Information Paper

Local Government

Typical scopes and benchmark costs of local infrastructure

12 November 2021

This information paper presents IPART's draft typical scopes and benchmark costs for local infrastructure. These were developed for us by specialist engineering consultant, Cardno (ACT/NSW) Pty Ltd (Cardno).

The benchmarks are part of a broader process we are undertaking to assist the NSW Government with proposed reforms to the infrastructure contributions system. The NSW Government is seeking to reform the system, in line with the recommendations of the NSW Productivity Commission, to make it more certain, efficient, simple, transparent and consistent. In order to facilitate this, the NSW Government has given IPART two terms of reference for related reviews on aspects of the proposed new system.

The benchmark costs in this paper relate to the Productivity Commission's recommendation, that IPART:

> *develop and maintain benchmark efficient costings for local infrastructure to be used by contributions plans*

We have also released a draft report that outlines our methodology to developing and reviewing the infrastructure benchmarks and provides information on other elements of the contributions plan process. More information about the development and use of the benchmarks is also available in the consultant's report on our website.

1.1 Infrastructure benchmarks

Based on our 2014 review and subsequent contributions plans we have assessed, we developed a list of transport, stormwater and open space infrastructure for benchmarking.

We provided the list to Cardno who provided advice on the typical scopes of local infrastructure items on the list we provided. This included identifying appropriate sub items, defining inclusions and exclusions and indicative engineering drawings or photos for each item.

IPART acknowledges the Traditional Custodians of the lands where we work and live. We pay respect to Elders, past, present and emerging. We recognise the unique cultural and spiritual relationship and celebrate the contributions of First Nations peoples.

Once typical scopes had been determined, Cardno costed these items using one of two methods:

1. **Reference pricing –** by analysing its database of contract costs for similar items, and making adjustments where necessary

2. **First principles cost estimating –** by working up a cost by costing individual items, drawing on advice or seeking quotes from relevant construction professionals.

1.2 Using the benchmarks

Base costs identified in each of the tables are the unadjusted construction and material costs.

When developing a contributions plan, councils may apply a relevant location, constraint or ground condition factor to adjust the cost based on local circumstances. Councils will also add on-costs or contingencies to the overall project construction costs. We will regularly review and update our benchmarks according to the process outlined in chapter 8 of our draft report, to ensure benchmarks maintain currency over time.

1.3 Stakeholder feedback

We are seeking submissions on the proposed benchmark items, typical scopes, base costs and adjustments, and allowances. We will also test the benchmarks on a range of previous project examples, prior to finalising our review.

Seek Comment

1. Are there other items that we should benchmark?
2. Are the inclusions, exclusions and typical scopes appropriate and clear?
3. Do the base costs reflect efficient costs?
4. Do the sub items and adjustments appropriately deal with project variability?
5. Do the project allowances for on-costs and contingency reflect efficient practice?

IPART invites written comment on this document by 10 December 2021 and encourages all interested parties to provide submissions addressing the matters discussed. We would prefer to receive them electronically via our online submission form Have your say. You can also send comments by mail to:

Review of the essential works list, nexus, efficient design and benchmark costs for local infrastructure
Independent Pricing and Regulatory Tribunal
PO Box K35
Haymarket Post Shop, Sydney NSW 1240

Late submissions may not be accepted at the discretion of the Tribunal.

A Benchmark datasheets draft report - Cardno

Supplementary Report - Benchmark Datasheets

Benchmark Costs for Local Infrastructure

360900

Prepared for

Independent Pricing and Regulatory Tribunal (IPART)

10 November 2021

Cardno

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1	5/11/2021	Draft	A. Hughes P. Lamb P Moy	A. Hughes
A	9/11/2021	Draft	A. Hughes P. Lamb P Moy	P. Lamb
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C	10/11/2021	Draft	A. Hughes P. Lamb P Moy	A. Hughes

1 Purpose of Document

The draft Benchmarking Items and Cost Methodology Report released by IPART on its website on the 29 October only included a sample of benchmark datasheets. The report may be located in

https://www.ipart.nsw.gov.au/sites/default/files/cm9_documents/Consultant-Report-Cardno-Draft-Benchmarking-Items-and-Costing-Methodology-27-October-2021.PDF

This document provides the complete datasheets for review by stakeholders.

For convenience, the worked example, along with associated adjustment factors, in the draft Benchmarking Items and Cost Methodology Report have been reproduced in the next section.

2 Worked Example

A worked example, outlining the application of various adjustment factors, is shown in Table 2-1. This is for a 3.5 km collector road. The work will occur in 2022 and the costs have been indexed from their 2021 value. It is located in Newcastle and 22 km from raw materials so the raw material factor is not used as the source is less than 25km away. There are local conditions that would indicate a minimally constrained construction environment. A small portion of the road will go through poor soils and the costs have been adjusted accordingly.

Note, the benchmark costs are based on the use of mid-tier contractors rather than a Tier 1 Contractor acting as a managing contractor. All rates are ex-GST.

Table 2-1 Worked example

New collector road				Reference
Unit Rate		$2,575/m		Appendix B Item 1.03
Minimum size		1000 m		
Quantity of infrastructure		3.5 km		
Adjustment Factors		Description	Factor (note that these are examples only and will be updated following further analysis)	
Regional		-	1.01	Note 1
Raw Materials		22km from source	1.00	Table 2-2
Constraints consideration		Minimally constrained	1.00	Table 2-4
Soil condition		95% >CBR3 5% CBR2-CBR3	1.0 1.15	Table 2-5
Indexation		Year 2022	1.02	Table 2-6
Base Cost		3.5 km x 1000m/km x $2,575/m = $9,012,500		
Adjustments	Indexation	$9,012,500 x (0.02)	$180,250	Table 2-6
	Site constraint	$9,012,500 x (0%)	$0	Table 2-3
	Soil	$9,012,500 x (5%*(1.15-1.00))	$67,593.75	Table 2-5
	Regional or raw material source	$9,012,500 x (1.01-1.00)	$90,125	Table 2-2
Construction Cost		$9,350,468.75		
On Cost		12% (project> $5 million) 0% cultural heritage (investigations suggests this is unlikely)		Table 2-7
On Cost		$9,350,468.75 x 0.12 = $1,122,056.25		
Contingency		20%		Table 2-8
Contingency		$9,350,468.75 x 0.2 = $1,870,093.75		
Total		**$12,342,618.75**		
Estimated installed unit rate		$3,526.46		

Note 1 Regional and raw material sourcing factor

The unit rate costs presented in this report are base costs and do not account for location or distance from raw materials. Regional factors are used for estimating increased costs associated with construction that occurs at a distance from metropolitan centres where sourcing some materials and labour requires additional costs. Additionally, when constructing roads at a distance from a quarry and other raw materials construction costs increase. Haulage costs of raw materials affect the cost of providing road infrastructure across regions more than materials and labour costs. These costs vary according to the infrastructure's distance from the raw material supply sources. Those located further away from these sources typically face higher transportation and logistics costs.

Rawlinsons Australian Construction Handbook provides guidance for regional adjustment factors and the provides a raw material adjustment factor. It is not appropriate to apply both a material and regional adjustment factor unless specific local knowledge can justify such an application.

When determining the location factor for open space embellishment and stormwater, the index for the closest regional centre taken from the Regional Building Indices section of the latest Rawlinsons Australian Construction Handbook should be used. The regional cost indices in Rawlinsons are relative to costs in Sydney (i.e. Sydney = 100), and are updated annually. In the 2021 edition of this handbook, these indices range from 101 (for Newcastle and Wollongong) to 134 (for Cobar). This indicates that costs in Newcastle and Wollongong are typically 1% higher than those in Sydney, while those in Cobar are typically 34% higher.

For roads infrastructure where the distance to raw materials becomes the key criteria in determining construction costs the percentage adjustment based on distance thresholds from the source of raw materials, as set out in Table 2-2, is appropriate.

Table 2-2 Recommended distance adjustment factors for road infrastructure raw materials

<25 km from raw material source	25-75km from raw material source	>75km from raw material source
0%	5%	10%

These factors indicate (for example) that the base cost of providing roads typically increases by 5% if the council is between 25km and 75km from the raw material source, and by 10% if it is more than 75km from the raw material source.

Either a regional or raw material factor should be applied, not both.

Note 2 Site constraint factor

Table 2-3 provides the site constraint categories

Table 2-4 provides the site constraints factor for roads and stormwater infrastructure

Table 2-3 Site constraint categories

Constraint level	Description
Highly constrained	Areas categorised as highly constrained have high quality footpaths and road pavement, high-to-heavy traffic density and heavily congested services. Construction would involve significant reinstatement costs and disruption to traffic. Town and city centres would usually be considered as highly constrained, however highly constrained corridors can be found in other areas as well.
Moderately constrained	Areas categorised as moderately constrained include residential, industrial or retail areas containing medium-to-high traffic density and services. Construction would involve some reinstatement of road pavement and driveways. The rate of construction would be slower due to the need to locate and relocate some services etc. Traffic control would also be required.
Minimally constrained	Construction within areas categorised as minimally constrained have little or no restoration costs, as there is generally an absence of permanent infrastructure (e.g. driveways, kerb and channelling) which would need restoration at the end of the project. In addition, there would be few services to relocate and very limited traffic control would be required. Greenfield areas would usually be considered as minimally constrained, however this can be dependent on the proposed alignment.

Site constraint factors are listed in Table 2-4. These figures are preliminary and further analysis is being undertaken. Stakeholder feedback, with supporting contract data, on infill cost impacts is welcomed.

Table 2-4 Recommended site constraint factors for roads and stormwater infrastructure

Minimally constrained	Moderately constrained	Highly constrained
0%	20% - 30%	30% - 40%

Note 3 Soil condition

Table 2-5 Adjustments as a function of CBR

CBR ≥3	CBR (2-3)	CBR (1-2)
1.0	1.15	1.44

Note 4 Indexation

The costs presented in this report are unit rates that have been adjusted to be 2021 values.

Table 2-6 Indices for benchmark cost indexing

Infrastructure Category	Recommended cost index
Roads	ABS PPI Road and Bridge Construction Index for NSW (no. 3101)
Stormwater	ABS PPI Road and Bridge Construction Index for NSW (no. 3101)
Open space	ABS PPI Non-Residential Building Construction Index for NSW (no. 3020)

Note 5 On-cost

Table 2-7 Recommended Council on-cost percentages

On-Cost	Small Program $250,000 to $1M Construction Cost	Small/Medium Program $1M-2M Construction Cost	Medium Program $2M to $5M Construction Cost	Large Program >$5M Construction Cost
Description	**Amount (%)**	**Amount (%)**	**Amount (%)**	**Amount (%)**
TOTAL	**22%**	**17%**	**15.0%**	**12.0%**
Cultural Heritage (where applicable)	10.0%	5.0%	3.0%	2.0%

Note 6 Contingency

Table 2-8 Recommended contingency allowances for benchmark items

Project stage	Open space embellishment	Roads	Stormwater
Planning	20%	20%	20%
Design	15%	15%	15%

APPENDIX A

ITEM AND SUB-ITEM LISTING

Item Datasheets

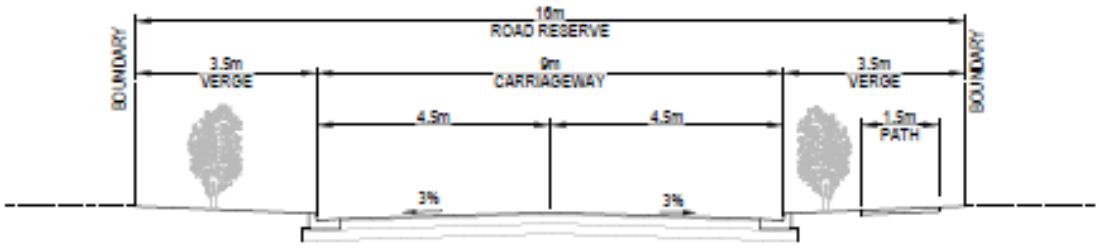
1 Transport	
1.01	New local road
1.03	New collector road
1.04	New sub-arterial road
1.05	New industrial road
1.06	New rural road
1.07	Upgrade to collector road
1.08	Upgrade to sub-arterial road
1.09	Signalised intersection – single lane
1.10	Signalised intersection – two lane
1.11	Signalised intersection and 1 turning lane
1.13	Priority controlled/ un-signalised intersection
1.14	Roundabout – single lane
1.16	Reinforced concrete pathway
1.19	Road bridge (including over railways, waterways)
1.20	Cycleway bridge
1.23	Bus shelter
1.25	Pedestrian crossing
1.27	Street lighting
2. Stormwater/ Transport Stormwater	
2.01	Culvert
2.02	Combined basin and raingarden facility
2.03	Single raingarden facility
2.04	Bio-retention basin
2.05	Bio-retention filter
2.06	Not used
2.07	Not used
2.08	Wetland basin
2.10	Detention basin / Enhanced Storage Area
2.11	Gross pollutant trap
2.12	Not used
2.13	Stormwater pipe
2.14	Stormwater headwall
2.15	Stormwater pit
2.16	Stormwater channel/open channel
2.17	Stormwater channel stabilisation
3. Plan administration	
3.01	Not Applicable
4. Open space embellishment	
4.01	Amenities building 100sqm
4.02	BBQ area
4.03	Boundary Fencing
4.04	Car park
4.05	Cricket wicket – 3 x practice nets
4.06	Cricket wicket only
4.07	Demolition
4.08	Double playing fields
4.09	Double playing lighting 100 Lux
4.10	Not Used
4.11	Not used
4.12	Basic landscaping
4.13	Netball courts with lighting
4.14	Netball courts/ 6no.
4.15	Park lighting
4.16	Pathway
4.17	Paved area
4.18	Picnic area
4.19	Playground
4.20	Seating area
4.21	Shade sail
4.22	Spectator seat
4.23	Tennis court & lighting
4.24	Turfing

APPENDIX

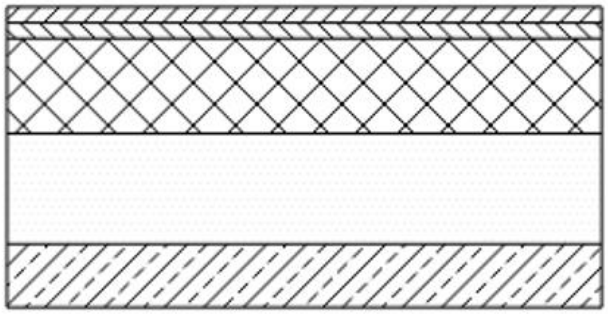
B

LOCAL INFRASTRUCTURE BENCHMARK DATASHEETS

Item Definition				
Item Name	**New Local Road**			
Item No.	1.01			
Functional Description	New, 2 Lane, flexible pavement local access road			
Inclusions	▪ Pavement structure: 275mm subbase, 150mm base, primer seal, 50mm AC 10 (2 x 25mm layers) ▪ Road corridor: 2 x 4.5m lanes, 9m wide carriageway, road reserve 16m ▪ Roll-top gutter ▪ Stormwater drainage ▪ Subsoil drainage - 100mm diameter corrugated perforated plastic pipe with sock, including drainage filter backfill ▪ 1 x 1.5m reinforced concrete footpath - 1500mm wide x 125mm thick concrete on 125mm thick DGS20 ▪ 1 x 3500mm and 1 x 2000m wide turfed grass nature strip ▪ Street Trees – semi mature 45L every 15m both sides			
Key scope of work inclusions	▪ Nominal 500mm cut/fill balance ▪ Clearing and grubbing of light to medium vegetation ▪ Minor traffic control allowance for construction vehicles/pedestrian and around tie-in point with trafficked road (includes installation and removal of signage and barriers) ▪ Installation works			
Exclusions (may be reasonably required)	▪ Guardrails and guide post ▪ Street lighting (see item 1.27)			
Exclusions (exceed minimum requirements	▪ Signage ▪ Line-marking			
Key identified risks	▪ Relocation and diversion of existing utilities ▪ Contaminated materials ▪ Surplus excavated material requiring disposal off-site ▪ Imported fill required for site levelling			
Sub-item details	▪ N/A			
Specific sub item information	▪ N/A			
Applicable standards	▪ Austroads > Guide to Traffic Engineering Practice > Guide to Asset Management Part 5: Pavement Performance > Guide to Pavement Technology Part 2: Pavement Structural Design > Guide to Road Design Part 3: Geometric Design > Roads and Maritime Services - Road Design Guide > Council's relevant work specification - Civil			
Cost information				
Methodology	Reference pricing			
Benchmark base cost	#	Item/ sub-item	Unit	$/ Unit
	1.01	New local access road	Lm	$2,300
Banding	▪ N/A			
Minimum quantity	▪ 80m length			



LOCAL ACCESS ROAD - TYPICAL SECTION



50mm AC10 WEARING COURSE (2x25mm AC10)
FINAL 25mm LAYER TO BE CONSTRUCTED AFTER
80% OF HOUSING CONSTRUCTION COMPLETED

7mm SINGLE COAT FLUSH SEAL

BASE COURSE DGB20 COMPACTED
TO MINIMUM MODIFIED DENSITY
RATIO OF 98%

SUB BASE DGS40 COMPACTED TO
MINIMUM MODIFIED DENSITY
RATIO OF 95%

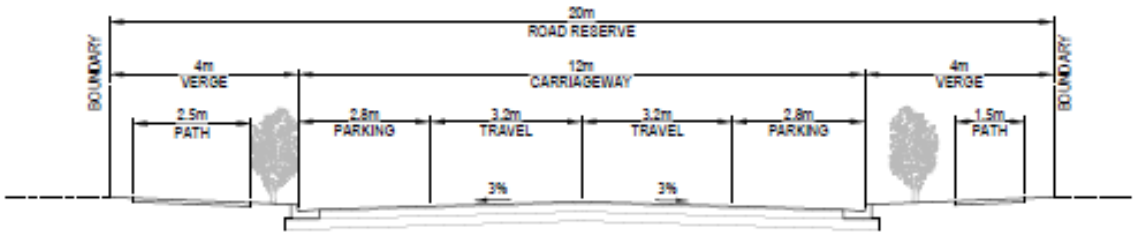
COMPACTED SUBGRADE TO
MINIMUM DENSITY RATIO OF 100%

ASSUMED CBR: REFER TABLE BELOW
ASSUMED ESA: $5x10^4$

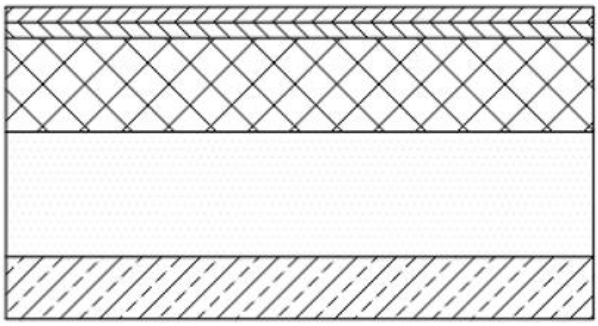
PAVEMENT TYPE 2
SCALE 1:10

Pavement Design	
Design Subgrade	CBR 3%
Wearing Surface	50mm AC10
Primer Seal	7mm
Basecourse	150mm
Subbase	275mm
Total Thickness	475mm

Item Definition	
Item Name	**New collector road**
Item No.	1.03
Functional Description	Not available
Inclusions	▪ Pavement structure: 410mm subbase, 150mm base, primer seal, 50mm AC 10 (2 x 25mm layers) ▪ Lime Stabilisation (150mm, 3%). ▪ Road corridor: 12m wide carriageway, road reserve 20m ▪ 150mm high Kerb & Gutter ▪ Stormwater drainage ▪ Subsoil drainage - 100mm diameter corrugated perforated plastic pipe with sock, including drainage filter backfill ▪ 1 x 1.5m reinforced concrete footpath - 1500mm wide x 125mm thick concrete on 125mm thick DGS20 ▪ 1 x 2.5 reinforced concrete shareway – 2500mm wide x 150mm thick concrete on 125mm thick DGS20 ▪ 1 x 1500mm and 1 x 2500m wide turfed grass nature strip ▪ Street Trees – semi mature 45L every 25m both sides
Key scope of work inclusions	▪ Nominal 500mm cut/fill balance ▪ Clearing and grubbing of light to medium vegetation ▪ Minor traffic control allowance for construction vehicles/pedestrian and around tie-in point with trafficked road (includes installation and removal of signage and barriers) ▪ Installation works
Exclusions (may be reasonably required)	▪ Signage ▪ Line-marking
Exclusions (exceed minimum requirements	▪ Guard rail and guide posts
Key identified risks	▪ Relocation and diversion of existing utilities ▪ Contaminated materials ▪ Surplus excavated material requiring disposal off-site ▪ Imported fill required for site levelling
Sub-item details	▪ N/A
Specific sub item information	▪ N/A
Applicable standards	▪ Austroads > Guide to Traffic Engineering Practice > Guide to Asset Management Part 5: Pavement Performance > Guide to Pavement Technology Part 2: Pavement Structural Design > Guide to Road Design Part 3: Geometric Design > Roads and Maritime Services - Road Design Guide > Council's relevant work specification - Civil
Cost information	
Methodology	Reference pricing
Benchmark base cost	# | Item/ sub-item | Unit | $/ Unit 1.03 | New Collector Road | Lm | 2,575
Banding	▪ N/A
Minimum quantity	▪ 1,000m



COLLECTOR ROAD - TYPICAL SECTION



50mm AC10 WEARING COURSE (2x25mm AC10)
FINAL 25mm LAYER TO BE CONSTRUCTED AFTER
80% OF HOUSING CONSTRUCTION COMPLETED

7mm SINGLE COAT FLUSH SEAL

BASE COURSE DGB20 COMPACTED
TO MINIMUM MODIFIED DENSITY
RATIO OF 98%

SUB BASE DGS40 COMPACTED TO
MINIMUM MODIFIED DENSITY
RATIO OF 95%

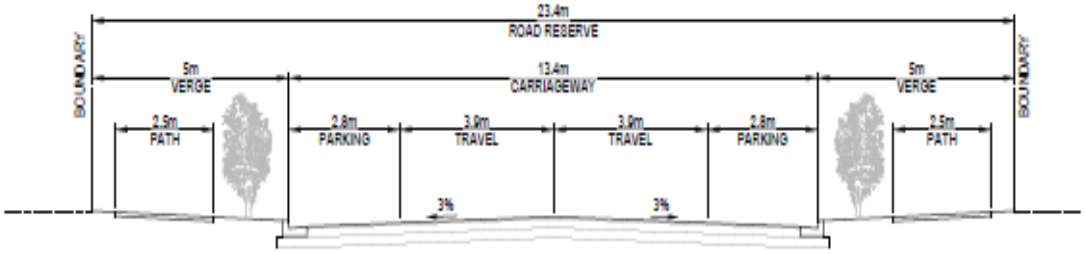
COMPACTED SUBGRADE TO
MINIMUM DENSITY RATIO OF 100%

ASSUMED CBR: REFER BELOW TABLE
ASSUMED ESA: $2x10^6$

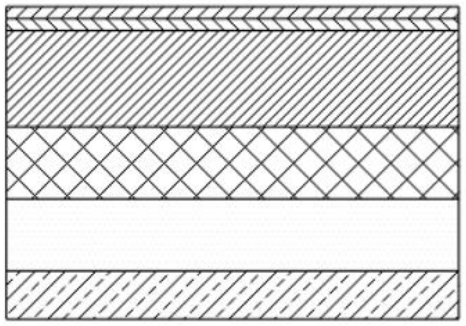
PAVEMENT TYPE 1
SCALE 1:10

Pavement Design	
Design Subgrade	CBR 3%
Wearing Surface	50mm AC10
Primer Seal	7mm
Basecourse	150mm
Subbase	410mm
Total Thickness	610mm

Item Definition	
Item Name	**New sub-arterial road**
Item No.	1.04
Functional Description	New, flexible pavement sub-arterial road, covering a range of pavement structures
Inclusions	▪ Pavement structure: Subgrade improvement layer 300mm, 150mm Subbase, 150mm Basecourse, Primer Seal, Asphalt Base 210mm, 2 x 25mm AC10. ▪ Lime Stabilisation (150mm, 3%). ▪ Road corridor: 13.4m wide carriageway, road reserve 23.4m ▪ 150mm high kerb and gutter ▪ Stormwater drainage ▪ Subsoil drainage - 100mm diameter corrugated perforated plastic pipe with sock, including drainage filter backfill ▪ 2 x 2.5m reinforced concrete footpath - 2500mm wide x 125mm thick concrete on 125mm thick DGS20 ▪ 2 x 2500mm wide turfed grass nature strip ▪ Typical signage - 1 small to medium sized sign (eg, speed limit sign) every 50 - 60m ▪ Tie-in works to existing lane ▪ Line-marking ▪ Street Trees – semi mature 45L every 50m both sides
Key scope of work inclusions	▪ Clearing and grubbing of light to medium vegetation ▪ Minor traffic control allowance for construction vehicles/pedestrian and around tie-in point with trafficked road (includes installation and removal of signage and barriers) ▪ Installation works
Exclusions (may be reasonably required)	▪ Street lighting (separate item - 1.27)
Exclusions (exceed minimum requirements	▪ Guardrails and guide posts
Key identified risks	▪ Relocation and diversion of existing utilities ▪ Payment of waste levy for general solid waste or restricted special waste ▪ Surplus excavated material requiring disposal off-site ▪ Imported fill required for site levelling
Sub-item details	▪ N/A
Specific sub item information	▪ N/A
Applicable standards	▪ Austroads > Guide to Traffic Engineering Practice > Guide to Asset Management Part 5: Pavement Performance > Guide to Pavement Technology Part 2: Pavement Structural Design > Guide to Road Design Part 3: Geometric Design > Roads and Maritime Services - Road Design Guide > Council's relevant work specification - Civil
Cost information	
Methodology	Reference pricing
Benchmark base cost	# | Item/ sub-item | Unit | $/ Unit 1.04 | 4 Lane sub-arterial road | m | 3,750
Banding	▪ N/A
Minimum quantity	▪ 1,000m



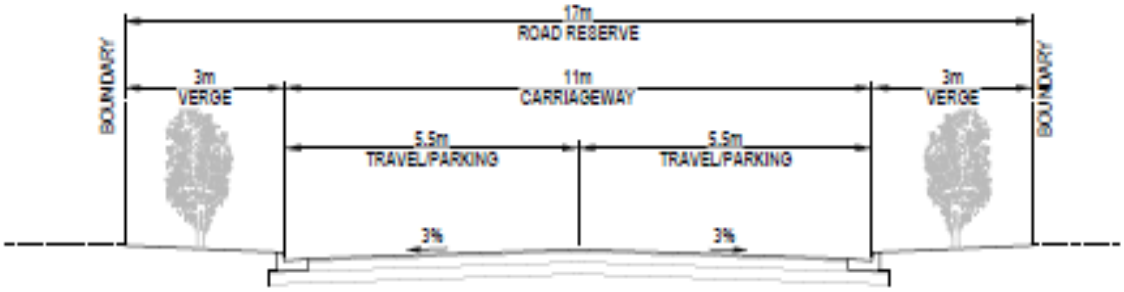
SUB ARTERIAL ROAD - TYPICAL SECTION
SCALE 1:150



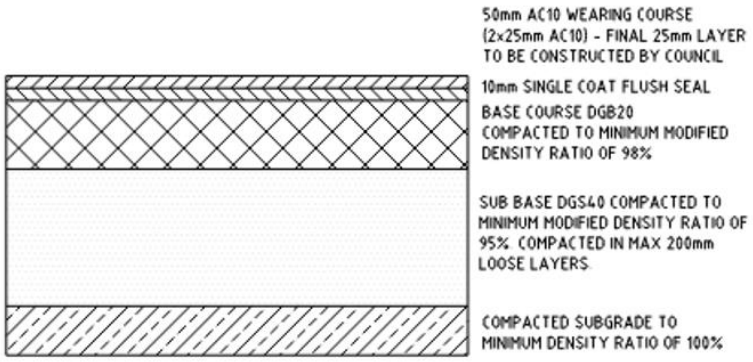
PAVEMENT TYPE 1
SCALE 1:10

Pavement Design	
Design Subgrade	CBR 3%
Wearing Surface	50mm AC10
Asphalt Base	210mm
Primer Seal	10mm
Basecourse (CBR >30)	150mm
Subbase (CBR >15)	150mm
Subgrade Improvement Layer (CBR >6)	300mm
Total Thickness	860mm

Item Definition	
Item Name	**New industrial road**
Item No.	1.05
Functional Description	New, 2 lane, flexible pavement Industrial road, covering a range of pavement structures
Inclusions	▪ Pavement structure: Subbase 420mm, basecourse 140mm, Primer Seal, 2 x 25mm AC10 ▪ Road corridor: 2 lanes x 11m wide carriageway, road reserve 17m ▪ 200mm high kerb and gutter ▪ Stormwater drainage ▪ Subsoil drainage - 100mm diameter corrugated perforated plastic pipe with sock, including drainage filter backfill ▪ 2 x 3000mm wide turfed grass nature strip ▪ Line-marking ▪ Street Trees – semi mature 45L every 25m both sides
Key scope of work inclusions	▪ Nominal 500mm cut/fill balance ▪ Clearing and grubbing of light to medium vegetation ▪ Minor traffic control allowance for construction vehicles/pedestrian and around tie-in point with trafficked road (includes installation and removal of signage and barriers) ▪ Installation works
Exclusions (may be reasonably required)	▪ Guardrails and guide post (separate item - 1.8) ▪ Street lighting (separate item - 1.17)
Exclusions (exceed minimum requirements	▪ N/A
Key identified risks	▪ Relocation and diversion of existing utilities ▪ Contaminated materials ▪ Surplus excavated material requiring disposal off-site ▪ Imported fill required for site levelling
Sub-item details	▪ N/A
Specific sub item information	▪ N/A
	▪ N/A
Applicable standards	▪ Austroads > Guide to Traffic Engineering Practice > Guide to Asset Management Part 5: Pavement Performance > Guide to Pavement Technology Part 2: Pavement Structural Design > Guide to Road Design Part 3: Geometric Design > Roads and Maritime Services - Road Design Guide > Council's relevant work specification – Civil
Cost information	
Methodology	Reference pricing
Benchmark base cost	# | Item/ sub-item | Unit | $/ Unit 1.05 | New Industrial road | m | 2,650
Banding	▪ N/A
Minimum quantity	▪ 100m length



INDUSTRIAL ROAD - TYPICAL SECTION
SCALE 1:150



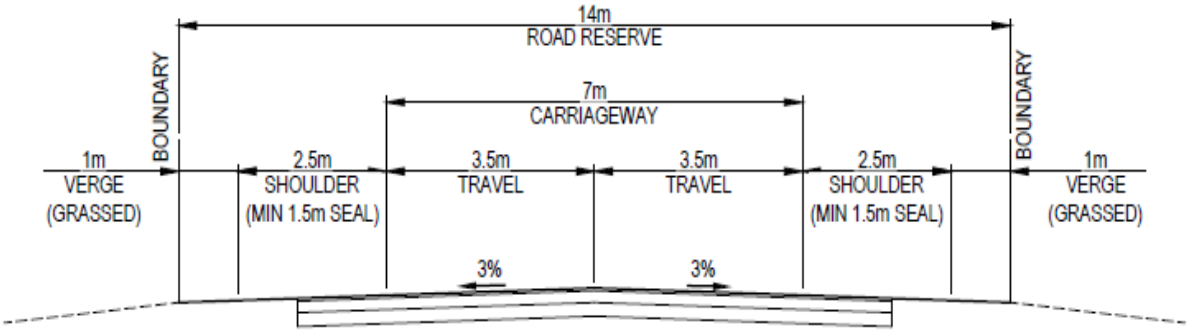
PAVEMENT TYPE 2
SCALE 1:10

Pavement Design	
Design Subgrade	CBR 3%
Wearing Surface	50mm AC10
Primer Seal	10mm
Basecourse	140mm
Subbase	420mm
Total Thickness	610mm

Item Definition	
Item Name	**New rural road**
Item No.	1.06
Functional Description	New, 2 lane, flexible pavement rural road
Inclusions	▪ Pavement structure: 300mm subbase, 260mm basecourse, primer seal, two coat seal ▪ Road corridor: 2 lanes x 3m wide carriageway, road reserve 8m and carriageway width 6m ▪ 2 x 500mm wide turfed grass nature strip ▪ 1.8m wide swale drain with hydro mulching ▪ Typical signage - 1 small to medium sized sign (eg, speed limit sign) every 50 - 60m ▪ Line-marking ▪ Tie-in works to existing lane
Key scope of work inclusions	▪ Nominal 500mm cut/fill balance ▪ Clearing and grubbing of light to medium vegetation ▪ Minor traffic control allowance for construction vehicles/pedestrian and around tie-in point with trafficked road (includes installation and removal of signage and barriers) ▪ Installation works
Exclusions (may be reasonably required)	▪ Guardrails and guide post ▪ Street lighting (separate item - 1.27)
Exclusions (exceed minimum requirements	▪ Kerb & gutter ▪ Footpath ▪ Stormwater drainage
Key identified risks	▪ Relocation and diversion of existing utilities ▪ Contaminated materials ▪ Surplus excavated material requiring disposal off-site ▪ Imported fill required for site levelling
Sub-item details	▪ N/A
Specific sub item information	▪ N/A
Applicable standards	▪ Austroads > Guide to Traffic Engineering Practice > Guide to Asset Management Part 5: Pavement Performance > Guide to Pavement Technology Part 2: Pavement Structural Design > Guide to Road Design Part 3: Geometric Design > Roads and Maritime Services - Road Design Guide
Cost information	
Methodology	Reference pricing

Benchmark base cost	#	Item/ sub-item	Unit	$/ Unit
	1.06	New rural road	m	2,000

Banding	▪ N/A
Minimum quantity	▪ 1000m^2 (120m length)



RURAL ROAD - TYPICAL SECTION
SCALE 1:150

Pavement Design	
Design Subgrade	CBR 3%
Wearing Surface	Two coat seal incl tack coat
Primer Seal	10mm
Basecourse	260mm
Subbase	300mm
Total Thickness	560mm

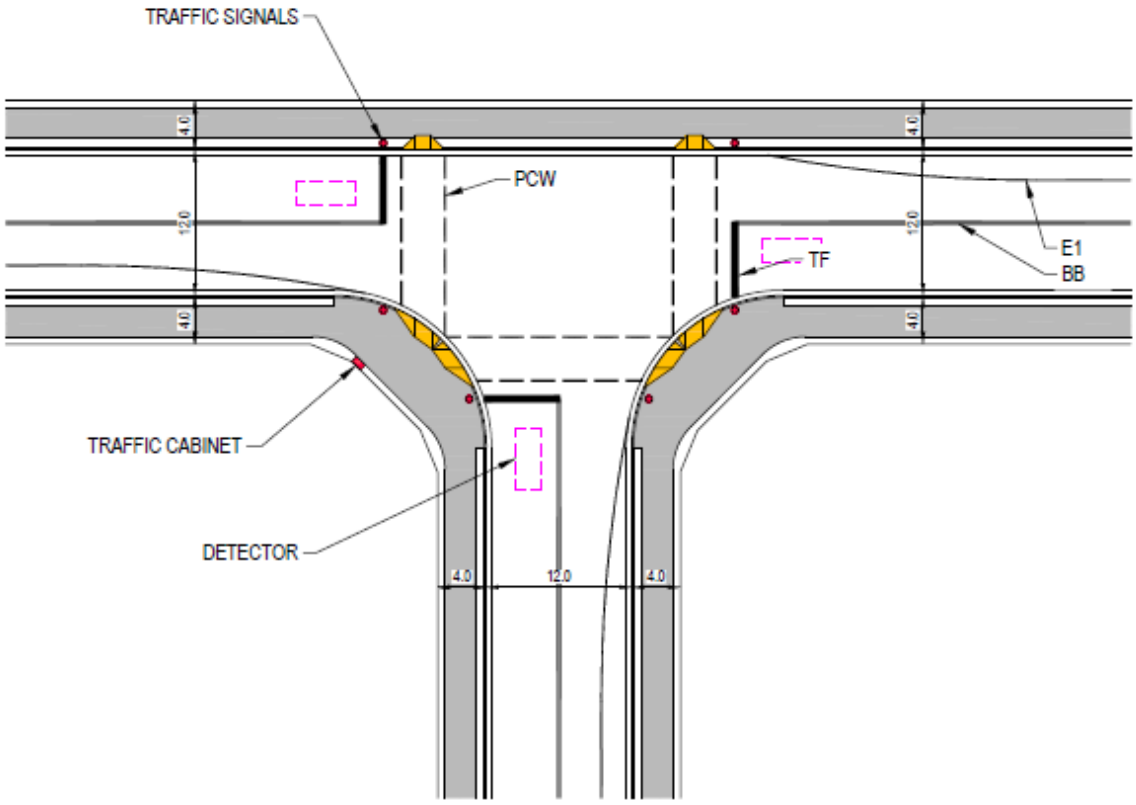
Item Definition	
Item Name	**Upgrade to collector road**
Item No.	1.07
Functional Description	Widening of a sub-arterial road adjacent to traffic by 1 lane, flexible pavement
Inclusions	▪ Road corridor: additional 1 x 3.2m wide lane ▪ Pavement structure: 200mm base, 1 x 100mm asphalt AC20HD, 2 x 75mm asphalt AC20HD, 50mm AC14HD A15E Binder ▪ Kerb and gutter ▪ Stormwater drainage ▪ Subsoil drainage - 100mm diameter corrugated perforated plastic pipe with sock, including drainage filter backfill ▪ 1 x 2.5m reinforced concrete footpath - 2500mm wide x 125mm thick concrete on 125mm thick DGS20 ▪ 1 x 500mm wide turfed grass nature strip ▪ Typical signage - 1 small to medium sized sign (eg, speed limit sign) every 50 - 60m ▪ Tie-in works to existing lane ▪ Line-marking
Key scope of work inclusions	▪ Nominal 500mm of excavation ▪ Clearing and grubbing of light to medium vegetation
Exclusions (may be reasonably required)	▪ Guardrails and guide post ▪ Street lighting (separate item - 1.27)
Exclusions (exceed minimum requirements	▪ N/A
Key identified risks	▪ Relocation and diversion of existing utilities ▪ Payment of full waste levy for general solid waste or restricted special waste ▪ Additional excavated material (over and above that stated in the basis of cost) requiring disposal off-site ▪ Imported fill required for site levelling
Sub-item details	▪ N/A
Specific sub item information	▪ N/A
Applicable standards	▪ Austroads > Guide to Traffic Engineering Practice > Guide to Asset Management Part 5: Pavement Performance > Guide to Pavement Technology Part 2: Pavement Structural Design > Guide to Road Design Part 3: Geometric Design > Roads and Maritime Services - Road Design Guide > Council's relevant work specification – Civil
Cost information	
Methodology	Reference pricing
Benchmark base cost	# | Item/ sub-item | Unit | $/ Unit 1.07 | Flexible pavement | m | 3,000
Banding	▪ N/A
Minimum quantity	▪ 1,000m

Pavement Design	
Design Subgrade	CBR 3%
Wearing Surface	50mm AC14HD A15E Binder
Asphalt Base	2 x 75mm Asphalt AC20HD (AR450) 1 x 100mm Asphalt AC20HD (AR450) 7mm Low Cutter Seal
Basecourse	200mm Base RMS R73/3051 DGB(HD) 4%
Total Thickness	500mm

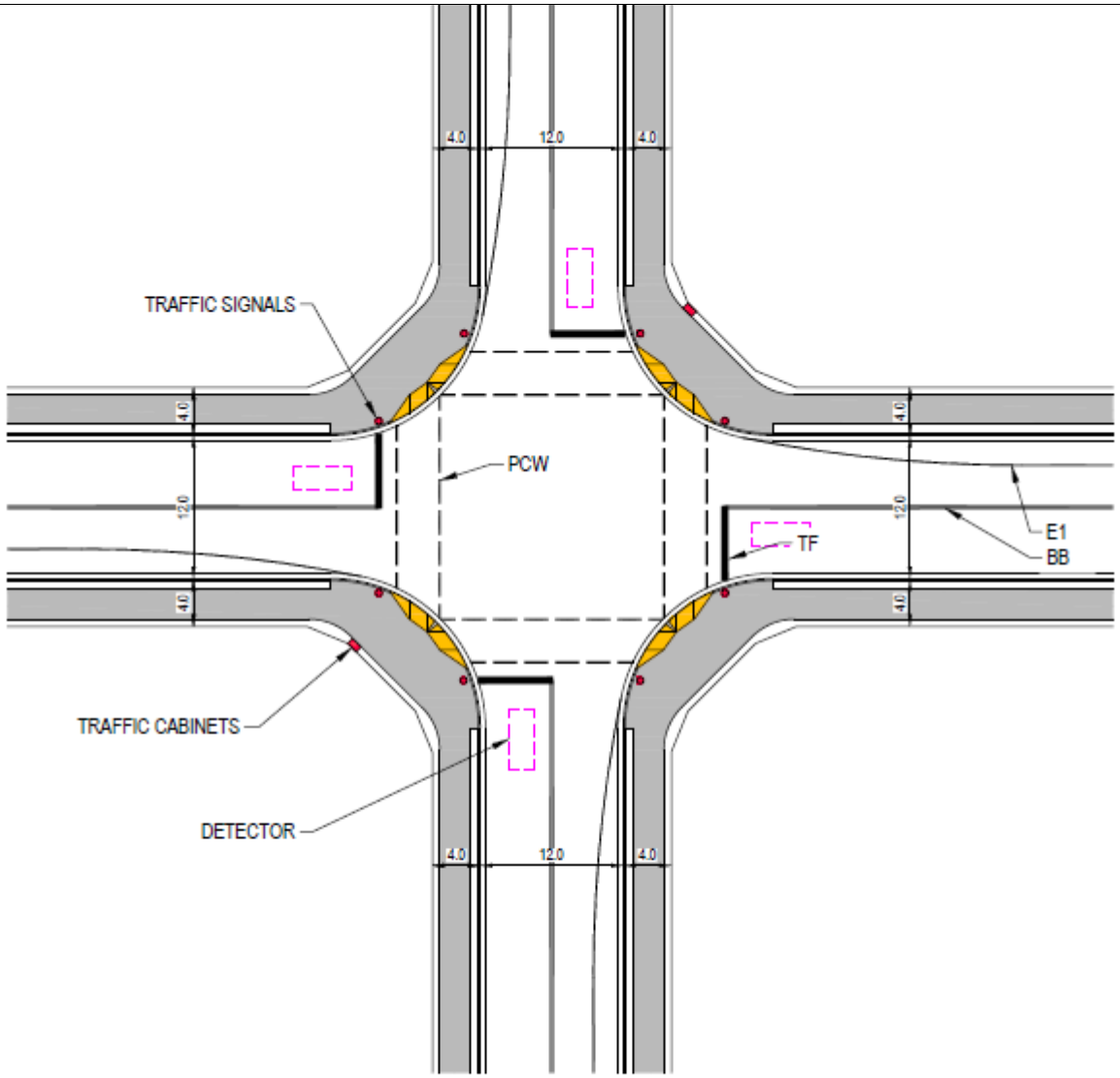
Item Definition	
Item Name	**Upgrade to sub-arterial road**
Item No.	1.08
Functional Description	Widening of a sub-arterial road adjacent to traffic by 1 lane, flexible pavement
Inclusions	▪ Road corridor: additional 1 x 3.2m wide lane ▪ Pavement structure: Subgrade improvement layer 300mm, 150mm Subbase, 150mm Basecourse, Primer Seal, Asphalt Base 210mm, 2 x 25mm AC10. ▪ Lime Stabilisation (150mm, 3%). ▪ Kerb and gutter ▪ Stormwater drainage ▪ Subsoil drainage - 100mm diameter corrugated perforated plastic pipe with sock, including drainage filter backfill ▪ 1 x 2.5m reinforced concrete footpath - 2500mm wide x 125mm thick concrete on 125mm thick DGS20 ▪ 1 x 500mm wide turfed grass nature strip ▪ Typical signage - 1 small to medium sized sign (eg, speed limit sign) every 50 - 60m ▪ Tie-in works to existing lane ▪ Line-marking
Key scope of work inclusions	▪ Nominal 500mm of excavation ▪ Clearing and grubbing of light to medium vegetation
Exclusions (may be reasonably required)	▪ Guardrails and guide post ▪ Street lighting (separate item - 1.27)
Exclusions (exceed minimum requirements	▪ N/A
Key identified risks	▪ Relocation and diversion of existing utilities ▪ Payment of full waste levy for general solid waste or restricted special waste ▪ Additional excavated material (over and above that stated in the basis of cost) requiring disposal off-site ▪ Imported fill required for site levelling
Specific sub item information	▪ N/A
Applicable standards	▪ Austroads > Guide to Traffic Engineering Practice > Guide to Asset Management Part 5: Pavement Performance > Guide to Pavement Technology Part 2: Pavement Structural Design > Guide to Road Design Part 3: Geometric Design > Roads and Maritime Services - Road Design Guide > Council's relevant work specification – Civil
Cost information	
Methodology	Reference Pricing
Benchmark base cost	# | Item/ sub-item | Unit | $/ Unit 1.08 | Flexible pavement | m | 4,200
Banding	▪ N/A
Minimum quantity	▪ 1,000m

Pavement Design	
Design Subgrade	CBR 3%
Wearing Surface	50mm AC10
Asphalt Base	210mm
Primer Seal	10mm
Basecourse (CBR >30)	150mm
Subbase (CBR >15)	150mm
Subgrade Improvement Layer (CBR >6)	300mm
Total Thickness	860mm

Item Definition				
Item Name	**Signalised intersection (single lane)**			
Item No.	1.09			
Functional Description	Signalised intersection installations – single lane			
Inclusions	▪ Standard traffic signals with standard out reach ▪ Splays ▪ Kerb returns ▪ Pram ramp crossings ▪ Median pedestrian refuge ▪ Typical traffic signal configuration including pedestrian crossing to all legs and EZY loops and typical signage			
Key scope of work inclusions	▪ Installation works			
Exclusions (may be reasonably required)	▪ Road construction (separate items - 1.01 - 1.06) ▪ Traffic control			
Exclusions (exceed minimum requirements	▪ N/A			
Key identified risks	▪ Relocation and diversion of existing utilities			
Sub-item details	1.09.1	“T” intersection		
	1.09.2	4 way intersection		
Specific sub item information	▪ N/A			
Applicable standards	▪ Austroads > Guide to Traffic management; Part 4, 6, 9 & 10			
Cost information				
Methodology	Reference Pricing			
Benchmark base cost	#	Item/ sub-item	Unit	$/ Unit
	1.09.1	“T” intersection	each	250,000
	1.09.2	4 way intersection	each	300,000
Banding	▪ N/A			
Minimum quantity	▪ N/A			



SIGNALISED INTERSECTION - SINGLE LANE - "T" INTERSECTION

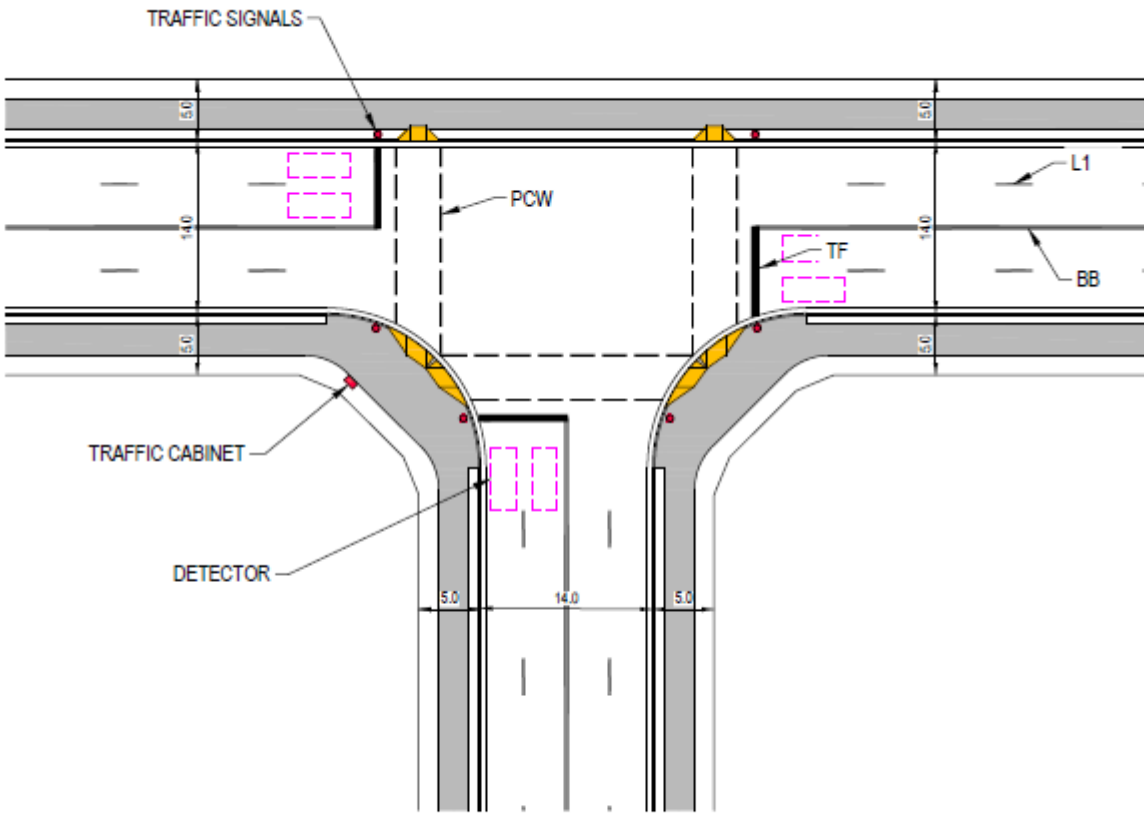


SIGNALISED INTERSECTION - SINGLE LANE - 4 WAY INTERSECTION

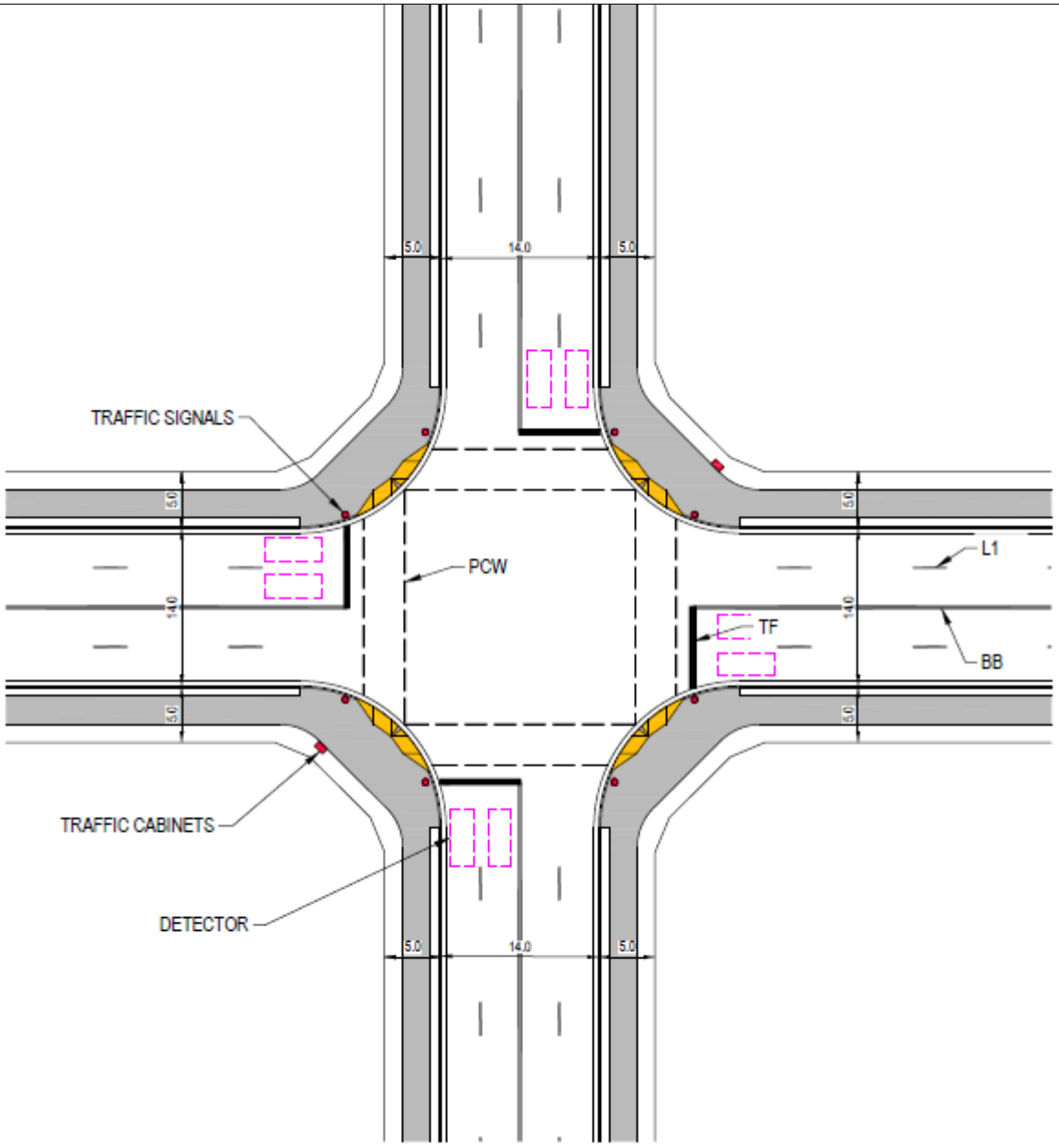
Item Definition		
Item Name	**Signalised intersection (2 lane)**	
Item No.	1.10	
Functional Description	Signalised intersection installations	
Inclusions	▪ Standard traffic signals with standard outreach sufficient to service 2 lanes ▪ Splays ▪ Kerb returns ▪ Pram ramp crossings ▪ Median pedestrian refuge ▪ Typical traffic signal configuration including pedestrian crossing to all legs and EZY loops and typical signage	
Key scope of work inclusions	▪ Installation works	
Exclusions (may be reasonably required)	▪ Road construction (separate items - 1.01 - 1.06) ▪ Traffic control	
Exclusions (exceed minimum requirements	▪ N/A	
Key identified risks	▪ Relocation and diversion of existing utilities	
Sub-item details	1.10.1	‘T’ intersection
	1.10.2	4 way intersection
Specific sub item information	▪ N/A	
Applicable standards	▪ Austroads > Guide to Traffic management; Part 4, 6, 9 & 10	
Cost information		
Methodology	Reference Pricing	

Benchmark base cost	#	Item/ sub-item	Unit	$/ Unit
	1.10.1	‘T’ intersection	each	325,000
	1.10.2	4 way intersection	each	430,000

Banding	▪ N/A
Minimum quantity	▪ N/A

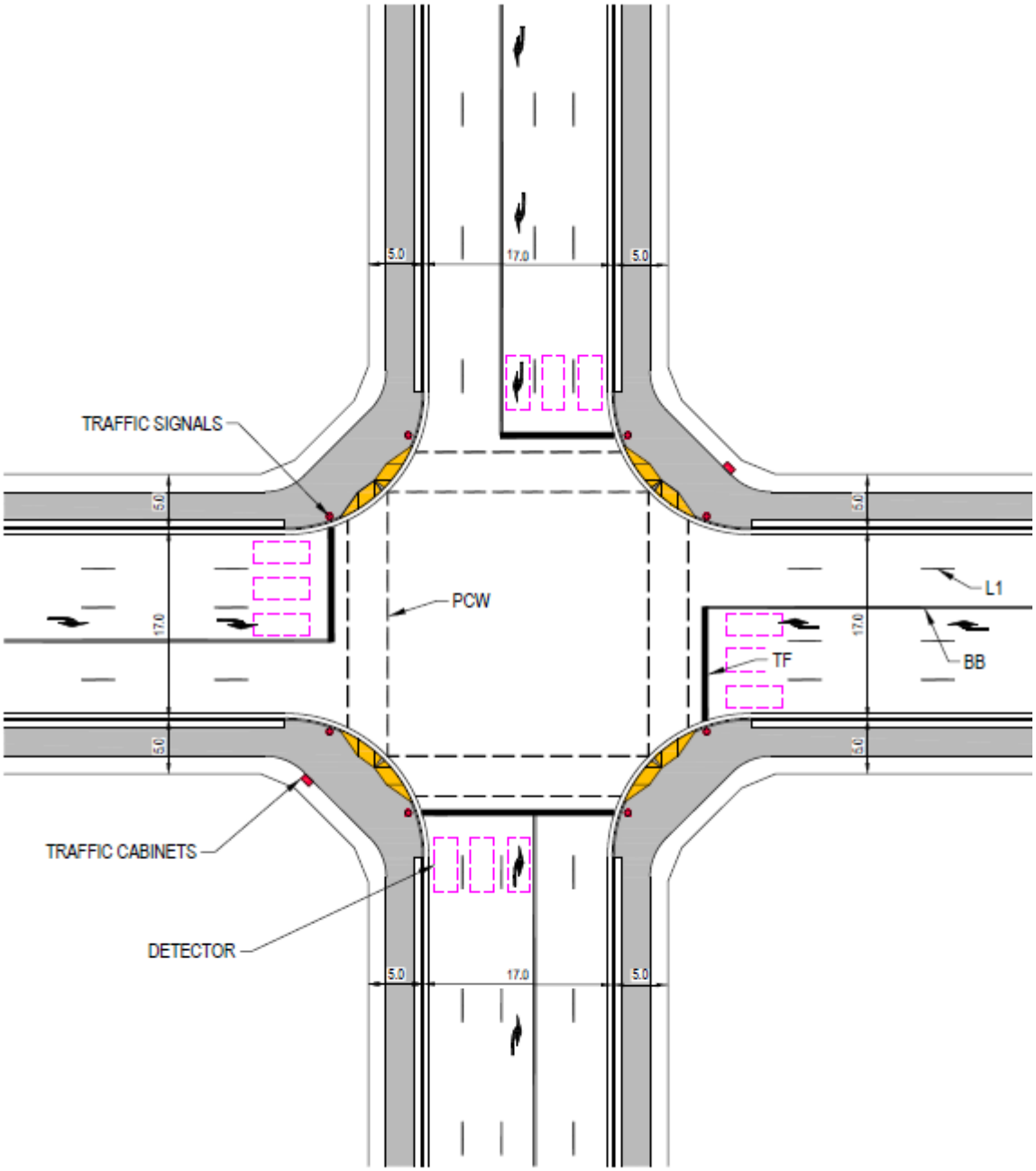


SIGNALISED INTERSECTION - 2 LANE - "T" INTERSECTION



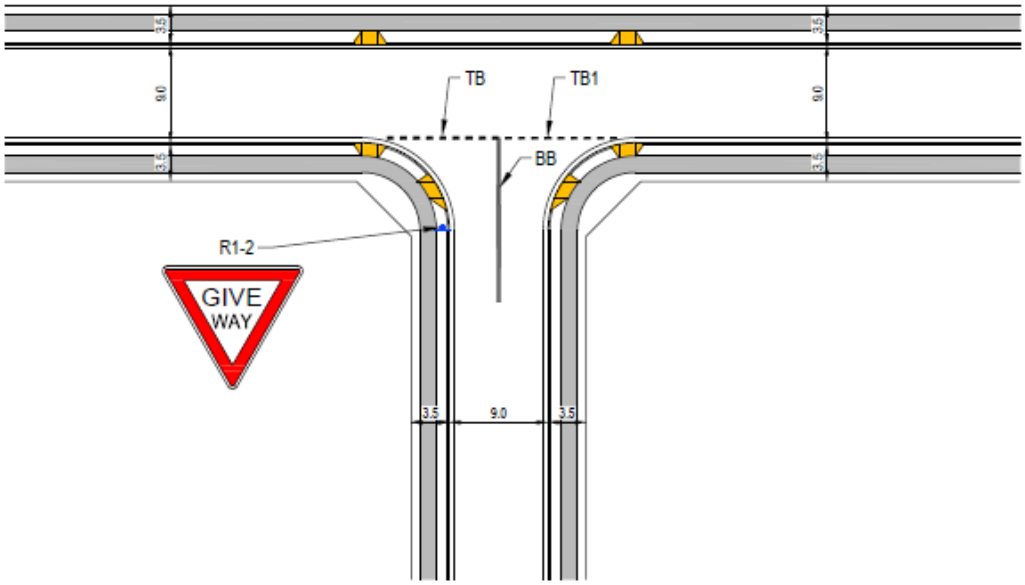
SIGNALISED INTERSECTION - 2 LANE - 4 WAY INTERSECTION

Item Definition				
Item Name	**Signalised intersection and 1 turning lane**			
Item No.	1.11			
Functional Description	Signalised intersection installations			
Inclusions	▪ Standard traffic signals with standard outreach sufficient to service 2 lanes ▪ Splays ▪ Kerb returns ▪ Pram ramp crossings ▪ Median pedestrian refuge ▪ Typical traffic signal configuration including pedestrian crossing to all legs and EZY loops and typical signage			
Key scope of work inclusions	▪ Installation works			
Exclusions (may be reasonably required)	Road construction (separate items - 1.01 - 1.06) Traffic control			
Exclusions (exceed minimum requirements	▪ N/A			
Key identified risks	Relocation and diversion of existing utilities			
Sub-item details	▪ N/A			
Specific sub item information	▪ N/A			
Applicable standards	▪ Austroads > Guide to Traffic management; Part 4, 6, 9 & 10			
Cost information				
Methodology	Reference pricing			
Benchmark base cost	#	Item/ sub-item	Unit	$/ Unit
	1.11	**Signalised intersection and 1 turning lane**	each	550,000
Banding	▪ N/A			
Minimum quantity	▪ N/A			

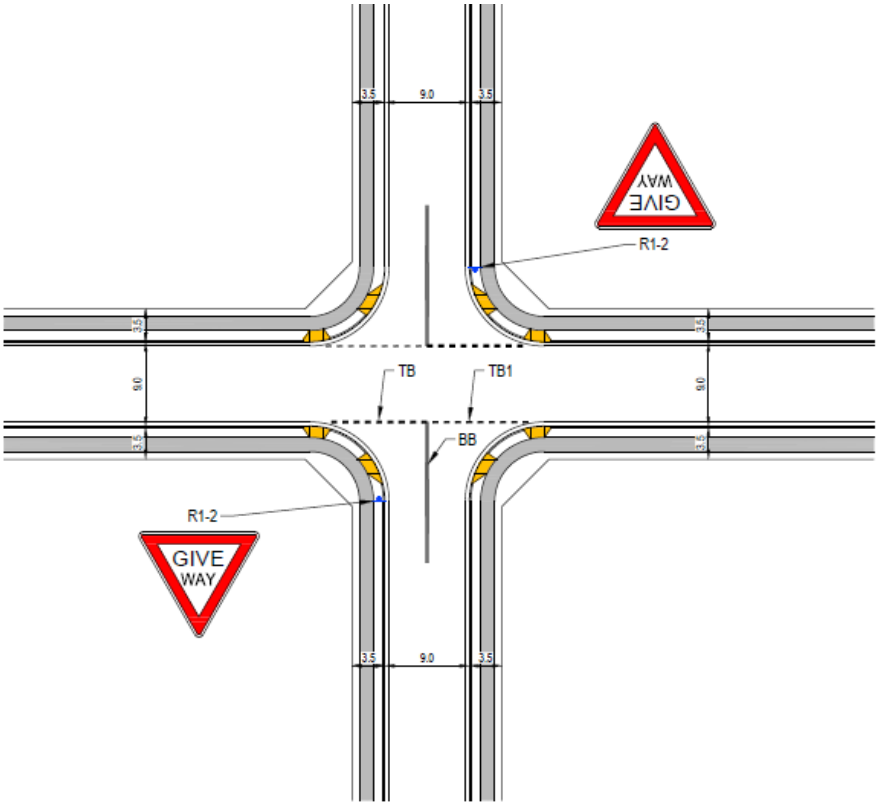


SIGNALISED INTERSECTION - WITH TURN LANE

Item Definition				
Item Name	**Priority controlled/ un-signalised intersection**			
Item No.	1.13			
Functional Description	Unsignalised intersection installations			
Inclusions	▪ Extra over cost for: ▪ Splays ▪ Kerb returns ▪ Pram ramp crossings ▪ Typical signage ▪ Tie-in works			
Key scope of work inclusions	▪ Installation works			
Exclusions (may be reasonably required)	▪ Road construction (separate items - 1.01 - 1.06) ▪ Traffic control			
Exclusions (exceed minimum requirements	▪ N/A			
Key identified risks	▪ Relocation and diversion of existing utilities			
Sub-item details	1.13.1	‘T’ intersection		
	1.13.2	4 way intersection		
Specific sub item information	▪ N/A			
Applicable standards	▪ Austroads > Guide to Traffic Management, Part 4, 6, 9 & 10			
Cost information				
Methodology	Reference Pricing			
Benchmark base cost	#	Item/ sub-item	Unit	$/ Unit
	1.13.1	‘T’ intersection	Each	4,200
	1.13.2	4 way intersection	Each	6,600
Banding	▪ N/A			
Minimum quantity	▪ N/A			

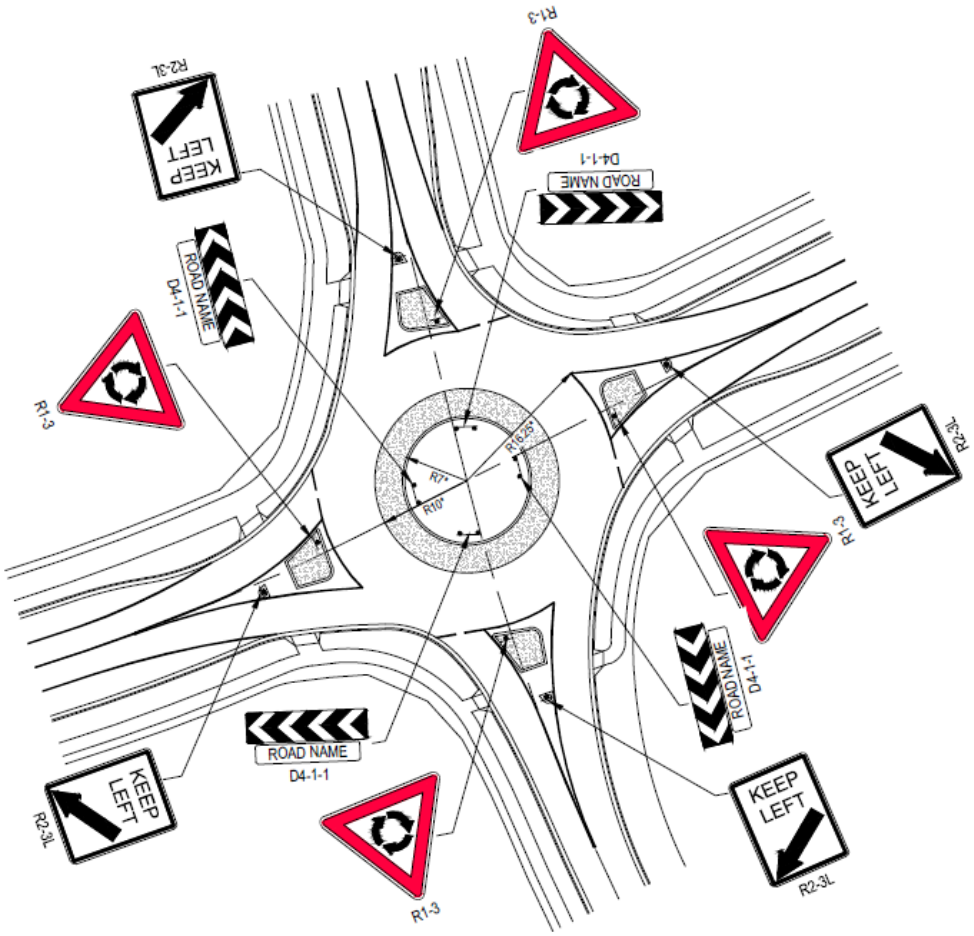


PRIORITY CONTROLLED / UNSIGNALISED "T" INTERSECTION



PRIORITY CONTROLLED / UNSIGNALISED 4 WAY INTERSECTION

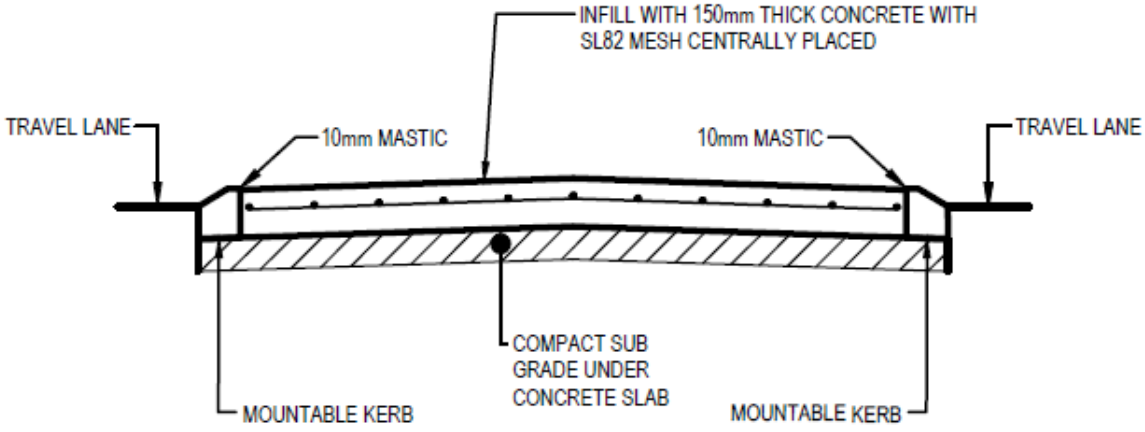
Item Definition				
Item Name	**Roundabout single lane**			
Item No.	1.14			
Functional Description	Trafficable, 4 leg Roundabout with 1 approaching lane			
Inclusions	▪ 6m diameter trafficable concrete roundabout ▪ 3m wide trafficable annulus ▪ 3m radius centre section with stencil finish ▪ 4 leg Roundabout with a single approaching lane ▪ Splays ▪ Kerb returns ▪ Typical signage ▪ Raised triangular medians ▪ Also refer to sub item specific information			
Key scope of work inclusions	▪ Installation works			
Exclusions (may be reasonably required)	▪ Pedestrian refuges ▪ Road construction (separate items - 1.01 - 1.06)			
Exclusions (exceed minimum requirements	▪ N/A			
Key identified risks	▪ Relocation and diversion of existing utilities			
Sub-item details	▪ N/A			
Specific sub item information	▪ N/A			
Applicable standards	▪ Austroads > Guide to Traffic Management, Part 4, 6, 9 & 10			
Cost information				
Methodology	Reference Pricing			
Benchmark base cost	#	Item/ sub-item	Unit	$/ Unit
	1.14.2	Roundabout only in greenfield with no traffic	each	42,000
Banding	▪ N/A			
Minimum quantity	▪ N/A			



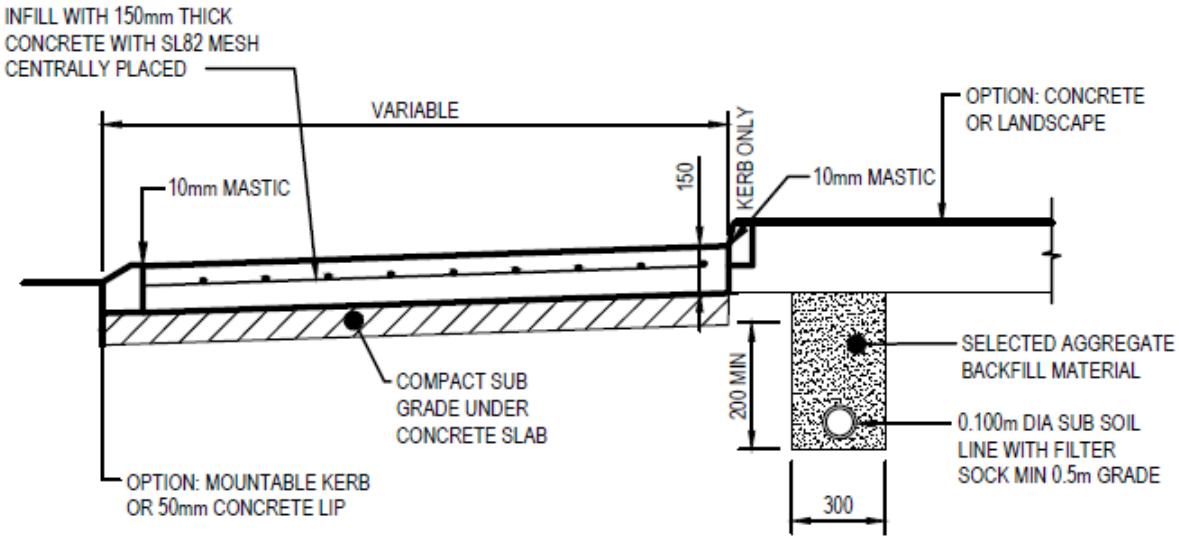
W2-7A
W2-7A TO BE LOCATED 60m FROM ROUNDABOUT INTERSECTION - ON ALL APPROACHES

ROUNDABOUT - 1 LANE

* = INDICATIVE DIMENSIONS MAY VARY

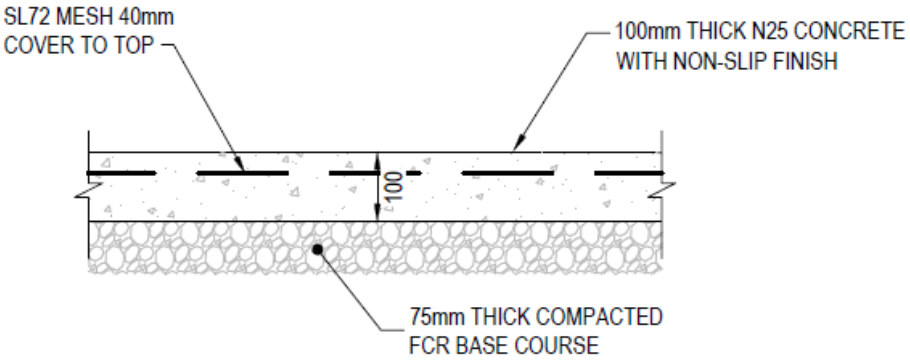


TYPICAL CONCRETE RAISED SPLITTER ISLAND INFILL



TYPICAL ROUNDABOUT CENTRE ISLAND DETAIL

Item Definition				
Item Name	**Concrete pathway**			
Item No.	1.16			
Functional Description	Reinforced Concrete Path			
Inclusions	▪ 100mm thick N25 concrete with non-slip finish ▪ SL72 Mesh ▪ 75mm compacted FCR base			
Key scope of work inclusions	▪ Contraction joints as per table below ▪ Expansion joints as per table below			
Exclusions (may be reasonably required)	▪ N/A			
Exclusions (exceed minimum requirements	▪ N/A			
Key identified risks	▪ N/A			
Sub-item details	▪ N/A			
Specific sub item information	▪ N/A			
Applicable standards	> General Council standard			
Cost information				
Methodology	Reference pricing			
Benchmark base cost	#	Item/ sub-item	Unit	$/ Unit
	1.16	Shared Path	M2	150
Banding	▪ N/A			
Minimum quantity	▪ N/A			



TYPICAL CONCRETE PATH DETAIL

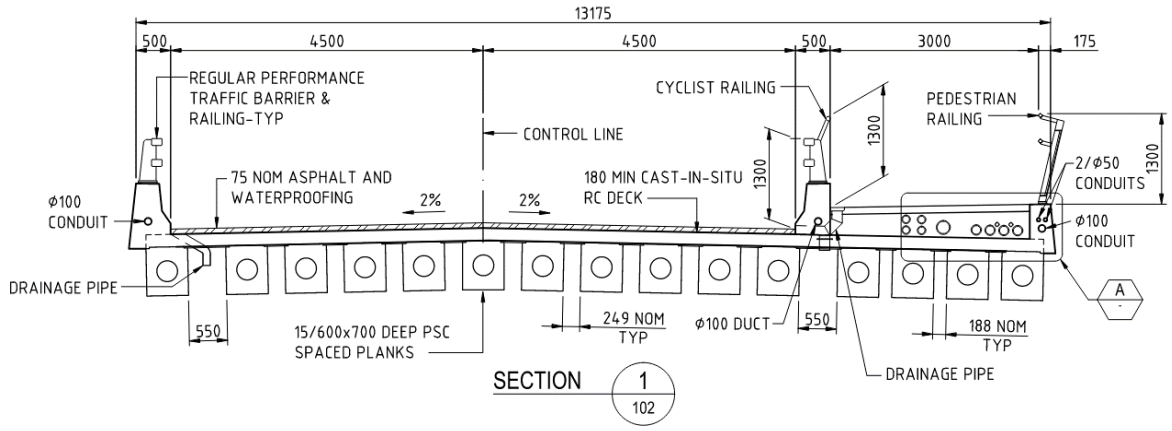
NOTE

1. CONTRACTION JOINTS TO BE PLACED PLACED LATERALLY AT INTERVALS NOT EXCEEDING 1 X PATH WIDTH (MAX 4m).
2. EXPANSION JOINTS TO BE PLACED LATERALLY AT INTERVALS NOT EXCEEDING 3 X PATH WIDTH (MAX 12m).

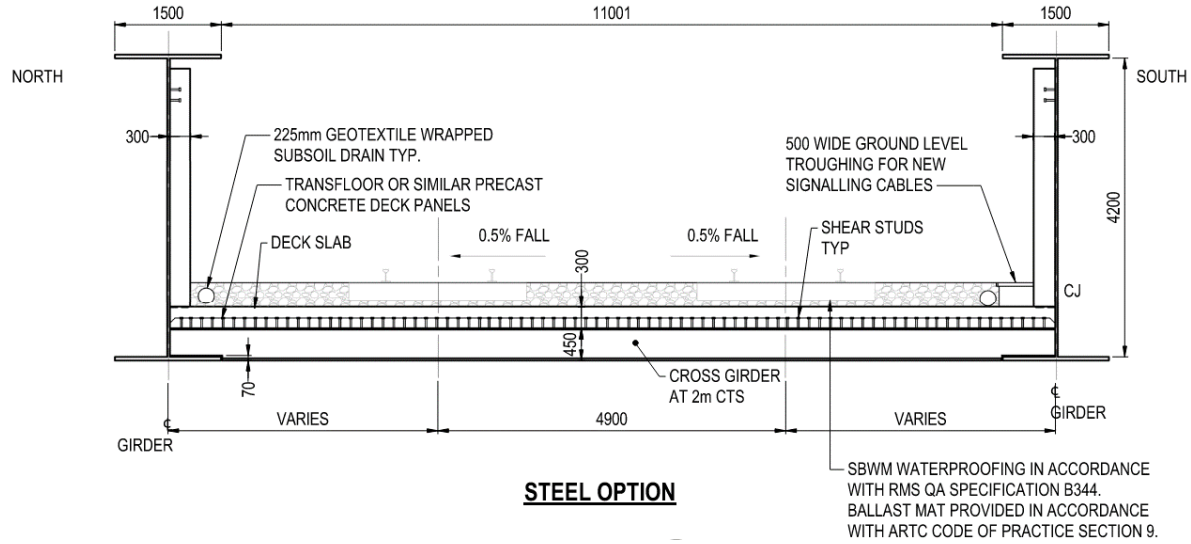
Item Definition	
Item Name	**Road bridge (including over railways, waterways)**
Item No.	1.19
Functional Description	Not available
Inclusions	▪ Reinforced concrete works to bridge substructure ▪ Wearing Surface ▪ Road and path barriers ▪ Anti-throw screens ▪ Anti-graffiti paint protection ▪ Lighting ▪ Configuration based on a typical single or multi-span bridge ▪ Also refer to specific sub item information
Key scope of work inclusions	▪ Piled Foundations ▪ Off-site fabrication of the bridge main girders ▪ Constructed over an operating road/rail ▪ Minor traffic control allowance within immediate proximity of work area (includes installation and removal of signage and barriers)
Exclusions (may be reasonably required)	▪ N/A
Exclusions (exceed minimum requirements	▪ Architectural embellishment ▪ Utilities impacts
Key identified risks	▪ Relocation and diversion of existing utilities ▪ Inefficient ramp configuration due to insufficient space
Sub-item details	▪ 1.19.1 Road Bridge ▪ 1.19.2 Rail Bridge
Specific sub item information	▪ Sub item 1.20.1 - Road bridge > Usually 2 Lanes + shared path ▪ Sub item 1.20.1 - Cycle overbridge > Usually 2 Lanes + shared path if over rail > Usually 2 tracks if carrying rail
Applicable standards	AS5100-2017 and all standards mention herein. > Often also TfNSW Specifications
Cost information	
Methodology	Reference pricing

Benchmark base cost	#	Item/ sub-item	Unit	$/ Unit
	1.19.1	Road Bridge over road/water	M2	4,000
	1.19.2	Road Bridge over rail	M2	6,000

Banding	▪ N/A
Minimum quantity	▪ N/A

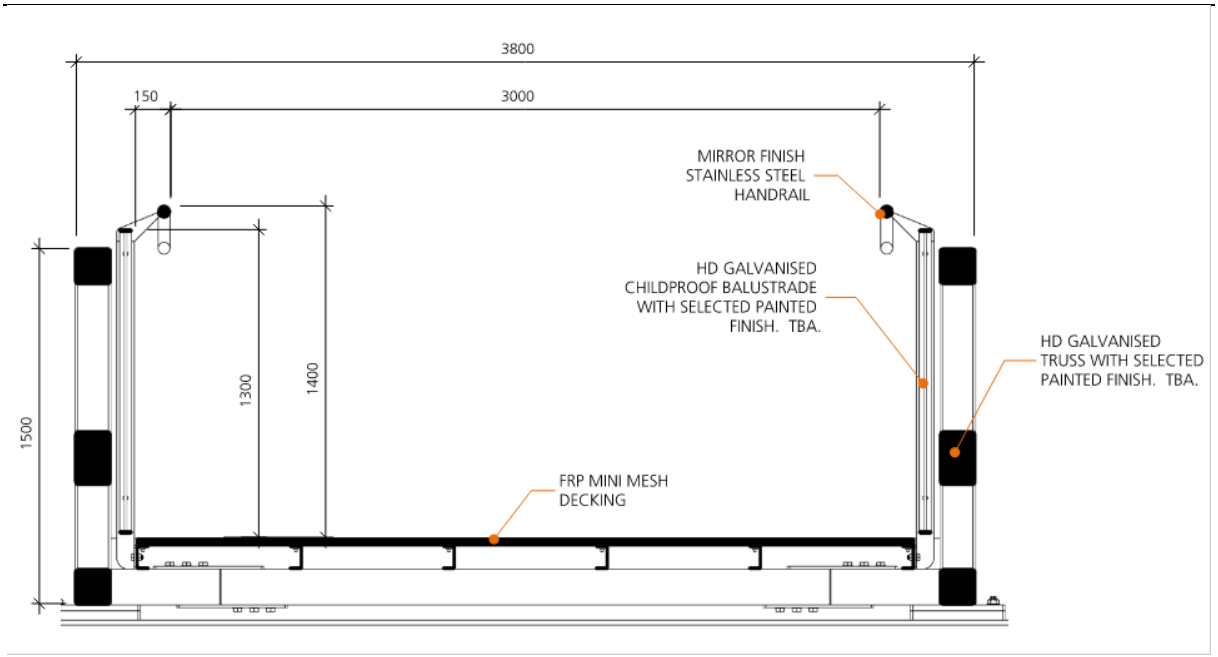


Typical Road Bridge Option

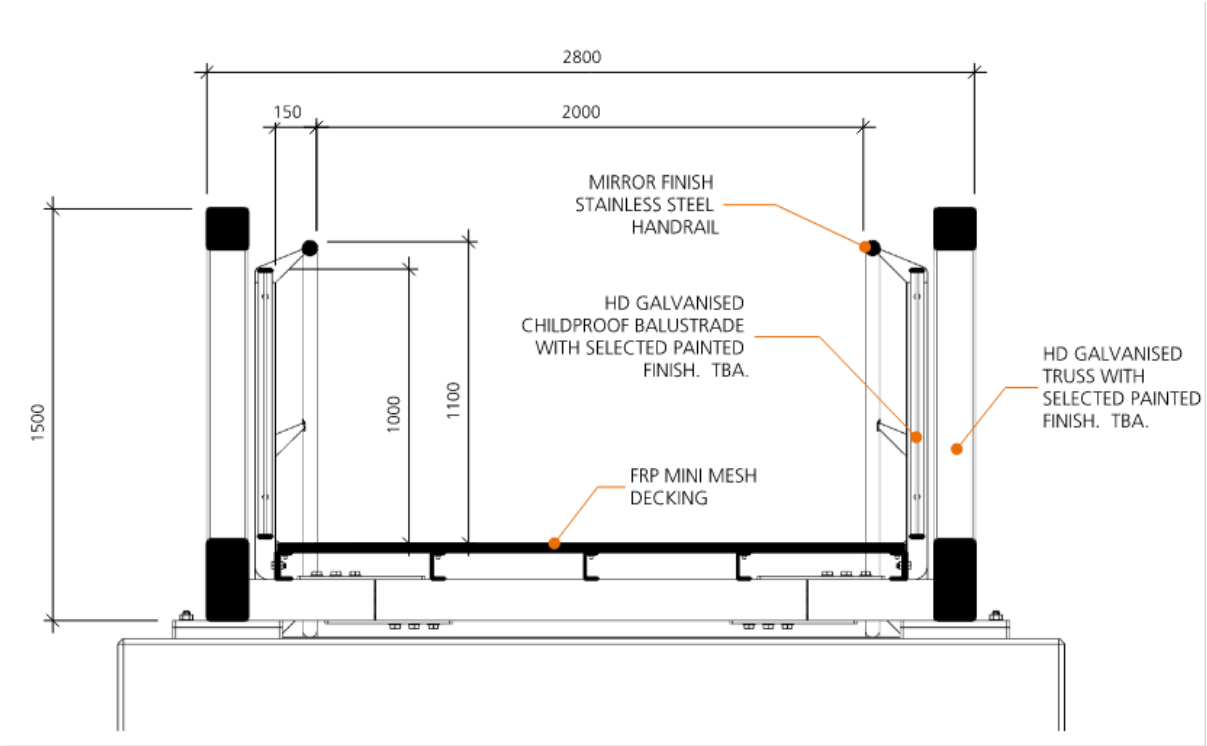


Typical Rail Bridge Option

Item Definition				
Item Name	**Pedestrian / Cycleway bridge**			
Item No.	1.20			
Functional Description	Pedestrian/cycle overpass with anti-throw screens and covered walkway			
Inclusions	▪ Reinforced concrete works to bridge substructure ▪ Non-slip surface on staircase ▪ Balustrades to stairs and bridge ▪ Anti-throw screens ▪ Anti-graffiti paint protection ▪ Lighting ▪ Configuration based on a pedestrian/ cycleway overpass ▪ Also refer to specific sub item information			
Key scope of work inclusions	▪ Piled Foundations ▪ Off-site fabrication of the bridge element ▪ Constructed over an operating road ▪ Minor traffic control allowance within immediate proximity of work area (includes installation and removal of signage and barriers)			
Exclusions (may be reasonably required)	▪ N/A			
Exclusions (exceed minimum requirements	▪ Architectural embellishment ▪ Utilities Impacts			
Key identified risks	▪ Relocation and diversion of existing utilities ▪ Inefficient ramp configuration due to insufficient space			
Sub-item details	▪ 1.20.1	▪ Pedestrian bridge		
	▪ 1.20.2	▪ Cycle overbridge		
Specific sub item information	▪ <u>Sub item 1.20.1 - Pedestrian bridge</u> > 3m wide steel girder pedestrian overpass with covered roofing to bridge section > Stair access ▪ <u>Sub item 1.20.1 - Cycle overbridge</u> > 3m wide concrete girder cycleway overpass without covered roofing > Ramp access			
Applicable standards	▪ AS5100-2017 and all standards mention herein. ▪ Often also TfNSW Specifications ▪ AS2156 for Walking Tracks			
Cost information				
Methodology	▪ Reference pricing			
Benchmark base cost	#	Item/ sub-item	Unit	$/ Unit
	1.20.1	Pedestrian bridge	M2	10,000
	1.20.2	Cycle overbridge	M2	8,000
Banding	▪ N/A			
Minimum quantity	▪ N/A			

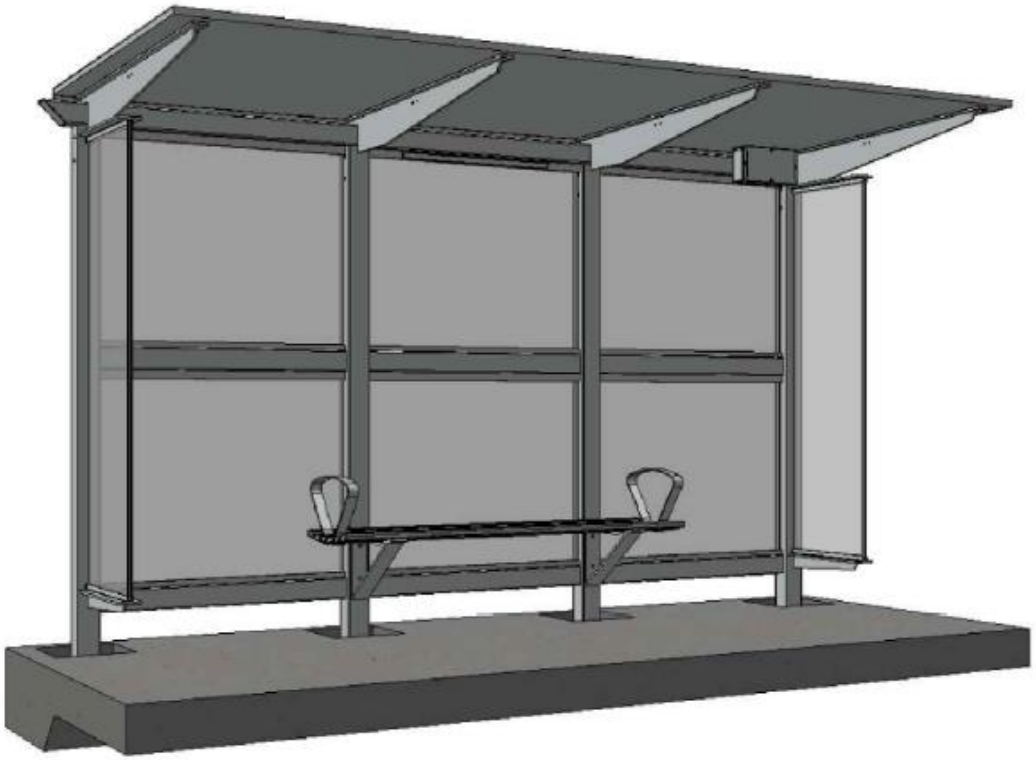


Cycleway Bridge



Pedestrian Bridge

Item Definition				
Item Name	**Bus Shelter**			
Item No.	1.23			
Functional Description	Bus stop including enclosure, seating and signage			
Inclusions	▪ 4.5m x 1.8m covered shed (includes disabled passenger space allocation), open side access and concrete slab / foundations ▪ 2 aluminium seats with seat height of 500mm (approximately) ▪ Short (<3m) connection to exiting footpath ▪ Nonslip surface at boarding point (textured concrete) ▪ Tactile ground surface indicators (TGSIs)			
Key scope of work inclusions	▪ Nominal excavation with material retained on-site ▪ Minor traffic control allowance within immediate proximity of work area (includes installation and removal of signage and barriers) ▪ Installation works			
Exclusions (may be reasonably required)	▪ Lighting (separate item 1.17)			
Exclusions (exceed minimum requirements	▪ Bus lane / bus bay construction			
Key identified risks	▪ Relocation and diversion of existing utilities			
Sub-item details	▪ N/A			
Specific sub item information	▪ N/A			
Applicable standards	▪ Disability Standards for Accessible Public Transport 2002 (Amended 2010) ▪ Australian Human Rights Commission Accessible Bus Stops Guidelines 2010			
Cost information				
Methodology	Reference Pricing			
Benchmark base cost	#	Item/ sub-item	Unit	$/ Unit
	1.23	Bus shelter	each	30,000
Banding	▪ N/A			
Minimum quantity	▪ N/A			



TYPICAL BUS SHELTER ELEVATION VIEW

CODES USED FOR ENGINEERING OF STRUCTURE:

DESIGN
ALUMINIUM STRUCTURES
AS/NZS 1664.1: 1997 PART1: LIMIT STATE DESIGN
AS/NZS 1664.2: 1997 PART2: ALLOWABLE STRESS DESIGN
AS/NZS 1665: 2004 WELDING OF ALUMINIUM STRUCTURES

PAINT
AS4506: 2005 - METAL FINISHING: THERMOSET POWDER COATINGS
AS3715: 2002 - METAL FINISHING: THERMOSET POWDER COATINGS FOR ARCHITECTURAL APPLICATIONS

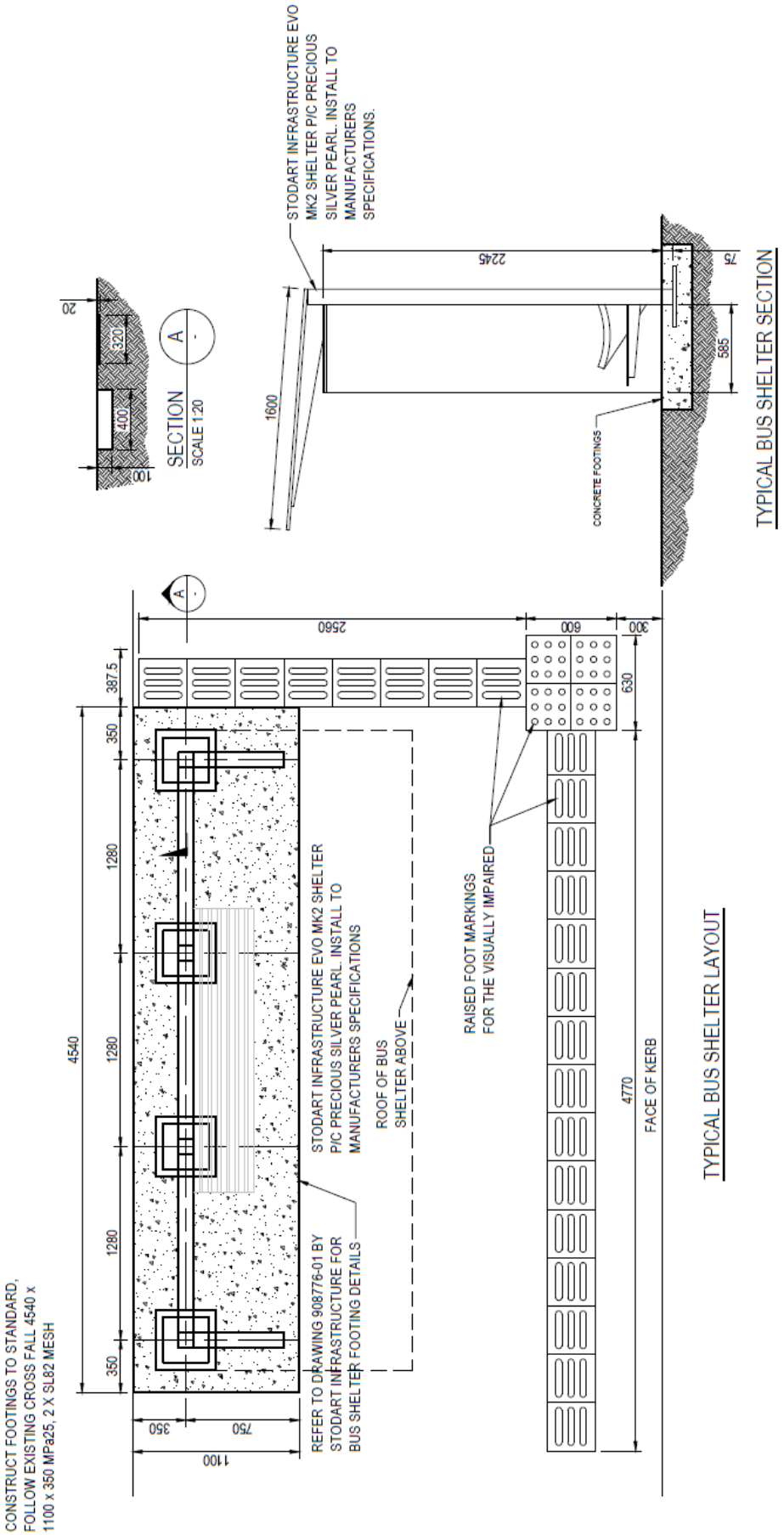
WELDING
AS1665: 2004 - WELDING OF ALUMINIUM STRUCTURES

CONCRETE
AS3600: 2009 - CONCRETE STRUCTURES

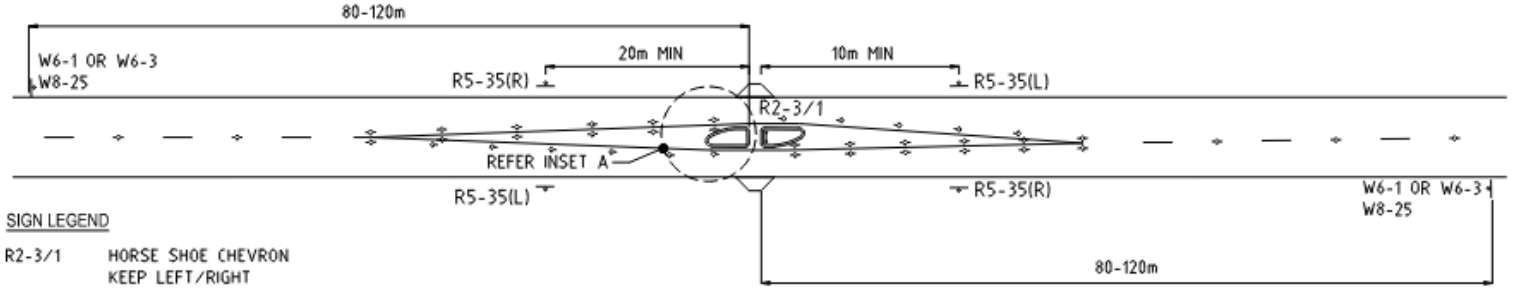
BOLTING
AS/NZS1252: 1996 - HIGHSTRENGTH STEEL BOLTS

GLASS
TO BE TOUGHENED IN ACCORDANCE WITH AS/NZS 2208: 1996 SAFETY GLAZING MATERIALS IN BUILDINGS

DESIGN LOADS
AS/NZS 1170.0: 2002 - STRUCTURAL DESIGN ACTIONS - GENERAL PRINCIPLES
AS/NZS 1170.1: 2002 - STRUCTURAL DESIGN ACTIONS - PERMANENT, IMPOSED, AND OTHER ACTIONS
AS/NZS 1170.2: 2011 - STRUCTURAL DESIGN ACTIONS - WIND ACTIONS


STODART INFRASTRUCTURE EVO MK2 SHELTER P/C PRECIOUS SILVER PEARL. INSTALL TO MANUFACTURERS SPECIFICATIONS.
2245
75
585
1600
CONCRETE FOOTINGS
TYPICAL BUS SHELTER SECTION
20
320
400
100
SECTION A - A
SCALE 1:20
2560
600
300
630
387.5
350
1280
1280
1280
350
4540
STODART INFRASTRUCTURE EVO MK2 SHELTER P/C PRECIOUS SILVER PEARL. INSTALL TO MANUFACTURERS SPECIFICATIONS
ROOF OF BUS SHELTER ABOVE
RAISED FOOT MARKINGS FOR THE VISUALLY IMPAIRED
4770
FACE OF KERB
TYPICAL BUS SHELTER LAYOUT
REFER TO DRAWING 908776-01 BY STODART INFRASTRUCTURE FOR BUS SHELTER FOOTING DETAILS
350
750
1100
CONSTRUCT FOOTINGS TO STANDARD, FOLLOW EXISTING CROSS FALL 4540 x 1100 x 350 MPa25, 2 X SL82 MESH

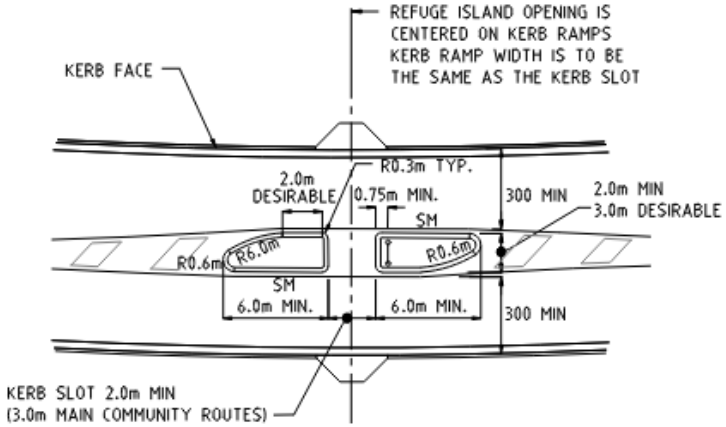
Item Definition				
Item Name	**Pedestrian crossing**			
Item No.	1.25			
Functional Description	Pedestrian crossing spanning 2 lanes (6.5m) including pedestrian refuge (Retrofit)			
Inclusions	▪ Pedestrian laybacks ▪ Surface markings applied at grade ▪ Signage ▪ Pedestrian refuge			
Key scope of work inclusions	▪ Preparations to existing road surface to receive markings ▪ Traffic control allowance based on works performed adjacent to moving traffic (includes installation, modifications and removal of signage and barriers as well as attendance by traffic controllers) ▪ Installation works			
Exclusions (may be reasonably required)	▪ Flat top road hump (separate item - 1.9.1) ▪ *Note: used in conjunction for elevated crossings*			
Exclusions (exceed minimum requirements	▪ N/A			
Key identified risks	▪ N/A			
Sub-item details	▪ N/A			
Specific sub item information	▪ N/A			
Applicable standards	▪ N/A			
Cost information				
Methodology	Reference Pricing			
Benchmark base cost	#	Item/ sub-item	Unit	$/ Unit
	1.25	Pedestrian crossing	each	$13,000
Banding	▪ N/A			
Minimum quantity	▪ N/A			



SIGN LEGEND

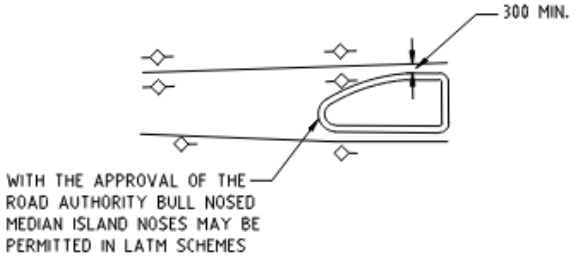
R2-3/1	HORSE SHOE CHEVRON KEEP LEFT/RIGHT
R5-35	NO STOPPING
W6-1	PEDESTRIANS
W6-3	CHILDREN
W8-25	REFUGE ISLAND

REFUGE ISLAND WITH UNRESTRICTED SIGHT DISTANCE



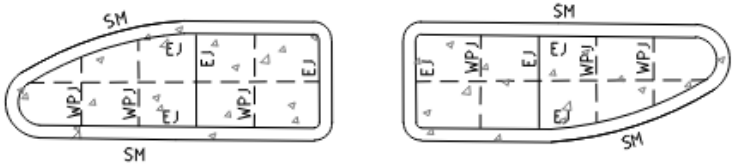
TYPICAL SETOUT PLAN

TAPER LENGTHS	
SPEED km/h	MINIMUM TAPER LENGTH PER METRE OF LATERAL SHIFT
50	14
60	17
70	20
80	23



INSET A

Note: Additional details of pedestrian refuges not requiring road widening or road narrowing can be found in Australian Standard AS1742 and the relevant RTA Supplement.



JOINT PLAN

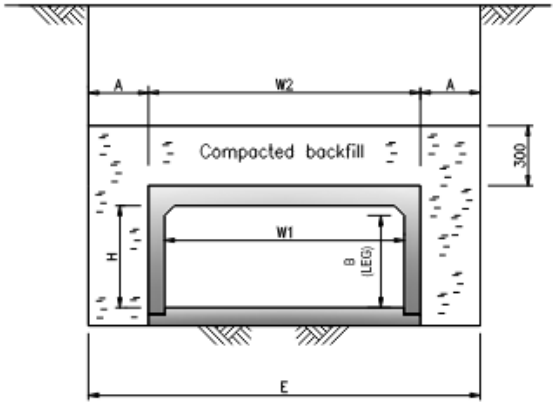
EJ's FOR PEDESTRIAN REFUGE ISLANDS TO BE JOINTEX FILLER BOARD (TYPE CANITE OR EQUIVALENT)

Item Definition				
Item Name	**Street lighting**			
Item No.	1.27			
Functional Description	Street Lighting			
Inclusions	▪ 6.5m Slimline 3m outreach 25W LED (General subdivision street) ▪ Cable pits ▪ Concrete plinth ▪ Control cabinet ▪ Cabling for underground connection ▪ Conduits			
Key scope of work inclusions	▪ Installation			
Exclusions (may be reasonably required)	▪ Substation			
Exclusions (exceed minimum requirements	▪ N/A			
Key identified risks	▪ N/A			
Sub-item details	▪ N/A			
Specific sub item information	▪ N/A			
Applicable standards	▪ AS 1158 Lighting for roads and public places			
Cost information				
Methodology	Reference pricing			
Benchmark base cost	#	Item/ sub-item	Unit	$/ Unit
	1.27	Street Lighting	each	12,600
Banding	▪ N/A			
Minimum quantity	▪ N/A			

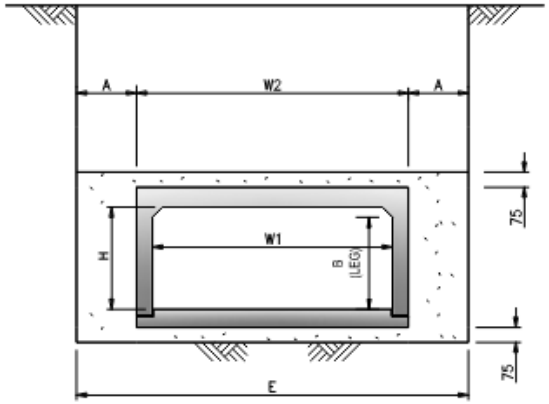
Item Definition		
Item Name	**Culvert**	
Item No.	2.01	
Functional Description	Precast concrete box culverts, single and twin cell	
Inclusions	▪ Precast concrete box culverts for road crossings and detention/retention basin outlet structures ▪ Refer to specific sub item information	
Key scope of work inclusions	▪ Excavation and backfilling but excluding reinstatement of any hard surfacing ▪ Excavation to total depth of culvert plus additional 100mm for bedding material ▪ Imported stabilised fill material ▪ Installation works ▪ Bedding, laying and jointing	
Exclusions (may be reasonably required)	▪ N/A	
Exclusions (exceed minimum requirements	▪ N/A	
Key identified risks	▪ Removal of excess spoil ▪ Waste levy allowances ▪ Excavated material other than VENM ▪ Encountering rock ▪ Dewatering ▪ Stockpile location located further than 500m from site	
Sub-item details	2.01.1	Single Cell; size 300 x 225mm
	2.01.2	Single Cell; size 600 x 450 mm
	2.01.3	Single Cell; size 1500 x 600 mm
	2.01.4	Single Cell; size 2100 x 2100 mm
	2.01.5	Twin Cell; size 300 x 225mm
	2.01.6	Twin Cell; size 600 x 450 mm
	2.01.7	Twin Cell; size 1500 x 600 mm
	2.01.8	Twin Cell; size 2100 x 2100 mm
Specific sub item information	▪ N/A	
Applicable standards	▪ AUS-SPEC NSW Development Design Specification D5 Stormwater Drainage Design ▪ AS1597 'Precast Reinforced Concrete Box Culverts' ▪ Camden Council Engineering Design Specification (adopted 10 February 2009)	
Cost information		
Methodology	▪ Reference Pricing	

Benchmark base cost	#	Item/ sub-item	Unit	$/ Unit
	2.01.1	Single Cell; size 300 x 225mm	m	550
	2.01.2	Single Cell; size 600 x 450 mm	m	1,100
	2.01.3	Single Cell; size 1500 x 600 mm	m	1,900
	2.01.4	Single Cell; size 2100 x 2100 mm	m	4,100
	2.01.5	Twin Cell; size 300 x 225mm	m	950
	2.01.6	Twin Cell; size 600 x 450 mm	m	2,100
	2.01.7	Twin Cell; size 1500 x 600 mm	m	5,100
	2.01.8	Twin Cell; size 2100 x 2100 mm	m	7,500

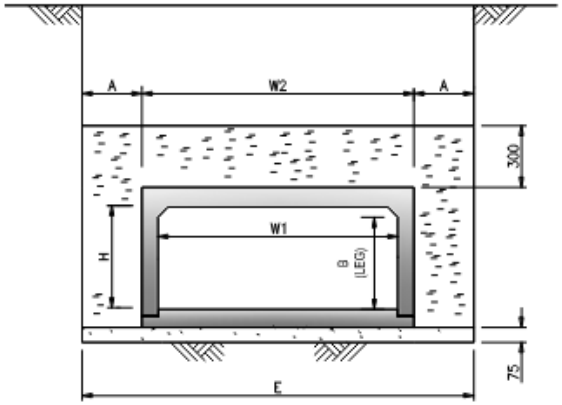
Banding	▪ N/A
Minimum quantity	▪ N/A



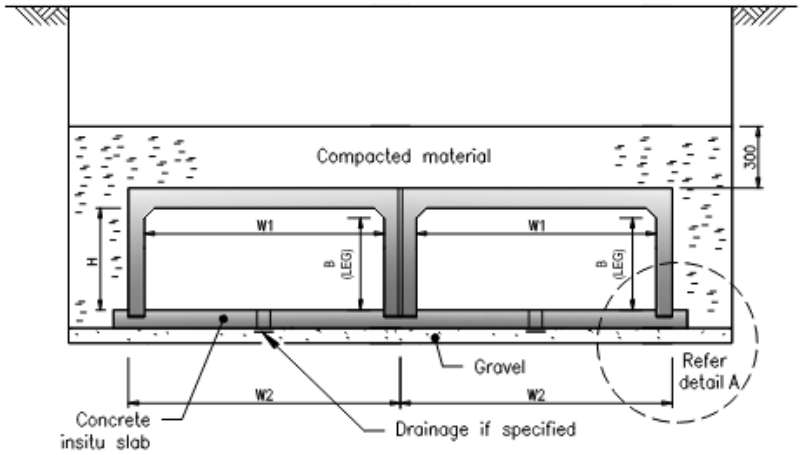
TYPE 1
(NATURAL BEDDING)



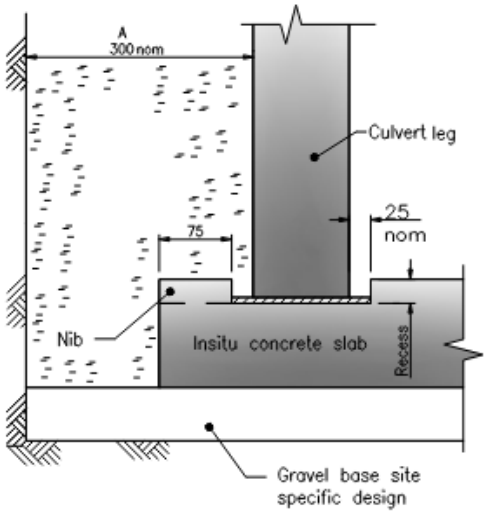
TYPE 2
(SAND SURROUND)



TYPE 3
(SAND BEDDING)



MULTIPLE CULVERTS



TYPICAL DETAIL - A

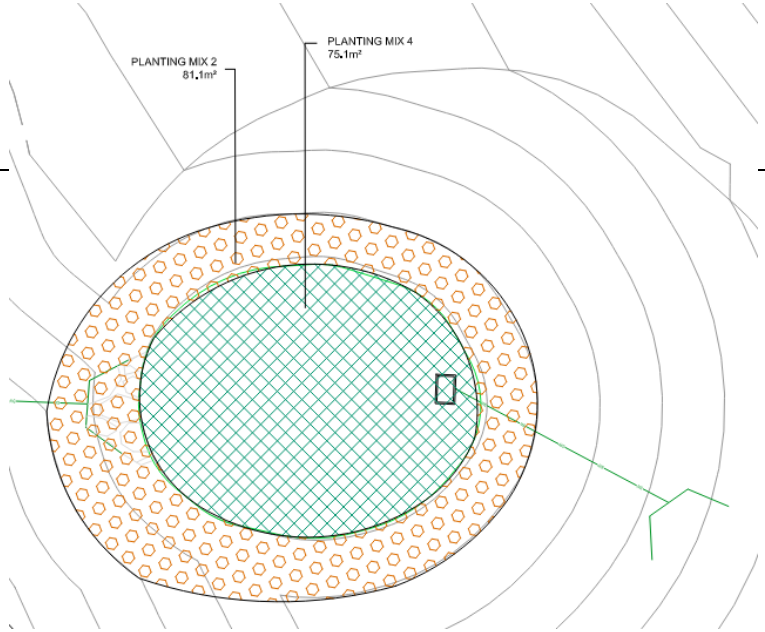
W1	W2	E Nom.
300	420	1000
600	730	1300
1500	1700	2300
2100	2340	3000

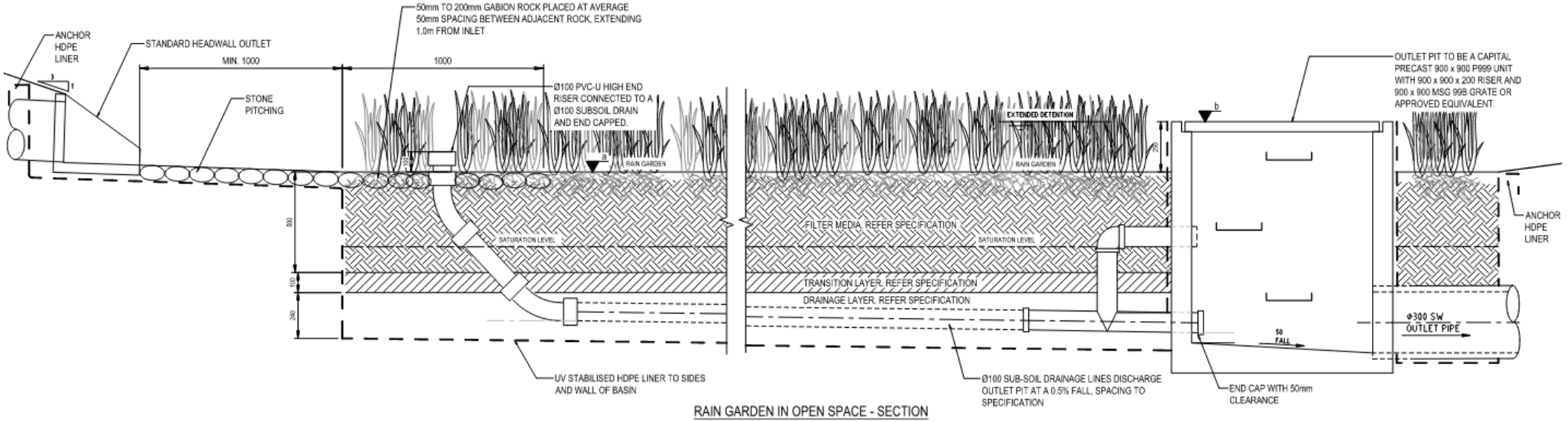
EXCAVATION WIDTH

BOX CULVERTS			
CULVERT SIZE (SPAN X LEG)	DIMENSIONS (mm)		
	W1 (SPAN)	B (LEG)	(LENGTH)
SINGLE CELL - 300 X 225mm	300	225	2440
SINGLE CELL - 600 X 450mm	600	450	2440
SINGLE CELL - 1500 X 600mm	1500	600	2440
SINGLE CELL - 2100 X 2100mm	2100	2100	2440
TWIN CELL - 300 X 225mm	300	225	2440
TWIN CELL - 600 X 450mm	600	450	2440
TWIN CELL - 1500 X 600mm	1500	600	2440
TWIN CELL - 2100 X 2100mm	2100	2100	2440

Item Definition	
Item Name	**Combined basin and raingarden facility**
Item No.	2.02
Functional Description	Secondary and tertiary pollution devices
Inclusions	▪ Excavation and backfilling but excluding reinstatement of any hard surfacing ▪ Imported stabilised fill material ▪ Installation works ▪ Connection into network ▪ UPVC sewer class stormwater drain pipes ▪ HDPE liner ▪ Slotted pipe to underground stormwater drains ▪ Flush out riser standpipe ▪ Planting ▪ Filtration layer ▪ Transition Layer ▪ Drainage Layer
Key scope of work inclusions	▪ Excavation and backfilling ▪ Imported stabilised fill material ▪ Installation works ▪ Connection into network
Exclusions (may be reasonably required)	▪ Maintenance
Exclusions (exceed minimum requirements	▪ N/A
Key identified risks	▪ Removal of excess spoil ▪ Waste levy allowances ▪ Excavated material other than VENM ▪ Encountering rock ▪ Dewatering ▪ Stockpile location located further than 500m from site
Sub-item details	▪ N/A
Specific sub item information	▪ N/A
Applicable standards	▪ Australian Runoff Quality: A Guide to Runoff Quality (Engineers Australia, 2007) ▪ Urban Stormwater - Best Practice Environmental Management Guidelines. Prepared for the Victorian Stormwater Committee (CSIRO, 1999) ▪ Stormwater Treatment Framework and Stormwater Quality Improvement Device Guidelines, Adopted by Port Macquarie Council on 1 September 2003 (WBM, 2003) ▪ Facility for Advancing Water Biofiltration (FAWB) Guidelines ▪ WSUD Technical Guidelines for Western Sydney (URS, 2004) ▪ Structural Stormwater Quality Best Management Practice Cost / Size Relationship Information from the Literature (CRC for Catchment Hydrology, 2005) ▪ Water Sensitive Urban Design Book 1 | Policy (Landcom, 2009)

Cost information				
Methodology	Reference Pricing			
Benchmark base cost	#	Item/ sub-item	Unit	$/ Unit
	2.02	Combined basin and raingarden facility	m^2	$270
Banding	▪ N/A			
Minimum quantity	▪ N/A			

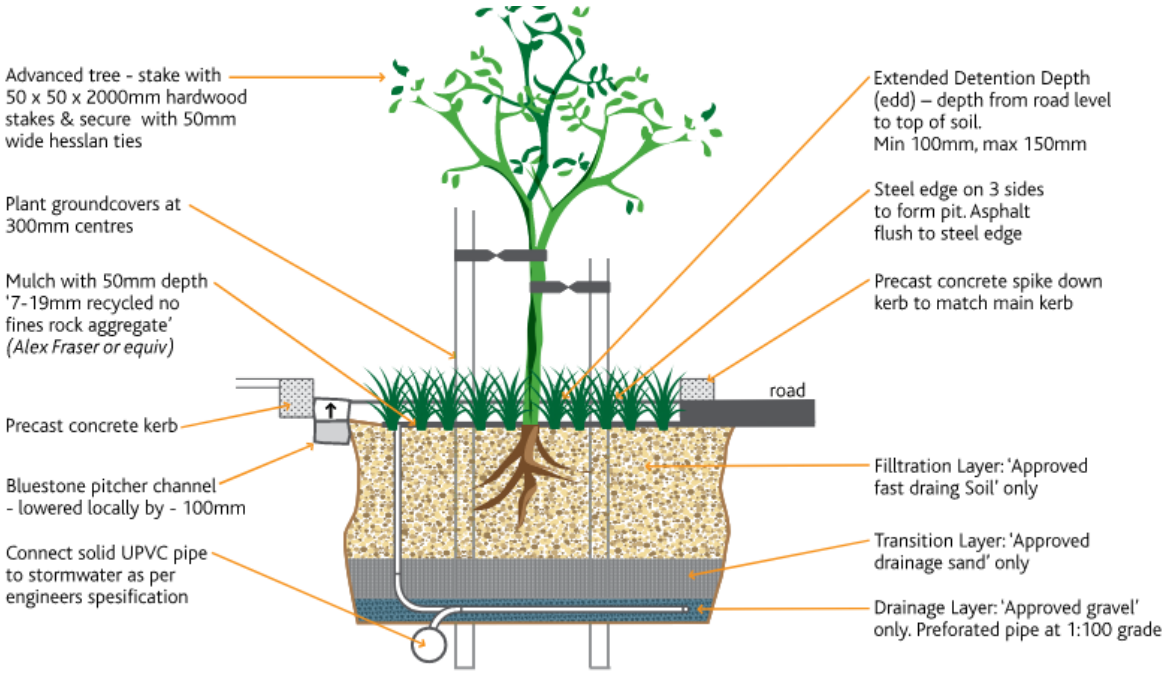


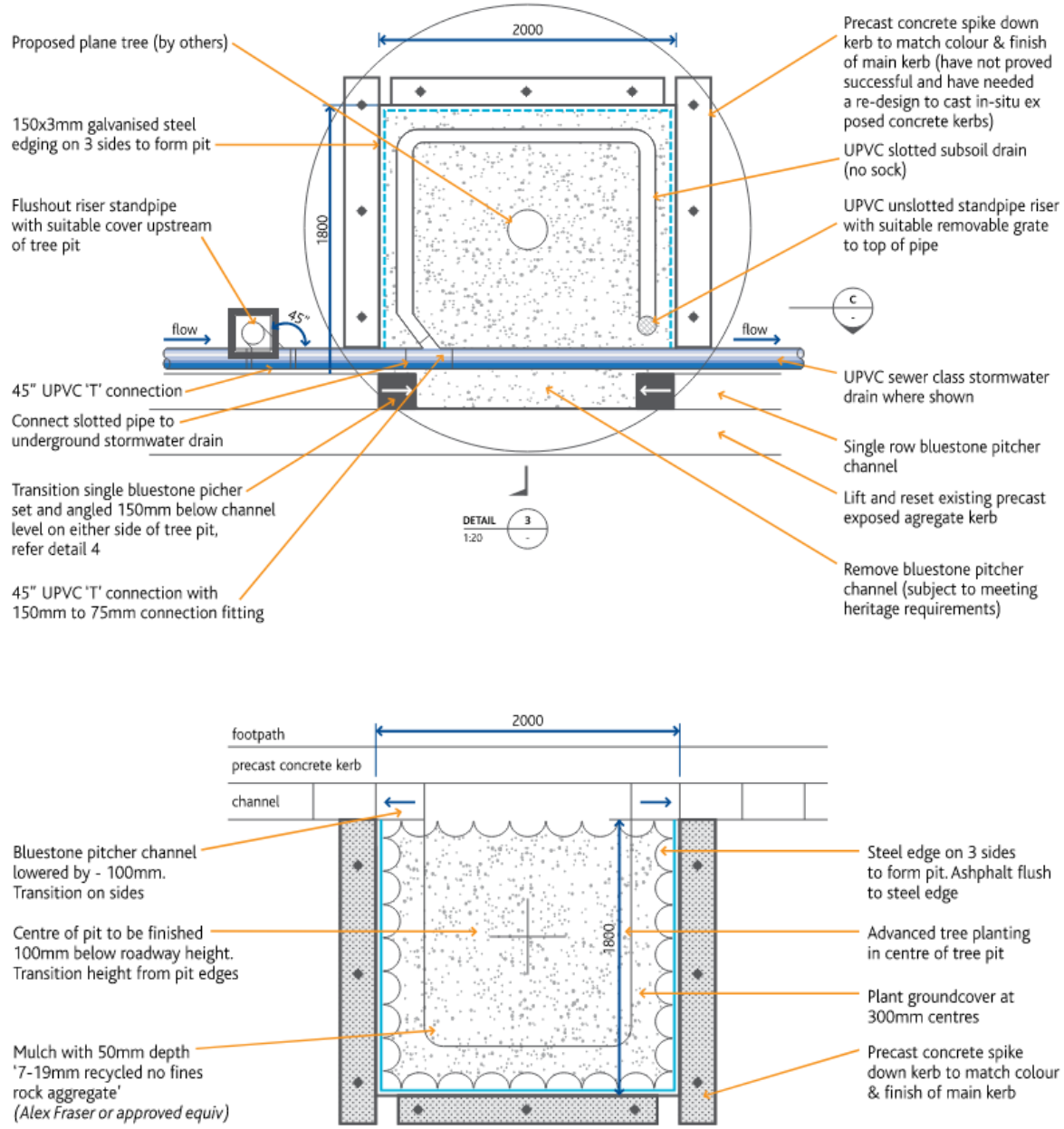


RAIN GARDEN IN OPEN SPACE - SECTION

Item Definition	
Item Name	**Single raingarden facility**
Item No.	2.03
Functional Description	Secondary and tertiary pollution devices
Inclusions	▪ Excavation and backfilling but excluding reinstatement of any hard surfacing ▪ Imported stabilised fill material ▪ Installation works ▪ Connection into network ▪ Advanced tree planting ▪ Precast concrete spike down kerb ▪ UPVC sewer class stormwater drain pipes ▪ Slotted pipe to underground stormwater drains ▪ Flush out riser standpipe ▪ galvanised steel edgings ▪ Filtration layer ▪ Transition Layer ▪ Drainage Layer ▪ Concrete kerb
Key scope of work inclusions	▪ Excavation and backfilling but excluding reinstatement of any hard surfacing ▪ Imported stabilised fill material ▪ Installation works ▪ Connection into network
Exclusions (may be reasonably required)	▪ N/A
Exclusions (exceed minimum requirements	▪ N/A
Key identified risks	▪ Removal of excess spoil ▪ Waste levy allowances ▪ Excavated material other than VENM ▪ Encountering rock ▪ Dewatering ▪ Stockpile location located further than 500m from site
Sub-item details	▪ N/A
Specific sub item information	▪ N/A
Applicable standards	▪ Australian Runoff Quality: A Guide to Runoff Quality (Engineers Australia, 2007) ▪ Urban Stormwater - Best Practice Environmental Management Guidelines. Prepared for the Victorian Stormwater Committee (CSIRO, 1999) ▪ Stormwater Treatment Framework and Stormwater Quality Improvement Device Guidelines, Adopted by Port Macquarie Council on 1 September 2003 (WBM, 2003) ▪ Facility for Advancing Water Biofiltration (FAWB) Guidelines ▪ WSUD Technical Guidelines for Western Sydney (URS, 2004) ▪ Structural Stormwater Quality Best Management Practice Cost / Size Relationship Information from the Literature (CRC for Catchment Hydrology, 2005) ▪ Water Sensitive Urban Design Book 1 | Policy (Landcom, 2009)

Cost information				
Methodology	Reference pricing			
Benchmark base cost	#	Item/ sub-item	Unit	$/ Unit
	2.03	Single raingarden facility	Each	$5,200.00
Banding	▪ N/A			
Minimum quantity	▪ N/A			

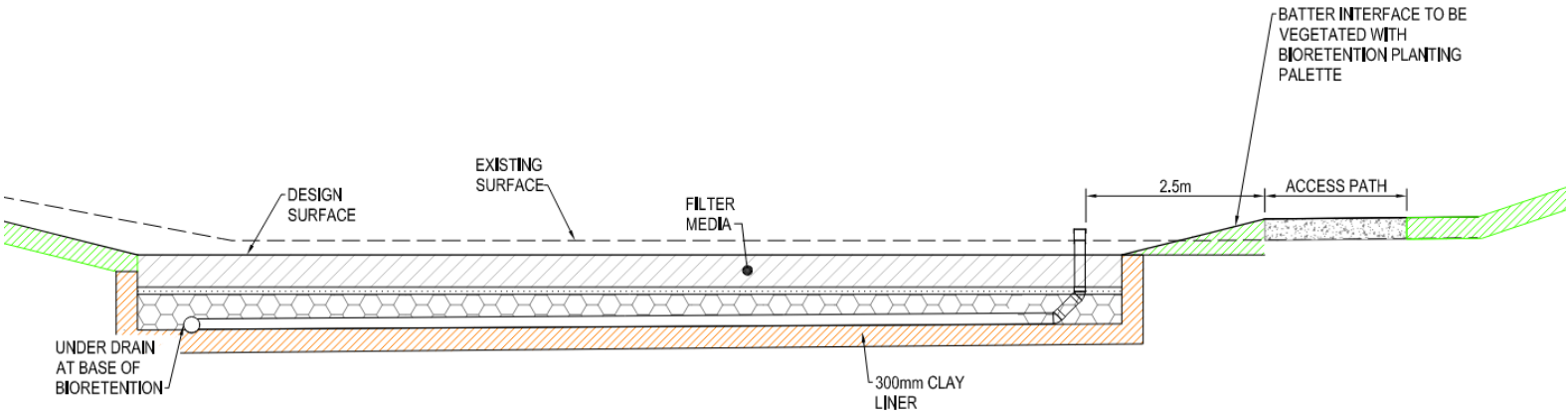




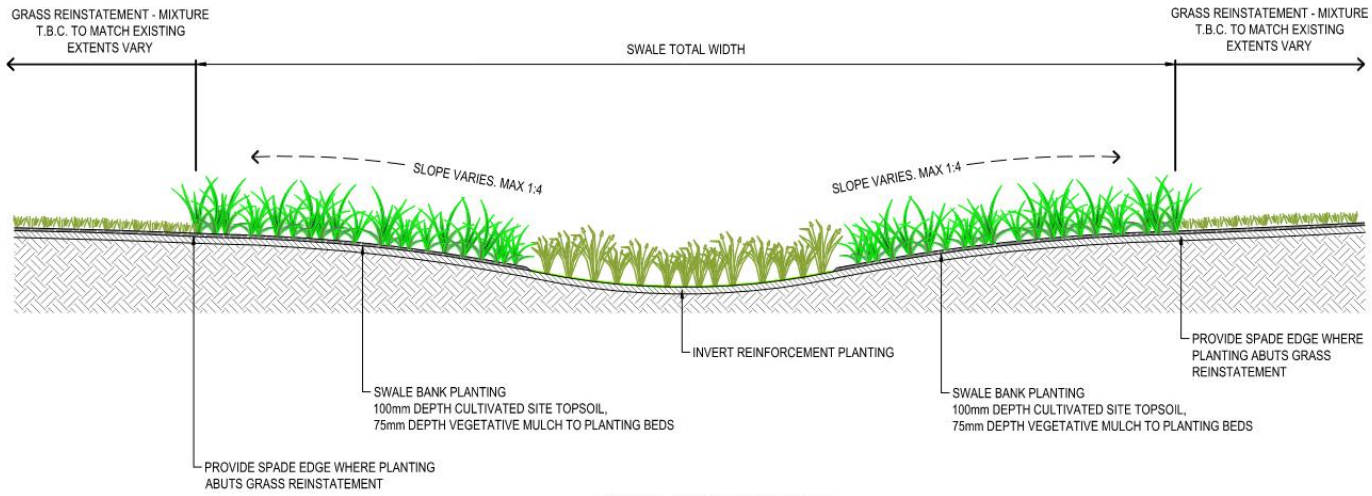
Source : Melbourne Water

Item Definition		
Item Name	**Bio-retention basin**	
Item No.	2.04	
Functional Description	Secondary and tertiary pollution devices	
Inclusions	▪ Refer to specific sub item information	
Key scope of work inclusions	▪ Excavation and backfilling but excluding reinstatement of any hard surfacing ▪ Excavation to total depth of culvert plus additional 100mm for bedding material ▪ Imported stabilised fill material ▪ Installation works ▪ Bedding, laying and jointing	
Exclusions (may be reasonably required)	▪ Forebay area (for basin) ▪ Access driveways and paths for maintenance ▪ Rock riprap for overflow	
Exclusions (exceed minimum requirements	▪ N/A	
Key identified risks	▪ Removal of excess spoil ▪ Waste levy allowances ▪ Excavated material other than VENM ▪ Encountering rock ▪ Dewatering ▪ Stockpile location located further than 500m from site	
Sub Items details	2.04.1	Grassed swale 1.5m total width
	2.04.2	Grassed swale 3.0m total width
	2.04.3	Grassed swale 5.0m total width
	2.04.4	Bio retention trench
	2.04.5	Bio retention basin
Specific sub item information	▪ <u>Sub items 2.04.1 - 2.04.3 - Grassed swale</u> ▪ Maximum flow velocity adopted for grass swales is 2.0 m/s (1% AEP* flows) (where AEP = Annual Exceedance Probability) ▪ Minimum flow velocity adopted for grass swales is 0.6 m/s (100% AEP flows) ▪ Maximum batter slope adopted for grassed swales is 1(V):4(H) ▪ Planting (of grass and/or small native plants) ▪ Transition filter (100mm to 200m depending on size), gravel, geo-fabric liner in central channel ▪ <u>Sub item 2.04.4 - Bio retention trench</u> ▪ Bio retention trench 3 m wide (W) by 1 m nominal depth (H) ▪ Geo-fabric liner ▪ Underdrainage pipe (100 mm diameter) ▪ Gravel drainage layer ▪ Filter media ▪ Sand ▪ Topsoil and vegetation cover	
Applicable standards	▪ Australian Runoff Quality: A Guide to Runoff Quality (Engineers Australia, 2007) ▪ Water Sensitive Urban Design Book 1 | Policy (Landcom, 2009)	

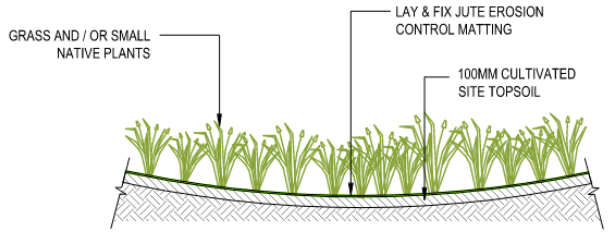
Cost information				
Methodology	▪ Reference pricing			
Benchmark base cost	#	Item/ sub-item	Unit	$/ Unit
	2.04.1	Grassed swale 1.5m total width	m	$130
	2.-04.2	Grassed swale 3.0m total width	m	$250
	2.04.3	Grassed swale 5.0m total width	m	$330
	2.04.4	Bio retention trench	m	$580
	2.04.5	Bio retention basin	m^2	$220
Banding	▪ N/A			
Minimum quantity	▪ N/A			



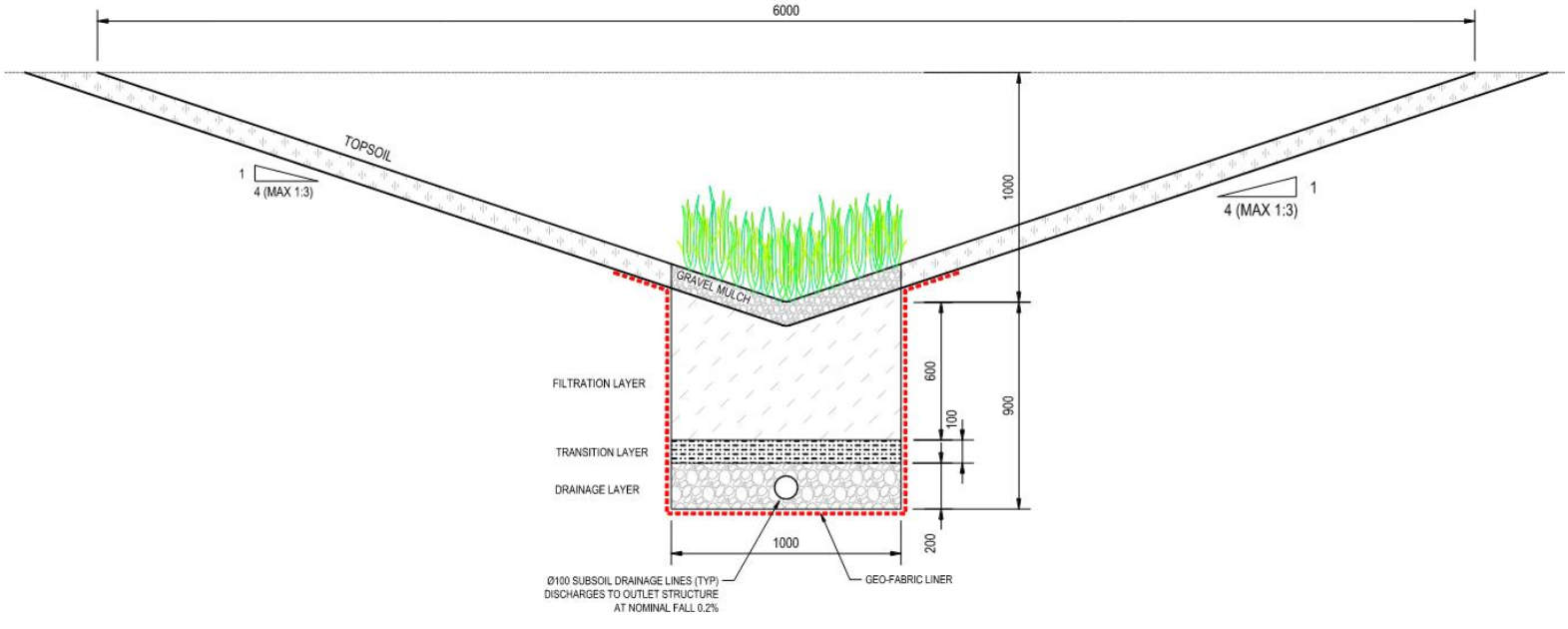
BIORETENTION BASIN DETAIL



TYPICAL SWALE TREATMENT



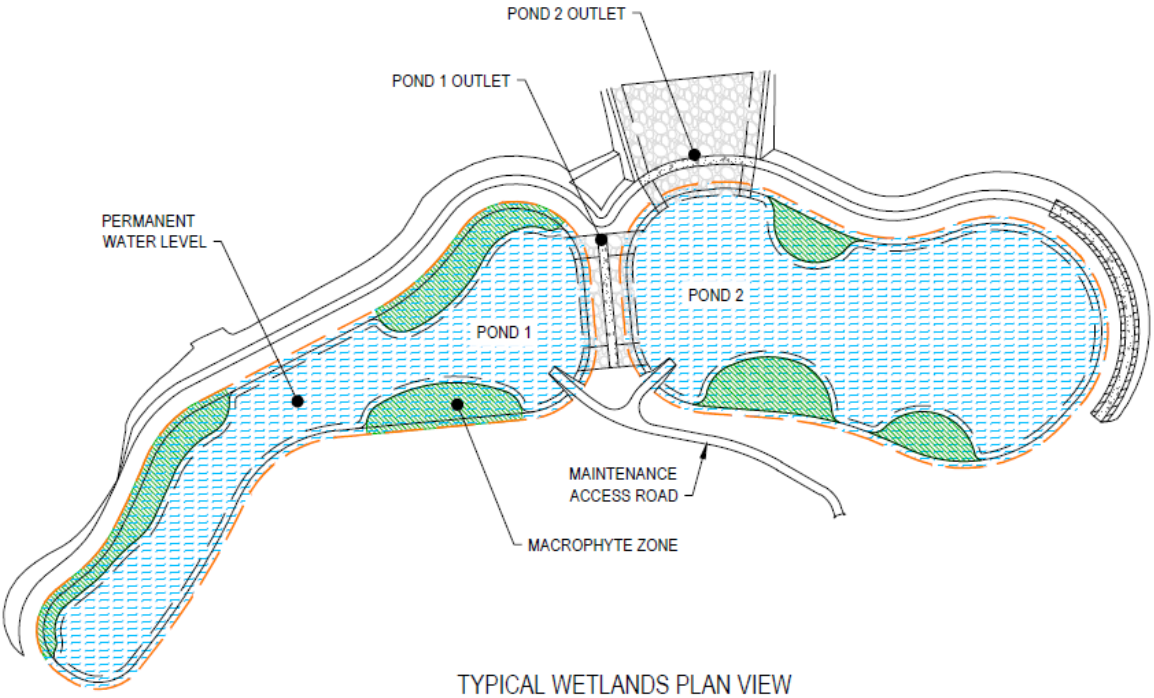
INVERT REINFORCEMENT PLANTING



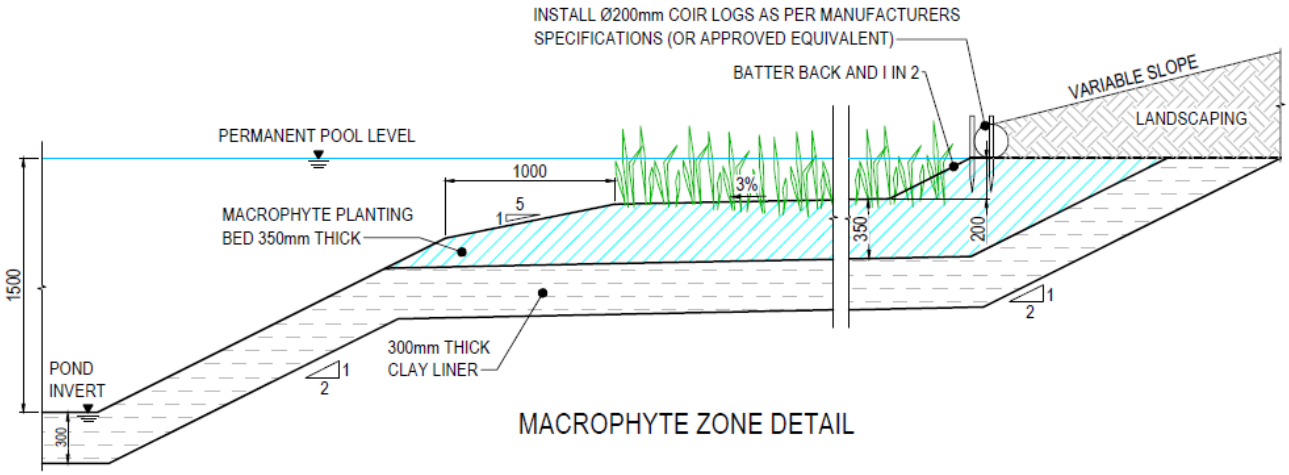
TYPICAL BIO RETENTION TRENCH

Item Definition				
Item Name	**Bio-retention filter**			
Item No.	2.05			
Functional Description	Filter media maintenance			
Inclusions	▪ Remove and replace existing filter media on a bioretention system ▪ Protection of transition layer ▪ Protection of HDPE or clay liner ▪ Protection of drainage structures			
Key scope of work inclusions	▪ Excavation and backfilling but excluding reinstatement of any hard surfacing ▪ Imported stabilised filter media material to specifications (450mm) ▪ Installation works ▪ Connection into network			
Exclusions (may be reasonably required)	▪ N/A			
Exclusions (exceed minimum requirements	▪ Replacement of transition layer ▪ Replacement of HDPE/clay liner			
Key identified risks	▪ Removal of excess spoil ▪ Waste levy allowances ▪ Excavated material other than VENM ▪ Encountering rock ▪ Dewatering ▪ Stockpile location located further than 500m from site			
Sub-item details	▪ N/A			
Specific sub item information	▪ N/A			
Applicable standards	▪ Australian Runoff Quality: A Guide to Runoff Quality (Engineers Australia, 2007) ▪ Water Sensitive Urban Design Book 1 | Policy (Landcom, 2009)			
Cost information				
Methodology	Reference pricing			
Benchmark base cost	#	Item/ sub-item	Unit	$/ Unit
	2.05	Replacement of filter media (450mm)	m^2	65
Banding	▪ N/A			
Minimum quantity	▪ N/A			

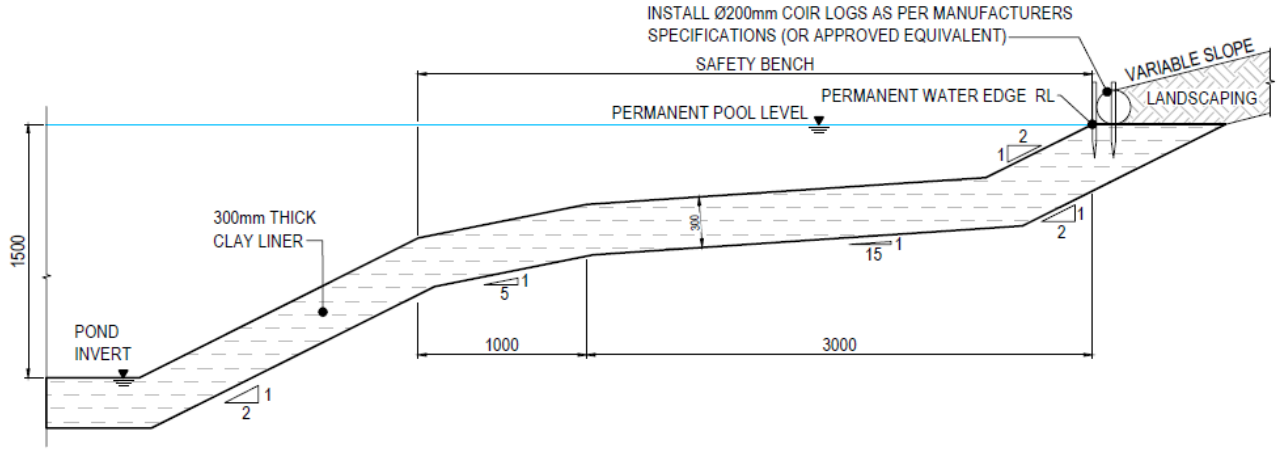
Item Definition	
Item Name	**Wetland basin (Ephemeral)**
Item No.	2.08
Functional Description	Secondary and tertiary pollution devices
Inclusions	▪ Excavation and backfilling but excluding reinstatement of any hard surfacing ▪ Excavation to total depth of wetlands plus additional 300mm for clay liner ▪ Imported stabilised fill material ▪ Macrophyte planting bed 350mm thick ▪ 300mm thick clay liner
Key scope of work inclusions	▪ Excavation and backfilling but excluding reinstatement of any hard surfacing ▪ Imported stabilised fill material ▪ Installation works ▪ Connection into network ▪ Planting ▪ Inlet/Outlet structures
Exclusions (may be reasonably required)	▪ Maintenance access road
Exclusions (exceed minimum requirements	▪ N/A
Key identified risks	▪ Removal of excess spoil ▪ Waste levy allowances ▪ Excavated material other than VENM ▪ Encountering rock ▪ Dewatering ▪ Stockpile location located further than 500m from site
Sub-item details	▪ N/A
Specific sub item information	▪ N/A
Applicable standards	▪ Australian Runoff Quality: A Guide to Runoff Quality (Engineers Australia, 2007) ▪ WSUD Technical Guidelines for Western Sydney (URS, 2004) ▪ Water Sensitive Urban Design Book 1 | Policy (Landcom, 2009)
Cost information	
Methodology	Reference pricing
Benchmark base cost	# / Item/ sub-item / Unit / $/ Unit 2.08 / Wetland basin / M2 / 130
Banding	▪ N/A
Minimum quantity	▪ N/A



TYPICAL WETLANDS PLAN VIEW

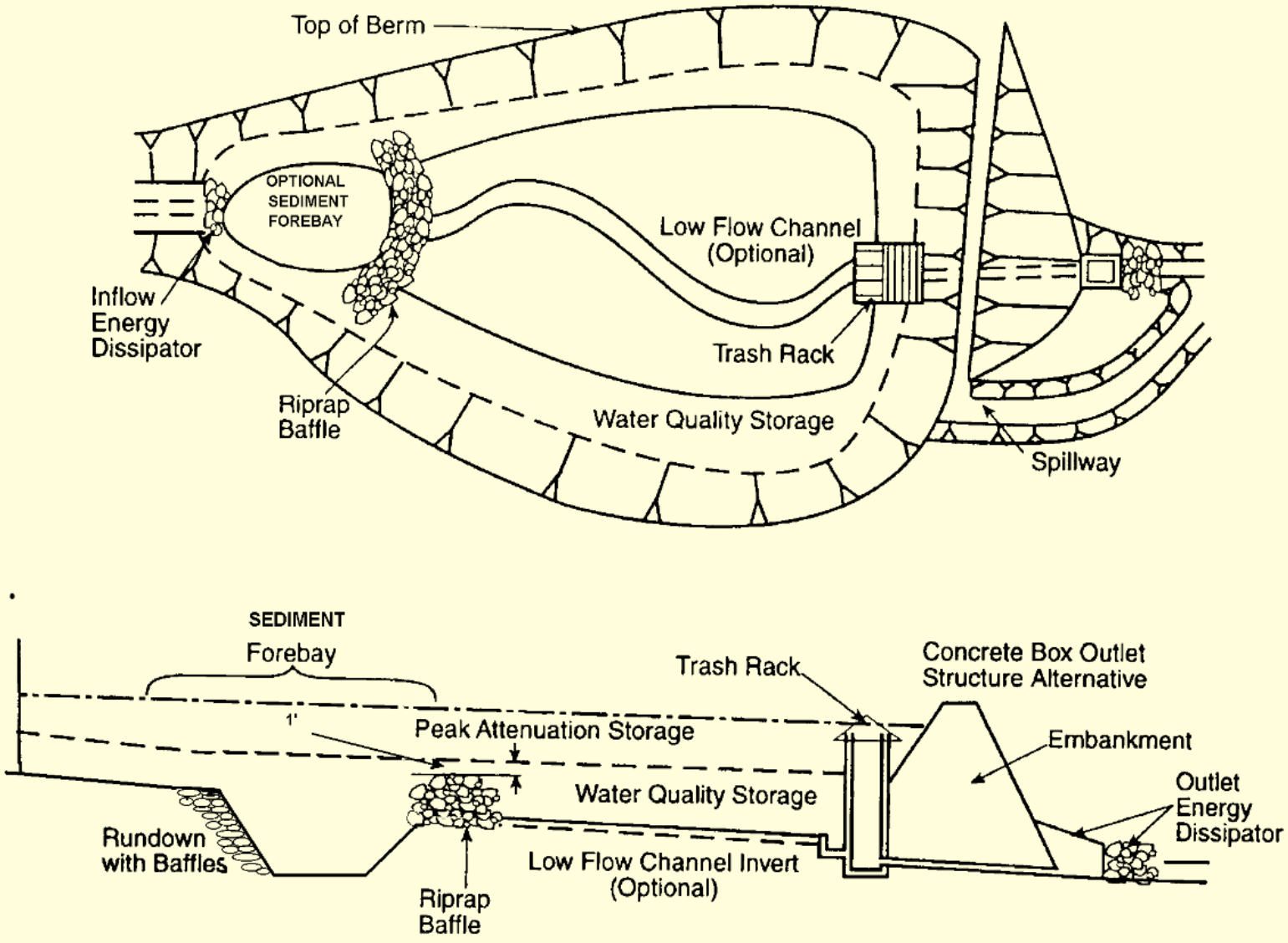


MACROPHYTE ZONE DETAIL



SAFETY BENCH DETAIL

Item Definition				
Item Name	**Detention basin / Enhanced Storage Area**			
Item No.	2.10			
Functional Description	Permanent detention basin (350 m^2 footprint 1m depth) Enhanced Storage Area (100 m^2 footprint 1m depth)			
Inclusions	▪ Excavation and backfilling ▪ Imported stabilised fill material ▪ Installation works ▪ Connection into network ▪ UPVC sewer class stormwater drain pipes ▪ HDPE liner ▪ Slotted pipe to underground stormwater drains ▪ Flush out riser standpipe ▪ Planting ▪ Trash rack ▪ Emergency spillway (weir) ▪ Inflow energy dissipator			
Key scope of work inclusions	▪ Excavation and backfilling ▪ Clay liner ▪ Imported stabilised fill material ▪ Installation works ▪ Connection into network			
Exclusions (may be reasonably required)	▪ Riprap baffle ▪ Sediment forebay ▪ Disposal of excess material ▪ Stormwater drainage structures other than overflow/trash rack			
Exclusions (exceed minimum requirements	▪ Bio retention layers			
Key identified risks	▪ Removal of excess spoil ▪ Waste levy allowances ▪ Excavated material other than VENM ▪ Encountering rock ▪ Dewatering ▪ Stockpile location located further than 500m from site			
Sub-item details	Sub Item 2.10.1 - Detention Basin Sub Item 2.10.2 – Enhanced Storage Area			
Specific sub item information	▪ N/A			
Applicable standards	▪ Australian Runoff Quality: A Guide to Runoff Quality (Engineers Australia, 2007) ▪ Water Sensitive Urban Design Book 1 | Policy (Landcom, 2009)			
Cost information				
Methodology	First principles			
Benchmark base cost	#	Item/ sub-item	Unit	$/ Unit
	2.10.1	Permanent detention basin (350 m^2 footprint 1m depth)	M2	200
	2.10.2	Enhanced Storage Area (100 m^2 footprint 1m depth)	M2	280
Banding	▪ N/A			
Minimum quantity	▪ N/A			



Source : New Jersey Stormwater Best Management Practices Manual (Feb 2004)

Item Definition		
Item Name	**Gross pollutant trap**	
Item No.	2.11	
Functional Description	Primary pollution devices including proprietary devices	
Inclusions	▪ As per manufacturers specifications	
Key scope of work inclusions	▪ Excavation and backfilling but excluding reinstatement of any hard surfacing ▪ Imported stabilised fill material ▪ Installation works ▪ Connection into network	
Exclusions (may be reasonably required)	▪ N/A	
Exclusions (exceed minimum requirements	▪ N/A	
Key identified risks	▪ Removal of excess spoil ▪ Waste levy allowances ▪ Excavated material other than VENM ▪ Encountering rock ▪ Dewatering ▪ Stockpile location located further than 500m from site	
Sub-item details	2.11.1	Proprietary GPT system – outlet size 450mm diameter
	2.11.2	Proprietary GPT system – outlet size 750mm diameter
	2.11.3	Proprietary GPT system - -outlet size 1200mm diameter
Specific sub item information	▪ Sub items 2.11.1 - 2.11.3 - Proprietary GPT system ▪ Gross Pollutant Trap, proprietary system based on industry standard	
Applicable standards	▪ Australian Runoff Quality: A Guide to Runoff Quality (Engineers Australia, 2007) ▪ WSUD Technical Guidelines for Western Sydney (URS, 2004) ▪ Water Sensitive Urban Design Book 1 | Policy (Landcom, 2009)	
Cost information		
Methodology	▪ Reference pricing	

Benchmark base cost

#	Item/ sub-item	Unit	$/ Unit
2.11.1	Proprietary GPT system - outlet size 450mm diameter	each	35,000
2.11.2	Proprietary GPT system - outlet size 750mm diameter	each	65,000
2.11.3	Proprietary GPT system - outlet size 1200mm diameter	each	150,000

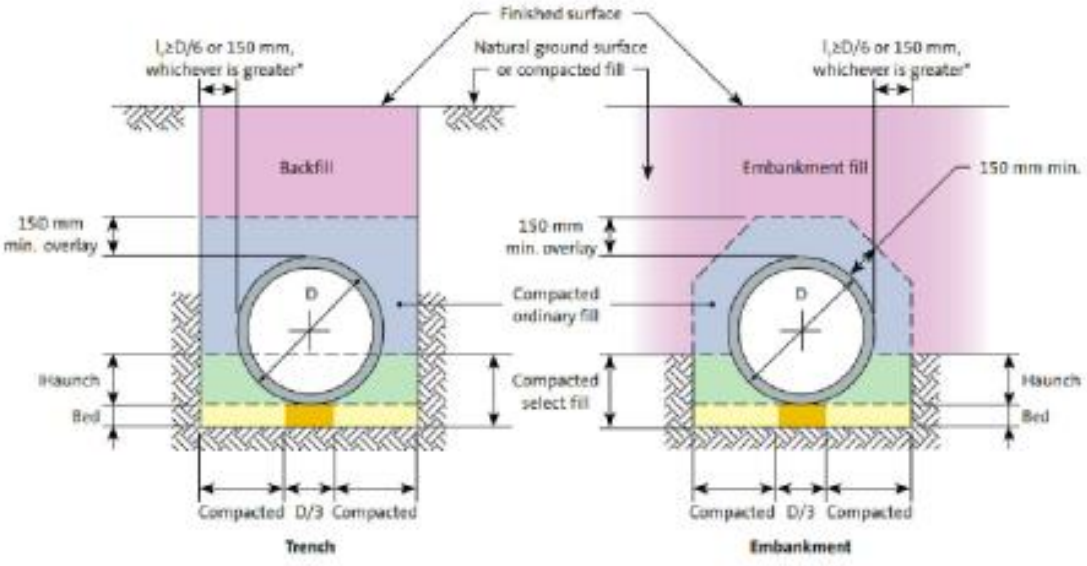
Banding	▪ N/A
Minimum quantity	▪ N/A

Item Definition		
Item Name	**Stormwater pipe**	
Item No.	2.13	
Functional Description	Reinforced concrete pipes	
Inclusions	▪ N/A	
Key scope of work inclusions	▪ Reinforced Concrete Pipe (RCP) Class 2 ▪ Bedding materials ▪ Type H1 support ▪ Type 1 backfill material ▪ Pipe depths are based on – 1.5m deep for pipes < 600mm, – 1.9m deep for pipes between 600 & 900mm ▪ 2.5m deep for pipes between 900mm and 1.5m	
Exclusions (may be reasonably required)	▪ N/A	
Exclusions (exceed minimum requirements	▪ N/A	
Key identified risks	▪ Removal of excess spoil ▪ Waste levy allowances ▪ Excavated material other than VENM ▪ Encountering rock ▪ Dewatering ▪ Stockpile location located further than 500m from site	
Sub-item details	2.13.1	375mm RCP
	2.13.2	450mm RCP
	2.13.3	600mm RCP
	2.13.4	750mm RCP
	2.13.5	900mm RCP
	2.13.6	1350mm RCP
	2.13.7	1500mm RCP
Specific sub item information	▪ N/A	
Applicable standards	▪ AUS-SPEC NSW Development Design Specification D5 Stormwater Drainage Design ▪ AS 4058 'Precast Reinforced Concrete Pipes' ▪ AS 3725 'Loads on Buried Concrete Pipes' ▪ Camden Council Engineering Construction Specification (Feb 2009) ▪ Camden Council Engineering Design Specification (Feb 2009)	
Cost information		
Methodology	▪ Reference Pricing	

Benchmark base cost	#	Item/ sub-item	Unit	$/ Unit
	2.13.1	375mm RCP	m	180
	2.13.2	450mm RCP	m	200
	2.13.3	600mm RCP	m	250
	2.13.4	750mm RCP	m	350
	2.13.5	900mm RCP	m	450
	2.13.6	1350mm RCP	m	750
	2.13.7	1500mm RCP	m	950

Banding	▪ N/A
Minimum quantity	▪ N/A

Figure 1.2 – Type H1 and type H2 supports



TYPICAL BACKFILL/TRENCHING DETAILS

Table 1.1 – Material quantities - H1 and HS1 support types

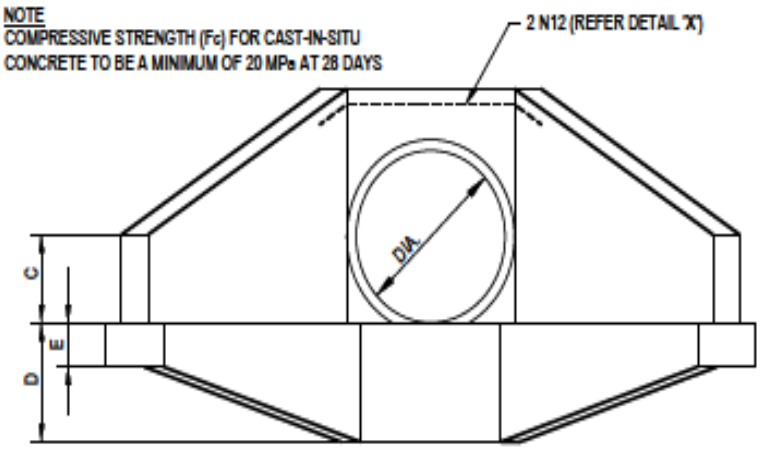
Size class (DN)	Min trench width (m)	Material quantities (m³/lin.m)						
		Bedding zone	Haunch zone	H1 Overlay zone		HS1 side zone	HS1 Overlay zone	
				Trench	Embank		Trench	Embank
225	600	0.066	0.015	0.201	0.161	0.044	0.157	0.117
300	650	0.072	0.020	0.234	0.197	0.053	0.181	0.144
375	750	0.083	0.028	0.292	0.237	0.070	0.222	0.167
450	850	0.094	0.037	0.356	0.281	0.089	0.267	0.192
525	900	0.099	0.044	0.386	0.316	0.097	0.289	0.219
600	1,000	0.110	0.055	0.457	0.362	0.118	0.338	0.243
675	1,100	0.121	0.067	0.532	0.408	0.142	0.390	0.267
750	1,150	0.127	0.076	0.562	0.444	0.148	0.414	0.296
825	1,250	0.138	0.090	0.644	0.503	0.174	0.470	0.329
900	1,400	0.154	0.112	0.786	0.594	0.221	0.564	0.372
1,050	1,650	0.182	0.155	1.046	0.771	0.309	0.736	0.461
1,200	1,850	0.204	0.195	1.276	0.935	0.388	0.888	0.547
1,350	2,050	0.338	0.239	1.528	1.080	0.475	1.053	0.605
1,500	2,300	0.380	0.302	1.875	1.296	0.597	1.278	0.699

Item Definition		
Item Name	**Stormwater headwalls**	
Item No.	2.14	
Functional Description	Primary pollution devices including proprietary devices	
Inclusions	▪ Precast stormwater headwalls ▪ Erosion protection at headwall outlet (extra over - sub item 2.7.7)	
Key scope of work inclusions	▪ Excavation works (refer to specific sub items) ▪ Installation works	
Exclusions (may be reasonably required)	▪ N/A	
Exclusions (exceed minimum requirements	▪ N/A	
Key identified risks	▪ Removal of excess spoil ▪ Waste levy allowances ▪ Excavated material other than VENM ▪ Encountering rock ▪ Dewatering ▪ Stockpile location located further than 500m from site	
Sub-item details	2.14.1	Headwalls to suit 375mm pipe
	2.14.2	Headwalls to suit 525mm pipe
	2.14.3	Headwalls to suit 750mm pipe
	2.14.4	Headwalls to suit 900mm pipe
	2.14.5	Headwalls to suit 1200mm pipe
	2.14.6	Headwalls to suit 1350mm pipe
Specific sub item information	▪ <u>Sub item 2.14.1 to 2.14.6 - Headwalls</u> – Excavation (minimal) and backfilling (minimal) but excluding reinstatement of any hard surfacing – Imported stabilised fill material – Connection into network	
Applicable standards	▪ AUS-SPEC NSW Development Design Specification D5 Stormwater Drainage Design ▪ Camden Council Engineering Construction Specification (Feb 2009) ▪ Camden Council Engineering Design Specification (Feb 2009)	
Cost information		
Methodology	▪ Reference Pricing	

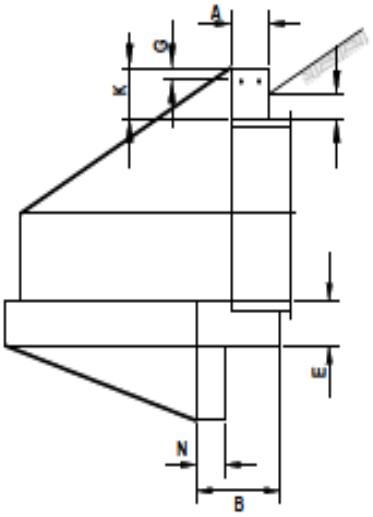
Benchmark base cost

#	Item/ sub-item	Unit	$/ Unit
2.14.1	Headwalls to suit 375mm pipe	each	675
2.14.2	Headwalls to suit 525mm pipe	each	975
2.14.3	Headwalls to suit 750mm pipe	each	1,720
2.14.4	Headwalls to suit 900mm pipe	each	2,000
2.14.5	Headwalls to suit 1200mm pipe	each	3,650
2.14.6	Headwalls to suit 1350mm pipe	each	4,675

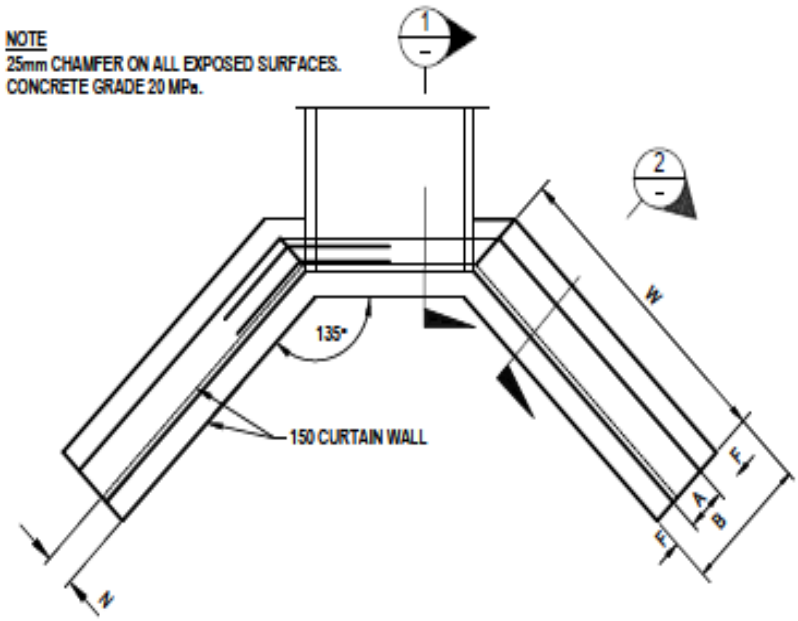
Banding	▪ N/A
Minimum quantity	▪ N/A



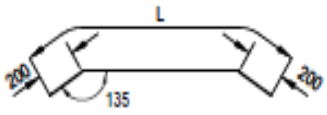
ELEVATION



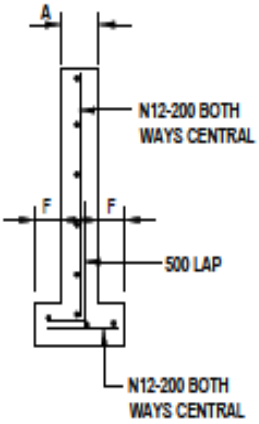
SECTION 1



HEADWALL



DETAIL 'X'

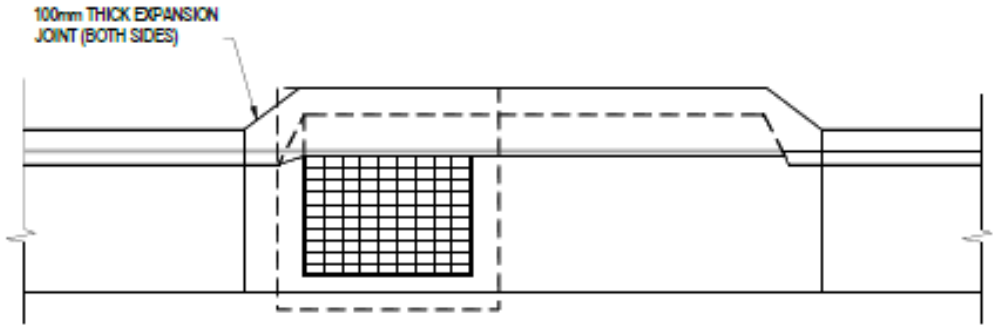


SECTION 2

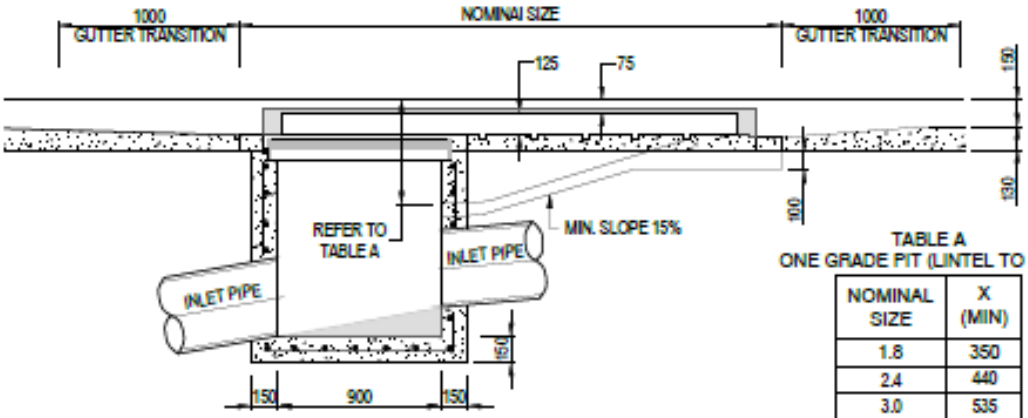
HEADWALL TYPE "A" & "B"

PIPE DIAMETER	300	375	450	525	600	675	750	825	900
A	150	150	150	175	175	175	200	200	225
B	300	300	300	450	450	450	600	600	600
C	300	300	300	300	350	350	350	350	350
D	375	375	375	375	530	530	530	530	530
E	150	150	150	150	175	175	200	200	225
F	75	75	75	138	100	100	200	200	188
G	40	40	40	40	50	50	50	50	50
H	70	70	70	70	75	75	100	100	125
J	100	100	100	100	100	100	100	100	100
K	200	200	200	200	300	300	300	30	300
N	150	150	150	150	150	150	150	150	150
W	700	700	850	1000	1100	1300	1450	1600	1750
L	800	850	950	1000	1100	1200	1250	1350	1400
M	1800	1900	2100	2200	2400	2100	2700	2900	3000
REINFORCEMENT DIAMETER	12	12	12	12	12	12	12	12	12
REINFORCEMENT LENGTH (mm)	1600	1700	1900	2000	2200	2400	2500	2700	2800

Item Definition				
Item Name	**Stormwater pit**			
Item No.	2.15			
Functional Description	Precast reinforced concrete gully pit including heavy duty grates			
Inclusions	▪ Precast gully pits type SA1 (trafficable) ▪ Pits to suit pipes up to 600mm in size assumed to be 2.0m in depth ▪ Pits to suit pipes above 600mm in size assumed to be 2.5m in depth ▪ Bedding materials ▪ Type 1 backfill material ▪ Galvanised frame ▪ Heavy duty grates			
Key scope of work inclusions	▪ Excavation (minimal) and backfilling (minimal) but excluding reinstatement of any hard surfacing ▪ Imported stabilised fill material ▪ Installation works ▪ Connection into network ▪ 1.8m lintel kerb inlet, up to 2m in depth			
Exclusions (may be reasonably required)	▪ N/A			
Exclusions (exceed minimum requirements	▪ N/A			
Key identified risks	▪ Removal of excess spoil ▪ Waste levy allowances ▪ Excavated material other than VENM ▪ Encountering rock ▪ Dewatering ▪ Stockpile location located further than 500m from site			
Sub-item details	2.15.1	Precast pit to suit 375mm pipe		
	2.15.2	Precast pit to suit 450mm pipe		
	2.15.3	Precast pit to suit 600mm pipe		
	2.15.4	Precast pit to suit 900mm pipe		
	2.15.5	Precast pit to suit 1050mm pipe		
	2.15.6	Precast pit to suit 1200mm pipe		
Specific sub item information	▪ N/A			
Applicable standards	▪ AUS-SPEC NSW Development Design Specification D5 Stormwater Drainage Design			
Cost information				
Methodology	Reference pricing			
Benchmark base cost	#	Item/ sub-item	Unit	$/ Unit
	2.15.1	Precast pit to suit 375mm pipe	each	3,500
	2.15.2	Precast pit to suit 450mm pipe	each	3,500
	2.15.3	Precast pit to suit 600mm pipe	each	3,850
	2.15.4	Precast pit to suit 900mm pipe	each	4,800
	2.15.5	Precast pit to suit 1050mm pipe	each	5,800
	2.15.6	Precast pit to suit 1200mm pipe	each	6,800
Banding	▪ N/A			
Minimum quantity	▪ N/A			



PIT (TYPICAL)
NTS



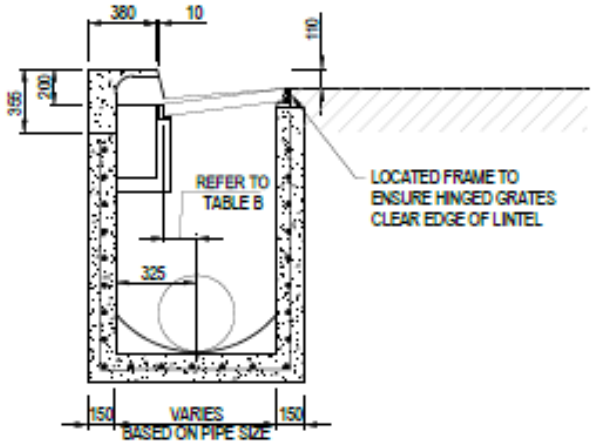
PIT ELEVATION (TYPICAL)
NTS

TABLE A
ONE GRADE PIT (LINTEL TO SIDE)

NOMINAL SIZE	X (MIN)
1.8	350
2.4	440
3.0	535
3.6	625

ONE GRADE PIT (LINTEL TO CENTRE)

NOMINAL SIZE	X (MIN)
1.8	270
2.4	315
3.0	360
3.6	405

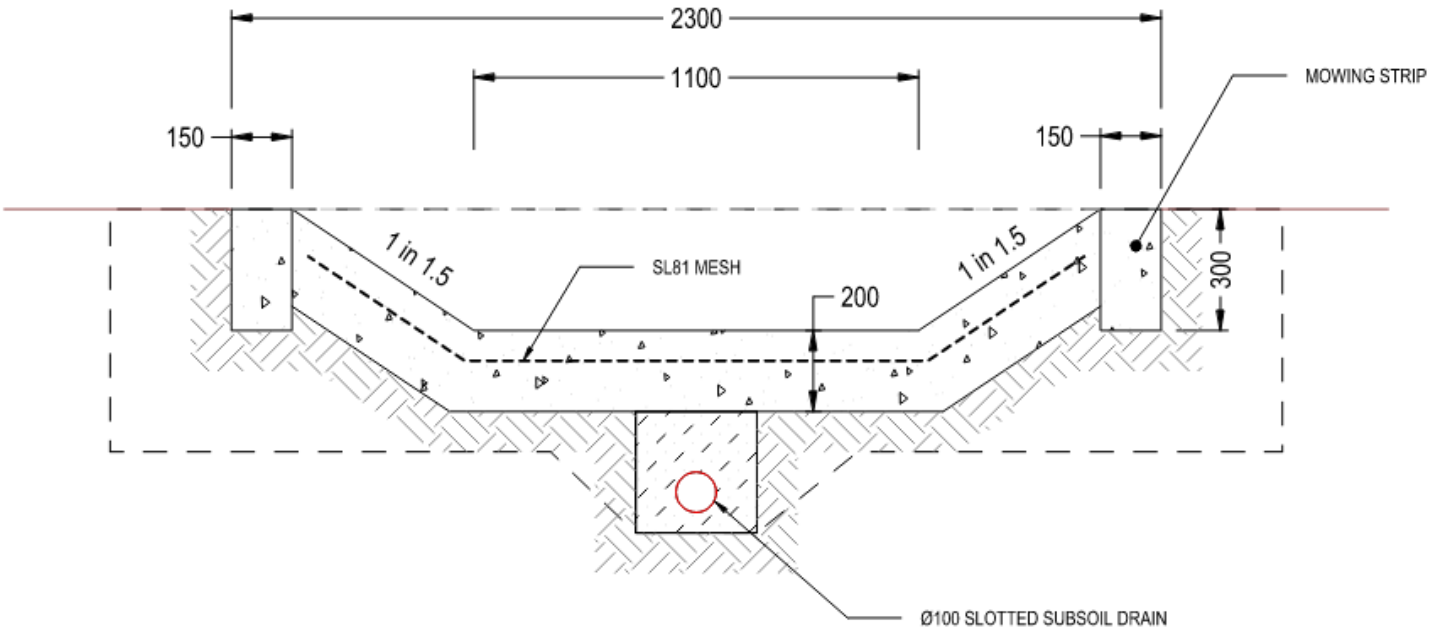


PIT SECTION (TYPICAL)
NTS

TABLE B

PIPE DIA	CL PIPE TO INV. GUTTER
<675	120
675	170
750	230
825	260
900	330
1050	425
1200	500
1350	580
1500	700
1650	775
1800	835

Item Definition				
Item Name	**Stormwater channel/open channel**			
Item No.	2.16			
Functional Description	Concrete lined open channels			
Inclusions	▪ Cast in-situ base slab ▪ 1.2m wide x 200mm thick x 300mm deep reinforced concrete channel including subgrade preparation			
Key scope of work inclusions	▪ Excavation and backfilling but excluding reinstatement of any hard surfacing ▪ Imported stabilised fill material ▪ Installation works ▪ Bedding, laying and jointing			
Exclusions (may be reasonably required)	▪ N/A			
Exclusions (exceed minimum requirements	▪ N/A			
Key identified risks	▪ Removal of excess spoil ▪ Waste levy allowances ▪ Excavated material other than VENM ▪ Encountering rock ▪ Dewatering ▪ Stockpile location located further than 500m from site			
Sub-item details	▪ N/A			
Specific sub item information	▪ N/A			
Applicable standards	▪ AUS-SPEC NSW Development Design Specification D5 Stormwater Drainage Design ▪ Camden Council Engineering Construction Specification (Feb 2009) ▪ Camden Council Engineering Design Specification (Feb 2009)			
Cost information				
Methodology	▪ Reference Pricing			
Benchmark base cost	#	Item/ sub-item	Unit	$/ Unit
	2.16	Concrete channel	m	920
Banding	▪ N/A			
Minimum quantity	▪ 15m			



STORMWATER CHANNEL/OPEN CHANNEL
1100mm wide x 200mm thick x 300mm deep

NOTES

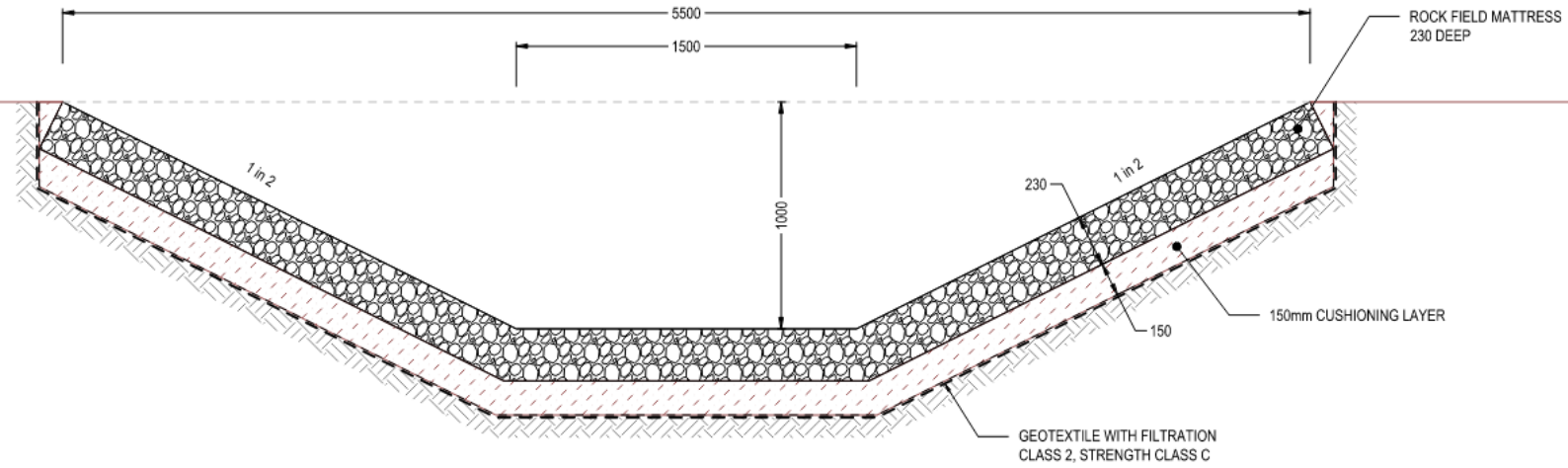
MINIMUM CONCRETE COMPRESSIVE STRENGTH SHALL BE 32MPA WITH 20mm MAXIMUM AGGREGATE SIZE.

MINIMUM COVER TO REINFORCEMENT SHALL BE 50mm UNLESS OTHERWISE SHOWN

FOUNDATIONS SHALL HAVE A MINIMUM BEARING PRESSURE OF 150KPa AND SHALL BE VERIFIED BY THE CONTRACTOR'S GEOTECH ENGINEER PRIOR TO FOOTING CONSTRUCTION.

Ø100 SUBSOIL DRAIN CLASS 1000 AT 1% MIN LONGITUDINAL GRADE WITH FILTER FABRIC SOCK.

Item Definition	
Item Name	**Stormwater channel stabilisation**
Item No.	2.17
Functional Description	Rock field mattress open channels
Inclusions	▪ 1500mm wide x 1000mm deep Rock filled wire mattresses in 230mm deep ▪ Minimum 150mm thick cushion layer with material D85 < 75mm to form the channel including subgrade preparation ▪ Supply and lay Geotextile with filtration Class 2, strength Class C to TfNSW R63
Key scope of work inclusions	▪ Excavation and backfilling but excluding reinstatement of any hard surfacing ▪ Imported stabilised fill material ▪ Installation works ▪ Bedding, laying and jointing
Exclusions (may be reasonably required)	▪ Subsoil drainage
Exclusions (exceed minimum requirements	▪ N/A
Key identified risks	▪ Removal of excess spoil ▪ Waste levy allowances ▪ Excavated material other than VENM ▪ Encountering rock ▪ Dewatering ▪ Stockpile location located further than 500m from site
Sub-item details	▪ N/A
Specific sub item information	▪ N/A
Applicable standards	▪ TfNSW QA specification R63 ▪ AUS-SPEC NSW Development Design Specification D5 Stormwater Drainage Design ▪ Camden Council Engineering Construction Specification (Feb 2009) ▪ Camden Council Engineering Design Specification (Feb 2009)
Cost information	
Methodology	▪ Reference Pricing
Benchmark base cost	# / Item/ sub-item / Unit / $/ Unit 2.17 / Stormwater channel stabilisation / m / 1600
Banding	▪ N/A
Minimum quantity	▪ N/A



STORMWATER CHANNEL STABILISATION
1500mm wide x 230mm thick x 1000mm deep

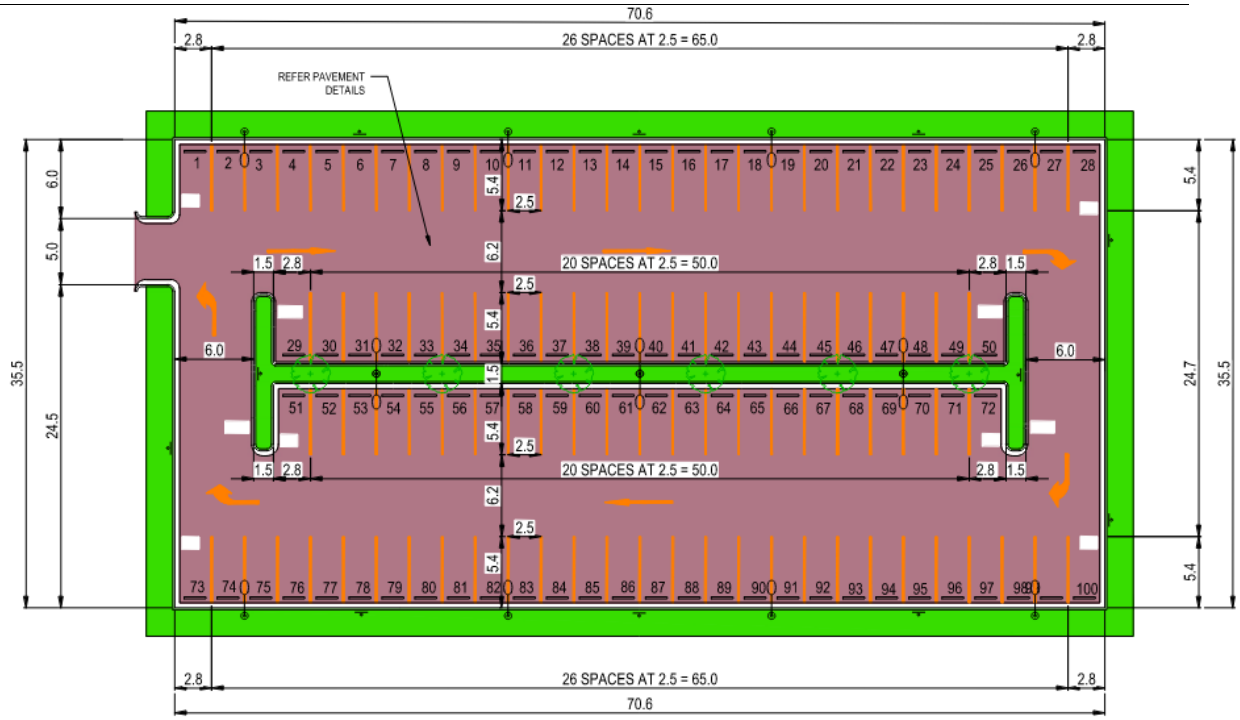
Item Definition				
Item Name	**Amenities building 400sqm**			
Item No.	4.01			
Functional Description	General amenity block including a combination of toilets, change rooms, canteen and/or equipment storage			
Inclusions	▪ Single storey structure ▪ External blockwork walls, minimal internal walls, screens and doors ▪ Basic floor, wall and ceiling finishes and fitments ▪ Mechanical, electrical and hydraulic services including typical connections to existing mains ▪ Basic external works including paving, site landscaping, fencing and external lighting ▪ Notional facility size 100m2			
Key scope of work inclusions	▪ Typical site preparations ▪ Nominal excavation for foundations with material retained on-site ▪ Service connections within 20m of facility			
Exclusions (may be reasonably required)	▪ N/A			
Exclusions (exceed minimum requirements	▪ Security/ CCTV installations			
Key identified risks	▪ Contaminated materials ▪ Surplus excavated material requiring disposal off-site ▪ Imported fill required for site levelling ▪ Relocation or diversion of existing utilities			
Sub-item details	▪ N/A			
Specific sub item information	▪ N/A			
Applicable standards	▪ N/A			
Cost information				
Methodology	Reference pricing			
		Item/sub-item	Unit	$/unit
	4.01	Amenity block	m2	2,500
Banding	▪ N/A			
Minimum quantity	▪ N/A			

No drawing provided

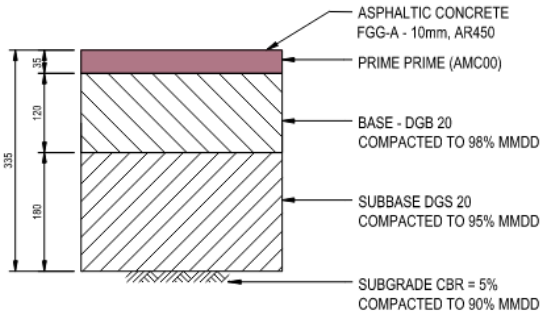
Item Definition				
Item Name	**BBQ area**			
Item No.	4.02			
Functional Description	Electric cooker BBQ with surrounds/bench top			
Inclusions	▪ Basic electric cooker BBQ ▪ Stainless steel surrounds/bench top ▪ Concrete base			
Key scope of work inclusions	▪ Nominal excavation for foundations with material retained on-site ▪ Electrical connection (20m run) ▪ Installation works			
Exclusions (may be reasonably required)	▪ N/A			
Exclusions (exceed minimum requirements	▪ Sink units			
Key identified risks	▪ N/A			
	4.02.1	Single plate; uncovered		
	4.02.2	Double plate; uncovered		
Specific sub item information	▪ N/A			
Applicable standards	▪ N/A			
Cost information				
Methodology	▪ Reference pricing			
Benchmark base cost	#	Item/ sub-item	Unit	$/ Unit
	4.02.1	Single plate; uncovered	each	$11,800
	4.02.2	Double plate; uncovered	each	$15,200
Banding	▪ N/A			
Minimum quantity	▪ N/A			

Item Definition				
Item Name	**Boundary Fencing**			
Item No.	4.03			
Functional Description	Perimeter fencing (fronting a road) and access gates including foundations			
Inclusions	▪ Fencing consisting of vertical steel posts, top and bottom rail, steel bars and powder-coated, steel galvanised finish ▪ Extra over for gate access ▪ Concrete footings ▪ Vandal resistant coating			
Key scope of work inclusions	▪ Nominal excavation for foundations with material retained on-site ▪ Installation works			
Exclusions (may be reasonably required)	▪ N/A			
Exclusions (exceed minimum requirements	▪ Motorised/ electrical gate access			
Key identified risks	▪ N/A			
Specific sub item information	▪ N/A			
Applicable standards	▪ N/A			
Cost information				
Methodology	▪ Reference Pricing			
Benchmark base cost	#	Item/ sub-item	Unit	$/ Unit
	4.03	Boundary Fencing	m	$200
Banding	▪ N/A			
Minimum quantity	▪ N/A			

Item Definition				
Item Name	**Car park**			
Item No.	4.04			
Functional Description	Carpark at grade, open access			
Inclusions	▪ Bitumen paving ▪ Linemarking ▪ Stormwater drainage ▪ Security lighting ▪ Kerbing ▪ Minimal landscaping, some planting ▪ Notional 100 car spaces			
Key scope of work inclusions	▪ Typical site preparations ▪ Excavated material retained on-site ▪ Utilities connections ▪ Installation works			
Exclusions (may be reasonably required)	▪ Security fencing ▪ Wheel stops ▪ Security gate			
Exclusions (exceed minimum requirements	▪ Roads other than entrance and exit paving ▪ Loose equipment including ticket machines ▪ CCTV ▪ Retaining walls			
Key identified risks	▪ Allowance for rock excavation ▪ Contaminated materials ▪ Surplus excavated material requiring disposal off-site ▪ Imported fill required for site levelling			
Specific sub item information	▪ N/A			
Applicable standards	▪ Building Code of Australia ▪ Australian Standards ▪ Disability Discrimination Act (DDA)			
Cost information				
Methodology	▪ Reference pricing			
Benchmark base cost	#	Item/ sub-item	Unit	$/ Unit
	4.04	At grade carpark (100 spaces)	each	$700,000
Banding	▪ N/A			
Minimum quantity	▪ N/A			

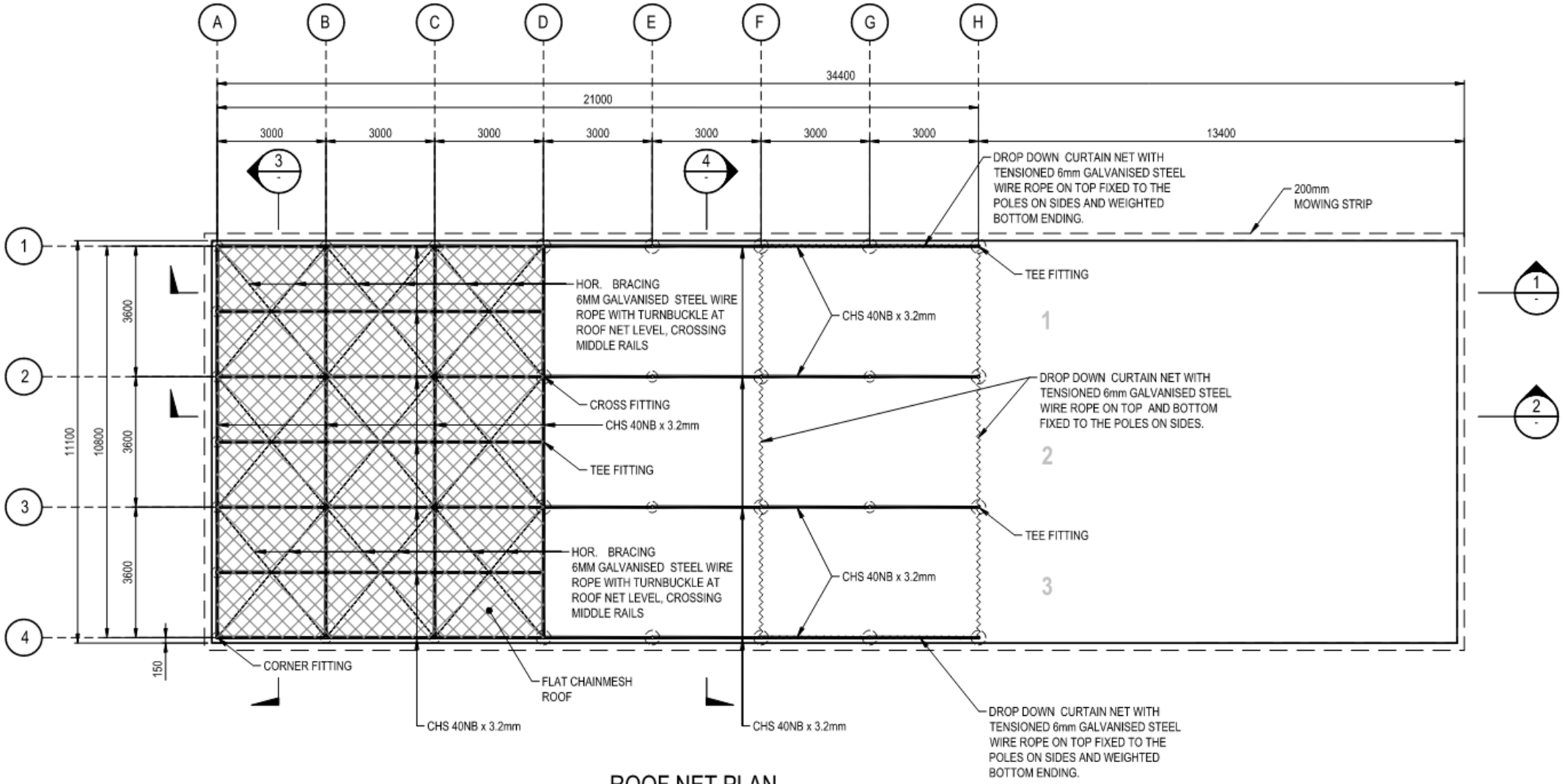


100 CARPARKS LAYOUT PLAN

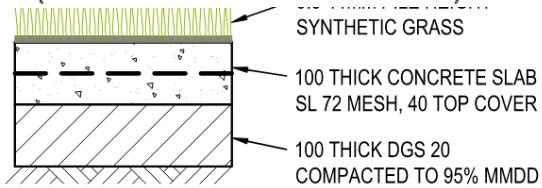


(DESIGN PROCEDURE: AUSTROADS)

Item Definition				
Item Name	**Cricket Wicket**			
Item No.	4.05			
Functional Description	Practice Cricket nets (3-bay)			
Inclusions	▪ Synthetic cricket surface ▪ Linemarking ▪ Chain mesh enclosures ▪ Steel structure (CHS members) + straining cables ▪ Rubberised padding at the back and sides ▪ 100mm concrete base with reinforcement on 100mm DGS20 compacted to 95%MMDD			
Key scope of work inclusions	▪ Site levelling (cut/fill neutral) ▪ Installation works			
Exclusions (may be reasonably required)	▪ Drainage ▪ Perimeter fencing			
Exclusions (exceed minimum requirements	▪ Spectator seating ▪ Equipment storage			
Key identified risks	▪ Relocation and diversion of existing utilities ▪ Contaminated materials ▪ Surplus excavated material requiring disposal off-site ▪ Imported fill required for site levelling			
Sub-item details	▪ N/A			
Specific sub item information	▪ N/A			
Applicable standards	▪ AS1725.4 – 2010: Chain link fabric fencing – Cricket net fencing enclosures ▪ AS1725.1 – 2010: Chain link fabric fencing –Security fencing and gates – General requirements			
Cost information				
Methodology	Reference pricing			
Benchmark base cost	#	Item/ sub-item	Unit	$/ Unit
	4.05	Practice Cricket nets (3-bay)	item	$79,500
Banding	▪ N/A			
Minimum quantity	▪ N/A			

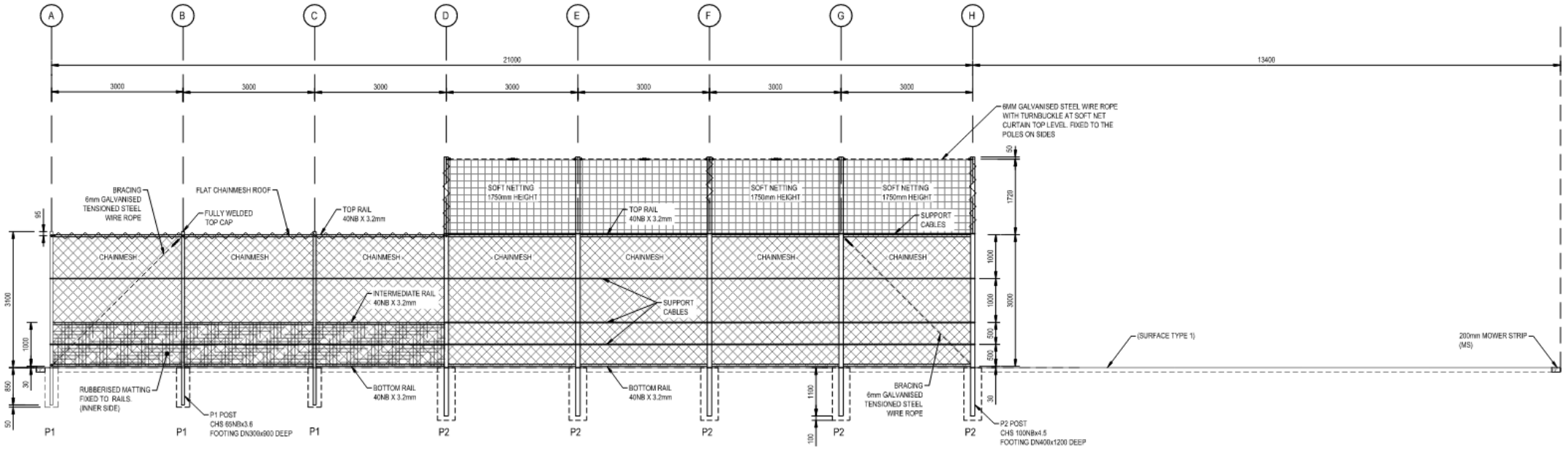


ROOF NET PLAN (COMMUNITY PRACTICE NETS)

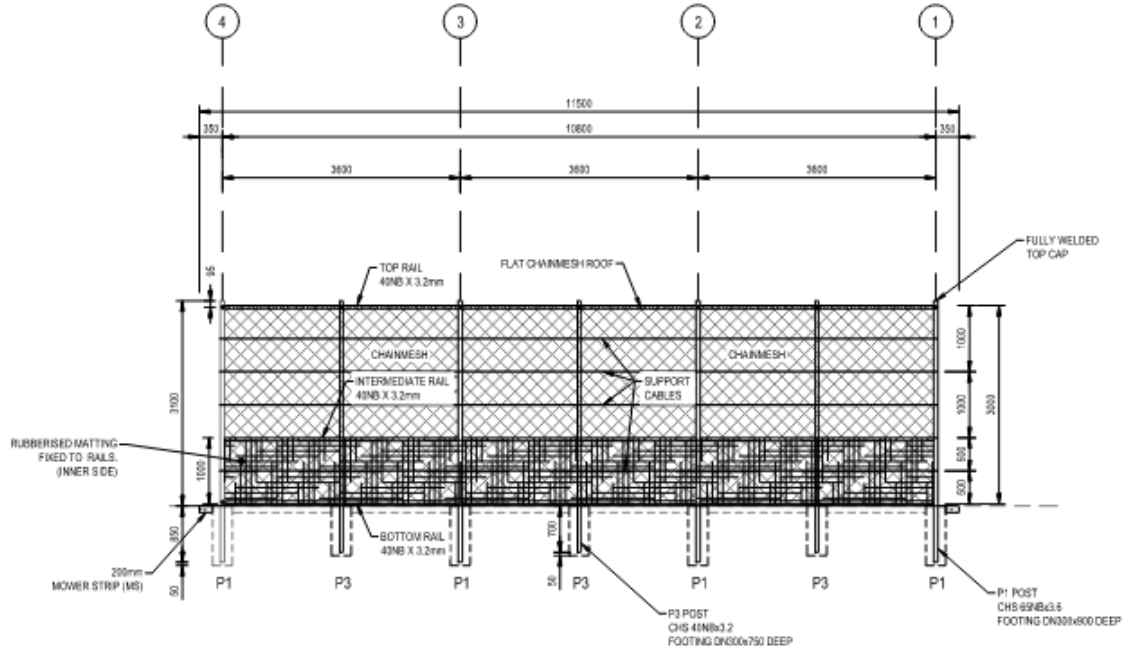


SURFACE TYPE 1

SYNTHETIC PRACTICE WICKETS

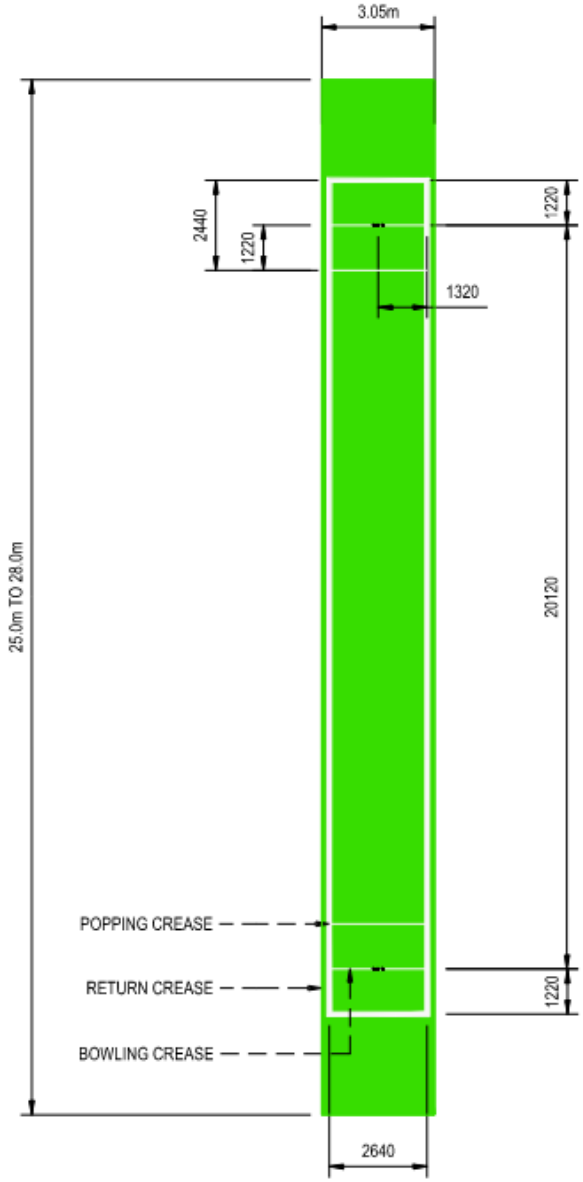


SEC 1
SCALE 1:50

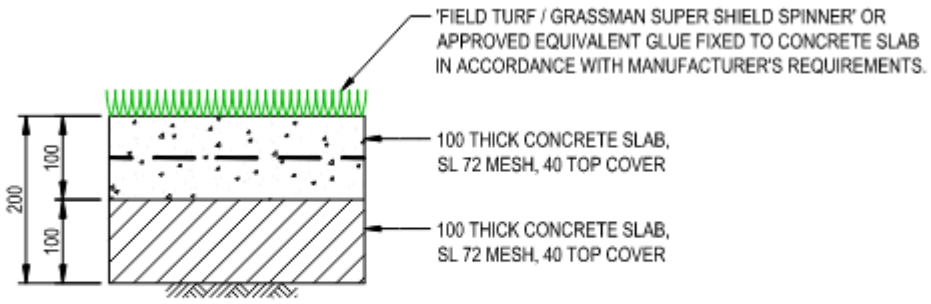


SEC 3 (GRID A)

Item Definition				
Item Name	**Cricket Wicket only**			
Item No.	4.06			
Functional Description	Synthetic cricket pitch			
Inclusions	▪ Synthetic cricket pitch 28.0m x 3.05m ▪ Linemarking ▪ 100mm concrete base with reinforcement on 100mm DGS20 compacted to 95%MMDD			
Key scope of work inclusions	▪ Site levelling (cut/fill neutral) ▪ Installation works			
Exclusions (may be reasonably required)	▪ Drainage ▪ Perimeter fencing			
Exclusions (exceed minimum requirements	▪ Spectator seating ▪ Equipment storage			
Key identified risks	▪ Relocation and diversion of existing utilities ▪ Contaminated materials ▪ Surplus excavated material requiring disposal off-site ▪ Imported fill required for site levelling			
Sub-item details	▪ N/A			
Specific sub item information	▪ N/A			
Applicable standards	▪ N/A			
Cost information				
Methodology	Reference pricing			
Benchmark base cost	#	Item/ sub-item	Unit	$/ Unit
	4.06	Synthetic Cricket pitch	item	$18,500
Banding	▪ N/A			
Minimum quantity	▪ N/A			



CRICKET WICKET DETAIL PLAN



SURFACE - TYPE 2
SYNTHETIC PRACTICE WICKETS

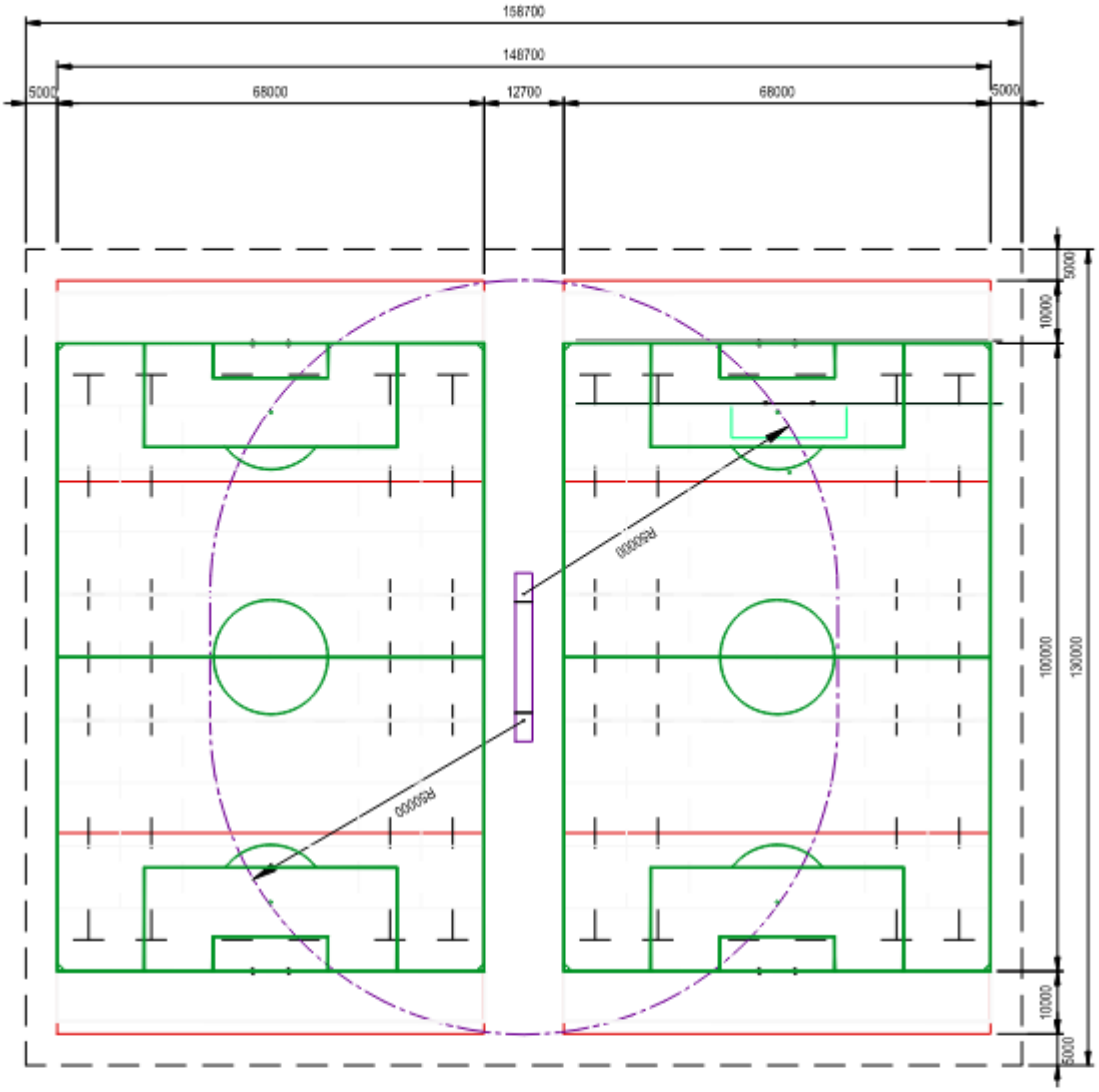
Item Definition		
Item Name	**Demolition**	
Item No.	4.07	
Functional Description	**Demolition of various materials and structures**	
Inclusions	▪ N/A	
Key scope of work inclusions	▪ Demolition of up to 200mm thick slabs ▪ Demolition of concrete/masonry structure including foundations, sealing off services and removing all debris from site ▪ Sealing off of existing services ▪ Clearance works by heavy machinery ▪ Disposal of all debris including haulage of up to 45km and tipping fees for general solid waste of $60/Tn, inclusive of partial waste levy	
Exclusions (may be reasonably required)	▪ N/A	
Exclusions (exceed minimum requirements	▪ N/A	
Key identified risks	▪ Relocation or diversion of existing utilities ▪ Payment of full waste levy for general solid waste or restricted special waste ▪ Road/ footpath closures and detours	
Sub-item details	4.07.1	Demolition; reinforced concrete slabs
	4.07.2	Demolition; unreinforced concrete slabs
	4.07.3	Demolition; bitumen paving including base course
	4.07.4	Demolition; concrete/masonry structure
	4.07.5	Demolition; light structure
	4.07.6	Demolition; double storey light structure
	4.07.7	Demolition; double storey concrete/masonry structure
Specific sub item information	▪ N/A	
Applicable standards	▪ Building Code of Australia	

Cost information				
Methodology	Reference pricing			
Benchmark base cost	#	Item/ sub-item	Unit	$/ Unit
	4.07.1	Demolition; reinforced concrete slabs	m^2	80
	4.07.2	Demolition; unreinforced concrete slabs	m^2	65
	4.07.3	Demolition; bitumen paving including base course	m^2	70
	4.07.4	Demolition; concrete/masonry structure	m^2	90
	4.07.5	Demolition; single storey light structure	m^2	60
	4.07.6	Demolition; double storey light structure	m^2	120
	4.07.7	Demolition; double storey concrete/masonry structure	m^2	160
Banding	▪ N/A			
Minimum quantity	▪ N/A			

No drawing provided

Item Definition		
Item Name	**Double playing fields**	
Item No.	4.08	
Functional Description	Sports field including turfing, markings and posts as required	
Inclusions	▪ Refer to specific sub item information	
Key scope of work inclusions	▪ Site levelling (cut/fill neutral) ▪ Installation works ▪ Imported topsoil	
Exclusions (may be reasonably required)	▪ Drainage ▪ Sand slit drainage or subsurface drainage (subsoils) ▪ Perimeter fencing ▪ Floodlighting ▪ Amenity block ▪ Car parking ▪ Top soil amelioration (as an alternative to import)	
Exclusions (exceed minimum requirements	▪ Spectator seating ▪ Irrigation sprinklers ▪ Equipment storage ▪ Practice nets (cricket) ▪ Turf maintenance	
Key identified risks	▪ Relocation and diversion of existing utilities ▪ Contaminated materials ▪ Surplus excavated material requiring disposal off-site ▪ Imported fill required for site levelling	
Sub-item details	4.08.1	Combined Field Module (Soccer/Rugby League/Rugby Union/Cricket)
	4.08.2	Double Soccer field
	4.08.3	Double Rugby League / Union field
	4.08.3	Single Cricket pitch and field
Specific sub item information	▪ ▪ <u>Sub item 4.08.1 – Combined field module</u> ▪ Field size of approximately 21,000m^2 including runoffs (Combined field module) ▪ Turf on 250mm imported topsoil, on 200mm ripped subgrade with application of gypsum (or similar treatment approved) ▪ Combined rugby/soccer posts ▪ <u>Sub item 4.08.2 - Soccer field</u> ▪ Field size of approximately 17,200m^2 including runoffs (2 no playing fields) ▪ Turf on 250mm imported topsoil, on 200mm ripped subgrade with application of gypsum (or similar treatment approved) ▪ Sockets for soccer posts ▪ <u>Sub item 4.08.3 - Rugby League / Union field</u> ▪ Field size of approximately 21,000m^2 including runoffs (2 no playing fields) ▪ Turf on 250mm imported topsoil, on 200mm ripped subgrade with application of gypsum (or similar treatment approved) ▪ Supply and install of rugby posts ▪ <u>Sub item 4.08.4 - Cricket pitch and field</u> ▪ Overall field size (satisfies AFL requirements): – Diameter (A) = 110m perimeter (50m field suitable for club level use + 5m runoff) – Area = 9,500m^2 ▪ Cricket pitch size: – 28m x 2.6m wide ▪ Synthetic pitch: – Synthetic turf laid on concrete base – Includes permanent line markings ▪ Outfield consists of turf on 250mm imported topsoil, on 200mm ripped subgrade with application of gypsum (or similar treatment approved)	
Applicable standards	▪ NSW Cricket Association - Recommended Approach to Management of Turf Cricket Pitches and Outfield	

Cost information				
Methodology	▪ Reference Pricing			
Benchmark base cost	#	Item/ sub-item	Unit	$/ Unit
	4.08.1	Combined Field	Item	$650,000
	4.08.2	Double Soccer field	Item	$500,000
	4.08.3	Double Rugby League / Union field	Item	$590,000
	4.08.4	Cricket pitch and field	Item	$320,000
Banding	▪ N/A			
Minimum quantity	▪ N/A			



COMBINED OVAL FOR RUGBY UNION, RUGBY LEAGUE, SOCCER AND CRICKET WITH 5.0m SIDE OVERRUNS

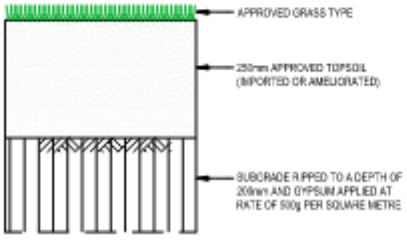
RUGBY UNION
100.0m x 68.0m WITH 10.0m DEADBALL

RUGBY LEAGUE
100.0m x 68.0m WITH 8.0m DEADBALL

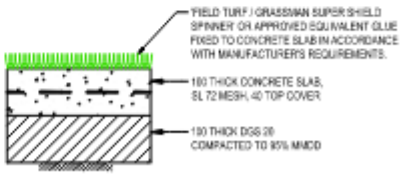
SOCCER
100.0m x 68.0m

CRICKET
50.0m FROM WICKET TO BOUNDARY

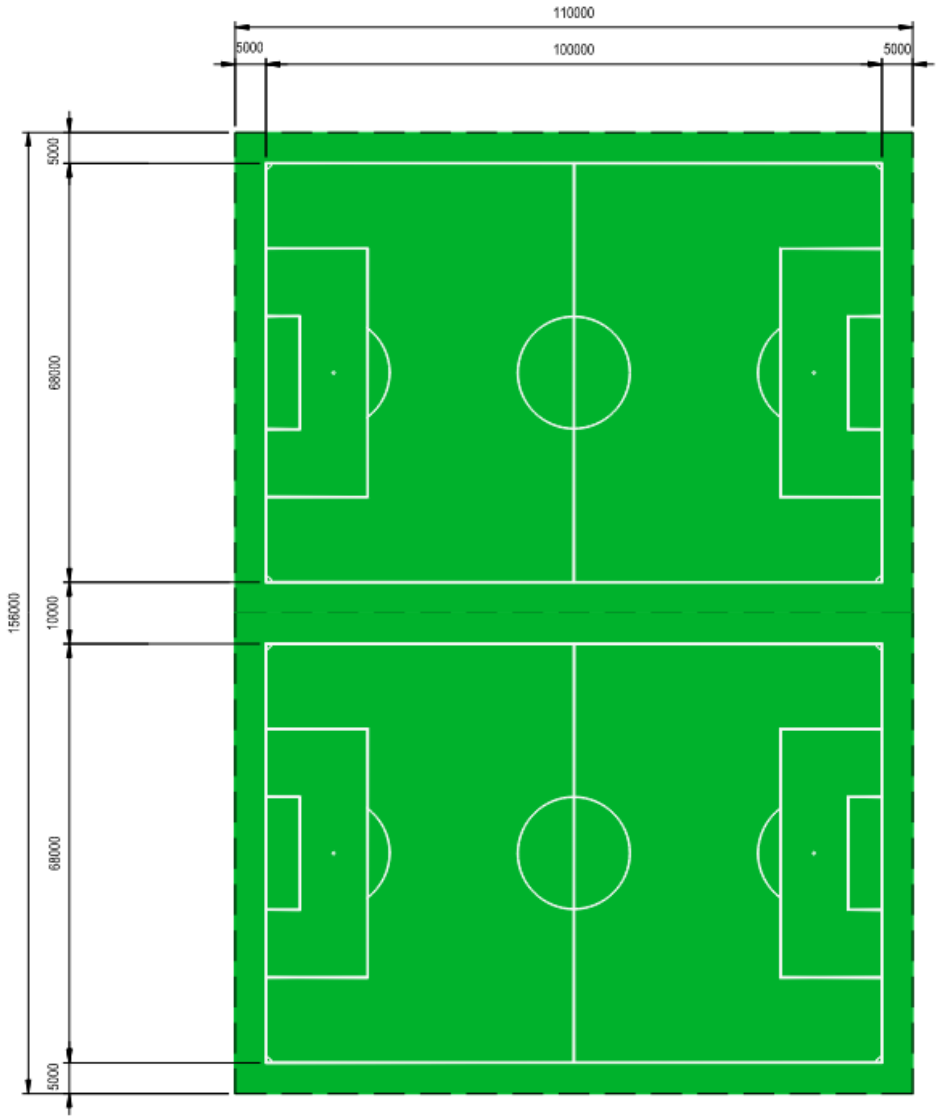
GOALS
COMBINED RUGBY / SOCCER GOALS



GRASS SURFACE TYPE G1
IRRIGATED GRASS PLAYING FIELD



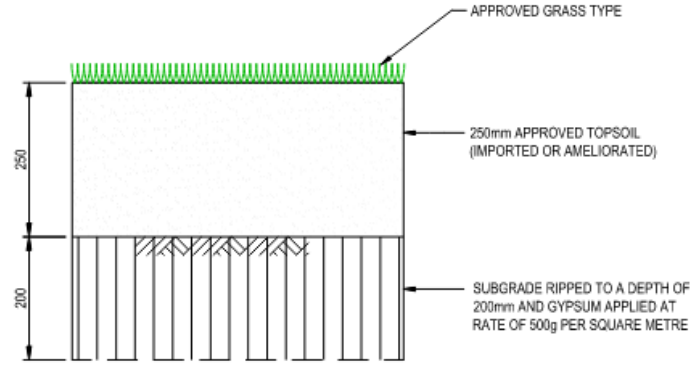
SURFACE - TYPE 2
SYNTHETIC PITCH



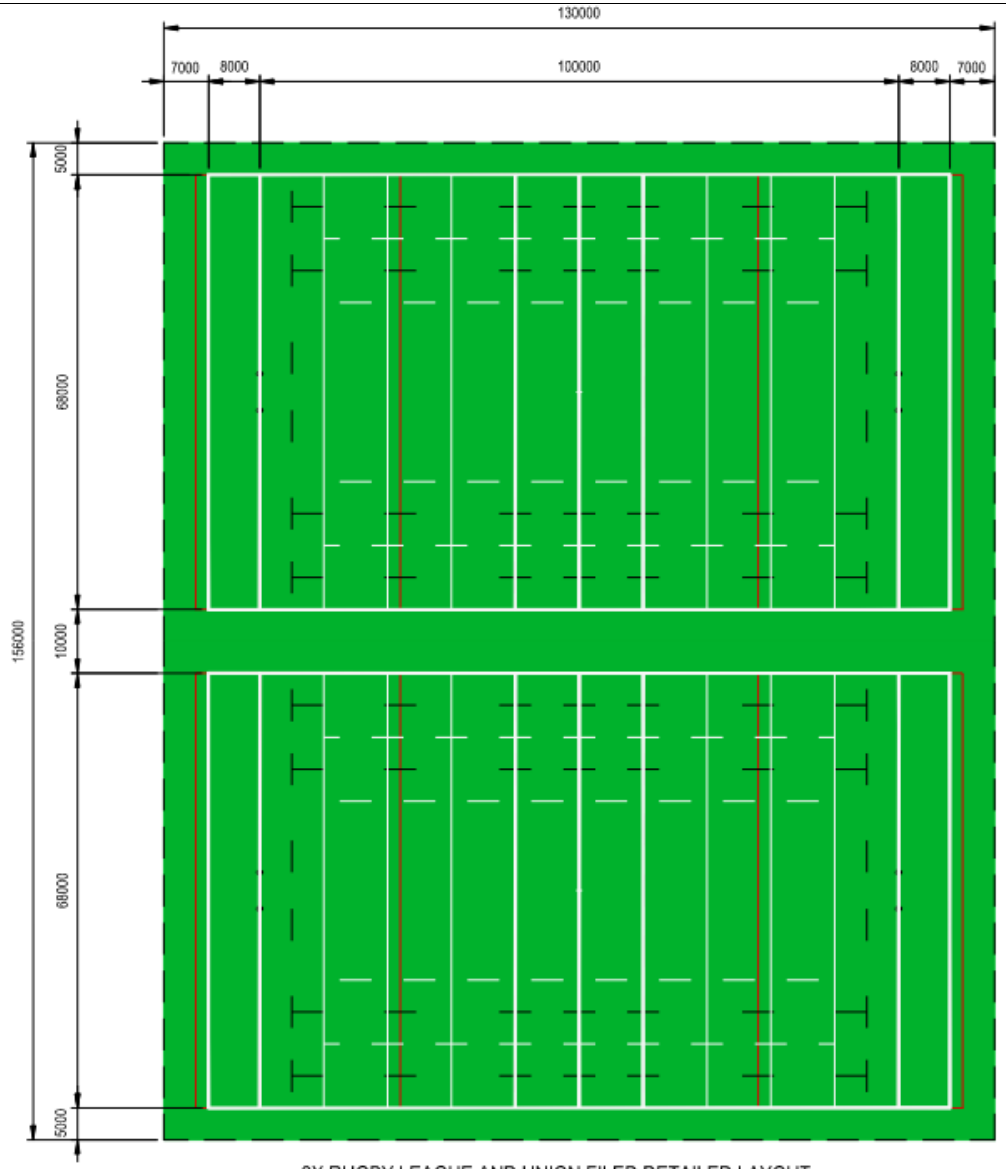
2X SOCCER FIELD DETAILED PLAN

SOCCER FIELD
100.0m x 68.0m

SEPARATION DISTANCE / OVERRUN
5.0m SIDES AND 5.0m ENDS.



GRASS SURFACE TYPE G1
IRRIGATED GRASS PLAYING FIELD

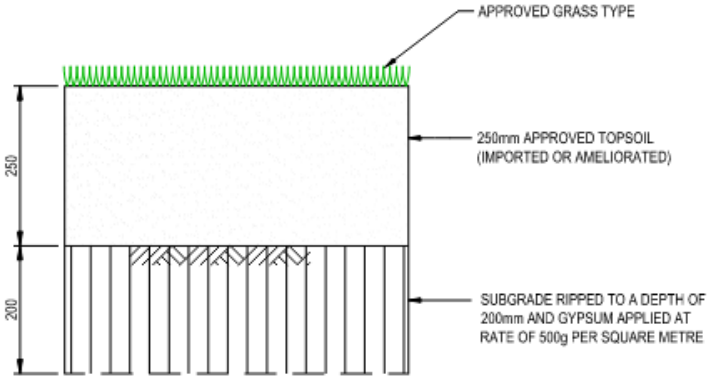


2X RUGBY LEAGUE AND UNION FILED DETAILED LAYOUT

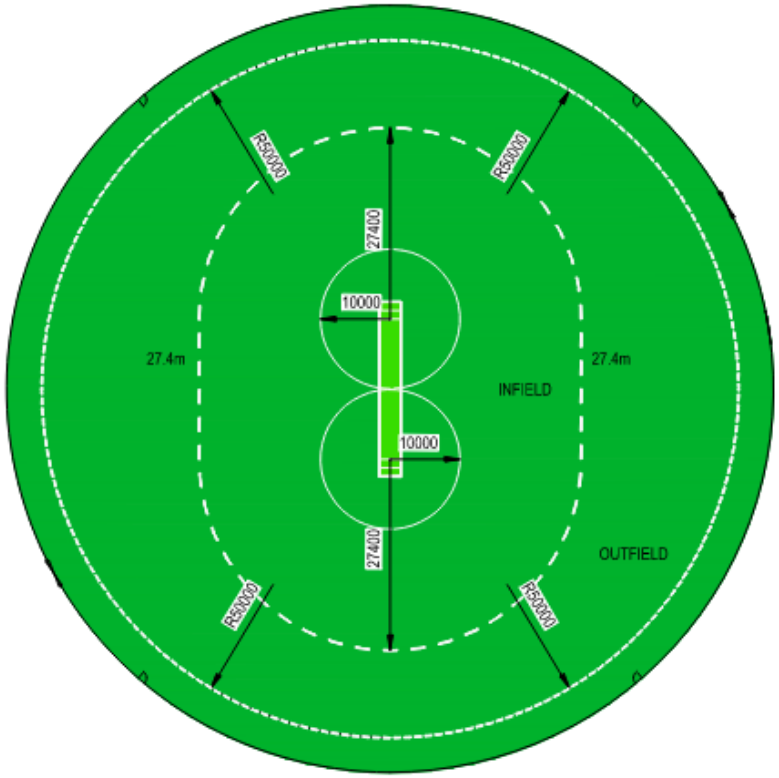
RUGBY LEAGUE
100.0m x 68.0m WITH 8.0m DEADBALL

RUGBY UNION
100.0m x 68.0m WITH 10.0m DEADBALL

SEPARATION DISTANCE / OVERRUN
5.0m SIDES AND 7.0m ENDS.
WHEN COMBINED WITH RUGBY UNION FIELD.

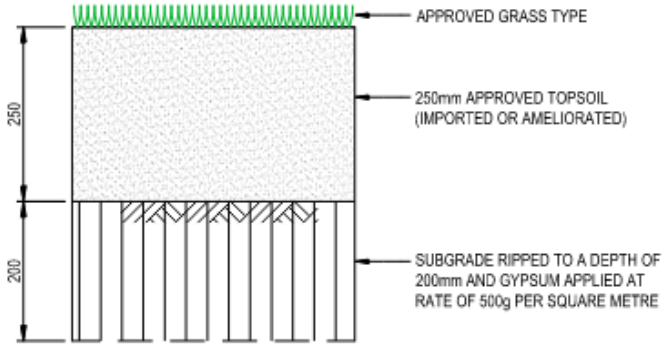


GRASS SURFACE TYPE G1
IRRIGATED GRASS PLAYING FIELD



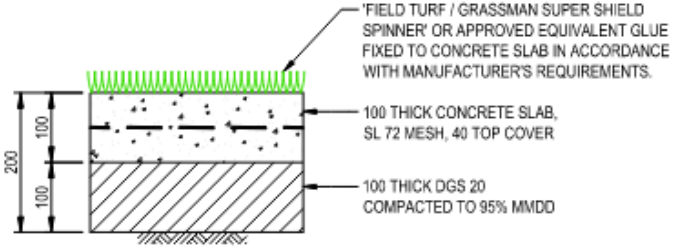
50M CRICKET FIELD PLAN LAYOUT

50.0m FROM WICKET TO BOUNDARY



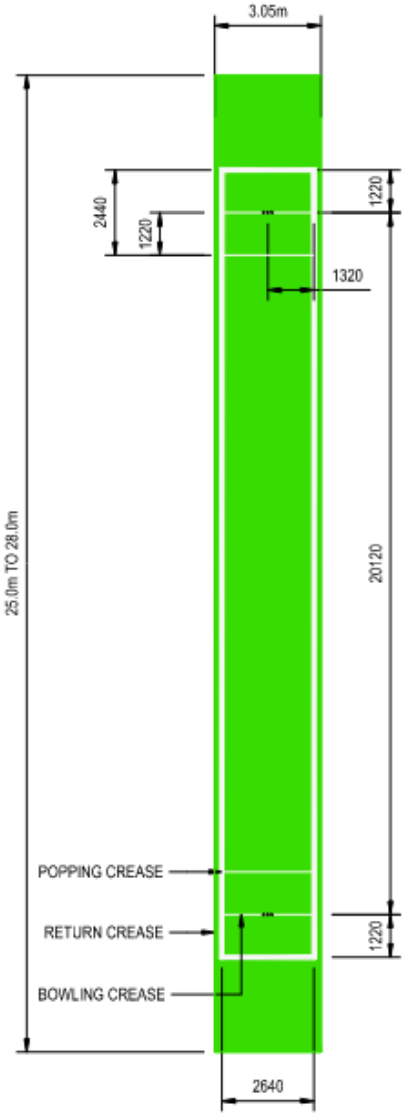
GRASS SURFACE TYPE G1

IRRIGATED GRASS PLAYING FIELD



SURFACE - TYPE 2

SYNTHETIC PITCH



CRICKET WICKET DETAIL PLAN

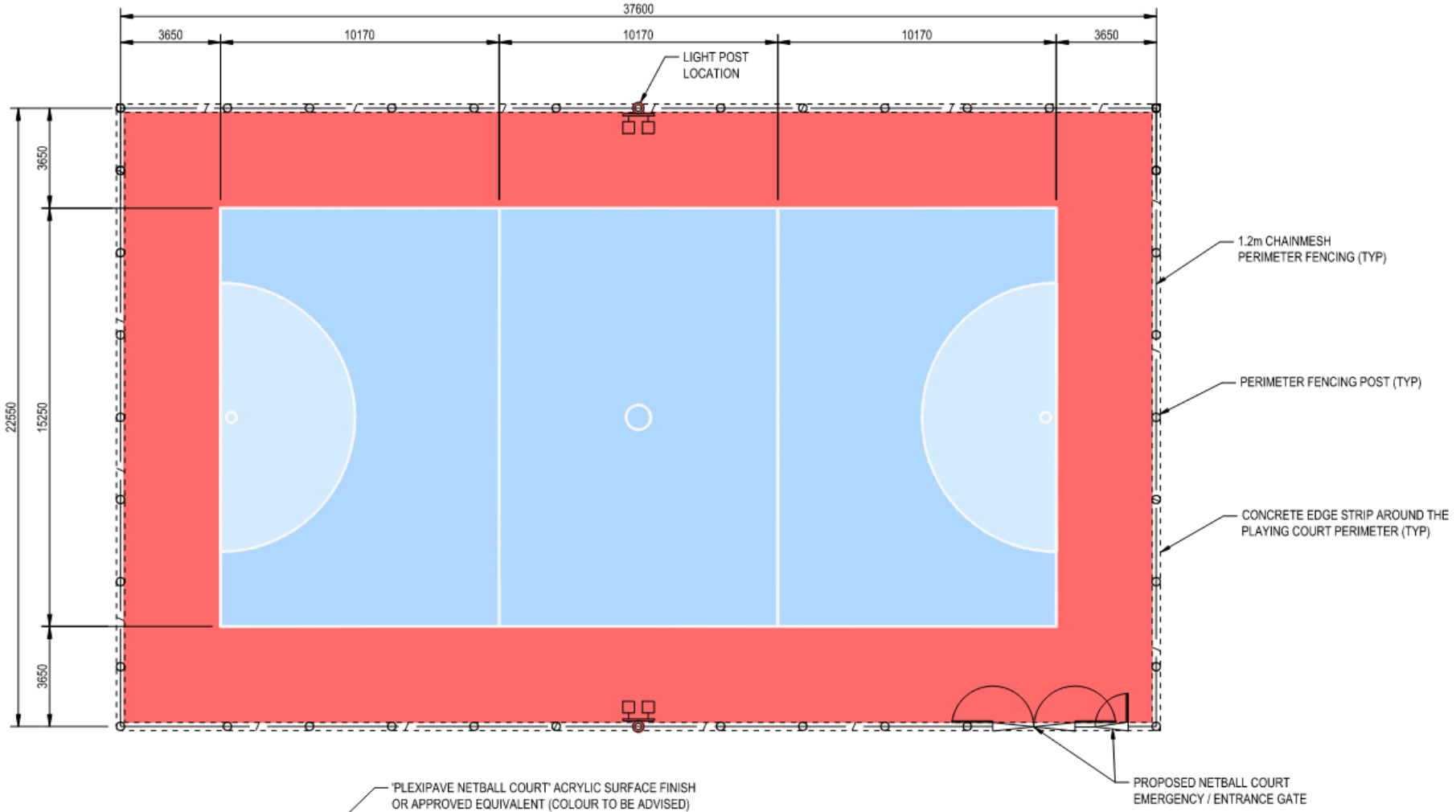
Item Definition				
Item Name	Double playing lighting 100 Lux			
Item No.	4.09			
Functional Description	Sportsfield floodlighting, column mounted			
Inclusions	▪ Columns, luminaries, accessories and wiring from nearby switchboard ▪ Connection into existing power supply ▪ Light column foundations ▪ Lighting control ▪ Switchboards ▪ Poles per court / pitch: – Soccer (single playing field): 4 x 18m high poles, 4 x lights – Tennis: single court, 2x12m high poles, 4 lights, 100lx – Netball & basketball: single court, 2x12m high poles, 4 lights, 100lx			
Key scope of work inclusions	▪ Excavation for floodlighting foundations retained on site ▪ Installation works			
Exclusions (may be reasonably required)	▪ N/A			
Exclusions (exceed minimum requirements	▪ Electrical substation			
Key identified risks	▪ Relocation and diversion of existing utilities ▪ Contaminated materials ▪ Surplus excavated material requiring disposal off-site			
Sub-item details	4.09.1	Floodlighting for football (all codes)		
	4.09.2	Floodlighting for tennis		
	4.09.3	Floodlighting for netball and basketball		
Specific sub item information	▪ N/A			
Applicable standards	▪ AS/NZS2560 for sports lighting			
Cost information				
Methodology	▪ Reference pricing			
Benchmark base cost	#	Item/ sub-item	Unit	$/ Unit
	4.09.1	Floodlighting for football (all codes)	pitch	$165,000
	4.09.2	Floodlighting for tennis	court	$45,500
	4.09.3	Floodlighting for netball and basketball	court	$45,500
Banding	▪ N/A			
Minimum quantity	▪ N/A			

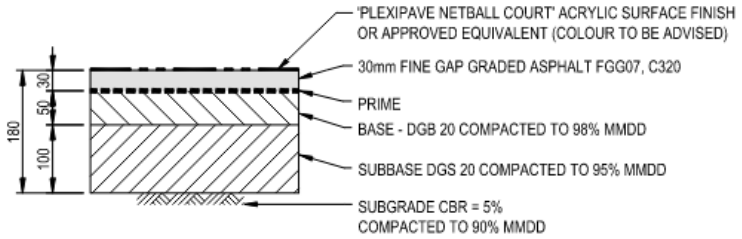
No drawing provided

Item Definition				
Item Name	**Basic landscaping**			
Item No.	4.12			
Functional Description	**Native trees and shrubs including mulching and edging**			
Inclusions	▪ Native sapling plant, semi mature trees, mature trees and shrubs ▪ Imported topsoil ▪ Mulching allows to cut and mulch trees (semi mature) ▪ Insitu concrete edging, 300mm			
Key scope of work inclusions	▪ Nominal 500mm cut/fill balance			
Exclusions (may be reasonably required)	▪ Planter box (no longer a separate item -may need to include)			
Exclusions (exceed minimum requirements	▪ Drainage system ▪ Tree guard ▪ Pine bark chips			
Key identified risks	▪ Contaminated materials ▪ Surplus excavated material requiring disposal off-site ▪ Imported fill required for site levelling			
Sub-item details	4.12.1	Planting; sapling		
	4.12.2	Planting; semi mature tree (45ltr)		
	4.12.3	Planting; mature tree (100ltr)		
	4.12.4	Planting; shrubs		
	4.12.5	Mulching		
	4.12.6	Steel Edging		
	4.12.6	Concrete Edging 150 x 150		
Specific sub item information	▪ N/A			
Applicable standards	▪ N/A			
Cost information				
Methodology	Reference Pricing			
Benchmark base cost	▪ #	▪ Item/ sub-item	▪ Unit	▪ $/ Unit
	4.12.1	Planting; sapling	each	$5.00
	4.12.2	Planting; semi mature tree (45ltr)	each	$90.00
	4.12.3	Planting; mature tree (100ltr)	each	$300.00
	4.12.4	Planting; shrubs	M2	$45.00
	4.12.5	Mulching – Forest Blend	M2	$25.00
	4.12.6	Steel Edging	m	$70.00
	4.12.7	Concrete Edging 150 x 150	m	$80.00
Banding	▪ N/A			
Minimum quantity	▪ N/A			

No drawing provided

Item Definition				
Item Name	**Netball courts lighting / court**			
Item No.	4.13			
Functional Description	**Single court outdoor netball court, with concrete surfacing, including court markings and ring installations**			
Inclusions	▪ Court size of 860m^2 inclusive of 3.65m clearance each side ▪ 'Non-cushion' Netball Court Acrylic Surface Finish ▪ Linemarking ▪ Goal posts ▪ 30mm fine gap graded Asphalt FGG07, C320 ▪ Primer ▪ Base – DGB 20 Compacted to 98% MMDD ▪ Subbase – DGS 20 Compacted to 95% MMDD ▪ Subgrade CBR 5% compacted to 90% MMDD ▪ Drainage (including perimeter trench drains)			
Key scope of work inclusions	▪ Site levelling (cut/fill neutral) ▪ Installation works			
Exclusions (may be reasonably required)	▪ Perimeter fencing (separate item – 4.03) ▪ Floodlighting – 200lux for club level use (separate item – 4.09) ▪ Amenity block (separate item – 4.01) ▪ Car parking (separate item - 4.04)			
Exclusions (exceed minimum requirements	▪ Spectator seating ▪ Players/umpire enclosure and seating ▪ Equipment storage			
Key identified risks	▪ Relocation and diversion of existing utilities ▪ Contaminated materials ▪ Surplus excavated material requiring disposal off-site ▪ Imported fill required for site levelling			
Sub-items details	▪ N/A			
Specific sub item information	▪ N/A			
Applicable standards	▪ Court size: International Federation of Netball Associations (IFNA) Official Rules, Rules of Tennis, adopted by Netball Australia ▪ National Facilities Policy, Netball Australia (2016)			
Cost information				
Methodology	First principles estimate and reference pricing (hybrid approach)			
Benchmark base cost	#	Item/ sub-item	Unit	$/ Unit
	3b.4	Netball court (outdoor)	court	320,000
Banding	▪ N/A			
Minimum quantity	▪ N/A			



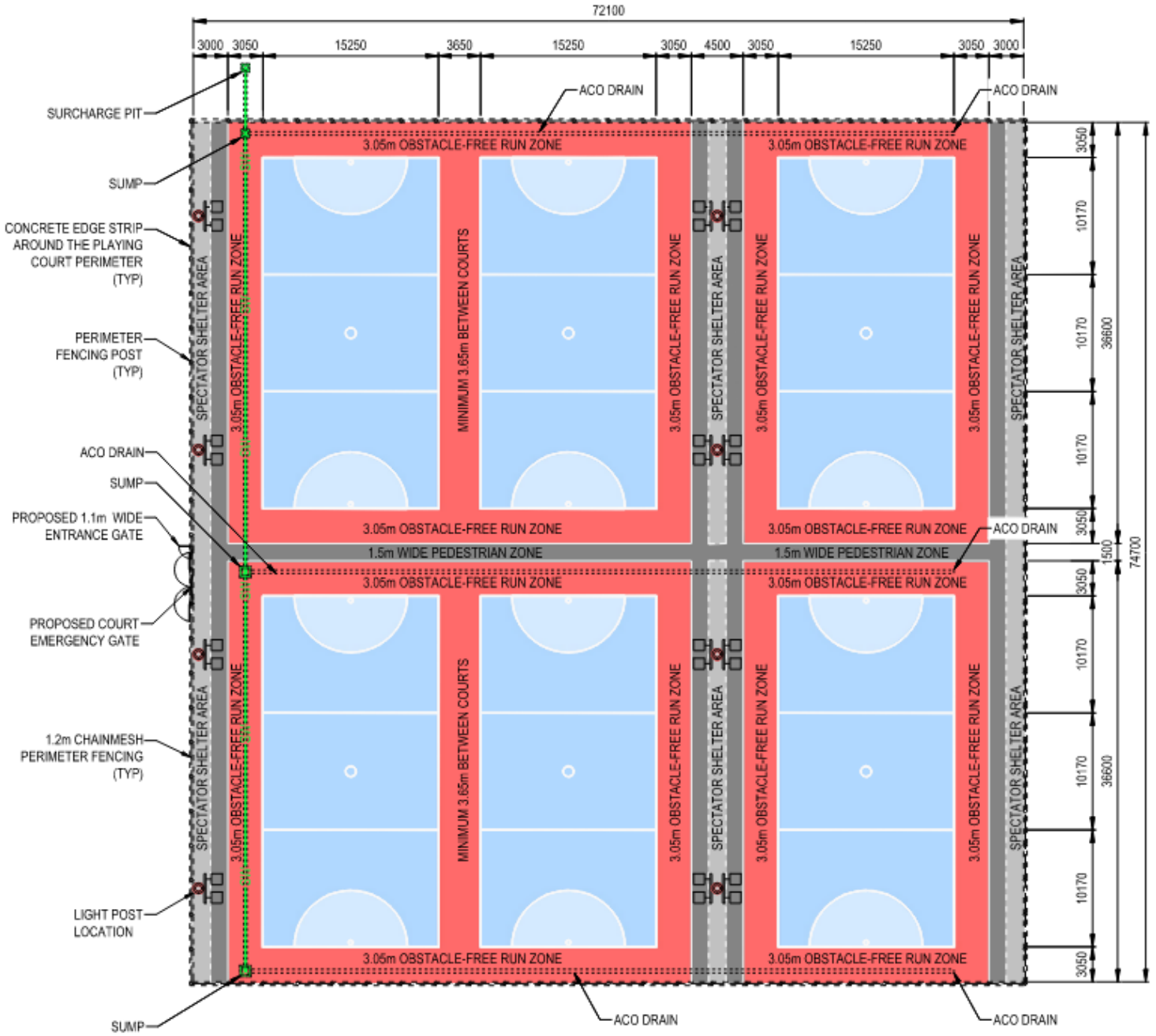


ACRYLIC SURFACE - TYPE AS1
NETBALL COURT SURFACE FINISH

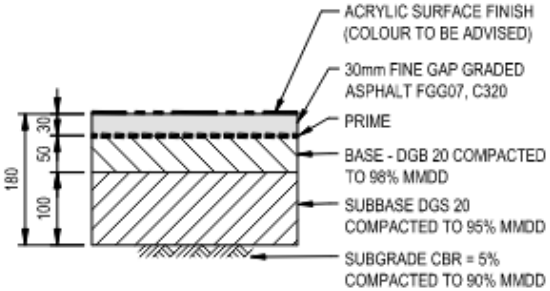
NETBALL COURT
FINAL SURFACE TREATMENT

1. THE ASPHALT SURFACE TO THE NETBALL COURTS SHALL BE PROVIDED WITH A SYNTHETIC SURFACE FINISH EQUAL TO 'PLEXIPAVE NETBALL'. IN ACCORDANCE WITH THE PROJECT SPECIFICATION. CONTRACTOR TO PROVIDE ASSURANCE THAT SOLVENTS IN THE PRODUCT DO NOT REACT NEGATIVELY WITH THE ASPHALT BINDERS.
2. ALL LINEMARKING SHALL BE WHITE 'PLEXIPAVE' ACRYLIC LINE PAINT 50mm WIDE.

Item Definition				
Item Name	**Netball courts/6no**			
Item No.	4.14			
Functional Description	**Not available**			
Inclusions	▪ Court size of 5,385m^2 inclusive of spectator areas ▪ 'Non-cushion' Netball Court Acrylic Surface Finish ▪ Linemarking ▪ Goal posts ▪ 30mm fine gap graded Asphalt FGG07, C320 ▪ Primer ▪ Base – DGB 20 Compacted to 98% MMDD ▪ Subbase – DGS 20 Compacted to 95% MMDD ▪ Subgrade CBR 5% compacted to 90% MMDD ▪ Drainage (including perimeter trench drains)			
Key scope of work inclusions	▪ Site levelling (cut/fill neutral) ▪ Installation works			
Exclusions (may be reasonably required)	▪ Perimeter fencing 1.2m high chainmesh (separate item – 4.03) ▪ Floodlighting – 200 Lux for club level use (separate item – 4.09) ▪ Amenity block (separate item – 4.01) ▪ Car parking (separate item - 4.04)			
Exclusions (exceed minimum requirements	▪ Spectator seating ▪ Players/umpire enclosure and seating ▪ Equipment storage			
Key identified risks	▪ Relocation and diversion of existing utilities ▪ Contaminated materials ▪ Surplus excavated material requiring disposal off-site ▪ Imported fill required for site levelling			
Sub-item details	▪ N/A			
Specific sub item information	▪ N/A			
Applicable standards	▪ Court size: International Federation of Netball Associations (IFNA) Official Rules, Rules of Tennis, adopted by Netball Australia ▪ National Facilities Policy, Netball Australia (2016)			
Cost information				
Methodology	Reference pricing			
Benchmark base cost	#	Item/ sub-item	Unit	$/ Unit
	4.14	Netball court x 6 (outdoor)	item	1,700,000
Banding	▪ N/A			
Minimum quantity	▪ N/A			



6X NETBALL COURTS PLAN LAYOUT



ACRYLIC SURFACE - TYPE AS1
NETBALL COURT SURFACE FINISH

NETBALL COURT
FINAL SURFACE TREATMENT

1. CONTRACTOR TO PROVIDE ASSURANCE THAT SOLVENTS IN THE PRODUCT DO NOT REACT NEGATIVELY WITH THE ASPHALT BINDERS.
2. ALL LINEMARKING SHALL BE WHITE 'PLEXIPAVE' ACRYLIC LINE PAINT 50mm WIDE.

NOTE:
THE DIAGRAM'S STATED RUN-OFF ZONES ARE A MINIMUM ONLY. AN ADDITIONAL CONSTRUCTION TOLERANCE SHOULD BE ADDED TO EACH (APPROX.100MM) IN THE DETAILED DESIGN STAGE TO ENSURE COMPLIANT COURT DIMENSIONS AND RUN-OFF ZONES ARE ACHIEVABLE DURING THE CONSTRUCTION AND LINE-MARKING WORKS.

Item Definition				
Item Name	**Park lighting**			
Item No.	4.15			
Functional Description	**Security lighting including light column, luminaire and foundation**			
Inclusions	▪ 5.5m high tapered octagonal hot dipped galvanised steel column ▪ Column foundations ▪ Light fittings ▪ Weatherproof lantern			
Key scope of work inclusions	▪ Nominal excavation for foundations with material retained on-site ▪ Connection into existing power supply within 20m ▪ Installation works			
Exclusions (may be reasonably required)	▪ N/A			
Exclusions (exceed minimum requirements	▪ Feature lighting			
Key identified risks	▪ N/A			
Sub-item details	▪ N/A			
Specific sub item information	▪ N/A			
Applicable standards	▪ N/A			
Cost information				
Methodology	▪ Reference pricing			
Benchmark base cost	#	Item/ sub-item	Unit	$/ Unit
	▪ 4.15	▪ Park lighting – spaced every 25m (to provide approximately 14 lux horizontal illuminance	each	1,500
Banding	▪ N/A			
Minimum quantity	▪ N/A			

Item Definition				
Item Name	**Pathway /Lm**			
Item No.	4.16			
Functional Description	**Concrete pathways**			
Basis of Costs	▪ Refer to 1.17			
Sub-item details	▪ N/A			
Specific sub item information	▪ N/A			
Applicable standards	▪ N/A			
Cost information				
Methodology	▪ Reference pricing			
Benchmark base cost	#	Item/ sub-item	Unit	$/ Unit
	4.16	Concrete pathways	*Refer to item 1.16 footpath*	

Item Definition		
Item Name	**Paved area/m²**	
Item No.	4.17	
Functional Description	**Hard surfacing with foundation layers and drainage**	
Inclusions	▪ Foundation layers ▪ upvc drainage pipework ▪ Pavers laid to pattern ▪ Basic line marking for asphalt surfaces ▪ Grind and seal finish of concrete surfaces ▪ Non-slip sealer for external polished concrete surfaces ▪ Paver sizes: – Precast concrete paver slabs 450x450x50mm – Sandstone paver slab 400x400x40mm – Brick paver 200x150x50mm ▪ Bitumen asphalt ▪ Polished finished concrete including surface hardeners and sealing	
Key scope of work inclusions	▪ Nominal 500mm cut/fill balance ▪ Installation works	
Exclusions (may be reasonably required)	▪ N/A	
Exclusions (exceed minimum requirements	▪ N/A	
Key identified risks	▪ Contaminated materials ▪ Surplus excavated material requiring disposal off-site ▪ Imported fill required for site levelling	
Sub-item details	4.17.1	Asphalt; pedestrian access only
	4.17.2	Asphalt; shared pedestrian / vehicular access
	4.17.3	Paving; precast concrete
	4.17.4	Paving; sandstone
	4.17.5	Paving; brick
	4.17.6	Polished concrete
Specific sub item information	▪ N/A	
Applicable standards	▪ N/A	
Cost information		
Methodology	Reference pricing	

Benchmark base cost	#	Item/ sub-item	Unit	$/ Unit
	4.17.1	Asphalt; pedestrian access only	m²	120
	4.17.2	Asphalt; shared pedestrian / vehicular access	m²	250
	4.17.3	Paving; precast concrete	m²	120
	4.17.4	Paving; sandstone	m²	280
	4.17.5	Paving; brick	m²	200
	4.17.6	Polished concrete	m²	300

Banding	▪ N/A
Minimum quantity	▪ N/A

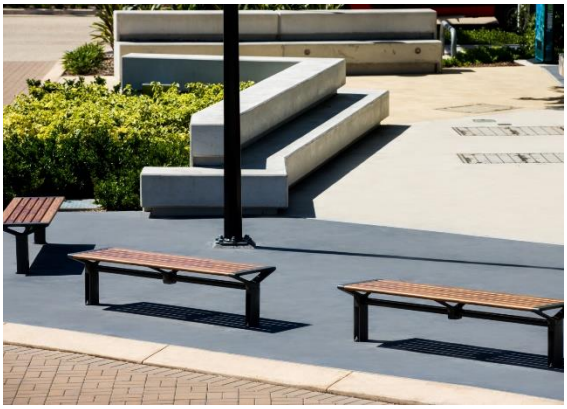
No drawing provided

Item Definition				
Item Name	**Picnic area**			
Item No.	4.18			
Functional Description	**Hard surfacing with foundation layers and drainage**			
Inclusions	▪ Steel frame picnic set ▪ Concrete base ▪ Extra over provided for shade covering			
Key scope of work inclusions	▪ Nominal excavation for foundations with material retained on site ▪ Installation works			
Exclusions (may be reasonably required)	▪ N/A			
Exclusions (exceed minimum requirements	▪ Structural Engineering – assumed the street furniture is 'off the shelf' to Australian standards.			
Key identified risks	▪ N/A			
	4.18.1	Fixed table; aluminium slats; back supported seats		
	4.18.2	Extra over for shade covering		
Specific sub item information	▪ N/A			
Applicable standards	▪ N/A			
Cost information				
Methodology	Reference pricing			
Benchmark base cost	#	Item/ sub-item	Unit	$/ Unit
	4.18.1	Fixed table; aluminium slats; back supported seats	each	4,800
	4.18.2	Extra over for shade covering	M2	350
Banding	▪ N/A			
Minimum quantity	▪ N/A			

Note: material is aluminium (faux wood)

Item Definition – Combination of the 3 tables				
Item Name	**Playground** **Soft surfaces-softfall under play equipment** **Fencing - playground**			
Item No.	4.19			
Functional Description	Installation only of play equipment for children of a mixed age Softfall under play equipment with foundation layers and drainage Playground fencing and access gates including foundations			
Inclusions	▪ Concrete foundations ▪ Supply of plant and labour for equipment install ▪ EPDM softfall, coloured rubber approximately 65mm depth with rubber top coat ▪ 200mm loose fill material ▪ Basic drainage ▪ Timber edge treatment ▪ Notional installation area of 400m2 ▪ Fencing consisting of vertical steel posts, top and bottom rail, mesh and powder-coated, steel galvanised finish ▪ Extra over for gate access ▪ Concrete footings ▪ Vandal resistant coating			
Key scope of work inclusions	▪ Nominal excavation for foundations with material retained on-site ▪ Installation works (for varying Prime Cost (PC) Sums of playground equipment) ▪ Nominal 500mm cut/fill balance ▪ Installation works ▪ Nominal excavation for foundations with material retained on-site ▪ Installation works			
Exclusions (may be reasonably required)	▪ Security lighting (separate item - 3.22 (L))			
Exclusions (exceed minimum requirements	▪ Soft surfacing and associated site preparation ▪ Line-markings ▪ Motorised/ electrical gate access			
Key identified risks	▪ Contaminated materials ▪ Surplus excavated material requiring disposal off site ▪ Imported fill required for site levelling			
Sub-item details	4.19.1	Installation of playset equipment with a PC Sum value of up to $10,000		
	4.19.2	Installation of playset equipment with a PC Sum value of up to $15,000		
	4.19.3	Installation of playset equipment with a PC Sum value of up to $20,000		
	4.19.4	Soft fall - Single colour; no pattern		
	4.19.5	Soft fall Multiple colours; patterned		
	4.19.6	Fencing Steel posts and mesh: height 950mm		
	4.19.7	Extra over mesh access gate; single		
Specific sub item information	▪ N/A			
Applicable standards	▪ Australian Standard AS4685-2004: Playground Equipment ▪ Australian Standard AS/NZS4422-1996: Playground Surfacing			
Cost information				
Methodology	First principles estimate - Manufacture cost and projects of similar scope			
Benchmark base cost	#	Item/ sub-item	Unit	$/ Unit
	4.19.1	Installation of playset equipment with a PC Sum value of up to $10,000	each	5,400
	4.19.2	Installation of playset equipment with a PC Sum value of up to $15,000	each	7,200
	4.19.3	Installation of playset equipment with a PC Sum value of up to $20,000	each	9,000
	4.19.4	Soft fall - Single colour; no pattern	m2	250
	4.19.5	Soft fall Multiple colours; patterned	m2	280
	4.19.6	Steel posts and mesh: height 950mm	m	120
	4.19.7	Extra over mesh access gate; single	each	280
Banding	▪ N/A			
Minimum quantity	▪ 100m2			

Item Definition				
Item Name	**Seating area**			
Item No.	4.20			
Functional Description	**Aluminium framed park bench**			
Inclusions	▪ Aluminium park seating 2000-3000mm wide ▪ Concrete base			
Key scope of work inclusions	▪ Nominal excavation for foundations with material retained on site ▪ Installation works			
Exclusions (may be reasonably required)	▪ N/A			
Exclusions (exceed minimum requirements	▪ Arm rests			
Key identified risks	▪ N/A			
Sub-item details	4.20.1	Aluminium frame; aluminium slats; back support		
	4.20.2	Aluminium frame; aluminium slats; no back support		
	4.20.3	Aluminium frame; timber slats; back support		
	4.20.4	Aluminium frame; timber slats; no back support		
Specific sub item information	▪ N/A			
Applicable standards	▪ Landcom: Open Space Design Guidelines (2008)			
Cost information				
Methodology	First principles estimate (supplemented with market quotation			
Benchmark base cost	#	Item/ sub-item	Unit	$/ Unit
	4.20.1	Aluminium frame; aluminium slats; back support	each	4,800.00
	4.20.2	Aluminium frame; aluminium slats; no back support	each	4,200.00
	4.20.3	Aluminium frame; timber slats; back support	each	3,800.00
	4.20.4	Aluminium frame; timber slats; no back support	each	3,200.00
Banding	▪ N/A			
Minimum quantity	▪ N/A			



Item Definition				
Item Name	**Shade sail**			
Item No.	4.21			
Functional Description	**Free standing shade structure including shade cloth**			
Inclusions	▪ Standalone shade structure, galvanised steel, powder-coated posts with stainless steel fixings ▪ Concrete foundations ▪ Stitched shade sail with hipped roof based on 100m2 total cover			
Key scope of work inclusions	▪ Nominal excavation for foundations with material retained on site ▪ Installation works			
Exclusions (may be reasonably required)	▪ N/A			
Exclusions (exceed minimum requirements	▪ N/A			
Key identified risks	▪ N/A			
Sub-item details	▪ N/A			
Specific sub item information	▪ N/A			
Applicable standards	▪ N/A			
Cost information				
Methodology	Reference pricing			
Benchmark base cost	**#**	**Item/ sub-item**	**Unit**	**$/ Unit**
	4.21	Shade Structure	m^2	350
Banding	▪ N/A			
Minimum quantity	▪ N/A			

Item Definition		
Item Name	**Spectator seat/ea**	
Item No.	4.22	
Functional Description	**Portable tiered seating (3 tiers)**	
Inclusions	▪ Aluminium tiered seating 3000-5000mm wide x 1800mm deep	
Key scope of work inclusions	▪ Excavations for levelling of platform base ▪ Setout, supply, installation, preparation and cleaning of each component of the metal seating stands.	
Exclusions (may be reasonably required)	▪ Concrete/gravel base	
Exclusions (exceed minimum requirements	▪ N/A	
Key identified risks	▪ N/A	
Sub-item details	▪ 4.22.1	▪ Aluminium tiered seating 3000mm wide
	▪ 4.22.2	▪ Aluminium tiered seating 3500mm wide
	▪ 4.22.3	▪ Aluminium tiered seating 4000mm wide
	▪ 4.22.4	▪ Aluminium tiered seating 5000mm wide
Specific sub item information	▪ N/A	
Applicable standards	▪ N/A	

Cost information

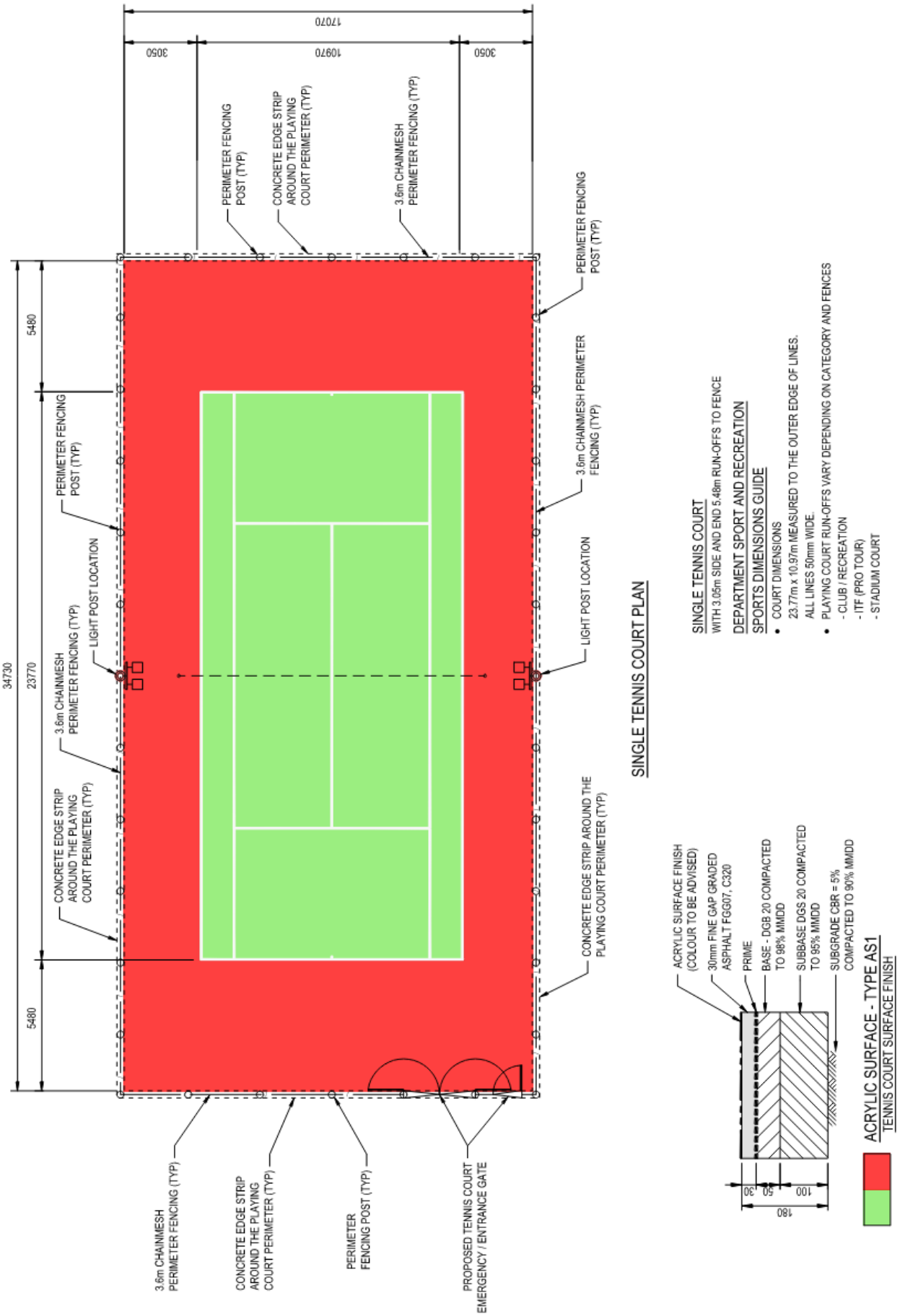
Methodology: Contractor quotations with applied CPI

Benchmark base cost

#	Item/ sub-item	Unit	$/ Unit
4.22.1	Aluminium tiered seating 3000mm wide	each	5,000.00
4.22.2	Aluminium tiered seating 3500mm wide	each	5,300.00
4.22.3	Aluminium tiered seating 4000mm wide	each	5,500.00
4.22.4	Aluminium tiered seating 5000mm wide	each	6,500.00

Banding	▪ N/A
Minimum quantity	▪ N/A

Item Definition				
Item Name	**Tennis court & lighting**			
Item No.	4.23			
Functional Description	Single court outdoor tennis court, with 'Plexipave Tennis Court' Acrylic Surface, including court markings and net posts			
Inclusions	▪ Court size of 593m2, inclusive of 5.48m clearance at back of court, 3.05 clearance at side of court. ▪ 100mm thick subbase DGS 20 ▪ 50mm thick Base DGB 20 ▪ 30mm Fine Gap Graded Asphalt ▪ 'Plexipave Tennis Court' Acrylic Surface Finish ▪ Court markings and removable net posts ▪ Perimeter fencing ▪ Pedestrian gate (1.2m wide) ▪ Double leaf Emergency gate (3.0m wide) ▪ Floodlighting (typical 250 Lux for social play on 15m high pole) ▪ Basic drainage			
Key scope of work inclusions	▪ Site levelling (cut/fill neutral) ▪ Installation works			
Exclusions (may be reasonably required)	▪ N/A			
Exclusions (exceed minimum requirements	▪ Spectator seating			
Key identified risks	▪ Relocation and diversion of existing utilities ▪ Contaminated materials ▪ Surplus excavated material requiring disposal off-site ▪ Imported fill required for site levelling			
Sub-item details	▪ N/A			
Specific sub item information	▪ N/A			
Applicable standards	▪ Court size: International Tennis Federation Rules of Tennis, adopted by Tennis Australia			
Cost information				
Methodology	Reference pricing			
Benchmark base cost	#	Item/ sub-item	Unit	$/ Unit
	4.23	Tennis court & lighting	court	460,000
Banding	▪ N/A			
Minimum quantity	▪ N/A			


17070
3050
10970
3050
PERIMETER FENCING POST (TYP)
CONCRETE EDGE STRIP AROUND THE PLAYING COURT PERIMETER (TYP)
3.6m CHAINMESH PERIMETER FENCING (TYP)
PERIMETER FENCING POST (TYP)
3.6m CHAINMESH PERIMETER FENCING (TYP)
LIGHT POST LOCATION
LIGHT POST LOCATION
CONCRETE EDGE STRIP AROUND THE PLAYING COURT PERIMETER (TYP)
34730
23770
5480
5480
PERIMETER FENCING POST (TYP)
3.6m CHAINMESH PERIMETER FENCING (TYP)
CONCRETE EDGE STRIP AROUND THE PLAYING COURT PERIMETER (TYP)
3.6m CHAINMESH PERIMETER FENCING (TYP)
CONCRETE EDGE STRIP AROUND THE PLAYING COURT PERIMETER (TYP)
PERIMETER FENCING POST (TYP)
PROPOSED TENNIS COURT EMERGENCY / ENTRANCE GATE
SINGLE TENNIS COURT PLAN
SINGLE TENNIS COURT
WITH 3.05m SIDE AND END 5.48m RUN-OFFS TO FENCE
DEPARTMENT SPORT AND RECREATION
SPORTS DIMENSIONS GUIDE
• COURT DIMENSIONS
23.77m x 10.97m MEASURED TO THE OUTER EDGE OF LINES.
ALL LINES 50mm WIDE.
• PLAYING COURT RUN-OFFS VARY DEPENDING ON CATEGORY AND FENCES
- CLUB / RECREATION
- ITF (PRO TOUR)
- STADIUM COURT
ACRYLIC SURFACE FINISH (COLOUR TO BE ADVISED)
30mm FINE GAP GRADED ASPHALT FGG07, C320
PRIME
BASE - DGB 20 COMPACTED TO 98% MMDD
SUBBASE DGS 20 COMPACTED TO 95% MMDD
SUBGRADE CBR = 5% COMPACTED TO 90% MMDD
30
50
100
180
ACRYLIC SURFACE - TYPE AS1
TENNIS COURT SURFACE FINISH

Item Definition		
Item Name	**Turfing**	
Item No.	4.24	
Functional Description	**Rolled turf on sand bed with irrigation**	
Inclusions	▪ Rolled buffalo turf or hydroseeding on 200mm-400mm sand bed ▪ Water supply piping and tap connections for irrigation ▪ Hose and portable sprinkler accessories	
Key scope of work inclusions	▪ Nominal 500mm cut/fill balance ▪ Re-use of topsoil from local stockpile ▪ Water supply piping maximum run of 50m ▪ Initial fertilisation ▪ Installation works	
Exclusions (may be reasonably required)	▪ N/A	
Exclusions (exceed minimum requirements	▪ 6 months maintenance	
Key identified risks	▪ Contaminated materials ▪ Surplus excavated material requiring disposal off-site ▪ Imported fill required for site levelling	
Sub-item details	4.24.1	Rolled turf; buffalo
	4.24.2	Hydro seeding
Specific sub item information	▪ N/A	
Applicable standards	▪ Landcom: Open Space Design Guidelines (2008)	
Cost information		
Methodology	Reference pricing	

Benchmark base cost	#	Item/ sub-item	Unit	$/ Unit
	4.24.1	Rolled turf; buffalo – includes ground prep and pop up sprinklers. No provision for water connection	m2	40.00
	4.24.2	Hydro seeding – include ground prep	m2	10.00

Banding	▪ N/A
Minimum quantity	▪ N/A