# PROPOSED DEVELOPMENT
# Lot 17 (No.3) BROOKVALE AVENUE, BROOKVALE
## 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

DIAL BEFORE YOU DIG www.1100.com.au

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 ACOR CONSULTANTS (CC) 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 ACOR CONSULTANTS (CC)

### 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 ACOR CONSULTANTS (CC) 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



### NORTHERN BEACHES COUNCIL REQUIREMENTS

1. FULL COMPUTATION METHOD ADOPTED USING DRAINS PROGRAM. REFER TO DRAINS MODEL CC210062.drn
2. DRAINS SUMMARY

SITE AREA (m²).....706
IMPERVIOUS PRE-DEVELOPED FOR CALCULATIONS..... 0 (0%)

PRE-DEVELOPED DISCHARGE FLOW RATES

| 5 year ARI | 100 year ARI |
|---|---|
| 23 L/S | 41 L/S |

ROOF AREA (m²).....265
DRIVEWAY AREA + MISC. (m²).....84 + 131
+ 15% ADDITIONAL (m²).....105.9
TOTAL IMPERVIOUS AREA (m²).....585
FOR CALCULATION

OSD CATCHMENT = 480 m² (100% IMPERVIOUS)
OSD BYPASS = 226 m² (100% PERVIOUS)

POST DEVELOPED DISCHARGE FLOW RATES FROM OSD

| 5 year ARI | 100 year ARI |
|---|---|
| 11 L/S | 17 L/S |

4. STORAGE VOLUME REQUIRED =15m³
   REFER SHEET C3 FOR DETAILS
5. TOTAL POST DEVELOPED SITE DISCHARGE INCLUDING BYPASS

| 5 year ARI | 100 year ARI |
|---|---|
| 18 L/S | 29 L/S |

MAXIMUM HEADWATER DEPTH =2.65m
THEREFORE: ADOPT = 92mm ORIFICE
TOP STORED WSL - RL 23.40

DESIGN PREPARED IN ACCORDANCE WITH WARRINGAH COUNCIL "ON SITE STORMWATER DETENTION TECHNICAL SPECIFICATION", WATER MANAGEMENT DEVELOPMENT POLICY, WARRINGAH DCP 2011, AR&R & AS/NZS 3500.

DEVELOPMENT APPLICATION ISSUE
NOT FOR CONSTRUCTION

DRAWINGS MUST BE PRINTED IN COLOUR



| Issue | Description | Date | Drawn | Approved |
|---|---|---|---|---|
| B | RE-ISSUED FOR DEVELOPMENT APPROVAL | 11.01.22 | RH | BK |
| A | ISSUED FOR DEVELOPMENT APPROVAL | 10.06.21 | RH | BK |

1 0 1cm at full size 10cm

North

Client: PRIMO DESIGN PTY LTD

Architect: BARRY RUSH & ASSOCIATES PTY LTD


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ENGINEERS | MANAGERS | INFRASTRUCTURE PLANNERS | DEVELOPMENT CONSULTANTS


Project: PROPOSED RESIDENTIAL DEVELOPMENT
LOT 17 (No. 3)
BROOKVALE AVENUE
BROOKVALE

Drawing Title: COVER SHEET & NOTES

| Drawn | Date | Scale A1 | Q.A. Check | Date |
|---|---|---|---|---|
| RH | JUN 21 | AS NOTED | BAK | 10.06.21 |

| Designed | Project No. | Dwg. No. | Issue |
|---|---|---|---|
| BK | CC210062 | C1 | B |

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. FOR CHARGED/SEALED LINES PROVIDE APPROPRIATE CLEAN OUT FACILITY AT LOW POINTS OF SYSTEM, TYP.
3. ALL PLANTER BEDS TO HAVE ATLANTIS DRAINAGE CELL COMPLETE WITH PLANTER DRAIN OUTLET.
4. STORMWATER PIPES WITHIN CEILING SPACES OVER HABITABLE AREAS AND THE ADJACENT VERTICAL STACK TO BE ACOUSTICALLY LAGGED. REFER TO ACOUSTIC ENGINEERS REPORT FOR FURTHER DETAIL.

**WARNING**
LOCATION AND DEPTH OF ALL UNDERGROUND SERVICES TO BE INVESTIGATED WITH THE RELEVANT AUTHORITIES PRIOR TO COMMENCING WORK

PIT P1
600 x 900 PIT WITH LIGHT DUTY GRATED INLET
TOP OF GRATE - 22.10 nom
INVERT OF OUTLET IL 20.55 nom

DISCHARGE STORMWATER TO EXISTING INTER-ALLOTMENT DRAINAGE PIT TO THE SATISFACTION OF COUNCIL MAKE GOOD EXISTING CONSTRUCTION.
INVERT LEVEL OF OUTLET SHALL BE SITE CONFIRMED PRIOR TO COMMENCEMENT OF WORKS
DESIGN INVERT: IL 20.50 nom

**ON-SITE DETENTION TANK (OSD)**
PROVIDE COMBINED OSDTANK WITH: OSD
STORAGE VOLUME: 15m³
INTERNAL FOOTPRINT : 6m²
REFER TO SHEET C3 FOR DETAILS

CONSTRUCT 300 WIDE GRATED BOX DRAIN MIN 150mm DEEP . INVERT TO GRADE TO OUTLET AT A MINIMUM GRADE OF 2%
TOP OF GRATE RL 20.90 NOM

**RAINWATER RE-USE TANK (OSR)**
PROVIDE OSR TANK WITH:
VOLUME: 5m³ MIN.
REFER TO SHEET C4 FOR DETAILS
FINAL LOCATION OF RAINWATER TANK TO BE CONFIRMED AT CC STAGE

CROSSOVER AND DRIVEWAY TO BE IN ACCORDANCE WITH COUNCIL REQUIREMENTS. THE LEVELS AND DESIGN OF THE CROSSOVER AND DRIVEWAY SHALL BE BY OTHERS.

**RECHARGE TRENCH**
1 ROW 5m LONG RECHARGE TRENCH TO SATIFY WATER QUALITY MEASURES.
FINAL LOCATION TO BE CONFIRMED AT CC STAGE & VERIFIED BY THE ARBORIST.
ALLOW TO PROVIDE LOW LEVEL PIPE TO TRENCH FROM PIT P1.

INVERT OF OUTLET IL 20.70NOM

150 DIA RAINWATER TANK OVERFLOW PIPE

W/RM TO BE CONVEYED TO THE OSD TANK

PROPOSED BASEMENT FFL RL.20.65

DROP PIPE IL 23.40 NOM

150 DIA RAINWATER TANK OVERFLOW PIPE

TANK OVERFLOW PIPE TO TURNOUT HARDTO UNDERSIDE OF GROUND FLOOR SLAB
DESIGN INVERT IL 24.20 NOM

FFL RL.21.15

150 INGROUND

AERIAL PIPES INSTALLED AT HIGH LEVEL THROUGH BASEMENT TYP UNO

W/RM - BY OTHERS

OUTLINE OF GROUND FLOOR DECK OVER

RL23.55 DECK OVER

COURTYARD

STAIR 1

BENCH MARK
CUT ON KERB
RL. 26.79 A.H.D.

BROOKVALE AVENUE

(A) EASEMENT FOR DRAINAGE OF WATER 3 WIDE (D.P. 1050382) TO THE BENEFIT OF NORTHERN BEACHES COUNCIL

**BASEMENT PUMPOUT TANK**
REFER TO SHEET C5 FOR DETAILS
MINIMUM STORAGE CAPACITY BASED ON DRIVEWAY CATCHMENT AREA OF 50m² = 10m³
APPROXIMATE TANK DIMENSIONS
INTERNAL LENGTH 4.0m
INTERNAL WIDTH 2.0m
INTERNAL DEPTH 1.25m
COVER LEVEL 20.55NOM.

PIT BP1
450 SQUARE PIT WITH MEDIUM DUTY GRATED INLET
TOP OF GRATE - 21.10 nom

**BASIX REQUIREMENT**
A MINIMUM 100m² OF ROOF AREA IS TO BE CONVEYED TO THE RAINWATER REUSE TANK IN ACCORDANCE WITH THE BASIX CERTIFICATE.

DENOTES SEALED SOLVENT WELDED AERIAL LINE @ 1% GRADE. SUPPORT PIPE THRU BASEMENT IN ACC. WITH AS/NZS 3500.3. CONNECT ALL OUTLETS AND DOWNPIPES COLLECTING SURFACE WATER TO AERIAL DRAINAGE SYSTEM UNDER SOFFIT OF GROUND FLOOR SLAB.
FINAL PIPE ALIGNMENTS AND CONNECTIONS TO BE DETERMINED AT CC STAGE.

DENOTES SEALED SOLVENT WELDED AERIAL LINE @ 1% GRADE. SUPPORT THRU BASEMENT IN ACC. WITH AS/NZS 3500.3. CONNECT ALL ROOFWATER DOWNPIPES TO AERIAL DRAINAGE SYSTEM UNDER SOFFIT OF GROUND FLOOR SLAB.
FINAL PIPE ALIGNMENTS AND CONNECTIONS TO BE DETERMINED AT CC STAGE.

NOTE: ALLOW TO CONVEY SURFACE WATER RUNOFF GENERATED FROM ALL IMPERVIOUS AREAS INCLUDING DRIVEWAY RUNOFF TO THE ON SITE DETENTION TANK UNO

## STORMWATER MANAGEMENT PLAN
SCALE - 1:75/A1, 1:150/A3
0 0.75 1.5 3 4.5 6 7.5m



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|---|---|---|---|---|
| B | RE-ISSUED FOR DEVELOPMENT APPROVAL | 11.01.22 | RH | BK |
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1cm at full size

North

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Drawing Title: STORMWATER MANAGEMENT PLAN

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|---|---|---|---|---|
| RH | JUN 21 | AS NOTED | BAK | 10.06.21 |
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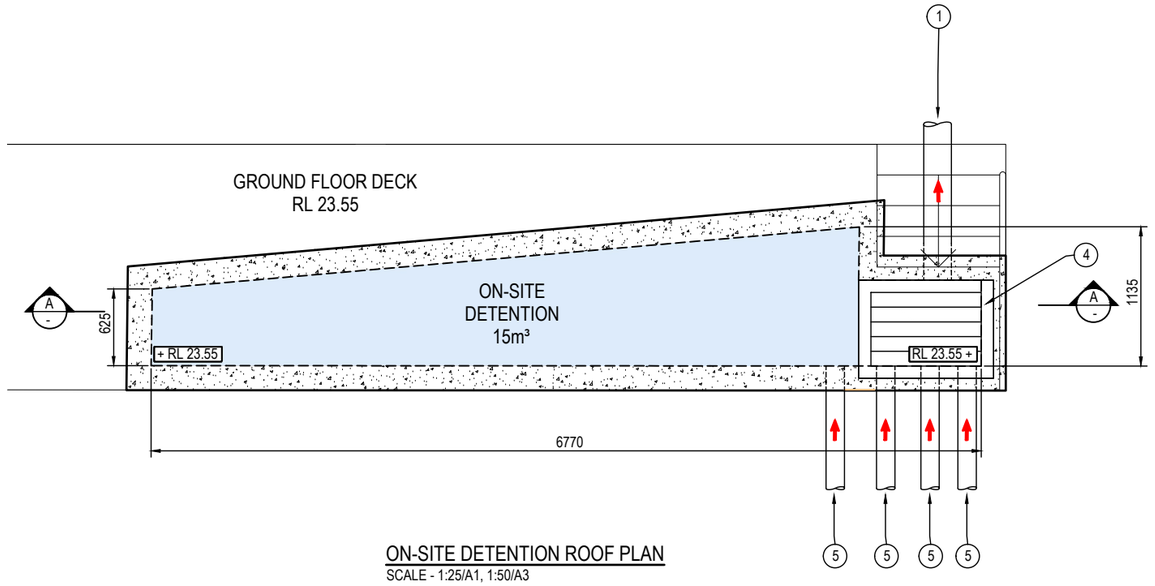
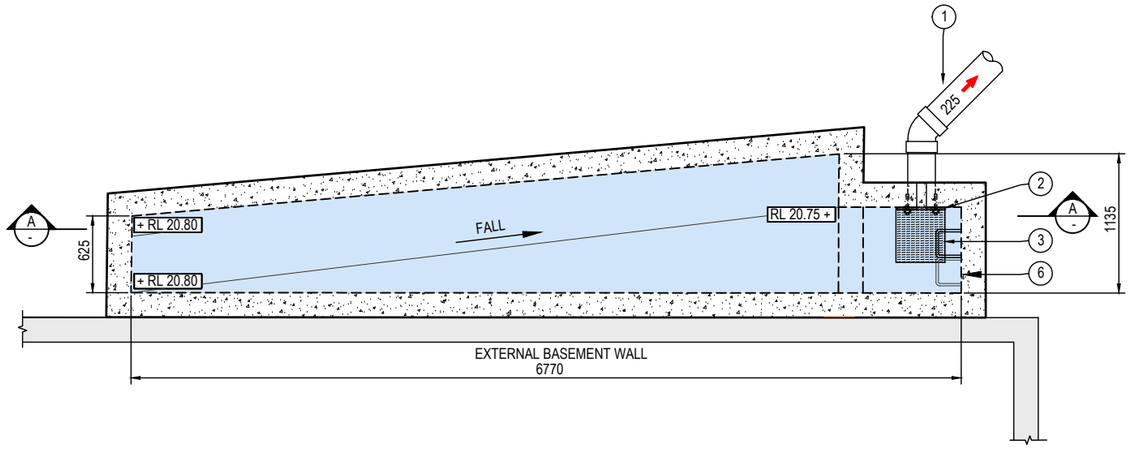
| BK | CC210062 | | C2 | B |



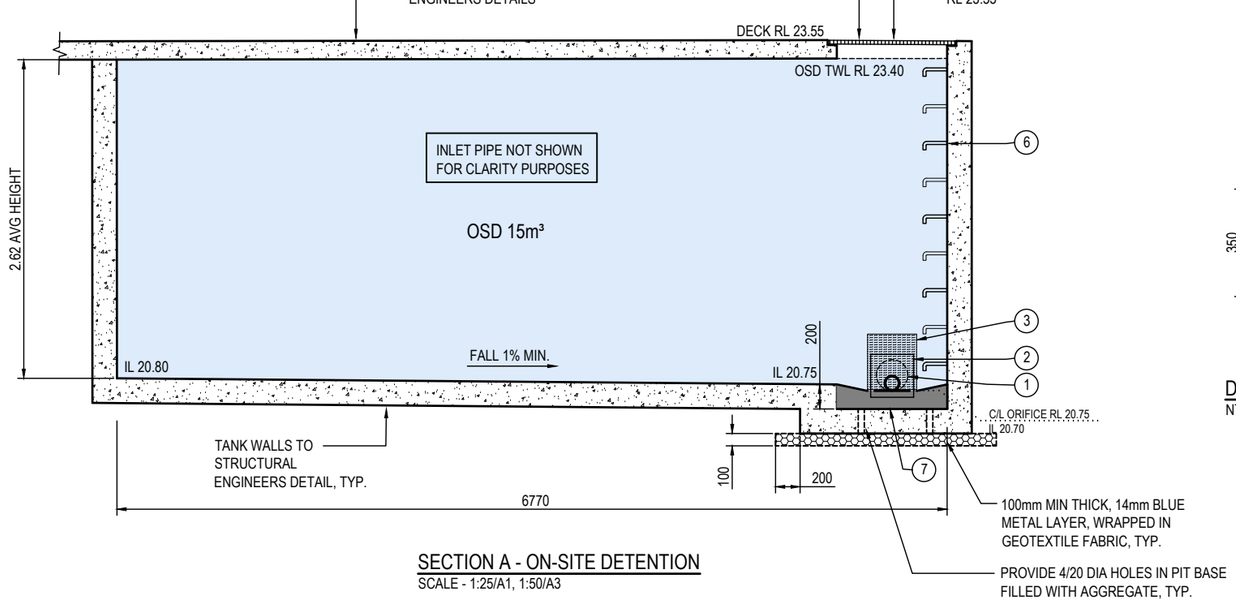

## ON-SITE DETENTION ROOF PLAN
SCALE - 1:25/A1, 1:50/A3



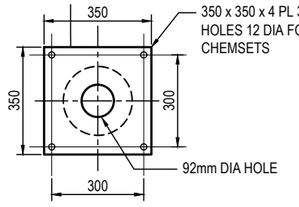

## ON-SITE DETENTION BASE PLAN
SCALE - 1:25/A1, 1:50/A3


PROVIDE CONFINED SPACE SIGNAGE
AT ENTRY POINTS INTO TANK.


## DETAIL 1 TRASH SCREEN
NTS




## SECTION A - ON-SITE DETENTION
SCALE - 1:25/A1, 1:50/A3




## DETAIL 2 - ORIFICE PLATE
NTS

## LEGEND

| | | | |
|---|---|---|---|
| 1 | 225 DIA OUTLET PIPE | 5 | INLET PIPE/S |
| 2 | 350 x 350 x 4 PL 316SS 4 HOLES 12 DIA FOR M10 CHEMSETS REFER TO DETAIL 2 SHEET C8 | 6 | 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. |
| 3 | TRASH SCREEN LYSAGHT RH3030 GALV. REMOVABLE WITH HANDLE REFER TO DETAIL 1 SHEET CX | 7 | MASS CONCRETE BENCHING |
| 4 | 600 x 900 BOLTED DOWN GRATED INLET WITH STAINLESS STEEL HEELPROOF GRATE. PROVIDE CHILDPROOF AND CORROSION RESISTENT FASTENING SYSTEM (IE. SPRING LOADED J-BOLTS OR SIMILAR) | | |



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1cm at full size 10cm

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LOT 17 (No. 3)
BROOKVALE AVENUE
BROOKVALE

Drawing Title: STORMWATER MANAGEMENT DETAILS SHEET No.1

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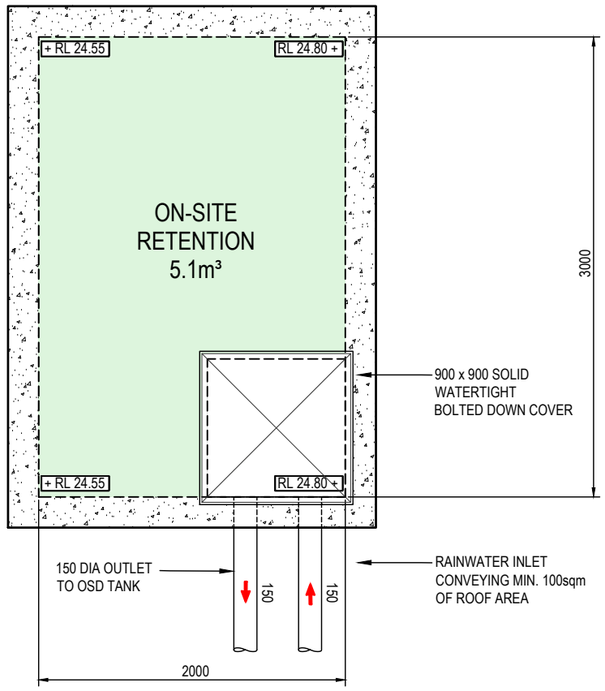
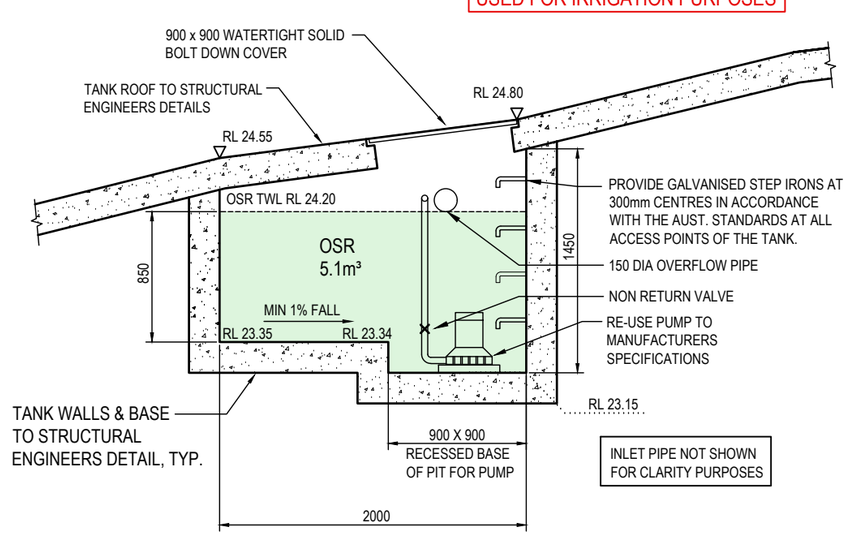
| BK | CC210062 | | C3 | B |




ON SITE RETENTION ROOF PLAN
SCALE 1:20/A1, 1:40/A3


PROVIDE CONFINED SPACE SIGNAGE AT
ENTRY POINTS INTO TANK.

RAINWATER REUSE TO BE
USED FOR IRRIGATION PURPOSES




TYPICAL SECTION RAINWATER TANK
SCALE 1:20/A1, 1:40/A3



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0 1cm at full size 10cm

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Architect
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& ASSOCIATES
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Drawing Title
STORMWATER MANAGEMENT
DETAILS SHEET No.2

| Drawn | Date | Scale A1 | Q.A. Check | Date |
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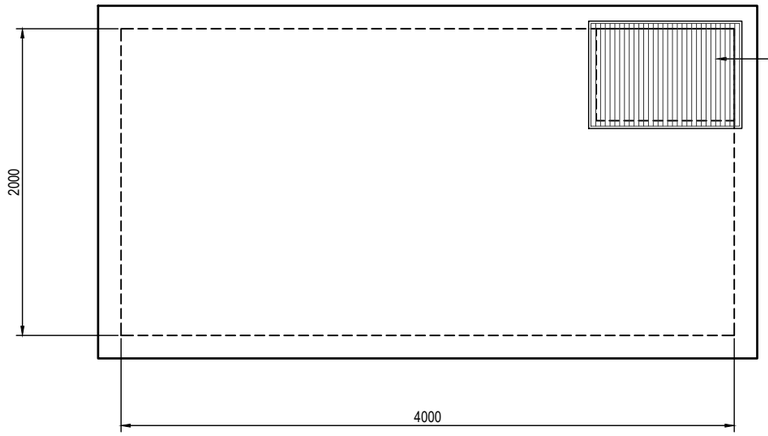


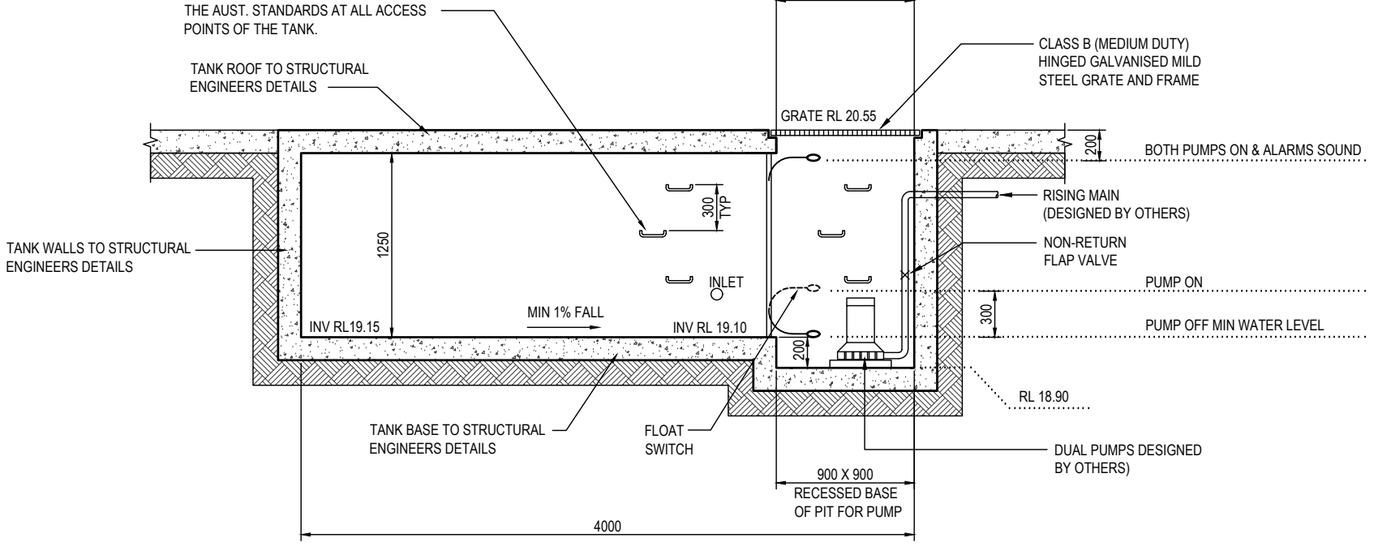

PUMP OUT TANK PLAN
SCALE 1:20/A1, 1:40/A3


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 = 1.25m
WIDTH = 2.0m
LENGTH = 4.0
VOLUME PROVIDED = $10m^3$

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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1cm at full size 0 10cm

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Architect
BARRY RUSH
& ASSOCIATES
PTY LTD

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Project
PROPOSED RESIDENTIAL
DEVELOPMENT
LOT 17 (No. 3)
BROOKVALE AVENUE
BROOKVALE

Drawing Title
STORMWATER MANAGEMENT
DETAILS SHEET No.3

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| BK | CC210062 | | C5 | B |

# EROSION AND SEDIMENT CONTROL NOTES

## GENERAL INSTRUCTIONS

1. THIS SOIL AND WATER MANAGEMENT PLAN IS TO BE READ IN CONJUNCTION WITH OTHER ENGINEERING PLANS RELATING TO THIS DEVELOPMENT.
2. CONTRACTORS WILL ENSURE THAT ALL SOIL AND WATER MANAGEMENT WORKS ARE UNDERTAKEN AS INSTRUCTED IN THIS SPECIFICATION AND CONSTRUCTED FOLLOWING THE GUIDELINES OF "MANAGING URBAN STORMWATER SOILS AND CONSTRUCTION", DEPT OF HOUSING, 1998 (BLUE BOOK).
3. ALL SUBCONTRACTORS WILL BE INFORMED OF THEIR RESPONSIBILITIES IN REDUCING THE POTENTIAL FOR SOIL EROSION AND POLLUTION TO DOWNSLOPE AREAS.

## LAND DISTURBANCE INSTRUCTIONS

4. DISTURBANCE TO BE NO FURTHER THAN 5 (PREFERABLY 2) METRES FROM THE EDGE OF ANY ESSENTIAL ENGINEERING ACTIVITY AS SHOWN ON APPROVED PLANS. ALL SITE WORKERS WILL CLEARLY RECOGNISE THESE ZONES THAT, WHERE APPROPRIATE, ARE IDENTIFIED WITH BARRIER FENCING (UPSLOPE) AND SEDIMENT FENCING (DOWNSLOPE) OR SIMILAR MATERIALS.
5. ACCESS AREAS ARE TO BE LIMITED TO A MAXIMUM WIDTH OF 10 METRES THE SITE MANAGER WILL DETERMINE AND MARK THE LOCATION OF THESE ZONES ON-SITE. ALL SITE WORKERS WILL CLEARLY RECOGNISE THESE BOUNDARIES THAT, WHERE APPROPRIATE, ARE IDENTIFIED WITH BARRIER FENCING (UPSLOPE) AND SEDIMENT FENCING (DOWNSLOPE) OR SIMILAR MATERIALS.
6. ENTRY TO LANDS NOT REQUIRED FOR CONSTRUCTION OR ACCESS IS PROHIBITED EXCEPT FOR ESSENTIAL THINNING OF PLANT GROWTH.
7. WORKS ARE TO PROCEED IN THE FOLLOWING SEQUENCE:
   - A) INSTALL ALL BARRIER AND SEDIMENT FENCING WHERE SHOWN ON THE PLAN.
   - B) CONSTRUCT THE STABILISED SITE ACCESS.
   - C) CONSTRUCT DIVERSION DRAINS AS REQUIRED.
   - D) INSTALL MESH AND GRAVEL INLETS FOR ANY ADJACENT KERB INLETS.
   - E) INSTALL GEOTEXTILE INLET FILTERS AROUND ANY ON-SITE DROP INLET PITS.
   - F) CLEAR SITE AND STRIP AND STOCKPILE TOPSOIL IN LOCATIONS SHOWN ON THE PLAN.
   - G) UNDERTAKE ALL ESSENTIAL CONSTRUCTION WORKS ENSURING THAT ROOF AND/OR PAVED AREA STORMWATER SYSTEMS ARE CONNECTED TO PERMANENT DRAINAGE AS SOON AS PRACTICABLE.
   - H) GRADE LOT AREAS TO FINAL GRADES AND APPLY PERMANENT STABILISATION (LANDSCAPING) WITHIN 20 DAYS OF COMPLETION OF CONSTRUCTION WORKS.
   - I) REMOVE TEMPORARY EROSION CONTROL MEASURES AFTER THE PERMANENT LANDSCAPING HAS BEEN COMPLETED.
5. ENSURE THAT SLOPE LENGTHS DO NOT EXCEED 80 METRES WHERE PRACTICABLE. SLOPE LENGTHS ARE DETERMINED BY SILTATION FENCING AND CATCH DRAIN SPACING.
6. ON COMPLETION OF MAJOR WORKS LEAVE DISTURBED LANDS WITH A SCARIFIED SURFACE TO ENCOURAGE WATER INFILTRATION AND ASSIST WITH KEYING TOPSOIL LATER.

## SITE MAINTENANCE INSTRUCTIONS

7. THE SITE SUPERINTENDENT WILL INSPECT THE SITE AT LEAST WEEKLY AND AT THE CONCLUSION OF EVERY STORM EVENT TO:
   - A) ENSURE THAT DRAINS OPERATE PROPERLY AND TO EFFECT ANY NECESSARY REPAIRS.
   - B) REMOVE SPILLED SAND OR OTHER MATERIALS FROM HAZARD AREAS, INCLUDING LANDS CLOSER THAN 5 METRES FROM AREAS OF LIKELY CONCENTRATED OR HIGH VELOCITY FLOWS ESPECIALLY WATERWAYS AND PAVED AREAS.
   - C) REMOVE TRAPPED SEDIMENT WHENEVER THE DESIGN CAPACITY OF THAT STRUCTURE HAS BEEN EXCEEDED.
   - D) ENSURE REHABILITATED LANDS HAVE EFFECTIVELY REDUCED THE EROSION HAZARD AND TO INITIATE UPGRADING OR REPAIR AS NECESSARY.
   - E) CONSTRUCT ADDITIONAL EROSION AND/OR SEDIMENT CONTROL WORKS AS MIGHT BECOME NECESSARY TO ENSURE THE DESIRED PROTECTION IS GIVEN TO DOWNSLOPE LANDS AND WATERWAYS. MAKE ONGOING CHANGES TO THE PLAN WHERE IT PROVES INADEQUATE IN PRACTICE OR IS SUBJECTED TO CHANGES IN CONDITIONS ON THE WORK-SITE OR ELSEWHERE IN THE CATCHMENT.
   - F) MAINTAIN EROSION AND SEDIMENT CONTROL STRUCTURES IN A FULLY FUNCTIONING CONDITION UNTIL ALL EARTHWORK ACTIVITIES ARE COMPLETED AND THE SITE IS REHABILITATED.
8. THE SITE SUPERINTENDENT WILL KEEP A LOGBOOK MAKING ENTRIES AT LEAST WEEKLY, IMMEDIATELY BEFORE FORECAST RAIN AND AFTER RAINFALL. ENTRIES WILL INCLUDE:
   - A) THE VOLUME AND INTENSITY OF ANY RAINFALL EVENTS.
   - B) THE CONDITION OF ANY SOIL AND WATER MANAGEMENT WORKS.
   - C) THE CONDITION OF VEGETATION AND ANY NEED TO IRRIGATE.
   - D) THE NEED FOR DUST PREVENTION STRATEGIES.
   - E) ANY REMEDIAL WORKS TO BE UNDERTAKEN.

   THE LOGBOOK WILL BE KEPT ON-SITE AND MADE AVAILABLE TO ANY AUTHORISED PERSON UPON REQUEST. IT WILL BE GIVEN TO THE PROJECT MANAGER AT THE CONCLUSION OF THE WORKS.

## SEDIMENT CONTROL INSTRUCTIONS

9. SEDIMENT FENCES WILL BE INSTALLED AS SHOWN ON THE PLAN AND ELSEWHERE AT THE DISCRETION OF THE SITE SUPERINTENDENT TO CONTAIN SOIL AS NEAR AS POSSIBLE TO THEIR SOURCE.
10. SEDIMENT FENCES WILL NOT HAVE CATCHMENT AREAS EXCEEDING 900 SQUARE METRES AND HAVE A STORAGE DEPTH OF AT LEAST 0.6 METRES.
11. SEDIMENT REMOVED FROM ANY TRAPPING DEVICES WILL BE RELOCATED WHERE FURTHER POLLUTION TO DOWNSLOPE LANDS AND WATERWAYS CANNOT OCCUR.
12. STOCKPILES ARE NOT TO BE LOCATED WITHIN 5 METRES OF HAZARD AREAS INCLUDING AREAS OF HIGH VELOCITY FLOWS SUCH AS WATERWAYS, PAVED AREAS AND DRIVEWAYS.
13. WATER WILL BE PREVENTED FROM DIRECTLY ENTERING THE PERMANENT DRAINAGE SYSTEM UNLESS THE CATCHMENT AREA HAS BEEN PERMANENTLY LANDSCAPED AND/OR WATER HAS BEEN TREATED BY AN APPROVED DEVICE.
14. TEMPORARY SEDIMENT TRAPS WILL REMAIN IN PLACE UNTIL AFTER THE LANDS THEY ARE PROTECTING ARE COMPLETELY REHABILITATED.
15. ACCESS TO SITES SHOULD BE STABILISED TO REDUCE THE LIKELIHOOD OF VEHICLES TRACKING SOIL MATERIALS ONTO PUBLIC ROADS AND ENSURE ALL-WEATHER ENTRY/EXIT.

## SOIL EROSION CONTROL INSTRUCTIONS

16. EARTH BATTERS WILL BE CONSTRUCTED WITH AS LOW A GRADIENT AS PRACTICABLE BUT NO STEEPER, UNLESS OTHERWISE NOTED, THAN:
    - 2(H):1(V) WHERE SLOPE LENGTH LESS THAN 12 METRES
    - 2.5(H):1(V) WHERE SLOPE LENGTH BETWEEN 12 AND 16 METRES.
    - 3(H):1(V) WHERE SLOPE LENGTH BETWEEN 16 AND 20 METRES.
    - 4(H):1(V) WHERE SLOPE LENGTH GREATER THAN 20 METRES.
17. ALL WATERWAYS, DRAINS, SPILLWAYS AND THEIR OUTLETS WILL BE CONSTRUCTED TO BE STABLE IN AT LEAST THE 1:20 YEAR ARI, TIME OF CONCENTRATION STORM EVENT.
18. WATERWAYS AND OTHER AREAS SUBJECT TO CONCENTRATED FLOWS AFTER CONSTRUCTION ARE TO HAVE A MAXIMUM GROUNDCOVER C-FACTOR OF 0.05 (70% GROUND COVER) WITHIN 10 WORKING DAYS FROM COMPLETION OF FORMATION. FLOW VELOCITIES ARE TO BE LIMITED TO THOSE SHOWN IN TABLE 5-1 OF "MANAGING URBAN STORMWATER - SOILS AND CONSTRUCTION", DEPT OF HOUSING 1998 (BLUE BOOK). FOOT AND VEHICULAR TRAFFIC WILL BE PROHIBITED IN THESE AREAS.
19. STOCKPILES AFTER CONSTRUCTION ARE TO HAVE A MAXIMUM GROUND-COVER C-FACTOR OF 0.1 (60% GROUND-COVER) WITHIN 10 WORKING DAYS FROM COMPLETION OF FORMATION.
20. ALL LANDS, INCLUDING WATERWAYS AND STOCKPILES, DURING CONSTRUCTION ARE TO HAVE A MAXIMUM GROUND-COVER C-FACTOR OF 0.15 (50% GROUND COVER) WITHIN 20 WORKING DAYS FROM INACTIVITY EVEN THOUGH WORKS MAY CONTINUE LATER.
21. FOR AREAS OF SHEET FLOW USE THE FOLLOWING GROUND COVER PLANT SPECIES FOR TEMPORARY COVER: JAPANESE MILLET 20 KG/HA AND OATS 20 KG/HA.
22. PERMANENT REHABILITATION OF LANDS AFTER CONSTRUCTION WILL ACHIEVE A GROUND-COVER C-FACTOR OF LESS THAN 0.1 AND LESS THAN 0.05 WITHIN 60 DAYS. NEWLY PLANTED LANDS WILL BE WATERED REGULARLY UNTIL AN EFFECTIVE COVER IS ESTABLISHED AND PLANTS ARE GROWING VIGOROUSLY. FOLLOW-UP SEED AND FERTILISER WILL BE APPLIED AS NECESSARY.
23. REVEGETATION SHOULD BE AIMED AT RE-ESTABLISHING NATURAL SPECIES. NATURAL SURFACE SOILS SHOULD BE REPLACED AND NON-PERSISTANT ANNUAL COVER CROPS SHOULD BE USED.

## WASTE CONTROL INSTRUCTIONS

24. ACCEPTABLE BINS WILL BE PROVIDED FOR ANY CONCRETE AND MORTAR SLURRIES, PAINTS, ACID WASHING, LIGHTWEIGHT WASTE MATERIALS AND LITTER. CLEARANCE SERVICES WILL BE PROVIDED AT LEAST WEEKLY. DISPOSAL OF WASTE WILL BE IN A MANNER APPROVED BY THE SITE SUPERINTENDENT.
25. ALL POSSIBLE POLLUTANT MATERIALS ARE TO BE STORED WELL CLEAR OF ANY POORLY DRAINED AREAS, FLOOD PRONE AREAS, STREAMBANKS, CHANNELS AND STORMWATER DRAINAGE AREAS. STORE SUCH MATERIALS IN A DESIGNATED AREA UNDER COVER WHERE POSSIBLE AND WITHIN CONTAINMENT BUNDS.
26. ALL SITE STAFF AND SUB-CONTACTORS ARE TO BE INFORMED OF THEIR OBLIGATION TO USE WASTE CONTROL FACILITIES PROVIDED.
27. ANY DE-WATERING ACTIVITIES ARE TO BE CLOSELY MONITORED TO ENSURE THAT WATER IS NOT POLLUTED BY SEDIMENT, TOXIC MATERIALS OR PETROLEUM PRODUCTS.
28. PROVIDE DESIGNATED VEHICULAR WASHDOWN AND MAINTENANCE AREAS WHICH ARE TO HAVE CONTAINMENT BUNDS.

## PROCEDURE FOR DE-WATERING

1. ENSURE PERMISSION FOR DE-WATERING IS RECEIVED FROM AUTHORITIES BEFORE PUMPING OUT.
2. AN ON-SITE TREATMENT PROCESS DISCHARGING TO THE STORMWATER SYSTEM WILL BE IMPLEMENTED. ALL SITE WATERS DURING CONSTRUCTION WILL BE CONTAINED ON SITE AND RELEASED ONLY WHEN pH IS BETWEEN 8.5 & 6.5, SUSPENDED SOLIDS ARE LESS THAN 50mg/L, TURBIDITY LESS THAN 100 NTU'S, OIL AND GREASE LESS THAN 10mg/L AND BIOCHEMICAL OXYGEN DEMAND (BOD5) LESS THAN 30mg/L (FOR STORMS LESS INTENSE THAN 1 IN 5 YEAR EVENTS).
3. METHODS OF SAMPLING AND ANALYSIS OF WATER QUALITY WILL BE IN ACCORDANCE WITH THE APPLICABLE METHOD LISTED IN THE EPA PUBLISHED APPROVED METHODS FOR THE SAMPLING ANALYSIS OF WATER POLLUTANTS IN NEW SOUTH WALES.
4. WHERE LABORATORY ANALYSIS IS REQUIRED AS INDICATED BY IN-SITU TESTING, APPROPRIATE SAMPLE BOTTLES AND PRESERVATIVES WILL BE USED AND GUIDANCE FOR THE SAMPLING METHOD OBTAINED FROM APPLICABLE PARTS OF AS5667.1 AND AS5667.6. ANALYSIS WILL BE UNDERTAKEN WHERE PRACTICAL BY A NATA REGISTERED LABORATORY CERTIFIED TO PERFORM THE APPLICABLE ANALYSIS.
5. A FURTHER INSPECTION WILL BE CARRIED OUT DURING A STORM EVENT (DURING WORK HOURS WHERE POSSIBLE) TO ENSURE CONTROLS ARE COPING WITH THE EVENT. THIS APPLIES TO ANY RAIN EVENT AS WELL.
6. AS EXCAVATION TO TOP SOIL PROGRESSES, ANY WATER COLLECTED AT THE BOTTOM OF EXCAVATIONS WILL BE DIVERTED TO A TEMPORARY SEDIMENTATION BASIN OR SETTLEMENT TANK. IF THE WATER CONTAINS ONLY SEDIMENTS, IT WILL BE FILTERED AND PUMPED TO STORMWATER. BEFORE THIS CAN HAPPEN IT MUST CONTAIN LESS THAN 50mg/L TOTAL SUSPENDED SOLIDS.
7. POLLUTED WATER MUST NOT ENTER THE STORMWATER SYSTEM. IN SOME CIRCUMSTANCES, A LIQUID WASTE COMPANY MAY BE REQUIRED TO COLLECT CONTAMINATED WATER FOR DISPOSAL AT A LICENSED TREATMENT FACILITY



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| B | RE-ISSUED FOR DEVELOPMENT APPROVAL | 11.01.22 | RH | BK |
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North

1cm at full size (0 – 10cm)

Client: PRIMO DESIGN PTY LTD

Architect: BARRY RUSH & ASSOCIATES PTY LTD

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Project: PROPOSED RESIDENTIAL DEVELOPMENT
LOT 17 (No. 3)
BROOKVALE AVENUE
BROOKVALE

Drawing Title: EROSION & SEDIMENT CONTROL NOTES

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## EROSION & SEDIMENT LEGEND

1. INSTALL SEDIMENT FENCING REFER DETAIL SD 6-8, SHEET C8. WHERE UNDER CANOPY AREAS OF TREES TO BE RETAINED, FENCING NOT TO BE DUG INTO THE GROUND BUT INSTEAD ATTACHED TO GROUND BY TIGHTLY PACKED SANDBAGS.

2. NOTE: PROVIDE PROTECTION TO DRAINAGE PITS FOLLOWING PIT INSTALLATION. REFER DETAIL SD6-12 ON SHEET C8

3. THE EXISTING CROSSOVER & LAYBACK ARE TO BE RETAINED FOR SITE ACCESS UNTIL REASONABLE COMPLETION OF CONSTRUCTION WORKS

4. STOCKPILE IN ACCORDANCE WITH DETAIL SD 4-1, REFER TO SHEET C8

5. WASTE STORAGE AREA PROVIDE SOLID AND LIQUID WASTE RECEPTACLE BINS

6. BARRIER FENCING OR UTILISE EXISTING BOUNDARY FENCE — B — B —

7. PROPOSED DISTURBED AREA

8. SITE ACCESS PROVIDE LARGE COARSE DIA AGGREGATE OR RECYCLED CONCRETE. IN ACCORDANCE WITH DETAIL SD 6-14, SHEET C8

9. PROVIDE TYPE 'D' SEDIMENT RETENTION BASIN.
NOMINAL SIZE: 4.0m x 4.0m x 0.5m DEEP
VOLUME = 8.0m³
TO BE CONFIRMED AT CC STAGE
DISHCARGE TO BE CONTOLLED PUMP OUT FOLLOWING FLOCCULATION

10. PROVIDE TEMPORARY PUMP OUT AND RISING MAIN TO OUTLET. — W/RM —

TREE BARRIERS REQUIRED IN ACCORDANCE WITH THE ARBORISTS REPORT

EXACT LOCATION OF OUTLET TO BE DETERMINED ON SITE

PROVIDE TEMPORARY PUMPOUT AND RISING MAIN TO OUTLET.

EXCAVATIONS FOR LIFT WELL SHALL BE USED AS A PRIMARY STORAGE AREA FOR TEMPORARY PUMP-OUT SYSTEM

WASHDOWN SURFACE WATER TO BE DIRECTED TO TEMPORARY (UNLINED) 1000 x 1000 x 500 DEEP PIT TO BE DRAINED TO SEDIMENT RETENTION BASIN FOR TREATMENT PRIOR TO DISCHARGE TO COUNCIL STORMWATER SYSTEM

BENCH MARK
CUT ON KERB
RL. 26.79 A.H.D.

BROOKVALE AVENUE

## EROSION & SEDIMENT CONTROL PLAN

SCALE - 1:100/A1, 1:200/A3

0 1 2 4 6 8 10m



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LOT 17 (No. 3)
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BROOKVALE

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| RH | JUN 21 | AS NOTED | BAK | 10.06.21 |
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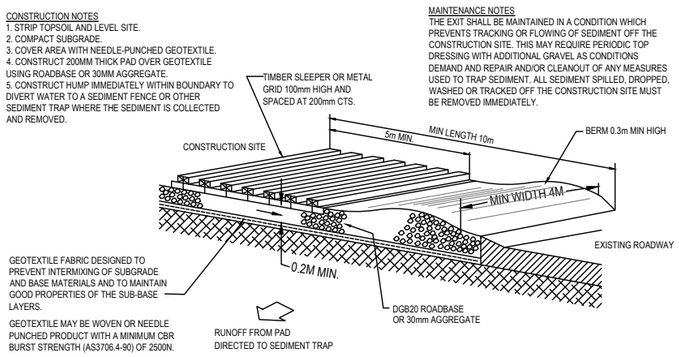
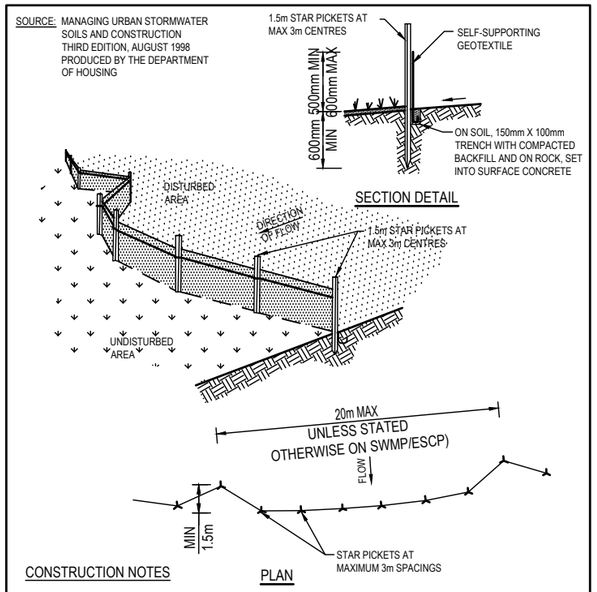


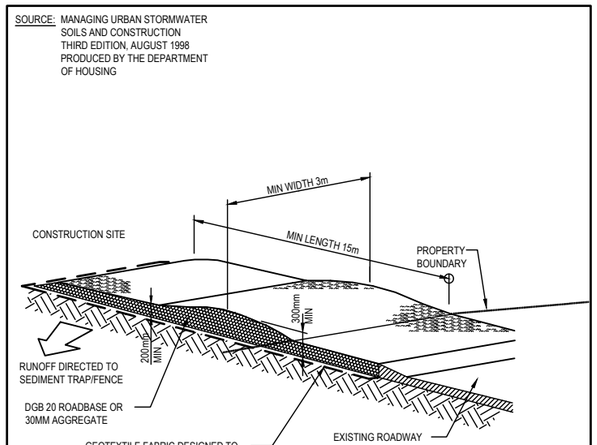

TEMPORARY WASH-DOWN AREA DURING EXCAVATION




CONSTRUCTION NOTES

1. CONSTRUCT SEDIMENT FENCE AS CLOSE AS POSSIBLE TO PARALLEL TO THE CONTOURS OF THE SITE.
2. DRIVE 1.5 METRE LONG STAR PICKETS INTO GROUND, 3 METRES APART.
3. DIG A 150 MM DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
4. BACKFILL TRENCH OVER BASE OF FABRIC.
5. FIX SELF-SUPPORTING GEOTEXTILE TO UPSLOPE SIDE OF POSTS WITH WIRE TIES OR AS RECOMMENDED BY GEOTEXTILE MANUFACTURER.
6. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150 MM OVERLAP.

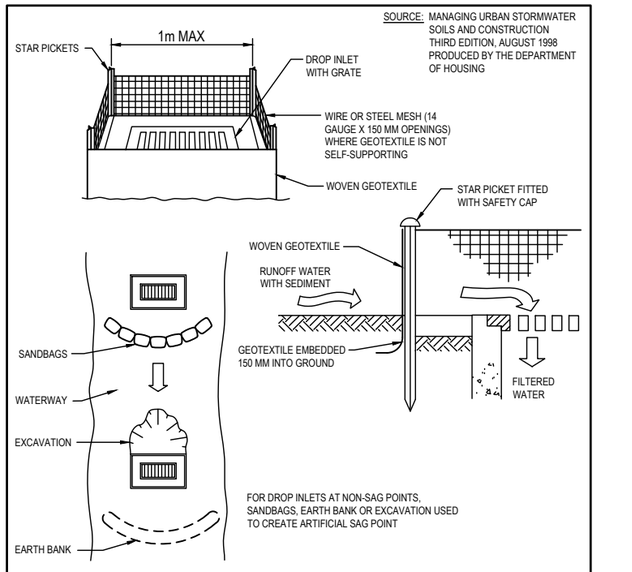
SEDIMENT FENCE SD 6-8




CONSTRUCTION NOTES:

1. STRIP TOPSOIL AND LEVEL SITE.
2. COMPACT SUBGRADE.
3. COVER AREA WITH NEEDLE-PUNCHED GEOTEXTILE.
4. CONSTRUCT 200MM THICK PAD OVER GEOTEXTILE USING ROADBASE OR 30MM AGREGATE. MINIMUM LENGTH 15M OR TO BUILDING ALIGNMENT. MINIMUM WIDTH 3 METRES.
5. CONSTRUCT HUMP IMMEDIATELY WITHIN BUUNDARY TO DIVERT WATER TO A SEDIMENT FENCE OR OTHER SEDIMENT TRAP.

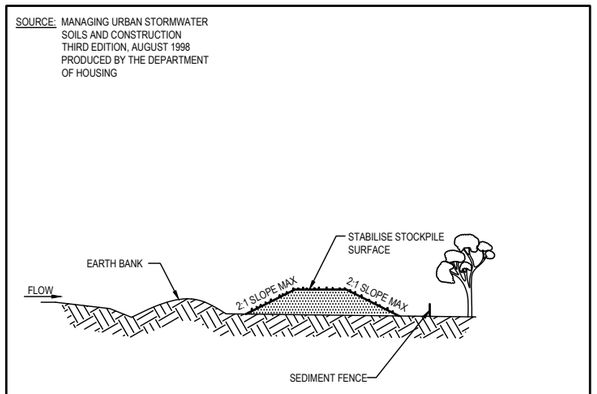
STABILISED SITE ACCESS SD 6-14




CONSTRUCTION NOTES:

1. FABRICATE A SEDIMENT BARRIER FROM GEOTEXTILE OR STRAW BALES.
2. SUPPORT GEOTEXTILE WITH MESH TIED TO POSTS AT 1 METRE CENTRES.
3. DO NOT COVER INLET WITH GEOTEXTILE.
4. CONSTRUCTION DETAILS ARE SIMILAR TO TYPICAL SEDIMENT FENCING DETAIL.

GEOTEXTILE INLET FILTER SD 6-12




CONSTRUCTION NOTES:

1. LOCATE STOCKPILE AT LEAST 5 METRES FROM EXISTING VEGETATION, CONCENTRATED WATER FLOWS, ROADS AND HAZARD AREAS.
2. CONSTRUCT ON THE CONTOUR AS A LOW, FLAT, ELONGATED MOUND.
3. WHERE THERE IS SUFFICIENT AREA TOPSOIL STOCKPILES SHALL BE LESS THAN 2 METERS IN HEIGHT.
4. REHABILITATE IN ACCORDANCE WITH THE SWMP/ESCP.
5. CONSTRUCT EARTH BANK (STANDARD DRAWING 5-2) ON THE UPSLOPE SIDE TO DIVERT RUN OFF AROUND THE STOCKPILE AND A SEDIMENT FENCE (STANDARD DRAWING 6-7) 1 TO 2 METRES DOWNSLOPE OF STOCKPILE.

STOCKPILES SD 4-1



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North

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Project: PROPOSED RESIDENTIAL DEVELOPMENT
LOT 17 (No. 3) BROOKVALE AVENUE BROOKVALE

Drawing Title: EROSION & SEDIMENT CONTROL DETAIL SHEET

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## Appendix 16 – On-site Detention Checklist

This checklist is to be used to determine the on-site stormwater disposal requirement for developments and must be completed and included with the submission of any development application for these works. Please read this form carefully for its notes, guidelines, definition and relevant policies.

For assistance and support, please contact Council's Development Engineering and Certification team on 1300 434 434.

| **Part 1 Location of the Property** | | | |
|---|---|---|---|
| House Humber | No. 3 | Legal Property Description | |
| Street | BROOKVALE AVENUE | Lot 17 | |
| Suburb | BROOKVALE | Section | |
| Postcode | 2100 | DP 6040 | |

| **Part 2 Site Details** | | | |
|---|---|---|---|
| Northern Beaches Stormwater Regions (refer to Map 2 of Northern Beaches Council's Water Management for Development policy) | REGION 2 | Total Site Area | 706.1 |
| Pre-Development Impervious Area | 253 | Post-Development Impervious Area | 480 |
| Is the site of the development located within an established Flood Prone Land as referred to Council's Local Environmental Plans?<br>If yes, On-site stormwater Detention system (OSD) is not required and please proceed to part 5 of this checklist<br>If no, please proceed to part 3 of this checklist. | | | Yes ☐ No ☑ |

| **Part 3: Northern Beaches Stormwater Regions**<br>(refer to Map 2 of Northern Beaches Council's Water Management for Development policy) |
|---|
| If the site of the development located within Region 1, please proceed to the part 4.1 of this checklist |
| If the site of the development located within Region 2, please proceed to the part 4.2 of this checklist |
| If the site of the development located within Region 3, please proceed to the part 4.3 of this checklist |
| If the site of the development located within Region 4, please refer to Council's Warriewood Valley Water Management Specification. |



| **Part 4 Determination of OSD Requirements** | |
|---|---|
| **Part 4.1 Northern Beaches Stormwater Region 1** | |
| Is the additional impervious area of the development more than 50 $m^2$ on a cumulative basis since February 1996? | Yes ☐ No ☐ |
| If yes, OSD is required and please refer to section 9.3.1 of Council's Water Management for Development Policy<br>If no, OSD is not required and please proceed to the part 5 of this checklist | |

| **Part 4.2 Northern Beaches Stormwater Region 2** | |
|---|---|
| **Part 4.2.1 Description of Work** | |
| Residential flat building, commercial, industrial, multiple occupancy development and subdivisions resulting in the creation of three lots or more, will require OSD in all case. Please provide a design in accordance with the section 9.3.2 of Council's Water Management for Development Policy.<br>Any single residential building development, please proceed to part 4.2.2 of this checklist. | |
| **Part 4.2.2 Exemption** | |
| Is the site area less than 450$m^2$? | Yes ☐ No ☑ |
| Does the site of the development drain directly to the ocean without the need to pass through a drainage control structure such as pipe, bridge, culvert, kerb and gutter or natural drainage system? | Yes ☐ No ☑ |
| Is it an alternation and addition development to the existing dwellings? | Yes ☐ No ☑ |
| If yes to any of the above questions, OSD is not required.<br>If no to all the above questions, proceed to part 4.2.3 | |
| **Part 4.2.3 Determination of OSD Requirements** | |
| Calculation | a) Site area $m^2$ x 0.40 (40%) = 282.44 $m^2$<br>b) Post- development impervious area = 480 $m^2$<br>**OSD will not be required when (a) is greater than (b)**<br>Is OSD required for this development (tick one only) Yes ☑ No ☐<br>If yes, provide a design in accordance with the section 9.3.2 of Council's Water Management for Development Policy.<br>If no, OSD is not required and please proceed to part 5 of this checklist. |





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Project: PROPOSED RESIDENTIAL DEVELOPMENT
LOT 17 (No. 3)
BROOKVALE AVENUE
BROOKVALE

Drawing Title: ON SITE DETENTION CHECKLIST

| Drawn | Date | Scale A1 | Q.A. Check | Date |
|---|---|---|---|---|
| RH | JUN 21 | AS NOTED | BAK | 10.06.21 |
| Designed | Project No. | | Dwg. No. | Issue |
| BK | CC210062 | | C9 | B |

# 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 TABLE 5 OF NORTHERN BEACHES COUNCIL 'WATER MANAGEMENT FOR DEVELOPMENT POLICY 2021. IN THIS REGARD WE REFER TO THE PRESCRIBED TARGETS TABLED FOLLOWING:

TABLE 1 - STORMWATER POLUTANT REDUCTION TARGETS

| STORMWATER POLLUTANT | REDUCTION TARGETS |
|---|---|
| GROSS POLLUTANT | 90% |
| 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

THE ADOPTED RAINFALL, RUNOFF AND EVAPOTRANSPIRATION USED IN THIS STUDY IS IN ACCORDANCE WTH THE VALUES RECOMMENDED IN NORTHERN BEACHES COUNCIL WSUD & MUSIC MODELLING GUIDELINES. 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 | 01/01/1981-31/12/1985 | 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 | 0.027 | 100 | 0 |
| IMPERVIOUS AREA TO OSD | 0.013 | 100 | 0 |
| DRIVEWAY | 0.08 | 100 | 0 |

## 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 IN ACCORDANCE WTH THE VALUES RECOMMENDED IN NORTHERN BEACHES COUNCIL WSUD & MUSIC MODELLING GUIDELINES FOR SANDY LOAM.

| TABLE 4.1 - ADOPTED MUSIC RAINFALL/RUNOFF PARAMETERS | |
|---|---|
| PARAMETER | VALUE |
| IMPERVIOUS AREA PROPERTIES | |
| RAINFALL THRESHOLD (mm/DAY) | 1.5 (0.3 ROOFS) |
| PERVIOUS AREA PROPERTIES | |
| SOIL STORAGE CAPACITY (mm) | 108 |
| SOIL INITIAL STORAGE (% OF CAPACITY) | 30 |
| FIELD CAPACITY (mm) | 73 |
| INFILTRATION CAPACITY COEFFICIENT - a | 250 |
| INFILTRATION CAPACITY EXPONENT - b | 1.3 |
| GROUNDWATER PROPERTIES | |
| INITIAL DEPTH (mm) | 10 |
| DAILY RECHARGE RATE (%) | 60 |
| DAILY BASEFLOW RATE (%) | 45 |
| DAILY DEEP SEEPAGE RATE (%) | 0 |



| Issue | Description | Date | Drawn | Approved |
|---|---|---|---|---|
| B | RE-ISSUED FOR DEVELOPMENT APPROVAL | 11.01.22 | NB | BK |
| A | ISSUED FOR DEVELOPMENT APPROVAL | 12.10.21 | RH | BK |

North

1 0 1cm at full size 10cm

Client: PRIMO DESIGN PTY LTD

Architect: BARRY RUSH & ASSOCIATES PTY LTD

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LOT 17 (No. 3)
BROOKVALE AVENUE
BROOKVALE

Drawing Title: STORMWATER QUALITY SHEET 1 OF 2

| Drawn | Date | Scale A1 | Q.A. Check | Date |
|---|---|---|---|---|
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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:

- 5,000 LITRE OSR TANK FOR IRRIGATION
- 15,000 LITRE OSD TANK
- 5 LINEAL METRES MIN. EVERTRENCH 410 JUMBO' PLASTIC TRENCH OR APPROVED EQUIVALENT

THE SCHEMATIC LAYOUT FOR THE POST DEVELOPED MUSIC MODEL IS DEPICTED IN FOLLOWING FIGURE 1

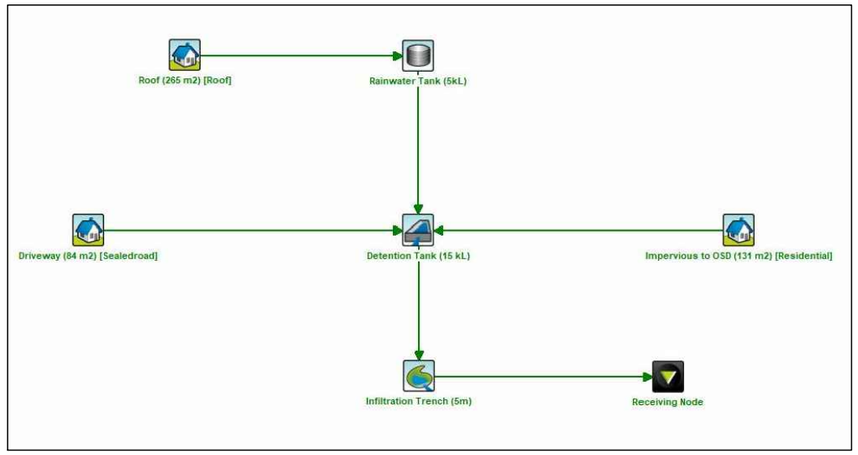


FIGURE 1 - MUSIC MODEL SCHEMATIC

## 5 RESULTS & CONCLUSION

BASED ON THE FOREGOING AND THE ACHIEVED POLLUTANT REDUCTION RESULTS DEPICTED IN TABLE 5.1 THE PROPOSED STORMWATER QUALITY TREATMENT MEASURES MEET THE REQUIRED TARGETS OF NORTHERN BEACHES COUNCIL.

TABLE 5.1 - TREATMENT TRAIN EFFECTIVENESS

Treatment Train Effectiveness - Receiving Node

| | Sources | Residual Load | % Reduction |
|---|---|---|---|
| Flow (ML/yr) | 0.552 | 0.103 | 81.3 |
| Total Suspended Solids (kg/yr) | 65.4 | 5.58 | 91.5 |
| Total Phosphorus (kg/yr) | 0.142 | 0.019 | 86.6 |
| Total Nitrogen (kg/yr) | 1.22 | 0.215 | 82.4 |
| Gross Pollutants (kg/yr) | 13.9 | 0 | 100 |



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