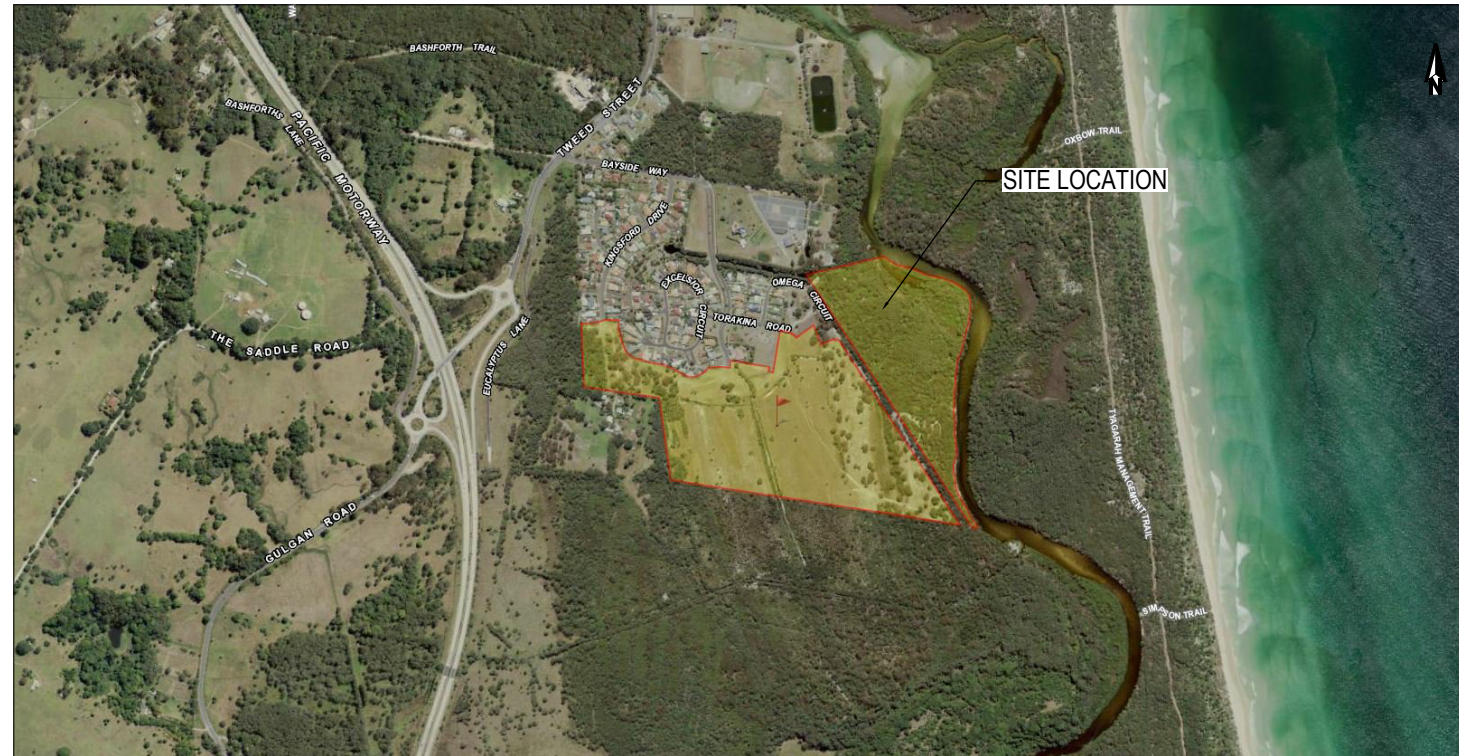


PROJECT: PROPOSED SUBDIVISION

PLANSET: CONCEPT STORMWATER MANAGEMENT PLAN

CLIENT: CLARENCE PROPERTY

DRAWING LIST		
DWG NO.	REV	DWG TITLE
GENERAL		
PS03-A000	H	COVER SHEET
DRAINAGE		
PS03-E600	D	ON SITE DETENTION CATCHMENT PLAN, MODEL & RESULTS (SHEET 1)
PS03-E601	D	ON SITE DETENTION CATCHMENT PLAN, MODEL & RESULTS (SHEET 2)
PS03-E700	E	WATER QUALITY CATCHMENT PLAN, MODEL & RESULTS (TTE)
PS03-E701	G	STAGE 1 - WATER QUALITY CATCHMENT PLAN (NORBE)
PS03-E702	G	STAGE 1 - WATER QUALITY MODEL & RESULTS (NORBE)
PS03-E703	D	STAGE 1 TO 2 - WATER QUALITY CATCHMENT PLAN (NORBE)
PS03-E704	D	STAGE 1 TO 2 - WATER QUALITY MODEL & RESULTS (NORBE)
PS03-E705	E	STAGE 1 TO 3 - WATER QUALITY CATCHMENT PLAN (NORBE)
PS03-E706	D	STAGE 1 TO 3 - WATER QUALITY MODEL & RESULTS (NORBE)
PS03-E707	A	STAGE 1 TO 4 - WATER QUALITY CATCHMENT PLAN (NORBE)
PS03-E708	A	STAGE 1 TO 4 - WATER QUALITY MODEL & RESULTS (NORBE)
PS03-E709	A	STAGE 1 TO 5 - WATER QUALITY CATCHMENT PLAN (NORBE)
PS03-E710	A	STAGE 1 TO 5 - WATER QUALITY MODEL & RESULTS (NORBE)



LOCALITY PLAN
NOT TO SCALE

LGA: BYRON SHIRE COUNCIL

15 TORAKINA ROAD, BRUNSWICK HEADS, NSW
LOT 13 DP 1251383

DEVELOPMENT APPLICATION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD	SCALE	GRID	DATUM	PROJECT MANAGER	CLIENT	DRAWING TITLE	
H	MINOR AMENDMENTS	13/03/2023	JS	TW	SL	SL				GT	CLARENCE PROPERTY	COVER SHEET	
G	MINOR AMENDMENTS	01/03/2023	YI	TW	SL	SL							
F	MINOR AMENDMENTS	24/02/2023	YI	TW	SL	SL							
E	MINOR AMENDMENTS	23/02/2023	NP/YI	TW	SL	SL							
D	MINOR AMENDMENTS	12/08/2022	NN	TW	SL	GT							
C	MINOR AMENDMENTS	08/08/2022	NN	TW	SL	GT							
B	MINOR AMENDMENTS	03/09/2021	JS	EZ	SL	GT							
A	INITIAL RELEASE	17/08/2021	JS	EZ	SL	GT							

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PROJECT NAME/PLANSET TITLE
PROPOSED SUBDIVISION
CONCEPT STORMWATER MANAGEMENT PLAN
LOT 13 DP 1251383 BRUNSWICK HEADS, NSW



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Geotechnical
Civil

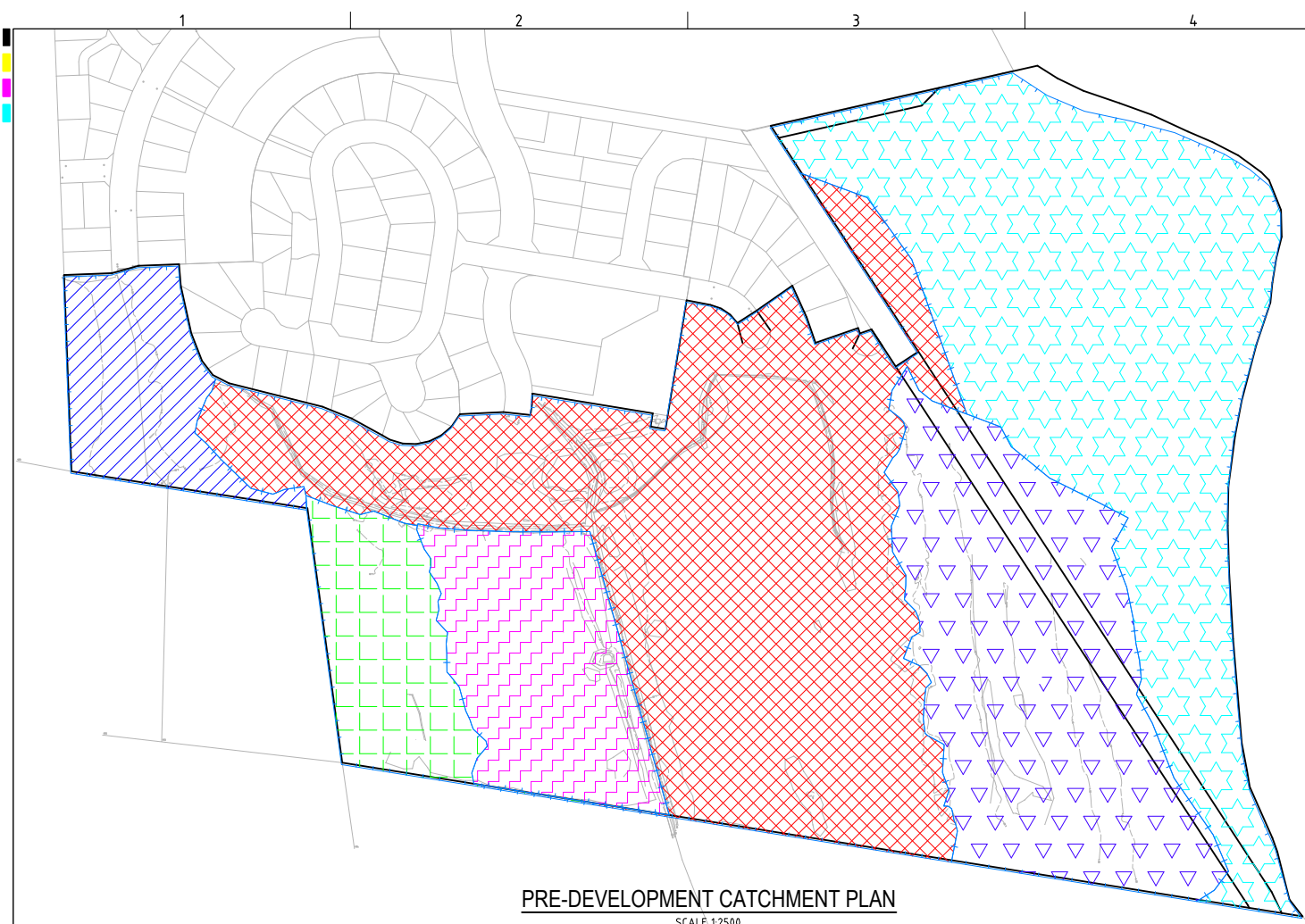
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PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P2008063	PS03	R09	PS03-A000	H

DRAWING ID: P2008063-PS03-R09-A000

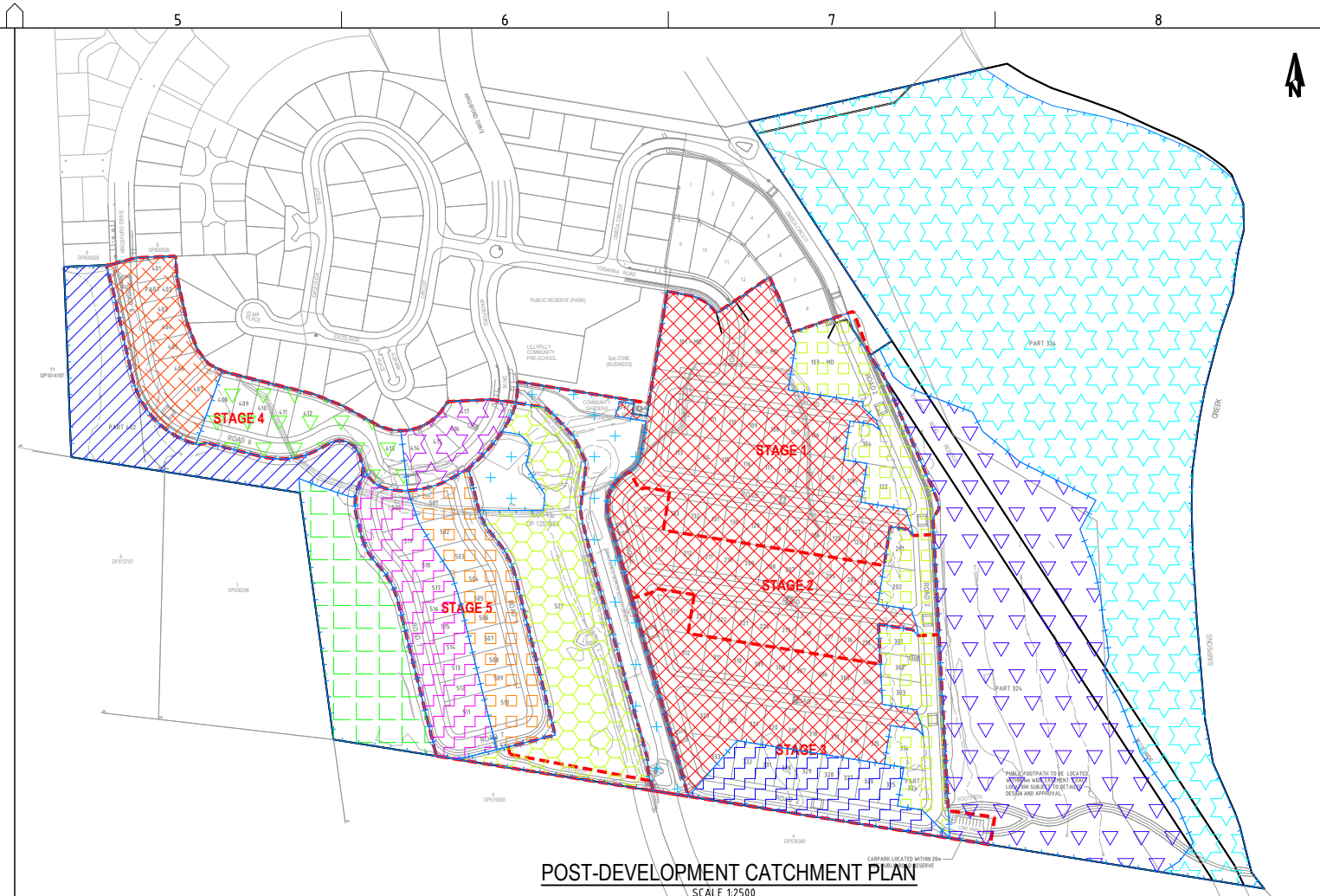
PRINTED: USER: JSMANZ

AT 7 A3 LANDSCAPE (ATEL_022.01)



PRE-DEVELOPMENT CATCHMENT PLAN

SCALE 1:2500



POST-DEVELOPMENT CATCHMENT PLAN

SCALE 1:2500

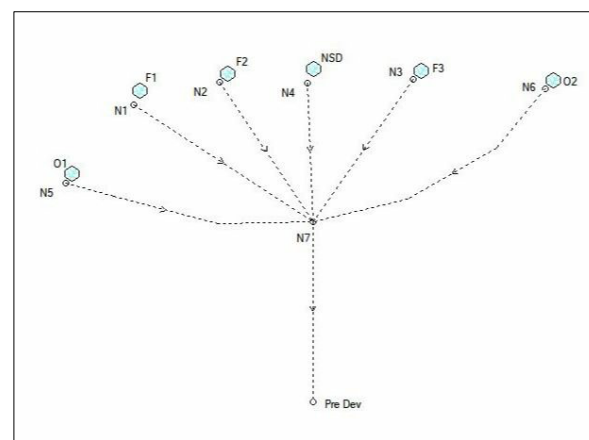
PRE DEVELOPMENT DRAINS CATCHMENTS (P2008063DRN01V10)

KEY	DRAINS CAT	DESCRIPTION	AREA (ha)	%PAVED	Tc Path Length (m)	Tc Path Slope (%)	Tc Paved (min)	Tc GRASS (min)
	F1	FROG HABITAT 01	1.934	0	35	1	0	12
	F2	FROG HABITAT 02	2.577	0	38	1	0	12
	F3	FROG HABITAT 03	5.552	0	87	3.4	0	14
	NSD	NS DRAIN	10.700	0	65	1	0	13
	O1	AREA BYPASSING	1.511	0	50	4	0	10
	O2	AREA BYPASSING	9.137	0	160	3	0	16
		TOTAL - AREA	31.411	= 100 % OF OVERALL AREA				
		TOTAL - IMPERVIOUS	0.000	= 0 % OF OVERALL AREA				
		TOTAL - PERVIOUS	31.411	= 100 % OF OVERALL AREA				

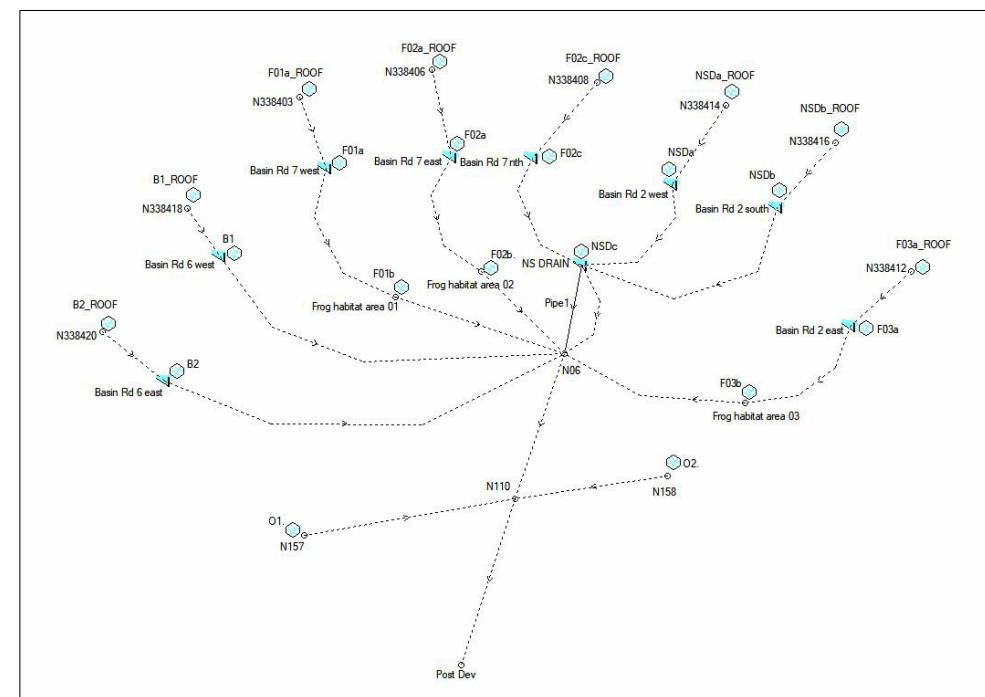
POST DEVELOPMENT DRAINS CATCHMENTS (P2008063DRN01V10)

KEY	DRAINS CAT	DESCRIPTION	AREA (ha)	%PAVED	Tc Path Length (m)	Tc Path Slope (%)	Tc Paved (min)	Tc GRASS (min)
	F01a_ROOF	ROOF TO OSD BASIN	0.275	100	x	x	5	0
	F01a	ROAD 7 WEST TO OSD BASIN	0.704	4.0	-	-	6	8
	F01b	F01 BYPASSING OSD BASIN	1.200	0	35	1	0	12
	F02a_ROOF	ROOF TO OSD BASIN	0.292	100	x	x	5	0
	F02a	ROAD 7 EAST TO OSD BASIN	0.673	38	-	-	6	8
	F02b	F02 BYPASSING OSD BASIN	1.783	0	38	1	0	12
	F02c_ROOF	ROOF TO OSD BASIN	0.102	100	x	x	5	0
	F02c	ROAD 7 NORTH TO OSD BASIN	0.272	4.2	-	-	6	8
	F03a_ROOF	ROOF TO OSD BASIN	0.443	100	x	x	5	0
	F03a	ROAD 2 EAST TO OSD BASIN	1.147	4.6	-	-	6	8
	F03b	F03 BYPASSING OSD BASIN	4.429	0	87	3.4	0	14
	NSDa_ROOF	ROOF TO OSD BASIN	2.056	100	x	x	5	0
	NSDa	ROAD 2 WEST TO OSD BAIN	3.856	39	-	-	6	8
	NSDb_ROOF	ROOF TO OSD BASIN	0.208	100	x	x	5	0
	NSDb	ROAD 2 SOUTH TO OSD BASIN	0.540	38	-	-	6	8
	NSDc	AREA TO NS DRAIN	1.150	0	45	3.25	0	9
	B1_ROOF	ROOF TO OSD BASIN	0.208	100	x	x	5	0
	B1	ROAD 6 WEST TO OSD BASIN	0.502	4.7	-	-	6	8
	B2_ROOF	ROOF TO OSD BASIN	0.195	100	x	x	5	0
	B2	ROAD 6 EAST TO OSD BASIN	0.512	4.1	-	-	6	8
	O1	AREA BYPASSING	1.187	0	50	4	0	10
	O2	AREA BYPASSING	9.681	0	160	3	0	16
		TOTAL - AREA	31.411	= 100 % OF OVERALL AREA				
		TOTAL - IMPERVIOUS	7.134	= 23 % OF OVERALL AREA				
		TOTAL - PERVIOUS	24.278	= 77 % OF OVERALL AREA				

NOTES
 Grass Tc was calculated using the Friend's equation for overland sheet flow and Horton's surface roughness (n).
 *Roof Tc assumed to be 5 minutes based on typical runoff travel times for roof drainage systems.
 *Road Tc assumed to be 6 minutes based on typical runoff travel times for road surfaces and paved areas.



PRE-DEVELOPMENT MODELLING LAYOUT (P2008063DRN01V10)



POST-DEVELOPMENT MODELLING LAYOUT (P2008063DRN01V10)

DEVELOPMENT APPLICATION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
D	MINOR AMENDMENTS	24/02/2023	YI	TW	SL	SL
C	MINOR AMENDMENTS	12/08/2022	NN	TW	SL	GT
B	MINOR AMENDMENTS	08/08/2022	NN	TW	SL	GT
A	INITIAL RELEASE	17/08/2021	JS	EZ	SL	GT

SCALE
 0 25 50 75 100 125 150 175 200 225 250
 A1 (A3) 1:2,500 (1:5,000)
 METRES

GRID
 DATUM
 PROJECT MANAGER
 GT
 CLIENT
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 PROJECT NAME/PLANSSET TITLE
 PROPOSED SUBDIVISION
 CONCEPT STORMWATER MANAGEMENT PLAN
 LOT 13 DP 1251383 BRUNSWICK HEADS, NSW

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DRAWING TITLE				
ON SITE DETENTION CATCHMENT PLAN, MODEL & RESULTS SHEET 1				
PROJECT NO.	PLANSSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P2008063	PS03	R09	PS03-E600	D

DRAINS PRE VS POST DEVELOPMENT MODELLING RESULTS (P2008063DRN01V10)																					
DURATION	1			2			5			10			20			50			100		
	PRE	POST	DIFFERENCE	PRE	POST	DIFFERENCE	PRE	POST	DIFFERENCE	PRE	POST	DIFFERENCE	PRE	POST	DIFFERENCE	PRE	POST	DIFFERENCE	PRE	POST	DIFFERENCE
5 min	0.438	0.225	-0.213	1.532	0.835	-0.697	2.756	1.517	-1.239	4.103	2.277	-1.826	5.036	2.941	-2.095	6.806	4.538	-2.268	7.708	5.219	-2.489
10 min	1.164	0.637	-0.527	2.838	1.604	-1.234	4.834	3.143	-1.691	7.173	4.887	-2.286	8.718	6.431	-2.287	11.723	9.966	-1.757	13.204	11.558	-1.646
15 min	1.469	0.923	-0.546	3.594	2.581	-1.013	6.175	4.511	-1.664	9.263	7.697	-1.566	11.094	9.547	-1.547	14.732	12.218	-2.514	16.469	13.576	-2.893
20 min	2.042	1.275	-0.767	4.286	3.112	-1.174	7.253	6.169	-1.084	10.476	9.117	-1.359	12.686	11.125	-1.561	16.346	13.783	-2.563	18.328	15.316	-3.012
25 min	2.135	1.496	-0.639	4.594	3.490	-1.104	7.696	6.989	-0.707	11.153	9.987	-1.166	13.397	12.012	-1.385	16.266	14.136	-2.130	18.165	15.682	-2.483
30 min	1.891	1.440	-0.451	4.332	3.284	-1.048	7.282	6.518	-0.764	10.667	9.483	-1.184	12.866	11.482	-1.384	15.784	13.681	-2.103	17.799	15.319	-2.480
45 min	1.897	1.540	-0.357	4.192	3.203	-0.989	7.142	6.403	-0.739	10.358	9.027	-1.331	12.430	10.783	-1.647	15.685	13.349	-2.336	17.625	14.896	-2.729
1 hour	2.838	2.218	-0.620	5.233	4.476	-0.757	8.014	7.838	-0.176	11.243	10.373	-0.870	13.324	12.139	-1.185	16.144	14.294	-1.850	18.197	16.020	-2.177
15 hours	3.117	2.530	-0.587	5.764	5.536	-0.228	8.628	8.564	-0.064	11.180	10.576	-0.604	13.138	12.236	-0.902	15.542	14.150	-1.392	17.392	16.409	-0.983
2 hours	3.323	2.668	-0.655	6.346	5.999	-0.347	9.415	8.822	-0.593	11.817	10.710	-1.107	13.769	12.293	-1.476	16.272	14.813	-1.459	18.280	17.318	-0.962
3 hours	1.718	1.562	-0.156	4.534	3.595	-0.939	6.865	6.710	-0.155	8.980	8.362	-0.618	10.632	9.725	-0.907	12.396	11.153	-1.243	13.857	12.658	-1.199

OVERFLOWS FROM BIORETENTION BASINS ENTERING FROG HABITATS (P2008063DRN01V10)									
Storm Event	Wallum Froglet 01			Wallum Froglet 02			Wallum Froglet 03		
	1	2	5	1	2	5	1	2	5
5 min	0	0	0	0	0	0	0	0	0
10 min	0	0	0	0	0	0	0	0	0
15 min	0	0	0	0	0	0	0	0	0
20 min	0	0	0.167	0	0	0.170	0	0	0.293
25 min	0	0	0.242	0	0	0.244	0	0	0.415
30 min	0	0.021	0.201	0	0.026	0.203	0	0.073	0.349
45 min	0	0.103	0.199	0	0.103	0.199	0	0.181	0.340
1 hour	0	0.120	0.344	0	0.119	0.341	0.026	0.207	0.575
15 hours	0.038	0.191	0.434	0.039	0.193	0.429	0.069	0.340	0.714
2 hours	0.054	0.206	0.408	0.053	0.206	0.403	0.090	0.357	0.670
3 hours	0.062	0.101	0.255	0.062	0.104	0.251	0.107	0.196	0.418

DEVELOPMENT APPLICATION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD	SCALE
D	MINOR AMENDMENTS	24/02/2023	YI	TW	SL	SL	
C	MINOR AMENDMENTS	12/08/2022	NN	TW	SL	GT	
B	MINOR AMENDMENTS	08/08/2022	NN	TW	SL	GT	
A	INITIAL RELEASE	17/08/2021	JS	EZ	SL	GT	

GRID	DATUM	PROJECT MANAGER	CLIENT
		GT	CLARENCE PROPERTY

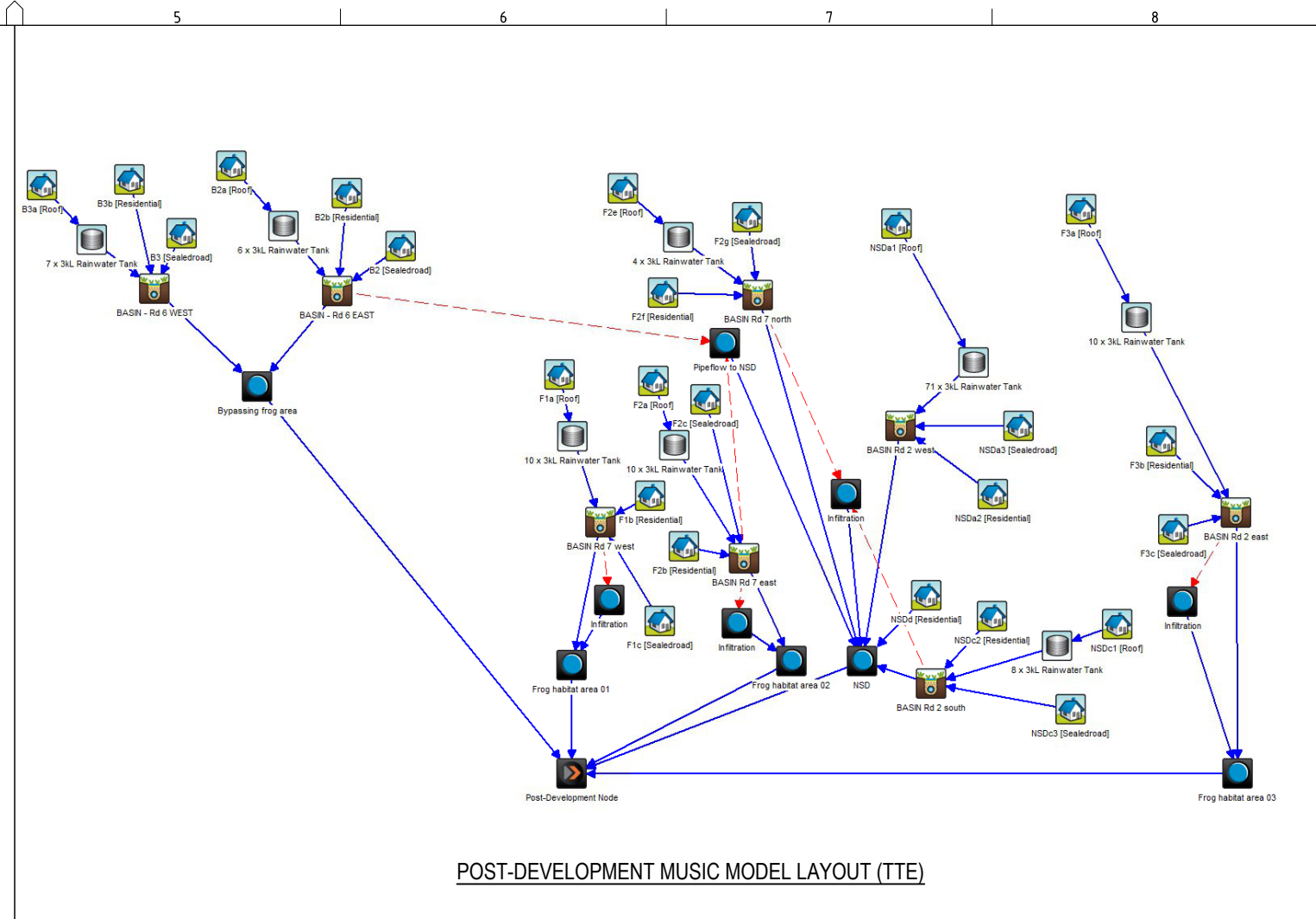
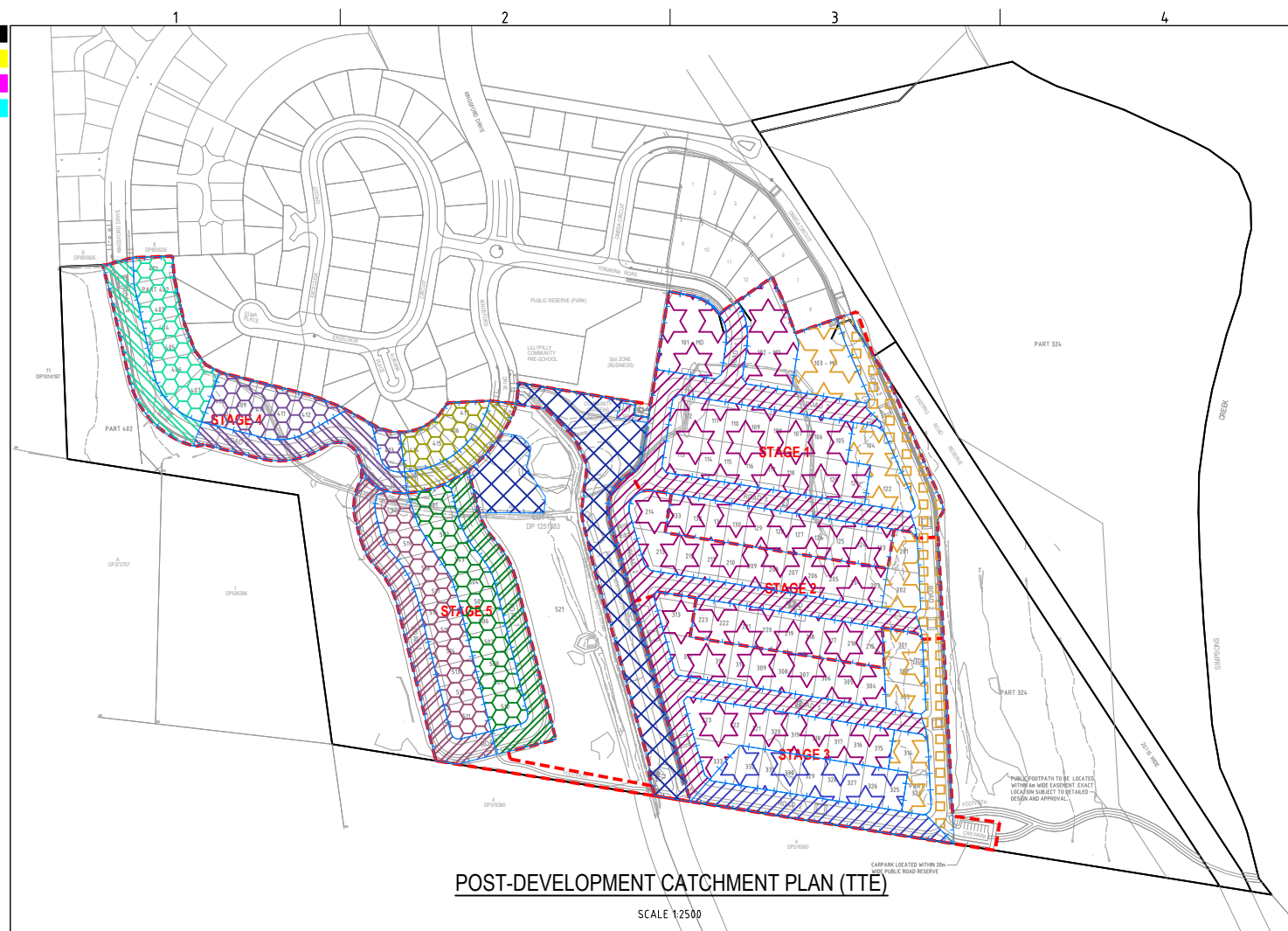
PROJECT NAME/PLANSET TITLE
PROPOSED SUBDIVISION
 CONCEPT STORMWATER MANAGEMENT PLAN
 LOT 13 DP 1251383 BRUNSWICK HEADS, NSW



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DRAWING TITLE				
ON SITE DETENTION CATCHMENT PLAN, MODEL & RESULTS SHEET 2				
PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P2008063	PS03	R09	PS03-E601	D



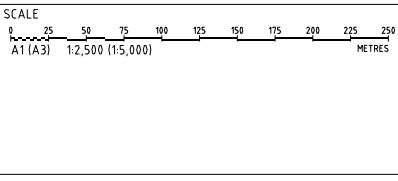
POST DEVELOPMENT MUSIC CATCHMENTS (P2008063MUS01V10)											
KEY	DESCRIPTION	MUSIC NODE ID	AREA (ha)	IMPERVIOUS %	MUSIC NODE REFERENCE	KEY	DESCRIPTION	MUSIC NODE ID	AREA (ha)	IMPERVIOUS %	MUSIC NODE REFERENCE
BASIN - ROAD 7 WEST						BASIN - ROAD 6 EAST					
[Pattern]	ROOF	F1a	0.275	100	Waterbydesign 2010	[Pattern]	ROOF	B2a	0.195	100	Waterbydesign 2010
[Pattern]	REMAINING LOT	F1b	0.357	20	Waterbydesign 2010	[Pattern]	REMAINING LOT AREA	B2b	0.195	20	Waterbydesign 2010
[Pattern]	SEALED ROAD	F1c	0.417	51	Waterbydesign 2010	[Pattern]	SEALED ROAD	B2	0.317	54	Waterbydesign 2010
BASIN - ROAD 7 EAST						BASIN - ROAD 2 EAST					
[Pattern]	ROOF	F2a	0.275	100	Waterbydesign 2010	[Pattern]	ROOF	F3a	0.443	100	Waterbydesign 2010
[Pattern]	REMAINING LOT	F2b	0.292	25	Waterbydesign 2010	[Pattern]	REMAINING LOT	F3b	0.454	30	Waterbydesign 2010
[Pattern]	SEALED ROAD	F2c	0.398	52	Waterbydesign 2010	[Pattern]	SEALED ROAD	F3c	0.693	57	Waterbydesign 2010
BASIN - ROAD 7 NORTH						BASIN - ROAD 2 WEST					
[Pattern]	ROOF	F2e	0.102	100	Waterbydesign 2010	[Pattern]	ROOF	NSDa1	2.056	100	Waterbydesign 2010
[Pattern]	REMAINING LOT AREA	F2f	0.102	20	Waterbydesign 2010	[Pattern]	REMAINING LOT	NSDa2	2.059	24	Waterbydesign 2010
[Pattern]	SEALED ROAD	F2g	0.170	55	Waterbydesign 2010	[Pattern]	SEALED ROAD	NSDa3	1.797	57	Waterbydesign 2010
BASIN - ROAD 6 WEST						BASIN - ROAD 2 SOUTH					
[Pattern]	ROOF	B3a	0.208	100	Waterbydesign 2010	[Pattern]	ROOF	NSDc1	0.208	100	Waterbydesign 2010
[Pattern]	REMAINING LOT AREA	B3b	0.208	42	Waterbydesign 2010	[Pattern]	REMAINING LOT	NSDc2	0.208	20	Waterbydesign 2010
[Pattern]	SEALED ROAD	B3	0.294	51	Waterbydesign 2010	[Pattern]	SEALED ROAD	NSDc3	0.333	49	Waterbydesign 2010
						[Pattern]	RESIDENTIAL	NSDd	1.150	0	Waterbydesign 2010
							TOTAL AREA				
							TOTAL - OVERALL	13.201		= 100 % OF OVERALL AREA	
							TOTAL - IMPERVIOUS	7.140		= 54 % OF OVERALL AREA	
							TOTAL - PERVIOUS	6.061		= 46 % OF OVERALL AREA	

Treatment Train Effectiveness - Post-Development Node			
	Sources	Residual Load	% Reduction
Flow (ML/yr)	184	157	14.6
Total Suspended Solids (kg/yr)	33600	2550	92.4
Total Phosphorus (kg/yr)	67.4	25.6	61.9
Total Nitrogen (kg/yr)	379	143	62.2
Gross Pollutants (kg/yr)	3430	0	100

Warning - upstream treatment train includes losses

MUSIC MODEL RESULTS (TTE)

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
E	MINOR AMENDMENTS	01/03/2023	YI	TW	SL	SL
D	MINOR AMENDMENTS	12/08/2022	NN	TW	SL	GT
C	MINOR AMENDMENTS	08/08/2022	NN	TW	SL	GT
B	MINOR AMENDMENTS	03/09/2021	JS	EZ	SL	GT
A	INITIAL RELEASE	17/08/2021	JS	EZ	SL	GT



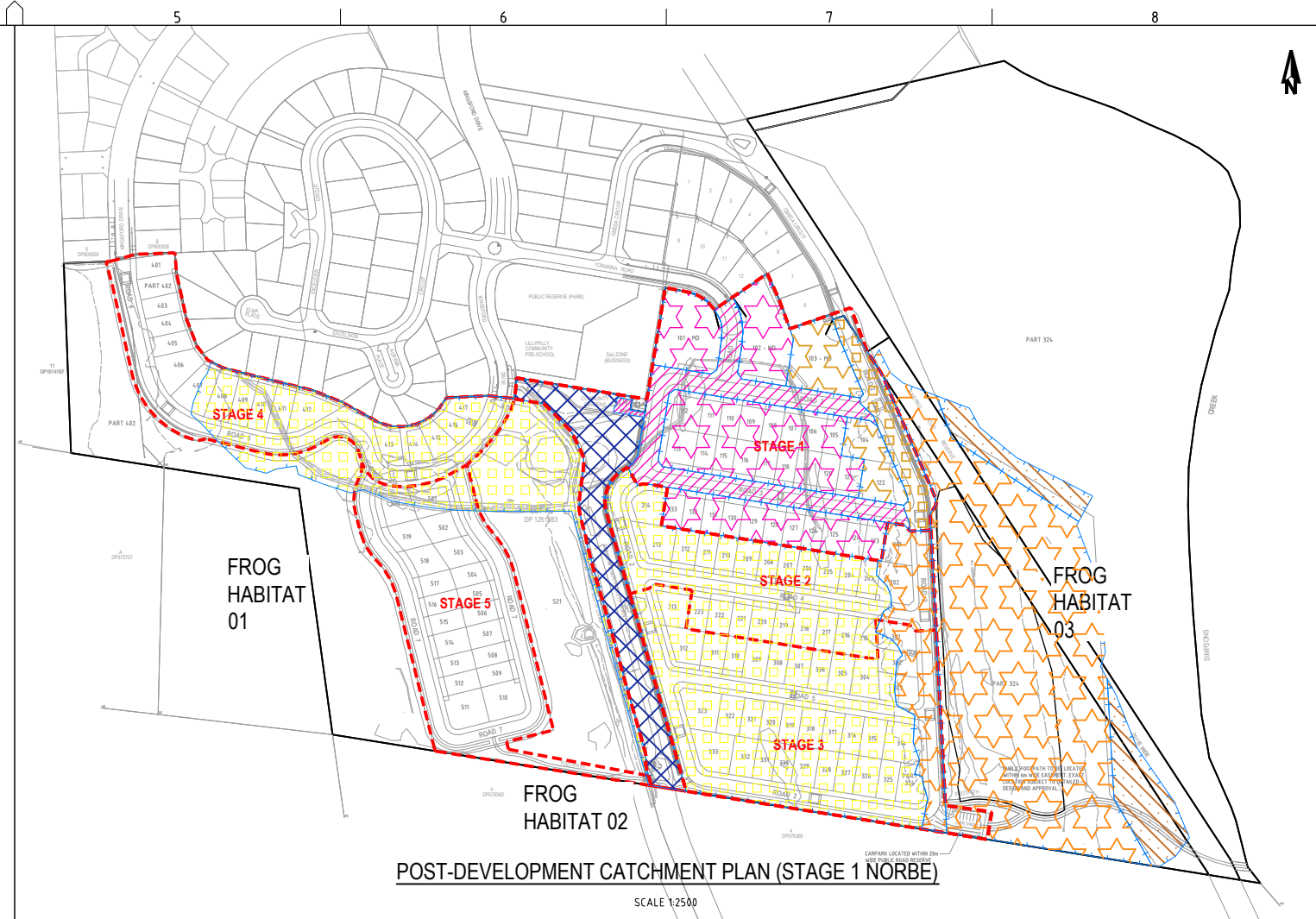
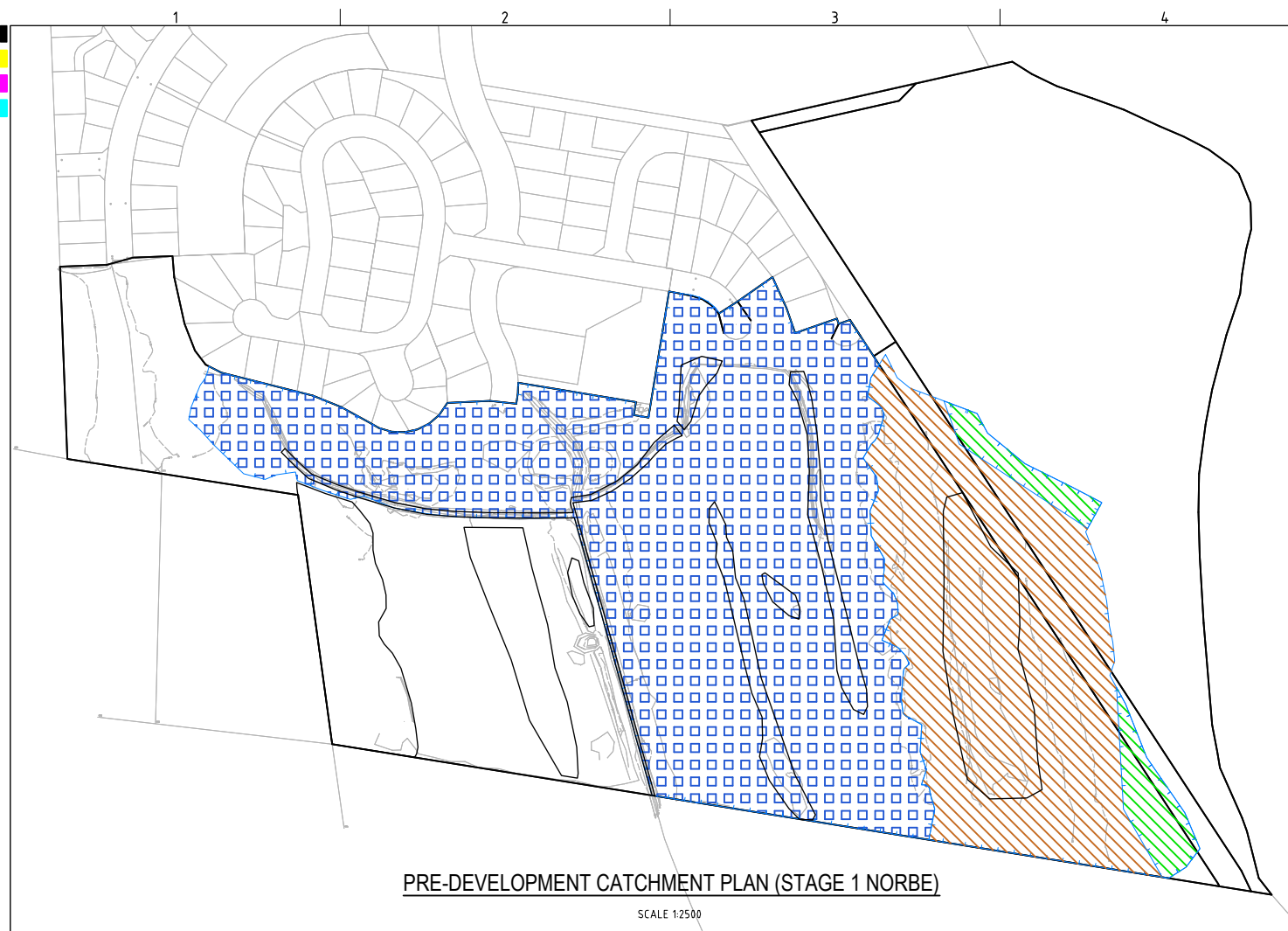
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DRAWING TITLE				
WATER QUALITY CATCHMENT PLAN, MODEL & RESULTS (TTE)				
PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P2008063	PS03	R09	PS03-E700	E

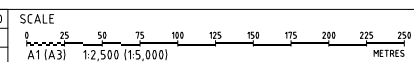
DEVELOPMENT APPLICATION



PRE DEVELOPMENT MUSIC CATCHMENTS (P2008063MUS01V11 - STAGE 1)					
KEY	DESCRIPTION	MUSIC NODE ID	AREA (ha)	IMPERVIOUS %	MUSIC NODE REFERENCE
[Green/Blue Pattern]	RESIDENTIAL TO FROG HABITAT 03	F3a	3.899	0	Waterbydesign 2010
[Green/Blue Pattern]	FOREST TO FROG HABITAT 03	F3b	0.618	0	Waterbydesign 2010
[Blue/Orange Pattern]	UNSEALED ROAD TO FROG HABITAT 03	F3c	1.035	50	Waterbydesign 2010
[Blue/Orange Pattern]	RESIDENTIAL TO NS DRAIN	NSDa	9.114	0	Waterbydesign 2010
[Blue/Orange Pattern]	UNSEALED ROAD TO NS DRAIN	NSDb	1.071	50	Waterbydesign 2010
TOTAL AREA					
TOTAL - OVERALL			15.737		= 100 % OF OVERALL AREA
TOTAL - IMPERVIOUS			1.053		= 7 % OF OVERALL AREA
TOTAL - PERVIOUS			14.684		= 93 % OF OVERALL AREA

POST DEVELOPMENT MUSIC CATCHMENTS (P2008063MUS01V11 - STAGE 1)					
KEY	DESCRIPTION	MUSIC NODE ID	AREA (ha)	IMPERVIOUS %	MUSIC NODE REFERENCE
BASIN - ROAD 2 EAST					
[Blue/Orange Pattern]	ROOF	F3a	0.209	100	Waterbydesign 2010
[Blue/Orange Pattern]	REMAINING LOT	F3b	0.221	4.1	Waterbydesign 2010
[Blue/Orange Pattern]	SEALED ROAD	F3c	0.319	58	Waterbydesign 2010
[Blue/Orange Pattern]	RESI	F3d	2.883	0	Waterbydesign 2010
[Blue/Orange Pattern]	FOREST	F3e	0.618	0	Waterbydesign 2010
[Blue/Orange Pattern]	FROG HABITAT AREA (RESI)	F3f	1.606	0	Waterbydesign 2010
BASIN - ROAD 2 WEST					
[Blue/Orange Pattern]	ROOF	NSDa1	0.966	100	Waterbydesign 2010
[Blue/Orange Pattern]	REMAINING LOT	NSDa2	0.969	29	Waterbydesign 2010
[Blue/Orange Pattern]	SEALED ROAD	NSDa3	0.802	49	Waterbydesign 2010
BASIN - ROAD 2 SOUTH					
[Blue/Orange Pattern]	RESIDENTIAL	NSDd	0.905	0	Waterbydesign 2010
ADDITIONAL NSD CATCHMENT					
[Blue/Orange Pattern]	RESIDENTIAL TO FROG NS DRAIN	NSDa	6.237	0	Waterbydesign 2010
TOTAL AREA					
TOTAL - OVERALL			15.735		= 100 % OF OVERALL AREA
TOTAL - IMPERVIOUS			2.118		= 13 % OF OVERALL AREA
TOTAL - PERVIOUS			13.617		= 87 % OF OVERALL AREA

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
G	MINOR AMENDMENTS	13/03/2023	JS	TW	SL	SL
F	MINOR AMENDMENTS	24/02/2023	YI	TW	SL	SL
E	MINOR AMENDMENTS	23/02/2023	NP/YI	TW	SL	SL
D	MINOR AMENDMENTS	12/08/2022	NN	TW	SL	GT
C	MINOR AMENDMENTS	08/08/2022	NN	TW	SL	GT
B	MINOR AMENDMENTS	03/09/2021	JS	EZ	SL	GT
A	INITIAL RELEASE	17/08/2021	JS	EZ	SL	GT



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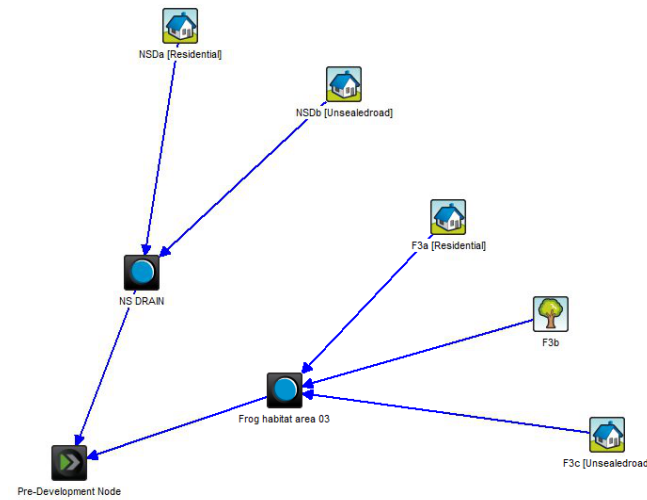
PROJECT NAME/PLANSET TITLE
PROPOSED SUBDIVISION
CONCEPT STORMWATER MANAGEMENT PLAN
LOT 13 DP 1251383 BRUNSWICK HEADS, NSW



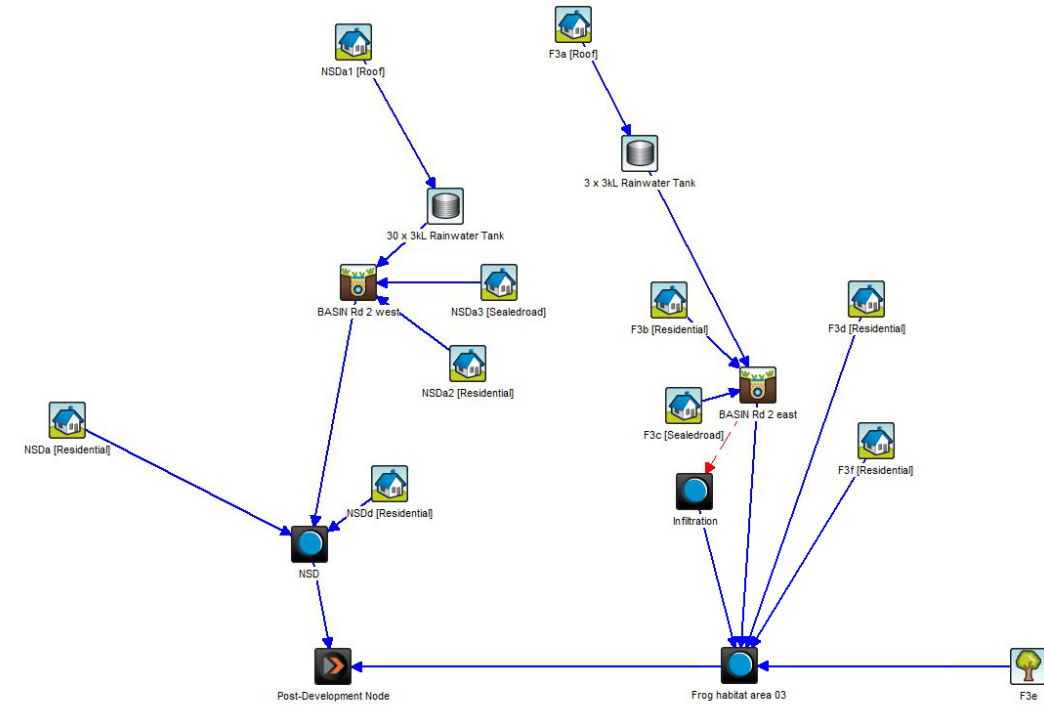
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DEVELOPMENT APPLICATION

DRAWING TITLE				
STAGE 1 - WATER QUALITY CATCHMENT PLAN (INORBE)				
PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P2008063	PS03	R09	PS03-E701	G



PRE-DEVELOPMENT MUSIC MODEL LAYOUT
(STAGE 1 NORBE)



POST-DEVELOPMENT MUSIC MODEL LAYOUT
(STAGE 1 NORBE)

OVERALL MUSIC MODELLING RESULTS (P2008063MUS01V11 - STAGE 1)				
PARAMETER	PRE-DEVELOPMENT	POST-DEVELOPMENT	REDUCTION	% CHANGE
Flow (ML/yr)	14.7	14.8	-1	1%
Total Suspended Solids (kg/yr)	26700	15300	11400	-43%
Total Phosphorus (kg/yr)	53.6	38.9	14.7	-27%
Total Nitrogen (kg/yr)	288	235	53	-18%
Gross Pollutants (kg/yr)	580	0	580	0%

MUSIC MODELLING RESULTS_NORBE_FROG HABITAT 03 (P2008063MUS01V11 - STAGE 1)				
PARAMETER	PRE-DEVELOPMENT	POST-DEVELOPMENT	REDUCTION	% CHANGE
Flow (ML/yr)	53.2	53.2	0	0%
Total Suspended Solids (kg/yr)	10300	6090	4210	-41%
Total Phosphorus (kg/yr)	19.5	14.2	5.3	-27%
Total Nitrogen (kg/yr)	99.6	90.4	9.2	-9%
Gross Pollutants (kg/yr)	285	0	285	0%

MUSIC MODELLING RESULTS_NORBE_NS DRAIN (P2008063MUS01V11 - STAGE 1)				
PARAMETER	PRE-DEVELOPMENT	POST-DEVELOPMENT	REDUCTION	% CHANGE
Flow (ML/yr)	94.2	95.3	-1.1	1%
Total Suspended Solids (kg/yr)	16400	9220	7180	-44%
Total Phosphorus (kg/yr)	34.1	24.7	9.4	-28%
Total Nitrogen (kg/yr)	188	145	43	-23%
Gross Pollutants (kg/yr)	295	0	295	0%

DEVELOPMENT APPLICATION

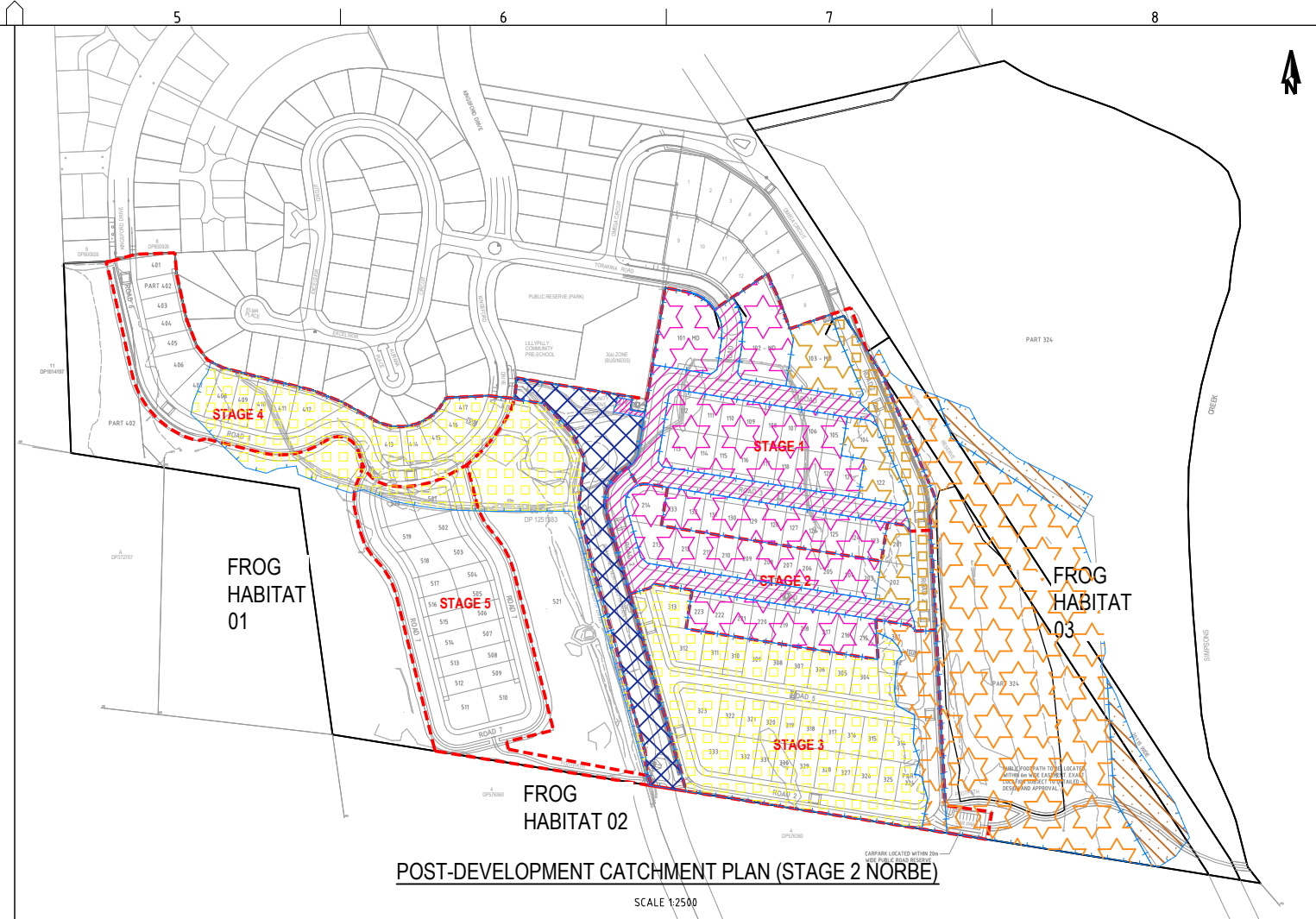
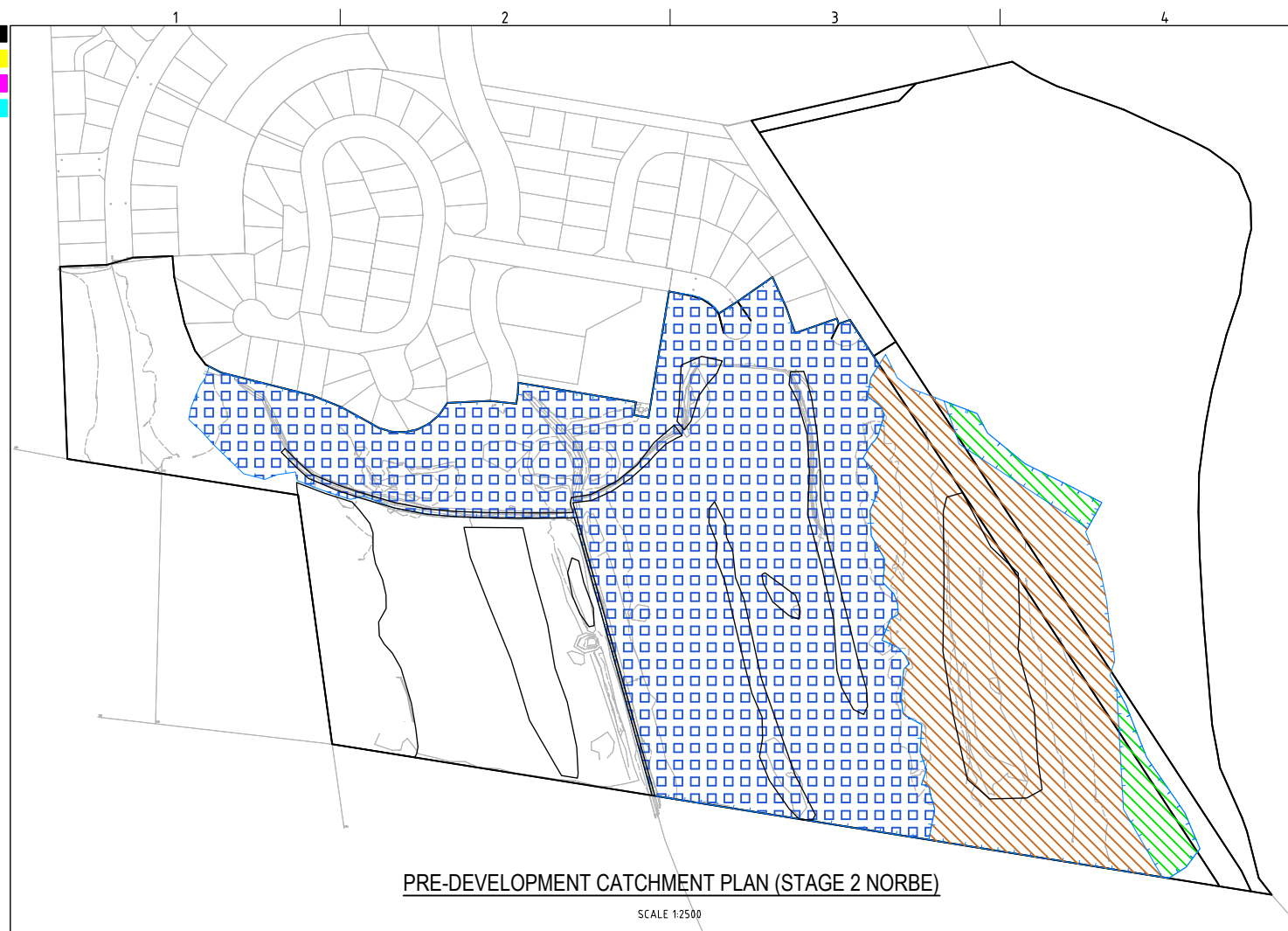
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F	MINOR AMENDMENTS	24/02/2023	YI	TW	SL	SL	
E	MINOR AMENDMENTS	23/02/2023	NP/YI	TW	SL	SL	
D	MINOR AMENDMENTS	12/08/2022	NN	TW	SL	GT	
C	MINOR AMENDMENTS	08/08/2022	NN	TW	SL	GT	
B	MINOR AMENDMENTS	03/09/2021	JS	EZ	SL	GT	
A	INITIAL RELEASE	17/08/2021	JS	EZ	SL	GT	

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PROJECT NAME/PLANSET TITLE PROPOSED SUBDIVISION CONCEPT STORMWATER MANAGEMENT PLAN LOT 13 DP 1251383 BRUNSWICK HEADS, NSW			


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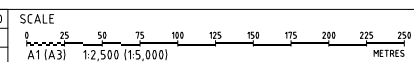
DRAWING TITLE				
STAGE 1 - WATER QUALITY MODEL & RESULTS (NORBE)				
PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P2008063	PS03	R09	PS03-E702	G



PRE DEVELOPMENT MUSIC CATCHMENTS (P2008063MUS01V11 - STAGE 2)					
KEY	DESCRIPTION	MUSIC NODE ID	AREA (ha)	IMPERVIOUS %	MUSIC NODE REFERENCE
[Green Hatched]	RESIDENTIAL TO FROG HABITAT 03	F3a	3.899	0	Waterbydesign 2010
[Blue Hatched]	FOREST TO FROG HABITAT 03	F3b	0.618	0	Waterbydesign 2010
[Orange Hatched]	UNSEALED ROAD TO FROG HABITAT 03	F3c	1.035	50	Waterbydesign 2010
[Blue Dotted]	RESIDENTIAL TO NS DRAIN	NSDa	9.114	0	Waterbydesign 2010
[Blue Grid]	UNSEALED ROAD TO NS DRAIN	NSDb	1.071	50	Waterbydesign 2010
TOTAL AREA					
TOTAL - OVERALL			15.737	= 100 % OF OVERALL AREA	
TOTAL - IMPERVIOUS			1.053	= 7 % OF OVERALL AREA	
TOTAL - PERVIOUS			14.684	= 93 % OF OVERALL AREA	

POST DEVELOPMENT MUSIC CATCHMENTS (P2008063MUS01V11 - STAGE 2)					
KEY	DESCRIPTION	MUSIC NODE ID	AREA (ha)	IMPERVIOUS %	MUSIC NODE REFERENCE
BASIN - ROAD 2 EAST					
[Orange Hatched]	ROOF	F3a	0.280	100	Waterbydesign 2010
[Blue Hatched]	REMAINING LOT	F3b	0.291	41	Waterbydesign 2010
[Orange Hatched]	SEALED ROAD	F3c	0.446	58	Waterbydesign 2010
[Blue Hatched]	RESI	F3d	2.596	0	Waterbydesign 2010
[Blue Hatched]	FOREST	F3e	0.618	0	Waterbydesign 2010
[Blue Hatched]	FROG HABITAT AREA (RESI)	F3f	1.606	0	Waterbydesign 2010
BASIN - ROAD 2 WEST					
[Blue Hatched]	ROOF	NSDa1	1.507	100	Waterbydesign 2010
[Blue Hatched]	REMAINING LOT	NSDa2	1.510	29	Waterbydesign 2010
[Blue Hatched]	SEALED ROAD	NSDa3	1.269	49	Waterbydesign 2010
BASIN - ROAD 2 SOUTH					
[Blue Hatched]	RESIDENTIAL	NSDd	0.905	0	Waterbydesign 2010
ADDITIONAL NSD CATCHMENT					
[Blue Grid]	RESIDENTIAL TO FROG NS DRAIN	NSDa	4.707	0	Waterbydesign 2010
TOTAL AREA					
TOTAL - OVERALL			15.735	= 100 % OF OVERALL AREA	
TOTAL - IMPERVIOUS			3.229	= 21 % OF OVERALL AREA	
TOTAL - PERVIOUS			12.506	= 79 % OF OVERALL AREA	

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
D	MINOR AMENDMENTS	13/03/2023	JS	TW	SL	SL
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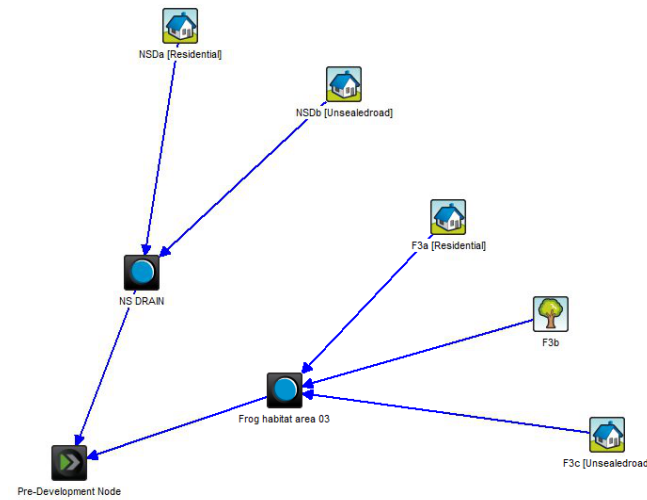
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LOT 13 DP 1251383 BRUNSWICK HEADS, NSW



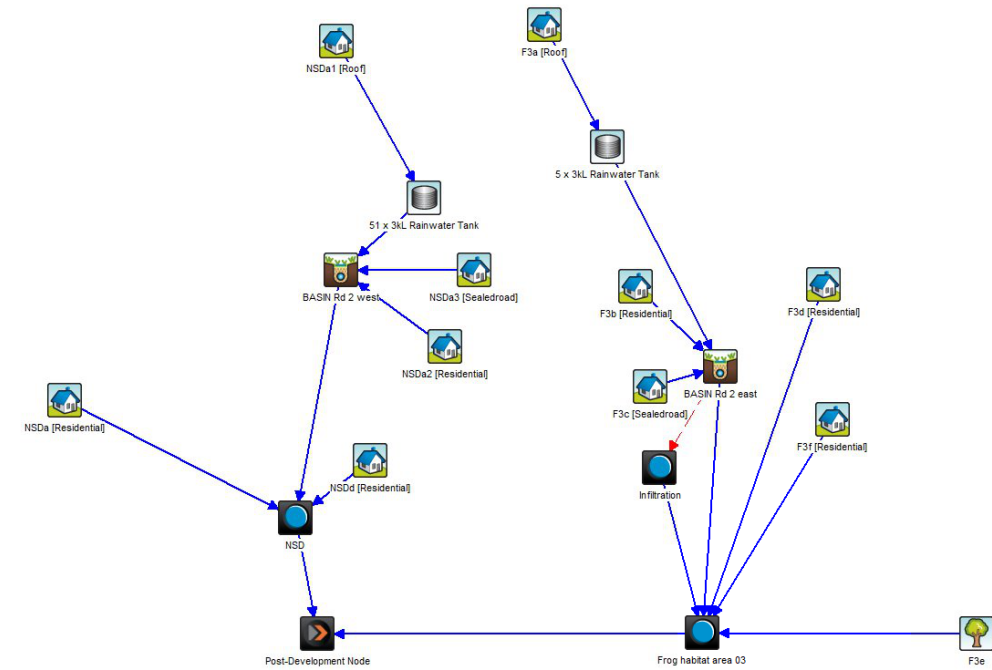
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DEVELOPMENT APPLICATION

DRAWING TITLE STAGE 1 TO 2 - WATER QUALITY CATCHMENT PLAN (NORBE)				
PROJECT NO. P2008063	PLANSET NO. PS03	RELEASE NO. R09	DRAWING NO. PS03-E703	REVISION D



PRE-DEVELOPMENT MUSIC MODEL LAYOUT
(STAGE 2 NORBE)



POST-DEVELOPMENT MUSIC MODEL LAYOUT
(STAGE 2 NORBE)

OVERALL MUSIC MODELLING RESULTS (P2008063MUS01V11 - STAGE 2)				
PARAMETER	PRE-DEVELOPMENT	POST-DEVELOPMENT	REDUCTION	% CHANGE
Flow (ML/yr)	147	156	-9	6%
Total Suspended Solids (kg/yr)	26700	13200	13500	-51%
Total Phosphorus (kg/yr)	54.8	36.7	18.1	-33%
Total Nitrogen (kg/yr)	285	224	61	-21%
Gross Pollutants (kg/yr)	580	0	580	0%

MUSIC MODELLING RESULTS_NORBE_FROG HABITAT 03 (P2008063MUS01V11 - STAGE 2)				
PARAMETER	PRE-DEVELOPMENT	POST-DEVELOPMENT	REDUCTION	% CHANGE
Flow (ML/yr)	53.2	54.4	-1.2	2%
Total Suspended Solids (kg/yr)	10200	5610	4590	-45%
Total Phosphorus (kg/yr)	19.9	13.9	6	-30%
Total Nitrogen (kg/yr)	99.2	90.7	8.5	-9%
Gross Pollutants (kg/yr)	285	0	285	0%

MUSIC MODELLING RESULTS_NORBE_NS DRAIN (P2008063MUS01V11 - STAGE 2)				
PARAMETER	PRE-DEVELOPMENT	POST-DEVELOPMENT	REDUCTION	% CHANGE
Flow (ML/yr)	94.2	102	-7.8	8%
Total Suspended Solids (kg/yr)	16500	7580	8920	-54%
Total Phosphorus (kg/yr)	34.9	22.8	12.1	-35%
Total Nitrogen (kg/yr)	186	134	52	-28%
Gross Pollutants (kg/yr)	295	0	295	0%

DEVELOPMENT APPLICATION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD	SCALE
D	MINOR AMENDMENTS	13/03/2023	JS	TW	SL	SL	
C	MINOR AMENDMENTS	24/02/2023	YI	TW	SL	SL	
B	MINOR AMENDMENTS	12/08/2022	NN	TW	SL	GT	
A	MINOR AMENDMENTS	08/08/2022	NN	TW	SL	GT	

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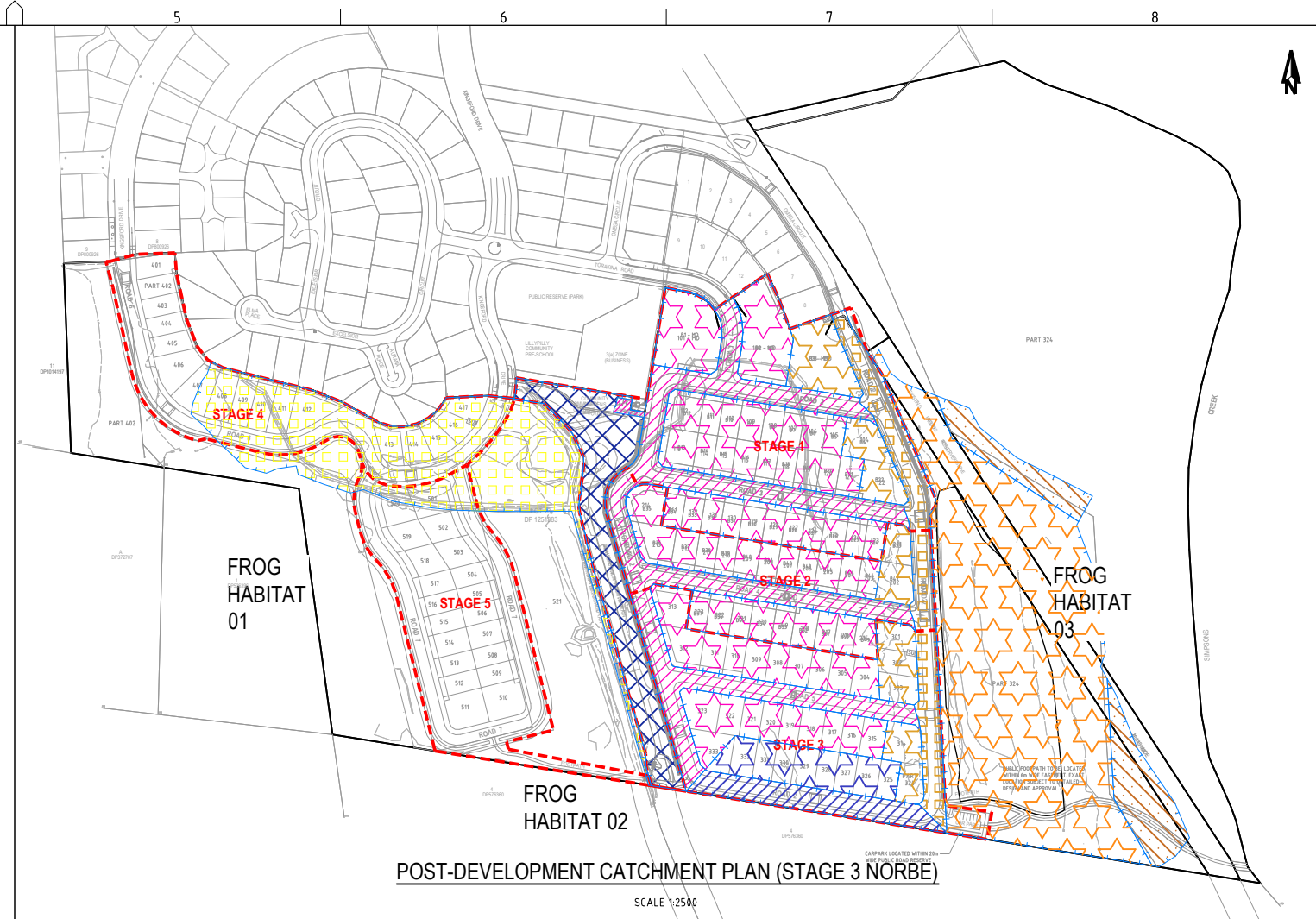
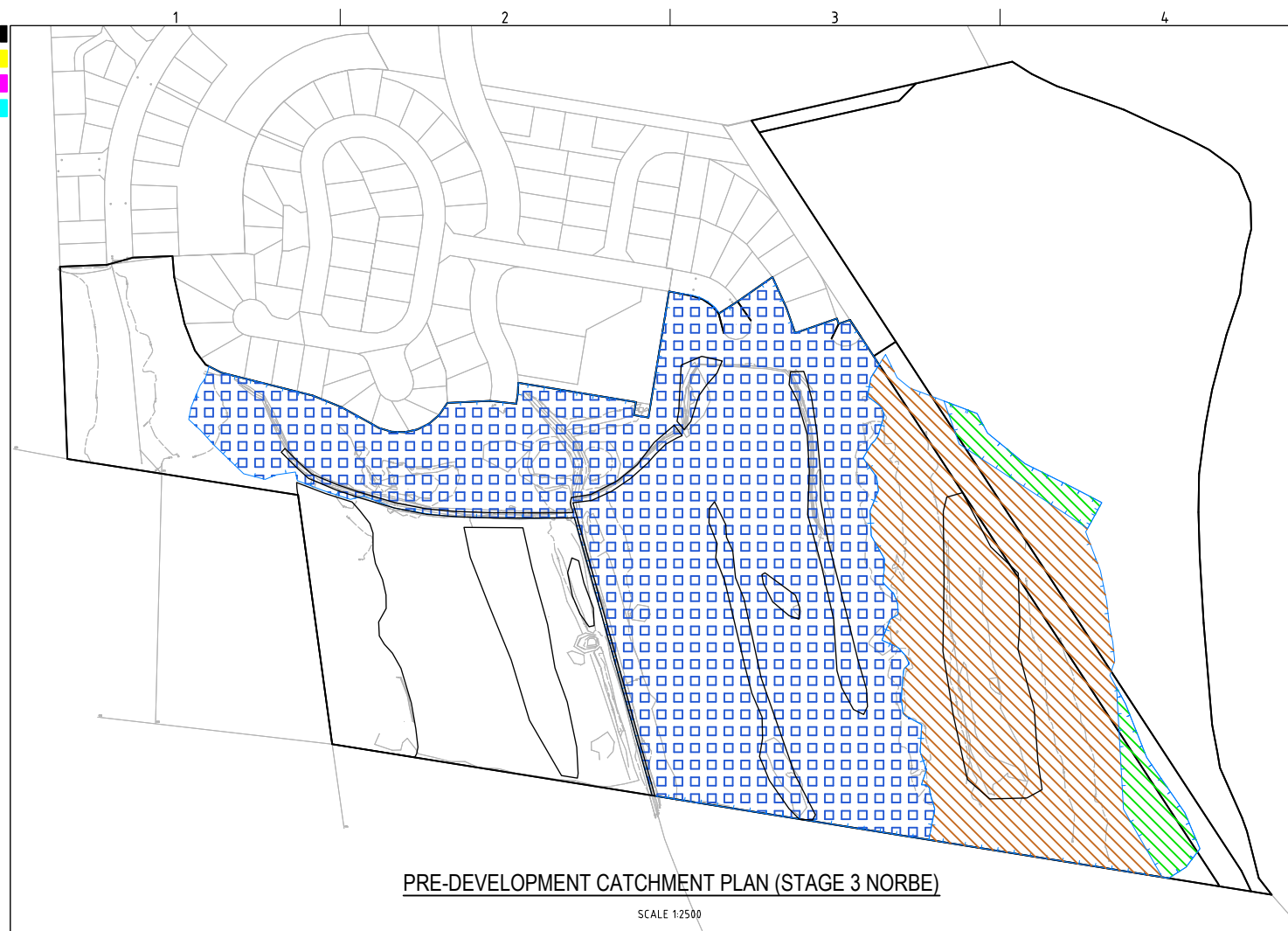
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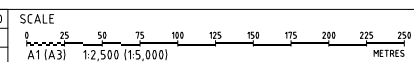
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STAGE 1 TO 2 - WATER QUALITY MODEL & RESULTS (NORBE)				
PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P2008063	PS03	R09	PS03-E704	D



PRE DEVELOPMENT MUSIC CATCHMENTS (P2008063MUS01V11 - STAGE 3)					
KEY	DESCRIPTION	MUSIC NODE ID	AREA (ha)	IMPERVIOUS %	MUSIC NODE REFERENCE
[Green/Blue Hatched]	RESIDENTIAL TO FROG HABITAT 03	F3a	3.899	0	Waterbydesign 2010
[Blue/Orange Hatched]	FOREST TO FROG HABITAT 03	F3b	0.618	0	Waterbydesign 2010
[Blue/White Hatched]	UNSEALED ROAD TO FROG HABITAT 03	F3c	1.035	50	Waterbydesign 2010
[Blue/White Hatched]	RESIDENTIAL TO NS DRAIN	NSDa	9.114	0	Waterbydesign 2010
[Blue/White Hatched]	UNSEALED ROAD TO NS DRAIN	NSDb	1.071	50	Waterbydesign 2010
TOTAL AREA					
TOTAL - OVERALL			15.737	= 100 % OF OVERALL AREA	
TOTAL - IMPERVIOUS			1.053	= 7 % OF OVERALL AREA	
TOTAL - PERVIOUS			14.684	= 93 % OF OVERALL AREA	

POST DEVELOPMENT MUSIC CATCHMENTS (P2008063MUS01V11 - STAGE 3)					
KEY	DESCRIPTION	MUSIC NODE ID	AREA (ha)	IMPERVIOUS %	MUSIC NODE REFERENCE
BASIN - ROAD 2 EAST					
[Blue/White Hatched]	ROOF	F3a	0.443	100	Waterbydesign 2010
[Blue/White Hatched]	REMAINING LOT	F3b	0.454	30	Waterbydesign 2010
[Blue/White Hatched]	SEALED ROAD	F3c	0.687	58	Waterbydesign 2010
[Blue/White Hatched]	RESI	F3d	2.205	0	Waterbydesign 2010
[Blue/White Hatched]	FOREST	F3e	0.618	0	Waterbydesign 2010
[Blue/White Hatched]	FROG HABITAT AREA (RESI)	F3f	1.606	0	Waterbydesign 2010
BASIN - ROAD 2 WEST					
[Blue/White Hatched]	ROOF	NSDa1	2.056	100	Waterbydesign 2010
[Blue/White Hatched]	REMAINING LOT	NSDa2	2.059	24	Waterbydesign 2010
[Blue/White Hatched]	SEALED ROAD	NSDa3	1.797	57	Waterbydesign 2010
BASIN - ROAD 2 SOUTH					
[Blue/White Hatched]	ROOF	NSDc1	0.208	100	Waterbydesign 2010
[Blue/White Hatched]	REMAINING LOT	NSDc2	0.208	20	Waterbydesign 2010
[Blue/White Hatched]	SEALED ROAD	NSDc3	0.333	49	Waterbydesign 2010
[Blue/White Hatched]	RESIDENTIAL	NSDd	0.905	0	Waterbydesign 2010
ADDITIONAL NSD CATCHMENT					
[Blue/White Hatched]	RESIDENTIAL TO NS DRAIN	NSDa	2.159	0	Waterbydesign 2010
TOTAL AREA					
TOTAL - OVERALL			15.737	= 100 % OF OVERALL AREA	
TOTAL - IMPERVIOUS			4.965	= 32 % OF OVERALL AREA	
TOTAL - PERVIOUS			10.771	= 68 % OF OVERALL AREA	

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C	MINOR AMENDMENTS	23/02/2023	NP/YI	TW	SL	SL
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A	MINOR AMENDMENTS	08/08/2022	NN	TW	SL	GT



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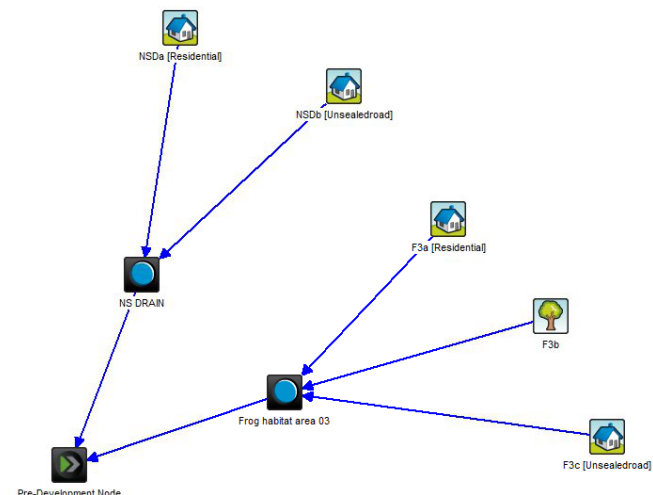


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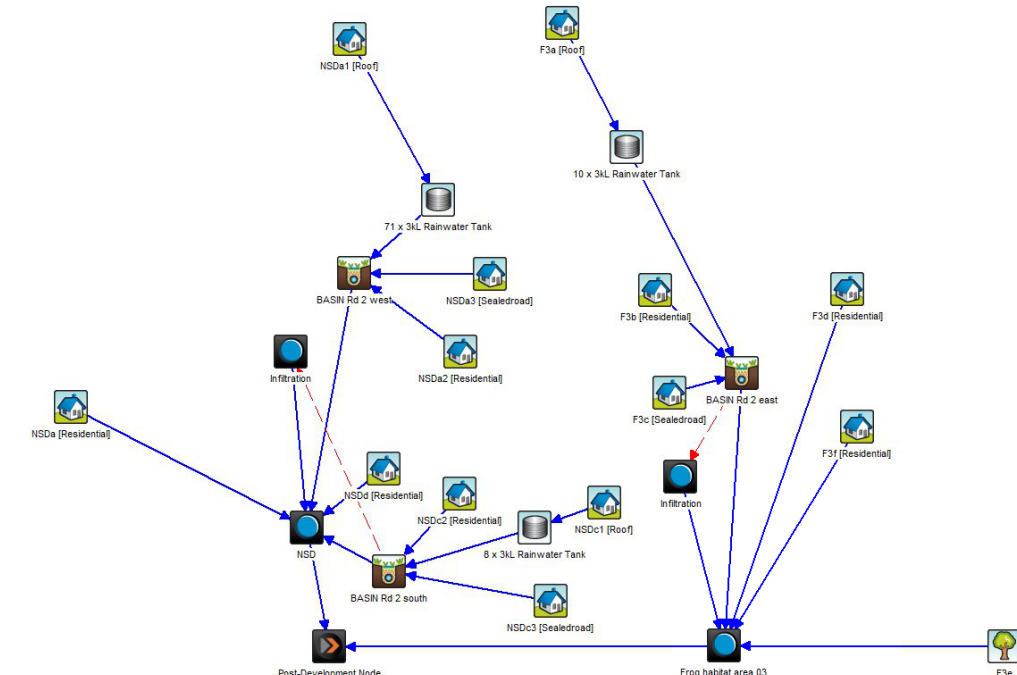
DEVELOPMENT APPLICATION

DRAWING TITLE
STAGE 1 TO 3 - WATER QUALITY CATCHMENT PLAN (NORBE)

PROJECT NO.	PLANSSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P2008063	PS03	R09	PS03-E705	E



PRE-DEVELOPMENT MUSIC MODEL LAYOUT
(STAGE 3 NORBE)



POST-DEVELOPMENT MUSIC MODEL LAYOUT
(STAGE 3 NORBE)

OVERALL MUSIC MODELLING RESULTS (P2008063MUS01V11 - STAGE 3)				
PARAMETER	PRE-DEVELOPMENT	POST-DEVELOPMENT	REDUCTION	% CHANGE
Flow (ML/yr)	147	169	-22	15%
Total Suspended Solids (kg/yr)	26800	9670	17130	-64%
Total Phosphorus (kg/yr)	54.3	33.4	20.9	-38%
Total Nitrogen (kg/yr)	285	209	76	-27%
Gross Pollutants (kg/yr)	580	0	580	0%

MUSIC MODELLING RESULTS_NORBE_FROG HABITAT 03 (P2008063MUS01V11 - STAGE 3)				
PARAMETER	PRE-DEVELOPMENT	POST-DEVELOPMENT	REDUCTION	% CHANGE
Flow (ML/yr)	53.2	58.4	-5.2	10%
Total Suspended Solids (kg/yr)	10100	5290	4810	-48%
Total Phosphorus (kg/yr)	19.8	13.8	6	-30%
Total Nitrogen (kg/yr)	99.7	94	5.7	-6%
Gross Pollutants (kg/yr)	285	0	285	0%

MUSIC MODELLING RESULTS_NORBE_NS DRAIN (P2008063MUS01V11 - STAGE 3)				
PARAMETER	PRE-DEVELOPMENT	POST-DEVELOPMENT	REDUCTION	% CHANGE
Flow (ML/yr)	94.2	111	-16.8	18%
Total Suspended Solids (kg/yr)	16700	4380	12320	-74%
Total Phosphorus (kg/yr)	34.5	19.5	15	-43%
Total Nitrogen (kg/yr)	186	115	71	-38%
Gross Pollutants (kg/yr)	295	0	295	0%

DEVELOPMENT APPLICATION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD	SCALE
D	MINOR AMENDMENTS	13/03/2023	JS	TW	SL	SL	
C	MINOR AMENDMENTS	23/02/2023	NP/YI	TW	SL	SL	
B	MINOR AMENDMENTS	12/08/2022	NN	TW	SL	GT	
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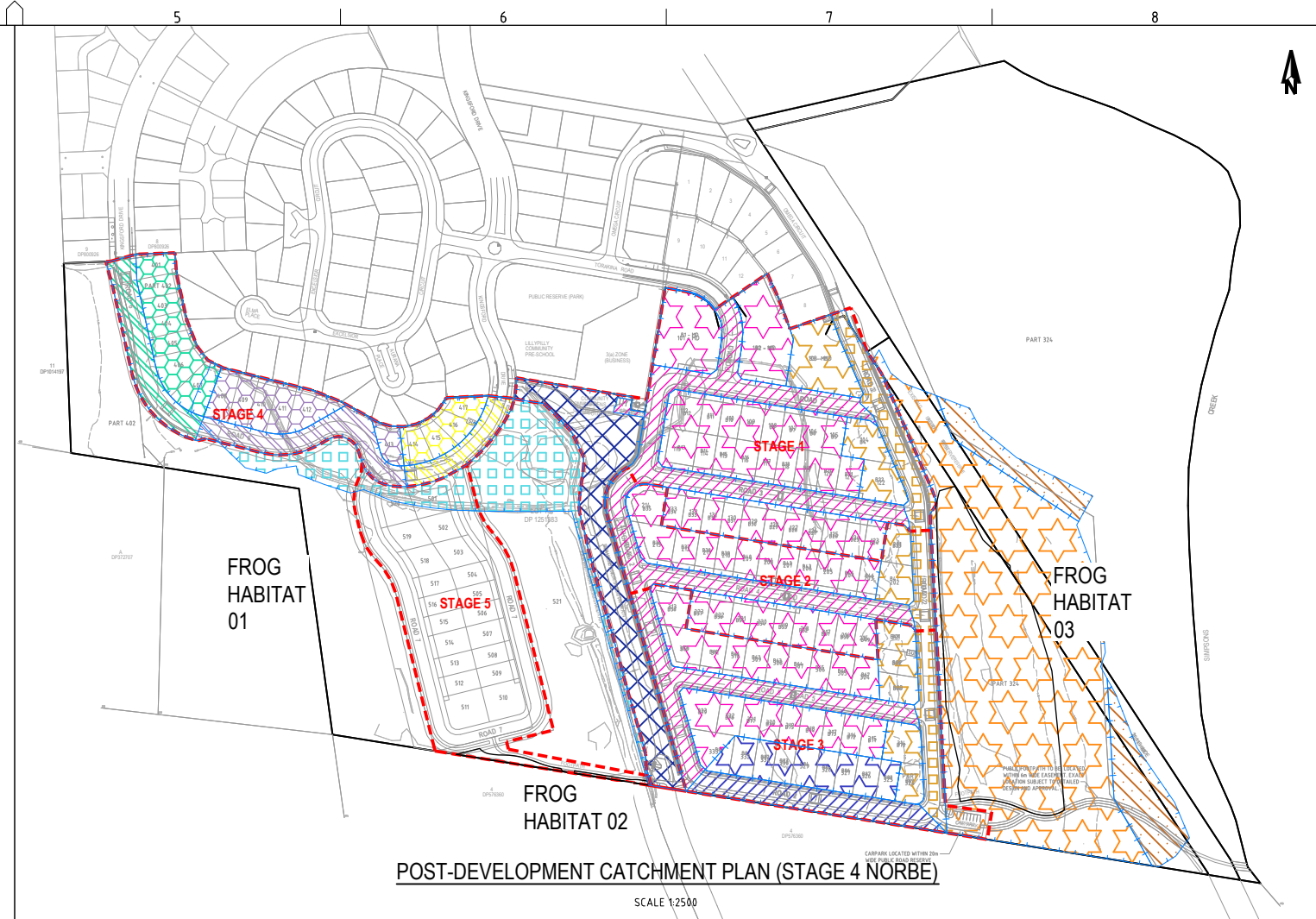
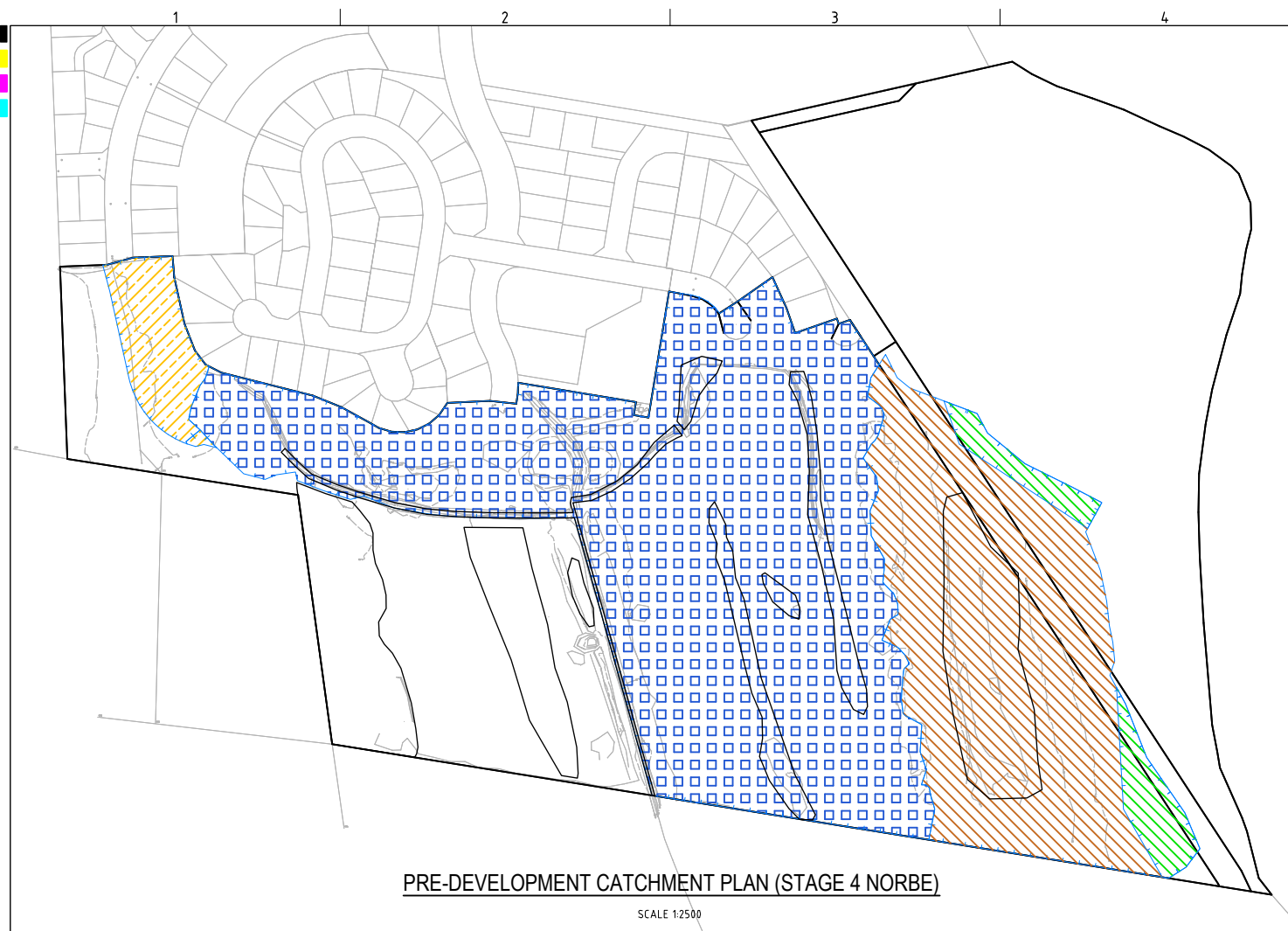
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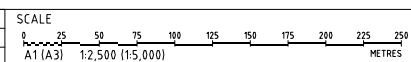
DRAWING TITLE				
STAGE 1 TO 3 - WATER QUALITY MODEL & RESULTS (NORBE)				
PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P2008063	PS03	R09	PS03-E706	D



PRE DEVELOPMENT MUSIC CATCHMENTS (P2008063MUS01V11 - STAGE 4)					
KEY	DESCRIPTION	MUSIC NODE ID	AREA (ha)	IMPERVIOUS %	MUSIC NODE REFERENCE
[Hatched]	RESIDENTIAL TO FROG HABITAT 03	F3a	3.899	0	Waterbydesign 2010
[Green]	FOREST TO FROG HABITAT 03	F3b	0.618	0	Waterbydesign 2010
[Blue]	UNSEALED ROAD TO FROG HABITAT 03	F3c	1.035	50	Waterbydesign 2010
[Blue]	RESIDENTIAL TO NS DRAIN	NSDa	9.114	0	Waterbydesign 2010
[Blue]	UNSEALED ROAD TO NS DRAIN	NSDb	1.071	50	Waterbydesign 2010
[Blue]	AREA BYPASSING FROG HABITAT 01	F4	0.680	0	Waterbydesign 2010
TOTAL AREA					
TOTAL - OVERALL			16.417	= 100 % OF OVERALL AREA	
TOTAL - IMPERVIOUS			12.518	= 76 % OF OVERALL AREA	
TOTAL - PERVIOUS			11.900	= 72 % OF OVERALL AREA	

POST DEVELOPMENT MUSIC CATCHMENTS (P2008063MUS01V11 - STAGE 4)											
KEY	DESCRIPTION	MUSIC NODE ID	AREA (ha)	IMPERVIOUS %	MUSIC NODE REFERENCE	KEY	DESCRIPTION	MUSIC NODE ID	AREA (ha)	IMPERVIOUS %	MUSIC NODE REFERENCE
BASIN - ROAD 7 NORTH						BASIN - ROAD 2 WEST					
[Yellow]	ROOF	F2e	0.102	100	Waterbydesign 2010	[Pink]	ROOF	NSDa1	2.056	100	Waterbydesign 2010
[Yellow]	REMAINING LOT AREA	F2f	0.102	20	Waterbydesign 2010	[Pink]	REMAINING LOT	NSDa2	2.059	24	Waterbydesign 2010
[Yellow]	SEALED ROAD	F2g	0.170	55	Waterbydesign 2010	[Pink]	SEALED ROAD	NSDa3	1.797	57	Waterbydesign 2010
BASIN - ROAD 6 WEST						BASIN - ROAD 2 SOUTH					
[Green]	ROOF	B3a	0.208	100	Waterbydesign 2010	[Blue]	ROOF	NSDc1	0.208	100	Waterbydesign 2010
[Green]	REMAINING LOT AREA	B3b	0.208	42	Waterbydesign 2010	[Blue]	REMAINING LOT	NSDc2	0.208	20	Waterbydesign 2010
[Green]	SEALED ROAD	B3	0.294	51	Waterbydesign 2010	[Blue]	SEALED ROAD	NSDc3	0.333	49	Waterbydesign 2010
BASIN - ROAD 6 EAST						ADDITIONAL NSD CATCHMENT					
[Purple]	ROOF	B2a	0.195	100	Waterbydesign 2010	[Blue]	RESIDENTIAL TO NS DRAIN	NSDa	1.045	0	Waterbydesign 2010
[Purple]	REMAINING LOT AREA	B2b	0.195	20	Waterbydesign 2010	[Blue]	TOTAL AREA				
[Purple]	SEALED ROAD	B2	0.317	54	Waterbydesign 2010		TOTAL - OVERALL	16.417	= 100 % OF OVERALL AREA		
BASIN - ROAD 2 EAST							TOTAL - IMPERVIOUS	6.037	= 37 % OF OVERALL AREA		
[Orange]	ROOF	F3a	0.443	100	Waterbydesign 2010		TOTAL - PERVIOUS	10.380	= 63 % OF OVERALL AREA		
[Orange]	REMAINING LOT	F3b	0.454	30	Waterbydesign 2010						
[Orange]	SEALED ROAD	F3c	0.693	57	Waterbydesign 2010						
[Orange]	RESI	F3d	2.205	0	Waterbydesign 2010						
[Orange]	FOREST	F3e	0.618	0	Waterbydesign 2010						
[Orange]	FROG HABITAT 03 AREA (RESI)	F3f	1.606	0	Waterbydesign 2010						

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LOT 13 DP 1251383 BRUNSWICK HEADS, NSW

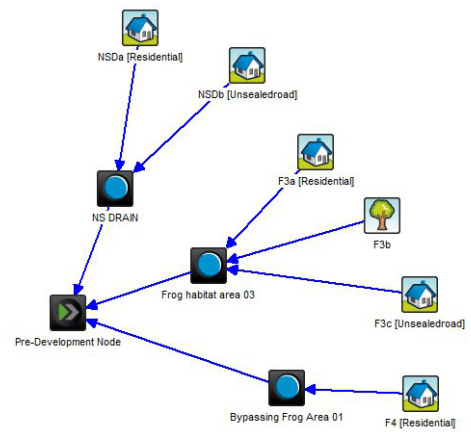
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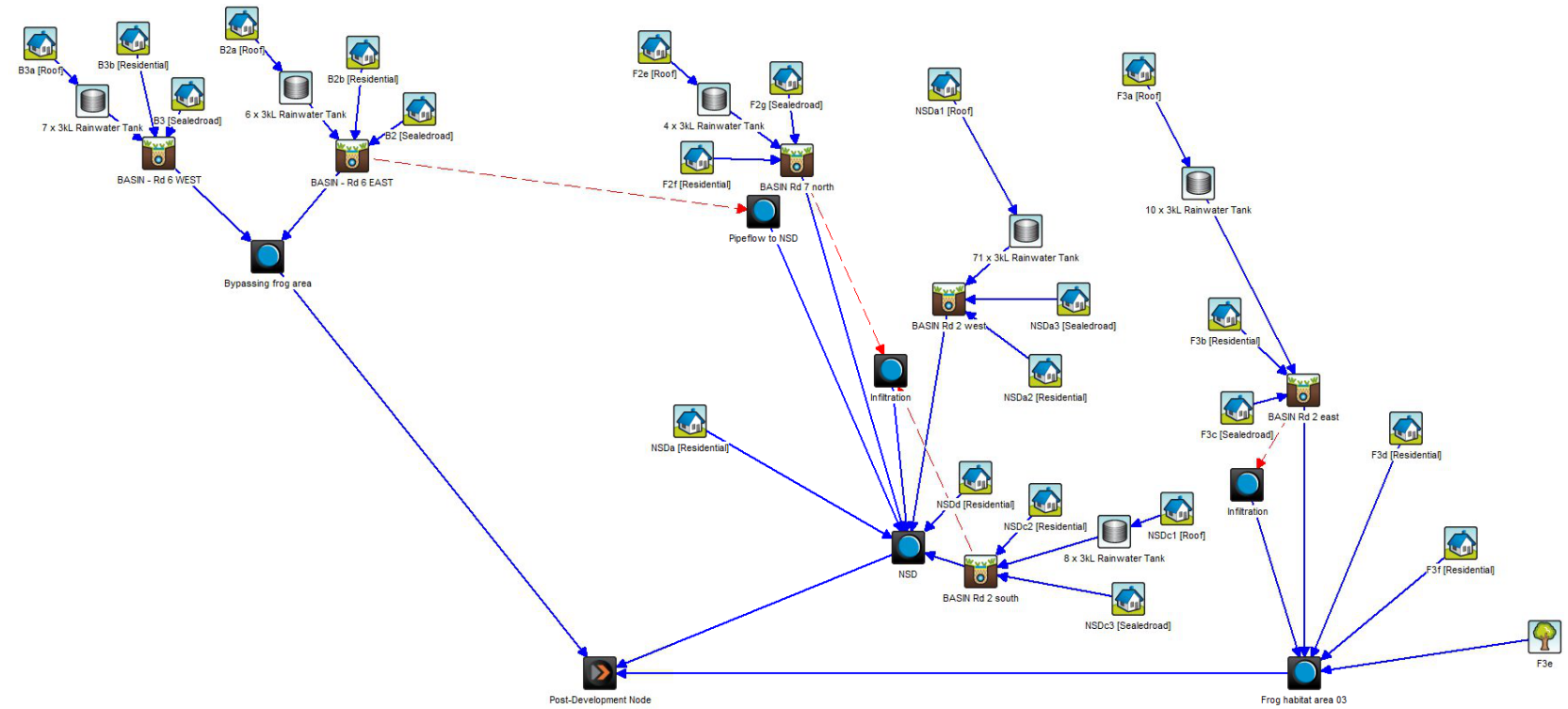
DRAWING TITLE
STAGE 1 TO 4 - WATER QUALITY MODEL & RESULTS (NORBE)

PROJECT NO.	PLANSSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P2008063	PS03	R09	PS03-E707	A

DRAWING ID: P2008063-PS03-R09-E707



**PRE-DEVELOPMENT MUSIC MODEL LAYOUT
(STAGE 4 NORBE)**



**POST-DEVELOPMENT MUSIC MODEL LAYOUT
(STAGE 4 NORBE)**

OVERALL MUSIC MODELLING RESULTS (P2008063MUS01V11 - STAGE 4)				
PARAMETER	PRE-DEVELOPMENT	POST-DEVELOPMENT	REDUCTION	% CHANGE
Flow (ML/yr)	153	178	-25	16%
Total Suspended Solids (kg/yr)	27700	8460	19240	-69%
Total Phosphorus (kg/yr)	57	36.2	20.8	-36%
Total Nitrogen (kg/yr)	299	210	89	-30%
Gross Pollutants (kg/yr)	580	0	580	0%

MUSIC MODELLING RESULTS_NORBE_FROG HABITAT 03 (P2008063MUS01V11 - STAGE 4)				
PARAMETER	PRE-DEVELOPMENT	POST-DEVELOPMENT	REDUCTION	% CHANGE
Flow (ML/yr)	53.2	58.4	-5.2	10%
Total Suspended Solids (kg/yr)	10300	5320	4980	-48%
Total Phosphorus (kg/yr)	19.9	13.9	6	-30%
Total Nitrogen (kg/yr)	99.2	94.3	4.9	-5%
Gross Pollutants (kg/yr)	285	0	285	0%

MUSIC MODELLING RESULTS_NORBE_NS DRAIN (P2008063MUS01V11 - STAGE 4)				
PARAMETER	PRE-DEVELOPMENT	POST-DEVELOPMENT	REDUCTION	% CHANGE
Flow (ML/yr)	94.2	112	-17.8	19%
Total Suspended Solids (kg/yr)	16600	3100	13500	-81%
Total Phosphorus (kg/yr)	35.1	19.6	15.5	-44%
Total Nitrogen (kg/yr)	188	107	81	-43%
Gross Pollutants (kg/yr)	295	0	295	0%

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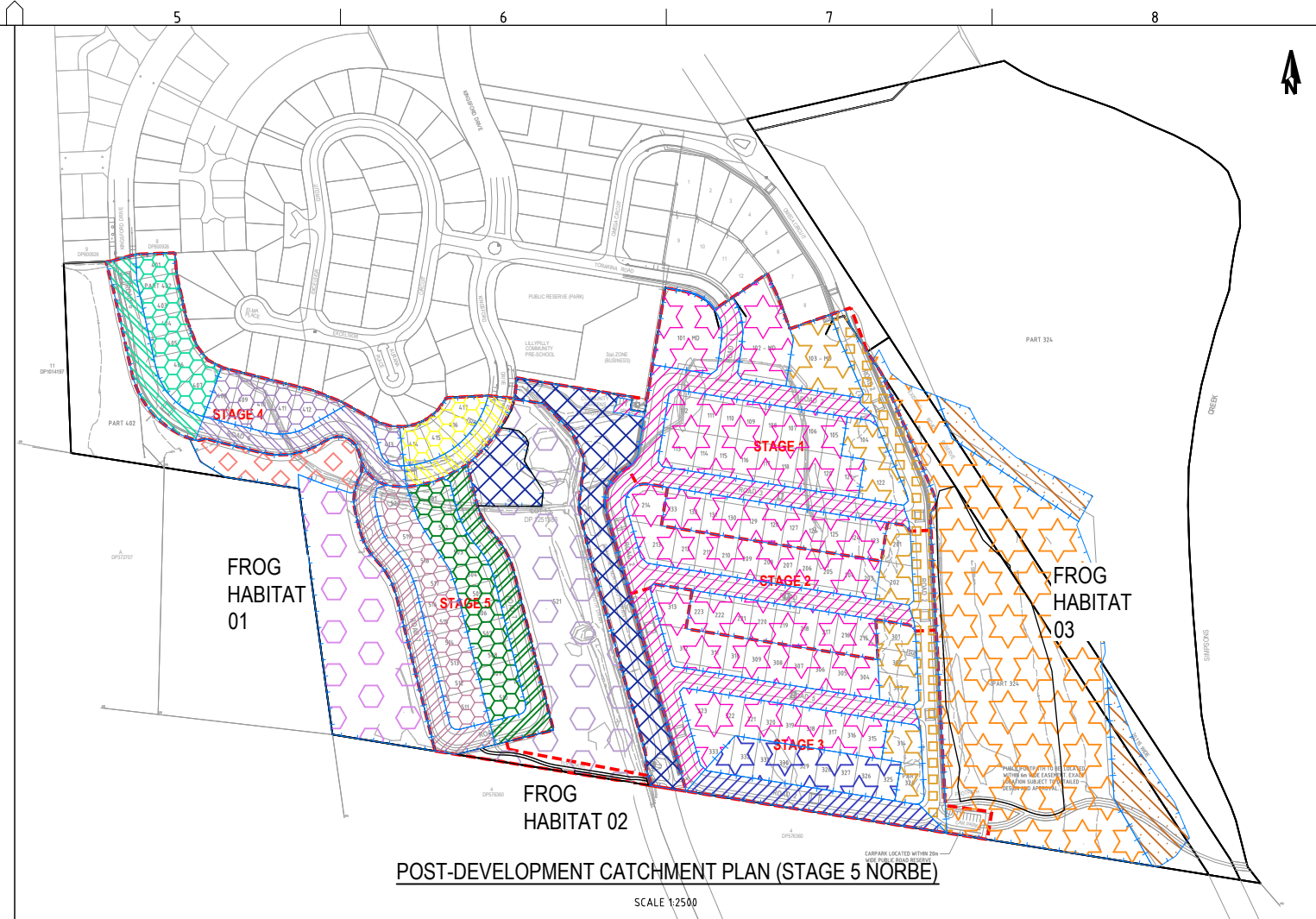
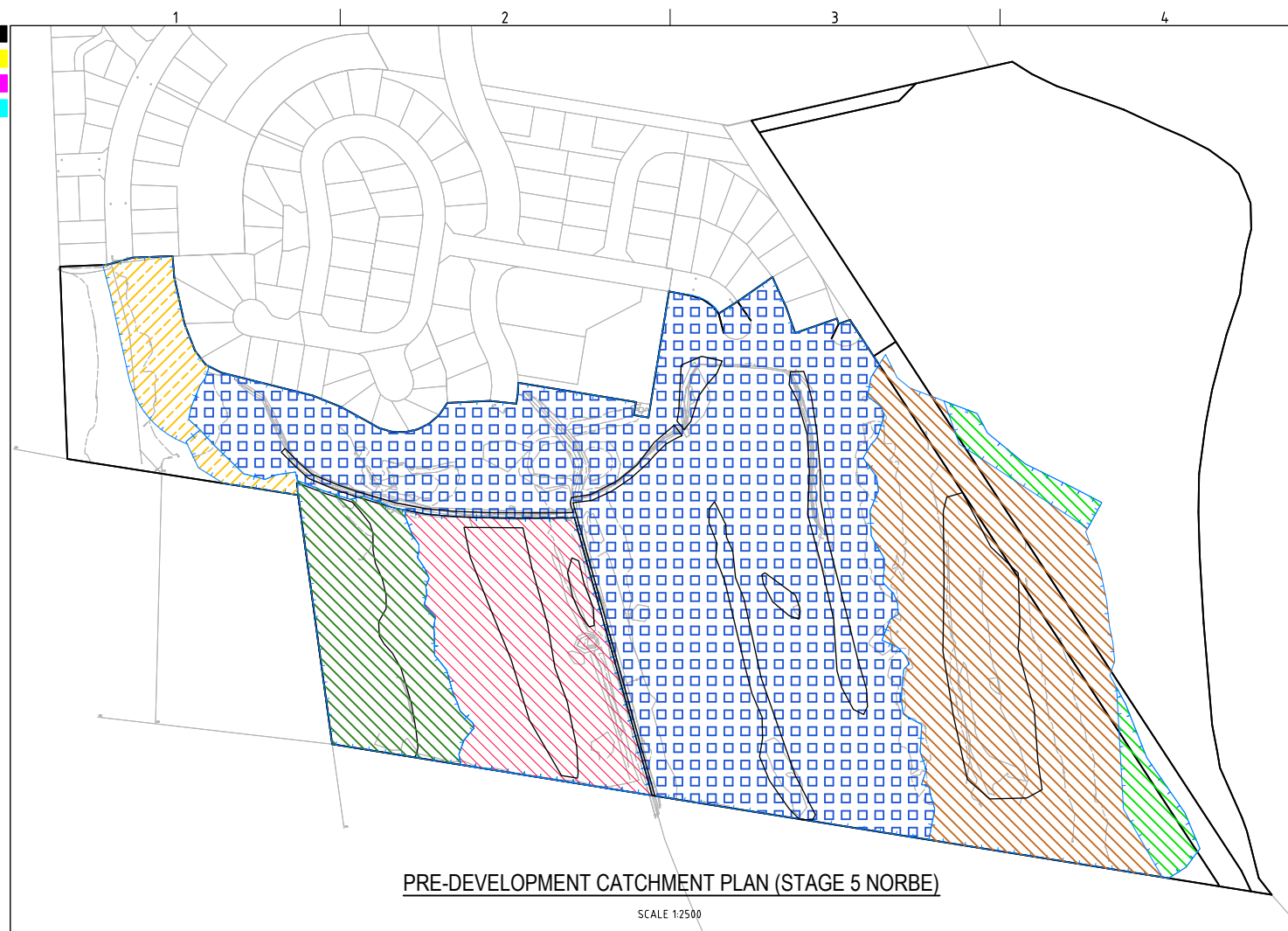
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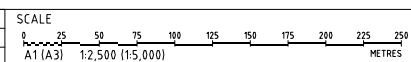
DRAWING TITLE				
STAGE 1 TO 4 - WATER QUALITY MODEL & RESULTS (NORBE)				
PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P2008063	PS03	R09	PS03-E708	A



PRE DEVELOPMENT MUSIC CATCHMENTS (P2008063MUS01V11 - STAGE 5)					
KEY	DESCRIPTION	MUSIC NODE ID	AREA (ha)	IMPERVIOUS %	MUSIC NODE REFERENCE
[Hatched Yellow]	RESIDENTIAL TO FROG HABITAT 01	F1	1.771	0	Waterbydesign 2010
[Hatched Red]	RESIDENTIAL TO FROG HABITAT 02	F2a	2.436	0	Waterbydesign 2010
[Hatched Blue]	UNSEALED ROAD TO FROG HABITAT 02	F2b	0.142	50	Waterbydesign 2010
[Hatched Green]	RESIDENTIAL TO FROG HABITAT 03	F3a	3.899	0	Waterbydesign 2010
[Hatched Orange]	FOREST TO FROG HABITAT 03	F3b	0.618	0	Waterbydesign 2010
[Hatched Pink]	UNSEALED ROAD TO FROG HABITAT 03	F3c	1.035	50	Waterbydesign 2010
[Hatched Blue]	RESIDENTIAL TO NS DRAIN	NSDa	9.114	0	Waterbydesign 2010
[Hatched Blue]	UNSEALED ROAD TO NS DRAIN	NSDb	1.071	50	Waterbydesign 2010
[Hatched Yellow]	BYPASS AREA	F4	0.793	0	Waterbydesign 2010
	TOTAL AREA				
	TOTAL - OVERALL		20.878	= 100 % OF OVERALL AREA	
	TOTAL - IMPERVIOUS		1.124	= 5 % OF OVERALL AREA	
	TOTAL - PERVIOUS		19.754	= 95 % OF OVERALL AREA	

POST DEVELOPMENT MUSIC CATCHMENTS (P2008063MUS01V11 - STAGE 5)											
KEY	DESCRIPTION	MUSIC NODE ID	AREA (ha)	IMPERVIOUS %	MUSIC NODE REFERENCE	KEY	DESCRIPTION	MUSIC NODE ID	AREA (ha)	IMPERVIOUS %	MUSIC NODE REFERENCE
	BASIN - ROAD 7 WEST						BASIN - ROAD 2 EAST				
[Hatched Yellow]	ROOF	F1a	0.275	100	Waterbydesign 2010	[Hatched Orange]	ROOF	F3a	0.443	100	Waterbydesign 2010
[Hatched Red]	REMAINING LOT	F1b	0.357	20	Waterbydesign 2010	[Hatched Blue]	REMAINING LOT	F3b	0.454	30	Waterbydesign 2010
[Hatched Blue]	SEALED ROAD	F1c	0.417	51	Waterbydesign 2010	[Hatched Green]	SEALED ROAD	F3c	0.693	57	Waterbydesign 2010
[Hatched Pink]	FROG HABITAT 01 AREA (RESI)	F1d	1.130	0	Waterbydesign 2010	[Hatched Orange]	RESI	F3d	2.205	0	Waterbydesign 2010
	BASIN - ROAD 7 EAST					[Hatched Orange]	FOREST	F3e	0.618	0	Waterbydesign 2010
[Hatched Green]	ROOF	F2a	0.275	100	Waterbydesign 2010	[Hatched Orange]	FROG HABITAT 03 AREA (RESI)	F3f	1.606	0	Waterbydesign 2010
[Hatched Red]	REMAINING LOT	F2b	0.292	25	Waterbydesign 2010		BASIN - ROAD 2 WEST				
[Hatched Blue]	SEALED ROAD	F2c	0.398	52	Waterbydesign 2010	[Hatched Blue]	ROOF	NSDa1	2.056	100	Waterbydesign 2010
[Hatched Pink]	FROG HABITAT 02 AREA (RESI)	F2d	1.783	0	Waterbydesign 2010	[Hatched Red]	REMAINING LOT	NSDa2	2.059	24	Waterbydesign 2010
	BASIN - ROAD 7 NORTH					[Hatched Blue]	SEALED ROAD	NSDa3	1.797	57	Waterbydesign 2010
[Hatched Yellow]	ROOF	F2e	0.102	100	Waterbydesign 2010		BASIN - ROAD 2 SOUTH				
[Hatched Red]	REMAINING LOT AREA	F2f	0.102	20	Waterbydesign 2010	[Hatched Blue]	ROOF	NSDc1	0.208	100	Waterbydesign 2010
[Hatched Blue]	SEALED ROAD	F2g	0.170	55	Waterbydesign 2010	[Hatched Green]	REMAINING LOT	NSDc2	0.208	20	Waterbydesign 2010
	BASIN - ROAD 6 WEST					[Hatched Pink]	SEALED ROAD	NSDc3	0.333	49	Waterbydesign 2010
[Hatched Green]	ROOF	B3a	0.208	100	Waterbydesign 2010	[Hatched Orange]	RESIDENTIAL	NSDd	1.150	0	Waterbydesign 2010
[Hatched Red]	REMAINING LOT AREA	B3b	0.208	42	Waterbydesign 2010		TOTAL AREA				
[Hatched Blue]	SEALED ROAD	B3	0.294	51	Waterbydesign 2010		TOTAL - OVERALL		20.878	= 100 % OF OVERALL AREA	
	BASIN - ROAD 6 EAST						TOTAL - IMPERVIOUS		7.140	= 34 % OF OVERALL AREA	
[Hatched Yellow]	ROOF	B2a	0.195	100	Waterbydesign 2010		TOTAL - PERVIOUS		13.738	= 66 % OF OVERALL AREA	
[Hatched Red]	REMAINING LOT AREA	B2b	0.195	20	Waterbydesign 2010						
[Hatched Blue]	SEALED ROAD	B2	0.317	54	Waterbydesign 2010						
[Hatched Pink]	BYPASS AREA	F4	0.335	0	Waterbydesign 2010						

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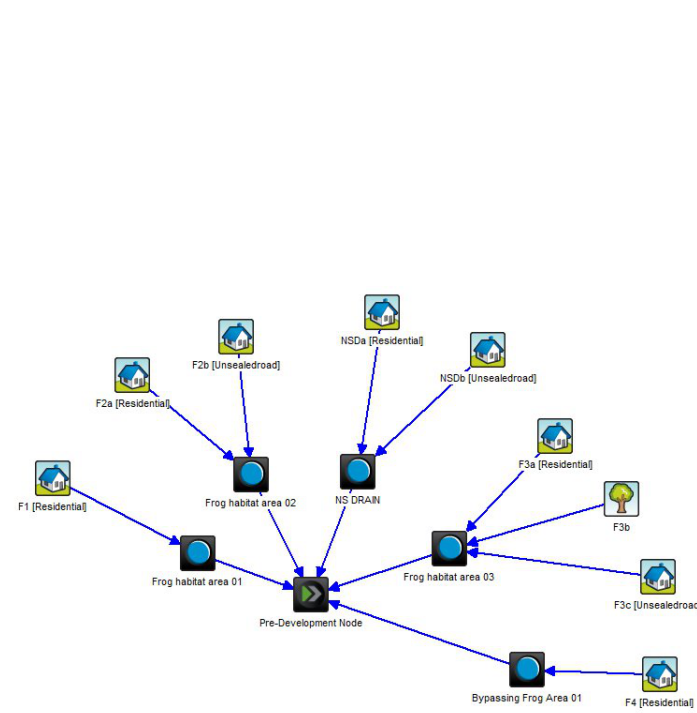
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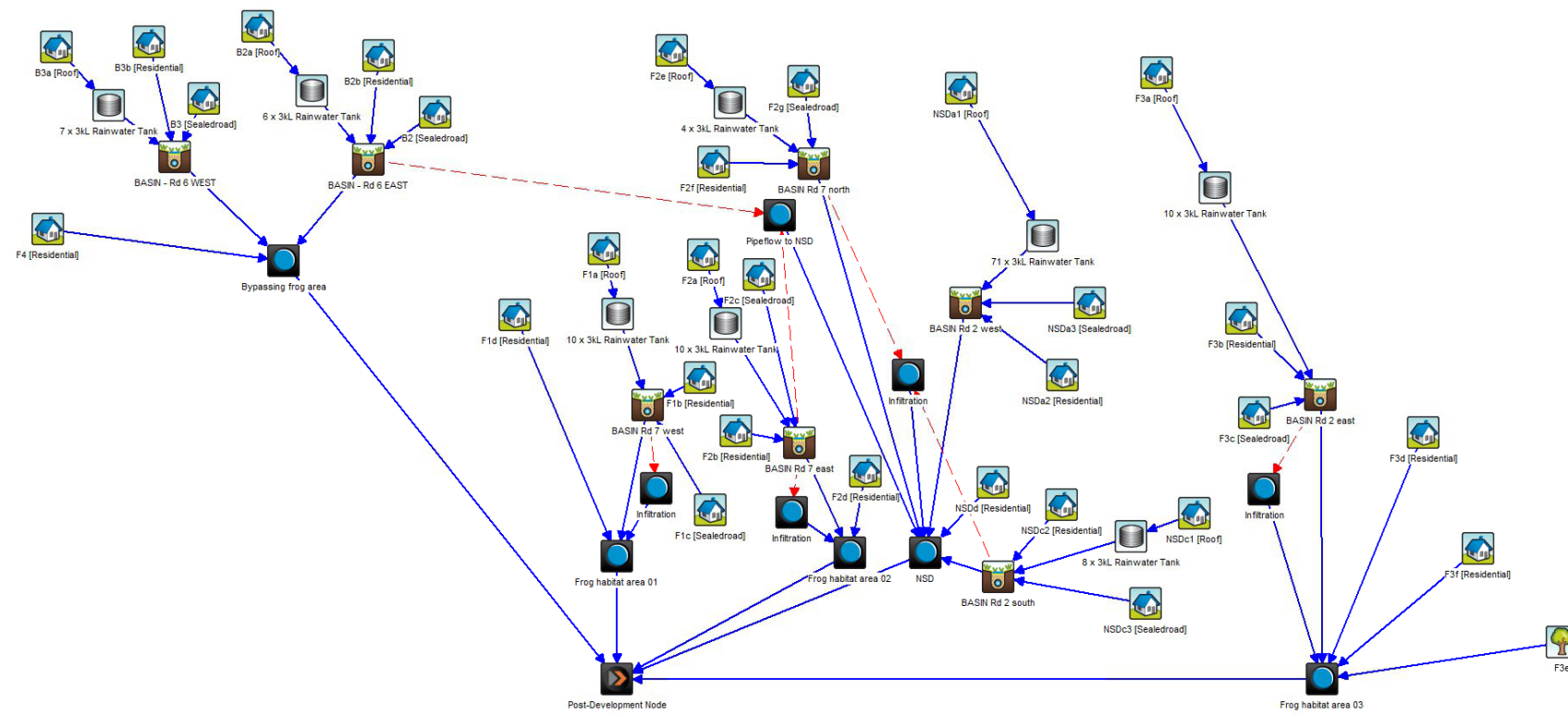
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STAGE 1 TO 5 - WATER QUALITY MODEL & RESULTS (NORBE)				
PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P2008063	PS03	R09	PS03-E709	A

DEVELOPMENT APPLICATION



PRE-DEVELOPMENT MUSIC MODEL LAYOUT
(STAGE 5 NORBE)



POST-DEVELOPMENT MUSIC MODEL LAYOUT
(STAGE 5 NORBE)

OVERALL MUSIC MODELLING RESULTS (P2008063MUS01V11 - STAGE 5)				
PARAMETER	PRE-DEVELOPMENT	POST-DEVELOPMENT	REDUCTION	% CHANGE
Flow (ML/yr)	193	224	-31	16%
Total Suspended Solids (kg/yr)	34100	11800	22300	-65%
Total Phosphorus (kg/yr)	69.7	4.63	23.4	-34%
Total Nitrogen (kg/yr)	378	268	110	-29%
Gross Pollutants (kg/yr)	619	0	619	0%

MUSIC MODELLING RESULTS_NORBE_FROG HABITAT 03 (P2008063MUS01V11 - STAGE 5)				
PARAMETER	PRE-DEVELOPMENT	POST-DEVELOPMENT	REDUCTION	% CHANGE
Flow (ML/yr)	53.2	58.4	-5.2	10%
Total Suspended Solids (kg/yr)	10300	5340	4960	-48%
Total Phosphorus (kg/yr)	19.6	13.9	5.7	-29%
Total Nitrogen (kg/yr)	101	94.2	6.8	-7%
Gross Pollutants (kg/yr)	285	0	285	0%

MUSIC MODELLING RESULTS_NORBE_FROG HABITAT 01 (P2008063MUS01V11 - STAGE 5)				
PARAMETER	PRE-DEVELOPMENT	POST-DEVELOPMENT	REDUCTION	% CHANGE
Flow (ML/yr)	15.5	22.2	-6.7	43%
Total Suspended Solids (kg/yr)	2250	1500	750	-33%
Total Phosphorus (kg/yr)	5.08	4.75	0.33	-6%
Total Nitrogen (kg/yr)	30.6	27.7	2.9	-9%
Gross Pollutants (kg/yr)	0	0	0	0%

MUSIC MODELLING RESULTS_NORBE_NS DRAIN (P2008063MUS01V11 - STAGE 5)				
PARAMETER	PRE-DEVELOPMENT	POST-DEVELOPMENT	REDUCTION	% CHANGE
Flow (ML/yr)	94.2	114	-19.8	21%
Total Suspended Solids (kg/yr)	16900	2140	14760	-87%
Total Phosphorus (kg/yr)	34.6	18.5	16.1	-47%
Total Nitrogen (kg/yr)	188	99	89	-47%
Gross Pollutants (kg/yr)	295	0	295	0%

MUSIC MODELLING RESULTS_NORBE_FROG HABITAT 02 (P2008063MUS01V11 - STAGE 5)				
PARAMETER	PRE-DEVELOPMENT	POST-DEVELOPMENT	REDUCTION	% CHANGE
Flow (ML/yr)	23.2	18.5	4.7	-20%
Total Suspended Solids (kg/yr)	3700	2320	1380	-37%
Total Phosphorus (kg/yr)	8.09	5.5	2.59	-32%
Total Nitrogen (kg/yr)	45.8	32.5	13.3	-29%
Gross Pollutants (kg/yr)	39.1	0	39.1	0%

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P2008063	PS03	R09	PS03-E710	A