	1	%	0.50	17078.91	0.50	19529.61
	Surveying and Design	1	%	5.00	170789.09	5.00	195296.14
	Supervision and Project management	1	%	9.00	307420.36	9.00	351533.05
	Site Establishment	1	%	2.50	85394.54	2.50	97648.07
	Contingency	1	%	15.00	512367.26	15.00	585888.42
Total	Excluding Delivery				**3,415,782**		**3,905,923**
	Including Delivery				**4,824,792**		**5,517,116**

Appendix C	
Description:	INTERSECTION - Primary - Secondary T Intersection
Civil Component Number:	Item 12

Group	Sub Item	Qty	Unit	Rate (P50)	Amount (P50)	Rate (P90)	Amount (P90)
Siteworks/ Earthworks	Site Preperation	49353	m2	3.68	181619.04	4.96	244790.88
	Earthworks	6034.6	m3	34.07	205598.82	40.52	244521.99
Road Pavement	Primary Arterial Pavement	5974	m2	169.62	1013309.88	186.26	1112717.24
	Secondary Arterial Pavement	2466	m2	127.01	313206.66	133.78	329901.48
	Collector Arterial Pavement	0	m2	105.15	0.00	112.44	0.00
	Subgrade Preparation	1688	m2	14.22	24003.36	16.16	27278.08
	Pavement Rehab	0	m2	51.58	0.00	59.32	0.00
	Pavement Other	0	m2	0.00	0.00	0.00	0.00
Concrete Works	Kerb and Channel	1543	m	54.81	84571.83	60.90	93968.70
	Cycle Path	1190	m2	76.59	91142.10	91.94	109408.60
	SUP/ Footpath	410	m2	63.51	26039.10	73.63	30188.30
	Traffic Island	1105	m2	77.60	85748.00	84.07	92897.35
Drainage	Drainage Pipe 300mm CR Bfilled	195	m	179.85	35070.75	197.96	38602.20
	Drainage Pipe 375mm CR Bfilled	0	m	259.10	0.00	282.96	0.00
	Drainage Pipe 450mm CR Bfilled	580	m	299.43	173669.40	334.33	193911.40
	Drainage Pipe 525mm CR Bfilled	0	m	403.86	0.00	448.03	0.00
	Drainage - pits	31	No.	2565.39	79527.09	2806.10	86989.10
	Drainage – Sub-soil drainage	2303	m	33.88	78025.64	43.40	99950.20
	Drainage Culvert	0	No.	0.00	0.00	0.00	0.00
Traffic signals	Traffic Signals (all inclusive)	3	Item/ Per Leg	109730.28	329190.84	128786.34	386359.02
Landscape	Tree Planting	72	No.	303.34	21840.48	363.01	26136.72
	Landscaping	3450	m2	21.61	74554.50	25.16	86802.00
	Topsoil Seeding	3450	m2	7.21	24874.50	8.44	29118.00
Street Lighting	Street Lighting - Road	0	m	216.34	0.00	225.67	0.00
	Street Lighting - Intersections	3	Item/ Per Leg	48468.93	145406.79	55617.74	166853.22
Misc.	Regulatory Signage	9	Item	338.43	3045.87	380.39	3423.51
	Line marking	8440	m2 of Pavement	3.11	26248.40	4.09	34519.60
	Landscape maintenance (intersections)	1	Item	71344.66	71344.66	88131.43	88131.43
	Landscape maintenance (roads)	0	m2 of l'scape	2.90	0.00	2.96	0.00
	Tactile Pavers (Hazard only)	18	Item	292.43	5263.74	319.78	5756.04
Other	Sub-standard site conditions	0	% of area	0.00	0.00	0.00	0.00
Delivery	Council Fees	1	%	3.25	100532.30	3.25	114797.31
	VicRoads Fees	1	%	1.00	30933.01	1.00	35322.25
	Traffic Management	1	%	5.00	154665.07	5.00	176611.25
	Environmental Management	1	%	0.50	15466.51	0.50	17661.13
	Surveying and Design	1	%	5.00	154665.07	5.00	176611.25
	Supervision and Project management	1	%	9.00	278397.13	9.00	317900.26
	Site Establishment	1	%	2.50	77332.54	2.50	88305.63
	Contingency	1	%	15.00	463995.22	15.00	529833.76
Total	Excluding Delivery				**3,093,301**		**3,532,225**
	Including Delivery				**4,369,288**		**4,989,268**

Appendix C	
Description:	INTERSECTION - Primary - Connector T Intersection
Civil Component Number:	Item 13

Group	Sub Item	Qty	Unit	Rate (P50)	Amount (P50)	Rate (P90)	Amount (P90)
Siteworks/ Earthworks	Site Preperation	41601	m2	3.68	153091.68	4.96	206340.96
	Earthworks	4381	m3	34.07	149260.67	40.52	177518.12
Road Pavement	Primary Arterial Pavement	5295	m2	169.62	898137.90	186.26	986246.70
	Secondary Arterial Pavement	0	m2	127.01	0.00	133.78	0.00
	Collector Arterial Pavement	482	m2	105.15	50682.30	112.44	54196.08
	Subgrade Preparation	1155.4	m2	14.22	16429.79	16.16	18671.26
	Pavement Rehab	0	m2	51.58	0.00	59.32	0.00
	Pavement Other	0	m2	0.00	0.00	0.00	0.00
Concrete Works	Kerb and Channel	1607	m	54.81	88079.67	60.90	97866.30
	Cycle Path	1225	m2	76.59	93822.75	91.94	112626.50
	SUP/ Footpath	120	m2	63.51	7621.20	73.63	8835.60
	Traffic Island	675	m2	77.60	52380.00	84.07	56747.25
Drainage	Drainage Pipe 300mm CR Bfilled	165	m	179.85	29675.25	197.96	32663.40
	Drainage Pipe 375mm CR Bfilled	0	m	259.10	0.00	282.96	0.00
	Drainage Pipe 450mm CR Bfilled	410	m	299.43	122766.30	334.33	137075.30
	Drainage Pipe 525mm CR Bfilled	0	m	403.86	0.00	448.03	0.00
	Drainage - pits	19	No.	2565.39	48742.41	2806.10	53315.90
	Drainage – Sub-soil drainage	2107	m	33.88	71385.16	43.40	91443.80
	Drainage Culvert	0	No.	0.00	0.00	0.00	0.00
Traffic signals	Traffic Signals (all inclusive)	3	Item/ Per Leg	109730.28	329190.84	128786.34	386359.02
Landscape	Tree Planting	53	No.	303.34	16077.02	363.01	19239.53
	Landscaping	2456	m2	21.61	53074.16	25.16	61792.96
	Topsoil Seeding	2456	m2	7.21	17707.76	8.44	20728.64
Street Lighting	Street Lighting - Road	0	m	216.34	0.00	225.67	0.00
	Street Lighting - Intersections	3	Item/ Per Leg	48468.93	145406.79	55617.74	166853.22
Misc.	Regulatory Signage	6	Item	338.43	2030.58	380.39	2282.34
	Line marking	5777	m2 of Pavement	3.11	17966.47	4.09	23627.93
	Landscape maintenance (intersections)	1	Item	71344.66	71344.66	88131.43	88131.43
	Landscape maintenance (roads)	0	m2 of l'scape	2.90	0.00	2.96	0.00
	Tactile Pavers (Hazard only)	18	Item	292.43	5263.74	319.78	5756.04
Other	Sub-standard site conditions	1	% of area	0.00	0.00	0.00	0.00
Delivery	Council Fees	1	%	3.25	79304.46	3.25	91270.34
	VicRoads Fees	1	%	1.00	24401.37	1.00	28083.18
	Traffic Management	1	%	5.00	122006.85	5.00	140415.91
	Environmental Management	1	%	0.50	12200.69	0.50	14041.59
	Surveying and Design	1	%	5.00	122006.85	5.00	140415.91
	Supervision and Project management	1	%	9.00	219612.34	9.00	252748.65
	Site Establishment	1	%	2.50	61003.43	2.50	70207.96
	Contingency	1	%	15.00	366020.56	15.00	421247.74
Total	Excluding Delivery				**2,440,137**		**2,808,318**
	Including Delivery				**3,446,694**		**3,966,750**

Appendix C	
Description:	INTERSECTION - Secondary Arterial - Secondary Arterial T Intersection
Civil Component Number:	Item 14

Group	Sub Item	Qty	Unit	Rate (P50)	Amount (P50)	Rate (P90)	Amount (P90)
Siteworks/ Earthworks	Site Preperation	43060	m2	3.68	158460.80	4.96	213577.60
	Earthworks	6544.395	m3	34.07	222967.54	40.52	265178.89
Road Pavement	Primary Arterial Pavement	0	m2	169.62	0.00	186.26	0.00
	Secondary Arterial Pavement	9153	m2	127.01	1162522.53	133.78	1224488.34
	Collector Arterial Pavement	0	m2	105.15	0.00	112.44	0.00
	Subgrade Preparation	1830.6	m2	14.22	26031.13	16.16	29582.50
	Pavement Rehab	0	m2	51.58	0.00	59.32	0.00
	Pavement Other	0	m2	0.00	0.00	0.00	0.00
Concrete Works	Kerb and Channel	1650	m	54.81	90436.50	60.90	100485.00
	Cycle Path	0	m2	76.59	0.00	91.94	0.00
	SUP/ Footpath	1100	m2	63.51	69861.00	73.63	80993.00
	Traffic Island	688	m2	77.60	53388.80	84.07	57840.16
Drainage	Drainage Pipe 300mm CR Bfilled	220	m	179.85	39567.00	197.96	43551.20
	Drainage Pipe 375mm CR Bfilled	0	m	259.10	0.00	282.96	0.00
	Drainage Pipe 450mm CR Bfilled	660	m	299.43	197623.80	334.33	220657.80
	Drainage Pipe 525mm CR Bfilled	0	m	403.86	0.00	448.03	0.00
	Drainage - pits	33	No.	2565.39	84657.87	2806.10	92601.30
	Drainage – Sub-soil drainage	2430	m	33.88	82328.40	43.40	105462.00
	Drainage Culvert	0	No.	0.00	0.00	0.00	0.00
Traffic signals	Traffic Signals (all inclusive)	3	Item/ Per Leg	109730.28	329190.84	128786.34	386359.02
Landscape	Tree Planting	54	No.	303.34	16380.36	363.01	19602.54
	Landscaping	2640	m2	21.61	57050.40	25.16	66422.40
	Topsoil Seeding	2640	m2	7.21	19034.40	8.44	22281.60
Street Lighting	Street Lighting - Road	0	m	216.34	0.00	225.67	0.00
	Street Lighting - Intersections	3	Item/ Per Leg	48468.93	145406.79	55617.74	166853.22
Misc.	Regulatory Signage	9	Item	338.43	3045.87	380.39	3423.51
	Line marking	9153	m2 of Pavement	3.11	28465.83	4.09	37435.77
	Landscape maintenance (intersections)	1	Item	71344.66	71344.66	88131.43	88131.43
	Landscape maintenance (roads)	0	m2 of l'scape	2.90	0.00	2.96	0.00
	Tactile Pavers (Hazard only)	18	Item	292.43	5263.74	319.78	5756.04
Other	Sub-standard site conditions	0	% of area	0.00	0.00	0.00	0.00
Delivery	Council Fees	1	%	3.25	93048.42	3.25	104997.21
	VicRoads Fees	1	%	1.00	28630.28	1.00	32306.83
	Traffic Management	1	%	5.00	143151.41	5.00	161534.17
	Environmental Management	1	%	0.50	14315.14	0.50	16153.42
	Surveying and Design	1	%	5.00	143151.41	5.00	161534.17
	Supervision and Project management	1	%	9.00	257672.54	9.00	290761.50
	Site Establishment	1	%	2.50	71575.71	2.50	80767.08
	Contingency	1	%	15.00	429454.24	15.00	484602.50
Total	Excluding Delivery				**2,863,028**		**3,230,683**
	Including Delivery				**4,044,027**		**4,563,340**

Appendix C	
Description:	INTERSECTION - Secondary - Connector T Intersection
Civil Component Number:	Item 15

Group	Sub Item	Qty	Unit	Rate (P50)	Amount (P50)	Rate (P90)	Amount (P90)
Siteworks/ Earthworks	Site Preperation	36110	m2	3.68	132884.80	4.96	179105.60
	Earthworks	4905	m3	34.07	167113.35	40.52	198750.60
Road Pavement	Primary Arterial Pavement	0	m2	169.62	0.00	186.26	0.00
	Secondary Arterial Pavement	5915	m2	127.01	751264.15	133.78	791308.70
	Collector Arterial Pavement	482	m2	105.15	50682.30	112.44	54196.08
	Subgrade Preparation	1279.4	m2	14.22	18193.07	16.16	20675.10
	Pavement Rehab	0	m2	51.58	0.00	59.32	0.00
	Pavement Other	0	m2	0.00	0.00	0.00	0.00
Concrete Works	Kerb and Channel	1460	m	54.81	80022.60	60.90	88914.00
	Cycle Path	170	m2	76.59	13020.30	91.94	15629.80
	SUP/ Footpath	940	m2	63.51	59699.40	73.63	69212.20
	Traffic Island	485	m2	77.60	37636.00	84.07	40773.95
Drainage	Drainage Pipe 300mm CR Bfilled	140	m	179.85	25179.00	197.96	27714.40
	Drainage Pipe 375mm CR Bfilled	0	m	259.10	0.00	282.96	0.00
	Drainage Pipe 450mm CR Bfilled	450	m	299.43	134743.50	334.33	150448.50
	Drainage Pipe 525mm CR Bfilled	0	m	403.86	0.00	448.03	0.00
	Drainage - pits	21	No.	2565.39	53873.19	2806.10	58928.10
	Drainage – Sub-soil drainage	1960	m	33.88	66404.80	43.40	85064.00
	Drainage Culvert	0	No.	0.00	0.00	0.00	0.00
Traffic signals	Traffic Signals (all inclusive)	3	Item/ Per Leg	109730.28	329190.84	128786.34	386359.02
Landscape	Tree Planting	41	No.	303.34	12436.94	363.01	14883.41
	Landscaping	2386	m2	21.61	51561.46	25.16	60031.76
	Topsoil Seeding	2386	m2	7.21	17203.06	8.44	20137.84
Street Lighting	Street Lighting - Road	0	m	216.34	0.00	225.67	0.00
	Street Lighting - Intersections	3	Item/ Per Leg	48468.93	145406.79	55617.74	166853.22
Misc.	Regulatory Signage	5	Item	338.43	1692.15	380.39	1901.95
	Line marking	6397	m2 of Pavement	3.11	19894.67	4.09	26163.73
	Landscape maintenance (intersections)	1	Item	71344.66	71344.66	88131.43	88131.43
	Landscape maintenance (roads)	0	m2 of l'scape	2.90	0.00	2.96	0.00
	Tactile Pavers (Hazard only)	18	Item	292.43	5263.74	319.78	5756.04
Other	Sub-standard site conditions	0	% of area	0.00	0.00	0.00	0.00
Delivery	Council Fees	1	%	3.25	72953.10	3.25	82905.53
	VicRoads Fees	1	%	1.00	22447.11	1.00	25509.39
	Traffic Management	1	%	5.00	112235.54	5.00	127546.97
	Environmental Management	1	%	0.50	11223.55	0.50	12754.70
	Surveying and Design	1	%	5.00	112235.54	5.00	127546.97
	Supervision and Project management	1	%	9.00	202023.97	9.00	229584.55
	Site Establishment	1	%	2.50	56117.77	2.50	63773.49
	Contingency	1	%	15.00	336706.62	15.00	382640.92
Total	Excluding Delivery				**2,244,711**		**2,550,939**
	Including Delivery				**3,170,654**		**3,603,202**

Appendix C	
Description:	INTERSECTION -Connector - Connector T Intersection
Civil Component Number:	Item 16

Group	Sub Item	Qty	Unit	Rate (P50)	Amount (P50)	Rate (P90)	Amount (P90)
Siteworks/ Earthworks	Site Preperation	26980	m2	3.68	99286.40	4.96	133820.80
	Earthworks	1448	m3	34.07	49333.36	40.52	58672.96
Road Pavement	Primary Arterial Pavement	0	m2	169.62	0.00	186.26	0.00
	Secondary Arterial Pavement	0	m2	127.01	0.00	133.78	0.00
	Collector Arterial Pavement	2706	m2	105.15	284535.90	112.44	304262.64
	Subgrade Preparation	542	m2	14.22	7707.24	16.16	8758.72
	Pavement Rehab	0	m2	51.58	0.00	59.32	0.00
	Pavement Other	0	m2	0.00	0.00	0.00	0.00
Concrete Works	Kerb and Channel	696	m	54.81	38147.76	60.90	42386.40
	Cycle Path	705	m2	76.59	53995.95	91.94	64817.70
	SUP/ Footpath	851	m2	63.51	54047.01	73.63	62659.13
	Traffic Island	0	m2	77.60	0.00	84.07	0.00
Drainage	Drainage Pipe 300mm CR Bfilled	26	m	179.85	4676.10	197.96	5146.96
	Drainage Pipe 375mm CR Bfilled	0	m	259.10	0.00	282.96	0.00
	Drainage Pipe 450mm CR Bfilled	184	m	299.43	55095.12	334.33	61516.72
	Drainage Pipe 525mm CR Bfilled	0	m	403.86	0.00	448.03	0.00
	Drainage - pits	8	No.	2565.39	20523.12	2806.10	22448.80
	Drainage – Sub-soil drainage	696	m	33.88	23580.48	43.40	30206.40
	Drainage Culvert	0	No.	0.00	0.00	0.00	0.00
Traffic signals	Traffic Signals (all inclusive)	0	Item/ Per Leg	109730.28	0.00	128786.34	0.00
Landscape	Tree Planting	35	No.	303.34	10616.90	363.01	12705.35
	Landscaping	2970	m2	21.61	64181.70	25.16	74725.20
	Topsoil Seeding	2970	m2	7.21	21413.70	8.44	25066.80
Street Lighting	Street Lighting - Road	0	m	216.34	0.00	225.67	0.00
	Street Lighting - Intersections	3	Item/ Per Leg	48468.93	145406.79	55617.74	166853.22
Misc.	Regulatory Signage	20	Item	338.43	6768.60	380.39	7607.80
	Line marking	2706	m2 of Pavement	3.11	8415.66	4.09	11067.54
	Landscape maintenance (intersections)	1	Item	71344.66	71344.66	88131.43	88131.43
	Landscape maintenance (roads)	0	m2 of l'scape	2.90	0.00	2.96	0.00
	Tactile Pavers (Hazard only)	48	Item	292.43	14036.64	319.78	15349.44
Other	Sub-standard site conditions	0	% of area	0.00	0.00	0.00	0.00
Delivery	Council Fees	1	%	3.25	33576.18	3.25	38876.63
	VicRoads Fees	1	%	1.00	10331.13	1.00	11962.04
	Traffic Management	1	%	5.00	51655.65	5.00	59810.20
	Environmental Management	1	%	0.50	5165.57	0.50	5981.02
	Surveying and Design	1	%	5.00	51655.65	5.00	59810.20
	Supervision and Project management	1	%	9.00	92980.18	9.00	107658.36
	Site Establishment	1	%	2.50	25827.83	2.50	29905.10
	Contingency	1	%	15.00	154966.96	15.00	179430.60
Total	Excluding Delivery				**1,033,113**		**1,196,204**
	Including Delivery				**1,459,272**		**1,689,638**

Appendix C	
Description:	BRIDGE - 50m - Primary
Civil Component Number:	Item 17

Group	Sub Item	Qty	Unit	Rate (P50)	Amount P(50)	Rate (P90)	Amount P(90)
Earthworks	Site Preperation	7923	m2	3.68	29,156.64	6.62	52,450.26
	Earthworks	13262	m3	50.07	664,028.34	54.62	724,370.44
On-Structure Works	Retaining Walls, abutments, footings	incl	No	369,439.34	0.00	415,928.97	0.00
	Bridge Deck	incl	m2	1,258.48	0.00	2,060.14	0.00
	Guard Rails/ Balustrade	incl	m	2,355.21	0.00	3,032.46	0.00
	Transition Slab	2	No	33,425.31	66,850.62	38,439.11	76,878.22
	Overall Super T Cost	865	m2	4,425.57	3,828,118.05	5,226.40	4,520,836.00
Off Structure	Guard Rails/ Balustrade	240	m	187.10	44,904.00	224.54	53,889.60
	GREAT Terminal	4	No	8,767.42	35,069.68	13,875.66	55,502.64
	Off structure barrier	0	Item	1,565.45	0.00	2,311.95	0.00
Other							
Delivery	Council Fees	1	%	3.25	150,766.55	3.25	176,523.00
	VicRoads Fees	1	%	1.00	46,389.71	1.00	54,314.77
	Traffic Management	1	%	5.00	231,948.53	5.00	271,573.85
	Environmental Management	1	%	0.50	23,194.85	0.50	27,157.38
	Surveying and Design	1	%	5.00	231,948.53	5.00	271,573.85
	Supervision and Project management	1	%	9.00	417,507.36	9.00	488,832.92
	Site Establishment	1	%	2.50	115,974.27	2.50	135,786.92
	Contingency	1	%	20.00	927,794.14	20.00	1,086,295.38
Total	Excluding Delivery				**4,668,127**		**5,483,927**
	Including Delivery				**6,827,136**		**8,020,243**

Appendix C	
Description:	BRIDGE - 100m - Primary
Civil Component Number:	Item 18

Group	Sub Item	Qty	Unit	Rate (P50)	Amount P(50)	Rate (P90)	Amount P(90)
Earthworks	Site Preperation	9348	m2	3.68	34,400.64	6.62	61,883.76
	Earthworks	13262	m3	50.07	664,028.34	54.62	724,370.44
On-Structure Works	Retaining Walls, abutments, footings	incl	No	369,439.34	0.00	415,928.97	0.00
	Bridge Deck	incl	m2	1,258.48	0.00	2,060.14	0.00
	Guard Rails/ Balustrade	incl	m	2,355.21	0.00	3,032.46	0.00
	Transition Slab	2	No	33,425.31	66,850.62	38,439.11	76,878.22
	Overall Super T Cost	1730	m2	4,425.57	7,656,236.10	5,226.40	9,041,672.00
Off Structure	Guard Rails/ Balustrade	240	m	187.10	44,904.00	224.54	53,889.60
	GREAT Terminal	4	No	8,767.42	35,069.68	13,875.66	55,502.64
	Off structure barrier	0	Item	1,565.45	0.00	2,311.95	0.00
Other							
Delivery	Council Fees	1	%	3.25	275,180.38	3.25	323,450.17
	VicRoads Fees	1	%	1.00	84,670.89	1.00	99,523.13
	Traffic Management	1	%	5.00	423,354.44	5.00	497,615.65
	Environmental Management	1	%	0.50	42,335.44	0.50	49,761.56
	Surveying and Design	1	%	5.00	423,354.44	5.00	497,615.65
	Supervision and Project management	1	%	9.00	762,037.99	9.00	895,708.16
	Site Establishment	1	%	2.50	211,677.22	2.50	248,807.82
	Contingency	1	%	20.00	1,693,417.75	20.00	1,990,462.58
Total	Excluding Delivery				**8,501,489**		**10,014,197**
	Including Delivery				**12,433,428**		**14,645,763**

Appendix C	
Description:	BRIDGE - 50m - Secondary
Civil Component Number:	Item 19

Group	Sub Item	Qty	Unit	Rate (P50)	Amount P(50)	Rate (P90)	Amount P(90)
Earthworks	Site Preperation	7506	m2	3.68	27,622.08	6.62	49,689.72
	Earthworks	12313	m3	50.07	616,511.91	54.62	672,536.06
On-Structure Works	Retaining Walls, abutments, footings	incl	No	369,439.34	0.00	415,928.97	0.00
	Bridge Deck	incl	m2	1,258.48	0.00	2,060.14	0.00
	Guard Rails/ Balustrade	incl	m	2,355.21	0.00	3,032.46	0.00
	Transition Slab	2	No	33,425.31	66,850.62	38,439.11	76,878.22
	Overall Super T Cost	790	m2	4,425.57	3,496,200.30	5,226.40	4,128,856.00
Off Structure	Guard Rails/ Balustrade	240	m	187.10	44,904.00	224.54	53,889.60
	GREAT Terminal	4	No	8,767.42	35,069.68	13,875.66	55,502.64
	Off structure barrier	0	Item	1,565.45	0.00	2,311.95	0.00
Other							
Delivery	Council Fees	1	%	3.25	138,434.94	3.25	162,099.03
	VicRoads Fees	1	%	1.00	42,595.37	1.00	49,876.63
	Traffic Management	1	%	5.00	212,976.83	5.00	249,383.13
	Environmental Management	1	%	0.50	21,297.68	0.50	24,938.31
	Surveying and Design	1	%	5.00	212,976.83	5.00	249,383.13
	Supervision and Project management	1	%	9.00	383,358.29	9.00	448,889.63
	Site Establishment	1	%	2.50	106,488.41	2.50	124,691.56
	Contingency	1	%	20.00	851,907.30	20.00	997,532.50
Total	Excluding Delivery				**4,287,159**		**5,037,352**
	Including Delivery				**6,269,969**		**7,367,128**

Appendix C	
Description:	BRIDGE - 100m - Secondary
Civil Component Number:	Item 20

Group	Sub Item	Qty	Unit	Rate (P50)	Amount P(50)	Rate (P90)	Amount P(90)
Earthworks	Site Preperation	8856	m2	3.68	32,590.08	6.62	58,626.72
	Earthworks	12313	m3	50.07	616,511.91	54.62	672,536.06
On-Structure Works	Retaining Walls, abutments, footings	incl	No	369,439.34	0.00	415,928.97	0.00
	Bridge Deck	incl	m2	1,258.48	0.00	2,060.14	0.00
	Guard Rails/ Balustrade	incl	m	2,355.21	0.00	3,032.46	0.00
	Transition Slab	2	No	33,425.31	66,850.62	38,439.11	76,878.22
	Overall Super T Cost	1580	m2	4,425.57	6,992,400.60	5,226.40	8,257,712.00
Off Structure	Guard Rails/ Balustrade	240	m	187.10	44,904.00	224.54	53,889.60
	GREAT Terminal	4	No	8,767.42	35,069.68	13,875.66	55,502.64
	Off structure barrier	0	Item	1,565.45	0.00	2,311.95	0.00
Other							
Delivery	Council Fees	1	%	3.25	252,061.45	3.25	296,286.85
	VicRoads Fees	1	%	1.00	77,557.37	1.00	91,165.19
	Traffic Management	1	%	5.00	387,786.84	5.00	455,825.93
	Environmental Management	1	%	0.50	38,778.68	0.50	45,582.59
	Surveying and Design	1	%	5.00	387,786.84	5.00	455,825.93
	Supervision and Project management	1	%	9.00	698,016.31	9.00	820,486.67
	Site Establishment	1	%	2.50	193,893.42	2.50	227,912.96
	Contingency	1	%	20.00	1,551,147.36	20.00	1,823,303.70
Total	Excluding Delivery				**7,788,327**		**9,175,145**
	Including Delivery				**11,390,428**		**13,418,650**

Appendix C	
Description:	BRIDGE - 50m - Connector
Civil Component Number:	Item 21

Group	Sub Item	Qty	Unit	Rate (P50)	Amount P(50)	Rate (P90)	Amount P(90)
Earthworks	Site Preperation	7506	m2	3.68	27,622.08	6.62	49,689.72
	Earthworks	12313	m3	50.07	616,511.91	54.62	672,536.06
On-Structure Works	Retaining Walls, abutments, footings	incl	No	369,439.34	0.00	415,928.97	0.00
	Bridge Deck	incl	m2	1,258.48	0.00	2,060.14	0.00
	Guard Rails/ Balustrade	incl	m	2,355.21	0.00	3,032.46	0.00
	Transition Slab	2	No	33,425.31	66,850.62	38,439.11	76,878.22
	Overall Super T Cost	790	m2	4,425.57	3,496,200.30	5,226.40	4,128,856.00
Off Structure	Guard Rails/ Balustrade	240	m	187.10	44,904.00	224.54	53,889.60
	GREAT Terminal	4	No	8,767.42	35,069.68	13,875.66	55,502.64
	Off structure barrier	0	Item	1,565.45	0.00	2,311.95	0.00
Other							
Delivery	Council Fees	1	%	3.25	138,434.94	3.25	162,099.03
	VicRoads Fees	1	%	1.00	42,595.37	1.00	49,876.63
	Traffic Management	1	%	5.00	212,976.83	5.00	249,383.13
	Environmental Management	1	%	0.50	21,297.68	0.50	24,938.31
	Surveying and Design	1	%	5.00	212,976.83	5.00	249,383.13
	Supervision and Project management	1	%	9.00	383,358.29	9.00	448,889.63
	Site Establishment	1	%	2.50	106,488.41	2.50	124,691.56
	Contingency	1	%	20.00	851,907.30	20.00	997,532.50
Total	Excluding Delivery				**4,287,159**		**5,037,352**
	Including Delivery				**6,269,969**		**7,367,128**

Appendix C	
Description:	BRIDGE - 100m - Connector
Civil Component Number:	Item 22

Group	Sub Item	Qty	Unit	Rate (P50)	Amount P(50)	Rate (P90)	Amount P(90)
Earthworks	Site Preperation	8856	m2	3.68	32,590.08	6.62	58,626.72
	Earthworks	12313	m3	50.07	616,511.91	54.62	672,536.06
On-Structure Works	Retaining Walls, abutments, footings	incl	No	369,439.34	0.00	415,928.97	0.00
	Bridge Deck	incl	m2	1,258.48	0.00	2,060.14	0.00
	Guard Rails/ Balustrade	incl	m	2,355.21	0.00	3,032.46	0.00
	Transition Slab	2	No	33,425.31	66,850.62	38,439.11	76,878.22
	Overall Super T Cost	1580	m2	4,425.57	6,992,400.60	5,226.40	8,257,712.00
Off Structure	Guard Rails/ Balustrade	240	m	187.10	44,904.00	224.54	53,889.60
	GREAT Terminal	4	No	8,767.42	35,069.68	13,875.66	55,502.64
	Off structure barrier	0	Item	1,565.45	0.00	2,311.95	0.00
Other							
Delivery	Council Fees	1	%	3.25	252,061.45	3.25	296,286.85
	VicRoads Fees	1	%	1.00	77,557.37	1.00	91,165.19
	Traffic Management	1	%	5.00	387,786.84	5.00	455,825.93
	Environmental Management	1	%	0.50	38,778.68	0.50	45,582.59
	Surveying and Design	1	%	5.00	387,786.84	5.00	455,825.93
	Supervision and Project management	1	%	9.00	698,016.31	9.00	820,486.67
	Site Establishment	1	%	2.50	193,893.42	2.50	227,912.96
	Contingency	1	%	20.00	1,551,147.36	20.00	1,823,303.70
Total	Excluding Delivery				**7,788,327**		**9,175,145**
	Including Delivery				**11,390,428**		**13,418,650**

Appendix C	
Description:	BRIDGE - 20m - Pedestrian
Civil Component Number:	Item 23

Group	Sub Item	Qty	Unit	Rate (P50)	Amount P(50)	Rate (P90)	Amount P(90)
Earthworks	Site Preperation	3968	m2	3.68	14,602.24	6.62	26,268.16
	Earthworks	2994	m3	50.07	149,909.58	54.62	163,532.28
On-Structure Works	Retaining Walls, abutments, footings	incl	No	369,439.34	0.00	415,928.97	0.00
	Bridge Deck	incl	m2	1,258.48	0.00	2,060.14	0.00
	Guard Rails/ Balustrade	incl	m	2,355.21	0.00	3,032.46	0.00
	Transition Slab	2	No	33,425.31	66,850.62	38,439.11	76,878.22
	Overall Super T Cost	96	m2	4,425.57	424,854.72	5,226.40	501,734.40
Off Structure	Pedestrian Guard Rails/ Balustrade	20	m	187.10	3,742.00	224.54	4,490.80
	GREAT Terminal	0	No	8,767.42	0.00	13,875.66	0.00
	Off structure barrier	0	Item	1,565.45	0.00	2,311.95	0.00
Other							
Delivery	Council Fees	1	%	3.25	20,974.10	3.25	24,265.66
	VicRoads Fees	1	%	1.00	6,453.57	1.00	7,466.36
	Traffic Management	1	%	5.00	32,267.85	5.00	37,331.79
	Environmental Management	1	%	0.50	3,226.78	0.50	3,733.18
	Surveying and Design	1	%	5.00	32,267.85	5.00	37,331.79
	Supervision and Project management	1	%	9.00	58,082.12	9.00	67,197.21
	Site Establishment	1	%	2.50	16,133.92	2.50	18,665.89
	Contingency	1	%	20.00	129,071.38	20.00	149,327.14
Total	Excluding Delivery				**659,959**		**772,904**
	Including Delivery				**965,190**		**1,130,372**

Appendix C	
Description:	BRIDGE - 80m - Pedestrian
Civil Component Number:	Item 24

Group	Sub Item	Qty	Unit	Rate (P50)	Amount P(50)	Rate (P90)	Amount P(90)
Earthworks	Site Preperation	5248	m2	3.68	19,312.64	6.62	34,741.76
	Earthworks	2994	m3	50.07	149,909.58	54.62	163,532.28
On-Structure Works	Retaining Walls, abutments, footings	incl	No	369,439.34	0.00	415,928.97	0.00
	Bridge Deck	incl	m2	1,258.48	0.00	2,060.14	0.00
	Guard Rails/ Balustrade	incl	m	2,355.21	0.00	3,032.46	0.00
	Transition Slab	2	No	33,425.31	66,850.62	38,439.11	76,878.22
	Overall Super T Cost	384	m2	4,425.57	1,699,418.88	5,226.40	2,006,937.60
Off Structure	Pedestrian Guard Rails/ Balustrade	80	m	187.10	14,968.00	224.54	17,963.20
	GREAT Terminal	0	No	8,767.42	0.00	13,875.66	0.00
	Off structure barrier	0	Item	1,565.45	0.00	2,311.95	0.00
Other							
Delivery	Council Fees	1	%	3.25	62,762.28	3.25	73,622.62
	VicRoads Fees	1	%	1.00	19,311.47	1.00	22,653.11
	Traffic Management	1	%	5.00	96,557.35	5.00	113,265.57
	Environmental Management	1	%	0.50	23,388.06	0.50	11,326.56
	Surveying and Design	1	%	5.00	96,557.35	5.00	113,265.57
	Supervision and Project management	1	%	9.00	173,803.24	9.00	203,878.02
	Site Establishment	1	%	2.50	48,278.68	2.50	56,632.78
	Contingency	1	%	20.00	386,229.42	20.00	453,062.26
Total	Excluding Delivery				**1,950,460**		**2,300,053**
	Including Delivery				**2,852,547**		**3,363,828**

Appendix C	
Description:	Culvert Option 1
Civil Component Number:	Item 25

Group	Sub Item	Qty	Unit	Rate (P50)	Amount (P50)	Rate (P90)	Amount (P90)
Sitework and Earthwork	Site Preperation	224	m2	3.68	824.32	4.23	947.97
	Diversion works (item)	1	Item	10000.00	10000.00	11500.00	11500.00
	Waterway re-shaping	1	Item	3000.00	3000.00	3450.00	3450.00
	Stripping of topsoil (m2)	462	m2	3.90	1801.80	4.49	2072.07
	Excavation (m3)	1015	m3	37.00	37555.00	42.55	43188.25
	Formation of batters (m3)	220	m3	15.00	3300.00	17.25	3795.00
Drainage Structure	Box culvert units 1200 x 2100 (No.)	24	No.	2395.00	57480.00	2754.25	66102.00
	Link slab 1200 x 2100 (No.)	8	No.	1463.00	11704.00	1682.45	13459.60
	Foundation slab 1200 x 2100 (200 mm)	340	m2	212.00	72080.00	243.80	82892.00
	Granular Bedding 150 mm thick crushed	340	m2	17.25	5865.00	19.84	6744.75
	Apron Slab (m2)	51	m2	220.25	11232.75	253.29	12917.66
	Wing wall (m2)	19	m2	700.00	13300.00	805.00	15295.00
	Endwall (m2)	19	m2	700.00	13300.00	805.00	15295.00
On Structure	Structural Fill (m3)	370	m3	75.00	27750.00	86.25	31912.50
	Vehicle Barrier	28	lm	247.50	6930.00	284.63	7969.50
	Signs (Item)	1	Item	1800.00	1800.00	2070.00	2070.00
Delivery	Council Fees	1	%	3.25	9032.49	3.25	10387.37
	Authority Fees	1	%	1.00	2779.23	1.00	3196.11
	Traffic Management	1	%	5.00	13896.14	5.00	15980.57
	Environmental Management	1	%	0.50	1389.61	0.50	1598.06
	Surveying and Design	1	%	5.00	13896.14	5.00	15980.57
	Supervision and Project management	1	%	9.00	25013.06	9.00	28765.02
	Site Establishment	1	%	2.50	6948.07	2.50	7990.28
	Contingency	1	%	15.00	41688.43	15.00	47941.70
Total	Excluding Delivery				**277,923**		**319,611**
	Including Delivery				**392,566**		**451,451**

Appendix C	
Description:	Culvert Option 2
Civil Component Number:	Item 26

Group	Sub Item	Qty	Unit	Rate (P50)	Amount (P50)	Rate (P90)	Amount (P90)
Sitework and Earthwork	Site Preperation	335	m2	3.68	1232.80	4.23	1417.72
	Diversion works (item)	1	Item	11500.00	11500.00	13225.00	13225.00
	Waterway re-shaping	1	Item	3000.00	3000.00	3450.00	3450.00
	Stripping of topsoil (m2)	675	m2	3.90	2632.50	4.49	3027.38
	Excavation (m3)	1695	m3	37.00	62715.00	42.55	72122.25
	Formation of batters (m3)	195	m3	15.00	2925.00	17.25	3363.75
Drainage Structure	Box culvert units 1200 x 2100 (No.)	39	No.	2395.50	93424.50	2754.83	107438.18
	Link slab 1200 x 2100 (No.)	13	No.	1463.00	19019.00	1682.45	21871.85
	Foundation slab 1200 x 2100 (200 mm)	450	m2	212.00	95400.00	243.80	109710.00
	Granular Bedding 150 mm thick crushed	450	m2	17.25	7762.50	19.84	8926.88
	Apron Slab (m2)	51	m2	220.25	11232.75	253.29	12917.66
	Wing wall (m2)	19	m2	700.00	13300.00	805.00	15295.00
	Endwall (m2)	19	m2	700.00	13300.00	805.00	15295.00
On Structure	Structural Fill (m3)	650	m3	75.00	48750.00	86.25	56062.50
	Vehicle Barrier	30	lm	247.50	7425.00	284.63	8538.75
	Signs (Item)	1	Item	1800.00	1800.00	2070.00	2070.00
Delivery	Council Fees	1	%	3.25	12851.12	3.25	14778.79
	Authority Fees	1	%	1.00	3954.19	1.00	4547.32
	Traffic Management	1	%	5.00	19770.95	5.00	22736.60
	Environmental Management	1	%	0.50	1977.10	0.50	2273.66
	Surveying and Design	1	%	5.00	19770.95	5.00	22736.60
	Supervision and Project management	1	%	9.00	35587.71	9.00	40925.87
	Site Establishment	1	%	2.50	9885.48	2.50	11368.30
	Contingency	1	%	15.00	59312.86	15.00	68209.79
Total	Excluding Delivery				**395,419**		**454,732**
	Including Delivery				**558,529**		**642,309**

Appendix C	
Description:	Culvert Option 3
Civil Component Number:	Item 27

Group	Sub Item	Qty	Unit	Rate (P50)	Amount (P50)	Rate (P90)	Amount (P90)
Sitework and Earthwork	Site Preperation	509	m2	3.68	1873.12	4.23	2154.09
	Diversion works (item)	1	Item	15000.00	15000.00	17250.00	17250.00
	Waterway re-shaping	1	Item	3000.00	3000.00	3450.00	3450.00
	Stripping of topsoil (m2)	740	m2	3.90	2886.00	4.49	3318.90
	Excavation (m3)	2300	m3	37.00	85100.00	42.55	97865.00
	Formation of batters (m3)	320	m3	15.00	4800.00	17.25	5520.00
Drainage Structure	Box culvert units 1200 x 2100 (No.)	32	No.	4200.00	134400.00	4830.00	154560.00
	Link slab 1200 x 2100 (No.)	16	No.	2469.00	39504.00	2839.35	45429.60
	Foundation slab 1200 x 2100 (200 mm)	560	m2	212.00	118720.00	243.80	136528.00
	Granular Bedding 150 mm thick crushed	560	m2	17.25	9660.00	19.84	11109.00
	Apron Slab (m2)	153	m2	220.25	33698.25	253.29	38752.99
	Wing wall (m2)	33	m2	700.00	23100.00	805.00	26565.00
	Endwall (m2)	40	m2	700.00	28000.00	805.00	32200.00
On Structure	Structural Fill (m3)	640	m3	75.00	48000.00	86.25	55200.00
	Vehicle Barrier	52	lm	247.50	12870.00	284.63	14800.50
	Signs (Item)	1	Item	1800.00	1800.00	2070.00	2070.00
Delivery	Council Fees	1	%	3.25	18278.37	3.25	21020.12
	Authority Fees	1	%	1.00	5624.11	1.00	6467.73
	Traffic Management	1	%	5.00	28120.57	5.00	32338.65
	Environmental Management	1	%	0.50	2812.06	0.50	3233.87
	Surveying and Design	1	%	5.00	28120.57	5.00	32338.65
	Supervision and Project management	1	%	9.00	50617.02	9.00	58209.58
	Site Establishment	1	%	2.50	14060.28	2.50	16169.33
	Contingency	1	%	15.00	84361.71	15.00	97015.96
Total	Excluding Delivery				**562,411**		**646,773**
	Including Delivery				**794,406**		**913,567**

Appendix C	
Description:	Culvert Option 4
Civil Component Number:	Item 28

Group	Sub Item	Qty	Unit	Rate (P50)	Amount (P50)	Rate (P90)	Amount (P90)
Sitework and Earthwork	Site Preperation	747	m2	3.68	2748.96	4.23	3161.30
	Diversion works (item)	1	Item	17500.00	17500.00	20125.00	20125.00
	Waterway re-shaping	1	Item	4000.00	4000.00	4600.00	4600.00
	Stripping of topsoil (m2)	1080	m2	3.90	4212.00	4.49	4843.80
	Excavation (m3)	3765	m3	37.00	139305.00	42.55	160200.75
	Formation of batters (m3)	292	m3	15.00	4380.00	17.25	5037.00
Drainage Structure	Box culvert units 1200 x 2100 (No.)	52	No.	4200.00	218400.00	4830.00	251160.00
	Link slab 1200 x 2100 (No.)	26	No.	2469.00	64194.00	2839.35	73823.10
	Foundation slab 1200 x 2100 (200 mm)	940	m2	212.00	199280.00	243.80	229172.00
	Granular Bedding 150 mm thick crushed	940	m2	17.25	16215.00	19.84	18647.25
	Apron Slab (m2)	153	m2	220.25	33698.25	253.29	38752.99
	Wing wall (m2)	33	m2	700.00	23100.00	805.00	26565.00
	Endwall (m2)	40	m2	700.00	28000.00	805.00	32200.00
On Structure	Structural Fill (m3)	1030	m3	75.00	77250.00	86.25	88837.50
	Vehicle Barrier	64	lm	247.50	15840.00	284.63	18216.00
	Signs (Item)	1	Item	2300.00	2300.00	2645.00	2645.00
Delivery	Council Fees	1	%	3.25	27638.75	3.25	31784.57
	Authority Fees	1	%	1.00	8504.23	1.00	9779.87
	Traffic Management	1	%	5.00	42521.16	5.00	48899.33
	Environmental Management	1	%	0.50	4252.12	0.50	4889.93
	Surveying and Design	1	%	5.00	42521.16	5.00	48899.33
	Supervision and Project management	1	%	9.00	76538.09	9.00	88018.80
	Site Establishment	1	%	2.50	21260.58	2.50	24449.67
	Contingency	1	%	15.00	127563.48	15.00	146698.00
Total	Excluding Delivery				**850,423**		**977,987**
	Including Delivery				**1,201,223**		**1,381,406**

Appendix C	
Description:	Culvert Option 5
Civil Component Number:	Item 29

Group	Sub Item	Qty	Unit	Rate (P50)	Amount (P50)	Rate (P90)	Amount (P90)
Sitework and Earthwork	Site Preperation	910	m2	3.68	3348.80	4.23	3851.12
	Diversion works (item)	1	Item	20000.00	20000.00	23000.00	23000.00
	Waterway re-shaping	1	Item	4000.00	4000.00	4600.00	4600.00
	Stripping of topsoil (m2)	1116	m2	3.90	4352.40	4.49	5005.26
	Excavation (m3)	4300	m3	37.00	159100.00	42.55	182965.00
	Formation of batters (m3)	250	m3	15.00	3750.00	17.25	4312.50
Drainage Structure	Box culvert units 1200 x 2100 (No.)	64	No.	3747.00	239808.00	4309.05	275779.20
	Link slab 1200 x 2100 (No.)	56	No.	1463.00	81928.00	1682.45	94217.20
	Foundation slab 1200 x 2100 (200 mm)	1005	m2	212.00	213060.00	243.80	245019.00
	Granular Bedding 150 mm thick crushed	1005	m2	17.25	17336.25	19.84	19936.69
	Apron Slab (m2)	304	m2	220.25	66956.00	253.29	76999.40
	Wing wall (m2)	41	m2	700.00	28700.00	805.00	33005.00
	Endwall (m2)	71	m2	700.00	49700.00	805.00	57155.00
On Structure	Structural Fill (m3)	1110	m3	75.00	83250.00	86.25	95737.50
	Vehicle Barrier	90	lm	247.50	22275.00	284.63	25616.25
	Signs (Item)	1	Item	2300.00	2300.00	2645.00	2645.00
Delivery	Council Fees	1	%	3.25	32495.59	3.25	37369.93
	Authority Fees	1	%	1.00	9998.64	1.00	11498.44
	Traffic Management	1	%	5.00	49993.22	5.00	57492.21
	Environmental Management	1	%	0.50	4999.32	0.50	5749.22
	Surveying and Design	1	%	5.00	49993.22	5.00	57492.21
	Supervision and Project management	1	%	9.00	89987.80	9.00	103485.97
	Site Establishment	1	%	2.50	24996.61	2.50	28746.10
	Contingency	1	%	15.00	149979.67	15.00	172476.62
Total	Excluding Delivery				**999,864**		**1,149,844**
	Including Delivery				**1,412,309**		**1,624,155**

Appendix C	
Description:	Culvert Option 6
Civil Component Number:	Item 30

Group	Sub Item	Qty	Unit	Rate (P50)	Amount (P50)	Rate (P90)	Amount (P90)
Sitework and Earthwork	Site Preperation	1328	m2	3.68	4887.04	4.23	5620.10
	Diversion works (item)	1	Item	20000.00	20000.00	23000.00	23000.00
	Waterway re-shaping	1	Item	5000.00	5000.00	5750.00	5750.00
	Stripping of topsoil (m2)	1600	m2	3.90	6240.00	4.49	7176.00
	Excavation (m3)	7200	m3	37.00	266400.00	42.55	306360.00
	Formation of batters (m3)	260	m3	15.00	3900.00	17.25	4485.00
Drainage Structure	Box culvert units 1200 x 2100 (No.)	104	No.	3747.00	389688.00	4309.05	448141.20
	Link slab 1200 x 2100 (No.)	91	No.	1463.00	133133.00	1682.45	153102.95
	Foundation slab 1200 x 2100 (200 mm)	1600	m2	212.00	339200.00	243.80	390080.00
	Granular Bedding 150 mm thick crushed	1600	m2	17.25	27600.00	19.84	31740.00
	Apron Slab (m2)	304	m2	220.25	66956.00	253.29	76999.40
	Wing wall (m2)	41	m2	700.00	28700.00	805.00	33005.00
	Endwall (m2)	71	m2	700.00	49700.00	805.00	57155.00
On Structure	Structural Fill (m3)	2000	m3	75.00	150000.00	86.25	172500.00
	Vehicle Barrier	88	lm	247.50	21780.00	284.63	25047.00
	Signs (Item)	1	Item	3050.00	3050.00	3507.50	3507.50
Delivery	Council Fees	1	%	3.25	49277.61	3.25	56669.25
	Authority Fees	1	%	1.00	15162.34	1.00	17436.69
	Traffic Management	1	%	5.00	75811.70	5.00	87183.46
	Environmental Management	1	%	0.50	7581.17	0.50	8718.35
	Surveying and Design	1	%	5.00	75811.70	5.00	87183.46
	Supervision and Project management	1	%	9.00	136461.06	9.00	156930.22
	Site Establishment	1	%	2.50	37905.85	2.50	43591.73
	Contingency	1	%	15.00	227435.11	15.00	261550.37
Total	Excluding Delivery				**1,516,234**		**1,743,669**
	Including Delivery				**2,141,681**		**2,462,933**

Appendix C	
Description:	Culvert Option 7
Civil Component Number:	Item 31

Group	Sub Item	Qty	Unit	Rate (P50)	Amount (P50)	Rate (P90)	Amount (P90)
Sitework and Earthwork	Site Preperation	118	m2	3.68	434.24	4.23	499.38
	Diversion works (item)	1	Item	9000.00	9000.00	10350.00	10350.00
	Waterway re-shaping	1	Item	3000.00	3000.00	3450.00	3450.00
	Stripping of topsoil	302	m2	3.90	1177.80	4.49	1354.47
	Excavation (m3)	602	m3	37.00	22274.00	42.55	25615.10
	Formation of batters (m3)	144	m3	15.00	2160.00	17.25	2484.00
Drainage Structure	Circular Pipes 1200 dia (m)	34	No.	1487.50	50575.00	1710.63	58161.25
	Foundation Slab 1200 dia (250 mm)	183	No.	212.00	38796.00	243.80	44615.40
	Granular Bedding 150 mm thick crushed	183	m2	17.25	3156.75	19.84	3630.26
	Apron Slab (m2)	24	m2	220.25	5286.00	253.29	6078.90
	Wing wall (m2)	19	m2	700.00	13300.00	805.00	15295.00
	Endwall (m2)	12	m2	700.00	8400.00	805.00	9660.00
On Structure	Structural Fill (m3)	170	m2	75.00	12750.00	86.25	14662.50
	Vehicle Barrier	17	m2	247.50	4207.50	284.63	4838.63
	Signs (Item)	1	m3	1800.00	1800.00	2070.00	2070.00
Delivery	Council Fees	1	%	3.25	5730.31	3.25	6589.86
	Authority Fees	1	%	1.00	1763.17	1.00	2027.65
	Traffic Management	1	%	5.00	8815.86	5.00	10138.24
	Environmental Management	1	%	0.50	881.59	0.50	1013.82
	Surveying and Design	1	%	5.00	8815.86	5.00	10138.24
	Supervision and Project management	1	%	9.00	15868.56	9.00	18248.84
	Site Establishment	1	%	2.50	4407.93	2.50	5069.12
	Contingency	1	%	15.00	26447.59	15.00	30414.73
Total	Excluding Delivery				**176,317**		**202,765**
	Including Delivery				**249,048**		**286,405**

Appendix C	
Description:	Culvert Option 8
Civil Component Number:	Item 32

Group	Sub Item	Qty	Unit	Rate (P50)	Amount (P50)	Rate (P90)	Amount (P90)
Sitework and Earthwork	Site Preperation	176	m2	3.68	647.68	4.23	744.83
	Diversion works (item)	1	Item	10000.00	10000.00	11500.00	11500.00
	Waterway re-shaping	1	Item	3000.00	3000.00	3450.00	3450.00
	Stripping of topsoil	453	m2	3.90	1766.70	4.49	2031.71
	Excavation (m3)	1008	m3	37.00	37296.00	42.55	42890.40
	Formation of batters (m3)	128	m3	15.00	1920.00	17.25	2208.00
Drainage Structure	Circular Pipes 1200 dia (m)	64	No.	1487.50	95200.00	1710.63	109480.00
	Foundation Slab 1200 dia (250 mm)	183	No.	212.00	38796.00	243.80	44615.40
	Granular Bedding 150 mm thick crushed	183	m2	17.25	3156.75	19.84	3630.26
	Apron Slab (m2)	24	m2	220.25	5286.00	253.29	6078.90
	Wing wall (m2)	19	m2	700.00	13300.00	805.00	15295.00
	Endwall (m2)	12	m2	700.00	8400.00	805.00	9660.00
On Structure	Structural Fill (m3)	320	m2	75.00	24000.00	86.25	27600.00
	Vehicle Barrier	17	m2	247.50	4207.50	284.63	4838.63
	Signs (Item)	1	m3	1800.00	1800.00	2070.00	2070.00
Delivery	Council Fees	1	%	3.25	8085.24	3.25	9298.03
	Authority Fees	1	%	1.00	2487.77	1.00	2860.93
	Traffic Management	1	%	5.00	12438.83	5.00	14304.66
	Environmental Management	1	%	0.50	1243.88	0.50	1430.47
	Surveying and Design	1	%	5.00	12438.83	5.00	14304.66
	Supervision and Project management	1	%	9.00	22389.90	9.00	25748.38
	Site Establishment	1	%	2.50	6219.42	2.50	7152.33
	Contingency	1	%	15.00	37316.49	15.00	42913.97
Total	Excluding Delivery				**248,777**		**286,093**
	Including Delivery				**351,397**		**404,107**

Appendix C	
Description:	Culvert Option 9
Civil Component Number:	Item 33

Group	Sub Item	Qty	Unit	Rate (P50)	Amount (P50)	Rate (P90)	Amount (P90)
Sitework and Earthwork	Site Preperation	265	m2	3.68	975.20	4.23	1121.48
	Diversion works (item)	1	Item	10000.00	10000.00	11500.00	11500.00
	Waterway re-shaping	1	Item	3000.00	3000.00	3450.00	3450.00
	Stripping of topsoil	452	m2	3.90	1762.80	4.49	2027.22
	Excavation (m3)	1097	m3	37.00	40589.00	42.55	46677.35
	Formation of batters (m3)	128	m3	15.00	1920.00	17.25	2208.00
Drainage Structure	Circular Pipes 1200 dia (m)	51	No.	2357.00	120207.00	2710.55	138238.05
	Foundation Slab 1200 dia (250 mm)	280	No.	212.00	59360.00	243.80	68264.00
	Granular Bedding 150 mm thick crushed	280	m2	17.25	4830.00	19.84	5554.50
	Apron Slab (m2)	74	m2	220.25	16298.50	253.29	18743.28
	Wing wall (m2)	37	m2	700.00	25900.00	805.00	29785.00
	Endwall (m2)	31	m2	700.00	21700.00	805.00	24955.00
On Structure	Structural Fill (m3)	272	m2	75.00	20400.00	86.25	23460.00
	Vehicle Barrier	26	m2	247.50	6435.00	284.63	7400.25
	Signs (Item)	1	m3	1800.00	1800.00	2070.00	2070.00
Delivery	Council Fees	1	%	3.25	10893.27	3.25	12527.26
	Authority Fees	1	%	1.00	3351.78	1.00	3854.54
	Traffic Management	1	%	5.00	16758.88	5.00	19272.71
	Environmental Management	1	%	0.50	1675.89	0.50	1927.27
	Surveying and Design	1	%	5.00	16758.88	5.00	19272.71
	Supervision and Project management	1	%	9.00	30165.98	9.00	34690.87
	Site Establishment	1	%	2.50	8379.44	2.50	9636.35
	Contingency	1	%	15.00	50276.63	15.00	57818.12
Total	Excluding Delivery				**335,178**		**385,454**
	Including Delivery				**473,438**		**544,454**

Appendix C	
Description:	Culvert Option 10
Civil Component Number:	Item 34

Group	Sub Item	Qty	Unit	Rate (P50)	Amount (P50)	Rate (P90)	Amount (P90)
Sitework and Earthwork	Site Preperation	387	m2	3.68	1424.16	4.23	1637.78
	Diversion works (item)	1	Item	10000.00	10000.00	11500.00	11500.00
	Waterway re-shaping	1	Item	3000.00	3000.00	3450.00	3450.00
	Stripping of topsoil	652	m2	3.90	2542.80	4.49	2924.22
	Excavation (m3)	1836	m3	37.00	67932.00	42.55	78121.80
	Formation of batters (m3)	194	m3	15.00	2910.00	17.25	3346.50
Drainage Structure	Circular Pipes 1200 dia (m)	96	No.	2357.00	226272.00	2710.55	260212.80
	Foundation Slab 1200 dia (250 mm)	468	No.	212.00	99216.00	243.80	114098.40
	Granular Bedding 150 mm thick crushed	468	m2	17.25	8073.00	19.84	9283.95
	Apron Slab (m2)	74	m2	220.25	16298.50	253.29	18743.28
	Wing wall (m2)	37	m2	700.00	25900.00	805.00	29785.00
	Endwall (m2)	31	m2	700.00	21700.00	805.00	24955.00
On Structure	Structural Fill (m3)	512	m2	75.00	38400.00	86.25	44160.00
	Vehicle Barrier	26	m2	247.50	6435.00	284.63	7400.25
	Signs (Item)	1	m3	1800.00	1800.00	2070.00	2070.00
Delivery	Council Fees	1	%	3.25	17286.86	3.25	19879.89
	Authority Fees	1	%	1.00	5319.03	1.00	6116.89
	Traffic Management	1	%	5.00	26595.17	5.00	30584.45
	Environmental Management	1	%	0.50	2659.52	0.50	3058.44
	Surveying and Design	1	%	5.00	26595.17	5.00	30584.45
	Supervision and Project management	1	%	9.00	47871.31	9.00	55052.01
	Site Establishment	1	%	2.50	13297.59	2.50	15292.22
	Contingency	1	%	15.00	79785.52	15.00	91753.35
Total	Excluding Delivery				**531,903**		**611,689**
	Including Delivery				**751,314**		**864,011**

Appendix C	
Description:	Culvert Option 11
Civil Component Number:	Item 35

Group	Sub Item	Qty	Unit	Rate (P50)	Amount (P50)	Rate (P90)	Amount (P90)
Sitework and Earthwork	Site Preperation	406	m2	3.68	1494.08	4.23	1718.19
	Diversion works (item)	1	Item	11500.00	11500.00	13225.00	13225.00
	Waterway re-shaping	1	Item	3000.00	3000.00	3450.00	3450.00
	Stripping of topsoil	550	m2	3.90	2145.00	4.49	2466.75
	Excavation (m3)	1624	m3	37.00	60088.00	42.55	69101.20
	Formation of batters (m3)	260	m3	15.00	3900.00	17.25	4485.00
Drainage Structure	Circular Pipes 1200 dia (m)	68	No.	2882.50	196010.00	3314.88	225411.50
	Foundation Slab 1200 dia (250 mm)	387	m2	212.00	82044.00	243.80	94350.60
	Granular Bedding 150 mm thick crushed	387	m2	17.25	6675.75	19.84	7677.11
	Apron Slab (m2)	130	m2	220.25	28632.50	253.29	32927.38
	Wing wall (m2)	48	m2	700.00	33600.00	805.00	38640.00
	Endwall (m2)	50	m2	700.00	35000.00	805.00	40250.00
On Structure	Structural Fill (m3)	357	m2	75.00	26775.00	86.25	30791.25
	Vehicle Barrier	36	m2	247.50	8910.00	284.63	10246.50
	Signs (Item)	1	m3	2050.00	2050.00	2357.50	2357.50
Delivery	Council Fees	1	%	3.25	16309.29	3.25	18755.68
	Authority Fees	1	%	1.00	5018.24	1.00	5770.98
	Traffic Management	1	%	5.00	25091.22	5.00	28854.90
	Environmental Management	1	%	0.50	2509.12	0.50	2885.49
	Surveying and Design	1	%	5.00	25091.22	5.00	28854.90
	Supervision and Project management	1	%	9.00	45164.19	9.00	51938.82
	Site Establishment	1	%	2.50	12545.61	2.50	14427.45
	Contingency	1	%	15.00	75273.65	15.00	86564.70
Total	Excluding Delivery				**501,824**		**577,098**
	Including Delivery				**708,827**		**815,151**

Appendix C	
Description:	Culvert Option 12
Civil Component Number:	Item 36

Group	Sub Item	Qty	Unit	Rate (P50)	Amount (P50)	Rate (P90)	Amount (P90)
Sitework and Earthwork	Site Preperation	586	m2	3.68	2156.48	4.23	2479.95
	Diversion works (item)	1	Item	20000.00	20000.00	23000.00	23000.00
	Waterway re-shaping	1	Item	4000.00	4000.00	4600.00	4600.00
	Stripping of topsoil	824	m2	3.90	3213.60	4.49	3695.64
	Excavation (m3)	2718	m3	37.00	100566.00	42.55	115650.90
	Formation of batters (m3)	250	m3	15.00	3750.00	17.25	4312.50
Drainage Structure	Circular Pipes 1200 dia (m)	128	No.	2882.50	368960.00	3314.88	424304.00
	Foundation Slab 1200 dia (250 mm)	648	m2	212.00	137376.00	243.80	157982.40
	Granular Bedding 150 mm thick crushed	648	m2	17.25	11178.00	19.84	12854.70
	Apron Slab (m2)	130	m2	220.25	28632.50	253.29	32927.38
	Wing wall (m2)	48	m2	700.00	33600.00	805.00	38640.00
	Endwall (m2)	50	m2	700.00	35000.00	805.00	40250.00
On Structure	Structural Fill (m3)	672	m2	75.00	50400.00	86.25	57960.00
	Vehicle Barrier	36	m2	247.50	8910.00	284.63	10246.50
	Signs (Item)	1	m3	2300.00	2300.00	2645.00	2645.00
Delivery	Council Fees	1	%	3.25	26326.38	3.25	30275.34
	Authority Fees	1	%	1.00	8100.43	1.00	9315.49
	Traffic Management	1	%	5.00	40502.13	5.00	46577.45
	Environmental Management	1	%	0.50	4050.21	0.50	4657.74
	Surveying and Design	1	%	5.00	40502.13	5.00	46577.45
	Supervision and Project management	1	%	9.00	72903.83	9.00	83839.41
	Site Establishment	1	%	2.50	20251.06	2.50	23288.72
	Contingency	1	%	15.00	121506.39	15.00	139732.35
Total	Excluding Delivery				**810,043**		**931,549**
	Including Delivery				**1,144,185**		**1,315,813**

Appendix C	
Description:	Community Facilities - Level 1
Civil Component Number:	Item 37

Group	Sub Item	Qty	Unit	Rate (P50)	Amount P(50)	Rate (P90)	Amount P(90)
Building	Kindergarten	750	m2	2544.60	1908450.00	2623.87	1967902.50
	Small commercial Kitchen	15	m2	2854.70	42820.50	3109.11	46636.65
	Maternal And Child Health Consulting	100	m2	2464.03	246403.00	2567.64	256764.00
	Multipurpose community Spaces	200	m2	2301.97	460394.00	2440.90	488180.00
	Storage External	0	m2	1830.21	0.00	2040.01	0.00
	Extra 33-place Kindergarten Room/ multipurpoes meeting space	150	m2	2301.97	345295.50	2440.90	366135.00
	Disabled toilet/ Parent's Change room	0	m2	3039.66	0.00	3461.73	0.00
	Toilets/ Change Rooms	0	m2	2852.57	0.00	3108.74	0.00
	Administration	0	m2	2245.34	0.00	2290.02	0.00
	Cleaners	0	m2	2148.82	0.00	2324.84	0.00
Canopy & Veranda	Canopy & Veranda	0	m2	1105.52	0.00	1298.89	0.00
Car Park	Pavement	1910	m2	97.15	185556.50	105.90	202269.00
	Kerb and Channel	220	m	54.81	12058.20	62.05	13651.00
	Drainage Pipes	159	m	179.85	28596.15	201.37	32017.83
	Drainage Pits	7	Item	2565.39	17957.73	2851.46	19960.22
	Linemarking/Signage	1910	Item	3.11	5940.10	4.27	8155.70
	Car Park Lighting	2047	m2 of carpark	15.08	30868.76	18.35	37562.45
	Other	0		0.00	0.00	0.00	0.00
Outdoor Play	Kindergarten outdoor playspaces	700	m2	530.00	371000.00	609.50	426650.00
	Playground	800	m3	794.33	635464.00	1131.30	905040.00
Site Works	Site Preperation	6797	m2	3.68	25012.96	5.20	35344.40
	Paths	210	m2	67.64	14204.40	81.25	17062.50
	Landscaping	500	m2	26.18	13090.00	29.81	14905.00
	Lighting	0	Item	0.00	0.00	0.00	0.00
	Boundary Fencing	125	m	88.98	11122.50	115.53	14441.25
	Gates	1	Item	614.85	614.85	707.08	707.08
	Other			0.00	0.00	0.00	0.00
Services	Stormwater	1	%	3.30	143710.02	3.30	160161.69
	Sewer	1	%	2.03	88403.44	2.03	98523.71
	Water	1	%	1.98	86226.01	1.98	96097.01
	Gas	1	%	0.88	38322.67	0.88	42709.78
	Fire Protection	1	%	0.66	28742.00	0.66	32032.34
	Light & Power	1	%	2.38	103645.41	2.38	115510.55
	Communication	1	%	0.50	21774.25	0.50	24266.92
Miscellaneous	Sub-standard site conditions	0	% of area	0.00	0.00	0.00	0.00
Delivery	Council Fees	1	%	3.25	158134.37	3.25	176237.31
	Authority Fees	1	%	1.00	48656.73	1.00	54226.87
	Traffic Management	1	%	2.00	97313.46	2.00	108453.73
	Environmental Management	1	%	0.50	24328.36	0.50	27113.43
	Survey/ Design Fees	1	%	5.00	243283.65	5.00	271134.33
	Supervision and Project Management	1	%	9.00	437910.57	9.00	488041.79
	Site Establishment	1	%	2.50	121641.82	2.50	135567.16
	Environmentally Sustainable Design	1	%	2.00	97313.46	2.00	108453.73
	Contingency	1	%	15.00	729850.94	15.00	813402.99
Total	Excluding Delivery				**4,865,673**		**5,422,687**
	Including Delivery				**6,824,106**		**7,605,318**

Appendix C	
Description:	Community Facilities - Level 2
Civil Component Number:	Item 38

Group	Sub Item	Qty	Unit	Rate (P50)	Amount P(50)	Rate (P90)	Amount P(90)
Building	Kindergarten	750	m2	2544.60	1908450.00	2623.87	1967902.50
	Small commercial Kitchen	30	m2	2854.70	85641.00	3109.11	93273.30
	Maternal And Child Health Consulting	100	m2	2464.03	246403.00	2567.64	256764.00
	Multipurpose community Spaces	500	m2	2301.97	1150985.00	2440.90	1220450.00
	Storage External	0	m2	1830.21	0.00	2040.01	0.00
	Extra 33-place Kindergarten Room/	150	m2	2301.97	345295.50	2440.90	366135.00
	Disabled toilet/ Parent's Change room	0	m2	3039.66	0.00	3461.73	0.00
	Toilets/ Change Rooms	0	m2	2852.57	0.00	3108.74	0.00
	Administration	0	m2	2245.34	0.00	2290.02	0.00
	Cleaners	0	m2	2148.82	0.00	2324.84	0.00
Canopy & Veranda	Canopy & Veranda	0	m2	1105.52	0.00	1298.89	0.00
Car Park	Pavement	2253	m2	97.15	218878.95	105.90	238592.70
	Kerb and Channel	398	m	54.81	21814.38	62.05	24695.90
	Drainage Pipes	195	m	179.85	35070.75	201.37	39267.15
	Drainage Pits	7	Item	2565.39	17957.73	2851.46	19960.22
	Linemarking/Signage	2253	Item	3.11	7006.83	4.27	9620.31
	Car Park Lighting	2380	m2	15.08	35890.40	18.35	43673.00
	Other	0		0.00	0.00	0.00	0.00
Outdoor Play	Kindergarten outdoor playspaces	700	m2	530.00	371000.00	609.50	426650.00
	Playground	800	m3	794.33	635464.00	1131.30	905040.00
Site Works	Site Preperation	7313	m2	3.68	26911.84	5.20	38027.60
	Paths	202	m2	67.64	13663.28	81.25	16412.50
	Landscaping	500	m2	26.18	13090.00	29.81	14905.00
	Lighting	0	Item	0.00	0.00	0.00	0.00
	Boundary Fencing	130	m	88.98	11567.40	115.53	15018.90
	Gates	1	Item	614.85	614.85	707.08	707.08
	Other	0		0.00	0.00	0.00	0.00
Services	Stormwater	1	%	3.30	169808.26	3.30	188004.14
	Sewer	1	%	2.03	104457.81	2.03	115651.03
	Water	1	%	1.98	101884.96	1.98	112802.48
	Gas	1	%	0.88	45282.20	0.88	50134.44
	Fire Protection	1	%	0.66	33961.65	0.66	37600.83
	Light & Power	1	%	2.38	122467.78	2.38	135590.86
	Communication	1	%	0.50	25728.52	0.50	28485.48
Miscellaneous	Sub-standard site conditions	0	% of area	0.00	0.00	0.00	0.00
Delivery	Council Fees	1	%	3.25	186852.12	3.25	206874.34
	Authority Fees	1	%	1.00	57492.96	1.00	63653.64
	Traffic Management	1	%	2.00	114985.92	2.00	127307.29
	Environmental Management	1	%	0.50	28746.48	0.50	31826.82
	Survey/ Design Fees	1	%	5.00	287464.80	5.00	318268.22
	Supervision and Project Management	1	%	9.00	517436.65	9.00	572882.80
	Site Establishment	1	%	2.50	143732.40	2.50	159134.11
	Environmentally Sustainable Design	1	%	2.00	114985.92	2.00	127307.29
	Contingency	1	%	15.00	862394.41	15.00	954804.66
Total	Excluding Delivery				**5,749,296**		**6,365,364**
	Including Delivery				**8,063,388**		**8,927,424**

Appendix C	
Description:	Community Facilities - Level 3
Civil Component Number:	Item 39

Group	Sub Item	Qty	Unit	Rate (P50)	Amount P(50)	Rate (P90)	Amount P(90)
Building	Library	1500	m2	2301.97	3452955.00	2440.90	3661350.00
	Small commercial Kitchen	45	m2	2854.70	128461.50	3109.11	139909.95
	Consulting Suite	200	m2	2464.03	492806.00	2567.64	513528.00
	Multipurpose community Spaces	450	m2	2301.97	1035886.50	2440.90	1098405.00
	Storage External	0	m2	1830.21	0.00	2040.01	0.00
	Specialist Community Space	250	m2	2301.97	575492.50	2440.90	610225.00
	Disabled toilet/ Parent's Change room	0	m2	3039.66	0.00	3461.73	0.00
	Toilets/ Change Rooms	0	m2	2852.57	0.00	3108.74	0.00
	Administration	0	m2	2245.34	0.00	2290.02	0.00
	Cleaners	0	m2	2148.82	0.00	2324.84	0.00
Canopy & Veranda	Canopy & Veranda	0	m2	1105.52	0.00	1298.89	0.00
Car Park	Pavement	3327	m2	97.15	323218.05	105.90	352329.30
	Kerb and Channel	473	m	54.81	25925.13	62.05	29349.65
	Drainage Pipes	282	m	179.85	50717.70	201.37	56786.34
	Drainage Pits	10	Item	2565.39	25653.90	2851.46	28514.60
	Linemarking/Signage	3327	Item	3.11	10346.97	4.27	14206.29
	Car Park Lighting	3456	m2	15.08	52116.48	18.35	63417.60
	Other	0		0.00	0.00	0.00	0.00
Outdoor Play	Kindergarten outdoor playspaces	0	m2	530.00	0.00	609.50	0.00
	Playground	800	m3	794.33	635464.00	1131.30	905040.00
Site Works	Site Preperation	8777	m2	3.68	32299.36	5.20	45640.40
	Paths	180	m2	67.64	12175.20	81.25	14625.00
	Landscaping	500	m2	26.18	13090.00	29.81	14905.00
	Lighting	0	Item	0.00	0.00	0.00	0.00
	Boundary Fencing	0	m	88.98	0.00	115.53	0.00
	Gates	1	Item	614.85	614.85	707.08	707.08
	Other	0		0.00	0.00	0.00	0.00
Services	Stormwater	1	%	3.30	226618.36	3.30	249114.99
	Sewer	1	%	2.03	139404.63	2.03	153243.47
	Water	1	%	1.98	135971.02	1.98	149469.00
	Gas	1	%	0.88	60431.56	0.88	66430.67
	Fire Protection	1	%	0.66	45323.67	0.66	49823.00
	Light & Power	1	%	2.38	163439.91	2.38	179664.75
	Communication	1	%	0.50	34336.12	0.50	37744.70
Miscellaneous	Sub-standard site conditions	0	% of area	0.00	0.00	0.00	0.00
Delivery	Council Fees	1	%	3.25	249364.32	3.25	274118.97
	Authority Fees	1	%	1.00	76727.48	1.00	84344.30
	Traffic Management	1	%	2.00	153454.97	2.00	168688.60
	Environmental Management	1	%	0.50	38363.74	0.50	42172.15
	Survey/ Design Fees	1	%	5.00	383637.42	5.00	421721.49
	Supervision and Project Management	1	%	9.00	690547.36	9.00	759098.68
	Site Establishment	1	%	2.50	191818.71	2.50	210860.74
	Environmentally Sustainable Design	1	%	2.00	153454.97	2.00	168688.60
	Contingency	1	%	15.00	1150912.26	15.00	1265164.47
Total	Excluding Delivery				**7,672,748**		**8,434,430**
	Including Delivery				**10,761,030**		**11,829,288**

Appendix C	
Description:	Sporting Pavillions - 1
Civil Component Number:	Item 40

Group	Sub Item	Qty	Unit	Rate (P50)	Amount P(50)	Rate (P90)	Amount P(90)
Building	Site Preperation	721	m2	3.68	2,653.28	5.18	3,734.78
	Change Rooms With Toilets and Showers X 6	120	m2	2,408.05	288,966.00	2,445.18	293,421.60
	Umpire Change Rooms with Toilets	40	m2	2,519.24	100,769.60	2,594.83	103,793.20
	Storage Rooms	80	m2	2,414.15	193,132.00	2,406.11	192,488.80
	Multipurpose Room/ Social Room	100	m2	2,365.43	236,543.00	2,330.09	233,009.00
	Office/ First Aid Room	20	m2	2,351.62	47,032.40	2,360.28	47,205.60
	Canteen and Kitchen	20	m2	2,514.88	50,297.60	2,524.88	50,497.60
	Public Toilet	40	m2	1,238.63	49,545.20	1,585.83	63,433.20
Canopy & Veranda	Canopy & Veranda	80	m2	761.83	60,946.40	862.50	69,000.00
Site Works	Concrete Paths	0	m2	0.00	0.00	0.00	0.00
	Lighting	0	m2	0.00	0.00	0.00	0.00
	Gates/entrances	0	m2	0.00	0.00	0.00	0.00
	Other-Miscellaneous	0	M2	0.00	0.00	0.00	0.00
Services	Stormwater	1	%	3.30	33,986.22	3.30	34,867.26
	Sewer	1	%	2.03	20,906.68	2.03	21,448.65
	Water	1	%	1.98	20,391.73	1.98	20,920.36
	Gas	1	%	0.88	9,062.99	0.88	9,297.94
	Fire Protection	1	%	0.66	6,797.24	0.66	6,973.45
	Light & Power	1	%	2.38	24,511.27	2.38	25,146.69
	Communication	1	%	0.50	5,149.43	0.50	5,282.92
Miscellaneous	Sub-standard site conditions	0	% of area	0.00	0.00	0.00	0.00
Delivery	Council Fees	1	%	3.25	37,397.46	3.25	38,366.93
	Authority Fees	1	%	1.00	11,506.91	1.00	11,805.21
	Traffic Management	1	%	2.00	23,013.82	2.00	23,610.42
	Environmental Management	1	%	0.50	5,753.46	0.50	5,902.61
	Survey/Design	1	%	5.00	57,534.55	5.00	59,026.05
	Supervision & Project Management	1	%	9.00	103,562.19	9.00	106,246.90
	Site Establishment	1	%	2.50	28,767.28	2.50	29,513.03
	Envioronmentally Sustainable Design	1	%	2.00	23,013.82	2.00	23,610.42
	Contingency	1	%	15.00	172,603.66	15.00	177,078.16
Total	Excluding Delivery				**1,150,691**		**1,180,521**
	Including Delivery				**1,613,844**		**1,655,681**

Appendix C	
Description:	Sporting Pavillions - 2
Civil Component Number:	Item 41

Group	Sub Item	Qty	Unit	Rate (P50)	Amount P(50)	Rate (P90)	Amount P(90)
Building	Site Preperation	1048	m2	3.68	3,856.64	5.18	5,428.64
	Change Rooms With Toilets and Showers X 6	240	m2	2,408.05	577,932.00	2,445.18	586,843.20
	Umpire Change Rooms with Toilets	60	m2	2,519.24	151,154.40	2,594.83	155,689.80
	Storage Rooms	120	m2	2,414.15	289,698.00	2,406.11	288,733.20
	Multipurpose Room/ Social Room	150	m2	2,365.43	354,814.50	2,330.09	349,513.50
	Office/ First Aid Room	30	m2	2,351.62	70,548.60	2,360.28	70,808.40
	Canteen and Kitchen	40	m2	2,514.88	100,595.20	2,524.88	100,995.20
	Public Toilet	60	m2	1,238.63	74,317.80	1,585.83	95,149.80
Canopy & Veranda	Canopy & Veranda	120	m2	761.83	91,419.60	862.50	103,500.00
Site Works	Concrete Paths	0	m2	0.00	0.00	0.00	0.00
	Lighting	0	m2	0.00	0.00	0.00	0.00
	Gates/entrances	0	m2	0.00	0.00	0.00	0.00
	Other-Miscellaneous	0	m2	0.00	0.00	0.00	0.00
Services	Stormwater	1	%	3.30	56,573.11	3.30	57,969.84
	Sewer	1	%	2.03	34,801.04	2.03	35,660.23
	Water	1	%	1.98	33,943.87	1.98	34,781.90
	Gas	1	%	0.88	15,086.16	0.88	15,458.62
	Fire Protection	1	%	0.66	11,314.62	0.66	11,593.97
	Light & Power	1	%	2.38	40,801.21	2.38	41,808.55
	Communication	1	%	0.50	8,571.68	0.50	8,783.31
Miscellaneous	Sub-standard site conditions	0	% of area	0.00	0.00	0.00	0.00
Delivery	Council Fees	1	%	3.25	62,251.42	3.25	63,788.34
	Authority Fees	1	%	1.00	19,154.28	1.00	19,627.18
	Traffic Management	1	%	2.00	38,308.57	2.00	39,254.36
	Environmental Management	1	%	0.50	9,577.14	0.50	9,813.59
	Survey/Design	1	%	5.00	95,771.42	5.00	98,135.91
	Supervision & Project Management	1	%	9.00	172,388.56	9.00	176,644.63
	Site Establishment	1	%	2.50	47,885.71	2.50	49,067.95
	Envioronmentally Sustainable Design	1	%	2.00	38,308.57	2.00	39,254.36
	Contingency	1	%	15.00	287,314.27	15.00	294,407.72
Total	Excluding Delivery				**1,915,428**		**1,962,718**
	Including Delivery				**2,686,388**		**2,752,712**

Appendix C	
Description:	Item 42 - Sporting and Recreational Facilities (5-6)Ha
Civil Component Number:	Item 42

Group	Sub Item	Qty	Unit	Rate (P50)	Amount P(50)	Rate (P90)	Amount P(90)
Playing Fields	Football Field	1	No	805074.24	805074.24	860162.38	860162.38
	Cricket Pitch	1	No	24049.94	24049.94	28173.45	28173.45
	Cricket Nets	1	No	49791.30	49791.30	57497.73	57497.73
	Soccer Field	1	No	526667.50	526667.50	597198.85	597198.85
	Netball Court	2	No	83143.13	166286.26	98076.30	196152.60
	Tennis Court	0	No	65422.94	0.00	72602.00	0.00
Lighting	Lighting Netball Court	2	No	22802.95	45605.90	24396.01	48792.02
	Lighting Tennis	0	No	21415.84	0.00	24493.23	0.00
	Lighting Soccer	1	No	73003.05	73003.05	97409.90	97409.90
	Lighting Football	1	No	163494.28	163494.28	201714.52	201714.52
Landscaping	Landscaping Construction	28000	m2	20.28	567840.00	26.19	733320.00
	Landscaping Establishment (12wk)	28000	m2	1.12	31360.00	1.29	36120.00
	Landscape maintenance-1 year/2 summers	28000	m2	2.90	81200.00	2.94	82320.00
Car Parking	Pavement	2740	m2	94.73	259560.20	109.24	299317.60
	Kerb and Channel	440	m	55.04	24217.60	60.11	26448.40
	Drainage Pipes	500	m	177.49	88745.00	192.51	96255.00
	Drainage Pits	22	No	2611.95	57462.90	2802.77	61660.94
	Car Park Lighting	2572	m2	15.13	38914.36	17.31	44521.32
	Linemarking/ Signage	2740	m2/pavement	3.26	8932.40	4.07	11151.80
Site Works	Site Preperation	60000	m2	3.68	220800.00	4.71	282600.00
	Footpaths and paved areas	750	m2	63.65	47737.50	71.96	53970.00
Services	Stormwater Drainage	1	Item	251068.39	251068.39	285507.93	285507.93
	Sewer	1	Item	52065.67	52065.67	62444.50	62444.50
	Water	1	Item	75629.58	75629.58	88426.00	88426.00
	Gas	1	Item	16727.49	16727.49	20125.23	20125.23
	Light & power	1	Item	231657.53	231657.53	286561.25	286561.25
	Communications	1	Item	46504.09	46504.09	65834.30	65834.30
	Fire	1	Item	25236.69	25236.69	27694.32	27694.32
Miscellaneous	Gates	1	Item	689.27	689.27	740.17	740.17
	Interchange shelter	10	Item	8443.47	84434.70	9944.59	99445.90
	Fencing	1000	m	91.87	91870.00	106.27	106270.00
	Signage	10	No	0.00	0.00	0.00	0.00
Irrigation	Irrigation Soccer	1	Item	40441.04	40441.04	43757.35	43757.35
	Irrigation Football	1	Item	72462.96	72462.96	82052.35	82052.35
Other	Access Road	1350	m2	217.50	293625.00	225.71	304708.50
	Playground	1	No	415857.14	415857.14	464304.86	464304.86
	Tree Planting	30	No	200.00	6000.00	230.00	6900.00
Delivery	Council Fees	1	%	3.25	162012.89	3.25	187185.67
	Authority Fees	1	%	0.00	0.00	0.00	0.00
	Traffic Management	1	%	2.00	99700.24	2.00	115191.18
	Environmental Management	1	%	0.50	24925.06	0.50	28797.80
	Survey/Design	1	%	5.00	249250.60	5.00	287977.96
	Supervision & Project Management	1	%	9.00	448651.08	9.00	518360.33
	Site Establishment	1	%	2.50	124625.30	2.50	143988.98
	Environmentally sustainable design	1	%	2.00	86839.01	2.00	115191.18
	Contingency	1	%	15.00	747751.80	15.00	863933.88
Total	Excluding Delivery				**4,985,012**		**5,759,559**
	Including Delivery				**6,941,629**		**8,020,186**

Appendix C	
Description:	Item 43 - Sporting & Recreation Facilities (8-10 Ha)
Civil Component Number:	Item 43

Group	Sub Item	Qty	Unit	Rate (P50)	Amount P(50)	Rate (P90)	Amount P(90)
Playing Fields	Football Field	2	No	805074.24	1610148.48	860162.38	1720324.76
	Cricket Pitch	2	No	24049.94	48099.88	28173.45	56346.90
	Cricket Nets	1	No	49791.30	49791.30	57497.73	57497.73
	Soccer Field	0	No	526667.50	0.00	597198.85	0.00
	Netball Court	2	No	83143.13	166286.26	98076.30	196152.60
	Tennis Court	2	No	65422.94	130845.88	72602.00	145204.00
Lighting	Lighting Netball Court	2	No	22802.95	45605.90	24396.01	48792.02
	Lighting Tennis	2	No	21415.84	42831.68	24493.23	48986.46
	Lighting Soccer	0	No	73003.05	0.00	97409.90	0.00
	Lighting Football	2	No	163494.28	326988.56	201714.52	403429.04
Landscaping	Landscaping Construction	38000	m2	20.28	770640.00	26.19	995220.00
	Landscaping Establishment (12wk)	38000	m2	1.12	42560.00	1.29	49020.00
	Landscape maintenance-1 year/2 summers	38000	m2	2.90	110200.00	2.94	111720.00
Car Parking	Pavement	5465	m2	94.73	517699.45	109.24	596996.60
	Kerb and Channel	510	m	55.04	28070.40	60.11	30656.10
	Drainage Pipes	560	m	177.49	99394.40	192.51	107805.60
	Drainage Pits	28	No	2611.95	73134.60	2802.77	78477.56
	Car Park Lighting	4190	m2	15.13	63394.70	17.31	72528.90
	Linemarking/ Signage	5465	m2/pavement	3.26	17815.90	4.07	22242.55
Site Works	Site Preperation	100000	m2	3.68	368000.00	4.71	471000.00
	Footpaths and paved areas	875	m2	63.65	55693.75	71.96	62965.00
Services	Stormwater Drainage	1	Item	251068.39	251068.39	285507.93	285507.93
	Sewer	1	Item	52065.67	52065.67	62444.50	62444.50
	Water	1	Item	75629.58	75629.58	88426.00	88426.00
	Gas	1	Item	16727.49	16727.49	20125.23	20125.23
	Light & power	1	Item	231657.53	231657.53	286561.25	286561.25
	Communications	1	Item	46504.09	46504.09	65834.30	65834.30
	Fire	1	Item	25236.69	25236.69	27694.32	27694.32
Miscellaneous	Gates	2	Item	689.27	1378.54	740.17	1480.34
	Interchange shelter	10	Item	8443.47	84434.70	9944.59	99445.90
	Fencing	1300	m	91.87	119431.00	106.27	138151.00
	Signage	20	No	0.00	0.00	0.00	0.00
Irrigation	Irrigation Soccer	0	m	40441.04	0.00	43757.35	0.00
	Irrigation Football	2	Item	72462.96	144925.92	82052.35	164104.70
Other	Access Road	1980	m2	217.50	430650.00	225.71	446905.80
	Playground	1	m2	415857.14	415857.14	464304.86	464304.86
	Tree Planting	40	No	200.00	8000.00	230.00	9200.00
Delivery	Council Fees	1	%	3.25	210299.96	3.25	241655.44
	Authority Fees	1	%	0.00	0.00	0.00	0.00
	Traffic Management	1	%	2.00	129415.36	2.00	148711.04
	Environmental Management	1	%	0.50	32353.84	0.50	37177.76
	Survey/Design	1	%	5.00	323538.39	5.00	371777.60
	Supervision & Project Management	1	%	9.00	582369.11	9.00	669199.68
	Site Establishment	1	%	2.50	161769.20	2.50	185888.80
	Environmentally sustainable design	1	%	2.00	101418.39	2.00	148711.04
	Contingency	1	%	15.00	970615.18	15.00	1115332.79
Total	Excluding Delivery				**6,470,768**		**7,435,552**
	Including Delivery				**9,010,544**		**10,354,006**