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TITLE:

Developer Contributions for Water
Supply and Sewerage Headworks

*Mirani Shire
Planning Scheme Policy No. 1*

DATE POLICY TOOK EFFECT:

1 AUGUST 2009



TITLE:

Developer Contributions for Water
Supply and Sewerage Headworks

*Mirani Shire
Planning Scheme Policy No. 1*

DATE ADOPTED BY COUNCIL:

24 JUNE 2009

DATE POLICY TOOK EFFECT:

1 AUGUST 2009

SIGNATURE:

A handwritten signature in blue ink, appearing to read "Peter Franks", with a large, stylized loop at the end.

FULL NAME:
TITLE:

Peter Franks
Chief Executive Officer
Mackay Regional Council

B : PLANNING SCHEME POLICIES

PLANNING SCHEME POLICY NO. 1 (DEVELOPER CONTRIBUTIONS FOR WATER SUPPLY AND SEWERAGE HEADWORKS)

This Developer Contributions Policy for Water Supply and Sewerage Headworks was adopted by resolution of Mackay Regional Council (Council) on 24 June 2009 pursuant to provisions of the *Integrated Planning Act (IPA 1997)* and has effect on and from 1 August 2009. The provisions of this Policy are subject to review by Council from time to time and adoption of any revised Policy will be in accordance with Schedule 3 of *IPA 1997*. This Policy is an update of the existing Policy (No. 1) adopted by the Mirani Shire Council in 2007.

The intent of this policy is to confirm the requirements for the payment of contributions by developers towards the cost of water supply and sewerage headworks.

A contribution will be payable as a condition of approval under a development permit for a material change of use and/or a reconfiguration of a lot for any development to be serviced by a reticulated water supply and/or sewerage scheme.

This policy, and the contributions payable under this policy, covers the provision of water supply and sewerage headworks only, which comprise:

Water supply headworks	▪ all water bores and extraction facilities, ▪ all pump stations and rising mains, ▪ all water treatment facilities, ▪ all storage reservoirs, ▪ all trunk mains 200mm in diameter or larger, ▪ all mains 150mm in diameter or larger.
Sewerage headworks	▪ all trunk mains 225mm in diameter or larger, ▪ all gravity mains 150mm in diameter or larger, ▪ all pump stations and rising mains, ▪ all sewage treatment facilities.

To remove any doubt, it is confirmed that the cost of any external works necessary to connect an approved development to a water supply or sewerage scheme shall be undertaken at the sole cost of the developer or, at Council's sole discretion, shall be covered by an additional contribution determined by Council.

Contributions shall be paid on the basis of the increase in the equivalent population associated with an approved development, expressed in equivalent tenements (ETs), and at the applicable charge rate at the time of payment.



The developer contributions for the Water Supply and Sewerage networks will automatically be adjusted for inflation each quarter according to movements in the General Construction Index – Queensland (GCI – Qld) published by the Australian Bureau of Statistics (Producer Price Indexes (PPI) 6427.0 - Tables 15 and 16). The contribution will be adjusted to the applicable charge rate at the time of payment. The indexes for the period March 2004 to December 2008 are presented in the Table on the following page.

The indexation of applicable charge rates will be applied on the first day of the month following the publication of the relevant index by the Australian Bureau of Statistics. Updated indexed contribution rates are effective on 1 February (December index), 1 May (March index), 1 August (June index) and 1 November (September index).

Table – General Construction Index– Queensland (PPI Tables 15 and 16)

Financial Year	GCI - Qld
2004 – March, June, September, December	123.0, 127.8, 129.5, 132.0
2005 – March, June, September, December	136.0, 138.5, 141.1, 143.3
2006 – March, June, September, December	145.4, 147.6, 149.9, 151.3
2007 – March, June, September, December	154.0, 155.9, 158.2, 161.2
2008 – March, June, September, December	163.6, 166.3, 170.4, 171.2
2009 – March, June, September, December	166.2

Source: Australian Bureau of Statistics 2009

The base charge rates (unindexed) for each network are:

- Water Supply Headworks \$ 3,680 per ET.
- Sewerage Headworks \$ 4,397 per ET.

The General Construction Index (GCI) – Qld for the base charge rates is 166.3 (June 2008).

Appendix A contains details of costing assumptions and methodology.

Appendix B contains details of headwork infrastructure summary schedules, including existing assets and proposed new assets.



The number of ETs shall be determined as follows:

PROPOSED USE	ETs
Accommodation Units, Dependant Person's Accommodation, Multiple Dwelling Units, or Retirement Housing.	1 bedroom 0.6ET/unit 2 bedrooms 0.8ET/unit 3 or more bedrooms 1.0ET/unit
Bed and Breakfast Accommodation	1.0 ET plus 0.6ET/guest bedroom
Caravan Park	0.5 ET/site (caravan site or camp site)
Dwelling House, or Home Occupation	1.0ET/dwelling unit
Hardware Shop, Office Building, or Shop/Shopping Centre	1.0ET/200m ² gross floor area
Restaurant	1.0ET/100m ² gross floor area
All other uses	As determined by Council

Headworks contributions shall be paid in full prior to:

- For a material change of use – any building works or operational works permit being issued (where applicable) or, otherwise, prior to the commencement of the use
- For the reconfiguration of a lot – any survey plan being endorsed by Council.

APPENDIX A - COSTING ASSUMPTIONS

Trunk Assets

Existing trunk assets are expressed in terms of 'Current Replacement Cost', as recorded in Council's Asset Registers. Accordingly, the value of existing trunk assets are neither escalated nor discounted.

Future trunk assets are originally expressed in terms of 'Current Construction Cost', then escalated by a long term construction cost inflator and discounted by a long term cost of capital rate. Accordingly, the following equation is applied to calculate the 'Present Value' of future trunk assets.

$$PV = \frac{CCC \times (1 + CCI_R)^Y}{(1 + DR_R)^Y}$$

Where:

PV = Present Value;

CCC = Current Construction Cost;

CCI_R = Construction Cost Inflator (Real);

DR_R = Discount Rate (Real);

Y = Years from base year to the mid-point of the time horizon.

Value

2.83% Real

5.56% Real

2008 Base Year

Total assets are calculated by adding the value of existing assets to the 'Present Value' of future assets.

WATER SUPPLY ASSETS

Catchment	Existing Assets	+ Future Assets		= Total Assets
	Current Value	Nominal Value	Present Value	Total Value
Mirani, Marian, Finch Hatton & Gargett	\$ 6,606,961	\$ 2,973,933	\$ 2,682,908	\$ 9,289,869

Tables B1.1 and B1.2		\$ 2,973,933	Nominal Inflated
	\$ 6,606,961	\$ 2,820,000	Nominal CRC

SEWERAGE ASSETS

Catchment	Existing Assets	+ Future Assets		= Total Assets
	Current Value	Nominal Value	Present Value	Total Value
Mirani & Marian	\$ 8,405,312	\$ 2,853,711	\$ 2,558,541	\$ 10,963,853

Tables B2.1 and B2.2		\$ 2,853,711	Nominal Inflated
	\$ 8,405,312	\$ 2,697,000	Nominal CRC



Demand

Existing demand is expressed in terms of 'Present Value'. Accordingly, the value of existing demand is neither escalated nor discounted.

Future demand is originally expressed in 'Nominal' terms, which is then discounted by a long term cost of capital rate. Accordingly, the following equation is applied to calculate the 'Present Value' of future demand.

$$PV = \frac{FD_N}{(1 + DR_R)^Y}$$

Where:

PV = Present Value;

FD_N = Future Demand (Nominal);

DR_R = Discount Rate (Real);

Y = Years from base year to the mid-point of the time horizon.

Value

5.56% Real

2008 Base Year

Total demand is calculated by adding the value of existing demand to the 'Present Value' of future demand.

WATER SUPPLY DEMAND

Catchment	Existing Demand	+ Future Demand		= Total Demand
	Current Value	Nominal Value	Present Value	Total Value (EP)
Mirani, Marian, Finch Hatton & Gargett	EP 3,513	4,810	2,924	6,437

SEWERAGE DEMAND

Catchment	Existing Demand	+ Future Demand		= Total Demand
	Current Value	Nominal Value	Present Value	Total Value (EP)
Mirani & Marian	EP 3,382	4,902	2,976	6,358



Base Charge Rate

The Base Charge Rate is calculated by applying the formula:

$$\frac{\text{TOTAL ASSETS}}{\text{TOTAL DEMAND}} + \text{Administration Charge of 0\%}$$

WATER SUPPLY CHARGE RATE

Catchment	Total Assets	÷ Total Demand	+ Admin	= Charge Rate / EP
Mirani, Marian, Finch Hatton & Gargett	\$ 6,606,691	6,437	0%	\$ 1,443.29 / EP

SEWERAGE CHARGE RATE

Catchment	Total Assets	÷ Total Demand	+ Admin	= Charge Rate / EP
Mirani & Marian	\$ 8,405,312	6,358	0%	\$ 1,724.42 / EP



APPENDIX B – HEADWORK INFRASTRUCTURE SUMMARY SCHEDULES

Appendix B1 – Water Supply Headwork Infrastructure:

A summary of the scope of Water Supply Headwork infrastructure is contained in the Schedule below. A more detailed breakdown of the Headwork infrastructure is available from Council upon request.



**Table B1.1 - Summary Trunk WATER SUPPLY Infrastructure Schedule
(Existing Assets)**



Table B1.1 - Water
Existing Assets

Mackay Regional Council

Infrastructure Charges for MIRANI Water Infrastructure

Existing REGIONAL Assets

Active Assets						Asset Allocation						
						Mirani, Marian, Finch						
Asset Type	Description	Subsidy	CRC	Adj CRC								
Water Reservoirs												
MIRANI SYSTEM new TANK - Structure - Reservoir	Reservoir - 243KL		\$ 693,139	\$ 693,139	Y							
MIRANI SYSTEM new TANK - Roofing	Reservoir roof		\$ 107,881	\$ 107,881	Y							
MIRANI SYSTEM new TANK - Pipework & Fittings	Pipes & Fittings		\$ 80,013	\$ 80,013	Y							
MIRANI SYSTEM new TANK - Fencing	Fencing		\$ 104,731	\$ 104,731	Y							
MIRANI SYSTEM new TANK - GROUNDS & SITEWORKS	GROUNDS & SITEWORKS		\$ 17,980	\$ 17,980	Y							
MIRANI SYSTEM new TANK - Telemetry	Telemetry		\$ 23,323	\$ 23,323	Y							
MIRANI SYSTEM ELEVATED TANK - Structure - Reservoir	Reservoir - 243KL		\$ 732,191	\$ 732,191	Y							
MIRANI SYSTEM ELEVATED TANK - Pipework & Fittings	Pipes & Fittings		\$ 71,531	\$ 71,531	Y							
MIRANI SYSTEM ELEVATED TANK - Telemetry	Telemetry		\$ -	\$ -	Y							
FINCH HATTON SYSTEM RESERVOIR - Structure - Reservoir	Reservoir - 455KL		\$ 324,289	\$ 324,289	Y							
FINCH HATTON SYSTEM RESERVOIR - Roofing	Reservoir roof		\$ 49,197	\$ 49,197	Y							
FINCH HATTON SYSTEM RESERVOIR - Pipework & Fittings	Pipes & Fittings		\$ 36,487	\$ 36,487	Y							
FINCH HATTON SYSTEM RESERVOIR - building	Building		\$ 55,713	\$ 55,713	Y							
FINCH HATTON SYSTEM RESERVOIR - Dosing	Chlorine Dosing		\$ 26,250	\$ 26,250	Y							
FINCH HATTON SYSTEM RESERVOIR - Telemetry	Telemetry		\$ 23,323	\$ 23,323	Y							
GARGETT SYSTEM RESERVOIR - Structure - Reservoir	Reservoir -500KL		\$ 346,388	\$ 346,388	Y							
GARGETT SYSTEM RESERVOIR - Roofing	Reservoir roof		\$ 52,550	\$ 52,550	Y							
GARGETT SYSTEM RESERVOIR - Pipework & Fittings	Pipes & Fittings		\$ 38,974	\$ 38,974	Y							
GARGETT SYSTEM RESERVOIR - Telemetry	Telemetry		\$ 23,323	\$ 23,323	Y							
MARIAN SYSTEM ELEVATED TANK - Structure - Reservoir	Reservoir -205kL		\$ 617,692	\$ 617,692	Y							
MARIAN SYSTEM ELEVATED TANK - Pipework & Fittings	Pipes & Fittings		\$ 60,345	\$ 60,345	Y							
MARIAN SYSTEM ELEVATED TANK - Telemetry	Telemetry		\$ -	\$ -	Y							
				\$ -								
Bores												
Bore including pumping and treatment			\$ 142,808	\$ 142,808	Y							
				\$ -								
				\$ -								
WTP												
			\$ 285,559	\$ 285,559	Y							
				\$ -								
				\$ -								
				\$ -								
Ajustents for SCAP received												
Mirani and Marian Water Supply Scheme	Mirani and Marian Water Supply Scheme		-\$1,325,494	\$ 1,325,494	Y							
Pinnacle Water Supply	Pinnacle Water Supply		-\$536,000	\$ 536,000	Y							
Gargett Water Supply	Gargett Water Supply		-\$627,000	\$ 627,000	Y							
Finch Hatton Water Supply	Finch Hatton Water Supply		-\$100,000	\$ 100,000	Y							
				\$ -								
				\$ -								
				\$ -								
				\$ -								
				\$ -								
Passive Assets												
Asset Description	Length	Dia	Base Cost /m	Multiplier	CRC	Adj CRC						
Water Mains												
Watermain Asset No - MA2 ; 20m of 200Dia	20	200	\$ 348	1.0	\$ 6,952	\$ 6,952	Y					
Watermain Asset No - MA2 ; 250m of 200Dia	250	200	\$ 348	1.0	\$ 86,897	\$ 86,897	Y					
Watermain Asset No - MA4 ; 308m of 200Dia	308	200	\$ 348	1.0	\$ 107,057	\$ 107,057	Y					
Watermain Asset No - MA6 ; 388m of 200Dia	388	200	\$ 348	1.0	\$ 134,864	\$ 134,864	Y					
Watermain Asset No - G11 ; 22m of 200Dia	22	200	\$ 348	1.0	\$ 7,647	\$ 7,647	Y					
Watermain Asset No - G14 ; 20m of 200Dia	20	200	\$ 348	1.0	\$ 6,952	\$ 6,952	Y					
Watermain Asset No - G17 ; 17m of 200Dia	17	200	\$ 348	1.0	\$ 5,909	\$ 5,909	Y					
Watermain Asset No - P5 ; 84m of 200Dia	84	200	\$ 348	1.0	\$ 29,197	\$ 29,197	Y					
Watermain Asset No - MI10 ; 70m of 150Dia	70	150	\$ 268	1.0	\$ 18,740	\$ 18,740	Y					
Watermain Asset No - MI11 ; 142m of 150Dia	142	150	\$ 268	1.0	\$ 38,016	\$ 38,016	Y					
Watermain Asset No - MI12 ; 45m of 150Dia	45	150	\$ 268	1.0	\$ 12,047	\$ 12,047	Y					
Watermain Asset No - MI12 ; 120m of 150Dia	120	150	\$ 268	1.0	\$ 32,126	\$ 32,126	Y					
Watermain Asset No - MI9 ; 105m of 150Dia	105	150	\$ 268	1.0	\$ 28,110	\$ 28,110	Y					
Watermain Asset No - FH1 ; 175m of 150Dia	175	150	\$ 268	1.0	\$ 46,851	\$ 46,851	Y					
Watermain Asset No - FH10 ; 97m of 150Dia	97	150	\$ 268	1.0	\$ 25,969	\$ 25,969	Y					
Watermain Asset No - FH12 ; 31m of 150Dia	31	150	\$ 268	1.0	\$ 8,299	\$ 8,299	Y					
Watermain Asset No - FH15 ; 177m of 150Dia	177	150	\$ 268	1.0	\$ 47,386	\$ 47,386	Y					
Watermain Asset No - FH17 ; 25m of 150Dia	25	150	\$ 268	1.0	\$ 6,693	\$ 6,693	Y					
Watermain Asset No - FH17 ; 560m of 150Dia	560	150	\$ 268	1.0	\$ 149,922	\$ 149,922	Y					
Watermain Asset No - FH2 ; 237m of 150Dia	237	150	\$ 268	1.0	\$ 63,449	\$ 63,449	Y					

Active Assets							Asset Allocation						
Watermain Asset No - FH31 : 252m of 150Dia	252	150	\$ 268	1.0	\$ 67,465	\$ 67,465	y						
Watermain Asset No - FH4 : 170m of 150Dia	170	150	\$ 268	1.0	\$ 45,512	\$ 45,512	y						
Watermain Asset No - FH6 : 210m of 150Dia	210	150	\$ 268	1.0	\$ 56,221	\$ 56,221	y						
Watermain Asset No - FH8 : 15m of 150Dia	15	150	\$ 268	1.0	\$ 4,016	\$ 4,016	y						
Watermain Asset No - MI1 : 675m of 150Dia	675	150	\$ 268	1.0	\$ 180,710	\$ 180,710	y						
Watermain Asset No - MI2 : 390m of 150Dia	390	150	\$ 268	1.0	\$ 104,410	\$ 104,410	y						
Watermain Asset No - MA1 : 808m of 150Dia	808	150	\$ 268	1.0	\$ 216,316	\$ 216,316	y						
Watermain Asset No - MA13 : 800m of 150Dia	800	150	\$ 268	1.0	\$ 214,174	\$ 214,174	y						
Watermain Asset No - MA15 : 174m of 150Dia	174	150	\$ 268	1.0	\$ 46,583	\$ 46,583	y						
Watermain Asset No - MA21 : 550m of 150Dia	550	150	\$ 268	1.0	\$ 147,245	\$ 147,245	y						
Watermain Asset No - MA31 : 700m of 150Dia	700	150	\$ 268	1.0	\$ 187,403	\$ 187,403	y						
Watermain Asset No - MA23 : 210m of 150Dia	210	150	\$ 268	1.0	\$ 56,221	\$ 56,221	y						
Watermain Asset No - MI11 : 48m of 150Dia	48	150	\$ 268	1.0	\$ 12,850	\$ 12,850	y						
Watermain Asset No - MI22 : 25m of 150Dia	25	150	\$ 268	1.0	\$ 6,693	\$ 6,693	y						
Watermain Asset No - MI22 : 171m of 150Dia	171	150	\$ 268	1.0	\$ 45,780	\$ 45,780	y						
Watermain Asset No - MI24 : 58m of 150Dia	58	150	\$ 268	1.0	\$ 15,528	\$ 15,528	y						
Watermain Asset No - MI35 : 53m of 150Dia	53	150	\$ 268	1.0	\$ 14,189	\$ 14,189	y						
Watermain Asset No - MI25 : 126m of 150Dia	126	150	\$ 268	1.0	\$ 33,732	\$ 33,732	y						
Watermain Asset No - MI32 : 226m of 150Dia	226	150	\$ 268	1.0	\$ 60,504	\$ 60,504	y						
Watermain Asset No - MI33 : 114m of 150Dia	114	150	\$ 268	1.0	\$ 30,520	\$ 30,520	y						
Watermain Asset No - G10 : 14m of 150Dia	14	150	\$ 268	1.0	\$ 3,748	\$ 3,748	y						
Watermain Asset No - G10 : 675m of 150Dia	675	150	\$ 268	1.0	\$ 180,710	\$ 180,710	y						
Watermain Asset No - G12 : 156m of 150Dia	156	150	\$ 268	1.0	\$ 41,764	\$ 41,764	y						
Watermain Asset No - G13 : 6m of 150Dia	6	150	\$ 268	1.0	\$ 1,606	\$ 1,606	y						
Watermain Asset No - G15 : 174m of 150Dia	174	150	\$ 268	1.0	\$ 46,583	\$ 46,583	y						
Watermain Asset No - G18 : 18m of 150Dia	18	150	\$ 268	1.0	\$ 4,819	\$ 4,819	y						
Watermain Asset No - G25 : 240m of 150Dia	240	150	\$ 268	1.0	\$ 64,252	\$ 64,252	y						
Watermain Asset No - G9 : 663m of 150Dia	663	150	\$ 268	1.0	\$ 177,497	\$ 177,497	y						
Watermain Asset No - G9 : 189m of 150Dia	189	150	\$ 268	1.0	\$ 50,599	\$ 50,599	y						
Watermain Asset No - G29 : 68m of 150Dia	68	150	\$ 268	1.0	\$ 18,205	\$ 18,205	y						
Watermain Asset No - P1 : 5m of 150Dia	5	150	\$ 268	1.0	\$ 1,339	\$ 1,339	y						
Watermain Asset No - P2 : 242m of 150Dia	242	150	\$ 268	1.0	\$ 64,788	\$ 64,788	y						
Watermain Asset No - P3 : 16m of 150Dia	16	150	\$ 268	1.0	\$ 4,283	\$ 4,283	y						
Watermain Asset No - P4 : 640m of 150Dia	640	150	\$ 268	1.0	\$ 171,340	\$ 171,340	y						
Watermain Asset No - P6 : 68m of 150Dia	68	150	\$ 268	1.0	\$ 18,205	\$ 18,205	y						
Watermain Asset No - P7 : 1040m of 150Dia	1040	150	\$ 268	1.0	\$ 278,427	\$ 278,427	y						
Watermain Asset No - P8 : 266m of 150Dia	266	150	\$ 268	1.0	\$ 71,213	\$ 71,213	y						
Watermain Asset No - P8 : 320m of 150Dia	320	150	\$ 268	1.0	\$ 85,670	\$ 85,670	y						
Watermain Asset No - P9 : 36m of 150Dia	36	150	\$ 268	1.0	\$ 9,638	\$ 9,638	y						
Watermain Asset No - MA32 : 487m of 150Dia	487	150	\$ 268	1.0	\$ 130,379	\$ 130,379	y						
Watermain Asset No - MA33 : 1423m of 150Dia	1423	150	\$ 268	1.0	\$ 380,963	\$ 380,963	y						
Watermain Asset No - MA34 : 2m of 150Dia	2	150	\$ 268	1.0	\$ 535	\$ 535	y						
Watermain Asset No - MI1 : 2m of 150Dia	2	150	\$ 268	1.0	\$ 535	\$ 535	y						
Watermain Asset No - MI37 : 1920m of 150Dia	1920	150	\$ 268	1.0	\$ 514,019	\$ 514,019	y						
Watermain Asset No - MI38 : 2060m of 150Dia	2060	150	\$ 268	1.0	\$ 551,499	\$ 551,499	y						
						\$ 6,606,960.72							



**Table B1.2 - Summary Trunk WATER SUPPLY Infrastructure Schedule
(Proposed NEW Assets)**



Table B1.2 - Water
Future Assets

Mackay Regional Council

Infrastructure Charges for MIRANI Water Infrastructure

NEW Assets

Active Assets							Mirani, Marian, Finch Hatton at	Asset Allocation					
Proj No	Description			Subsidy	Proposed Date	CRC	Adj CRC						
WAT303 - Year 1	Mirani New water treatment plant - Year 1			40%	2008	\$ 15,000	\$ 9,000	Y					
WAT303 - Year 2	Mirani New water treatment plant - Year 2			40%	2009	\$ 425,000	\$ 255,000	Y					
WAT303 - Year 3	Mirani New water treatment plant - Year 3			40%	2010	\$ 4,260,000	\$ 2,556,000	Y					
							\$ -						
							\$ -						
							\$ 2,820,000.00						

**Appendix B2 – Sewerage Headwork Infrastructure:**

A summary of the scope of Sewerage Headwork infrastructure is contained in the Schedule below. A more detailed breakdown of the Headwork infrastructure is available from Council upon request.

Mackay Regional Council

Infrastructure Charges for MIRANI Sewer Infrastructure

Existing REGIONAL Assets

Active Assets					Asset Allocation						
					Mirani and Marian						
Asset Type	Description	Subsidy	CRC	Adj CRC							
Pump Stations - Mirani				\$ -							
PUMP STATION 1 - (Mackay-Eungella Rd) (Wet Well)	PUMP STATION 1 - (Mackay-Eungella Rd) (Wet Well)	\$	86,982	\$ 86,982	y						
PUMP STATION 1 - (Mackay-Eungella Rd) (Pump 1)	PUMP STATION 1 - (Mackay-Eungella Rd) (Pump 1)	\$	14,759	\$ 14,759	y						
PUMP STATION 1 - (Mackay-Eungella Rd) (Pump 2)	PUMP STATION 1 - (Mackay-Eungella Rd) (Pump 2)	\$	14,759	\$ 14,759	y						
PUMP STATION 1 - (Mackay-Eungella Rd) (Pipework)	PUMP STATION 1 - (Mackay-Eungella Rd) (Pipework)	\$	36,850	\$ 36,850	y						
PUMP STATION 1 - (Mackay-Eungella Rd) (Electrical)	PUMP STATION 1 - (Mackay-Eungella Rd) (Electrical)	\$	18,693	\$ 18,693	y						
PUMP STATION 1 - (Mackay-Eungella Rd) (Telemetry)	PUMP STATION 1 - (Mackay-Eungella Rd) (Telemetry)	\$	17,492	\$ 17,492	y						
PUMP STATION 2 - (Elizabeth St) (Wet Well)	PUMP STATION 2 - (Elizabeth St) (Wet Well)	\$	80,774	\$ 80,774	y						
PUMP STATION 2 - (Elizabeth St) (Pump 1)	PUMP STATION 2 - (Elizabeth St) (Pump 1)	\$	6,278	\$ 6,278	y						
PUMP STATION 2 - (Elizabeth St) (Pump 2)	PUMP STATION 2 - (Elizabeth St) (Pump 2)	\$	6,278	\$ 6,278	y						
PUMP STATION 2 - (Elizabeth St) (Pipework)	PUMP STATION 2 - (Elizabeth St) (Pipework)	\$	17,029	\$ 17,029	y						
PUMP STATION 2 - (Elizabeth St) (Electrical)	PUMP STATION 2 - (Elizabeth St) (Electrical)	\$	13,144	\$ 13,144	y						
PUMP STATION 2 - (Elizabeth St) (Telemetry)	PUMP STATION 2 - (Elizabeth St) (Telemetry)	\$	17,492	\$ 17,492	y						
PUMP STATION 3 - (Caroline St) (Wet Well)	PUMP STATION 3 - (Caroline St) (Wet Well)	\$	80,774	\$ 80,774	y						
PUMP STATION 3 - (Caroline St) (Pump 1)	PUMP STATION 3 - (Caroline St) (Pump 1)	\$	7,223	\$ 7,223	y						
PUMP STATION 3 - (Caroline St) (Pump 2)	PUMP STATION 3 - (Caroline St) (Pump 2)	\$	7,223	\$ 7,223	y						
PUMP STATION 3 - (Caroline St) (Pipework)	PUMP STATION 3 - (Caroline St) (Pipework)	\$	23,193	\$ 23,193	y						
PUMP STATION 3 - (Caroline St) (Electrical)	PUMP STATION 3 - (Caroline St) (Electrical)	\$	13,701	\$ 13,701	y						
PUMP STATION 3 - (Caroline St) (Telemetry)	PUMP STATION 3 - (Caroline St) (Telemetry)	\$	17,492	\$ 17,492	y						
PUMP STATION 4 - (Mary St) (Wet Well)	PUMP STATION 4 - (Mary St) (Wet Well)	\$	86,982	\$ 86,982	y						
PUMP STATION 4 - (Mary St) (Pump 1)	PUMP STATION 4 - (Mary St) (Pump 1)	\$	6,278	\$ 6,278	y						
PUMP STATION 4 - (Mary St) (Pump 2)	PUMP STATION 4 - (Mary St) (Pump 2)	\$	6,278	\$ 6,278	y						
PUMP STATION 4 - (Mary St) (Pipework)	PUMP STATION 4 - (Mary St) (Pipework)	\$	17,029	\$ 17,029	y						
PUMP STATION 4 - (Mary St) (Electrical)	PUMP STATION 4 - (Mary St) (Electrical)	\$	13,144	\$ 13,144	y						
PUMP STATION 4 - (Mary St) (Telemetry)	PUMP STATION 4 - (Mary St) (Telemetry)	\$	17,492	\$ 17,492	y						
PUMP STATION 5 - (Alexandra St) (Wet Well)	PUMP STATION 5 - (Alexandra St) (Wet Well)	\$	74,426	\$ 74,426	y						
PUMP STATION 5 - (Alexandra St) (Pump 1)	PUMP STATION 5 - (Alexandra St) (Pump 1)	\$	6,278	\$ 6,278	y						
PUMP STATION 5 - (Alexandra St) (Pump 2)	PUMP STATION 5 - (Alexandra St) (Pump 2)	\$	6,278	\$ 6,278	y						
PUMP STATION 5 - (Alexandra St) (Pipework)	PUMP STATION 5 - (Alexandra St) (Pipework)	\$	17,029	\$ 17,029	y						
PUMP STATION 5 - (Alexandra St) (Electrical)	PUMP STATION 5 - (Alexandra St) (Electrical)	\$	13,144	\$ 13,144	y						
PUMP STATION 5 - (Alexandra St) (Telemetry)	PUMP STATION 5 - (Alexandra St) (Telemetry)	\$	17,492	\$ 17,492	y						
PUMP STATION 6 - (Louise St) (Wet Well)	PUMP STATION 6 - (Louise St) (Wet Well)	\$	46,121	\$ 46,121	y						
PUMP STATION 6 - (Louise St) (Pump 1)	PUMP STATION 6 - (Louise St) (Pump 1)	\$	6,278	\$ 6,278	y						
PUMP STATION 6 - (Louise St) (Pump 2)	PUMP STATION 6 - (Louise St) (Pump 2)	\$	6,278	\$ 6,278	y						
PUMP STATION 6 - (Louise St) (Pipework)	PUMP STATION 6 - (Louise St) (Pipework)	\$	17,029	\$ 17,029	y						
PUMP STATION 6 - (Louise St) (Electrical)	PUMP STATION 6 - (Louise St) (Electrical)	\$	13,144	\$ 13,144	y						
PUMP STATION 6 - (Louise St) (Telemetry)	PUMP STATION 6 - (Louise St) (Telemetry)	\$	17,492	\$ 17,492	y						
PUMP STATION 7 - (Alice St) (Wet Well)	PUMP STATION 7 - (Alice St) (Wet Well)	\$	46,121	\$ 46,121	y						
PUMP STATION 7 - (Alice St) (Pump 1)	PUMP STATION 7 - (Alice St) (Pump 1)	\$	6,278	\$ 6,278	y						
PUMP STATION 7 - (Alice St) (Pump 2)	PUMP STATION 7 - (Alice St) (Pump 2)	\$	6,278	\$ 6,278	y						
PUMP STATION 7 - (Alice St) (Pipework)	PUMP STATION 7 - (Alice St) (Pipework)	\$	17,029	\$ 17,029	y						
PUMP STATION 7 - (Alice St) (Electrical)	PUMP STATION 7 - (Alice St) (Electrical)	\$	13,144	\$ 13,144	y						
PUMP STATION 7 - (Alice St) (Telemetry)	PUMP STATION 7 - (Alice St) (Telemetry)	\$	17,492	\$ 17,492	y						
PUMP STATION 8a - (Wet Well)	PUMP STATION 8a - (Wet Well)	\$	86,982	\$ 86,982	y						
PUMP STATION 8a - (Pump 1)	PUMP STATION 8a - (Pump 1)	\$	12,787	\$ 12,787	y						
PUMP STATION 8a - (Pump 2)	PUMP STATION 8a - (Pump 2)	\$	11,896	\$ 11,896	y						
PUMP STATION 8a - (Pipework)	PUMP STATION 8a - (Pipework)	\$	38,849	\$ 38,849	y						
PUMP STATION 8a - (Electrical)	PUMP STATION 8a - (Electrical)	\$	19,351	\$ 19,351	y						
PUMP STATION 8a - (Telemetry)	PUMP STATION 8a - (Telemetry)	\$	17,492	\$ 17,492	y						
PUMP STATION 1 - (Wet Well)	PUMP STATION 1 - (Wet Well)	\$	99,036	\$ 99,036	y						
PUMP STATION 1 - (Pump)	PUMP STATION 1 - (Pump)	\$	27,178	\$ 27,178	y						
PUMP STATION 1 - (Pump)	PUMP STATION 1 - (Pump)	\$	27,178	\$ 27,178	y						
PUMP STATION 1 - (Pipework)	PUMP STATION 1 - (Pipework)	\$	38,849	\$ 38,849	y						
PUMP STATION 1 - (Electrical)	PUMP STATION 1 - (Electrical)	\$	19,351	\$ 19,351	y						
PUMP STATION 1 - (Telemetry)	PUMP STATION 1 - (Telemetry)	\$	17,492	\$ 17,492	y						
PUMP STATION 2 - (Wet Well)	PUMP STATION 2 - (Wet Well)	\$	99,036	\$ 99,036	y						
PUMP STATION 2 - (Pump 1)	PUMP STATION 2 - (Pump 1)	\$	8,828	\$ 8,828	y						
PUMP STATION 2 - (Pump 2)	PUMP STATION 2 - (Pump 2)	\$	8,828	\$ 8,828	y						
PUMP STATION 2 - (Pipework)	PUMP STATION 2 - (Pipework)	\$	23,168	\$ 23,168	y						
PUMP STATION 2 - (Electrical)	PUMP STATION 2 - (Electrical)	\$	14,899	\$ 14,899	y						
PUMP STATION 2 - (Telemetry)	PUMP STATION 2 - (Telemetry)	\$	-	\$ -	y						

Active Assets							Asset Allocation						
							Mirani and Marian						
PUMP STATION 3 - (Wet Well)	PUMP STATION 3 - (Wet Well)		\$	104,906	\$	104,906	y						
PUMP STATION 3 - (Pump 1)	PUMP STATION 3 - (Pump 1)		\$	7,089	\$	7,089	y						
PUMP STATION 3 - (Pump 2)	PUMP STATION 3 - (Pump 2)		\$	6,278	\$	6,278	y						
PUMP STATION 3 - (Pipework)	PUMP STATION 3 - (Pipework)		\$	22,804	\$	22,804	y						
PUMP STATION 3 - (Electrical)	PUMP STATION 3 - (Electrical)		\$	13,615	\$	13,615	y						
PUMP STATION 3 - (Telemetry)	PUMP STATION 3 - (Telemetry)		\$	-	\$	-	y						
PUMP STATION 4 - (Wet Well)	PUMP STATION 4 - (Wet Well)		\$	104,906	\$	104,906	y						
PUMP STATION 4 - (Pump 1)	PUMP STATION 4 - (Pump 1)		\$	8,828	\$	8,828	y						
PUMP STATION 4 - (Pump 2)	PUMP STATION 4 - (Pump 2)		\$	7,966	\$	7,966	y						
PUMP STATION 4 - (Pipework)	PUMP STATION 4 - (Pipework)		\$	27,802	\$	27,802	y						
PUMP STATION 4 - (Electrical)	PUMP STATION 4 - (Electrical)		\$	14,899	\$	14,899	y						
PUMP STATION 4 - (Telemetry)	PUMP STATION 4 - (Telemetry)		\$	-	\$	-	y						
PUMP STATION 6 - (Wet Well)	PUMP STATION 6 - (Wet Well)		\$	110,682	\$	110,682	y						
PUMP STATION 6 - (Pump 1)	PUMP STATION 6 - (Pump 1)		\$	8,828	\$	8,828	y						
PUMP STATION 6 - (Pump 2)	PUMP STATION 6 - (Pump 2)		\$	8,828	\$	8,828	y						
PUMP STATION 6 - (Pipework)	PUMP STATION 6 - (Pipework)		\$	27,802	\$	27,802	y						
PUMP STATION 6 - (Electrical)	PUMP STATION 6 - (Electrical)		\$	14,899	\$	14,899	y						
PUMP STATION 6 - (Telemetry)	PUMP STATION 6 - (Telemetry)		\$	-	\$	-	y						
PUMP STATION 7 - (Wet Well)	PUMP STATION 7 - (Wet Well)		\$	121,985	\$	121,985	y						
PUMP STATION 7 - (Pump 1)	PUMP STATION 7 - (Pump 1)		\$	16,887	\$	16,887	y						
PUMP STATION 7 - (Pump 2)	PUMP STATION 7 - (Pump 2)		\$	15,939	\$	15,939	y						
PUMP STATION 7 - (Pipework)	PUMP STATION 7 - (Pipework)		\$	49,941	\$	49,941	y						
PUMP STATION 7 - (Electrical)	PUMP STATION 7 - (Electrical)		\$	26,454	\$	26,454	y						
PUMP STATION 7 - (Telemetry)	PUMP STATION 7 - (Telemetry)		\$	-	\$	-	y						
PUMP STATION 8 - (Wet Well)	PUMP STATION 8 - (Wet Well)		\$	80,480	\$	80,480	y						
PUMP STATION 8 - (Pump 1)	PUMP STATION 8 - (Pump 1)		\$	8,828	\$	8,828	y						
PUMP STATION 8 - (Pump 2)	PUMP STATION 8 - (Pump 2)		\$	8,828	\$	8,828	y						
PUMP STATION 8 - (Pipework)	PUMP STATION 8 - (Pipework)		\$	27,802	\$	27,802	y						
PUMP STATION 8 - (Electrical)	PUMP STATION 8 - (Electrical)		\$	14,899	\$	14,899	y						
PUMP STATION 8 - (Telemetry)	PUMP STATION 8 - (Telemetry)		\$	-	\$	-	y						
PUMP STATION 9 - (Wet Well)	PUMP STATION 9 - (Wet Well)		\$	99,036	\$	99,036	y						
PUMP STATION 9 - (Pump 1)	PUMP STATION 9 - (Pump 1)		\$	8,828	\$	8,828	y						
PUMP STATION 9 - (Pump 2)	PUMP STATION 9 - (Pump 2)		\$	7,966	\$	7,966	y						
PUMP STATION 9 - (Pipework)	PUMP STATION 9 - (Pipework)		\$	27,802	\$	27,802	y						
PUMP STATION 9 - (Electrical)	PUMP STATION 9 - (Electrical)		\$	14,899	\$	14,899	y						
PUMP STATION 9 - (Telemetry)	PUMP STATION 9 - (Telemetry)		\$	-	\$	-	y						
PUMP STATION 10 - (Wet Well)	PUMP STATION 10 - (Wet Well)		\$	104,906	\$	104,906	y						
PUMP STATION 10 - (Pump 1)	PUMP STATION 10 - (Pump 1)		\$	8,828	\$	8,828	y						
PUMP STATION 10 - (Pump 2)	PUMP STATION 10 - (Pump 2)		\$	8,828	\$	8,828	y						
PUMP STATION 10 - (Pipework)	PUMP STATION 10 - (Pipework)		\$	27,802	\$	27,802	y						
PUMP STATION 10 - (Electrical)	PUMP STATION 10 - (Electrical)		\$	14,899	\$	14,899	y						
PUMP STATION 10 - (Telemetry)	PUMP STATION 10 - (Telemetry)		\$	-	\$	-	y						
				-	\$	-							
Pump Sttaions - Marian					\$	-							
Pump Sttaiosn (Total)	Pump Sttaiosn (Total)		\$	1,155,547	\$	1,155,547	y						
WWTP					\$	-							
STP	STP		\$	3,099,605	\$	3,099,605	y						
STP Upgarde (07/08)	STP Upgarde (07/08)		\$	176,137	\$	176,137	y						
					\$	-							
Ajustents for SCAP received for MIRANI					\$	-							
All Mirani Sewer Mains	All Mirani Sewer Mains			-\$791,205	-\$	791,205	y						
All Mirani Manholes	All Mirani Manholes			-\$128,504	-\$	128,504	y						
All Mirani SPS	All Mirani SPS			-\$833,538	-\$	833,538	y						
All Mirani STP	All Mirani STP			-\$1,058,560	-\$	1,058,560	y						
					\$	-							
Ajustents for SCAP received for MARIAN					\$	-							
All Marian Sewer Mains	All Marian Sewer Mains			-\$2,043,120	-\$	2,043,120	y						
All Marian Manholes	All Marian Manholes			-\$884,178	-\$	884,178	y						
All Marian SPS	All Marian SPS			-\$924,438	-\$	924,438	y						
					\$	-							
Passive Assets													
Asset Description	Length	Dia	Base Cost /m	Multiplier	CRC	Adj CRC							
Sewer Mains Mirani ONLY						\$	-						
Sewer Main Asset No - MI1/101/1066.2m of 150mmdia	66.2	150	\$ 430	1.0	\$ 28,457	\$ 28,457	y						
Sewer Main Asset No - MI1/101/10A19m of 150mmdia	19	150	\$ 430	1.0	\$ 8,167	\$ 8,167	y						
Sewer Main Asset No - MI1/101/10A40.4m of 150mmdia	40.4	150	\$ 430	1.0	\$ 17,366	\$ 17,366	y						
Sewer Main Asset No - MI1/101/1146.5m of 150mmdia	46.5	150	\$ 430	1.0	\$ 19,989	\$ 19,989	y						
Sewer Main Asset No - MI1/101/289.1m of 225mmdia	89.1	225	\$ 565	1.0	\$ 50,333	\$ 50,333	y						
Sewer Main Asset No - MI1/101/29m of 150mmdia	9	150	\$ 430	1.0	\$ 3,869	\$ 3,869	y						
Sewer Main Asset No - MI1/101/233m of 150mmdia	33	150	\$ 430	1.0	\$ 14,185	\$ 14,185	y						

Active Assets	Asset Allocation						
	Mirani and Marian						
Sewer Main Asset No - MI1/101/393.35m of 225mmdia	93.35	225	\$ 565	1.0	\$ 52,734	\$ 52,734	y
Sewer Main Asset No - MI1/101/342.5m of 150mmdia	42.5	150	\$ 430	1.0	\$ 18,269	\$ 18,269	y
Sewer Main Asset No - MI1/101/485.4m of 225mmdia	85.4	225	\$ 565	1.0	\$ 48,243	\$ 48,243	y
Sewer Main Asset No - MI1/101/560.1m of 225mmdia	60.1	225	\$ 565	1.0	\$ 33,951	\$ 33,951	y
Sewer Main Asset No - MI1/101/546.4m of 150mmdia	46.4	150	\$ 430	1.0	\$ 19,946	\$ 19,946	y
Sewer Main Asset No - MI1/101/646.9m of 150mmdia	46.9	150	\$ 430	1.0	\$ 20,161	\$ 20,161	y
Sewer Main Asset No - MI1/101/719.8m of 150mmdia	19.8	150	\$ 430	1.0	\$ 8,511	\$ 8,511	y
Sewer Main Asset No - MI1/101/878.2m of 150mmdia	78.2	150	\$ 430	1.0	\$ 33,615	\$ 33,615	y
Sewer Main Asset No - MI1/101/867.7m of 150mmdia	67.7	150	\$ 430	1.0	\$ 29,102	\$ 29,102	y
Sewer Main Asset No - MI1/101/940.2m of 150mmdia	40.2	150	\$ 430	1.0	\$ 17,280	\$ 17,280	y
Sewer Main Asset No - MI1/102/075.1m of 150mmdia	75.1	150	\$ 430	1.0	\$ 32,283	\$ 32,283	y
Sewer Main Asset No - MI1/102/191.8m of 150mmdia	91.8	150	\$ 430	1.0	\$ 39,461	\$ 39,461	y
Sewer Main Asset No - MI1/102/222.9m of 150mmdia	22.9	150	\$ 430	1.0	\$ 9,844	\$ 9,844	y
Sewer Main Asset No - MI1/102/374.9m of 150mmdia	74.9	150	\$ 430	1.0	\$ 32,197	\$ 32,197	y
Sewer Main Asset No - MI1/103/151.5m of 150mmdia	51.5	150	\$ 430	1.0	\$ 22,138	\$ 22,138	y
Sewer Main Asset No - MI1/103/125.1m of 150mmdia	25.1	150	\$ 430	1.0	\$ 10,790	\$ 10,790	y
Sewer Main Asset No - MI1/103/1A16.3m of 150mmdia	16.3	150	\$ 430	1.0	\$ 7,007	\$ 7,007	y
Sewer Main Asset No - MI1/103/219.7m of 150mmdia	19.7	150	\$ 430	1.0	\$ 8,468	\$ 8,468	y
Sewer Main Asset No - MI1/104/157.9m of 150mmdia	57.9	150	\$ 430	1.0	\$ 24,889	\$ 24,889	y
Sewer Main Asset No - MI1/104/1A23.9m of 150mmdia	23.9	150	\$ 430	1.0	\$ 10,274	\$ 10,274	y
Sewer Main Asset No - MI1/104/237.4m of 150mmdia	37.4	150	\$ 430	1.0	\$ 16,077	\$ 16,077	y
Sewer Main Asset No - MI1/104/328.8m of 150mmdia	28.8	150	\$ 430	1.0	\$ 12,380	\$ 12,380	y
Sewer Main Asset No - MI1/104/325m of 150mmdia	25	150	\$ 430	1.0	\$ 10,747	\$ 10,747	y
Sewer Main Asset No - MI1/105/125.1m of 150mmdia	25.1	150	\$ 430	1.0	\$ 10,790	\$ 10,790	y
Sewer Main Asset No - MI1/105/227.1m of 150mmdia	27.1	150	\$ 430	1.0	\$ 11,649	\$ 11,649	y
Sewer Main Asset No - MI1/108/130.8m of 150mmdia	30.8	150	\$ 430	1.0	\$ 13,240	\$ 13,240	y
Sewer Main Asset No - MI1/108/232.9m of 150mmdia	32.9	150	\$ 430	1.0	\$ 14,142	\$ 14,142	y
Sewer Main Asset No - MI1/108/374.6m of 150mmdia	74.6	150	\$ 430	1.0	\$ 32,068	\$ 32,068	y
Sewer Main Asset No - MI1/108/478m of 150mmdia	78	150	\$ 430	1.0	\$ 33,529	\$ 33,529	y
Sewer Main Asset No - MI1/108/443.9m of 150mmdia	43.9	150	\$ 430	1.0	\$ 18,871	\$ 18,871	y
Sewer Main Asset No - MI1/108/545.8m of 150mmdia	45.8	150	\$ 430	1.0	\$ 19,688	\$ 19,688	y
Sewer Main Asset No - MI1/108/635.8m of 150mmdia	35.8	150	\$ 430	1.0	\$ 15,389	\$ 15,389	y
Sewer Main Asset No - MI1/109/13.9m of 150mmdia	3.9	150	\$ 430	1.0	\$ 1,676	\$ 1,676	y
Sewer Main Asset No - MI1/109/253.3m of 150mmdia	53.3	150	\$ 430	1.0	\$ 22,912	\$ 22,912	y
Sewer Main Asset No - MI2/201/173.7m of 150mmdia	73.7	150	\$ 430	1.0	\$ 31,681	\$ 31,681	y
Sewer Main Asset No - MI2/201/137m of 150mmdia	37	150	\$ 430	1.0	\$ 15,905	\$ 15,905	y
Sewer Main Asset No - MI2/201/283.9m of 150mmdia	83.9	150	\$ 430	1.0	\$ 36,065	\$ 36,065	y
Sewer Main Asset No - MI2/201/251m of 150mmdia	51	150	\$ 430	1.0	\$ 21,923	\$ 21,923	y
Sewer Main Asset No - MI2/201/363.9m of 150mmdia	63.9	150	\$ 430	1.0	\$ 27,468	\$ 27,468	y
Sewer Main Asset No - MI2/201/435.4m of 150mmdia	35.4	150	\$ 430	1.0	\$ 15,217	\$ 15,217	y
Sewer Main Asset No - MI2/201/585m of 150mmdia	85	150	\$ 430	1.0	\$ 36,538	\$ 36,538	y
Sewer Main Asset No - MI2/201/534.5m of 150mmdia	34.5	150	\$ 430	1.0	\$ 14,830	\$ 14,830	y
Sewer Main Asset No - MI2/201/66.6m of 150mmdia	6.6	150	\$ 430	1.0	\$ 2,837	\$ 2,837	y
Sewer Main Asset No - MI2/201/775.2m of 150mmdia	75.2	150	\$ 430	1.0	\$ 32,326	\$ 32,326	y
Sewer Main Asset No - MI2/201/844.6m of 150mmdia	44.6	150	\$ 430	1.0	\$ 19,172	\$ 19,172	y
Sewer Main Asset No - MI2/202/124.3m of 150mmdia	24.3	150	\$ 430	1.0	\$ 10,446	\$ 10,446	y
Sewer Main Asset No - MI2/203/125.3m of 150mmdia	25.3	150	\$ 430	1.0	\$ 10,876	\$ 10,876	y
Sewer Main Asset No - MI2/204/160.5m of 150mmdia	60.5	150	\$ 430	1.0	\$ 26,007	\$ 26,007	y
Sewer Main Asset No - MI2/205/122.9m of 150mmdia	22.9	150	\$ 430	1.0	\$ 9,844	\$ 9,844	y
Sewer Main Asset No - MI2/205/174.5m of 150mmdia	74.5	150	\$ 430	1.0	\$ 32,025	\$ 32,025	y
Sewer Main Asset No - MI2/205/264.2m of 150mmdia	64.2	150	\$ 430	1.0	\$ 27,597	\$ 27,597	y
Sewer Main Asset No - MI2/205/335.7m of 150mmdia	35.7	150	\$ 430	1.0	\$ 15,346	\$ 15,346	y
Sewer Main Asset No - MI3/301/160.6m of 150mmdia	60.6	150	\$ 430	1.0	\$ 26,050	\$ 26,050	y
Sewer Main Asset No - MI3/301/144.1m of 150mmdia	44.1	150	\$ 430	1.0	\$ 18,957	\$ 18,957	y
Sewer Main Asset No - MI3/301/260.7m of 150mmdia	60.7	150	\$ 430	1.0	\$ 26,093	\$ 26,093	y
Sewer Main Asset No - MI3/301/244.5m of 150mmdia	44.5	150	\$ 430	1.0	\$ 19,129	\$ 19,129	y
Sewer Main Asset No - MI3/301/248.2m of 150mmdia	48.2	150	\$ 430	1.0	\$ 20,719	\$ 20,719	y
Sewer Main Asset No - MI3/301/363.5m of 150mmdia	63.5	150	\$ 430	1.0	\$ 27,296	\$ 27,296	y
Sewer Main Asset No - MI3/301/429.8m of 150mmdia	29.8	150	\$ 430	1.0	\$ 12,810	\$ 12,810	y
Sewer Main Asset No - MI3/301/425.1m of 150mmdia	25.1	150	\$ 430	1.0	\$ 10,790	\$ 10,790	y
Sewer Main Asset No - MI3/301/537.4m of 150mmdia	37.4	150	\$ 430	1.0	\$ 16,077	\$ 16,077	y
Sewer Main Asset No - MI3/305/139m of 150mmdia	39	150	\$ 430	1.0	\$ 16,765	\$ 16,765	y
Sewer Main Asset No - MI3/305/158m of 150mmdia	58	150	\$ 430	1.0	\$ 24,932	\$ 24,932	y
Sewer Main Asset No - MI3/305/245.8m of 150mmdia	45.8	150	\$ 430	1.0	\$ 19,688	\$ 19,688	y
Sewer Main Asset No - MI3/305/324.1m of 150mmdia	24.1	150	\$ 430	1.0	\$ 10,360	\$ 10,360	y
Sewer Main Asset No - MI3/305/486.4m of 150mmdia	86.4	150	\$ 430	1.0	\$ 37,140	\$ 37,140	y
Sewer Main Asset No - MI3/305/486.8m of 150mmdia	86.8	150	\$ 430	1.0	\$ 37,312	\$ 37,312	y
Sewer Main Asset No - MI3/305/563.5m of 150mmdia	63.5	150	\$ 430	1.0	\$ 27,296	\$ 27,296	y
Sewer Main Asset No - MI3/307/168.6m of 150mmdia	68.6	150	\$ 430	1.0	\$ 29,489	\$ 29,489	y
Sewer Main Asset No - MI3/308/163.5m of 150mmdia	63.5	150	\$ 430	1.0	\$ 27,296	\$ 27,296	y
Sewer Main Asset No - MI3/308/27.9m of 150mmdia	7.9	150	\$ 430	1.0	\$ 3,396	\$ 3,396	y

	Active Assets							Asset Allocation						
								Mirani and Marian						
Sewer Main Asset No - MI3/308/367.5m of 150mmdia	67.5	150	\$	430	1.0	\$	29,016	\$	29,016	y				
Sewer Main Asset No - MI3/308/359.4m of 150mmdia	59.4	150	\$	430	1.0	\$	25,534	\$	25,534	y				
Sewer Main Asset No - MI3/308/442.6m of 150mmdia	42.6	150	\$	430	1.0	\$	18,312	\$	18,312	y				
Sewer Main Asset No - MI3/309/185.8m of 150mmdia	85.8	150	\$	430	1.0	\$	36,882	\$	36,882	y				
Sewer Main Asset No - MI3/309/136.6m of 150mmdia	36.6	150	\$	430	1.0	\$	15,733	\$	15,733	y				
Sewer Main Asset No - MI3/309/23.9m of 150mmdia	3.9	150	\$	430	1.0	\$	1,676	\$	1,676	y				
Sewer Main Asset No - MI3/309/352.3m of 150mmdia	52.3	150	\$	430	1.0	\$	22,482	\$	22,482	y				
Sewer Main Asset No - MI3/309/432.2m of 150mmdia	32.2	150	\$	430	1.0	\$	13,842	\$	13,842	y				
Sewer Main Asset No - MI4/401/1056.3m of 150mmdia	56.3	150	\$	430	1.0	\$	24,201	\$	24,201	y				
Sewer Main Asset No - MI4/401/1181m of 150mmdia	81	150	\$	430	1.0	\$	34,819	\$	34,819	y				
Sewer Main Asset No - MI4/401/127.7m of 150mmdia	7.7	150	\$	430	1.0	\$	3,310	\$	3,310	y				
Sewer Main Asset No - MI4/401/241.3m of 150mmdia	41.3	150	\$	430	1.0	\$	17,753	\$	17,753	y				
Sewer Main Asset No - MI4/401/2A13.6m of 150mmdia	13.6	150	\$	430	1.0	\$	5,846	\$	5,846	y				
Sewer Main Asset No - MI4/401/2A35.2m of 150mmdia	35.2	150	\$	430	1.0	\$	15,131	\$	15,131	y				
Sewer Main Asset No - MI4/401/378.9m of 150mmdia	78.9	150	\$	430	1.0	\$	33,916	\$	33,916	y				
Sewer Main Asset No - MI4/401/345.8m of 150mmdia	45.8	150	\$	430	1.0	\$	19,688	\$	19,688	y				
Sewer Main Asset No - MI4/401/62.8m of 150mmdia	2.8	150	\$	430	1.0	\$	1,204	\$	1,204	y				
Sewer Main Asset No - MI4/401/742.9m of 150mmdia	42.9	150	\$	430	1.0	\$	18,441	\$	18,441	y				
Sewer Main Asset No - MI4/401/820.4m of 150mmdia	20.4	150	\$	430	1.0	\$	8,769	\$	8,769	y				
Sewer Main Asset No - MI4/401/847.5m of 150mmdia	47.5	150	\$	430	1.0	\$	20,418	\$	20,418	y				
Sewer Main Asset No - MI4/401/921.3m of 150mmdia	21.3	150	\$	430	1.0	\$	9,156	\$	9,156	y				
Sewer Main Asset No - MI4/405/124.3m of 150mmdia	24.3	150	\$	430	1.0	\$	10,446	\$	10,446	y				
Sewer Main Asset No - MI4/405/280.5m of 150mmdia	80.5	150	\$	430	1.0	\$	34,604	\$	34,604	y				
Sewer Main Asset No - MI4/405/294.9m of 150mmdia	94.9	150	\$	430	1.0	\$	40,794	\$	40,794	y				
Sewer Main Asset No - MI4/405/2A37.9m of 150mmdia	37.9	150	\$	430	1.0	\$	16,292	\$	16,292	y				
Sewer Main Asset No - MI4/405/324.7m of 150mmdia	24.7	150	\$	430	1.0	\$	10,618	\$	10,618	y				
Sewer Main Asset No - MI4/405/3A37.9m of 150mmdia	37.9	150	\$	430	1.0	\$	16,292	\$	16,292	y				
Sewer Main Asset No - MI4/405/3A37.5m of 150mmdia	37.5	150	\$	430	1.0	\$	16,120	\$	16,120	y				
Sewer Main Asset No - MI4/405/440.6m of 150mmdia	40.6	150	\$	430	1.0	\$	17,452	\$	17,452	y				
Sewer Main Asset No - MI4/405/4A3.6m of 150mmdia	3.6	150	\$	430	1.0	\$	1,548	\$	1,548	y				
Sewer Main Asset No - MI4/405/4A34.9m of 150mmdia	34.9	150	\$	430	1.0	\$	15,002	\$	15,002	y				
Sewer Main Asset No - MI4/405/542.9m of 150mmdia	42.9	150	\$	430	1.0	\$	18,441	\$	18,441	y				
Sewer Main Asset No - MI4/405/636.7m of 150mmdia	36.7	150	\$	430	1.0	\$	15,776	\$	15,776	y				
Sewer Main Asset No - MI4/405/744.8m of 150mmdia	44.8	150	\$	430	1.0	\$	19,258	\$	19,258	y				
Sewer Main Asset No - MI4/405/743m of 150mmdia	43	150	\$	430	1.0	\$	18,484	\$	18,484	y				
Sewer Main Asset No - MI4/405/817.5m of 150mmdia	17.5	150	\$	430	1.0	\$	7,523	\$	7,523	y				
Sewer Main Asset No - MI4/405/845.7m of 150mmdia	45.7	150	\$	430	1.0	\$	19,645	\$	19,645	y				
Sewer Main Asset No - MI4/405/944.2m of 150mmdia	44.2	150	\$	430	1.0	\$	19,000	\$	19,000	y				
Sewer Main Asset No - MI4/408/24.2m of 150mmdia	4.2	150	\$	430	1.0	\$	1,805	\$	1,805	y				
Sewer Main Asset No - MI4/408/318.9m of 150mmdia	18.9	150	\$	430	1.0	\$	8,124	\$	8,124	y				
Sewer Main Asset No - MI4/408/464.6m of 150mmdia	64.6	150	\$	430	1.0	\$	27,769	\$	27,769	y				
Sewer Main Asset No - MI4/408/431.1m of 150mmdia	31.1	150	\$	430	1.0	\$	13,369	\$	13,369	y				
Sewer Main Asset No - MI4/408/520.2m of 150mmdia	20.2	150	\$	430	1.0	\$	8,683	\$	8,683	y				
Sewer Main Asset No - MI4/408/523.4m of 150mmdia	23.4	150	\$	430	1.0	\$	10,059	\$	10,059	y				
Sewer Main Asset No - MI4/410/181.2m of 150mmdia	81.2	150	\$	430	1.0	\$	34,905	\$	34,905	y				
Sewer Main Asset No - MI4/410/216.9m of 150mmdia	16.9	150	\$	430	1.0	\$	7,265	\$	7,265	y				
Sewer Main Asset No - MI4/410/234.9m of 150mmdia	34.9	150	\$	430	1.0	\$	15,002	\$	15,002	y				
Sewer Main Asset No - MI4/410/316.9m of 150mmdia	16.9	150	\$	430	1.0	\$	7,265	\$	7,265	y				
Sewer Main Asset No - MI5/501/045.2m of 150mmdia	45.2	150	\$	430	1.0	\$	19,430	\$	19,430	y				
Sewer Main Asset No - MI5/501/159.6m of 150mmdia	59.6	150	\$	430	1.0	\$	25,620	\$	25,620	y				
Sewer Main Asset No - MI5/501/144.5m of 150mmdia	44.5	150	\$	430	1.0	\$	19,129	\$	19,129	y				
Sewer Main Asset No - MI5/501/281.5m of 150mmdia	81.5	150	\$	430	1.0	\$	35,034	\$	35,034	y				
Sewer Main Asset No - MI5/501/33.7m of 150mmdia	3.7	150	\$	430	1.0	\$	1,590	\$	1,590	y				
Sewer Main Asset No - MI5/501/477.3m of 150mmdia	77.3	150	\$	430	1.0	\$	33,228	\$	33,228	y				
Sewer Main Asset No - MI5/501/538.4m of 150mmdia	38.4	150	\$	430	1.0	\$	16,507	\$	16,507	y				
Sewer Main Asset No - MI5/501/530.4m of 150mmdia	30.4	150	\$	430	1.0	\$	13,068	\$	13,068	y				
Sewer Main Asset No - MI5/501/664.4m of 150mmdia	64.4	150	\$	430	1.0	\$	27,683	\$	27,683	y				
Sewer Main Asset No - MI5/502/179.3m of 150mmdia	79.3	150	\$	430	1.0	\$	34,088	\$	34,088	y				
Sewer Main Asset No - MI6/601/137.3m of 150mmdia	37.3	150	\$	430	1.0	\$	16,034	\$	16,034	y				
Sewer Main Asset No - MI6/601/180.4m of 150mmdia	80.4	150	\$	430	1.0	\$	34,561	\$	34,561	y				
Sewer Main Asset No - MI6/601/1A3.7m of 150mmdia	3.7	150	\$	430	1.0	\$	1,590	\$	1,590	y				
Sewer Main Asset No - MI6/601/1B78.3m of 150mmdia	78.3	150	\$	430	1.0	\$	33,658	\$	33,658	y				
Sewer Main Asset No - MI6/601/243.5m of 150mmdia	43.5	150	\$	430	1.0	\$	18,699	\$	18,699	y				
Sewer Main Asset No - MI6/601/340.8m of 150mmdia	40.8	150	\$	430	1.0	\$	17,538	\$	17,538	y				
Sewer Main Asset No - MI6/601/339.1m of 150mmdia	39.1	150	\$	430	1.0	\$	16,808	\$	16,808	y				
Sewer Main Asset No - MI6/601/443.9m of 150mmdia	43.9	150	\$	430	1.0	\$	18,871	\$	18,871	y				
Sewer Main Asset No - MI6/601/419.9m of 150mmdia	19.9	150	\$	430	1.0	\$	8,554	\$	8,554	y				
Sewer Main Asset No - MI6/603/33.5m of 150mmdia	3.5	150	\$	430	1.0	\$	1,505	\$	1,505	y				
Sewer Main Asset No - MI6/603/480.4m of 150mmdia	80.4	150	\$	430	1.0	\$	34,561	\$	34,561	y				
Sewer Main Asset No - MI6/603/538m of 150mmdia	38	150	\$	430	1.0	\$	16,335	\$	16,335	y				
Sewer Main Asset No - MI6/603/5A3.8m of 150mmdia	3.8	150	\$	430	1.0	\$	1,633	\$	1,633	y				

Active Assets							Asset Allocation						
							Mirani and Marian						
Sewer Main Asset No - MI6/603/5A23.8m of 150mmdia	23.8	150	\$ 430	1.0	\$ 10,231	\$ 10,231	y						
Sewer Main Asset No - MI7/701/114.6m of 150mmdia	14.6	150	\$ 430	1.0	\$ 6,276	\$ 6,276	y						
Sewer Main Asset No - MI7/701/181.3m of 150mmdia	81.3	150	\$ 430	1.0	\$ 34,948	\$ 34,948	y						
Sewer Main Asset No - MI7/701/297m of 150mmdia	97	150	\$ 430	1.0	\$ 41,697	\$ 41,697	y						
Sewer Main Asset No - MI7/701/436.9m of 150mmdia	36.9	150	\$ 430	1.0	\$ 15,862	\$ 15,862	y						
Sewer Main Asset No - MI7/703/181m of 150mmdia	81	150	\$ 430	1.0	\$ 34,819	\$ 34,819	y						
Sewer Main Asset No - MI7/703/140.2m of 150mmdia	40.2	150	\$ 430	1.0	\$ 17,280	\$ 17,280	y						
Sewer Main Asset No - MI7/703/253.4m of 150mmdia	53.4	150	\$ 430	1.0	\$ 22,955	\$ 22,955	y						
Sewer Main Asset No - MI7/703/314.1m of 150mmdia	14.1	150	\$ 430	1.0	\$ 6,061	\$ 6,061	y						
Sewer Main Asset No - MI7/703/337.9m of 150mmdia	37.9	150	\$ 430	1.0	\$ 16,292	\$ 16,292	y						
Sewer Main Asset No - MI7/703/48.2m of 150mmdia	8.2	150	\$ 430	1.0	\$ 3,525	\$ 3,525	y						
Sewer Main Asset No - MI7/704/1A30.7m of 150mmdia	30.7	150	\$ 430	1.0	\$ 13,197	\$ 13,197	y						
Sewer Main Asset No - MI7/704/1A3.5m of 150mmdia	3.5	150	\$ 430	1.0	\$ 1,505	\$ 1,505	y						
Sewer Main Asset No - MI7/704/212.4m of 150mmdia	12.4	150	\$ 430	1.0	\$ 5,330	\$ 5,330	y						
Sewer Main Asset No - MI7/705/135.7m of 150mmdia	35.7	150	\$ 430	1.0	\$ 15,346	\$ 15,346	y						
Sewer Main Asset No - MI7/705/124.6m of 150mmdia	24.6	150	\$ 430	1.0	\$ 10,575	\$ 10,575	y						
Sewer Main Asset No - MI7/705/218.8m of 150mmdia	18.8	150	\$ 430	1.0	\$ 8,081	\$ 8,081	y						
Sewer Main Asset No - MI7/706/1A39.1m of 150mmdia	39.1	150	\$ 430	1.0	\$ 16,808	\$ 16,808	y						
Sewer Main Asset No - MIPS120.2m of 225mmdia	20.2	225	\$ 565	1.0	\$ 11,411	\$ 11,411	y						
Sewer Main Asset No - MIPS27.3m of 150mmdia	7.3	150	\$ 430	1.0	\$ 3,138	\$ 3,138	y						
Sewer Main Asset No - MIPS312.8m of 150mmdia	12.8	150	\$ 430	1.0	\$ 5,502	\$ 5,502	y						
Sewer Main Asset No - MIPS47m of 150mmdia	7	150	\$ 430	1.0	\$ 3,009	\$ 3,009	y						
Sewer Main Asset No - MIPS511.8m of 150mmdia	11.8	150	\$ 430	1.0	\$ 5,072	\$ 5,072	y						
Sewer Main Asset No - MIPS68.1m of 150mmdia	8.1	150	\$ 430	1.0	\$ 3,482	\$ 3,482	y						
Sewer Main Asset No - MIPS74.2m of 150mmdia	4.2	150	\$ 430	1.0	\$ 1,805	\$ 1,805	y						
Sewer RM Asset No - MI1/101/12496m of 100mmdia	496	100	\$ 160	1.0	\$ 79,330	\$ 79,330	y						
Sewer RM Asset No - MI1/101/6140m of 100mmdia	140	100	\$ 160	1.0	\$ 22,391	\$ 22,391	y						
Sewer RM Asset No - MI1/103/2122m of 100mmdia	122	100	\$ 160	1.0	\$ 19,513	\$ 19,513	y						
Sewer RM Asset No - MI3/301/6212m of 100mmdia	212	100	\$ 160	1.0	\$ 33,907	\$ 33,907	y						
Sewer RM Asset No - MI5/501/6336m of 100mmdia	336	100	\$ 160	1.0	\$ 53,739	\$ 53,739	y						
Sewer RM Asset No - MI6/601/4140m of 100mmdia	140	100	\$ 160	1.0	\$ 22,391	\$ 22,391	y						
Sewer RM Asset No - MISTP1252m of 150mmdia	1252	150	\$ 211	1.0	\$ 264,295	\$ 264,295	y						
				1.0	\$ -	\$ -	y						
Manholes - Mirani				1.0	\$ -	\$ -	y						
MI1/101/10			\$ 2,628	1.0	\$ 2,628	\$ 2,628	y						
MI1/101/10A			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI1/101/11			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI1/101/12			\$ 2,628	1.0	\$ 2,628	\$ 2,628	y						
MI1/101/2			\$ 4,358	1.0	\$ 4,358	\$ 4,358	y						
MI1/101/3			\$ 4,358	1.0	\$ 4,358	\$ 4,358	y						
MI1/101/4			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI1/101/5			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI1/101/6			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI1/101/7			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI1/101/8			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI1/101/9			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI1/102/0			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI1/102/1			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI1/102/2			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI1/102/3			\$ 2,628	1.0	\$ 2,628	\$ 2,628	y						
MI1/102/4			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI1/103/1			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI1/103/1A			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI1/103/2			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI1/103/3			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI1/104/1			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI1/104/1A			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI1/104/2			\$ 2,628	1.0	\$ 2,628	\$ 2,628	y						
MI1/104/3			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI1/104/4			\$ 2,628	1.0	\$ 2,628	\$ 2,628	y						
MI1/105/1			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI1/105/2			\$ 2,628	1.0	\$ 2,628	\$ 2,628	y						
MI1/105/3			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI1/106/1			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI1/107/1			\$ 2,628	1.0	\$ 2,628	\$ 2,628	y						
MI1/108/1			\$ 4,358	1.0	\$ 4,358	\$ 4,358	y						
MI1/108/2			\$ 4,358	1.0	\$ 4,358	\$ 4,358	y						
MI1/108/3			\$ 4,358	1.0	\$ 4,358	\$ 4,358	y						
MI1/108/4			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI1/108/5			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI1/108/6			\$ 2,628	1.0	\$ 2,628	\$ 2,628	y						

Active Assets							Asset Allocation						
							Mirani and Marian						
MI1/108/7			\$ 2,628	1.0	\$ 2,628	\$ 2,628	y						
MI1/109/1			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI1/109/2			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI1/109/3			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI1/110/1			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI2/201/1			\$ 4,358	1.0	\$ 4,358	\$ 4,358	y						
MI2/201/2			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI2/201/3			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI2/201/4			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI2/201/5			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI2/201/6			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI2/201/7			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI2/201/8			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI2/201/9			\$ 2,628	1.0	\$ 2,628	\$ 2,628	y						
MI2/202/1			\$ 2,628	1.0	\$ 2,628	\$ 2,628	y						
MI2/202/2			\$ 2,628	1.0	\$ 2,628	\$ 2,628	y						
MI2/203/1			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI2/203/2			\$ 2,628	1.0	\$ 2,628	\$ 2,628	y						
MI2/204/1			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI2/204/2			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI2/205/1			\$ 4,358	1.0	\$ 4,358	\$ 4,358	y						
MI2/205/2			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI2/205/3			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI2/205/4			\$ 2,628	1.0	\$ 2,628	\$ 2,628	y						
MI3/301/1			\$ 4,358	1.0	\$ 4,358	\$ 4,358	y						
MI3/301/2			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI3/301/3			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI3/301/4			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI3/301/5			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI3/301/6			\$ 2,628	1.0	\$ 2,628	\$ 2,628	y						
MI3/302/1			\$ 2,628	1.0	\$ 2,628	\$ 2,628	y						
MI3/303/1			\$ 2,628	1.0	\$ 2,628	\$ 2,628	y						
MI3/304/1			\$ 2,628	1.0	\$ 2,628	\$ 2,628	y						
MI3/305/1			\$ 4,358	1.0	\$ 4,358	\$ 4,358	y						
MI3/305/2			\$ 4,358	1.0	\$ 4,358	\$ 4,358	y						
MI3/305/3			\$ 4,358	1.0	\$ 4,358	\$ 4,358	y						
MI3/305/4			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI3/305/5			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI3/305/6			\$ 2,628	1.0	\$ 2,628	\$ 2,628	y						
MI3/307/1			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI3/307/2			\$ 2,628	1.0	\$ 2,628	\$ 2,628	y						
MI3/308/1			\$ 4,358	1.0	\$ 4,358	\$ 4,358	y						
MI3/308/2			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI3/308/3			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI3/308/4			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI3/308/5			\$ 2,628	1.0	\$ 2,628	\$ 2,628	y						
MI3/309/1			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI3/309/2			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI3/309/3			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI3/309/4			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI3/309/5			\$ 2,628	1.0	\$ 2,628	\$ 2,628	y						
MI3/310/1			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI4/401/10			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI4/401/11			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI4/401/12			\$ 2,628	1.0	\$ 2,628	\$ 2,628	y						
MI4/401/13			\$ 2,628	1.0	\$ 2,628	\$ 2,628	y						
MI4/401/2			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI4/401/2A			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI4/401/3			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI4/401/6			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI4/401/7			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI4/401/8			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI4/401/9			\$ 2,990	1.0	\$ 2,990	\$ 2,990	y						
MI4/402/1			\$ 2,628	1.0	\$ 2,628	\$ 2,628	y						
MI4/403/1			\$ 2,628	1.0	\$ 2,628	\$ 2,628	y						
MI4/404/1			\$ 2,628	1.0	\$ 2,628	\$ 2,628	y						
MI4/405/1			\$ 6,265	1.0	\$ 6,265	\$ 6,265	y						
MI4/405/10			\$ 2,628	1.0	\$ 2,628	\$ 2,628	y						
MI4/405/2			\$ 4,358	1.0	\$ 4,358	\$ 4,358	y						
MI4/405/2A			\$ 4,358	1.0	\$ 4,358	\$ 4,358	y						
MI4/405/3			\$ 4,358	1.0	\$ 4,358	\$ 4,358	y						

Active Assets							Asset Allocation						
							Mirani and Marian						
MI4/405/3A			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI4/405/4			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI4/405/4A			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI4/405/5			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI4/405/6			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI4/405/7			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI4/405/8			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI4/405/9			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI4/406/1			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI4/407/1			\$	2,628	1.0	\$	2,628	\$	2,628	y			
MI4/408/2			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI4/408/3			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI4/408/4			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI4/408/5			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI4/408/6			\$	2,628	1.0	\$	2,628	\$	2,628	y			
MI4/409/1			\$	2,628	1.0	\$	2,628	\$	2,628	y			
MI4/410/1			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI4/410/2			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI4/410/3			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI4/410/4			\$	2,628	1.0	\$	2,628	\$	2,628	y			
MI4/411/1			\$	2,628	1.0	\$	2,628	\$	2,628	y			
MI4/412/1			\$	2,628	1.0	\$	2,628	\$	2,628	y			
MI5/501/0			\$	4,358	1.0	\$	4,358	\$	4,358	y			
MI5/501/1			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI5/501/2			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI5/501/3			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI5/501/4			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI5/501/5			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI5/501/6			\$	2,628	1.0	\$	2,628	\$	2,628	y			
MI5/502/1			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI5/502/2			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI5/503/1			\$	2,628	1.0	\$	2,628	\$	2,628	y			
MI6/601/1			\$	4,358	1.0	\$	4,358	\$	4,358	y			
MI6/601/1A			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI6/601/1B			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI6/601/2			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI6/601/3			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI6/601/4			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI6/602/1			\$	2,628	1.0	\$	2,628	\$	2,628	y			
MI6/603/3			\$	4,358	1.0	\$	4,358	\$	4,358	y			
MI6/603/4			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI6/603/5			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI6/603/5A			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI6/603/6			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI6/604/1			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI6/605/1			\$	2,628	1.0	\$	2,628	\$	2,628	y			
MI7/701/1			\$	4,358	1.0	\$	4,358	\$	4,358	y			
MI7/701/2			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI7/701/4			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI7/701/5			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI7/703/1			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI7/703/2			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI7/703/3			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI7/703/4			\$	2,628	1.0	\$	2,628	\$	2,628	y			
MI7/703/5			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI7/704/1A			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI7/704/2			\$	2,628	1.0	\$	2,628	\$	2,628	y			
MI7/704/3			\$	2,628	1.0	\$	2,628	\$	2,628	y			
MI7/705/1			\$	4,358	1.0	\$	4,358	\$	4,358	y			
MI7/705/2			\$	4,358	1.0	\$	4,358	\$	4,358	y			
MI7/705/3			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI7/706/1			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI7/706/1A			\$	2,990	1.0	\$	2,990	\$	2,990	y			
MI7/707/1			\$	2,628	1.0	\$	2,628	\$	2,628	y			
			\$	-		\$	-	\$	-				
Reuse			\$			\$		\$					
			\$	322	1.0	\$	-	\$	-				
			\$	-	1.0	\$	-	\$	-				
			\$	-	1.0	\$	-	\$	-				
			\$	-	1.0	\$	-	\$	-				
			\$	-		\$	-	\$	-				

Active Assets							Asset Allocation						
							Mirani and Marian						
Pipework Mirian			\$ -		\$ -	\$ -							
150mm Mains			\$ -	1.0	\$ 2,228,624	\$ 2,228,624	y						
225mm Mains			\$ -	1.0	\$ 325,276	\$ 325,276	y						
			\$ -			\$ -							
			\$ -			\$ -							
Manholes - Marian			\$ -		\$ -	\$ -							
Manhole 0.5-1.5			\$ -	1.0	\$ 35,027	\$ 35,027	y						
Manhole 1.5-2.5			\$ -	1.0	\$ 437,427	\$ 437,427	y						
Manhole 2.5-3.5			\$ -	1.0	\$ 361,934	\$ 361,934	y						
Manhole 3.5-4.5			\$ -	1.0	\$ 197,548	\$ 197,548	y						
Manhole >4.5			\$ -	1.0	\$ 73,287	\$ 73,287	y						
			\$ -			\$ -							
			\$ -	1.0	\$ -	\$ -							
					\$ -	\$ -							
						\$ 8,405,311.85							



**Table B2.1 - Summary Trunk SEWERAGE Infrastructure Schedule
(Existing Assets)**



Table B2.1 - Sewer
Existing Assets



**Table B2.2 - Summary Trunk SEWERAGE Infrastructure Schedule
(Proposed NEW Assets)**



Table B2.2 - Sewer
Future Assets

Mackay Regional Council
Infrastructure Charges for MIRANI Sewer Infrastructure

NEW Assets

Active Assets							Asset Allocation						
							Mirani and Marian						
Proj No	Description			Subsidy	Proposed Date	CRC	Adj CRC						
							-						
	Source: email of 13th Juen 2009						\$ -						
							\$ -						
STP Upgarde (09/10)	STP Upgarde (09/10)			40%	2009	\$ 1,000,000	\$ 600,000	Y					
STP Upgarde (10/11)	STP Upgarde (10/11)			40%	2010	\$ 2,000,000	\$ 1,200,000	Y					
							\$ -						
Stp reuse Scheem (10/11)	Stp reuse Scheem (10/11)			50%	2010	\$ 500,000	\$ 250,000	Y					
STP Reuse Scheem (11/12)	STP Reuse Scheem (11/12)			50%	2011	\$ 1,294,000	\$ 647,000	Y					
							\$ -						
							\$ -						
							\$ -						
							\$ -						
							\$ 2,697,000.00						

PLANNING SCHEME POLICY NO. 2 (DEVELOPER CONTRIBUTIONS FOR EXTERNAL ROADWORKS)

This policy outlines the requirements for developer contributions towards external roadworks.

The provision of external roadworks and/or the payment of a monetary contribution for external roadworks will be required as a condition of approval under any development permit for a material change of use and/or lot reconfiguration that will, in Council's opinion, result in an increase in traffic utilising the Shire's road network. This policy applies in cases where:

1. Council is satisfied that a proposed development will *exclusively* require the provision of a new external road(s) to provide access to the subject land and/or the upgrading or improvement of an existing external road(s) providing access to the subject land.
2. Council is satisfied that a proposed development will *jointly* require the provision of a new external road(s) to provide access to the subject land and/or the upgrading or improvement of an existing external road(s) providing access to the subject land.
3. Council is satisfied that a proposed development will increase traffic generally utilising roads within the Shire.

In the case of (1) above, the proponent shall be required to construct or upgrade (whichever is applicable) the relevant external road(s), to a standard acceptable to Council and based upon the required function of the relevant road(s).

In the case of (2) above, the proponent shall be required to pay a monetary contribution toward the cost of constructing or upgrading the road(s) to a standard acceptable to Council and based upon the required function of the relevant road(s). Such contribution shall be determined by Council on the basis of the anticipated cost of the required works and the proportion of the anticipated total traffic volume that will be generated by the approved development itself. At its sole discretion, Council may agree to the provision of roadworks in lieu of a monetary contribution.

In the case of (3) above, the proponent shall be required to pay a monetary contribution toward the cost of providing and maintaining the Shire's general road network. Such contribution shall be paid in addition to any works undertaken and/or monetary contribution paid in relation to (1) or (2), and shall be on the basis of the increase in the equivalent population associated with an approved development, expressed in equivalent tenements (ETs). This contribution shall be based upon the rates specified in Council's adopted Schedule of Fees and Charges at the time of actual payment.

Council shall determine the number of ETs involved in a particular development. The following shall be used as a guide only.

<i>Proposed Land Use</i>	<i>Calculation of ETs</i>
Accommodation Units, Dependant Person's Accommodation, Multiple Dwelling Units, or Retirement Housing.	1 bedroom 0.6ET per unit 2 bedrooms 0.8ET per unit 3 or more bedrooms 1.0ET per unit
Bed and Breakfast Accommodation	1.0 ET plus 0.6ET/guest bedroom
Caravan Park	0.8ET/site (caravan or camp site)

<i>Proposed Land Use</i>	<i>Calculation of ETs</i>
Dwelling House, or Home Occupation	1.0ET/unit
Hardware Shop, Health Care Centre, Office Building, Restaurant, Shop/Shopping Centre, or Veterinary Centre	1.0 ET/50m ² gross floor area (GFA)
Service Station	1.0 ET/350m ² site area plus 1.0 ET/100m ² GFA
Light Industry	1.0 ET/500m ² site area
Repair Workshop	1.0 ET/25m ² gross floor area
Warehouse	1.0 ET/200m ² gross floor area
Any other use	As determined by Council

Any roadworks required under this policy shall be completed to Council's satisfaction, and any monetary contributions payable under this policy shall be paid in full, prior to:

- For a material change of use – any building works or operational works permit being issued (where applicable) or, otherwise, prior to the commencement of the use
- For the reconfiguration of a lot – any survey plan being endorsed by Council.

PLANNING SCHEME POLICY NO. 3 (DEVELOPER CONTRIBUTIONS FOR PARKLAND)

The intent of this policy is to confirm the requirements for the payment of a parkland contribution by developers toward the cost of providing and maintaining parkland areas and facilities within the Shire.

A parkland contribution will be payable as a condition of approval under any development permit for:

- a material change of use for a use included in the Residential Use Class or any other use that will, in Council's opinion, result in an increase in the demand for parkland and associated facilities,
- the reconfiguration of a lot within the Residential or Rural Residential Zones.

Contributions shall be paid on the basis of the increase in the equivalent population associated with an approved development, expressed in equivalent tenements (ETs), and at the rates specified in Council's adopted Schedule of Fees and Charges at the time of actual payment.

The number of ETs shall be determined as follows:

MATERIAL CHANGE OF USE FOR	CALCULATION OF ETs
Accommodation Units, Dependant Person's Accommodation, Multiple Dwelling Units, or Retirement Housing.	1 bedroom 0.6ET per unit 2 bedrooms 0.8ET per unit 3 or more bedrooms 1.0ET per unit
Bed and Breakfast Accommodation	1.0 ET plus 0.6ET/guest bedroom
Caravan Park	0.5ET/site (caravan or camp site)
Dwelling House, or Home Occupation	1.0ET/unit
Any other use	As determined by Council
RECONFIGURATION OF A LOT	1.0 ET/additional lot

The parkland contribution shall be paid in full prior to:

- For a material change of use – any building works or operational works permit being issued (where applicable) or, otherwise, prior to the commencement of the use, or
- For the reconfiguration of a lot – any survey plan being endorsed by Council.

Council may, at its sole discretion, accept the dedication of land within an approved development, and/or the provision of associated parkland works, as part of the contribution for that development. In all such cases, any such land to be dedicated shall be fully useable for its intended purpose as parkland, flood free (unless Council agrees otherwise) and suitably located within the approved development, to Council's satisfaction. Where land is accepted in lieu of part of the monetary contribution, such land shall be dedicated to Council in fee simple and at no cost to Council.

In cases where Council accepts the provision of land and/or parkland works in lieu of part of the contribution, the monetary contribution amount shall be reduced by an amount determined by Council, up to a maximum reduction of 50%.

Planning Scheme Policy No. 4 (Engineering Design and Construction Manual)

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1.0 DESIGN

1.1 INTRODUCTION

1.1.1 Design Guidelines

This section of the manual details Council's standards for the design of works covered by the following Codes:-

- Filling & Excavation Code
- Lot Reconfiguration Code
- Infrastructure Code
- Operational Works Code

The design of operational works in accordance with these standards will achieve compliance with the Codes. In determining an application for an operational works development approval, Council may approve an alternative standard proposed by the applicant provided such alternative standard meets the specific outcomes of these Codes.

1.1.2 Quality Assurance

It is the stated aim of the Council to implement a system of Quality Assurance procedures for the performance of works. Accordingly, with the exception of some inspections, the Council's role in the completion of works will be in an audit capacity only.

Quality Assurance is concerned with systematic management techniques which provide a high level of confidence for all parties that the ultimate aim of the construction of Municipal Infrastructure to an acceptable quality will be achieved.

All Consulting Engineers performing design activities within the Mirani Shire shall be encouraged to implement a Quality System such that the Council is satisfied that the Consulting Engineer is able to plan, establish and maintain a quality system in accordance with the above standard.

1.2 ENVIRONMENTAL CONSIDERATIONS

1.2.1 General

The design shall conform with the limitations and constraints imposed by applicable legislation and planning instruments.

1.2.2 Vegetation Preservation and Environmentally Significant Areas

Council may, in its conditions of development approval, nominate all or part of the subject land as environmentally significant in order to preserve flora, fauna, habitat, geology or other environmental or cultural heritage attributes.

These areas and any associated preservation and/or management requirements shall be taken into account in the design. Appropriate details shall be included on the drawings and/or in the specifications.

In order to maintain existing natural drainage networks, and to ensure there is no adverse effect on stream bank vegetation the limit of residential development shall be in accordance with the following:-

- Not less than 3m clear of tree trunks of adjacent trees.
- Not less than 10m clear of the high bank of the adjacent drainage path.

-
- Clear of the Q₁₀₀ influence from the adjacent drainage path.
 - Clear of the vertical projection of the tree canopy of the adjacent trees.

1.2.3 Contaminated Lands

Where land to be developed may have been subject to contamination, then investigation and/or clearance in accordance with the *Environmental Protection Act 1994* will be required.

The developer is responsible for ensuring contaminated land is not used for inappropriate developments.

1.2.4 Noise

Any development conditions or requirements relating to noise shall be incorporated into the design. These, particularly, relate to new residential developments adjacent to trunk collector, sub arterial, and arterial roads, and railway and cane railway lines.

1.2.5 Air

Any development conditions or requirements relating to air emissions shall be incorporated into the design.

1.2.6 Erosion, Sedimentation and Stormwater Quality Control

Any development shall be designed to provide control of erosion, sedimentation and stormwater quality in accordance with the details provided in Section 1.6.

1.3 SITE AND ROAD LAYOUT (ROADS AND STREETS)

1.3.1 General

The optimum site and road layout resulting from consideration of social, environmental, planning, traffic and development layout constraints may need to be modified to satisfy engineering issues.

Although the engineering design of roads is the province of the Consulting Engineer, it is essential that the Surveyor, Landscape Architect or Town Planner preparing the development proposal plan be fully aware of the engineering issues to ensure that the road layouts proposed are satisfactory in this respect. Major alterations to the development layout may otherwise be necessary to accommodate engineering requirements.

The factors to be taken into consideration when designing new subdivisions are as follows:-

- Proposed land use and amenity.
- Road hierarchy (interim and ultimate) and connectivity.
- Public and non-motorised transport network.
- Access requirements for services, vehicles, cycle and pedestrians.
- Topography of the area.
- Existing constraints and services and proposed augmentation.
- Existing stormwater drainage including external catchments.
- Flooding and ponding.
- Adjoining properties.
- Environmental values, eg significant existing vegetation.
- Impact of earthworks.
- Water quality issues.

- Existing soil conditions.
- Geotechnical considerations.

1.3.2 Transport Network

Council has prepared a road hierarchy which is reflected in Tables 7-4(B) to 7-4(E) of the planning scheme. The hierarchy is detailed below:-

Road Hierarchy – Type and Function

Road Type	Function
Access Place	A minor local cul-de-sac street providing local property access with shared traffic, pedestrian and cycle movements.
Access Street	A minor local street providing local property access with shared traffic, pedestrians and cycle movements.
Collector Street	A street carrying traffic having a trip end within the local area with direct access to properties, access for public transport, controlled pedestrian and local cycle movements.
Sub-Arterial Road	A road providing connections between local areas and arterial roads including connections for through-traffic between arterial roads, access for public transport, through movement of public transport, regional-local bicycle movements (off road) and controlled pedestrian movements.
Arterial Road	A road providing through-traffic movements, longer distance traffic movements, line haul transport movements, primary freight and dangerous good routes and regional (off road) bicycle movements.
Commercial or Industrial Street or a Rural Residential or Rural Road	A road or street which has the primary function of providing access to lots in the respective zone.

Road Hierarchy – Catchment Area and Design Speed

Road Type	Maximum Catchment Area	Maximum Design Speed (km/h)
Access Place	15 dwelling units	40
Access Street	75 dwelling units	40
Collector Street	300 dwelling units	60
Sub-Arterial Road	n/a	Site specific solutions apply
Arterial Road	n/a	Site specific solutions apply
Commercial or Industrial Street, Rural Residential or Rural Road	Site specific solutions apply	

Road Hierarchy – Width and Gradient

Road Type	Reserve Width (m)	Carriageway Width (m)	Shoulder / Parking Lane (m)	Minimum Verge Width (m)	Maximum Longitudinal Grade (%)
Access Street or Place	15	6	n/a	3.5	16
Collector Street	17.5 minimum	7.5	n/a	5	16
Sub-Arterial Road	30	7	2.5 Both sides	5	10
Arterial Road	40	7	2.5 Both sides	10	5
Commercial Road	25	7	3.5 Both sides	5	5
Industrial Road	25	7	3.5 Both sides	5	5
Rural Residential or Rural Road	20	6	1 Both sides	5	10

Road Hierarchy – Pedestrian and Cycle Facilities

Road Type ¹	Pedestrian Footpath	On-Road Lane	Cycle	Off-Road Cycleway
Access Street or Place	Nil	Nil		Nil
Collector Street	Concrete 1.2m wide One side	Shared		Nil
Sub-Arterial Road	Concrete 2.5m wide Both sides	Nil		Shared footpath with
Arterial Road	Concrete 2.5m wide Both sides	Nil		Shared footpath with
Commercial Street	Concrete Full width Both sides	2.5m Linkemarked	Dedicated	Nil
Industrial Street	Concrete 1.2m wide Both sides	Site specific solutions apply		Nil
Rural Residential or Rural Road	Nil	Nil		Nil

¹ Except State Controlled Roads

1.3.3 Road Layout

The road layout within and adjacent to the development site shall satisfy the engineering constraints. These include overland drainage flow paths, vertical and horizontal alignment, allotment access, intersection spacing, etc.

Road and street classifications shall conform to the Council's hierarchy detailed in Section 1.2.1.

Roads and streets shall be designed in accordance with this manual and the general parameters set out in Queensland Streets, Austroads and QDMR Manuals (as amended). In the event of a conflict, this manual prevails.

1.3.4 Geometric Design

Design Standards (all references below are as amended)

- Streets - Queensland Streets Sections 2.10, 8.10, 9.10 and 10.10.
- Roads - Austroads "Rural Road Design".
 - QDMR "Road Design Manual".

Design Speed

The design speed shall be as detailed in Section 1.3.2.

The principles of Queensland Streets (as amended) shall be used to confirm that the layout will achieve the nominated design speed. Where this is not achieved the layout should be modified. If this is not possible, speed restriction devices approved by the Council shall be added to achieve the nominated speed.

Horizontal Alignment

The horizontal alignment of the street system shall not require superelevation. For collectors, which do not have direct access, superelevation may be used if necessary.

Subarterial roads without direct access shall be provided with superelevation as required by the design speed/horizontal alignment. In addition, the superelevation shall be provided where the speed environment indicates that a higher design speed than nominated should be used.

Vertical Alignment

The maximum grade for all road/street types is set out in the road hierarchy. The minimum grade for road/street types with kerb and channel is 0.2%. Where no kerb and channel is required (eg rural residential roads) a level grade may be provided if table drains can be separately graded at a minimum slope of 0.5%.

A vertical curve, of parabolic form, shall be provided at every change of grade, where the algebraic change of grade exceeds 0.5%.

Crossfall

All pavement and shoulders should be provided with a crossfall of 3%. The minimum and maximum crossfalls allowable are 2.5% and 4% respectively.

In turning areas such as intersections, cul de sac ends and roundabouts, the crossfall limits may be increased to 2% and 5%.

Where widening to an existing bitumen surfaced road, the crossfall limits of 3% and 6% apply. If kerb and channel is to be provided, the crossfalls are to be checked prior to laying the kerb and channel.

Where an unsealed surface is used as part of a staged construction the crossfall shall be between 4% and 5%.

The maximum crossfall on grassed medians on divided roads shall be desirable 1 in 6 with an absolute maximum of 1 in 4. Also refer QDMR design manuals (as amended). However, at median openings, the pavement crossfall should not exceed 5%.

1.3.5 Truncations

Truncations of the property boundaries shall be provided at traffic management devices, curves and intersections so that the carriageway and verge widths are maintained at not less than the normal widths at any point and minimum sight distances are achieved unless approved otherwise.

Future road widenings and/or new roads should also be considered when determining required truncations.

1.3.6 Access Restriction Strip

Under IPA, access restriction strips are not permissible as a condition of approval, however can be provided if offered by the developer.

1.3.7 Pavement Tapers

Pavement tapers shall be provided outside the limits of the development and shall be designed in accordance with Austroads (as amended) requirements. Pavements shall be full depth and width for the length of the taper. Signing and linemarking shall be provided to Austroads (as amended) and QDMR requirements (as amended).

1.3.8 Frontage Streets/Roads

Where the development fronts an existing sealed road and the opposite half street/road is constructed to the required standard, the required road/street shall be provided to the centerline including the reconstruction of any pavements.

If the opposite half road/street is not to the required standard or no sealed road/street exists, a preliminary design of the required full width shall be provided to ensure the proposed design is feasible. A road/street shall be constructed to half full width. However a minimum of 6m of bitumen surface is required unless subdivision approval conditions require a greater sealed width.

The road/street shall be constructed for the full frontage of all lots with road reserve access unless otherwise approved.

Temporary sealed widening may be approved subject to conditions such as a roadworks contribution to the future full half construction.

1.3.9 Intersections

All new intersections shall be three way intersections unless approved otherwise.

Four way intersections are encouraged as suitable alternatives to three way intersections where undesirable Staggered-Ts are created and/or insufficient

intersection spacing is available. A roundabout shall be used in the design of these four way intersections, unless otherwise agreed with Council.

Design Standards (all references below are as amended)

The following design standards apply:-

- | | |
|----------------------------------|---|
| ▪ Streets | - Queensland Streets – Section 2.11 |
| ▪ Roads | - Austroads “Guide to Traffic Engineering Practice – Part 5 – Intersections at Grade” |
| | - QDMR “Road Planning and Design Manual” |
| ▪ Roundabouts | - Queensland Streets – Section 2.11 |
| | - Austroads “Guide to Traffic Engineering Practice – Part 6 – Roundabouts” |
| | - QDMR “Road Planning and Design Manual” |
| ▪ Linemarking and Signs Devices” | - QDMR “Manual of Uniform Traffic Control |
| | - QDMR “Guide to Pavement Marking: |

Channelisation

Traffic volume and classification and intersection layout are to be used to determine the requirements for channelisation. Generally collectors and above will require channelisation.

Roundabouts

All roundabouts for streets shall be designed in accordance with Queensland Streets (as amended) and Austroads (as amended). The vehicle type to be accommodated on a roundabout is to be determined by Council however as a minimum a single unit rubbish truck must be able to negotiate the roundabout without mounting any kerb.

Roundabouts on roads shall be designed in accordance with Austroads (as amended) and QDMR design manuals.

Raised splitter islands are required on all approaches unless approved otherwise. Barrier kerb and channel is required on the outside kerb.

Traffic Islands

All islands, raised or painted, and pavement markings and signs associated with channelisation shall be designed to conform to Austroads (as amended) and QDMR Manual of Uniform Traffic Control Devices requirements (as amended).

Raised traffic islands and medians less than 12m² or narrower than 2m between kerb faces shall be infilled with a minimum of 100mm thick N25 reinforced concrete. The concrete shall be plain or coloured as approved.

Larger islands shall be provided with subsoil drainage (refer Section 1.5.11), landscaping and water services if required.

On collectors, sub-arterial and arterial roads, no median breaks will be permitted except at approved intersections.

Threshold Treatments

Threshold treatments are to be provided at all intersections of streets with roads. The treatments shall include splitter islands with pedestrian refuges as required. Pavers are not acceptable.

Intersection Lighting

Requirements for lighting are given in Section 1.3.18.

1.3.10 Speed Control Devices

Design Standards

- Queensland Street Sections 2.13 (as amended).

Maximum height of any device shall be 100mm above finished pavement.

Speed humps are not to be used.

A single unit garbage truck shall be able to negotiate all speed control devices without mounting any kerbs. In addition, a HRV (heavy rigid vehicle) shall be able to negotiate all speed control devices without mounting verges, conflicting with signs, landscaped areas or parking bays.

Where speed control devices including any linemarking restrict access to adjacent properties, driveways shall be designed and provided at the time of construction. This shall also apply at intersections including roundabouts.

1.3.11 Culs De Sac / Turning Areas

Design Standards

- Queensland Streets Sections 2.12 and 9.12 (as amended).

“*Single movement facilities*” in residential streets shall have a minimum radius of 9m. In the case of “*three point turn*” turning areas, the following should also be applied:-

- Maximum leg length – 20m (centerline to end)
- Minimum length of property frontage – 10m
- Driveways to all frontage lots to be designed and provided at time of construction.
- Pick up points for garbage bins, pathways and parking to be considered in design.

In streets with temporary dead ends provision is to be made for turning area for single unit garbage truck.

1.3.12 Parking

Design Standards (all references below are as amended)

- Queensland Streets Section 2.4.
- Austroads “Guide to Traffic Engineering Practice Part 11 – Parking”.

1.3.13 Footpaths/Cyclepaths

Design Standards (all references below are as amended)

- Queensland Streets Section 5.
- Austroads “Guide to Traffic Engineering Practice Part 13 – Pedestrians”.
- Austroads “Guide to Traffic Engineering Practice Part 14 – Bicycles”.
- QDMR “Manual of Uniform Traffic Control Devices”.

Standard Drawings

QDMR KR01 and KR02 – Kerb Ramp.

Location/Layout

Footpaths are to be provided in accordance with the road hierarchy.

Construction Standards

- Preferred construction – Reinforced concrete minimum 100mm thick. Council is to be consulted for specific surface finish requirements in commercial areas.
- The maximum crossfall shall be 1:50 (2%).
- Where not tied to road gradients, the footpath/cyclepath shall have maximum gradients conforming to the design standards, including provision for wheel chair access, where practical.
- Where a footpath/cyclepath intersects kerb and channel, a kerb ramp is to be constructed, and appropriate signage provided defining the intended use of the path.

- For cyclepaths, rails may be required at the exit point depending on the location.
- Where a pathway is provided on a footpath adjacent to allotments, provision is to be made for roof drainage pipes with kerb adaptors.

Detailed Requirements

The requirements for footpaths/cyclepaths to be constructed longitudinally along roads shall be in accordance with the road hierarchy.

Kerb Ramps

Kerb ramps, suitable for wheelchairs, shall be provided at all locations where footpaths/cyclepaths intersect kerb and channel and traffic islands or other locations required by Council.

Pedestrian Refuges

Pedestrian refuges shall be provided at all concentrated crossing points on roads/streets, collector and above.

Pathways Between Allotments and in Parks

Concrete paving shall be to the minimum width provisions of the road hierarchy. The areas adjacent to the concrete shall be turfed and shall have a maximum slope of 1 on 5.

Pathways in parks shall be 1.2m wide for pedestrian use only and 2.5m wide for combined pedestrian/cycle use. The preferred construction is reinforced concrete (min. 100mm thick). The concrete pavement shall be constructed to the adjacent kerb and channel together with a kerb ramp. Vehicular access is to be restricted at the ends of pathways by the provision of bollards.

Appropriate signage shall be provided at the ends of any pathway to define the intended use.

The gradient on pathways shall comply with relevant design standards.

Cross drainage with an immunity of Q_1 shall be provided under the concrete paths between allotments or in parkland.

Lighting as detailed in section 1.3.18 shall be provided at the ends of the pathways where they intersect roads or streets.

1.3.14 Kerb and Channel

Standard Drawings

MCC Standard Drawing No. PA3-865 Kerbs and Channels
QDMR 1033 Kerb and Channel
MCC Standard Drawing No. PA3-773c Invert Type Vehicle for Kerb and Channel

Concrete kerb and channel shall be provided on both sides of all roads and streets, except rural and, in certain cases, residential roads, unless otherwise stated in the development approval as detailed in the following table.

Street Type	Kerb and Channel Type
Access Street and Place	Mountable

Collector Street	Mountable
Sub-Arterial Road	Barrier
Arterial Road	Barrier
Commercial Street	Barrier
Industrial Street	Barrier
Rural Residential	Where required: Mountable Otherwise: Sealed shoulder with table drain
Rural Road	Sealed Shoulder with table drain

Minimum channel grade shall be 0.2%.

Change in alignment shall be made by providing horizontal or vertical curves of as long a length as possible.

Barrier kerb and channel is required along the frontage of parkland.

Where vehicular access is required at kerb and channel (barrier or mountable) an invert crossing is to be provided in accordance with MCC Standard Drawing No. PA3-773c. Access provided as part of the construction works are to be shown on the engineering drawings.

1.3.15 Signs and Road Markings

Design Standards (all references below are as amended)

- QDMR - "Manual of Uniform Traffic Control Devices"
- QDMR - "Guide to Pavement Markings"
- Austroads - "Guide to Traffic Engineering Practice:-
Part 5 – Intersections at Grade
Part 6 – Roundabouts
Part 7 – Traffic Signals
Part 10 – Local Areas Traffic Management
Part 11 – Parking
Part 13 – Pedestrians
Part 14 – Bicycles

The QDMR sign reference number including size shall be detailed for each sign.

All signs and pavement markings shall be adequately dimensioned to ensure accurate setting out.

All posts set into concrete slabs shall be sleeved and bolted.

1.3.16 Property Addressing

Property addresses shall be determined by Council in accordance with AS/NZS 4819:2003. Each new property shall have a number displayed in front of each premise. In the urban locality, the street numbers shall be painted on the kerb face with paint and reflective glass beads. In the rural locality the rural address shall be erected at the property access using reflective yellow numbers on black background on a yellow post.

Street/road name signs shall be erected at the start of all new streets/roads and at major intersections along the street/road. The street/road name signs shall be standard fingerboard type signs with reflective green letters on a yellow background with a Council logo. In the urban locality the sign blades shall be a 150mm high aluminium extrusion and in the rural locality, the blades shall be a 200mm high

aluminium extrusion. For multi-lane roads and large intersections the sign requirements may be upgraded to suit the intersection layout.

Property addressing numbers (urban and rural) and street/road name signs shall be erected by Council at the developer's expense.

1.3.17 Guide Posts and Guard Rails

Standard Drawings

- QDMR 1356 Road Edge Guide Posts: Timber and Tubular Steel Post and Installation Details
- QDMR 1357 Road Edge Guide Posts: Post Spacing Details
- QDMR 1338 Corrugated Steel Beam Guardrail: Installation of Guardrail
- QDMR 1340 Corrugated Steel Beam Guardrail: Installation of Timber and Steel End Posts and Guardrail Ends

Guide posts shall be provided at locations where no kerb and channel is provided in accordance with QDMR 1357.

Guardrail shall be provided in accordance with the requirements of QDMR Engineering Note 56 – Guidelines for the Location of Longitudinal Barriers (November 1982).

1.3.18 Utility Services

Utility services which include electricity, telecommunications and gas (in future) shall be provided in accordance with the development conditions and service provider requirements.

In addition the following apply:-

- Utility services plan to be submitted with engineering drawings.
- Above ground facilities to be located clear of footpath areas and parkland areas, unless approved by Council.
- Should any amendment be made to the design which may impact on services the relevant authorities shall be notified immediately.

1.3.19 Lighting

Design Standards (all references below are as amended)

- AS/NZS 1158.0:2005 Lighting for Roads and Public Spaces - Introduction
- AS/NZS 1158.1.1:2005 Lighting for Roads and Public Spaces – Vehicular Traffic (Category V) Lighting – Performance and Design Requirements
- AS/NZS 1158.1.3:1997 Road Lighting – Vehicular Traffic (Category V) Lighting – Guide to Design, Installation, Operation and Maintenance
- AS/NZS 1158.3.1: 2005 Lighting for Roads and Public Spaces – Pedestrian Area (Category P) Lighting – Performance and Design Requirements
- Austroroads “Guide to Traffic Engineering Practice Part 12 – Roadway Lighting”

Road lighting as detailed in the table below shall be provided on all road/street types except rural residential roads. However, street lighting is required at intersections of rural residential roads unless otherwise approved.

Particular care is required for lighting at traffic islands, raised or painted. These include roundabouts, speed control devices and pedestrian refuges.

In addition, lighting shall be provided on footpaths and bikeways through parkland including at the street entrances.

Road/Street Type	Lighting Category
Arterial	V3
Sub Arterial	V4
Collector	V5
Access Street or Place	P4
Rural or Rural Residential	Not required by Council
Commercial	P4
Industrial	P5
Bikeways	P1 – P4
Footpaths	P1 – P4

1.4 EARTHWORKS

1.4.1 Clearing

Clearing shall generally be kept to a minimum. Trees and vegetation of significance shall be identified prior to design in order that the amount of disturbance may be minimised through appropriate design (refer specification for specific treatment).

Generally, in areas with significant trees and vegetation:-

- Roadways clearing shall be limited to the limits of approved earthworks plus a sufficient lateral clearance to ensure that the works are not interfered with by the trees or vegetation.
- Allotment clearing shall be limited to the minimum areas required to safely construct services such as sewers and catchment drains, and the limits of approved earthworks to allotments plus a sufficient lateral clearance to ensure the works are not interfered by the trees or vegetation.

No trees except as directed shall be damaged or removed from areas to be dedicated under the control of Council without prior written approval of Council.

Dead, dying or dangerous trees and trees likely to be dangerous shall be removed as directed by Council.

Trees on existing roads shall not be damaged or removed without the approval of Council. All trees on existing roads affected by the works shall be shown and details given of proposed protection, relocation methods on removal.

On all developments no incineration of cleared vegetation is permitted. All material is to be chipped and/or mulched and disposed of as approved by Council.

In rural residential developments the recommendations of the Queensland Fire and Rescue Authority (Rural Fire Division) are to be sought and considered.

1.4.2 Excavation

Details of the disposal of surplus or unsuitable materials are to be included in the design submitted to Council for approval. Where disposal is proposed on road reserves or parkland or the volume of material exceeds 2,500m³ (loose) and transport over Council roads is required, Council's requirements should be sought prior to the design being finalised.

Where the surplus material is generated from works within existing declared roads, the Council may nominate that the spoil be placed on Council controlled land within 5km of the project site.

1.4.3 Embankment

Any filling should take into account the requirements of Australian Standard AS 3798-1996 "Guidelines on earthworks for commercial and residential developments" (as amended).

All materials proposed for use in embankments, whether allotment, parkland or road/street, shall be suitable for the works. Where the volume of material to be imported to the site exceeds 2,500m³ (loose) the proposed source, volume and transport route are to be detailed in the operational works application.

Where embankments require maintenance by conventional machinery then the maximum slope shall be 1:5.

1.4.4 Batter Treatments

Cut and fill batters shall not straddle allotment or road reserve boundaries or extend into existing parkland reserves unless approved by Council. Where filling is required to meet flood level criteria the filling may extend onto the adjoining land with the owner's written approval. This filling shall have a 1m wide strip at a slope of between 1:200 and 1:20 outside the property line and a batter with a maximum slope of 1:5.

Where batters require maintenance by conventional machinery then the maximum slope shall be 1:5.

Where the proposed batters exceed the following maximum slope, the stability of the batters shall be proven to the satisfaction of Council.

Cut	1:2
Fill	1:2

All batters steeper than 1:2 and higher than 1.5m shall require certification as to stability by a suitably qualified (as determined by Council) Registered Professional Engineer or NPER-3 Civil Engineer (Geotechnical Specialisation).

1.4.5 Allotment Levels and Access

Standard Drawings

MCC Standard Drawing No. PA3-870 Details of Allotment Gradings and Allotment Drainage

MCC Standard Drawing No. PA4-25 Typical Minor Access Details – Rural Roads

Levels

The final allotment levels shall be above the minimum development levels detailed in the Council's Planning Scheme. These development levels make allowance for:-

- River and stream flooding.
- Local flooding.

The grading of allotments and footpaths shall be in accordance with MCC Standard Drawing No. PA3-870 and in particular the following shall apply:-

- Allotments should preferably drain to the street where this is practical.
- Where significant allotment areas drain to rear or other adjoining allotments, then an inter-allotment drainage system shall be provided.
- The following minimum falls in allotments shall apply:-

-
- Residential 1:200
 - Commercial, Industrial 1:300

Verges and Access

In urban areas the first 2.7m of the verge, measured from the invert of kerb and channel shall be graded at 1:50 towards the street or road. The balance of the verge should also be graded at 1:50 towards the street or road. Where this is not possible due to steep terrain the balance of the verge shall not be steeper than 1:6 (towards or away from the street or road) and the width of the area graded away from the street or road is to be kept to a minimum.

Driveway grades should be limited for safety and amenity. Access to each allotment shall conform to the following:-

Urban Areas

- The first 2.7m of the driveway measured from invert of kerb and channeling shall be graded in accordance with MCC Standard Drawing No. PA4-773C.
- Balance of verge maximum 1:6 (17%)
minimum 1:50 (2%)
- Within allotment:-
 - Residential desirable 1:6 (17%)
absolute 1:4 (25%) for 6m
from front
boundary
 - Industrial desirable 1:10 (10%)
absolute 1:6 (17%)
- Accesses to battleaxe allotments to be concrete (3.0 minimum width) for full length of access leg from kerb and channel.

Rural Areas

- Unless excluded in the development approval, accesses are to be provided to all rural residential lots. The access shall be provided to the boundary and shall be located to provide the required sight distance in accordance with MSC Drawing Mi 1712 Rev C. Accesses with gradients greater than 1:10 shall be paved and sealed or concreted to the boundary and it shall be demonstrated practical access can be provided to a building envelope beyond the boundary.

1.4.6 Topsoiling and Grassing

Topsoil is defined as surface soils high in organic matter and contaminated by residual grass seeds and grass roots.

The area under paved areas, footpaths, batters and areas of fill shall be stripped of topsoil and any other organic matter.

On the completion of the works, topsoil shall be re-spread to allotments, batters and footpaths and fill areas to a depth of 75mm with an absolute minimum of 40mm.

All areas are to be seeded/turfed, watered and fertilised to obtain 80% grass coverage within six (6) months of the works being accepted on maintenance.

1.4.7 Retaining Walls

Retaining walls except where the walls have no surcharge and are less than 1m high shall have a detailed design and structural certification.

Walls, retaining allotment fill, shall be located within the allotment.

Walls, retaining road or parkland fill shall be located within the road or parkland reserve.

Permanent fencing, having a minimum height of 1.2m and of a type approved by Council shall be provided for retaining walls located on future public land. Temporary fencing shall be provided for walls exceeding 1m in height located on private land.

The height of a retaining wall between adjacent allotments shall be limited to 2m unless approved by Council.

1.5 STORMWATER DRAINAGE

1.5.1 General

Design Standard

- Queensland Urban Drainage Manual (QUDM) (as amended).

The design of the proposed drainage system, and earthworks, for the development shall be such that the upstream drainage is not adversely affected and that the downstream drainage system is capable of adequately catering for the discharge of the modified flow produced as a result of the development and a change in the quality of water.

If the downstream system is not capable of carrying the modified discharge, the Consulting Engineer shall indicate the measures proposed to ensure the downstream system is capable of carrying the modified discharge. This will involve

negotiation with adjoining land owners for minor creek systems to produce easements over downstream drainage paths. Written approval from the respective property owners is required for the easement and any engineering works on their property from the development site to the legal point of discharge.

The design of the drainage system for the proposed development shall accommodate both existing and future developed flows from upstream catchments on the basis of development in accordance with the Planning Scheme.

The Consulting Engineer shall be responsible for assessing the existing and future flow regimes entering the development site from upstream catchments and the future flow regimes from the development site to the lawful point of discharge.

Unless approved otherwise by Council, piped drainage systems shall extend to the lawful point of discharge with inlet works within the subject property.

1.5.2 Design Criteria

Design Storms and General Requirements

Drainage systems shall be designed for the ARI 100 years flow to be contained within a reserve or easement and with a positive outlet for flows above ARI 100 years.

Drainage systems may be a combination of open and underground drainage.

Underground drainage shall be provided to meet the following design storms:-

- | | |
|-----------------------------------|--------------|
| - Commercial Zone | ARI 10 years |
| - Industrial Zone | ARI 2 years |
| - Residential Zone (<15 units/ha) | ARI 2 years |
| - Residential Zone (otherwise) | ARI 10 years |
| - Community Purposes Zone | ARI 10 years |

For Major Trunk Drains carrying flows of more than $10\text{m}^3/\text{s}$ in a drainage reserve but not located in a traffic area in a road reserve, the underground drainage component may be reduced to ARI 2 years. Lower return periods may be accepted for underground drainage for individual developments where flows are of such magnitude that a reduced design standard is considered appropriate by Council.

Overland Flow Paths

Overland flow paths shall be provided at all sag points.

Where associated underground drainage has a design flow less than ARI 100 years, then the balance surface flow up to ARI 100 years is to be accommodated within a drainage reserve which shall include a concrete invert of minimum width of 1.2m commencing from the back of kerb. The balance of the reserve shall be turfed with a maximum slope of 1:5. The concrete section across the footpath shall be graded away from the kerb at 1:50.

Where underground drainage has a design flow of ARI 100 years, then the underground system may be accommodated within an easement (minimum width of $2.5\text{m} + \text{external diameter/width of the underground culverts}$) and preferably include a positive outlet by surface drainage along the route of the easement. The inlet capacity of the sag pits is designed to capture the Q_{100} flow is to provide for blockage in accordance with QUDM.

Allotments adjacent to overland flow paths are to have Q_{100} floor levels shown on the relevant design drawings.

Runoff Coefficients/Inlet Times

Runoff coefficients determined from QUDM Tables 5.04.1, .2 and .3 (as amended) and standard inlet times detailed in QUDM Table 5.05.1 (as amended) shall be used.

Intensity – Frequency – Duration Data

IFD curves used for design purposes are to be provided to Council if requested.

1.5.3 Drainage Reserves and Easements

Urban Developments

All overland flow paths and open drains not located within road reserves or parkland shall be accommodated within a drainage reserve.

Unless approved by Council, narrow reserves between allotments for the provision of an overland flow path will not be accepted. Overland flow paths between allotments may be provided within local linkages or linear parks of minimum width 15m. The linkages are to be designed as an integral part of the development providing access to parks, schools, shops, etc.

Underground drainage systems of design capacity of ARI 100 years or above not located within road reserves or parkland shall be accommodated within easements. Systems less than ARI 100 years capacity shall be located within reserves unless an alternative overland flow path is provided.

Easements shall be provided over the downstream drainage path, whether underground or open, to the lawful point of discharge.

The minimum width of easements and reserves shall be the greater of:-

- (a) 2.5m plus the outer width of the underground culvert.
- (b) Open drain with maximum batter slopes of 1:5 plus 0.5m outside each batter point.
- (c) Where Council approved batter slopes greater than 1:5, 1m outside one (1) batter point and 4m outside the other batter point to provide for the operation of maintenance vehicles. Where the drain is of a width or geometry that it cannot be suitably accessed or maintained from one (1) side, provision is to be made for access on each side.
- (d) For reserves a minimum of 5m (excluding reserves between allotments).

Rural Residential Development

Easement requirements for rural residential developments will be assessed by Council for each individual application however, in general, an easement is not required over a watercourse (as defined in the Water Act 2000 as amended) where the watercourse can contain the Q_{100} flow.

Where the Q_{100} flow cannot be contained within the watercourse an easement is to be provided over the Q_{100} flow limits.

In all other situations an easement is to be provided.

Notwithstanding the above, an easement is to be provided adjacent to culvert inlets where the calculated Q_{100} headwater extends beyond the limits of the road reserve.

The requirement for downstream easements to the lawful point of discharge will be assessed by Council.

1.5.4 Drainage Components

The hydraulic capacity of all drainage components shall be in accordance with the manufacturers specifications or as otherwise approved.

The following components are approved for use and the following requirements apply:-

Gully Pits

- Bro Pit.
- MCC gully pit (MCC Standard Drawing No. PA3-864) (Assumed to have the same hydraulic capacity as a Bro Pit with no troughs).
- Drainway.
- No grated pits allowed.
- Gully pit in mountable kerb and channel to be provided with 1m long concrete transitions.
- Pits with troughs on curves to be saw cut on the appropriate angle (no mortar infill permitted).
- Preferred location adjacent property boundaries. Alternatively in centre of lots.
- Where gully pit locations will restrict property access, an invert crossing is to be provided to define the access location.

Field Gully Pits

- MCC Standard Field Inlet Pit (MCC Standard Drawing No. PA4-42).
- CPO with approved tops.
- FRC pit systems.

Manholes

- MCC Standard Manholes (MCC Standard Drawing No. PA3-866).
- CPO with approved lids.
- Maximum spacing of manholes/gully pits is to be 100m.

Pipes

- Reinforced concrete (RCP) - Rubber ring joints in sandy soil.
- Fibre reinforced cement (FRC) - Flush joint pipes with cover greater than 2m to be fitted with sand bands.
- Pipe class to suit loadings (based on H2 bedding/backfill unless otherwise approved).
- Minimum diameter in roadway – 375mm

Box Culverts

- RCBC.
- SLBC.
- Lincrete.
- RCC.

Roof Drainage and Inter-allotment Drainage

- RCP.
- UPVC - DWV.
- FRC.
- Inter allotment drainage, minimum diameter – 225mm.

Footpath Crossings Roof Drainage

- UPVC - DWV.
- Galvansied CHS/RHS.

Kerb Outlets

- Kerb adaptors – Powdercoated steel or aluminium.

Headwalls

Pipes 300-600	Precast sloping face	
	675-900	Precast wingwall type
	1050-24	QDMR Standard Drawing 1304 Type 3 Apron QDMR Standard Drawing 1305
Boxes RCBC/SLBC	150-600	QDMR Standard Drawing 1174
	750-	QDMR Standard Drawing 1303
		QDMR Standard Drawing 1316
		QDMR Standard Drawing 1318
		Type 3 Aprons

1.5.5 Drainage Calculations

Detailed drainage calculations (minor and major flows) including a catchment plan (one of the design drawings) shall be submitted with final design for approval. Catchment plans shall show existing contours and final contours and shall be drawn on an overall development plan.

Agreement on legal point of discharge and tailwater conditions should be confirmed prior to proceeding with detailed design. These should be clearly shown on the design calculations and drawings are to account for future extension of the drainage system where applicable.

1.5.6 Roof/Allotment Drainage

The stormwater drainage system is to allow for underground drainage connections from all forms of development within the Urban Locality (as provided in the Council's Planning Scheme).

These connections are to be provided with an appropriately sized and located stub pipe extending 1m into the property and blanked off.

The street inlet design capacity shall not account for the direct drainage connections.

Allotments including those adjoining drainage or park reserves are required to drain to the road frontage unless otherwise approved by Council.

Where allotments do not drain to the road frontage, inter-allotment drainage shall be provided in accordance with MCC Standard Drawing No. PA3-870. The outlet discharge point shall be as approved by Council.

Where concrete footpaths/cyclepaths are required adjacent to lots, roof drainage outlets shall be provided one on each side of the lot between 1.3m and 1.5m from the side boundary. The outlet shall include kerb adaptor and pipe extending 0.5m into the property.

1.5.7 Utility Services

All services including existing services are to be located, both horizontally and vertically. The clearances between any service and underground stormwater drainage is to be detailed on the design plans. A minimum of clearance of 150mm is to be provided unless otherwise approved.

Service penetrations through underground stormwater drainage may be permitted if no reasonable alternative is available (maximum diameter of service allowed – 150mm). Full details including diameters, levels, hydraulic losses allowed, etc are to be provided for Council consideration and approval. Council may require the installation of a manhole if considered necessary.

1.5.8 Open Channels

Open channels shall conform to the requirements of Council. All channels shall have a maximum batter slop of 1:5.

1.5.9 Detention Basins

Detention basins may be considered as drainage solutions in the assessment of an operational works application, but are not to be used other than in accordance with any operational works development permit.

Detention basins shall be designed in accordance with QUDM Section 6 (as amended) and the following provisions:-

Design Standards

- The peak discharge resulting from a storm having an average recurrence interval of 100 years (Q_{100}) on the fully developed catchment shall be attenuated such that the peak discharge from the detention basin is equal to or less than the peak discharge produced from the undeveloped catchment by a storm of similar average recurrence interval.
- The design of the detention basin shall be checked for its performance during floods resulting from the probable maximum precipitation to ensure that sudden catastrophic failure will not occur, and that escape routes for excess discharge are provided at locations where public safety will not be endangered.
- The maximum depth of water in the detention basin shall be 1m above the basin floor for the Q_{100} event, and the maximum depth of ponding at any time prior to operation of the spillway shall be 1.2m.
- The detention basin shall have a graded floor and contain anti-ponding culverts, to ensure the basin is self-draining.
- The detention basins must be demonstrably capable of being incorporated in, and in conformity with, the Council's overall drainage strategy for the area.

Public Safety

The proposed use of detention basins requires that the public safety question be dealt with in a measured way. This implies that the need to consider the

incorporation of a number of safety measures, which depending on the particular circumstances of locality, topography, amenity and public safety may include:-

- Warning notices.
- Fencing off of the basins.
- Depth gauges.
- Maximum depths of ponding (1.2m prior to operation of the spillway; 1m for Q_{50}) and the maximum batter slopes (1 on 6).
- Child-proofing of the outlet structures, gully pits or manholes.
- Adequate allowance in the design for the probable maximum discharge and the safe conveyance of this flow through downstream properties.

Drainage Areas

It is intended that the area used for detention basins be under the control and maintenance of the Council. In respect of development applications, the area required for detention basins shall be set aside as drainage areas.

If the developer intends that the drainage area also be used as part of the public open space, this shall be stated at the time application is made for Council's approval.

1.5.10 Culvert Headwalls

The headwalls shall meet the following requirements:-

- QDMR standard drawings (as amended).
- Concrete aprons, cutoff walls, and scour protection where required, shall be provided at all headwalls.
- Headwall height not below line of batter, which shall not be modified in the vicinity of the headwall.
- Approved safety rail to be provided for walls over 1m in height – urban areas.
- Approved man proof grate to be provided over the culvert outlet – urban areas.

1.5.11 Pavement Drainage

Subsoil drainage shall be provided in all locations where kerb and channel is required and in other locations such as road cuttings where subsurface water may cause problems for the adjacent pavement. The subsoil drainage shall be installed in accordance with MCC Standard Drawing No. PA3-867.

Underground stormwater drainage shall be provided to all landscaped islands and medians. Subsoil drainage shall be installed in all landscaped island and medians to prevent subsurface water infiltrating into the adjacent pavement. The subsoil drainage shall be connected to the underground stormwater drainage.

1.6 EROSION, SEDIMENTATION AND WATER QUALITY

1.6.1 General

The development shall make provision for control of erosion, sedimentation and stormwater quality control. Design shall generally be based on the following relevant documents (all references below are as amended):-

- *Environmental Protection Act 1994.*
- Environmental Protection (Water) Policy 1997 (EPP).
- Stormwater Quality Control Guidelines for Local Government (DOE and DNR).
- Soil Erosion and Sediment Control (Institution of Engineers, Australia).
- Mirani Shire Council Planning Scheme Provisions.

1.6.2 Soil and Water Quality Management

The Council seeks to encourage development practices which minimise soil loss and water quality impacts from construction sites, thereby reducing the siltation of stormwater drainage systems and the pollution of waterways.

The Council requires the developer to:-

- Minimise the potential for soil erosion from developments during and after construction; and
- Control the transport of sediment generated from developments.
- Prevent contamination of waterways by on-site activities.

The Consulting Engineer is required to provide a Soil and Water Management Plan (SWMP) based on the relevant documents listed above.

Additionally Council requires the works associated with the development to include long term measures for the minimisation of soil loss and the reduction of pollutants into the downstream receiving waters.

Specifically, the following requirements apply:

- A detailed SWMP shall be provided at the time of lodgement of engineering plans.
- The SWMP shall be site specific showing all control measures proposed for the project. For the construction, maintenance and permanent phases, ongoing modification of the plan may be required to achieve the best result. This may be undertaken with the approval of Council.
- The SWMP shall be a site specific plan showing all erosion prevention and sediment control measures proposed for the project.
- The Consulting Engineer shall ensure that the Contract for construction of the works requires the Contractor to apply all approved SWMP measures necessary. The Contract shall also require validation of the effectiveness of these measures is undertaken for each rainfall event. Action to repair or modify control measures shall be undertaken in the event of failure.

Revegetation

The minimum surfaced vegetative cover standard required by Council is as follows:-

Surface protection of 80% across that area of the site which is to remain free of constructions and/or infrastructure to be achieved within six (6) months of the works being accepted on maintenance, or as otherwise provided on the SWMP.

1.6.3 Soil and Water Management Plan (SWMP)

General

Based upon an evaluation of the existing site, the current water quality and the proposed development, the Consulting Engineer is required to prepare a SWMP, detailing how erosion prevention and sediment control will be achieved.

Every site differs in topography, soil type, vegetative cover, surrounding land use and intended development. Measures to manage soil and water quality must therefore be tailored to suit each individual site. The areas required to be addressed are as follows:-

- Surface protection of exposed areas.
- Control of run-off.
- Trapping and removal of eroded soil materials.
- Maintenance of control structures.
- Limited access areas (eg. areas of significant vegetation, acid sulphate soils etc).
- Segregation of clean and dirty water.
- Provision of permanent water quality structures.

The application of these measures are to be included in the SWMP.

The SWMP to be lodged with the engineering design submission shall contain at a minimum the requirements detailed in Section 1.12.

At all times throughout the construction of the works, it will be the Contractor's responsibility to ensure that water quality is maintained and the sediment transport is minimised with no impact upon discharge receival waters.

At all times during the construction of the works, discharge of sedimentation and pollutants into receival waters will not be considered acceptable.

1.7 PAVEMENT

1.7.1 General

Unless otherwise approved by Council, all pavements shall be flexible and pavement designs shall be undertaken as follows (all references below are as amended):-

Collector Streets and below	ARRB Transport Research "Sealed Local Roads Manual"
Sub Arterials and above	QDMR Pavement Design Manual
Industrial/Commercial	Refer Section 1.7.6

1.7.2 Subgrade Evaluation

Site Investigation

A site investigation involving at least the following shall be carried out:-

- Test holes to 1m minimum below proposed gradeline
 - Soil Classification
 - DCPs
- Test holes at 100m spacing with minimum of two (2).

Laboratory Testing

Soaked CBRs of representative samples of subgrade and material proposed for road embankment.

Low CBR Subgrade

Where the subgrade CBR (soaked) is less than 3, the top 150 (minimum) is to be insitu stabilised with lime or cement or the unsuitable subgrade is to be removed. The proposed method is to be approved by Council.

1.7.3 Pavement Materials

Where the pavement design is based on material supplied from commercial quarries, the Council may request recent CBR test results to support the proposed pavement design.

Where the pavement materials from new quarries or pits are proposed, test results such as CBR, atterberg limits shall be provided with the pavement design for Council's approval.

1.7.4 Design Life

A minimum design life of 20 years shall apply to all Council roads.

1.7.5 Design Traffic Loading

New Streets/Roads

For collector streets and below, including rural residential roads but excluding industrial and commercial streets, the design traffic loading shall be calculated using the method detailed in Sealed Local Roads Manual - Section 9.2 (as amended).

The following traffic statistics are to be used unless otherwise approved:-

▪ Construction traffic	20 ESA/allotment
▪ Garbage truck loading	2.6 ESA
▪ Traffic generation rate (low density residential)	10 vpd/allotment
▪ Commercial vehicle (CV) %	
- Local	4%
- Collector	7%
- Trunk Collector	5%
- Park/Rural Residential	5%
▪ Traffic loading/CV	
- Local	0.3 ESA
- Collector	0.5 ESA
- Park/Rural Residential	0.5 ESA
▪ Traffic growth rate	
- Local	0%
- Collector	1.5%
- Trunk Collector	2.5%
- Park/Rural Residential	1%
▪ Bus traffic	No separate calculation required

For medium and high density residential development the traffic generation rate shall be determined and submitted to Council for approval.

For Sub Arterials and Arterials the design traffic loading shall be determined and approved by Council (or, in the case of a state-controlled road, by QDMR) for individual situations.

The calculated values for design traffic loading shall not be less than the values given in the table in section 1.7.6.

The allowable design traffic loadings given in the table in section 1.7.6 may be used to determine pavement thickness if no traffic calculations are undertaken.

For industrial and commercial developments the design traffic loading shall be calculated by determining traffic generation from the proposed land uses within the

development. Full details of these calculations are to be provided with the pavement design. These details are to include sources of traffic generation rates, allotment coverage and vehicle classification distributions. As an alternative the traffic generations given in Queensland Streets (as amended) may be used.

Existing Streets/Roads

In addition to the determination of traffic generation for the new development it shall be necessary to determine the existing traffic volumes and classifications. Council may be able to provide such data, if no Council data is available then a minimum of a 12 hour traffic count on one (1) day shall be undertaken. This day shall be a normal weekday without any abnormal traffic patterns.

1.7.6 Pavement Thickness

For Collector Streets and below including industrial and commercial streets the pavement thickness shall be determined using the Sealed Local Road Manual design chart Fig. 10.3 (as amended). Where the design traffic loading exceeds 5×10^5 the QDMR Pavement Design Manual Chart 1 (as amended) shall be used.

For Sub Arterials and Arterials the QDMR Pavement Design Manual Chart 1 (as amended) shall be used to determine the pavement thickness.

Where an existing pavement layer is to be overlaid the pavement design method is to be approved by Council.

Unless otherwise approved by Council the minimum granular pavement thickness for each road/street shall be as shown in the table below.

Design Traffic Loading/Pavement Thickness

Road/Street Type	Traffic Max. Volume/Lot Catchment	Min. Design Traffic Loading	Allowable Design Traffic Loading	Min. Pavement Thickness	Asphalt* Min. Thickness	Surfacing Bituminous Spray Seal
ARTERIAL	N/A	N/A	N/A	N/A	50	A
SUB ARTERIALS	12,000 vpd	3×10^6	-	300	50	NP
COLLECTOR	300 lots	2×10^5	5×10^5	250	25 [†]	NP
ACCESS STREET	50 lots	1×10^4	2.5×10^4	200	25	NP
ACCESS PLACE	30 lots	1×10^4	1.5×10^4	200	25	NP
RURAL RESIDENTIAL ROAD	-	2×10^4	-	200	NP	A
COMMERCIAL STREET	-	-	-	250	50	NP
INDUSTRIAL STREET	-	-	-	300	50	NP

* All asphalt to be underlaid with a 7 mm primerseal.

† At intersections and roundabouts minimum thickness to be increased to 50 mm.

NP Not permitted.

A Allowable standard treatment – 2 coat 16/7 (rural residential 2 coat 16/10).

1.8 WATER RETICULATION

1.8.1 Design Criteria and References

Design Standards

All water supply mains and facilities shall be designed to satisfy the following requirements in order:-

- This Development Manual.
- DNR&W "Planning Guidelines for Water Supply and Sewerage – March 2005" (as amended).

Population assessments and water demands shall be determined in accordance with Council's requirements. Unless otherwise required by Council, the following minimum design parameters shall be used.

Population Per Residential Lot (Excludes Multi Residential)

For average residential lots adopt 3.2 persons per lot.

Demand

Average daily domestic demand per person:-

Urban Locality	500 l/c/d
Rural Locality	200 l/c/d

Flow Factors

Mean Day Maximum Month - Factor 1.5 Average Day
Maximum Day Maximum Month - Factor 2.25 Average Day

The design of mains and facilities shall take into consideration the capacity of existing and future systems, existing and future external demands and shall be compatible with overall system planning.

In relation to all design matters, where details are not available in this Manual or other documentation, then Council is to be contacted for advice on requirements.

Specific Design Requirements

Attention is drawn to the following matters to be provided for in the design of the water supply system.

Staged Development

Each stage shall be provided with full reticulation facilities. Any temporary servicing arrangements are to be approved by Council by way of an operational works development permit.

Allowance for Larger Mains

Provision shall be made for larger trunk mains to meet overall system requirements. Council may meet the cost increase above a 150 diameter main or larger main where such larger main would not have been required to service the particular development. Council may also examine larger main requirements in accordance with any relevant infrastructure policy.

Ring Mains

Provision should be made for ring mains where practicable to improve flow conditions, particularly under fire fighting conditions.

Road Frontages

Mains shall be provided to the full road frontage of new allotments where mains are required as part of the reticulation system.

Alteration to Mains System

Where alterations are required to an existing mains system as a result of works associated with the development, such alterations shall be carried out at the expense of the developer.

Mains on Private Property

Where Council owned mains are required to be located on private property, they shall be located in a minimum 3m wide easement to Council requirements.

Special Designs

General

Special designs may be required to provide a satisfactory water supply system to service a development. This would include the following:-

- Water supply system to service elevated areas above the normal service area.
- Water supply system connecting to high pressure mains.
- Water supply system based on a low flow/off peak flow in combination with a resident's storage tank to service larger lots in more remote areas eg. rural residential lots.
- Independent bore water supply to service individual allotments or group of allotments eg. rural residential lots.

Bore Supplies

Bore supplies shall generally satisfy the following requirements:-

- Bore capacity is to be assessed on a minimum six (6) hour pump test and based on drawdown and recovery readings.
- Bore capacity shall be assessed on 0.3 litres/second per dwelling unit.
- Bores servicing individual lots shall be located on the lot being serviced unless otherwise approved by Council under a development approval.
- Bores shall be fully constructed as part of development works but do not need to be equipped.
- Water Quality is to be in accordance with Section 3 of the DNR (QWRC) Guidelines for Planning and Design of Urban Water Supply Schemes (as amended).

1.8.2 Connection to Existing Mains

Connection to existing mains shall only be at locations approved by Council and shall be at the developer's expense. Connections shall be carried out by Council unless otherwise approved by Council.

1.8.3 Mains Sizes

The following nominal pipe diameters shall apply:-

100, 150, 250, 300, 375, 450.

Minimum acceptable diameters shall be 100mm in residential areas and 150mm in commercial and industrial areas subject to adequately providing for design flows and pressures including fire fighting requirements.

1.8.4 Pipe Materials

Pipe materials shall comply as follows (all references below are as amended):-

- | | | |
|--------------|---|---|
| UPVC | - | This shall be Series 2 (CIOD compatible) in accordance with AS 1477-1996. |
| | - | Minimum pressure class shall be Class 16. |
| Ductile Iron | - | This shall comply with AS 2280 and be Class K9 or K12 bitumen coated with cement lining and shall have polyethylene sleeving to AS 3680 and 3681. |
| Hobas | - | This shall comply with AS 3571 with minimum Class 16 and stiffness SM 10,000. |
| MDPE | - | This shall be Series 1 PN16 in accordance with AS/NZS 4130:1997. |
| | | This is generally not acceptable for use as mains as it is not CIOD compatible. |
| Other Pipe | - | Where approved this shall comply with Council requirements. |

1.8.5 Hydrants, Valves and Fittings

(a) Pipe Fittings (all references below are as amended)

- | | | |
|--------------|---|---|
| Ductile Iron | - | These shall comply with AS 2280. |
| Cast Iron | - | These shall comply with AS 2544. |
| Coatings | - | All valves and hydrants shall be coated internally and externally with a fusion bonded epoxy or Rilsan nylon. Where necessary valves are to be machined to ensure effective valve seatings. |

Other fittings (bends, tees, hydrant risers, etc) are to be bitumen coated with cement lining and shall have polyethylene sleeving to AS 3680 and 3681. Fusion bonded epoxy or Rilsan nylon coatings are acceptable alternatives.

(b) Sluice Valves

Sluice valves shall be generally to AS 2638-1991 "Sluice Valves for Water Works Purposes" (as amended). Valves shall be resilient seated and be of the inside screw, non rising stem design. The valves shall be anti-clockwise close unless otherwise specified and operated by a removable key as required. Valves shall have a minimum working pressure of 1.4 Mpa ie. class 14.

(c) Hydrants

Hydrants shall be of the spring type conforming to MCC Standard Drawing No. WA3-837 and shall be fitted with dust caps.

Hydrant risers are to be provided where required to ensure the dust cap to the hydrant is a maximum of 350mm below ground level.

(d) Flanges

Flanges shall be drilled to Table C of AS 2129 "Flanges for Pipes, Valves and Fittings" (as amended) unless pressure requirements require alternative drilling. All flange bolts are to be 316 grade Stainless Steel.

1.8.6 Main Alignment

The main alignment is to comply as follows:-

Generally locate water mains 2.5m from the property boundary on the opposite side of the street to Telstra and Ergon Energy cables (this alignment may require alteration where concrete footpaths/cycleways are provided).

Locate hydrants opposite side property boundaries at maximum 80m intervals. Provide hydrants at ends of mains. Additional hydrants may be required to service deeper allotments eg. battle-axe lots.

Locate sluice valves in footpaths at all intersections of mains (each leg). In addition, sufficient valves are to be provided to limit the maximum number of properties isolated to the following:-

- 100mm and 150mm diameter mains - 40 properties
- 200mm and larger diameter mains - 50 properties

Provide 63mm OD polyethylene pipe loops, in cul de sac bulbs to eliminate "dead end" mains. Refer to MCC Standard Drawing No. WA3-833.

1.8.7 Pipe Cover

Pipe cover is to make allowance for pavement depths but shall provide for minimum cover as follows:-

- Mains in footpaths – minimum 0.6m
- Mains across streets:-
 - Minimum 1.0m at crown
 - Minimum 0.8m at shoulder

-
- Services in footpath – minimum 0.3m
 - Services across streets – minimum 0.6m

1.8.8 Service Connections

General

For new subdivisions the developer is to provide a service pipe a minimum of 300mm into each allotment but exclude the provision of an isolating valve and meter within the allotment.

The building developer of an individual allotment is to subsequently provide an isolating valve, meter etc as required for the building project.

The size of the service extended into each allotment shall be determined taking into consideration the normal flow requirements plus provision for any likely flow requirements to service fire hose reels and internal fire hydrants.

Water service connections to individual allotments shall generally be provided in pairs at the common boundary. Services should generally be located staggered from electricity/telephone services which are also generally provided in pairs at alternate common boundaries.

Where services less than 100mm cross existing or new streets they shall be provided with an enveloper pipe. Diagonal road crossings shall be provided where property boundaries are staggered as shown on Standard Drawing No. WA3-840.

The location of the service crossings are to be marked into the kerb and channel as shown on the Standard Drawing.

Services to Residential Dwellings

Services to residential dwellings and buildings of similar water demand shall be MDPE Class 16 polyethylene pipe coloured blue and terminating with capped end 300mm within the allotment generally in accordance with MCC Standard Plan No. WA3-840.

The minimum diameter of enveloper pipes at cross street services shall be 50mm internal diameter.

Services to Commercial, Industrial, Community Title Developments etc Sites

Services to commercial, industrial etc sites shall be sized to provide for all likely flows including flows to service fire hose reels and internal fire hydrants.

The minimum service diameter to service a single fire hose reel is nominal 32mm ID (40 mm OD). However each development should be individually assessed.

The minimum service diameter to service an internal hydrant is to be 100mm.

Services to Reserves for Public Open Space, Landscaping etc

Where reserves for public space are provided as part of a subdivision development, then a service is to be extended to such reserves terminating in a hose cock to Council requirements.

Landscaped areas provided as part of a subdivision are to be provided with irrigation systems including a backflow prevention device. Irrigation is not required for single tree plantings in footpaths and traffic islands.

Where communal open space (common areas in BCCM development) and landscaping areas are provided, then appropriate provision should be made for internal services for irrigation systems including a backflow prevention device.

1.8.9 Separation from Other Services

The minimum separation between the water main and other services that cross the mains path is 150mm. No other services shall share a trench with the water main unless prior approval has been obtained from all authorities, including Council. Water mains are to be located above any adjacent sewer line.

1.8.10 Markers for Sluice Valves and Hydrants

Attention is drawn to MCC Standard Drawing No. WA3-837.

1.8.11 Dead Ends and Thrust Blocks

Attention is drawn to MCC Standard Drawing No. WA3-836.

Dead ends to water mains should be avoided. However, should dead ends be unavoidable, the following facilities shall be constructed to facilitate scouring of the lines:-

- For mains 100mm diameter or greater, the dead end shall be fitted with a hydrant.

1.8.12 Road Crossings

General

Typically open excavated crossings will apply in new roads. Thrust bored crossings are required in existing roads unless specific approval is given to open excavated crossings.

Thrust-Bored Crossings

Entry and exit pits for boring equipment shall be located clear of existing underground services and to the approval of Council. Enveloper pipes shall be installed in all bored crossings and shall comprise 8mm wall thickness mild steel pipe or approved equivalent. Typically the internal diameter of the enveloper pipe shall be a minimum of 150mm larger than the external diameter of the sewer or pressure main. The enveloper pipe shall extend for a minimum of 1m behind kerb and channel or 3m beyond bitumen edge where there is no kerb and channel.

Open-Excavated Crossings

Details are subject to the specific conditions of approval of Council. However, the following will generally apply.

For existing bitumen streets, the pipe shall be sand bedded and surrounded to 150 above top of barrel of pipe. Lean mix concrete (7 Mpa) shall then be provided to within 250mm of the surface. Base course gravels shall then be provided to within 50mm of the surface. Hot mix of 50mm shall then be provided to the surface. The lean mix concrete and base course gravel shall be provided a minimum of 1m beyond the line of the bitumen or rear of kerb unless a greater width is required.

For new streets, lean mix concrete may be deleted and sand filling and the specified street pavement adopted.

Council may vary requirements for individual situations.

Department of Main Roads Roads/Streets

For these roads/streets, the requirements of the Department of Main Roads shall apply for either open-excavated or thrust-bored crossings.

1.8.13 Crossings of QR or Mackay Sugar Railways

Crossings are to comply with requirements of Queensland Rail or Mackay Sugar as applicable.

1.8.14 Rising Mains

Rising mains shall be designed to satisfy DNR&W "Planning Guidelines for Water Supply and Sewerage – March 2005" (as amended) and specific conditions of approval of Council.

1.8.15 Storage Reservoirs

Storage reservoirs shall be designed to satisfy DNR&W "Planning Guidelines for Water Supply and Sewerage – March 2005" (as amended).and specific conditions of approval of Council.

1.8.16 Pump Stations

Construction Generally

Pump stations will generally comprise duplicate centrifugal pumps with control equipment located in a pump building.

A pump station shall generally include provision for the following:-

- Floor of building to be above 1 in 100 year flood level.
- Underground electricity supply to switchboard in building.
- Water service.
- Bitumen standard road access in reserve or easement (unless gravel approved).
- Pump station site freehold.
- Provision for connection of emergency power (if applicable).

An accurate site layout plan is to be provided showing the location of all facilities in relation to boundaries and including final earthworks levels. The pump station shall provide sufficient area to allow access by maintenance vehicles with a minimum 3m clearance from the wall to side boundaries. The pump station site is to be transferred to Council as freehold land.

Pumps

Pumps shall be designed to satisfy DNR&W "Planning Guidelines for Water Supply and Sewerage – March 2005" (as amended) and specific conditions of approval of Council.

Where required variable speed drive pumps shall be provided.

Pump capacities should be considered for pumping heads with "C" valves varying from 100 to 140 and system resistance curves shall be prepared accordingly. Duty point shall generally be as per DNR&W "Planning Guidelines for Water Supply and Sewerage – March 2005" (as amended).

The following information shall be provided when the plans are submitted for approval:-

- Place of manufacture of all components.
- Rating of the motor.
- Speed of the pump/motor.
- Pump duty points.
- kWh/100 litres pumped.
- System resistance curves.
- Pump performance curves.
- Guarantees.

Upon commissioning, the following information shall be provided by the Engineer for checking prior to survey plans being endorsed by Council:-

- Curves with at least four (4) points plotted of the actual performance established in the field, or similar, supervised works certificate.
- Actual kWh/1000 litres pumped.
- Complete wiring diagrams and details.
- Mechanical details and parts list of pump and motor.
- Maintenance catalogue showing daily, weekly, monthly and annual requirements.
- List of recommended spares.

Pipework

Pipeworks shall be flanged with provision of flexible joints for dismantling and re-assembling pipework and include:-

- Isolating valve each side of each pump.
- Reflux valve on delivery side of each pump.
- Flow meter.
- Pressure gauges each side of pumps.

Switchboard and Control Equipment

The switchboard and control equipment shall comply with standard specification MCC 8.

Telemetry System

Except for minor installations, each pump station control panel shall incorporate SCADA equipment for the transmission of monitoring and data and control to Council's existing master system in accordance with Council's Standard specification and Council requirements generally.

1.9 SEWERAGE RETICULATION

1.9.1 Design Criteria and References

Design Standards

All sewerage mains and facilities shall be designed to satisfy the following requirements in order:-

- This Development Manual.
- DNR&W “Planning Guidelines for Water Supply and Sewerage – March 2005” (as amended).

Population assessments and sewerage discharges shall be determined in accordance with specific conditions of approval of Council

Unless otherwise required by Council, the following design parameters shall be used.

Population Per Residential Lot (Excludes Multi Residential)

For average residential lots adopt 3.2 persons per lot.

Discharge

Average daily dry weather domestic discharge per person	230 l/c/d
Infiltration	350 l/c/d

Flow Factors

Adopt C₁ and C₂ flow factors in accordance with DNR&W “Planning Guidelines for Water Supply and Sewerage – March 2005” (as amended).

The design of mains and facilities shall take into consideration the capacity of existing and future systems, existing and future external demands and shall be compatible with overall system planning.

In relation to all design matters, where details are not available in the Manual or other documentation, then Council is to be contacted for advice or requirements.

Specific Design Requirements

Attention is drawn to the following matters which are to be provided for in the design of the sewerage system:-

Staged Development

Each stage shall be provided with full reticulation facilities. Any temporary servicing arrangements are to be to the separate approval of Council.

Allowance for Larger Mains etc

Provision shall be made for larger trunk mains and pumping capacity to meet overall system requirements. Council may meet the cost increase above a 150 diameter sewer or larger main where such larger main would not have been required to service the particular development. Alternatively Council may examine larger main requirements in accordance with any relevant infrastructure policy.

Extension to Boundaries

Where reticulation system provided by a developer are required to be extended in the future to service other developments then the relevant reticulation mains are to be extended to the property boundary to avoid later intrusion into the developed properties. Mains shall be designed to allow for future extension where applicable. The cost of such works is to be borne by the developer unless Council is satisfied that a satisfactory cost sharing arrangement can be implemented. Sewers provided along boundaries adjacent to future development shall include house connection branches where feasible.

Alteration to Mains System

Where alterations are required to an existing mains system, such alterations shall be carried out at the expense of the developer.

Works in Private Property

Gravity sewers may be provided in private property without easements but shall be located to minimize any future restriction to building works. In general buildings will not be permitted over sewers except where existing sewers cause undue restriction on building works. In these circumstances refer to Council's policy "Building Over and Adjacent to Sewers".

1.9.2 Connection to Existing Sewers, Sewer Manholes or Pump Station

Connection to existing sewers, sewer manholes or pump stations shall only be at locations approved by Council and shall be at the developer's expense. Unless otherwise approved connections shall be carried out by Council.

Where the connection is to be made in private property, the property owner is to be advised and all reinstatement works are to be completed to the satisfaction of the property owner and Council.

1.9.3 Pipe Sizes

The following nominal sewer pipe diameters shall apply:-

150, 225, 300, 375, 450.

1.9.4 Pipe Materials

Sewers (references below are as amended)

Sewer pipe materials shall comply as follows:-

- uPVC- To comply with AS 1260 and Class SEH with rubber ring joints.
 - Pipes shall be of maximum lengths of 3 m.
- VC - To comply with AS 1741 suitable for rubber ring joints.
- Black Brute - To comply with AS 1463.
- Other Pipe - Where approved this shall comply with Council requirements.

House Drains (references below are as amended)

House drainage pipe shall generally comply as follows:-

- uPVC- To comply with AS 1260 and Class SH with rubber ring joints.
- Other Pipe - Where approved this shall comply with Council requirements.

Combined house drains are not acceptable. Existing combined house drains shall be replaced where redevelopment occurs. In this regard it will be necessary to liaise with Council's Water and Sewerage Department.

1.9.5 Sewer Gradings and Manhole Drops

Sewer Gradings

Notwithstanding provisions contained in the Sewerage Guidelines, the following minimum sewer gradings shall generally apply:-

Sewer Diameter	Minimum Grade	Maximum No. of Tenements Served (Gravity)
150	1:100 First Length	-
	1:150 Second Length	-
	1:150 Thereafter	210
	1:200 For Critical Sewers (with Council approval)	180 (Min. 10)
225	1:290	460 (Min. 50)
300	1:420	900
375	1:570	1,400
450	1:750	2,100

Manhole Drops (Pipes of Same Diameter)

Manhole drops through manholes shall comply as follows:-

<u>Change in Direction</u>	<u>Fall</u>
Straight Through	20mm
Angle up to 45°	30mm
Angle 45° - 90°	40mm
Angle above 90°	80mm
Branch less than 30°	30mm
Branch 30° - 60°	50mm
Branch 60° - 90°	80mm

Other Specific Requirements

Where sewers increase in diameter then soffit to soffit grading shall apply.

Sewers shall clear other services and infrastructure by a minimum of 150 mm.

Where new sewers are proposed to connect to existing sewers then the levels for existing sewers are to be verified by a surveyor prior to works being carried out.

1.9.6 Sewer Alignments and Depths

The typical alignment is to be 1.5m inside front, rear and side boundary. In new streets, sewers should be located in footpaths or roadways only at road crossings unless approved by Council (refer MCC Standard Drawing No. PA3-870 for alignment adjacent to rear allotment drainage systems).

For commercial, industrial etc sites, sewers should be located along the road frontage approximately 1.5m inside the allotment.

Sewers should normally commence with a depth to invert of approximately 1.2m unless greater depth is required to adequately service a lot or to accommodate a possible future extension of the sewer. Where future extension is required it is to be demonstrated the design depth is adequate.

Minimum sewer depths shall provide for the grading of house drains at 1:60 allowing for a depth to invert of 400mm at commencement and 250mm drop at the sewer branch.

The preferred maximum depth for sewers is 3.5m but short lengths of sewers at greater depths can be accepted.

The total area of the lot, excluding building setbacks is to be capable of being serviced.

Sewers along the frontage of steep lots shall be below top of kerb.

1.9.7 Concrete Manholes

Manholes Generally	These shall generally be constructed in accordance with MCC Standard Drawing No. SA3-856. In particular it is to be noted that:- (a) internal backdrops are not accepted; and (b) the clear opening of the manhole is to be 600 diameter.
Precast Manholes	These are acceptable subject to an approved design.
Manhole Lids	These shall be ductile iron or concrete infill ductile iron set in a ductile iron frame and positioned centrally above the downstream sewer. In all sandy or beach areas close fitting "Gatic Type" lids are to be used to prevent intrusion of sand into sewers.
Manhole Tops	These should finish 75mm above average ground level except where located in footpaths or streets.

Manhole Bases

These should be cast in-situ unless Council grants specific approval to the use of prefabricated fiberglass or concrete bases.

1.9.8 Sewer House Connection Branches

Sewer branches shall be Type A or Type C and be located in or be extended at least 1 meter into each property as indicated in MCC Standard Drawing No. SA3-855.

Type A sewer branches to uPVC sewers shall not be provided to sewers where the depth to sewer invert is greater than 1.5m unless with the specific approval of Council. The depth may only be increased to a maximum of 2m where grading of house drains requires such extra depth as approved by Council.

Type C sewer branches shall be constructed in accordance with MCC Standard Drawing No. SA3-855.

Branches are to be concrete encased from base of sewer to branch socket unless otherwise approved.

Typically junctions shall be located 1.5m inside the downstream property boundary where the sewer is in the allotment. A separate junction is to be provided for each allotment and their locations are to be shown on the sewer layout plan. A maximum 6m long house connection across to a property boundary is permitted.

1.9.9 Road Crossings

General

Typically open excavated crossings will apply to new roads. Thrust bored crossings are required in existing roads unless specific approval is given to open excavated crossings.

Thrust-Bored Crossings

Entry and exit pits for boring equipment shall be located clear of existing underground services and to the approval of Council. Enveloper pipes shall be installed in all bored crossings and shall comprise 8mm wall thickness mild steel pipe or approved equivalent. Typically the internal diameter of the enveloper pipe shall be a minimum of 150mm larger than the external diameter of the sewer or pressure main. The enveloper pipe shall extend for a minimum of 1m behind kerb and channel or 3m beyond bitumen edge where there is no kerb and channel.

Open-Excavated Crossings

Details are subject to the specific conditions of approval of Council. However, the following will generally apply:-

For existing bitumen streets, the pipe shall be sand bedded and surrounded to 150 above top of barrel of pipe. Lean mix concrete (7 Mpa) shall then be provided to within 250mm of the surface. Base course gravel shall then be provided to within 50mm of the surface. Hot mix of 50mm shall then be provided to the surface. The lean mix concrete and base course gravel shall be provided a minimum of 1m beyond the line of the bitumen or rear of kerb unless a greater width is required.

For new streets, lean mix concrete may be deleted and sand filling and the specified street pavement adopted.

Council may vary requirements for individual situations.

Department of Main Roads Roads/Streets

For these roads/streets, the requirements of the Department of Main Roads shall apply for either open-excavated or thrust-bored crossings.

1.9.10 Crossings of QR or Mackay Sugar Railways

Crossings are to comply with requirements of Queensland Rail or Mackay Sugar, as applicable.

1.9.11 End of Lines

Manholes are to be provided at all ends of lines unless alternative treatment is approved specifically by Council.

1.9.12 Pressure Mains

Pressure mains shall be located in Council owned land where practicable. Where pressure mains are required to be located on private property they are to be located in a minimum 3m wide easement.

Air release valves are to be provided at high points in long rising mains. Pressure mains shall comply as follows:-

Minimum pipe diameter	100mm
Minimum pipe class	16
Minimum pump rate	6 ℓ/s

1.9.13 Pump Stations

Construction Generally

Pump stations will generally be of the single or dual wet well type suitable for submersible sewage pumps. Single pump wells apply for pumps less than 30 litres per second capacity while dual pump wells would apply for greater capacity pumps.

For dual well pump stations, one pump is to be located in each well and each well is to provide for storage for the pump capacity provided.

Single well pump stations are to be provided to the detail shown on MCC Standard Drawing No. SA3-857.

All pump stations shall include the following:-

- Top of pump station to be 300mm above 1 in 50 year flood level.
- Screened overflow in accordance with MCC Standard Drawing No. SA3-853.
- Underground electricity supply to switchboard.
- Water service including meter and back flow prevention device in accordance with MCC Standard Drawing WA3-834.
- Bitumen standard road access in reserve or easement (unless gravel approved).
- Pump station site (freehold).
- Provision for connection of emergency power.

An accurate site layout plan is to be provided showing the location of all facilities in relation to boundaries and including final earthworks levels.

The pump station site shall provide sufficient area to allow access by maintenance vehicles with a minimum 3m clearance from the edge of pump station to site boundaries. The pump station site is to be transferred to Council as freehold land.

Pumps

Pumps shall be designed to satisfy DNR&W "Planning Guidelines for Water Supply and Sewerage – March 2005" (as amended) and specific conditions of approval of Council.

The consultant shall provide hydraulic design calculations using the Summary Sheet – Sewage Pump Station Design (Form DMV2-14).

Duplicate pumps shall be provided.

The arrangement of submersible pumps in a single well is to be in accordance with MCC Standard Drawing No. SA3-857.

Pump capacities should be considered for pumping heads with "C" values ranging from 100 to 140 and system resistance curves shall be prepared accordingly.

The following information shall be provided when the plans are submitted for approval:-

- Place of manufacture of all components.
- Rating of the motor.
- Speed of pump/motor.
- Pump duty points.
- kWh/1,000 litres pumped.
- System resistance curves.
- Pump performance curves.
- Guarantees.

Upon commissioning the following information shall be provided by the Engineer for checking prior to accepting works onto maintenance:-

- Curves with a least four points plotted of the actual performance established in the field, or similar supervised works certificate.
- Actual kWh/1,000 litres pumped.
- Complete wiring diagrams and details (2 laminated copies).
- Mechanical details and parts list of pump and motor.
- Maintenance catalogue showing daily, weekly, monthly and annual requirements (2 copies).
- List of recommended spares.

Pipework

Pipework shall be flanged and include:-

- Isolating valve on delivery side of each pump.
- Reflux valve on delivery side of each pump.
- Pressure gauge for each pump delivery pipework.

Switchboard and Control Equipment

The switchboard and control equipment shall comply with Council's standard specification and Council requirements generally.

Telemetry System

Each pump station control panel shall incorporate SCADA equipment for the transmission of monitoring data and control to Council's existing master system in accordance with Council's Standard Specification and Council requirements generally.

1.9.14 Sewage Treatment Plants

Sewage treatment plant facilities for urban reticulation will be provided by Council except where there is an agreed arrangement with a developer on the provision of such facilities.

For development outside the normal urban reticulation areas, consideration may be given to provision of independent package type treatment plants generally owned and operated by individual or group allotment owners or Council.

The requirements for such independent package type treatment plants shall generally be determined by Council.

Particular attention is to be given to the provision of suitable and adequate areas for the disposal of treated effluent by irrigation or other means in accordance with AS 1547 (as amended).

1.10 COMMERCIAL INDUSTRIAL AND COMMUNITY TITLE DEVELOPMENTS

Specific building developments on individual allotments including buildings subject to community titles scheme subdivision are required to meet the requirements of any material change of use and/or lot reconfiguration development approval.

All building development proposals shall include development plans including the relevant:-

- External infrastructure/services.
- Internal site development works.

Relevant existing and proposed external infrastructure/services for the frontage of the allotment and adjacent lands should be identified on plan and these would generally include:-

- Roads/streets and access driveways including traffic assessment and impact on external roadway.
- Stormwater drainage including kerb and channeling, piped and open drains, gully pits etc.
- External catchment and any flow paths entering the site including levels.
- Footpaths/street trees.
- Water supply mains.
- Sewerage mains.
- Electricity/Telstra services.
- Required upgrading work.
- Other specific to development.

Relevant internal site development works should be identified on plan and these would generally include:-

- Access driveways.
- Off street parking and manoeuvring areas.
- Site and building stormwater drainage including piped drainage from roofs to external drainage systems.
- Water supply services including metering and fire mains to service fire hose reels and fire hydrants where applicable.
- Sewerage mains/house drains.
- Underground electricity/Telstra services.
- Landscaping areas including edging at boundary of landscaping.
- Refuse collection areas.
- Fencing (type and height).

Plan details shall include existing site contours/spot levels and final design spot levels to AHD for site earthworks and other infrastructure/services.

Design standards for external infrastructure/services and internal site development works are generally to be to the standards described in other sections of this Manual but taking into consideration the circumstances of use of the individual site.

Nominal drainage provisions are not acceptable and drainage from buildings and whole site shall be subject to an acceptable hydraulic design.

Significant items of infrastructure/services/site works as determined by Council shall be the subject of engineering design and engineering certification by a suitably qualified civil engineer.

In respect of significant items of infrastructure/services/site works subject to engineering design, Council may also require that such works are subject to engineering supervision and certification of completion.

External infrastructure to be accepted by Council shall be the subject of the normal requirements for development works, except in the case of minor works as determined by Council. This would include:-

- Submission of engineering design drawings.
- Engineering supervision of construction.
- Maintenance period.
- Submission of 'as constructed' drawings.

1.11 LANDSCAPING

The requirements for landscaping are assessed for each development. The following general requirements apply:

- Residential developments shall have at least one (1) street tree/lot.
- Street trees shall be planted in "Root Director – RD640" or a similar root barrier.
- No irrigation systems are allowed except where approved by Council.

1.12 ENGINEERING DRAWINGS

1.12.1 General

These presentation guidelines shall apply to engineering drawings submitted for approval for subdivisional works and external civil works associated with approved developments.

Standardisation for the presentation of engineering drawings submitted for approval is necessary for consistency in Council's records and desirable for expedient checking and approval.

For a staged subdivision, the overall roadworks drainage, water, sewerage, bikeway/pathway and soil and water quality management plans are to be submitted to Council with Stage 1.

1.12.2 Presentation

Title Block

Each sheet of Engineering Drawings shall have a Title Block containing the following information:-

- (i) Subdivision estate name.
- (ii) Locality.
- (iii) Developer's name.
- (iv) Scales.
- (v) Plan number and sheet number.
- (vi) Space for Council Drawing Number (100mm x 25mm above title block in bottom right hand corner of sheet).
- (vii) Schedule and date of amendments.
- (viii) Signed design certification, by an experienced designer.
- (ix) Signed checking certification, by a qualified Civil Engineer.

Sheet Sizes

Size	Overall Dimensions	
A0	1,189mm x 841mm	Useable only with approval of Council
A1	841mm x 594mm	Preferred size
A3	420mm x 297mm	

Scales

Scales used for all plans should preferably be those recommended by the Standards Association and Austroads (as amended) namely:-

1:1, 1:2 and 1:5

And multiples of 10 of these scales.

- Although not preferred, 1:25 will be accepted along with multiples of 10 of this scale.
- No other scales are acceptable.
- All scales to be bar scales.

The following scales are suggested for particular use but these may be varied as appropriate to the works concerned:-

-
- Plans 1:1,000 or 1:500 (*)
 - Longitudinal Section:
 - Horizontal 1:1,000 or 1:500
 - Vertical 1:100 or 1:50
 - Intersection Details 1:200, 1:100 or 1:250
 - Cross Sections 1:100
 - Engineering Details 1:10 or 1:20
 - (*) Sewerage Reticulation should be 1:500.

Dimensioning on Plans

- Linear dimensions on all roadworks plans will be in metres, with the exception of some detail plans of small structures (eg manholes) and some standard plans (eg kerb and channel), which may be in millimeters.
- Details of methods of dimensioning shall be in accordance with AS 1155 Appendix A – Metric Units in Construction (as amended).

Standard Cross-Section Intervals

- Cross sections should be provided to rods at 20m intervals and tangent points, with further subdivision of 10m to 5m intervals where necessary due to horizontal or vertical curvature.

Chainages and Offset Dimensions

- Chainage and offset dimensions on plans shall be expressed to 0.01m (0.005 may be used as the order of accuracy requires).

The minimum requirements for each drawing are details in the following sections.

Locality Plan

- Locate the subdivision in relation to main roads, major streets etc.
- North Point.
- May be included on layout/staging plan.

Layout/Staging Plan

- For large subdivisions, the layout plan should show the relationship of all new roads to each other, and to existing roads adjoining the subdivision.
- Where development is to be carried out by stages, the boundaries of proposed stages should be shown on this plan, and the stages identified by numbering.
- For small subdivisions, where all new roads can be shown on one detail plan, the layout plan may be omitted.

Earthworks Plan

- Legend.
- Existing site contours and finished allotment spot levels and are to be on the corners of the lot plus at any change in grades within the lot.
- Limits and levels of major allotment cut and fill – distinguished by hatching.
- Location of cut and fill batters relative to allotment boundaries.
- Location and levels of retaining walls (if required).
- Batter slopes and treatments.
- Allotment numbers and boundaries.
- North Point.
- For small subdivisions, the earthwork details may be included on the Roadworks and Drainage Plan.
- Location(s) and level(s) of permanent survey mark(s), reference stations etc, used at datum for the works.
- Vegetation including trees to be retained.

Roadworks and Drainage Plan

The plan of each road shall include:-

- Legend.
- Road reserve boundaries.
- Allotment numbers and boundaries, both existing and proposed, a centre line or other construction line.
- Chainages, on centre line or construction line.
- Bearings of the centre line or construction line (set out co-ordinates may also be used).
- Tangent point chainages of each curve.
- Radius, arc length, tangent length and secant distance of each curve.
- Chainage and the intersection point or road centre lines or construction lines.
- Kerb lines, kerb radii, and chainage of all tangent points of the kerb line.
- Footpaths/bikeways and perambulator ramp locations.
- Overland flow paths including levels.
- Fencing.
- Access where required to be constructed.
- Edge of pavement, where no kerb is to be constructed.
- Dimensioned road reserve, footpath and pavement widths, where these differ from the standard cross section.
- Finished allotment spot levels.
- Drain line locations, dimensions (including extent of easements where required).
- Drainage structures and structure number eg $\frac{1}{2}$ structure 1 on line 2.
- All easements including easement width.
- Location of existing utilities or other existing works within the site (including clearance at service crossings).
- Location and levels of bench marks and reference pegs.
- North point.
- Linemarking.

-
- Guide posts, guard rails and other traffic control devices.
 - Creek protection works and the like.
 - Street name signs and all appropriate road signs including size.

Longitudinal Sections of Roads

The longitudinal section of each road shall include:-

- Chainages.
- Existing surface or peg levels.
- Design road centre line.
- Kerb and channel levels – to be referenced to lip of kerb and channel.
- Cut or fill depths.
- Design grades.
- Chainages and levels of grade intersection points.
- Chainages and levels of tangent points of vertical curves.
- Chainages and levels of crest and sag locations.
- Lengths and radii of vertical curves.

Standard Cross Sections

A standard cross section shall be shown for each road, including:-

- Road reserve width.
- Pavement widths.
- Footpath widths.
- Crossfalls of pavement and footpaths.
- Designed pavement depth.
- Type of kerb and channel.
- Type of pavement surfacing.
- Sub-soil drainage.

The standard cross section may be included in the detailed cross sections provided for each road.

Cross Sections of Roads

A cross section shall be shown for each pegged chainage on each road.

Cross sections shall show:-

Road reserve boundaries.

Pavement centre line and/or other construction line.

Natural surface.

Design cross section.

Crossfall of pavement and footpath, pavement and footpath widths and pavement depths wherever these differ from the standard cross section.

Detail Plans of Intersections and Cul de Sacs

Inspection detail plans shall include all the relevant information required for roadworks and drainage plans, together with additional details such as kerb levels on all kerb returns, pavement contours, channelisation works, linemarking, signing and perambulator ramps.

Longitudinal Sections of Stormwater Drainage Lines

A longitudinal section of each drain line shall be shown, including:-

- Chainages.

-
- Existing surface levels.
 - Design finished surface and invert levels.
 - Drainage structure chainages and offsets and inlet and outlet invert levels.
 - Distances between drainage structures.
 - Grade of each pipe.
 - Material, diameter and class of each pipe length.
 - Drainage structures and structure number eg $\frac{1}{2}$ structure 1 on line 2.
 - Hydraulic grade line and water surface levels.
 - Drainage structure type and sizes and/or reference to separate detail drawing.
 - Crossings with any other services (location and invert level of pipe crossing).
 - Joint type note.

Water Reticulation Plan

The water reticulation plan shall include:-

- Legend.
- All allotments and allotment numbers.
- Boundary of subdivision.
- North point.
- Location and size of existing mains.
- Location, size, material and class of new mains.
- Location of other services which cross the mains.
- The location of valves, hydrants, scours and caps, T's, reducers, etc.
- Road crossing conduit locations, size and class.

Sewerage Reticulation Plan

The sewerage reticulation plan shall include:-

- Legend.
- All allotments and allotment numbers.
- Boundary of the subdivision.
- North point.
- Location and size of existing sewer.
- Location of new sewers including line number.
- Location of other services which cross sewer lines.
- Location of sewer manholes with manhole numbers.
- Identification of allotment which are currently sewer.
- Finished surface levels and house connection design.
- Details of permanent survey marks including AHD from which levels are to be transferred.
- Details of pumping stations including location, inlet/outlet levels, overflow, cutoff levels, and water supply, size of pumping plant.
- Diameter, material class and route of pressure main(s); indicating air valve and scour valve locations.
- Easement and width of easement for pressure mains.
- Clear identification of any alterations/connections to existing sewers to be completed by Council at developer's cost.
- Location, level and type of sewer house connections.

Longitudinal Sections of Sewerage Lines

A longitudinal section of each sewerage line shall be shown, including:-

- Existing surface levels.
- Design finished surface.
- Manhole number.
- Distance between manholes.
- Grade of each pipe length.
- Diameter, material and class of each pipe length.
- Manhole inlet types.
- Invert levels of existing lines.
- Crossings with any other services (location and invert level of pipe crossing).

Soil and Water Quality Management Plan

The soil and water quality management plan shall include:-

- North point.
- A plan of development showing the road and allotment boundaries.
- Stormwater catchment boundaries to fully define the limits of external catchments.
- Line diagram of drain lines and drainage structures.
- The location of soil and water quality management control measures that are proposed for construction, maintenance and permanent phases.
- Location of fencing for restricted areas.
- Extent of footpath turfing.
- Existing significant vegetation.

Service Providers/Conduit Plan Including Street Lighting

This plan shall include:-

- Legend.
- Road reserve boundaries.

-
- Allotment numbers and boundaries.
 - North point.
 - Kerb and channel or edge of pavement where no kerb is to be constructed.
 - Cross road conduits type and size.
 - Location of pad mount transformers.
 - Location of roadside cabinets and shelters.
 - Location of street lighting.
 - Lux contours and street light pole details for major intersection design.
 - Service markers.

Miscellaneous Details

Detail drawings are required for the following:-

- Stormwater outlet structures, other than standard head walls.
- Manhole details where pipe alignments are critical for clearances or flow considerations.
- Detail of soil and water quality management structures.
- Surcharge structures.
- Overland drainage paths.
- Sewer pump stations showing all relevant levels for pumps etc (where not provided elsewhere).
- Footbridges.
- Reservoirs.
- Entry structures.
- Retaining walls.
- Buildings.
- Any details or variations from standard drawings.

Stormwater Catchment Plan/Drainage Calculations Tabulation

A catchment plan shall form part of construction documentation.

- North point.
- A plan of the development showing the road and allotment boundaries.
- Finished surface contours/levels to define the terrain and allow definition of the sub-catchments.
- Contours/levels extending beyond the limits of the development site to fully define the limits of external catchments (existing and future catchments).
- Sub-catchment boundaries, labels and areas.
- Line diagram of drainline, manhole, gully and outlet locations.
- Labelling of stormwater structures.
- Overland flow paths.
- Proposed easements.
- Drainage calculation table generally in a format in accordance with QUDM and is to include roadway approach flow width to each pit, depth of ponding at sag points and bypass flows.

Drafting Requirements

The general drafting requirements for the preparation of drawings shall be as detailed in this section. Any elements encountered in the preparation of these drawings not specifically covered by this manual shall be confirmed with Council's Design Office prior to submission of drawing file.

Linework

Linetype and colour of all linework shall be by layer.

It should be noted that the pen size colours are as follows:-

0.18 – Red
0.25 – Yellow
0.35 – Green
0.50 – Cyan
0.70 – Blue
1.00 – Magenta
1.50 – White

Text Styles

Text styles shall be in the standard Autocad, Font Romans / Width 1.0.

All upper case minimum height 2.5 (unreduced).

Features

Plan features are to be provided on easily identifiable separate layers with documentation describing content of each layer.

2.0 CONSTRUCTION

2.1 INTRODUCTION

2.1.1 General

This section of the manual details Council's requirements for the construction of works covered by the following Codes:-

- Filling & Excavation Code
- Lot Reconfiguration Code
- Infrastructure Code
- Operational Works Code

The construction of works in accordance with these requirements will achieve compliance with these Codes.

2.2 SPECIFICATIONS

2.2.1 Standard Specifications

Construction is to be undertaken in accordance with the following Mackay City Council specifications:

MCC 1 General
MCC 2 Allotment Earthworks
MCC 3 Stormwater Drainage
MCC 4 Erosion, Sedimentation and Water Quality Control
MCC 5 Roadworks
MCC 6 Water Supply and Sewerage Pressure Mains
MCC 7 Sewers and House Drains and Associated Works
MCC 8 Sewerage Pump Station – Submersible Type
MCC 9 Concrete

2.3 SUPERVISION

2.3.1 General

The consulting engineer shall be responsible for ensuring that professional engineering supervision is undertaken in respect of development works. This includes responsibility for ensuring that all required checks and testing are carried out during construction.

It would be expected that engineering drawings, specifications and associated documents for development works will include relevant requirements for quality control during construction including compliance with the Standard Inspection and Testing Plan.

Council's approval of engineering drawings will generally outline any specific requirements for quality control.

Council has a preference for Consulting Engineers and Contractors to have accredited Quality Assurance systems in place.

2.3.2 Notification to Commence Works

The consultant shall be responsible for ensuring that the relevant Notice to Commence Work is lodged with Council at least one (1) week prior to works being commenced.

The Notice is to be lodged using the standard form (DMV2-6).

2.3.3 Prestart Meeting

Except for minor works, a Prestart Meeting is to be held prior to commencement of works and attendance shall include:

Contractor representative;
Consultant representative;
Council Inspecting Officer(s).

The Prestart Meeting shall be recorded by the Consulting Engineer using the "Prestart Meeting Record Standard Form" (form DMV2-7).

Recorded detail is for Council information and is primarily intended to ensure all parties are familiar with Council requirements.

The prestart meeting is not intended to consider other matters of a contractual nature between Developer and Contractor.

2.3.4 Subgrade Evaluation and Pavement Design

The Consulting Engineer shall submit, as early as possible, subgrade evaluation tests at appropriate box level together with recommended pavement depths determined in accordance with Section 2 – Design.

The testing shall be carried out by a NATA registered testing laboratory. Consulting Engineers should allow a period of three (3) working days for Council processing and approval of the proposed pavement design.

Council will not inspect pavement subgrades or permit the placement pavement materials until a pavement design has been submitted and approved.

2.3.5 Subsoil Drainage

The Consulting Engineer shall arrange an inspection of the subgrade with the Council Inspector before pavement materials are placed, to determine if additional drains are required. Side drains shall be inspected with the subgrade.

2.3.6 Environmental Considerations

The Consulting Engineer shall ensure that all reasonable measures are taken in respect of environmental matters. In particular, the following matters shall be properly addressed to Council's satisfaction.

Dust and other air emissions shall be controlled such that nuisance is not caused to surrounding properties. Council reserves the right to direct such measures as are necessary to ensure compliance including cessation of works and the developer shall be responsible for such costs.

Noise emissions shall be controlled such that nuisance is not caused to surrounding properties. Council reserves the right to direct such measures as are necessary to ensure compliance including cessation of works and the developer shall be responsible for such costs. Unless varied by Council, construction shall be carried out between the following hours:-

Monday to Saturday (Excluding Public Holidays)	7:00am – 6:00pm
Sundays & Public Holidays	Nil

Water quality control including erosion and sedimentation control shall be implemented in accordance with the approved Stormwater Management Plan prepared by the developer.

2.3.7 Inspection and Testing

During construction, Council will conduct audit inspections of any or all of the works with or without prior notification.

The major inspections and their coverage are listed below. The listings are not intended to be exhaustive and Council may require inspection and testing of other items.

The Consulting Engineer shall confirm adoption of Council's Standard Inspection and Testing Plan or submit an alternative plan for Council's approval.

The Consulting Engineer must follow the plan, unless variations are approved, and submit certification that the plan has been followed with the "as constructed" documentation.

The major inspections by Council will generally include the following:

Subgrade Inspection

- Backfill compaction of service trenches.
- Location of subsoil drains.
- Proof rolling after compaction.
- Subgrade level and crossfall.
- Compaction test results.
- Stormwater drainage.
- Related civil works.

Pre-Seal Inspection

-
- Base course pavement after compaction – compaction test results and gravel quality test results of the base, sub-base and select fill courses.
 - Pre-prime inspection of the pavement surface to ensure profile is correct and surface is suitable for priming.
 - Subsoil drains.
 - All pipe and services crossings of the roadworks.
 - Conduit markers against service conduits.
 - Stormwater drainage works affecting the roadworks.
 - Spray seal – proposed application rates of prime and binder and spread rates of pre-coated aggregate.
 - Asphalt – proposed application rates of prime and results of mix acceptance tests.
 - Intersection contouring.

Separate inspections will be undertaken for water and sewerage works and for kerb and channel prior to placing of base course pavement.

2.4 “AS CONSTRUCTED” DRAWINGS & DOCUMENTATION

2.4.1 General

“As constructed” drawings serve two (2) distinct functions:

- Checking: to enable a quantitative check of the “as constructed” works against the approved design, so as to ensure design philosophies and criteria have been achieved; and
- Recording: to provide an accurate record of the “as constructed” locations of underground services.

Information required for the checking function must be presented in a form which allows ready comparison between design and “as constructed” data by engineering staff.

2.4.2 Prerequisites for Submission

Development works will not be accepted “on maintenance”, until such time as all of the “as constructed” drawings have been received, checked and approved.

With the implementation of these guidelines, it is Council’s intention to expedite the approval and checking process by reducing the level of checking from rigorous detailed checking to checking on an audit basis. Compliance with these guidelines is essential. In particular, the following points should be strictly adhered to in the supervision of development works and preparation of “as constructed” drawings:

- Major departures (a change which varies the design intent) from approved design should be approved by Council in writing before implementation and before submission of “as constructed” drawings. Refer also to the Statement of Compliance.
- Construction shall generally comply with the approved design (as amended above, if required), within the tolerances cited in these guidelines or Council’s standard specifications. Refer also to the Statement of Compliance.
- Where tolerances are not stated in these guidelines or Council’s standard specifications, tolerances shall be in accordance with the relevant Australian Standard and accepted engineering practice.

2.4.3 Submission for Approval

As constructed drawings and documentation shall be submitted using the appropriate forms and shall generally comprise the following:

- As constructed drawings – Submission and Compliance (form DMV2-8).
- As constructed drawings – Non Compliance Report (form DMV2-9).
- Inspection and Testing Verification and Records (form DMV2-10).
- Other documentation.

Every drawing included in the approved design, including stormwater calculation sheets, catchment plans and landscaping plans, shall be submitted in certified “as constructed” form as fully size drawings.

Submission of a single set of prints is satisfactory for checking, until approved. Once approved copies of all drawings, are to be submitted in both hard copy (paper) and electronic form.

The electronic data is to be in Autocad.DWG or DXF format and PDF format and is to include at least two (2) relatively well spaced permanent survey marks with AMG co-ordinates and AHD levels to fourth order standard as defined by the Department of Natural Resources and Water specification.

As Council will be checking only a sample of the “as constructed” information, any departure from these guidelines will be grounds for rejection of the submission and resubmission will be necessary after amendment.

2.4.4 Compliance Statement

Notwithstanding the most diligent efforts of the Consultant Engineer to comply with these requirements of this manual and specifications, it is recognised that on completion of the works and final review of “as constructed” information, some non-complying works may be discovered.

The Non Compliance Report has been introduced to expedite the checking and approval process by placing the responsibility for identifying and reporting non conforming works with the Consultant.

The Non Compliance Report shall:

- Identify the nature and number of non-complying items;
- Nominate the Consultant's justification for Council acceptance.

2.4.5 Legibility

All "as constructed" drawings are to have linework and lettering of suitable thickness and clarity to be legible typically, 0.25mm black lettering minimum.

Numerical amendments are usually denoted as a diagonal line through the design value with the "as constructed" value adjacent in brackets. Other amendments are usually denoted by encircling with a notated cloud.

2.4.6 Specific "As Constructed" Drawings Requirements

Correct street names and lot numbers shall be shown on all relevant drawings.

Engineering certification of drawings is required. The certification shall be as follows:-

"This drawing is an accurate representation of the works as constructed and the information is suitable for use by Council and others. As constructed levels have been provided by a person, registered under the *Surveyors Act 1977*
..... certified by
....."

Earthworks

Certification of the design plans is sufficient provided that the "as constructed" spot levels are shown adjacent to the design level.

Roadworks

Certification of the design plans is sufficient provided that the "as constructed" spot levels are shown adjacent to the design level.

Location of permanent signs – street, warning, regulatory – confirm that these signs are in place in accordance with the approved drawings and standard locations, accurate survey is not required.

"As constructed" pavement thickness and composition, including minimum CBR values for the pavement materials shall be noted.

Stormwater Drainage

Certification of the design plans is sufficient provided that the "as constructed" invert levels, surface levels and pipe lengths are shown adjacent to the design information.

"As constructed", departures from design, exceeding tolerances, will only be accepted where the consultant can demonstrate and certify that the design intent is not compromised.

Only where the drainage systems have been constructed out of tolerance and they may be extended by future development either upstream or downstream, and in exceptional circumstances such as incorrect pipe sizes and major out of tolerance construction, shall the design calculation sheets be amended to reflect the "as constructed" performance of the systems.

Water Reticulation

Certification of the design plans is sufficient provided that the following “as constructed” information is provided:

- Correct main size and class.
- Main alignment each side of every deflection from a straight line.
- Alignment to valves and hydrants from common property boundaries.
- Location of reducers, scours, dead ends and other fittings.
- Alignment tolerance is 0.1 metre.
- Level tolerance is 0.01 metre (where applicable).

Sewer Reticulation

Certification of the design plans is sufficient provided that the following “as constructed information is provided:

- Manholes
 - location – centre of lid
 - top lid level
- Mains (Gravity and Rising Mains)
 - diameter, class, type
 - length
 - grade
 - alignment
 - invert levels (on upstream and downstream lines)
- House Connections
 - diameter
 - type
 - location – measured from centre of nearest downstream manhole
 - surface level
 - invert level
- Tolerances
 - alignment tolerance is 1.0 metre
 - level tolerance is 0.005 metres

2.4.7 “As Constructed” Documentation

Development works will not be accepted “on maintenance” or as practically complete until as constructed documentation has been submitted to Council.

As indicated above, as constructed drawings and documentation shall comprise:

- As Constructed Drawings – Submission and Compliance (form DMV2-8)
- As Constructed Drawings – Non Compliance Report (form DMV2-9)
- Inspection and Testing Verification and Records (form DMV2-10 series)
- Other Documentation

Other documentation may include:

- Certification of foundation conditions by the Consulting Engineer (where applicable).
- Operation and maintenance manuals for WS&S pumping equipment.
- “As constructed” paper copies of electronic data for electrical wiring diagrams for pumping stations etc, laminated A3 wiring diagram, identification tags
- Structural certification for retaining walls.
- Asset costs and details.

Inspection and testing verification and records include relevant copies of test results on:

- Fill and subgrade compaction.
- Compaction of backfill material.
- Subgrade CBR.
- Subsoil drain filter media grading.
- Base, subbase and selected fill material quality.
- Base, subbase and selected fill compaction.
- Primer seal spray and application rates.
- Asphalt core tests.
- Grading to water main bedding.
- Water main pressure tests.
- Grading to sewer bedding.
- Sewer pressure tests.
- Any concrete testing required by the technical specifications.
- Pump station commissioning/testing.
- Any other job specific testing carried out or ordered by Council if used.

Should any of the above test results fail to meet specification the Consulting Engineer shall include in his submission, details of retesting/rectification carried out.

The documentation should be presented in a logically assembled and bound document including a table of contents confirming completeness.

2.5 ACCEPTANCE OF WORKS ON AND OFF MAINTENANCE

2.5.1 On Maintenance

A written request shall be submitted to Council for acceptance of works on maintenance.

This request is to follow or include:

- The acceptance of as constructed drawings and documentation.
- A satisfactory on maintenance inspection.
- Engineering certification of all works.
- Lodgement of maintenance bond.
- Completion of all relevant obligations.

Council will subsequently confirm acceptance of works “on maintenance” following satisfactory attention to the above and will also arrange for the release or reduction of any outstanding bonds.

An on maintenance inspection will be carried out by Council after submission of a completed “on maintenance inspection checklist” (form DMV2-12) to be completed by the Consultant. Council’s inspection will then be generally on an audit basis.

The Consultant is responsible for ensuring that the approved works have been completed in accordance with the approved drawings, Council’s technical specifications and accepted engineering and landscaping practice prior to requesting an on maintenance inspection.

Failure to do so may result in cancellation of the inspection and/or the charging of a reinspection fee.

2.5.2 Off Maintenance

A written request shall be submitted to Council for acceptance of works off maintenance. This request is to follow a satisfactory "off maintenance" inspection.

An off maintenance inspection will be carried out by Council after submission of a completed "Off Maintenance Inspection Checklist" (form DMV2-13) to be completed by the Consultant. Council's inspection will then be generally on an audit basis.

The Consultant is responsible for ensuring that the works are presented in accordance with the approved drawings, Council's Technical Specifications and accepted engineering practice prior to requesting an off maintenance inspection.

Failure to do so may result in cancellation of the inspection and/or the charging of a reinspection fee.

The consultant shall also include any request for refund of any maintenance bond held.

2.6 WORKS TO BE MAINTAINED DURING MAINTENANCE PERIOD

2.6.1 General

All development works and works that will be transferred to Council control are subject to a 12 month maintenance period or such other period as determined by Council during which time the developer is to maintain the works, and any defects relating to materials, workmanship and design errors or omissions are to be corrected at the developer's expense.

At any time during the maintenance period Council may undertake random inspections to determine the satisfactory maintenance of the works. Where maintenance requirements or defects are noted, written advice will be sent to the consultant requiring appropriate works to be carried out within 30 days. Where public safety or health is at risk as a result of a lack of maintenance or defective works, verbal advice will be given to the consultant requiring appropriate action within 24 hours. Where either of Council's notifications are not complied with, Council may undertake the necessary works without further reference to the developer. All costs incurred by Council in carrying out the works will be recovered from the maintenance bond.

2.6.2 Maintenance Requirements

The following is a list of the maintenance works generally considered applicable to development work. Specific works may however have special maintenance requirements that may also need to be carried out during the maintenance period.

- Water and fertilise all disturbed areas to obtain an 80% grass coverage within six (6) months of the works being accepted on maintenance.
- Water, fertilise and weed all landscaped areas provided (including street trees) as part of the development works.
- Slash all private property remaining in control of the developer and drainage reserves to maintain a grass length of less than 300mm.
- Mow road verges, pathways and park areas to maintain a grass length of less than 150mm.
- Sweep roads to maintain a surface free of loose stones and excessive dirt deposits.
- Remove silt and debris washed into kerb and channel and stormwater pipes and structures by stormwater runoff.
- Temporary and permanent stormwater quality control structures are to be cleared of silt and debris when filled to 50% capacity.

-
- Repair scours, replace topsoil and grassing to areas eroded by stormwater. Severe scouring may indicate the need for the installation of permanent erosion control structures.
 - Repair all trench subsidence to water, sewer, stormwater, power and telephone trenches.
 - Maintain all fire hydrants and valves free of silt and in an operable condition.
 - Repaint road linemarking as necessary.
 - Maintain staking to street trees.

2.6.3 Construction and Design Defects and Omissions

The repair of construction defects or the rectification of design errors and omissions will be required to be undertaken as they are identified. Construction defects include but are not limited to:

- Shrinkages of materials used in construction; eg movement of asphalt away from kerbs, subsidence in trenches and fill areas etc.
- Incorrect installation of materials; eg deflection of pipes in excess of the specification, incorrect bedding etc.
- Use of materials that do not comply with the specification; eg gravels and bedding sands with incorrect grading, incorrect class of pipes, low concrete strength etc.

Engineering designs are to comply with all Council Local Laws, Policies and Codes and relevant Australian Standards current at the time of submission of the design. Where after Council's approval of the design and the acceptance of the project on maintenance, it is identified that an aspect of the works does not comply was a result of either an error or omission in the design, that portion of the works will be required to be rectified.

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PLANNING SCHEME POLICY NO. 5 (PLANS OF DEVELOPMENT FOR DWELLING HOUSES ON LOTS LESS THAN 700m²)

This policy supports the achievement of Specific Outcome O1 in the Dwelling House Code for developments comprising a dwelling house(s) on a lot(s) less than 700m².

Any application for a material change of use development approval for a dwelling house on a lot within the Residential Zone that is or will be less than 700m² shall be supported by a detailed plan of development. The plan of development must clearly demonstrate how the Specific Outcome will be achieved, i.e. that the subject lot will be of sufficient area to:

- (a) Accommodate the dwelling house and associated vehicle access, parking, landscaping, private open space and setback requirements; and to
- (b) Ensure a high standard of acoustic and visual privacy.

A plan of development submitted in accordance with this policy shall meet the following minimum requirements:

1. It shall be prepared by a qualified building designer, engineer or architect, or similarly qualified person, whose name or business name, address and telephone contact details shall appear on each plan, drawing or sheet comprising the submitted plan of development.
2. Each plan, drawing or sheet shall also contain the following information:
 - a) The applicant's name,
 - b) Details clearly identifying the subject land (eg real property description or street address),
 - c) A unique plan/drawing number and revision number,
 - d) A date for each revision,
 - e) The scale of each plan or drawing.
3. Each plan drawing or sheet shall be drawn to scale and shall also show all necessary dimensions, in metres, for lot boundaries, buildings, structures and setbacks.
4. As a minimum, the plan of development should include:
 - a) A detailed site plan, accurately showing the location, extent and, where applicable, the levels of all existing and proposed development on the site (including all buildings, structures, services, etc) and significant site features (eg significant trees, topographical features, etc). As a minimum, the site plan must include the following information:
 - i) North sign,
 - ii) The nature, location and extent of buildings and structures on adjacent allotments,
 - iii) All vehicle access, parking and manoeuvring areas, including design vehicle turning paths in accordance with Australian Standard AS2890.1 (as amended),
 - iv) All landscaping areas, including broad details of the nature of landscaping proposed,
 - v) All private open space areas, including representative finished levels,
 - vi) All dimensions necessary to demonstrate compliance with the Specific Outcome.
 - b) A detailed and fully annotated and dimensioned floor plan of the proposed dwelling house.
 - c) A complete set of fully annotated elevations of the proposed development, clearly showing proposed ground and floor levels and building height dimensions.
 - d) A schedule of areas including the lot area, the gross floor area of the proposed dwelling house and the areas of the site allocated to private open space and landscaped areas.
 - e) Full details of all design measures adopted to meet the Specific Outcome, eg buffering details, fencing details, privacy measures, acoustic mitigation measures, separation distances, etc.

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SUPERSEDED PLANNING SCHEME **POLICIES**

PLANNING SCHEME POLICY NO. 1 (DEVELOPER CONTRIBUTIONS FOR WATER SUPPLY AND SEWERAGE HEADWORKS)

The intent of this policy is to confirm the requirements for the payment of contributions by developers towards the cost of water supply and sewerage headworks.

A contribution will be payable as a condition of approval under a development permit for a material change of use and/or a reconfiguration of a lot for any development to be serviced by a reticulated water supply and/or sewerage scheme.

This policy, and the contributions payable under this policy, covers the provision of water supply and sewerage headworks only, which comprise:

Water supply headworks

- all water bores and extraction facilities,
- all pump stations and rising mains,
- all water treatment facilities,
- all storage reservoirs,
- all trunk mains 200mm in diameter or larger,
- all mains 150mm in diameter or larger.

Sewerage headworks

- all trunk mains 225mm in diameter or larger,
- all gravity mains 150mm in diameter or larger,
- all pump stations and rising mains,
- all sewage treatment facilities.

To remove any doubt, it is confirmed that the cost of any external works necessary to connect an approved development to a water supply or sewerage scheme shall be undertaken at the sole cost of the developer or, at Council's sole discretion, shall be covered by an additional contribution determined by Council.

Contributions shall be paid on the basis of the increase in the equivalent population associated with an approved development, expressed in equivalent tenements (ETs), and at rates specified in Council's Schedule of Fees & Charges at time of payment.

The number of ETs shall be determined as follows:

PROPOSED USE	ETs
Accommodation Units, Dependant Person's Accommodation, Multiple Dwelling Units, or Retirement Housing.	1 bedroom 0.6ET/unit 2 bedrooms 0.8ET/unit 3 or more bedrooms 1.0ET/unit
Bed and Breakfast Accommodation	1.0 ET plus 0.6ET/guest bedroom
Caravan Park	0.5 ET/site (caravan site or camp site)
Dwelling House, or Home Occupation	1.0ET/dwelling unit

PROPOSED USE	ETs
Hardware Shop, Office Building, or Shop/Shopping Centre	1.0ET/200m ² gross floor area
Restaurant	1.0ET/100m ² gross floor area
All other uses	As determined by Council

Headworks contributions shall be paid in full prior to:

- For a material change of use – any building works or operational works permit being issued (where applicable) or, otherwise, prior to the commencement of the use
- For the reconfiguration of a lot – any survey plan being endorsed by Council.

