

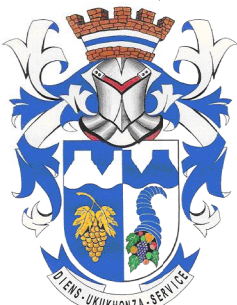
COST ESTIMATES AND PHASING OF THE REQUIRED WORKS						
Item No.	MP Item Type	Description	Estimated cost* (R-yr 2011 value)	Time Related Phasing	Comments	Project no.
Robertson						
Distribution System Items						
LRS1.01	MP	900 m x 525 mm Ø Upgrade existing gravity	1 880 300	2008	When overflow problems occur	PRJ LRS-001
LRS1.02	MP	240 m x 250 mm Ø Upgrade existing Gravity	337 400	2001	When overflow problems occur	PRJ LRS-001
LRS1.03	MP	430 m x 300 mm Ø Upgrade existing Gravity	466 800	2008	When overflow problems occur	PRJ LRS-001
LRS1.04	FM	722 m x 180 mm Ø New Gravity	514 000	2014	Required when FDA R07 & R08 develops	PRJ LRS-004
LRS1.05	FM	85 m x 180 mm Ø New Gravity	35 100	2014	Required when FDA R07 & R08 develops	PRJ LRS-004
LRS1.06	FM	331 m x 180 mm Ø New Gravity	217 500	2018	Required when FDA R08 develops	PRJ LRS-004
LRS2.01	MP	Upgrade existing Pump Station (Investigate first)	166 800	2018	Upgrade pumping station (Investigate upstream pumping stations first)	PRJ LRS-002
LRS2.02	MP	120 m x 250 mm Ø Upgrade existing Rising (Investigate first)	132 700	2018	Upgrade rising main with item LRS2.01	PRJ LRS-002
LRS2.03	MP	81 m x 250 mm Ø Upgrade existing Gravity (Investigate first)	133 300	2011	When overflow problems occur. Modelled on 200 mm Ø at minimum slope	PRJ LRS-002
LRS3.01	MPS	Investigate existing Pump Station	14 300	2012	Verify pump capacity of existing pumping station	PRJ LRS-003
LRS3.02	MPS	Investigate existing Pump Station	14 300	2012	Verify pump capacity of existing pumping station	PRJ LRS-003
LRS3.03	MPS	Investigate existing Pump Station	14 300	2012	Verify pump capacity of existing pumping station	PRJ LRS-003
LRS3.04	MPS	Investigate existing Pump Station	14 300	2012	Verify pump capacity of existing pumping station	PRJ LRS-003
LRS3.05	MPS	Investigate existing Gravity	1 500	2012	Environmental release information required	PRJ LRS-003
LRS4.01	FM	59 m x 180 mm Ø New Gravity	537 600	2015	New railway crossing when FDA R16 develops	PRJ LRS-004
LRS4.02	FM	89 m x 180 mm Ø New Gravity	87 800	2015	Required when FDA R24 develops	PRJ LRS-004
TOTALS			4 636 500			

* Costs include P&G's, Contingencies & Fees, but exclude EIA studies, registration of servitudes and/or land acquisition, protection, monitoring and VAT.

Note: FM = Future main - New gravity outfall sewer, rising main, pump station, diversion structure or WWTP
MP = Master Plan Items which reinforce the existing system
MPS = Master Plan Items which are abandoned
MPH = Master Plan Investigate - Upgrades for existing facilities, where there is uncertainty over e.g. actual diameters, actual slopes or actual pump capacities. The existing facilities must be investigated first, prior to implementing the master plan item
MPS = Master Plan Items where only investigation is required

FUTURE DEVELOPMENT AREAS (FDA)

Future Development Name	Description	Anticipated Landuse	Density (units/ha)	Gross Area (ha)	No. of Units (Base year : 2011)				LWD (inc. UAW) (M)	LWD (inc. UAW) (M)	AAD (inc. UAW) (M)
					Next 5 yrs	5 - 10 yrs	10 - 20 yrs	Total			
Robertson											
R01	High density	Single residential 500	25	1.2	30			30	15	18	
R02	High density	Single residential 500	25	1.9	48			48	15	20	
R03	High density	Single residential 500	25	3.0	74			74	400	15	45
R04	Cluster	Group Housing 40 to 60	53	1.3	69			69		20	
R05	High density	Single residential 500	25	4.1	103			103	15	62	
R06	High density	Single residential 500	25	12.2	147	306		249	15	183	
R07	Medium density	Single residential 1000	13	11.8	147			147	13	147	
R08	Medium density	Single residential 1000	13	16.1	201			201	13	201	
R09	High density	Single residential 500	25	4.4	111			111	15	66	
R10	High density	Single residential 500	25	4.3	108			108	15	65	
R11	High density	Single residential 500	25	11.6	290			290	15	174	
R12	Industrial	Industrial	50	4.1	205			205	20	62	
R13	Industrial	Industrial	50	3.0	148			148	20	59	
R15	High density	Single residential 500	15	1.0	15			15	600	8	
R16	Industrial	Industrial	50	3.1	155			155	20	62	
R17	Industrial	Industrial	50	2.3	117			117	20	47	
R18	High density	Single residential 500	25	16.7	317	417		417	15	290	
R19	Medium density	Single residential 1000	13	2.5	31			31	13	31	
R20	Medium density	Single residential 1000	13	5.3	67			67	13	67	
R21	Medium density	Single residential 1000	13	2.3	29			29	13	29	
R22	Medium density	Single residential 1000	13	2.9	36			36	13	36	
R23	Cluster	Group Housing 40 to 60	50	2.6	131			131	400	52	
R24	High density	Single residential 500	25	2.4	100			100	600	60	
R25	High density	Single residential 500	25	4.7	119	119		119	15	71	
R26	Bus/Comm	Business/Commercial	20	0.4	9			9	400	4	
R27	Bus/Comm	Business/Commercial	50	0.1	6			6	400	2	
R28	Cluster	Group Housing 40 to 60	52	0.3	16			16	400	6	
R29	Cluster	Group Housing 40 to 60	49	0.5	24			24	400	10	
R30	Cluster	Group Housing 40 to 60	43	0.4	17			17	400	7	
R31	Cluster	Group Housing 40 to 60	54	0.3	15			15	400	6	
R32	Cluster	Group Housing 40 to 60	60	0.4	24			24	400	10	
R33	Cluster	Group Housing 40 to 60	47	0.2	8			8	400	3	
Sub-Total Robertson									1 984	400	1 922



March 2012

Sewer Master Plan Langeberg Municipality

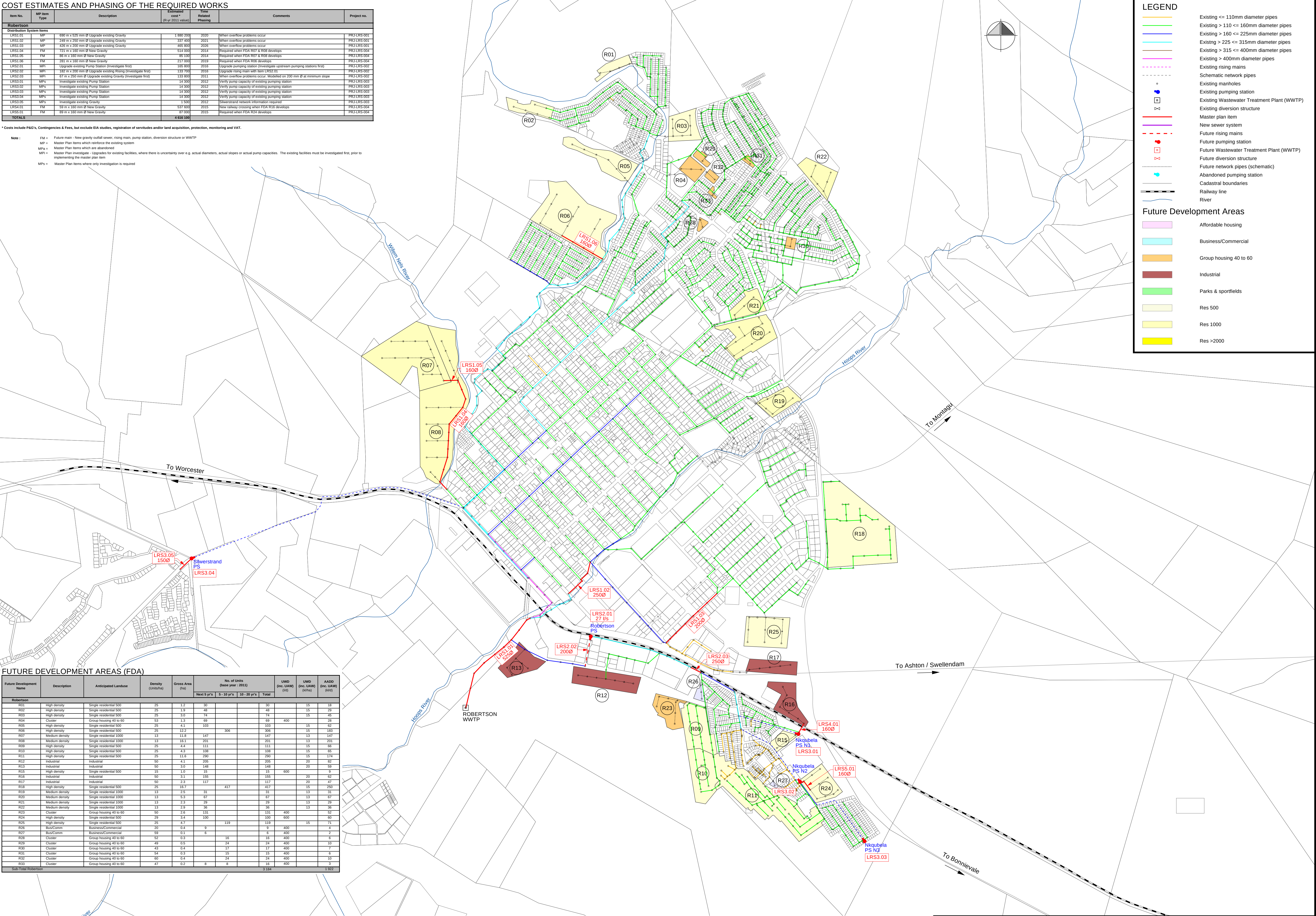


Figure LBS 6.4e
Future required works -
Robertson