





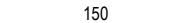
















PROPOSED DEVELOPMENT (No.2 - 8) GLENN AVENUE, NORTHMEAD STORMWATER MANAGEMENT PLANS

LEGEND	
	DENOTES ON-SITE DETENTION TANK
	DENOTES ON-SITE RETENTION TANK
	DENOTES DWELLING FOOTPRINT
	DENOTES 100mm DIA. STORMWATER/SURFACE WATER SYSTEM PIPE AT 1% MIN. GRADE U.N.O.
	DENOTES 100mm DIA. FULLY SEALED RAINWATER SYSTEM PIPE U.N.O.
	DENOTES RAINWATER PIPE AND DIA. WHEN PIPE EXCEEDS 100mm DIA.
	DENOTES STORMWATER/SURFACE WATER PIPE AND DIA. WHEN PIPE EXCEEDS 100mm DIA.
	DENOTES RISING MAIN AND PIPE DIA. U.N.O.
	DENOTES SUBSOIL DRAINAGE LINE AND DIA. WRAPPED IN GEOFABRIC U.N.O.
	DENOTES DOWNPIPE
	DENOTES INSPECTION OPENING WITH SCREW DOWN LID AT FINISHED SURFACE LEVEL
	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
	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

- 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
- 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
- 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

- 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
- 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
- THE MINIMUM GRADIENT OF STORMWATER DRAINS SHALL BE 1%, UNLESS NOTED OTHERWISE
- COUNCIL'S TREE PRESERVATION ORDER IS TO BE STRICTLY ADHERED TO. NO TREES SHALL BE REMOVED UNTIL PERMIT IS OBTAINED
- PUBLIC UTILITY SERVICES ARE TO BE ADJUSTED AS NECESSARY AT THE CLIENT'S EXPENSE
- ALL PITS TO BE BENCHED AND STREAMLINED. PROVIDE STEP IRONS FOR ALL PITS OVER 1.2m DEEP
- MAKE SMOOTH JUNCTION WITH ALL EXISTING WORK
- VEHICULAR ACCESS AND ALL SERVICES TO BE MAINTAINED AT ALL TIMES TO ADJOINING PROPERTIES AFFECTED BY CONSTRUCTION
- 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
- 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

- RAINWATER SUPPLY PLUMBING TO BE CONNECTED TO OUTLETS WHERE REQUIRED BY BASIX CERTIFICATE (BY OTHERS)
- TOWN WATER CONNECTION TO RAINWATER TANK TO BE TO THE SATISFACTION OF THE REGULATORY AUTHORITY. THIS MAY REQUIRE PROVISION OF:
 - PERMANENT AIR GAP
 - BACKFLOW PREVENTION DEVICE
- NO DIRECT CONNECTION BETWEEN TOWN WATER SUPPLY AND THE RAIN WATER SUPPLY
- AN APPROVED STOP VALVE AND/OR PRESSURE LIMITING VALVE AT THE RAINWATER TANK
- 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
- ALL PLUMBING WORKS ARE TO BE CARRIED OUT BY LICENSED PLUMBERS IN ACCORDANCE WITH AS/NZS3500.1 NATIONAL PLUMBING AND DRAINAGE CODE
- PRESSURE PUMP ELECTRICAL CONNECTION TO BE CARRIED OUT BY A LICENSED ELECTRICIAN
- ONLY ROOF RUN-OFF IS TO BE DIRECTED TO THE RAINWATER TANK. SURFACE WATER INLETS ARE NOT TO BE CONNECTED
- 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)
- EVERY RAINWATER SUPPLY OUTLET POINT AND THE RAINWATER TANK ARE TO BE LABELED 'RAINWATER' ON A METALLIC SIGN IN ACCORDANCE WITH AS1319
- ALL INLETS AND OUTLETS TO THE RAINWATER TANK ARE TO HAVE SUITABLE MEASURES PROVIDED TO PREVENT MOSQUITO AND VERMIN ENTRY

PARRAMATTA COUNCIL REQUIREMENTS

- SITE AREA (m²) 2812.9
- ON-SITE DETENTION
REFER TO SHEET C9 FOR THE UPPER PARRAMATTA RIVER CATCHMENT TRUST ON-SITE DETENTION DRAINAGE CALCULATIONS
- RAINWATER REUSE
PROVIDE RAINWATER REUSE TANK AS REQUIRED BY BASIX. BASIX REQUIREMENT = 10m³.
- SITE DISCHARGE TO PROPOSED KERB INLET PIT IN GLENN AVENUE. REFER TO SHEET C4.
- DESIGN HAS BEEN PREPARED IN ACCORDANCE WITH PARRAMATTA COUNCIL DESIGN & DEVELOPMENT GUIDELINES, UPPER PARRAMATTA RIVER CATCHMENT TRUST, AR&R AND AS/ANZS 3500

SHEET INDEX




COVER SHEET & NOTES	SHEET C1
ON SITE DETENTION CATCHMENT PLAN	SHEET C2
STORMWATER MANAGEMENT PLAN - PART 1	SHEET C3
STORMWATER MANAGEMENT PLAN - PART 2	SHEET C4
STORMWATER MANAGEMENT DETAILS SHEET No.1	SHEET C5
STORMWATER MANAGEMENT DETAILS SHEET No.2	SHEET C6
EROSION & SEDIMENT CONTROL PLAN	SHEET C7
EROSION & SEDIMENT CONTROL NOTES & DETAILS	SHEET C8
OSD CALCULATION SHEET & MAINTENANCE SCHEDULE	SHEET C9
ON-SITE DETENTION CHECKLIST SHEET 1 OF 2	SHEET C10
ON-SITE DETENTION CHECKLIST SHEET 2 OF 2	SHEET C11
PIPE LONG SECTION PIT P1 - PIT P4	SHEET C12
STORMWATER QUALITY REPORT SHEET 1 OF 2	SHEET C13
STORMWATER QUALITY REPORT SHEET 2 OF 2	SHEET C14

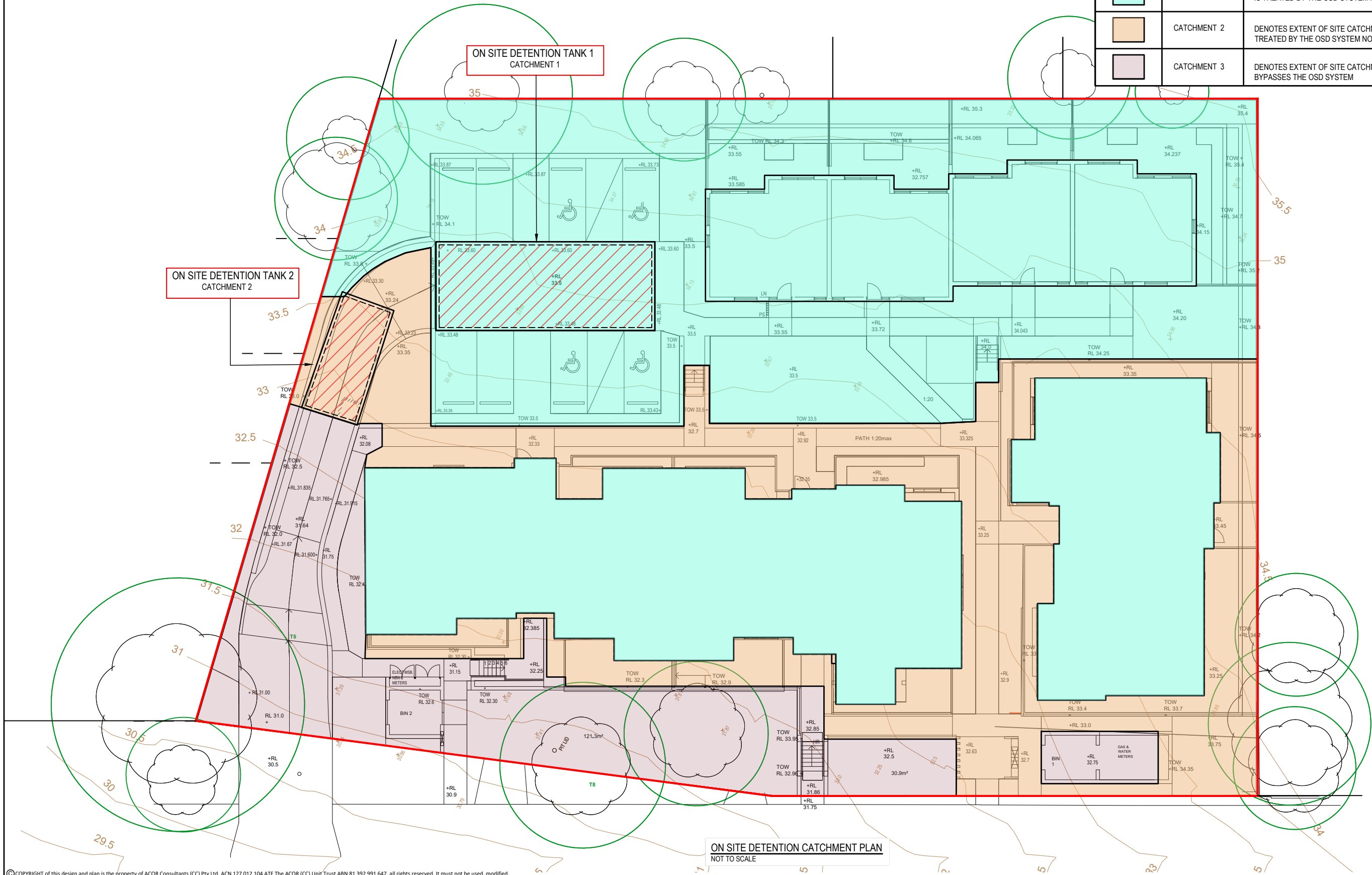
DEVELOPMENT APPLICATION ISSUE
NOT FOR CONSTRUCTION

DRAWINGS MUST BE PRINTED IN COLOUR

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CATCHMENT SUMMARY			
SITE AREA 2812.9m ²			
		COMMENT	AREA (m ²)
	CATCHMENT 1	DENOTES EXTENT OF SITE CATCHMENT THAT IS TREATED BY THE OSD SYSTEM NO. 1	1785 (63%)
	CATCHMENT 2	DENOTES EXTENT OF SITE CATCHMENT THAT IS TREATED BY THE OSD SYSTEM NO. 2	605 (22%)
	CATCHMENT 3	DENOTES EXTENT OF SITE CATCHMENT THAT BYPASSES THE OSD SYSTEM	423 (15%)



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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.

OVERFLAND FLOW PATH

DEPICTED ON THIS SHEET AND SHOWN THUS:

OVERLAND FLOW PATH TO BE GRADED AT A MIN.1% FALL TO PIT P1. LOCALLY TAIL INTO PIT P1 AND PROVIDE BARRIER AS SHOWN. OVERLAND FLOW BASED ON 2300m² OF UPSTREAM CATCHMENT. REFER TO SHEET C12 FOR DRAINS ASSESSMENT AND LONG SECTION.

WARNING

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

ON-SITE DETENTION(OSD) TANK 1

REFER OSD CALCULATIONS TABLE ON SHEET C9 AND DETAIL ON SHEET C5
BELOW GROUND STORAGE TANK
INTERNAL FOOTPRINT - 74m²
TOP STORED WSL = RL 32.95
INVERT OF OUTLET IL 31.20
VOLUME OF TANK = 107m³
ACCESS COVERS TO TANK MUST BE CHILDPROOF WITH NON CORROSIVE LOCKING DEVICES

ON-SITE RETENTION (OSR)

REFER TO DETAIL ON SHEET C6
BELOW GROUND STORAGE TANK
INTERNAL FOOTPRINT - 9.2m²
TOP STORED WSL = RL 32.95
VOLUME OF TANK REQUIRED = 10m³ MIN.
VOLUME OF TANK PROVIDED = 12m³
ACCESS COVERS TO TANK MUST BE CHILDPROOF WITH NON CORROSIVE LOCKING DEVICES

ROOF WATER ONLY DRAINAGE SYSTEM.
ALLOW TO CONVEY 400m² MIN. OF ROOF WATER TO THE ON SITE RETENTION TANK (OSR) SHOWN SHADED GREEN.
CONNECT ROOF WATER DOWNPIPES FROM UNITS 09 - 16 TO RAINWATER TANK AS REQUIRED BY THE BASIX. DOWNPIPE & DISCHARGE NETWORK TO BE DETERMINED AT CC STAGE DOCUMENTATION

NOTE: PIPE ALIGNMENTS SHOWN ON THESE PLANS ARE INDICATIVE ONLY. FINAL ALIGNMENT TO BE DETERMINED AT CC STAGE. TYP UNO

CONSTRUCT BARRIER AS SHOWN SHADED BROWN TO DIRECT OVERLAND SURFACE FLOWS TO PIT P1. TOP OF WALL TO BE MINIMUM 300mm HIGH ABOVE NATURAL SURFACE LEVEL TYP UNO.

SURFACE WATER DRAINAGE SYSTEM. PIPE & PIT NETWORK TO BE DETERMINED AT CC STAGE DOCUMENTATION TYP UNO

PIT P1
900 SQUARE PIT WITH LIGHT DUTY GRATED INLET
TOP OF GRATE - RL 34.50nom
INVERT OF OUTLET - IL 33.975nom

CONSTRUCT BARRIER AS SHOWN SHADED BROWN TO DIRECT OVERLAND SURFACE FLOWS TO PIT P1. TOP OF KERB TO BE MINIMUM 300mm HIGH ABOVE NATURAL SURFACE LEVEL TYP UNO.

WATER QUALITY CHAMBER
PROVIDE 4 x FULL HEIGHT SPEL FILTERS FOR WATER QUALITY MEASURES.

WATER QUALITY CHAMBER

PROVIDE 4 x FULL HEIGHT SPEL FILTERS FOR WATER QUALITY MEASURES.

PIT P2 - 600 SQUARE PIT WITH LIGHT DUTY GRATED INLET
TOP OF GRATE - RL 33.35nom
INVERT OF OUTLET - IL 32.80nom

ON-SITE DETENTION (OSD) TANK 2

REFER OSD CALCULATIONS TABLE ON SHEET C9 AND DETAIL ON SHEET C6
BELOW GROUND STORAGE TANK
INTERNAL FOOTPRINT - 24m²
TOP STORED WSL = RL 31.79
INVERT OF OUTLET IL 30.12
VOLUME OF TANK = 40m³
ACCESS COVERS TO TANK MUST BE CHILDPROOF WITH NON CORROSIVE LOCKING DEVICES

ALLOW TO CONVEY ROOF WATER AND ASSOCIATED DOWNPIPES FOR UNITS 01 - 08 TO ON SITE DETENTION TANK 1

100mm WIDE x 100mm DEEP LINEAR GRATED DRAIN WITH HEELPROOF GRATE TO ARCHITECTS SPECIFICATION. GRATED DRAINS SHOWN INDICATIVELY. EXACT LOCATION TO BE COORDINATED AT CC STAGE TYP UNO

STORMWATER MANAGEMENT PLAN

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

0 1 2 4 6 8 10m

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Issue	Description	Date	Drawn	Approved	

Client
BARRY RUSH & ASSOCIATES
PTY LTD

Architect



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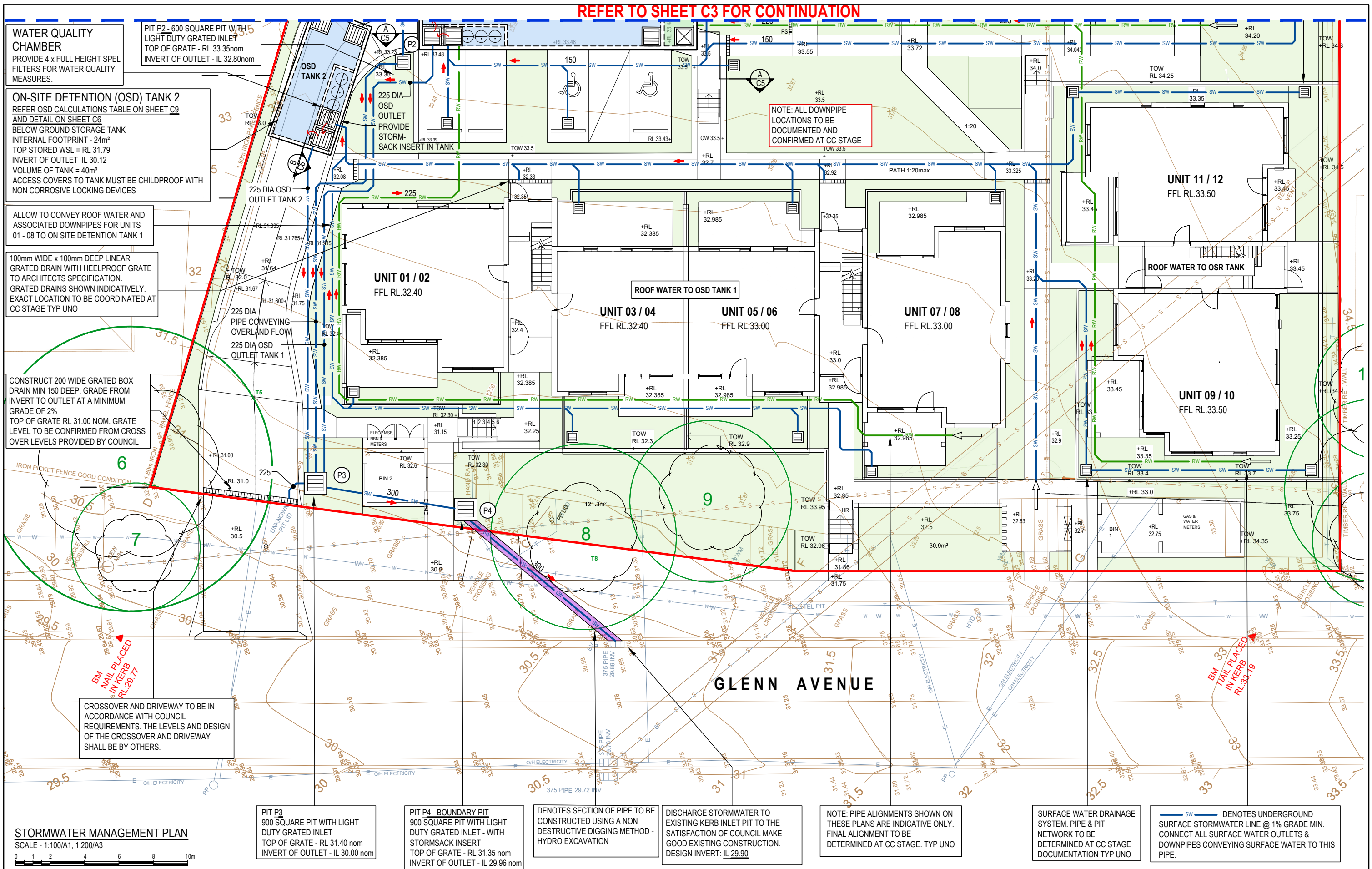


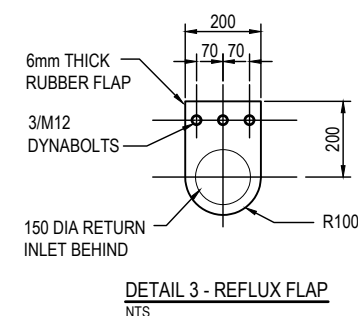
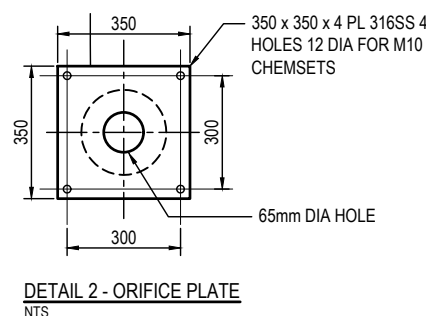
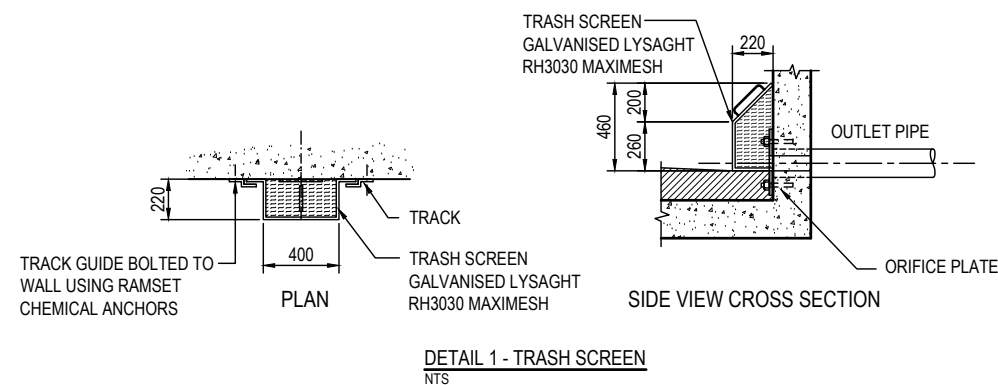
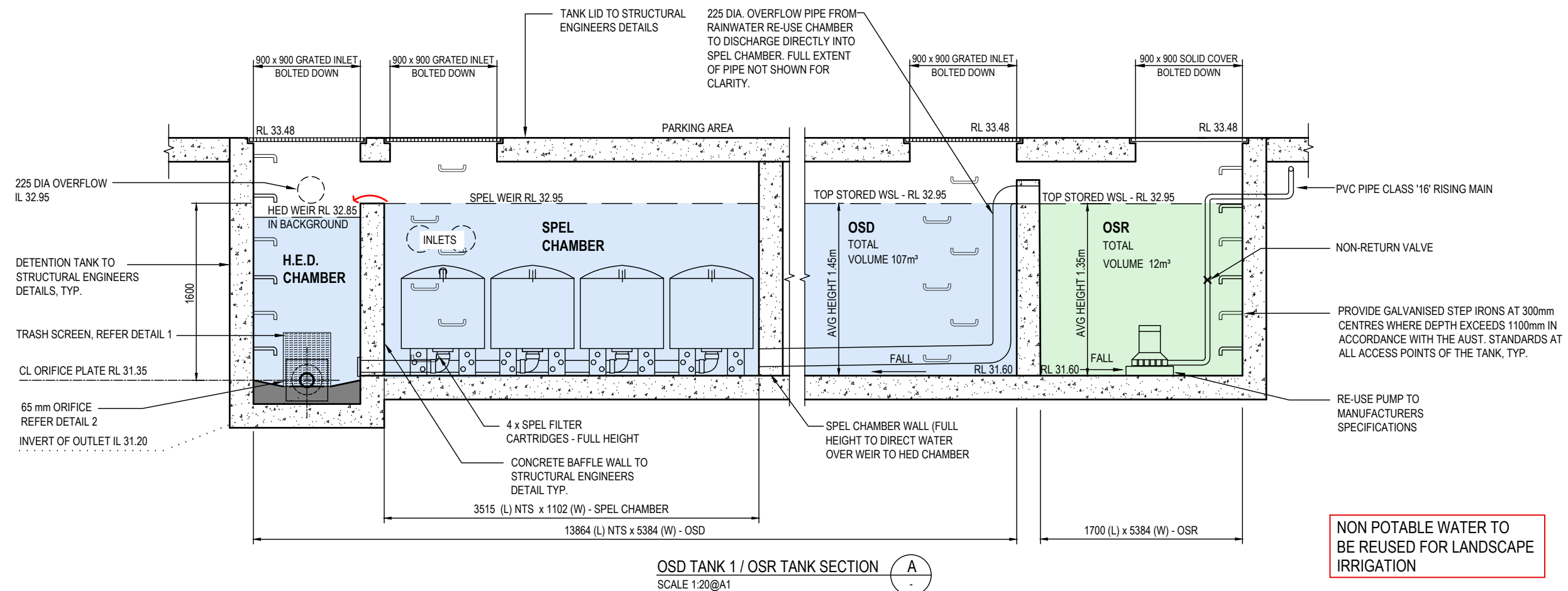
Project
PROPOSED RESIDENTIAL DEVELOPMENT
LOTS 73, 74, 75 & 76
No. 2 - 8
GLENN AVENUE, NORTHMEAD

Drawing Title
STORMWATER MANAGEMENT PLAN - PART 1

Drawn	Date	Scale	A1	C.A. Check	Date
RH	MAY 21	AS NOTED		BAK	20.04.22
Designed	Project No.	Dwg. No.		Issue	
BK	CC210151	C3		D	

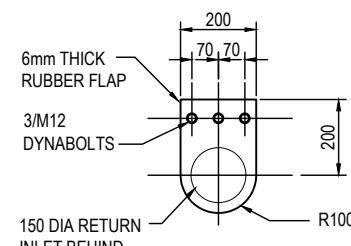
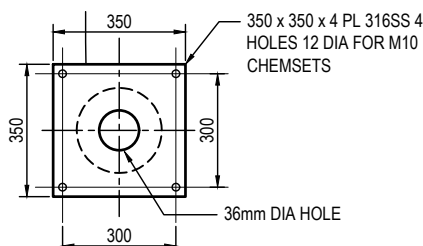
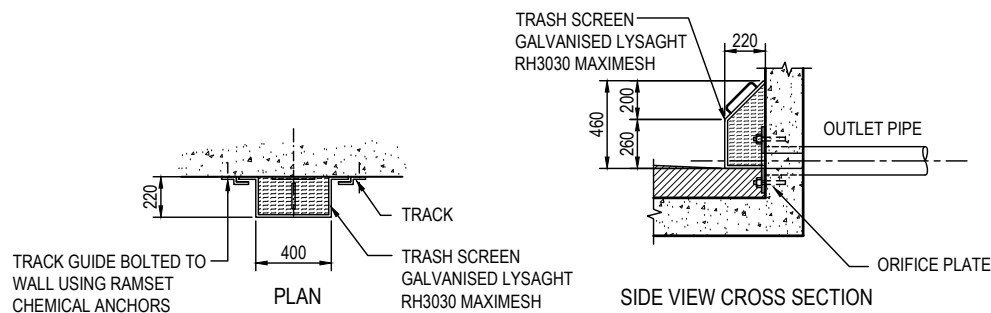
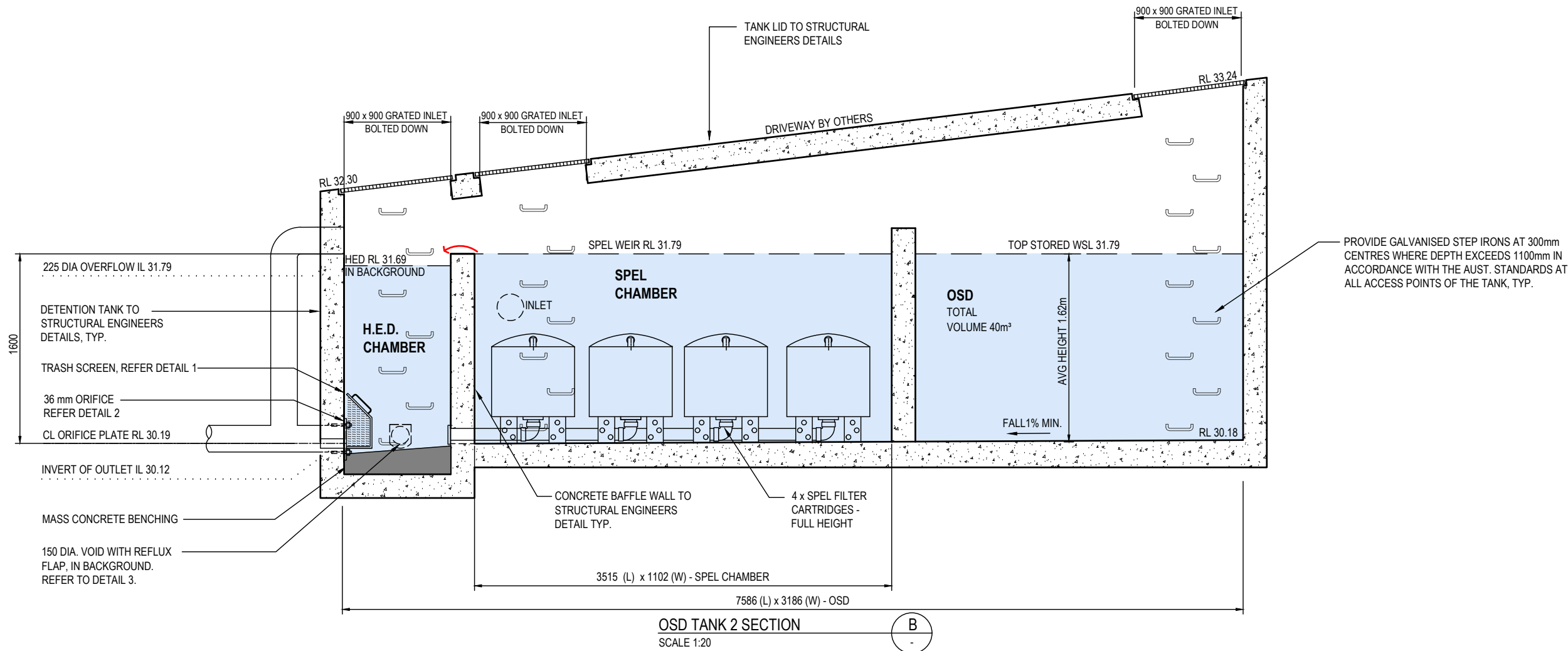
REFER TO SHEET C4 FOR CONTINUATION





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<table><tr><td>D</td><td>REISSUED TO SUIT COUNCIL COMMENTS</td><td>09.10.22</td><td>RH</td><td>BK</td><td rowspan="5">North</td></tr><tr><td>C</td><td>RE-ISSUED FOR DEVELOPMENT APPROVAL</td><td>21.04.22</td><td>RH</td><td>BK</td></tr><tr><td>B</td><td>ISSUED FOR DEVELOPMENT APPROVAL</td><td>21.10.21</td><td>RH</td><td>BK</td></tr><tr><td>A</td><td>NIL ISSUE</td><td>-</td><td>-</td><td>-</td></tr><tr><td>Issue</td><td>Description</td><td>Date</td><td>Drawn</td><td>Approved</td></tr><tr><td>1B</td><td>ISSUED FOR DEVELOPMENT APPROVAL</td><td>21.10.21</td><td>RH</td><td>BK</td></tr></table>					D	REISSUED TO SUIT COUNCIL COMMENTS	09.10.22	RH	BK	North	C	RE-ISSUED FOR DEVELOPMENT APPROVAL	21.04.22	RH	BK	B	ISSUED FOR DEVELOPMENT APPROVAL	21.10.21	RH	BK	A	NIL ISSUE	-	-	-	Issue	Description	Date	Drawn	Approved	1B	ISSUED FOR DEVELOPMENT APPROVAL	21.10.21	RH	BK	<div>Client</div> <div>BARRY RUSH & ASSOCIATES PTY LTD</div>	<div>Architect</div> <div><div><div>AcOR</div><div>CONSULTANTS</div></div><div>ENGINEERS MANAGERS INFRASTRUCTURE PLANNERS DEVELOPMENT CONSULTANTS</div></div>	<div>Project</div> <div><div>ACOR Consultants (CC) Pty Ltd</div><div>Platinum Building, Suite 2.01, 4 Ilya Avenue ERINA NSW 2250, Australia T +61 2 4324 3499</div></div> <div><div>PROPOSED RESIDENTIAL DEVELOPMENT</div><div>LOTS 73, 74, 75 & 76 No. 2 - 8 GLENN AVENUE, NORTHMEAD</div></div>	<div>Drawing Title</div> <div>STORMWATER MANAGEMENT DETAILS SHEET No.1</div> <table><tr><td>Drawn</td><td>Date</td><td>Scale</td><td>A1</td><td>Q.A. Check</td><td>Date</td></tr><tr><td>RH</td><td>OCT 21</td><td>AS NOTED</td><td>BAK</td><td></td><td>20.04.22</td></tr><tr><td>Designed</td><td>Project No.</td><td>Dwg. No.</td><td>Issue</td><td></td><td></td></tr><tr><td>BK</td><td>CC210151</td><td>C5</td><td>D</td><td></td><td></td></tr></table>	Drawn	Date	Scale	A1	Q.A. Check	Date	RH	OCT 21	AS NOTED	BAK		20.04.22	Designed	Project No.	Dwg. No.	Issue			BK	CC210151	C5	D		
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PROVIDE CONFINED SPACE SIGNAGE AT ENTRY POINTS INTO TANK.

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EROSION & SEDIMENT LEGEND

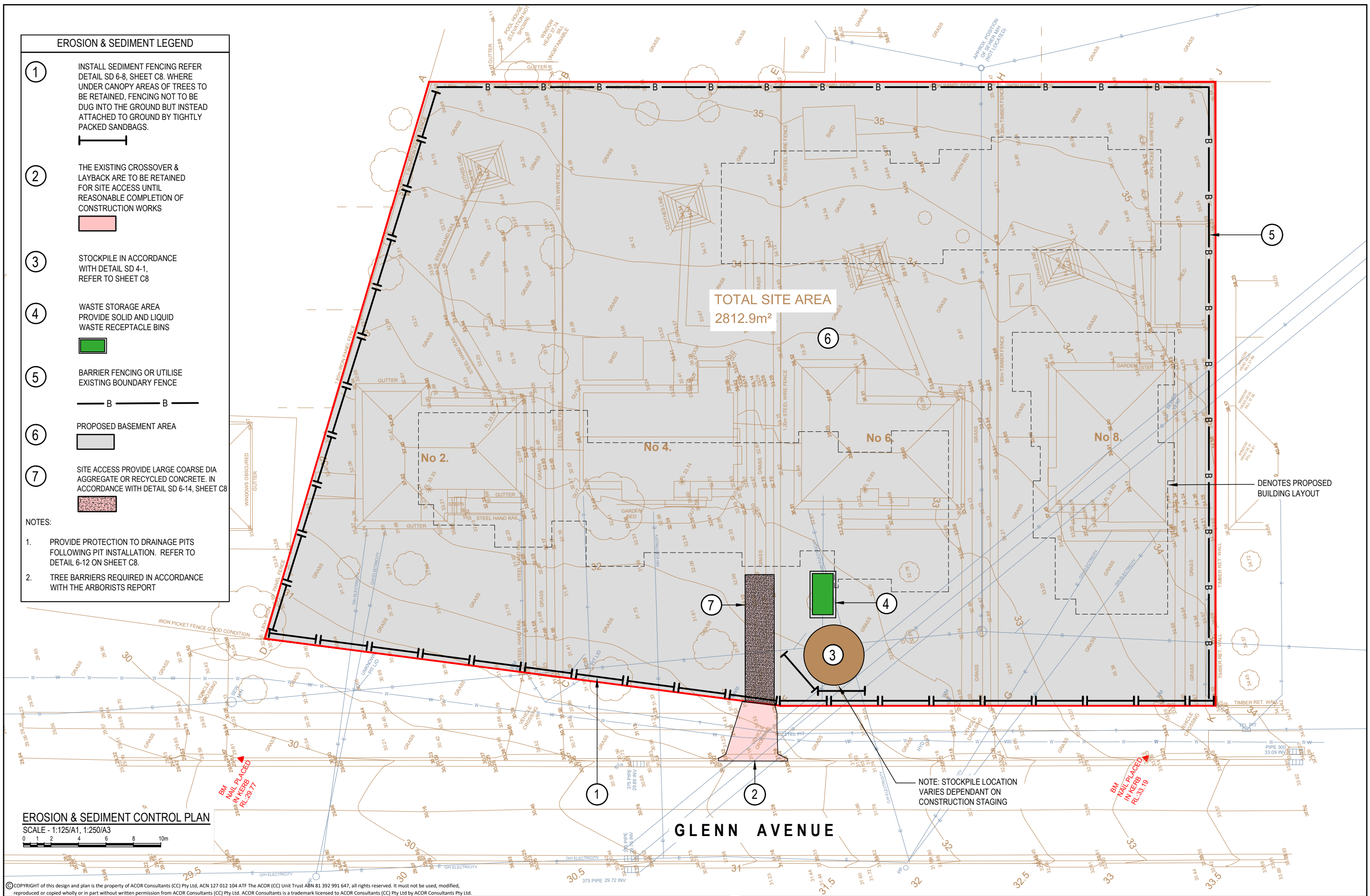
- 1 INSTALL SEDIMENT FENCING REFER DETAIL SD 6-8, SHEET C8. WHERE UNDER CANOPY AREAS OF TREES TO BE RETAINED, FENCING NOT TO BE DUG INTO THE GROUND BUT INSTEAD ATTACHED TO GROUND BY TIGHTLY PACKED SANDBAGS.
- 2 THE EXISTING CROSSOVER & LAYBACK ARE TO BE RETAINED FOR SITE ACCESS UNTIL REASONABLE COMPLETION OF CONSTRUCTION WORKS
- 3 STOCKPILE IN ACCORDANCE WITH DETAIL SD 4-1, REFER TO SHEET C8
- 4 WASTE STORAGE AREA PROVIDE SOLID AND LIQUID WASTE RECEPTACLE BINS
- 5 BARRIER FENCING OR UTILISE EXISTING BOUNDARY FENCE
- 6 PROPOSED BASEMENT AREA
- 7 SITE ACCESS PROVIDE LARGE COARSE DIA AGGREGATE OR RECYCLED CONCRETE. IN ACCORDANCE WITH DETAIL SD 6-14, SHEET C8

- NOTES:
1. PROVIDE PROTECTION TO DRAINAGE PITS FOLLOWING PIT INSTALLATION. REFER TO DETAIL 6-12 ON SHEET C8.
2. TREE BARRIERS REQUIRED IN ACCORDANCE WITH THE ARBORISTS REPORT

EROSION & SEDIMENT CONTROL PLAN

SCALE - 1:125/A1, 1:250/A3

0 1 2 4 8 10m



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A	NIL ISSUE	-	-	-	
Issue	Description	Date	Drawn	Approved	

Client
BARRY RUSH & ASSOCIATES
PTY LTD

Architect
AcOR
CONSULTANTS

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Project
PROPOSED RESIDENTIAL DEVELOPMENT
LOTS 73, 74, 75 & 76
No. 2 - 8
GLENN AVENUE, NORTHMEAD

Drawing Title EROSION & SEDIMENT CONTROL PLAN					
Drawn RH	Date OCT 21	Scale AS NOTED	A1	Q.A. Check BAK	Date 20.04.22
Designed BK	Project No. CC210151	Dwg. No. C7	Issue D		

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.

SITE MAINTENANCE INSTRUCTIONS

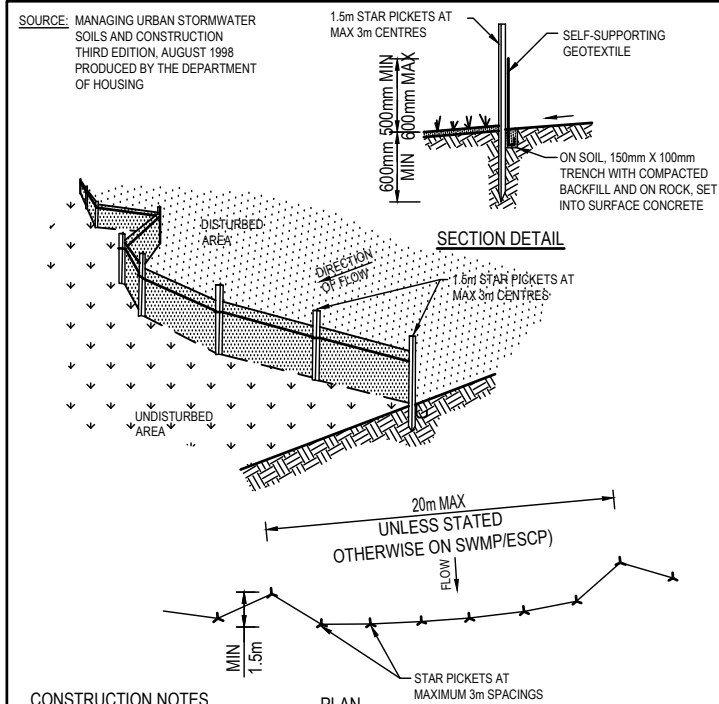
7. THE SITE SUPERINTENDENT WILL INSPECT THE SITE AT LEAST WEEKLY AND AT THE CONCLUSION OF EVERY STORM EVENT TO:
 - A) ENSURE THAT DRAINS OPERATE PROPERLY AND TO EFFECT ANY NECESSARY REPAIRS.
 - B) REMOVE SPILLED SAND OR OTHER MATERIALS FROM HAZARD AREAS, INCLUDING LANDS CLOSER THAN 5 METRES FROM AREAS 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 SUBJECT 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.

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 GROUND COVER 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

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.

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.

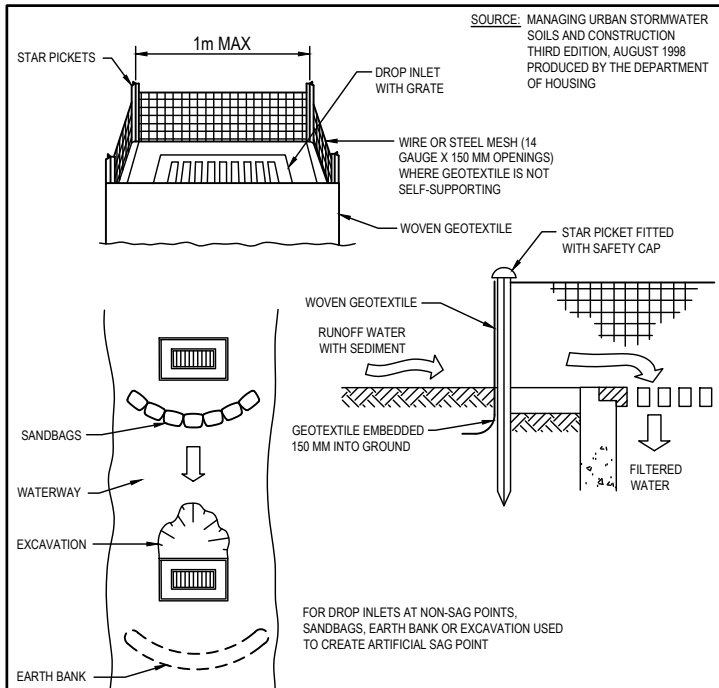


CONSTRUCTION NOTES

1. CONSTRUCT SEDIMENT FENCE AS CLOSE AS POSSIBLE TO PARALLEL TO THE CONTOURS OF THE SITE.
2. DRIVE 15 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

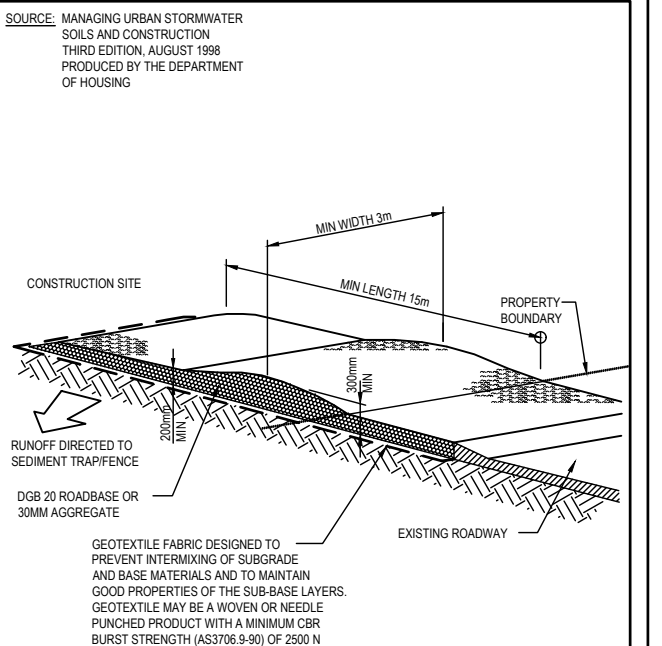


CONSTRUCTION NOTES:

1. 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

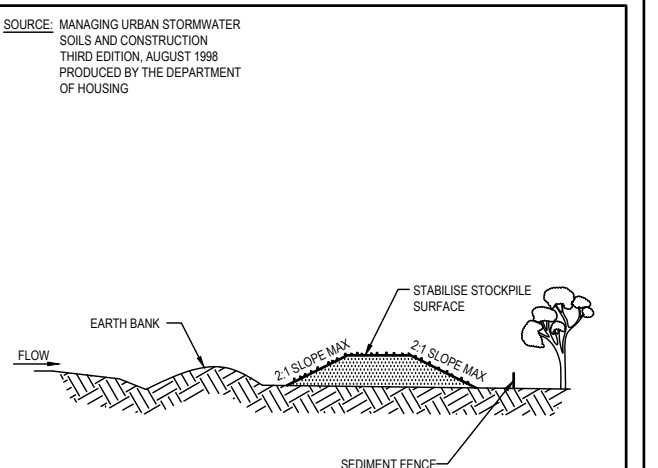


CONSTRUCTION NOTES:

1. 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 AGGREGATE. MINIMUM LENGTH 15M OR TO BUILDING ALIGNMENT. MINIMUM WIDTH 3 METRES.
5. CONSTRUCT HUMP IMMEDIATELY WITHIN BOUNDARY TO DIVERT WATER TO A SEDIMENT FENCE OR OTHER SEDIMENT TRAP.

STABILISED SITE ACCESS

SD 6-14



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/ESP.
5. CONSTRUCT EARTH BANK (STANDARD DRAWING 6-2) 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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Issue	Description	Date	Drawn	Approved	

Client
**BARRY RUSH &
ASSOCIATES**
PTY LTD

Architect



ACOR Consultants (CC) Pty Ltd
Platinum Building, Suite 2.01, 4 Ilya Avenue
ERINA NSW 2250, Australia
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Project

PROPOSED RESIDENTIAL DEVELOPMENT

LOTS 73, 74, 75 & 76
No. 2 - 8
GLENN AVENUE, NORTHMEAD

Drawing Title

EROSION & SEDIMENT CONTROL NOTES & DETAILS

Drawn RH	Date OCT 21	Scale AS NOTED	A1 Q.A. Check BAK	Date 20.04.22
Designed BK	Project No. CC210151		Dwg. No. C8	Issue D

Form B1¹ DRAINAGE DESIGN SUMMARY SUB/DA**No.** _____**Project:** CC210151 **Location:** 2-8 GLENN AVENUE NORTHMEAD**Designed By:** BK **Company:** ACOR CONSULTANTS (CC) Pty. Ltd **Phone:** (02) 4324 3499SITE AREA 0.2813 ha *See Section 3.4.3 for dual occupancy [A]Upstream catchment draining through site = 0 ha [AA]

See Section 4.1.3 for assessment of external flows.

Basic storage volume 470 x [A] 0.2813 = 132.21 m³ [B]Basic Discharge = 0.08 x [A] 0.2813 = 0.0225 m³/s [C]Area of site drained to storage = 0.239 ha [D]

(Must be as much as possible and not be less than 85% of the total site without written Council approval).

[D]/[A] + [0.239]/[0.2813] x 100 = 85 % [E]Storage per ha. Of contributing area = [B]/[D] = 553.18 [F]Enter *volume/PSD adjustment chart* (Fig 5.1) using [F], and = 64.59 * l/s/ha [G]

Read new PSD in litres/second/ha (l/s/ha).

Determine PSD = [G] x [D] 64.59 x 0.239 = 15.44 ** l/s [H]Maximum head to orifice center ** OSD 1 = 75% x 15.44 = 11.6 l/s
OSD 2 = 25% x 15.44 = 3.86 l/s/ha = 1.6 m [K]Weir flow to storage $Q^{Weir} = CL(H^{Weir})^{1.5}$ ∴ H^{Weir} = 0.19 m [I]Select orifice diameter: $d = (0.464 \times Q / \sqrt{h})^{0.5} = (0.464 \times [H] / \sqrt{[K]})^{0.5}$ = 0.075 *** m [J]Maximum discharge *** OSD 1 ORIFICE = Ø65
OSD 2 ORIFICE = Ø36 = 15.44 l/s [L]Head for high early discharge = 1.5 m [M]High early discharge $\{[L] \times \sqrt{[M]/[K]}\}$ (min 75% of [L]) = 14.95 l/s [N]Approximate mean discharge = ([L] + [N])/2 = 15.19 l/s [P]Average discharge/ha = [P]/[D] = 15.19 / 0.239 = 63.56 l/s/ha [Q]Enter *volume/PSD adjustment chart* (Fig 5.1) using [Q]And read off final storage volume per hectare = 559.69 m³/ha [R]Determine final SSR = [R] x [D] = 559.69 x 0.239 = 133.77 **** m³ [S]Primary storage proportion = [S] x _____ % _____ m³ [T]Secondary storage proportion = [S] x _____ % _____ m³ [U]Tertiary storage proportion = [S] x _____ % _____ m³ [V]Check [T] + [U] + [V] = [S] _____ m³¹ Revised for third edition to include flow from upstream and revised by pass flows**** TOTAL STORAGE REQUIRED = 134m³
TOTAL STORAGE PROVIDED = 147m³
- OSD TANK 1 = 107m³
- OSD TANK 2 = 40m³**Upper Parramatta River Catchment Trust**

D										REISSUED TO SUIT COUNCIL COMMENTS		09.10.22		RH		BK		North	
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A										NIL ISSUE		-		-		-			
Issue		Description								Date		Drawn		Approved					
1		1cm at full size																	

Client		Architect	
BARRY RUSH & ASSOCIATES PTY LTD		ACOR Consultants (CC) Pty Ltd Platinum Building, Suite 2.01, 4 Ilya Avenue ERINA NSW 2250, Australia T +61 2 4324 3499	

Project		Drawing Title	
PROPOSED RESIDENTIAL DEVELOPMENT LOTS 73, 74, 75 & 76 No. 2 - 8 GLENN AVENUE, NORTHMEAD		OSD CALCULATION SHEET & MAINTENANCE SCHEDULE	
Drawn RH	Date OCT 21	Scale AS NOTED	A1 Q.A. Check BAK Date 20.04.22
Designed BK	Project No. CC210151	Dwg. No. C9	Issue D

ON-SITE DETENTION CHECKLIST - SHEET 1 OF 2

This page last updated December 1999 B.9-1 On-site Stormwater Detention Handbook

B9. OSD DETAILED DESIGN SUBMISSION

This form is to be completed by the stormwater designer and submitted to Council together with the design plan/s and any necessary attachments.

PROJECT ADDRESS:

PROJECT APPLICANT:

OSD DESIGNER DETAILS:

Company Name: ACOR CONSULTANTS (CC) PTY LTD

Address: SUITE 2.01, 4 ILYA AVENUE, ERINA NSW 2250

Telephone No.: (02) 43243499 Fax No:

Accreditation organisation:

Accreditation Reference:

Name and signature of designer: BRUCE KENNY (Print Name)

Date: 21.10.21

Items submitted: **

- OSD Design Plan/s Yes / No
- OSD Detailed Design Checklist Yes / No
 - Attachment A: Flood Affection Information Yes / No
 - Attachment B: External Catchment Assessment Yes / No
 - Attachment C: On-line System Calculations Yes / No
 - Attachment D: Overflow and Surge Pathway Calculations Yes / No
 - Attachment E: Site Drainage Calculations Yes / No
 - Attachment F: Outlet Hydraulic Assessment Yes / No
 - Attachment G: Site Storage Details Yes / No
 - Attachment H: Drainage Design Summary Sheet Yes / No

COUNCIL REVIEW DETAILS:

Council Review Officer's Name:

Review officer's comments:

Signature of Review Officer: Date:

** The above items are to be submitted in a single bound form — a 'loose leaf' format is unacceptable.

Upper Parramatta River Catchment Trust

This page last updated December 1999 B.9-2 On-site Stormwater Detention Handbook

OSD DETAILED DESIGN CHECKLIST

ITEM	DESIGNER		COUNCIL REVIEW	
	YES	NO	YES	NO
1. A Stormwater Concept Plan (SCP) has been approved previously (refer Section 4.1)		✓		
2. The site (whole or partly) is defined as floodprone in a 100 year event		✓		
If YES, see Plan No. in Attachment A				
2(a) Has any floodplain storage been lost?	N/A			
If YES, see Plan No. in Attachment A				
2(b) Has the floodprone area been excluded from the OSD calculations?	N/A			
2(c) Is the OSD system performance adversely affected by the 100 year flood level?	N/A			
3. Is there an external catchment draining into the site?		✓		
If YES, see Plan No. and calculations of 100 year ARI flow in Attachment B				
4. The location and extent of any floodway/flowpath has been determined, (refer Sections 4.1.3 & 4.2.2)	N/A			
If YES, see Plan No. and accompanying 100 year event hydraulic calculations in Attachment B. Buildings are not inundated (and have the required freeboard) nor are flows concentrated on an adjoining property (refer Sections 4.1.3, 4.2.7 & 4.2.9)				
5. The detailed design submission is consistent with the approved SCP	✓			
6. Are there any conditions on the development approval that may affect the drainage design (for example, trees to be retained)?				
7. The detailed design submission addresses the drainage-related conditions of the development approval				
8. A site layout plan with accompanying ground levels/contours which extend into adjoining properties is submitted	✓			
If YES, see Plan No. C3-C4				
9. Have other constraints, e.g. easements, services, been defined?				
If YES, see Plan No.				
10. How many OSD storage systems are there? TWO				
11. Are the storage system/s off-line (refer Section 4.2.6)?	✓			
If NO, see alternative calculations included in Attachment C				
12. State the type of discharge control device (i.e. orifice or)? Where the device is not an orifice, has specific Trust approval been obtained?				
13. The area of the site to be drained by each OSD storage has been determined, (refer Section 4.2.2)	✓			
If YES, see Plan No. C2 - CATCHMENT PLAN				
If YES, the uncommanded site percentage is 15% (to be less than 25%, refer Section 4.1.4 unless specific approval has been granted).				
14. The plan/s identify the maximum water levels, and the levels and locations of each storage's discharge point (refer Section 4.2.2)	✓			
If YES, see Plan No. C3 & C4 & DETAIL SHEET C5 & C6				
15. The location of overflow structures and surcharge pathways have been determined, (refer Sections 4.2.2 & 4.2.9)	✓			
If YES, see Plan No. C3 & C4 and calculations in Attachment D				
Buildings are not inundated nor are flows concentrated on an adjoining property (refer Sections 4.2.7 & 4.2.9)	✓			
16. The drainage plans have been checked for consistency against the Architectural and landscaping plans	✓			
17. A maintenance schedule has been prepared (ref Section 4.2.10)	✓			

Upper Parramatta River Catchment Trust

D REISSUED TO SUIT COUNCIL COMMENTS				09.10.22	RH	BK	North
C RE-ISSUED FOR DEVELOPMENT APPROVAL				21.04.22	RH	BK	
B ISSUED FOR DEVELOPMENT APPROVAL				21.10.21	RH	BK	
A NIL ISSUE				-	-	-	
Issue Description				Date	Drawn	Approved	
							

Client	Architect	Drawing Title	Project
BARRY RUSH & ASSOCIATES PTY LTD	 ENGINEERS MANAGERS INFRASTRUCTURE PLANNERS DEVELOPMENT CONSULTANTS	ACOR Consultants (CC) Pty Ltd Platinum Building, Suite 2.01, 4 Ilya Avenue ERINA NSW 2250, Australia T +61 2 4324 3499	PROPOSED RESIDENTIAL DEVELOPMENT LOTS 73, 74, 75 & 76 No. 2 - 8 GLENN AVENUE, NORTHMEAD

ON SITE DETENTION CHECKLIST SHEET 1 OF 2			
Drawn RH	Date OCT 21	Scale AS NOTED	A1 Q.A. Check BAK
Designed BK		Project No. CC210151	Dwg. No. C10
			Issue D

ON-SITE DETENTION CHECKLIST - SHEET 2 OF 2

This page last updated December 1999 B.9-3 On-site Stormwater Detention Handbook

Where there is more than one OSD system, Questions 18 to 26 are to be answered separately for each OSD storage system.

OSD Storage system identifier.....

ITEM	DESIGNER		COUNCIL REVIEW	
	YES	NO	YES	NO
18. The design explicitly shows how all the drained area grades to the storage, including roof gutter overflows (refer Section 6.2) If YES, see Plan No. If NO, see calculations in Attachment E showing how all drainage system components (including all roof gutters, downpipes, collecting pits and pipe systems, etc) have 100 year ARI capacities with 50% blockage factor				
19. The invert level of storage is not less than ground level (or top of kerb) at point of connection to external stormwater system If YES, see Plan No. If NO, see explanatory notes in Attachment F				
20. The discharge control pit design is consistent with the principles shown in Figures 4.3, 7.10 and/or 7.11				
20(a) The DCP has an open grating type lid (for ease of inspection)				
20(b) The DCP minimum dimensions are consistent with Section 4.2.3				
20(c) The floor of the DCP has a localised sump adjacent to the orifice with level at least 150 mm below the return pipe, (refer Section 4.2.8)				
20(d) The return pipe from the storage is at least 150 mm in diameter (refer Section 4.2.8)				
20(e) The return pipe flap valve is consistent with Figure 4.3				
20(f) If an orifice control is specified, is it consistent with the requirements set out in Section 4.2.3? If YES, see: Plan No. for stainless steel plate specification, thickness and fixing to pit wall				
20(g) The overflow weir is fitted with a basket (refer Section 6.3). There is a surface grate above the basket to facilitate inspection and maintenance				
20(h) The high early discharge (HED) characteristics are consistent with the requirements set out in Section 4.2.3 If YES, see: Plan No. for height of discharge to storage relative to permissible site discharge (PSD) Accompanying weir calculations in Attachment E Plan No. showing majority of site drainage system connecting to the DCP & the volume of the DCP is small compared to the volume of the storage				
20(i) The screen design is consistent with Section 4.2.5 If YES, see: Plan No. for screen type, area and orientation Plan No. for fabrication note re aperture orientation Plan No. for fixing and handle details Plan No. showing how all inflows to the DCP are on the upstream side of the screen protecting the orifice				
20(j) The outlet pipe from the DCP has a capacity at least twice the PSD (refer Section 4.2.4) If YES, see calculations in Attachment E				

Upper Parramatta River Catchment Trust

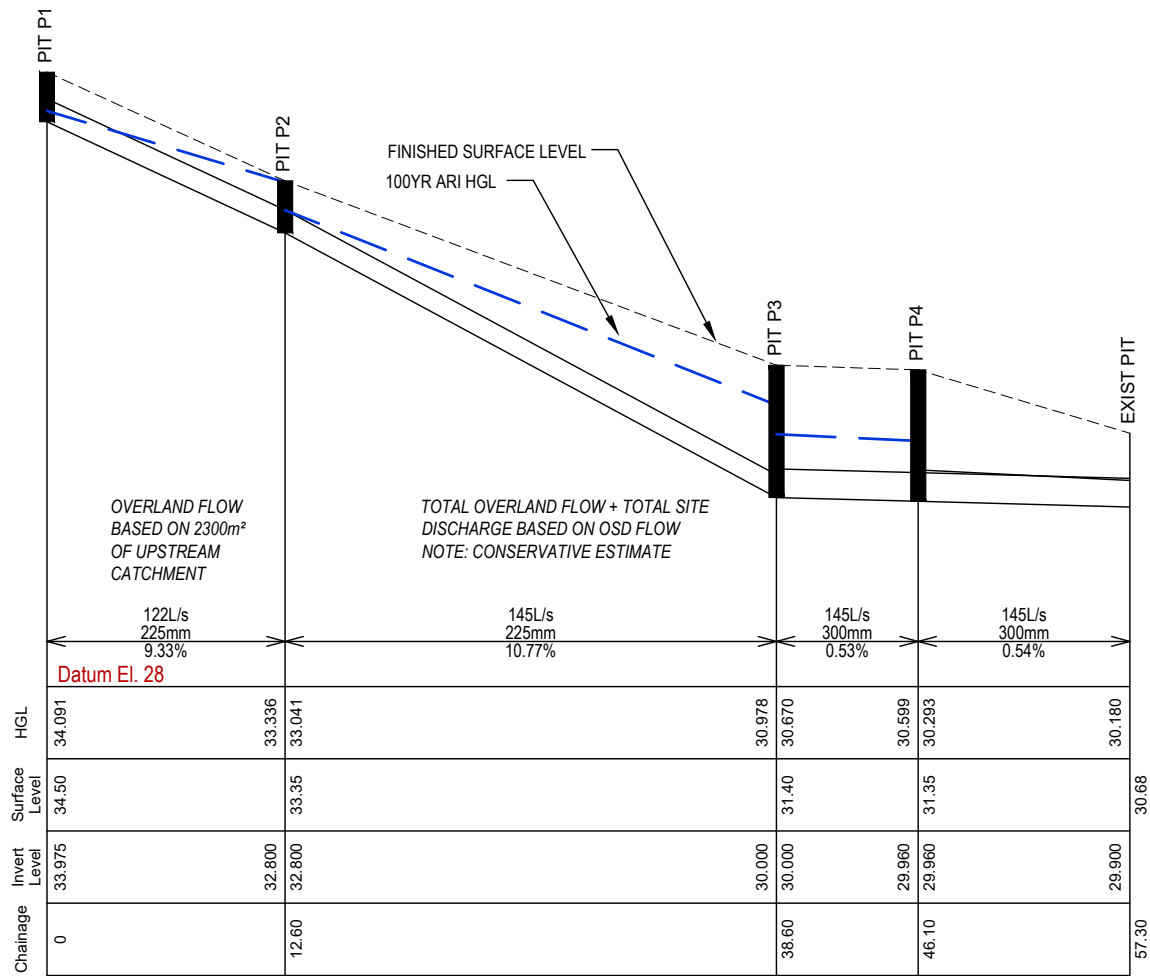
This page last updated December 1999 B.9-4 On-site Stormwater Detention Handbook

ITEM	DESIGNER		COUNCIL REVIEW	
	YES	NO	YES	NO
21. If an above ground/landscaped storage is specified, answer Q21(a) to Q21(g), otherwise move to Q22.				
21(a) The first 10%-20% of storage is provided in an area able to tolerate frequent inundation(refer Section 4.2.7)				
21(b) Where the depth of ponding exceeds 600 mm, consideration has been given to whether there are steep drops, and/or a need for steps or 'walk-in' 'walk-out' batters, etc. when deciding if fencing and/or warning signs are required (Refer Sections 4.2.7 & 6.2)				
21(c) The landscaping treatment within the storage area is such that it does not limit storage volumes or provide a significant source of debris loading				
21(d) The minimum surface slope is consistent with Section 4.2.7				
21(e) Subsoil drainage is provided in areas subject to frequent ponding and around the outlet (refer Section 4.2.7)				
21(f) If the design includes a retaining wall, has it been structurally checked?				
21(g) Does the system have the correct storage? If YES, see stage-storage calculations in Attachment G				
22. If a driveway/car-park storage is specified, answer Q22(a) to Q22(c), otherwise move to Q23				
22(a) The maximum depth is less than or equal to 200mm (refer Section 4.2.7)				
22(b) The minimum transverse slope is 0.7% (refer Section 4.2.7)				
22(c) The system has the correct storage If YES, see stage-storage calculations in Attachment G				
23. If a structural/underground storage is specified, answer Q 23(a) to Q 23(f), otherwise move to Q24				
23(a) The dimensions of openings are consistent with Section 4.2.8	✓			
23(b) The storage floor has a minimum slope of 0.7% (refer Section 4.2.8)	✓			
23(c) There are sufficient access points for flushing purposes (refer Section 4.2.8)				
23(d) There are sufficient grated openings for ventilation purposes (refer Section 4.2.8)				
23(e) All access points have light weight covers	✓			
23(f) The system has the correct storage If YES, see stage-storage calculations in Attachment G	✓			
24. The distribution of storage minimises inconvenience (refer Section 5.1.4)	✓			
25. The Drainage Design Summary sheet has been completed (refer Appendix B1) If YES, see completed sheet in Attachment H	✓			
26. The Drainage Design Summary sheet details are consistent with the design plans	✓			

Upper Parramatta River Catchment Trust

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D REISSUED TO SUIT COUNCIL COMMENTS					09.10.22	RH	BK	North	Client BARRY RUSH & ASSOCIATES PTY LTD	Architect  ACOR CONSULTANTS (CC) Pty Ltd Platinum Building, Suite 2.01, 4 Ilya Avenue ERINA NSW 2250, Australia T +61 2 4324 3499	Project PROPOSED RESIDENTIAL DEVELOPMENT LOTS 73, 74, 75 & 76 No. 2 - 8 GLENN AVENUE, NORTHMEAD	Drawing Title ON SITE DETENTION CHECKLIST SHEET 2 OF 2							
C RE-ISSUED FOR DEVELOPMENT APPROVAL					21.04.22	RH	BK					Date OCT 21				Scale AS NOTED	A1 Q.A. Check BAK	Date 20.04.22	
B ISSUED FOR DEVELOPMENT APPROVAL					21.10.21	RH	BK					Designed BK				Project No. CC210151		Dwg. No. C11	Issue D
A NIL ISSUE					-	-	-												
Issue Description					Date	Drawn	Approved												
0 10m at full size																			



PIPE LONG SECTION PIT P1 - P4 & EXISTING KIP
HORIZONTAL SCALE - 1:200/A1, 1:400/A3
VERTICAL SCALE - 1:40/A1, 1:80/A3

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C	NIL ISSUE	-	-	-	Drawn RH	Date OCT 21	Scale AS NOTED					A1	Q.A. Check BAK	Date 20.04.22		
B	NIL ISSUE	-	-	-	Issue Description	Date	Drawn					Approved	Designed BK	Project No. CC210151	Dwg. No. C12	Issue D
A	NIL ISSUE	-	-	-												
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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 WATER SENSITIVE URBAN DESIGN (WSUD) REQUIREMENTS OF PARRAMATTA DEVELOPMENT CONTROL PLAN PART 3.3.6 AND APPENDIX 7. IN THIS REGARD WE REFER TO THE PRESCRIBED TARGETS TABLED FOLLOWING:

TABLE 1 - STORMWATER POLLUTANT REDUCTION TARGETS

STORMWATER POLLUTANT	REDUCTION TARGETS
GROSS POLLUTANT	90%
TOTAL SUSPENDED SOLIDS (TSS)	85%
TOTAL PHOSPHORUS (TP)	60%
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 MUSIC MODEL WAS FORCED WITH 6 MINUTE RAINFALL DATA FROM THE PARRAMATTA NORTH (MASONS DRIVE) GAUGE (ID 066124) FOR THE PERIOD 25 DECEMBER 1984 TO 30 DECEMBER 2007.

DAILY AVERAGE PET VALUES WERE NOT AVAILABLE FOR STATION ID 066124 AND WERE SOURCED FROM THE BUREAU OF METEOROLOGY FOR THE NEIGHBOURING PROSPECT RESERVOIR GAUGE (ID 067019).

THE DETAILS ARE SUMMARISED IN TABLE 3.1 AND 3.2

TABLE 3.1 - DETAILS OF DAILY RAINFALL DATA			
STATION	NAME	PERIOD	TIMESTEP
066124	PARRAMATTA NORTH (MASONS DRIVE)	25/12/1984-30/12/2007	6 min

TABLE 3.2 - SUMMARY OF POTENTIAL EVAPOTRANSPIRATION (PET)					
JAN	FEB	MAR	APR	MAY	JUN
170.5	131.6	120.9	87	62	48
JUL	AUG	SEP	OCT	NOV	DEC
51	77.5	108	136.4	155	173.6

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 RWT	0.055	100	0
ROOF TO OSD 1	0.039	100	0
AREA TO OSD 1	0.084	70	30
OSD CATCHMENT 2	0.061	100	0
OSD BYPASS	0.042	60	40

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 IN ACCORDANCE WITH NSW MUSIC MODELLING GUIDELINES 2015 FOR MEDIUM CLAY ARE SUMMARISED IN TABLE 4.1.

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)	94
SOIL INITIAL STORAGE (% OF CAPACITY)	25
FIELD CAPACITY (mm)	70
INFILTRATION CAPACITY COEFFICIENT - a	135
INFILTRATION CAPACITY EXPONENT - b	4
GROUNDWATER PROPERTIES	
INITIAL DEPTH (mm)	10
DAILY RECHARGE RATE (%)	10
DAILY BASEFLOW RATE (%)	10
DAILY DEEP SEEPAGE RATE (%)	0

<table><tr><td>D</td><td>REISSUED TO SUIT COUNCIL COMMENTS</td><td>09.10.22</td><td>RH</td><td>BK</td><td rowspan="4">North</td></tr><tr><td>C</td><td>NIL ISSUE</td><td>-</td><td>-</td><td>-</td></tr><tr><td>B</td><td>NIL ISSUE</td><td>-</td><td>-</td><td>-</td></tr><tr><td>A</td><td>NIL ISSUE</td><td>-</td><td>-</td><td>-</td></tr><tr><td>Issue</td><td>Description</td><td>Date</td><td>Drawn</td><td>Approved</td><td></td></tr><tr><td colspan="6"></td></tr></table>						D	REISSUED TO SUIT COUNCIL COMMENTS	09.10.22	RH	BK	North	C	NIL ISSUE	-	-	-	B	NIL ISSUE	-	-	-	A	NIL ISSUE	-	-	-	Issue	Description	Date	Drawn	Approved							
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Client BARRY RUSH & ASSOCIATES PTY LTD		Architect		 ENGINEERS MANAGERS INFRASTRUCTURE PLANNERS DEVELOPMENT CONSULTANTS																																		
Project PROPOSED RESIDENTIAL DEVELOPMENT LOTS 73, 74, 75 & 76 No. 2 - 8 GLENN AVENUE, NORTHMEAD		Drawing Title STORMWATER QUALITY REPORT SHEET 1 OF 2		<table><tr><td>Drawn</td><td>Date</td><td>Scale</td><td>A1</td><td>Q.A. Check</td><td>Date</td></tr><tr><td>RH</td><td>OCT 21</td><td>AS NOTED</td><td></td><td>BAK</td><td>20.04.22</td></tr><tr><td>Designed</td><td>Project No.</td><td>Dwg. No.</td><td colspan="3">Issue</td></tr><tr><td>BK</td><td>CC210151</td><td>C13</td><td colspan="3">D</td></tr></table>		Drawn	Date	Scale	A1	Q.A. Check	Date	RH	OCT 21	AS NOTED		BAK	20.04.22	Designed	Project No.	Dwg. No.	Issue			BK	CC210151	C13	D											
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BK	CC210151	C13	D																																			

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
RESIDENTIAL	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
GENERAL URBAN	MEAN	2.20	1.10	-0.45	-0.82	0.42	0.32
	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:

- 12,000 LITRE RAINWATER TANK (REUSE FOR IRRIGATION)
- 4 x SPELFILTERS (FULL HEIGHT) IN EACH OSD TANK
- 2 x STORMSACKS

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

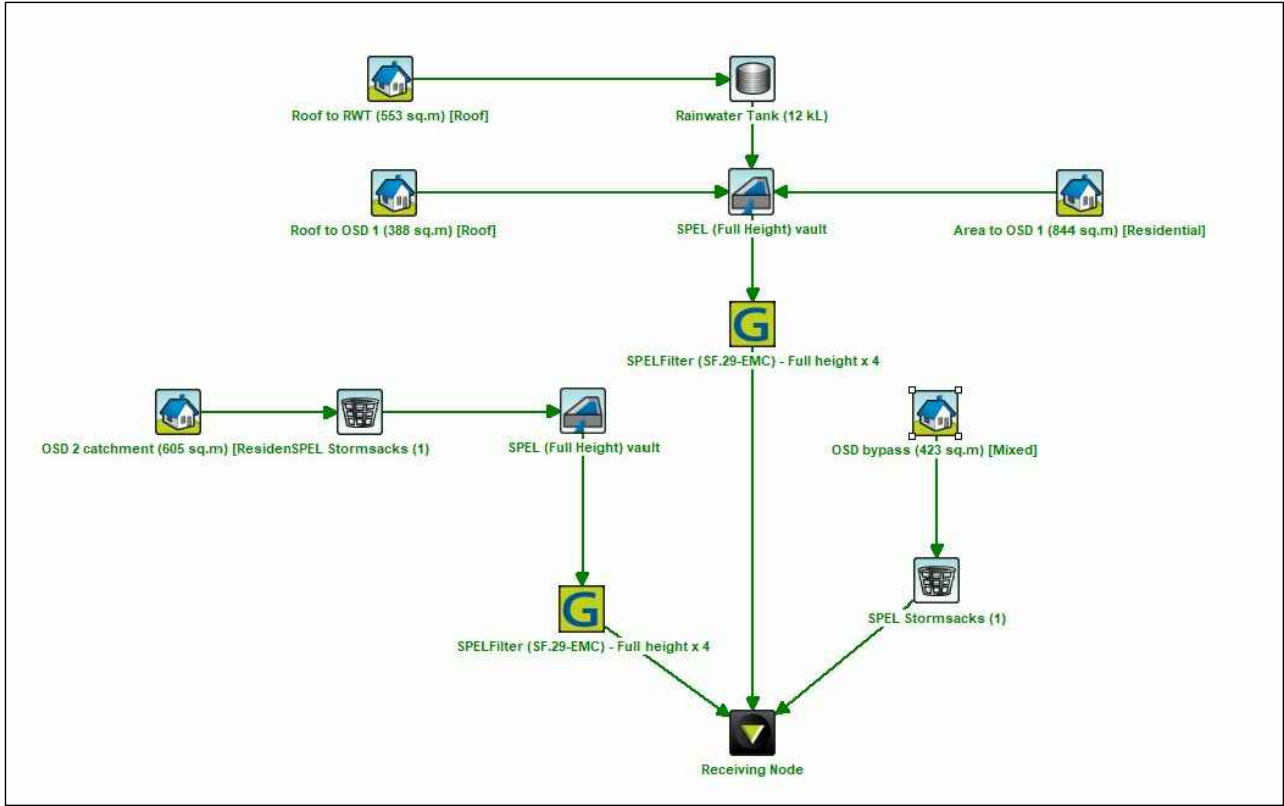


FIGURE 1 - MUSIC MODEL SCHEMATIC

5 RESULTS & CONCLUSION

BASED ON THE FOREGOING AND THE RESULTS DEPICTED IN TABLE 5.1, THE PROPOSED STORMWATER QUALITY TREATMENT MEASURES MEET THE REQUIRED TARGETS OF THE CITY OF PARRAMATTA. REFER TO CC210151_20221008.SQZ AS PREPARED BY ACOR CONSULTANTS (CC) PTY LTD FOR FURTHER INFORMATION.

TABLE 5.1 - TREATMENT TRAIN EFFECTIVENESS

Treatment Train Effectiveness - Receiving Node			
	Sources	Residual Load	% Reduction
Flow (ML/yr)	1.96	1.69	13.9
Total Suspended Solids (kg/yr)	244	36.3	85.1
Total Phosphorus (kg/yr)	0.494	0.159	67.8
Total Nitrogen (kg/yr)	4.45	2.05	54.1
Gross Pollutants (kg/yr)	52.9	0.259	99.5