

**BODDINGTON - RANFORD
DRAINAGE STUDY –
STAGE 2**

Porter



Report Prepared For:

SHIRE OF BODDINGTON

Report Prepared By:

PORTER CONSULTING ENGINEER

PO Box 1036

CANNING BRIDGE WA 6153

Phone: (08) 9315 9955

Fax: (08) 9315 9959

Email: office@portereng.com.au

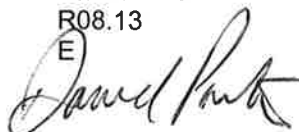
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1.0 INTRODUCTION

Porter Consulting Engineers carried out a Stage 1 drainage study for the Boddington and Ranford townsites to identify deficiencies in the existing drainage network and the extent of catchments and new development areas, along with likely upgrades in drainage required to service those development areas.

The Stage 2 study examines in more detail the drainage infrastructure and its capacity within each catchment and through reference to the Boddington Growth Plan, Local Planning Strategy, draft Local Planning Scheme No. 3 and recent subdivision development applications, makes an assessment on costs needed to upgrade the existing drainage network to accommodate future growth and apportions cost to future subdivision / development.

2.0 DRAINAGE NETWORK REVIEW

The existing drainage network has been mapped and reviewed during a severe winter storm to identify local deficiencies and peculiarities. The study area is shown in **Plan 1**. The attached **Plans 2, 3 and 9** outline the:

- existing drainage;
- natural topographic drainage catchments;
- the development modified catchments;
- significant floodways; and
- likely development areas within the townsite catchment.

The Boddington townsite has been split into the Boddington West precinct and the Boddington precinct separated by the major north south floodway. The Ranford townsite is treated as a single precinct. The drainage catchments for each are shown in **Plans 4, 5 and 9**.

Following detailed onsite review of the drainage network, **Plans 6, 7 and 10** show where improvements are required to overcome either existing deficiencies in the network or upgrading to accommodate development from the likely development areas.

The improvement drainage works are those required as a matter of normal course to overcome deficiencies in the local network but are unrelated to future development. These works are the responsibility of the local authority.

The brownfield development works largely consists of installing additional lot drainage systems, providing in system detention and upgrading primary outlet lines from Bannister Road to the river via Wuraming Avenue and Memorial Park.

The greenfield development works consists of:

- maintaining predevelopment runoff rates or a discharge rate agreed with Department of Water; and

- the main drain upgrade that has been recently undertaken along Pollard Street and Forrest Street to connect the development area east of the townsite to the river. This is essentially the main drain for the eastern precinct where the upgrade is largely required to allow that area to develop.

As a general improvement across all drainage networks, where a pipe drainage system discharges to the natural creek or river system, we have allowed to provide a gross pollutant trap at that outlet. Where that outlet is being upgraded as part of either a greenfield or brownfield drainage improvement, the cost of that gross pollutant trap has been allocated to that upgrade. The balance, however, have been allocated to the general improvements in the local drainage network.

The Ranford townsite has little formal drainage other than culverts on natural drainage lines at road crossings.

The current assessment relates to their capacity to deal with post development drainage at the extreme 1 in 100 storm event. Any greenfield development will require the subdividers to construct a drainage system that manages runoff within the subdivision for the lesser storm events and discharge does not exceed the pre development rate. The Department of Water requires the 1 year 1 hour event to be retained and treated for water quality. Bio retention areas are to be sized at 2% of the connected impervious catchment.

Roof runoff should be detained on lots for at least the 1 year 1 hour event and opportunity should be sought to locate bio retention areas in the road reserve high in the catchment for ‘close to source’ water quality treatment.

Table 1 summarizes the assessment of the Ranford culverts post development.

Table 1
Ranford -Culvert Size Required Post Development

CATCHMENT DETAIL	CROSSMAN 1	CROSSMAN 2	CROSSMAN 3	RIVER 4	RIVER 5	RIVER 6	MITCHELL 7	CROSSMAN 8	CROSSMAN 9	CROSSMAN 10
Cumulative Area (ha)	15.2	18.7	42.6	19.4	17.8	143.0	1722.0	1872	9.5	18
L (km)	0.63	0.70	1.09	1.03	0.34	1.43	5.68	6.60	0.43	1.0
S (m/km)	156	128	63	188	92	30	17	7.6	15	156
tc (min)	16	18	30	24	10	41	142	191	18	25
C 1	0.2	0.45	0.3	0.45	0.2	0.2	0.2	0.2	0.45	0.2
I _{10tc} (mm/hr)	62	56	39	46	78	39	14	11	56	45
I _{30tc} (mm/hr)	92	83	56	67	118	48	19	15	83	65
I _{100tc} (mm/hr)	107	96	64	77	138	55	22	17	96	75
Q ₁₀ (m ³ /s)	0.52	1.31	1.38	1.12	0.77	3.10	13.40	11.45	0.66	0.45
Q ₅₀ (m ³ /s)	0.78	1.94	1.99	1.62	1.17	3.82	18.19	15.61	0.98	0.65
Q ₁₀₀ (m ³ /s)	0.90	2.25	2.27	1.87	1.37	10.08	21.06	17.69	1.14	0.75
Pipe Diameter required for Q ₁₀₀ (m) 2	0.6	0.9	0.9	0.9	0.75	2 x 1.2	2 x 1.5	2 x 1.5	0.75	0.6

Existing	Box 0.6 x 1.2	2 x 0.75 \emptyset	2 x Box 0.45 x 0.9	2 x Box 0.45 x 0.9	0.45 \emptyset	0.375 \emptyset	4 x 1.05 \emptyset	4 x 1.5 \emptyset	Box 0.45 x 0.9	1.0 \emptyset 0.6 \emptyset
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- 1 C for large rural residential lots and pasture after redevelopment = 0.2
C for urban residential infill = 0.45.
- 2 Assume grade 1:50

3.0 DRAINAGE IMPROVEMENT COSTS

In the attached schedules we outline the costs for undertaking the respective base drainage, greenfield drainage and brownfield drainage improvements, and separate costs for the upgrading of the Forrest Street/Pollard Street main drain. Council undertook the latter in 2008/09 and we have escalated the figure to March 2013 value.

The costs use current rates escalated for the Boddington region and allow for design work, construction work, project control by Council and site management.

In each precinct, we have assumed that drainage works would be undertaken as a construction package and not as a series of separate small projects.

Table 2 summarises the costs based on the three primary precincts.

Table 2
Drainage Improvement Costs

Precinct	Rectification of Existing (excl GST)	Brownfield Infill Development (excl GST)	Greenfield Development (excl GST)
Boddington West	\$743,898.00	\$129,132.00	-
Boddington	\$720,254.00	\$1,005,211.00	\$1,220,283.00
Forrest St/Pollard St Main Drain	-	-	*\$686,537.00
Ranford	\$117,315.00	\$332,584.00	\$123,699.00

*Actual cost by Council indexed to March 2013.

4.0 DEVELOPMENT COST CONTRIBUTION FOR DRAINAGE WORKS

Each of the precincts has been reviewed based on the Boddington Supertown Growth Plan, Local Planning Strategy and draft Local Planning Scheme No. 3. The identified development areas are within the drainage catchments discharging to the Boddington, Boddington West and Ranford drainage infrastructure.

The expected lot yield for the development areas are shown in **Table 3**. The yields are based on the density coding and 80% lot area and 20% roads and public open space and information from the Council in relation to the practical likely uptake in the brownfield areas. It is evident that the majority of the development will be greenfield development, however, it is likely that:

- a number of infill sites will become attractive as part of any rezoning initiatives;
- the main town residential and commercial precinct will undergo additional growth as allowable densities are increased.

**Table 3
Boddington and Ranford Drainage**

Site	Density	Brownfield Lots	Greenfield Lots
Boddington / Boddington West			
Lots 58 – 60 Pollard	R20	48	-
Lots 12 Hakea & 32, 3, 10 Pollard	R20	18	-
Lot 9001 River (west)	R20/40	-	550
Lot 1 Farmers	R15	64	-
Main Town Residential (R15)	Rezone to R20/30	59	-
Ranford			
Lot 28 Crossman	R5	82	-
Lots 9 & 10 River	R5	19	-
Lot 9001 River (east)	R1 – R12.5	-	540
Lot 51 River	R5	8	-
Lots 79, 81, 97, 99 & 101 River	R5	82	-

The distribution of the drainage improvement costs to those developments that create the need for the drainage improvement work is shown in **Table 4**.

**Table 4
Development Cost Contribution to Drainage Upgrades (excluding GST)**

Area	Brownfield			Greenfield		
	Lot Yield	Drainage Cost	Cost Per Lot	Lot Yield	Drainage Cost	Cost Per Lot
Boddington	145	\$1,005,211	\$6932	550	\$1,220,083 (basins) \$ 686,537 (pipe) \$1,906,620	\$2,218 \$1,248 \$3,466
Boddington West	66	\$129,132	\$1,956	-	-	-
Ranford	191	\$332,584	\$1741	540	\$123,699	\$229

The improvements in the Boddington West brownfield area and the Boddington greenfield area are quite clear cut, however, in the Boddington brownfield development it is difficult to fully determine the timeframe over which those changes might occur. It is expected that all of the existing lots within that area will also benefit from improved drainage. Council may need to consider a revised cost per lot on the basis that there will be other beneficiary lots to those new lots being created. Council currently has a drainage contribution levy of \$2,000 per lot. In view of the Boddington West brownfield area having drainage costs estimated at just under \$2,000 per lot, it would seem reasonable to maintain the \$2,000 per lot for the Boddington infill.

The Ranford brownfield area drainage consists of drainage detention and treatment systems prior to discharge to the natural waterway.

The Ranford greenfield area is largely unplanned and two large catchments. Each will require a drainage plan to retain the natural valley lines and attenuate runoff before it is released into the natural drainage system. The location of the drainage attenuation and treatment system must be part of the structure planning.

The introduction of a development cost contribution for new developments will need to be created in accordance with the West Australian State Planning Policy 3.6 Development Contributions for Infrastructure.

The purpose of the assessment of the drainage network and the identification of upgrading works is to provide the direct nexus between the need for the drainage and the development. This will allow a more robust scrutiny of the proposal as contributions can be clearly calculated and a development area identified.

In the case of greenfield developments, where the developer is required to install at its cost as part of the development of the primary infrastructure necessary to manage site discharge, only those works external to the site that are required to accommodate that discharge should be considered.

The drainage costs for the Boddington greenfield site do include the primary detention basins immediately adjacent to the existing residential area and their connections to the existing downstream drainage. If those works were all undertaken as part of the development at the subdivider's cost, the Developer Cost Contribution for that area could be reduced and restricted only to the costs associated with providing the primary outlet via the upgraded drain along Pollard Street and Forrest Street. That reduced cost would be \$1,248 per lot.

The drainage costs for the Ranford greenfield areas do not include any detention basins or treatment structures and their connections to the existing downstream drainage.

In summary, we expect Council should consider a development cost contribution in the order of:

- \$1,956 per lot for the Boddington West area;
- \$1,248 per lot for the Boddington greenfield area and require the Subdivider to install all development drainage, detention and treatment systems;
- a discounted \$2,000 per lot for the Boddington brownfield development area;
- \$229 per lot for the Ranford greenfield area and require the Subdivider to install all development drainage, detention and treatment systems; and
- \$1,741 per lot for the Ranford brownfield area.

These costs are in 2013/14 values and should be subject to an annual CPI review.

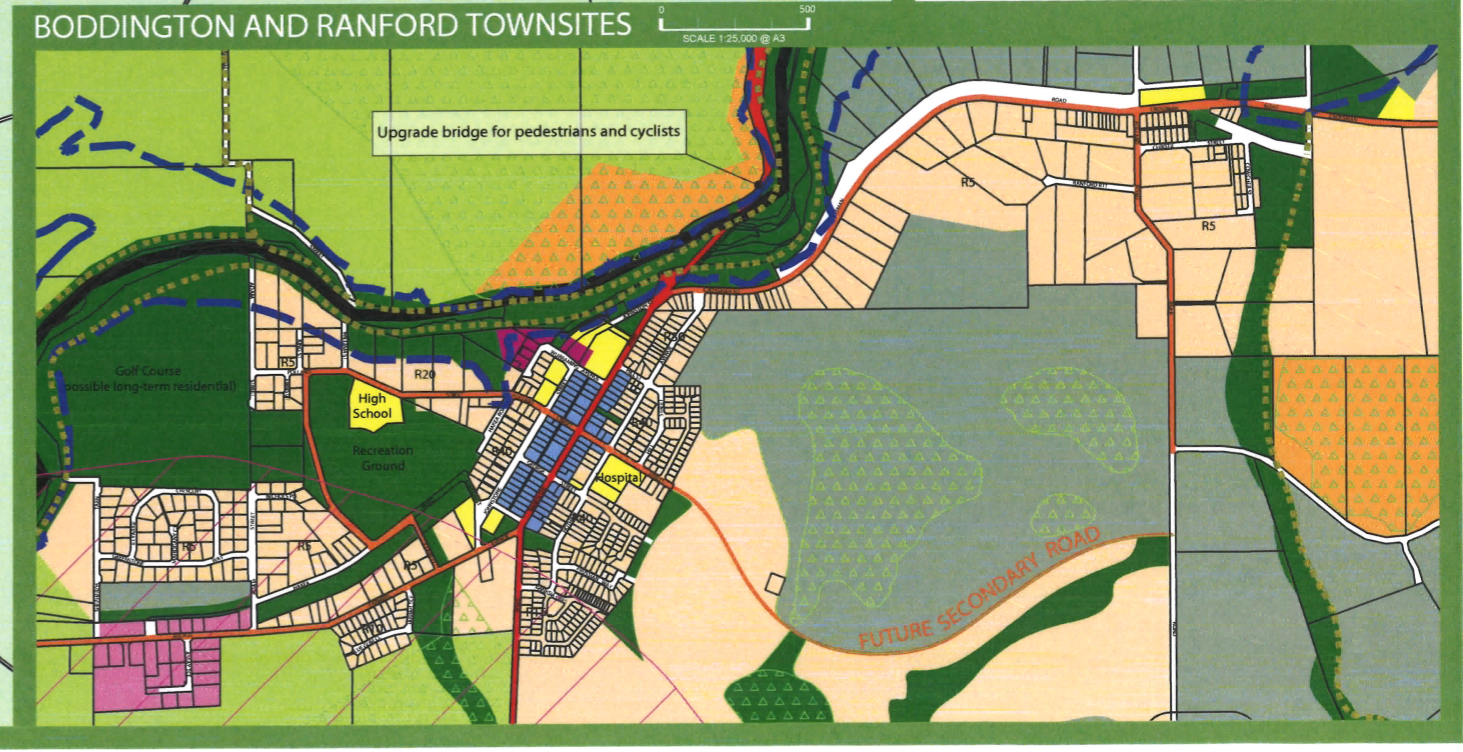
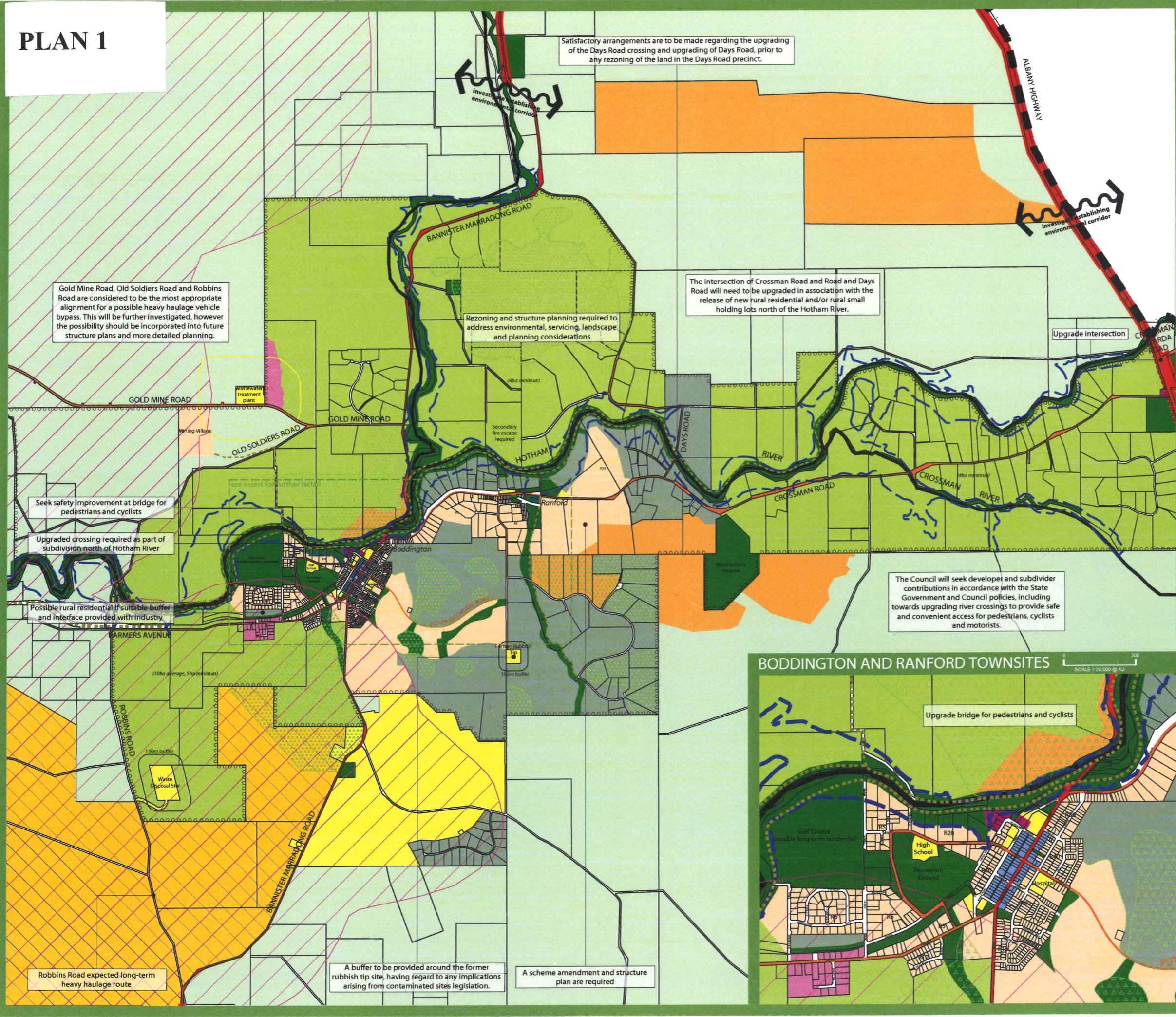
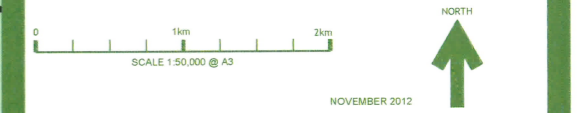
Developments outside these areas should require the Subdivider, at its cost, to manage and treat the stormwater to the pre development runoff rates or a discharge rate agreed with the Department of Water.

PLAN 1
Overall Guide Plan

PLAN 1

Shire of Boddington Local Planning Strategy Boddington and Surrounds

- Residential
- Rural Residential
- Rural Smallholdings
- Town Centre
- Industry
- Tourist
- Community Purposes
- General Agriculture
- State Forest / DEC Managed Land
- Conservation & Recreation
- Bushland Protection
- Mining Buffer
- Landscape Protection Area
- Tree Plantation Exclusion Area
- Environmental Corridor (Indicative)
- Flood Prone Land
- Wastewater Treatment Buffer
- Main Road
- Secondary Road
- Walking / Cycling Track
- Rivers / Watercourses
- Local Government Boundary



Satisfactory arrangements are to be made regarding the upgrading of the Days Road crossing and upgrading of Days Road, prior to any rezoning of the land in the Days Road precinct.

Gold Mine Road, Old Soldiers Road and Robbins Road are considered to be the most appropriate alignment for a possible heavy haulage vehicle bypass. This will be further investigated, however the possibility should be incorporated into future structure plans and more detailed planning.

The intersection of Crossman Road and Road and Days Road will need to be upgraded in association with the release of new rural residential and/or rural small holding lots north of the Hotham River.

Rezoning and structure planning required to address environmental, servicing, landscape and planning considerations

Seek safety improvement at bridge for pedestrians and cyclists

Upgraded crossing required as part of subdivision north of Hotham River

Possible rural residential if suitable buffer and interface provided with industry

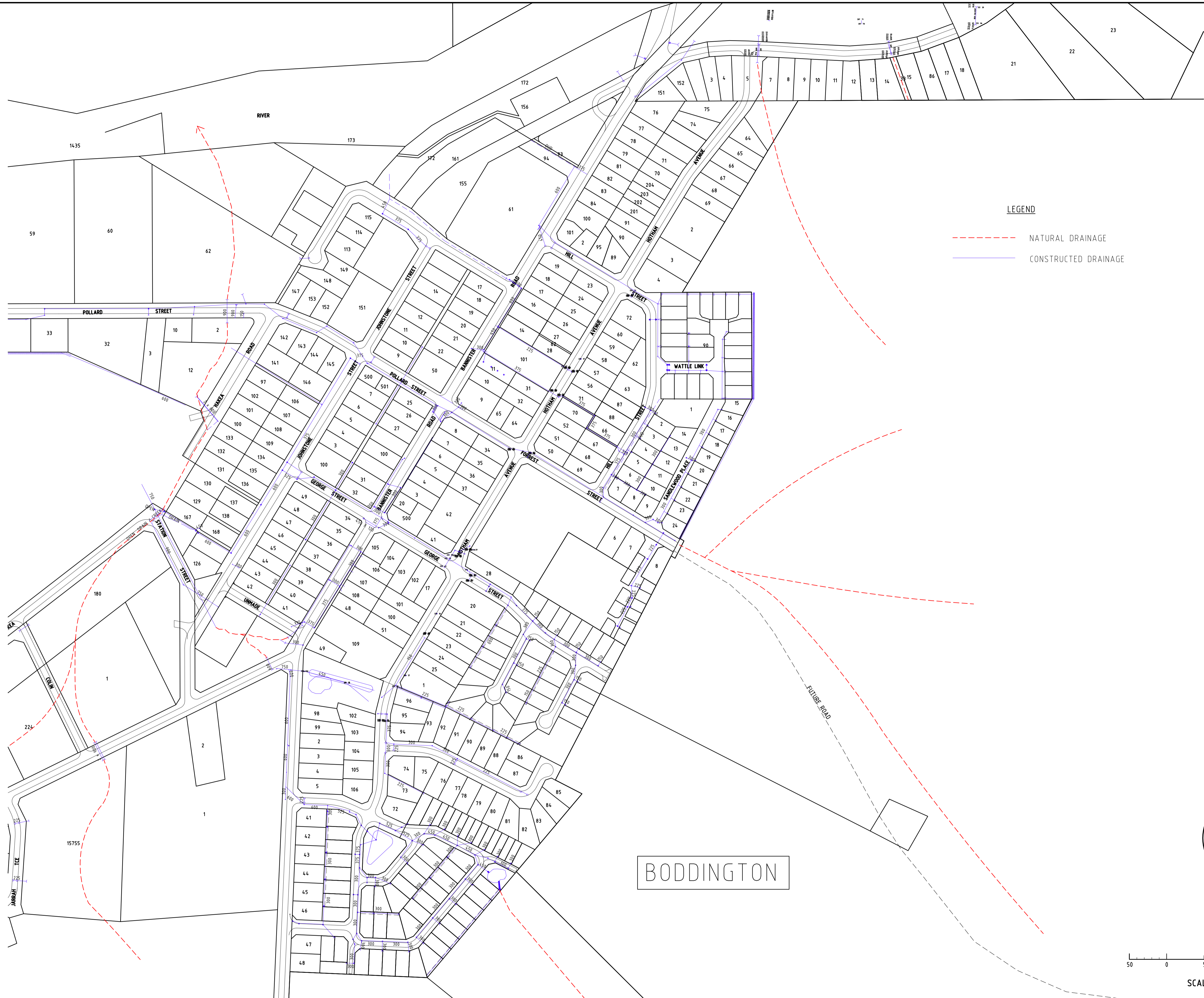
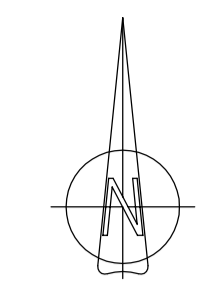
The Council will seek developer and subdivider contributions in accordance with the State Government and Council policies, including towards upgrading river crossings to provide safe and convenient access for pedestrians, cyclists and motorists.

Robbins Road expected long-term heavy haulage route

A buffer to be provided around the former rubbish tip site, having regard to any implications arising from contaminated sites legislation.

A scheme amendment and structure plan are required

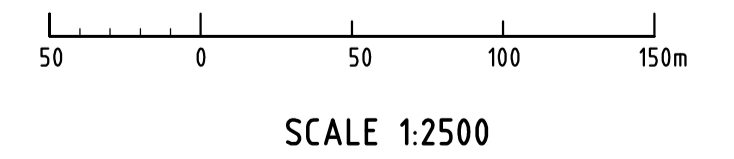
PLAN 2
Boddington Existing Drainage Plan



LEGEND

- - - NATURAL DRAINAGE
- CONSTRUCTED DRAINAGE

BODDINGTON



PROJECT: **BODDINGTON- RANFORD DRAINAGE MANAGEMENT PLAN**

REV	DATE	CHANGES AS PER COUNCIL, PLAN NUMBERS ALTERED	MEG
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Porter
 Consulting Engineers

Level 2 Kishara Court
 58 Kishara Road
 Mt Pleasant 4553 WA
 PO Box 1936
 Cannington 4153 WA
 Tel (08) 9315 9955
 Fax (08) 9315 9959
 Email office@portering.com.au
 www.portering.com.au

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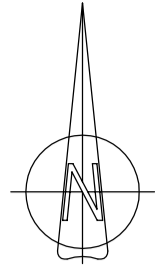
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PLAN 3
Boddington West Existing Drainage Plan



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BODDINGTON WEST

LEGEND

- NATURAL DRAINAGE
- CONSTRUCTED DRAINAGE

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Level 2 Kishara Court
 59 Kishara Road
 Mt Pleasant 4553 WA
 PO Box 1036
 Coalinga Bridge 4153 WA
 Tel (08) 9315 9955
 Fax (08) 9315 9959
 Email office@portereng.com.au
 www.portereng.com.au

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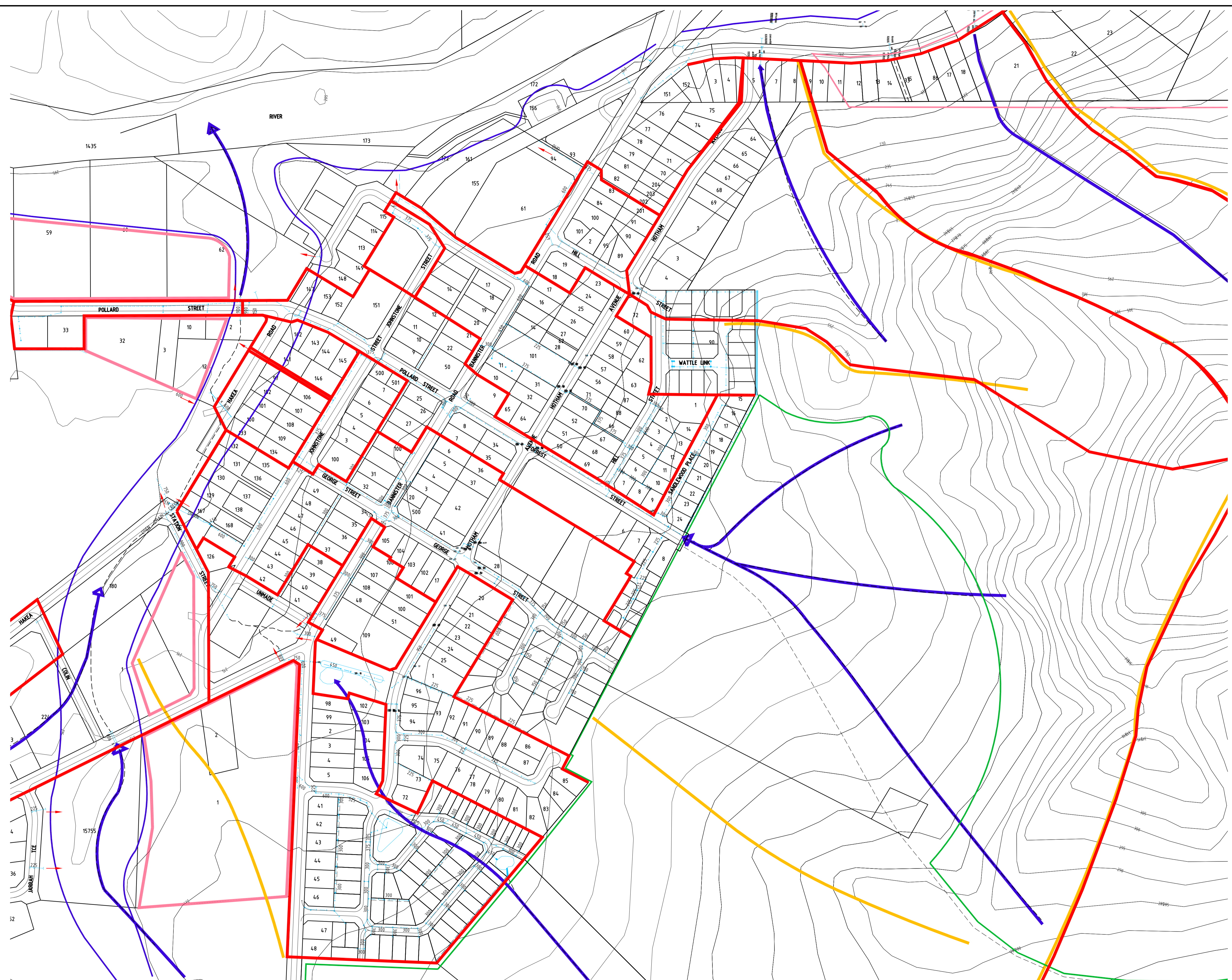
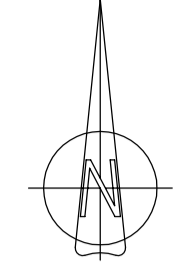
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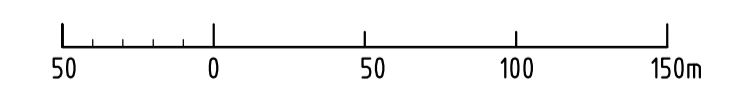
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PLAN 4
Boddington Catchment Plan



BODDINGTON

- LEGEND**
- OUTLET
 - MODIFIED CATCHMENT BOUNDARY
 - GREENFIELD DEVELOPMENT
 - BROWNFIELD DEVELOPMENT
 - NATURAL RIDGE
 - NATURAL VALLEY



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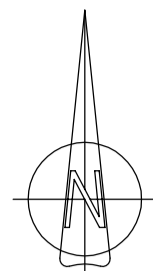
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 Consulting Engineers
 Level 2 Kishara Court
 53 Kishara Road
 Mt Pleasant 453 WA
 PO Box 1936
 Canning Bridge 4153 WA
 Tel (08) 9335 9955
 Fax (08) 9335 9959
 Email office@portereng.com.au
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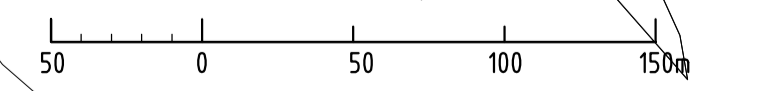
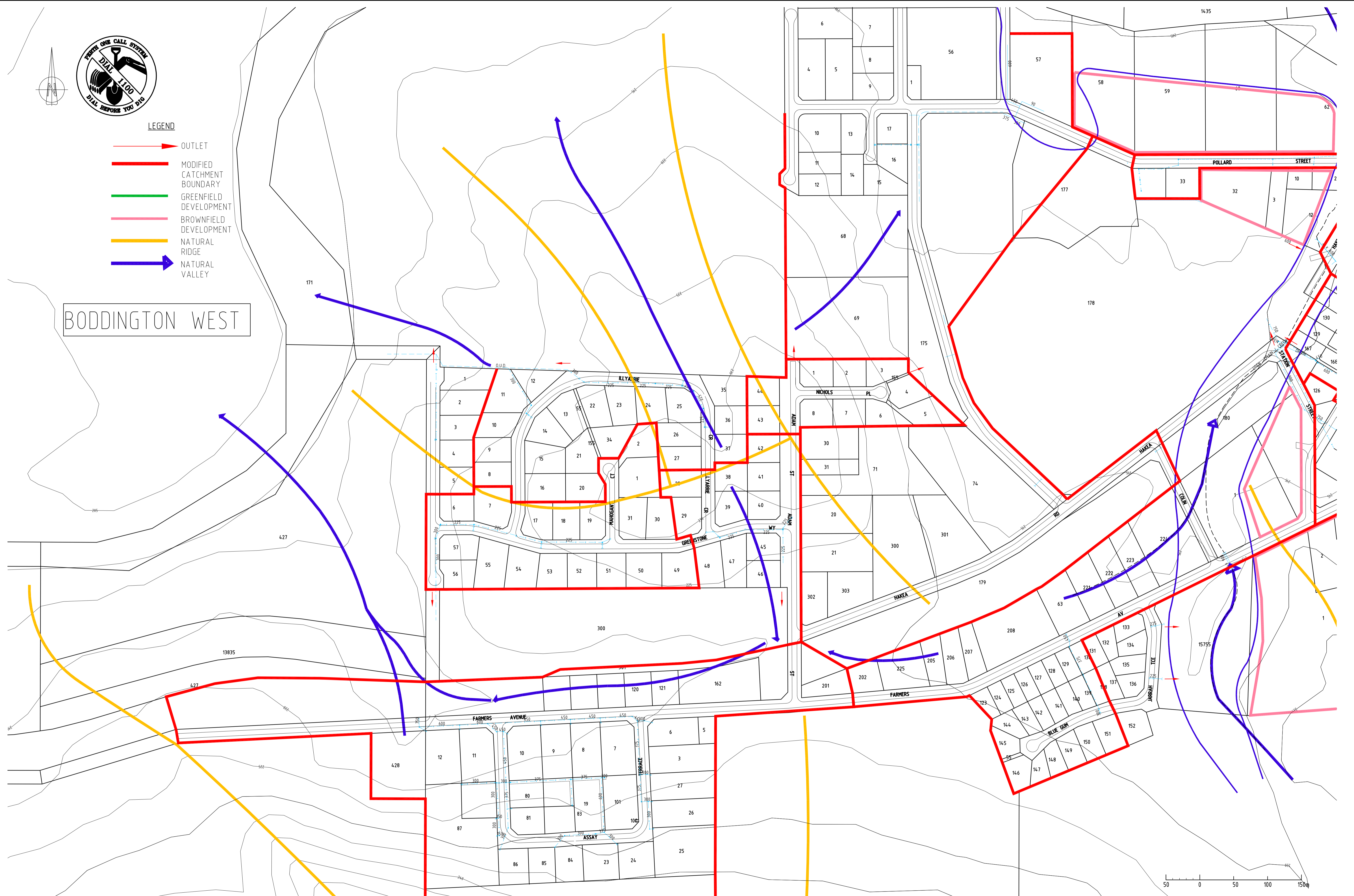
PLAN 5
Boddington West Catchment Plan



LEGEND

-  OUTLET
-  MODIFIED CATCHMENT BOUNDARY
-  GREENFIELD DEVELOPMENT
-  BROWNFIELD DEVELOPMENT
-  NATURAL RIDGE
-  NATURAL VALLEY

BODDINGTON WEST



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 Mt Pleasant 453 WA
 PO Box 1936
 Coalinga Bridge 453 WA
 Tel (08) 9315 9955
 Fax (08) 9315 9959
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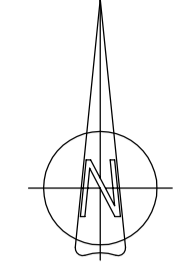
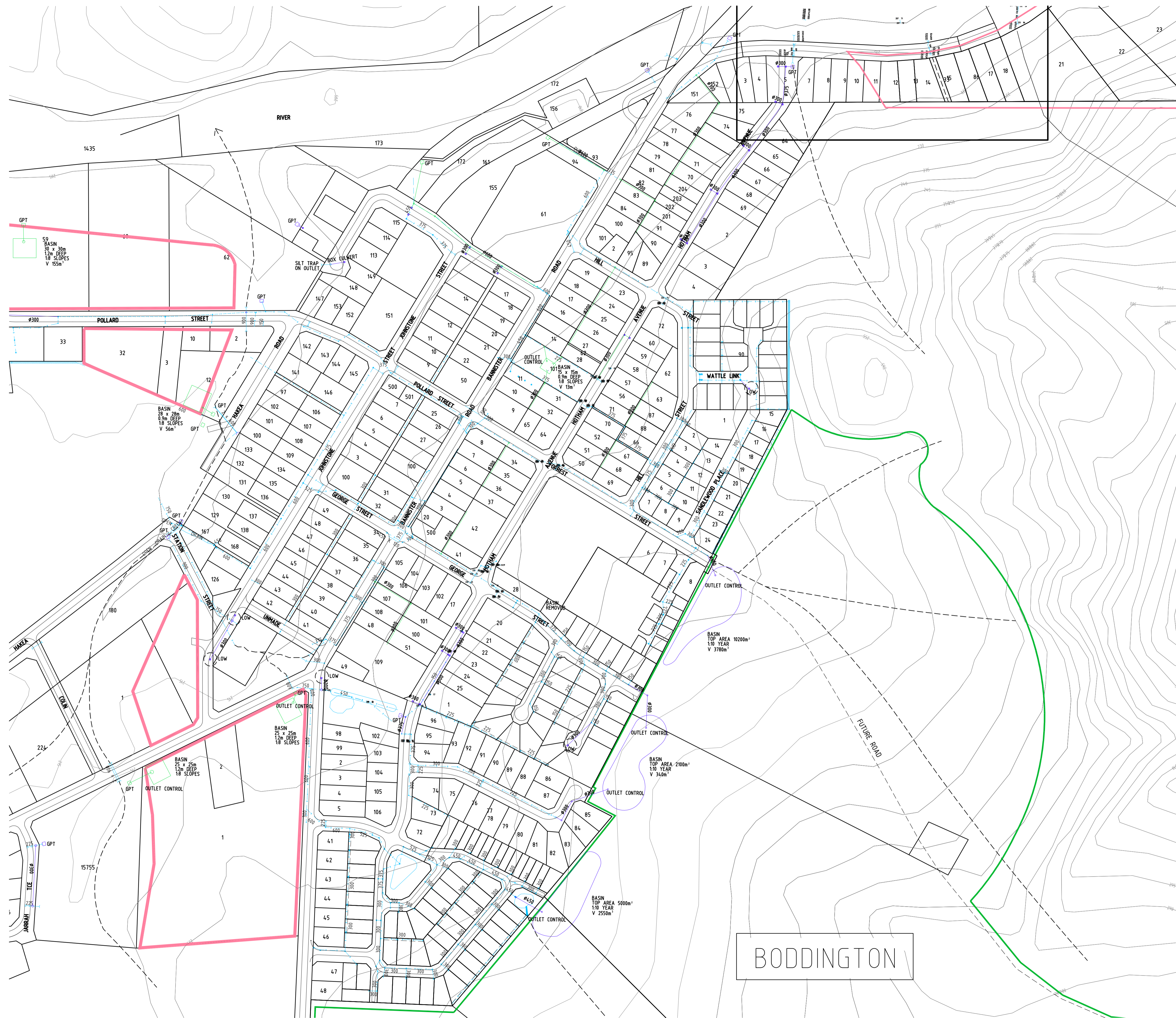
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PLAN 6
Boddington Proposed Drainage Plan



- LEGEND**
- EXISTING GROUND CONTOUR
 - EXISTING PAVEMENT
 - PROPOSED DRAINAGE INFILL
 - PROPOSED DRAINAGE RECTIFICATION
 - EXISTING DRAINAGE LINE
 - FUTURE RESIDENTIAL
 - BROWNFIELD DEVELOPMENT



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BODDINGTON

**BODDINGTON- RANFORD
DRAINAGE MANAGEMENT PLAN**

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 Mt Pleasant 453 WA
 PO Box 1036
 Cannock Bridge 453 WA
 Tel: (08) 9315 9955
 Fax: (08) 9315 9959
 Email: office@portereng.com.au
 www.portereng.com.au

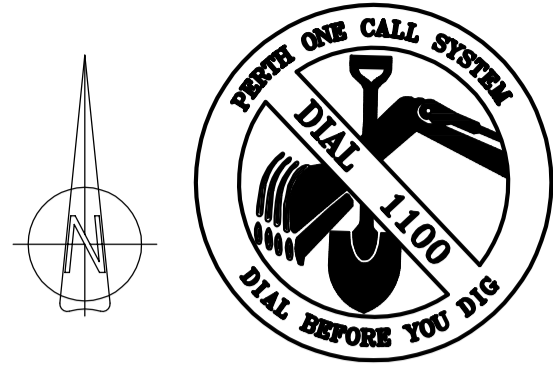
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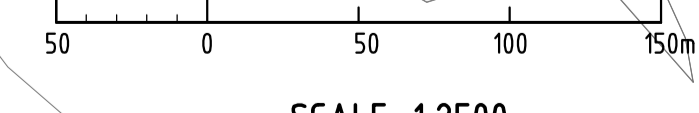
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DATE:	JUNE 2014	DESIGN:	BIH	DRAWN:	MEB	FILE NAME:	c:\PCE\11-4-57\11457-6.dwg
CHECK:	APPD						

PLAN 7
Boddington West Proposed Drainage Plan



LEGEND

-  EXISTING GROUND CONTOUR
-  EXISTING PAVEMENT
-  PROPOSED DRAINAGE INFILL
-  PROPOSED DRAINAGE RECTIFICATION
-  EXISTING DRAINAGE LINE
-  FUTURE RESIDENTIAL
-  BROWNFIELD DEVELOPMENT



SCALE 1:2500

PROJECT: BODDINGTON- RANFORD DRAINAGE MANAGEMENT PLAN

B 11-6-2014 CHANGES AS PER COUNCIL, PLAN NUMBERS ALTERED
 A 4-10-2010 PRELIMINARY PLOT FOR APPROVAL

MEG
MEB

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Level 2 Kishara Court
 59 Kishara Road
 Mt Pleasant 453 WA
 PO Box 1036
 Canning Bridge 4153 WA
 Tel (08) 9315 9955
 Fax (08) 9315 9959
 Email office@portereng.com.au
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CLIENT:

SHIRE OF BODDINGTON

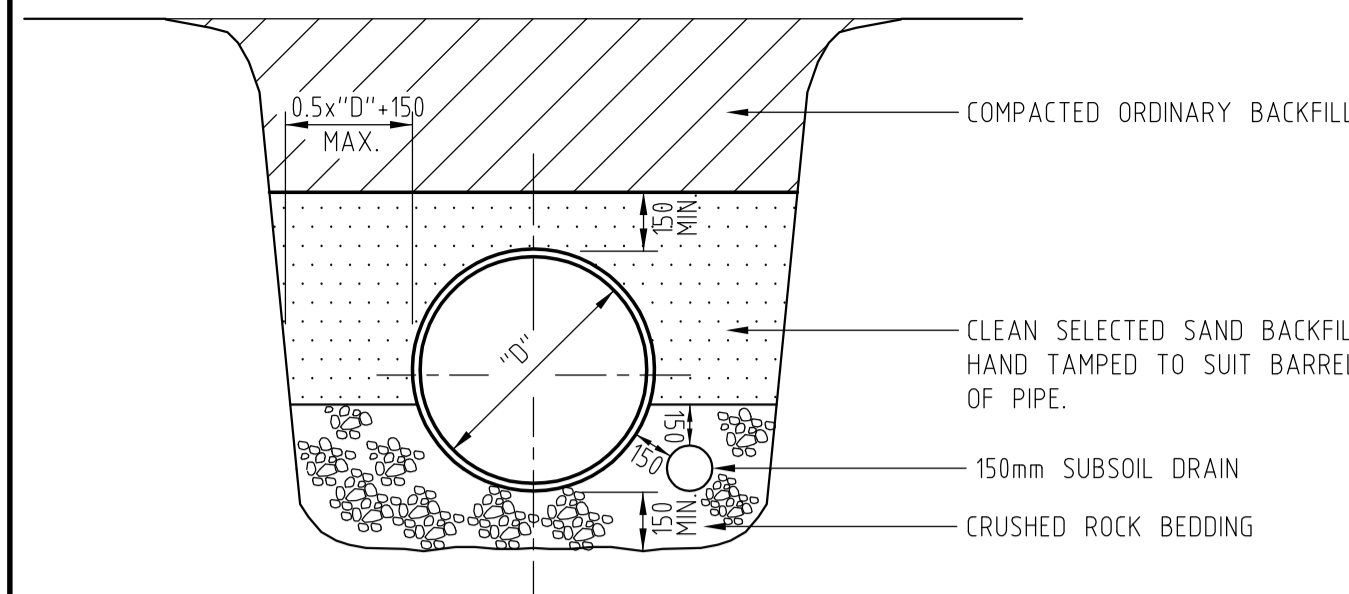
DRAWING: BODDINGTON WEST PROPOSED DRAINAGE

STATUS: **FOR APPROVAL**

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CHECK	APPD		



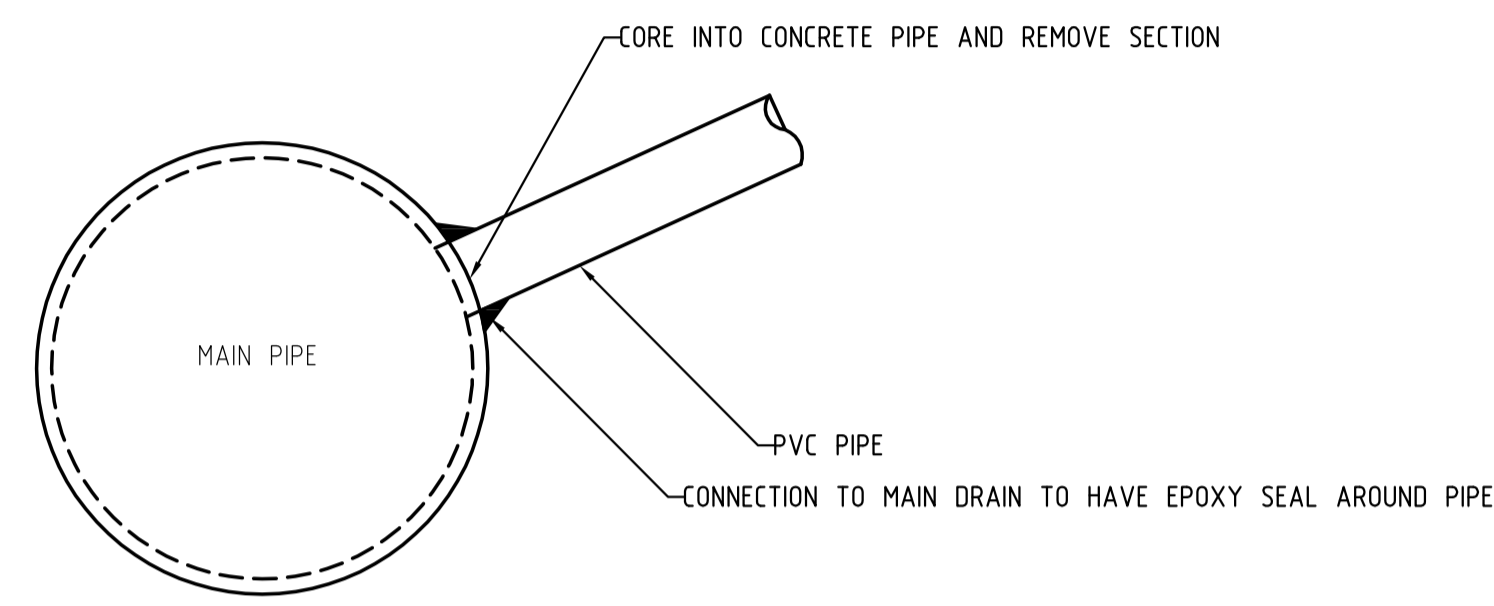
PLAN 8
Standard Details Plan



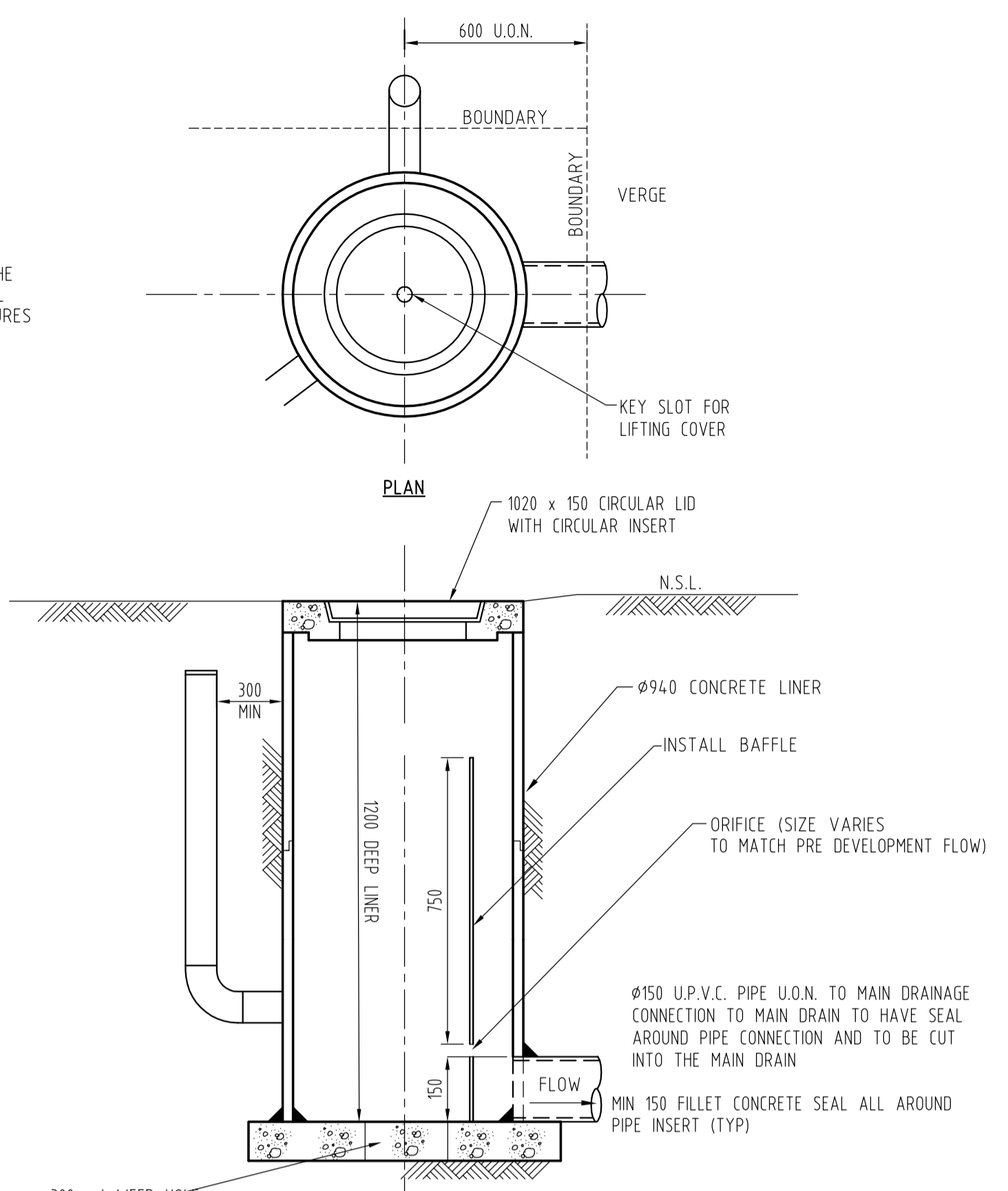
PIPE BEDDING DETAILS
NOT TO SCALE

PIPE BEDDING NOTES

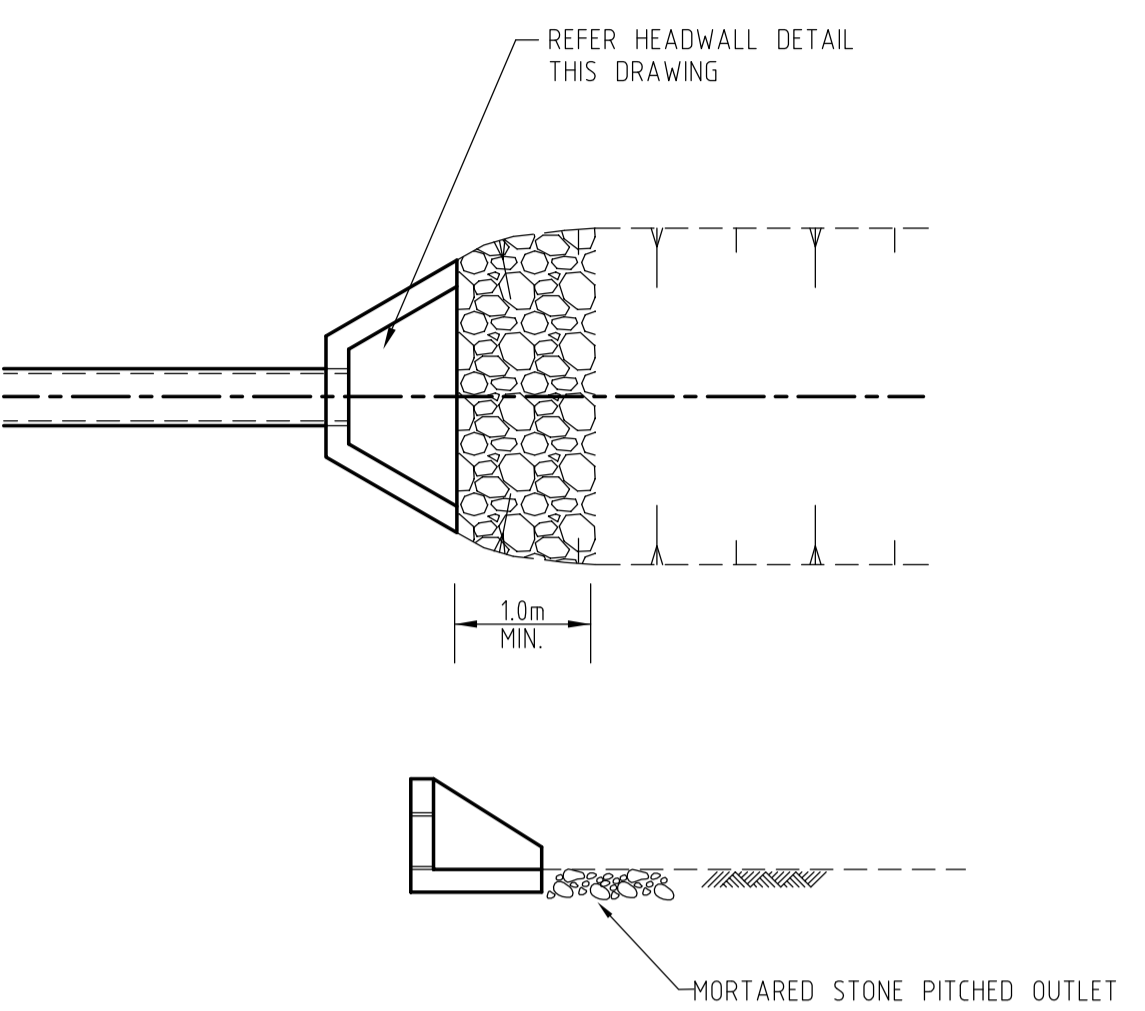
- SUB-SOIL DRAINAGE PIPES SHALL BE OF PVC SLOTTED PIPE WITH SLOTS LAID DOWN.
- WHERE PIPES ARE BEDDED ON CRUSHED ROCK, THE BEDDING CONDITION SHALL BE CARRIED PAST ALL MANHOLES, GULLIES & OTHER DRAINAGE STRUCTURES DOWNSTREAM.



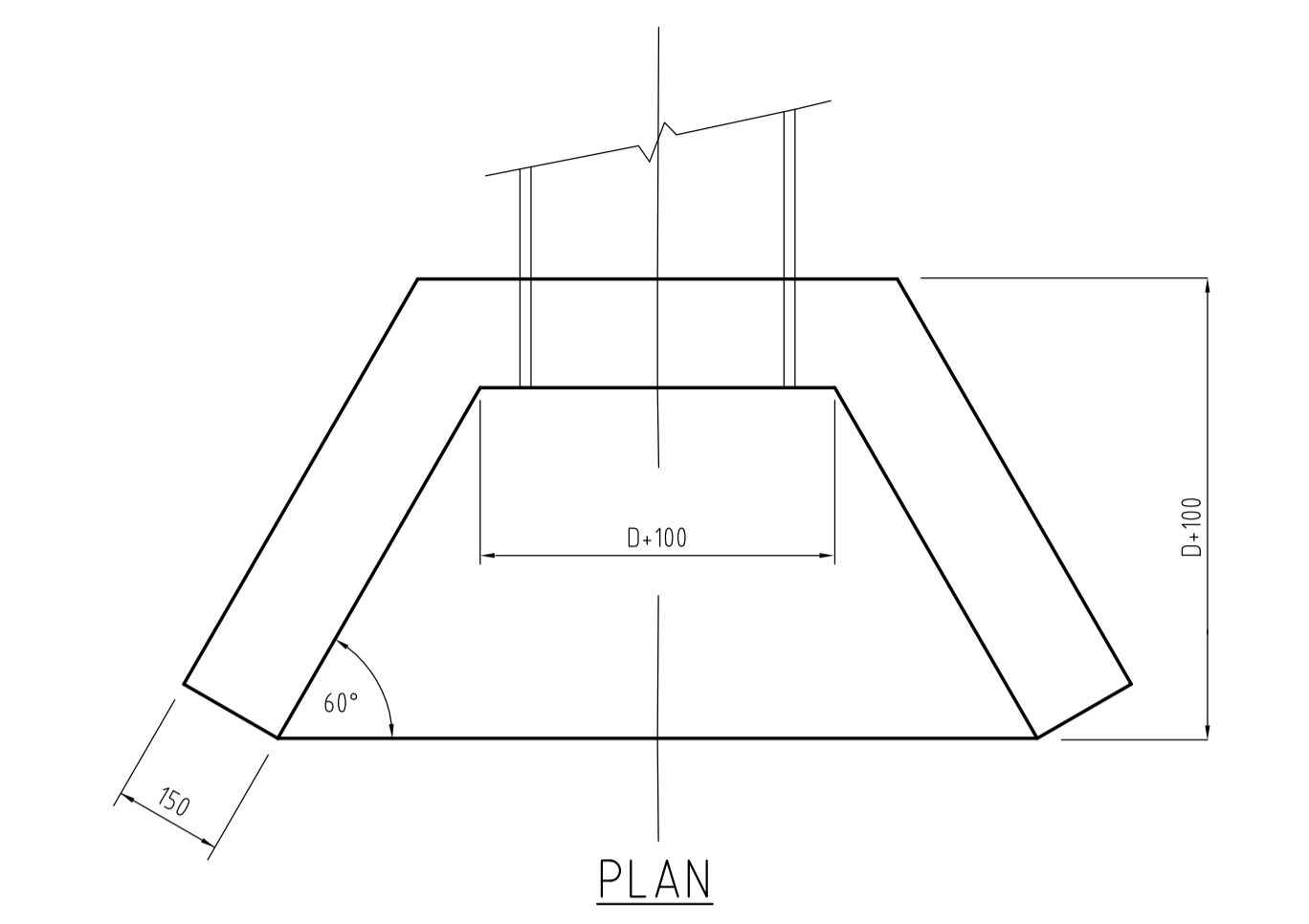
PVC DRAINAGE CONNECTIONS
NOT TO SCALE



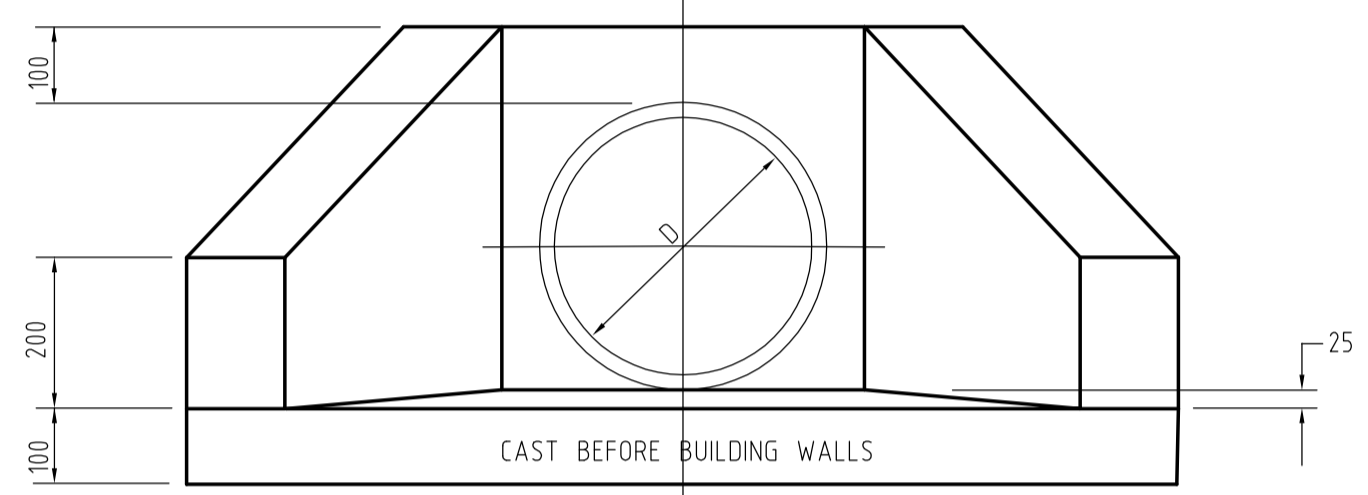
LOT CONNECTION PIT DETAIL



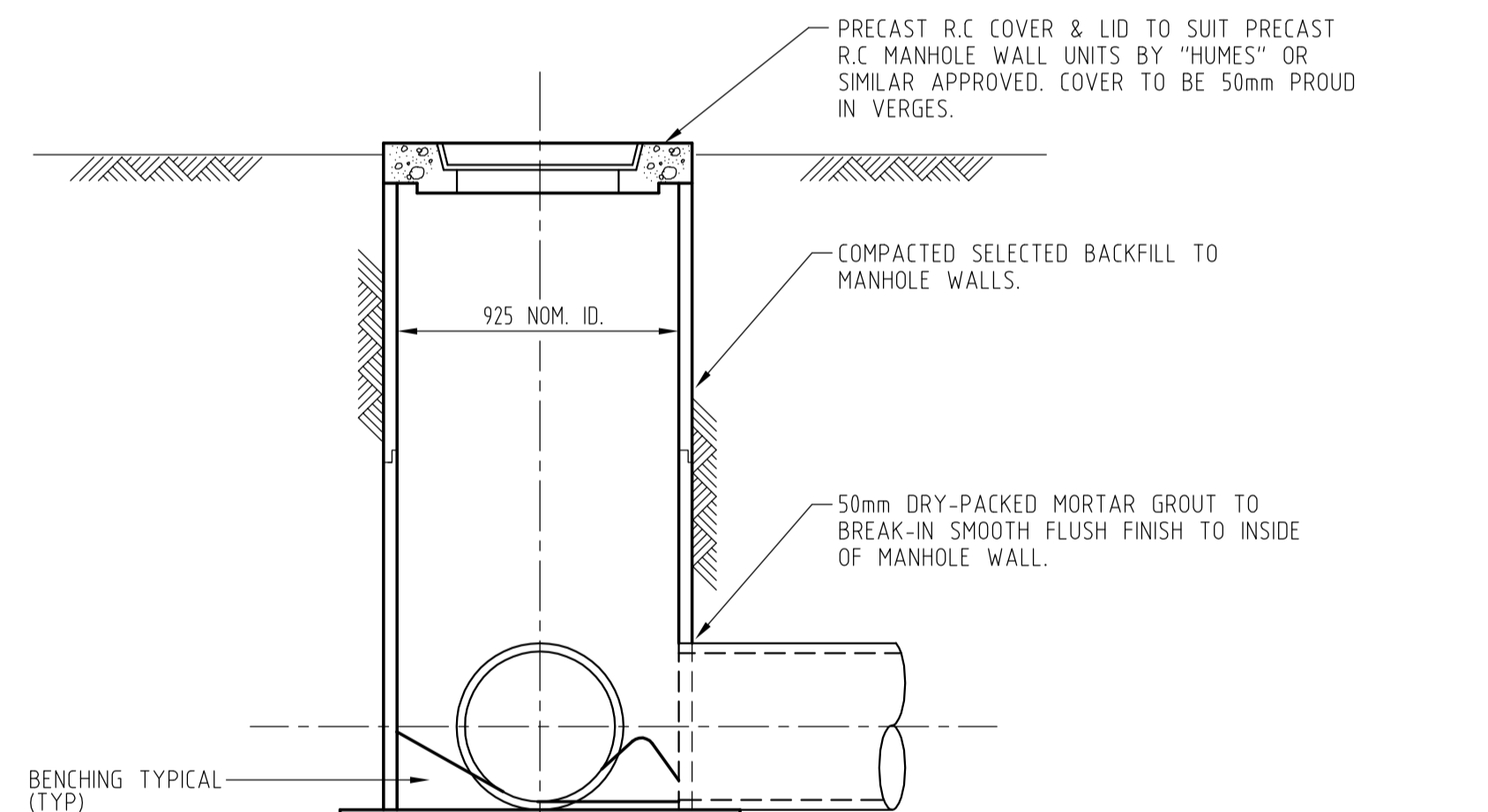
STONE PITCHING DETAIL
NTS



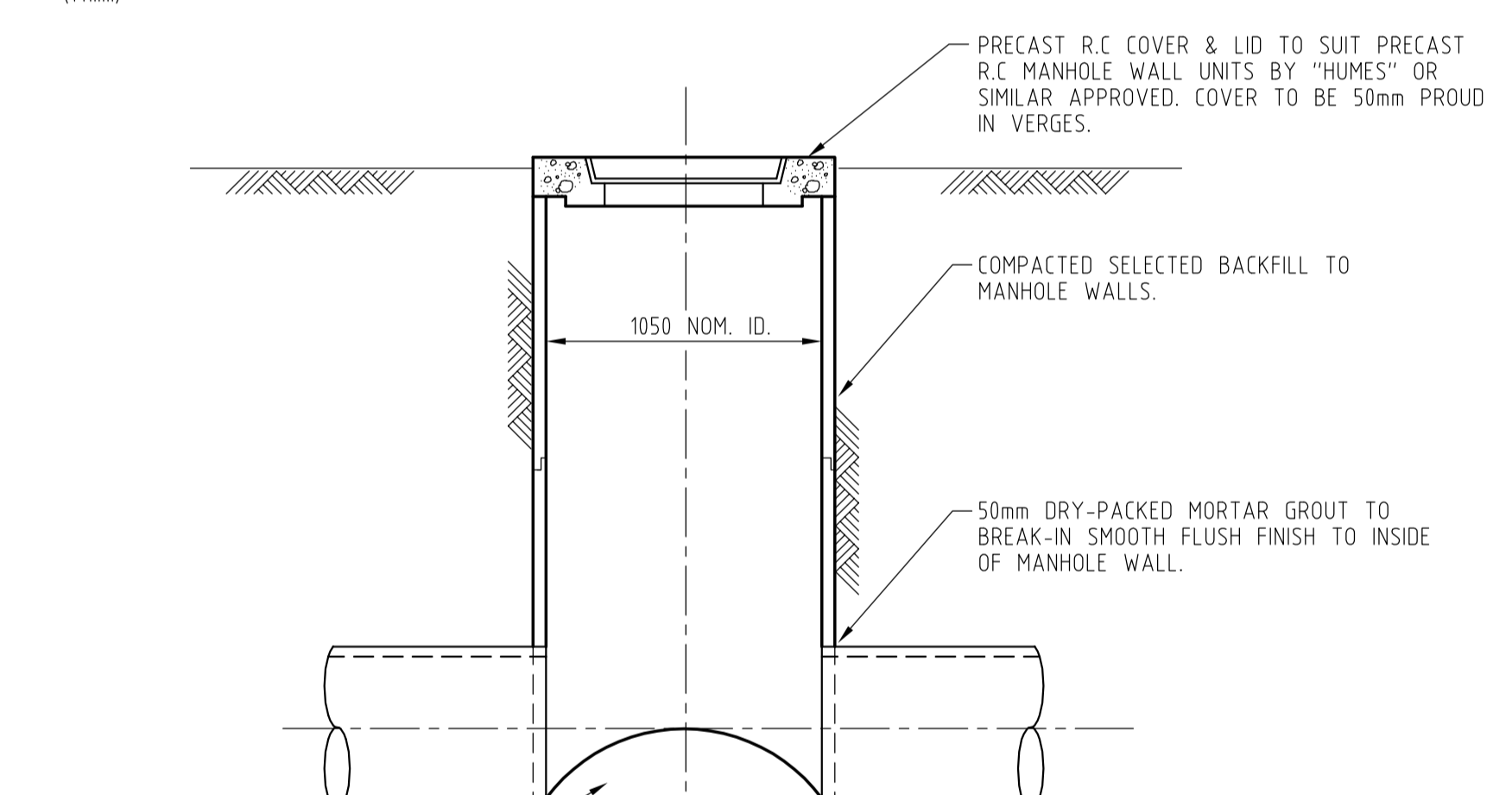
PLAN



ELEVATION
TYPICAL CULVERT HEADWALL
SCALE 1:20



STORMWATER MANHOLE TYPE 1
SCALE 1:20



STORMWATER MANHOLE TYPE 2
SCALE 1:20

NOTE
TYPE 1 MANHOLE SHALL BE USED FOR PIPES UP TO 375Ø & WHERE OTHERWISE INDICATED ON THE LAYOUT PLAN, TYPE 2 MAYBE USED IN PLACE OF TYPE 1.
MANHOLES GREATER THAN 10m DEEP SHALL HAVE HOT DIP GALV. STEP IRONS. STEP IRONS TO BE FIXED TO WALL UNITS PRIOR TO INSTALLATION.

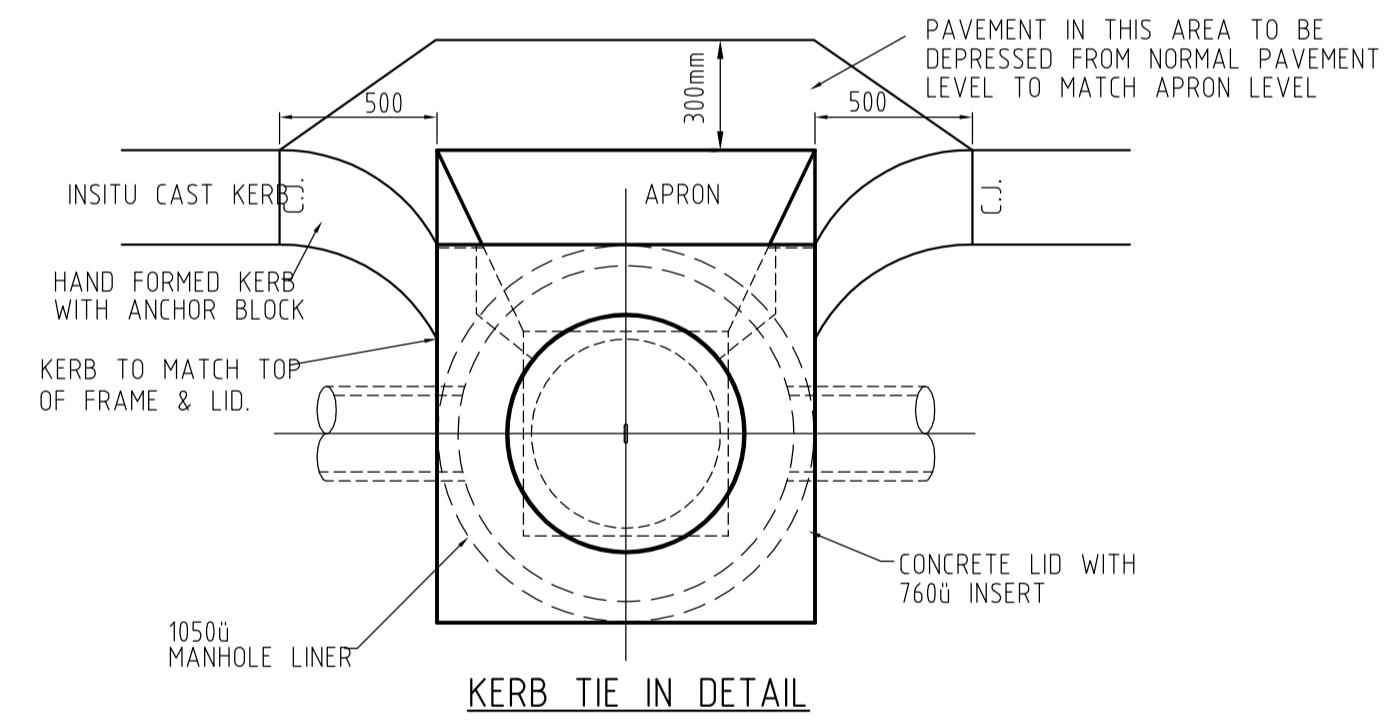
NOTE
IN WET CONDITIONS BASE SHALL BE POURED ONTO A MIN. 150mm CRUSHED ROCK BEDDING. (SEE PIPE BEDDING DETAILS)

NOTE
WHERE THE CONTRACTOR IS REQUIRED TO BREAK INTO A PRECAST MANHOLE ONLY THAT MUCH OF THE WALL SHALL BE REMOVED AS IS REASONABLY NEEDED TO MAKE THE CONNECTION

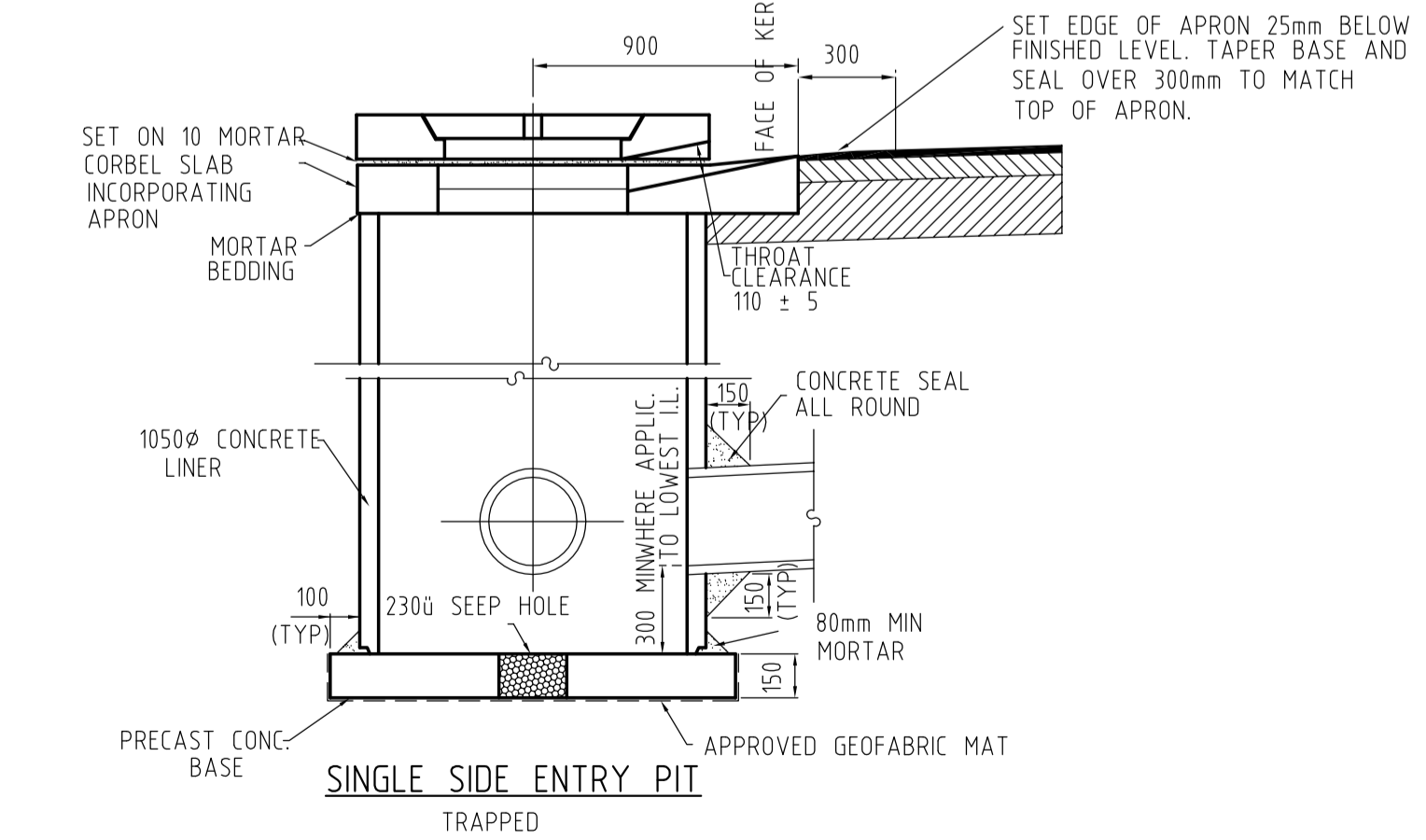
NOTE
TYPE 2 MANHOLE SHALL BE USED FOR PIPES FROM 450Ø TO 600Ø & WHERE OTHERWISE INDICATED ON THE LAYOUT PLAN.
MANHOLES GREATER THAN 10m DEEP SHALL HAVE HOT DIP GALV. STEP IRONS. STEP IRONS TO BE FIXED TO WALL UNITS PRIOR TO INSTALLATION.

NOTE
IN WET CONDITIONS BASE SHALL BE POURED ONTO A MIN. 150mm CRUSHED ROCK BEDDING. (SEE PIPE BEDDING DETAILS)

NOTE
WHERE THE CONTRACTOR IS REQUIRED TO BREAK INTO A PRECAST MANHOLE ONLY THAT MUCH OF THE WALL SHALL BE REMOVED AS IS REASONABLY NEEDED TO MAKE THE CONNECTION



KERB TIE IN DETAIL



TYPICAL SIDE ENTRY PIT
NOT TO SCALE

PROJECT: **BODDINGTON- RANFORD DRAINAGE MANAGEMENT PLAN**

11-6-2014 CHANGES AS PER COUNCIL, PLAN NUMBERS ALTERED
4-10-2010 PRELIMINARY PLOT FOR APPROVAL
DATE REVISION

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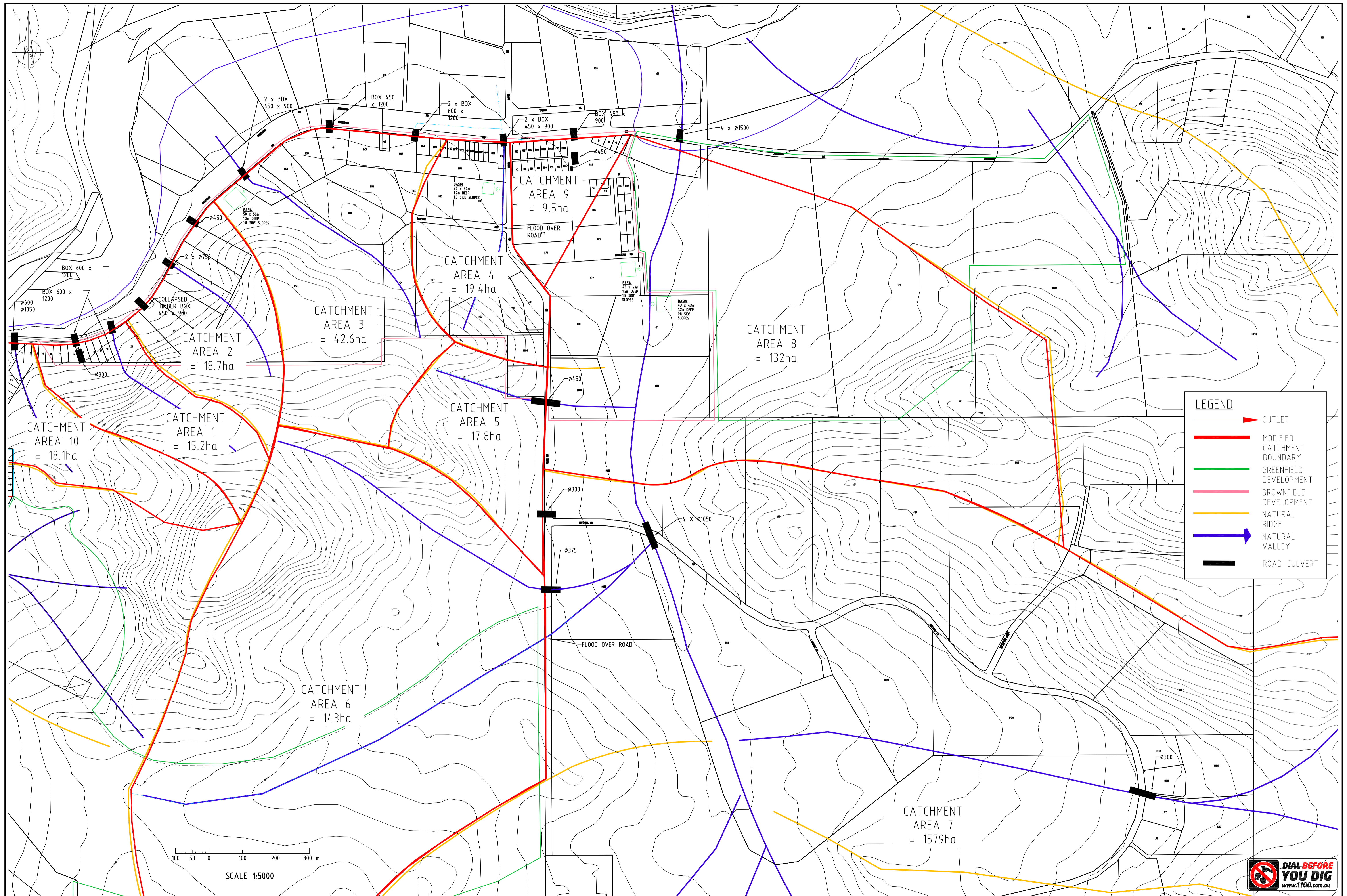
Porter
Consulting Engineers
Level 2 Kishara Court
59 Kishara Road
M1 Plesanton 4153 WA
PO Box 1036
Coalinga Bridge 4153 WA
Tel (08) 9315 9955
Fax (08) 9315 9959
Email office@portereng.com.au
www.portereng.com.au

CLIENT: **SHIRE OF BODDINGTON**

DRAWING: **STANDARD DETAILS PLAN**
STATUS: **FOR APPROVAL**

SCALE AS ABOVE	DRAWING No.	REV No.	SIGNAL DRAWING SIZE
DATE JUNE 2014	11-4-57/8	B	A1
DESIGN BIH	FILE NAME c:\PCE\11-4-57\114-57-8.dwg		
DRAWN MEB	APPD		
CHECK			

PLAN 9
Ranford Catchment Plan



PROJECT: **BODDINGTON- RANFORD DRAINAGE MANAGEMENT PLAN**

NO.	DATE	REVISION
C	16-12-2014	BROWNFIELD AREA ALTERED
B	11-6-2014	CHANGES AS PER COUNCIL, PLAN NUMBERS ALTERED
A	17-9-2013	PRELIMINARY PLOT FOR APPROVAL

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Porter
 Consulting Engineers

Level 2 Kishara Court
 59 Kishara Road
 Mt Pleasant 453 WA
 PO Box 1936
 Canning Bridge 4153 WA
 Tel (08) 9315 9955
 Fax (08) 9315 9959
 Email office@portereng.com.au
 www.portereng.com.au

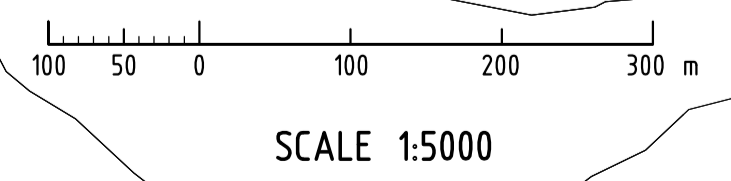
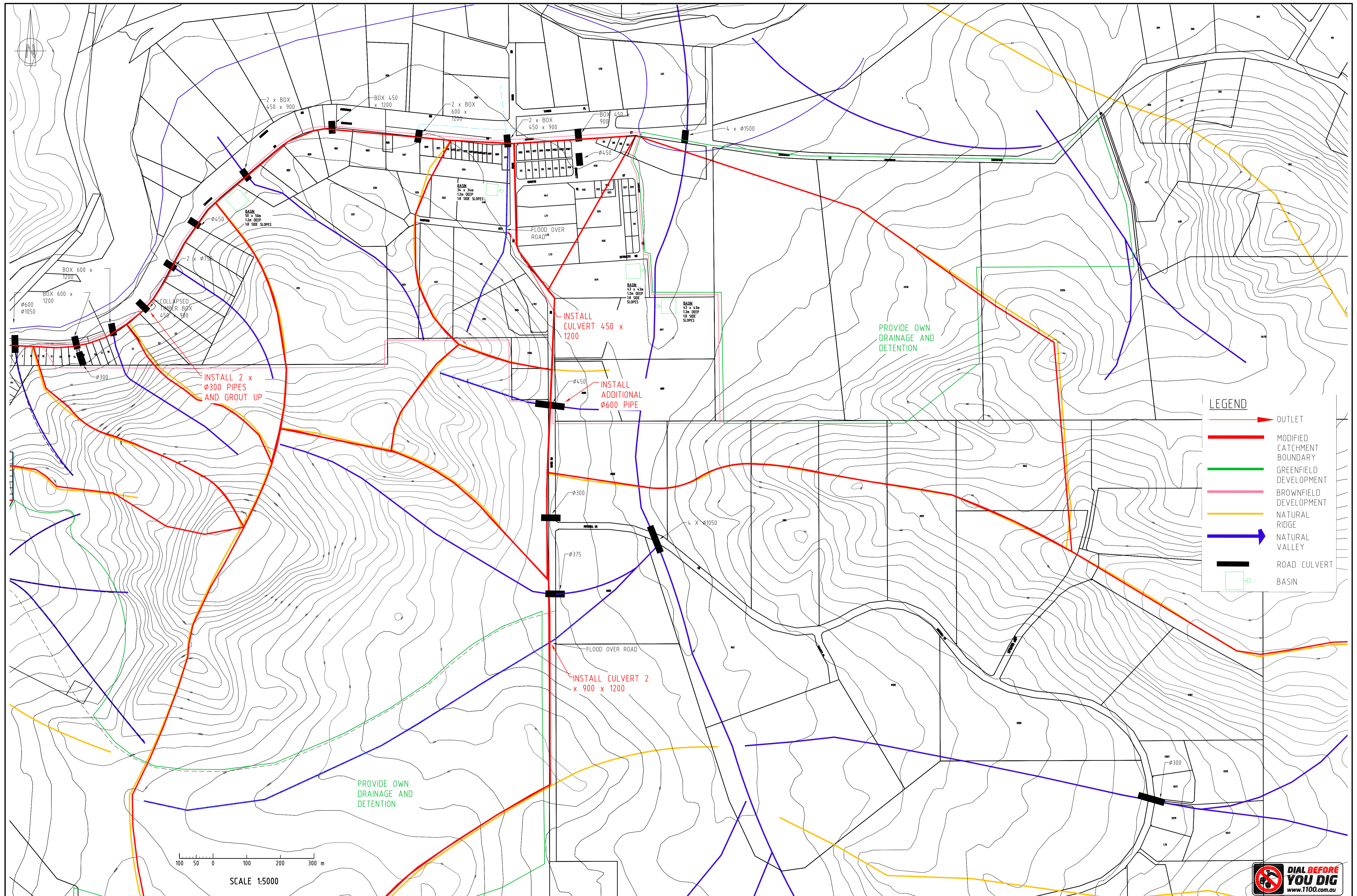
CLIENT: **SHIRE OF BODDINGTON**

DRAWING: **RANFORD CATCHMENT PLAN DETAIL**

STATUS: **FOR APPROVAL**

SCALE	DATE	DESIGN	DRAWN	CHECK	DRAWING No.	REV No.	BRG/NO.
1:5000	JUNE 2014	DEP	MJV	APPD	11-4-57/9	C A1	
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PLAN 10
Ranford Drainage Upgrade Plan



LEGEND	
	OUTLET
	MODIFIED CATCHMENT BOUNDARY
	GREENFIELD DEVELOPMENT
	BROWNFIELD DEVELOPMENT
	NATURAL RIDGE
	NATURAL VALLEY
	ROAD CULVERT
	BASIN

PROJECT: **BODDINGTON- RANFORD DRAINAGE MANAGEMENT PLAN**

NO.	DATE	REVISION
C	16-12-2014	BASINS ADDED
B	11-6-2014	CHANGES AS PER COUNCIL, PLAN NUMBERS ALTERED
A	17-9-2013	PRELIMINARY PLOT FOR APPROVAL

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Porter
 Consulting Engineers

Level 2 Kishara Court
 59 Kishara Road
 Mt Pleasant 453 WA
 PO Box 1036
 Canning Bridge 4153 WA
 Tel (08) 9315 9955
 Fax (08) 9315 9959
 Email office@portereng.com.au
 www.portereng.com.au

CLIENT: **SHIRE OF BODDINGTON**

DRAWING: **RANFORD DRAINAGE UPGRADE**

STATUS: **FOR APPROVAL**

SCALE	DATE	DESIGN	DRAWN	CHECK	DRAWING No.	REV No.	ORIGIAL DRAWING SIZE
1:5000	JUNE 2014	DEP	MJV	APPD	11-4-57/10	C A1	A1



COST SCHEDULES

Schedule 1
INDICATIVE DEVELOPMENT COSTS

Job No: 11-04-57
Project: Boddington Drainage
Option: Boddington - Rectification of Existing

Date: 21/3/13
Our Ref: T37.13

Item	Description	Unit	Quantity	Rate (\$)	Amount (\$)
1.0	Establishment & Survey				
1.1	Supervision and Survey	Week	10.00	1,700.00	17,000
1.2	Mob/Demob	ea	2.00	3,000.00	6,000
1.3	Overheads (Site Facilities, Insurances etc)	Week	10.00	1,700.00	17,000
1.4	Traffic Management	Day	20.00	1,700.00	34,000
1.5	Service Location	Item	1.00	10,000.00	10,000
	Sub-Total Establishment & Survey				84,000
2.0	Clearing & Disposal				
2.1	Light Clearing	ha	0.20	8,000.00	1,600
2.2	Heavy Clearing	ha		15,000.00	0
2.3	Remove Old Drain	m		20.00	0
	Sub-Total Clearing & Disposal				1,600
3.0	Basin Earthworks				
3.1	Topsoil Strip & Respread	m ²		1.50	0
3.2	Cut to Fill/Spoil and Shape	m ³		28.00	0
3.3	Stabilisation and Planting	m ²		8.00	0
3.5	Rock Excavation - Laterite	m ³		160.00	0
3.6	Rock Excavation - Granite	m ³		600.00	0
	Sub-Total Earthworks				0
4.0	Roads - Repair				
4.1	Pavement & Primer Seal	m ²	240.00	120.00	28,800
4.2	AC Surface	m ²	240.00	35.00	8,400
4.3	Kerbing	m	500.00	35.00	17,500
4.4	Paths	m ²		58.00	0
4.5	Trim verges/backfill	m	640.00	15.00	9,600
4.6	Pavement Testing	Item	1.00	5,000.00	5,000
4.7	Crossovers	ea	7.00	580.00	4,060
	Sub-Total Roads				73,360
5.0	Drainage				
5.1	DN300 - Class 2	m		223.00	0
5.2	DN300 - Class 4	m	590.00	246.00	145,140
5.3	DN375	m	50.00	253.00	12,650
5.4	DN450	m		316.00	0
5.5	DN600	m		402.00	0
5.6	DN750	m		517.00	0
5.7	SEP/Gully Pit	No.	9.00	3,450.00	31,050
5.8	Manhole	No.	3.00	3,000.00	9,000
5.9	GPTs	ea	8.00	25,580.00	204,640
5.10	Headwalls	ea	1.00	600.00	600
5.11	Basin Outlet Control	ea		3,450.00	0
5.12	Open Unlined Drain	m		40.00	0
5.13	300diam P Lot Drain	m		150.00	0
5.14	150diam P Lot Drain	m		128.00	0
5.15	Lot Drainage Pits	ea		1,800.00	0
5.16	Stone Pitching	m ²		52.00	0
5.17	Sand Bedding	m		65.00	0

Item	Description	Unit	Quantity	Rate (\$)	Amount (\$)
	Sub-Total Drainage				403,080
6.0	Prof. Fees & Charges (15%)	Item			84,306
7.0	Local Authority Charges (1.5%)	Item			8,431
8.0	Contingency (10%)	Item			65,478
	SUB-TOTAL				720,254
	GST				72,025
	TOTAL				792,280

- AL Asphactic Concrete
- DN Diameter Nominal
- SEP Side Entry Pit
- GPT Gross Pollutant Trap
- P Plastic

We confirm that the costs presented are indicative only and should be read in conjunction with the covering letter. If the reader intends to use these costs for financial purposes they should be satisfied that they are adequate. Porter Consulting Engineers does not accept liability or responsibility for their interpretation or use.

Schedule 2
INDICATIVE DEVELOPMENT COSTS

Job No: 11-04-57
Project: Boddington Drainage
Option: Boddington West - Rectification of Existing

Date: 21/3/13
Our Ref: T35.13

Item	Description	Unit	Quantity	Rate (\$)	Amount (\$)
1.0	Establishment & Survey				
1.1	Supervision and Survey	Week	10.00	1,700.00	17,000
1.2	Mob/Demob	ea	2.00	3,000.00	6,000
1.3	Overheads (Site Facilities, Insurances etc)	Week	10.00	1,700.00	17,000
1.4	Traffic Management	Day	20.00	1,700.00	34,000
1.5	Service Location	Item	1.00	10,000.00	10,000
	Sub-Total Establishment & Survey				84,000
2.0	Clearing & Disposal				
2.1	Light Clearing	ha	0.30	8,000.00	2,400
2.2	Heavy Clearing	ha		15,000.00	0
2.3	Remove Old Drain	m		20.00	0
	Sub-Total Clearing & Disposal				2,400
3.0	Basin Earthworks				
3.1	Topsoil Strip & Respread	m ²		1.50	0
3.2	Cut to Fill/Spoil and Shape	m ³		28.00	0
3.3	Stabilisation and Planting	m ²		8.00	0
3.5	Rock Excavation - Laterite	m ³	220.00	160.00	35,200
3.6	Rock Excavation - Granite	m ³		600.00	0
	Sub-Total Earthworks				35,200
4.0	Roads - Repair				
4.1	Pavement & Primer Seal	m ²	270.00	120.00	32,400
4.2	AC Surface	m ²	270.00	35.00	9,450
4.3	Kerbing	m	54.00	35.00	1,890
4.4	Paths	m ²		58.00	0
4.5	Trim verges/backfill	m	300.00	15.00	4,500
4.6	Pavement Testing	Item	1.00	5,000.00	5,000
4.7	Crossovers	ea	1.00	580.00	580
	Sub-Total Roads				53,820
5.0	Drainage				
5.1	DN300 - Class 2	m		223.00	0
5.2	DN300 - Class 4	m	625.00	246.00	153,750
5.3	DN375	m		253.00	0
5.4	DN450	m	15.00	316.00	4,740
5.5	DN600	m		402.00	0
5.6	DN750	m		517.00	0
5.7	SEP/Gully Pit	No.	15.00	3,450.00	51,750
5.8	Manhole	No.	5.00	3,000.00	15,000
5.9	GPTs	ea	6.00	25,580.00	153,480
5.10	Headwalls	ea	6.00	600.00	3,600
5.11	Basin Outlet Control	ea		3,450.00	0
5.12	Open Unlined Drain	m	390.00	40.00	15,600
5.13	300diam P Lot Drain	m		150.00	0
5.14	150diam P Lot Drain	m		128.00	0
5.15	Lot Drainage Pits	ea		1,800.00	0
5.16	Stone Pitching	m ²		52.00	0
5.17	Sand Bedding	m	110.00	65.00	7,150

Item	Description	Unit	Quantity	Rate (\$)	Amount (\$)
	Sub-Total Drainage				405,070
6.0	Prof. Fees & Charges (15%)	Item			87,074
7.0	Local Authority Charges (1.5%)	Item			8,707
8.0	Contingency (10%)	Item			67,627
	SUB-TOTAL				743,898
	GST				74,390
	TOTAL				818,288

- AL Asphactic Concrete
- DN Diameter Nominal
- SEP Side Entry Pit
- GPT Gross Pollutant Trap
- P Plastic

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Schedule 3
INDICATIVE DEVELOPMENT COSTS

Job No: 11-04-57
Project: Boddington Drainage
Option: Boddington - Brownfield Infill Development

Date: 21/3/13
Our Ref: T38.13

Item	Description	Unit	Quantity	Rate (\$)	Amount (\$)
1.0	Establishment & Survey				
1.1	Supervision and Survey	Week	20.00	1,700.00	34,000
1.2	Mob/Demob	ea	2.00	3,000.00	6,000
1.3	Overheads (Site Facilities, Insurances etc)	Week	20.00	1,700.00	34,000
1.4	Traffic Management	Day	17.00	1,700.00	28,900
1.5	Service Location	Item	1.00	10,000.00	10,000
	Sub-Total Establishment & Survey				112,900
2.0	Clearing & Disposal				
2.1	Light Clearing	ha	0.30	8,000.00	2,400
2.2	Heavy Clearing	ha		15,000.00	0
2.3	Remove Old Drain	m	310.00	20.00	6,200
	Sub-Total Clearing & Disposal				8,600
3.0	Basin Earthworks				
3.1	Topsoil Strip & Respread	m ²	1,475.00	1.50	2,213
3.2	Cut to Fill/Spoil and Shape	m ³	563.00	28.00	15,764
3.3	Stabilisation and Planting	m ²	1,475.00	8.00	11,800
3.5	Rock Excavation - Laterite	m ³		160.00	0
3.6	Rock Excavation - Granite	m ³		600.00	0
	Sub-Total Earthworks				29,777
4.0	Roads - Repair				
4.1	Pavement & Primer Seal	m ²	120.00	120.00	14,400
4.2	AC Surface	m ²	120.00	35.00	4,200
4.3	Kerbing	m	380.00	35.00	13,300
4.4	Paths	m ²		58.00	0
4.5	Trim verges/backfill	m	380.00	15.00	5,700
4.6	Pavement Testing	Item	1.00	5,000.00	5,000
4.7	Crossovers	ea	5.00	580.00	2,900
	Sub-Total Roads				45,500
5.0	Drainage				
5.1	DN300 - Class 2	m	225.00	223.00	50,175
5.2	DN300 - Class 4	m		246.00	0
5.3	DN375	m	60.00	253.00	15,180
5.4	DN450	m		316.00	0
5.5	DN600	m	310.00	402.00	124,620
5.6	DN750	m		517.00	0
5.7	SEP/Gully Pit	No.	9.00	3,450.00	31,050
5.8	Manhole	No.	18.00	3,000.00	54,000
5.9	GPTs	ea	5.00	25,580.00	127,900
5.10	Headwalls	ea	4.00	600.00	2,400
5.11	Basin Outlet Control	ea	3.00	3,450.00	10,350
5.12	Open Unlined Drain	m		40.00	0
5.13	300diam P Lot Drain	m	700.00	150.00	105,000
5.14	150diam P Lot Drain	m		128.00	0
5.15	Lot Drainage Pits	ea	26.00	1,800.00	46,800
5.16	Stone Pitching	m ²		52.00	0
5.17	Sand Bedding	m	310.00	65.00	20,150

Item	Description	Unit	Quantity	Rate (\$)	Amount (\$)
	Sub-Total Drainage				587,625
6.0	Prof. Fees & Charges (15%)	Item			117,660
7.0	Local Authority Charges (1.5%)	Item			11,766
8.0	Contingency (10%)	Item			91,383
	SUB-TOTAL				1,005,211
	GST				100,521
	TOTAL				1,105,732

AL Asphactic Concrete
DN Diameter Nominal
SEP Side Entry Pit
GPT Gross Pollutant Trap
P Plastic

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Schedule 4
INDICATIVE DEVELOPMENT COSTS

Job No: 11-04-57
Project: Boddington Drainage
Option: Boddington West - Brownfield Infill Development

Date: 21/3/13
Our Ref: T36.13

Item	Description	Unit	Quantity	Rate (\$)	Amount (\$)
1.0	Establishment & Survey				
1.1	Supervision and Survey	Week	4.00	1,700.00	6,800
1.2	Mob/Demob	ea	2.00	3,000.00	6,000
1.3	Overheads (Site Facilities, Insurances etc)	Week	4.00	1,700.00	6,800
1.4	Traffic Management	Day		1,700.00	0
1.5	Service Location	Item			0
	Sub-Total Establishment & Survey				19,600
2.0	Clearing & Disposal				
2.1	Light Clearing	ha		8,000.00	0
2.2	Heavy Clearing	ha		15,000.00	0
2.3	Remove Old Drain	m		20.00	0
	Sub-Total Clearing & Disposal				0
3.0	Basin Earthworks				
3.1	Topsoil Strip & Respread	m ²	1,684.00	1.50	2,526
3.2	Cut to Fill/Spoil and Shape	m ³	211.00	28.00	5,908
3.3	Stabilisation and Planting	m ²	1,684.00	8.00	13,472
3.5	Rock Excavation - Laterite	m ³		160.00	0
3.6	Rock Excavation - Granite	m ³		600.00	0
	Sub-Total Earthworks				21,906
4.0	Roads - Repair				
4.1	Pavement & Primer Seal	m ²		120.00	0
4.2	AC Surface	m ²		35.00	0
4.3	Kerbing	m		35.00	0
4.4	Paths	m ²		58.00	0
4.5	Trim verges/backfill	m		15.00	0
4.6	Pavement Testing	Item		5,000.00	0
4.7	Crossovers	ea		580.00	0
	Sub-Total Roads				0
5.0	Drainage				
5.1	DN300 - Class 2	m		223.00	0
5.2	DN300 - Class 4	m		246.00	0
5.3	DN375	m		253.00	0
5.4	DN450	m		316.00	0
5.5	DN600	m		402.00	0
5.6	DN750	m		517.00	0
5.7	SEP/Gully Pit	No.		3,450.00	0
5.8	Manhole	No.		3,000.00	0
5.9	GPTs	ea	2.00	25,580.00	51,160
5.10	Headwalls	ea	2.00	600.00	1,200
5.11	Basin Outlet Control	ea	2.00	3,450.00	6,900
5.12	Open Unlined Drain	m		40.00	0
5.13	300diam P Lot Drain	m		150.00	0
5.14	150diam P Lot Drain	m		128.00	0
5.15	Lot Drainage Pits	ea		1,800.00	0
5.16	Stone Pitching	m ²		52.00	0
5.17	Sand Bedding	m		65.00	0

Item	Description	Unit	Quantity	Rate (\$)	Amount (\$)
	Sub-Total Drainage				59,260
6.0	Prof. Fees & Charges (15%)	Item			15,115
7.0	Local Authority Charges (1.5%)	Item			1,511
8.0	Contingency (10%)	Item			11,739
	SUB-TOTAL				129,132
	GST				12,913
	TOTAL				142,045

AL Asphactic Concrete
 DN Diameter Nominal
 SEP Side Entry Pit
 GPT Gross Pollutant Trap
 P Plastic

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Schedule 5
INDICATIVE DEVELOPMENT COSTS

Job No: 11-04-57
Project: Boddington Drainage
Option: Boddington - Greenfield Development (East of Town)

Date: 21/3/13
Our Ref: T39.13

Item	Description	Unit	Quantity	Rate (\$)	Amount (\$)
1.0	Establishment & Survey				
1.1	Supervision and Survey	Week	10.00	1,700.00	17,000
1.2	Mob/Demob	ea	2.00	3,000.00	6,000
1.3	Overheads (Site Facilities, Insurances etc)	Week	10.00	1,700.00	17,000
1.4	Traffic Management	Day		1,700.00	0
1.5	Service Location	Item	1.00	5,000.00	5,000
	Sub-Total Establishment & Survey				45,000
2.0	Clearing & Disposal				
2.1	Light Clearing	ha	2.05	8,000.00	16,400
2.2	Heavy Clearing	ha		15,000.00	0
2.3	Remove Old Drain	m		20.00	0
	Sub-Total Clearing & Disposal				16,400
3.0	Basin Earthworks				
3.1	Topsoil Strip & Respread	m ²	20,000.00	1.50	30,000
3.2	Cut to Fill/Spoil and Shape	m ³	7,245.00	28.00	202,860
3.3	Stabilisation and Planting	m ²	20,000.00	8.00	160,000
3.5	Rock Excavation - Laterite	m ³	2,000.00	160.00	320,000
3.6	Rock Excavation - Granite	m ³		600.00	0
	Sub-Total Earthworks				712,860
4.0	Roads - Repair				
4.1	Pavement & Primer Seal	m ²		120.00	0
4.2	AC Surface	m ²		35.00	0
4.3	Kerbing	m		35.00	0
4.4	Paths	m ²		58.00	0
4.5	Trim verges/backfill	m		15.00	0
4.6	Pavement Testing	Item		5,000.00	0
4.7	Crossovers	ea		580.00	0
	Sub-Total Roads				0
5.0	Drainage				
5.1	DN300 - Class 2	m	150.00	223.00	33,450
5.2	DN300 - Class 4	m		246.00	0
5.3	DN375	m		253.00	0
5.4	DN450	m	50.00	316.00	15,800
5.5	DN600	m		402.00	0
5.6	DN750	m		517.00	0
5.7	SEP/Gully Pit	No.		3,450.00	0
5.8	Manhole	No.	4.00	3,000.00	12,000
5.9	GPTs	ea	4.00	25,580.00	102,320
5.10	Headwalls	ea	1.00	600.00	600
5.11	Basin Outlet Control	ea	4.00	3,450.00	13,800
5.12	Open Unlined Drain	m		40.00	0
5.13	300diam P Lot Drain	m		150.00	0
5.14	150diam P Lot Drain	m		128.00	0
5.15	Lot Drainage Pits	ea		1,800.00	0
5.16	Stone Pitching	m ²		52.00	0
5.17	Sand Bedding	m		65.00	0

Item	Description	Unit	Quantity	Rate (\$)	Amount (\$)
	Sub-Total Drainage				177,970
6.0	Prof. Fees & Charges (15%)	Item			142,835
7.0	Local Authority Charges (1.5%)	Item			14,283
8.0	Contingency (10%)	Item			110,935
	SUB-TOTAL				1,220,283
	GST				122,028
	TOTAL				1,342,311

AL Asphactic Concrete
DN Diameter Nominal
SEP Side Entry Pit
GPT Gross Pollutant Trap
P Plastic

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INDICATIVE DEVELOPMENT COSTS**Job No:** 11-04-57**Date:** 21/3/13**Project:** Boddington Drainage**Our Ref:** T149.13**Option:** Forrest St/Pollard St - Main Drain Upgrade - Boddington Greenfield Development

Council Construction cost 2008/2009

Town drainage works cost ledger: \$559,375.60

WA Building Price Index cost adjustment to March 2013:	$\frac{236.47 - 224.46}{224.46} \times 100$
	= + 5.35%

Adjusted construction value: \$589,302.19

Professional fees and charges 15%: \$88,395.33

Local Authority charges 1.5%: \$8,839.53

Contingency: \$0.00

Sub-Total: \$686,537.05

GST: \$68,653.71**TOTAL \$755,190.76**

INDICATIVE DEVELOPMENT COSTS

Job No: 11-04-57
Project: Boddington Drainage
Option: Ranford - Rectification of Existing

Date: 21/10/13
Our Ref: T158.13

Item	Description	Unit	Quantity	Rate (\$)	Amount (\$)
1.0	Establishment & Survey				
1.1	Supervision and Survey	Week	3.00	1,700.00	5,100
1.2	Mob/Demob	ea	2.00	3,000.00	6,000
1.3	Overheads (Site Facilities, Insurances etc)	Week	3.00	1,700.00	5,100
1.4	Traffic Management	Day	10.00	1,700.00	17,000
1.5	Service Location	Item	1.00	10,000.00	10,000
	Sub-Total Establishment & Survey				43,200
2.0	Clearing & Disposal				
2.1	Light Clearing	ha		8,000.00	0
2.2	Heavy Clearing	ha		15,000.00	0
2.3	Remove Old Drain	m		20.00	0
	Sub-Total Clearing & Disposal				0
3.0	Basin Earthworks				
3.1	Topsoil Strip & Respread	m ²		1.50	0
3.2	Cut to Fill/Spoil and Shape	m ³		28.00	0
3.3	Stabilisation and Planting	m ²		8.00	0
3.5	Rock Excavation - Laterite	m ³		160.00	0
3.6	Rock Excavation - Granite	m ³		600.00	0
	Sub-Total Earthworks				0
4.0	Roads - Repair				
4.1	Pavement & Primer Seal	m ²	75.00	120.00	9,000
4.2	AC Surface	m ²	75.00	35.00	2,625
4.3	Kerbing	m	60.00	35.00	2,100
4.4	Paths	m ²		58.00	0
4.5	Trim verges/backfill	m	60.00	15.00	900
4.6	Pavement Testing	Item		5,000.00	0
4.7	Crossovers	ea		580.00	0
	Sub-Total Roads				14,625
5.0	Drainage				
5.1	DN300 - Class 2	m		223.00	0
5.2	DN300 - Class 4	m	60.00	246.00	14,760
5.3	DN375	m		253.00	0
5.4	DN450	m		316.00	0
5.5	DN600	m		402.00	0
5.6	DN750	m		517.00	0
5.7	SEP/Gully Pit	No.		3,450.00	0
5.8	Manhole	No.		3,000.00	0
5.9	GPTs	ea		25,580.00	0
5.10	Headwalls	ea		600.00	0
5.11	Basin Outlet Control	ea		3,450.00	0
5.12	Open Unlined Drain	m	80.00	40.00	3,200
5.13	300diam P Lot Drain	m		150.00	0
5.14	150diam P Lot Drain	m		128.00	0
5.15	Lot Drainage Pits	ea		1,800.00	0
5.16	Stone Pitching	m ²	5.00	52.00	260
5.17	Sand Bedding	m		65.00	0

Item	Description	Unit	Quantity	Rate (\$)	Amount (\$)
5.18	Culvert 0.45 x 1.2	m	15.00	700.00	10,500
5.19	Culvert 0.60 x 1.2	m		800.00	0
5.20	Culvert 0.80 x 1.2	m		985.00	0
5.21	Urethane Grouting	item	1.00	5,000.00	5,000
	Sub-Total Drainage				33,720
6.0	Prof. Fees & Charges (15%)	Item			13,732
7.0	Local Authority Charges (1.5%)	Item			1,373
8.0	Contingency (10%)	Item			10,665
	SUB-TOTAL				117,315
	GST				11,731
	TOTAL				129,046

AL Asphactic Concrete
DN Diameter Nominal
SEP Side Entry Pit
GPT Gross Pollutant Trap
P Plastic

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INDICATIVE DEVELOPMENT COSTS

Job No: 11-04-57
Project: Boddington Drainage
Option: Ranford - Greenfield Development

Date: 21/10/13
Our Ref: T159.13

Item	Description	Unit	Quantity	Rate (\$)	Amount (\$)
1.0	Establishment & Survey				
1.1	Supervision and Survey	Week	2.00	1,700.00	3,400
1.2	Mob/Demob	ea	2.00	3,000.00	6,000
1.3	Overheads (Site Facilities, Insurances etc)	Week		1,700.00	0
1.4	Traffic Management	Day	5.00	1,700.00	8,500
1.5	Service Location	Item	1.00	10,000.00	10,000
	Sub-Total Establishment & Survey				27,900
2.0	Clearing & Disposal				
2.1	Light Clearing	ha	0.10	8,000.00	800
2.2	Heavy Clearing	ha		15,000.00	0
2.3	Remove Old Drain	m		20.00	0
	Sub-Total Clearing & Disposal				800
3.0	Basin Earthworks				
3.1	Topsoil Strip & Respread	m ²		1.50	0
3.2	Cut to Fill/Spoil and Shape	m ³		28.00	0
3.3	Stabilisation and Planting	m ²		8.00	0
3.5	Rock Excavation - Laterite	m ³		160.00	0
3.6	Rock Excavation - Granite	m ³		600.00	0
	Sub-Total Earthworks				0
4.0	Roads - Repair				
4.1	Pavement & Primer Seal	m ²	150.00	120.00	18,000
4.2	AC Surface	m ²	35.00	35.00	1,225
4.3	Kerbing	m		35.00	0
4.4	Paths	m ²		58.00	0
4.5	Trim verges/backfill	m	80.00	15.00	1,200
4.6	Pavement Testing	Item	1.00	5,000.00	5,000
4.7	Crossovers	ea		580.00	0
	Sub-Total Roads				25,425
5.0	Drainage				
5.1	DN300 - Class 2	m		223.00	0
5.2	DN300 - Class 4	m		246.00	0
5.3	DN375	m		253.00	0
5.4	DN450	m		316.00	0
5.5	DN600	m	15.00	402.00	6,030
5.6	DN750	m		517.00	0
5.7	SEP/Gully Pit	No.		3,450.00	0
5.8	Manhole	No.		3,000.00	0
5.9	GPTs	ea		25,580.00	0
5.10	Headwalls	ea	4.00	600.00	2,400
5.11	Basin Outlet Control	ea		3,450.00	0
5.12	Open Unlined Drain	m		40.00	0
5.13	300diam P Lot Drain	m		150.00	0
5.14	150diam P Lot Drain	m		128.00	0
5.15	Lot Drainage Pits	ea		1,800.00	0
5.16	Stone Pitching	m ²	10.00	52.00	520
5.17	Sand Bedding	m	60.00	65.00	3,900

Item	Description	Unit	Quantity	Rate (\$)	Amount (\$)
5.18	Culvert 0.45 x 1.2	m		700.00	0
5.19	Culvert 0.6 x 1.2	m		800.00	0
5.20	Culvert 0.9 x 1.2	m	30.00	985.00	29,550
	Sub-Total Drainage				42,400
6.0	Prof. Fees & Charges (15%)	Item			14,479
7.0	Local Authority Charges (1.5%)	Item			1,448
8.0	Contingency (10%)	Item			11,245
	SUB-TOTAL				123,697
	GST				12,370
	TOTAL				136,066

AL Asphactic Concrete
DN Diameter Nominal
SEP Side Entry Pit
GPT Gross Pollutant Trap
P Plastic

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INDICATIVE DEVELOPMENT COSTS

Job No: 11-04-057
Project: Boddington Drainage
Option: Ranford - Brownfield Development

Date: 21/10/13
Our Ref: T158.13 Sch9

Item	Description	Unit	Quantity	Rate (\$)	Amount (\$)
1.0	Establishment & Survey				
1.1	Supervision and Survey	Week	4.00	1,700.00	6,800
1.2	Mob/Demob	ea	2.00	3,000.00	6,000
1.3	Overheads (Site Facilities, Insurances etc)	Week	4.00	1,700.00	6,800
1.4	Traffic Management	Day	0.00	1,700.00	0
1.5	Service Location	Item	0.00	10,000.00	0
	Sub-Total Establishment & Survey				19,600
2.0	Clearing & Disposal				
2.1	Light Clearing	ha	0.72	8,000.00	5,760
2.2	Heavy Clearing	ha		15,000.00	0
2.3	Remove Old Drain	m		20.00	0
	Sub-Total Clearing & Disposal				5,760
3.0	Basin Earthworks				
3.1	Topsoil Strip & Respread	m ²	7,184.00	1.50	10,776
3.2	Cut to Fill/Spoil and Shape	m ³	2,670.00	28.00	74,760
3.3	Stabilisation and Planting	m ²	2,942.00	8.00	23,536
3.5	Rock Excavation - Laterite	m ³		160.00	0
3.6	Rock Excavation - Granite	m ³		600.00	0
	Sub-Total Earthworks				109,072
4.0	Roads - Repair				
4.1	Pavement & Primer Seal	m ²		120.00	0
4.2	AC Surface	m ²		35.00	0
4.3	Kerbing	m		35.00	0
4.4	Paths	m ²		58.00	0
4.5	Trim verges/backfill	m		15.00	0
4.6	Pavement Testing	Item		5,000.00	0
4.7	Crossovers	ea		580.00	0
	Sub-Total Roads				0
5.0	Drainage				
5.1	DN300 - Class 2	m	40.00	223.00	8,920
5.2	DN300 - Class 4	m		246.00	0
5.3	DN375	m		253.00	0
5.4	DN450	m		316.00	0
5.5	DN600	m		402.00	0
5.6	DN750	m		517.00	0
5.7	SEP/Gully Pit	No.		3,450.00	0
5.8	Manhole	No.		3,000.00	0
5.9	GPTs	ea	4.00	25,580.00	102,320
5.10	Headwalls	ea	4.00	600.00	2,400
5.11	Basin Outlet Control	ea	4.00	3,450.00	13,800
5.12	Open Unlined Drain	m		40.00	0
5.13	300diam P Lot Drain	m		150.00	0
5.14	150diam P Lot Drain	m		128.00	0
5.15	Lot Drainage Pits	ea		1,800.00	0
5.16	Stone Pitching	m ²	20.00	52.00	1,040
5.17	Sand Bedding	m		65.00	0

Item	Description	Unit	Quantity	Rate (\$)	Amount (\$)
5.18	Culvert 0.45 x 1.2	m		700.00	0
5.19	Culvert 0.60 x 1.2	m		800.00	0
5.20	Culvert 0.80 x 1.2	m		985.00	0
5.21	Urethane Grouting	item		5,000.00	0
	Sub-Total Drainage				128,480
6.0	Prof. Fees & Charges (15%)	Item			39,437
7.0	Local Authority Charges (1.5%)	Item			3,944
8.0	Contingency (10%)	Item			26,291
	SUB-TOTAL				332,584
	GST				33,258
	TOTAL				365,842

AL Asphactic Concrete
DN Diameter Nominal
SEP Side Entry Pit
GPT Gross Pollutant Trap
P Plastic

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