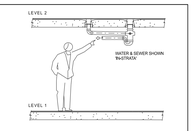
STORMWATER DRAINAGE

RESIDENTIAL DEVELOPMENT - 16-20 CARRINGTON RD, CASTLE HILL NSW



STRATA ZONES

STORMWATER NOTES

1. INTRODUCTION
PLANS AND NOTES SHALL BE READ IN CONJUNCTION WITH THE APPROVED ARCHITECTURAL, STRUCTURAL AND OTHER SERVICE DRAWINGS AS WELL AS OTHER PERTINENT REPORTS SUCH AS COUNCIL CONSENT CONDITIONS, BASIX, GEOTECHNICAL AND OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED THROUGHOUT THE TERM OF THE CONTRACT.

2. AUTHORITIES AND STANDARDS
ALL WORK SHALL COMPLY TO AND BE IN ACCORDANCE WITH AS 3500, NCC BCA AND THE REQUIREMENTS OF THE RELEVANT AUTHORITIES HAVING JURISDICTION OVER THE WORK.
ALL WORK SHALL BE CARRIED OUT UNDER THE SUPERVISION OF A FULLY LICENSED PLUMBER.
ALL TRADESMEN SHALL HAVE THE NECESSARY EXPERIENCE AND SKILLS TO PERFORM THE WORK DESCRIBED HEREIN.

3. STORMWATER DESIGN DRAWINGS
THE DESIGN DRAWINGS ARE DIAGRAMMATIC ONLY AND SHOW DESIGN INTENT; THEY DO NOT PURPORT SHOW ALL NECESSARY FITTINGS AND ITEMS INCLUDING DROPPERS, RISERS, OFFSETS, BRACKETS AND SUNDRY ITEMS. THE CONTRACTOR SHALL ALLOW FOR ALL NECESSARY ITEMS AND FITTINGS REQUIRED FOR THE COMPLETE AND COMPLIANT INSTALLATION OF THE STORMWATER DRAINAGE SYSTEM.
ANY DISCREPANCY OR VARIATIONS OF DESIGN SHALL BE REFERRED TO THE PRINCIPLE FOR DECISIONS PRIOR THE COMMENCEMENT OF ANY SUCH WORK.
UNAUTHORISED VARIATIONS MAY LEAD TO FAILURE IN OBTAINING OCCUPANCY CERTIFICATE

4. MATERIALS AND WORKMANSHIP
UNLESS INDICATED OTHERWISE, THE WHOLE OF MATERIALS USED SHALL BE NEW, OF FIRST QUALITY, APPROVED FOR USE AND CARRY ALL REQUIRED TEST CERTIFICATIONS AND WATERMARKS TO SATISFY THE REQUIREMENT OF THE NCC BCA.
ALL WORK SHALL BE CARRIED OUT IN A TRADESMAN LIKE MANNER, IN ACCORDANCE WITH RELEVANT AUSTRALIAN STANDARDS AND CODES OF PRACTICE AND THE SATISFACTION OF THE PRINCIPLE.

5. EXISTING SERVICES
THE LOCATION OF UNDERGROUND SERVICES SHOWN ON THESE PLANS HAVE BEEN PLOTTED FROM DIAGRAMS PROVIDED BY SERVICE AUTHORITIES. THIS INFORMATION HAS BEEN PREPARED FOR THE AUTHORITIES OWN USE AND MAY NOT BE ACCURATE.
THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND IDENTIFYING ALL EXISTING SERVICES PRIOR ANY EXCAVATION OR WORK. THIS SHALL INCLUDE CARRYING OUT A "DIAL - BEFORE -YOU DIG" APPLICATION AND MAY REQUIRE POT HOLING OVER SERVICES TO DETERMINE EXACT LEVELS AND LOCATION.

6 SETTING OUT, CORE HOLES AND PENETRATIONS
REQUIREMENT: THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SETTING OUT AND PLACEMENT OF CORE HOLES AND PENETRATIONS. THE MAIN CONTRACTOR SHALL PROVIDE DATUM SET OUT LINES, GRID LINES AND BENCH MARKS ONLY.
THE CONTRACTOR SHALL SUPERVISE ALL LAYOUTS; CHECK ALL LEVELS AND MEASUREMENTS PRIOR TO THE POURING OF CONCRETE CORE HOLES AND PENETRATIONS SHALL BE TO THE APPROVAL OF THE STRUCTURAL ENGINEER AND MAIN CONTRACTOR.
THE CONTRACTOR SHALL SEAL ALL PENETRATIONS IN ACCORDANCE WITH NCC BCA, REGULATORY AND THE CERTIFYING AUTHORITY REQUIREMENTS.

7. FIRE SEALS AND FIRE COLLARS
ALLOW TO SEAL ALL PENETRATIONS IN ACCORDANCE WITH THE NCC BCA ,RELEVANT AS STANDARDS, THE PRINCIPLE CERTIFYING AUTHORITY AND ALL AUTHORITIES HAVING JURISDICTION OVER THE WORKS.
PROVIDE A FIRE SEAL REGISTER INCLUDING CERTIFICATION AND MANUFACTURES DATA TO THE SATISFACTION OF THE PRINCIPLE CERTIFYING AUTHORITY.

8. SAMPLES
THE CONTRACTOR SHALL SUBMIT SAMPLES OF THE SELECTED MATERIALS AND ITEMS AND FITTINGS TO THE PRINCIPLE FOR APPROVAL PRIOR TO THE INSTALLATION OF SUCH MATERIAL OR ITEM. THIS MUST BE STRICTLY ADHERED TO WHEN OFFERING ALTERNATIVES TO SPECIFIED ITEMS.

9. BRACKETING AND NOISE
ALL PIPEWORK SHALL BE INSTALLED SO THAT THERE WILL BE NO UNDUE STRESS ON ANY FITTING OR PIPE
ALL PIPE CLAMPS, HANGERS AND BRACKETS SHALL BE PROPRIETY MADE ITEMS, GALVANISED MILD STEEL OR OTHER SUITABLE MATERIAL, THEY SHALL BE EQUAL TO ABBEY MANUFACTURE OR UNI-STRUT DEPENDING ON THE PARTICULAR TYPE OF SUPPORT REQUIRED. ALL FASTENERS AND ANCHORS SHALL BE EQUAL TO HILTI MANUFACTURE.
SPECIAL CARE SHALL BE TAKEN TO AVOID CONTACT OF DISSIMILAR MATERIALS
ALL SERVICES INTERNALLY OR OTHER NOISE SENSITIVE AREAS DEEMED BY THE ARCHITECT, CLIENT OR EQUIVALENT PERSONS SHALL BE ACOUSTICALLY INSULATED TO SATISFY THE REQUIREMENTS OF THE NCC BCA, THE CERTIFYING AUTHORITIES REQUIREMENTS AND ANY SPECIFIC PROJECT REQUIREMENT.

10. CAST IN PIPEWORK
ALL STORMWATER UPVC PIPES CAST IN CONCRETE UP TO 40MPA SHALL BE SEWER GRADE UPVC SN8 WRAPPED IN NO LESS THAN 100MM SOFTLON FOAM. PIPES SHALL REMAIN CHANGED WITH WATER TROUGHOUT THE CONCRETE POUR AND CURING PROCESS.
WHERE CONCRETE IS GREATER THAN 40MPA OR THE CURING TEMPERATURE EXCEEDS 50C OR THE SLAB THICKNESS IS GREATER THAN 600MM THE CONTRACTOR MUST SEEK ADVICE FROM THE PIPE MANUFACTURE AND CONFIRM THEIR REQUIREMENTS IN WRITING PRIOR TO COMMENCEMENT OF WORKS.
ALL CAST IN PIPEWORK SHALL BE TO THE APPROVAL OF THE STRUCTURAL ENGINEER.

11. EXCAVATION
ALL EXCAVATION SHALL BE CARRIED OUT IN A SAFE WORKING MANNER WITH ALL NECESSARY SAFETY PRECAUTIONS TAKEN AND IN ACCORDANCE WITH WORKCOVER REQUIREMENTS.
THE CONTRACTOR SHALL PAY ALL ASSOCIATED ROAD AND FOOTPATH OPENING FEES RELEVANT TO THE AUTHORITIES REQUIREMENTS.
CONDUCT ALL NECESSARY SERVICE SEARCHES INCLUDING CONTACTING THE DIAL BEFORE YOU DIG SERVICE AND OTHER REQUIREMENTS AS NOTED ABOVE.
ALL SERVICES SHALL BE LAID ON APPROVED BEDDING MATERIALS AND TO THE REQUIRED DEPTHS AND GRADES WHERE APPLICABLE.
BACKFILL USING SAND TO THE REQUIRED DEPTH SUFFICIENTLY COVERING THE SERVICE TO THE REQUIREMENTS OF AS3500.
SUBJECT TO THE APPROVAL OF THE PRINCIPLE FILL THE REMAINDER OF THE EXCAVATION USING THE EXCAVATED SOIL ENSURING COMPACTION TO 95% MODIFIED AASHO

12. FINISHED SITE LEVELS
ENSURE FINAL SITE LEVELS AND CONTOURS OF NEW WORKS GRADE AWAY FROM ANY HABITABLE AREAS AND TOWARDS ANY GRATED PITS, DRAINS, SWALES OR LANDSCAPED AREAS. THRESHOLDS AND FREEBOARDS SHALL BE IN ACCORDANCE WITH NCC BCA AND REGULATORY AUTHORITIES REQUIREMENTS.

13. DRAINAGE PITS
STORMWATER PIT INTERNAL DIMENSIONS AS FOLLOWS:
TOTAL DEPTH LESS THAN 600MM + 450MM SQUARE OR 600MM DIAMETER.
TOTAL DEPTH 601MM TO 900MM + 600MM SQUARE OR 900MM DIAMETER.
TOTAL DEPTH 901MM TO 1200MM + 600X900MM OR 1050MM DIAMETER.
TOTAL DEPTH GREATER THAN 1200M + 600MM SQUARE OR 1050 DIAMETER.
PITS DEEPER THAN 1200MM SHALL BE FITTED WITH STEP IRONS AT 300MM CENTRES. APPROVED PRE-CAST PITS MAY BE USED.
PIT GRATES, FRAMES AND SOLID COVERS SHALL BE TYPE B IN NON-TRAFFICABLE AREAS AND TYPE D IN TRAFFICABLE AREAS OR IN ACCORDANCE WITH AS 3996 AND AS 1428.1
ALL CONNECTIONS TO DRAINAGE PITS SHALL BE MADE IN A TRADESMAN LIKE MANNER AND THE INTERNAL WALL OF THE PIT AT THE POINT OF ENTRY SHALL BE CEMENT RENDERED TO ENSURE A SMOOTH FINISH.
SUBSOIL DRAINAGE AS NOTED BELOW SHALL EXTEND 3M UPSTREAM OF ANY DRAINAGE PIT AND BE SEALED WITH A SUITABLE CAP. THE OUTLET SHALL TERMINATE A MINIMUM OF 100MM ABOVE THE INVERT OF THE SUBJECT PIT.
ALL BUILDING SURROUNDS SHALL BE GRADED TO ENSURE OVERLAND FLOW FROM UPSTREAM AREAS CAN DRAIN AROUND THE FOUNDATIONS, WALLS AND BUILDING.

14. SUBSOIL DRAINAGE
SUBSOIL DRAINAGE SHALL BE CONSISTENT WITH THE STRUCTURAL ENGINEERS DETAILS AND THE GEOTECHNICAL REPORT.
SUBJECT TO TANKING REQUIREMENTS SUBSOIL DRAINS SHALL BE SLOTTED UPVC 100MM DIAMETER FITTED WITH GEOFABRIC FILTER SOCK.
SUBSOIL DRAINAGE SHALL BE LAID AT A MINIMUM GRADE OF 1.0% U.N.O.
SUBSOIL DRAINAGE SHOULD BE INSTALLED ON THE UPSTREAM END OF ANY PROPOSED PAVED AREAS AND CONNECTED TO THE PIPED DRAINAGE SYSTEM OR WATERCOURSE.
ADDITIONAL SUBSOIL DRAINAGE SHALL BE LAID TO SUIT SITE CONDITIONS AND GROUNDWATER PRESENCE AS DIRECTED.
PROVIDE CLEAROUTS AND FLUSHING POINTS SO THAT EACH SECTION OF PIPE IS ACCESSIBLE FOR MAINTENANCE

15. DRAINAGE PIPES
REFER TO MATERIALS SCHEDULE
MINIMUM GRADE OF ANY DRAINAGE PIPES TO BE 1% (U.N.O.)
ALL PIPE JUNCTIONS AND TAPERS SHALL BE VIA PROPRIETARY MADE FITTINGS.
ALL DRAINAGE PIPES 300MM AND GREATER IN DIAMETER SHALL BE REINFORCED CONCRETE RUBBER RING JOINTED CLASS '2' U.N.O.) MANUFACTURED TO AS 4058.
EQUIVALENT STRENGTH FRC PIPES OR BLACKMAX MAY BE USED WHEN APPROVED.
MINIMUM PIPE DIAMETER 100MM U.N.O.

16. DOWNPIPES & GUTTERS
THE FINAL NUMBER, SIZES AND LOCATION OF RAINWATER DOWNPIPES AND GUTTERS SHALL BE CO-ORDINATED ON-SITE BETWEEN THE PLUMBING CONTRACTOR, THE BUILDER AND THE ROOFING CONTRACTOR, TO THE APPROVAL OF THE ARCHITECT AND ENGINEER AND IN ACCORDANCE WITH AS3500.3
MINIMUM DOWNPIPE DIAMETER 100MM (U.N.O. EQUIVALENT SIZE RECTANGULAR DOWNPIPES MAY BE USED IN PLACE OF EXTERNAL, NON CHARGED CIRCULAR DOWNPIPES
ALL EAVES GUTTERS SHALL BE SIZED FOR THE 20YR (Tc 5min) ARI STORM EVENT IN ACCORDANCE WITH AS3500.3
ALL BOX GUTTERS, RAINWATER HEADS AND FAILSAFE OVERFLOWS SHALL BE SIZED FOR A 100YR (Tc 5min) ARI STORM EVENT IN ACCORDANCE WITH AS3500.3

17. FAILSAFE OVERFLOWS AND OVERLAND FLOW PATHS
PROVIDE 100% FAILSAFE OVERFLOWS, OVERLAND FLOW PATHS AND ESCAPE ROUTES TO CATER FOR ALL STORMS EVENTS IN THE EVENT OF A SYSTEM FAILURE .

FAILSAFE OVERFLOWS SHALL BE PROVIDED TO ALL GUTTERS, ROOFS, TERRACES, BALCONIES, PODIUMS AND AREAS THAT HAVE THE POTENTIAL TO TRAP RAINWATER AND RUNOFF.

ALL FINISHED SURFACE LEVELS INCLUDING GROUND AND LANDSCAPE LEVELS SHALL SLOPE AWAY FROM HABITABLE AREAS

IT IS THE BUILDERS AND ONSITE CONSTRUCTION TEAMS RESPONSIBILITY TO ENSURE THE BUILDING IS WATER TIGHT AND ALL FAILSAFE MEASURES ARE PROVIDED.

18. STORMWATER REUSE PIPEWORK
ALL WORK CARRIED OUT SHALL COMPLY TOO AND BE IN ACCORDANCE WITH COUNCIL REQUIREMENTS AND SYDNEY WATER'S PUBLICATION 'GUIDELINES FOR RAINWATER TANKS ON RESIDENTIAL PROPERTIES'.
THE CONTRACTOR IS TO MAKE APPLICATIONS AND PAY ALL FEES AND CHARGES AS REQUIRED BY THE REGULATORY AUTHORITIES.
SYDNEY WATER'S APPROVAL IS REQUIRED FOR ANY TOP UP FROM DRINKING WATER SUPPLY REGARDLESS OF TANK SIZE.
THE CONTRACTOR SHALL PROVIDE A FLOW RESTRICTOR RATED AT 2 LITRES PER MINUTE TO THE DOMESTIC WATER INLET FILLING VALVE IN ACCORDANCE WITH THE CODE REQUIREMENTS.
ALL PIPEWORK AND OUTLETS ARE TO BE LABELLED "RAINWATER" IN ACCORDANCE WITH CODE REQUIREMENTS.
RE-CYCLED RAINWATER PIPEWORK IS TO BE INSTALLED WITH A 300MM CLEARANCE FROM DOMESTIC WATER SUPPLIES IN ACCORDANCE WITH CODE REQUIREMENTS.
RE-CYCLED RAINWATER PIPEWORK IS TO BE STAINLESS STEEL PRESS FIT OR APPROVED COMPOSITE PLASTIC SUCH AS PEX ONLY. COPPER PIPEWORK SHALL NOT BE USED
A TESTABLE DOUBLE CHECK VALVE SHALL BE INSTALLED AT THE PROPERTIES WATER METER IN ACCORDANCE WITH CODE REQUIREMENTS.
ON COMPLETION PROVIDE A COPY OF "AS-INSTALLED DRAWINGS" WITH CERTIFICATION FOR THE COMPLETED WORKS AND BACKFLOW PROTECTION.

19. TESTING AND COMMISSIONING
ALL WORK SHALL BE PROGRESSIVELY TESTED AND INSPECTED TO THE APPROVAL OF THE CONSTRUCTION MANAGER AND AUTHORITY HAVING JURISDICTION. COPIES OF ALL TEST AND COMPLIANCE CERTIFICATES SHALL BE FORWARDED TO THE CONSTRUCTION MANAGER AND PRINCIPLE. THE CONTRACTOR SHALL PROVIDE ALL LABOUR AND MATERIALS REQUIRED FOR THE CARRYING OUT OF SUCH TESTS AND SHALL ALSO BE RESPONSIBLE FOR THE RECTIFICATION OF ANY WORK FAILING ANY TEST.
THE ENTIRE SYSTEM SHALL BE COMMISSIONED PRIOR PRACTICAL COMPLETION AND HANDOVER, WHICH SHALL INCLUDE BUT NOT LIMITED TO THE FOLLOWING>
~ THE CLEARING OF ALL DEBRIS FROM ANY INLINE FILTER OR STRAINER.
~ CLEANING OF DEBRIS FROM ALL PITS, PIPES, RAINWATER OUTLETS, ROOF OUTLETS, GRATED DRAINS AND BALCONY OUTLETS
~ ENSURING ALL TRASH SCREENS ARE CLEAR AND CLEAN OF DEBRIS
~ ALL ACCESS GRATES AND FRAMES ARE SECURE AND WHERE REQUIRED FITTED WITH CHILD LOCKING DEVICES
~ ENSURING ALL FAILSAFE OVERFLOWS ARE INSTALLED AND CLEAR OF ANY OBSTRUCTION.
~ PUMPWELL AND CLEARED OF FORMORK AND DEBRIS AND PUMPS HAVE BEEN COMMISSIONED WITH FLOAT SWITCHES SET AT CORRECT LEVELS

20. STORMWATER MAINTENANCE
AFTER COMPLETION AND OCCUPATION OF THE BUILDING IT IS THE RESPONSIBILITY OF THE OWNERS OR BODY CORPORATE TO MAINTAIN THE INTEGRITY AND FUNCTIONALITY OF ALL STORM WATER SYSTEMS.
THIS INCLUDES ALL OVERFLOWS, GRATES, BALCONY OUTLETS, SURFACE PITS, ON-SITE DETENTION STORAGE, TRASH SCREENS, FAILSAFE FLOW PATHS, SUBMERSIBLE PUMPS AND ASSOCIATED INFRASTRUCTURE.

21. MATERIAL SCHEDULE
Unless Noted Otherwise the following materials schedule shall be adopted.

Service	Size	Location	Material
Stormwater Drainage	100 - 225	Below Ground <3m deep	UPVC DWV
	300 +		RRJ class 2 / Blackmax
	100 - 225	Below Ground >3	UPVC SN8
	300 +		RSJ Class 4
	100 - 375	Above Ground	UPVC DWV
	375 +		FRC / Blackmax
	100 - 225	Cast in Concrete	UPVC SN8 / HDPE (Wrapped)
Downpipes	65 - 150	Internal	UPVC DWV / HDPE (Acoustic wrapped where required)
	65 - 150	External	UPVC DWV / Zincalum / Stainless Steel

22. DISCLAIMER
ALL CALCULATIONS PRESENTED IN THIS DOCUMENT HAVE BEEN CALCULATED IN ACCORDANCE WITH AUSTRALIAN RAINFALL AND RUNOFF AND COUNCILS POLICIES AND CODES. GAH HAS PERFORMED THESE CALCULATIONS TO THE BEST OF THEIR ABILITY TO ENSURE COMPLIANCE WITH THE ABOVE MANUALS AND COUNCIL POLICIES, BEST PRACTICE AND THE INSTITUTION OF ENGINEERS, AUSTRALIA CODE OF ETHICS. GAH TAKES NO RESPONSIBILITY OR LIABILITY FOR ANY DAMAGES OR LOSSES INCURRED TO ANY PERSONS OR PROPERTY (INCLUDING THE DEVELOPMENT SITE) AS A RESULT OF MISINTERPRETATION OF THE RESULTS AND UNFORESEEN CIRCUMSTANCES SUCH AS: POOR CONSTRUCTION, LACK OF MAINTENANCE AFTER CONSTRUCTION, ALTERATIONS TO GROUND FLOOR LEVELS UPSTREAM, DOWNSTREAM OR ADJACENT TO THE DEVELOPMENT

ABBREVIATIONS

AFFL	ABOVE FINISHED FLOOR LEVEL	OF	OVERFLOW
BWVO	BALCONY RAINWATER OUTLET	OSD	ON-SITE DETENTION
BTFW	BUCKET TRAP FOR FLOOR WASTE	PBO	PLANTER BOX OUTLET
CI	CAST IRON	PSD	PERMISSIBLE SITE DISCHARGE
CIC	CAST IN COUAIN	PVC	POLYVINYL CHLORIDE
CIS	CAST IN SLAB	RHS	RECTANGULAR HOLLOW SECTION
CO	CLEAROUT	RL	REDUCED LEVEL
CP	CHROME PLATED	RM	RISING MAIN
CU	COPPER	RRJ	RUBBER RING JOINT
DIA	DIAMETER	RWO	RAINWATER OUTLET
DP	DOWNPIPE	RWR	RAINWATER RE-USE
DTU	DRAINAGE TURN UP POINT	RWT	RAIN WATER TANK
EJ	EXPANSION JOINT	SCO	SPOON DRAIN OUTLET
EX	EXISTING	SL	SURFACE LEVEL
FFL	FINISHED FLOOR LEVEL	SQ	SQUARE
FRC	FIBRE REINFORCED CONCRETE	SSR	SITE STORAGE REQUIREMENTS
FSL	FINISHED SURFACE LEVEL	STW	STORMWATER
GTO	GRATED TRENCH DRAIN	SW	SEWER
HDPE	HIGH DENSITY POLYETHYLENE	SYP	SYPHONIC DOWNPIPES
HL	HIGH LEVEL	TD	TUNDISH
IL	INVERT LEVEL	TOW	TOP OF WALL
IO	INSPECTION OPENING	TTD	TRAPPED TUNDISH
KPA	PRESSURE IN KILOPASCALS	UNO	UNLESS NOTED OTHERWISE
LL	LOW LEVEL	UPVC	UNPLASTISIZED POLYVINYL CHLORIDE
L/S	LITRES PER SECOND		
M	METER	US	UNDERSIDE
MH	PRESSURE IN METERS/HEAD		
NPCW	NON POTABLE COLD WATER		
NPHT	NON POTABLE HOSE TAP		

BALCONY DP NOTES:
DPN.1 Boxed out by Builder
DPN 2. DP within cavity wall to have min. 230mm clearance for fire collar & acoustic insulation
DPN 3. Subject to Structural Engineers approval DP cast in column wrapped in 10mm soffton foam

LEGEND

PIPEWORK:
- SW — SEWER DRAINAGE
- SUB SOIL
- STW — STORMWATER
- TRUNK MAIN
- SEDIMENT & EROSION FENCE
- EX.STW — EXISTING STORMWATER
- EXISTING TO BE REMOVED
- SYP — SYPHONIC
- RWR — RAIN WATER RE-USE
- RISE IN SERVICE
- DROP IN SERVICE
- FLOW DIRECTION
- E — ELECTRICAL
- CIS — CAST IN SLAB

SERVICE ACCESSORIES
- D-2 / HA02 — REFER DETAIL NO. / REFER DRAWING NO.
- DIRECTION OF SERVICE
- 55 — TYPE OF SERVICE
- 100 — SIZE OF SERVICE
- F — FIRST FLUSH DIVERTER
- RWT — RAINWATER TANK
- RAINWATER SUMP
- RAINHEAD

- DOWN PIPE
- DOWN PIPE & SPREADER
- PLANTER BOX DRAINAGE OUTLET 100 DIA U.N.O
- RAINWATER OUTLET (150GRATE U.N.O)
- DRAINAGE TURN UP POINT 100 DIA U.N.O.
- BALCONY RAINWATER OUTLET (150 GRATE U.N.O)
- OVERFLOW SPITTER - U.N.O. (1 X 50MMDIA / 12NO OF BALCONY AREA) (1 X 200W X 75H / 90NO OF CONCRETE ROOF, TERRACE AREA)
- CLEAR OUT
- GRATED STORMWATER PIT
- CONCRETE COVERED JUNCTION PIT
- GRATED TRENCH DRAIN (150 WIDE U.N.O.)
- KERB INLET PIT
- STORMWATER PUMP WELL
- VEHICULAR CROSSING
- REVISION
- EXISTING SURFACE LEVEL
- 21.11 — FINISHED SURFACE LEVEL

OSD TANK 1A CALCULATIONS

HAWKESBURY RIVER CATCHMENT
COUNCIL O.S.D. CHECK SHEET

Site Address = 16-20 Carrington Road, Castle Hill
File No. = OSD 1a

Site Area		=	0.3060 Ha	[A]
Site Slope		=	7 %	[A1]
Site Storage Volume	= See Chart	=	362 m3/Ha	[A2]
Permissable Discharge	= See Chart	=	104 l/s/Ha	[A3]
Basic Storage Volume	= [A2] x [A]	=	110.8 m3	[B]
Basic Discharge	= [A3] x [A]	=	31.8 l/s	[C]
Area of Site Drained to Storage		=	0.3150 Ha	[D]
% of Total Site	= [D] / [A] x 100	=	103 %	[E]
Storage Per Ha.	= [B] / [D]	=	351.7 m3/Ha	[F]
Permissable Discharge	= ({[F] / 69.21)^ (-1.368)) x 1000	=	108.2 l/s/Ha	[G]
P.S.D.	= [G] x [D]	=	34.1 l/s	[H]
Maximum Head to Orifice Centre		=	0.950 m	[K]
Selected Orifice Dia.	= ((0.464x[H]/1000)^0.5[K]^0.5)x1000	=	127 mm	[J]
Maximum Discharge	= [H]	=	34.1 l/s	[L]
Head for High Early Discharge		=	0.740 m	[M]
High Early Discharge	= ([L] x ([M]/[K])^0.5)	=	30.1 l/s	[N]
Approx. Ave. Discharge	= ({[L] + [N]) / 2)	=	32.1 l/s	[P]
Ave. Discharge per Ha.	= [P] / [D]	=	101.9 l/s/Ha	[Q]
Storage Volume	= 69.21 x ([Q] / 1000)^-0.731	=	367.3 m3/Ha	[R]
Site Storage Volume	= [R] x [D]	=	115.7 m3	[S]

OSD TANK 1B CALCULATIONS

HAWKESBURY RIVER CATCHMENT
COUNCIL O.S.D. CHECK SHEET

Site Address = 16-20 Carrington Road, Castle Hill
File No. = OSD 1b

Site Area		=	0.4583 Ha	[A]
Site Slope		=	7 %	[A1]
Site Storage Volume	= See Chart	=	362 m3/Ha	[A2]
Permissable Discharge	= See Chart	=	104 l/s/Ha	[A3]
Basic Storage Volume	= [A2] x [A]	=	165.9 m3	[B]
Basic Discharge	= [A3] x [A]	=	47.7 l/s	[C]
Area of Site Drained to Storage		=	0.4583 Ha	[D]
% of Total Site	= [D] / [A] x 100	=	100 %	[E]
Storage Per Ha.	= [B] / [D]	=	362.0 m3/Ha	[F]
Permissable Discharge	= ({[F] / 69.21)^ (-1.368)) x 1000	=	104.0 l/s/Ha	[G]
P.S.D.	= [G] x [D]	=	47.7 l/s	[H]
Maximum Head to Orifice Centre		=	1.550 m	[K]
Selected Orifice Dia.	= ((0.464x[H]/1000)^0.5[K]^0.5)x1000	=	133 mm	[J]
Maximum Discharge	= [H]	=	47.7 l/s	[L]
Head for High Early Discharge		=	1.450 m	[M]
High Early Discharge	= ([L] x ([M]/[K])^0.5)	=	46.1 l/s	[N]
Approx. Ave. Discharge	= ({[L] + [N]) / 2)	=	46.9 l/s	[P]
Ave. Discharge per Ha.	= [P] / [D]	=	102.4 l/s/Ha	[Q]
Storage Volume	= 69.21 x ([Q] / 1000)^-0.731	=	366.2 m3/Ha	[R]
Site Storage Volume	= [R] x [D]	=	167.8 m3	[S]

OSD TANK 2 CALCULATIONS

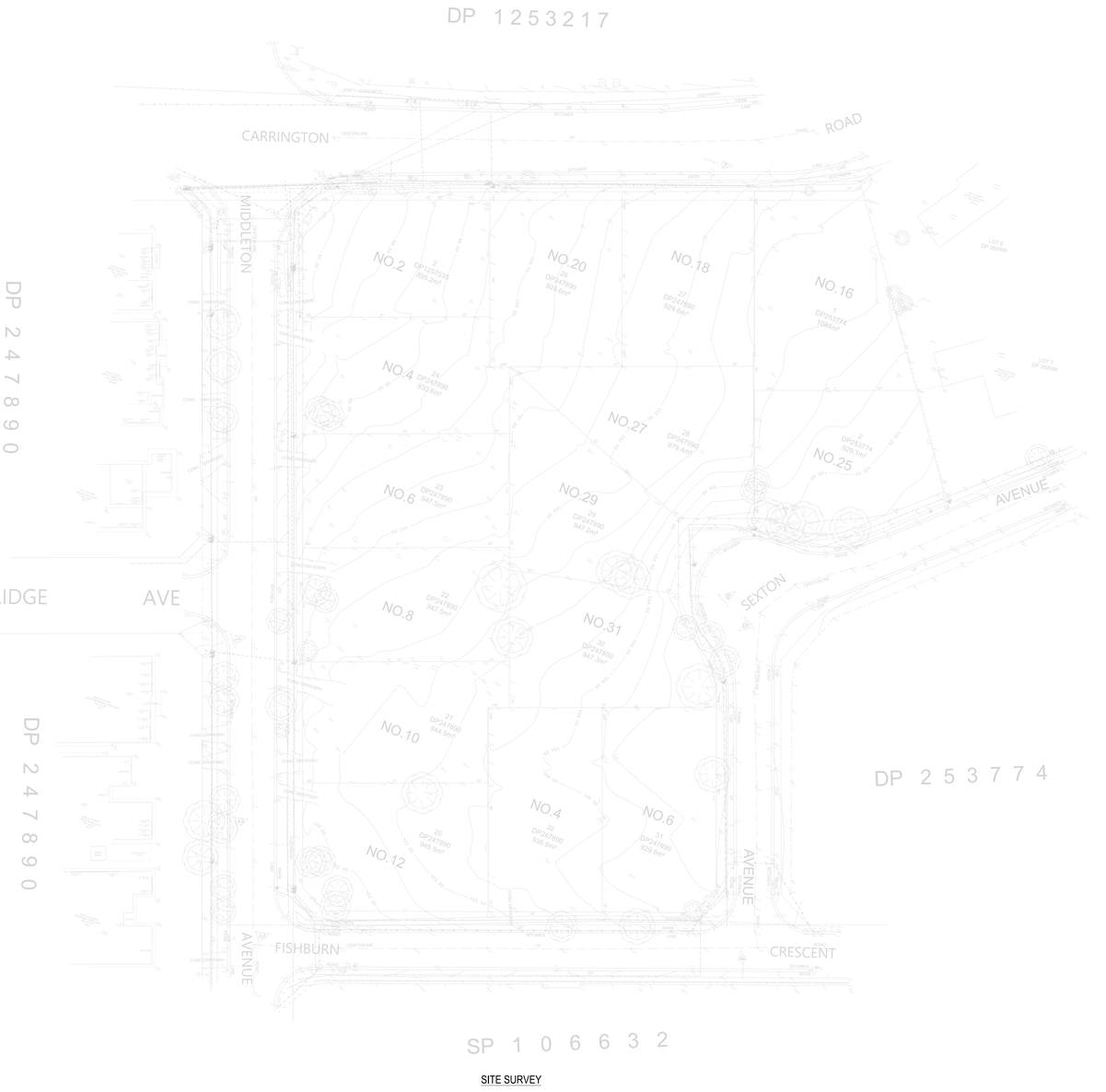
HAWKESBURY RIVER CATCHMENT
COUNCIL O.S.D. CHECK SHEET

Site Address = 16-20 Carrington Road, Castle Hill
File No. = OSD 2

Site Area		=	0.5611 Ha	[A]
Site Slope		=	7 %	[A1]
Site Storage Volume	= See Chart	=	362 m3/Ha	[A2]
Permissable Discharge	= See Chart	=	104 l/s/Ha	[A3]
Basic Storage Volume	= [A2] x [A]	=	203.1 m3	[B]
Basic Discharge	= [A3] x [A]	=	58.4 l/s	[C]
Area of Site Drained to Storage		=	0.5611 Ha	[D]
% of Total Site	= [D] / [A] x 100	=	100 %	[E]
Storage Per Ha.	= [B] / [D]	=	362.0 m3/Ha	[F]
Permissable Discharge	= ({[F] / 69.21)^ (-1.368)) x 1000	=	104.0 l/s/Ha	[G]
P.S.D.	= [G] x [D]	=	58.4 l/s	[H]
Maximum Head to Orifice Centre		=	2.040 m	[K]
Selected Orifice Dia.	= ((0.464x[H]/1000)^0.5[K]^0.5)x1000	=	138 mm	[J]
Maximum Discharge	= [H]	=	58.4 l/s	[L]
Head for High Early Discharge		=	1.910 m	[M]
High Early Discharge	= ([L] x ([M]/[K])^0.5)	=	56.5 l/s	[N]
Approx. Ave. Discharge	= ({[L] + [N]) / 2)	=	57.5 l/s	[P]
Ave. Discharge per Ha.	= [P] / [D]	=	102.4 l/s/Ha	[Q]
Storage Volume	= 69.21 x ([Q] / 1000)^-0.731	=	366.1 m3/Ha	[R]
Site Storage Volume	= [R] x [D]	=	205.4 m3	[S]

DRAWING SCHEDULE:

STW-DA-000	COVER PAGE & SITE SURVEY
STW-DA-001	SITE PLAN
STW-DA-100	BASEMENT 01 STORMWATER SERVICES PART 1 OF 2
STW-DA-101	BASEMENT 01 STORMWATER SERVICES PART 2 OF 2
STW-DA-102	LOWER GROUND STORMWATER SERVICES PART 1 OF 3
STW-DA-103	LOWER GROUND STORMWATER SERVICES PART 2 OF 3
STW-DA-104	LOWER GROUND STORMWATER SERVICES PART 3 OF 3
STW-DA-105	GROUND LEVEL STORMWATER SERVICES PART 1 OF 3
STW-DA-106	GROUND LEVEL STORMWATER SERVICES PART 2 OF 3
STW-DA-107	GROUND LEVEL STORMWATER SERVICES PART 3 OF 3
STW-DA-200	DETAILS 1
STW-DA-201	DETAILS 2
STW-DA-202	DETAILS 3
STW-DA-203	DETAILS 4
STW-DA-300	WATER QUALITY MODELLING & SITE AREA BREAK UP



SITE SURVEY

													REFERENCED DRAWINGS		
													DISCIPLINE:		
													DWG NO:		
													REVISION:		
A	AUTHORITY SUBMISSION	TC	MG	30.04.2026											
REV.	ISSUE	DRAFT.	ENG.	DATE	REV.	ISSUE		DRAFT.	ENG.	DATE	DATED:				

APPROVAL: **AUTHORITY SUBMISSION**

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CLIENT: ARADA

ARCHITECT: TURNER

PROJECT: **16-20 CARRINGTON RD, CASTLE HILL**

CONTRACTORS CONSULTANT: greenarrow hydraulics — Hydraulics • fire suppression • civil drainage
greenarrow hydraulics pty ltd. admin@greenarrow.net.au Tel: (02) 4226 4490

SHEET TITLE: **COVER SHEET & SITE SURVEY**

PROJECT No:	DRAWING NO:	REVISION:	DRAWN:	CHECKED:	DATE:
224-2065	STW-DA-000	A	TC	MG	JULY, 2024

SCALE: A0@1:400 SHEET:

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12) FINISHED SURFACE LEVELS SHALL BE GRADED AWAY FROM BUILDINGS AND STRUCTURES TO OUTLET AND GRATES PROVIDED

DP 247890

DP 247890

DP 253774

CARRINGTON ROAD

MIDDLETON AVENUE

PARTRIDGE AVENUE

SEXTON AVENUE

FISHBURN CRESCENT

OVERLAND FLOW PATH

1M2 FILTER CHAMBER
GPT EQUAL TO ATLAN VORTCEPTOR SVI.025

600x600 STW PIT WITH CLASS B GRATE
RL: 99.60
IL: 99.00

600x600 STW PIT WITH CLASS B GRATE
RL: 100.50
IL: 99.90

EX.SMH
RL:96.60
IL:94.70 (TBC)

EX.Ø375 STW

ex. sw

Ø375mm uPVC

UNDERGROUND OSD 01b
VOLUME 168m3

24500

18000

8500

LOCATE AND CONNECT TO EXISTING KERB INLET PIT
RL:95.87 (grade)
IL: 94.85

900x900 STW PIT WITH CLASS B MULTIPART GRATE AND STEP IRONS
RL:96.45
IL:95.05

8000L RAINWATER TANK 1
LENGTH = 4M
WIDTH = 3M
STORAGE HEIGHT = 0.7M

900x900 SIDE ACCESS INTO RAINWATER HARVESTING TANK AT LOWER GROUND FLOOR LEVEL

GPT EQUAL TO ATLN VORTCEPTOR SVI.025

UNDERGROUND OSD 01a
VOLUME 116m3

ex. sw 150

CONC DRIVEWAY

300STW@1%

EX.SMH
RL:103.15
IL:101.85

600x600 STW PIT WITH CLASS B GRATE
RL: 103.10
IL: 102.50

600x600 STW PIT WITH CLASS B GRATE
RL: 102.55
IL:101.95

600x600 STW PIT WITH CLASS B GRATE
RL: 103.60
IL: 103.00

225STW@1%

600x600 STW PIT WITH CLASS B GRATE
RL: 105.15
IL: 104.60

155STW@1%

600x600 STW PIT WITH CLASS B GRATE
RL: 105.60
IL: 105.00

600x600 STW PIT WITH CLASS B GRATE
RL: 99.35
IL:98.75

600x600 STW PIT WITH CLASS B GRATE
RL: 98.90
IL:98.30

CONSTRUCT NEW KERB INLET PIT IN ACCORDANCE WITH COUNCIL REQUIREMENTS
RL: 99.74
IL: 97.18

CONSTRUCT NEW KERB INLET PIT IN ACCORDANCE WITH COUNCIL REQUIREMENTS
RL: 99.62
IL: 97.00

155STW@1%

600x600 STW PIT WITH CLASS B GRATE
RL: 99.65
IL: 99.05

EX.SMH
RL:100.20 (TBC)
IL: 99.00 (TBC)

375 STW RCP CLASS 4 @ 1%

Ø375mm uPVC

IL: 97.32

300

900x900 STW PIT WITH CLASS B MULTIPART GRATE AND STEP IRONS
RL:100.08
IL:97.27

6000

16000

UNDERGROUND OSD 02
VOLUME 205m3

LOCATE AND CONNECT TO EXISTING KERB INLET PIT
RL:96.95 (grade)
IL: 96.23

CONSTRUCT NEW KERB INLET PIT IN ACCORDANCE WITH COUNCIL REQUIREMENTS
RL: 99.66
IL: 96.91

1300L RAINWATER TANK 2
LENGTH = 5M
WIDTH = 3M
STORAGE HEIGHT = 0.9M

1M2 FILTER CHAMBER

GPT EQUAL TO ATLAN VORTCEPTOR SVI.025

600x600 STW PIT WITH CLASS B GRATE
RL: 101.15
IL: 100.55

NEW SEWER MANHOLE TO BE CONSTRUCTED OVER EXISTING SEWER LINE
RL: 101.99
IL: 100.82

300STW@1%

150SW@1.24%

NEW SEWER MANHOLE
RL: 102.00
IL: 101.00

600x600 STW PIT WITH CLASS B GRATE
RL: 102.10
IL: 101.50

DEMOLISH EXISTING KERB INLET PIT

RELOCATE EXISTING STORMWATER PIPE

600x600 STW PIT WITH CLASS B GRATE RL: 102.50
IL: 101.75

600x600 STW PIT WITH CLASS B GRATE
RL: 102.50
IL: 101.90

150SW@1.90%

225STW@1%

NEW SEWER MANHOLE
RL: 104.80
IL: 102.30

600x600 STW PIT WITH CLASS B GRATE
RL: 105.25
IL: 104.80

150SW@2%

150STW@1%

375 STW RCP CLASS 4 @ 1.25%

CONSTRUCT NEW KERB INLET PIT IN ACCORDANCE WITH COUNCIL REQUIREMENTS
GRATE RL:105.15
IL: 104.15

NEW SEWER MANHOLE TO BE CONSTRUCTED OVER EXISTING SEWER LINE
RL: 105.00
IL: 102.95

MODIFY EXISTING KERB INLET PIT TO A VEE GRATE INLET
RL: 104.62
IL: 103.62

600x600 STW PIT WITH CLASS B GRATE
RL: 105.00
IL: 104.40

MODIFY EXISTING KERB INLET PIT TO A SEALED PIT

MODIFY EXISTING KERB INLET PIT TO A SEALED PIT

CONSTRUCT NEW KERB INLET PIT IN ACCORDANCE WITH COUNCIL REQUIREMENTS

CONSTRUCT NEW KERB INLET PIT IN ACCORDANCE WITH COUNCIL REQUIREMENTS

CONSTRUCT NEW KERB INLET PIT IN ACCORDANCE WITH COUNCIL REQUIREMENTS

CONSTRUCT NEW KERB INLET PIT IN ACCORDANCE WITH COUNCIL REQUIREMENTS

REV.	ISSUE	DRAFT.	ENG.	DATE
A	AUTHORITY SUBMISSION	TC	MG	30.04.2026
P2	PRELIMINARY ISSUE	TC	MG	13.04.2026
P1	PRELIMINARY ISSUE	TC	MG	19.03.2026

REFERENCED DRAWINGS
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REVISION:
DATED:

APPROVAL:
AUTHORITY SUBMISSION

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CLIENT: ARADA

ARCHITECT: TURNER

PROJECT:
16-20 CARRINGTON RD, CASTLE HILL

CONTRACTORS CONSULTANT:
greenarrow hydraulics-fire suppression-civil drainage
greenarrow hydraulics pty ltd. admin@greenarrow.net.au Tel: (02) 4226 4490

SHEET TITLE: **SITE PLAN**
PROJECT No: **224-2065**
DRAWING NO: **STW-DA-001**
REVISION: **A**
DRAWN: TC
CHECKED: MG
DATE: JULY, 2024
SCALE: A0@1:250
SHEET:

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12) FINISHED SURFACE LEVELS SHALL BE GRADED AWAY FROM BUILDINGS AND STRUCTURES TO OUTLET AND GRATES PROVIDED

RAIL PROTECTION RESERVE (2nd RESERVE)

URE_SP2_SITE BOUNDARY

RM'S TO MERGE TOGETHER AT HIGH LEVEL ABOVE

RM	RM	ELEC
80	80	40

DP-STW 100 | DP-STW 100 | DP-STW 100 | DP-STW 100 | DP-STW 100 | DP-STW 100 | DP-STW 100 | DP-STW 100 | DP-STW 100 | DP-STW 100

100SUB-SOIL@1% | SDO | IL: 95.55 | 100 SLOTTED UPVC | 600x600 STW PIT WITH CLASS D GRATE RL:95.85 IL:95.45 | 900x900 STW PIT WITH CLASS D MULTIPART GRATE AND STEP IRONS RL:96.85 IL:94.65 | 150STW@1% | 200x65 PERIMETER DRAIN | CWB | TAN | RES | CPE PLENUM | A2_A | A2_B | A2_S1 | A1_B1 | FS.A1 | EVDB overhead | 900x900 STW PIT WITH CLASS D MULTIPART GRATE AND STEP IRONS RL:95.85 IL:94.65 | 150 | 600x600 STW PIT WITH CLASS D GRATE RL:95.85 IL:95.05 | 600x600 STW PIT WITH CLASS D GRATE RL:95.85 IL:95.18 | IL: 95.500 | 600x600 STW PIT WITH CLASS D GRATE RL:95.85 IL:95.39 | 600x600 STW PIT WITH CLASS D GRATE RL:95.85 IL:95.25 | 600x600 STW PIT WITH CLASS D GRATE RL:95.85 IL:95.38 | 100STW@1% | 900x900 STW PIT WITH CLASS D MULTIPART GRATE AND STEP IRONS RL:95.85 IL:94.45 | 600x600 STW PIT WITH CLASS D GRATE RL:95.85 IL:95.12 | 600x600 STW PIT WITH CLASS D GRATE RL:95.85 IL:96.29 | 600x600 STW PIT WITH CLASS D GRATE RL:95.85 IL:95.39 | 4000 | 2500 | IL: 94.30 | BASEMENT PUMPWELL: EFFECTIVE AVE STORAGE HEIGHT = 1m INTERNAL WIDTH = 2.5m INTERNAL LENGTH = 4m EFFECTIVE VOLUME PROVIDED = 10m3 REFER TO DETAIL | SUMP | ELEC 40 RM 80 | CONTROL PANEL | B.C | B.B | B.A | FS.B | STORAGE | MBP | 900x900 STW PIT WITH CLASS D MULTIPART GRATE AND STEP IRONS RL:95.85 IL:94.85 | 600x600 STW PIT WITH CLASS D GRATE RL:95.85 IL:95.03 | 600x600 STW PIT WITH CLASS D GRATE RL:95.85 IL:95.20 | 150STW@1% | 100 SLOTTED UPVC | 100SUB-SOIL@1%

FOR CONTINUATION REFER TO DRAWING STW-DA-101

FOR CONTINUATION REFER TO DRAWING STW-DA-101

REV.	ISSUE	DRAFT.	ENG.	DATE
A	AUTHORITY SUBMISSION	TC	MG	30.04.2026

REFERENCED DRAWINGS
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DWG NO:
REVISION:

APPROVAL: **AUTHORITY SUBMISSION**

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CLIENT: ARADA

ARCHITECT: TURNER

PROJECT: **16-20 CARRINGTON RD, CASTLE HILL**

CONTRACTORS CONSULTANT:
greenarrow hydraulics pty ltd. admin@greenarrow.net.au Tel: (02) 4226 4490

SHEET TITLE: **BASEMENT 01 STORMWATER SERVICES PART 1 OF 2**

PROJECT No: **224-2065**

DRAWING NO: **STW-DA-100**

REVISION: **A**

DRAWN: TC | CHECKED: MG | DATE: JULY, 2024

SCALE: A0@1:100

SHEET:

FOR CONTINUATION REFER TO DRAWING STW-DA-100

FOR CONTINUATION REFER TO DRAWING STW-DA-100

DA NOTES STW NOTES

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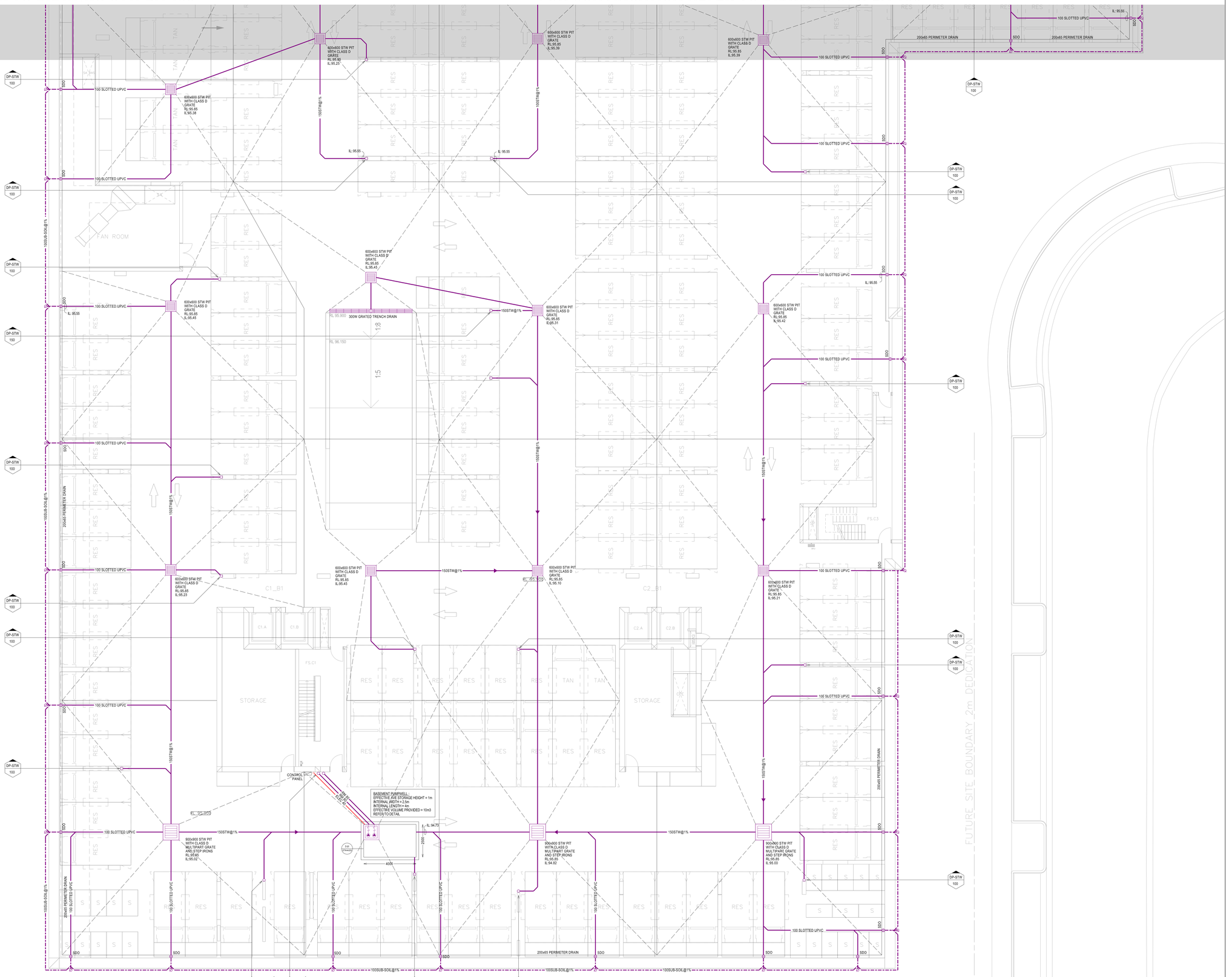
8) 100YR ARI FAILSAFE OVERFLOWS SHALL BE PROVIDED TO ALL BALCONIES, TERRACES & ROOF AREAS

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REFERENCED DRAWINGS

DISCIPLINE:

DWG NO:

REVISION:

REV:	ISSUE	DRAFT:	ENG:	DATE
A	AUTHORITY SUBMISSION	TC	MG	30.04.2025

REV:	ISSUE	DRAFT:	ENG:	DATE:

APPROVAL:
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CLIENT: ARADA

ARCHITECT: TURNER

PROJECT:
16-20 CARRINGTON RD, CASTLE HILL

CONTRACTORS CONSULTANT:
greenarrow
hydraulics-fire suppression-civil drainage
greenarrow hydraulics pty ltd. admin@greenarrow.net.au Tel: (02) 4226 4490

SHEET TITLE:
BASEMENT 01 STORMWATER SERVICES PART 2 OF 2

PROJECT No:	DRAWING NO:	REVISION:	DRAWN:	CHECKED:	DATE:
224-2065	STW-DA-101	A	TC	MG	JULY, 2024

SCALE: A0@1:100

SHEET:

BALCONY DP NOTES:
DPN.1 Boxed out by Builder
DPN.2. DP within cavity wall to have min. 230mm clearance for the collar & acoustic insulation
DPN.3. Subject to Structural Engineers approval DP (SN8) cast in column wrapped in 10mm soffiton foam. (charged with water during pour & curing)

DA NOTES STW NOTES

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12) FINISHED SURFACE LEVELS SHALL BE GRADED AWAY FROM BUILDINGS AND STRUCTURES TO OUTLET AND GRATES PROVIDED

LOCATE AND CONNECT TO EXISTING KERB INLET PIT RL:95.87 (grate) IL: 94.85
Ø375mm uPVC
300STW@1%
900x900 STW PIT WITH CLASS B MULTIPART GRATE AND STEP IRONS RL:96.45 IL:95.05
UNDERGROUND OSD 01a VOLUME 116m3
18000
8500
RL 98.20
GPT EQUAL TO ATLAN VORTCEPTOR SVI-025
UNDERGROUND OSD 01b VOLUME 168m3
24500
4000
RL 98.60
300STW@1%
GPT EQUAL TO ATLAN VORTCEPTOR SVI.025
100,300
600x600 STW PIT WITH CLASS B GRATE RL: 99.63 IL: 99.00
FOR CONTINUATION REFER TO DRAWING STW-DA-105
150STW@1%
100STW@1%
200STW@1%
RWO
O/F
TD
DP-STW 100
RM R0
500mm DEEP FULL HEIGHT PLENUM FOR CARPARK SUPPLY AIR
RAINWATER TANK
RWO EQUAL TO SPS TIA100F
600mm full height plenum
GBR BLD A2
A2_LG
RL 99.400
BIKE STORAGE
LOBBY A
A1_LG
RL 99.250
FCR
COMMS R
POTABLE WATER PUMP
GAS METER ROOM
BOOSTER WATER
FIRE TANK 1
FIRE TANK 2
FIRE PUMP ROOM
PUMPS
RL 98.500
STORAGE
ARM1 OVER SHOWN DASHED
MIDDLETON AVENUE
MINOR COLLECTOR (24M) + CYCLE WAY
600x600 STW PIT WITH CLASS B GRATE RL: 99.35 IL:98.75

FOR CONTINUATION REFER TO DRAWING STW-DA-104

FOR CONTINUATION REFER TO DRAWING STW-DA-104

FOR CONTINUATION REFER TO DRAWING STW-DA-103

REV.	ISSUE	DRAFT.	ENG.	DATE
A.	AUTHORITY SUBMISSION	TC	MG	30.04.2026

REFERENCED DRAWINGS
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REVISION:
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APPROVAL: **AUTHORITY SUBMISSION**

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CLIENT: ARADA
ARCHITECT: TURNER
PROJECT: **16-20 CARRINGTON RD, CASTLE HILL**

CONTRACTORS CONSULTANT:
greenarrow
Hydraulics for suppression civil drainage
greenarrow hydraulics pty ltd. admin@greenarrow.net.au Tel: (02) 4226 4490

SHEET TITLE: **LOWER GROUND FLOOR STORMWATER SERVICES PART 1 OF 3**
PROJECT No: **224-2065**
DRAWING NO: **STW-DA-102**
REVISION: **A**
DRAWN: TC CHECKED: MG DATE: JULY, 2024
SCALE: A0@1:100
SHEET:

FOR CONTINUATION REFER TO DRAWING STW-DA-102

TW@1%

FOR CONTINUATION REFER TO DRAWING STW-DA-105

100.300

600x600 STW PIT WITH CLASS B GRATE
RL: 99.60
IL: 99.09

DP-STW 100

DP-STW 100

RM 80

500mm DEEP FULL HEIGHT PLENUM FOR CARPARK SUPPLY AIR

RAINWATER TANK

RES

STORAGE

B_LG

B.C

B.B

B.A

F.S.B

S/R

100STW@1%

RWO EQUAL TO 'SPS TIA100F'

RWO EQUAL TO 'SPS TIA150F'

RWO EQUAL TO 'SPS TIA150F'

RWO EQUAL TO 'SPS TIA100F'

RWO EQUAL TO 'SPS TIA100F'

RWO EQUAL TO 'SPS TIA100

FOR CONTINUATION REFER TO DRAWING STW-DA-102

FOR CONTINUATION REFER TO DRAWING STW-DA-103

DA NOTES STW NOTES

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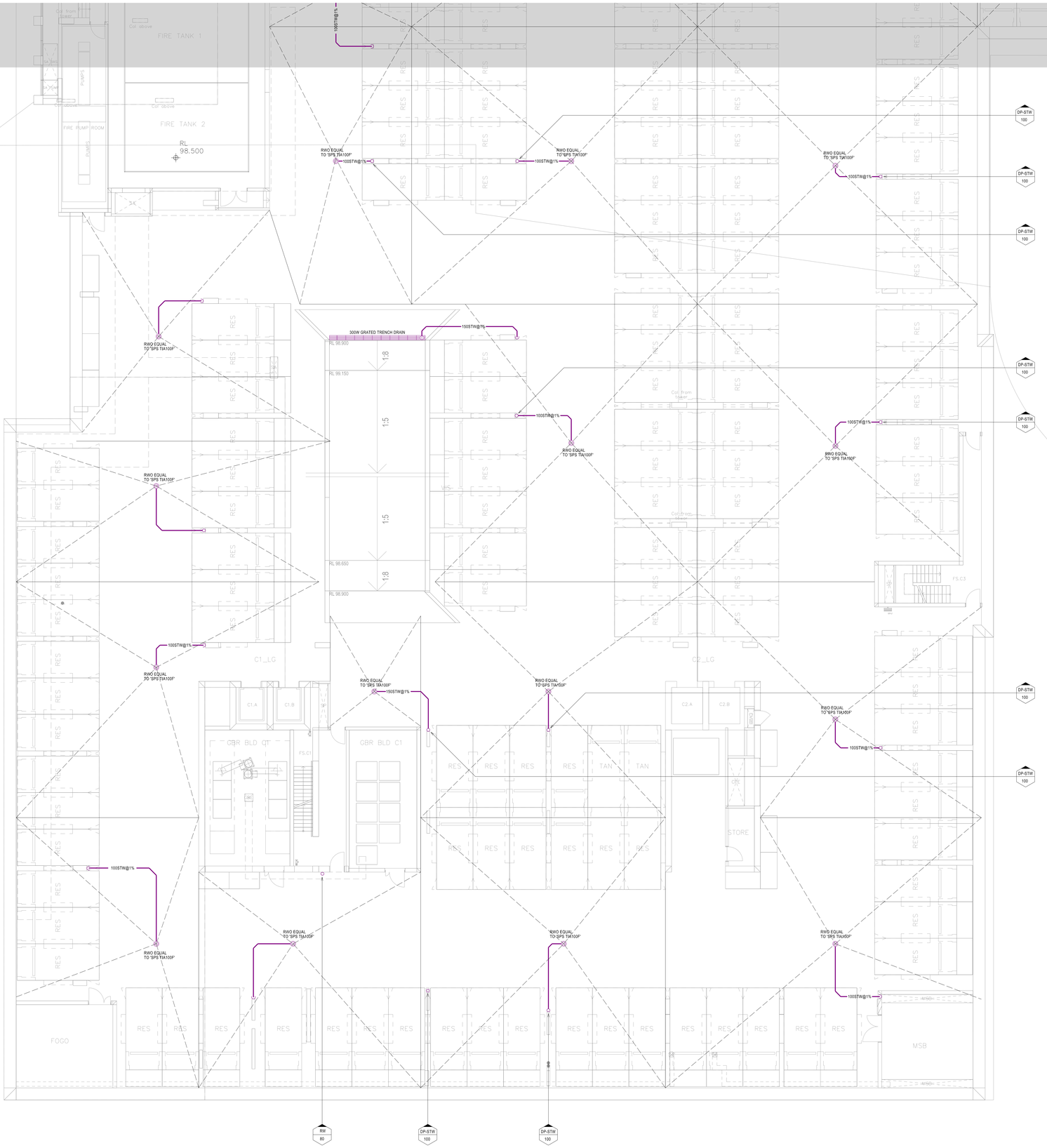
9) 1% MINIMUM FALLS SHALL BE PROVIDE TO ALL RAINWATER OUTLETS INCLUDING PITS AND GRATES IN ACCORDANCE WITH CODE REQUIREMENTS

10) OVERLAND FLOW PATHS SHALL BE PROVIDE TO DIRECT WATER AROUND AND AWAY FROM HABITABLE AREAS

11) MINIMUM FREEBOARD SHALL BE PROVIDED BETWEEN ALL INTERNAL AND EXTERNAL AREAS TO MEET NCC BCA AND CONSENT AUTHORITY REQUIREMENTS

12) FINISHED SURFACE LEVELS SHALL BE GRADED AWAY FROM BUILDINGS AND STRUCTURES TO OUTLET AND GRATES PROVIDED

BALCONY DP NOTES:
DPN.1 Boxed out by Builder
DPN.2 DP within cavity wall to have min. 230mm clearance for fire collar & acoustic insulation
DPN.3 Subject to Structural Engineers approval DP (SN8) cast in column wrapped in 10mm softon foam.
(charged with water during pour & curing)



											REFERENCED DRAWINGS
											DISCIPLINE:
											DWG NO:
											REVISION:
A.	AUTHORITY SUBMISSION	TC	MG	30.04.2026							
REV.	ISSUE	DRAFT.	ENG.	DATE	REV.	ISSUE	DRAFT.	ENG.	DATE	DATED:	

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APPROVAL: **AUTHORITY SUBMISSION**

CLIENT: ARADA

ARCHITECT: TURNER

PROJECT: **16-20 CARRINGTON RD, CASTLE HILL**

CONTRACTORS CONSULTANT:
greenarrow hydraulics pty ltd. admin@greenarrow.net.au Tel: (02) 4226 4490

SHEET TITLE: **LOWER GROUND FLOOR STORMWATER SERVICES PART 3 OF 3**

PROJECT No:	DRAWING NO:	REVISION:	DRAWN:	CHECKED:	DATE:
224-2065	STW-DA- 104	A	TC	MG	JULY, 2024
			SCALE: A0@1:100		SHEET:

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3) ALL INVERT LEVELS SHOWN SHALL BE TAKEN AS A GUIDE ONLY.

4) THE EXTENT OF SUBSOIL DRAINAGE SHOWN IS INDICATIVE AND GENERAL IN NATURE AND WILL BE SUBJECT TO THE FINDINGS AND RECOMMENDATION FROM A SUITABLY QUALIFIED GEOTECHNICAL ENGINEER AND STRUCTURAL ENGINEER.

5) DRAINAGE PIPES CAST IN CONCRETE SHALL BE TO THE APPROVAL OF A STRUCTURAL ENGINEER AND SHALL BE WRAPPED IN NO LESS THAN 100MM SOFTLON FOAM. THE INSTALLATION IN ALL REGARDS SHALL BE IN ACCORDANCE WITH THE RELEVANT AUSTRALIAN STANDARDS AND MANUFACTURES TECHNICAL NOTES AND GUIDELINES.

6) FINAL NUMBER AND LOCATION OF DOWNPIPES AND RAINWATER OUTLETS SHALL BE COORDINATED AT CC STAGE

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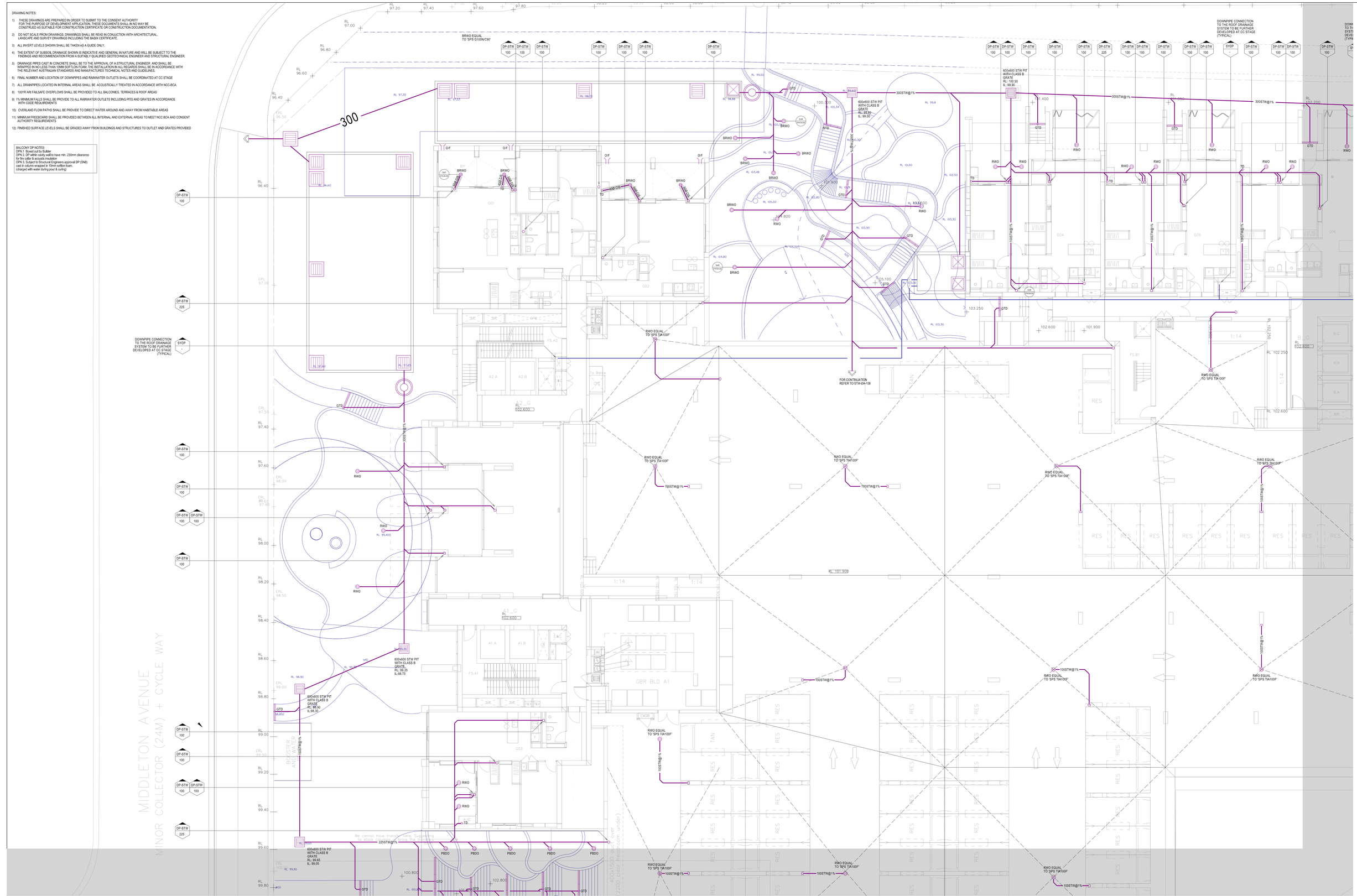
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DPN.3. Subject to Structural Engineers approval DP (SN8) cast in column wrapped in 10mm soffton foam, (charged with water during pour & curing)



REV.	ISSUE	DRAFT.	ENG.	DATE
A	AUTHORITY SUBMISSION	TC	MG	30.04.2026

REFERENCED DRAWINGS
DISCIPLINE:
DWG NO:
REVISION:
DATED:

APPROVAL: **AUTHORITY SUBMISSION**

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CLIENT: ARADA
ARCHITECT: TURNER
PROJECT: 16-20 CARRINGTON RD, CASTLE HILL

CONTRACTORS CONSULTANT:
greenarrow hydraulics pty ltd. admin@greenarrow.net.au Tel: (02) 4226 4490

SHEET TITLE:	PROJECT No:	DRAWING NO:	REVISION:	DRAWN:	CHECKED:	DATE:
GROUND FLOOR STORMWATER SERVICES PART 1 OF 3	224-2065	STW-DA-105	A	TC	MG	JULY, 2024
				SCALE: A0@1:100		SHEET:

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BALCONY DP NOTES:
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DPN.2: DP within cavity wall to have min. 230mm clearance for fire collar & acoustic insulation
DPN.3: Subject to Structural Engineers approval DP (SN6) cast in column wrapped in 10mm soften foam, (charged with water during pour & curing)

FOR CONTINUATION REFER TO DRAWING STW-DA-105

FOR CONTINUATION REFER TO DRAWING STW-DA-107

FOR CONTINUATION REFER TO DRAWING STW-DA-107

REV.	ISSUE	DRAFT.	ENG.	DATE
A	AUTHORITY SUBMISSION	TC	MG	30.04.2026

REFERENCED DRAWINGS
DISCIPLINE:
DWG NO:
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CLIENT: ARADA

ARCHITECT: TURNER

PROJECT: 16-20 CARRINGTON RD, CASTLE HILL

CONTRACTORS CONSULTANT:
greenarrow hydraulics pty ltd. admin@greenarrow.net.au Tel: (02) 4226 4490

SHEET TITLE: GROUND FLOOR STORMWATER SERVICES PART 2 OF 3

PROJECT No: 224-2065

DRAWING NO: STW-DA- 106

REVISION: A

DRAWN: TC CHECKED: MG DATE: JULY, 2024

SCALE: A0@1:100

SHEET:

FOR CONTINUATION REFER TO DRAWING STW-DA-105

FOR CONTINUATION REFER TO DRAWING STW-DA-106

DA NOTES STW NOTES

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(changed with water during pour & curing)

NOTE:
REFER TO DRAWING STW-DA-001 FOR DETAILS OF THE WORKS TO UPGRADE COUNCIL'S STORMWATER SYSTEM ON SEXTON AVENUE.

NOTE:
REFER TO DRAWING STW-DA-001 FOR DETAILS OF THE WORKS TO UPGRADE COUNCIL'S STORMWATER SYSTEM ON FISHBOURNE CRESCENT.

REV.	ISSUE	DRAFT.	ENG.	DATE
A	AUTHORITY SUBMISSION	TC	MG	30.04.2025

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CLIENT: ARADA

ARCHITECT: TURNER

PROJECT: **16-20 CARRINGTON RD, CASTLE HILL**

CONTRACTORS CONSULTANT:
greenarrow hydraulics pty ltd. admin@greenarrow.net.au Tel: (02) 4226 4490

SHEET TITLE: **GROUND FLOOR STORMWATER SERVICES PART 3 OF 3**

PROJECT No:	DRAWING NO:	REVISION:	DRAWN:	CHECKED:	DATE:
224-2065	STW-DA- 107	A	TC	MG	JULY, 2024

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12) FINISHED SURFACE LEVELS SHALL BE GRADED AWAY FROM BUILDINGS AND STRUCTURES TO OUTLET AND GRATES PROVIDED

THIS IS AN

ON-SITE STORMWATER DETENTION SYSTEM

REQUIRED BY YOUR LOCAL COUNCIL IT IS AN OFFENCE TO REDUCE THE VOLUME OF THE CHAMBER BY CONSTRUCTION WORKS OR CHANGE IN LEVELS OF THE DETENTION SYSTEM.

THE BASE OF THE OUTLET CONTROL PIT AND THE DEBRIS SCREEN IN PIT TO BE CLEARED OF TOWING AND SEDIMENT ON A REGULAR BASIS BY THE OWNER

THIS PLATE MUST NOT BE REMOVED

SIZE: 150MM X 100MM
CONSTRUCTION: ENGRAVED
COLOUR: ETCHED AND FILLED BLACK LEGEND ON NATURAL SILVER BACKGROUND
MATERIAL: ALUMINIUM LIMM

DANGER

CONFINED SPACE

NO ENTRY WITHOUT CONFINED SPACE TRAINING

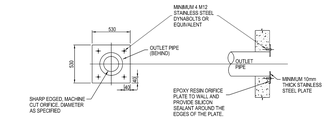
SIZE: 250MM X 180MM
CONSTRUCTION: ENGRAVED
COLOUR: ETCHED AND FILLED BLACK LEGEND ON NATURAL SILVER BACKGROUND
MATERIAL: ALUMINIUM LIMM
LOCATION: ALL ACCESS POINTS TO OSD TANK

OSD SIGNAGE &CONFINED SPACE SIGNAGE

Detention Tank 1a Details:	
Length:	18 m
Width:	8.5 m
Area:	153 m2
IL Min:	95.2 m AHD
IL Max:	95.36 m AHD
IL Ave:	95.29 m AHD
Top of water RL:	96.15 m AHD
Storage Depth	0.86 m
Volume:	**131.58** m3
Orifice Details:	
Orifice CL:	95.2 m AHD
Top of water RL:	96.15 m AHD
Maximum head to orifice:	0.95 m
Orifice diameter	**127** mm
Maximum discharge:	**32.1** l/s

OSD CALCULATION SUMMARY

REFER TO STW-DA-000 FOR FULL CALCULATIONS



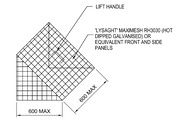
ORIFICE PLATE DETAIL

NOT TO SCALE

TRASH SCREEN NOTES:

1. MAXIMESH SCREENS MUST BE PLACED SUCH THAT THE LONGARS OF THE OVAL SHAPED HOLES ARE ORIENTATED HORIZONTALLY WITH THE PORTRUDING LIP ANGLED UPWARDS AND FACING TOWARDS THE OUTLET.

2. THE SCREEN IS TO BE FORMED BY WELDING TWO TRIANGULAR MAXIMESH (OR EQUIVALENT) PANELS TO A RECTANGULAR FRONT MAXIMESH PANEL (OR EQUIVALENT).



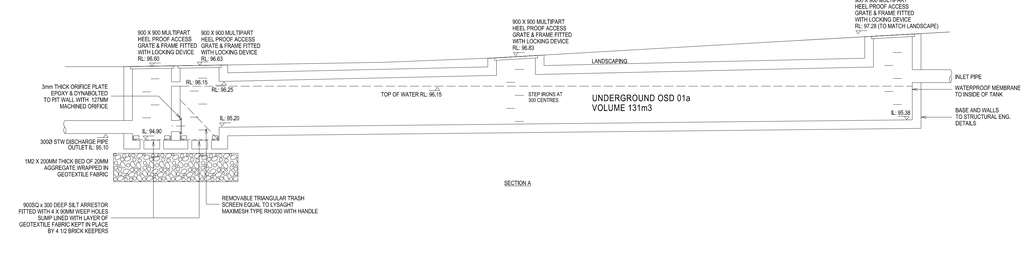
TRASH SCREEN DETAIL

NOT TO SCALE

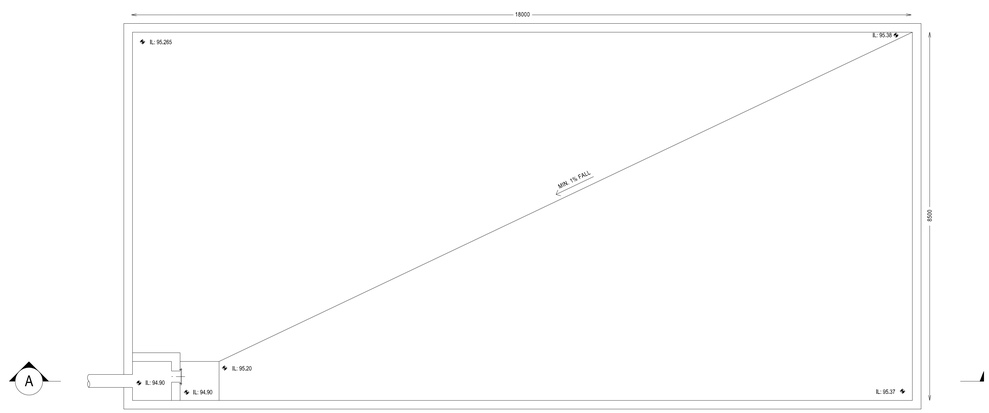
Detention Tank 1b Details:	
Length:	24.5 m
Width:	4.8 m
Area:	117.6 m2
IL Min:	95.3 m AHD
IL Max:	95.55 m AHD
IL Ave:	95.4225 m AHD
Top of water RL:	96.85 m AHD
Storage Depth	1.4275 m
Volume:	**167.87** m3
Orifice Details:	
Orifice CL:	95.3 m AHD
Top of water RL:	96.85 m AHD
Maximum head to orifice:	1.55 m
Orifice diameter round:	**133** mm
Maximum discharge:	**46.9** l/s

OSD CALCULATION SUMMARY

REFER TO STW-DA-000 FOR FULL CALCULATIONS

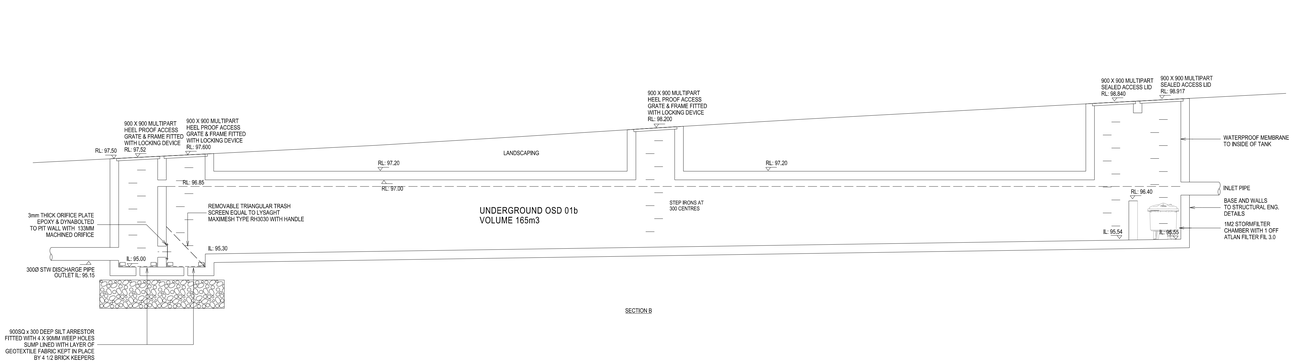


SECTION A

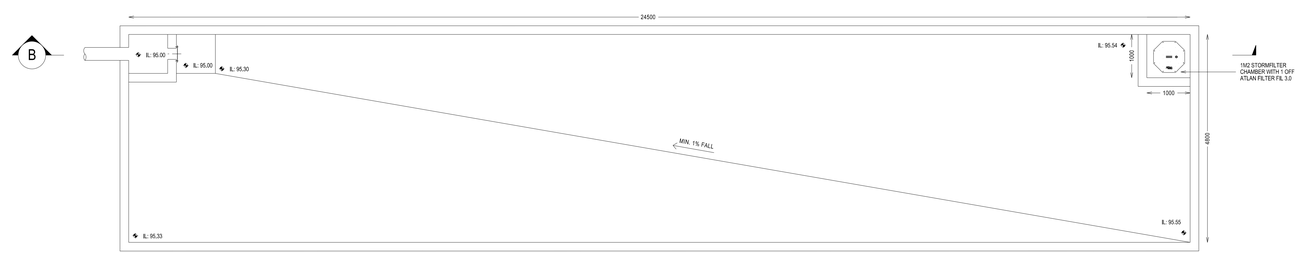


BASE PLAN

OSD TANK 01-A DETAIL 01



SECTION B



BASE PLAN

OSD TANK 1-B DETAIL 02

REV.	ISSUE	DRAFT.	ENG.	DATE
A	AUTHORITY SUBMISSION	TC	MG	30.04.2026
P2	FOR INFORMATION	TC	MG	16.04.2026
P1	FOR INFORMATION	TC	MG	19.03.2026

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DISCIPLINE:
DWG NO:
REVISION:
DATED:

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CLIENT: ARADA

ARCHITECT: TURNER

PROJECT: **16-20 CARRINGTON RD, CASTLE HILL**

CONTRACTORS CONSULTANT:
greenarrow
Hydraulics-fire suppression-civil drainage
greenarrow hydraulics pty ltd. admin@greenarrow.net.au Tel: (02) 4226 4490

SHEET TITLE:	PROJECT No:	DRAWING NO:	REVISION:	DRAWN:	CHECKED:	DATE:
DETAILS 1	**224-2065**	**STW-DA- 200**	**A**	TC	MG	JULY, 2024
				SCALE: NTS		SHEET:

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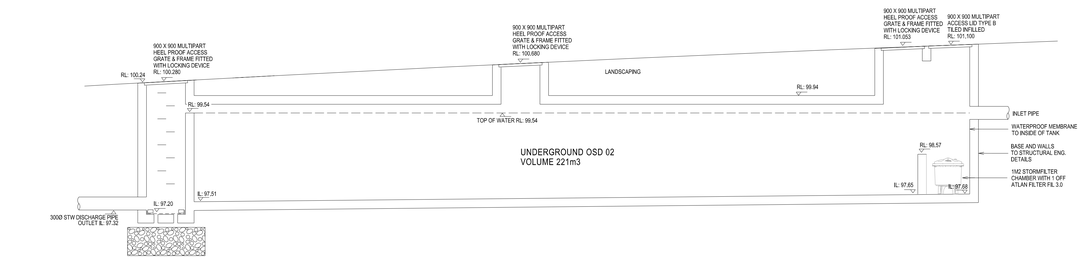
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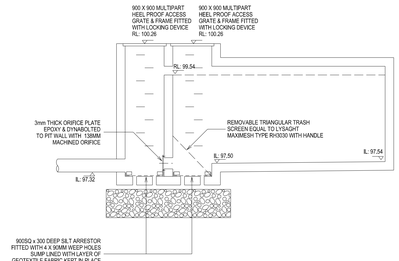
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SECTION C



SECTION D

THIS IS AN

ON-SITE STORMWATER DETENTION SYSTEM

REQUIRED BY YOUR LOCAL COUNCIL
IT IS AN OFFENCE TO REDUCE THE VOLUME OF THE TANK OR BARN OR TO INTERFERE WITH THE ORIFICE PLATE THAT CONTROLS THE OUTFLOW

THE BASE OF THE OUTLET CONTROL PIT AND THE ORIFICE PLATE MUST NOT BE REMOVED OR ALTERED OR SEDIMENT ON A REGULAR BASIS BY THE OWNER

THIS PLATE MUST NOT BE REMOVED

SIZE: 150MM X 100MM
CONNERS: SQUARE
COLOUR: ETCHED AND FILLED BLACK LEGEND ON NATURAL SILVER BACKGROUND
MATERIAL: ALUMINIUM SUNNY

DANGER

CONFINED SPACE

NO ENTRY WITHOUT CONFINED SPACE TRAINING

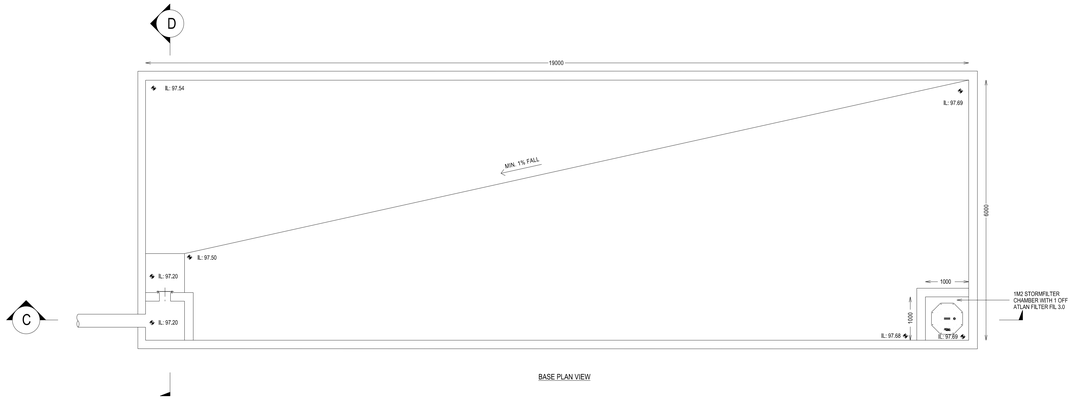
SIZE: 250MM X 150MM
CONNERS: SQUARE
COLOUR: ETCHED AND FILLED BLACK LEGEND ON NATURAL SILVER BACKGROUND
MATERIAL: ALUMINIUM SUNNY
LOCATION: ALL ACCESS PORTS TO OSD TANK

OSD SIGNAGE &CONFINED SPACE SIGNAGE

Detention Tank 2 Details:	
Length:	19 m
Width:	6 m
Area:	114 m2
IL Min:	97.5 m AHD
IL Max:	97.69 m AHD
IL Ave:	97.595 m AHD
Top of water RL:	99.54 m AHD
Storage Depth	1.945 m
Volume:	**221.73** m3
Orifice Details:	
Orifice CL:	97.5 m AHD
Top of water RL:	99.54 m AHD
Maximum head to orifice:	2.04 m
Orifice diameter:	**138** mm
Maximum discharge:	**57.7** l/s

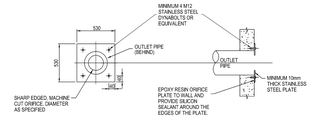
OSD CALCULATION SUMMARY

REFER TO STW-DA-000 FOR FULL OSD CALCULATIONS



BASE PLAN VIEW

OSD TANK 02
DEATIL 03



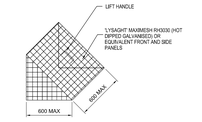
ORIFICE PLATE DETAIL

NOT TO SCALE

TRASH SCREEN NOTES:

1. MAXIMESH SCREENS MUST BE PLACED SUCH THAT THE LONGAXIS OF THE OVAL SHAPED HOLES ARE ORIENTATED HORIZONTALLY WITH THE POINTRUDING UP ANGLED UPWARDS AND FACING TOWARDS THE OUTLET.

2. THE SCREEN IS TO BE FORMED BY WELDING TWO TRIANGULAR MAXIMESH (OR EQUIVALENT) PANELS TO A RECTANGULAR FRONT MAXIMESH PANEL (OR EQUIVALENT).



TRASH SCREEN DETAIL

NOT TO SCALE

REV.	ISSUE	DRAFT.	ENG.	DATE	REV.	ISSUE	DRAFT.	ENG.	DATE
A	AUTHORITY SUBMISSION	TC	MG	30.04.2026					
P1	FOR INFORMATION	TC	MG	16.04.2026					

REFERENCED DRAWINGS
DISCIPLINE:
DWG NO:
REVISION:
DATED:

APPROVAL: **AUTHORITY SUBMISSION**

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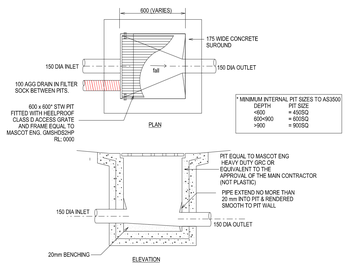
CLIENT: ARADA

ARCHITECT: TURNER

PROJECT: **16-20 CARRINGTON RD, CASTLE HILL**

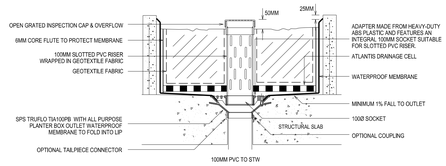
CONTRACTORS CONSULTANT: greenarrow hydraulics pty ltd. admin@greenarrow.net.au Tel: (02) 4226 4490

SHEET TITLE:	PROJECT No:	DRAWING NO:	REVISION:	DRAWN:	CHECKED:	DATE:
DETAILS 2	**224-2065**	**STW-DA- 201**	**A**	TC	MG	JULY, 2024
				SCALE: NTS		SHEET:



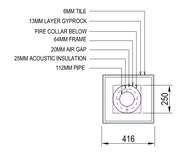
STANDARD STORMWATER PIT
DETAIL 04

NOTES:
- ALL PITS TO BE BENCHED
- 20MM MINIMUM FALL ACROSS PIT
- PITS DEEP THAN 1200 TO BE FITTED WITH STEP IRONS
- PITS LARGER THAN 600 BE FITTED WITH MULTI-PART HINGED GRATES
- PITS DEEPER THAN 300 FITTED WITH J BOLT LOCKING SYSTEM OR EQUIVALENT

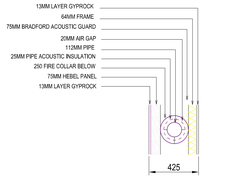


PLANTER BOX DRAINAGE OUTLET
DETAIL 05

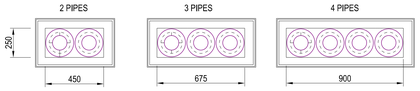
* WHERE REQUIRED PROVIDE FIRE SEAL OR COLLAR IN ACCORDANCE WITH NCC BCA



100MM PIPES IN DUCT IN WET AREAS



TYPICAL 100MM STORMWATER PIPE IN PARTY WALL



100MM PIPES IN DUCT IN WET AREAS

TYPICAL 100MM PIPE ALLOWANCES FOR RISERS AND IN DUCTS
DETAIL 06

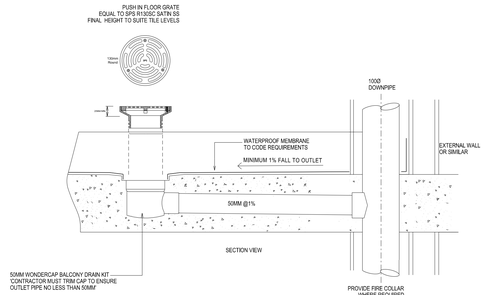
~ FINAL DETAIL SUBJECT TO ACOUSTIC ENGINEERS, NCC BCA AND SITE SPECIFIC REQUIREMENTS.
~ USED AS GUIDE ONLY FOR MINIMUM SPATIAL ALLOCATIONS

FLOORWASTE & RAINWATER OUTLET SCHEDULE

LOCATION	CODE	DESCRIPTION	PRODUCT CODE
CARPARK LEVELS	DTU	SPS 100MM RETRO-FIT DOMED GRATE & FLANGES WHEN USED IN RUBBLE PERIMETER DRAIN	RC100AD
	SDO	SPS 100MM RETRO-FIT DOMED GRATE & FLANGES	RC100AD
	RWO (1)	SPS TRUFLOW 100MM RWO WITH CLASS C HEAVY DUTY FLAT GRATE WITH COUPLING CONNECTOR	TIA100F
	BTFW	SPS 300MM SQUARE 316SS BUCKET TRAP WITH STRAINER BASKET (SHALLOW BODY)	Q200SSA-3 BT (SHALLOW BODY)
	PLFW	SPS TRUFLOW 100MM RWO WITH CLASS C HEAVY DUTY FLAT GRATE WITH COUPLING CONNECTOR	TIA100F
	225 BTFW (1)	SPS 225MM SQUARE 316SS BUCKET TRAP WITH STRAINER BASKET (SHALLOW BODY)	Q225SA-S BT (SHALLOW BODY)
	GTD 300	WELDLOK 300W CLEAR OPENING HEEL GUARD CLASS D BOLT DOWN GALVANISED STEEL GRATED TRENCH DRAIN	TGFHG-0300D2C
	GTD 150HG	WELDLOK 150W CLEAR OPENING HEELGUARD CLASS B BOLT DOWN GALVANISED STEEL GRATED TRENCH DRAIN	TGFHG-0150B2C (TBC. Refer to Arch. Schedule)
UPPER LEVELS	GTD 100S/S	STORMTECH 100W/440D STAINLESS STEEL GRATED DRAIN AND TROUGH INSTALLED TOPPING SCREED	100TM-40MTLSTAINLESS STEEL (TBC. Refer to Arch. Schedule)
	PBOD	SPS TRUFLOW 100MM RWO WITH ALL PURPOSE PLANTER ADAPTOR AND 100MM SLOTTED PVC RISER AND COUPLING CONNECTOR	TIA100PB
	PBDO (1)	SPS TRUFLOW 80MM RWO WITH ALL PURPOSE PLANTER ADAPTOR AND 100MM SLOTTED PVC RISER AND COUPLING CONNECTOR	TIA80/90PB
	RWO (2)	100MM WONDERCAP KIT WITH SPS 150MM PUSHIN STAINLESS STEEL GRATE	SPS Q150 SR (SQUARE). SPS R150 SR (ROUND)
	RWO (3)	SPS 200MM VARI LEVEL FLOOR DRAIN. LOWER C/I BODY AND STAINLESS STEEL GRATE	R225S/C
	RWO (4)	150MM GRATE CASTIN SIDE OUTLET SPSR150STIC/SS CAST IRON BODY WITH 65MM OUTLET	Q150SR/CSS (SQUARE) R150SR/CSS (ROUND)
	BRWO (1)	WONDERCAP BALCONY OUTLET WITH SPS 130 PUSHIN STAINLESS STEEL GRATE	SPS Q130 SR (SQUARE) SPS R130 SR (ROUND)
	BRWO (2)	150MM DOME GRATE SPS C509/AD CASTIN SIDE OUTLET WITH 50MM OUTLET FOR UNDER DECK / PEDESTAL PAVING	C509/AD
	BRWO (3)	WONDERCAP BALCONY OUTLET WITH STORMTECH 100W/440D CONTINUOUS GRATED DRAIN INSTALLED IN TILE SCREED	100AR/ 40 STAINLESS STEEL (TBC. Refer to Arch. Schedule)
	FW	100MM WONDERCAP KIT COMPLETE WITH WASTELAND 316 SS ROUND FLOORWASTE (U.N.O BY ARCHITECT).	13101.12 (TBC. Refer to Arch. Schedule)
ROOF AREAS	RWO (5)	SPS TRUFLOW 80MM & 100MM 90DEG RWO WITH DOME GRATE & MEMBRANE RING & GRAVEL GUARD	SPS TIA90/80D2
	RWO (6)	SPS TRUFLOW 100MM & 150MM RWO WITH DOME GRATE & MEMBRANE CLAMP & GRAVEL GUARD	SPS TIA100D2 SPS TIA150D2
	RWO (7)	SPS TRUFLOW 100MM & 160MM RWO WITH FLAT GRATE & MEMBRANE CLAMP & GRAVEL GUARD	SPS TIA100F2 SPS TIA150F2

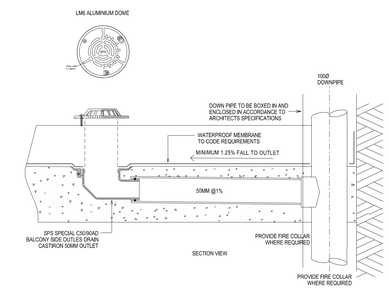
FLOOR WASTE AND RAINWATER OUTLET SCHEDULE

* TO BE READ IN CONJUNCTION WITH ARCHITECTURAL FINISHES SCHEDULE



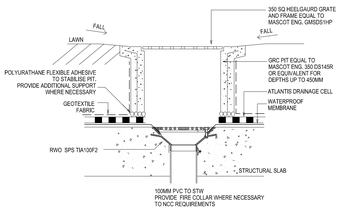
BRWO (1) FOR COVERED BALCONIES WITH VERTICAL LINEAR OPENING OF MAX. 8M
DETAIL 07

NOTES:
- MAXIMUM LINEAR VERTICAL OPENING PER BRWO = 8M
  Q= (3.1-1/2) x 8 *271.0600 = 0.64L/S (100yr)
  SPS R130SC INLET CAPACITY @20MM HEAD = 0.65L/S
  50MM PIPE @1%=0.9L/S
- EACH BWRO MUST BE ADJACENT A FAILSAFE OVERFLOW
- NO OPEN AREA TO SKY ABOVE
- WATERPROOF MEMBRANE TO CODE REQUIREMENTS



BRWO (2) CAST IN SLAB FOR UNDER PEDESTAL PAVING SHOWING DP CONNECTION
DETAIL 08

NOTES:
- MAXIMUM LINEAR VERTICAL OPENING PER BRWO = 8M
  Q= (3.1-1/2) x 8 *271.0600 = 0.64L/S (100yr)
  SPS R130SC INLET CAPACITY @20MM HEAD = 0.65L/S
  50MM PIPE @1%=0.9L/S
- EACH BWRO MUST BE ADJACENT A FAILSAFE OVERFLOW
- NO OPEN AREA TO SKY ABOVE
- WATERPROOF MEMBRANE TO CODE REQUIREMENTS

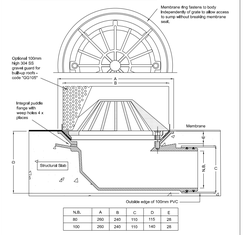


PBDO & SURFACE WATER INLET SUMP FOR LANDSCAPED AREAS OVER PODIUM SLAB UP TO 450DEEP
350 SQ SUMPS
DETAIL 09

SPS Truflo 80mm & 100mm 90° RWO with Dome Grate & Membrane Ring

Specification codes:
TIA100D2 (CI body, aluminium dome grate & membrane ring)
TIB80/90D2 (80mm CI body, bronze ring & dome)
TIA100/90D2 (100mm CI body, aluminium clamp ring & dome)
TIB100/90D2 (100mm CI body, bronze ring & dome)

Suggested applications:
Roof decks with plee cast in



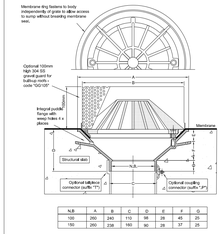
Speciality Plumbing Supplies Pty Ltd
Tel: (02) 9416 8031 Fax: (02) 9416 7614 E-mail: sps@bigpond.net.au 1.06

80MM CAST IN RWO (5)
DETAIL 10

SPS Truflo 100mm & 150mm RWO with Dome Grate & Membrane Clamp

Specification codes:
TIA100D2 (CI body, aluminium dome grate & membrane ring)
TIB100D2 (CI body, bronze dome grate & membrane ring)
TIBA100D2 (all-bronze assembly)
~ for 150mm outlet, use "150" instead of "100"

Suggested application:
Roof decks



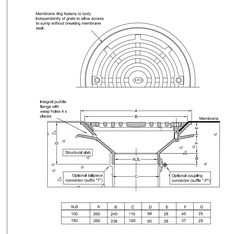
Speciality Plumbing Supplies Pty Ltd
Tel: (02) 9416 8031 Fax: (02) 9416 7614 E-mail: sps@bigpond.net.au 1.04

100MM TRUFLOW WITH DOME AND GRAVEL GUARD RWO (4) DETAIL 11

SPS Truflo 100mm & 150mm RWO with Flat Grate & Membrane Clamp

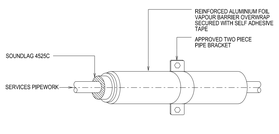
Specification codes:
TIA100F2 (CI body, aluminium flat grate & membrane ring)
TIB100F2 (CI body, bronze flat grate & membrane ring)
TIBA100F2 (all-bronze assembly)
~ for 150mm outlet, use "150" instead of "100"

Suggested application:
Membranes/ floors or roofs with no further topping, eg planter boxes, plant rooms, roof decks.

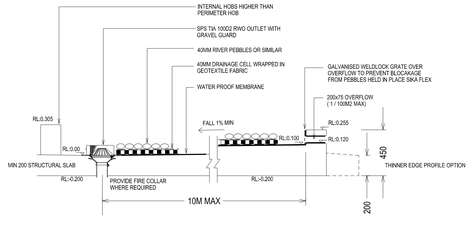


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100MM TRUFLOW WITH FLATE GRATE RWO (4) DETAIL 12



ACOUSTIC INSULATION
DETAIL 13

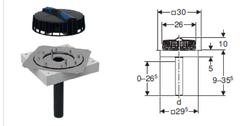


TYPICAL ROOF RWO/HOB AND OVERFLOW WITH BALLAST
DETAIL 14

NOTES:
- MAX ROOF AREA TO 100TIA D2 = 80M2 (SYDNEY BASIN 100YR 50MM HEAD)
- MAX ROOF AREA TO 150TIA D2 = 150M2 (SYDNEY BASIN 100YR 50MM HEAD)
- WATER PROOFING BY SPECIALIST CONTRACTOR
- ASSUMES INSULATION IS UNDERSIDE OF SLAB

Geberit Pluvia Roof Drainage Systems
Roof outlets
Roof outlets up to 12 l/s

Roof outlets
Roof outlets up to 12 l/s
Geberit Pluvia roof outlet with fastening flange, for roof foils

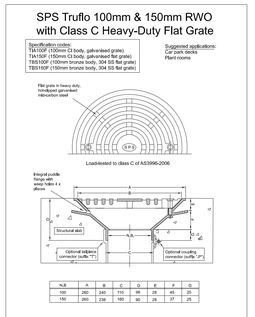


SIPHONIC RWO
DETAIL 15

SPS Truflo 100mm & 150mm RWO with Class C Heavy-Duty Flat Grate

Specification codes:
TIA100F (100mm CI body, galvanised grate)
TIA150F (150mm CI body, galvanised flat grate)
TIS100F (100mm bronze body, 304 SS flat grate)
TIS150F (150mm bronze body, 304 SS flat grate)

Suggested applications:
Car park decks
Plant rooms

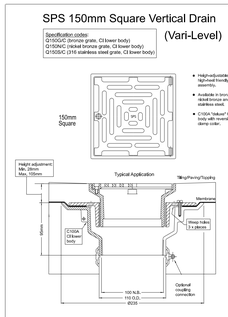


Speciality Plumbing Supplies Pty Ltd
Tel: (02) 9416 8031 Fax: (02) 9416 7614 E-mail: sps@bigpond.net.au 1.02

CARPARK RWO (1)
DETAIL 16
'SPS TRUFLO TIA100F'

SPS 150mm Square Vertical Drain (Vari-Level)

Specification codes:
Q150G/C (bronze grate, CI lower body)
Q150N/C (nickel bronze grate, CI lower body)
Q150S/C (316 stainless steel grate, CI lower body)

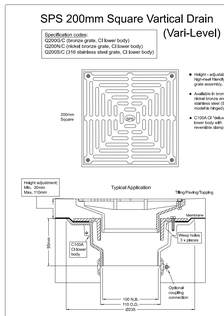


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150 SQUARE RWO (2)
DETAIL 17
'SPS Q150 S/C'

SPS 200mm Square Vertical Drain (Vari-Level)

Specification codes:
Q200G/C (bronze grate, CI lower body)
Q200N/C (nickel bronze grate, CI lower body)
Q200S/C (316 stainless steel grate, CI lower body)



Speciality Plumbing Supplies Pty Ltd
Tel: (02) 9416 8031 Fax: (02) 9416 7614 E-mail: sps@bigpond.net.au

200 ROUND RWO (3)
DETAIL 18
'SPS Q200S/C'

Geberit Pluvia RWO (1)

REV.	ISSUE	DRAFT.	ENG.	DATE
A	AUTHORITY SUBMISSION	TC	MG	30.04.2026

REFERENCED DRAWINGS:
DISCIPLINE:
DWG NO:
REVISION:
DATED:

APPROVAL: **AUTHORITY SUBMISSION**

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CLIENT: ARADA
ARCHITECT: TURNER
PROJECT: **16-20 CARRINGTON RD, CASTLE HILL**
CONTRACTORS CONSULTANT: greenarrow hydraulics pty ltd. admin@greenarrow.net.au Tel: (02) 4226 4490

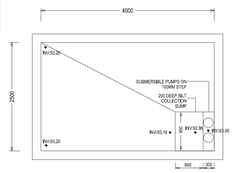
SHEET TITLE: **DETAILS 3**
PROJECT No: **224-2065**
DRAWING NO: **STW-DA- 202**
REVISION: **A**
DRAWN: TC CHECKED: MG DATE: JULY, 2024
SCALE: NTS SHEET: 8.1 9

STANDARD PUMP OUT DESIGN NOTES:

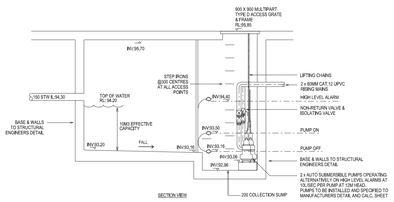
THE PUMP OUT SYSTEM SHALL BE DESIGNED TO BE OPERATED IN THE FOLLOWING MANNER
1. THE PUMPS SHALL BE PROGRAMMED TO OPERATE ALTERNATIVELY TO ALLOW EACH PUMP TO HAVE AN EQUAL OPERATION LOAD AND PUMP LIFE
2. A FLOAT SHALL BE PROVIDED TO ENSURE OF THE MINIMUM REQUIRED WATER LEVEL IS MAINTAINED WITHIN THE SUMP 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 THE WATER LEVEL IN THE TANK RISING TO APPROXIMATELY 300MM ABOVE THE MINIMUM WATER LEVEL.
3. A SECOND FLOAT SHALL BE PROVIDED AT A HIGH LEVEL, WHICH IS APPOXIMATELY 100MM ABOVE THE INLET PIPE. THIS FLOAT SHALL START THE OTHER PUMP THAT IS NOT OPERATING AND ACTIVATE THE ALARM (ASSUMING THE TANK IS FULL IS BECAUSE OF A FAILURE IN THE FIRST PUMP)
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 IN ACCORDANCE WITH COUNCIL REQUIREMENTS

IMPORTANT NOTE:
PUMPS TO BE WIRED TO THE BUILDING MANAGEMENT SYSTEM TO ALERT THE BUILDING MANAGER TO A SYSTEM FAILURE.
PUMPWELL SHALL BE WIRED TO A STROBE AND SIREN LOCATED NEXT TO THE VEHICLE ENTRY.
PUMPS SHALL BE ON A 6 MONTH MAINTENANCE SCHEDULE

TANK INTERNAL DIMENSIONS (M):
EFFECTIVE STORAGE HEIGHT = 1m
WIDTH = 2.0m
LENGTH = 4m
VOLUME PROVIDED = 10m3 (effective capacity)



BASE PLAN VIEW

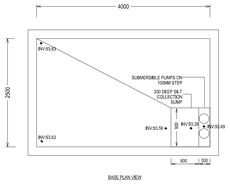


SECTION VIEW

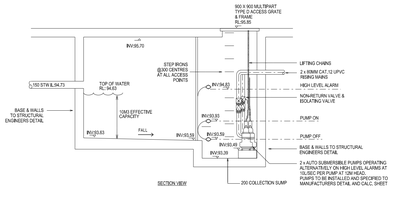
BASEMENT PUMP STORAGE TANK
DETAIL 19

IMPORTANT NOTE:
PUMPS TO BE WIRED TO THE BUILDING MANAGEMENT SYSTEM TO ALERT THE BUILDING MANAGER TO A SYSTEM FAILURE.
PUMPWELL SHALL BE WIRED TO A STROBE AND SIREN LOCATED NEXT TO THE VEHICLE ENTRY.
PUMPS SHALL BE ON A 6 MONTH MAINTENANCE SCHEDULE

TANK INTERNAL DIMENSIONS (M):
EFFECTIVE STORAGE HEIGHT = 1m
WIDTH = 2.0m
LENGTH = 4m
VOLUME PROVIDED = 10m3 (effective capacity)



BASE PLAN VIEW



SECTION VIEW

BASEMENT PUMP STORAGE TANK
DETAIL 20

Submersible Pumps | **Drainage** | **AL3700**

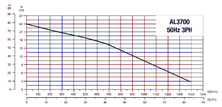
Features & Benefits

Submersible drainage pump suitable for drainage of greywater and stormwater from building basements and sumps in domestic, commercial and industrial applications. Can be installed free standing or mounted on optional guide rails.

- Three phase 415V 50Hz 2 pole induction motor
- Class F insulation
- Impeller: Cast iron
- Mechanical seal: Ceramic/Graphite, Silicon Carbide alloy
- Submersible depth: 5m
- Liquid temperature up to + 40°C
- Ambient temperature up to + 40°C
- Passage of suspended solid up to 30mm
- Maximum starts per hour: 20



Performance Curve



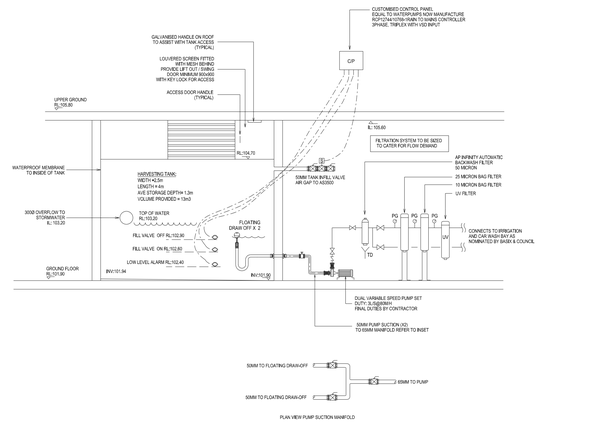
Specifications

TYPE	HP	kW	CONTINUOUS DUTY RATING	OPERATING CONDITIONS	VOLTAGE	AUTO MANUAL	SWITCHING TYPE	CABLE LENGTH
Open Impeller	5.0	3.7	7.5	0°C to 40°C	415V	Manual	3C	10M

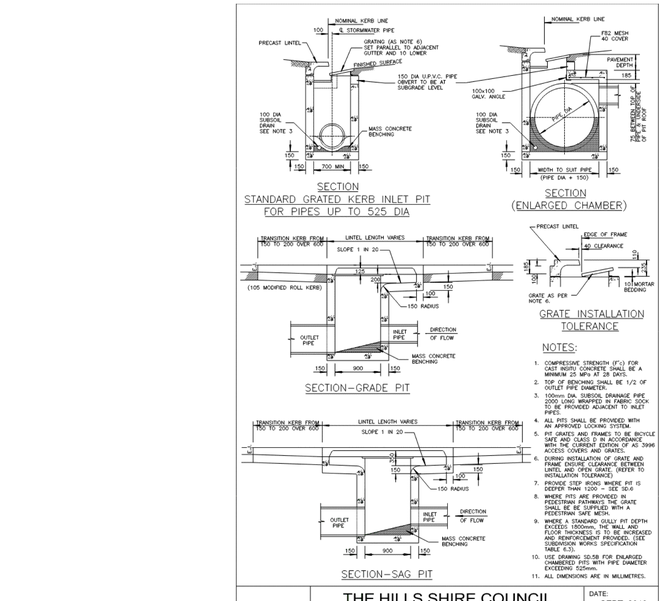
OUTLET		MAX FLOW	FLOW AT 40 HEAD (LPM)					MAX HEAD	DIMENSIONS	WEIGHT
MM	INCH	LPM	5M	10M	15M	20M	25M	M	L X W X H (MM)	KG
80	3"	1200	1500	1100	850	600	320	24	574 x 571 x 585	81

Be you need confirmation? Call Our Customer Service Team on **1800 018 999**

SUBMERSIBLE STW PUMP DETAIL



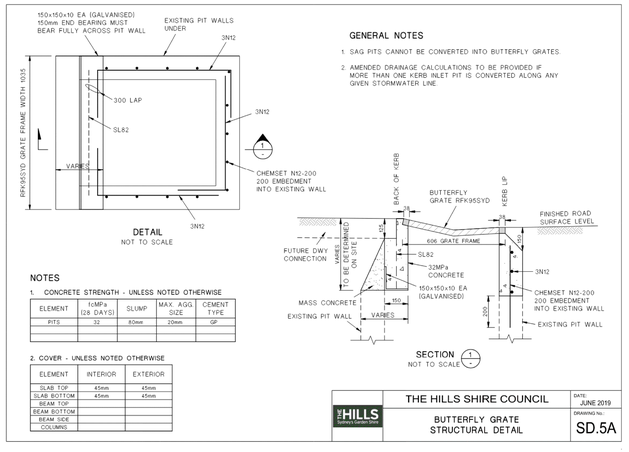
RAINWATER HARVESTING TANK
DETAIL 21



NOTES:
1. COMPRESSIVE STRENGTH (F'c) FOR CAST INSITU CONCRETE SHALL BE A MINIMUM 25 MPa AT 28 DAYS.
2. TOP OF BENCHING SHALL BE 1/2 OF OUTLET PIPE DIAMETER.
3. 100mm DIA. SUBSOIL DRAINAGE PIPE 2000 LONG WRAPPED IN FABRIC SOCK TO BE PROVIDED ADJACENT TO INLET PIPES.
4. ALL PITS SHALL BE PROVIDED WITH AN APPROVED LOCKING SYSTEM.
5. PIT GRATES AND FRAMES TO BE BICYCLE SAFE GRATES AND SHALL COMPLY WITH THE CURRENT EDITION OF AS 3996 ACCESS COVERS AND GRATES.
6. DURING INSTALLATION OF GRATE AND FRAME ENSURE CLEARANCE BETWEEN LINTEL AND OPEN GRATE UNDER TO INSTALLATION TOLERANCE.
7. PROVIDE STEP IRONS WHERE PIT IS GREATER THAN 1000 + WIDE - SEE SD.4.
8. WHERE PITS ARE PROVIDED IN PEDESTRIAN PATHWAYS THE GRATE SHALL BE BE SUPPLIED WITH A PEDESTRIAN SAFE MESH.
9. WHERE A STANDARD GULLY PIT DEPTH EXCEEDS 1800mm, THE WALL AND FLOOR THICKNESS IS TO BE INCREASED AS SPECIFIED BY A QUALIFIED SITE SUBDIVISION WORKS SPECIFICATION TABLE 6.3).
10. USE DRAWING SD.5B FOR ENLARGED CHAMBERED PITS WITH PIPE DIAMETER EXCEEDING 525mm.
11. ALL DIMENSIONS ARE IN MILLIMETRES.

THE HILLS Sydney's Garden Shire	THE HILLS SHIRE COUNCIL	DATE: SEPT. 2019
	STANDARD GRATED KERB INLET PITS AND ENLARGED CHAMBERED PITS (FOR PIPES UP TO 525mm DIA.)	DRAWING No.: SD.5

THE HILLS SHIRE COUNCIL
STANDARD KERB INLET PIT
DETAIL 22



NOTES

1. CONCRETE STRENGTH - UNLESS NOTED OTHERWISE

ELEMENT	f'c MPa (28 DAYS)	SLUMP	MAX. AGG. SIZE	CEMENT TYPE
PITS	32	80mm	20mm	GP

2. COVER - UNLESS NOTED OTHERWISE

ELEMENT	INTERIOR	EXTERIOR
SLAB TOP	45mm	45mm
SLAB BOTTOM	45mm	45mm
BEAM TOP		
BEAM BOTTOM		
BEAM SIDE		
COLUMNS		

THE HILLS Sydney's Garden Shire	THE HILLS SHIRE COUNCIL	DATE: JUNE 2019
	BUTTERFLY GRATE STRUCTURAL DETAIL	DRAWING No.: SD.5A

THE HILLS SHIRE COUNCIL
BUTTERFLY GRATE
DETAIL 23

REV.	ISSUE	DRAFT.	ENG.	DATE
A	AUTHORITY SUBMISSION	TC	MG	30.04.2026

REFERENCED DRAWINGS
DISCIPLINE:
DWG NO.
REVISION:
DRAFT. ENG. DATE
DATED:

APPROVAL: **AUTHORITY SUBMISSION**

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CLIENT: ARADA

ARCHITECT: TURNER

PROJECT: **16-20 CARRINGTON RD, CASTLE HILL**

CONTRACTORS CONSULTANT:
greenarrow hydraulics-fire suppression-civil drainage
greenarrow hydraulics pty.ltd. admin@greenarrow.net.au Tel: (02) 4226 4490

SHEET TITLE:	PROJECT No:	DRAWING NO:	REVISION:	DRAWN:	CHECKED:	DATE:
DETAILS 4	224-2065	STW-DA- 203	A	TC	MG	JULY, 2024
				SCALE: NTS		SHEET:

NOTES:

1) THESE DRAWINGS ARE PREPARED IN ORDER TO SUBMIT TO THE CONSENT AUTHORITY FOR THE PURPOSE OF DEVELOPMENT APPLICATION. THESE DOCUMENTS SHALL IN NO WAY BE CONSTRUED AS SUITABLE FOR CONSTRUCTION CERTIFICATE OR CONSTRUCTION DOCUMENTATION.

2) DO NOT SCALE FROM DRAWINGS, DRAWINGS SHALL BE READ IN CONJUCTION WITH ARCHITECTURAL, LANDCAPE AND SURVEY DRAWINGS INCLUDING THE BASIX CERTIFICATE.

3) ALL INVERT LEVELS SHOWN SHALL BE TAKEN AS A GUIDE ONLY.

4) THE EXTENT OF SUBSOIL DRAINAGE SHOWN IS INDICATIVE AND GENERAL IN NATURE AND WILL BE SUBJECT TO THE FINDINGS AND RECOMMENDATION FROM A SUITABLY QUALIFIED GEOTECHNICAL ENGINEER AND STRUCTURAL ENGINEER.

5) DRAINAGE PIPES CAST IN CONCRETE SHALL BE TO THE APPROVAL OF A STRUCTURAL ENGINEER AND SHALL BE WRAPPED IN NO LESS THAN 100MM SOFTLON FOAM. THE INSTALLATION IN ALL REGARDS SHALL BE IN ACCORDANCE WITH THE RELEVANT AUSTRALIAN STANDARDS AND MANUFACTURES TECHNICAL NOTES AND GUIDELINES.

6) FINAL NUMBER AND LOCATION OF DOWNPIPES AND RAINWATER OUTLETS SHALL BE COORDINATED AT CC STAGE

7) ALL DRAINPIPES LOCATED IN INTERNAL AREAS SHALL BE ACOUSTICALLY TREATED IN ACCORDANCE WITH NCC-BCA.

8) 100YR ARI FAILSAFE OVERFLOWS SHALL BE PROVIDED TO ALL BALCONIES, TERRACES & ROOF AREAS

9) 1% MINIMUM FALLS SHALL BE PROVIDE TO ALL RAINWATER OUTLETS INCLUDING PITS AND GRATES IN ACCORDANCE WITH CODE REQUIREMENTS

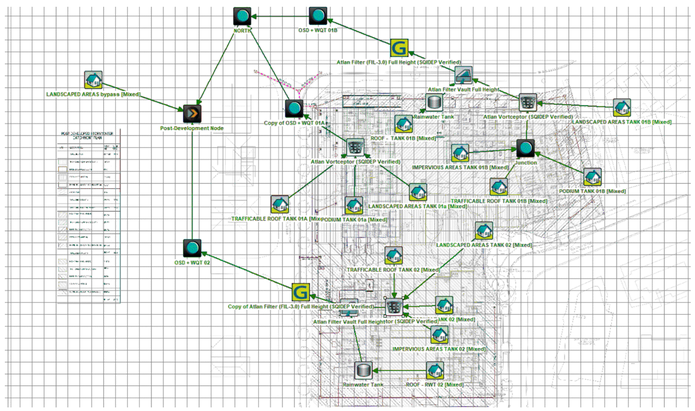
10) OVERLAND FLOW PATHS SHALL BE PROVIDE TO DIRECT WATER AROUND AND AWAY FROM HABITABLE AREAS

11) MINIMUM FREEBOARD SHALL BE PROVIDED BETWEEN ALL INTERNAL AND EXTERNAL AREAS TO MEET NCC BCA AND CONSENT AUTHORITY REQUIREMENTS

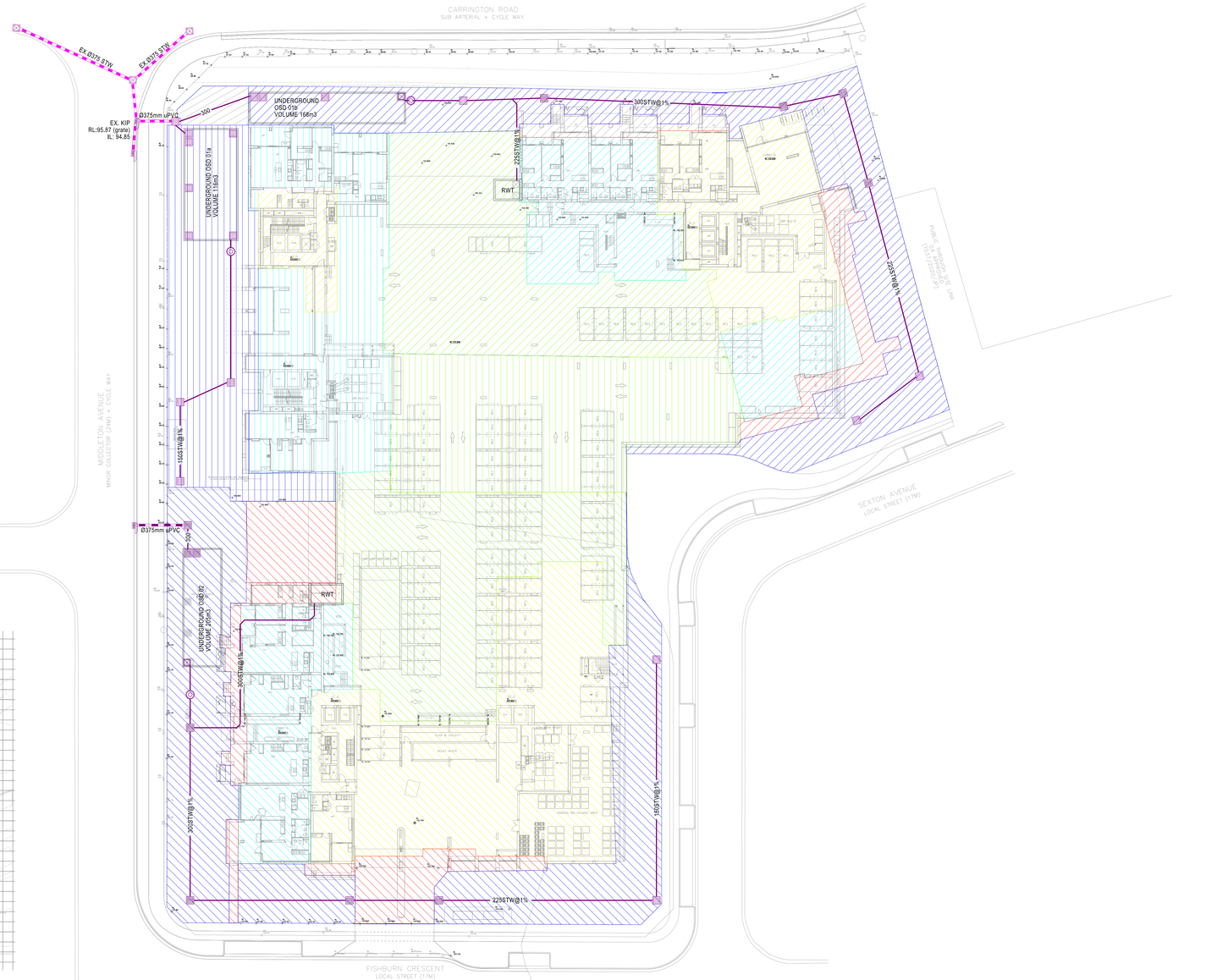
12) FINISHED SURFACE LEVELS SHALL BE GRADED AWAY FROM BUILDINGS AND STRUCTURES TO OUTLET AND GRATES PROVIDED

POST DEVELOPED STORMWATER CATCHMENT PLAN

KEY	DESCRIPTION	AREA M2	% OF SITE
	TOTAL SITE AREA	13344 M2	100 %
	TRAFFICABLE ROOF AREAS (OSD 1a)	1027M2	
	IMPERVIOUS AREAS (OSD 1a)	0 M2	
	PODIUM AREA (OSD 1a)	1119 M2	
	PERVIOUS LANDSCAPING AREA (OSD 1a)	914 M2	
	OSD BYPASS	90 M2	
	TOTAL AREA TO OSD 1a	3060 M2	22.9%
	TOTAL AREA INCLUDING BYPASS	3150 M2	23.6%
	ROOF AREA TO RWT (OSD1b)	972 M2	
	TRAFFICABLE ROOF AREAS (OSD 1b)	824 M2	
	IMPERVIOUS AREAS (OSD 1b)	293 M2	
	PODIUM AREA (OSD 1b)	1220 M2	
	PERVIOUS LANDSCAPING AREA (OSD 1b)	1274 M2	
	TOTAL AREA TO OSD 1b	4583 M2	34.3%
	ROOF AREA TO RWT (OSD2)	1610 M2	
	TRAFFICABLE ROOF AREA (OSD 2)	580 M2	
	IMPERVIOUS AREAS (OSD 2)	562M2	
	PODIUM AREA (OSD 2)	1250 M2	
	PERVIOUS LANDSCAPING AREA (OSD 2)	1609M2	
		5611 M2	42.1%



MUSIC MODEL RESULTS



SITE BREAK UP

REV.	ISSUE	DRAFT.	ENG.	DATE
A	AUTHORITY SUBMISSION	TC	MG	30.04.2025
P1	FOR INFORMATION	TC	MG	26.04.2025

REFERENCED DRAWINGS
DISCIPLINE:
DWG NO:
REVISION:
DATED:

APPROVAL: **AUTHORITY SUBMISSION**

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CLIENT: ARADA

ARCHITECT: TURNER

PROJECT: **16-20 CARRINGTON RD, CASTLE HILL**

CONTRACTORS CONSULTANT:
greenarrow hydraulics pty ltd. admin@greenarrow.net.au Tel: (02) 4226 4490

SHEET TITLE: **WATER QUALITY MODELLING AND SITE AREA BREAK UP**

PROJECT No: **224-2065**

DRAWING NO: **STW-DA- 300**

REVISION: **A**

DRAWN: TC CHECKED: MG DATE: JULY, 2024

SCALE: A0@1:300 SHEET: