



ALL AREAS AND DIMENSIONS ARE APPROXIMATE AND ARE SUBJECT TO A FINAL SURVEY AND ARE SUBJECT TO COUNCIL APPROVAL.

PROPOSED TELSTRA, ELECTRICITY & GAS
 DIRECTION OF NATURAL SURFACE
 PROPOSED SEWER
 PROPOSED WATER
 PROPOSED DRAINAGE
 EXISTING WATER
 EXISTING TELSTRA & ELECTRICITY
 EXISTING SEWER

- PROPOSED LOTS**
- FRONTAGE (AVERAGE 15m)
 - MINIMUM 450m² LOTS
 - 16m WIDE ROADS
 - AREA ABUTTING TRANSMISSION LINES
 - LEFT AS RIPARIAN CORRIDOR
- Ⓜ EASEMENT FOR WATER SUPPLY (1525 & 1095 WIDE (L34217))
- Ⓝ EASEMENT FOR WATER SUPPLY (1675 WIDE (NO.326 BK B53))
- Ⓞ EASEMENT FOR TRANSMISSION LINES (1982341)
- Ⓟ EASEMENT FOR WATER SERVICE (1 WIDE (W364251))

LEAN LACKENBY & HAYWARD LP/OL PTY LTD.
 CONSULTANTS IN SURVEYING, ENGINEERING & LAND DEVELOPMENT
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 PO BOX 160 BRIDGECROSS NSW 1571 EMAIL: info@llh.com.au

A	AMENDMENT	DATE	APPROVED
B	LOT LAYOUT AMENDED	24/10/17	AMH
C	LOT LAYOUT AMENDED	12/12/17	AMH
RIPARIAN CORRIDOR AMENDED AND LOTS REMOVED			

TABLE OF DIM.	
100	100
200	200
300	300
400	400
500	500
600	600
700	700
800	800
900	900
1000	1000

LG.A:	CAMPBELLTOWN	SCALE:	1:1000
LOCALITY:	DERRIHAN COURT	PROPERTY DESCRIPTION:	LOT 71 IN DP706546
SURVEY:	AMH	DRAWN:	BG
DESIGN:	APPROVED	AHD:	CONTROLS SCALED FROM ORTHOPHOTO MAPS

DATE:	AUG 2015	SHEET:	1 OF 4	DRAWING NUMBER:	59904-PP54-SERVICES	AMEND FILE:	C	No.:	59904
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CONCEPT SERVICES PLAN



ALL AREAS AND DIMENSIONS ARE APPROXIMATE AND ARE SUBJECT TO A FINAL SURVEY AND ARE SUBJECT TO COUNCIL APPROVAL.

— sw — PROPOSED DRAINAGE

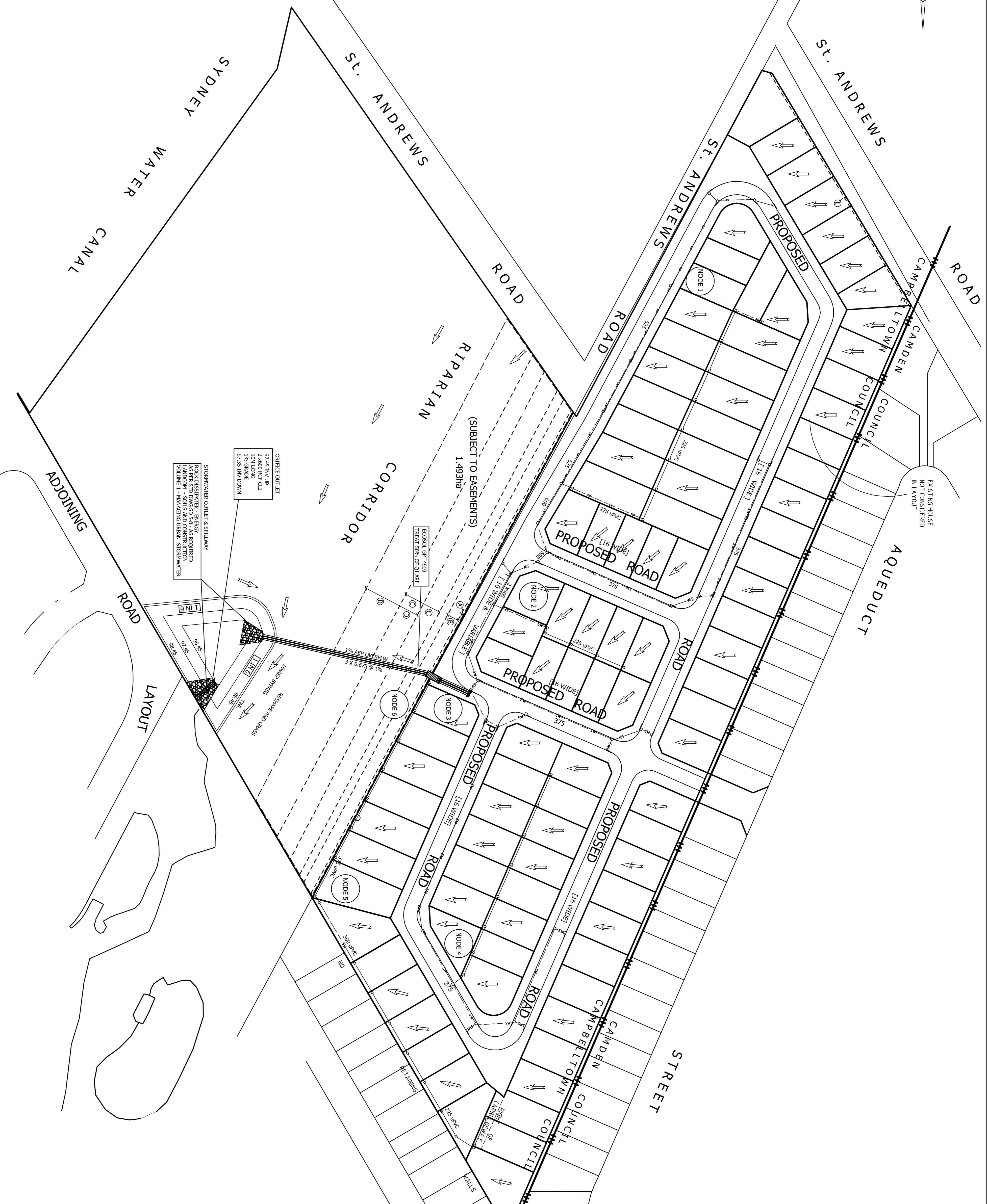
— — DIRECTION OF NATURAL SURFACE

PROPOSED LOTS

- FRONTAGE (AVERAGE 15m)
- MINIMUM 450m² LOTS
- 16m WIDE ROADS
- AREA SPLITTING TRANSMISSION LINES LEFT AS RIPARIAN CORRIDOR

- ① EASEMENT FOR WATER SUPPLY 1.575 & 1.095 WIDE (L343711)
- ② EASEMENT FOR WATER SUPPLY 6.095 WIDE (N6-326 BK1855)
- ③ EASEMENT FOR PIPELINE (B352310)
- ④ EASEMENT FOR TRANSMISSION LINES (J98324-1)
- ⑤ EASEMENT FOR WATER SERVICE 1 WIDE (V354425)

DESCRIPTION	EXISTING
ELECTRICITY (AERIAL)	
POWER POLE, POWER POLE & LIGHT LIGHT POLE	
ELECTRICITY (UNDERGROUND), PILLAR PIT	
TELECOMMUNICATION CABLE (UNDERGROUND), PIT, ACCESS PIT, PILLAR, EQUIPMENT HOUSING	
TELECOMMUNICATION CABLE (AERIAL), POLE	
SHARED TELECOMMUNICATION/ELECTRICITY	
WATER MAIN, METER, HYDRANT, STOP VALVE	
GAS MAIN, METER, MARKER, VALVE	
SEWER MAIN, ACCESS CHAMBER, INSPECTION POINT, LAMP HOLE	
DRAINAGE PIPE, KERB INLET PIT, SEALED PIT, GRATED PIT, DOWN PIPE, GUTTER OVERFLOW	
SIGN (GENERAL), TRAFFIC LIGHT, TRAFFIC LIGHT CONTROL BOX	
FENCE	
WATERCOURSE/TABLE DRAIN	
EMBANKMENT/BATTER	
CONTOURS	
LEVELS, TOP OF KERB LEVEL	



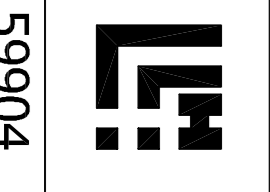
LEAN LACKENBY & HAYWARD LP/OL PVTY LTD.
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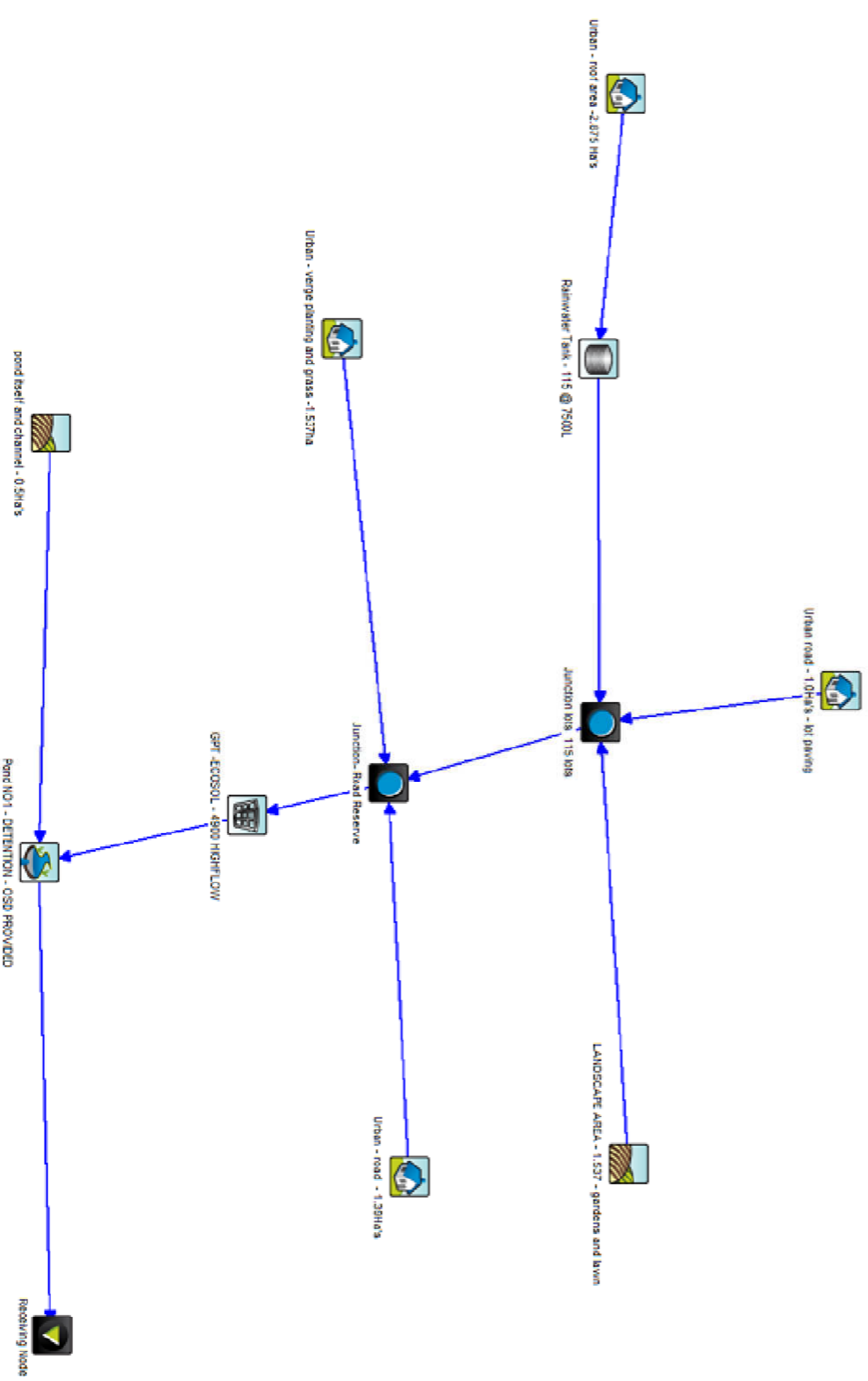
NO.	REVISION	DATE	BY	CHKD.
D	RESUBMITTING AND RELOCATION OF OSD AND POND	22/11/18	ANH	
C	LOT LAYOUT AMENDED	12/12/17	ANH	
B	LOT LAYOUT AMENDED	24/10/17	ANH	
A	ISSUE TO COUNCIL AND CLIENT FOR REZONING AMENDMENT	12/10/17	ANH	

NO.	REVISION	DATE	BY	CHKD.
1	ISSUE TO COUNCIL AND CLIENT FOR REZONING AMENDMENT	12/10/17	ANH	

LG.A:	CAMPBELLTOWN	SCALE:	1:1,000
LOCALITY:	DERHAM COURT	PROPERTY DESCRIPTION:	LOT 71 IN DP706546
SURVEY:	NA	DRAWN:	BG
DESIGN:	K8	APPROVED:	ANH
		AHD:	CONTOURS SCALED FROM ORTHOPHOTO MAPS

DATE:	OCT 2017	SHEET:	2 of 4	DRAWING NUMBER:	59904PFS4-DR	AMEND FILE:	D No:
CONCEPT DRAINAGE & ON SITE DETENTION/W/SUD							





MUSIC - POST DEVELOPMENT TREATMENT TRAIN MODELLING

CA TYPE	IMPERVIOUS	PERVIOUS	TOTAL CA
BLOCKS			
ROOF ZONES	2.875 Ha		
SITE IMPERVIOUS	1.00 Ha		
GARDENS		1.537Ha	5.412 Ha
ROAD RESERVE			
PAVEMENT	1.39 Ha		
VERGE GRASS		0.923Ha	2.313 Ha
BYPASS			
TO POND	0.5Ha		0.50Ha
	5.7650	2.46 Ha	8.225 Ha

OVERALL % IMPERVIOUS = 70%

POLLUTANT	TARGET	OUTPUT
OILS /GREASE	90	90%
TSS	80	93-100%
TP	45%	70-90%
TN	45%	59%
GROSS LITTER	90%	99%

ECOSOL™ GPT - MUSIC Modelling Calculations

Pollutant	Removal Rate (%)	Entered Flow Rate (L/s)	Entered Quantity (kg/d)
Total Suspended Solids (TSS - 2000um)	55	1000	450
Total Phosphorus	45	1000	600
Total Nitrogen	40	1000	600
Gross Pollutants (P-2000um)	99	1000	10
Heavy Metals	25	n/a	n/a
Total Petroleum/ Hydrocarbon (by weight and volume)	99	n/a	n/a

Pollutant	Removal Rate (%)	Entered Flow Rate (L/s)	Entered Quantity (kg/d)
Total Suspended Solids (TSS - 2000um)	80	1000	200
Total Phosphorus	45	1000	550
Total Nitrogen	45	1000	500
Gross Pollutants (P-2000um)	99	1000	10
Heavy Metals	25	n/a	n/a
Total Petroleum/ Hydrocarbon (by weight and volume)	99	n/a	n/a

ECOSOL GPT Model	Retention Length (m)	Travel Flow Rate (L/s)	High Flow Travelable Flow Rate (L/s)
ECOSOL GPT 4200	2,200 x 300	36	51
ECOSOL GPT 4300	2,700 x 1,350	120	120
ECOSOL GPT 4450	3,600 x 1,350	78	260
ECOSOL GPT 4600	4,500 x 1,350	141	470
ECOSOL GPT 4750	5,400 x 2,300	219	750
ECOSOL GPT 4900	6,300 x 2,300	315	1,050
ECOSOL GPT 4950	7,450 x 2,950	429	1,450
ECOSOL GPT 4200	8,550 x 3,300	561	1,870
ECOSOL GPT 4250	9,700 x 3,700	674	2,370
ECOSOL GPT 4300	10,950 x 4,000	805	2,950
ECOSOL GPT 4350	12,200 x 4,700	1,076	3,210

Once the transfer functions have been defined for each of the pollutants the node has been fully defined. When completed the Properties window can be closed by clicking the 'Finish' button.

ECOSOL GPT DESIGN AND DOCUMENTATION



TREATMENT TRAIN MUSIC OUTCOME

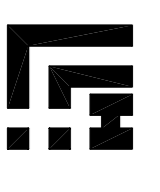
POLLUTANT	TARGET	OUTPUT
OILS /GREASE	90	90%
TSS	80	93-100%
TP	45%	70-90%
TN	45%	59%
GROSS LITTER	90%	99%

NO	ISSUE TO COUNCIL AND CLIENT FOR REZONING AMENDMENT	DATE	APPRO
A		12/10/17	AMH

NO	ISSUE TO COUNCIL AND CLIENT FOR REZONING AMENDMENT	DATE	APPRO

LG.A:	CAMPBELLTOWN	SCALE:	1:1000
LOCALITY:	DERHAM COURT	PROPERTY DESCRIPTION:	LOT 71 IN DP706546
SURVEY:	NA	DRAWN:	BG
DESIGN:	KB	APPROVED:	AMH
		AHD:	CONTOURS SCALED FROM ORTHOPHOTO MAPS

DATE:	OCT 2017	SHEET:	3 of 4	DRAWING NUMBER:	59904MSJD	AMEND FILE:	59904
WATER QUALITY MUSIC MODELLING CALCULATIONS							



NETWORK NO 1
AR&R 1987 - CHAPTER 14 ANALYSIS - CHECK ONLY

OSD MODELLING

OSD - ILSAMS - STORAGE TO OUTFLOW ANALYSIS						
NO	RL - AHD	DEPTH	STORAGE	LOW FLOW	HIGH FLOW	TOTAL
1	97.4500	0.0000	0.0000	0.0000	0	0
2	97.8500	0.4000	1013	0.8820	0	0.8820
3	98.0500	0.6000	1519	1.3240	0	1.3240
4	98.1500	0.7000	1772	1.5430	0	1.5430
5	98.2500	0.8000	2026	1.7630	0	1.7630
6	98.3500	0.9000	2279	1.9840	0	1.9840
7	98.4500	1.0000	2532	2.2040	0	2.2040
8	98.5500	1.1000	2750	2.2300	4.0000	6.2300

OUTFLOW 2.075 CUMSECS 1% AEP
PRE TO POST
DEPTH IN BASIN 0.95M
VOLUME : 2405.5 CUBIC METRES

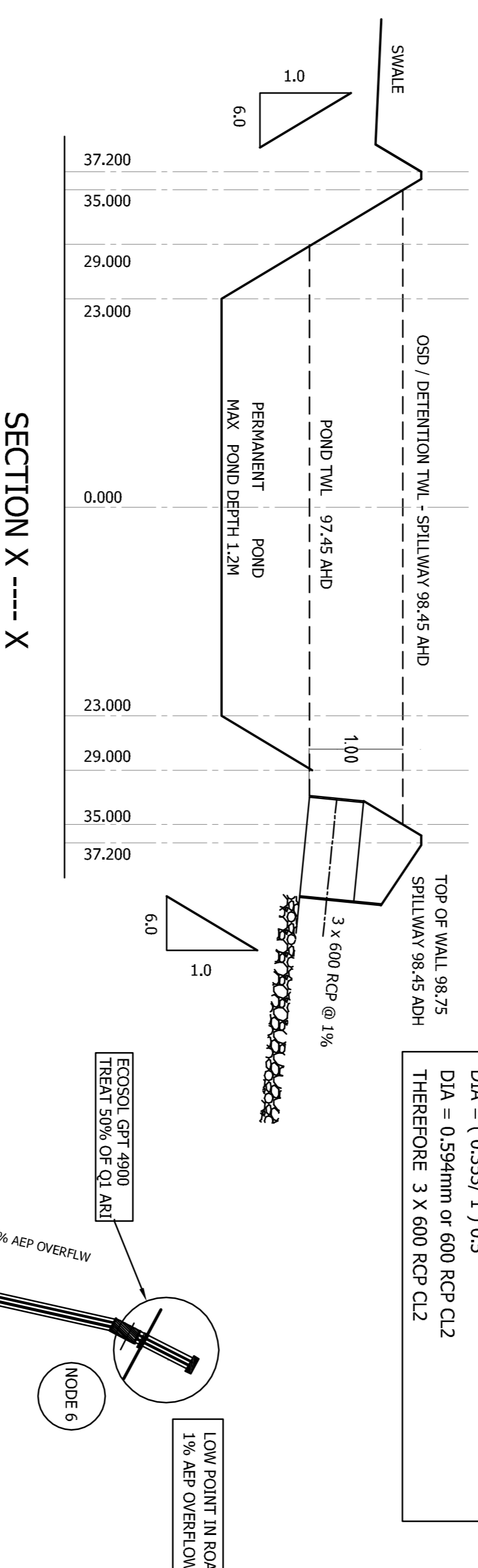
NODE TYPE	CATCHMENT Ha's	% IMPER	C-BERV.	C-IMP PERV.	Q 5 ARI cumsecs	Q 100ARI cumsecs	GAP FLOW cumsecs	Q5 P/WORK	COMMENT
1-Q5 P	0.29		0.44		0.029				
1-Q5 IMP	1.15	80		0.9	0.369				
1-Q5 TOT	1.44	80			0.400			525 @ 1%	OK
1-Q100 P	0.29		0.56			0.061			
1-Q100 IMP	1.15	80		1.0		0.673			
1-Q100 TOT	1.44	80				0.734		525 @ 1%	OK
2-Q5 P	0.412		0.04		0.064				
2-Q5 IMP	1.618	80		0.90	0.528				
2-Q5 TOT	2.06	80			0.567			600 @ 1%	OK
2-Q100 P	0.412		0.56			0.087			
2-Q100 IMP	1.618	80		1.0		0.962			
2-Q100 TOT	2.06	80				1.049			
SUMMARY SUB					0.967	1.783	1.106	2 X 600 RCP	OK
3-Q5 P	0.246		0.44		0.024				
3-Q5 IMP	1.00	80		0.90	0.320				
3-Q5 TOT	3.272	80			0.344				
3-Q100 P	0.654		0.56			0.052			
3-Q100 IMP	0.246	80		1.0		0.584			
3-Q100 TOT	1.246	80				0.636			
SUMMARY SUB					1.311	2.419	1.501	2 X 675	OK
4-Q5 P	0.47		0.44		0.046				
4-Q5 IMP	1.90	80		0.90	0.608				
4-Q5 TOT	2.370	80			0.655				
4-Q100 P	0.47		0.56			0.100			
4-Q100 IMP	1.900	80		1.0		1.109			
4-Q100 TOT	2.370	80				1.210			
SUMMARY SUB					1.966	3.629	2.253	3 X 675	OK
5-Q5 P	0.122		0.44		0.013				
5-Q5 IMP	0.488	80		0.90	0.165				
5-Q5 TOT	0.610	80			0.180			375 @ 1%	NIL
5-Q100 P	0.122		0.56			0.027			
5-Q100 IMP	0.488	80		1.0		0.292			
5-Q100 TOT	0.610	80				0.320			
SUMMARY SUB					0.180	0.320	0.320	375 @ 1%	BYPASS
N1 TO N4					1.966	3.629			
6-Q5 TOT	0.610	80			0.180				NIL
SUMMARY SUB					2.146	3.629		3 X 675	OVERFLOW TO ROAD LOW POINT

ADOPTED FOR OSD MODELLING

STORMWATER SUMMARY TO OSD POND - ILSAMS HYDROLOGY					
SITE ZONE	DESCRIPTION	CATCHMENT	PRE 1% AEP	POST 1% AEP	
NODE 1 TO 2	URBAN	3.489 Ha			
NODE 3	URBAN	1.246 Ha			
NODE 4-5	URBAN	2.98 Hap			
TO POND	POND ONLY	0.5000			
TOTAL		8.825 Ha	2.2040	3.387 cumsecs	

OVERALL IMPERVIOUS AREA ADOPTED 72.5%
1% AEP PERMISSIBLE SITE DISCHARGE 2.204 CUMSECS
1% AEP CATCHMENT SET AS WET PRIOR TO THE STORM EVENT

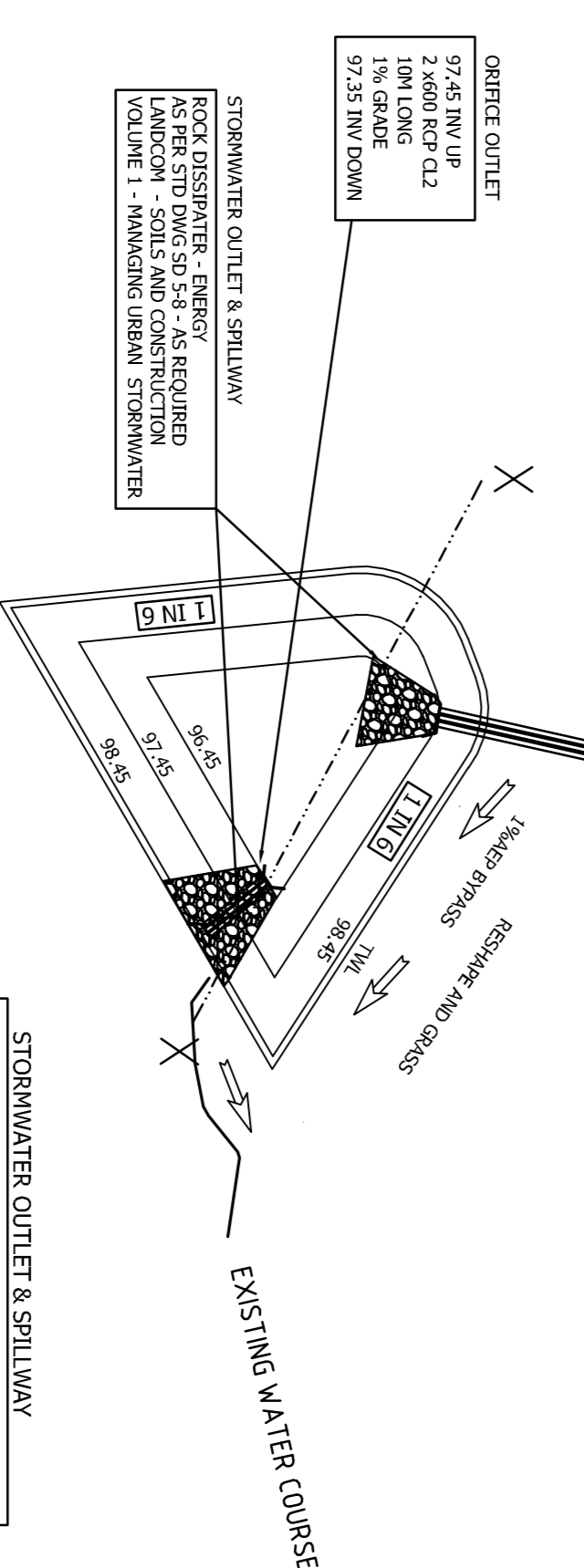
OVERFLOW TO ROAD LOW POINT
OVERFLOW TO ROAD LOW POINT
OVERFLOW TO ROAD LOW POINT
OVERFLOW TO ROAD LOW POINT
OVERFLOW TO ROAD LOW POINT



OUTLET ORIFACE
2.204 / 3 (TWIN PIPES) = 0.735 CUMSECS PER PIPE
DIA = (0.48 X Q / (0.735) / H (1.0) 0.5) 0.5
DIA = (0.353 / 1) 0.5
DIA = 0.594mm or 600 RCP CL2
THEREFORE 3 X 600 RCP CL2

GENERAL NOTES

THIS DESIGN MASTER PLAN IS BASED ON AR & R 1987 - CHAPTER 14 ANALYSIS AND IFD INTENSITIES SOURCED FROM CAMPBELLTOWN CITY COUNCIL
ALL EXISTING STORMWATER UPSTREAM OF ST ANDREWS ROAD SHALL BE DESIGNED TO BY PASS THE PROPOSED OSD BASIN FOR THE SITE - THIS INCLUDES THE EXISTING ST ANDREWS ROAD CATCHMENT.



STORMWATER OUTLET & SPILLWAY
ROCK DISPATER - ENERGY AS PER STD DWG SD 5-8 - AS REQUIRED LANDCOM - SOLTS AND CONSTRUCTION VOLUME 1 - MANAGING URBAN STORMWATER

REVISION	DESCRIPTION	DATE	BY	APP'D
A	RESUBMIT AND RELOCATION OF OSD AND POND ISSUE TO COUNCIL AND CLIENT FOR ZONING AMENDMENT	12/10/17	ANH	
B		22/1/18	ANH	

TABLE OF DIM	SCALE
1:1000	1:1000

LOCALITY	PROPERTY DESCRIPTION	SCALE
CAMPBELLTOWN	DERHAM COURT LOT 71 IN DP706546	1:1000

DESIGN	APPROVED	DATE	SHEET	DRAWING NUMBER	AMEND FILE
K9	ANH	OCT 2017	4 of 4	59904SD	59904