PROPOSED DEVELOPMENT
(No.'s 3 - 9) PARK AVENUE, GORDON
STORMWATER MANAGEMENT PLANS

LEGEND

- DENOTES ON-SITE DETENTION TANK
- DENOTES ON-SITE RETENTION TANK
- DENOTES DWELLING FOOTPRINT
- SW — DENOTES 100mm DIA. STORMWATER/SURFACE WATER SYSTEM PIPE AT 1% MIN. GRADE U.N.O.
- RW — DENOTES 100mm DIA. FULLY SEALED RAINWATER SYSTEM PIPE U.N.O.
- 150 RW — DENOTES RAINWATER PIPE AND DIA. WHEN PIPE EXCEEDS 100mm DIA.
- 150 SW — DENOTES STORMWATER/SURFACE WATER PIPE AND DIA. WHEN PIPE EXCEEDS 100mm DIA.
- W/RM — DENOTES RISING MAIN AND PIPE DIA. U.N.O.
- 100 SS — DENOTES SUBSOIL DRAINAGE LINE AND DIA. WRAPPED IN GEOFABRIC U.N.O.
- DP — DENOTES DOWNPIPE
- IO — DENOTES INSPECTION OPENING WITH SCREW DOWN LID AT FINISHED SURFACE LEVEL
- CO — DENOTES INSPECTION OPENING WITH SCREW DOWN LID AT FINISHED SURFACE LEVEL FOR SYSTEM FLUSHING PURPOSES
- STORMWATER PIT - SOLID COVER
- STORMWATER PIT - GRATED INLET
- DENOTES GRATED DRAIN
- DENOTES ABSORPTION TRENCH
- NON RETURN VALVE
- PUMP
- STOP VALVE (ISOLATION VALVE)
- 240v REQUIRED
- IL23.31 — DENOTES LEVEL OF INLET /OUTLET OF STORMWATER PIPE. NOTE: UNLESS NOTED OTHERWISE, THE BASE OF THE PIT IS THE SAME AS THE PIPE INLET/OUTLET.

DIAL BEFORE YOU DIG

IMPORTANT: THE CONTRACTOR IS TO MAINTAIN A CURRENT SET OF "DIAL BEFORE YOU DIG" DRAWINGS ON SITE AT ALL TIMES.

GENERAL NOTES

1. THESE PLANS SHALL BE READ IN CONJUNCTION WITH OTHER RELEVANT CONSULTANTS' PLANS, SPECIFICATIONS, CONDITIONS OF DEVELOPMENT CONSENT AND CONSTRUCTION CERTIFICATE REQUIREMENTS. WHERE DISCREPANCIES ARE FOUND HYDRACOR CONSULTING ENGINEERS PTY LTD MUST BE CONTACTED IMMEDIATELY FOR VERIFICATION
2. WHERE THESE PLANS ARE NOTED FOR DEVELOPMENT APPLICATION PURPOSES ONLY, THEY SHALL NOT BE USED FOR OBTAINING A CONSTRUCTION CERTIFICATE NOR USED FOR CONSTRUCTION PURPOSES
3. SUBSOIL DRAINAGE SHALL BE DESIGNED AND DETAILED BY THE STRUCTURAL ENGINEER. SUBSOIL DRAINAGE SHALL NOT BE CONNECTED INTO THE STORMWATER SYSTEM IDENTIFIED ON THESE PLANS UNLESS APPROVED BY HYDRACOR CONSULTING ENGINEERS PTY LTD.

STORMWATER CONSTRUCTION NOTES

1. ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH AS/NZS 3500 (CURRENT EDITION) AND THE REQUIREMENTS OF THE LOCAL COUNCIL'S POLICIES AND CODES
2. THE MINIMUM SIZES OF THE STORMWATER DRAINS SHALL NOT BE LESS THAN DN90 FOR CLASS 1 BUILDINGS AND DN100 FOR OTHER CLASSES OF BUILDING OR AS REQUIRED BY THE REGULATORY AUTHORITY
3. THE MINIMUM GRADIENT OF STORMWATER DRAINS SHALL BE 1%, UNLESS NOTED OTHERWISE
4. COUNCIL'S TREE PRESERVATION ORDER IS TO BE STRICTLY ADHERED TO. NO TREES SHALL BE REMOVED UNTIL PERMIT IS OBTAINED
5. PUBLIC UTILITY SERVICES ARE TO BE ADJUSTED AS NECESSARY AT THE CLIENT'S EXPENSE
6. ALL PITS TO BE BENCHED AND STREAMLINED. PROVIDE STEP IRONS FOR ALL PITS OVER 1.2m DEEP
7. MAKE SMOOTH JUNCTION WITH ALL EXISTING WORK
8. VEHICULAR ACCESS AND ALL SERVICES TO BE MAINTAINED AT ALL TIMES TO ADJOINING PROPERTIES AFFECTED BY CONSTRUCTION
9. SERVICES SHOWN ON THESE PLANS HAVE BEEN LOCATED FROM INFORMATION SUPPLIED BY THE RELEVANT AUTHORITIES AND FIELD INVESTIGATIONS AND ARE NOT GUARANTEED COMPLETE NOR CORRECT. IT IS THE CLIENT & CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL PRIOR TO CONSTRUCTION
10. ANY VARIATION TO THE WORKS AS SHOWN ON THE APPROVED DRAWINGS ARE TO BE CONFIRMED BY HYDRACOR CONSULTING ENGINEERS PTY LTD PRIOR TO THEIR COMMENCEMENT

RAINWATER RE-USE SYSTEM NOTES

1. RAINWATER SUPPLY PLUMBING TO BE CONNECTED TO OUTLETS WHERE REQUIRED BY BASIX CERTIFICATE (BY OTHERS)
2. TOWN WATER CONNECTION TO RAINWATER TANK TO BE TO THE SATISFACTION OF THE REGULATORY AUTHORITY. THIS MAY REQUIRE PROVISION OF:
   - 2.1. PERMANENT AIR GAP
   - 2.2. BACKFLOW PREVENTION DEVICE
3. NO DIRECT CONNECTION BETWEEN TOWN WATER SUPPLY AND THE RAIN WATER SUPPLY
4. AN APPROVED STOP VALVE AND/OR PRESSURE LIMITING VALVE AT THE RAINWATER TANK
5. PROVIDE APPROPRIATE FLOAT VALVES AND/OR SOLENOID VALVES TO CONTROL TOWN WATER SUPPLY INLET TO TANK IN ORDER TO ACHIEVE THE TOP-UP INDICATED ON THE TYPICAL DETAIL
6. ALL PLUMBING WORKS ARE TO BE CARRIED OUT BY LICENSED PLUMBERS IN ACCORDANCE WITH AS/NZS3500.1 NATIONAL PLUMBING AND DRAINAGE CODE
7. PRESSURE PUMP ELECTRICAL CONNECTION TO BE CARRIED OUT BY A LICENSED ELECTRICIAN
8. ONLY ROOF RUN-OFF IS TO BE DIRECTED TO THE RAINWATER TANK . SURFACE WATER INLETS ARE NOT TO BE CONNECTED
9. PIPE MATERIALS FOR RAINWATER SUPPLY PLUMBING ARE TO BE APPROVED MATERIALS TO AS/NZS3500 PART 1 SECTION 2 AND TO BE CLEARLY AND PERMANENTLY IDENTIFIED AS 'RAINWATER'. THIS MAY BE ACHIEVED FOR BELOW GROUND PIPES USING IDENTIFICATION TAPE (MADE IN ACCORDANCE WITH AS2648) OR FOR ABOVE GROUND PIPES BY USING ADHESIVE PIPE MARKERS (MADE IN ACCORDANCE WITH AS1345)
10. EVERY RAINWATER SUPPLY OUTLET POINT AND THE RAINWATER TANK ARE TO BE LABELED 'RAINWATER' ON A METALLIC SIGN IN ACCORDANCE WITH AS1319
11. ALL INLETS AND OUTLETS TO THE RAINWATER TANK ARE TO HAVE SUITABLE MEASURES PROVIDED TO PREVENT MOSQUITO AND VERMIN ENTRY

SHEET INDEX

LOCALITY PLAN
NOT TO SCALE

DRAWINGS MUST BE PRINTED IN COLOUR

Issue	Description	Date	Drawn	Approved
D	ISSUED FOR APPROVAL	02.04.25	IK	BK
C	ISSUED FOR APPROVAL	26.03.25	IK	BK
B	DRAFT ISSUE FOR CO-ORDINATION	20.03.25	LW	BK
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North

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Architect: PTW

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Project: PROPOSED RESIDENTIAL DEVELOPMENT
No.3 - 9
PARK AVENUE
GORDON

Drawing Title: COVER SHEET & NOTES

Drawn	Date	Scale A1	Q.A. Check	Date
LW	MARCH 2025	AS SHOWN	-	-

Designed	Project No.	Dwg. No.	Issue
BK	CC240193	C1	D

KU-RING-GAI DCP PART 24 STORMWATER DRAINAGE SUMMARY

SITE AREA . . . . . 4430.3 m²

PRE-DEVELOPED IMPERVIOUS AREA . . . . . 1888 m²

POST DEVELOPED IMPERVIOUS AREA . . . . . 2568 m²

DESIGN SUMMARY IN RESPONSE TO THE KU-RING-GAI DCP PART 24 - WATER MANAGEMENT:

- STORMWATER DISCHARGE (24B.5)

  ON-SITE DETENTION / RAINWATER TANK OVERFLOW AND SURFACE

  PITS TO DISCHARGE TO PARK LANE

- STREAM FLOW CONTROLS PART 24 CLAUSE 24.C3

  PROPOSAL

  PROVISION OF 40,000 LITRE MIN. RAINWATER TANK.

  REFER TO SHEET C5

- ON-SITE DETENTION PART 24 CLAUSE 24.C5

  REFER TO CALCULATION SHEET.

  PROPOSAL

  PROVISION OF 88,000 LITRE MIN. ON-SITE DETENTION TANK

  REFER TO SHEET C5

- WATER QUALITY PART 24 CLAUSE 24.C6

  PROPOSAL

  PROVISION OF: 40,000 LITRE MINIMUM RAINWATER TANK

  7 X OCEAN PROTECT STORMFILTERS (FULL HEIGHT)

  2 X OCEAN PROTECT OCEANGUARD INSERTS

  REFER TO SHEETS C9 - C11

CATCHMENT DETAIL ON-SITE DETENTION CALCULATION SHEET - 24R.4

1. CATCHMENT NAME RC1
2. CATCHMENT DISCHARGE RATE 0.0124 l/sec/m² **A**
3. CATCHMENT STORAGE RATE 0.0345 m³/m² **B**

SITE DETAILS

4. SITE AREA (m²) 4430.3 60% OF SITE AREA m² 2568.2 **C**
5. AREA(S) NOT DRAINING TO THE DETENTION SYSTEM N/A m²
6. TOTAL IMPERVIOUS AREA (ROOFS, DRIVEWAYS, PAVING, FUTURE DEV.) 3815 m² **D**
7. IMPERVIOUS AREA BYPASSING DETENTION SYSTEM 266 m² **E**

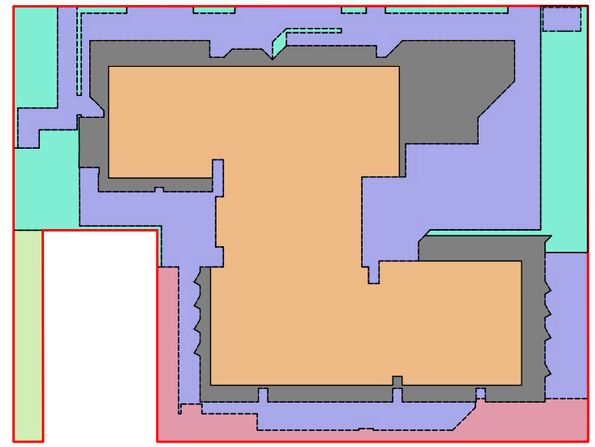
PERMITTED SITE DISCHARGE

8. C[2568.2 m²] x A [0.0124 l/sec/m²] = 31.8 l/sec **Flow 1**
9. ADJUSTMENT FOR ANY UNCONTROLLED IMPERVIOUS FLOW E / D= 0.07 (<0.25) **F**
10. FLOW 1 [31.8 l/sec x F [0.07] = 2.23 l/sec **Flow 2**
11. FLOW 1 [31.8] - FLOW 2 [2.23] = 29.5 l/sec **PSD**

SITE STORAGE REQUIREMENT

12. C [2568.2 m²] x B [0.0345 m³/m²] = 88.6 m³ **SSR1**
13. IF THE STORAGE IS IN A LANDSCAPED BASIN, SSR1 x 1.2 = m³ N/A **SSR2**

- RAINWATER TANK OFFSET APPLIED (10% OF THE ON SITE RETENTION TO BE DISCOUNTED)
- ADJUSTED ON SITE DETENTION VOLUME = 85m³ REQUIRED
- 88m³ PROVIDED



IMPERVIOUS PAVEMENT AREAS DIRECTED TO OSD TANK INCLUDING **LANDSCAPE PLANTERS OVER SLABS** (AREA = 1273m²)

IMPERVIOUS BALCONY AREAS DIRECTED TO OSD TANK(AREA = 661m²)

ROOF AREA DIRECTED TO OSD TANK VIA OSR (RAINWATER) TANK (AREA = 1615m²)

LANDSCAPE AREA DIRECTED TO OSD TANK (AREA = 494m²)

LANDSCAPE AREA BYPASSING OSD SYSTEM (AREA = 121m²)

IMPERVIOUS AREA BYPASSING OSD SYSTEM PATHS / COURTYARDS (AREA = 266m²)

TOTAL CATCHMENT DIRECTED TO OSD TANK = 4043m² (91%)

SUMMARY

SITE AREA = 4430m²

TOTAL IMPERVIOUS AREA = 3815m² (86%)

TOTAL AREA BEING DIRECTED TO OSD SYSTEM = 4043m² (91% OF SITE)

TOTAL IMPERVIOUS CATCHMENT AREA BYPASSING OSD SYSTEM = 266² (6%)

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North

0 1cm at full size 10cm

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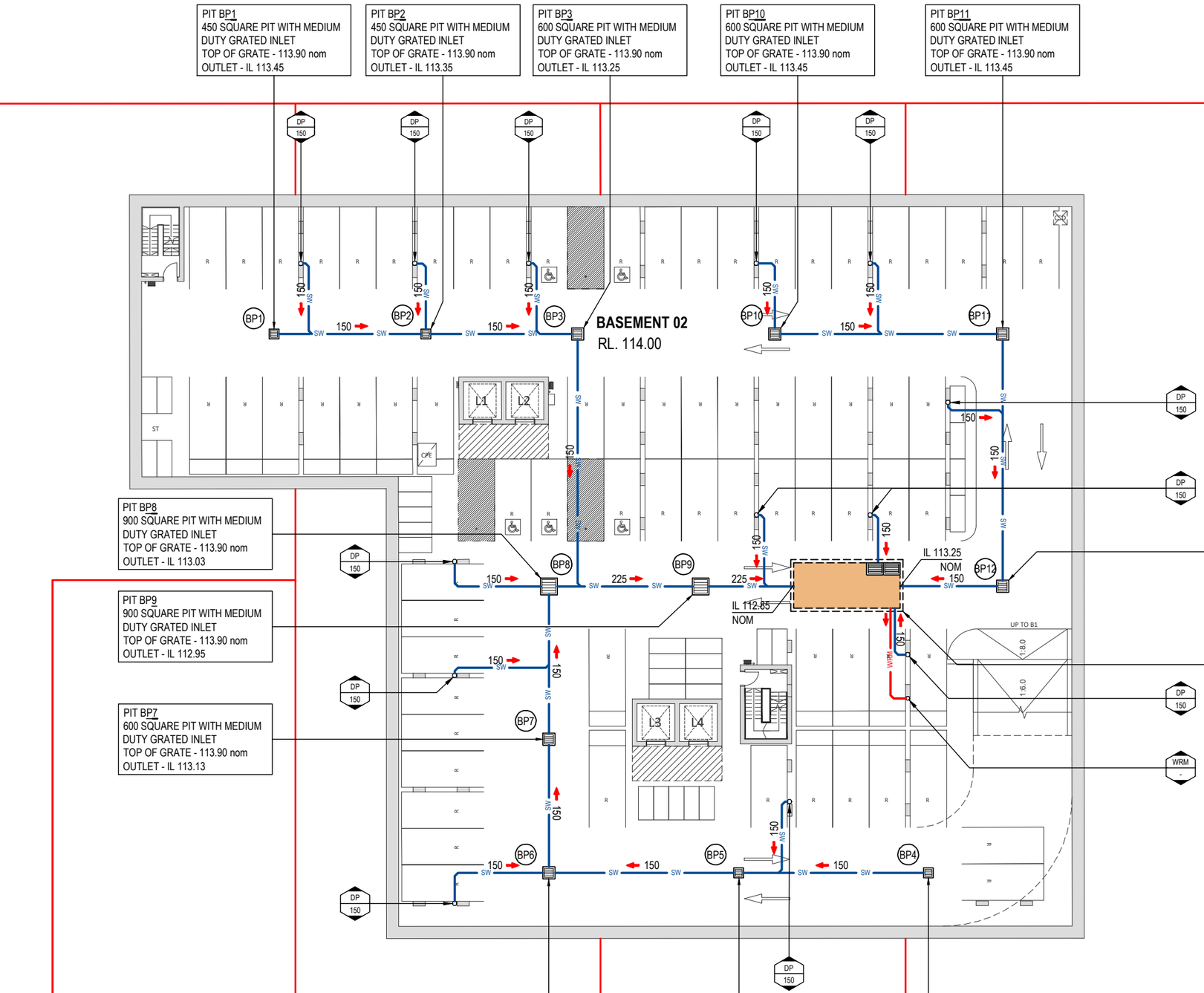
Project: PROPOSED RESIDENTIAL DEVELOPMENT
No.3 - 9
PARK AVENUE
GORDON

Drawing Title: STORMWATER DRAINAGE SUMMARY

Drawn	Date	Scale A1	Q.A. Check	Date
LW	MARCH 2025	AS SHOWN	-	-
Designed	**Project No.**		**Dwg. No.**	**Issue**
BK	CC240193		C4	D



STORMWATER MANAGEMENT PLAN - BASEMENT 02

SCALE - 1:150/A1, 1:300/A3

0 1 2 4 6 8 10m

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D	ISSUED FOR APPROVAL	02.04.25	IK	BK
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1cm at full size

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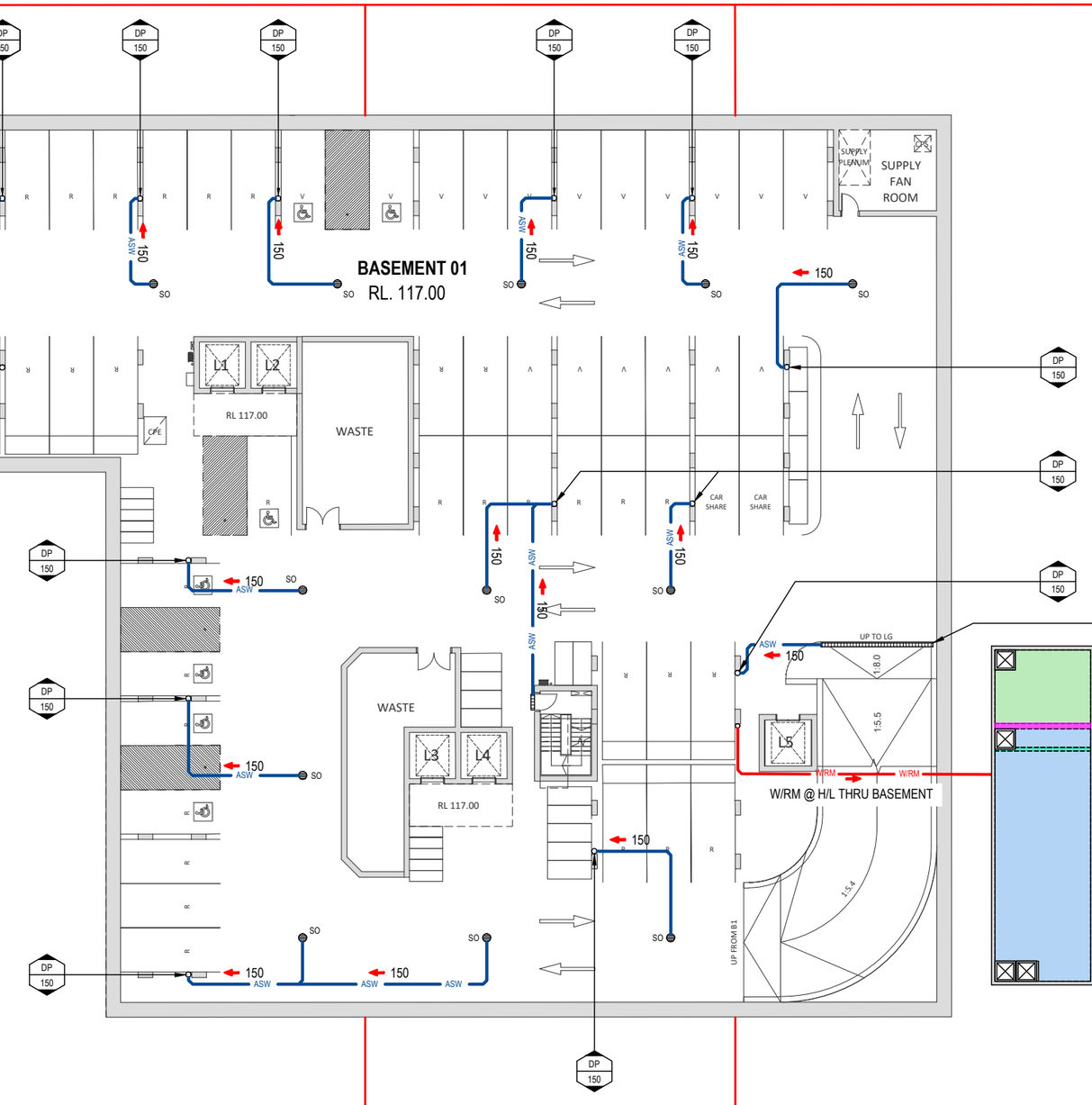
PARK AVENUE
GORDON

Drawing Title: STORMWATER MANAGEMENT PLAN - BASEMENT 02

Drawn	Date	Scale A1	Q.A. Check	Date
LW	MARCH 2025	AS SHOWN	-	-
Designed	Project No.	Dwg. No.	Issue	
BK	CC240193	C3	D	

DENOTES 100 WIDE, 100 DEEP GRATED BOX DRAIN, SHOW TYPICAL. UNO



CONSTRUCT 200 WIDE x 200 DEEP GRATED BOX DRAIN. GRADE INVERT TO OUTLET AT A MINIMUM GRADE OF 2%.
TOP OF GRATE RL 117.00

STORMWATER MANAGEMENT PLAN - BASEMENT 01

SCALE - 1:150/A1, 1:300/A3

0 1 2 4 6 8 10m

Issue	Description	Date	Drawn	Approved
D	ISSUED FOR APPROVAL	02.04.25	IK	BK
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0 10cm at full size 10cm

North

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Project: PROPOSED RESIDENTIAL DEVELOPMENT
No.3 - 9
PARK AVENUE
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Drawing Title: STORMWATER MANAGEMENT PLAN - BASEMENT 01

Drawn	Date	Scale A1	Q.A. Check	Date
LW	MARCH 2025	AS SHOWN	-	-
Designed	**Project No.**		**Dwg. No.**	**Issue**
BK	CC240193		C4	D

DESIGN NOTES:

1. TOP OF GRATE LEVELS HAVE BEEN DETERMINED FROM THE SURVEY DETAIL PROVIDED. FOLLOWING EARTHWORKS AND BENCHING, VALIDITY OF GRATE LEVELS SHOULD BE ASSESSED AND ADJUSTED AS REQUIRED TO MEET THE INTENT OF THE DESIGN. WHERE IN DOUBT CONTACT THE DESIGN ENGINEER.

2. DOWNPIPES CONVEYING ROOF WATER TO DISCHARGE TO RAINWATER TANK INDEPENDANT OF ANY OTHER STORMWATER SYSTEM ON SITE. REFER TO HYDRAULIC SERVICES PLANS AT CC STAGE FOR LOCATION OF ALL BUILDING DOWNPIPES. THE HYDRAULIC ENGINEER SHOULD ALLOW TO TIE IN AS REQUIRED TO THE STORMWATER CONCEPT SHOWN ON THESE PLANS. TYP UNO.

3. FULLY SEALED ROOF DRAINAGE SYSTEM SHOWN THUS:
   ARW — OR — RW
   DENOTES DRAINAGE SYSTEM TO BE FULLY SEALED FROM ROOF GUTTERS TO OSR TANK. SEAL ALL PIPEWORK FROM TANK TO ROOF USING SOLVENT WELDED JOINTS. RAINWATER SYSTEM SHALL COLLECT ROOF WATER ONLY. NO ADDITIONAL PITS FOR COLLECTION OF SURFACE WATER WILL BE PERMITTED FOR THE ROOF WATER SYSTEM TYP.

4. DOWNPIPES, PIPES & STORMWATER FEATURES LOCATED WITHIN THE BUILDING ENVELOPE ARE SHOWN ON THIS PLAN FOR APPROVAL PURPOSES ONLY. FINAL PIPE ALIGNMENTS LOCATED WITHIN THE BUILDING ENVELOPE WITH THE EXCEPTION OF THE BASEMENT DRAINAGE IS TO BE COORDINATED & DOCUMENTED AT CC STAGE BY THE BUILDING SERVICES HYDRAULIC ENGINEER AND SHOULD ALLOW TO TIE IN WITH THE STORMWATER CONCEPT SHOWN ON THESE PLANS.

5. CONSTRUCT PIPES AS CLOSE AS PRACTICABLE TO BUILDING TO MINIMISE DISTURBANE ON EXISTING TREE ROOTS. HAND DIG TRENCH UNDER THE SUPERVISION OF THE CONSULTING ARBORIST. DO NOT SEVER ROOTS >30mm WITHIN CANOPY OF TREES TO BE RETAINED. TREE PROTECTION MEASURES TO BE CARRIED OUT IN ACCORDANCE WITH KU-RING-GAI COUNCIL SPECIFICATIONS. FINAL ALIGNMENT TO BE CONFIRMED ON SITE BY ARBORIST.

LOWER GROUND FLOOR
RL. 120.00

FIRE PUMP ROOM
PLANT
MAIN SWITCH ROOM
COMMUNITY ROOM
RESI. LOBBY A
RESI. LOBBY B
COMMUNAL COURTYARD
LANDSCAPE
COVERED PATIO
RAMP TO PARKING BASEMENT
BRIDGE OVERHEAD

LANDSCAPE DRAINAGE OVER BASEMENT SUBJECT TO BE COORDINATED WITH THE LANDSCAPE ARCHITECT, SERVICES AND STRUCTURE AT CC STAGE.

450 SQ SWP
RL 120.95
IL 120.50

450 SQ SWP
RL 120.00
IL 119.55

900 SQ SWP - WITH OCEANGUARD INSERT
RL 120.00
IL 118.70

600 SQ SWP
RL 120.00
IL 119.30

450 SQ SWP
RL 120.00
IL 119.55

ROOF WATER

ON SITE RETENTION
PROVIDE OSR WITH :-
OSR STORAGE VOLUME: 40m³
INTERNAL FOOTPRINT: 20.8m²
TOP STORED WATER LEVEL - RL 119.60
REFER TO SHEET C7 & C8 FOR DETAILS

ON-SITE DETENTION (OSD) & WATER QUALITY TANK
PROVIDE OSD WITH :-
OSD STORAGE VOLUME: 88m³
INTERNAL FOOTPRINT: 70m²
TOP STORED WATER LEVEL - 119.50
REFER TO SHEET C8 & C9 FOR DETAILS

OUTLINE OF BASEMENT BELOW SHOWN DASHED

DISCHARGE STORMWATER TO EXISTING PIT TO THE SATISFACTION OF COUNCIL. MAKE GOOD EXISTING CONSTRUCTION. INVERT LEVEL OF OUTLET SHALL BE SITE CONFIRMED PRIOR TO COMMENCEMENT OF WORK. DESIGN INVERT: IL 116.70 NOM.

PROPOSED PIPE DESIGN IN ROAD BASED ON INDICATIVE SEWER ALIGNMENT AND LEVELS OBTAINED FROM BYDA. ALL LEVELS AND ALIGNMENTS FOR EXISTING SERVICES TO BE CONFIRMED ON SITE.

IL U/S 116.75
375Ø RCP CLASS 4
1% MIN
4.0m
IL D/S 116.70

PIT A2
900 SQUARE PIT WITH BOLT DOWN/WATER TIGHT SOLID COVER
TOP OF COVER - 117.55 nom
OUTLET - IL 116.75

IL U/S 118.00
375Ø RCP CLASS 4
1% MIN
72.5m
IL D/S 116.75

IL U/S 118.15
375Ø RCP CLASS 4
1% MIN
6.5m
IL D/S 118.05

PIT P1
900 SQUARE PIT WITH BOLT DOWN/WATER TIGHT SOLID COVER WITH OCEANGUARD INSERT
TOP OF COVER - 120.76 nom
OUTLET - IL 118.05

IL U/S 118.05
375Ø RCP CLASS 4
1% MIN
4.5m
IL D/S 118.00

PIT A2
900 SQUARE PIT WITH BOLT DOWN/WATER TIGHT SOLID COVER
TOP OF COVER - 120.25 nom
OUTLET - IL 118.00

STORMWATER MANAGEMENT PLAN - LOWER GROUND FLOOR

SCALE - 1:150/A1, 1:300/A3

0 1 2 4 6 8 10m

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D	ISSUED FOR APPROVAL	02.04.25	IK	BK
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1cm at full size 10cm

North

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Project: PROPOSED RESIDENTIAL DEVELOPMENT
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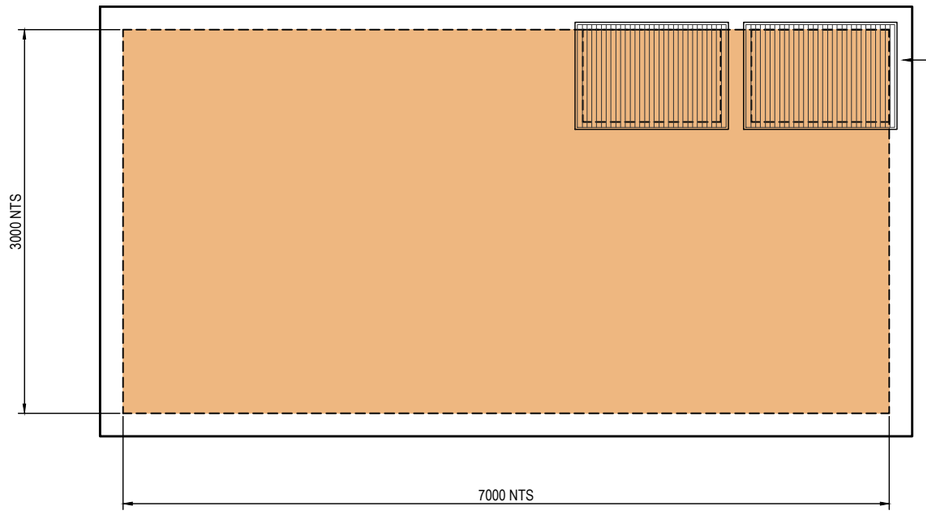
GORDON

Drawing Title: STORMWATER MANAGEMENT PLAN - LOWER GROUND FLOOR

Drawn	Date	Scale A1	Q.A. Check	Date
LW	MARCH 2025	AS SHOWN	-	-

Designed	Project No.	Dwg. No.	Issue
BK	CC240193	C5	D



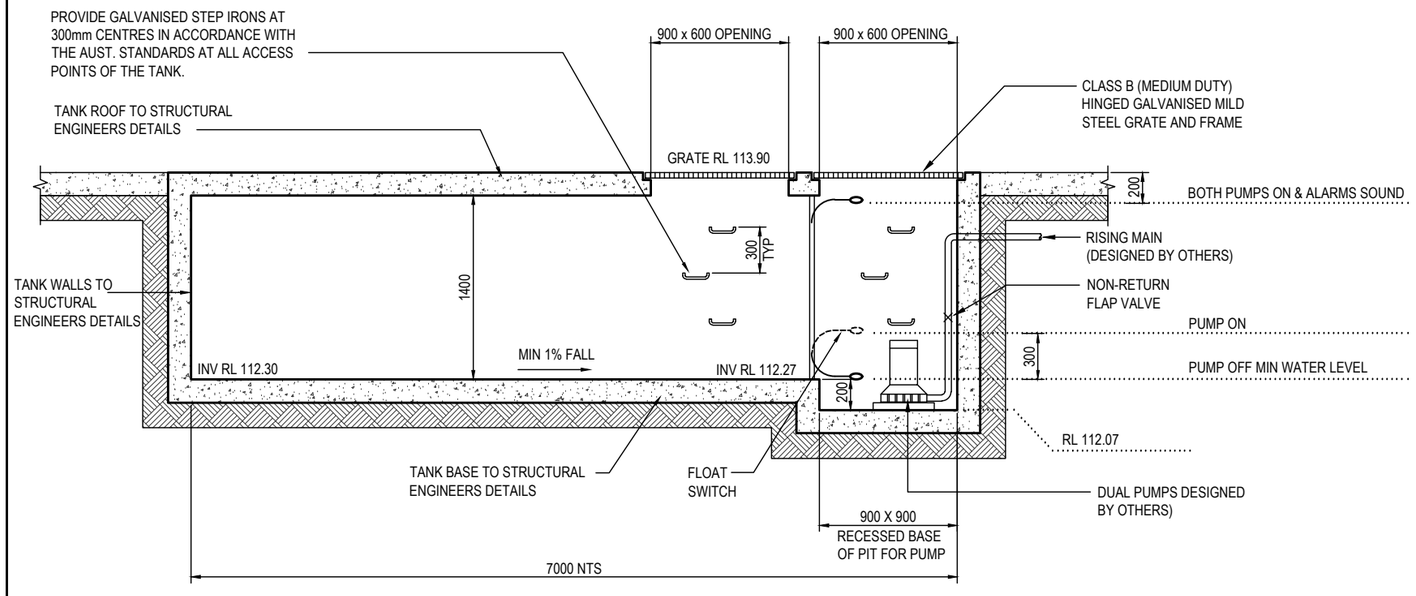
PUMP OUT TANK PLAN
SCALE 1:20/A1, 1:40/A3

INSTALL CONFINED SPACE WARNING SIGN

STANDARD PUMP OUT DESIGN NOTES

THE PUMP SYSTEM SHALL BE OPERATED IN THE FOLLOWING MANNER:-

1. THE PUMPS SHALL BE PROGRAMMED TO WORK ALTERNATELY TO ALLOW BOTH PUMPS TO HAVE AN EQUAL OPERATION LOAD AND PUMP LIFE
2. A FLOAT SHALL BE PROVIDED TO ENSURE THAT THE MINIMUM REQUIRED WATER LEVEL IS MAINTAINED WITHIN THE SUMP AREA OF THE BELOW GROUND TANK. IN THIS REGARD THIS FLOAT WILL FUNCTION AS AN OFF SWITCH FOR THE PUMPS AT THE MINIMUM WATER LEVEL. THE SAME FLOAT SHALL BE SET TO TURN ONE OF THE PUMPS ON UPON WATER LEVEL IN THE TANK RISING TO APPROXIMATELY 300mm ABOVE THE MINIMUM WATER LEVEL. THE PUMP SHALL OPERATE UNTIL THE TANK IS DRAINED TO THE MINIMUM WATER LEVEL.
3. A SECOND FLOAT SHALL BE PROVIDED AT A HIGH LEVEL, WHICH IS APPROXIMATELY THE ROOF LEVEL OF THE BELOW GROUND TANK. THIS FLOAT SHALL START THE OTHER PUMP THAT IS NOT OPERATING AND ACTIVATE THE ALARM.
4. AN ALARM SYSTEM SHALL BE PROVIDED WITH A FLASHING STROBE LIGHT AND A PUMP FAILURE WARNING SIGN WHICH ARE TO BE LOCATED AT THE DRIVEWAY ENTRANCE TO THE BASEMENT LEVEL. THE ALARM SYSTEM SHALL BE PROVIDED WITH A BATTERY BACK-UP IN CASE OF POWER FAILURE.
5. A CONFINED SPACE DANGER SIGN SHALL BE PROVIDED AT ALL ACCESS POINTS TO THE PUMP OUT STORAGE TANK.



PUMP OUT TANK
AVERAGE HEIGHT = 1.4m
WIDTH = 3.0m
LENGTH = 7.0m
VOLUME PROVIDED = 30m^3

TYPICAL SECTION THROUGH PUMP OUT TANK
SCALE 1:20/A1, 1:40/A3

PUMP-OUT TANK MAINTENANCE SCHEDULE

MAINTENANCE CONTRACT

NOTE: A 24 HOUR X 12 MONTHLY EMERGENCY AND MAINTENANCE CONTRACT SHALL BE OBTAINED FROM A COMPANY CAPABLE OF EXECUTING THE WORK AND SHALL BE KEPT IN FORCE BY THE PROPERTY OWNER(S) FOR THE LIFE OF THE BUILDING.

THE MAINTENANCE CONTRACT SHALL BE CARRIED OUT EVERY THREE (3) MONTHS AND SHALL INCLUDE THE FOLLOWING ACTIVITIES:

1. CLEAN OUT ALL PITS OF SILT AND DEBRIS.
2. CHECK AND CLEAN OUT, IF NECESSARY, ALL PIPELINES.
3. CHECK:
   - 3.1. PUMPS FOR WEAR
   - 3.2. PUMP OIL SEALS
   - 3.3. PUMP STRAINER AND CLEAN
4. CARRY OUT ROUTINE MAINTENANCE TO PUMPS AS RECOMMENDED BY THE MANUFACTURER.
5. CHECK OPERATIONAL SEQUENCE OF LEVEL SWITCHES, PUMPS AND CONTROL PANEL.
6. THE EMERGENCY CONTRACT SHALL PROVIDE FOR A 24 HOUR X 7 DAY PER WEEK SERVICE.

THE CONTRACTOR SHALL PROVIDE A NAME PLATE STATING NAME, WORKING HOURS, TELEPHONE NUMBER AND OUT OF HOURS NUMBER AND SUCH NAME PLATE SHALL BE FIXED TO THE FRONT OF THE CONTROL PANEL.

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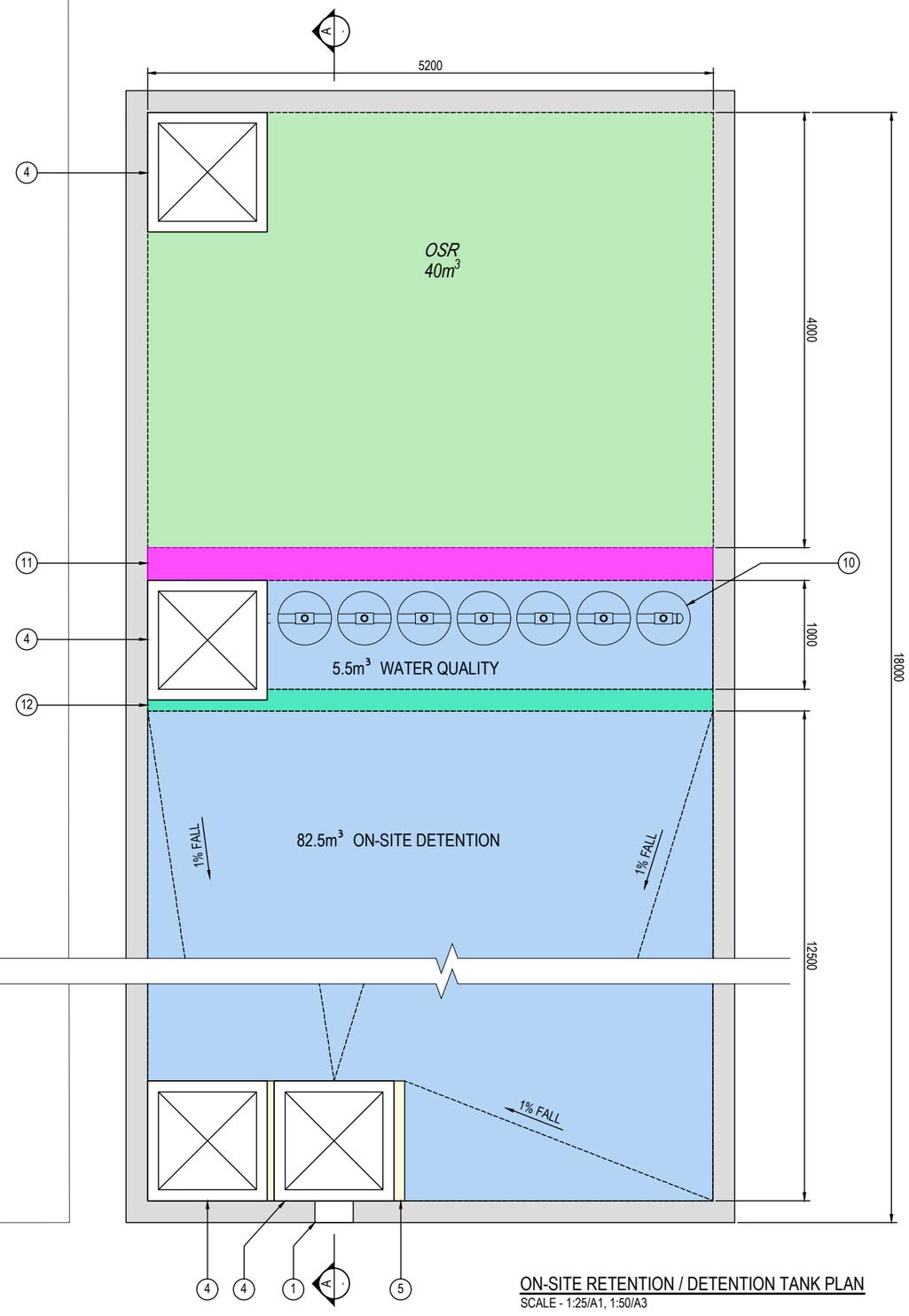
Drawing Title: STORMWATER MANAGEMENT DETAILS - SHEET No.1

Drawn	Date	Scale A1	Q.A. Check	Date
LW	MARCH 2025	AS SHOWN	-	-

Designed	Project No.	Dwg. No.	Issue
BK	CC240193	C6	D



ON-SITE RETENTION / DETENTION TANK PLAN

SCALE - 1:25/A1, 1:50/A3

OSD & OSR TANK WALL LEGEND

- FULL HEIGHT WALL
- OSR WEIR - TOP OF WEIR RL 119.60
- WATER QUALITY - TOP OF WEIR RL 119.35
- OSD WEIR - TOP OF WEIR RL 119.50

LEGEND

1. 375 DIA OUTLET PIPE
2. 350 x 350 x 4 PL 316SS 4 HOLES 12 DIA FOR M10 CHEMSETS
3. TRASH SCREEN LYSAGHT RH3030 GALV. REMOVABLE WITH HANDLE
4. 900 x 900 SOLID COVER BOLTED DOWN CLASS D
5. OSD OVERFLOW WEIR
6. RE-USE PUMP TO MANUFACTURERS SPECIFICATIONS
7. NON-RETURN VALVE
8. PVC PIPE CLASS '16' RISING MAIN BY OTHERS
9. PROVIDE GALVANISED STEP IRONS AT 300mm CENTRES WHERE DEPTH EXCEEDS 1100mm IN ACCORDANCE WITH THE AUST. STANDARDS AT ALL ACCESS POINTS OF THE TANK, TYP.
10. 7 x FULL HEIGHT OCEAN PROTECT FILTERS
11. 5.2m LONG OSR OVERFLOW WEIR
12. WATER QUALITY CHAMBER WEIR

Issue	Description	Date	Drawn	Approved
D	ISSUED FOR APPROVAL	02.04.25	IK	BK
C	ISSUED FOR APPROVAL	26.03.25	IK	BK
B	DRAFT ISSUE FOR CO-ORDINATION	20.03.25	LW	BK
A	ISSUE FOR INFORMATION	13.03.25	IK	BK

1cm at full size

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Architect: PTW

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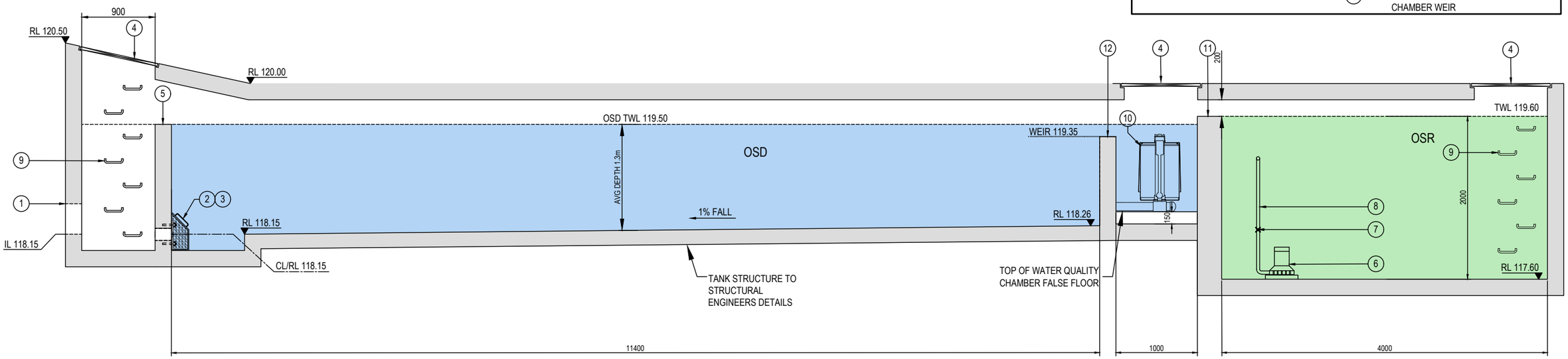
Drawing Title: STORMWATER MANAGEMENT DETAILS - SHEET No.2

Drawn	Date	Scale A1	Q.A. Check	Date
LW	MARCH 2025	AS SHOWN	-	-

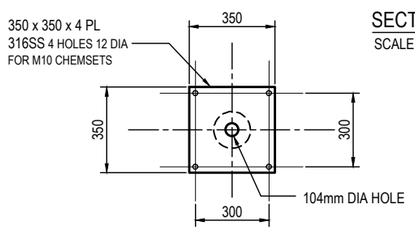
Designed	Project No.	Dwg. No.	Issue
BK	CC240193	C7	D

LEGEND

1	375 DIA OUTLET PIPE
2	350 x 350 x 4 PL 316SS 4 HOLES 12 DIA FOR M10 CHEMSETS
3	TRASH SCREEN LYSAGHT RH3030 GALV. REMOVABLE WITH HANDLE
4	900 x 900 SOLID COVER BOLTED DOWN CLASS D
5	OSD OVERFLOW WEIR
6	RE-USE PUMP TO MANUFACTURERS SPECIFICATIONS
7	NON-RETURN VALVE
8	PVC PIPE CLASS '16' RISING MAIN BY OTHERS
9	PROVIDE GALVANISED STEP IRONS AT 300mm CENTRES WHERE DEPTH EXCEEDS 1100mm IN ACCORDANCE WITH THE AUST. STANDARDS AT ALL ACCESS POINTS OF THE TANK, TYP.
10	7 x FULL HEIGHT OCEAN PROTECT FILTERS
11	5.2m LONG OSR OVERFLOW WEIR
12	WATER QUALITY CHAMBER WEIR

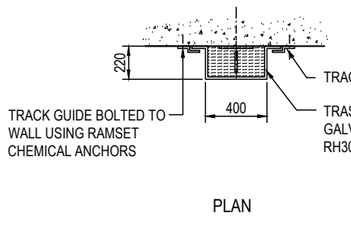


SECTION A
SCALE: 1:20/A1, 1:40/A3

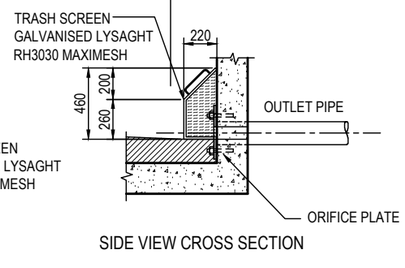


ORIFICE PLATE DETAIL
NTS

PROVIDE CONFINED SPACE SIGNAGE AT ENTRY POINTS INTO TANK.



PLAN



SIDE VIEW CROSS SECTION

TRASH SCREEN
SCALE NTS

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STREAM FLOW CONTROL REPORT

INTRODUCTION & METHODOLOGY

WE REFER TO KU-RING-GAI COUNCIL DEVELOPMENT CONTROL PLAN AND SPECIFICALLY CLAUSE 24C.3 SECTION 4 WHICH REQUIRES THE ASSESSMENT OF A RAINWATER TANK SYSTEM WHICH PROVIDES A 50% REDUCTION IN RUNOFF DAYS. IN ORDER TO DETERMINE THE RAINWATER TANK VOLUME REQUIRED TO MEET THE 50% REDUCTION TARGET A WATER BALANCE MODEL WAS DEVELOPED TO REPRESENT THE WATER TRANSPORTATION PROCESS IDENTIFIED IN FIGURE 1 BELOW.

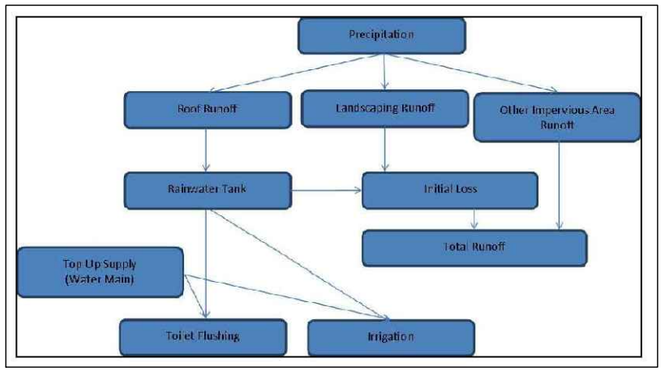

FIGURE 1. WATER BALANCE MODEL SUMMARY

THE METHODOLOGY ADOPTED, ASSESSES THE STORMWATER RUNOFF DIRECTED TO THE TANK ON A DAILY BASIS AND THE DAILY DRAWDOWN ASSOCIATED WITH DOMESTIC USAGE. THE MODELLING PRODUCES A DAILY TIME SERIES FOR THE AVAILABLE STORAGE IN THE TANK, DAILY MAINS WATER TOP UP, SPILL DURING STORMS, AND THE STORAGE LEVEL IN THE TANK.

WATER BALANCE SUMMARY

Post-development site (no management measures)			Post-development site (with management measures)		
areas			**areas**		
total area	3852	m^2	total area	3852	m^2
impervious area draining to re-use	0	m^2	impervious area draining to re-use	1100	m^2
pervious area	1540.8	m^2	pervious area	1540.8	m^2
impervious area graded to landscaping	0	m^2	impervious area graded to landscaping	1211.2	m^2
impervious area bypassing reuse & landscapin	2311.2	m^2	impervious area bypassing reuse & landscapir	0	m^2
reuse			**reuse**		
reuse tank volume	0	m^3	reuse tank volume	40	m^3
initial fraction full of reuse tanks	1		initial fraction full of reuse tanks	0.5	
daily reuse	0	m^3	daily reuse	0	m^3
irrgiation use per week	0	m	irrgiation use per week	0.02	m
losses			**losses**		
pervious area loss (mm)	10	mm	pervious area loss (mm)	10	mm
impervious area loss (mm) **	0.5	mm	impervious area loss (mm) **	0.5	mm
area to re-use loss (mm) *	0.5	mm	area to re-use loss (mm) *	0.5	mm
statistics			**statistics**		
Number of runoff days	3552		Number of runoff days	1740	
number of tank spill days	0		number of tank spill days	790	
total runoff volume	118,090.40		total runoff volume	87,768.12	
number of simulated days	11323		number of simulated days	11323	
number of rain events	4595		number of rain events	4595	
days reuse demand met	0		days reuse demand met	10172	
number of irrigation days	0		number of irrigation days	1618	
			reduction in runoff days	**51.0%**	
			reduction in runoff volume	**25.7%**	

WATER BALANCE DATA SUMMARY

AS SHOWN ABOVE REUSE IS ONLY REQUIRED TO CONNECT TO IRRIGATION ONLY TO ACHIEVE COMPLIANCE WITH COUNCIL'S REQUIREMENTS FOR RUNOFF REDUCTION.

CONCLUSION

BASED ON THE FOREGOING A MINIMUM TOTAL RAINWATER TANK VOLUME OF 40kL IS REQUIRED TO REDUCE RUNOFF DAYS BY 51.0%.

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Drawing Title: STREAMFLOW REPORT

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STORMWATER QUALITY REPORT

1 INTRODUCTION

A CATCHMENT BASED WATER QUALITY MODEL WAS DEVELOPED TO ASSESS THE STORMWATER RUNOFF QUALITY IN ACCORDANCE WITH THE REQUIREMENTS OF KU-RING-GAI DEVELOPMENT CONTROL PLAN PART 24 CLAUSE 24C.6 'STORMWATER QUALITY CONTROL.' IN THIS REGARD WE REFER TO THE PRESCRIBED TARGETS TABLED FOLLOWING:

TABLE 1 - STORMWATER POLUTANT REDUCTION TARGETS (MUSIC v6.3.0)

STORMWATER POLLUTANT	REDUCTION TARGETS
GROSS POLLUTANT	70%
TOTAL SUSPENDED SOLIDS (TSS)	85%
TOTAL PHOSPHORUS (TP)	65%
TOTAL NITROGEN (TN)	45%

2 STUDY METHODOLOGY

THE OBJECTIVES OF THIS REPORT ARE TO:

- ASSESS THE RUNOFF QUALITY FOR THE UNTREATED POST DEVELOPED SCENARIO AND IDENTIFY STORMWATER QUALITY CONTROLS LIKELY TO IMPACT ON RUNOFF QUALITY.
- ASSESS THE STORMWATER QUALITY FOR THE POST DEVELOPED SCENARIO INCLUDING THE MEASURES PROPOSED TO MEET THE POLLUTANT REMOVAL TARGETS .

THE REPORT IS BASED ON THE APPLICATION OF MUSIC SOFTWARE (MODEL FOR URBAN STORMWATER IMPROVEMENT CONCEPTUALISATION). IN THIS REGARD THE MODEL IS DEFINED AS FOLLOWS:

- A STORMWATER QUALITY MODEL TO CONVERT RAINFALL AND EVAPOTRANSPIRATION INTO RUNOFF.
- ESTIMATION OF STORMWATER FLOW AND POLLUTION GENERATION BY SIMULATING THE PERFORMANCE OF STORMWATER TREATMENT DEVICES INDIVIDUALLY AND AS PART OF A TREATMENT TRAIN.

THE MODEL DEFINES WATER QUALITY PROFILES FOR BOTH TREATED AND UNTREATED POST DEVELOPED SCENARIOS. THE TREATED POST DEVELOPED MODEL INCLUDES PARAMETERS WHICH REPRESENT THE WATER QUALITY MEASURES.

3 STORMWATER QUALITY MODELLING

3.1 GENERAL

THE FOLLOWING PARAMETERS WERE ASSESSED FOR THE HYDROLOGICAL MODELLING ASSOCIATED WITH THE CATCHMENT.

- RAINFALL/RUNOFF AND EVAPOTRANSPIRATION.
- SUB CATCHMENT DIVERSIONS.
- LAND USE (PERVIOUS AND IMPERVIOUS)

3.2 RAINFALL/RUNOFF AND EVAPOTRANSPIRATION

COUNCIL'S MUSIC-LINK DATA VERSION 6.35 WAS UTILISED IN THIS STUDY. THEREFORE DAILY RAINFALL DATA WAS OBTAINED FROM THE SYDNEY OBSERVATORY HILL RAINFALL STATION WITH 6 min TIMESTEP, STATION NO. 066062. THE DEFAULT KU-RING-GAI COUNCIL MUSIC LINK MONTHLY AVERAGE POTENTIAL EVAPOTRANSPIRATION DATA WAS ALSO UTILISED IN THIS STUDY.
THE DETAILS ARE SUMMARISED IN TABLE 3.1 AND 3.2

TABLE 3.1 - DETAILS OF DAILY RAINFALL DATA

STATION	NAME	PERIOD	TIMESTEP
066062	SYDNEY OBSERVATORY HILL	01/01/1963-31/12/1993	6 min

TABLE 3.2 - SUMMARY OF POTENTIAL EVAPOTRANSPIRATION (PET)

JAN	FEB	MAR	APR	MAY	JUN
180	135	128	85	58	43
JUL	AUG	SEP	OCT	NOV	DEC
43	58	88	127	152	163

3.3 CATCHMENT DEFINITION

THE POST DEVELOPED CATCHMENT CHARACTERISTICS ARE IDENTIFIED IN TABLE 3.3.

TABLE 3.3 - POST DEVELOPMENT SUB CATCHMENT DETAILS

SUB CATCHMENT ID	SUB CATCHMENT AREA (ha)	% IMPERVIOUS AREA	% PERVIOUS AREA
ROOF TO OSR	0.16	100	0
DRIVEWAY TO OSD	0.018	100	0
IMPERVIOUS TO OSD	0.088	100	0
OSD BYPASS	0.177	0	100

4 MUSIC MODEL

THE MUSIC MODEL IS BASED ON A 6 min RAINFALL-RUNOFF MODEL IN CONJUNCTION WITH REPRESENTATIVE BASEFLOW AND STORMFLOW EVENT MEAN CONCENTRATIONS (EMCs).

4.1 WATER QUALITY PARAMETERS

THE ADOPTED VALUES OF VARIOUS MUSIC RAINFALL AND RUNOFF PARAMETERS ARE SUMMARISED IN TABLE 4.1 AS PER THE DEFAULT NODE VALUES WHEN ADOPTING THE KU-RING-GAI COUNCIL MUSIC LINK.

TABLE 4.1 - ADOPTED MUSIC RAINFALL/RUNOFF PARAMETERS

PARAMETER	VALUE
IMPERVIOUS AREA PROPERTIES	
RAINFALL THRESHOLD (mm/DAY)	1.0 (0.3 ROOFS)
PERVIOUS AREA PROPERTIES	
SOIL STORAGE CAPACITY (mm)	170
SOIL INITIAL STORAGE (% OF CAPACITY)	30
FIELD CAPACITY (mm)	70
INFILTRATION CAPACITY COEFFICIENT - a	210
INFILTRATION CAPACITY EXPONENT - b	4.70
GROUNDWATER PROPERTIES	
INITIAL DEPTH (mm)	10
DAILY RECHARGE RATE (%)	50
DAILY BASEFLOW RATE (%)	5
DAILY DEEP SEEPAGE RATE (%)	0

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0 10cm at full size 10cm

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4.1 WATER QUALITY PARAMETERS CONT.

STORMWATER QUALITY IS CHARACTERISED USING EVENT MEAN CONCENTRATION (EMCs) UNDER STORM AND BASE FLOW CONDITIONS. THE VALUE OF WATER QUALITY PARAMETERS ADOPTED IN THIS STUDY IS SUMMARISED IN TABLE 4.2

TABLE 4.2 - ADOPTED MUSIC WATER QUALITY PARAMETERS

LAND-USE CATEGORY		Log_{10} TSS (mg/L)		Log_{10} TP (mg/L)		Log_{10} TN (mg/L)	
		STORM FLOW	BASE FLOW	STORM FLOW	BASE FLOW	STORM FLOW	BASE FLOW
GENERAL URBAN	MEAN	2.15	1.20	-0.60	-0.85	0.30	0.11
	STD DEV	0.32	0.17	0.25	0.19	0.19	0.12
ROADS	MEAN	2.43	1.20	-0.3	-0.85	0.34	0.11
	STD DEV	0.32	0.17	0.25	0.19	0.19	0.12
ROOFS	MEAN	1.30	1.10	-0.89	-0.82	0.30	0.32
	STD DEV	0.32	0.17	0.25	0.19	0.19	0.12

4.2 STORMWATER TREATMENT MEASURES

THE PROPOSED STORMWATER TREATMENT MEASURES INCLUDED IN THE POST DEVELOPED MODEL ARE AS FOLLOWS:

- 40,000 LITRE OSR TANK (FOR IRRIGATION ONLY)
- 7 X OCEAN PROTECT STORMFILTERS (FULL HEIGHT)
- 2 X OCEANGUARDS
- THE SCHEMATIC LAYOUT FOR THE POST DEVELOPED MUSIC MODEL IS DEPICTED IN FOLLOWING FIGURE 1

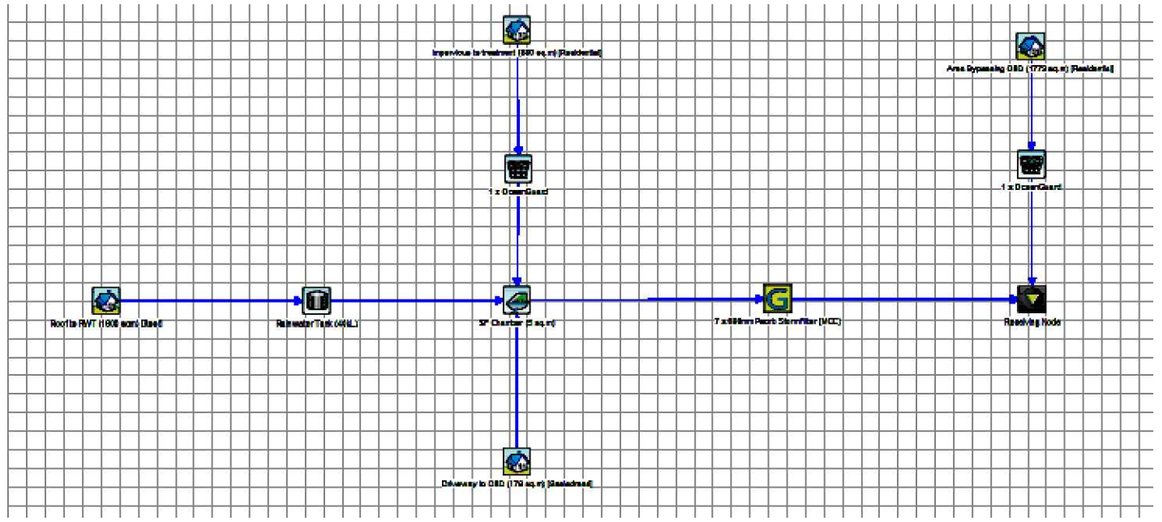

FIGURE 1 - MUSIC MODEL SCHEMATIC

5 RESULTS & CONCLUSION

BASED ON THE FOREGOING THE PROPOSED STORMWATER QUALITY TREATMENT MEASURES MEET THE REQUIRED TARGETS OF KU-RING-GAI COUNCIL.

REFER TO THE ASSOCIATED MUSIC LINK REPORT: 'CC240193 musicLink Report.pdf' AS PREPARED BY HYDRACOR CONSULTING ENGINEERS PTY LTD FOR FURTHER INFORMATION.

TABLE 5.1 - TREATMENT TRAIN EFFECTIVENESS

Treatment Train Effectiveness - Receiving Node

	Sources	Residual Load	% Reduction
Flow (ML/yr)	4.11	3.62	12
Total Suspended Solids (kg/yr)	392	56.6	85.5
Total Phosphorus (kg/yr)	0.92	0.307	66.7
Total Nitrogen (kg/yr)	8.6	4.2	51.2
Gross Pollutants (kg/yr)	79.1	0	100

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