

STORMWATER MANAGEMENT PLANS

PROPOSED DUPLEX

Lot 1, No. 79 ASHWORTH AVENUE, BELROSE

DRAINAGE NOTES

PIPE SIZE:

THE MINIMUM PIPE SIZE SHALL BE:

- 90mm DIA WHERE THE LINE ONLY RECEIVES ROOFWATER RUNOFF; OR
- 100mm DIA WHERE THE LINE RECEIVES RUNOFF FROM PAVED OR UNPAVED AREAS ON THE PROPERTY

THE MINIMUM PIPE VELOCITY SHOULD BE 0.6 m/s AND A MAXIMUM PIPE VELOCITY OF 6.0 m/s DURING THE DESIGN STORM.

PIPE GRADE:

THE MINIMUM PIPE GRADE SHALL BE:

- 1.0% FOR PIPES LESS THAN 225mm DIA
- 0.5% FOR ALL LARGER PIPES

PIPES WITH A GRADIENT GREATER THAN 20% WILL REQUIRE ANCHOR BLOCKS AT THE TOP AND BOTTOM OF THE INCLINED SECTION; AND AT INTERVALS NOT EXCEEDING 3.0m

ANCHOR BLOCKS ARE DESIGNED ACCORDING TO *CLAUSE 7.9 OF AS3500.3:2021*

DEPTH OF COVER FOR PVC PIPES:

MINIMUM PIPE COVER SHALL BE AS FOLLOWS:

LOCATION	MINIMUM COVER
NOT SUBJECT TO VEHICLE LOADING	100mm SINGLE RESIDENTIAL 300mm ALL OTHER DEVELOPMENTS
SUBJECT TO VEHICLE LOADING UNDER A SEALED ROAD	450mm WHERE NOT IN A ROAD 600mm
UNSEALED ROAD	750mm
PAVED DRIVEWAY	100mm PLUS DEPTH OF CONCRETE

SEE AS2032 INSTALLATION OF UPVC PIPES FOR FURTHER INFORMATION.

CONCRETE PIPE COVER SHALL BE IN ACCORDANCE WITH *AS3725-2007 LOADS ON BURIED CONCRETE PIPES*, HOWEVER A MINIMUM COVER OF 450mm WILL APPLY.

WHERE INSUFFICIENT COVER IS PROVIDED, THE PIPE SHALL BE COVERED AT LEAST 50mm THICK OVERLAY AND SHALL THEN BE PAVED WITH AT LEAST:

- 150mm REINFORCED CONCRETE WHERE SUBJECT TO HEAVY VEHICLE TRAFFIC;
- 75mm THICKNESS OF BRICK OR 100mm OF CONCRETE PAVING WHERE SUBJECT TO LIGHT VEHICLE TRAFFIC; OR
- 50mm THICK BRICK OR CONCRETE PAVING WHERE NOT SUBJECT TO VEHICLE TRAFFIC.

CONNECTIONS TO STORMWATER DRAINS UNDER BUILDINGS:

SHALL BE CARRIED OUT IN ACCORDANCE WITH *SECTION 6.2.8 OF AS3500.3:2021*

ABOVE GROUND PIPEWORK:

SHALL BE CARRIED OUT IN ACCORDANCE WITH *SECTION 6 OF AS3500.3:2021*

PIT SIZES AND DESIGN:

DEPTH (mm)	MINIMUM PIT SIZE (mm)
UP TO 450mm	450 x 450
450mm TO 600mm	600 x 600
600mm TO 900mm	600 x 900
900mm TO 1500mm	900 x 900 (WITH STEP IRONS)
1500mm TO 2000mm	1200 x 1200 (WITH STEP IRONS)

ALL PIPES SHOULD BE CUT FLUSH WITH THE WALL OF THE PIT.

PITS GREATER THAN 600mm DEEP SHALL HAVE A MINIMUM ACCESS OPENING OF 600 x 600mm

THE GRATED COVERS OF PITS LARGER THAN 600 x 600mm ARE TO BE HINGED TO PREVENT THE GRATE FROM FALLING INTO THE PIT.

THE BASE OF THE DRAINAGE PITS SHOULD BE AT THE SAME LEVEL AS THE INVERT OF THE OUTLET PIPE. RAINWATER SHOULD NOT BE PERMITTED TO POND WITHIN THE STORMWATER SYSTEM

- TRENCH DRAINS:**
CONTINUOUS TRENCH DRAINS ARE TO BE OF WIDTH NOT LESS THAN 150mm AND DEPTH NOT LESS THAN 100mm. THE BARS OF THE GRATING ARE TO BE PARALLEL TO THE DIRECTION OF SURFACE FLOW.
- STEP IRONS:**
PITS BETWEEN 1.2m AND 6m ARE TO HAVE STEP IRONS IN ACCORDANCE WITH AS1657. FOR PITS GREATER THAN 6m OTHER MEANS OF ACCESS MUST BE PROVIDED.
- IN-SITU PITS:**
IN-SITU PITS ARE TO BE CONSTRUCTED ON A CONCRETE BED OF AT LEAST 150mm THICK. THE WALLS ARE TO BE DESIGNED TO MEET THE MINIMUM REQUIREMENTS OF *CLAUSE 7.5.5.1 OF AS3500.3:2021*. PITS DEEPER THAN 1.8m SHALL BE CONSTRUCTED WITH REINFORCED CONCRETE.
- GRATES:**
GRATES ARE TO BE GALVANISED STEEL GRID TYPE. GRATES ARE TO BE OF HEAVY-DUTY TYPE IN AREAS WHERE THEY MAY BE SUBJECT TO VEHICLE LOADING.

CLASS	USE
A	EXTRA LIGHT DUTY AREAS INCLUDING FOOTWAYS, ACCESSIBLE ONLY TO PEDESTRIANS, PEDAL CYCLISTS AND CLOSED TO OTHER TRAFFIC
B	LIGHT DUTY AREAS INCLUDING FOOTWAYS AND LIGHT TRACTOR PATHS ACCESSIBLE TO VEHICLES (EXCLUDING COMMERCIAL VEHICLES) OR LIVESTOCK
C	MEDIUM DUTY MALLS AND AREAS OPEN TO SLOW-MOVING COMMERCIAL TRAFFIC
D	HEAVY DUTY CARRIAGEWAYS OF ROADS AND AREAS OPEN TO COMMERCIAL VEHICLES
E	EXTRA HEAVY DUTY GENERAL DOCKS AND AIRCRAFT PAVEMENTS
F	EXTRA HEAVY DUTY DOCK AND AIRCRAFT PAVEMENTS SUBJECT TO HIGH WHEEL LOADS
G	EXTRA HEAVY DUTY DOCKS AND AIRCRAFT PAVEMENTS SUBJECT TO VERY HIGH WHEEL LOADS

GENERAL NOTES

- FINAL LOCATION OF NEW DOWNPIPES TO BE DETERMINED BY BUILDER/ARCHITECT AT TIME OF CONSTRUCTION.
- THESE DRAWINGS TO BE READ IN CONJUNCTION WITH ARCHITECTS AND OTHER CONSULTANTS DRAWINGS. ANY DISCREPANCIES TO BE REFERRED TO THE ENGINEER BEFORE PROCEEDING WITH WORK.
- ALL MATERIALS AND WORKMANSHIP TO BE IN ACCORDANCE WITH AS/NZS 3500.3:2021 STORMWATER DRAINAGE, BCA AND LOCAL COUNCIL POLICY/CONSENT/REQUIREMENTS.
- ALL DIMENSIONS AND LEVELS TO BE VERIFIED BY BUILDER ON-SITE PRIOR TO COMMENCEMENT OF WORKS. THESE DRAWINGS ARE NOT TO BE SCALED FOR DIMENSIONS NOR TO BE USED FOR SETOUT PURPOSES.
- ALL SURVEY INFORMATION AND PROPOSED BUILDING AND FINISHED SURFACE LEVELS SHOWN IN THESE DRAWINGS ARE BASED ON LEVELS OBTAINED FROM DRAWINGS BY OTHERS.
- THESE DRAWINGS DEPICT THE DESIGN OF SURFACE STORMWATER RUNOFF DRAINAGE SYSTEMS ONLY AND DO NOT DEPICT ROOF DRAINAGE OR SUBSOIL DRAINAGE SYSTEMS UNLESS NOTED OTHERWISE. THE DESIGN OF ROOF AND SUBSOIL DRAINAGE SYSTEMS IS THE RESPONSIBILITY OF OTHERS.
- ALL STORMWATER DRAINAGE PIPES ARE TO BE uPVC AT MINIMUM 1% GRADE UNLESS NOTED OTHERWISE.
- IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE AND LEVEL ALL EXISTING SERVICES OR OTHER STRUCTURES WHICH MAY AFFECT/BE AFFECTED BY THIS DESIGN PRIOR TO COMMENCEMENT OF WORKS.
- ALL PITS WITHIN DRIVEWAYS TO BE 150mm THICK CONCRETE OR EQUAL.
- THIS PLAN IS THE PROPERTY OF QUANTUM ENGINEERS AND MAY NOT BE USED OR REPRODUCED WITHOUT WRITTEN PERMISSION FROM QUANTUM ENGINEERS.

PLAN NOTES

- ROOF DRAINAGE NOTE:** AS 3500 ROOF DRAINAGE REQUIRES EAVES GUTTERS TO BE SIZED FOR 20 YEAR 5 MIN. STORM = 205mm/hr. FOR EAVES GUTTERS, AS 3500.3:2021 THEN HAS THE FOLLOWING REQUIREMENTS:
 - FOR TYPICAL STANDARD QUAD GUTTER WITH $A_e = 6000\text{mm}^2$ AND GUTTER SLOPE 1:500 AND STEEPER, THIS REQUIRES ONE DOWNPIPE PER 30m^2 ROOF AREA.
 - DOWNPIPES TO BE MINIMUM 90mm DIA. OR $100 \times 50\text{mm}$ FOR GUTTERS SLOPE 1:500 AND STEPPER.
 - OVERFLOW METHOD TO FIGURE F.1 OF AS 3500.3:2021 IT IS THE RESPONSIBILITY OF THE PLUMBER AND / OR BUILDER TO COMPLY WITH THIS. THIS DRAWING SHOWS PRELIMINARY LOCATIONS / NUMBERS OF DOWNPIPES ONLY WHICH ARE TO BE VERIFIED BY BUILDER / PLUMBER
- TREE PRESERVATION:** IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN ANY PRIOR APPROVAL REQUIRED FROM COUNCIL WITH RESPECT TO POTENTIAL IMPACT ON TREES FOR ANY WORKS SHOWN ON THIS DRAWING PRIOR TO THE COMMENCEMENT OF THOSE WORKS
- ALL ROOF GUTTERS TO HAVE OVERFLOW PROVISION IN ACCORDANCE WITH AS 3500.3:2021 AND SECTIONS 3.5, 3.7.7 AND APPENDIX G OF AS 3500.3:2021
- THIS DRAWING IS NOT TO BE USED FOR SET-OUT PURPOSES - REFER TO ARCHITECTURAL DRAWINGS
- LOCATION OF SURFACE STORMWATER GRATED INLET PITS MAY BE VARIED OR NEW PITS INSTALLED AT THE CONSTRUCTION STAGE PROVIDED DESIGN INTENT OF THIS DRAWING IS MAINTAINED

LEGEND			
SURFACE INLET PIT		GRADED TRENCH DRAIN	
SURFACE INLET PIT (WITH ENVIROPOD 200 MICRON)		ABSORPTION TRENCH	
ACCESS GRATE (WITH ENVIROPOD 200 MICRON)		PROPOSED ROOF GUTTER FALL	
ACCESS GRATE (TO HED PIT)		PROPOSED DOWNPIPE SPREADER	
450 SQUARE INTERVAL	450 X 450	STORMWATER PIPE 100mm DIA. MIN. UNO	
GRATE LEVEL = 75.50	SL 75.50	SUBSOIL PIPE	
INVERT LEVEL = RL 75.20	IL 75.20	EXISTING STORMWATER PIPE	
PROPOSED DOWNPIPE 90mm DIA. PVC		INSPECTION RISER	
		RAINWATER HEAD	



QUANTUM
ENGINEERS

Suite 1A, Level 2, 2 Rowe
Street, EASTWOOD NSW 2122

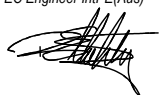
02 9807 7800
admin@quantumengineers.com.au

quantumengineers.com.au

APPROVED BY

ROBERT ELTOBBAGI

BE(CIVIL) MIEAust CPEng
NER (1052208) RPEQ (25464)
APEC Engineer IntPE(Aus)



CLIENT

LUCA MASTROIANI

ARCHITECT

RJK ARCHITECTS

DRAWING TITLE

DETAILS, NOTES & LEGEND

PROPOSED DUPLEX

Lot 1, No. 79 ASHWORTH AVENUE,
BELROSE

REVISION	DRAWN	DESCRIPTION	DATE
A	EW	PRELIMINARY ISSUE	01.04.2025
B	EW	ISSUED FOR CDC	02.04.2025

DESIGNED BY	No. IN SET
EW	12
SCALE - SIZE	REVISION
-	B
JOB NUMBER	DRAWING No.
240392_SW	D1

SITE AREA CALCULATIONS		
TOTAL SITE AREA	1094	m ²
EXISTING DEVELOPMENT		
BUILDING FOOTPRINT AREA	173.6	m ²
PAVED AREA	149.1	m ²
DRIVEWAY AREA	75.6	m ²
TOTAL IMPERVIOUS AREA	398.3	m ²
IMPERVIOUS AREA PERCENTAGE	36.4%	
PROPOSED DEVELOPMENT		
BUILDING FOOTPRINT AREA	438.7	m ²
PAVED AREA	18.3	m ²
DRIVEWAY AREA	97.68	m ²
TOTAL IMPERVIOUS AREA	554.7	m ²
INCREASE IN IMPERVIOUS AREA	156.4	m ²
TOTAL IMPERVIOUS AREA PERCENTAGE	50.7%	
AREA CALCULATIONS HAVE TAKEN INTO ACCOUNT THE REMOVED IMPERVIOUS AREA AS NOTED ON THE ARCHITECTURAL PLANS		

DRAINAGE PIPE LEGEND

- DRAINAGE PIPES VIA GRAVITY
- DRAINAGE PIPES TO RAINWATER TANK
- SUBSOIL DRAINAGE (AGG. LINE)

NOTE: ALL PIPES TO BE 100mm DIA UNO

NOTE: ALL PROPOSED GRATED DRAINS TO BE 100mm WIDE (UNO)

ALL STORMWATER DRAINAGE TO BE SEWER GRADE PVC U.N.O
ALL STORMWATER DRAINAGE TO BE 1% MINIMUM GRADE U.N.O

OSD WARRANT

LGA: NORTHERN BEACHES COUNCIL
RELEVANT CODE: WATER MANAGEMENT FOR DEVELOPMENT
POLICY SECTION 9.3.2

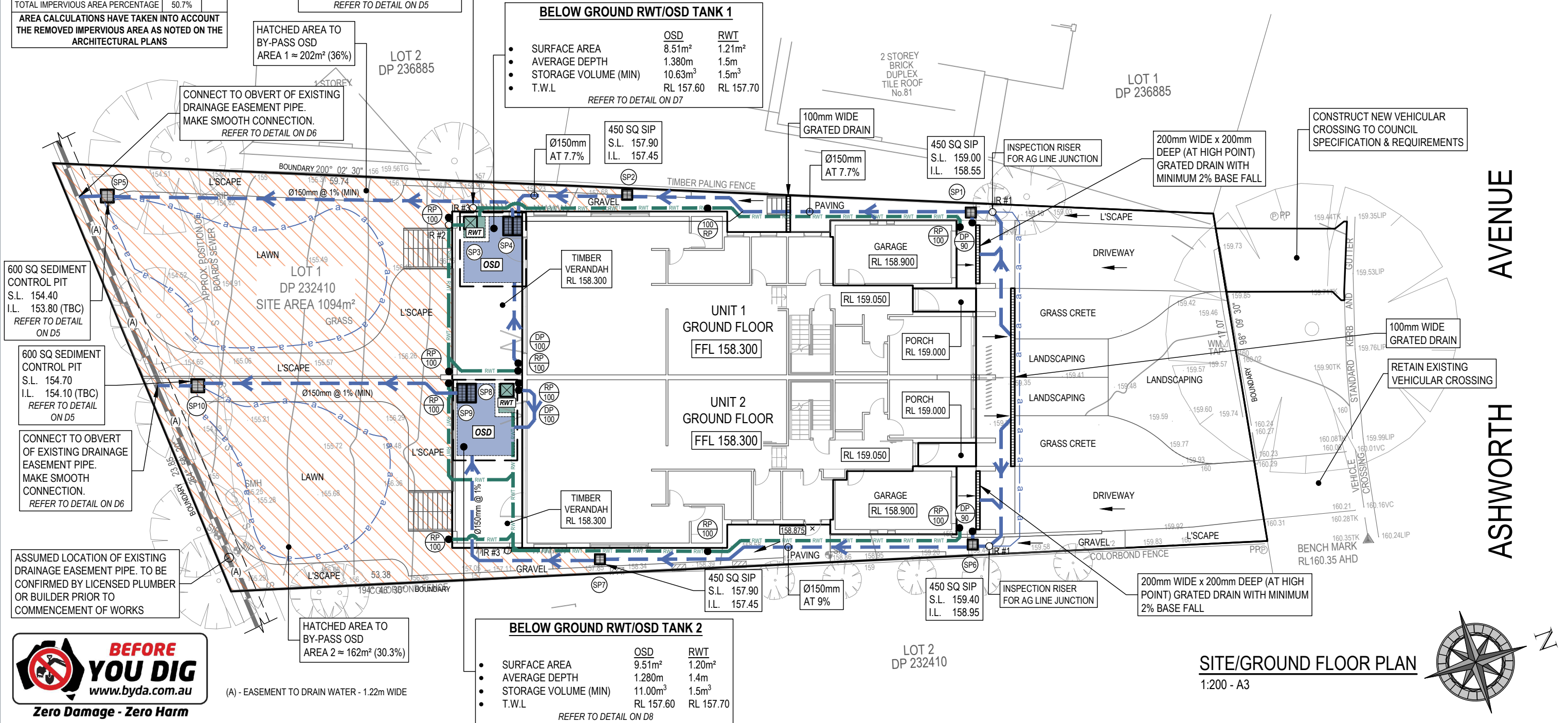
"OSD IS REQUIRED FOR ALL DEVELOPMENTS IN REGION 2 WHERE THE TOTAL EXISTING AND PROPOSED IMPERVIOUS AREAS EXCEED 40% OF THE TOTAL SITE AREA"

- PROPOSED IMPERVIOUS AREA 50.7%

THEREFORE, OSD REQUIRED
FULL COMPUTATIONAL METHOD TO BE USED

DOWNPIPE LEGEND

- INDICATES DOWNPIPE TO RWT
- INDICATES DOWNPIPE DIAMETER
- INDICATES DOWNPIPE DIRECTLY TO KERB OUTLET
- INDICATES DOWNPIPE DIAMETER
- DOWNPIPE PENETRATING FLOOR SLAB
- DOWNPIPE COMMENCING BELOW FLOOR SLAB
- SPREADER





QUANTUM ENGINEERS
Suite 1A, Level 2, 2 Rowe Street, EASTWOOD NSW 2122
02 9807 7800
admin@quantumengineers.com.au
quantumengineers.com.au

APPROVED BY
ROBERT ELTOBBAGI
BE(CIVIL) MIEAust CPEng
NER (1052208) RPEQ (25464)
APEC Engineer IntPE(Aus)



CLIENT
LUCA MASTROIANI

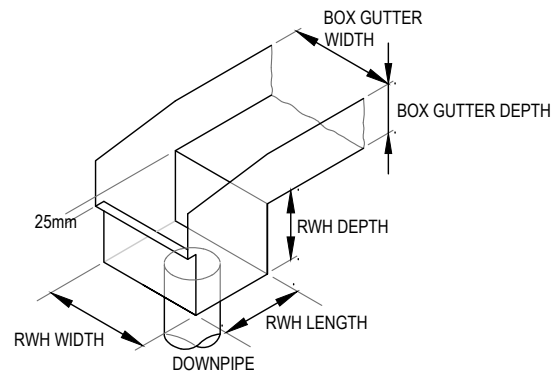
ARCHITECT
RJK ARCHITECTS

DRAWING TITLE
SITE/GROUND FLOOR PLAN

PROPOSED DUPLEX
Lot 1, No. 79 ASHWORTH AVENUE,
BELROSE

REVISION	DRAWN	DESCRIPTION	DATE
A	EW	PRELIMINARY ISSUE	01.04.2025
B	EW	ISSUED FOR CDC	02.04.2025

DESIGNED BY	No. IN SET
EW	12
SCALE - SIZE	REVISION
1:200 - A3	B
JOB NUMBER	DRAWING No.
240392_SW	D2



DRAINAGE PIPE LEGEND

- DRAINAGE PIPES VIA GRAVITY
 - DRAINAGE PIPES TO RAINWATER TANK
- NOTE: ALL PIPES TO BE 100mm DIA UNO**

BOX GUTTER #1

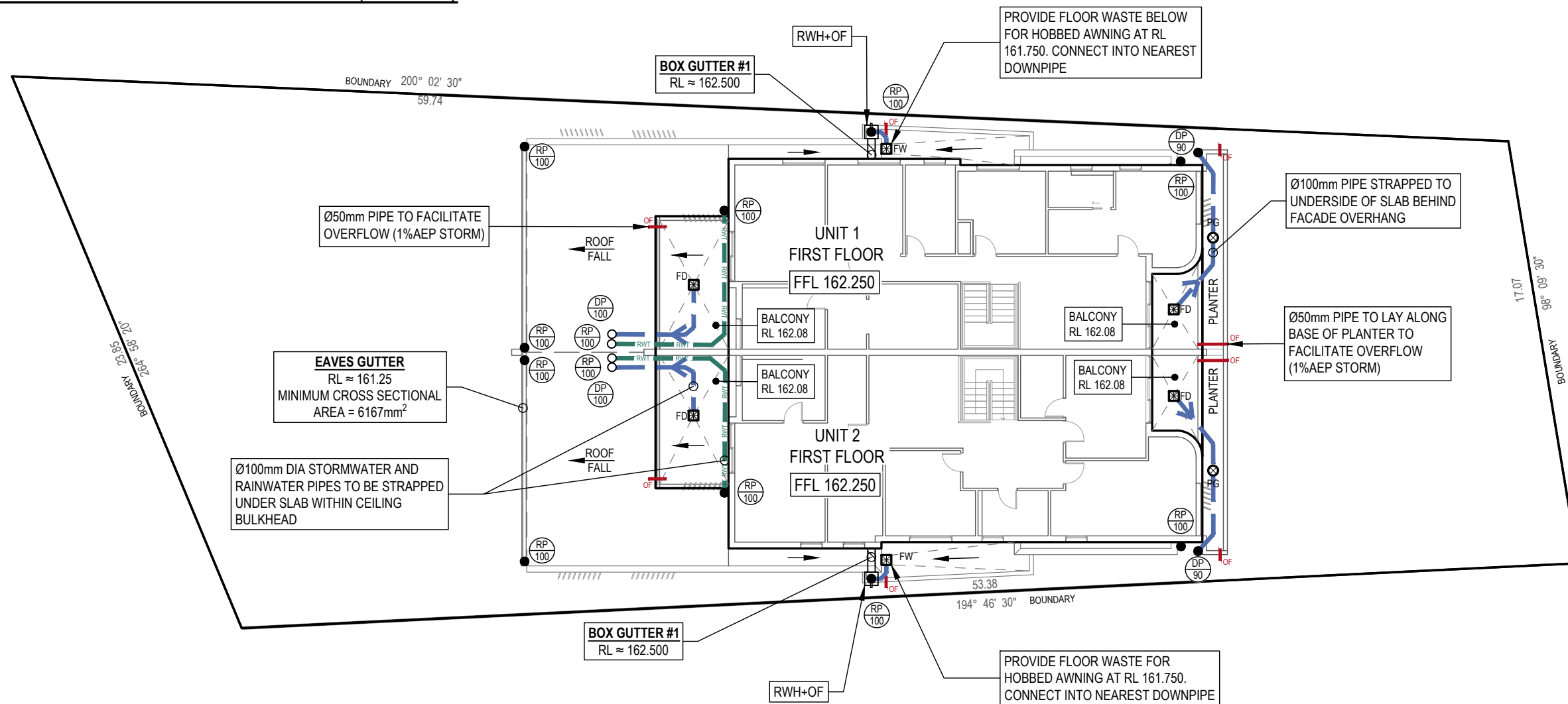
- BOX GUTTER TO BE CONSTRUCTED IN ACCORDANCE WITH AS/NZS 3500.3.2:2021: SECTION J2
- BOX GUTTER - 300mm WIDTH x 150mm DEPTH (MIN)
 - RWH (EXTERNAL) - 120mm LENGTH x 300 WIDTH x 125mm DEPTH (MIN)
- REFER TO DRAWING D10 FOR CALCULATIONS

DOWNPIPE LEGEND

- RP 150 - INDICATES DOWNPIPE TO RWT
- RP 150 - INDICATES DOWNPIPE DIAMETER
- DP 150 - INDICATES DOWNPIPE DIRECTLY TO KERB OUTLET
- DP 150 - INDICATES DOWNPIPE DIAMETER
- - DOWNPIPE PENETRATING FLOOR SLAB
- - DOWNPIPE COMMENCING BELOW FLOOR SLAB
- SP - SPREADER

RAINWATER HEAD & OVERFLOW DETAIL (TYPICAL)

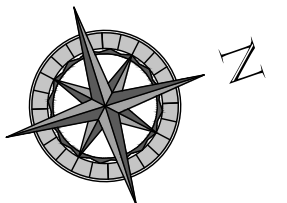
NTS



ASHWORTH AVENUE

FIRST FLOOR PLAN

1:200 - A3



QUANTUM ENGINEERS
Suite 1A, Level 2, 2 Rowe Street, EASTWOOD NSW 2122
02 9807 7800
admin@quantumengineers.com.au
quantumengineers.com.au

APPROVED BY
ROBERT ELTOBBAGI
BE(CIVIL) MIEAust CPEng
NER (1052208) RPEQ (25464)
APEC Engineer IntPE(Aus)

CLIENT
LUCA MASTROIANI

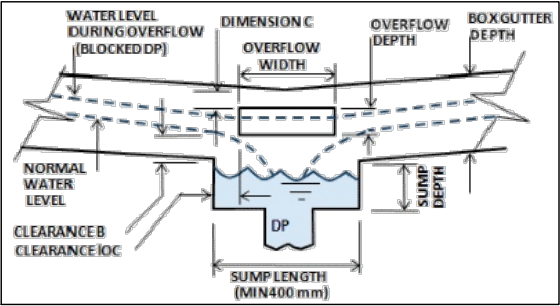
ARCHITECT
RJK ARCHITECTS

DRAWING TITLE
FIRST FLOOR PLAN

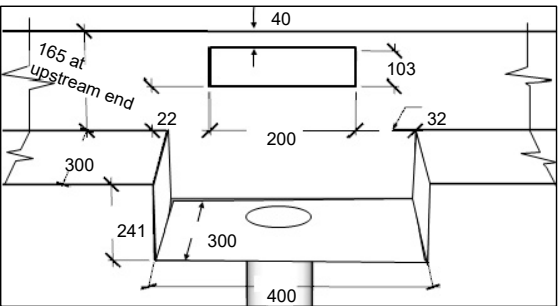
PROPOSED DUPLEX
Lot 1, No. 79 ASHWORTH AVENUE,
BELROSE

REVISION	DRAWN	DESCRIPTION	DATE
A	EW	PRELIMINARY ISSUE	01.04.2025
B	EW	ISSUED FOR CDC	02.04.2025

DESIGNED BY	No. IN SET
EW	12
SCALE - SIZE	REVISION
1:200 - A3	B
JOB NUMBER	DRAWING No.
240392_SW	D3



SUMP AND OVERFLOW
DETAIL (TYPICAL)



BOX GUTTER #2 DIAGRAM

DRAINAGE PIPE LEGEND

- DRAINAGE PIPES VIA GRAVITY
- NOTE: ALL PIPES TO BE 100mm DIA UNO

DOWNPIPE LEGEND

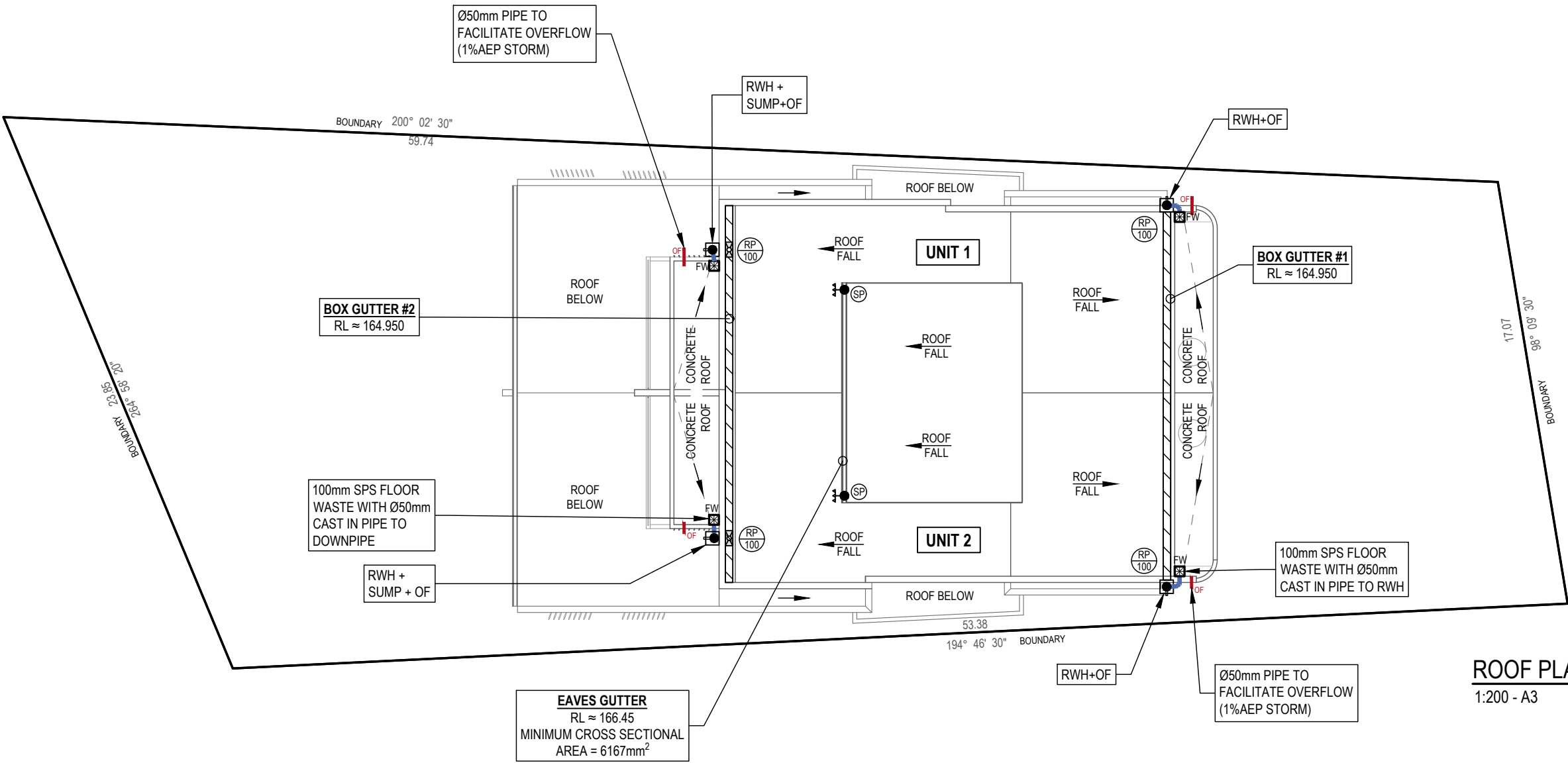
- RP 150 INDICATES DOWNPIPE TO RWT
- INDICATES DOWNPIPE DIAMETER
- DP 150 INDICATES DOWNPIPE DIRECTLY TO KERB OUTLET
- INDICATES DOWNPIPE DIAMETER
- DOWNPIPE PENETRATING FLOOR SLAB
- DOWNPIPE COMMENCING BELOW FLOOR SLAB
- SPREADER

BOX GUTTER #1

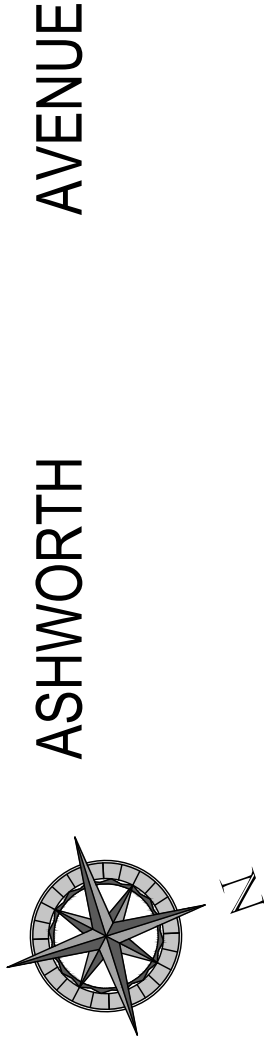
- BOX GUTTER TO BE CONSTRUCTED IN ACCORDANCE WITH AS/NZS 3500.3.2:2021: SECTION J2
- BOX GUTTER - 300mm WIDTH x 150mm DEPTH (MIN)
 - RWH (EXTERNAL) - 110mm LENGTH x 300 WIDTH x 113mm DEPTH (MIN)
- REFER TO DRAWING D10 FOR CALCULATIONS

BOX GUTTER #2

- BOX GUTTER TO BE CONSTRUCTED IN ACCORDANCE WITH AS/NZS 3500.3.2:2021: SECTION J2
- BOX GUTTER - 300mm WIDTH x 165mm DEPTH (MIN)
 - SUMP - 400mm LENGTH x 300 WIDTH x 241mm DEPTH (MIN)
 - RWH (EXTERNAL) - 110mm LENGTH X 300 WIDTH X 113mm DEPTH (MIN)
 - RWH OVERFLOW (OF) - 200mm WIDE x 103mm HIGH (MIN)
- REFER TO DRAWING D10 FOR CALCULATIONS



ROOF PLAN
1:200 - A3



**QUANTUM
ENGINEERS**
Suite 1A, Level 2, 2 Rowe
Street, EASTWOOD NSW 2122
02 9807 7800
admin@quantumengineers.com.au
quantumengineers.com.au

APPROVED BY
ROBERT ELTOBBAGI
BE(CIVIL) MIEAust CPEng
NER (1052208) RPEQ (25464)
APEC Engineer InPE(Aus)

CLIENT
LUCA MASTROIANI

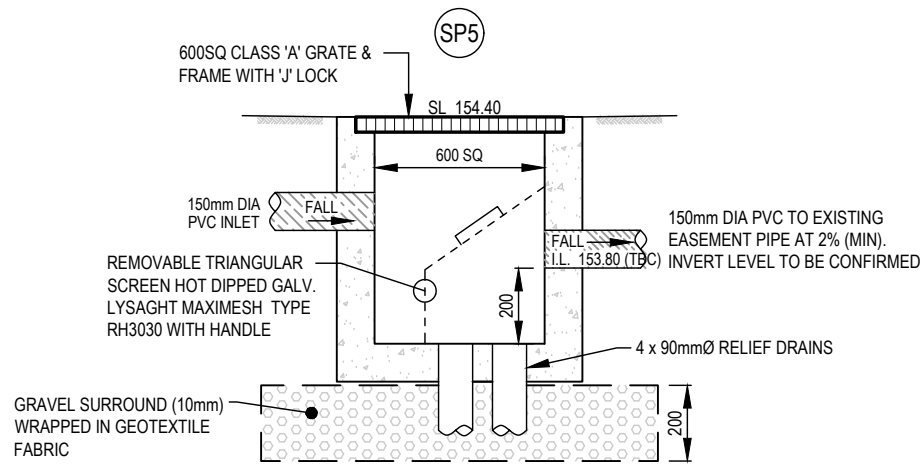
ARCHITECT
RJK ARCHITECTS

DRAWING TITLE
ROOF PLAN

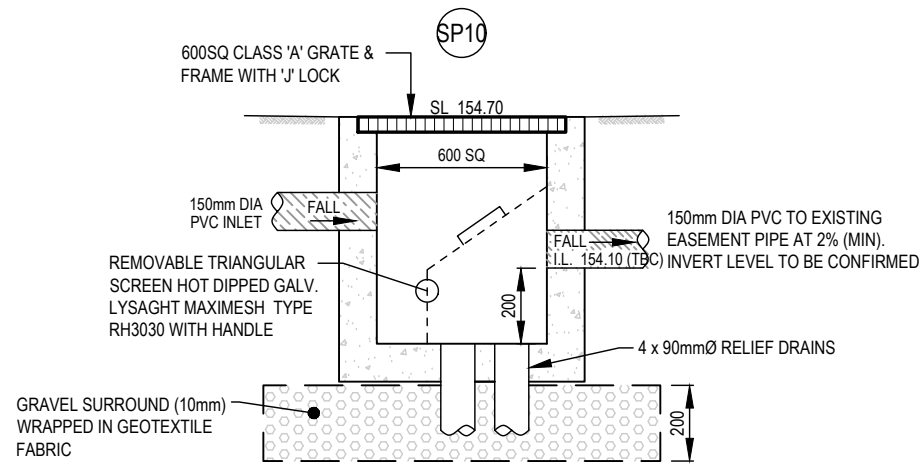
PROPOSED DUPLEX
Lot 1, No. 79 ASHWORTH AVENUE,
BELROSE

REVISION	DRAWN	DESCRIPTION	DATE
A	EW	PRELIMINARY ISSUE	01.04.2025
B	EW	ISSUED FOR CDC	02.04.2025

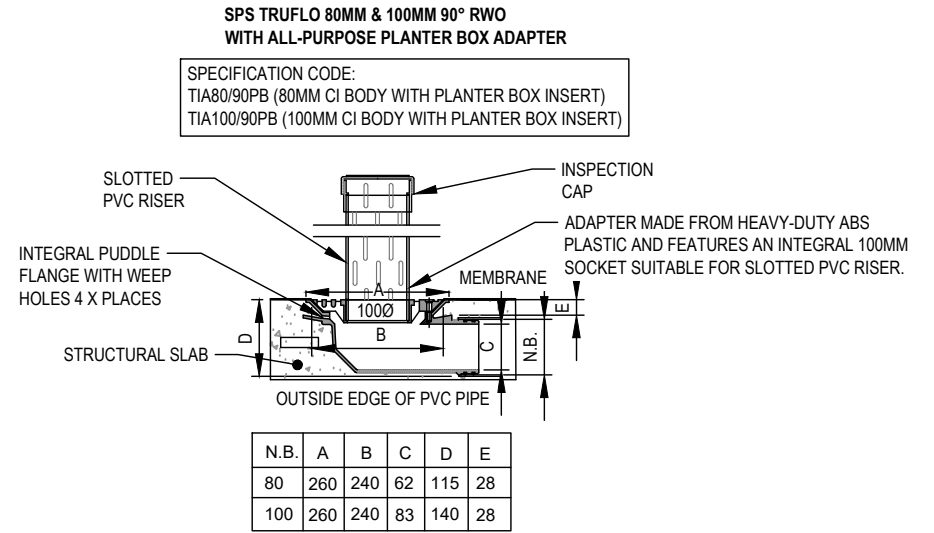
DESIGNED BY	No. IN SET
EW	12
SCALE - SIZE	REVISION
1:200 - A3	B
JOB NUMBER	DRAWING No.
240392_SW	D4



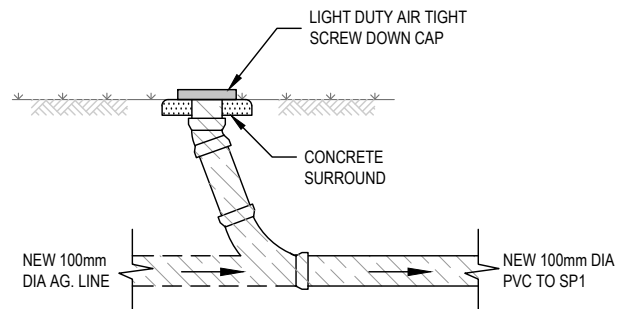
SEDIMENT CONTROL PIT - SP5
NTS



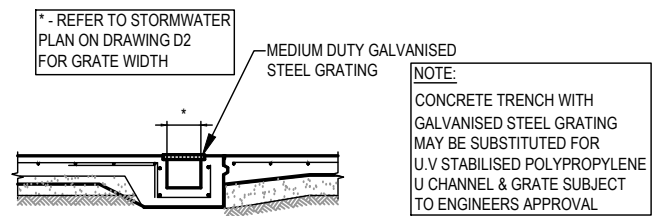
SEDIMENT CONTROL PIT - SP10
NTS



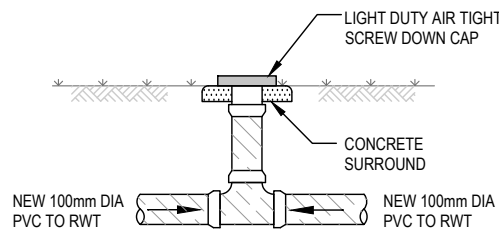
PLANTER GRATE (SPS) - PG
NTS



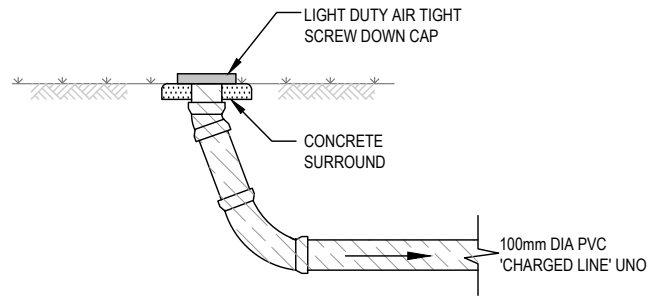
AG. LINE INSPECTION RISER - IR #1
NTS



GRADED DRAIN
NTS



INSPECTION RISER - IR #2
NTS



INSPECTION RISER - IR #3
NTS



QUANTUM ENGINEERS
Suite 1A, Level 2, 2 Rowe Street, EASTWOOD NSW 2122
02 9807 7800
admin@quantumengineers.com.au
quantumengineers.com.au

APPROVED BY
ROBERT ELTOBBAGI
BE(CIVIL) MIEAust CPEng
NER (1052208) RPEQ (25464)
APEC Engineer InPE(Aus)

CLIENT
LUCA MASTROIANI

ARCHITECT
RJK ARCHITECTS

DRAWING TITLE
STORMWATER DETAILS SHEET 1

PROPOSED DUPLEX
Lot 1, No. 79 ASHWORTH AVENUE,
BELROSE

REVISION	DRAWN	DESCRIPTION	DATE
A	EW	PRELIMINARY ISSUE	01.04.2025
B	EW	ISSUED FOR CDC	02.04.2025

DESIGNED BY	No. IN SET
EW	12
SCALE - SIZE	REVISION
AS NOTED - A3	B
JOB NUMBER	DRAWING No.
240392_SW	D5

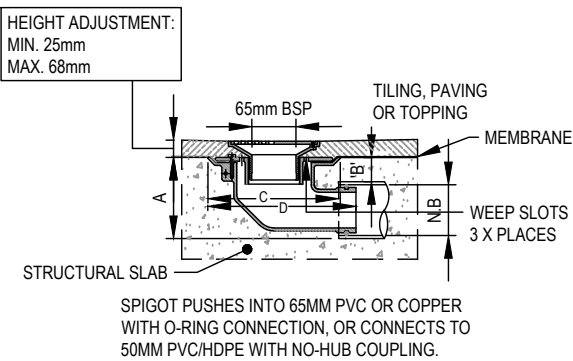
SPS 130MM SQUARE VARI-LEVEL SIDE OUTLET DRAIN
65/50MM OUTLET

SPECIFICATION CODE:
Q130S4/C90 (POLISHED 304 STAINLESS STEEL, ABS LOWER BODY)
Q130S/C90 (SATIN 316 STAINLESS STEEL GRATE, ABS LOWER BODY)

130MM SQUARE

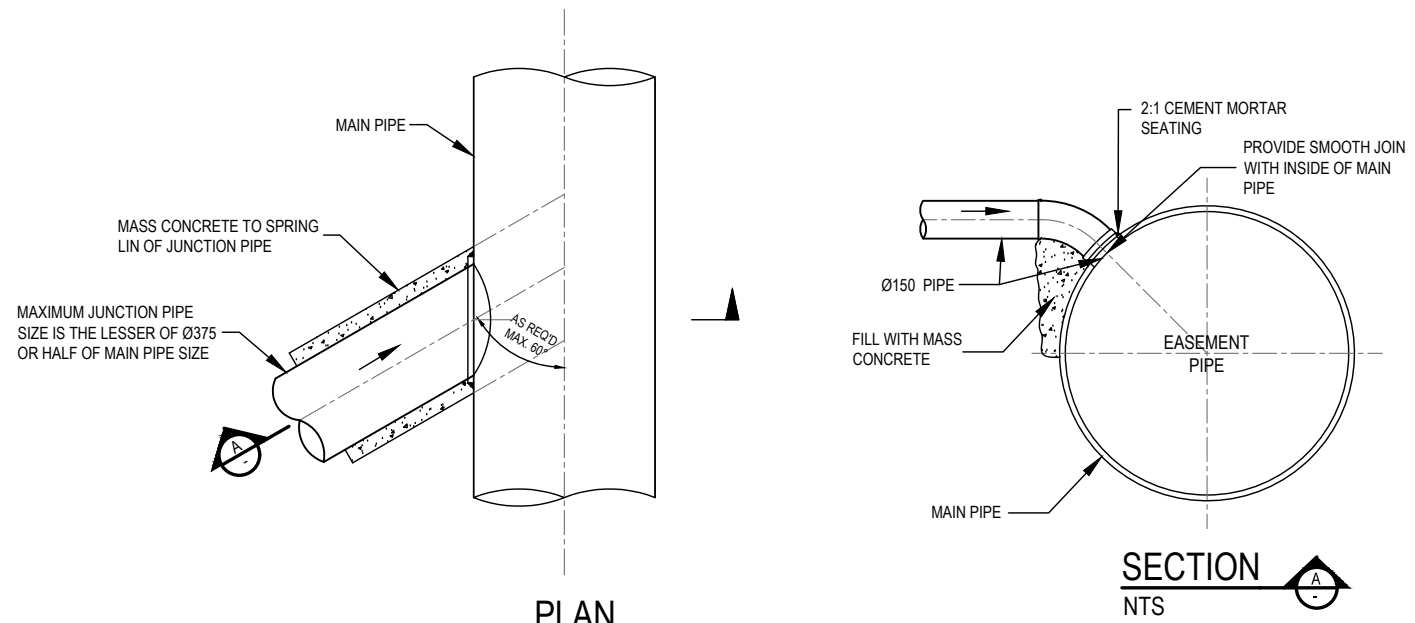
SQUARE GRATE POLISHED 304 OR SATIN 316 STAINLESS STEEL.

UPVC 90° BODY AND REVERSIBLE MEMBRANE CLAMP COLLAR WITH FEMALE 65MM BSP THREAD.



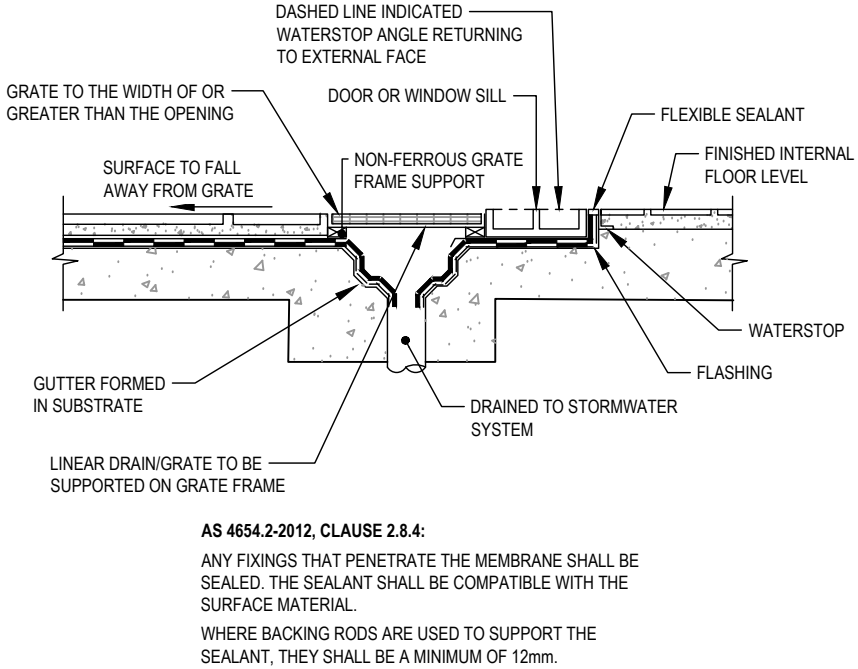
N.B.	A	B	C	D
50	100	40	180	200
65	105	37	180	200

FLOOR WASTE (SPS) - FW
NTS



DIRECT CONNECTION TO STORMWATER PIPE
NTS

- NOTE:
1. ALL CONNECTIONS TO BE IN TOP HALF OF MAIN PIPE ONLY.
 2. THE R.C. STORM WATER PIPE SHALL BE PIERCED BY A NEAT OPENING AS SHOWN TO ALLOW THE INSTALLATION OF A PIPE CONNECTION FLANGE WHICH SHALL NOT PROTRUDE BEYOND THE INNER SURFACE OF THE R.C. STORM WATER PIPE. THE INTERNAL JUNCTION SHALL BE SMOOTHLY FINISHED WITH 2:1 CEMENT MORTAR SO AS TO PRESENT NO OBSTRUCTION WITHIN THE INTERNAL CHANNEL OF THE R.C. STORM WATER PIPE. THE CONNECTION FLANGE IS TO BE INSPECTED & APPROVED PRIOR TO INSTALLATION OF THE DRAINAGE PIPE.
 3. DRAINAGE HOLES IN KERBS WHERE REQUIRED ARE TO BE PROVIDED USING APPROVED PROPRIETARY KERB CONNECTORS AND ARE TO BE FINISHED FLUSH WITH KERB FACES.
 4. PROVIDE STANDARD JUNCTION PIT FOR CONNECTION OF PIPE SIZES NOT COMPLYING WITH THIS STANDARD.
 5. COMPRESSIVE STRENGTH (FC) FOR CAST INSITU CONCRETE TO BE 32 MPa AT 28 DAYS.
 6. ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

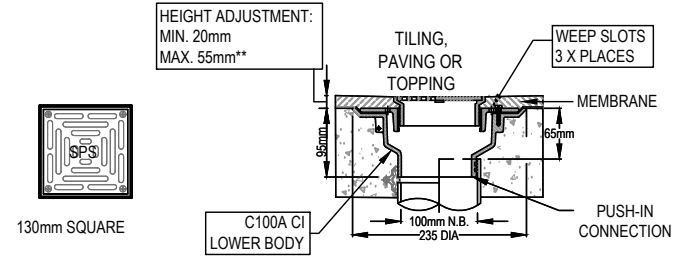


AS 4654.2-2012, CLAUSE 2.8.4:
ANY FIXINGS THAT PENETRATE THE MEMBRANE SHALL BE SEALED. THE SEALANT SHALL BE COMPATIBLE WITH THE SURFACE MATERIAL.
WHERE BACKING RODS ARE USED TO SUPPORT THE SEALANT, THEY SHALL BE A MINIMUM OF 12mm.

'ZERO' THRESHOLD LINEAR DRAIN DETAIL
NTS

SPS 130mm SQUARE VARI-LEVEL VERTICAL DRAIN
65/50mm OUTLET

SPECIFICATION CODES:
Q130S4/C (POLISHED 304 STAINLESS STEEL GRATE)
Q130S/C (SATIN 316 STAINLESS STEEL GRATE)
INCLUDES 100MM CAST IRON LOWER BODY



FLOOR DRAIN (SPS) - FD
NTS



QUANTUM ENGINEERS
Suite 1A, Level 2, 2 Rowe Street, EASTWOOD NSW 2122
02 9807 7800
admin@quantumengineers.com.au
quantumengineers.com.au

APPROVED BY
ROBERT ELTOBBAGI
BE(CIVIL) MIEAust CPEng
NER (1052208) RPEQ (25464)
APEC Engineer IntPE(Aus)

CLIENT
LUCA MASTROIANI

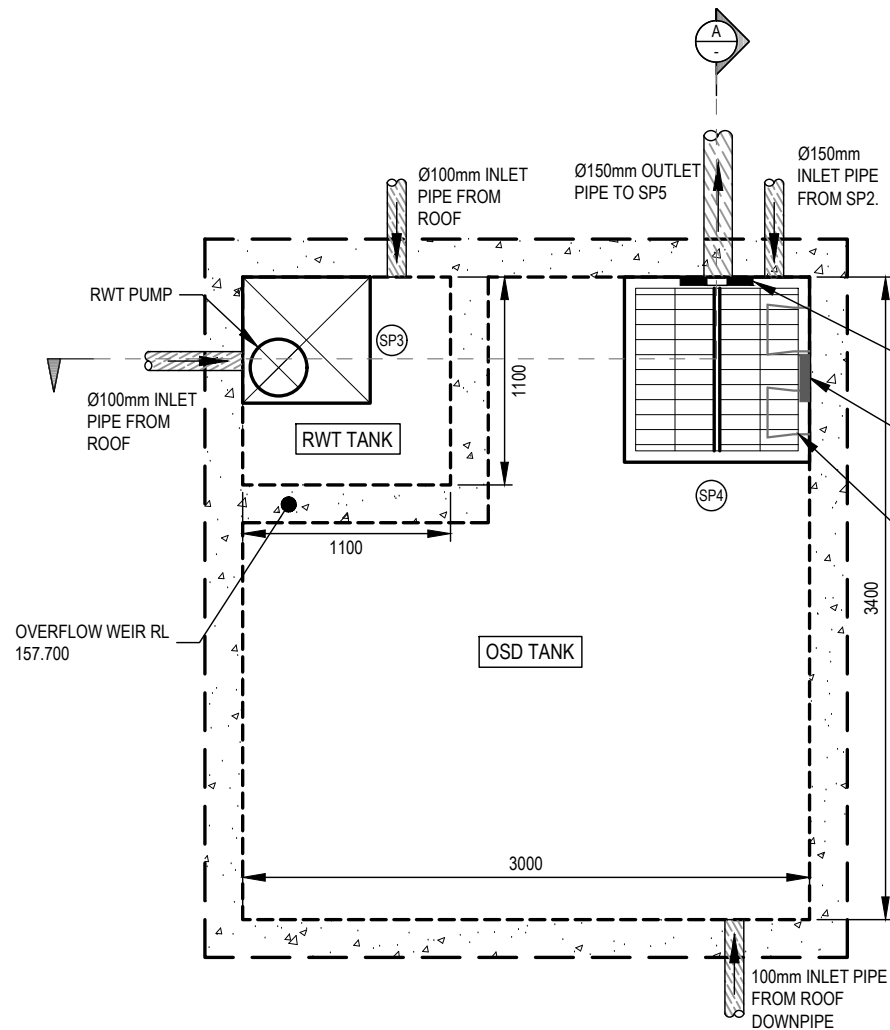
ARCHITECT
RJK ARCHITECTS

DRAWING TITLE
STORMWATER DETAILS SHEET 2

PROPOSED DUPLEX
Lot 1, No. 79 ASHWORTH AVENUE,
BELROSE

REVISION	DRAWN	DESCRIPTION	DATE
A	EW	PRELIMINARY ISSUE	01.04.2025
B	EW	ISSUED FOR CDC	02.04.2025

DESIGNED BY	No. IN SET
EW	12
SCALE - SIZE	REVISION
AS NOTED - A3	B
JOB NUMBER	DRAWING No.
240392_SW	D6



COMBINED BELOW GROUND RWT / OSD TANK 1
1:40 @ A3

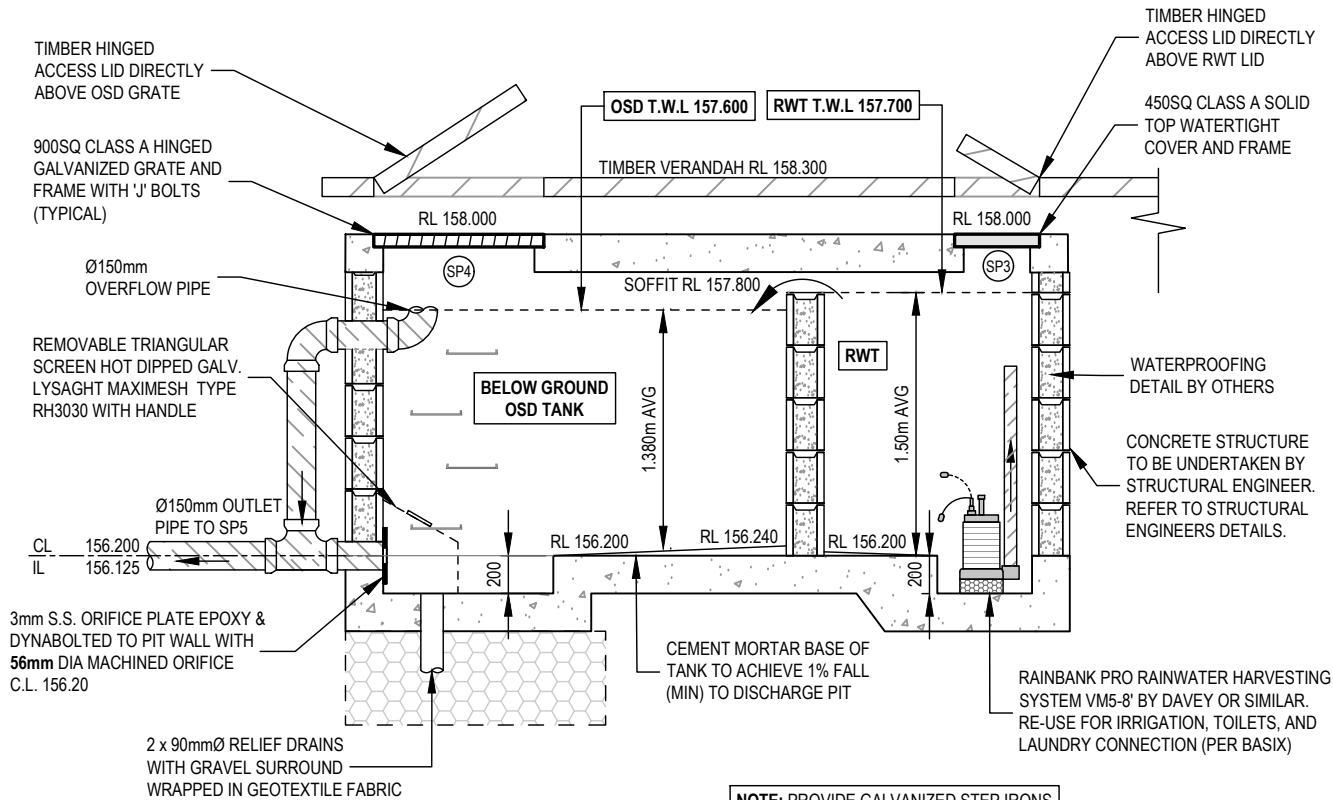


TYPICAL WARNING SIGN
NTS

EVERY EXTERNAL SUPPLY OUTLET FROM
RAINWATER RE-USE TANK TO BE LABELED
WITH METALLIC WARNING SIGN

- 3mm S.S. ORIFICE PLATE EPOXY & DYNABOLTED
TO PIT WALL WITH **56mm** DIA MACHINED ORIFICE
C.L. 156.20
- PROVIDE CONFINED
SPACE DANGER SIGN.
SEE DETAILS.
- PROVIDE GALVANIZED STEP IRONS AT
300mm CENTRES IN ACCORDANCE
WITH THE AUST STANDARDS AT ALL
ACCESS POINTS OF THE TANK
(TYPICAL)

BELOW GROUND RWT/OSD TANK 1			
	OSD	RWT	
• SURFACE AREA	8.51m²	1.21m²	
• AVERAGE DEPTH	1.380m	1.5m	
• STORAGE VOLUME (MIN)	10.63m³	1.5m³	
• T.W.L	RL 157.60	RL 157.70	

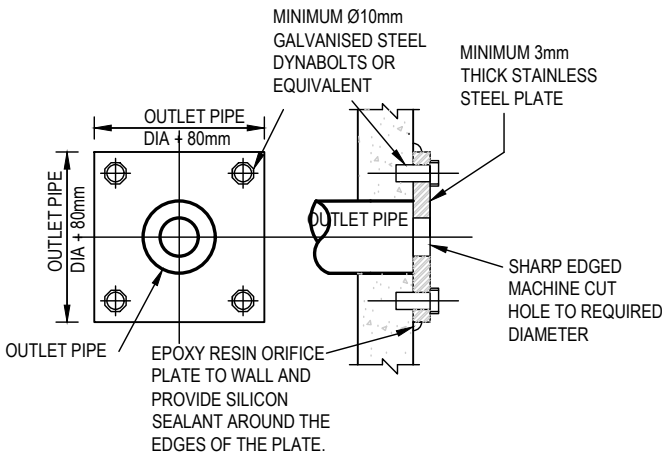


SECTION A
1:40 @ A3



- CORNERS: SQUARE
- COLOUR: ETCHED AND FILLED BLACK LEGEND ON
NATURAL SILVER BACKGROUND
- MATERIAL: ALUMINIUM 0.9mm MILL

OSD PLAQUE
NTS



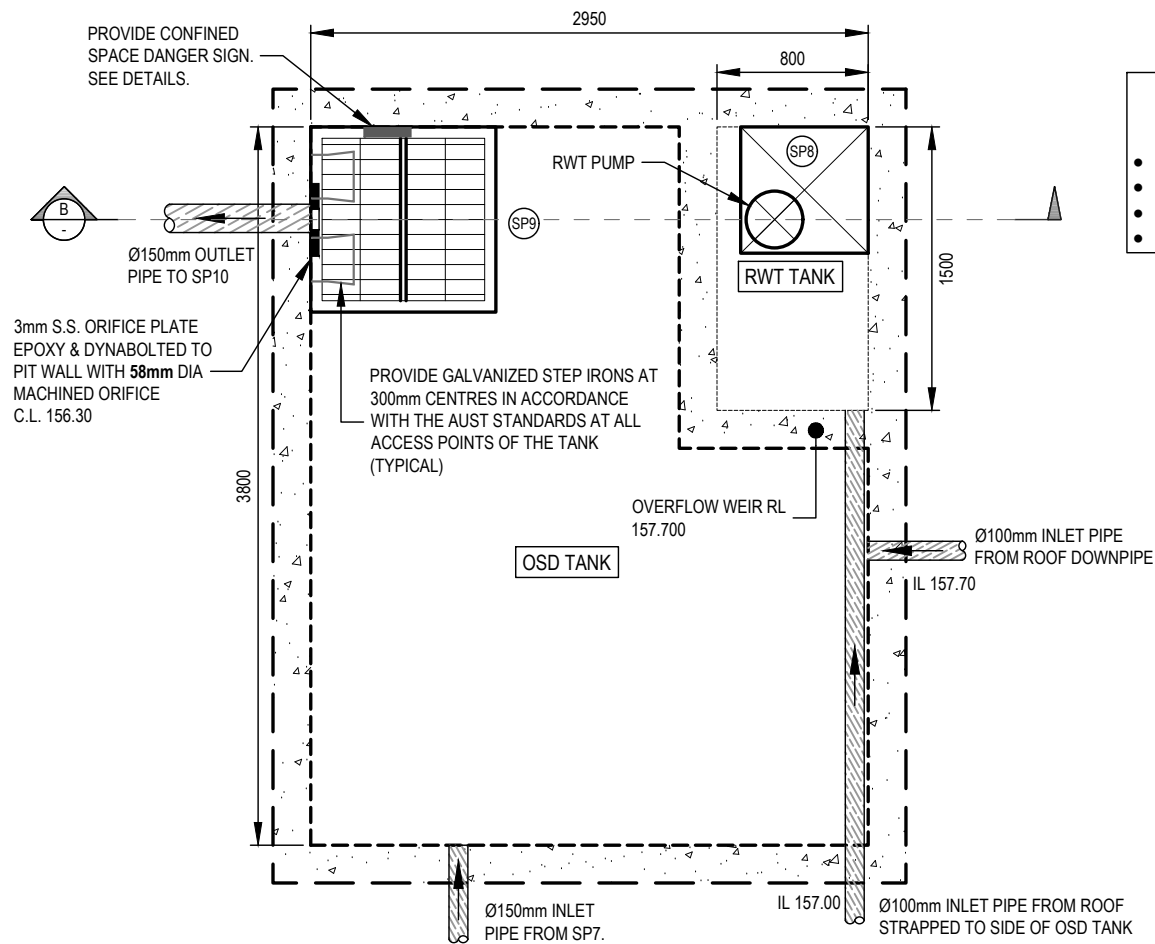
ORIFICE PLATE DETAIL
NTS



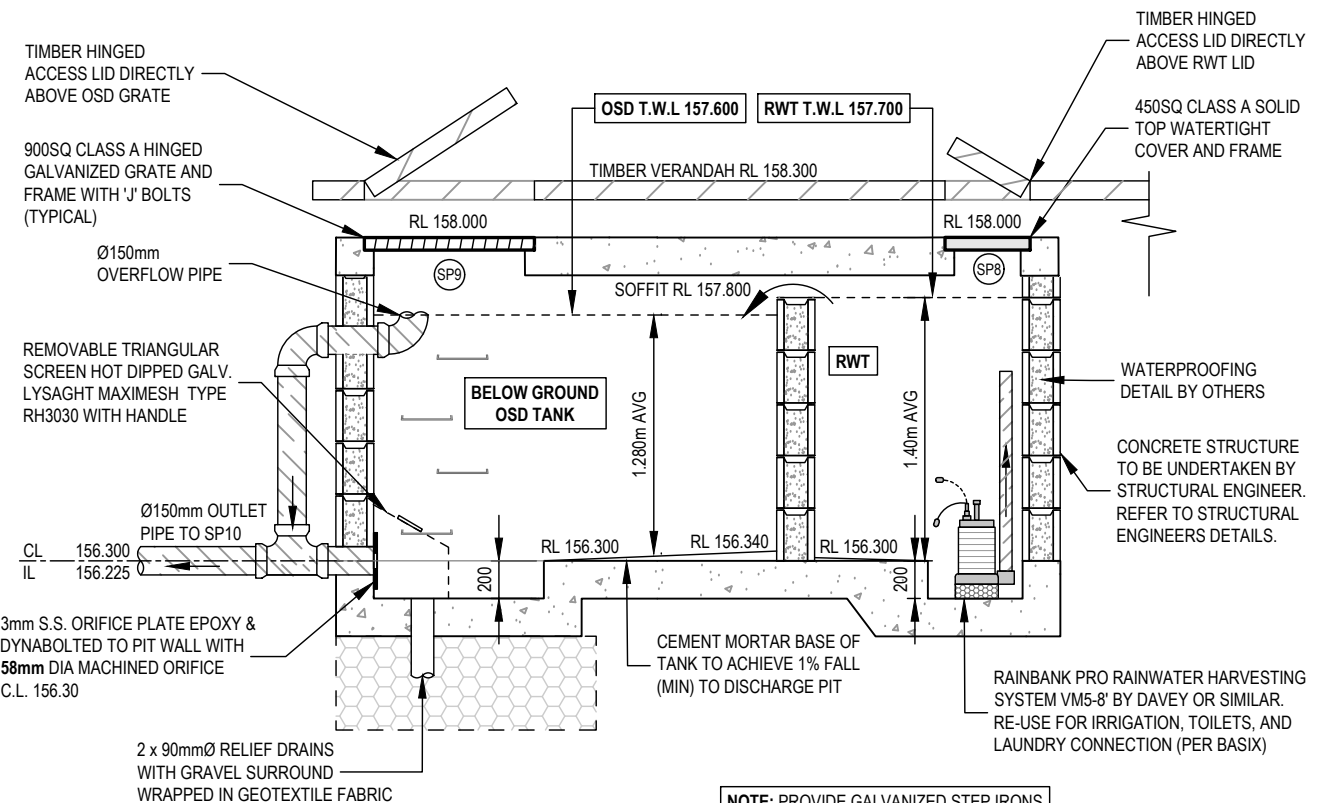
CONFINED SPACE DANGER SIGN

- COLOURS:- "DANGER" AND BACKGROUND - WHITE
- ELLIPTICAL AREA - RED
- RECTANGLE CONTAINING ELLIPSE - BLACK
- OTHER LETTERING AND BORDER - BLACK

- A) A CONFINED SPACE DANGER SIGN SHALL BE POSITIONED AT ALL ACCESS POINTS, SUCH THAT IT IS CLEARLY VISIBLE TO PERSONS PROPOSING TO ENTER THE BELOW GROUND TANK/S CONFINED SPACE.
- B) MINIMUM DIMENSIONS OF THE SIGN - 300mm x 450mm (LARGE ENTRIES, SUCH AS DOORS) - 250mm x 180mm (SMALL ENTRIES SUCH AS GRATES AND MANHOLES)
- C) THE SIGN SHALL BE MANUFACTURED FROM COLOUR BONDED ALUMINIUM OR POLYPROPYLENE.
- D) SIGN SHALL BE AFFIXED USING SCREWS AT EACH CORNER OF THE SIGN.



BELOW GROUND RWT/OSD TANK 2		
	OSD	RWT
• SURFACE AREA	9.51m ²	1.20m ²
• AVERAGE DEPTH	1.280m	1.4m
• STORAGE VOLUME (MIN)	11.00m ³	1.5m ³
• T.W.L	RL 157.60	RL 157.70



SECTION B
1:40 @ A3

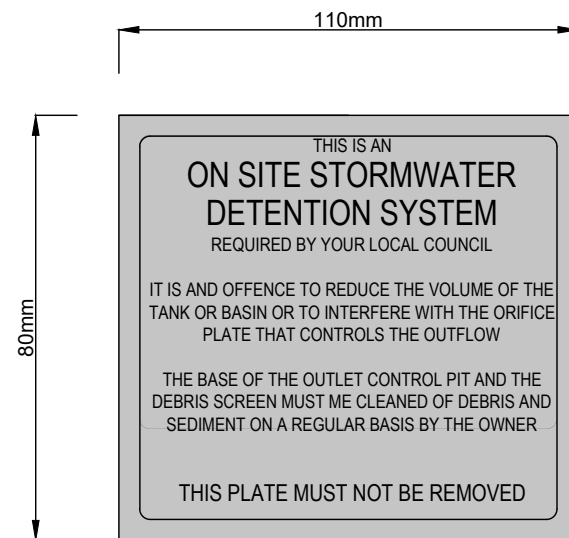
NOTE: PROVIDE GALVANIZED STEP IRONS AT 300mm CENTRES IN ACCORDANCE WITH THE AUST STANDARDS AT ALL ACCESS POINTS OF THE TANK.

COMBINED BELOW GROUND RWT / OSD TANK 2
1:40 @ A3



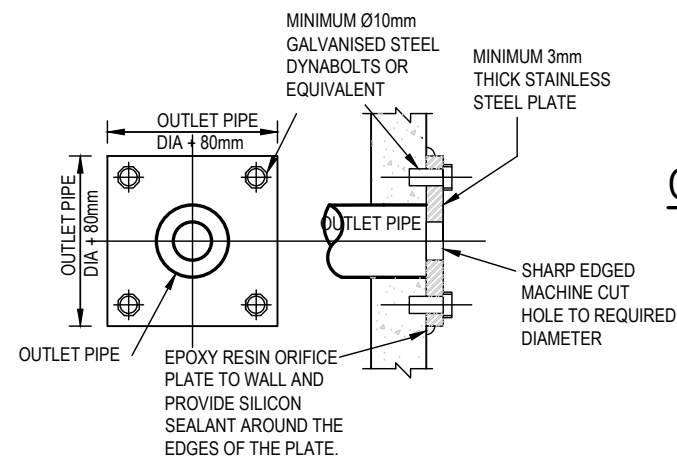
TYPICAL WARNING SIGN
NTS

EVERY EXTERNAL SUPPLY OUTLET FROM RAINWATER RE-USE TANK TO BE LABELED WITH METALLIC WARNING SIGN



CORNERS: SQUARE
COLOUR: ETCHED AND FILLED BLACK LEGEND ON NATURAL SILVER BACKGROUND
MATERIAL: ALUMINIUM 0.9mm MILL

OSD PLAQUE
NTS



ORIFICE PLATE DETAIL
NTS



CONFINED SPACE DANGER SIGN

COLOURS:- "DANGER" AND BACKGROUND - WHITE
ELLIPTICAL AREA - RED
RECTANGLE CONTAINING ELLIPSE - RED
OTHER LETTERING AND BORDER - BLACK

- A) A CONFINED SPACE DANGER SIGN SHALL BE POSITIONED AT ALL ACCESS POINTS, SUCH THAT IT IS CLEARLY VISIBLE TO PERSONS PROPOSING TO ENTER THE BELOW GROUND TANK/S CONFINED SPACE.
- B) MINIMUM DIMENSIONS OF THE SIGN
- 300mm x 450mm (LARGE ENTRIES, SUCH AS DOORS)
- 250mm x 180mm (SMALL ENTRIES SUCH AS GRATES AND MANHOLES)
- C) THE SIGN SHALL BE MANUFACTURED FROM COLOUR BONDED ALUMINIUM OR POLYPROPYLENE.
- D) SIGN SHALL BE AFFIXED USING SCREWS AT EACH CORNER OF THE SIGN.



QUANTUM ENGINEERS
Suite 1A, Level 2, 2 Rowe Street, EASTWOOD NSW 2122
02 9807 7800
admin@quantumengineers.com.au
quantumengineers.com.au

APPROVED BY
ROBERT ELTOBBAGI
BE(CIVIL) MIEAust CPEng
NER (1052208) RPEQ (25464)
APEC Engineer InPE(Aus)

CLIENT
LUCA MASTROIANI

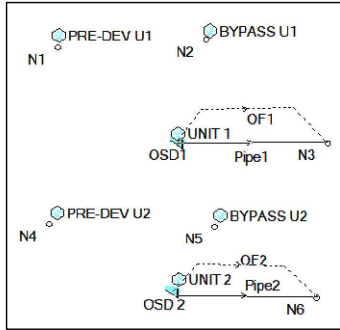
ARCHITECT
RJK ARCHITECTS

DRAWING TITLE
UNIT 2 - COMBINED RWT/OSD TANK

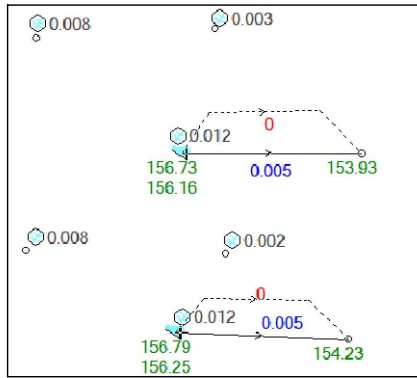
PROPOSED DUPLEX
Lot 1, No. 79 ASHWORTH AVENUE,
BELROSE

REVISION	DRAWN	DESCRIPTION	DATE
A	EW	PRELIMINARY ISSUE	01.04.2025
B	EW	ISSUED FOR CDC	02.04.2025

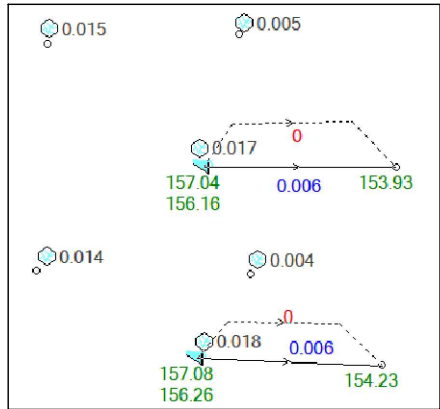
DESIGNED BY	No. IN SET
EW	12
SCALE - SIZE	REVISION
1:40 - A3	B
JOB NUMBER	DRAWING No.
240392_SW	D8



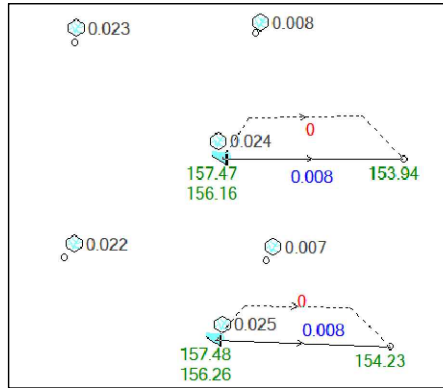
Drains Model Layout



Drains Model Results - 20% AEP



Drains Model Results - 5% AEP



Drains Model Results - 1% AEP

PIT/ NODE DETAILS																						
Name	Type	Family	Size	Ponding Volume (cu.m)	Pressure Change Coeff. Ku	Surface Elev (m)	Max Pond Depth (m)	Base Inflow (cu.m/s)	Blocking Factor	x	y	Bolt-down lid	Part Full Shock Los	Inflow Hydrograph	Pt is	Internal Width (mm)	Inflow Misalign	Minor Safe Pond Depth (m)	Major Safe Pond Depth (m)			
N1	Node							0		240	-103.333		4	No								
N2	Node							0		383.333	-96.667		7	No								
N3	Node					154.4		0		501	-195		25	No								
N4	Node							0		231.657	-273.333		17250	No								
N5	Node							0		391.657	-275.833		17256	No								
N6	Node					154.7		0		490.509	-344.676		25542	No								
DETENTION BASIN DETAILS																						
Name	Elev	Surf. Area	Not Used	Outlet Typ	K	Dia (mm)	Centre RL	Pt Family	Pt Type	x	y	HED	Crest RL	Crest Leng	id							
OSD1	156	1		Orifice		56	155.2				357	-195	No			12						
	156.19	1																				
	156.2	8.51																				
	157.6	8.51																				
OSD2	156.1	1		Orifice		58	155.3			352.199	-339.468	No				25549						
	156.29	1																				
	156.3	9.51																				
	157.6	9.51																				
SUB-CATCHMENT DETAILS																						
Name	Pit or Node	Total Area (ha)	Paved Area %	Grass Area %	Supp Area %	Paved Time (min)	Grass Time (min)	Supp Time (min)	Paved Length (m)	Grass Length (m)	Supp Length (m)	Paved Slope (%)	Grass Slope %	Supp Slope %	Paved Rough	Grass Rough	Supp Rough	Lag Time or Factor	Gutter Length (m)	Gutter Slope %	Gutter Flow Factor	Rainfall Multiplier
PRE-DEV/U1	N1	0.056	0	100	0	5	12	2										0				1
BYPASS/U1	N2	0.0202	0	100	0	5	12	2										0				1
UNIT1	OSD1	0.0358	86	14	0	5	9	2										0				1
PRE-DEV/U2	N4	0.0534	0	100	0	5	12	2										0				1
BYPASS/U2	N5	0.0162	0	100	0	5	12	2										0				1
UNIT2	OSD2	0.0372	86	14	0	5	9	2										0				1
PIPE DETAILS																						
Name	From	To	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Type	Dia (mm)	I.D. (mm)	Rough	Pipe Is	No. Pipes	Chg From	At Chg	Chg (m)	R (m)	Chg (m)	RL (m)	etc (m)			
Pipe1	OSD1	N3	20	156.125	153.9	11.13	uPVC, not	150	154	0.012	New	1	OSD1		0							
Pipe2	OSD2	N6	13	156.225	154.2	15.58	uPVC, not	150	154	0.012	New	1	OSD2		0							
OVERFLOW ROUTE DETAILS																						
Name	From	To	Travel Time (min)	Spill Level (m)	Crest Length (m)	Weir Coeff. C	Cross Section	Safe Depth Major (m)	Safe Depth Minor (m)	Safe Depth Stoi (m)	Bed Slope (%)	D/S Area Contributing %	Id	U/S IL	D/S IL	Length (m)						
OF1	OSD1	N3	0.1	157.6	1	1.6	4 m wide	0.3	0.15	0.4	17.78	0	21167	157.6	154.4	18						
OF2	OSD2	N6	0.1	157.6	1	1.6	4 m wide	0.3	0.15	0.4	24.62	1	26570	157.6	154.7	13						

Drains Model Data

PIT/ NODE DETAILS							
Name	Max HGL	Max Pond HGL	Max Surf. Flow Arriv (cu.m/s)	Max Pond Min Volume (cu.m)	Overflow Freeboard (cu.m/s)	Constraint	
N3	153.93			0			
N6	154.23			0			
SUB-CATCHMENT DETAILS							
Name	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)	Paved Tc (min)	Grassed Tc (min)	Supp. Tc (min)	Due to Storm
PRE-DEV U1	0.008	0	0.008	5	12		2 20% AEP, 20 min burst, Storm 5
BYPASS U1	0.003	0	0.003	5	12		2 20% AEP, 20 min burst, Storm 5
UNIT 1	0.012	0.012	0	5	9		2 20% AEP, 5 min burst, Storm 1
PRE-DEV U2	0.008	0	0.008	5	12		2 20% AEP, 20 min burst, Storm 5
BYPASS U2	0.002	0	0.002	5	12		2 20% AEP, 20 min burst, Storm 5
UNIT 2	0.012	0.012	0	5	9		2 20% AEP, 5 min burst, Storm 1
PIPE DETAILS							
Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm		
Pipe1	0.005	1.93	156.466	153.93	20% AEP, 25 min burst, Storm 6		
Pipe2	0.005	2.2	156.528	154.228	20% AEP, 25 min burst, Storm 6		
OVERFLOW ROUTE DETAILS							
Name	Max Q U/S (cu.m/s)	Max Q D/S (cu.m/s)	Safe Q (cu.m/s)	Max D (m)	Max D/V (m)	Max Width (m)	Max V (m/s)
OF1	0	0	1.307	0	0	0	0
OF2	0	0	1.292	0	0	0	0
DETENTION BASIN DETAILS							
Name	Max WL	Min Vol	Max Q Total	Max Q Low Level	Max Q High Level		
OSD1	156.73	4.7	0.005	0.005	0		
OSD 2	156.79	4.9	0.005	0.005	0		

Drains Model Results - 20% AEP

PIT/ NODEDETAILS							
Name	Max HGL	Max Pond HGL	Max Surface Flow Arriv (cu.m/s)	Max Pond Min Volume (cu.m)	Freeboard (cu.m/s)	Overflow	Constraint
N3	153.93			0			
N6	154.23			0			
SUB-CATCHMENTDETAILS							
Name	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)	Paved Tc (min)	Grassed Tc (min)	Supp. Tc (min)	Due to Storm
PRE-DEV U1	0.015	0	0.015	5	12		2 5% AEP, 15min burst, Storm 8
BYPASS U1	0.005	0	0.005	5	12		2 5% AEP, 15min burst, Storm 8
UNIT 1	0.017	0.016	0.001	5	9		2 5% AEP, 5min burst, Storm 1
PRE-DEV U2	0.014	0	0.014	5	12		2 5% AEP, 15min burst, Storm 9
BYPASS U2	0.004	0	0.004	5	12		2 5% AEP, 15min burst, Storm 9
UNIT 2	0.018	0.017	0.001	5	9		2 5% AEP, 5min burst, Storm 1
PIPE DETAILS							
Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm		
Pipe1	0.006	2.06	156.747	153.934	5% AEP, 30 min burst, Storm 8		
Pipe2	0.006	2.34	156.788	154.232	5% AEP, 30 min burst, Storm 8		
OVERFLOW ROUTE DETAILS							
Name	Max Q U/S (cu.m/s)	Max Q D/S (cu.m/s)	Safe Q (cu.m/s)	Max D (m)	Max D/V (m)	Max Width (m)	Max V (m/s)
OF1	0	0	1.307	0	0	0	0
OF2	0	0	1.292	0	0	0	0
DETENTION BASIN DETAILS							
Name	Max WL	Min Vol	Max Q Total	Max Q Low Level	Max Q High Level		
OSD1	157.04	7.4	0.006	0.006	0		
OSD2	157.08	7.6	0.006	0.006	0		

Drains Model Results - 5% AEP

PIT/ NODE DETAILS							
Name	Max HGL	Max Pond HGL	Max Surf. Flow Arriv (cu.m/s)	Max Pond Min Volume (cu.m)	Overflow Freeboard (cu.m/s)	Constraint	
N3	153.94			0			
N6	154.23			0			
SUB-CATCHMENT DETAILS							
Name	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)	Paved Tc (min)	Grassed Tc (min)	Supp. Tc (min)	Due to Storm
PRE-DEV/U1	0.023	0	0.023	5	12		2 1% AEP, 15 min burst, Storm 8
BYPASS/U1	0.008		0.008	5	12		2 1% AEP, 15 min burst, Storm 8
UNIT 1	0.024	0.023	0.001	5	9		2 1% AEP, 5 min burst, Storm 1
PRE-DEV/U2	0.022	0	0.022	5	12		2 1% AEP, 15 min burst, Storm 8
BYPASS/U2	0.007	0	0.007	5	12		2 1% AEP, 15 min burst, Storm 8
UNIT 2	0.025	0.023	0.001	5	9		2 1% AEP, 5 min burst, Storm 1
PIPE DETAILS							
Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm		
Pipe1	0.008	2.18	157.141	153.937	1% AEP, 25 min burst, Storm 9		
Pipe2	0.008	2.48	157.151	154.235	1% AEP, 25 min burst, Storm 9		
OVERFLOW ROUTE DETAILS							
Name	Max Q U/S (cu.m/s)	Max Q D/S (cu.m/s)	Safe Q (cu.m/s)	Max D (m)	Max D/V (m)	Max Width (m)	Max V (m/s)
OF1	0	0	1.307	0	0	0	0
OF2	0	0	1.292	0	0	0	0
DETENTION BASIN DETAILS							
Name	Max WL	Min Vol	Max Q Total	Max Q Low Level	Max Q High Level		
OSD1	157.47	10.63	0.008	0.008	0		
OSD2	157.48	11	0.008	0.008	0		

Drains Model Results - 1% AEP



APPROVED BY
ROBERT ELTOBBAGI
BE(CIVIL) MIEAust CPEng
NER (1052208) RPEQ (25464)
APEC Engineer InPE(Aus)

CLIENT
LUCA MASTROIANI
ARCHITECT
RJK ARCHITECTS

DRAWING TITLE
'OSD' DRAINS MODELLING DATA & RESULTS
PROPOSED DUPLEX
Lot 1, No. 79 ASHWORTH AVENUE,
BELROSE

REVISION	DRAWN	DESCRIPTION	DATE
A	EW	PRELIMINARY ISSUE	01.04.2025
B	EW	ISSUED FOR CDC	02.04.2025

DESIGNED BY	No. IN SET
EW	12
SCALE - SIZE	REVISION
NTS	B
JOB NUMBER	DRAWING No.
240392_SW	D9

EAVES GUTTER AND DOWN PIPE DESIGN TO AS/NZS 3500.3: 2021

Horizontal catchment area	Ah	= 68	sq.m
Roof Average slope	S	= 11	degrees
Intensity ARI 20 (AEP 5%)(5 min)	I	= 205	mm/hr
Is Gutter slope steeper than 1:500 ?	No		
Down pipe size selected	dia	= 100	mm
Cross referencing From Table 3.5.2 and Fig 3.5.4(A)or(B)			
Theoretical number of DPs required	Tnum	= 1.62	
Selected Number of Down pipes	n	= 2	
from AS3500 Table 3.4.3.2, C'ment Area Multiplier	f	= 1.1	
Roof Area allowing for slope	Ac	= Ah*f	
		= 74.8	sq.m
Catchment Area per DP	A	= Ac/n	sq.m
		= 37.4	sq.m
Flow/DP	q	= I*A/3600	litres/sec
		= 2.13	litres/sec
from AS/NZS 3500 fig 3.5.4(B), Gutter Area		= 9025	sq.mm
Gutter Area rounded to nearest 100sq.mm		= 9000	sq.mm
From AS/NZS 3500 Table 3.5.2, Down Pipe size		= 100	mm
Down Pipe size selected		= 100	mm
Summary			
This catchment requires :- number of DPs		= 2	
Downpipe size		= 100	mm
minimum eaves gutter cross sectional Area		= 9025	sq.mm

Notes: Catchment area of each DP to be roughly similar size.
Length of any gutter draining to a downpipe to be not longer than 12m.(NCCvol2).

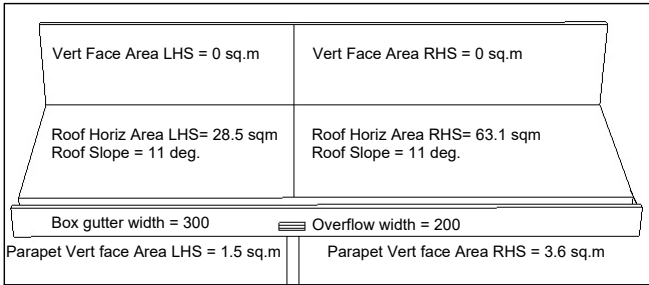
EAVES GUTTER CALCULATIONS

BOX GUTTER AND RAIN WATER HEAD DESIGN TO AS/NZS 35003:2021
BOX GUTTER 1

Design Storm Intensity	I	= 276	mm/hr
Horizontal catchment area	Ah	= 86.7	sq.m
Roof slope	S	= 11	degrees
Vertical Area	Av	= Ah*tan(S)	
		= 16.85	sq.m
from eqn 3.4.3.2(1), Catchment Area	Ac	= Ah+0.5*Av	
		= 95.1	sq.m
Flow	Q	= I*Ac/3600	Litres/sec
		= 7.29	Litres/sec
From AS/NZS 3500.3 Fig H1 (Interpolating where necessary)			
Using :- Gutter Slope	1	in	100
and Gutter Width	W	= 300	mm
from AS/NZS 3500.3 fig H1 Minimum Gutter Depth	d	= 118	mm
from AS/NZS 3500.3 fig H1 gutter depth at 1:200	d	= 125	mm
Rain Water Head Calculations			
Selected down pipe size		= 100	mm
From AS/NZS 3500.3 fig H3, Rain water head Depth		= 200	mm
From AS/NZS 3500.3 fig H3, Rain water head Length at slope 1:200		= 117	mm
Rain water Head Length increased to fit the DP - new Length		= 120	mm
Rain water Head Width		= 300	mm
Summary			
Down Pipe Size		= 100	mm
Box Gutter Width		= 300	mm
Box gutter minimum Depth		= 118	mm
Rain Water Head Depth		= 200	mm
Rain Water Head Length		= 120	mm
Rain Water Head Width		= 300	mm

BOX GUTTER #1 CALCULATIONS

BOX GUTTER AND SIDE OVERFLOW DESIGN TO AS/NZS 35003:2021
BOX GUTTER 2



Catchment areas and sizes as per diagram above

Design Storm Intensity (ARI 100)	I	= 276	mm/hr
Calculate Vertical areas.			
Roof Slope LHS = 11 deg Therefore Area Vertical rise		= roof Area*tan(Slope)	
		= 28.5*tan(11)	
		= 6	sqm
		= 6	sq.m
Total vert area LHS = roof rise + vert face = 6+0			
Roof Slope RHS= 11 deg Therefore Area Vertical rise		= roofArea*tan(Slope)	
		= 63.1*tan(11)	
		= 13	sq.m
		= 13	sq.m
Total vert area RHS = roof rise + vert face = 13+0			
Calculate LHS catchment area for each wind direction			
Ac = Ah + 1/2(Av facing wind - Av causing rain shadow)			
wind from front	Acf	= (28.5+ 0.5*(6-1.5)	
		= 30.75	sq.m
wind from back	AcB	= (28.5+ 0.5*(1.5-6)	
		= 26.25	sq.m

Calculate RHS catchment area for each wind direction
 $Ac = Ah + 1/2(Av \text{ facing wind} - Av \text{ causing rain shadow})$
wind from front

wind from back

Find worst case and design Box gutter for that condition
Largest catchment area = RHS with wind from front
Design Flow = $276 \times 67.8/3600$ therefore
from Fig H6(a)

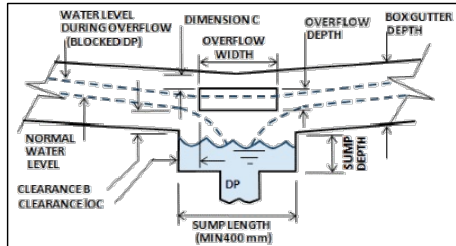
From Fig H6(b) Overflow (spitter) depth
Box gutter depth from Fig H5 $= d_{oc} + (d_{oc} + 30)$

Sump Design

Total catchment area
Therefore Flow in sump = $Ca \times 276 / 3600$
Downpipe Dia
from Fig H4 Sump Depth
From Code sump length = overflow width + $2 \times l_{oc}$

Sump length is less than Code min of 400 therefore sump length

Clearances



From Code clearance B, (Height of spitter above base of box gutter) $= 0.7 \times l_{oc}$

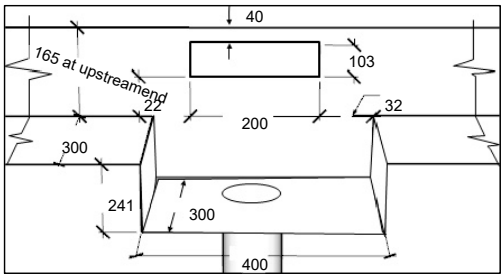
Dimension C (freeboard above spitter)=BG depth-B-O'flow depth

$$\begin{aligned}Acf &= (63.1 + 0.5 \times (13 - 3.6)) \\&= 67.8 \text{ sq.m} \\AcB &= (63.1 + 0.5 \times (3.6 - 13)) \\&= 58.4 \text{ sq.m}\end{aligned}$$

$$\begin{aligned}ca &= 67.8 \text{ sq.m} \\Q &= 5.2 \text{ L/s} \\l_{oc} &= 32 \text{ mm} \\d_{oc} &= 103 \text{ mm} \\BGd &= 165 \text{ mm}\end{aligned}$$

$$\begin{aligned}Ca &= 30.75 + 67.8 \text{ sq.m} \\Qs &= 7.5 \text{ L/s} \\Dia &= 100 \text{ mm} \\SD &= 241 \text{ mm} \\SL &= 200 + 2 \times 32 \text{ mm} \\&= 264 \text{ mm} \\&= 400 \text{ mm}\end{aligned}$$

Diagrammatic, Code required minimum sizes. (Not to scale)



DP Dia 100

Summary (minimum required sizes)

Box Gutter width	= 300	mm
Box Gutter depth (at upstream end)	= 165	mm
Overflow (spitter) width	= 200	mm
Overflow (spitter) depth	= 103	mm
Sump depth	= 241	mm
Sump width	= 300	mm
Sump length	= 400	mm
clearance d_{oc}	= 32	mm
clearance B	= 22	mm
Dimension C	= 40	mm
Downpipe Dia.	= 100	mm

BOX GUTTER #2 CALCULATIONS



**QUANTUM
ENGINEERS**

Suite 1A, Level 2, 2 Rowe
Street, EASTWOOD NSW 2122

02 9807 7800
admin@quantumengineers.com.au

quantumengineers.com.au

APPROVED BY

ROBERT ELTOBBAGI
BE(CIVIL) MIEAust CPEng
NER (1052208) RPEQ (25464)
APEC Engineer InPE(Aus)

CLIENT

LUCA MASTROIANI

ARCHITECT

RJK ARCHITECTS

DRAWING TITLE

ROOF GUTTER CALCULATIONS

PROPOSED DUPLEX

Lot 1, No. 79 ASHWORTH AVENUE,
BELROSE

REVISION

DRAWN

DESCRIPTION

DATE

DESIGNED BY

No. IN SET

A

EW

PRELIMINARY ISSUE

01.04.2025

EW

12

B

EW

ISSUED FOR CDC

02.04.2025

NTS

B

JOB NUMBER

DRAWING No.

240392_SW

D10

DUST CONTROL:

• NOTE: DURING EXCAVATION, DEMOLITION AND CONSTRUCTION, ADEQUATE MEASURES SHALL BE TAKEN TO PREVENT DUST FROM AFFECTING THE AMENITY OF THE NEIGHBORHOOD.

THE FOLLOWING MEASURES MUST BE ADOPTED:

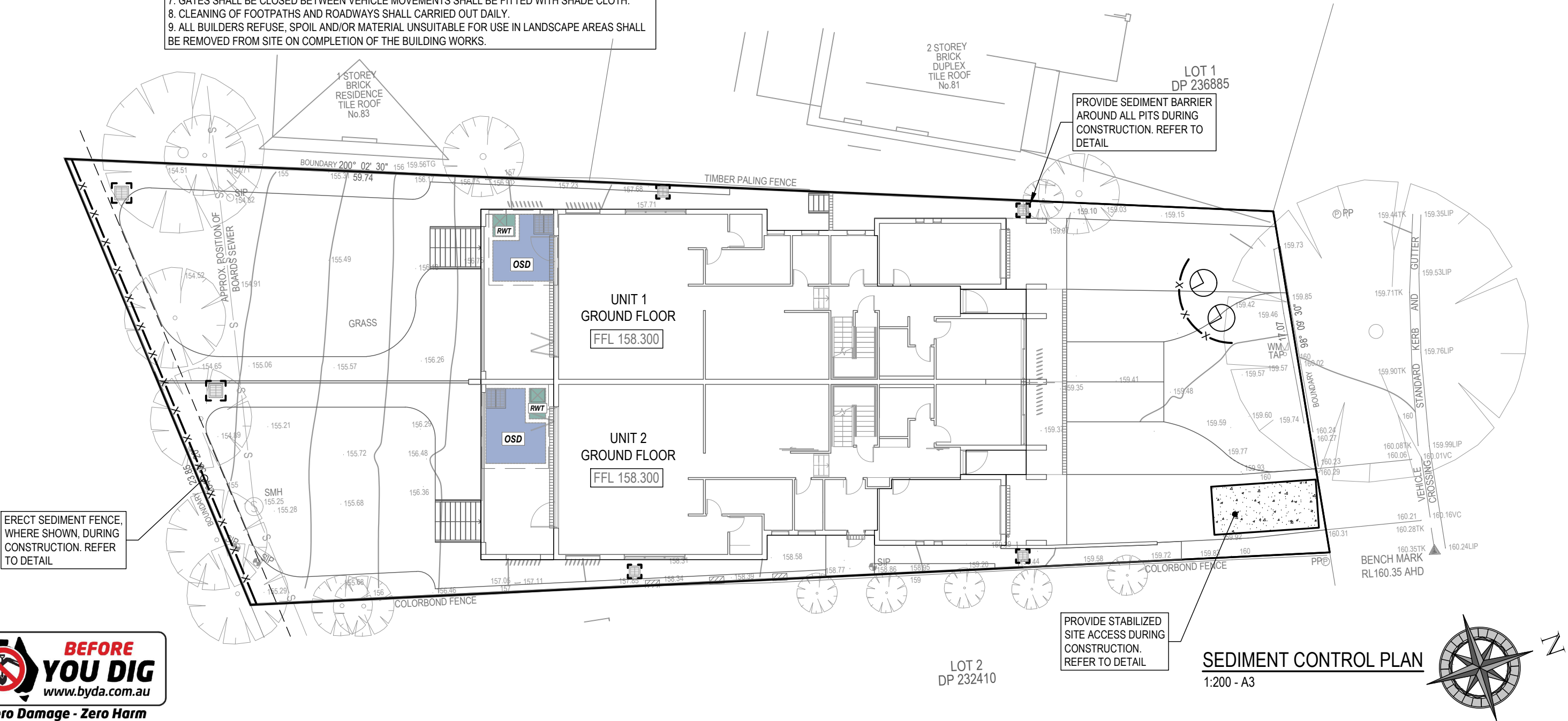
1. PHYSICAL BARRIERS SHALL BE ERECTED AT RIGHT ANGLES TO PREVENT WIND DIRECTION OR SHALL BE PLACED AROUND OR OVER DUST SOURCES TO PREVENT WIND OR ACTIVITY FROM GENERATING DUST.
2. EARTHWORKS AND SCHEDULING ACTIVITIES SHALL BE MANAGED TO COINCIDE WITH THE NEXT STAGE OF DEVELOPMENT TO MINIMISE THE AMOUNT OF TIME THE SITE IS LEFT TO CUT OR EXPOSED.
3. ALL MATERIALS SHALL BE STORED OR STOCKPILED AT THE BEST LOCATIONS.
4. THE GROUND SURFACE SHOULD BE DAMPENED SLIGHTLY TO PREVENT DUST FROM BECOMING AIRBORNE BUT SHOULD NOT BE WET TO THE EXTENT THAT RUN-OFF OCCURS.
5. ALL VEHICLES CARRYING SOIL OR RUBBLE TO OR FROM THE SITE SHALL AT ALL TIMES BE COVERED TO PREVENT THE ESCAPE OF DUST.
6. ALL EQUIPMENT WHEELS SHALL BE WASHED BEFORE EXISTING THE SITE USING MANUAL OR AUTOMATED SPRAYERS AND DRIVE - THROUGH WASHING BAYS.
7. GATES SHALL BE CLOSED BETWEEN VEHICLE MOVEMENTS SHALL BE FITTED WITH SHADE CLOTH.
8. CLEANING OF FOOTPATHS AND ROADWAYS SHALL CARRIED OUT DAILY.
9. ALL BUILDERS REFUSE, SPOIL AND/OR MATERIAL UNSUITABLE FOR USE IN LANDSCAPE AREAS SHALL BE REMOVED FROM SITE ON COMPLETION OF THE BUILDING WORKS.

NOTES:

1. ALL EROSION AND SEDIMENT CONTROL MEASURES TO BE INSPECTED AND MAINTAINED DAILY BY SITE MANAGER IN ACCORDANCE WITH COUNCIL REQUIREMENTS.
2. ALL STOCKPILES TO BE CLEAR FROM DRAINS, GUTTERS AND FOOTPATHS.
3. DRAINAGE IS TO BE CONNECTED TO STORMWATER SYSTEM AS SOON AS POSSIBLE.
4. ROADS AND FOOTPATH TO BE SWEEPED DAILY AS REQUIRED BY COUNCIL.
5. IF YOU DO NOT COMPLY WITH COUNCIL REQUIREMENTS & DOCUMENTATION, YOU MAY BE LIABLE TO PROSECUTION FROM GOVERNMENT AUTHORITIES .

LEGEND:

- UNDISTURBED VEGETATION
- SEDIMENT FENCE
- STOCK PILES
- STABILIZED SITE ACCESS
- MESH & GRAVEL INLET FILTER
- WATER DIVERSION
- STORMWATER PIT WITH SEDIMENT BARRIER



QUANTUM ENGINEERS

Suite 1A, Level 2, 2 Rowe Street, EASTWOOD NSW 2122

02 9807 7800
admin@quantumengineers.com.au
quantumengineers.com.au

APPROVED BY

ROBERT ELTOBBAGI
BE(CIVIL) MIEAust CPEng
NER (1052208) RPEQ (25464)
APEC Engineer InPE(Aus)

CLIENT

LUCA MASTROIANI

ARCHITECT

RJK ARCHITECTS

DRAWING TITLE

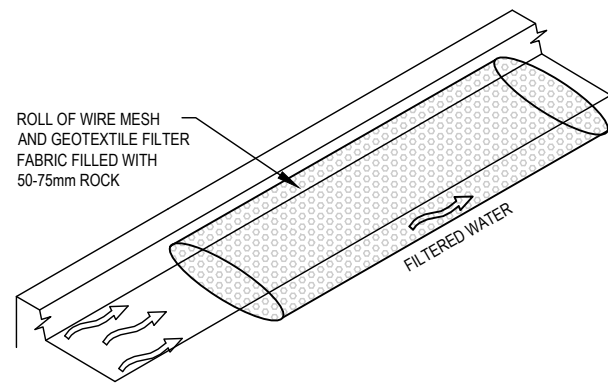
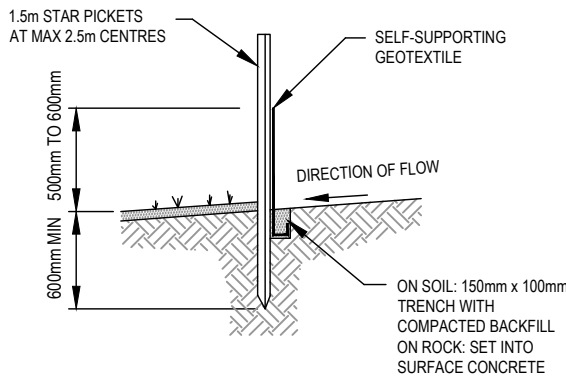
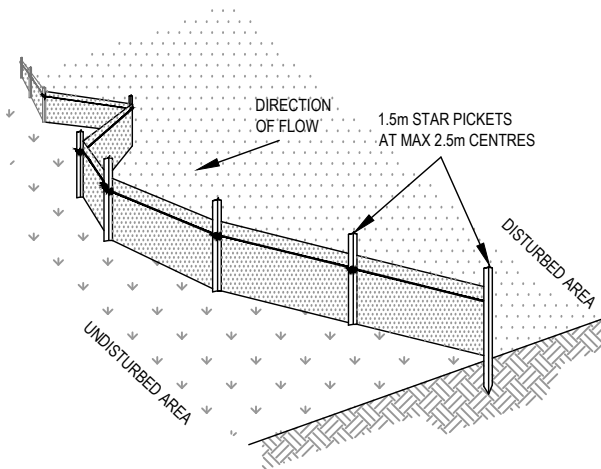
SEDIMENT CONTROL PLAN

PROPOSED DUPLEX

Lot 1, No. 79 ASHWORTH AVENUE,
BELROSE

REVISION	DRAWN	DESCRIPTION	DATE
A	EW	PRELIMINARY ISSUE	01.04.2025
B	EW	ISSUED FOR CDC	02.04.2025

DESIGNED BY	No. IN SET
EW	12
SCALE - SIZE	REVISION
1:200 - A3	B
JOB NUMBER	DRAWING No.
240392_SW	D11



MESH AND GRAVEL FILTER

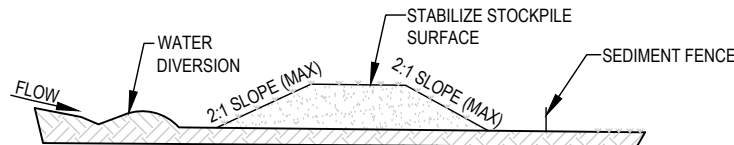
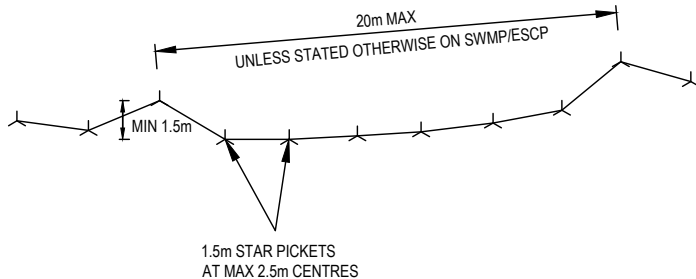
NTS

SEDIMENT FENCE DETAIL

NTS

CONSTRUCTION NOTES:

1. CONSTRUCT SEDIMENT FENCES AS CLOSE AS POSSIBLE TO BEING PARALLEL TO THE CONTOURS OF THE SITE, BUT WITH SMALL RETURNS AS SHOWN IN THE DRAWING TO LIMIT THE CATCHMENTS AREA OF ANY ONE SECTION. THE CATCHMENTS AREA SHOULD BE SMALL ENOUGH TO LIMIT WATER FLOW IF CONCENTRATED AT ONE POINT TO 50 LITRES PER SECOND IN THE DESIGN STORM EVENT, USUALLY THE 10 YEAR EVENT.
2. CUT A 150mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
3. DRIVE 1.5m LONG STAR PICKETS INTO GROUND AT 2.5m INTERVALS (MAX) AT THE DOWNSLOPE EDGE OF THE TRENCH. ENSURE ANY STAR PICKETS ARE FITTED WITH SAFETY CAPS.
4. FIX SELF-SUPPORTING GEOTEXTILE TO THE UPSLOPE SIDE OF THE POSTS ENSURING IT GOES TO THE BASE OF THE TRENCH. FIX THE GEOTEXTILE WITH WIRE TIES OR AS RECOMMENDED BY THE MANUFACTURER. ONLY USE GEOTEXTILE SPECIFICALLY PRODUCED FOR SEDIMENT FENCING. THE USE OF SHADE CLOTH FOR THIS PURPOSE IS NOT SATISFACTORY.
5. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH 150mm OVERLAP.
6. BACKFILL THE TRENCH OVER THE BASE OF THE FABRIC AND COMPACT IT THOROUGHLY OVER THE GEOTEXTILE.

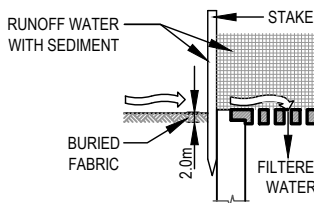


STOCKPILE

NTS

NOTE:

1. PLACE STOCKPILES MORE THAN 2 (PREFERABLY 5) METRES FROM EXISTING VEGETATION, CONCENTRATED WATER FLOW, ROADS AND HAZARD AREAS.
2. CONSTRUCT ON THE CONTOUR AS LOW, FLAT, ELONGATED MOUNDS.
3. WHERE THERE IS SUFFICIENT AREA, TOPSOIL STOCKPILES SHALL BE LESS THAN 2 METRES IN HEIGHT.
4. WHERE THEY ARE TO BE IN PLACE FOR MORE THAN 10 DAYS, STABILIZE FOLLOWING THE APPROVED ESCP OR SWMP TO REDUCE THE C-FACTOR TO LESS THAN 0.10.
5. CONSTRUCT EARTH BANKS (LOW FLOW) ON THE UPSLOPE SIDE TO DIVERT WATER AROUND STOCKPILES AND SEDIMENT FENCES 1 TO 2 METRES ON THE DOWNSLOPE.

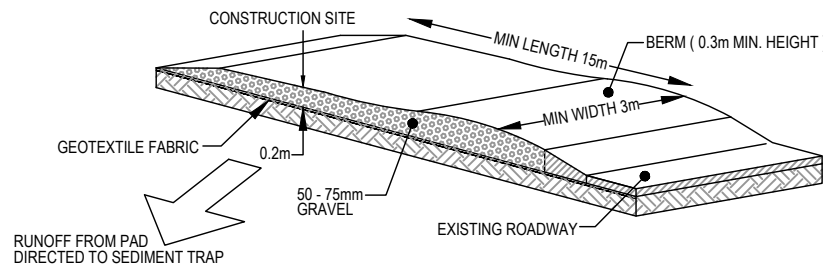


SEDIMENT BARRIER AROUND PIT

NTS

CONSTRUCTION NOTES:

1. FABRICATE A SEDIMENT BARRIER MADE FROM GEOTEXTILE OR STRAW BALES.
2. FOLLOW STRAW FILTER AND SEDIMENT FENCE FOR INSTALLATION PROCEDURES FOR THE STRAW BALES OR GEOTEXTILE. REDUCE THE PICKET SPACING TO 1 METRE CENTRES.
3. IN WATERWAYS, ARTIFICIAL SAG POINTS CAN BE CREATED WITH SANDBAGS OR EARTH BANKS AS SHOWN IN THE DRAWING.
4. DO NOT COVER THE INLET WITH GEOTEXTILE UNLESS THE DESIGN IS ADEQUATE TO ALLOW FOR ALL WATERS TO BYPASS IT.



STABILIZED SITE ACCESS

NTS

CONSTRUCTION NOTES:

1. STRIP THE TOPSOIL, LEVEL THE SITE AND COMPACT THE SUBGRADE
2. COVER THE AREA WITH NEEDLE-PUNCHED GEOTEXTILE
3. CONSTRUCT A 200mm THICK PAD OVER THE GEOTEXTILE USING ROAD BASED OR 30mm AGGREGATE
4. ENSURE THE STRUCTURE IS AT LEAST 15m LONG OR TO BUILD ALIGNMENT AND AT LEAST 3 METRES WIDE.
5. WHERE A SEDIMENT FENCE JOINS ONTO THE STABILIZED ACCESS, CONSTRUCT A HUMP IN THE STABILIZED ACCESS TO DIVERT WATER TO THE SEDIMENT FENCE.



**QUANTUM
ENGINEERS**

Suite 1A, Level 2, 2 Rowe
Street, EASTWOOD NSW 2122

02 9807 7800
admin@quantumengineers.com.au

quantumengineers.com.au

APPROVED BY

ROBERT ELTOBBAGI

BE(CIVIL) MIEAust CPEng
NER (1052208) RPEQ (25464)
APEC Engineer InPE(Aus)

CLIENT

LUCA MASTROIANI

ARCHITECT

RJK ARCHITECTS

DRAWING TITLE

SEDIMENT DETAILS

PROPOSED DUPLEX

Lot 1, No. 79 ASHWORTH AVENUE,
BELROSE

REVISION

DRAWN

DESCRIPTION

DATE

DESIGNED BY

No. IN SET

A

EW

PRELIMINARY ISSUE

01.04.2025

EW

12

B

EW

ISSUED FOR CDC

02.04.2025

AS NOTED - A3

B

JOB NUMBER

DRAWING No.

240392_SW

D12