



IGS INTEGRATED
GROUP
SERVICES

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45 McLaren Street, North Sydney

On-Site Detention (OSD) DRAINS Report

26 February 2024

Project No. EN-N22 - 314



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Document Control

Version	Date	Issue	Author		Reviewer	
01	11 th May 2023	Draft	Prabeg Sharma	PS	Bill Masri	BM
02	17 TH May 2023	For Approval	Prabeg Sharma	PS	Bill Masri	BM
03	26 th Feb 2024	For Approval	Prabeg Sharma	PS	Prabeg Sharma	PS

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DRAINS ANALYSIS FOR 45 McLaren Street, North Sydney

IGS has been engaged to provide stormwater design for the proposed development at 45 McLaren Street, North Sydney. This site is approximately 1794.00 m² and lies within North Sydney LGA.

The purpose of this assessment is to demonstrate that the OSD volume provided will allow for the detention of stormwater runoff resulting from 1% AEP storm events, and the Permissible Site Discharge (PSD) is limited to the maximum discharge from the site during the 20% AEP of 1-hour duration storm event under the undeveloped site conditions.

Drains Hydrological model was used with the IL-CL Hydrological Model. The model adopted ARR 2019 procedures. IFD was obtained from the Bureau of Meteorology, and the temporal patterns were obtained from the ARR Data Hub.

The summary of the Drains Analysis is presented below.

RAIN FALL EVENTS	PRE PSD (L/S)	POST PSD (L/S)	REQUIRED SSR (LITRES)	PROVIDED SSR (LITRES)
20% AEP	54 l/s	34 l/s	18,000	38,500
1% AEP	104 l/s	52 l/s	37,200	38,500



Figure 1: Locality Map (Source: Google Maps).



1 DRAINS ANALYSIS DURING 20% AEP

Drains Model Input Layout

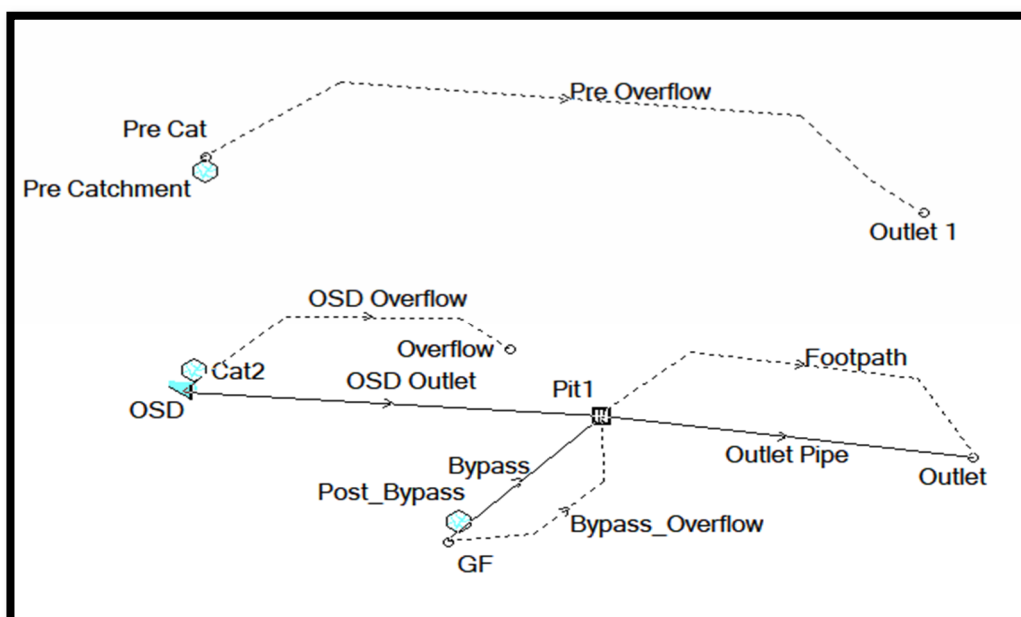


Figure 2: Drains Model Input Layout.

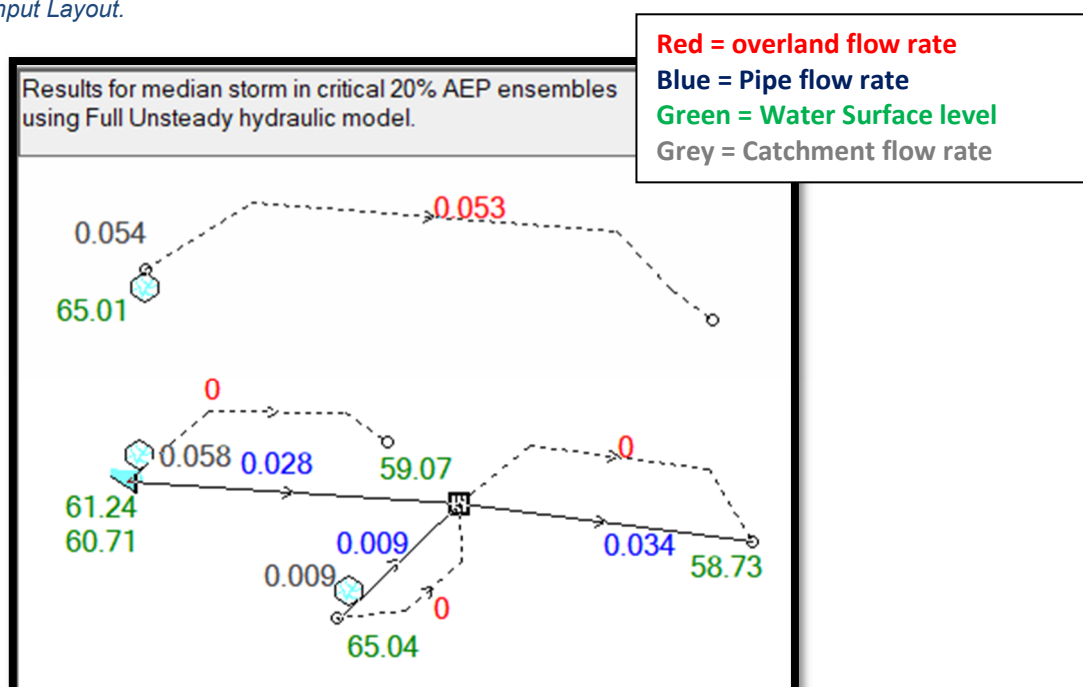


Figure 3: Drains Model for 20% AEP.

- Existing Site Discharged (20% AEP) = 53 l/s (Approx.)
- Post Development Discharge (20% AEP) = 34 l/s (Approximate)
- Required OSD Volume = 18.00 m³ (Approximate)
- Provided OSD Volume = 38.50 m³ (Approximate)
- Orifice OSD = 135 mm
- Centre of Orifice = 60.75 m AHD



2 DRAINS ANALYSIS DURING 1% AEP

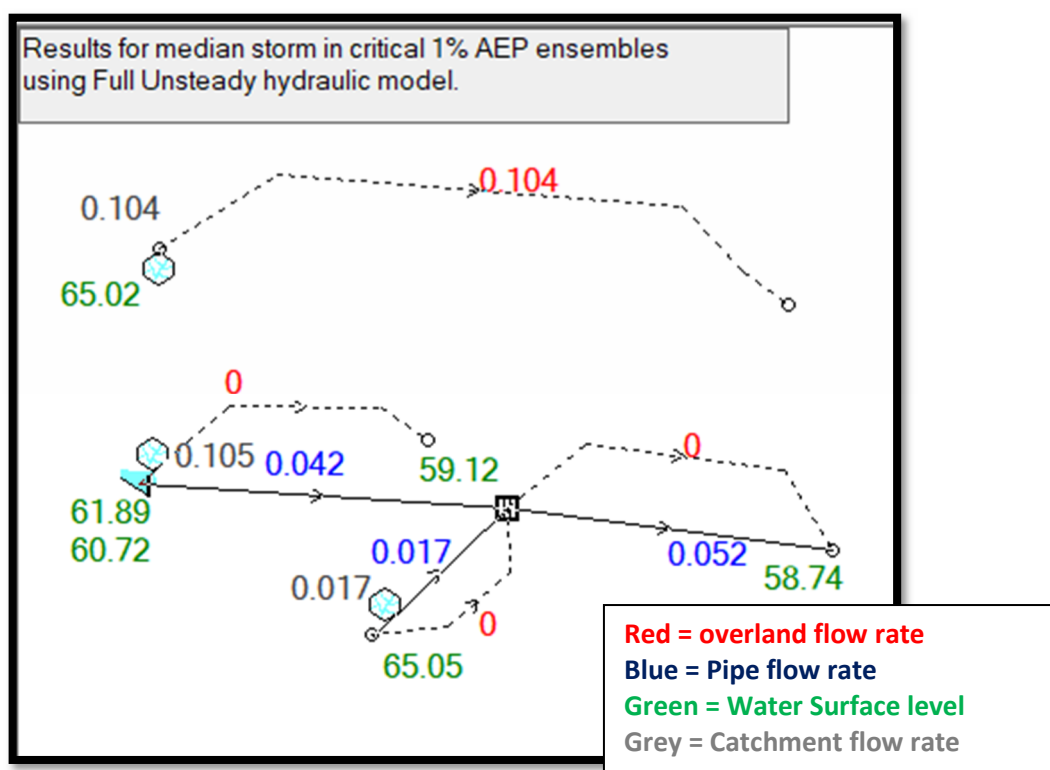


Figure 4: Drains Model for 1% AEP

- Existing Site Discharged 1% AEP = 104 l/s (Approx.)
- Post Development Discharge 1% AEP = 52 l/s (Approximate)
- Required OSD Volume = 37.20 m³ (Approximate)
- Provided OSD Volume = 38.00 m³ (Approximate)
- Orifice OSD = 135 mm
- Centre of Orifice = 60.75 m AHD



3 RAINFALL INTENSITY

Table

Chart

Unit: mm

	Annual Exceedance Probability (AEP)						
Duration	63.2%	50%#	20%*	10%	5%	2%	1%
1 min	2.44	2.74	3.69	4.34	4.98	5.85	6.52
2 min	4.07	4.53	6.00	7.02	8.02	9.43	10.6
3 min	5.64	6.29	8.36	9.78	11.2	13.2	14.7
4 min	7.06	7.89	10.5	12.3	14.2	16.6	18.6
5 min	8.34	9.34	12.5	14.7	16.8	19.8	22.1
10 min	13.2	14.8	19.9	23.5	27.0	31.7	35.3
15 min	16.4	18.5	24.9	29.4	33.8	39.6	44.1
20 min	18.9	21.2	28.6	33.7	38.8	45.5	50.6
25 min	20.9	23.4	31.5	37.1	42.7	50.1	55.8
30 min	22.5	25.2	34.0	40.0	45.9	53.9	60.0
45 min	26.3	29.5	39.5	46.4	53.3	62.6	69.9
1 hour	29.2	32.7	43.7	51.3	58.9	69.2	77.4
1.5 hour	33.7	37.6	50.1	58.9	67.6	79.7	89.3
2 hour	37.3	41.6	55.4	65.1	74.8	88.4	99.2
3 hour	43.3	48.2	64.1	75.5	87.1	103	116
4.5 hour	50.5	56.3	75.1	88.7	103	122	138
6 hour	56.7	63.2	84.7	100	116	139	157
9 hour	67.1	75.0	101	120	140	168	190
12 hour	75.9	85.0	115	138	161	193	219
18 hour	90.2	101	139	167	196	235	267
24 hour	102	115	158	191	224	269	305
30 hour	111	126	175	210	247	297	337
36 hour	119	135	188	227	267	321	363
48 hour	133	151	211	254	298	358	405
72 hour	151	172	241	290	339	406	457
96 hour	163	186	260	311	363	432	485
120 hour	171	195	272	325	378	447	500
144 hour	177	201	279	333	386	456	508
168 hour	181	206	285	338	392	460	511

Figure 5: Rainfall Intensity Chart (Source: BOM).



4 SUMMARY

As per the results obtained from this analysis, the proposed OSD volume is sufficient to cater to stormwater resulting from 1% AEP storm events. The Permissible Site Discharge (PSD) is limited to the maximum discharge from the site during 20% AEP storm events under undeveloped site conditions.

This result complies with the North Sydney Council's OSD Requirements.

DATA

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 Loss	Inflow Hydrograph	Pit is New	Internal Width (mm)	Inflow is Misaligned (m)	Minor Safe Pond Depth (m)	Major Safe Pond Depth (m)
Outlet 1	Node					59.15		0		904.861	-280.556		3	No					
Pit1	OnGrade	CUSTOMIS	600X600		1.5	59.66		0	0	764	-382	No	7	1 x Ku	No	New	No		
Outlet	Node					59.36		0		926.897	-403.117		8	No					
Pre Catchment	Node							0		590.278	-252.778		37	No					
Overflow	Node					64		0		724.016	-348.663		2384	509	No				
GF	Node					65.47		0		696.528	-445.756		1197	6683	No				

DETENTION BASIN DETAILS

Name	Elev	Surf. Area	Not Used	Outlet Type	K	Dia(mm)	Centre RL	Pit Family	Pit Type	x	y	HED	Crest RL	Crest Length	id
OSD	60.5	1		Orifice		135	60.75				581	-370	No		6
	60.75	30													
	62	30													
	62.35	30													

SUB-CATCHMENT DETAILS

Name	Pit or Node	Total Area (ha)	EIA %	Perv Area %	RIA %	EIA Time (min)	Perv Time (min)	RIA Time (min)	EIA Length (m)	Perv Length (m)	RIA Length (m)	EIA Slope(%)	Perv Slope %	RIA Slope %	EIA Rough	Perv Rough	RIA Rough	Rainfall Multiplier
Cat2	OSD	0.154		90	10	0	5	8	2									1
Pre Cat	Pre Catchment	0.179		60	40	0	5	8	2									1
Post_Bypass	GF	0.025		90	10	0	5	8	2									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)	RI (m)	Chg (m)	RL (m)	etc (m)
OSD Outlet	OSD	Pit1	20	60.64	59.21	7.15	uPVC, not i	225	242	0.012	NewFixed	1	OSD		0				
Outlet Pipe	Pit1	Outlet	3.5	58.91	58.65	7.43	uPVC, unde	225	242	0.012	New	1	Pit1		0				
Bypass	GF	Pit1	40	65	59.21	14.48	uPVC, not i	150	154	0.012	New	1	GF		0				

DETAILS of SERVICES CROSSING PIPES

Pipe	Chg (m)	Bottom Elev (m)	Height of S (m)	Chg (m)	Bottom Elev (m)	Height of S (m)	Chg (m)	Bottom Elev (m)	Height of S (m)	etc
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CHANNEL DETAILS

Name	From	To	Type	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Base Width (m)	L.B. Slope (1:?)	R.B. Slope (1:?)	Manning n	Depth (m)	Roofed
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OVERFLOW ROUTE DETAILS

Name	From	To	Travel Time (min)	Spill Level (m)	Crest Length (m)	Weir Coeff. C	Cross Section	Safe Depth Major (m)	SafeDepth Minor (m)	Safe DxV (sq.m/sec)	Bed Slope (%)	D/S Area Contributing %	id	U/S IL	D/S IL	Length (m)	
OSD Overflow	OSD	Overflow	0.1	62.35		0.3	1.7 Dummy us	0.2	0.05	0.6	1	0		9	62.35	62.25	5
Footpath	Pit1	Outlet	0.1				Footpath	0.1	0.1	0.6	1	0	11563	764	59.66	59.36	3.5
Pre Overflow	Pre Catchment	Outlet 1	0.4				Dummy us	0.2	0.05	0.6	1	0		4	65	59.15	40
Bypass_Overflow	GF	Pit1	0.4				Dummy us	0.2	0.05	0.6	1	0	12017	727	65.47	59.66	41

PIPE COVER DETAILS

Name	Type	Dia (mm)	Safe Cover	Cover (m)
OSD Outlet	uPVC, not under r	242	0.3	-0.39
Outlet Pipe	uPVC, under road	242	0.5	0.46
Bypass	uPVC, not under r	154	0.3	0.29

This model has no pipes with non-return valves

20% AEP RESULTS

DRAINS results prepared from Version 2023.11.8726.15750

PIT / NODE DETAILS

		Version 8				
Name	Max HGL	Max Pond HGL	Max Surface Flow (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s) Constraint
Pit1	59.07		0		0.59	0 None
Outlet	58.73		0			
Pre Catcher	65.01		0.072			
GF	65.04		0.011			

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	EIA Max Q (cu.m/s)	Remaining EIA Max Q (cu.m/s)	EIA Tc (cu.m/s)	RIA Tc (min)	PA Tc (min)	Due to Storm (min)
Cat2	0.058	0.057	0.002	5	2	2	8 20% AEP, 5 min burst, Storm 1
Pre Cat	0.054	0.035	0.018	5	2	2	8 20% AEP, 10 min burst, Storm 8
Post_Bypass	0.009	0.009	0	5	2	2	8 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
OSD Outlet	0.028	2.69	60.859	59.277	20% AEP, 20 min burst, Storm 4
Outlet Pipe	0.034	2.77	59.06	58.725	20% AEP, 15 min burst, Storm 4
Bypass	0.009	2.73	65.038	59.246	20% AEP, 5 min burst, Storm 1

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm
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OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
OSD Overfl	0	0	0.362	0	0	0	0	0
Footpath	0	0	0.169	0	0	0	0	0
Pre Overflc	0.053	0.053	0.362	0.014	0.01	7.09	1.05	20% AEP, 10 min burst, Storm 8
Bypass_Ov	0	0	0.362	0	0	0	0	0

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level
OSD	61.24	17.6	0.028	0.028	0

No water upwelling from any pit.
Freeboard was adequate at all pits.

Flows were safe in all overflow routes.

1% AEP RESULTS

DRAINS results prepared from Version 2023.11.8726.15750

PIT / NODE DETAILS

Version 8

Name	Max HGL	Max Pond HGL	Max Surface Flow (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
Pit1	59.12		0		0.54	0	None
Outlet	58.74		0				
Pre Catcher	65.02		0.137				
GF	65.05		0.021				

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	EIA Max Q (cu.m/s)	Remaining EIA Max Q (cu.m/s)	EIA Tc (cu.m/s)	RIA Tc (min)	PA Tc (min)	Due to Storm (min)
Cat2	0.105	0.1	0.005	5	2	2	8 1% AEP, 5 min burst, Storm 1
Pre Cat	0.104	0.063	0.042	5	2	2	8 1% AEP, 10 min burst, Storm 7
Post_Bypass	0.017	0.016	0.001	5	2	2	8 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
OSD Outlet	0.042	2.89	61.406	59.295	1% AEP, 20 min burst, Storm 8
Outlet Pipe	0.052	3.09	59.096	58.745	1% AEP, 20 min burst, Storm 4
Bypass	0.017	3.01	65.052	59.262	1% AEP, 5 min burst, Storm 1

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm
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OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
OSD Overfl	0	0	10.912	0	0	0	0	0
Footpath	0	0	0.169	0	0	0	0	0
Pre Overflc	0.104	0.104	10.912	0.018	0.02	9.23	1.22	1% AEP, 10 min burst, Storm 7
Bypass_Ov	0	0	10.912	0	0	0	0	0

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level
OSD	61.89	37.1	0.042	0.042	0

No water upwelling from any pit.
Freeboard was adequate at all pits.

Flows were safe in all overflow routes.

1. ALL WORKS ARE TO BE UNDERTAKEN IN ACCORDANCE WITH THE FOLLOWING AUSTRALIAN STANDARDS AS2032, AS3500 AND AS3725 AS A MINIMUM.
2. THESE PLANS ARE TO BE READ IN CONJUNCTION WITH THE FOLLOWING:
 - 2.1. ARCHITECTURAL PLANS BATES SMART, REVISION: 5, DATED 28.04.2023 , CONTACT: (02) 8354 5100
 - 2.2. STORMWATER MANGEMENT DRAINS REPORT BY IGS DATED 11 MAY 2023.
3. ALL PIPES LESS THAN OR EQUAL TO Ø300mm IN SIZE ARE TO BE SOLVENT WELD-JOINTED UPVC CLASS SN8 U.N.O.
4. ALL PIPES Ø375mm OR GREATER IN SIZE ARE TO BE MIN. CLASS 2 REINFORCED CONCRETE PIPE (RCP) OR FIBRE REINFORCED CONCRETE (FRC) RUBBER RING JOINTED (RRJ) U.N.O.
5. ALL PIPES ARE TO BE LAID AT MIN. 1.0% GRADE U.N.O.
6. PIPE BEDDING IS TO BE HS2 UNDER ROADS AND TRAFFICKED AREAS AND SHALL BE H2 IN LANDSCAPED AND PEDESTRIAN TRAFFICKED AREAS U.N.O.
7. ALL PIPE BENDS AND JUNCTIONS ARE TO BE MADE WITH EITHER PURPOSE MADE FITTINGS OR STORMWATER DRAINAGE PITS.
8. MINIMUM COVER FROM THE OBVERT OF THE STORMWATER PIPE OF 300mm IS TO BE PROVIDED IN LANDSCAPED AREAS AND 600mm IN VEHICULAR TRAFFICKED AREAS U.N.O.
9. WHERE MINIMUM COVER CANNOT BE ACHIEVED CONCRETE ENCASEMENT OF THE AFFECTED PIPE IS MAY BE UNDERTAKEN WITH 20MPa CONCRETE WITH A MIN. COVER OF 150mm TO ALL SIDES OF THE PIPE. THE CONTRACTOR SHALL CONFIRM THIS REQUIREMENT WITH THE ENGINEER OR SUPERINTENDENT.
10. LAID PIPELINES ARE TO HAVE THE FOLLOWING CONSTRUCTED TOLERANCES:
 - a. HORIZONTAL-1:300 ANGULAR DEVIATION FROM REQUIRED ALIGNMENT;
 - b. VERTICAL-1:300 ANGULAR DEVIATION FROM REQUIRED ALIGNMENT.
10. ALL DRAINAGE PITS ARE TO BE CAST IN-SITU. PRECAST DRAINAGE PITS MAY BE USED WITH APPROVAL FROM THE ENGINEER. THE CONTRACTOR SHALL SUBMIT A PRECAST PIT INSTALLATION WORK METHOD STATEMENT FOR ASSESSMENT BY THE ENGINEER FOR APPROVAL.
11. DRAINAGE PIT COVERS ARE TO BE EITHER GALVANISED STEEL OR CAST IRON CLASS 'B' IN LANDSCAPED AND PEDESTRIAN TRAFFICKED AREAS AND CLASS 'D' IN ALL VEHICULAR TRAFFICKED AREAS U.N.O.
12. DRAINAGE PIT COVERS ARE TO BE 'HEELSAFE' TYPE IN ALL PEDESTRIAN TRAFFICKED AREAS U.N.O.
13. EXISTING STORMWATER PIT LOCATIONS AND INVERT LEVELS TO BE CONFIRMED PRIOR TO COMMENCING WORKS ON SITE.
14. PROVIDE CLEANING EYES (RODDING POINTS) TO PIPES AT ALL CORNERS AND T-JUNCTIONS WHERE NO PITS ARE PRESENT.
15. DOWN PIPES CONNECTED DIRECT TO PIPES TO BE CONNECTED AT 45° TO THE FLOW DIRECTION WITH A CLEANING EYE PROVIDED AT GROUND LEVEL.

1. ALL WORKS ARE TO BE UNDERTAKEN IN A SAFE MANNER IN ACCORDANCE WITH ALL STATUTORY AND INDUSTRIAL RELATION REQUIREMENTS.
2. ACCESS TO ADJACENT BUILDINGS AND PROPERTIES SHALL BE MAINTAINED AT ALL TIMES.
3. WHERE NECESSARY SAFE PASSAGE SHALL BE PROVIDED FOR VEHICLES AND PEDESTRIANS THROUGH OR ADJACENT TO THE SITE.

1. ALL WORKS ARE TO BE UNDERTAKEN IN ACCORDANCE WITH LOCAL COUNCIL, AUSTRALIAN AND AUTHORITY STANDARDS.
2. ALL TRENCHING WORKS ARE TO BE RESTORED TO ORIGINAL CONDITION.
3. THE INTEGRITY OF ALL EXISTING AND NEW SERVICES IS TO BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD.
4. ALL PLANS ARE TO BE READ IN CONJUNCTION WITH APPROVED ARCHITECTS, STRUCTURAL ENGINEERS AND OTHER CONSULTANT'S PLANS. ANY DISCREPANCIES ARE TO BE NOTIFIED TO THE ENGINEER FOR CLARIFICATION.
5. THE ENGINEER SHALL BE GIVEN A MIN. OF 48 HOURS NOTICE FOR ALL STORMWATER DRAINAGE AND PAVEMENT INSPECTIONS. CONCRETE SHALL NOT BE DELIVERED UNTIL ENGINEERS APPROVAL IS OBTAINED.

1. THIS SITE IS LOCATED WITHIN NORTH SYDNEY COUNCIL. AS PER NORTH SYDNEY COUNCIL STORMWATER POLICY THIS SITE REQUIRES APPROXIMATELY 37,200 LITRES OF OSD VOLUME - REFER TO OSD CALCULATION REPORT BY IGS.
2. PROVIDED 5,000 LITRES RAINWATER TANK AS PER BASIX REQUIREMENTS.
3. PLEASE REFER TO CIVIL DESIGN BY ROBERT BIRD GROUP FOR CONNECTION TO COUNCIL'S STORMWATER NETWORK.
4. STORMWATER PLANS ARE SUBJECTED TO COUNCIL APPROVAL
5. ISSUE 03 - OSD LOCATION ALTERED TO AVOID TPZ.

	FLOW DIRECTION
	SERVICES TAG
	SERVICES DIAMETER
	FLOW DIRECTION
	CONTINUATION ARROW
	RISER/TEE RISER SYMBOL
	DROPPER SYMBOL
	TEE DROP SYMBOL
	PIPE FLOW SYMBOL PRESSURE
	CAP SERVICE
	SERVICES CONTINUOUS
	SERVICES UNKNOWN CONTINUATION
	CONNECTION TO EXISTING

	RAINWATER DRAINAGE
	STORMWATER
	STORMWATER RISING MAIN
	AUTHORITY STORM WATER MAIN
	PERFORATED AGG LINE

Diagram illustrating various stormwater infrastructure components:

- PROPOSED STORMWATER PITS GRATE / SOLID COVER
- PROPOSED KERB INLET PIT
- EXISTING STORMWATER PITS GRATE / SOLID COVER
- EXISTING KERB INLET PIT
- RAINWATER OUTLET

DP	DOWNPIPE
IL	INVERT LEVEL
OF	OVERFLOW
RL	REDUCED LEVEL
RWO	RAINWATER OUTLET
SYDP	SYPHONIC DOWNPIPE
STW	STORMWATER



LOCATION PLAN

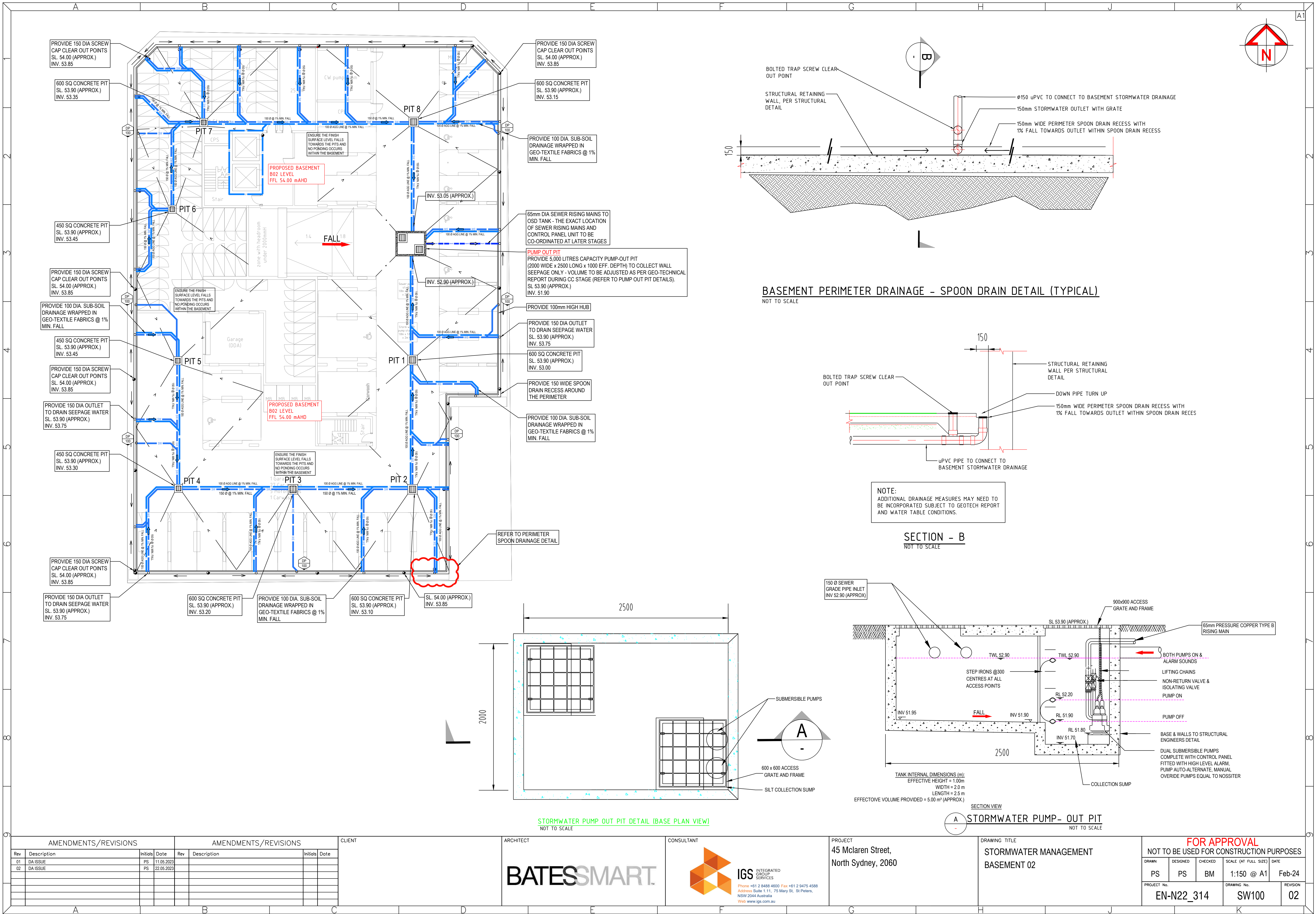
NOT TO SCALE

SW000 - STORMWATER LEGEND AND COVER SHEET

SW100 - BASEMENT 02
SW101 - BASEMENT 01
SW102 - LEVEL 00 LOWER
SW103 - LEVEL 00
SW104 - LEVEL 00 UPPER

SW200 - OSD PLAN

[illegible]



AMENDMENTS/REVISIONS				AMENDMENTS/REVISIONS			
Rev	Description	Initials	Date	Rev	Description	Initials	Date
01	DA ISSUE	PS	11.05.2023				
02	DA ISSUE	PS	22.05.2023				

CLIENT			

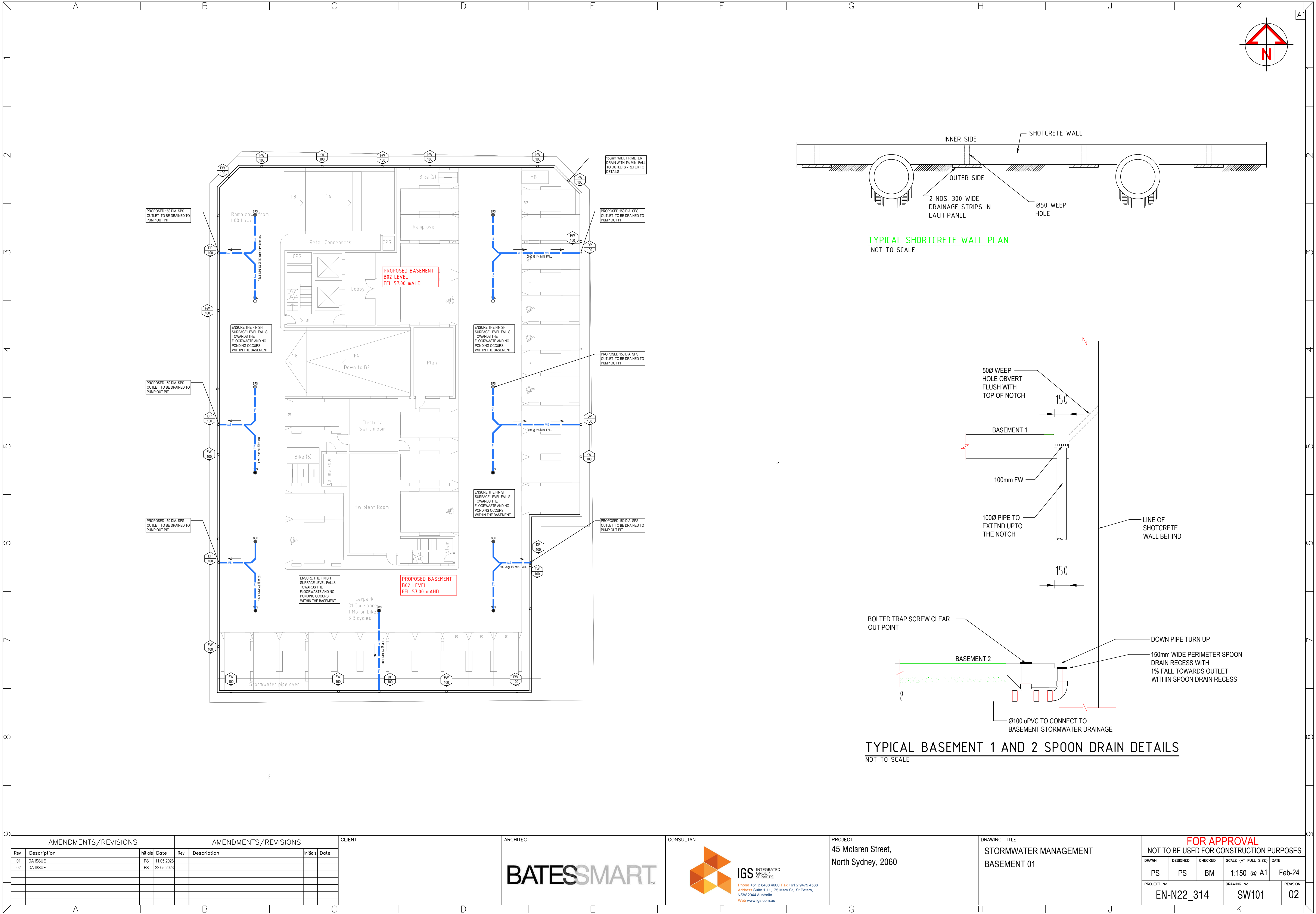
ARCHITECT	
BATESSMART	

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Phone +61 2 8458 4600 Fax +61 2 9475 4588	
Address Suite 1.11, 75 Mary St, St Peters, NSW 2044 Australia	
Web www.igs.com.au	

PROJECT	
45 McLaren Street, North Sydney, 2060	

DRAWING TITLE	
STORMWATER MANAGEMENT BASEMENT 02	

NOT TO BE USED FOR CONSTRUCTION PURPOSES			
DRAWN	DESIGNED	CHECKED	SCALE (AT FULL SIZE)
PS	PS	BM	1:150 @ A1
PROJECT No.		DRAWING No.	REVISION
EN-N22_314		SW100	02



AMENDMENTS/REVISIONS				AMENDMENTS/REVISIONS			
Rev	Description	Initials	Date	Rev	Description	Initials	Date
01	DAISSUE	PS	11.05.2023				
02	DAISSUE	PS	22.05.2023				

CLIENT	

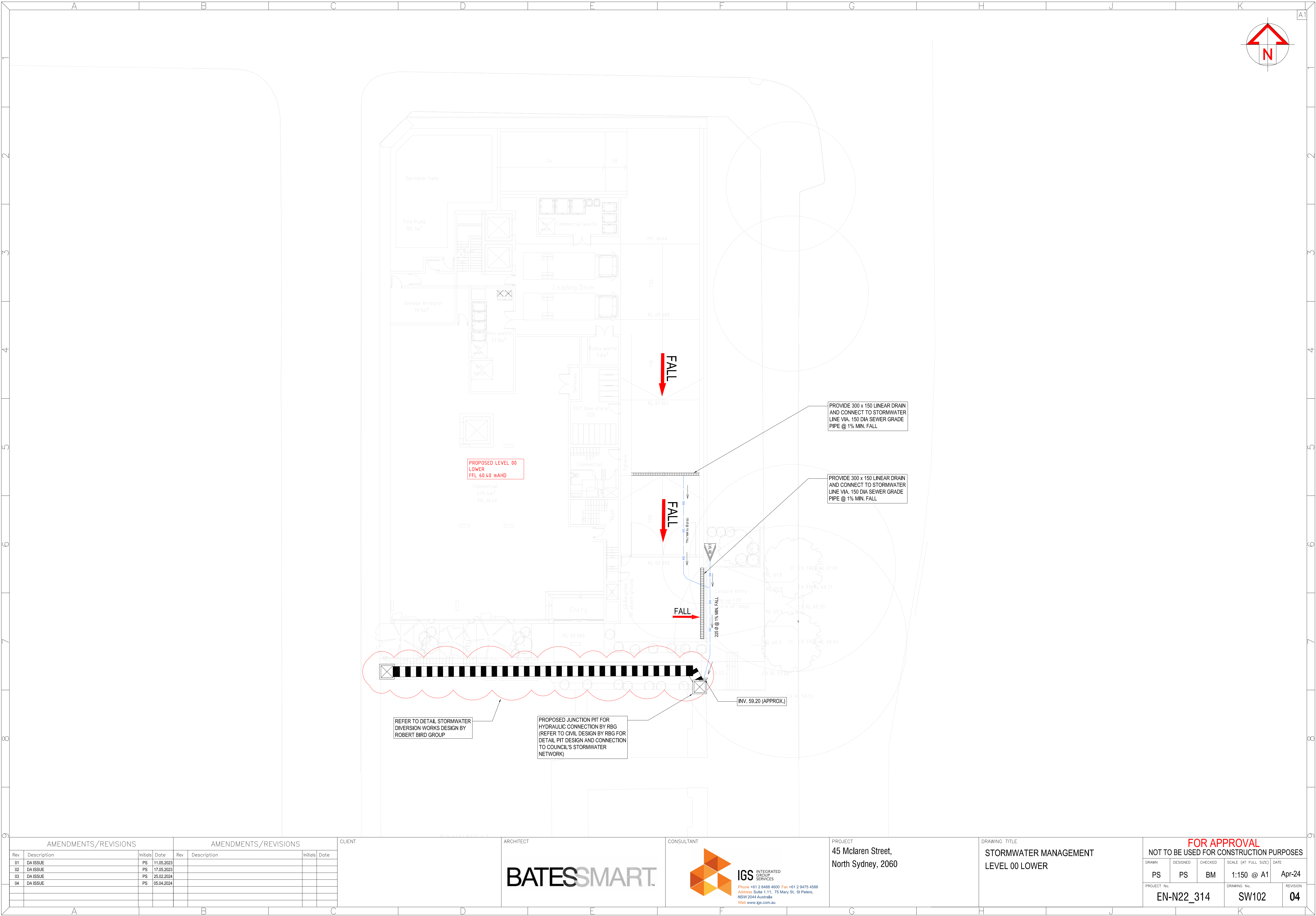
ARCHITECT	
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PROJECT	
45 McLaren Street, North Sydney, 2060	

DRAWING TITLE	
STORMWATER MANAGEMENT BASEMENT 01	

FOR APPROVAL NOT TO BE USED FOR CONSTRUCTION PURPOSES				
DRAWN	DESIGNED	CHECKED	SCALE (AT FULL SIZE)	DATE
PS	PS	BM	1:150 @ A1	Feb-24
PROJECT No.		DRAWING No.		REVISION
EN-N22_314		SW101		02



AMENDMENTS/REVISIONS				AMENDMENTS/REVISIONS			
Rev	Description	Initials	Date	Rev	Description	Initials	Date
01	DA ISSUE	PS	11.05.2023				
02	DA ISSUE	PS	17.05.2023				
03	DA ISSUE	PS	25.02.2024				
04	DA ISSUE	PS	05.04.2024				

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45 McLaren Street,
North Sydney, 2060

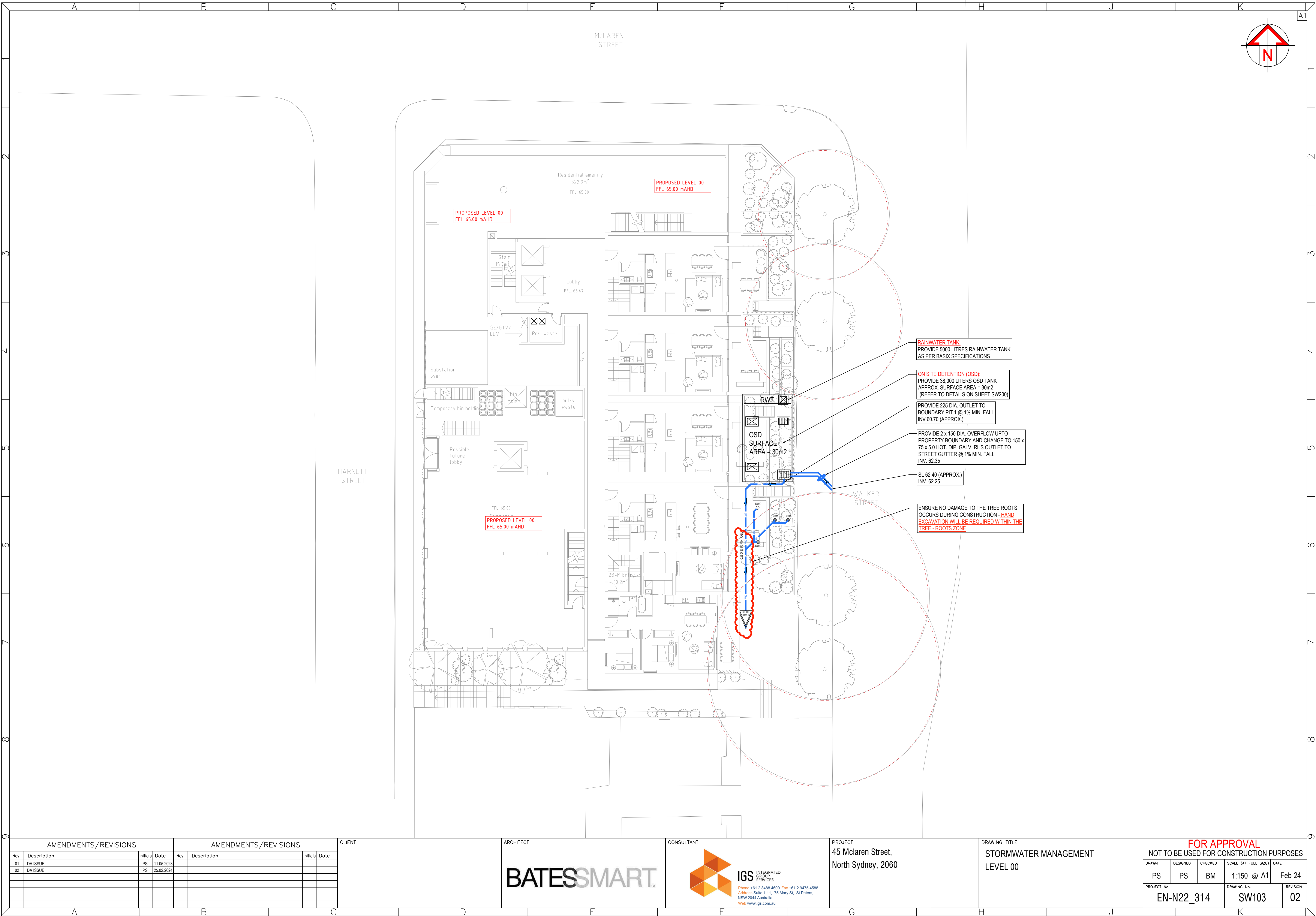
DRAWING TITLE

**STORMWATER MANAGEMENT
LEVEL 00 LOWER**

FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

DRAWN	DESIGNED	CHECKED	SCALE (AT FULL SIZE)	DATE
PS	PS	BM	1:150 @ A1	Apr-24

PROJECT No.	DRAWING No.	REVISION
EN-N22_314	SW102	04



AMENDMENTS/REVISIONS			
Rev	Description	Initials	Date
01	DA ISSUE	PS	11.05.2023
02	DA ISSUE	PS	25.02.2024

AMENDMENTS/REVISIONS			
Rev	Description	Initials	Date

CLIENT	

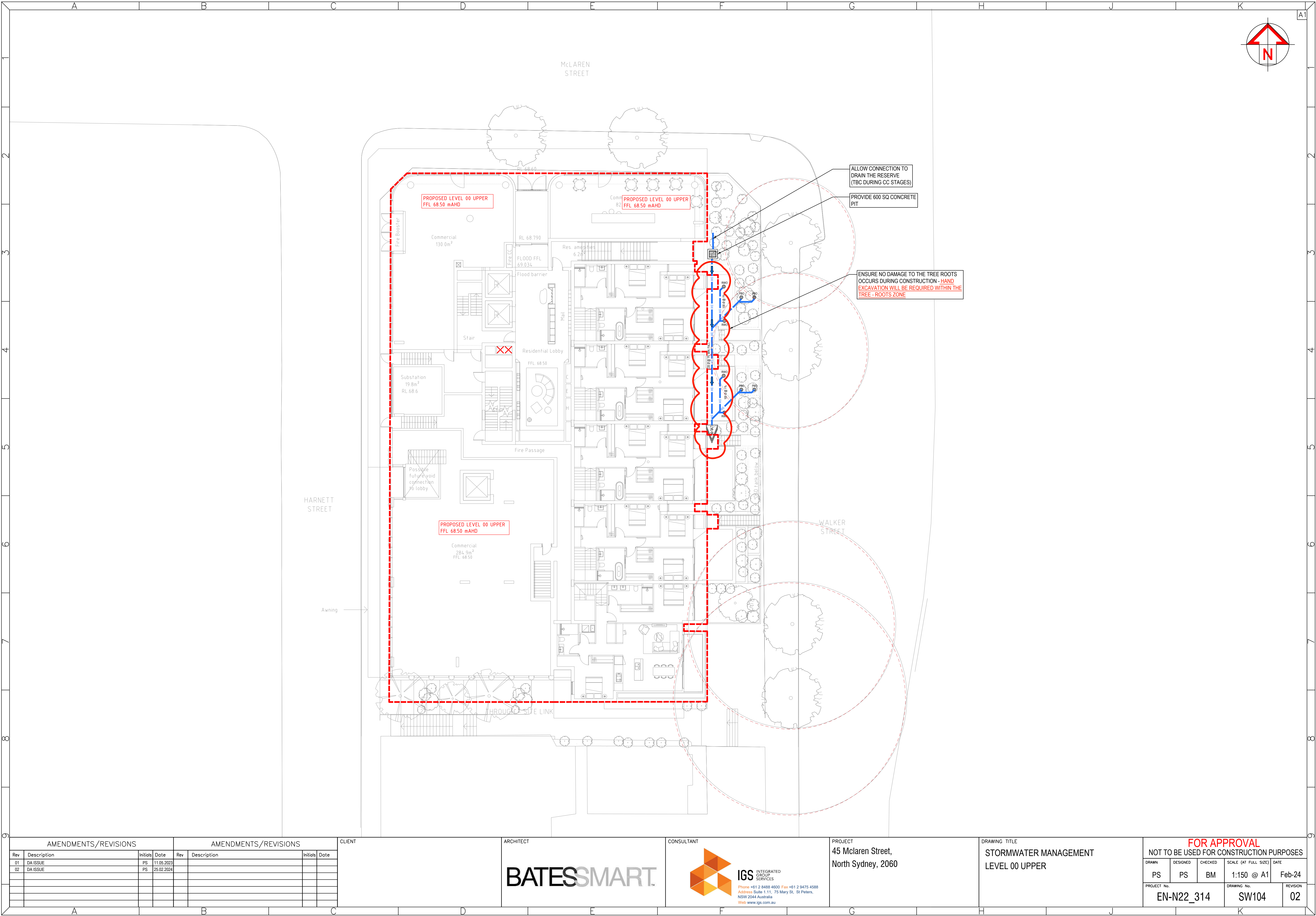
ARCHITECT	

CONSULTANT	

PROJECT	

DRAWING TITLE	

FOR APPROVAL NOT TO BE USED FOR CONSTRUCTION PURPOSES					
DRAWN	DESIGNED	CHECKED	SCALE (AT FULL SIZE)	DATE	
PS	PS	BM	1:150 @ A1	Feb-24	
PROJECT No.			DRAWING No.		REVISION
EN-N22_314			SW103		02



AMENDMENTS/REVISIONS			
Rev	Description	Initials	Date
01	DA ISSUE	PS	11.05.2023
02	DA ISSUE	PS	25.02.2024

AMENDMENTS/REVISIONS			
Rev	Description	Initials	Date

CLIENT	

ARCHITECT

BATESSMART

CONSULTANT

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PROJECT

45 McLaren Street,
North Sydney, 2060

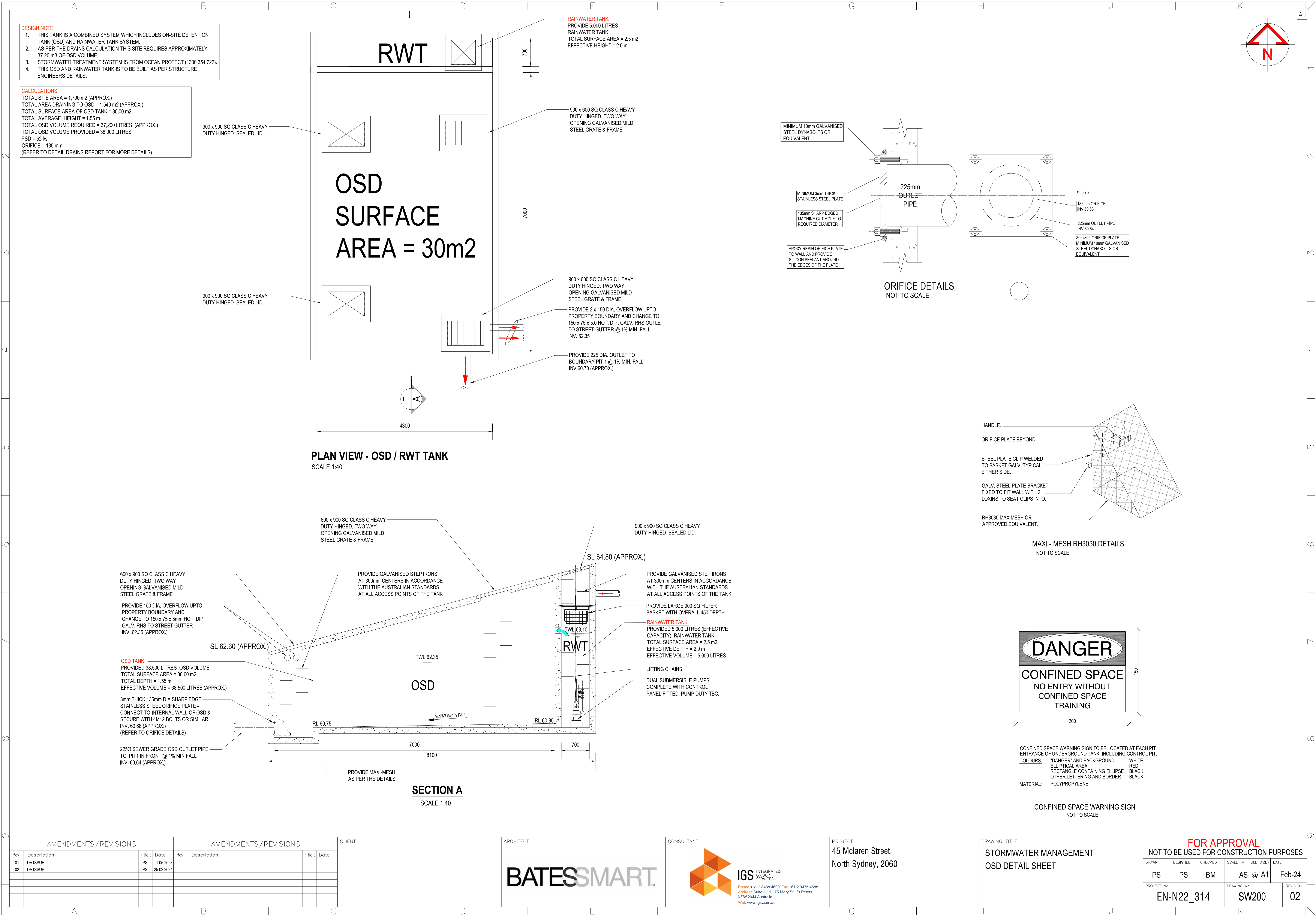
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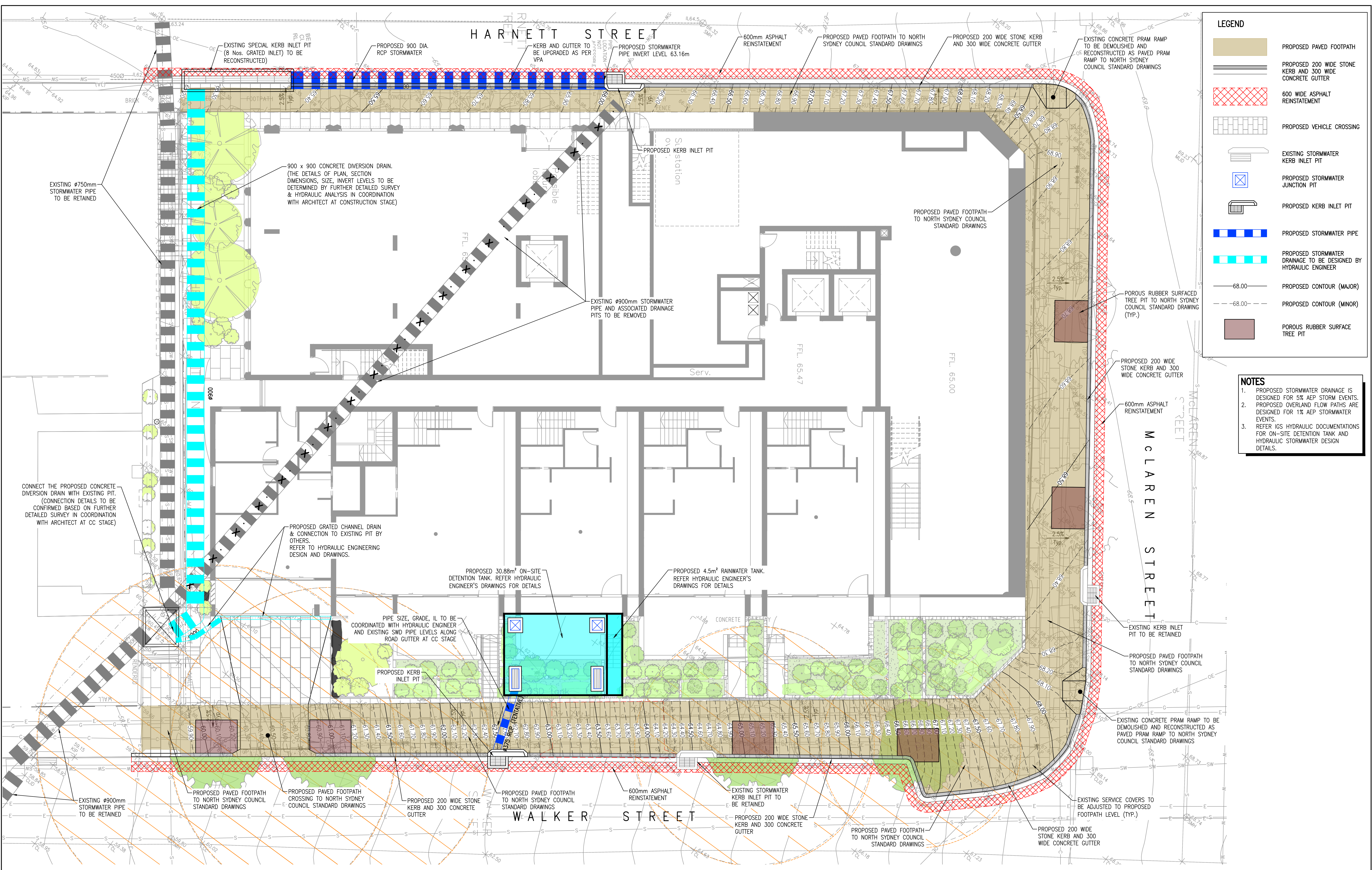
**STORMWATER MANAGEMENT
LEVEL 00 UPPER**

FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

DRAWN	DESIGNED	CHECKED	SCALE (AT FULL SIZE)	DATE
PS	PS	BM	1:150 @ A1	Feb-24

PROJECT No.	DRAWING No.	REVISION
EN-N22_314	SW104	02

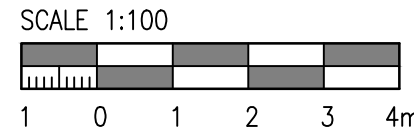




LEGEND

- PROPOSED PAVED FOOTPATH
- PROPOSED 200 WIDE STONE KERB AND 300 WIDE CONCRETE GUTTER
- 600 WIDE ASPHALT REINSTATEMENT
- PROPOSED VEHICLE CROSSING
- EXISTING STORMWATER KERB INLET PIT
- PROPOSED STORMWATER JUNCTION PIT
- PROPOSED KERB INLET PIT
- PROPOSED STORMWATER PIPE
- PROPOSED STORMWATER DRAINAGE TO BE DESIGNED BY HYDRAULIC ENGINEER
- PROPOSED CONTOUR (MAJOR)
- PROPOSED CONTOUR (MINOR)
- POROUS RUBBER SURFACE TREE PIT

- NOTES**
- PROPOSED STORMWATER DRAINAGE IS DESIGNED FOR 5% AEP STORM EVENTS.
 - PROPOSED OVERLAND FLOW PATHS ARE DESIGNED FOR 1% AEP STORMWATER EVENTS.
 - REFER IGS HYDRAULIC DOCUMENTATIONS FOR ON-SITE DETENTION TANK AND HYDRAULIC STORMWATER DESIGN DETAILS.



Rev	Revision Description	By	App	Date
1	ISSUED FOR DEVELOPMENT APPLICATION	CH	OW	10.05.23
2	ISSUED FOR 30% DESIGN	CR	OW	27.11.23
3	ISSUED FOR DA	HS	OW	26.02.24
4	ISSUED FOR DA	HS	OW	28.02.24

Rev	Revision Description	By	App	Date
1	ISSUED FOR DEVELOPMENT APPLICATION	CH	OW	10.05.23
2	ISSUED FOR 30% DESIGN	CR	OW	27.11.23
3	ISSUED FOR DA	HS	OW	26.02.24
4	ISSUED FOR DA	HS	OW	28.02.24

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Structural, Civil & Construction Engineering Consultant

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ACN 010 580 248

Client

CASA

Title
GENERAL ARRANGEMENT PLAN

Project
**45 MCLAREN STREET
NORTH SYDNEY**

Date
28.02.24
Scale of A1
1:100

Drawn
MARELLANO

Designer
H.SHAKH

Design Checker
H.SHAKH

Approved
C.WATE

22593

NOT FOR CONSTRUCTION

Drawing Number
22593-RBG-XX-XX-DR-CV-83001

Revision
04