Shire of Pingelly

Attachments

Ordinary Council Meeting
21 October 2015

Attachment 1

11.1.4 UWA Draft Proposal and ICRRE Framework

The University of Western Australia
An International Centre for Rural and Remote Engagement
"If you listen to communities you turn good ideas into great ones" L. Steel
Discussion Paper

Executive Summary

Formation of working party -

(Over the last five years, UWA staff from a variety of disciplines has worked alongside all levels of government, business and community members on a range of projects in the community of Pingelly. The development of the Centre will formalise the innovative transdisciplinary work already being undertaken in Pingelly.)

What?

This Discussion paper outlines a Concept Plan for the redevelopment of the Pingelly Hospital (due to be decommissioned by the end of 2015) to develop an **International Centre for Rural and Remote Engagement (ICRRE).** We are seeking UWA support for this Concept Plan, including the subsequent financial support to undertake its feasibility study. This project has evolved from existing relationships between the UWA and the Pingelly Community, led by the UWA Future Farm 2050 project.

Why?

The ICRRE will provide a physical and intellectual space where local Indigenous peoples, community members, education providers, government, business and civil society can meet to develop innovative solutions to ecological and social challenges in rural and remote areas through a transdisciplinary approach.

Where?

The Centre will be located on *Gnaala Karla Booja*, Pingelly, Western Australia where the University of Western Australia's Ridgefield Farm and the Future Farm 2050 Project (FF2050) are located.

How?

This project (Graeme) The first step has been completed in that the Shire of Pingelly has endorsed exploration of the concept of the hospital and the development of the ICRRE. The second step is for the UWA to commit to explore the concept to delay the demolition of the hospital. The third step is to formalise the existing relationships between UWA and the Pingelly Community. The final step is to undertake a feasibility study: including the investigation of a model for partnership between UWA and the Shire of Pingelly for taking control of the Pingelly Hospital, finding funds for the facility's development, and preparing a business model to maintain and run the joint enterprise. The diagram attached outlines potential ICCRE relationships with other associated facilities in Pingelly.

When?

Immediately – to know whether the UWA is interested so that we can delay the demolition of the hospital
Soon after this we will seek funding for a feasibility study

Background

When the UWA purchased Ridgefield in 2009 it signalled an investment in and commitment to rural and remote communities in Western Australia. This commitment has provided the UWA with credibility in the region and has enabled many opportunities. The FF2050 Project is the means by which the UWA have realised many of these opportunities through education, research and community engagement strategies. It has attracted the attention of a number of academics from disparate disciplines within UWA who have developed innovative teaching and research programmes as a result of the interaction with the growing transdisciplinary community. When visiting Ridgefield Farm it is not uncommon to meet esteemed international researchers and educators working alongside community members, volunteers and students in the paddocks. This means that social and ecological problems facing humanity are explored and discussed with community members ensuring that we work together to understand and respond to the needs of communities across the world. As a result relationships have flourished. Key developments are outlined below.

Community perspective ....

Developments to date

Leadership in Education (additions)

1) UWA disciplines engaged in the Pingelly region include: the UWA Institute of Agriculture (IoA), School of Animal Biology, School of Plant Biology, School of Earth and Environment, the Faculty of Architecture, Landscape and Visual Arts (ALVA), the School of Indigenous Studies (SIS), the School of Population Health (SPH), The School of Civil Engineering, the School of Electrical, Electronic and Computer Engineering;
2) There is a record of successful transdisciplinary collaboration over three years, with other projects now developing separately;
3) A series of interdisciplinary education programs from UWA through the Interdisciplinary Design Project, bring together a range of staff, students, alumni and industry groups to develop a diversity of social and physical infrastructure projects for rural communities;
4) Programmes to address the city-country divide through engaging primary and secondary schools, and TAFE centres in the city with Pingelly town and the FF2050 Project are delivered each year;
5) Rural schools surrounding Ridgefield are regularly engaged in field-based learning activities related to the FF2050 Project.

Internationally Renowned Research (additions)

1) The UWA FF2050 Project, with its major footprint in the Wheatbelt, has gained a substantial national and international profile;
2) Ridgefield is home to the site of the new Avon River Catchment Critical Zone Observatory, part of an international network of environmental observatories that scientists around the world use to study what they call Earth's "Critical Zone"
3) The FF2050 Project is part of the Worldwide Universities Network for Global Sustainable Farming Systems – Ensuring Sustainable and Responsible Production of Healthy Food from Healthy Animals. This global network of 'farm platforms', across different climatic and eco-regions of the planet, is being established as a resource for optimising and exemplifying research on the contribution of sustainable livestock production to global food security. The network includes farms in India and the UK.
4) Ridgefield is a trial site to develop and assess a new range of advanced polymers for agricultural use, as part of the international multidisciplinary research team Cooperative Research Centre for Polymers (CRC-P).

Community and Global Engagement

1) Pingelly's new Recreation and Cultural Centre, designed by Patrick Beale from UWA's Faculty of ALVA, in consultation with the Shire of Pingelly, will provide meeting rooms and other facilities for cultural events and professional development;
2) The Discipline of Social Work and Social Policy continue to develop relationships with the local Indigenous community;
3) There is a strong partnership between UWA and the Pingelly Community Resource Centre (CRC), one of almost 100 such CRCs scattered over all of WA; The Manager of the Pingelly CRC is also Chairperson of the Association of Western Australian Community Resource Centres (AWACRC), thus reaching everywhere from Esperance to Kununurra;
4) The CRC Network have a teleconference network that can facilitate the exchange of information to rural and remote communities that have little internet coverage. UWA staff have already delivered research and education via this network
5) The CGU insurance group have contributed funding in recognition of the important work being undertaken in the Pingelly community and continue to be interested and engaged.

The next step

We have been remarkably successful but often inhibited by the impediment of time lost in travelling between Perth and Pingelly. We need accommodation in the town. We need a nucleus facility to bring everyone together.

The Hospital could be the solution

The hospital is a quality building with all the required accommodation services. With some relatively minor modifications, it could readily provide the necessary facilities to support the proposed programs as well as accommodate 50 people and thus appeal to a wide range of users. However, the Pingelly Shire requires immediate guidance as to whether to allow the building to be demolished or whether to pursue a mutually beneficial alternative.

This will be a centre where people come together to explore ideas, share information, research and build relationships. It will develop and formalise the innovative transdisciplinary work already being undertaken. This is not a plan for another traditional University campus in the country; this is a plan for a Centre that can meet the future needs of humanity through authentic collaboration. A key feature of the Centre will be in the partnership and engagement of Western Australia's Indigenous peoples and their knowledge systems, placing these cultures into the core business of the Centre's programming and well-being.

Can it Work? Developing a Business Case

The feasibility of this project could be investigated by having a UWA or consultant team dedicated to developing the business case.

Potential sources of funding or key partners/stakeholders that could be explored as sponsors of the Centre on an annual basis could include: CGU Insurance, a Centre for Citizenship Grant (McCusker Centre), UWA, Wesfarmers, Royalties for Regions, rural philanthropists (grants focused on building vibrant rural community), mining companies (e.g., Rio Tinto, Boddington Gold), Lotterywest, and Federal infrastructure grants. The Centre could also generate income through the provision of paid accommodation from visiting universities, itinerant workers and backpackers.

A steering committee -
A suitable governance structure will be developed to oversee the whole project

Benefits for UWA

For a small investment UWA will expand their reach into rural and remote communities. This will lead to increased exposure and will meet many of the Strategic Goals in all three of UWA's priority areas. In particular this Centre will meet all the Community and Global Engagement Goals (Strategic Goal 3).

How the Centre will develop the UWA's 2020 Vision Strategic Plan

Strategic Goal 1: Leadership in Education

As indicated above many of the academics involved in collaborations are already leaders in education activities (list). The centre will develop and expand the opportunities for students. For example single-discipline classes such as Soil Science and Zoology could undertake field-based learning in block teaching across a week. For FF2050 projects, teaching and research on the farm would be far more feasible. This will provide students with experiential learning in a supportive setting.
Farm- and rural-based teaching and learning will be attractive for international students and could be the basis for a marketing campaign.
Potential to learn from Indigenous peoples in ways that are respectful and culturally appropriate

Strategic Goal 2: Internationally renowned research

As indicated above many of the academics involved in collaborations are already internationally renowned researchers. Their capacity to undertake activities would no longer be constrained by the need to include 5 hours travel in the daily plan. The time saved will lead to more productive time spent developing research

Strategic Goal 3: Community and Global Engagement

Strategic Goal 3 Community and Global Engagement	International Centre for Rural and Remote Engagement
We will recognise and engage with indigenous people as the traditional custodians of our land.	The Centre will model best practice engagement with Indigenous people at UWA through SIS and Pingelly Aboriginal Progress Association (PAPA).
UWA will be recognised for the strong and mutually beneficial relationships we have forged with our stakeholders. These will be developed in co-ordination across UWA: • with business, industry and the professions • with government at local, state and national levels • with our alumni around the world • with the arts and scientific communities • with a variety of constituencies such as parents, schools, local residents, and collaborators around the world.	Service Learning would be community-led and grounded in Indigenous respect, capacity-building and self determination. UWA's community projects would become more effective because staff and students could stay in the communities while completing their work, encouraging creativity and problem-solving in a rural setting; Community members will be equal partners in research and education through the development of participatory research processes; Primary and secondary schools, from Perth and country centres, would have real opportunities to interact and undertake learning with a variety of UWA-based projects, including FF2050; International visitors could hold conferences and meetings in a rural setting.
We will build our brand and reputation as a leading global university.	
We will engage proactively and strategically to garner support for our mission and to provide value to our stakeholders.	Private organisations could use the Centre as a venue for retreats for professional development; groups like the Wheatbelt NRM and Evergreen Farmers are an obvious fit;
We will communicate our successes and demonstrate our impact and value to the societies we serve.	A key focus of the Centre will be communication of research and education to community. This will also involve including community members in developing research that meets their needs through participatory research processes
We will collaborate with high quality international partners in research and education.	The Centre will enable collaboration with international partners

We will engage with communities in regional WA in the context of a strategy to enhance educational opportunities for WA communities outside of Perth, as evidenced by our campus in Albany.	The Centre will be in regional WA and will be a gateway to rural and remote communities across the world. Large cultural events could be held in the Centre, such as the Kwongan Foundation symposia and the astronomy nights run by the International Centre for Radio Astronomy Research (ICRAR); rural communities rarely have an opportunity to participate in such exciting events It will enhance access to education for Rural and remote Western Australians through the technology that the CRCs have available Opportunities for the exploration of remote learning, based in a real rural and remote space, with rural perspectives and challenges. The development of a Masters of Interdisciplinary Rural & Remote Studies, for example, could be easily within reach of the proposed centre.

Benefits for Students

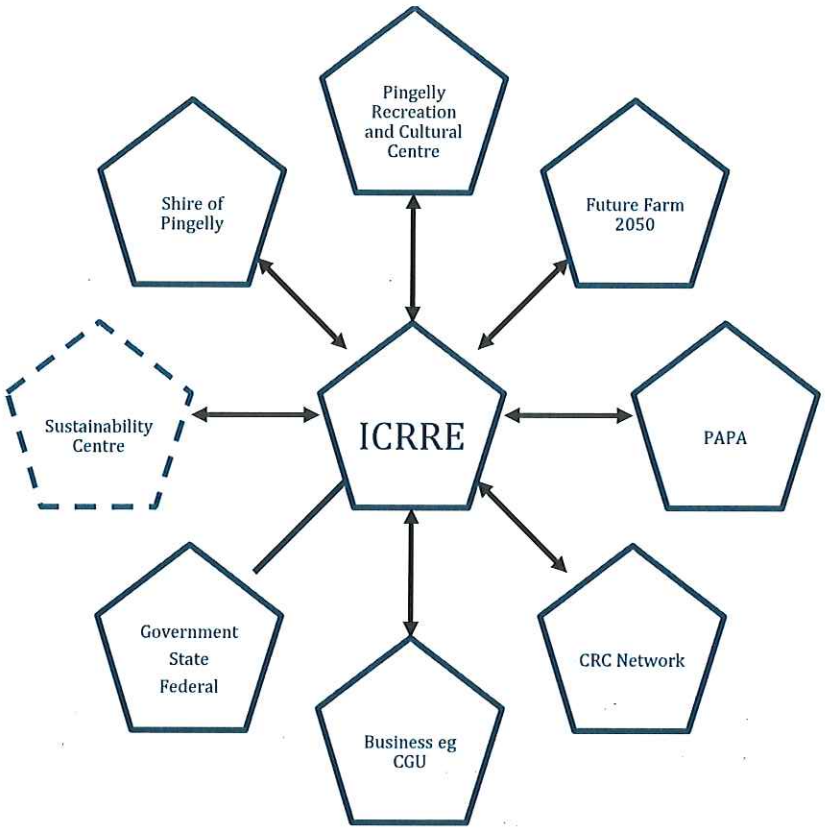
Experiential opportunity to work in real communities and develop their leadership skills

Benefits for Pingelly

Pingelly, like many small rural communities across the world is facing some significant challenges. It is clear that the activities outlined above would have a significant benefit for the local economy. The Pingelly Shire and Pingelly CRC are very keen to assist and promote the development of their relationship with UWA. However, they need immediate guidance on the possibility of this development so they can delay demolition of the hospital. If the business case stands, Pingelly can become a 'university town' with UWA at its heart, and a core resource for UWA to engage with regional and rural communities in the Wheatbelt, and indeed the nation and the rest of the world.

Conclusion

The combination of the Centre's offices, learning spaces and accommodation facilities, plus the new Pingelly Recreation and Cultural Centre will be an excellent resource for collaboration and engagement for bringing together world's-best teaching, research and community engagement programs.


Pingelly Recreation and Cultural Centre
Shire of Pingelly
Future Farm 2050
Sustainability Centre
ICRRE
PAPA
Government State Federal
Business eg CGU
CRC Network

Attachment 2

11.2.1 Monthly Statement of Financial Activity

SHIRE OF PINGELLY

MONTHLY STATEMENT OF FINANCIAL ACTIVITY

FOR THE PERIOD 1 JULY 2015 TO 30 SEPTEMBER 2015

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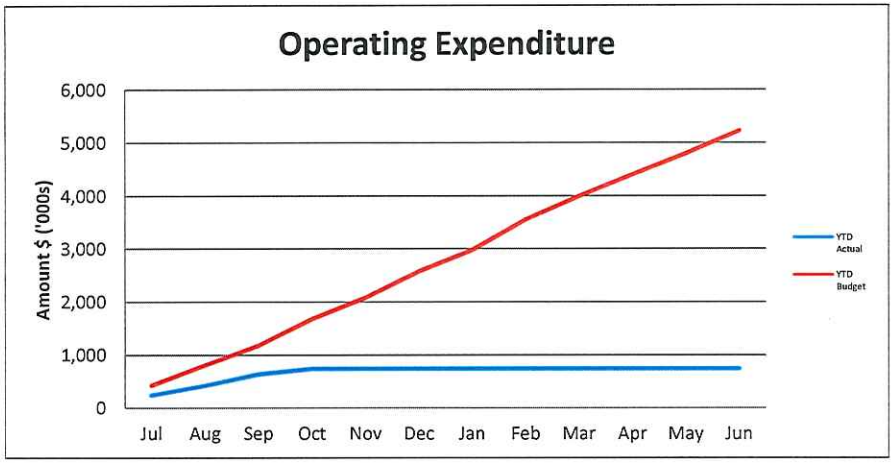
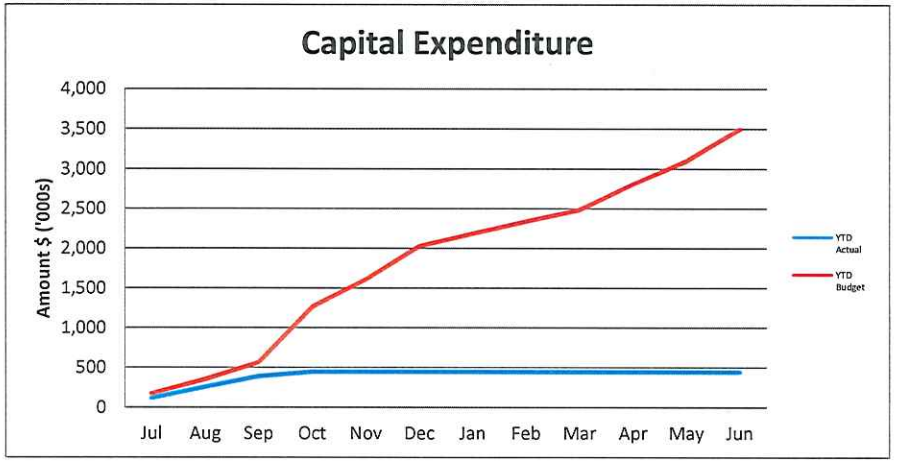
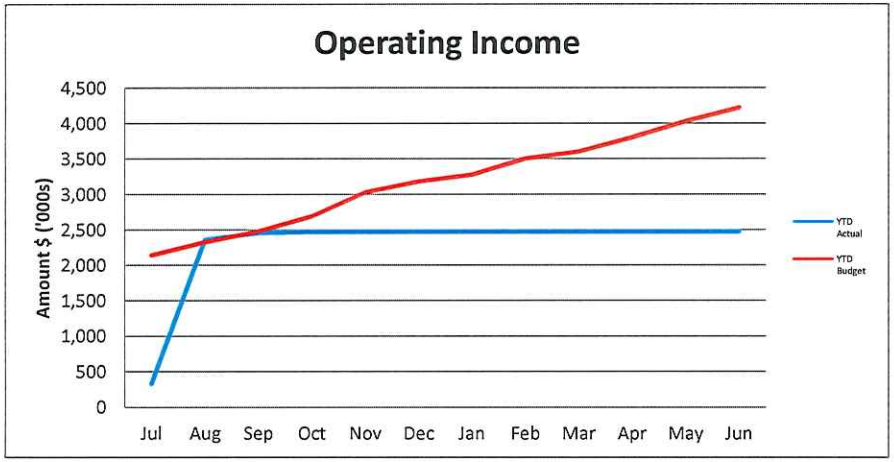
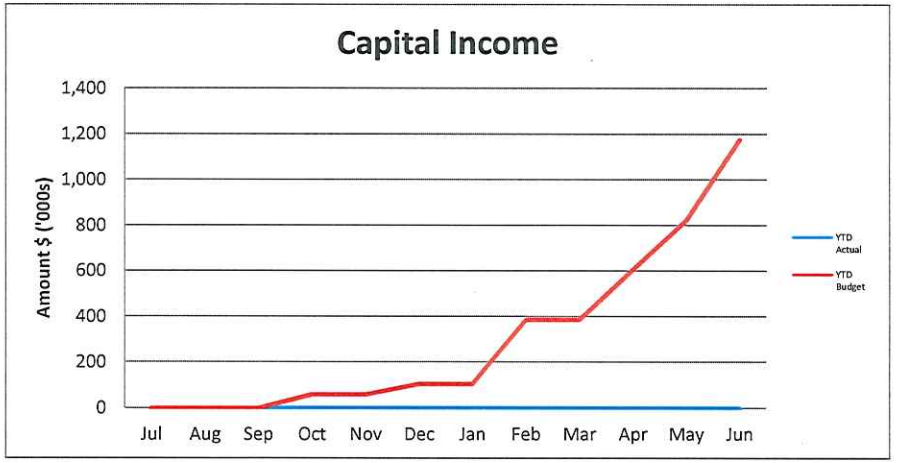
Income and Expenditure Graphs to 30 September 2015

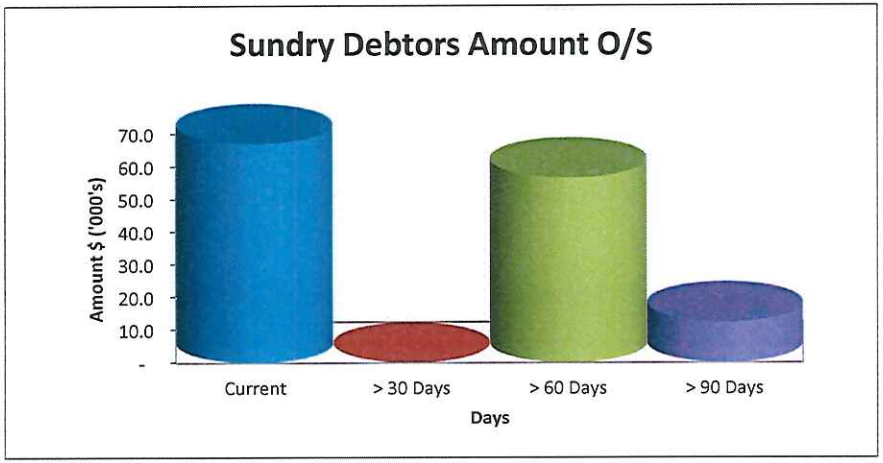


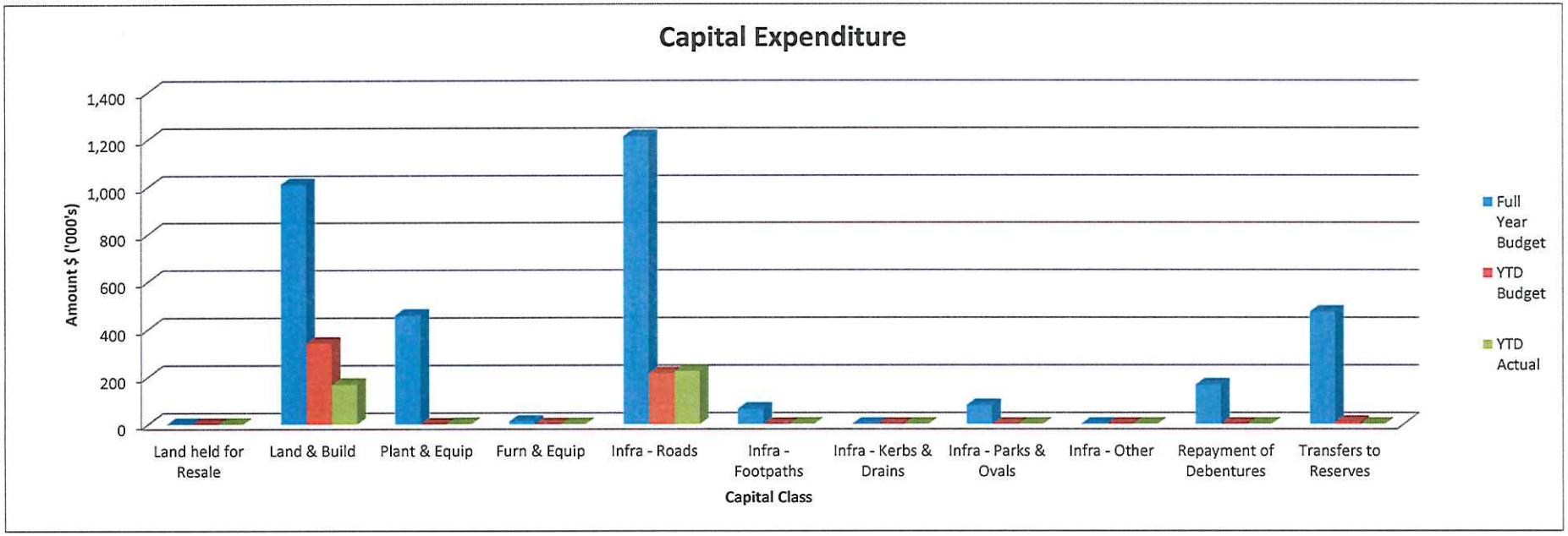






Other Graphs to 30 September 2015





Summary of Balancing Contained Within The Monthly Reports

	2015/16 Adopted Budget $	2015/16 Revised Budget $	September 2015 Y-T-D Budget $	September 2015 Actual $
Finance Statement				
Balancing to Rating Note				
Rates Balance per Finance Statement	1,675,739	1,675,739	1,675,739	1,678,254
Balance per Note 6 (Rating Information)	1,675,739	1,675,739	1,675,739	1,678,255
Variance	0	0	0	(1)
Balancing of Closing Position				
Closing Balance per Finance Statement	963	2,471,867	4,920,650	5,163,300
Closing Balance per General Fund Summary	963	2,471,867	4,920,650	5,163,300
Variance	0	0	0	(0)
Balancing of Operating Income				
Operating Income per Finance Statement	4,224,770	4,224,770	2,484,615	2,459,335
Operating Income per General Fund Summary	4,224,770	4,224,770	2,484,615	2,459,337
Variance	0	0	0	(2)
Balancing of Operating Expenditure				
Operating Expense per Finance Statement	(5,230,773)	(5,230,773)	(1,183,856)	(636,962)
Operating Expense per General Fund Summary	(5,230,773)	(5,230,773)	(1,183,856)	(636,962)
Variance	0	0	0	0
Balancing of Capital Income				
Capital Income per Finance Statement	1,260,247	1,260,247	0	0
Capital Income per General Fund Summary	1,260,247	1,260,247	0	0
Variance	0	0	0	0
Balancing of Capital Expenditure				
Capital Expense per Finance Statement	(3,497,488)	(3,497,488)	(565,192)	(394,114)
Capital Expense per General Fund Summary	(3,497,488)	(3,497,488)	(565,192)	(394,114)
Variance	0	0	0	0

SHIRE OF PINGELLY

STATEMENT OF FINANCIAL ACTIVITY

FOR THE PERIOD 1 JULY 2015 TO 30 SEPTEMBER 2015

Operating	NOTE	2015/16 Adopted Budget $	2015/16 Revised Budget $	September 2015 Y-T-D Budget $	September 2015 Actual $	Variances Actuals to Budget $	Variances Actual Budget to Y-T-D %	
Revenues/Sources								
Governance		102,100	102,100	22,641	21,493	(1,148)	(5.07%)	
General Purpose Funding		741,132	741,132	168,005	156,754	(11,251)	(6.70%)	
Law, Order, Public Safety		80,439	80,439	1,368	7,861	6,493	474.63%	▲
Health		12,900	12,900	3,222	517	(2,705)	(83.95%)	
Education and Welfare		46,196	46,196	453	420	(33)	(7.28%)	
Housing		0	0	0	0	0	0.00%	
Community Amenities		196,140	196,140	158,860	154,102	(4,758)	(3.00%)	
Recreation and Culture		99,050	99,050	19,663	12,912	(6,751)	(34.33%)	▼
Transport		1,119,454	1,119,454	396,768	399,462	2,694	0.68%	
Economic Services		74,020	74,020	18,504	13,586	(4,918)	(26.58%)	
Other Property and Services		77,600	77,600	19,392	13,973	(5,419)	(27.94%)	▼
		2,549,031	2,549,031	808,876	781,080	(27,796)	(3.44%)	
(Expenses)/(Applications)								
Governance		(655,193)	(655,193)	(171,959)	(116,495)	55,464	32.25%	▼
General Purpose Funding		(141,296)	(141,296)	(34,968)	(32,036)	2,932	8.38%	
Law, Order, Public Safety		(243,654)	(243,654)	(54,283)	(43,970)	10,313	19.00%	▼
Health		(133,856)	(133,856)	(44,018)	(37,897)	6,121	13.91%	▼
Education and Welfare		(77,548)	(77,548)	(8,800)	(4,331)	4,469	50.78%	
Housing		0	0	0	0	0	0.00%	
Community Amenities		(374,681)	(374,681)	(74,175)	(57,002)	17,173	23.15%	▼
Recreation & Culture		(1,081,451)	(1,081,451)	(205,643)	(135,324)	70,319	34.19%	▼
Transport		(2,079,217)	(2,079,217)	(497,688)	(214,560)	283,128	56.89%	▼
Economic Services		(409,552)	(409,552)	(58,973)	(46,864)	12,109	20.53%	▼
Other Property and Services		(34,325)	(34,325)	(33,349)	51,517	84,866	254.48%	▼
		(5,230,773)	(5,230,773)	(1,183,856)	(636,962)	546,894	(46.20%)	
Net Operating Result Excluding Rates		(2,681,742)	(2,681,742)	(374,980)	144,118	519,098	(138.43%)	
Adjustments for Non-Cash (Revenue) and Expenditure								
(Profit)/Loss on Asset Disposals	2	179,870	179,870	0	0	0	0.00%	
Movement in Deferred Pensioner Rates/ESL		0	0	0	0	0	0.00%	
Movement in Employee Benefit Provisions		0	0	0	0	0	0.00%	
Adjustments in Fixed Assets		0	0	0	0	0	0.00%	
Rounding		0	0	0	1	1	0.00%	
Depreciation on Assets		1,800,200	1,800,200	450,042	0	(450,042)	100.00%	▼
Capital Revenue and (Expenditure)								
Purchase Land Held for Resale	1	0	0	0	0	0	0.00%	
Purchase of Land and Buildings	1	(1,011,160)	(1,011,160)	(341,157)	(167,697)	173,460	50.84%	▼
Purchase of Furniture & Equipment	1	(12,000)	(12,000)	0	0	0	0.00%	
Purchase of Plant & Equipment	1	(457,460)	(457,460)	0	(1,904)	(1,904)	0.00%	
Purchase of Infrastructure Assets - Roads	1	(1,212,898)	(1,212,898)	(214,810)	(223,796)	(8,986)	(4.18%)	
Purchase of Infrastructure Assets - Footpaths	1	(64,250)	(64,250)	0	(717)	(717)	0.00%	
Purchase of Infrastructure Assets - Kerbs & Drains	1	0	0	0	0	0	0.00%	
Purchase of Infrastructure Assets - Parks & Ovals	1	(79,500)	(79,500)	0	0	0	0.00%	
Purchase of Infrastructure Assets - Other	1	(23,500)	(23,500)	0	0	0	0.00%	
Proceeds from Disposal of Assets	2	585,500	585,500	0	0	0	0.00%	
Repayment of Debentures	3	(165,510)	(165,510)	0	0	0	0.00%	
Proceeds from New Debentures	3	0	0	0	0	0	0.00%	
Advances to Community Groups		0	0	0	0	0	0.00%	
Self-Supporting Loan Principal Income		83,747	83,747	0	0	0	0.00%	
Transfers to Restricted Assets (Reserves)	4	(471,210)	(471,210)	(9,225)	0	9,225	100.00%	▼
Transfers from Restricted Asset (Reserves)	4	591,000	591,000	0	0	0	0.00%	
Transfers to Restricted Assets (Other)		0	0	0	0	0	0.00%	
Transfers from Restricted Asset (Other)		0	0	0	0	0	0.00%	
ADD Net Current Assets July 1 B/Fwd	5	1,264,137	3,735,041	3,735,041	3,735,041	0	0.00%	
LESS Net Current Assets Year to Date	5	963	2,471,867	4,920,650	5,163,300	242,650	(4.93%)	
Amount Raised from Rates		(1,675,739)	(1,675,739)	(1,675,739)	(1,678,254)	(2,515)	0.15%	

This statement is to be read in conjunction with the accompanying notes.

Material Variances Symbol

Above Budget Expectations	Greater than 10% and $5,000	▲
Below Budget Expectations	Less than 10% and $5,000	▼

SHIRE OF PINGELLY
FOR THE PERIOD 1 JULY 2015 TO 30 SEPTEMBER 2015
Report on Significant variances Greater than 10% and $5,000

Purpose

The purpose of the Monthly Variance Report is to highlight circumstances where there is a major variance from the YTD Monthly Budget and YTD Actual figures. These variances can occur because of a change in timing of the activity, circumstances change (e.g. a grants were budgeted for but was not received) or changes to the original budget projections. The Report is designed to highlight these issues and explain the reason for the variance.

The Materiality variances adopted by Council are:

Actual Variance to YTD Budget up to 5%:	Don't Report
Actual Variance exceeding 10% of YTD Budget	Use Management Discretion
Actual Variance exceeding 10% of YTD Budget and a value greater than $5,000:	Must Report

REPORTABLE OPERATING REVENUE VARIATIONS

Transport
Roads to Recovery funding over budget - timing variation

REPORTABLE OPERATING EXPENSE VARIATIONS

Governance
Depreciation not raised
Law,Order, Public Safety
Depreciation not calculated until after audit for 2014/15 completed (timing variance)
Bush Fire Brigade Expenses higher than budget - Season variance
Community Amenities
Timing variation in line with building new Recreation Centre
Recreation and Culture
Depreciation not raised
Timing Variation for Tennis Court Construction and Recreation Centre development
Museum under budget expenditure
Transport
Rural Road maintenance over budget - timing variance
Depreciation not raised
Economic Services
Depreciation not raised
Other Property and Services
Plant Operation Costs over allocated - To be reviewed prior to budget review

REPORTABLE NON-CASH VARIATIONS

Depreciation on Assets
Depreciation not calculated until after audit for 2014/15 completed (timing variance)

REPORTABLE CAPITAL EXPENSE VARIATIONS

Purchase of Land & Buildings
Timing of purchases variation
Transfers to Restricted Assets
Timing variance with calculation of reserve Term Deposit Interest

SHIRE OF PINGELLY

NOTES TO AND FORMING PART OF THE STATEMENT OF FINANCIAL ACTIVITY

FOR THE PERIOD 1 JULY 2015 TO 30 SEPTEMBER 2015

1. ACQUISITION OF ASSETS	2015/16 Adopted Budget $	2015/16 Revised Budget $	2015/16 YTD Budget $	September 2015 Actual $
The following assets have been acquired during the period under review:				
By Program				
Governance				
Other Governance				
Additional Female Toilet	2,000	2,000	0	0.00
Office Carpark And Line Marking	62,600	62,600	0	0.00
Phone System	12,000	12,000	0	0.00
Admin Plant Purchases	79,000	79,000	0	0.00
Law, Order & Public Safety				
Fire Prevention				
Plant Purchase - Weather Stations X 3	29,000	29,000	0	0.00
Animal Control				
Dog/Cat Pound Upgrade	15,000	15,000	0	0.00
Dog Transport Trailer	5,500	5,500	0	0.00
Community Amenities				
Sanitation - household Refuse				
Land Acquisition	80,000	80,000	0	0.00
Refuse Facility Monitoring Bores	18,500	18,500	0	0.00
Refuse Site Buildings	20,000	20,000	0	0.00
Recreation and Culture				
Other Recreation & Sport				
Outdoor Gym Equipment	19,500	19,500	0	0.00
Dam Cleaning	60,000	60,000	0	0.00
New Mower Trailer	10,230	10,230	0	0.00
Spray Tank & Equipment	21,200	21,200	0	1,783.79
Project Manager Vehicle	39,000	39,000	0	0.00
Recreation & Cultural Centre Development	100,000	100,000	24,999	44,970.69
Project Officer - Recreation & Cultural Centre	95,265	95,265	14,085	12,909.11
Tennis Court Construction	499,205	499,205	299,523	106,484.29
Transport				
Construction - Roads, Bridges, Depots				
Rural Roads Construction				
Wickepin Pingelly/Chopping Road Failure	31,890	31,890	0	137.50
Wickepin Pingelly Road 1 Km South Of Chopping	46,970	46,970	0	0.00
Bullaring Road Failure East Of South Kweda	44,950	44,950	1,710	0.00
Yealering Road Construction 3.8-4.3 Slk	109,804	109,804	2,000	1,932.56
Yealering-Pingelly Road Construction 2.0-3.8 Slk	272,102	272,102	6,000	6,605.01
North Wandering Road 9.00-13.00 Slk	51,410	51,410	0	0.00
Wickepin Pingelly Slk 7.9-9.0	122,915	122,915	0	0.00
Survey North Wandering Road	10,200	10,200	2,000	1,972.00
Crsf Jingaring Road Gravel Resheeting	218,254	218,254	171,400	181,440.15
Crsf Moorumbine Road Gravel Sheeting	69,653	69,653	0	0.00
Town Streets Construction				
Johnson Street	0	0	0	0.00
Quadrant Street Improvements	65,000	65,000	0	0.00
Parking Bays Parade St	35,990	35,990	0	0.00
Shaddick Street Drainage	18,155	18,155	0	0.00
Johnston St	42,890	42,890	31,700	31,708.92
Paragon St Reseal	23,760	23,760	0	0.00
Johnston Street Upgrade	48,955	48,955	0	0.00
Footpaths Construction				
Footpath Upgrade - Pioneer Park	41,250	41,250	0	717.00
Footpath Access Ramps	23,000	23,000	0	0.00
Building Purchase - Schedule 12				
Depot Tank	9,000	9,000	550	629.46
Depot Wash Down Bay	2,000	2,000	2,000	2,703.88
Depot Fence	24,690	24,690	0	0.00
Depot Showers	4,900	4,900	0	0.00
Depot Bund Pipe And Fuel Tank	6,000	6,000	0	0.00
Communications Tower - Depot	10,500	10,500	0	0.00
Road Plant Purchases				
Traffic Counters And Tubing	0	0	0	120.02
Digital Two Way Radio Network	40,000	40,000	0	0.00
Light Truck	68,530	68,530	0	0.00
Backhoe	165,000	165,000	0	0.00
Economic Services				
Tourism & Area Promotion				
Caravan Park Drainage	5,000	5,000	0	0.00
Other Economic Services				
Purchase Of Land	80,000	80,000	0	0.00
	2,860,768	2,860,768	555,967	394,114.38

1. ACQUISITION OF ASSETS (Continued)	2015/16 Adopted Budget $	2015/16 Revised Budget $	2015/16 YTD Budget $	September 2015 Actual $
By Class				
Land Held for Resale - Current	0	0	0	0.00
Land Held for Resale - Non Current	0	0	0	0.00
Land	160,000	160,000	0	0.00
Buildings	851,160	851,160	341,157	167,697.43
Furniture & Equipment	12,000	12,000	0	0.00
Plant & Equipment	457,460	457,460	0	1,903.81
Work in Progress - PPE	0	0	0	0.00
Infrastructure - Roads	1,212,898	1,212,898	214,810	223,796.14
Infrastructure - Footpaths	64,250	64,250	0	717.00
Infrastructure - Kerbs & Drains	0	0	0	0.00
Infrastructure - Parks & Ovals	79,500	79,500	0	0.00
Infrastructure - Other	23,500	23,500	0	0.00
Work in Progress - INFRA	0	0	0	0.00
	2,860,768	2,860,768	555,967	394,114.38

2. DISPOSALS OF ASSETS

The following assets have been disposed of during the period under review:

By Program

	Written Down Value		Sale Proceeds		Profit(Loss)	
	2015/16 Budget $	September 2015 Actual $	2015/16 Budget $	September 2015 Actual $	2015/16 Budget $	September 2015 Actual $
Governance						
1015 - 16 Eliot St	143,550	0.00	140,000	0.00	(3,550)	0.00
10182 - 16 Eliot St (land)	38,000	0.00	35,000	0.00	(3,000)	0.00
PCEO14 - CEO Car	28,820	0.00	40,000	0.00	11,180	0.00
5 Webb St	32,000	0.00	25,000	0.00	(7,000)	0.00
Transport						
PT8 Dyna II 4500 Single Cab	3,800	0.00	7,000	0.00	3,200	0.00
PT18 Fuso 918 Crew Cab Tip Truck	29,200	0.00	38,000	0.00	8,800	0.00
PBH2 John Deere Backhoe	24,000	0.00	20,000	0.00	(4,000)	0.00
PMR3 Pacific Roller	15,000	0.00	500	0.00	(14,500)	0.00
Economic Services						
Industrial Shed	396,000	0.00	225,000	0.00	(171,000)	0.00
Land - Industrial Shed	55,000	0.00	55,000	0.00	0	0.00
	765,370	0.00	585,500	0.00	(179,870)	0.00

By Class of Asset

	Written Down Value		Sale Proceeds		Profit(Loss)	
	2015/16 Budget $	September 2015 Actual $	2015/16 Budget $	September 2015 Actual $	2015/16 Budget $	September 2015 Actual $
Plant & Equipment						
PCEO14 - CEO Car	28,820	0.00	40,000	0.00	11,180	0.00
PT8 Dyna II 4500 Single Cab	3,800	0.00	7,000.00	0.00	3,200.00	0.00
PT18 Fuso 918 Crew Cab Tip Truck	29,200	0.00	38,000	0.00	8,800	0.00
PBH2 John Deere Backhoe	24,000	0.00	20,000	0.00	(4,000)	0.00
PMR3 Pacific Roller	15,000	0.00	500	0.00	(14,500)	0.00
Land & Buildings						
1015 - 16 Eliot St	143,550	0.00	140,000	0.00	(3,550)	0.00
10182 - 16 Eliot St (land)	38,000	0.00	35,000	0.00	(3,000)	0.00
5 Webb St	32,000	0.00	25,000	0.00	(7,000)	0.00
Industrial Shed	396,000	0.00	225,000	0.00	(171,000)	0.00
Land - Industrial Shed	55,000	0.00	55,000	0.00	0	0.00
	765,370	0.00	585,500	0.00	(179,870)	0.00

Summary

	2015/16 Adopted Budget $	September 2015 Actual $
Profit on Asset Disposals	23,180	0.00
Loss on Asset Disposals	(203,050)	0.00
	(179,870)	0.00

SHIRE OF PINGELLY

NOTES TO AND FORMING PART OF THE STATEMENT OF FINANCIAL ACTIVITY

FOR THE PERIOD 1 JULY 2015 TO 30 SEPTEMBER 2015

3. INFORMATION ON BORROWINGS

(a) Debenture Repayments

Particulars	Principal 1-Jul-15	New Loans		Principal Repayments		Principal Outstanding		Interest Repayments	
		2015/16 Budget $	2015/16 Actual $	2015/16 Budget $	2015/16 Actual $	2015/16 Budget $	2015/16 Actual $	2015/16 Budget $	2015/16 Actual $
Law, Order & Public Safety									
Loan 122 - SSL DFES	525,821	0	0	70,991	0	454,830	525,821	23,385	(4,208)
Education & Welfare									
Loan 120 - SSL Pingelly Cottage Homes	222,558	0	0	12,756	0	209,802	222,558	14,376	(2)
Recreation & Culture									
Loan 123 - Recreation and Cultural Centre	2,500,000	0	0	81,763	0	2,418,237	2,500,000	106,585	(293)
	3,248,379	0	0	165,510	0	3,082,869	3,248,379	144,346	(4,503)

(*) Self supporting loan financed by payments from third parties.
All other loan repayments were financed by general purpose revenue.

SHIRE OF PINGELLY

NOTES TO AND FORMING PART OF THE STATEMENT OF FINANCIAL ACTIVITY

FOR THE PERIOD 1 JULY 2015 TO 30 SEPTEMBER 2015

	2015/16 Adopted Budget $	September 2015 Actual $
4. RESERVES		
Cash Backed Reserves		
(a) Leave Reserve		
Opening Balance	160,807	160,807
Amount Set Aside / Transfer to Reserve	4,063	0
Amount Used / Transfer from Reserve	0	0
	164,870	160,807
(b) Plant Reserve		
Opening Balance	292,214	292,214
Amount Set Aside / Transfer to Reserve	7,384	0
Amount Used / Transfer from Reserve	(136,000)	0
	163,598	292,214
(c) Building and Recreation Reserve		
Opening Balance	735,067	735,066
Amount Set Aside / Transfer to Reserve	443,573	0
Amount Used / Transfer from Reserve	(455,000)	0
	723,640	735,066
(d) Electronic Equipment Reserve		
Opening Balance	1,016	1,016
Amount Set Aside / Transfer to Reserve	5,026	0
Amount Used / Transfer from Reserve	0	0
	6,042	1,016
(e) Community Bus Reserve		
Opening Balance	5,786	5,786
Amount Set Aside / Transfer to Reserve	4,556	0
Amount Used / Transfer from Reserve	0	0
	10,342	5,786
(f) Swimming Pool Reserve		
Opening Balance	42,619	42,619
Amount Set Aside / Transfer to Reserve	1,077	0
Amount Used / Transfer from Reserve	0	0
	43,696	42,619
(g) Joint Venture Housing Reserve		
Opening Balance	48,720	48,719
Amount Set Aside / Transfer to Reserve	5,531	0
Amount Used / Transfer from Reserve	0	0
	54,251	48,719
Total Cash Backed Reserves	**1,166,439**	**1,286,227**

All of the above reserve accounts are to be supported by money held in financial institutions.

	2015/16 Adopted Budget $	September 2015 Actual $
4. RESERVES (Continued)		
Cash Backed Reserves (Continued)		
Summary of Transfers To Cash Backed Reserves		
Transfers to Reserves		
Leave Reserve	4,063	0
Plant Reserve	7,384	0
Building and Recreation Reserve	443,573	0
Electronic Equipment Reserve	5,026	0
Community Bus Reserve	4,556	0
Swimming Pool Reserve	1,077	0
Joint Venture Housing Reserve	5,531	0
	471,210	0
Transfers from Reserves		
Leave Reserve	0	0
Plant Reserve	(136,000)	0
Building Reserve	(455,000)	0
Electronic Equipment Reserve	0	0
Community Bus Reserve	0	0
Swimming Pool Reserve	0	0
Joint Venture Housing Reserve	0	0
	(591,000)	0
Total Transfer to/(from) Reserves	(119,790)	0

In accordance with council resolutions in relation to each reserve account, the purpose for which the reserves are set aside are as follows:

Leave Reserve
- to be used to fund annual and long service leave requirements.

Plant Reserve
- to be used for the purchase of major plant.

Building and Recreation Reserve
- to be used to fund the renovation/purchase of Shire of Pingelly buildings and Recreation Infrastructure.

Electronic Equipment Reserve
- to be used to fund the purchase of administration computer system equipment.

Community Bus Reserve
- to be used to fund the change-over of the community bus.

Swimming Pool Reserve
- to be used to fund the upgrading of the swimming pool complex

Joint Venture Housing Reserve
- to be used for the future maintenance of the Joint Venture units

SHIRE OF PINGELLY

NOTES TO AND FORMING PART OF THE STATEMENT OF FINANCIAL ACTIVITY

FOR THE PERIOD 1 JULY 2015 TO 30 SEPTEMBER 2015

	2014/15 B/Fwd Per 2015/16 Budget $	2014/15 B/Fwd Per Financial Report $	September 2015 Actual $
5. NET CURRENT ASSETS			
Composition of Estimated Net Current Asset Position			
CURRENT ASSETS			
Cash - Unrestricted	1,100,789	2,940,550	1,621,142
Cash - Restricted Unspent Grants	0	660,239	2,568,822
Cash - Restricted Unspent Loans	2,500,000	0	0
Cash - Restricted Reserves	1,286,229	1,286,228	1,286,228
Receivables (Budget Purposes Only)	395,534	0	0
Rates Outstanding	0	143,505	803,212
Sundry Debtors	0	123,966	184,336
Provision for Doubtful Debts	0	0	0
Gst Receivable	0	40,029	15,794
Accrued Income/Payments In Advance	0	4,287	0
Investments	0	0	0
Inventories	3,966	3,966	240
	5,286,518	5,202,770	6,479,774
LESS: CURRENT LIABILITIES			
Payables and Provisions (Budget Purposes Only)	(152,405)	0	0
Sundry Creditors	0	(74,323)	(8,198)
Accrued Interest On Loans	0	(4,580)	0
Accrued Salaries & Wages	0	(57,458)	0
Income In Advance	0	0	0
Gst Payable	0	(9,269)	(7,548)
Payroll Creditors	0	(497)	(497)
Accrued Expenses	0	(10,883)	0
PAYG Liability	0	(24,064)	(13,517)
Other Payables	0	(427)	(486)
Current Employee Benefits Provision	(165,510)	(125,798)	(125,798)
Current Loan Liability	(125,798)	(165,510)	(165,510)
	(443,713)	(472,809)	(321,554)
NET CURRENT ASSET POSITION	4,842,805	4,729,961	6,158,220
Less: Cash - Reserves - Restricted	(1,286,229)	(1,286,228)	(1,286,228)
Less: Cash - Unspent Grants/Loans - Fully Restricted	(2,500,000)	0	0
Less: Current Loans - Clubs / Institutions	(83,747)	0	0
Add Back : Component of Leave Liability not Required to be Funded	165,510	125,798	125,798
Add Back : Current Loan Liability	125,798	165,510	165,510
Adjustment for Trust Transactions Within Muni	0	0	0
ESTIMATED SURPLUS/(DEFICIENCY) C/FWD	1,264,137	3,735,041	5,163,300

6. RATING INFORMATION

RATE TYPE	Rate in $	Number of Properties	Rateable Value $	2015/16 Rate Revenue $	2015/16 Interim Rates $	2015/16 Back Rates $	2015/16 Total Revenue $	2015/16 Budget $
General Rate								
GRV - Residential	11.149600	310	3,042,404	339,216	0	0	339,216	339,216
GRV - Rural Residential	11.149600	65	679,968	75,814	0	0	75,814	75,814
GRV - Commercial/Industrial	11.149600	30	432,514	48,224	0	0	48,224	48,224
GRV - Townsites	11.149600	12	128,960	14,379	0	0	14,379	14,379
UV - Broadacre Rural	1.017900	254	105,462,510	1,073,502	0	0	1,073,502	1,073,501
Sub-Totals		671	109,746,356	1,551,135	0	0	1,551,135	1,551,134
Minimum Rates	**Minimum $**							
GRV - Residential	835	66	0	55,110	0	0	55,110	54,275
GRV - Rural Residential	835	24	0	20,040	0	0	20,040	18,370
GRV - Commercial/Industrial	835	12	0	10,020	0	0	10,020	10,020
GRV - Townsites	835	6	0	5,010	0	0	5,010	5,010
UV - Broadacre Rural	835	44	0	36,740	0	0	36,740	36,740
Sub-Totals		152	0	126,920	0	0	126,920	124,415
							1,678,055	1,675,549
Ex Gratia Rates							200	190
Movement in Excess Rates							0	0
Total Amount of General Rates							1,678,255	1,675,739
Specified Area Rates							0	0
Total Rates							1,678,255	1,675,739

All land except exempt land in the Shire of Pingelly is rated according to its Gross Rental Value (GRV) in townsites or Unimproved Value (UV) in the remainder of the Shire.

The general rates detailed above for the 2015/16 financial year have been determined by Council on the basis of raising the revenue required to meet the deficiency between the total estimated expenditure proposed in the budget and the estimated revenue to be received from all sources other than rates and also bearing considering the extent of any increase in rating over the level adopted in the previous year.

The minimum rates have been determined by Council on the basis that all ratepayers must make a reasonable contribution to the cost of the Local Government services/facilities.

7. TRUST FUNDS

Funds held at balance date over which the Municipality has no control and which are not included in this statement are as follows:

Detail	Balance 01-Jul-15 $	Amounts Received $	Amounts Paid ($)	Balance $
Transport Licensing	3,837	87,800	(85,233)	6,404
BCITF Levy	0	0	0	0
Rates	200	0	0	200
Funds Held on Behalf of Groups	80	0	(80)	0
Unclaimed Monies	0	0	0	0
Builders Registration Board	0	0	0	0
Nomination Deposits	0	960	(80)	880
Bond Monies (Including Key Deposits)	4,210	3,099	(2,480)	4,829
	8,327	91,859	(87,873)	12,313

8. OPERATING STATEMENT

OPERATING REVENUES	September 2015 Actual $	2015/16 Adopted Budget $	2014/15 Actual $
Governance	21,493	102,100	93,276
General Purpose Funding	1,835,009	2,416,871	3,415,613
Law, Order, Public Safety	7,861	80,439	111,177
Health	517	12,900	36,186
Education and Welfare	420	46,196	20,604
Housing	0	0	0
Community Amenities	154,102	196,140	215,818
Recreation and Culture	12,912	99,050	62,230
Transport	399,462	1,119,454	683,363
Economic Services	13,586	74,020	83,251
Other Property and Services	13,973	77,600	121,577
TOTAL OPERATING REVENUE	**2,459,335**	**4,224,770**	**4,843,097**
OPERATING EXPENSES			
Governance	116,495	655,193	879,959
General Purpose Funding	32,036	141,296	96,490
Law, Order, Public Safety	43,970	243,654	215,706
Health	37,897	133,856	158,176
Education and Welfare	4,331	77,548	49,999
Housing	0	0	0
Community Amenities	57,002	374,681	328,788
Recreation & Culture	135,324	1,081,451	814,428
Transport	214,560	2,079,217	1,033,813
Economic Services	46,864	409,552	235,080
Other Property and Services	(51,517)	34,325	184,990
TOTAL OPERATING EXPENSE	**636,962**	**5,230,773**	**3,997,430**
CHANGE IN NET ASSETS RESULTING FROM OPERATIONS	**1,822,373**	**(1,006,003)**	**845,667**

SHIRE OF PINGELLY

NOTES TO AND FORMING PART OF THE STATEMENT OF FINANCIAL ACTIVITY

FOR THE PERIOD 1 JULY 2015 TO 30 SEPTEMBER 2015

9. STATEMENT OF FINANCIAL POSITION

	September 2015 Actual $	2014/15 Actual $
CURRENT ASSETS		
Cash and Cash Equivalents	5,476,192	4,887,017
Investments	5,000	5,000
Trade and Other Receivables	1,087,089	395,534
Inventories	240	3,966
TOTAL CURRENT ASSETS	6,568,521	5,291,517
NON-CURRENT ASSETS		
Other Receivables	664,631	664,631
Inventories	0	0
Property, Plant and Equipment	9,741,618	9,572,017
Infrastructure	63,762,122	63,537,607
TOTAL NON-CURRENT ASSETS	74,168,371	73,774,255
TOTAL ASSETS	80,736,892	79,065,772
CURRENT LIABILITIES		
Trade and Other Payables	30,245	181,501
Long Term Borrowings	165,510	165,510
Provisions	125,798	125,798
TOTAL CURRENT LIABILITIES	321,553	472,809
NON-CURRENT LIABILITIES		
Trade and Other Payables	0	0
Long Term Borrowings	3,082,868	3,082,868
Provisions	42,947	42,947
TOTAL NON-CURRENT LIABILITIES	3,125,815	3,125,815
TOTAL LIABILITIES	3,447,368	3,598,624
NET ASSETS	77,289,524	75,467,148
EQUITY		
Trust Imbalance	0	0
Retained Surplus	28,436,689	26,614,315
Reserves - Cash Backed	1,286,228	1,286,228
Revaluation Surplus	47,566,605	47,566,605
TOTAL EQUITY	77,289,522	75,467,148

10. FINANCIAL RATIOS

	2016 YTD	2015	2014	2013
Current Ratio	13.86	9.64	5.35	4.43
Operating Surplus Ratio	0.79	0.08	(0.91)	0.28

The above ratios are calculated as follows:

Current Ratio

$$\frac{\text{Current assets minus restricted current assets}}{\text{Current liabilities minus liabilities associated with restricted assets}}$$

Operating Surplus Ratio

$$\frac{\text{operating revenue minus operating expense}}{\text{own source operating revenue}}$$

SHIRE OF PINGELLY
RESTRICTED CASH RECONCILIATION
30 September 2015

Restricted Grants/Funds Received	Projects	GL/Job Account	Total Restricted Funds	Actual Expenditure Previous Years	Actual Expenditure 2015/16	Restricted Funds Remaining
Royalties for Regions 2012/13 (Individual)	Dam Clean/Tanks	R4R01	60,000.00	0.00	0.00	60,000.00
	Netball/Basketball	CT01	91,530.00	91,530.00	0.00	0.00
	Footpaths	FP001/FP002	80,000.00	71,178.00	0.00	8,822.00
	Tennis Courts	R4R03	90,000.00	0.00	90,000.00	0.00
Unspent Loan 123	Recreation & Cultural Centre		2,500,000.00			2,500,000.00
Sub Total						2,568,822.00
Total Restricted Grant Funds						**2,568,822.00**
Available Cash			Interest Rate	Term	Maturing	
Municipal Bank		0111	Variable	Ongoing	N.A.	1,187,796.68
Municipal Term Deposit 1		0108				0.00
Municipal Term Deposit 2		0109				0.00
Municipal Term Deposit CLGFR		0812				0.00
Municipal On Call Account		0811	Variable	Ongoing	N.A.	501,416.96
Municipal Term Deposit 155081136	Unspent Loan 123	TD01	2.95%	1 year	30-Jun-16	2,000,000.00
Muncipal Term Deposit 155081144	Unspent Loan 123	TD02	2.85%	6 months	30-Dec-15	500,000.00
Total Cash						4,189,213.64
Less Restricted Cash						(2,568,822.00)
Total Unrestricted Cash						**1,620,391.64**

Attachment 3

11.2.4 Pingelly Bowling Club New Lease Agreement with Site Plan

Memorandum of Understanding

Lease Arrangements

Between

The Shire of Pingelly ("the Lessor")

and

The Pingelly Bowling Club

("the Lessee")

MEMORANDUM OF UNDERSTANDING

LEASE ARRANGEMENTS FOR THE PINGELLY BOWLING CLUB (INC)

TERMS AND CONDITIONS OF LEASE

1. The lease arrangement is for the portion of reserve 23983 (Lot 492A) occupied by the Pingelly Bowling Club as specified in Schedule 1.
2. That within 18 months of the signing of this lease agreement the Shire of Pingelly and the Bowling Club Committee will have negotiated each parties funding contrubution towards the construction of a second green. As part of the negotiations a deliverable timeline and expectations is also to be established.

LEASE PERIOD

The lease period is effective from 1 July 2015 for a period of ten (10) years, ceasing on 30 June 2025 or as soon as the new Recreation and Cultural Centre plus one new green is completed and commissioned by the Chief Executive Officer in consultation with the Bowling Club Committee as suitable for the Bowling Club to relocate and vacate the existing premises.

LEASE PAYMENTS

The Pingelly Bowling Club hereby agrees to pay an annual lease payment of $1 for the use of the portion of reserve 23983 (Lot 492A).

INSURANCE

- Pingelly Bowling Club to pay for all insurances including property insurance (at replacement value) and public liability insurance (not less than twenty million dollars ($20,000,000).
- That the Pingelly Bowling Club pay for workers compensation insurance compensation to cover all employees.
- That evidence of insurance coverage is provided to the Shire of Pingelly annually.

BUILDING MAINTENANCE AND UTILITY ARRANGEMENTS

- That the building and associated lands be maintained to be compliant with all Shire of Pingelly and State of Western Australia Health, Building, Planning, Fire and Liquor Licencing Local Laws, Schemes, Acts and Regulations.
- That any new permanent structured signage put into place has planning and building approval prior to installation (excluding banners and temporary signage).

USE OF PROPERTY

- That the primary usage of the property be for the purposes of a "Bowling Club", with occasional use for other purposes permitted.

VARIATION

- The terms and conditions of this Memorandum of Understanding can be varied at any time by agreement of both parties.

PINGELLY BOWLING CLUB

Mr Timothy Haslam **President**	**Mr Raymond Narducci** **Secretary**
Date	**Date**

SHIRE OF PINGELLY

Cr Shirley Lange **Shire President**	**Mr Gavin Pollock** **Chief Executive Officer**
Date	**Date**

SCHEDULE 1

Attachment 4

11.3.2 Environmental Health Plan

Shire Of Pingelly

ENVIRONMENTAL HEALTH PLAN

Adopted 1998
Reviewed 2015

Adopted By Resolution of Council

Insert

Contents

Glossary of Terms

AIEH	Australian Institute of Environmental Health.
AQL	Acceptable Quality Level - refers to the hygiene standard for carcass and carton meat. It requires compliance with Australian Standard Hygienic Production of Meat for Human Consumption.
DEP	Department of Environmental Protection.
HACCP	Hazard Analysis Critical Control Point - a quality assurance principle developed for the food industry. The HACCP system is a proactive and preventative method of managing food safety and quality.
Immunity	Immunity is that resistance usually associated with the presence of antibodies or cells having a specific action on the microorganism concerned with a particular infectious disease or on its toxin.
Immunisation	Immunisation is inoculation of the infectious agent itself in killed, modified or variant form, or of fractions or products of the agent, to attain immunity.
NH&MRC	National Health & Medical Research Council.
WALGA	Western Australian Local Government Association.

INTRODUCTION

Section 26 of the *Health Act 1911* empowers and places responsibility on local government to administer the Act, its regulations and local laws, within its district.

This Environmental Health Plan has been prepared to satisfy the requirements of the *Health Act 1911* and the *Local Government Act 1995.*

It was developed in conjunction with the Shire of Pingelly's Corporate Plan.

Goals and strategies in each of the program areas of the plan were identified in consultations with all staff in the Shire of Pingelly Environmental Health Service after a thorough analysis of roles, responsibilities, practices and procedures.

Minimum and desirable inspection frequencies have also been determined to guide Staff and indicate the level of performance expected by the Executive Director Public Health of the Health Department of WA. These are produced separate to this document.

It is proposed that this Plan will be reviewed annually to enable progress and priorities to be re-assessed.

Mission Statement

The Shire of Pingelly Environmental Health Service will provide a progressive and effective public and environmental health service, which efficiently addresses community needs and expectations.

Stakeholders

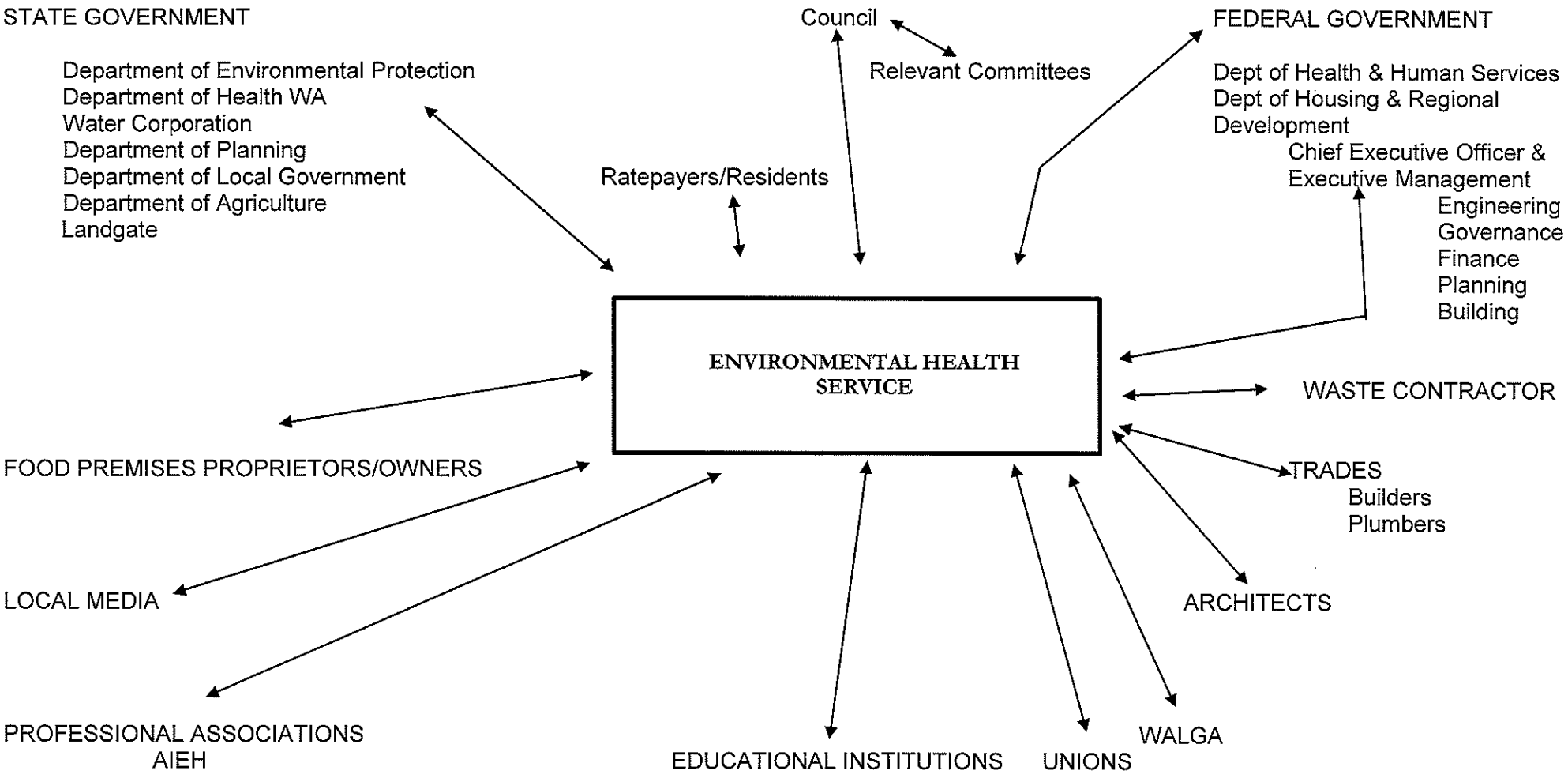
Internal

- Council
- Relevant Committees
- Chief Executive Officer
- Executive Management
  - Engineering
  - Finance
  - Planning
  - Building
  - Governance

External

- Ratepayers/Residents
- Federal Government
- State Government
  - Department of Environmental Protection.
  - Health Department of WA Water Corporation
  - Ministry of Planning
  - Local Government Department
  - Department of Agriculture
  - Landgate
- Food Premises Proprietors/Owners
- Trades
  - Builders
  - Plumbers
- Architects
- Waste Contractor
- Unions
- AIEH
- Curtin University
- Local Media
- WALGA

STAKEHOLDERS



Eg: Curtin University

S.W.O.T. Analysis

STRENGTHS

Effective leadership and management in organization.
Organizational stability.
Supportive Council in relation to environmental health issues.
Environmental Health Service staff competency and experience.
Organizational focus towards customer service, action and innovation.
Effective staff education and training programs.
Community support and participation in Environmental Health issues.

WEAKNESSES

Insufficient human resources to effectively carry out all functions
Ineffective community participation in Environmental Health issues in the community.

OPPORTUNITIES

Promotion of Environmental Health in the Community.
Economic growth and development in District.
Increased access to services in the community.

THREATS

Reduced funding from Federal and State Governments.
Devolution of legislative responsibilities from Federal and State Governments to Local Government.
Diminishing local economic base and subsequent revenue loss.
Increase in cost of services - transport, water sampling analysis.
Uncooperative stakeholders

PROGRAM 1 FOOD

Goal: That food for sale to the public meets the prescribed composition standard and is sold and prepared in a manner and in premises that complies with controlling legislation.

Sub Programs:

1.1 Food Premises Assessments
1.2 Food Sampling
1.3 Meat Inspection

1.1 FOOD PREMISES ASSESSMENTS

Description: Regular food premises assessments are conducted to ensure maintenance of and improvement of food hygiene standards. Assessments also include training of food handlers.

Priority:

- High.
- Prevention of serious disease in the community.
- Legislative requirement.

Legislation:

- Food Act 2008 and Food Regulations 2009.
- Eating House Local Laws.

Goal: To ensure food is prepared using high standards of hygiene in premises which comply with legislation.

Strategies:

- Conduct regular assessments of food premises.

Environmental Health Indicators:

Workload Number of food premises assessed per annum.

Effectiveness Number of complying food premises.

Efficiency Number of Work Orders issued.

Notes:

The Shire of Pingelly maintains a register of food premises.

1.2 FOOD SAMPLING

Description: The Shire of Pingelly participates in the Local Government Analytical Committee food sampling. Regular sampling and analysis of foods is carried out.

Priority:

- Medium.
- Prevention of adulteration of foods.

Legislation:

- Food Act 2008 and Food Regulations 2009.
- Food Standards Code.

Goal: That food provided to the public is safe, free from adulteration, properly described and complies with legislation

Strategies:

- Conduct food sampling on an as needs basis.

Environmental Health Indicators:

Workload Number of food samples submitted for chemical analysis and microbiological examination per annum.

Effectiveness Results of food sample analysis and examination.

Efficiency Number of warnings/prosecutions.

1.3 MEAT INSPECTION

Description: All beef, sheep, pork and game meat for human consumption is subject to inspection or control procedures to ensure disease free meat is supplied to consumers.

Priority:

- Medium.
- Prevention of serious disease in the community.

Legislation:

- Food Act 2008 and Food Regulations 2009.

Goal: To ensure all beef, sheep, pork and game meat is safe for human consumption.

Strategies:

- Conduct regular inspections of meat processing premises & operations.

Environmental Health Indicators:

Workload Premises to be inspected.

Effectiveness Premises compliant.

Efficiency Premises inspected.

Notes:

There are no abattoirs in the Shire of Pingelly. There is one butcher shop in the Shire of Pingelly.

PROGRAM 2 DISEASE CONTROL

Goal: To prevent or limit the spread of infectious diseases in the community.

Sub Programs:

2.1 Notifiable Diseases
2.2 Immunisation
2.3 Hairdressing & Skin Penetration

2.1 NOTIFIABLE DISEASES

Description: The Health Service is notified of cases of infectious diseases for Investigation.

Priority:

- High.
- Prevention of serious disease in the community.

Legislation: Health Act.

Goal: Reduce the spread of notifiable diseases in the community.

Strategies:

- Investigate all notifiable diseases reported to the Shire of Pingelly.
- Implement prevention programs.

Environmental Health Indicators:

Workload Number of notifiable diseases notifications per annum and the number investigated.

Effectiveness Evaluation of health promotion and prevention of notifiable diseases in the community.

Efficiency Number of infectious disease notifications in the District per annum and an annual review of immunisation service.

2.2 HAIRDRESSING & SKIN PENETRATION

Description: Regular assessment of premises is required to ensure high public health standards are maintained.

Priority: High.

Legislation:

- Health (Skin Penetration) Regulations 1987.
- Hairdressing Establishment Regulations 1972.

Goal: To prevent the spread of infectious diseases.

Strategies:

- Regular assessment of premises
- Education.
- Enforcement of standards

Environmental Health Indicators:

Workload Number of inspections of hairdressers and skin penetration premises per annum.

Effectiveness Number of follow up inspections required per annum.

Efficiency Number of warnings/prosecutions.

Notes:

There are no tattoo parlours in the Shire of Pingelly.

PROGRAM 3 WASTE MANAGEMENT

Goal

To ensure the safe and efficient collection, removal or disposal of waste.

Sub Programs

3.1 Effluent Disposal
3.2 Liquid Waste
3.3 Refuse Collection
3.4 Refuse Transfer/Disposal
3.5 Waste Minimisation (Recycling)

3.1 EFFLUENT DISPOSAL

Description: The Environmental Health Service provides service to developers and plumbers to assist in the development of effluent disposal units and prevent many of the problems that can occur.

Priority:

- High.
- Prevention of serious disease in the community.
- Prevention of ground water pollution.
- Legislative requirement.

Legislation: Treatment of Sewage and Disposal of Effluent and Liquid Waste Regulations 1974.

Goal: To ensure all onsite effluent disposal units are installed and operated in accordance with the legislation.

Strategies:

- Assess all development applications.
- Inspect all installations for approval.
- Monitor the regular maintenance programs (ATUs).

Environmental Health Indicators:

Workload Number of on-site effluent disposal inspections per annum.

Effectiveness Number of follow up inspections required per annum.

Efficiency Number of warnings/prosecutions.

Notes:

Pingelly has both deep sewer and septic systems. Deep sewer is operated by the Water Corporation and disposes into ponds on the northern side of Pingelly. The semi-processed effluent is pumped into the Shire of Pingelly's oval reticulation dam and shandied with stormwater.

3.2 LIQUID WASTE

Description: Monitoring of liquid waste collection vehicles is conducted to ensure health and odour problems do not occur. Investigations of illegal liquid waste disposals are also carried out.

Priority:

- High.
- Prevention of serious disease in the community.
- Prevention of pollution.
- Legislative requirement.

Legislation:

- Local Laws.
- Environmental Protection Controlled Waste Regulations 2004.

Goal: Ensure all liquid waste is disposed of at LICENSED facilities.

Strategies:

- Register all liquid waste contractors.
- Monitor operations.

Environmental Health Indicators:

Workload Number of inspections of liquid waste facilities per annum.

Effectiveness Number of follow up inspections of liquid waste facilities per Annum.

Efficiency Number of warnings/prosecutions.

Notes:

Liquid waste from septic tanks is disposed of into an evaporation pond at the refuse site. The local contractor is based in Brookton.

3.3 REFUSE COLLECTION

Description: The Shire of Pingelly has an obligation under the Health Act to ensure the collection and removal of rubbish from premises.

Priority:

- Medium.
- Legislative requirements.

Legislation:

- Health Act
- Health Local Laws.

Goal: The effective and safe management of solid waste.

Strategies:

- Devise a program to ensure the efficient collection and removal of rubbish.
- Implement and manage program.
- Devise a litter control program.

Environmental Health Indicators:

Workload Number of inspections of refuse sites and number of complaints per annum.

Effectiveness Number of follow up inspections and number of complaints per annum.

Efficiency Number of warnings/prosecutions and compliance with DEP licence conditions.

Notes:

The Shire of Pingelly provides a weekly kerbside refuse collection using MGBs and contractor Great Southern Waste for the Pingelly townsite. The refuse is dumped in the Pingelly Refuse Disposal Site.

3.4 REFUSE TRANSFER/DISPOSAL

Description: The Shire of Pingelly operates a refuse disposal site within the district. Inspections are carried out on a regular basis to ensure that the stations/sites are maintained and pollution of the environment does not occur (regular samples of leachate are taken to monitor pollution).

Priority:

- Medium
- Health Local Laws

Legislation:

- Health (Asbestos) Regulations 1992.
- Health Local Laws.
- Environmental Protection Act.

Goal: Disposal sites maintained to meet customer demands and without polluting the environment.

Strategies:

- Regular inspections.
- Monitor leachate.

Environmental Health Indicators:

Workload Number of inspections of refuse site and number of complaints per annum

Effectiveness Number of follow up inspections and number of complaints per annum

Efficiency Number of warnings/prosecutions and compliance with DEP licence condition

3.5 WASTE MINIMISATION (RECYCLING)

Description: The State Government has a goal to reduce waste going to landfill by 50% by the year 2000. The Shire of Pingelly supports State initiatives, as well as actively implementing its own strategies to extend the finite life of the landfill site.

Priority: Medium.

Legislation: Waste Avoidance and Resource Recovery Act 2007.

Goal: To reduce waste going to landfill by 50% by the year 2000.

Strategies:

- Develop, promote and implement a comprehensive recycling program.
- Monitor and annually review the program.

Environmental Health Indicators:

Workload	Number of man hours devoted to waste minimization.
Effectiveness	The percentage reduction in waste going to landfill.
Efficiency	Annual evaluation of waste minimization program.

Notes:

The Shire of Pingelly provides a fortnightly kerbside collection of recycling using MGBs and Great Southern Waste. A bulk bin is located in the centre of town for out of town residents who do not receive the kerbside service. The material collected is transported out of town. Some processing of recycling material is carried out by ad-hoc volunteers in a shed at the refuse site. The Shire of Pingelly has provided a cardboard crusher to the major supermarket in Pingelly.

PROGRAM 4 WATER

Goal To ensure all water used for drinking and recreation is safe.

Sub Programs

4.1 Water Surveillance
4.2 Public Swimming Pools

4.1 WATER SURVEILLANCE

Description: The Environmental Health Service conducts a range of water sampling activities. The major activity is testing of the public swimming pool for chemicals, bacteria and amoebae. Other activities include testing of oval reticulation water, non-scheme water, monitoring bores and food processing plants.

Priority:

- High.
- Prevention of serious disease in the community
- Legislative requirement

Legislation:

- Health Act

Goal: To ensure safe recreational and drinking water.

Strategies:

- Continue drinking water sampling program.
- Continue recreational water sampling program.

Environmental Health Indicators:

Workload	Number of water samples submitted for chemical analysis and microbiological examination per annum.
Effectiveness	Results of water sample analysis and examination
Efficiency	Number of water samples in compliance.

Notes:

The Shire of Pingelly has an obligation to regularly test the recycled effluent being used on the Pingelly oval under the agreement with the Water Corporation.

4.2 PUBLIC SWIMMING POOLS

Description: Public swimming pools have potential to spread disease or cause injury if not maintained in a hygienic and safe condition. Regular assessments are required to ensure a high standard of public health is maintained. (e.g. checking that pool chemicals such as chlorine gas are stored safely.).

Priority:

- High.
- Prevention of disease in the community Elimination of safety hazards.
- Legislative requirement.

Legislation: Health Act.

Goal: Public swimming pool facilities maintained in safe and hygienic condition.

Strategies:

- Regular inspections
- Continue the existing maintenance program for the Shire of Pingelly's public swimming pool.

Environmental Health Indicators:

Workload Number of inspections of public pools and number of water samples tested for chemical parameters and submitted for microbiological examination.

Effectiveness Results of water sample analysis and examination.

Efficiency Number of water samples in compliance.

Notes:

The Shire of Pingelly has one public swimming pool, currently operated under contract by Contract Aquatics.

PROGRAM 5 ACCOMMODATION

Goal That buildings are designed, maintained and operated in a manner to ensure the health and safety of users.

Sub Programs

5.1 Public Buildings
5.2 Accommodation

5.1 PUBLIC BUILDINGS

Description: It is the responsibility of the Shire of Pingelly to ensure that overcrowding and blocked exits to not occur. Other items inspected include exit signs, ventilation, toilet facilities and fire fighting equipment.

Priority:

- High.
- Public safety.
- Legislative requirement.

Legislation:

Health Act.

Goal: Safe Public Buildings.

Strategies:

- Ensure coordination of Shire of Pingelly's building approval process.
- Prepare and maintain a register of all public buildings.
- Regular assessments.

Environmental Health Indicators:

Workload Number of public buildings assessed per annum.

Effectiveness Number of follow up inspections required and number of work orders issued per annum.

Effectiveness Number of warnings/prosecutions.

Notes:

The Shire of Pingelly maintains a register of public buildings.

5.2 ACCOMMODATION

Description: Accommodation facilities such as dwellings, caravan parks, lodging houses, farm stay homes and workplaces are required to have adequate standards of hygiene and safety.

Priority:

- High.
- Prevention of disease Public safety.
- Legislative requirement.

Legislation:

- Health Act.
- Health Act (Caravan Parks and Camping Grounds) Regulations 1974.
- Health Local Laws.
- Construction Camp Regulations.
- Building Code of Australia.

Goal: To ensure healthy, safe accommodation.

Strategies:

- Review all development applications.
- Examine plans for compliance with health legislation.
- Prepare and maintain a register of all public accommodation facilities Regular assessments.

Environmental Health Indicators:

Workload Number of assessments of accommodation facilities per annum.

Effectiveness Number of work orders issued and follow up inspections required per annum.

Efficiency Number of warnings/prosecutions

Notes:

The Shire of Pingelly has one *farm stay*, one motel and two hotels (who occasionally provide accommodation). There is one caravan park – owned and operated by the Shire of Pingelly.

PROGRAM 6 VECTOR & PEST CONTROL

Goal

To manage the control of vectors and pests and ensure the safe use of pesticides.

Sub Programs

6.1 Vector & Pest Control
6.2 Pesticide Safety

6.1 VECTOR & PEST CONTROL

Description: The Environmental Health Service manages programs for the control of pests and vectors disease.

Priority:

- Medium.
- Legislative requirement.

Legislation:

- Health Local Laws.
- Health Pesticides Regulations 2011.

Goal: Minimise nuisances and health risks due to the presence of pests and vectors of disease.

Strategies:

- Develop monitoring programs.
- Implement eradication/management programs.

Environmental Health Indicators:

Workload Number of reports of notifiable disease (where the disease implicates a vector) and number investigated per annum.

Effectiveness Number of pest complaints received per annum

Efficiency Number of reports of notifiable diseases versus health promotion programs in place and the number of work orders issued.

PROGRAM 7 HEALTH PROMOTION

Goal To promote community and public health.

Sub Programs 7.1 Health Promotion

7.1 HEALTH PROMOTION

Description: The Environmental Health Service provides a range of health programs and activities to raise awareness and effect positive behavioural change.

Priority: Medium.

Legislation: Nil.

Goal: To promote community and public health.

Strategies:

- Undertake a community needs analysis.
- Develop programs according to priority of needs (e.g. Promote the I'm Alert Food Safety program.).

Environmental Health Indicators:

Workload	Number of premises undertaking I'm Alert Food Safety program.
Effectiveness	Number of food premises maintaining I'm Alert Food Safety principles.
Efficiency	Number of food premises maintaining I'm Alert Food Safety principles.

PROGRAM 8 ABORIGINAL ENVIRONMENTAL HEALTH

Goal

To improve and maintain the environmental health standards of Aboriginal communities.

Sub Programs

8.1 Food
8.2 Disease Control
8.3 Waste Management
8.4 Water
8.5 Accommodation
8.6 Pest Control
8.7 Health Promotion

8.1 FOOD

Description: An Aboriginal community may have its own food premises, the surveillance of which is important for food safety, since it will often be the only option for food supply. Food hygiene in the home may be an even bigger issue which can only be approached through culturally appropriate health education.

Priority:

- Medium.
- Prevention of enteric disease.
- Legislative Requirement.

Legislation:

- Food Act 2008 and Food Regulations 2009.
- Health Local Laws.

Goal: To ensure food is prepared using high standards of hygiene in commercial premises which comply with legislation and is handled safely at the domestic level.

Strategies:

- Conduct regular assessments of food premises.
- Contribute to health programs on food safety.
- Assist and train community Aboriginal Environmental Health Workers in food safety.

Environmental Health Indicators:

Workload	Number of food premises assessed per annum.
Effectiveness	Number of food premises implementing Food Safety Standard.
Efficiency	Number of participating community groups.

Notes:

The Shire of Pingelly does not have any *aboriginal communities* as defined under the Act however, there is a significant number of aboriginal people in Pingelly.

8.2 DISEASE CONTROL

Description: The Health Service is notified of cases of infectious diseases for investigation.

Priority:

- Medium
- Prevention of serious disease in each community.

Legislation: Health Act.

Goal: Reduce spread of notifiable diseases in each community.

Strategies:

- Ensure investigation of all notifications reported to the Shire of Pingelly.
- Implement prevention programs where indicated.

Environmental Health Indicators:

Workload Number of notifiable diseases notifications per annum and the number investigated.

Effectiveness Evaluation of health promotion and prevention of notifiable diseases in the community.

Efficiency Number of infectious disease notifications in the District per annum in comparison with other local authorities.

Notes:

The Shire of Pingelly does not have any *aboriginal communities* as defined under the Act however, there is a significant number of aboriginal people in Pingelly.

8.3 WASTE MANAGEMENT

Description: Waste management includes solid waste (refuse) and sewage/wastewater management. It is imperative to ensure each community has efficient systems for the collection and disposal of refuse and the treatment and/or the disposal of sewage and wastewater.

Priority:

- Medium.
- Prevention of disease
- Prevention of vectors of disease and other pests

Legislation:

- Health Act.
- Treatment of Sewage and Disposal of Effluent and Liquid Waste Regulations 1974.
- Health Local laws.

Goal: To ensure all sewage, wastewater and refuse is disposed of safely.

Strategies:

- Ensure approval of all applications and installations of sewage/wastewater treatment or disposal systems.
- Ensure an effective refuse collection system is implemented and conducted regularly.
- Ensure refuse disposal site is properly managed
- Ensure regular surveillance and maintenance of sewage/wastewater treatment or disposal systems.
- Ensure prompt repairs to systems are effected

Environmental Health Indicators:

Workload Number of inspections of liquid and solid waste facilities per annum.

Effectiveness Number of follow up inspections required per annum.

Efficiency Number of work orders issued.

8.4 WATER

Description: Aboriginal communities often have their own water supply system. The water must be protected from contamination at source, storage and reticulation. Recreational water (swimming pools) must also be protected.

Priority:

- Medium.
- Prevention of enteric disease.
- Legislative requirement.

Legislation:

- Health Act.

Goal: To ensure safe drinking, sanitation and recreational water.

Strategies

- Encourage relevant water monitoring programs (i.e. drinking and recreational) are in place.
- Encourage appropriate response when non-complying water sample result is obtained.
- Encourage regular assessment of water supply system, swimming pool etc.

Environmental Health Indicators:

Workload Number of water samples submitted for chemical analysis and microbiological examination per annum.

Effectiveness Results of water sample analysis and examination.

Efficiency Number of water samples in compliance.

Notes:

The Shire of Pingelly does not have any *aboriginal communities* as defined under the Act however, there is a significant number of aboriginal people in Pingelly.

8.5 ACCOMMODATION

Description: Many Aboriginal communities have inadequate or sub-standard housing. Improving both are important factors in improving the health of Aboriginal people. The safety of public buildings on Aboriginal communities also warrants attention.

Priority:

- Medium.
- Prevention of disease.
- Public safety.

Legislation:

- Health Act
- Health (Public Buildings) Regulations 1992
- Health Local Laws

Goal: To encourage adequate levels and hygienic standards of housing as well as safe public buildings

Strategies:

- Encourage regular assessments of houses and responsive maintenance.
- Assess public buildings
- Support community submissions for increase in levels or repairs/improvements to housing.

Environmental Health Indicators:

Workload Number of dwellings and public buildings assessed per annum.

Effectiveness Number of compliant buildings.

Notes:

The Shire of Pingelly does not have any *aboriginal communities* as defined under the Act however, there is a significant number of aboriginal people in Pingelly.

8.6 PEST CONTROL

Description: Vectors and pests such as mosquitoes, cockroaches and flies are significant health problems in many Aboriginal communities. Dogs may also be a significant health problem through the transmission of ectoparasites. Safe handling of pesticides will also be an issue in many Aboriginal communities.

Priority:

- Medium.
- Prevention of serious disease.

Legislation:

- Health Act.
- Health Local Laws.
- Health (Pesticide) Regulations 1956.

Goal: Minimise nuisances and health risks due to the presence of pests and vectors of disease and ensure the safe handling of pesticides.

Strategies:

- Monitor oxidation ponds etc for mosquitoes.
- Maintain oxidation ponds etc clear of vegetation.
- Monitor homes for cockroaches and flies and refuse disposal sites for flies.
- Ensure conduct of treatments as necessary.
- Ensure dog control treatment programs are implemented.
- Support training program implementation by community Aboriginal Environmental Health Worker.
- Ensure relevant community workers are adequately trained to use pesticides effectively and safely.

Environmental Health Indicators:

Workload Number of reports of notifiable diseases (where the disease implicates a vector) and number investigated per annum.

Effectiveness Number of complaints investigated per annum.

Efficiency Number of reports of notifiable diseases versus health promotion programs in place and the number of work orders issued.

Notes:

The Shire of Pingelly does not have any *aboriginal communities* as defined under the Act however, there is a significant number of aboriginal people in Pingelly.

8.7 HEALTH PROMOTION

Description: Health promotion is a very important factor in the long term improvement of environmental health standards in Aboriginal communities. Issues such as safe food handling (domestic and commercial), house sanitation and refuse disposal need to be progressed.

Priority: Medium.

Legislation: Nil.

Goal: To promote practices which will lead to improved community environmental health standards.

Strategies:

- Support/assist and where appropriate implement health promotion programs in communities.
- Support/assist training of Aboriginal Environmental Health Workers in health promotion and in implementation of programs.
- Incorporate health promotion activities into every assessment/contact possible.

Environmental Health Indicators:

Workload Number of health promotion programs adopted.

Effectiveness Participation rate in health promotion programs adopted.

Efficiency Participation rate in health promotion programs adopted.

Notes:

The Shire of Pingelly does not have any *aboriginal communities* as defined under the Act however, there is a significant number of aboriginal people in Pingelly.

PROGRAM 9 OTHER

Goal To effectively manage local government's obligations in relation to associated legislation and issues.

Sub Programs

9.1 Offensive Trades & Pet Food Establishments
9.2 Emergency Management

9.1 OFFENSIVE TRADES

Description: Regular inspections are conducted to ensure the activities undertaken in registered premises do not cause a public health nuisance.

Priority:

- Medium
- Legislative requirement Potential to cause pollution.

Legislation:

- Health Act
- Health Local Laws.
- Food Act 2008.

Goal: To ensure the operation of offensive trades and pet meat establishments do not create pollution or nuisance.

Strategies:

- Maintain a regular inspection program as necessary.
- Develop an improvement program.

Environmental Health Indicators:

Workload Number of offensive trade and pet food establishments inspected per annum.

Effectiveness Number of follow up inspections required and number of complaints received per annum.

Efficiency Number of compliant premises.

9.2 EMERGENCY MANAGEMENT

Description: Environmental health issues such as provision of safe food and water, sewage/waste disposal and infectious disease are major considerations in emergencies. The Shire of Pingelly has an obligation and a leading role to play in local planning and response to any emergencies.

Priority:

- Medium
- State Emergency Management arrangements.

Legislation: Nil.

Reference Documents:

- Emergency Management Act
- Health Act.

Strategies:

- Promote and support local emergency planning activities.
- Participate in the development of local emergency plans. Attend regular meetings to review plans.
- Implement staff training program.
- Participate in emergency plan exercises.

Environmental Health Indicators:

Workload	Completion of local emergency plan (environmental health component)
Effectiveness	Number of emergency plan exercises and review meetings per annum.
Efficiency	Completion of staff training programs.

Notes:

The Shire of Pingelly and the Shire of Wandering have formed the Pingelly Wandering Local Emergency Management Committee, with representatives from each of the emergency services.

Attachment 5

11.3.3 Shire of Pingelly Subdivisional Development Guidelines

SHIRE OF PINGELLY

17 QUEEN STREET
PINGELLY WA 6308

2015 SUBDIVISIONAL DEVELOPMENT GUIDELINES

GENERAL CONDITIONS AND GUIDELINES FOR THE DESIGN AND CONSTRUCTION OF SUBDIVISIONAL WORKS

SHIRE OF PINGELLY

SUBDIVISIONAL DEVELOPMENT GUIDELINES

Details of new or amended requirements

Clause	Details
SECTION 1:	GENERAL
SECTION 2:	DESIGN PRINCIPLES
SECTION 3:	DRAWINGS
SECTION 4:	CONSTRUCTION OF ROADS
SECTION 5:	CONSTRUCTION OF DRAINS

SHIRE OF PINGELLY

FOREWORD

This document details Council's requirements for engineering works associated with the subdivision and development of land within the Shire.

It is presented in the form of a guideline of minimum standards for Developers/Subdividers rather than a specification, and is performance or results-based, in which the end result is given rather than the means of achieving a desired outcome.

These guidelines were prepared by the Shire's Engineering and Development Services Section, and comments on any matter contained herein are welcome.

.....
GAVIN POLLOCK
CHIEF EXECUTIVE OFFICER

Date of Original Issue:

Date of Amendment:

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SECTION 1 – GENERAL CRITERIA

1. GENERAL

1.1 Development Requirements

1.1.1 Local Government (Miscellaneous Provisions) Act 1960, Section 295(1) states the following:

"Where a person who is the owner of land in a district proposes to subdivide the land into lots for disposal, if the proposal is to include in the subdivision a street or streets for use by the public, he shall not commence to put the proposal into effect until he has notified the local government of the proposal in writing and delivered to the local government with the notification a plan of the subdivision, and received the approval prescribed by the Town Planning and Development Act 1928 to do so."

And Section 295(4)(a):

"Where proposals for the subdivision of land in a district include the provision of streets for use by the public, and the proposals have been approved, owner of the land shall not dispose of the land, or part of it, or an estate or interest in it, until he has caused those streets to be constructed and drained to the satisfaction of the local government."

1.1.2 Any civil works required to be constructed under the above section of the Local Government Act, shall be constructed to Council requirements as detailed in these guidelines, which comprises a guide to the standard of work and design required before the works will be certified by the Council to the Department of Planning and Infrastructure as having been constructed to the satisfaction of the Council.

1.1.3 The terms "Council's Engineer" or "Engineer" shall mean a (representative of the CEO) or firm of Consulting Engineers (or their representatives) appointed by Council from time to time to act on its behalf.

The term "Subdivider" shall mean the owner of the land being subdivided or his authorised representative.

The term "Consulting Engineer" or "Consultant" shall mean the Engineer appointed by the Subdivider to design, document and superintend construction of the works. He may be required to furnish proof that he is a qualified Civil Engineer experienced in engineering work associated with the subdivision of land and must be eligible for membership to the Institution Of Engineers (Aust).

1.1.4 Technical provisions included in these Guidelines are intended to provide a guide to the standard of work, materials and design required before roads and drains will be certified to the Western Australian Planning Commission as having been made to the satisfaction of the Council. They are not necessarily complete and are not intended to be used as a specification or contract for

construction. They may be subject to alteration with the approval of the Engineer.

1.1.5 The Local Government (Miscellaneous Provisions) Act 1960, Section 295 (6) states:

(a) Where a person who is subdividing land is by the provisions of this Part required to construct and drain streets shown in the plan of subdivision he may;
  (i) carry out or cause to be carried out the construction and drainage at his own cost and expense; or
  (ii) arrange for the Council to carry out the work on his behalf and at his cost and expense.

(b) Where the person does not make the arrangements with Council, he shall pay to it, on demand, an amount to cover the reasonable costs of the Council in supervising the construction of roads, kerbs, drainage, paths and crossovers which amounts shall be reckoned as follows:
  (i) where the person has not engaged a Consulting Engineer and Clerk of Works to design and supervise the construction and drainage the amount shall be three percent (3%) of the cost of the construction and drainage as estimated by the Council;
  (ii) where the person has employed a Consulting Engineer and Clerk of Works to design and supervise the construction and drainage, the amount shall be one and one-half (1.5%) percent of the cost of the construction and drainage as estimated by the Council.

(c) The Council may require the person to employ a Consulting Engineer and Clerk of Works to design and supervise the construction and drainage and that person shall, when required to do so by the Council, carry out the requirement."

The design, preparation of drawings and specifications, and supervision of construction of subdivision works covered by these requirements shall be undertaken by the Consulting Engineer or his authorised representative. The Consulting Engineer shall carry out a site investigation to determine the geotechnical properties of the soils. Such information shall form the basis of the design of the roads, drainage system and site filling. A copy of this site investigation shall be lodged with the Council prior to or at the same time as drawings are lodged for approval.

1.1.7 Where a proposed subdivision abuts an existing road reserve containing a substandard road contained within the road reserve fronting the subdivision, this road shall be upgraded prior to the clearance of the subdivision to the required standard for that particular road as determined by Council's Engineer.

1.1.8 Every attempt shall be made to partially or wholly upgrade substandard roads fronting new subdivisions, but where it is impractical to physically construct the road or part thereof in accordance with this policy, the Subdivider shall lodge a non-refundable cash contribution with Council prior to the clearance of the subdivision equal to the estimated cost of the proposed roadworks.

The Subdivider shall be responsible for all damage to existing facilities, services and structures in both public and private ownership. Any damage shall be repaired to an acceptable standard without delay.

Where the conditions of approval of the subdivision require works to be carried out in an existing road reserve or on other land under Council's control, a permit to construct works in a street shall be obtained from Council and a bond in the form of cash or guarantee from a financial institution acceptable to Council to cover the reinstatement works of value equal to the estimated cost of the works plus 25% with a minimum of $1,000, shall be lodged with Council prior to the approval of the drawings and the work commencing, the unused portion of the bond to be returned upon the satisfactory completion of the works. The approval of engineering drawings and specifications shall not constitute permission to carry out works in streets within the Shire.

After clearance of survey diagrams by the Department of Planning and Infrastructure and the Office of Titles, any land delineated and shown as a new road on such diagrams shall come under the control of Council.

1.1.12 The supervision fee referred to in Clause 1.1.5(b) above shall be paid to Council before subdivision clearance will be granted.

The amount of the payment shall be based on the estimated cost of all of the works at the time of the commencement of the works. Upon certification of practical completion of the works, the Consultant shall provide the actual construction cost of the works and the amount of the supervision fee shall be calculated accordingly and paid as necessary.

1.1.13 Drawings and specifications for the construction of roads and drains shall be prepared in accordance with Section 3 of these requirements and must be approved by Council's Engineer before any work will be allowed to commence.

1.1.14 Endorsement of engineering design and drawings by the Shire does not imply fulfilment of planning requirements in any manner and the Shire of Pingelly excludes liability for any negligent act or omission in relation to the approval process carried out by the Shire involving the works the subject of the engineering design and drawings.

1.2 Control and Supervision Of Construction

1.2.1 The construction work shall be carried out in accordance with the approved drawings and specifications, and will be subject to staged inspection and approval by Council's Engineer or his representative during the course of

construction. Final approval shall only be given when the whole of the works shown on the approved plans have been executed to the true intent and meaning of the approved drawings and specifications.

1.2.2 An inspection is required for each of the following main stages of construction for roads:

(a) when the road has been boxed out and the subgrade shaped and compacted
(b) after the sub-base has been placed, graded and compacted to shape and level
(c) when the base has been placed, graded, compacted and water bound to correct shape and level
(d) before the priming operation
(e) during the kerbing works
(f) before the placement of asphalt or sprayed surface course.

1.2.3 An inspection is required for each of the following main stages of construction for drainage works:

(a) when the trenches have been excavated and the pipes laid to true line and level.
(b) when using sub-soil pipes, after the calibrated metal has been placed.
(c) after manholes, gullies and other structures have been built and backfilling of all trenches completed.

1.2.4 A minimum of 24 hours notice is required so that an inspection can be made prior to the next or following stage of construction being commenced.

1.2.5 Certification - Upon request, a certificate endorsed by the Consulting Engineer shall be submitted certifying the correctness of work in accordance with approved drawings and specifications for any of the main stages of construction. Documentary evidence to verify quantities and/or quality of work shall be provided when requested.

1.2.6 Supervision - When works are in progress, the Consulting Engineer shall ensure that the Contractor has at all times a competent Supervisor stationed and present on the site of the works. A representative of the Consulting Engineer shall be available for the purpose of joint interim inspection where deemed necessary by Council's Engineer.

1.2.7 Testing - The Consulting Engineer shall make available to the Engineer, all test results related to the subdivisional works. Testing shall be carried out by a N.A.T.A. approved testing laboratory. Where testing of a first or preceding stage of construction is requested, then no second or following stage of work shall proceed until approval to proceed is granted by the Engineer.

1.2.8 In addition to the normal inspection and testing requirements as detailed elsewhere in these guidelines, the Engineer reserves the right to inspect and require samples of materials being used to be taken and tested to ascertain quantity and/or quality of materials being placed in the construction work. The Consulting Engineer will be informed of any matters requiring remedial action. In the event that such testing reveals the work to be defective, the Subdivider shall reimburse Council for the cost of the testing.

1.2.9 Council's Engineer will direct all notices, requests, instructions and approvals to the Consulting Engineer, except in urgent circumstances when they may be given directly to other parties involved in the subdivision.

1.2.10 Council is conscious of the need to preserve natural vegetation wherever possible in rural subdivisions. To this end Council may impose special conditions on particular subdivisions to minimise the environmental impact of road and drainage construction, particularly in relation to preservation of established trees within road reserves and minimising soil erosion. Subdividers should be conscious of these aims and should take them into consideration in the various stages of planning for a subdivision.

1.2.11 Notification of Works - The Engineer shall be advised two (2) days before commencing work, and after cessation of work, one day before recommencing any work.

1.2.12 Hours of work - No work outside the hours of 7.00 am to 5.00 pm Monday to Friday shall be carried out without the written approval of the Engineer.

1.2.13 Indemnity Insurance - The Subdivider shall be responsible for arranging, taking out and keeping in operation all necessary insurance policies to totally indemnify and protect the Council against any and all claims of damages or other claims that may arise during the carrying out of the construction work.

1.3 Practical Completion Of Subdivisional Works

1.3.1 Upon the satisfactory completion of all subdivisional work including survey, lot pegging and soil stabilisation, the Consulting Engineer shall notify Council in writing that the works have been inspected and are in accordance with the approved drawings and/or specifications.

1.3.2 Upon receipt of this notification, the Engineer shall arrange a Practical Completion inspection of the completed works. Any such inspection shall require the presence of the Engineer and the Consulting Engineer.

1.3.3 At the time of the Practical Completion inspection or as soon as possible thereafter, the Engineer shall inform the Consulting Engineer of any item/s not in accordance with the drawings and specifications. Any such item/s so indicated shall be rectified without delay and a further inspection of these works shall be carried out upon completion of these remedial works.

1.3.4 If at any time after the granting of Practical Completion, the subdivisional work is found to be contrary to the approved drawings, then the Subdivider shall rectify the works at no expense to Council. Practical completion may be issued if uncompleted works have be bonded but the twelve month defects liability shall only commence once all bonded works have been completed.

1.4 Survey Release

1.4.1 The Consulting Engineer shall satisfy Council that the Subdivider has complied with all relevant conditions imposed by the Department of Planning and Infrastructure's Conditions of Approval of Subdivision pertaining to survey release of all or part of the subdivision.

1.4.2 The following items refer to the conditions which must be completed by the Subdivider prior to the approval of survey release for the subdivision.

(i) Diagram of survey showing full details of all lots, road reserves, easements (temporary and permanent) and reserves.
(ii) Payment of monies for construction of paths as required by Section 2.4.
(iii) Payment of appropriate supervision fee as required by Clause 1.1.5.
(iv) Receipt of the Consulting Engineer's Certificate as required by Clause 1.3.1.
(v) Completion of all works associated with the subdivisional construction or the payment of appropriate bond to cover outstanding works as required by Section 1.5.
(vi) Payment of Maintenance Retention Bond as required by Section 1.6.
(vii) Provision of "As Constructed" drawings as required by Section 3.5.5.

1.5 Bonding Outstanding Works

1.5.1 Council may accept payment from the Subdivider by way of a bond in the form of cash from a financial institution acceptable to Council in lieu of completion of part of the subdivisional works. Cash bonds will be placed in a non-interest bearing account.

1.5.2 Applications for bonding shall be in writing from the Consulting Engineer to the Engineer and shall include the following information:

(i) Concise reference to the extent, nature and location of the work to be bonded.
(ii) A timetable for proposed future completion of the bonded work.
(iii) An itemised estimate of the bonded work including contract price, name and address of the Contractors responsible for the bonded works.
(iv) Reasons for requesting the bonding of the incomplete works.
(v) Any other relevant information, which will assist the Engineer to assess the request.

Compliance with the above requirements does not necessarily imply Council acceptance of the bond and each request shall be subject to the Engineer's approval.

1.5.3 In cases where bonding is approved, the Subdivider shall enter into a written bond agreement with the Council which clearly states the following information:

(i) Name and address of the person or persons responsible for the payment or payments.
(ii) The amount of the payment or payments.
(iii) Name, staging number and location of the associated subdivision.
(iv) The Department of Planning and Infrastructure reference number of the associated subdivision.
(v) A concise explanation of the purpose and conditions of payment referring to all items for which the bond payment is to be utilised.

1.5.4 The earliest stage that bonding will be considered is upon completion of all filling, drainage and roads to sub-base stage. In this event, the value of the bond shall be 50% of the total contract value for the roads, drainage and filling works.

1.5.5 Bonding will be considered at any stage later than that specified in the preceding clause in which case the value of the bond shall be twice the estimated cost of the uncompleted works or $2,000 whichever is the greater.

1.5.6 Upon completion of the works described in the Bond Agreement, the Subdivider shall request in writing the release of the bond, following which the works will be inspected and, subject to all outstanding works being completed, the bond monies will be refunded.

1.6 Maintenance

1.6.1 Maintenance Liability

1.6.1.1 It shall be the responsibility of the Subdivider to maintain all roads and associated works for a period of twelve months from the date of Practical Completion hereinafter referred to as the Maintenance Period. Where defects requiring urgent attention become evident during the Maintenance Period, the Engineer may request these works to be rectified immediately. Failure to complete the rectification works within the time specified will cause Council to carry out the works using monies from the Maintenance Bond in clause 1.6.2.

1.6.1.2 At the expiry of the Maintenance Period the Consulting Engineer shall inform the Engineer of his intention to inspect the subdivision, and at a time mutually agreeable to all parties, such an inspection shall be made.

1.6.1.3 The Consulting Engineer shall apply in writing to Council for Maintenance Release, which will be subject to the satisfactory repair of defective works, cleaning of the drainage system and the sweeping of the roads, and the Engineer's acceptance of such works.

1.6.1.4 Where a Subdivider chooses to delay seeking subdivisional clearance after the date of Practical Completion, the Council may redefine the date of commencement of the Maintenance Period as being the date of subdivisional clearance.

1.6.1.5 The commencement date of maintenance liability shall be modified to the completion date of any bonded works that are completed after practical completion clearance is given to allow title creation.

1.6.2 Maintenance Bond

Prior to the release of the subdivision, the Subdivider shall pay to the Council a Maintenance Retention Bond equivalent to two and a half percent (2.5%) of the value of the road and drainage contract, with a minimum of $2,000. This payment is in the form of cash from a financial institution acceptable to Council and may be used at the discretion of the Engineer during the Maintenance Period for minor or urgent maintenance items after having notified the Consulting Engineer in writing of the need for such works. Cash bonds will be placed in a non-interest bearing account and, upon the Engineer's acceptance of Maintenance Release; all unspent bond monies will be refunded.

SECTION 2 – DESIGN PRINCIPLES

2. DESIGN CRITERIA

2.1 General

Criteria provided here are minimum criteria only and are necessarily broad based to cover general subdivision situations. In particular situations amendments may be required and Council may impose special conditions not covered by the criteria.

2.2 Roads

2.2.1 General

Roads should generally be designed in accordance with relevant Austroads (NAASRA) and ARRB guidelines and publications, which include:

(i) Guide to Traffic Engineering Practice – Part 5: Intersections at Grade

(ii) Urban Road Design - Guide to the Geometric Design of Major Urban Roads

(iii) Rural Road Design – A Guide to the Geometric Design of Rural Roads

(iv) Policy for Installation by Public Utility Authorities within the Road Reserve

(v) A Structural Design Guide for Flexible Residential Street Pavements

(vi) Pavement Design – A guide to the Structural Design of Road Pavements.

(vii) Australian Model Code for Residential Development

(viii) Bicycle Facilities Design Guidelines

(ix) Austroads AP-G72/02 Telecommunications in Road Reserves – Operational Guidelines for Installations

(x) Austroads A guide to the visual assessment of pavement condition 1987

(xi) Austroads AP-R258/04 Sprayed Seal Design – 2003/2004 Summary

(xii) Austroads AP-T68/06 Update of the Austroads Sprayed Seal Design Method

(xiii) Austroads AP-T17 Practitioner's Guide to Design of Sprayed Seals – Revision 2000 Method

(xiv) Austroads AP-T40/05 Audit and Surveillance of Sprayed Sealing Contract Works

(xv) Austroads AP-T38/05 Fibre-Reinforced Seals

(xvi) Austroads AP-T39/05 Sprayed Seal Cutting Practice

(xvii) Austroads AP-T05 Polymer Modified Binder Sprayed Seal Trials – Summary Report

(xviii) Austroads AP-T22 The State of the Art of Bitumen Emulsions in Australia and New Zealand

(xix) Austroads AP-R155 Pedestrian and Cyclist Safety – recent Developments

(xx) Austroads AP-R200 Frangible Sign Supports

(xxi) Main Roads Western Australia Document 67-08-4C Sign Guidelines

(xxii) Main Roads Western Australia Guideline for Assessing Trees Within the Recovery Zones on Established Roads

(xxiii) Main Roads Western Australia Assessment of Roadside Hazards March 2006 D06#26105

(xxiv) The Legal Implications of Frangible Poles – February 1984 Office of Road Safety Commonwealth Department of Transport

(xxv) AS1742.2 – 1994 /AS3845 (1999) requirements for signage and line marking.

(xxvi) Western Power guidelines for roadside power poles

(xxvii) Vicroads Road Design Guidelines Standard Drawings for Road Works -Part 9 Kerbs and Subsurface Drains

(xxviii) Renzo Tonin & Associates Pty Ltd Technical Note 4

(xxix) University of South Australia – Water Sensitive Urban Design Basic Procedures for Source Control of Stormwater

(xxx) Native Species listing for Pingelly for revegetation of road reserves.

(xxxi) Where there is any conflict between the requirements of these guidelines and the above publications, the details specified in these guidelines will prevail.

Generally all road pavement widths shall conform to the Shire of Pingelly road hierarchy, which enables the safe and orderly movement of vehicles, cyclists and pedestrians within and throughout the municipality. Consideration however must be given to the final aesthetic and functional aspects of the area, particularly in rural areas.

Aspects to be considered include minimising the environmental impact (particularly regarding existing trees and vegetation), fitting road grades as close to existing contours as practicable and provision of lot access.

2.2.2 Pavement Design

Pavements shall generally be designed for a 40 year design life in accordance with the publication "Pavement Design" NAASRA 1987 (or its latest issue).

In all cases pavement design shall be based on the in situ subgrade California Bearing Ratio (CBR), which shall be determined for each different subgrade type expected to be encountered in the works. Determination of subgrade CBR shall be by one of the methods nominated in the publication "Pavement Design", i.e. by laboratory testing, or by field testing backed up by limited laboratory tests. The Consultant shall adopt whatever test procedures are necessary to provide an accurate assessment of subgrade CBR for design purposes. Council's Engineer may request further field or laboratory testing at his discretion.

In any case the absolute minimum pavement profile shall be as follows:

	Alternative 1	Alternative 2
Access Roads & Collector Roads	125 "B" grade sub-basecourse 100 "A" grade basecourse 25mm asphalt on urban roads Two coat sprayed seal on rural roads.	200 "A" grade basecourse 25mm asphalt on Urban roads Two coat sprayed seal on rural roads.
Other Roads (except industrial)	150 "B" grade sub-basecourse 100 "A" grade basecourse 25mm asphalt on urban roads Two coat sprayed seal on rural roads.	225 "A" grade basecourse 25mm asphalt on urban roads Two coat sprayed seal on rural roads
Light Industrial roads	175 "B" grade sub-basecourse 100 "A" grade basecourse 25mm asphalt	250 "A" grade basecourse 25mm asphalt

Alternative pavement profiles giving equivalent load bearing capacities will be considered. Council may, at its discretion, allow sprayed seal surfacing in lieu of asphalt surfacing on urban roads.

In situations where heavy haulage operations and/or heavy clays are present case specific designs will be required.

2.2.3 Materials

2.2.3.1 "A" Grade Basecourse

"A" grade basecourse shall consist of graded crushed rock or laterite gravel. When tested in accordance with AS 1289 the material shall have the following properties:

As Sieve Aperture (mm)	Percentage Passing
26.5	100
19.0	95-100
9.5	70-88
4.75	48-71
2.36	34-57
1.18	24-46
0.425	14-33
0.075	6-20

Liquid Limit:	not to exceed 25%
Plasticity Index:	not to exceed 6%
Linear Shrinkage:	not to exceed 2%
Los Angeles Abrasion Value:	not to exceed 40%
Maximum Dry Comp. Strength:	not less than 1700 kPa

The material shall be free from organic matter and other deleterious substances.

2.2.3.2 "B" Grade Sub-Basecourse

"B" grade sub-basecourse shall consist of limestone or lateritic gravel.

Limestone and lateritic gravel shall be in accordance with Council's Specification for such materials, which in summary includes:

Limestone shall conform to the following requirements:

- all materials shall contain a maximum of 70% calcium carbonate;
- all material shall pass through a 100mm square sieve;
- not more than 80% of the material shall pass through a 2.36 AS sieve;
- not more than 15% of the material shall pass through a 75 micron AS Sieve;
- all material shall be free from capstone, roots and other deleterious substances.

Gravel shall be selected natural laterite gravel which exhibits an even grading curve throughout the full range. When tested to AS 1289 the material shall have the following properties:

-	Percentage passing 40mm sieve:	100%
-	Percentage passing 1.18mm sieve:	10% to 50%
-	Percentage passing 0.075mm sieve:	less than 20%
-	Plasticity Index:	3% to 10%
-	Linear Shrinkage:	less than 8%
-	Minimum CBR at the placed in situ moisture density condition:	35

The material shall be free from organic matter and other deleterious substances.

It is preferable for crushed gravel (Ferricrete or similar) to be used for the base course.

2.2.3.3 Asphalt

Asphalt shall be a nominal 10mm size asphaltic concrete mix in accordance with an AC10 mix designation to AS 2734.

2.2.3.4 Sprayed seals

Sprayed seals shall consist of a minimum two coat seal. The first or primerseal shall be a hot sprayed bitumen primer seal, unless, with the approval of the Engineer, a bitumen emulsion primer seal may be used.

In rural residential areas, the cover aggregates shall be 10mm prime coat, followed by the second coat of 7 mm diorite metal.

In areas zoned other than rural residential where a spray seal is applicable, the cover aggregate shall be 14 mm prime coat followed by the second coat of 10mm diorite metal.

2.2.4 Basecourse Widths

On kerbed roads the width of basecourse shall equal the width of seal plus 900mm. On unkerbed roads the width of basecourse shall equal the width of seal plus 1.5 metre shoulders.

2.2.5 Shoulders

Shoulders shall be constructed with the same materials and to the same depth as the adjacent basecourse.

2.2.6 Road Reserves

Local roads shall have a minimum road reserve width of 20 metres, however, Council reserves the right to make a wider road reserve should the site or engineering requirements dictate.

The designation of which road types shall apply to a particular subdivision (i.e. town centre residential, rural, rural living or mixed business) shall be in accordance with the Shire of Pingelly's Zoning Scheme.

The Subdivider shall comply with the requirements for those designations.

2.2.7 Town Centre And Residential Streets

Road design guidelines may generally be in accordance with Department of Planning and Infrastructure Policy DC 2.6 including:

Local Distributors: 7.0 m wide, concrete kerbed with 25mm asphalt surface on a primer seal.

Access Road: 6.0 m wide, concrete kerbed with 25mm asphalt surface on a primer seal.

The maximum longitudinal grade of a road shall be 10% (1 in 10) unless otherwise approved.

The minimum longitudinal grade shall be 0.50% or 1 in 200, however because of water shedding problems, this grade should only be used in extreme circumstances.

All changes of grade of more that 1% shall be joined by a vertical curve. The length of all vertical curves shall be in accordance with the relevant Austroads publications, and shall take into account overtaking and stopping sight distances and comfort factors.

The cross fall on the cross section of the road pavement shall be generally 3% each way from the crown but through horizontal curves, one way cross fall or superelevation shall be applied in accordance with the appropriate Austroads guidelines. In minor residential streets and cul-de-sacs the road pavement may have a one-way cross fall where the natural surface across the road reserve lends itself to this type of construction. This condition does not apply on horizontal curves where the normal requirement of superelevation to match design speeds and radii shall apply.

Verges shall have sufficient width for the provision of public utility services, and shall be a minimum of 3.5m. Verges shall normally be graded at +2% from the top of the kerb to the property boundary. In areas of steep cross fall or where earthworks should desirably be reduced to minimise environmental impact, the verge grading may be increased as agreed with Council's Engineer.

Culs-de-sac shall have a minimum head radius of 9m with 15m radius tapers.

Kerb type shall be mountable to residential frontages and semi-barrier elsewhere unless otherwise specified.

Rural Residential, Residential and Townsite roads shall be established with two (2) metre wide dual use footpaths installed on at least one side of each road. Street lighting at the intersections of roads and the end of cul-de-sacs will be required as a minimum standard.

2.2.8 Rural Living Streets

The minimum standard for rural living streets within a subdivision shall be as follows:

Straight Pavements: 6 metre wide, two coat seal (2x10/7 mm stone) with 1.5 metre shoulders, 2 coat seal (10/7 mm stone)

Intersections:

(a) All intersections shall be provided with concrete kerbing to at least 10 metres beyond the tangent point of the sweep. This kerbing shall repeat on the opposite side of the intersection on the straight section of road. At the terminating end, the kerbing shall be flared towards the verge.

(b) All intersections shall be provided with a 30mm asphalt surface on a primer seal, to the full extent of the concrete kerbing.

Geometric design shall be according to 'Rural Road Design', Austroads 1989. The maximum design speed for access roads shall be 60 km/hr, collector roads 70 km/hr and arterial roads 90 km/hr. These design speeds shall be verified by Main Roads Western Australia.

The maximum longitudinal grade of a road shall be 12.5% unless otherwise approved. The minimum longitudinal grade shall be 0.5% unless table drains are graded independently of the road to provide satisfactory drainage.

All changes of grade of more that 1% shall be joined by a vertical curve. The length of all vertical curves shall be in accordance with the relevant Austroads publications, and shall take into account overtaking and stopping sight distances and comfort factors.

One-way cross fall to a maximum of 3% may be approved for access roads when excessive cross fall exists in the natural surface. Roads shall normally have two-way cross-falls of 3% except where geometric design requirements dictate that superelevation is required.

Table drains shall be provided for all roads for a minimum width of 1.2m, flat bottomed, with side slopes of a minimum 1:3 grade (33%).

Cut batters shall generally be no steeper than 1 in 3 (33%) except in hilly terrain, where depth of cut is considerable, or where ground conditions are such that it is not practical to comply with this requirement without excessive cost or environmental disturbance. Subject to the approval of Council's Engineer, cut batters may be increased to a maximum of 1 in 1 (100%). Fill batters shall generally be no steeper than 1 in 4 (25%) except in hilly terrain or where fill heights are considerable, in which case a maximum slope of 1 in 2 (50%) may be used subject to the approval of Council's Engineer.

Verges shall have sufficient width to install public utility services. In particular sufficient width must be provided to install overhead power lines with poles located at least 2.5m from the invert of the table drain.

Roads shall be designed to enable access to lots at an absolute maximum grade of 16%.

Cul-de-sac heads shall have a minimum head radius of 9m to edge of seal, with 15m radius tapers and asphalt sealed.

2.2.9 Rural Roads

Rural roads shall comply with the standards prescribed in the Roads 2020 Strategy, and will be dependent on estimated AADT counts.

Council has identified minimum road standards, given known and/or estimated Annual Average Daily Traffic (AADT) counts.

Type 1 — Formed road constructed from surrounding local material: 10-20 AADT – 6m seal with 1.5m shoulders.

Type 2 — Formed road paved with imported gravel material: 20-75 AADT – 6m seal with 1.5m shoulders.

Type 3 — Sealed road (6m seal width): 75-500 AADT.

Type 4 — Sealed road (7m seal width): 500-1000 AADT.

Type 5 — Sealed road (8-9m seal width): 1000-4000 AADT.

Type 6 — Sealed road with overtaking lanes: 2000+ AADT but lower volumes may be considered depending on the percentage of heavy vehicles and terrain conditions.

Type 7 — Dual carriageway – divided rural road: 4500 +AADT.

For the purposes of determining the impact a subdivision will have on AADT counts for any particular road, Council will utilise eight vehicle movements per lot per day.

All rural roads shall be sealed with a two coat seal (14mm prime and 10mm second coat) with 1.5 metre shoulders, except at intersections which shall be kerbed with 30mm asphalt over a primer seal. The extent of the kerbing shall be as stipulated for "Rural Living Streets".

Where existing rural roads are considered by Council to warrant sealing, the width of such sealing shall be a minimum of 7.0 metres, the maximum width being determined on the basis of AADT counts, and future forecasts of increases in vehicle traffic movements in the medium term.

The maximum longitudinal grade of a road shall be 8% unless otherwise approved. The minimum longitudinal grade shall be 0.5%.

All changes of grade of more than 1% shall be joined by a vertical curve. The length of all vertical curves shall be in accordance with the relevant Austroads publications, and shall take into account overtaking and stopping sight distances and comfort factors.

Intersections of arterial roads shall be widened as follows:

- Terminating road (collector or access) shall be widened to at least 7.4 m seal width for a straight length of 10m from the tangent point of the turn-out radius, and then tapering to the normal seal width over an additional 10m length;
- Through road (arterial) shall be widened on the approach near side by a 2.5m deceleration lane, with a minimum 1.5m wide shoulder, for a distance of at least 30m from the tangent point of the turnout radius, and then tapered back to the normal seal width over an additional 10m length.
- On the departure near side, it shall be widened by at least 1m from the tangent point of the turnout radius for a length of at least 10m (which shall be kerbed).
- On the opposite side of the road, it shall be widened by a 2.5m passing lane for a distance of 45m either side of the centre line of the intersecting road, and then tapered back to the normal seal width over an additional 100m at each end.

Verges shall have sufficient width for the provision of public utility services, and shall be a minimum of 3.5m. In areas of steep crossfall or where earthworks should desirably be reduced to minimise environmental impact, the verge grading may be increased as agreed with Council's Engineer.

The maximum longitudinal grade of a road shall be 12.5% unless otherwise approved. The minimum longitudinal grade shall be 0.5% unless table drains are graded independently of the road to provide satisfactory drainage, where necessary. A vertical curve shall be provided when the grade change is 1% or greater.

Geometric design shall be according to 'Rural Road Design', Austroads 1989. The design speed for any rural road shall be determined by Main Roads Western Australia.

One-way cross fall to a maximum of 3% may be approved for access roads when excessive cross fall exists in the natural surface. Roads shall normally have two-way cross-falls of 3% except where geometric design requirements dictate that superelevation is required.

Table drains shall be provided for all roads for a minimum width of 1.2m, flat bottomed, with side slopes of a minimum 1:3 grade (33%).

Cut batters shall generally be no steeper than 1 in 3 (33%) except in hilly terrain, or where depth of cut is considerable, or where ground conditions are such that it is not practical to comply with this requirement without excessive cost or environmental disturbance. Then, subject to the approval of Council's Engineer, cut batters may be increased to a maximum of 1 in 1 (100%). Fill batters shall generally be no steeper than 1 in 4 (25%) except in hilly terrain or where fill heights are considerable, in which case a maximum slope of 1 in 2 (50%) may be used subject to the approval of Council's Engineer.

Traffic control devices, sign posts, guide posts, street nameplates, guide signs and warning signs shall be provided in accordance with AS1742 to the satisfaction of Council's Engineer.

2.2.10 Industrial Roads

In light industrial areas, roads shall be kerbed and sealed (30mm asphalt) to a minimum width of 7.4 m. All other design criteria shall be in accordance with the requirements for Urban Residential Streets with the following exceptions:

- Verge width to be a minimum 4.5m;
- Culs-de-sac shall be avoided wherever possible;
- Kerbs shall be semi-mountable.

In heavy industrial areas, road construction requirements will be subject to specific engineering design.

Where culs-de-sac cannot be avoided, they shall have a minimum head radius of 15m with 25m radius tapers.

2.2.11 Public Utility Conduits

The Consultant shall ascertain the need for conduits under roads for all public utility services for both present and future services. If the public utility authority concerned will not install conduits at the time of construction of the roads, then the conduits shall be installed by the Subdivider (prior to surfacing of roads) whether or not the conduits are immediately required. Backfill trenches for conduits with compacted sand and finish with 200 mm of gravel or road base as detailed for storm water pipeline systems in Section 2.3.7.

2.3 Stormwater Drainage

2.3.1 General

Stormwater drainage systems are required to provide for effective disposal of stormwater and all drainage designs shall comply with appropriate industry design standards such as:

- "Australian Rainfall and Runoff" Institution of Engineers, Australia.
- "Stormwater Drainage Design in Small Urban Catchments" J Argue, ARRB Special Report No 34.
- "Subsurface Drainage of Road Structures" R J Gerke, ARRB Special Report No 35.All piped drainage lines shall be designed in accordance with the pipe manufacturer's recommendations and appropriate Australian Standards.

2.3.2 All drainage systems shall be piped in urban and residential areas and open drains and swales in rural areas unless otherwise specified by the Shire Engineer. The designer shall design the drainage network using a recurrence interval of 10 years except in the case of arterial drains and compensating basins where a recurrence interval of 50 years shall be used. Additionally, the designer shall provide for the adequate discharge of flood flows between the intervals mentioned above and a 100 year recurrence interval in order that the floor level of all buildings shall be 500 mm above the 100-year flood level.

2.3.3 It is possible that some existing drainage systems in the municipality may not be able to carry the design storms applicable to the recurrence intervals detailed in the preceding Clause. It is the responsibility of the Consulting Engineer to examine the complete downstream network to evaluate the maximum quantity of water, which may be discharged into the existing network. If, using the recurrence intervals mentioned above, the capacity of the existing drainage network is exceeded, the Council Engineers may direct that the surplus water either be retained within the subdivision in an approved manner or the existing drainage system upgraded to accommodate the design run-off. A drainage Management Plan will be required for each subdivision.

2.3.4 It shall be the responsibility of the Consulting Engineer to examine the total catchment area of which a particular subdivision may form a part, and to ensure that any arterial drainage that may pass through the particular subdivision is capable of carrying the ultimate design flow from the upstream catchment. Subdividers are responsible for arranging their own cost sharing arrangements, however, in some instanced Council may administer such arrangements at the Subdivider's request.

2.3.5 In cases where stormwater is discharged onto private land downstream of a subdivision or development, arrangements shall be made by the Subdivider with the owner of the downstream land to provide an easement in favour of Council over the route of the drain and to construct and/or improve the drainage outlet to the requirements of Council's Engineer.

2.3.6 The subdivisional drainage system shall be connected to an approved outlet in the district drainage system by a suitable outfall drain as approved. Consultants shall where possible design systems that store and retain water for irrigation of Public Open Space.

2.3.7 Types Of Pipework

The following pipe types shall be permitted:

Residential areas:	reinforced concrete pipes (and boxes) in classes appropriate to loadings and cover heights; aluminium Hel-Cor pipes with a minimum cover of 600mm; PVC pipes in classes appropriate to loadings and cover heights.
Rural Areas:	reinforced concrete pipes (and boxes) in classes appropriate to loadings and cover heights; steel and aluminium Hel-Cor pipes with a minimum cover of 600mm.

Other types of pipes shall be approved by Council's Engineer.

The minimum pipe size in the verge or within private property shall be 300mm diameter and the minimum pipe size under roads shall be 300mm diameter.

Pipelines shall be designed to ensure that hydraulic grade lines do not reach a level of less than 150mm from finished surface levels for the design recurrence interval.

The velocity in pipes shall be limited to the range 1.0 m/sec - 6.0 m/sec. The possibility of scour at outfalls shall be considered and steps taken to eliminate it where it may occur.

Manholes shall be provided at each change in direction and at a maximum spacing of 60 metres.

Inlet pits shall be placed at low points and at the upstream side of intersections if warranted by flow considerations. Inlet pits shall also be placed at intervals to limit the width of gutter flow to 1.5m (or 2.0m in the case of one-way crossfall), in kerbed roads, and at intervals to prevent the top water level in the table drain from rising to within 200mm of the edge of the shoulder in the case of un-kerbed roads, or to limit the inflow to the entry pit to its inlet capacity, whichever is the least, for the design recurrence interval flows.

On kerbed roads side entry pits shall be used wherever possible, although combined side entry/grated pits may also be used.

On un-kerbed roads, any concrete catchpits situated in table drains shall have grated tops at least 150mm above entry lips to prevent access to the pit by the public.

All outlets to pipe drainage systems (and inlets in the case of open ended culverts) shall have concrete headwalls with concrete aprons, and shall have anti-scour rock beaching for a minimum distance of 2m beyond the edge of aprons.

All trenches for pipes laid under road pavements shall be backfilled to the pavement subgrade surface with compacted sand or road base course material. Sand and cement shall be thoroughly mixed in the proportions of 100kg of cement to one cubic metre of sand. Sufficient water shall be added and mixed such that the moisture content is just sufficient to enable mixing and placement of the material. The material shall be placed in even layers not exceeding 225mm in thickness and each layer shall be compacted with a minimum of four (4) passes of a vibratory plate compactor having a minimum static mass of 50kg.

Care shall be taken to ensure that the material fills all voids under the haunches and that no damage occurs to the pipe whilst compacting material next to and immediately over the pipe.

Any areas where piped drainage is used shall be fitted with gross pollutant traps to prevent discharge of pollution to the surrounding environment.

Retention tanks may be necessary to prevent excessive discharges downstream.

In areas where M or H class clays are present it may be necessary to drain water from private properties onto the road reserve. In these cases piped drainage shall be sized to accommodate 300 m2 house roof run off area per lot. The additional water volumes shall be outlined in the drainage management plan.

2.3.8 Open Drains

Where drainage is by means of open drains, allowances must be made for access culverts to properties which must be provided at the development stage by the Subdivider. It is considered that piped culvert cross-overs are required to the entrance of each new property to meet the requirements of a subdivision being drained and filled to the satisfaction of the Western Australian Planning Commission.

All culverts shall have adequate concrete headwalls and drain scour protection, Where pre-cast headwalls are used, the finished level of the headwall shall not project more than 100mm above the adjacent pavement level. Any cross over required where the boundary is more than 100 mm above the pavement level shall be sealed to the boundary.

Table drains to un-kerbed roads shall be sized so that the top water level in a drain does not rise to within 200mm of the edge of the shoulder for the design recurrence interval flow. Installation of catchpits is at the discretion of Council's Engineer. Culverts may be utilised to contain flows in table drains within permissible limits where practicable.

Where there is a risk of scouring in open drains (including table drains), the drains shall be fully lined with a lining of rock, concrete or other method approved by Council's Engineer. Flow rates in open drains shall be controlled by engineering controls if surface flows will exceed 1m/s. In areas where soils are subject to scouring such as red loams and sand, drains shall be lined to prevent scouring.

2.3.9 Sub-Soil Drains

Where sub-soil water is present, or is likely to become present at any time, and is likely to interfere with the stability of any buildings, the road pavement (or footpath or accessway, etc) a system of sub-soil drainage shall be designed and installed to the approval of Council's Engineer.

Sub-soil drains shall be installed to cut off flows at least 600mm clear of any building or surface of the pavement and shall discharge to piped drainage systems or open drains downstream of the affected area, as appropriate for each situation.

2.3.10 Drainage Easements

Where drains are laid within, or discharge stormwater onto private property the drain and stormwater discharge shall be protected by registered easements which shall show on all plans. The easement shall be centrally located over and about the drainage line and it shall have a width of at least twice the depth of the drain with an absolute minimum width of 3.0m.

2.4 Fire Management

Fire fighting facilities shall be provided in accordance with the Fire Management Plan for the subdivision. A minimum standard is for fire fighting tanks shall have a minimum volume of 50,000 litres and gravity feed an in-ground hydrant. To achieve the minimum 50,000 litre require two concrete tanks of equal or greater volume than 50,000 litres may be coupled to create the minimum storage requirements. Fire fighting tank pads shall be rock pitched to prevent erosion. The tanks should also be filled with level indicating devices and lockable gate valves and cam lock fittings at the base of the tanks to allow for easy refilling. The hydrant filling point shall be located within a sealed truck pull off bay constructed to the same specifications as the adjoining road.

Strategic breaks shall have a minimum width of 6 metres, with 4 metres being trafficable by two wheel drive vehicles.

The Consulting Engineer shall prepare detailed designs of the pavement thicknesses in accordance with Australian Road Research Board (A.R.R.B.) and/or Austroads Design Guidelines as follows:

- "Pavement Design – A Guide to the Structural Design of Road Pavements", Austroads, 1987.
- "A Structural Design Guide for Flexible Residential Street Pavements", P.J. Mulholland, ARRB Special Report No 41.

Notwithstanding the design thicknesses obtained, the sub-base course shall be a minimum compacted thickness of 150 mm, the base course shall be a minimum compacted thickness of 75 mm.

The designer shall provide pavement drainage where necessary to maintain a moisture-free subgrade and base course as determined by the site conditions.

2.5 Miscellaneous Facilities

2.5.1 Footpaths

Footpaths in road reserves shall be provided in residential & rural residential subdivisions unless special circumstances prevail in which case they may be omitted at Council's discretion. If footpaths are required they shall be provided at the Subdivider's cost. If footpaths are required Council may wish to defer construction until the majority of houses fronting the street are constructed to enable driveway crossings to be located and constructed. In this case the Subdivider shall pay to Council the estimated cost of deferred footpath construction (as estimated by Council) in lieu of constructing the footpaths at the time of subdivision.

Where paths are to be provided by the Subdivider they shall normally be 2.0m dual-use x 100mm thick concrete paths with a 2% slope towards kerbs (or edge of roadways).

Tooled lock-joint contraction joints shall be provided at 2m intervals and 12mm wide full depth expansion joints shall be provided at 6m intervals. The surfaces of concrete footpaths shall have a non-slip broomed finish. Alternatively Council may accept asphalt surfaced footpaths in lieu of concrete footpaths in special situations. Asphalt

footpaths shall consist of 30mm thick size 7 asphalt on 100mm thick "A" grade compacted basecourse. Other types of footpath may be accepted at Council's discretion.

Footpaths shall generally be provided on one side of a road only and shall be laid parallel to the kerb line (or edge of roadway). The longitudinal profile shall follow the longitudinal profile of the kerb line (or edge of roadway).

All footpaths are to follow the alignment that is illuminated when possible.

Footpaths in heavy clay (class M & H) shall be reinforced to withstand vehicle crossings and be placed on a 100 mm sand base.

2.5.2 Signs, Line Marking and Guide Posts

All direction or warning signs and guide posts shall be erected in accordance with AS 1742.5 - 1986. Requirements for such signs shall be clearly shown on the drawings.

All signage used shall conform with AS1742.2 (1994) and AS3845 (1999) for frangibility and crashworthy requirements.

Line marking shall be in accordance with the requirements of AS1742.2 – 1994 and is required for any subdivision greater than 42 lots.

Any developer sales signage shall not be installed in the road reserve and must meet frangibility requirements.

Guideposts shall be Ezydrive Steelflex EDFP1400D02 unless otherwise approved.

2.5.3 Street Nameplates

Street nameplates shall be erected at all newly created intersections and shall indicate the names of both streets. Nameplates shall generally be in accordance with AS 1742.5 - 1986 and shall incorporate any special feature which may be required by Council (eg Shire logo, colours of legend and background, etc).

Depth of sign shall be 150mm with 100mm lettering except on major roads where a depth of 200mm with 150mm lettering shall be used.

Signs shall be mounted at a height of three (3) metres above finished ground level. If two or more signs are to be erected on the same pole they shall be erected at differing levels.

Nameplates shall be mounted on a 50mm powder coated blue steel pole concreted a minimum of 600mm into the ground. The pole shall be erected where possible on the 2.7m alignment.

2.5.4 Battle-Axe Block Access Roads

Access road pavement to battle-axe blocks shall not be less than three metres wide and centrally located for the full length of the access way. Special consideration shall be given to "reciprocal rights" access ways which will require greater road pavement width.

The design, shape, width and drainage of these accessways shall be to the approval of Council.

2.5.5 Standard Crossovers

Crossovers, constructed to Council's standard, shall be constructed to all new lots. The location of such crossovers shall be to Council's satisfaction.

Crossovers shall be constructed to a minimum width of 4.7m, using either 100mm concrete, a 150mm thickness of gravel, or 100mm of limestone and 50mm of gravel. Culvert pipes beneath crossovers shall be a minimum 375mm diameter RCP and 4.8m in length. Headwalls to culverts shall be of concrete construction.

2.5.6 Public Open Space

In areas where the provision of public open space has been made a condition of sub-division the developer shall provide at their cost playground equipment that meets Australian Standards including the provision of shade sails and injury preventing fall surfaces.

Stormwater drainage shall be captured and used to irrigate public open space using sub-terrain irrigation methods.

2.5.7 Revegetation and Planting Constraints

Revegetation of decommissioned road reserves will be encouraged using native species to the Pingelly area that are planted in accordance with recovery zone requirements.

2.5.8 Bridle Trails

In rural residential areas or in large lot townsite areas where the keeping of horses may be allowed 3 metre gravel bridle trails shall be provided on the opposite side of the road to the footpath.

2.5.9 Bus Bays and Shelters

Sealed bus bays and bus shelters that conform to the Council Standard shall be required to be installed to allow for school bus operations. Bus shelters shall conform with disability access requirements.

SECTION 3 – DRAWINGS

3. REQUIREMENTS FOR DRAWINGS

3.1 General

3.1.1 Two copies of the initial design drawings, specifications and drainage and pavement calculations shall be submitted for approval by Council.

3.1.2 Any amendments will be marked up on one copy which shall be returned to the Consultant. Three copies of amended drawings and specifications shall then be re-submitted by the Consultant. One copy of approved drawings and specifications shall be signed by Council's Engineer and marked "Approved for Construction" and shall be returned to the Consultant together with any conditions imposed on the approval.

3.1.3 No construction shall commence until "approved for construction" drawings are certified by Council's Consulting Engineer.

3.2 Drainage Calculations

Submit drainage calculations for approval for every underground drain and all open drains (except table drains) including bridges, pipe drains, box culvert drains, etc. Calculations shall show catchment areas, run-off coefficients, recurrence intervals, rainfall intensities, times of concentration and method of sizing of drains. Calculations shall be set out in a standard tabular format or approved format to facilitate checking.

3.3 Pavement Calculations

Submit pavement calculations for approval. Calculations shall show the method adopted for calculation of subgrade CBR including test results, design pavement life, design traffic loadings, determination of basecourse thicknesses and need for subgrade stabilisation/improvement where necessary. Provide copies of all subgrade tests.

3.4 Required Drawing Scales

Scales of plans where possible should conform to the following:

(a)	Overall Layout Plan	1/500 or 1/1000
(b)	Plan	1/500
(c)	Longitudinal Section	1/500 horizontally 1/50 vertically
(d)	Cross Sections	1/200 horizontally 1/100 vertically
(e)	Particular Details (intersections, culs de-sac, turn circles, traffic devices)	1/200 or 1/250

These scales are minimal and may be increased on jobs of small extent.

The datum used shall be an established Department of Land Administration Bench Mark to Australian Height Datum. The location of such datum points shall be clearly indicated on the plan.

3.5 Drawing Information

3.5.1 Layout Plan

Layout Plan shall show:

(a) all existing and new streets and roads with the allocated street names
(b) all lots fronting such streets with each lot numbered and fully dimensioned
(c) all existing and proposed street drainage, allotment drains with necessary easements and outfall drains
(d) all survey and bench marks
(e) all existing and proposed contours
(f) the north point
(g) all proposed traffic management devices.

3.5.2 Road Plans

Each street shall be drawn in plan and profile.

The plan of the street shall show:

(a) width of all pavements, verges and medians
(b) design speed of the road
(c) distances on the centre line of the road (SKL)
(d) all horizontal curve data
(e) all existing and proposed contours
(f) all existing and proposed street drainage including manholes and gullies
(g) all lots facing onto the street
(h) all traffic management devices
(i) all existing and proposed services in the road reserve
(j) north point.

The longitudinal profile of the road shall show:

(a) a running distance along the centre line of the road (SKL)
(b) the natural surface levels along the centre line and both property lines
(c) design levels at the centre line and both channels. These levels shall be at 20 metre intervals on straight grades and alignments and at 10 metre intervals on vertical and horizontal curves
(d) lengths of grade lines with grades expressed as a percentage
(e) intersection and tangent points at change of grades
(f) length of vertical curves
(g) transition and superelevation details
(h) finished surface levels along both property lines

Cross section details shall be provided in all cases to show the thicknesses and other relevant details.

Intersections, cul-de-sac heads, roundabouts and any other traffic device or feature – details of these devices shall include:

(a) all lot boundaries
(b) geometric details
(c) design levels at appropriate points
(d) all services, including drainage
(e) north point.

3.5.3 Drainage Plans

All drainage lines will be drawn in plan and profile on the same drawing at the scales as previously specified.

The plan shall show:

(a) all existing and proposed drainage lines showing pipe sizes, grades, lengths, manholes, gullies, other drainage structures and whether the pipes are solid or slotted
(b upstream and downstream levels on all existing drainage outfalls to which connections are being made
(c) all existing and proposed sewer lines and any other services which may effect
(d) all existing and proposed contours and spot levels
(e) where appropriate and especially on industrial subdivisions, the stormwater connection location and the designed discharge from each lot.
(f) the north point
(g) all drainage easements including their description and width
(h) all streets with their allocated names and all lots facing onto such streets with the appropriate lot number

The longitudinal section shall show:

(a) a small plan (scale 1:2000) in the bottom right hand corner of the drawing, showing the location of the specific drains as detailed on the same drawing
(b) all pipe sizes and grades, the class of pipe and whether the pipe is solid or slotted
(c) the existing natural and finished surface levels
(d) the invert levels of the pipes and the depth to invert from the finished surface level
(e) the distances between gullies, manholes and other drainage structures.
(f) the location and levels of all other services, especially sewer line crossings
(g) details of all manholes, gullies and other structures.

Separate details shall be included on the drawings showing pipe laying and bedding details and other appropriate details as required.

3.5.4 Earthworks Plans

In all subdivisions involving earthworks, plans showing existing and proposed contours and appropriate cross sections are required.

3.5.5 "As Constructed" Drawings

The Subdivider shall submit to Council prior to the release of the subdivision, a full set of engineering drawings for the subdivisional works in reproducible form and in digital format, and certified by a licensed surveyor or other non-biased surveyors as approved as follows:

(a) Road Drawings – amended to show details of any alterations made during construction; and

(b) Drainage Drawings – amended to show actual lines, levels and grades against the design lines, levels and grades

and stamped "As Constructed".

Digital data to be provided in both 3D DXF and 2D plans in DWG (Autocad LT) format.

Drawings will not be approved for construction unless an approved fire management plan and drainage management plan are submitted with the drawings.

SECTION 4 – CONSTRUCTION OF ROADS

4. CONSTRUCTION OF ROADS AND ASSOCIATED WORKS

4.1 General

4.1.1 All works shall be carried out in accordance with the Occupational Health, Safety and Welfare Act, 1984.

4.1.2 Temporary Road Closure

Where it is necessary to close an existing road to carry out any part of the subdivisional works, approval for such closure shall be obtained from the Engineer at least (28) days prior to the work commencing.

The following conditions shall apply to such closures:

(a) A suitable detour shall be determined and clearly signposted with approved signs for the duration of the works and if no such detour is available, suitable and passable side tracks shall be provided.

(b) In the case of arterial roads and on other roads where a suitable and convenient detour is unavailable, the road closure shall be advertised by double column display advertisements in local newspapers advising the reason, location and duration of the closure and the route of the proposed detour, such advertisements being placed 21 days prior to the date of the proposed closure.

(c) In the case of arterial roads and on other roads where a suitable and convenient detour is unavailable, advisory signs shall be erected at appropriate locations on the site 21 days prior to the closure, such signs to comprise a minimum 100 mm letter height and to advise the reason, location and duration of the road closure.

(d) The works and road closure shall be adequately lit at night and other appropriate precautions shall be taken to ensure public safety.

(e) Emergency services, schools, other large institutions and large businesses that may be affected by the closure shall be advised in writing of the reason, location and duration of the road closure and the route of the proposed detour at least 21 days prior to the closure.

(f) The works shall be carried out in an expeditious manner to minimise the impact of the road closure on the general public.

(g) Where the road closure is required by a private contractor to carry out works in the road reserve then the contractor must obtain approval from Council's Engineers prior to commencing the works.

4.2 Survey Set Out

4.2.1 All works shall be set out and constructed in accordance with the alignments, levels, grades and cross sections as shown in the approved drawings.

4.2.2 Care shall be taken when working in the vicinity of survey pegs and bench marks to ensure the accuracy thereof.

4.2.3 The Subdivider shall be responsible for the accuracy of the setting out of works.

4.3 Construction Tolerances

The tolerances to levels permitted for the various stages of road construction shall be as follows:

Sub-grade	-50mm to + 0mm
Sub-base	-25mm to +10 mm
Base	-10mm to +10 mm
Bitumen primer	+/- 0.5 litres/m2
Concrete kerbing	Refer to Clause 4.2
Asphalt surfacing	+/- 5mm

4.4 Clearing Works

4.4.1 Clearing of all shrubs and trees shall be completed to an extent sufficient to facilitate the construction work. Natural vegetation should be retained where possible.

4.4.2 All tree roots, boulders and other deleterious material shall, where possible, be totally removed to a depth of 600 mm below the natural surface or finished surface levels of the street, whichever is the greater. Stumps shall be completely removed.

4.4.3 All holes and depressions resulting from clearing and grubbing shall be backfilled with approved material and compacted to at least the compaction of the surrounding in-situ material.

4.4.4 No material from the clearing shall be pushed beyond the limits of the site.

4.4.5 Material cleared shall be either removed from the site and disposed of at an approved waste disposal site or disposed of by burning. All burning off shall be strictly to the requirements of the Bush Fires Act and Environmental Protection Act.

4.5 Earthworks

4.5.1 Earthworks shall be completed to this specification and tolerances as set out herein and as detailed in the drawings.

4.5.2 The road shall be cut to the grades and batters indicated on the approved drawings.

4.5.3 All fill shall be clean free-draining medium to coarse sand and shall be compacted to the full depth of 95% of the modified maximum dry density when tested in accordance with AS 1289 E2.1 – 1977 unless otherwise approved.

4.5.4 All cut through rock shall be excavated to a depth of 100mm below sub-grade level and 200mm below the finished level of verges.

4.5.5 Blasting

4.5.5.1 Excavation in rock or hard soil may be carried out by blasting only if a blasting permit has been obtained from the Engineer in accordance with Explosives Regulations 1963 Regulation 115(6).

4.5.5.2 All explosives shall be stored and handled in accordance with AS2187-1983-4 under the personal supervision of the holder of a Shotfirers Permit. The shotfirer shall be held responsible for the repair, replacement, legal liability claims or anything that may arise from the blasting operations. All such screens, shields, matting and the like as is necessary to prevent rock, stones, earth, debris or other material from scattering or blowing from the immediate site of blasting shall be provided.

All road verges shall be graded evenly and smoothly, free from rubble and other deleterious material, to meet the level of the road kerb.

4.6 Soil Stabilisation

4.6.1 The subdivider shall be responsible for the satisfactory control of dust and sand drift from the construction site.

4.6.2 Stabilisation of topsoil, sand or other material or matter subject to movement over or near the subdivision shall generally be carried out in accordance with the Environmental Protection Authority's Dust Control Guidelines and to the satisfaction of the Engineer, both during the construction stages and upon completion of the subdivisional works.

4.6.3 Where initial stabilisation is carried out and subsequent works associated with the subdivisional works causes deterioration of effective stabilisation of the area, the area so affected shall be re-stabilised in an appropriate manner. The Subdivider shall effect a varying method of re-stabilisation should initial stabilisations be found to be unsuitable.

4.6.4 Stabilisation disturbed by works other than the subdivisional works shall be the responsibility of the person responsible for the disturbance of the stabilised areas (for example, builders, private lot owners and Service Authorities).

4.6.5 A special performance bond in the form of either cash or unconditional guarantee from a financial institution acceptable to Council to the value of $0.50 per square metre of the cleared or disturbed lot area shall be lodged with the Council prior to the commencement of any works as a condition of approval of drawings for the subdivisional works. These monies will be used by Council to control sand drift if, in the opinion of the Engineer, the contractor is not taking adequate precautions to control the sand drift during the progress of construction work.

The Consulting Engineer will be advised in writing on each occasion it becomes necessary for Council to use these monies for sand drift control. These monies will be refunded upon completion of the subdivisional works, including the stabilisation of the finished surface, less any amounts expended by Council on the control of sand drift during the construction period.

4.6.6 Council may reduce this bond to $0.25 per square metre for those developments assessed in accordance with the Environmental Protection Authority's Dust Control Guidelines and where the relevant contracts for subdivisional works incorporate the dust control strategies as indicated in the guidelines.

4.6.7 To avoid dust nuisance to adjacent owners the Engineer may direct that no earthworks, including stripping, filling or placing of topsoil, be carried out when a wind is blowing towards surrounding properties which is likely to cause sand drift or dust to reach those properties.

4.7 Sub-Grade

4.7.1 The formation shall be excavated in conformity with the profiles, dimensions, cambers and depths as shown on approved drawings.

4.7.2 Unless otherwise specified the width of the formation "boxed out" shall be at least 600mm greater on each side than the finished sealed width of the road pavement for urban roads.

4.7.3 Unless otherwise specified the width of the formation "boxed out" shall be at least 1.3m greater on each side than the finished running surface for rural roads.

4.7.4 The sub-grade shall be compacted to not less than 95% of its modified maximum dry density when tested in accordance with AS 1289 E2.1 – 1977 Methods of Testing Soil for Engineering Purposes.

4.7.4 This work shall be checked and approved prior to the placement of any foundation material.

4.7.5 In areas where heavy clays are present such as M or H class clays the bottom of the box shall be lime stabilised at 4% by volume.

4.8 Sub-Base Course

4.8.1 The sub-base shall be constructed of gravel complying with the requirements of Section 8.1 "Specification for Gravel" unless otherwise approved.

4.8.2 The sub-base shall be placed so that the compacted sub-grade is not disturbed and broken up and that the even thickness specified is achieved. Sub-base material shall not be spread upon a waterlogged sub-grade.

4.8.3 The sub-base course must be installed full depth (ie. no separate base course layers) to suit the overall pavement design.

4.8.4 The sub-base course shall be compacted to not less than 95% of its modified maximum dry density when tested in accordance with AS 1289 E2.1 – 1977.

4.8.5 Where damage to adjoining properties may result, the use of vibrating rollers will not be permitted.

4.8.6 All irregularities in the longitudinal grade and cross section shall be corrected in an approved manner until the road sub-base is brought to a uniformly compacted smooth and even surface.

4.8.7 If, during the construction period, the surface of the sub-base shows any imperfections or failures, such shall be corrected in an approved manner.

4.8.8 Unsatisfactory sub-base material shall be removed from the site and replaced with material as specified.

4.8.9 The sub-base construction shall be approved prior to the commencement of the placing of the base material.

4.9 Base Course

4.9.1 The pavement base material shall consist of fine crushed rock (road base) complying with the requirements of Section 8.2 "Specifications for Road Base" unless otherwise approved.

4.9.2 The base material shall be placed so that the gravel sub-base material is not disturbed or broken up during the placement of the base material and an even thickness as specified is obtained.

4.9.3 The base course must be installed full-depth (i.e. no separate sub-base course layers) to suit the overall pavement design as approved.

4.9.4 Grading of loose material over a hard surface and/or compaction in a thin layer is not permitted.

4.9.5 The base course shall be compacted to not less than 98% of its modified dry density when tested in accordance with AS 1289-E2.1 1977.

4.9.6 The base shall be water bound by the surface being sprayed with water and rolled until a slurry finish has been obtained. When this has dried, any surplus slurry material shall be broomed off the surface and disposed of as directed.

4.9.7 The base construction shall be approved prior to priming.

4.9.8 Prior to surfacing all underground public utilities service crossings shall be installed. All road crossings shall be backfilled and compacted in accordance with the requirements for sub-grade and sub-base construction.

4.10 Primer Sealing Of Pavement

4.10.1 The surface of the base course shall be primer sealed in accordance with Austroads publication "Bituminous Surfacing Volume 1, Sprayed Work 1989" prior to the application of the wearing course.

Final seal to be completed in 6months of prime seal.

4.10.2 Sweeping -The surface of the base course shall be swept free from any loose material and dust in such a manner that will not damage the finished surface of the base course prior to the application of the binder.

4.10.3 Application of Binder

In cases where a hot sprayed bitumen surface is specified, the primer seal shall be hot cut-back bitumen; for asphalt surfaces, either bitumen emulsion or hot cut-back bitumen as specified below may be used.

Primer sealing shall not be carried out for a period of at least 24 hours after completion of the water binding of the base course.

4.10.3.1 Bitumen Emulsion

Bitumen emulsion in accordance with AS 1160-1988 shall be uniformly and evenly sprayed onto the existing surface at a rate determined by the design but shall not be less than 1.4 litres per square metre measured at 15 degrees Celsius.

4.10.3.2 Hot Cut-Back Bitumen

Hot cut-back bitumen in accordance with AS2157-1980 'Cutback Bitumen" shall be applied at the rate determined by the design but shall not be less than 1.2 litres per square metre measured at 15 degrees Celsius, with the temperature of the bitumen being between 70 and 120 degrees Celsius.

4.10.3.3 The Binder Application

The primer seal shall be applied by an approved mechanical sprayer. Where the direct use of a mechanical spray is impracticable, the binder may be sprayed using a hand lance fed from the mechanical sprayer.

4.10.4 Application for Aggregate

4.10.4.1 The primer seal shall immediately after spraying be covered with approved 7mm nominal size aggregate as detailed in Section 6.3 "Specification for Sealing Aggregate" so that all sprayed areas shall be completely covered within a period of 15 minutes.

4.10.4.2 The aggregate shall be dry and free from dust and other deleterious material, and be spread by means of an approved aggregate spreader capable of spreading a uniform layer of aggregate.

4.10.4.3 Rate of application shall be determined by design but shall not exceed 150m2 per cubic metre of metal, controlled so that only sufficient is applied to give a uniform dense mat of one stone thickness.

4.10.4.4 Within 5 minutes of the application of the aggregate, rolling shall commence using appropriate equipment and continue until the aggregate is well embedded in the binder an a uniform surface obtained.

4.11 Hot Sprayed Bitumen Surfacing

4.11.1 The application of a single coat aggregate wearing course to a surface which has been primer sealed in accordance with Section 4.9 shall be designed and carried out in accordance with Austroads publication "Bituminous Surfacing, Volume 1, Sprayed Work 1989". The wearing course shall be applied to those areas as shown on the approved drawings and shall consist of a hot bitumen binder with appropriate aggregate.

The Subdivider shall submit his proposed application rates for binder and aggregate for approval.

4.11.2 Before the binder is applied, the surface shall be swept free of all loose stones, dust, dirt and foreign material. Any sections of pavement that are loose or damaged shall be repaired and finished to the correct level.

4.11.3 Materials

The binder and medium curing cutting oil shall comply with AS 2008-1980 and AS2157-1980.

The proportion of medium curing cutting oil to be added to the binder shall be determined by the design and shall not to exceed 8%.

The aggregate shall consist of crushed stone as specified in Section 8.3 "Specification for Sealing Aggregate" and shall be of 14 mm nominal size.

4.11.4 Application of Binder

4.11.4.1 The Subdivider shall give the Engineer at least 48 hours notice of his intention to apply the binder and the approval shall be obtained before any spraying commences. The surface to be sealed shall be dry and no binder shall be applied whilst the pavement temperature is less than 25 degrees Celsius or during wet conditions, or when adverse weather conditions may prevail at any time during such work.

4.11.4.2 The binder shall be applied by an approved mechanical sprayer. Where the direct use of the mechanical sprayer is impracticable, the binder may be applied by using a hand lance fed from the mechanical sprayer.

4.11.4.3 The binder edge shall not deviate from the desired edge lines by more than 50 mm. The rate of deviation of the binder edge from the desired edge lines shall not exceed one in four hundred (1:400).

4.11.4.4 All necessary precautions shall be taken to prevent over spray of binder. Any damage or defacement shall be made good immediately the sealing in that section has been completed, with all cleaning work being carried out to an acceptable standard.

4.11.5 Application of Aggregate

4.11.5.1 The aggregate shall be dry and free from dust and other deleterious material at the time of application and shall be uniformly spread over the sprayed area by means of an approved type of mechanical spreader.

4.11.5.2 The time lag between spraying and spreading shall be kept to a minimum and all sprayed areas, with the exception of approved lapping strips, shall be covered with 14mm nominal size aggregate within ten (10) minutes of spraying the binder.

4.11.5.3 If there are surplus loose particles on any portion of the sealed area such portion shall be swept lightly so as to move the loose particles but not disturb the aggregate embedded in the binder.

4.11.5.4 Rate of application shall be determined by design but shall not exceed 70 m^2 per cubic metre of metal, controlled so that only sufficient is applied to give a uniform dense mat of one stone thickness.

4.11.5.5 Within 5 minutes of the application of the aggregate, rolling shall commence using appropriate equipment and continue until the aggregate is well embedded in the binder and a uniform surface obtained.

4.11.5.6 Any loose cover material not incorporated in the seal after the completion of rolling shall be removed from the seal surface as directed and disposed of in an approved manner.

4.11.6 Two-Coat Surfacing

The application of a consecutive two coat aggregate wearing course seal may be approved on submission of a fully detailed specification.

4.11.7 Measurement and Recording of Application Rates

4.11.7.1 Binder

All loads of bitumen shall be sampled in accordance with AS 1160-1988, AS 2008-1980 or AS2157 –1980 as appropriate.

The following records shall be kept of all spray runs by a competent person and supplied to the Engineer:

(a) Spray width
(b) Start chainage – finish chainage
(c) Side of road (left or right)
(d) Road temperature
(e) Bitumen temperature
(f) Volume of bitumen used
(g) Average bitumen application rate

4.11.7.2 Aggregate

Aggregate volume shall be measured in truck at the point of spreading. Each load shall be levelled to facilitate calculation of volumes with the volume of the aggregate being recorded for each truck.

The actual application rate of cover aggregate shall be calculated from the measured volumes spread and the actual area measured on the site by the Consulting Engineer and supplied to the Engineer.

4.12 Concrete Kerbing

4.12.1 All concrete kerbing shall be cast in-situ using an extrusion machine to a cross sectional profile as shown on the approved drawings.

4.12.2 Appropriate measures shall be taken to ensure that kerbing is securely held in position. The laying of kerbing on the primed base course with asphalt placed against the front face and fill against the rear face is deemed to comply with this requirement. Provide a base key 150mm wide x 75mm deep under all kerbing laid to a radius of 50m or less.

4.12.3 All concrete work shall be carried out in accordance with AS3600-1988.

4.12.4 All concrete used shall be supplied in a ready mixed state and shall comply with the requirements of AS1379-1973. All concrete used in the works shall develop a minimum compressive strength of 20 MPa at 28 days with a maximum slump of 90mm.

4.12.5 The surface of the road shall be thoroughly swept clean of all loose material prior to the kerb being cast to ensure the maximum bond between the kerb and the pavement material.

4.12.6 Tolerances

The line, level and radius of all kerbing shall be in accordance with the following tolerances:

(a) The top surface of the kerb shall be parallel to the ruling grade of the pavement and shall be free from irregularities exceeding 5mm when measured with a 3mm long straight edge.
(b) Level +/- 5mm
(c) Line +/- 10mm
(d) Cross section dimensions +/- 5 mm.

4.12.7 The finished kerb shall be true to the cross-section dimensions specified and shall have a smooth finish.

4.12.8 Contraction Joints

Contraction joints shall be constructed every 2.5 metres run of kerbing. The contraction joints shall be 6mm wide and shall be cut through the kerb above the road surface level immediately after extrusion. Care must be taken to avoid any disturbance to the edges of the joint and any such disturbance shall be made good immediately.

4.12.9 Expansion Joints

Not less than 24 hours after placement of the kerb, expansion joints shall be formed by cutting completely through the kerb at 5.0 metre intervals, at sides of drainage gullies and at tangent points of all small radius horizontal curves. The expansion joints shall be 13mm wide. Each expansion joint will be filled with a foam packer which shall be covered with an approved compound.

4.12.10 Curing

All concrete shall be cured as specified in AS3600-1988.

4.12.11 Protection

All kerbing shall be protected from damage and any damage repaired immediately.

4.12.12 Backfilling

The backfill material shall be free draining sand and/or topsoil, free from debris and deleterious matter and levelled and compacted to not less than 90% of the modified maximum dry density when tested in accordance with AS1289 E2.1-1977.

4.12.13 Surplus Materials

All surplus materials including materials removed due to non-compliance with the specifications shall be removed from the site and the area left in a neat and tidy condition.

4.13 Asphalt Surfacing

4.13.1 General

Asphalt used for the wearing course on any road pavement shall consist of a combination of coarse aggregate, fine aggregate and mineral filler, uniformly coated and mixed with a bitumen binder in accordance with that detailed in Section 8.4 "Specification for Asphalt".

All work and material shall be in accordance with the requirements of AS 2734-1984 and shall provide a surface with level and roughness tolerances complying with the standard and having a compaction of at least 98% of the 50 blow, 35 blow or 25 blow Marshall density as approved.

4.13.2 Commencement of Works

The Contractor shall give at least 24 hours notice to the Engineer before commencing or recommencing any asphalt surfacing works.

4.13.3 Delivery Records

A weighbridge ticket showing the empty and loaded masses of the vehicle shall be made available to the Engineer at the point of delivery by the driver of the vehicle together with written confirmation of the following if requested:-

(i) the date and time of loading
(ii) the name of the supplier and the plant location
(iii) the identification number of the vehicle
(iv) the nominal size of the asphalt aggregate

4.13.4 Testing of Asphalt

Test results indicating the following shall be supplied on request:

Marshall stability
Marshall flow
Bitumen content
% air voids
% compaction

4.14 Street Name Plates

4.14.1 The subdivider shall be responsible for the supply and erection of all street nameplates in accordance with AS1742.5 –1986 Part 5.

Nameplates shall be of approved type, be fully reflectorised on extruded aluminium and shall be erected at all newly created intersections and shall indicate the names of both streets. Nameplates and shall incorporate any special feature which may be required by Council (eg Shire logo, colours of legend and background, etc).

4.14.3 Depth of sign shall be 150mm with 100mm lettering except on major roads where a depth of 200mm with 150mm lettering shall be used.

4.14.4 Signs shall be mounted on 50mm diameter galvanised or powder coated steel posts so that the bottom of the sign is 2.7 metres clear of the ground. Posts shall be concreted into the ground to a depth of at least 0.6 metres. The pole shall be erected on the 2.7 metre alignment.

Temporary "No Through Road" signs shall be erected on roads that have been temporarily terminated.

4.15 Path And Island Paving

4.15.1 The paving material used in the construction of off-road paths and islands shall be 100mm thick cast "in situ" concrete. The finished surface shall be smooth and free from defects with a "broomed" non-skid finish. Contraction joints shall be provided every 2.0 metres. These shall be cut with an approved grooving tool and be 6mm wide. Expansion joints fitted with "Lock-Joint" shall be provided every 6.0 metres. Every 48 metres, a non "Lock-Joint" expansion joint shall be provided. These shall be 13mm wide and filled flush with an approved jointing material. Alternative equivalent paving materials may be used as approved.

4.15.2 All concrete work shall be carried out in accordance with AS3600-1988.

4.15.3 All concrete used shall be supplied in a ready mixed state and shall comply with the requirements of AS1379-1973. All concrete used in the works shall develop a minimum compressive strength of 20 MPa at 28 days with a maximum slump of 90 mm.

4.15.4 All paving to median islands shall be to the colour as specified by the Engineer.

4.15.5 The sub-grade under all paths shall be clean, well compacted sand fill. All concrete to median islands shall be placed on a compacted sand bed.

4.15.6 All public utility services shall be installed under paths and other paved areas prior to the paving work commencing.

4.15.7 The level of the finished concrete path shall suit the surrounding ground levels provided that the paved surface is free draining, with all path levels to be approved. Generally, all paths will have a 2% crossfall towards the road pavement.

4.15.8 The Subdivider shall give landowners whose verges will be affected by the path construction at least two (2) weeks notice of the commencement of the construction work.

4.15.9 All work shall be carried out in accordance with Council's requirements as appropriate and as detailed in its "Path Construction Specification."

4.15.10 Appropriate alterations to existing verge reticulation systems shall be carried out as part of the work at no extra cost.

4.16 Lot Filling

4.16.1 Where lot filling is required in accordance with these guidelines, the fill area shall be cleared and stripped of all organic material rubbish and any other deleterious material and the filling placed and compacted to the approved design levels.

The tolerances on lot filling shall be +/- 50mm.

4.16.2 The fill material shall be clean, free draining, medium to coarse sand, free from foreign and organic matter.

4.16.3 Topsoil shall be stockpiled for later re-spreading on batters and other disturbed surfaces where appropriate.

4.16.4 Material from clearing shall be disposed of away from the site of the works in a place and manner approved by Council. No material from clearing shall be deposited within the road reserve or on property beyond the boundaries of the subdivision without the owner's permission.

4.16.5 Adequate precautions must be taken to ensure no damage occurs to trees, vegetation, fences, services and other improvements outside the designated areas of the works. Survey pegs or marks which are disturbed shall be reinstated by a licensed surveyor at the Subdivider's expense.

4.16.6 All fill shall be compacted to the full depth with a density of 95% over the building envelope and 90% over the remainder of the fill area, of the modified maximum dry density when tested in accordance with AS 1289 E2.1-1977.

4.16.7 Where open drains across lots have been backfilled, the compaction of the backfill shall be in accordance with the preceding Clause and such areas shall be subject to special testing as determined by the Engineer.

4.16.8 The requirements for stabilisation, dust control and sand drift as detailed in Section 4.6 shall also apply to lot filling.

4.16.9 For urban subdivisions on a clay subgrade, the clay surface shall be sloped at a minimum grade of 1:100 towards a subsoil drainage line and covered with a minimum fill of 300mm of clean sand over the entire site. Clay being used as fill to achieve a uniform graded surface shall be compacted to 90% of the modified maximum dry density when tested in accordance with AS1289 E2.1-1977.

SECTION 5 – CONSTRUCTION OF DRAINS

5. CONSTRUCTION OF DRAINAGE WORKS

5.1 General

5.1.1 All works shall be carried out in accordance with the Occupational Health, Safety and Welfare Act, 1984.

5.1.2 Temporary Road Closure

Where it is necessary to close an existing road to carry out any part of the subdivisional works, approval for such closure shall be obtained from the Engineer at least (28) days prior to the work commencing.

The following conditions shall apply to such closures:

(a) A suitable detour shall be determined and clearly signposted with approved signs for the duration of the works and if no such detour is available, suitable and passable side tracks shall be provided.
(b) In the case of arterial roads and on other roads where a suitable and convenient detour is unavailable, the road closure shall be advertised by double column display advertisements in local newspapers advising the reason, location and duration of the closure and the route of the proposed detour, such advertisements being placed 21 days prior to the date of the proposed closure.
(c) In the case of arterial roads and on other roads where a suitable and convenient detour is unavailable, advisory signs shall be erected at appropriate locations on the site 21 days prior to the closure, such signs to comprise a minimum 100 mm letter height and to advise the reason, location and duration of the road closure.
(d) The works and road closure shall be adequately lit at night and other appropriate precautions shall be taken to ensure public safety.
(e) Emergency services, schools, other large institutions and large businesses that may be affected by the closure shall be advised in writing of the reason, location and duration of the road closure and the route of the proposed detour at least 21 days prior to the closure.
(f) The works shall be carried out in an expeditious manner to minimise the impact of the road closure on the general public.
(g) Where the road closure is required by a private contractor to carry out works in the road reserve then the contractor must obtain approval from Council's Engineers prior to commencing the works.

5.2 Survey Set Out

5.2.1 All drainage works shall be set out and constructed in accordance with the alignments, levels and grades as shown in the approved drawings.

5.2.2 Care shall be taken when working in the vicinity of survey pegs and bench marks to ensure the accuracy thereof.

5.2.3 The Subdivider shall be responsible for the accuracy of the setting out of works.

5.3 Construction Tolerances

The tolerance for piped drainage lines shall generally be +/- 10mm for level and +/- 50 mm for line, but in all instances each section of drain shall be capable of carrying the design flow.

5.4 Materials

5.4.1 Pipes

5.4.1.1 Drainage pipes may be reinforced concrete, fibre reinforced cement, corrugated aluminium or plastic. Other types may be used on the approval of the Engineer.

5.4.1.2 All pipes shall conform to the appropriate Australian Standard, such as the following:

AS 1342 - 1973	Precast Concrete Pipes
AS1712 - 1976	Fibre Cement Pipes
AS1761 - 1985	Helical Corrugated
AS1762 - 1984	Steel Pipes
AS2566 - 1982	Plastic Pipelaying Design

5.4.1.3 Subsoil drainage pipes shall conform to the above but, except in the case of reinforced concrete pipes, shall have 250 mm by 5 mm slots cut through the pipe on alternate sides at 100 degrees so that the total length of slots is approximately half that of the pipe.

5.4.1.4 Reinforced concrete pipes shall be spigot and socket type unless otherwise approved.

5.4.2 Concrete

5.4.2.1 Concrete used for in-situ work shall conform to AS3600-1988 and be provided by a pre-mix concrete supplier conforming with AS1379-1973 or mixed on site, using materials as specified and plant to the approval of the Engineer.

5.4.2.2 Concrete for manholes, headwalls, endwalls and keels shall have a minimum compressive strength of 20 MPa after 28 days. The slump shall not exceed 70 mm or be less than 30 mm. Maximum size of aggregate shall be 20mm.

5.4.3 Cement

5.4.3.1 All cement used shall be Portland Cement in accordance with AS1315-1982 and obtained from an approved manufacturer.

5.4.3.2 Cement shall be delivered to the site fresh and in sealed bags and there stored in a weatherproof shed until such time that it is to be used. Any bag showing signs of deterioration or setting shall be rejected.

5.4.4 Concrete Aggregate

5.4.4.1 Fine aggregate shall be well graded, clean, sharp and free from clay and organic impurities in accordance with AS2758.1-1985.

5.4.4.2 Coarse aggregate shall be crushed granite or diorite clear and free from all impurities in accordance with AS2758.1-1985.

5.4.5 Water

5.4.5.1 Water for use in concrete and mortar shall be of potable quality, free from any impurities harmful to concrete mortar or steel.

5.4.6 Sand

5.4.6.1 Sand for mortar will be crushed stone or natural sand free from all deleterious substances and have a uniform grading.

5.4.6.2 Sand for bedding or backfilling shall be clean sand free from roots, clay or any deleterious matter.

5.4.7 Steel

5.4.7.1 Steel reinforcing fabric and steel reinforcing bars for concrete shall comply with the requirements of AS1302-1977, AS1303-1973 and AS1304-1973 and be free from loose rust or matter likely to impair the bond with concrete.

5.4.7.2 Structural steel shall comply with the requirements of AS1205-1980.

5.4.8 Bricks

5.4.8.1 Bricks shall be hard, well burnt, pressed or wire cut clay bricks in accordance with AS1225-1984 having a minimum ultimate strength of 30 MPa and absorbing when saturated, not more than 10% of their own weight in water.

5.4.8.2 Bricks shall be of uniform shape and size, carefully conveyed and unloaded at the site. No chipped or broken bricks shall be used, and no pieces of brick to be used except where necessary as closures.

5.4.9 Calibrated Metal

5.4.9.1 Calibrated metal (granite or diorite) shall conform to the following sieve grading:

Sieve Size	%Passing
19.0	100
13.2	98-100
9.5	80-90
6.7	53-70
2.4	5-14
0.6	0-3

and be free from roots, clay and any deleterious material.

5.4.10 Manhole Liners

5.4.10.1 Manhole liners shall be circular precast concrete liners from approved manufacturers capable of withstanding anticipated design loadings.

5.4.11 Manhole Covers

5.4.11.1 Manhole covers located in the carriageway shall be equipped with purpose built reinforced concrete surrounds a minimum of 150mm thick and fitted with a "Gatic" or similar type cast iron frame and lid.

5.4.11.2 Manhole covers located elsewhere in the road reserve shall be equipped with a purpose built reinforced concrete surround 150mm thick.

5.4.11.3 All manhole covers shall be equipped with 600mm square or circular access point with tapered inserts. Both cover and insert shall have suitable lifting points installed.

5.4.11.4 Manhole covers located in easements on private allotments shall be of suitable thickness as determined by design loading but not less than 100mm.

5.4.12 Grated Covers

5.4.12.1 Grated cover surrounds shall be 150mm thick reinforced concrete, 20 MPa at 28 days compressive strength concrete with sufficient reinforcement to withstand the design loading.

5.4.12.2 The steel insert shall be contained within a steel surround firmly embedded in the concrete and hinged on one side to permit opening with the steel surround protruding above the concrete surround by 25mm.

5.4.12.3 All grated gully covers shall be of a heavy duty construction and shall be load tested to full Austroads Highway Loading Conditions (90kN Wheel Load applied as per AS1597 Part 1-1974).

5.4.12.4 Grated covers shall have clear minimum internal dimension of 650mm x 490mm measured between and excluding the supporting angle frame.

5.4.12.5 Where there is any likelihood of cycle traffic crossing the road at right angles to the centreline of the road in the vicinity of gullies, 25mm x 3mm mild steel straps shall be welded to the bars at 100mm centres across the full length of the grate or other method as approved.

5.4.13 Side Entry Kerb

Side entry kerb sections shall be reinforced concrete to a design submitted and approved by Council's Engineer.

5.5 Installation Of Manholes And Road Gullies

5.5.1 Manholes shall be constructed from either circular precast concrete sections or square/rectangular brickwork as determined by detailed design. Minimum thickness of brickwork shall be 230 mm.

5.5.2 The minimum internal size of all manholes shall be either 900 mm circular or square but in all cases the manhole shall be at least 600mm larger than the largest pipe connected to the manhole. The minimum manhole diameter in private property shall be 750mm.

5.5.3 All manhole covers shall overhang the liner or walls by 100mm minimum. The tops of all manholes shall be flush with either the pavement level or the finished ground level and set at appropriate cross falls where necessary.

5.5.4 Manholes shall be embedded on sand compacted not less than 95% of the maximum dry density when tested in accordance with AS1289.E2.1-1977.

5.5.5 Steel step irons shall be installed in the walls of all manholes over 1.2 metres deep at approximately 400mm spacing or at every fifth course of brickwork. Step irons shall be of an approved design with a minimum diameter of 12mm. The surface of these steps be adequately protected against rust by galvanising or similar treatment.

5.5.6 Road gullies shall be of either a side entry pit design, a steel grate design or a combination of both.

5.5.7 All manholes located in the road reserve shall have bases of 150mm thick reinforced concrete, 20MPa at 28 days compressive strength concrete with sufficient reinforcement to withstand the design loading.

5.5.8 The grated cover shall be installed with the bars at right angles to the road centreline.

5.5.9 Side entry pits shall be created by installing a precast kerb section fitted with an opening into the kerbline. The minimum depth of the opening shall be 100mm.

5.5.10 The side entry kerb shall be located directly above the manhole wall such that the water flows directly from the water channel into the manhole.

5.5.11 The road pavement in the vicinity of the side entry pit shall be shaped to facilitate the ingress of water by forming an evenly graded depression, the maximum depth of which shall be 50mm at the face of kerb in the centre of the opening in the kerb section, constructed in such a manner that does not reduce the serviceability of the road pavement.

5.5.12 Manholes installed on the drainage lines 600mm diameter and over shall not be fitted with side entry inlets.

5.5.13 The road-wearing surface shall extend over grated gully surrounds. Gully grates shall be installed 25mm proud of the primed road surface in order to be flush with wearing surface.

5.6 Headwalls And Endwalls

5.6.1 Where a piped drain interfaces with an open drain, a suitable endwall structure shall be provided to prevent the entry of loose material into the pipe and the erosion of surrounding ground. In the case of pipes exceeding 600mm diameter, suitable structures shall be fitted to the inlet to the pipe drainage system to prevent access.

5.6.2 All headwalls and endwalls shall be constructed using either concrete with 20 MPa compressive strength, mortared stonework or brickwork.

5.6.3 For mortared stonework each stone shall weigh in excess of 10 kg and the greatest dimension of any stone shall not exceed 1.5 times its least dimension.

5.6.4 Endwalls located on outlet pipes exceeding 375mm diameter shall include suitable erosion protection in the form of aprons and edge beams.

5.7 Pipe Laying

5.7.1 Pipes shall not be laid on filled ground until such ground has been compacted to a minimum of 95% of its modified maximum dry density when tested in accordance with AS 1289.E2.1-1977.

5.7.2 Trenches shall be excavated to the dimensions shown on the approved drawings to the minimum consistent with bed width requirements.

5.7.3 In the case of rock occurring in the bottom of the trench, the trench shall be excavated to a depth of at least 200mm below the design levels, backfilled with clean sand fill and compacted as specified in Clause 5.7.1.

5.7.4 All blasting shall be carried out in accordance with Clause 4.5.5.

5.7.5 Free water in excavations shall be controlled to a level sufficiently low so as not to interfere with the construction work.

5.7.6 The trenches shall be cut to the line, depth and gradient required. If any pipe trench is excavated deeper than required, the extra depth shall be filled with sand and compacted to a density comparable to that of the natural surrounding material.

5.7.7 Any excavation which is carried out in public or private roads shall be arranged so that pedestrian and vehicle access is maintained at all times unless this is considered highly impractical, in which case work shall be arranged to cause the minimum disruption possible.

5.7.8 Pipes shall be laid true to the design lines and levels as shown on the approved drawings and shall be laid so that the pipes will be bearing uniformly on the foundation for their entire length.

5.7.9 All pipes shall be jointed in accordance with the manufacturer's recommendations unless specified otherwise.

5.7.10 No damaged pipe shall be used in the works.

5.7.11 All pipe laying and jointing shall be inspected and approval given before backfilling or metalling commences. Any work that is covered before being so approved, shall be uncovered if so directed.

5.7.12 Slotted pipes shall be laid with the slots in the down position symmetrical about the vertical centre line.

5.7.13 Calibrated metal as previously specified shall be placed along the full length of all subsoil pipes and inspected prior to backfilling.

5.7.14 The trenches shall be backfilled using clean coarse sand filling free from clods or stones and effectively free draining. This backfilling material shall be compacted evenly around manholes and gullies and over and around pipes. Compaction shall be 95% under paved areas and within the building envelope, and 90% elsewhere of the modified dry density when tested in accordance with AS1289-1977 E2.1.

5.7.15 Any surplus excavated material shall be disposed of in an approved manner.

5.7.16 All pipes protruding into gullies and manholes shall be trimmed to be flush with the internal face of the structure and any irregularities and depressions filled with an approved grouting material.

5.7.17 Where a drain is to be laid on unsound ground, or if the drain crosses over a sewer line or other essential services, the pipe shall be laid on a suitable independent support structure.

5.7.18 All backfilling shall be placed with great care in such a way that no pipes or joints or other works are displaced or damaged.

5.7.19 During construction no sand or other material shall find its way into the drainage system. Unfinished manholes shall be covered to prevent this occurring.

5.7.20 The backfilling and interim restoration of the trenches in existing road pavements shall be completed immediately after acceptance of piping work. The material used for backfilling pipe trenches and the pits in roadways shall be a clean granular material and shall be compacted to a density not less than 95% of the maximum dry density as tested in accordance with AS1289 E2.1 1977. The top 300mm of trench shall be filled with gravel or roadbase to surface level and compacted as specified herein. The surface of the trenches shall be kept in safe and reasonable condition for traffic until permanent road reinstatement is carried out. All subsidence shall be made good with fresh approved material. Unless otherwise stated interim restoration and maintenance of private roads or right of ways shall be carried out in the same manner as if they were public roads. The remainder of the reinstatement shall be carried out by Council unless otherwise approved.

5.7.21 The surface of verges and all other similar land shall be restored to the condition in which it was found and shall be left with the surrounding ground level after all consolidation has been completed. The surface soil and sub-soils shall be stored separately and afterwards reinstated in their natural order. All areas disturbed by drainage works shall be stabilised in accordance with Section 4.6 of this specification.

5.8 Open Drains

5.8.1 Open drains shall be installed to the lines and levels shown on the approved drawings.

5.8.2 Excavated material from open drains shall be disposed of in an approved manner.

5.8.3 Where over excavation occurs, this shall be corrected by filling with in-situ material and compacting to a density comparable to that of the natural surrounding material.

5.8.4 A corridor 3.0 metres wide shall be provided for future maintenance access along one side of the drain.

5.9 Embankments

5.8.1 Embankments shall have 2m catch berms installed if embankments are greater than 4m high. The catch berm shall be graded with a 1% cross fall sloping towards the embankment. Longitudinal drains shall be installed along the line of these berms.

Geotechnical stability studies shall be undertaken for embankments with heights greater than 3m such that a safety factor of a minimum of 1.5 is used.

A table drain shall be installed at the crest of embankments with a minimum set back distance of 3m from the edge of the embankment. A minimum cross fall on these drains of 1% will be required.

SECTION 6 – SUPERVISION

6. CONTROL & SUPERVISION OF CONSTRUCTION

6.1 Drawings

All subdivision works shall be designed and constructed in accordance with sound engineering principles and in compliance with the approved drawings and specifications.

Final approval for the works shall only be given when the whole of the works shown on the drawings of subdivision have been executed to the true intent and meaning of the approved drawings and specifications and to the satisfaction of Council's Engineer.

6.2 Responsibility for Quality of Construction

Irrespective of any approvals given by Council's Engineer, the Subdivider and his responsible agents (including where applicable the Consulting Engineer and/or the Contractor) shall remain fully responsible for the quality of the works. The inspections, checks and tests to be carried out by Council's Engineer are not intended to be comprehensive or detailed and do not take the place of comprehensive superintendence of the works by the Subdivider's Consulting Engineer.

All subdivision works shall be subject to the provisions of AS 2990 "Quality Systems for Engineering and Construction Projects" and AS 3900 to 3904 "Quality Systems". The quality assurance category to be adopted should be Category C generally with only critical aspects to be subject to Category B requirements. The Consultant shall ensure that all contract work complies with these provisions.

6.3 Schedule of Inspections

Inspections by Council's Engineer or his representative shall be required at the following stages of construction. A minimum of 48 hours notice shall be given by the Subdivider's Consultant that inspections are required:

Roads

(a) when the road has been boxed out and the subgrade shaped and compacted.
(b) after the sub-base has been placed, graded and compacted to shape and level.
(c) when the base has been placed, graded, compacted and waterbound to correct shape and level.
(d) before and during the priming operation
(e) during laying of concrete kerbing.
(f) before and during the placement of asphalt or sprayed surface course.

Drains

(a) when the trenches have been excavated and the pipes laid to true line and level.
(b) when using sub-soil pipes, after the calibrated metal has been placed
(c) after manholes, gullies and other structures have been built and backfilling of all trenches completed.

No second or follow up stage of construction shall proceed until approval has been given for the preceding stage.

Representatives of the Consultant and the Contractor shall be present at stage inspections if requested by Council's Engineer.

6.4 Testing & As Constructed Surveys

All test results and as constructed surveys taken during the works, whether required under this part or not, shall be made available to Council's Engineer. All materials and compaction tests shall be carried out by a NATA approved testing laboratory. All as constructed surveys shall be carried out by an independent licensed surveyor. Works which fail to meet specified criteria shall be corrected and re-tested or re-surveyed, as the case may be.

The following minimum tests shall be required:

(a) Grading and testing of properties of representative samples of sub-base and basecourse materials prior to commencement of supply of those materials;

(b) In situ density testing -
embankment filling: 4 tests per 1 000m^3
sub-base & basecourse: 4 tests per 500m^3

Additional density tests of foundation and subgrade to road pavements shall be taken at the Subdivider's cost when requested by Council's Engineer.

The following minimum as constructed surveys shall be required:

(a) After completion of subgrade preparation and prior to cartage of basecourses, take levels at no greater than 20m intervals on the centreline and on both edges of pavement boxing. The as constructed information shall be presented in plan or tabular form showing the chainage, the design subgrade levels for each point, the as constructed levels and the difference between the two.

(b) After completion of sub-basecourse construction and basecourse construction, and prior to surfacing (sealing), take levels at no greater than 20m intervals on the centreline (at chainages to match subgrade levels) and on both edges of basecourse. The as constructed information shall be presented in plan or tabular form showing the chainage, the design basecourse levels for each point, the as constructed levels and the difference between the two.

(c) Pipe drain systems and open drains (not including table drains). Details shall include location and size of pipes and drains, length between ends (or centreline distances to pits etc), lid or cover levels where appropriate, and invert levels at ends. For open drains bottom widths, invert levels at no greater than 20m intervals and side slopes shall additionally be required.

6.5 Practical Completion

Any items of work found to require rectification at the time of the practical completion inspection, or at any time thereafter, shall be rectified before practical completion will be certified by Council's Engineer.

When all subdivisional works are completed to the satisfaction of Council's Engineer, the Consultant shall be notified of the practical completion date.

If at any time after the granting of practical completion the subdivisional work is found to be contrary to Council's requirements, or is found to have been constructed in error to the approved drawings, specifications and any instructions which may have been issued by the Consultant or Council's Engineer during the course of construction, then the works shall be rectified at no cost to the Council. Minor rectification items may be undertaken at the completion of the maintenance period.

SECTION 7 – MAINTENANCE AND SURVEY RELEASE

7. MAINTENANCE & RELEASE

7.1 Survey Release

The Consultant shall satisfy Council that the Subdivider has complied with all relevant conditions imposed by the Western Australian Planning Commission pertaining to survey release of all or part of a constructed subdivision.

The conditions which must be complied with by the Subdivider prior to the Council's approval of survey release of a subdivision shall include, but shall not necessarily be limited to, the following:

(a) Creation and location of all stormwater drainage easements;
(b) Creation of any other easements (temporary or permanent) which are relevant to the subdivision;
(c) Creation of all reserves (including drainage and recreation reserves) pertaining to the subdivisional works;
(d) Payment of all moneys required to be paid to the Council in consideration of construction of footpaths, footways or any other works associated with the subdivision and which are to be carried out by the Council;
(e) Payment of any maintenance retention money (or lodgement of bank guarantees) and payment of supervision fees required by the Council;
(f) Stabilisation of topsoil, sand or other material or matter subject to movement over or near the subdivision shall be completed to the satisfaction of Council's Engineer;
(g) Completion of all roadworks and other works associated with the subdivision construction to the stage of practical completion;
(h) Such drawings shall be on a reproducible material, and show the location of all drains and services.

7.2 Maintenance

A twelve months defects liability period shall apply from the date of practical completion of the subdivisional works.

During the period the Subdivider and/or his responsible agents shall be responsible for rectification of any defects, whether they are construction or design defects, which may become apparent. The Subdivider or his responsible agents shall carry out rectification work within the time requested by Council when notified of such defects.

If defects are not rectified within the time required by Council then Council may have the defects rectified at the Subdivider's expense. In this case the cost of the work shall become a debt due to the Council and Council may draw on any retention money or bank guarantee being held, without reference to or approval from the Subdivider and without limiting its right to recover any balance of money due should the security be insufficient to cover the costs of the works.

Before practical completion is granted the Subdivider shall lodge with the Council an amount of 5% of the cost of the works as security for ensuring the rectification of defect, which shall be retained by Council for the duration of the defects liability period. Alternatively, a bank guarantee of approved form may be lodged in lieu of retention money.

The bank guarantee shall contain clauses where the bank shall guarantee to pay to Council unconditionally on demand any amount up to the total amount of the guarantee at any time so requested, and that the guarantee shall not be withdrawn until notified by Council (ie it shall not have a termination date). Any bank guarantee lodged with the subdivider by a contractor in lieu of retention money shall be acceptable as part or full security (as the case may be provided it is in a form which is acceptable to Council).

Any defects rectified during the defects liability period shall be subject to a further 12 months defects liability period. During this further period Council may, at its discretion, withhold the release of all or part of any security.

Retention money or bank guarantee shall only be released at the expiration of the defects liability period (or any further period) after satisfactory rectification of all defects.

SECTION 8 – MATERIAL SPECIFICATIONS

8. MATERIAL SPECIFICATIONS

8.1 Specification for Gravel - Laterite or Ferrocrete

Based on Main Roads Western Australia specification 501 for Pavements.
This will include specification:

- 501.06 - Gravel Sub Base
- 501.08 – Gravel Base Course

8.2 Specification for Road Base

8.2.1 General

The road base material shall consist of a combination of soil binder, sand and gravel and shall conform with this specification. It shall be free of vegetable matter and lumps or balls of clay and shall not contain objectionable quantities of pyrites or other deleterious substances.

Coarse aggregate retained on a 2.36mm sieve shall consist of hard, durable particles or fragments of gravel; materials that break up when alternatively wetted and dried shall not be used.

Coarse aggregate shall have a percentage wear by the Los Angeles Abrasion Test of not more than forty-five (45).

Fine aggregate passing a 2.36mm sieve shall consist of natural or crushed sand and fine mineral particles passing the 0.075mm sieve.

The ratio of the portion passing the 0.075mm sieve to the portion passing 0.425mm sieve shall fall within the range 40-60%.

8.2.2 Properties

The portion of the sample which passes the 0.425mm sieve (Soil Mortar) shall conform to the following requirements when tested in accordance with AS1289-1977:

Plastic limit shall not exceed	20
Liquid limit shall not exceed	25
Plasticity Index shall not exceed	5
Linear Shrinkage shall not exceed	1%
Dry Compressive Strength shall not be less than	1.75MPa
Dust ratio shall not exceed	0.67

8.2.3 Grading

When tested in accordance with AS1289-1977, the grading of the gravel shall conform to the following requirements:

Sieve Size (Square Opening AS Sieve)	Percent by Weight Passing
19mm	95 – 100%
13mm	75 – 85%
9.5mm	65 – 75%
4.75mm	40 – 60%
2.36mm	30 – 50%
1.18mm	20 – 40%
0.425mm	10 – 30%
0.150mm	5 – 15%
0.075mm	2 – 10%

8.3 Specification for Sealing Aggregate

8.3.1 Aggregate

The aggregate shall be crushed diorite or granite consisting of clean, washed, tough, durable fragments free from an excess of thin or elongated pieces, free from soft or disintegrated pieces, stone coated with dirt, dust or other deleterious matter.

8.3.2 Particle Shape

The proportion of flat or elongated particles in any grading of coarse aggregate shall not exceed 20 percent. A flat particle is one having a ratio of width to thickness of greater than three and an elongated particle is one having a ration of length to width greater than three. There shall not be more than 2.5% of particles of greater length in any direction than twice the gauge, and there shall not be more than 20% of particles of greater dimensions in any direction than 25% in excess of the gauge.

8.3.3 Hardness

Wear – the aggregate shall have a Los Angeles abrasion value not exceeding 20% of wear for diorite and not exceeding 40% for granite.

8.3.4 Specific Gravity

The bulk specific gravity of the particles of diorite shall be not less than 2.90 (2.60 for granite).

8.3.5 Elongation Factor

The elongation factor which shall be defined as the ratio of the average long dimension to the average least dimension shall not exceed 2.75 for the sample.

8.3.6 Method of Sampling and Testing

The method of testing the road metal shall be in accordance with AS1141-1974.

8.3.7 Grading Requirements – (Percentage by Weight)

Size No.	1	2	3	4	5	6
NORMAL SIZE	25mm	20mm	14mm	10mm	5mm	3mm
Passing						
A.S.mm Sieve						
37.5	100					
26.5	80 -100					
19	0 – 20	100				
16	0 – 2	80 -100	100			
13.2		0 – 20	80 -100	100		
9.5		0 – 2	0 – 20	80 -100		
6.7			0 – 2	0 – 25	100	
4.75				0 – 2	80 -100	100
2.36					0 – 30	80 -100
1.18	0 – 0.5	0 – 0.5	0 – 0.5	0 – 0.5	0 – 0.5	0 – 30
600 micron						0 – 5

8.3.8 Average Least Dimension Requirements

SIZE NO.	1	2	3	4	5
Average Least Dimension	15 – 25	10 – 18	9 – 13	6 – 8	4 – 6

8.4 Specification for Asphalt (Bituminious Concrete)

8.4.1 General

All asphalt used in paving works shall comply with AS2734-1984.

8.4.2 Binder

The binder shall be Class 170 residual asphaltic bitumen complying with AS2008-1980.

8.4.3 Aggregate

The aggregate shall be granite and be in accordance with Appendix "K" of AS2150-1978.

8.4.4 Characteristics of the Paving Mixture

The paving mixture for the surface course shall meet the following requirements by weight when determined by A.S. sieves. The residual binder, that is the residual asphaltic bitumen, shall be determined as a percentage by weight of the total mixture.

SIEVE SIZE	PERCENTAGE OF MINERAL AGGREGATE PASSING SIEVE (by weight)			
	AC5	AC7	AC10	AC14
19.0 mm	-	-	-	100
13.2 mm	-	-	100	85 – 100
9.50 mm	-	100	90 – 100	70 – 85
6.70 mm	100	80 – 100	70 – 90	62 – 75
4.75 mm	85 – 100	70 – 90	58 – 76	53 – 70
2.36 mm	55 – 75	45 – 60	40 – 58	35 – 52
1.18 mm	38 – 57	35 – 60	27 – 44	24 – 40
600 um	26 – 43	22 – 35	17 – 35	15 – 30
300 um	15 – 28	14 – 25	11 – 24	10 – 24
150 un	8 – 18	8 – 16	7 – 16	7 – 16
75 un	4 – 11	5 – 8	4 – 7	4 – 7
General limits of bitumen content	5.5 – 7.0	5.3 – 7.0	5.3 – 7.0	4.8 – 6.5

8.4.5 Marshall Properties

PROPERTY	MIX			
	AC5	AC7	AC10	AC14
Minimum Marshall Stability (50 blow)	5.0 kN	5.5 kN	6.5kN	6.5kN
Marshall flow (50 blow)	2 – 4 mm	2 – 4 mm	2 – 4 mm	2 – 4 mm
Voids Content	3 – 5%	3 – 5%	3 – 5%	3 – 5%
Bitumen Content	5.5 – 7.0%	5.3 – 7.0%	5.3 – 7.0%	4.8 – 6.5%