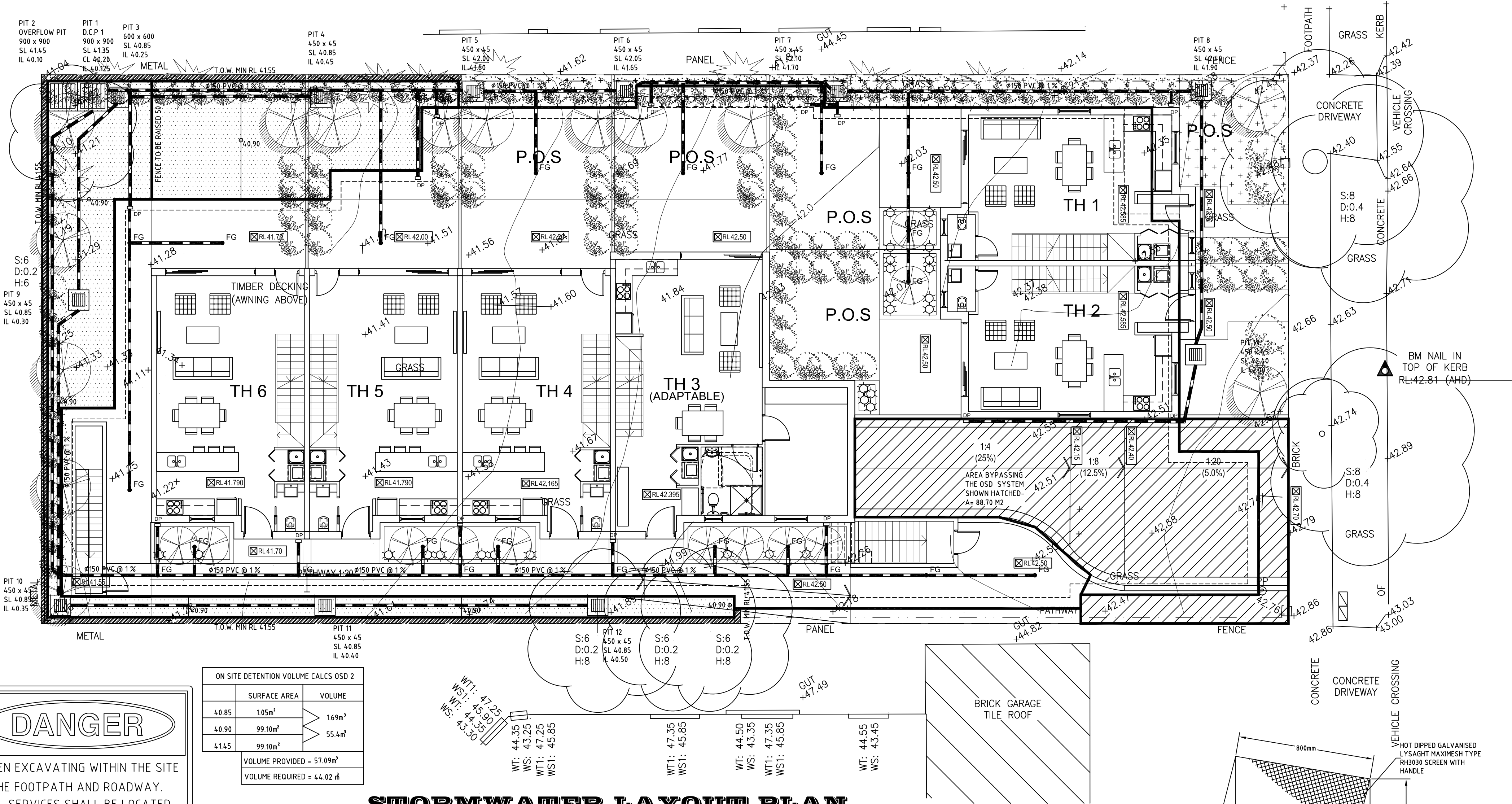


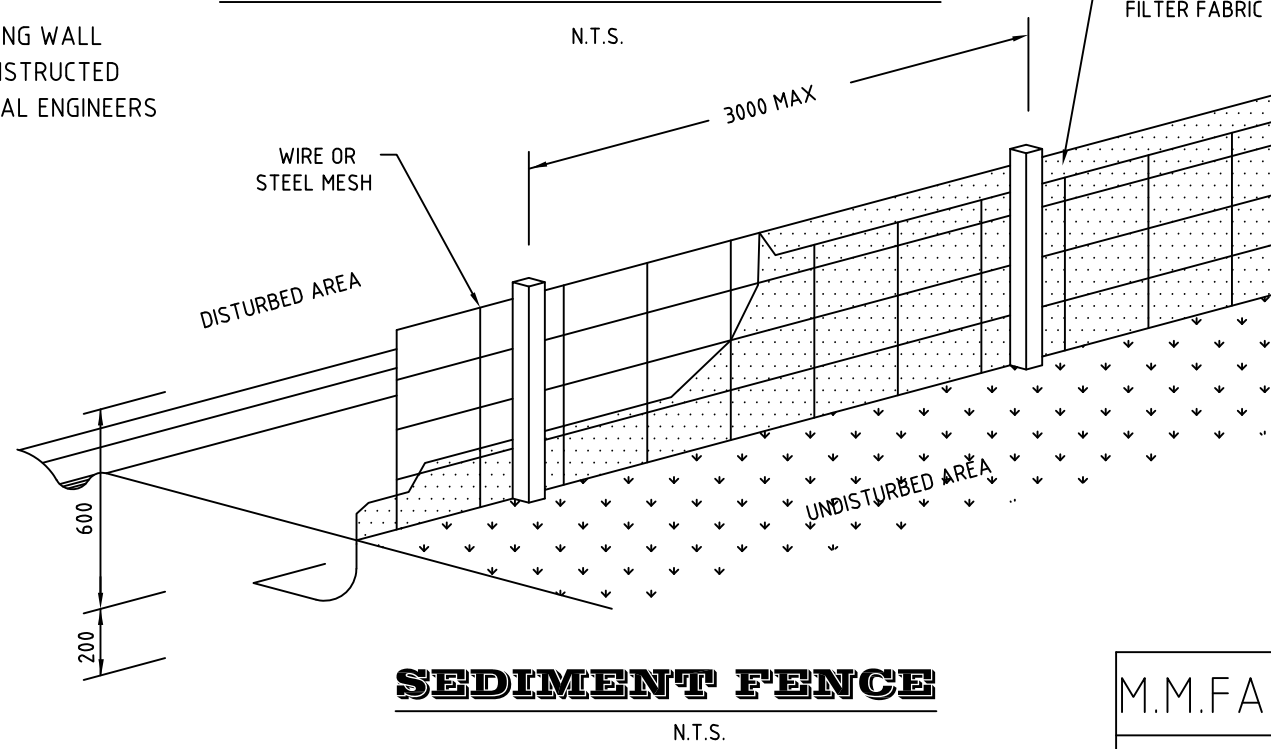
AN ON SITE DETENTION WARNING SIGN IN ACCORDANCE WITH THE UPPER PARRAMATTA RIVER CATCHMENT TRUST HANDBOOK SHALL BE PROVIDED WITHIN EACH STORAGE BASIN IN A CLEAR AND VISIBLE LOCATION.



## STORMWATER LAYOUT PLAN

ALL PIPES TO BE  $\phi$  100 PVC @ 1% U.O.N.  
THE DESIGN IS SUBJECT TO AN EASEMENT THROUGH THE DOWNSTREAM PROPERTIES.

## TRASH SCREEN DETAIL

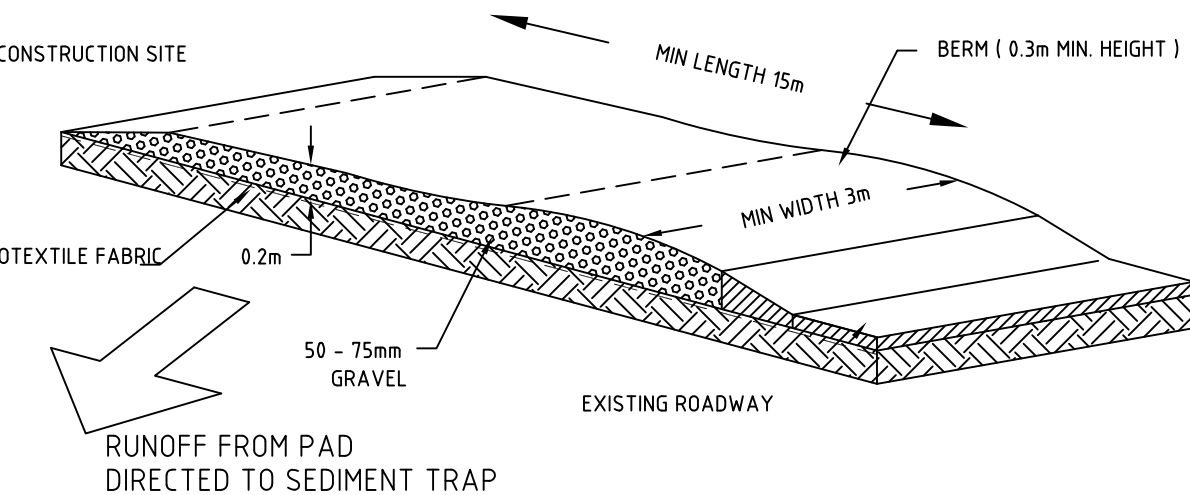


## SEDIMENT FENCE

N.T.S.

## GENERAL NOTES

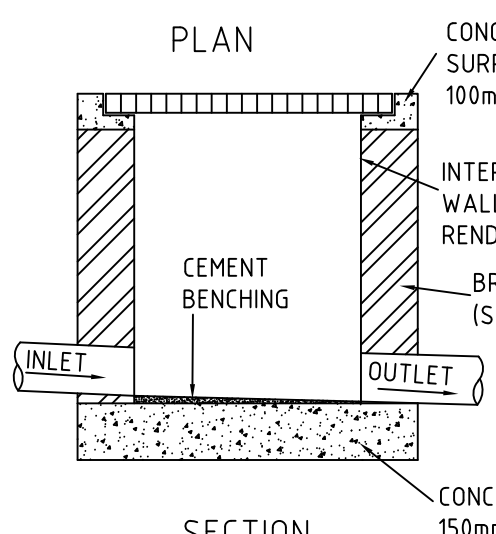
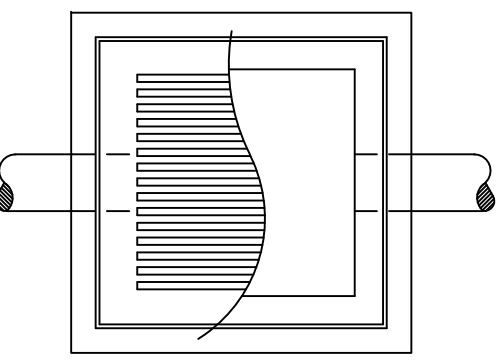
- 18.70<sup>+</sup> DENOTES EXISTING LEVEL
- 18.60<sup>+</sup> DENOTES PROPOSED LEVEL
- ALL PITS HAVING AN INTERNAL DEPTH THAT EXCEEDS 1.0m SHALL BE PROVIDED WITH GALVANISED STEP IRONS AT 300mm CENTRES PLACED IN A STAGGERED PATTERN AND SHALL BE IN ACCORDANCE WITH THE AUSTRALIAN STANDARDS.
- THE BUILDER/CONTRACTOR SHALL LOCATE ALL EXISTING PUBLIC UTILITY SERVICES WITHIN THE SITE, FOOTPATH AREA AND ROAD RESERVE PRIOR TO THE COMMENCEMENT OF ANY WORKS. ALL LOCATIONS AND LEVELS OF SERVICES SHALL BE REPORTED TO THE STORMWATER ENGINEER PRIOR TO THE COMMENCEMENT OF ANY WORKS.
- ALL LEVELS SHALL RELATE TO THE ESTABLISHED BENCH MARK.
- THE BASE OF ALL DRAINAGE PITS SHALL BE BENCHMARKED TO THE INVERT OF THE OULET PIPE.
- ALL GUTTERS SHALL BE MINIMUM 100 x 75mm AND DOWNPIPES SHALL BE MINIMUM 100 x 75mm UNLESS NOTED OTHERWISE.
- ALL STORMWATER DRAINAGE PIPES SHALL BE A MINIMUM  $\phi$ 100mm PVC LAID AT 1% MINIMUM GRADE UNLESS NOTED OTHERWISE ON THE DRAWING. WHERE GROUND COVER OVER THE PIPES IS LESS THAN 300mm THE STORMWATER PIPES SHALL BE SEWER GRADE uPVC.
- THE BUILDER SHALL ENSURE THAT THE STORMWATER ENGINEERING DRAWINGS CORRESPOND TO THE ARCHITECTURAL, STRUCTURAL AND LANDSCAPE DRAWINGS. IF THERE EXISTS ANY DISCREPANCIES BETWEEN THE DRAWINGS THE BUILDER SHALL REPORT THE DISCREPANCIES TO THE ENGINEER PRIOR TO COMMENCEMENT OF ANY WORKS.
- ALL MULCHING TO BE USED WITHIN THE AREA DESIGNATED AS ON SITE DETENTION STORAGE SHALL BE OF A NON-FLOATABLE MATERIAL SUCH AS DECORATIVE RIVER GRAVEL. PINE BARK MULCHING SHALL NOT BE USED WITHIN THE DETENTION STORAGE AREA.
- ALL WORKS WITHIN THE FOOTPATH AREA SHALL BE SUITABLY BARRICADED AND SIGNPOSTED IN ACCORDANCE WITH A TRAFFIC MANAGEMENT PLAN THAT HAS BEEN PREPARED BY A QUALIFIED AND RTA ACCREDITED TRAFFIC ENGINEER AND APPROVED BY COUNCIL. IT IS THE RESPONSIBILITY OF THE BUILDER OR CONTRACTOR CARRYING OUT THE WORKS WITHIN THE FOOTPATH AREA AND ROAD RESERVE TO OBTAIN THE NECESSARY APPROVED DOCUMENTS AS OUTLINED ABOVE.
- ALL RETAINING WALLS SHALL BE CONSTRUCTED COMPLETELY WITHIN THE PROPERTY BOUNDARY LIMITS TO DETAILS PREPARED BY THE STRUCTURAL ENGINEER.
- ALL SUB-SOIL DRAINAGE SHALL BE A MINIMUM OF  $\phi$ 65mm AND SHALL BE PROVIDED WITH A FILTER SOCK. THE SUBSOIL DRAINAGE SHALL BE INSTALLED IN ACCORDANCE WITH DETAILS TO BE PROVIDED BY THE LANDSCAPE ARCHITECT.
- THE BUILDER SHALL CHECK ALL LEVELS OF THE SITES STORMWATER CONNECTION POINT INTO THE KERB/COUNCIL DRAINAGE SYSTEM PRIOR TO COMMENCEMENT OF BUILDING WORKS ON THE SITE TO ENSURE THEY MATCH THE DESIGN LEVELS. ANY DISCREPANCIES SHALL BE REPORTED TO THE DESIGN ENGINEER IMMEDIATELY.



## TEMPORARY CONSTRUCTION

### EXIT / ENTRANCE

N.T.S.



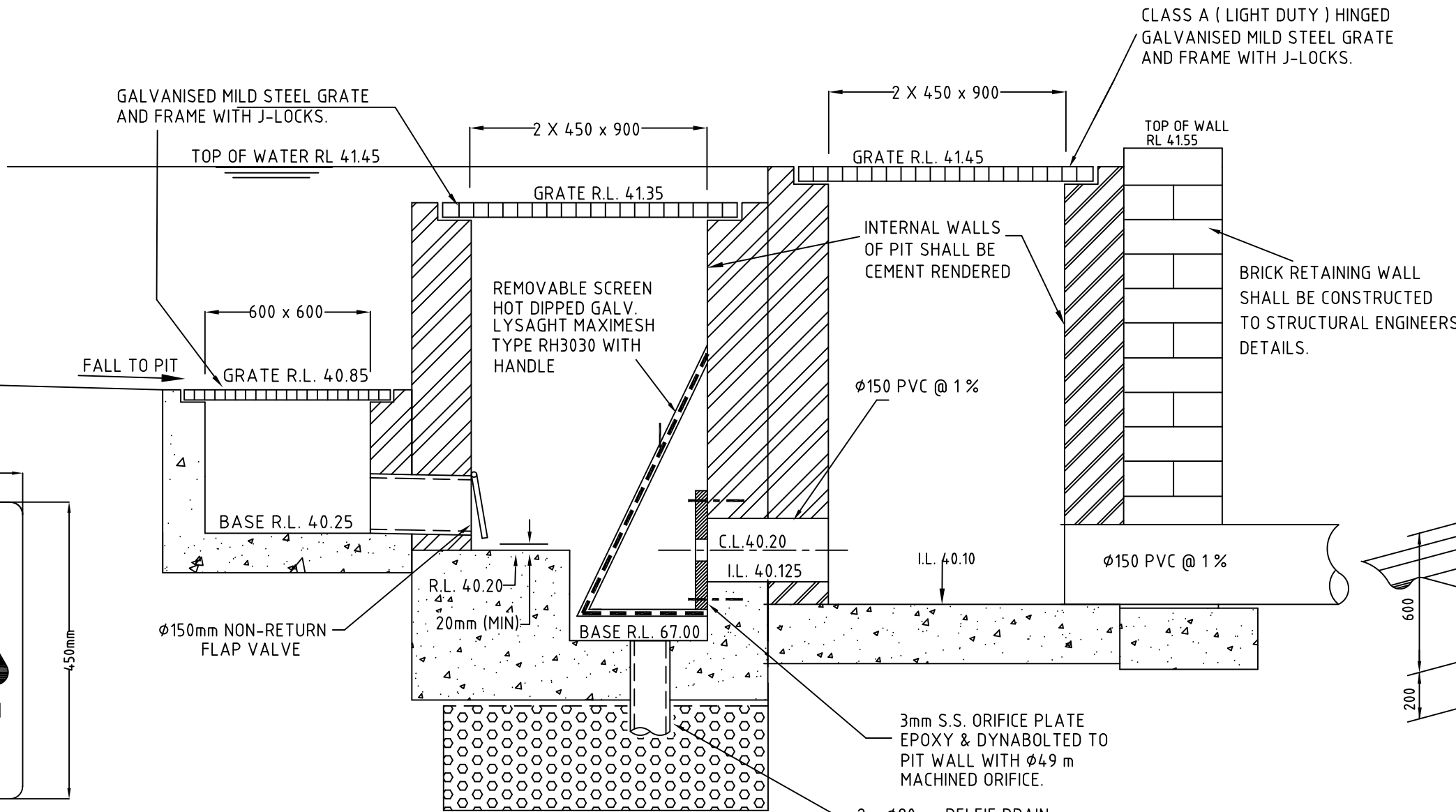
## STORMWATER PIT DETAIL

NOT TO SCALE

PIT WALL DETAILS	
DEPTH	WALL THICKNESS
0-0.5m	SINGLE SKIN BRICK
0.5m - 1.5m	DOUBLE SKIN BRICK
> 1.5m	TO STRUCTURAL DETAILS



ON SITE DETENTION WARNING SIGN  
NOTE:-  
1 - SIGN SHALL BE PLACED IN A CLEAR AND VISIBLE LOCATION  
COLORS:  
TRIANGLE AND "WARNING" - RED  
WATER - BLUE  
FIGURE AND OTHER LETTERING - BLACK



## D.C.P. DISCHARGE CONTROL PIT SECTION DETAIL

N.T.S.

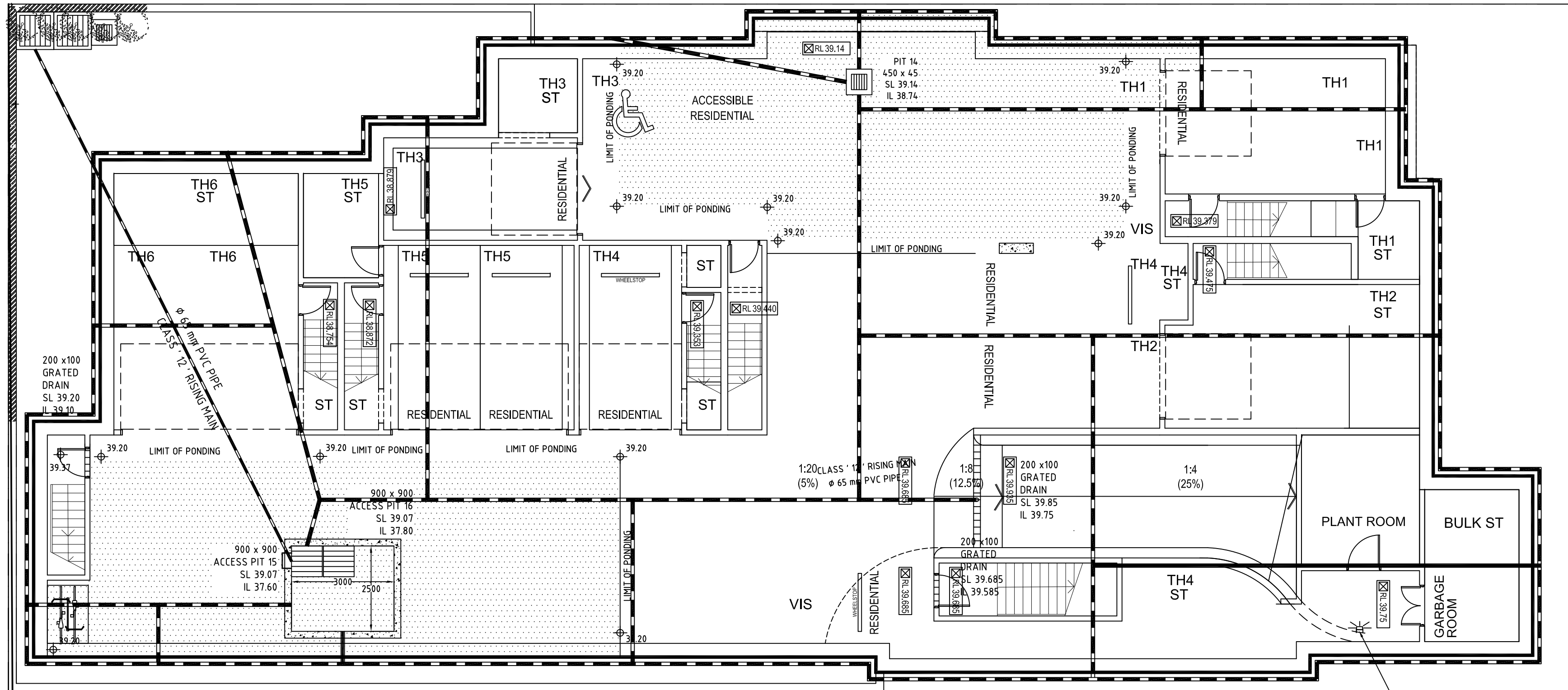
PIT 2  
OVERFLOW PIT  
900 x 900  
SL 41.45  
IL 40.10

PIT 1  
D/C P 1  
900 x 900  
SL 41.35  
CL 40.20  
IL 40.05

PIT 3  
600 x 600  
SL 40.85  
IL 40.25

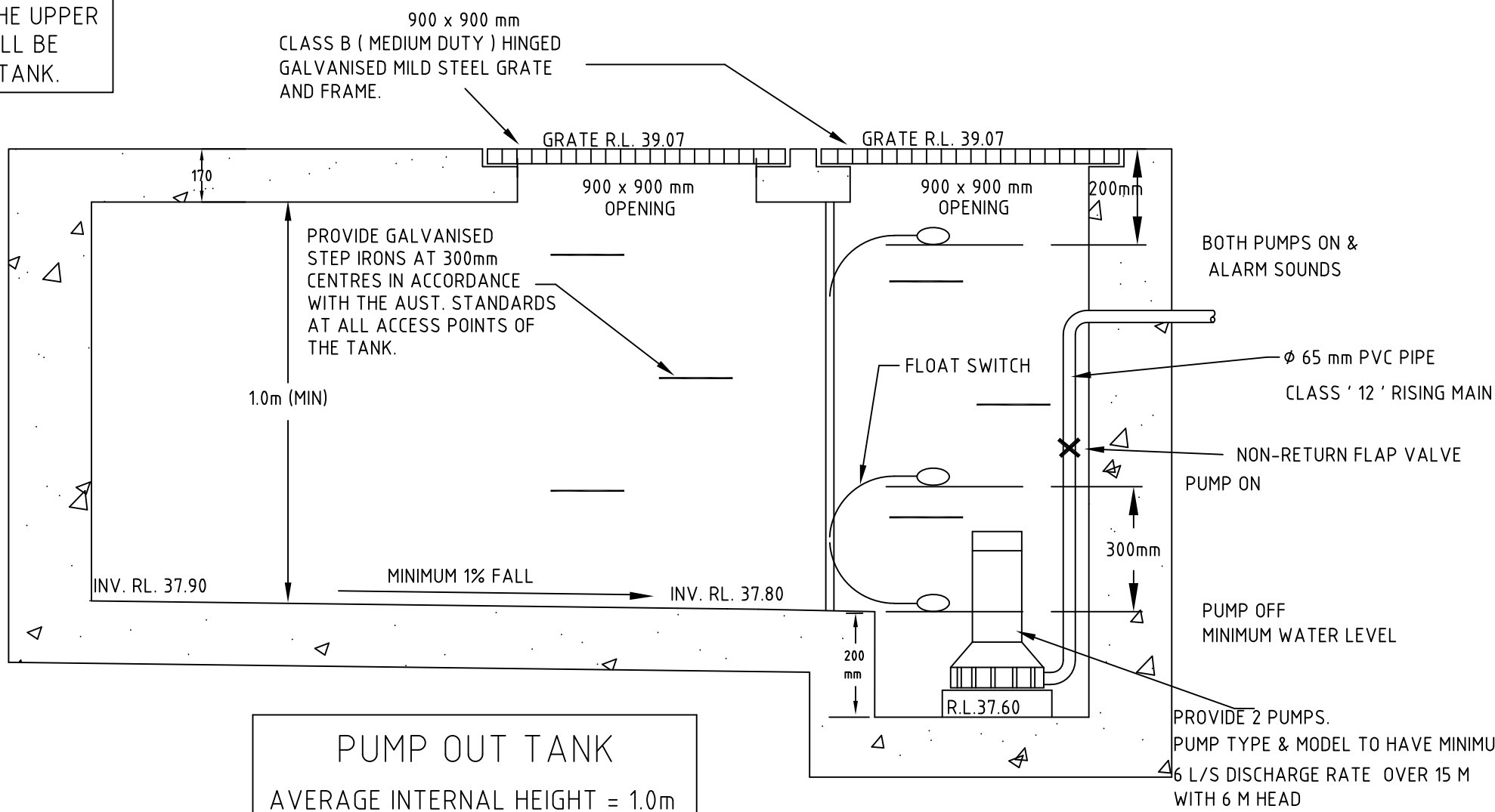
ALL SUB-SOIL DRAINAGE LAID  
AROUND BASEMENT WALLS SHALL BE  
CONNECTED TO THE  
BASEMENT DRAINAGE SYSTEM.

A CONFINED SPACE DANGER SIGN  
IN ACCORDANCE WITH THE UPPER  
PARRAMATTA RIVER CATCHMENT  
TRUST HANDBOOK SHALL BE PLACED  
AT ALL ACCESS POINTS TO THE PUMP  
STORAGE TANK.



## BASEMENT PLAN

A CONFINED SPACE DANGER SIGN IN ACCORDANCE WITH THE UPPER  
PARRAMATTA RIVER CATCHMENT TRUST HANDBOOK SHALL BE  
PLACED AT ALL ACCESS POINTS TO THE BELOW GROUND TANK.



**PUMP OUT TANK**  
AVERAGE INTERNAL HEIGHT = 1.0m  
INTERNAL WIDTH = 3.0m  
INTERNAL LENGTH = 2.5m  
VOLUME PROVIDED = 7.5m<sup>3</sup>  
VOLUME REQUIRED = 7.3 m<sup>3</sup>

### PUMP STORAGE TANK DETAIL

NOT TO SCALE

PUMP STORAGE TANK SHALL BE CONSTRUCTED TO THE  
STRUCTURAL ENGINEERS DETAILS



#### CONFINED SPACE DANGER SIGN

COLORS - DANGER AND BACKGROUND - WHITE  
ELLIPITICAL AREA - RED  
RECTANGLE CONTAINING ELLIPSE - BLACK  
OTHER LETTERING AND NUMBER - BLACK

A) A CONFINED SPACE DANGER SIGN SHALL BE POSITIONED IN A LOCATION AT ALL ACCESS POINTS, SUCH THAT  
IT IS CLEARLY VISIBLE TO PERSONS PROPOSED 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 150mm (SMALL ENTRIES SUCH AS GRATES & HATCHES)

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

### PUMP NOTES

THE PUMP OUT SYSTEM SHALL BE DESIGNED TO OPERATE IN THE FOLLOWING MANNER :-

1. THE PUMPS SHALL BE PROGRAMMED TO OPERATE ALTERNATELY SO AS TO ALLOW BOTH PUMPS TO HAVE AN EQUAL OPERATION LOAD AND PUMP LIFE.
2. A LOW LEVEL FLOAT SHALL BE PROVIDED TO ENSURE THAT A MINIMUM REQUIRED WATER LEVEL IS MAINTAINED WITHIN THE SUMP AREA OF THE BELOW GROUND TANK. THIS FLOAT WILL FUNCTION AS AN OFF SWITCH.
3. THE LOW LEVEL FLOAT SHALL ALSO BE PROGRAMMED TO SWITCH ONE OF THE PUMPS ON WHEN THE DEPTH OF WATER WITHIN THE BELOW GROUND TANK IS APPROXIMATELY 300mm DEEP. THE PUMP SHALL CONTINUE TO OPERATE UNTIL THE MINIMUM WATER LEVEL IN THE TANK IS REACHED.
4. A SECOND FLOAT SHALL BE PROVIDED AT A HIGH LEVEL, WHICH IS APPROXIMATELY THE ROOF LEVEL OF THE BELOW GROUND TANK. THIS FLOAT SHALL START THE OTHER PUMP THAT IS NOT OPERATING AND ACTIVATE THE ALARM.
5. AN ALARM SYSTEM, WITH SIREN/FLASHING STROBE LIGHT AND MUTE BUTTON ON THE CONTROL PANEL SHALL BE PROVIDED. THE FLASHING STROBE LIGHT SHALL BE LOCATED AT THE DRIVEWAY ENTRANCE TO THE BASEMENT ALONG WITH A "PUMP FAILURE" WARNING SIGN. THE ALARM SYSTEM SHALL BE PROVIDED WITH A BATTERY BACK-UP IN CASE OF POWER FAILURE.

## GENERAL NOTES

1. 18.70<sup>+</sup> DENOTES EXISTING LEVEL
2. 18.60<sup>+</sup> DENOTES PROPOSED LEVEL
3. ALL PITS HAVING AN INTERNAL DEPTH THAT EXCEEDS 1.0m SHALL BE PROVIDED WITH GALVANISED STEP IRONS AT 300mm CENTRES PLACED IN A STAGGERED PATTERN AND SHALL BE IN ACCORDANCE WITH THE AUSTRALIAN STANDARDS.
4. THE BUILDER/CONTRACTOR SHALL LOCATE ALL EXISTING PUBLIC UTILITY SERVICES WITHIN THE SITE, FOOTPATH AREA AND ROAD RESERVE PRIOR TO THE COMMENCEMENT OF ANY WORKS. ALL LOCATIONS AND LEVELS OF SERVICES SHALL BE REPORTED TO THE STORMWATER ENGINEER PRIOR TO THE COMMENCEMENT OF ANY WORKS.
5. ALL LEVELS SHALL RELATE TO THE ESTABLISHED BENCH MARK.
6. THE BASE OF ALL DRAINAGE PITS SHALL BE BENCHED TO THE INVERT OF THE OULET PIPE.
7. ALL GUTTERS SHALL BE MINIMUM 100 x 75mm AND DOWNPIPES SHALL BE MINIMUM 100 x 75mm UNLESS NOTED OTHERWISE.
8. ALL STORMWATER DRAINAGE PIPES SHALL BE A MINIMUM  $\phi$ 100mm PVC LAID AT 1% MINIMUM GRADE UNLESS NOTED OTHERWISE ON THE DRAWING. WHERE GROUND COVER OVER THE PIPES IS LESS THAN 300mm THE STORMWATER PIPES SHALL BE SEWER GRADE uPVC.
9. THE BUILDER SHALL ENSURE THAT THE STORMWATER ENGINEERING DRAWINGS CORRESPOND TO THE ARCHITECTURAL, STRUCTURAL AND LANDSCAPE DRAWINGS. IF THERE EXISTS ANY DISCREPANCIES BETWEEN THE DRAWINGS THE BUILDER SHALL REPORT THE DISCREPANCIES TO THE ENGINEER PRIOR TO COMMENCEMENT OF ANY WORKS.
10. ALL MULCHING TO BE USED WITHIN THE AREA DESIGNATED AS ON SITE DETENTION STORAGE SHALL BE OF A NON-FLOATABLE MATERIAL SUCH AS DECORATIVE RIVER GRAVEL. PINE BARK MULCHING SHALL NOT BE USED WITHIN THE DETENTION STORAGE AREA.
11. ALL WORKS WITHIN THE FOOTPATH AREA SHALL BE SUITABLY BARRICADED AND SIGNPOSTED IN ACCORDANCE WITH A TRAFFIC MANAGEMENT PLAN THAT HAS BEEN PREPARED BY A QUALIFIED AND RTA ACCREDITED TRAFFIC ENGINEER AND APPROVED BY COUNCIL. IT IS THE RESPONSIBILITY OF THE BUILDER OR CONTRACTOR CARRYING OUT THE WORKS WITHIN THE FOOTPATH AREA AND ROAD RESERVE TO OBTAIN THE NECESSARY APPROVED DOCUMENTS AS OUTLINED ABOVE.
12. ALL RETAINING WALLS SHALL BE CONSTRUCTED COMPLETELY WITHIN THE PROPERTY BOUNDARY LIMITS TO DETAILS PREPARED BY THE STRUCTURAL ENGINEER.
13. ALL SUB-SOIL DRAINAGE SHALL BE A MINIMUM OF  $\phi$ 65mm AND SHALL BE PROVIDED WITH A FLITER SOCK. THE SUBSOIL DRAINAGE SHALL BE INSTALLED IN ACCORDANCE WITH DETAILS TO BE PROVIDED BY THE LANDSCAPE ARCHITECT.
14. THE BUILDER SHALL CHECK ALL LEVELS OF THE SITES STORMWATER CONNECTION POINT INTO THE KERB/COUNCIL DRAINAGE SYSTEM PRIOR TO COMMENCEMENT OF BUILDING WORKS ONT THE SITE TO ENSURE THEY MATCH THE DESIGN LEVELS. ANY DISCREPANCIES SHALL BE REPORTED TO THE DESIGN ENGINEER IMMEDIATELY.

ABOVE GROUND VOLUME CALCULATIONS BASEMENT PUMP STORAGE AREA		
R.L.	SURFACE AREA	VOLUME
39.07	183m <sup>2</sup>	4.02 m <sup>3</sup>
39.14	84.5 m <sup>2</sup>	
39.20	164 m <sup>2</sup>	7.45 m <sup>3</sup>
VOLUME PROVIDE = 11.47 m <sup>3</sup>		
VOLUME REQUIRED = 9.6 m <sup>3</sup>		

M.M.FARAH CIVIL/STRUCTURAL PTY/LTD	AMENDMENTS	DATE
	DESIGNED	SCALE
PROPOSED NEW DEVELOPMENT AT NO 116 KINGSLAND ROAD REGENTS PARK	M.M.FARAH PENGMEIAUST LEVEL 1, 3/18 MACFARLANE ST MERRYLANDS NSW 2160 0411 780 327	1:100 @ A1 1:200 @ A3 DRAWN MMF 15-12-2017
	HYDRAULIC AND SEDIMENT CONTROL PLAN	SHEET No. 2 of 2 JOB # SW- 116 KINGSLAND



# M.M. Farah CIVIL/ STRUCTURAL PTY/LTD - PUMP STORAGE REQUIREMENT

Council Area: **Cumberland Council**

Property : **116 Kingsland Rd., Regents Park.**

Area = **88.7 sq.m**

Duration	1 Yr	Q1	V1	2 Yr	Q2	V2	5 Yr	Q5	V5	10 Yr	Q10	V10	20 Yr	Q20	V20	50 Yr	Q50	V50	100 Yr	Q100	V100
6 min	78	1.9	0.7	100	2.5	0.9	127	3.1	1.1	142	3.5	1.3	163	4.0	1.4	189	4.7	1.7	209	5.2	1.9
7 min	74	1.8	0.8	94	2.3	1.0	120	3.0	1.2	134	3.3	1.4	154	3.8	1.6	179	4.4	1.8	197	4.9	2.0
8 min	70	1.7	0.8	90	2.2	1.1	114	2.8	1.3	127	3.1	1.5	146	3.6	1.7	170	4.2	2.0	188	4.6	2.2
9 min	67	1.6	0.9	86	2.1	1.1	108	2.7	1.4	122	3.0	1.6	139	3.4	1.8	162	4.0	2.2	179	4.4	2.4
10 min	64	1.6	0.9	82	2.0	1.2	104	2.6	1.5	116	2.9	1.7	133	3.3	2.0	155	3.8	2.3	171	4.2	2.5
11 min	61	1.5	1.0	79	1.9	1.3	100	2.5	1.6	112	2.8	1.8	128	3.1	2.1	149	3.7	2.4	164	4.1	2.7
12 min	59	1.5	1.0	76	1.9	1.3	96	2.4	1.7	108	2.7	1.9	123	3.0	2.2	143	3.5	2.5	158	3.9	2.8
13 min	57	1.4	1.1	73	1.8	1.4	93	2.3	1.8	104	2.6	2.0	119	2.9	2.3	138	3.4	2.7	153	3.8	2.9
14 min	55	1.4	1.1	71	1.7	1.5	90	2.2	1.9	100	2.5	2.1	115	2.8	2.4	134	3.3	2.8	148	3.6	3.1
15 min	53	1.3	1.2	68	1.7	1.5	87	2.1	1.9	97	2.4	2.2	111	2.7	2.5	129	3.2	2.9	143	3.5	3.2
16 min	52	1.3	1.2	66	1.6	1.6	84	2.1	2.0	94	2.3	2.2	108	2.7	2.6	126	3.1	3.0	139	3.4	3.3
17 min	50	1.2	1.3	65	1.6	1.6	82	2.0	2.1	92	2.3	2.3	105	2.6	2.6	120	3.0	3.0	135	3.3	3.4
18 min	49	1.2	1.3	63	1.5	1.7	80	2.0	2.1	89	2.2	2.4	102	2.5	2.7	119	2.9	3.2	131	3.2	3.5
20 min	47	1.1	1.4	60	1.5	1.8	76	1.9	2.2	85	2.1	2.5	97	2.4	2.9	113	2.8	3.3	125	3.1	3.7
25 min	42	1.0	1.5	53	1.3	2.0	68	1.7	2.5	76	1.9	2.8	87	2.1	3.2	101	2.5	3.7	112	2.7	4.1
30 min	38	0.9	1.7	49	1.2	2.2	62	1.5	2.7	69	1.7	3.1	79	1.9	3.5	92	2.3	4.1	101	2.5	4.5
35 min	35	0.9	1.8	45	1.1	2.3	57	1.4	2.9	64	1.6	3.3	73	1.8	3.8	84	2.1	4.4	93	2.3	4.8
40 min	32	0.8	1.9	42	1.0	2.5	53	1.3	3.1	59	1.5	3.5	68	1.7	4.0	79	1.9	4.6	87	2.1	5.1
45 min	30	0.7	2.0	39	1.0	2.6	49	1.2	3.3	55	1.4	3.7	63	1.6	4.2	74	1.8	4.9	81	2.0	5.4
50 min	29	0.7	2.1	37	0.9	2.7	47	1.1	3.4	52	1.3	3.9	60	1.5	4.4	69	1.7	5.1	77	1.9	5.7
55 min	27	0.7	2.2	35	0.9	2.8	44	1.1	3.6	49	1.2	4.0	56	1.4	4.6	66	1.6	5.3	73	1.8	5.9
60 min	26	0.6	2.3	33	0.8	2.9	42	1.0	3.7	47	1.2	4.2	54	1.3	4.8	63	1.5	5.5	69	1.7	6.1
75 min	22	0.6	2.5	29	0.7	3.2	37	0.9	4.1	41	1.0	4.6	47	1.2	5.2	55	1.4	6.1	61	1.5	6.7
90 min	20	0.5	2.7	26	0.6	3.4	33	0.8	4.4	37	0.9	4.9	42	1.0	5.6	49	1.2	6.6	55	1.3	7.3
2 hr	17	0.4	2.9	21	0.5	3.8	27	0.7	4.9	31	0.8	5.5	36	0.9	6.3	42	1.0	7.4	46	1.1	8.2
3 hr	13	0.3	3.4	16	0.4	4.4	21	0.5	5.7	24	0.6	6.4	28	0.7	7.4	33	0.8	8.7	36	0.9	9.7
4 hr	11	0.3	3.7	14	0.3	4.8	18	0.4	6.3	20	0.5	7.1	23	0.6	8.3	27	0.7	9.7	31	0.8	10.9
5 hr	9	0.2	4.0	12	0.3	5.2	15	0.4	6.8	18	0.4	7.8	20	0.5	9.0	24	0.6	10.6	27	0.7	11.9
6 hr	8	0.2	4.3	10	0.3	5.6	14	0.3	7.3	16	0.4	8.3	18	0.4	9.7	21	0.5	11.4	24	0.6	12.8
8 hr	7	0.2	4.8	9	0.2	6.2	11	0.3	8.1	13	0.3	9.3	15	0.4	10.8	18	0.4	12.8	20	0.5	14.4
10 hr	6	0.1	5.1	8	0.2	6.7	10	0.2	8.9	11	0.3	10.1	13	0.3	11.8	16	0.4	14.0	18	0.4	15.7
12 hr	5	0.1	5.5	7	0.2	7.1	9	0.2	9.5	10	0.3	10.9	12	0.3	12.7	14	0.3	15.1	16	0.4	16.9
14 hr	5	0.1	5.8	6	0.2	7.6	8	0.2	10.1	9	0.2	11.6	11	0.3	13.5	13	0.3	16.1	15	0.4	18.1
16 hr	4	0.1	6.1	6	0.1	8.0	7	0.2	10.6	9	0.2	12.2	10	0.2	14.3	12	0.3	17.0	13	0.3	19.1
18 hr	4	0.1	6.4	5	0.1	8.3	7	0.2	11.1	8	0.2	12.8	9	0.2	15.0	11	0.3	17.9	13	0.3	20.1
20 hr	4	0.1	6.6	5	0.1	8.7	7	0.2	11.6	8	0.2	13.4	9	0.2	15.6	11	0.3	18.6	12	0.3	21.0
22 hr	4	0.1	6.9	5	0.1	9.0	6	0.2	12.0	7	0.2	13.9	8	0.2	16.2	10	0.2	19.4	11	0.3	21.8
24 hr	3	0.1	7.1	4	0.1	9.3	6	0.1	12.5	7	0.2	14.3	8	0.2	16.8	9	0.2	20.1	11	0.3	22.6
36 hr	3	0.1	8.2	3	0.1	10.7	5	0.1	14.5	5	0.1	16.7	6	0.2	19.6	7	0.2	23.5	8	0.2	26.5
48 hr	2	0.1	9.0	3	0.1	11.8	4	0.1	16.0	4	0.1	18.5	5	0.1	21.8	6	0.2	26.1	7	0.2	29.5
60 hr	2	0.0	9.6	2	0.1	12.6	3	0.1	17.1	4	0.1	19.9	4	0.1	23.4	5	0.1	28.1	6	0.1	31.8
72 hr	2	0.0	10.0	2	0.1	13.2	3	0.1	18.0	3	0.1	20.9	4	0.1	24.7	5	0.1	29.7	5	0.1	33.6

Required Pump Discharge

Volume of Storage in Tank

Volume of Total Storage

# MONZER FARAH

## Pump Design Check Sheet - 116 Kingsland Rd., Regents Park.

### PUMP CALCULATIONS

<b>HL=</b>	$(3.35 \times 10^6 \times Q/d^{2.63} \times C)^{1.852}$ <i>HL (m/100m), Q(L/s), d(mm)</i>	Hazen -Williams C	150
		Pipe Diameter	65 mm
		Pipe Length	22.3 m
<b>h1=</b>	$kv^2/2g$ <i>k(cum), v(m/s), g(gravity(m/s))</i>	Elevation Head	3.70 m
		Bend Losses, Kb	2.55 90 bend=0.51
		Valve Losses, Kv	0.28
<b>H=</b>	Hf+h1+Elevation Head (static head)	Entry/Exit Losses, Ke	2.00
<b>(Total Head)</b>		Cum Losses, K	4.83

Start Flow	0.5
Increment	1

Q (L/s)		0.5	1.5	2.5	3.5	4.5	5.5	6.5	7.5	8.5	9.5	10.5
HL (m/100m)		0.05	0.35	0.91	1.70	2.71	3.94	5.36	6.99	8.82	10.83	13.04
Hf (m)	<i>HL x pipe length/100</i>	0.01	0.08	0.20	0.38	0.61	0.88	1.20	1.56	1.97	2.42	2.91
v (m/s)	<i>Q(m) x area of pipe</i>	0.15	0.45	0.75	1.05	1.36	1.66	1.96	2.26	2.56	2.86	3.16
h1 (m)	<i>k(cum) x Q(m)^2/2g</i>	0.01	0.05	0.14	0.27	0.45	0.68	0.94	1.26	1.62	2.02	2.46
<b>H (m)</b>		<b>3.72</b>	<b>3.83</b>	<b>4.04</b>	<b>4.35</b>	<b>4.76</b>	<b>5.25</b>	<b>5.84</b>	<b>6.52</b>	<b>7.28</b>	<b>8.13</b>	<b>9.07</b>

Note:

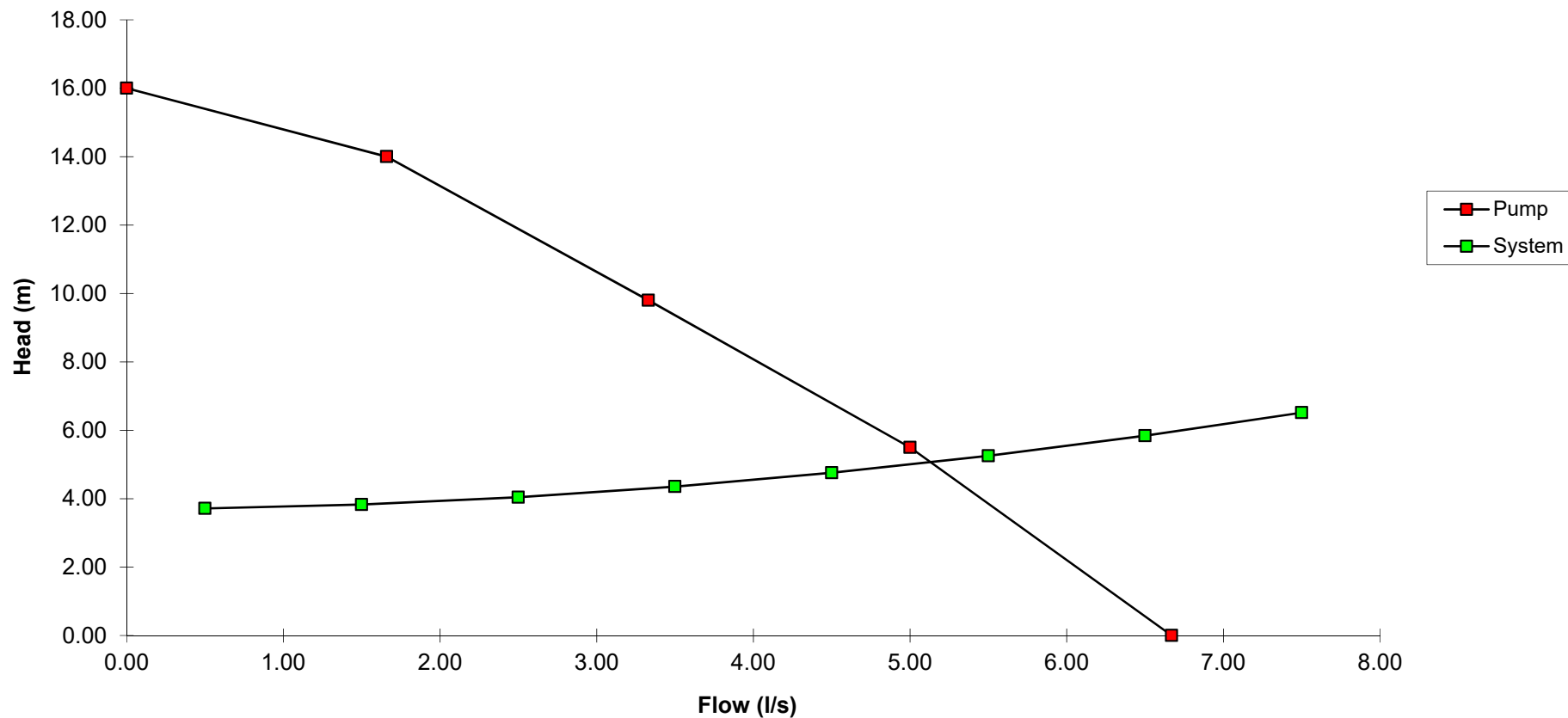
*Hazen-Williams constant*  
 125-140 Commercial Steel Pipe  
 135-140 Bitumen lined cast iron pipe  
 140-145 Copper Tube  
 145-150 PVC

# Rising main =65mm diameter Class 12 PVC Pipe

## Selected Pump 2 x Nossiter NP750S Pumps

Pump	Q(l/s)	6.67	5.00	3.33	1.66	0.00							
	H(m)	0.00	5.50	9.80	14.00	16.00							
System	Q(l/s)	0.50	1.50	2.50	3.50	4.50	5.50	6.50	7.50	8.50	9.50	10.50	
	H(m)	3.72	3.83	4.04	4.35	4.76	5.25	5.84	6.52	7.28	8.13	9.07	

Pump vs System Curve



# M.M.FARAH CIVIL/STRUCTURAL

## On-Site Detention Calculation Sheet

Project:	Proposed Development.
Location:	116 Kingsland Rd., Regents Park.
Designer:	M.M. Farah (P.Eng, MIEAust)
Phone:	0411-780-327

OSD Area:	<b>OSD</b>		
Site Area		0.092	ha
Basic Storage Volume	SSR = 470c.m/Ha	43.09	cu.m
Basic Discharge	PSD =80l/s/ha	7.34	L/s
Area of Site to Storage		0.083	<b>90%</b>
Percentage of Site		90.33	
Storage per ha of contributing area		520.34	
Volume/PSD Adjustment		69.65	
PSD for site		5.77	
Maximum Head to Orifice Centre		1.250	
Calculated Orifice Diameter		<b>0.049</b>	
Maximum discharge		5.768	
Head for high early discharge		1.150	
High Early Discharge		5.532	<b>96%</b>
Mean Discharge		5.650	
Average Discharge per Hectare		68.222	
Final Site Storage Ratio		531	
Site Storage Volume		<b>44.02</b>	
Volume Provided		<b>55.07</b>	<b>125%</b>

# TRANSFER GRANTING EASEMENT

New South Wales  
Real Property Act 1900

Leave this space clear. Affix additional  
pages to the top left-hand corner.

**PRIVACY NOTE: Section 31B of the Real Property Act 1900 (RP Act) authorises the Registrar General to collect the information required by this form for the establishment and maintenance of the Real Property Act Register. Section 96B RP Act requires that the Register is made available to any person for search upon payment of a fee, if any.**

(A) <b>TORRENS TITLE</b>	Servient Tenement 12/30667		Dominant Tenement Y/403688	
(B) <b>LODGED BY</b>	Document Collection Box	Name, Address or DX, Telephone, and Customer Account Number if any  Reference: 5011DEAL		CODE  <b>TG</b>
(C) <b>TRANSFEROR</b>	ANNE ILIC			
(D)	The transferor acknowledges receipt of the consideration of \$ _____ and transfers and grants—			
(E) <b>DESCRIPTION OF EASEMENT</b>	EASEMENT TO DRAIN WATER 0.9 WIDE as setout in Part 3 of Schedule 8 of the Conveyancing Act 1919 and as setout in the plan Annexure "A" hereto  out of the servient tenement and appurtenant to the dominant tenement.			
(F)	Encumbrances (if applicable): _____			
(G) <b>TRANSFeree</b>	MN SUKKAR PTY LTD			

**DATE** \_\_\_\_\_

(H) I certify I am an eligible witness and that the transferor  
signed this dealing in my presence.  
[See note\* below]

Certified correct for the purposes of the Real Property Act  
1900 by the transferor.

Signature of witness:

Signature of transferor:

Name of witness:

Address of witness:

Certified correct for the purposes of the Real Property Act 1900  
by the company named below the common seal of which was  
affixed pursuant to the authority specified and in the presence  
of the authorised person(s) whose signature(s) appear(s) below.

Company: MN SUKKAR PTY LTD ACN 168 767 771

Authority: section 127 of the Corporations Act 2001

Signature of authorised person:

Signature of authorised person:

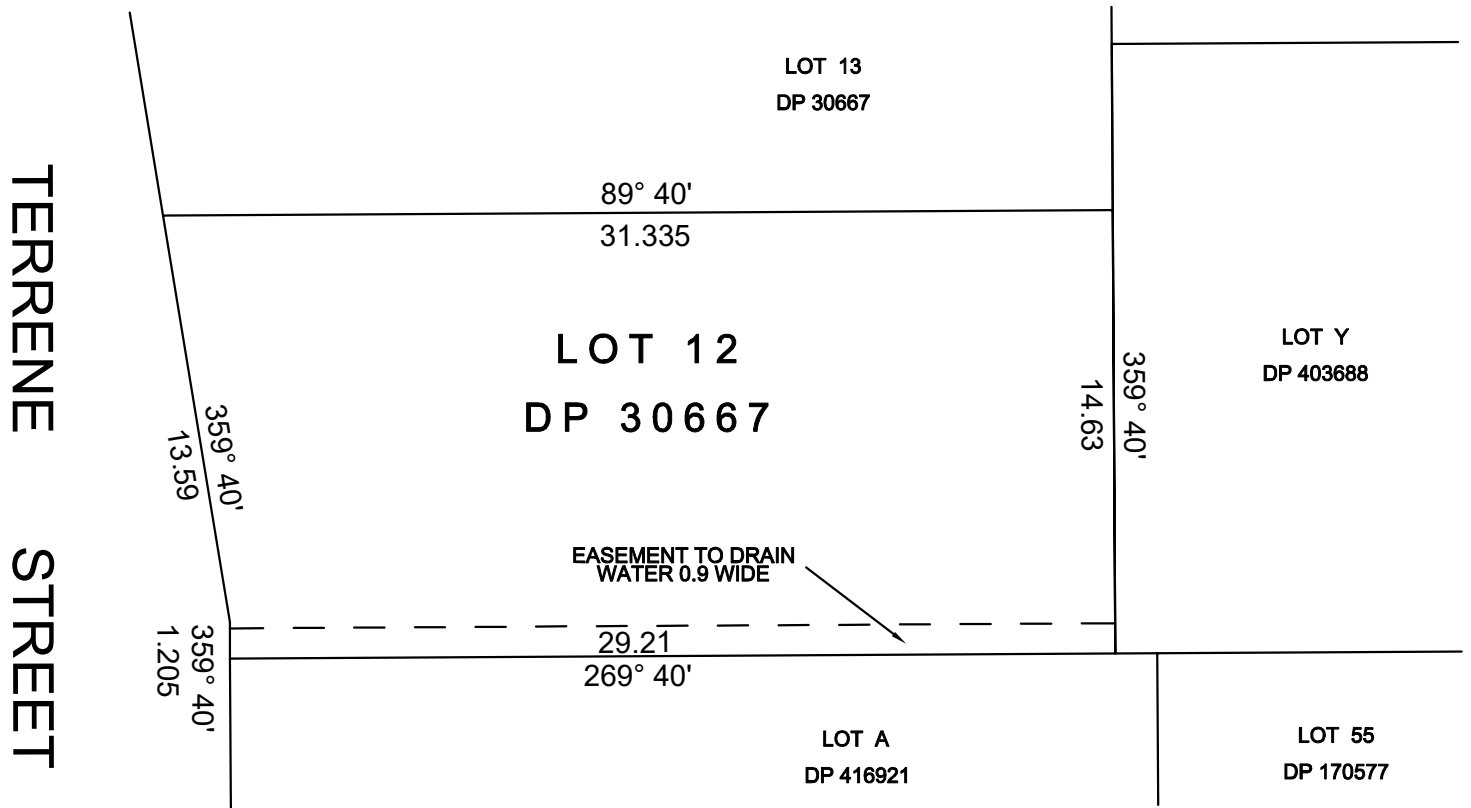
Name of authorised person: ANTHONY SUKKAR

Name of authorised person:

Office held: Sole Director/Secretary

Office held:

PLAN of EASEMENT  
TO DRAIN WATER 0.9 WIDE  
OVER LOT 12 IN DP 30667



Registered Proprietor  
Servient Tenement  
(Transferor)

Registered Proprietor  
Dominant Tenement  
(Transferee)

I, Jason Estephan, of  
Sydney Wide Surveying,  
P.O. Box 1184, Parramatta NSW 2150  
a Surveyor Registered under the  
Surveying and Spatial Information Act 2002,  
hereby certify that the survey represented  
in this plan was compiled.

Surveyor Registered under the  
Surveying and Spatial Information Act 2002



L.G.A. : CUMBERLAND  
LOCALITY : REGENTS PARK  
PARISH : LIBERTY PLAINS  
COUNTY : CUMBERLAND



## OSD DETAILED DESIGN CHECKLIST

ITEM	DESIGNER		COUNCIL REVIEW	
	YES	NO	YES	NO
1. A Stormwater Concept Plan (SCP) has been approved previously (refer Section 4.1)		/		
2. The site (whole or partly) is defined as floodprone in a 100 year event If YES, see Plan No ..... in Attachment A		/		
2(a) Has any floodplain storage been lost? If YES, see Plan No ..... in Attachment A	N/A			
2(b) Has the floodprone area been excluded from the OSD calculations?	N/A			
2(c) Is the OSD system performance adversely affected by the 100 year flood level?		/		
3. Is there an external catchment draining into the site? If YES, see Plan No ..... and calculations of 100 year ARI flow in Attachment B	N/A			
4. The location and extent of any floodway/flowpath has been determined, (refer Sections 4.1.3 & 4.2.2) If YES, see Plan No 1890/2 and accompanying 100 year event hydraulic calculations in Attachment B. Buildings are not inundated (and have the required freeboard) nor are flows concentrated on an adjoining property (refer Sections 4.1.3, 4.2.7 & 4.2.9)	/			
5. The detailed design submission is consistent with the approved SCP				
6. Are there any conditions on the development approval that may affect the drainage design (for example, trees to be retained)?				
7. The detailed design submission addresses the drainage-related conditions of the development approval				
8. A site layout plan with accompanying ground levels/contours which extend into adjoining properties is submitted If YES, see Plan No. ....	/			
9. Have other constraints, e.g. easements, services, been defined? If YES, see Plan No. 1820/2	/			
10. How many OSD storage systems are there? ..... 1 .....	/			
-				
11. Are the storage system/s off-line (refer Section 4.2.6)? If NO, see alternative calculations included in Attachment C	/			
12. State the type of discharge control device (i.e. orifice or .....)? Where the device is not an orifice, has specific Trust approval been obtained?	N/A			
13. The area of the site to be drained by each OSD storage has been determined, (refer Section 4.2.2) If YES, see Plan No. 1820/2	/			
If YES, the uncommanded site percentage is 1.0% (to be less than 15%, refer Section 4.1.4 unless specific approval has been granted).	/			
14. The plan/s identify the maximum water levels, and the levels and locations of each storage's discharge point (refer Section 4.2.2) If YES, see Plan No. ....	/			
15. The location of overflow structures and surcharge pathways have been determined, (refer Sections 4.2.2 & 4.2.9) If YES, see Plan No ..... and calculations in Attachment D	/			
Buildings are not inundated nor are flows concentrated on an adjoining property (refer Sections 4.2.7 & 4.2.9)	/			
16. The drainage plans have been checked for consistency against the Architectural and landscaping plans	/			
17. A maintenance schedule has been prepared (ref Section 4.2.10)		/		

At Certification  
Stage



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

OSD Storage system identifier.....

ITEM	DESIGNER		COUNCIL REVIEW	
	YES	NO	YES	NO
18. The design explicitly shows how all the drained area grades to the storage, including roof gutter overflows (refer Section 6.2)	/			
If YES, see Plan No. 11242	/			
If NO, see calculations in Attachment E showing how all drainage system components (including all roof gutters, downpipes, collecting pits and pipe systems, etc) have 100 year ARI capacities with 50% blockage factor	N/A			
19. The invert level of storage is not less than ground level (or top of kerb) at point of connection to external stormwater system	/			
If YES, see Plan No. ....	/			
If NO, see explanatory notes in Attachment F	N/A			
20. The discharge control pit design is consistent with the principles shown in Figures 4.3, 7.10 and/or 7.11	/			
20(a) The DCP has an open grating type lid (for ease of inspection)	/			
20(b) The DCP minimum dimensions are consistent with Section 4.2.3	/			
20(c) The floor of the DCP has a localised sump adjacent to the orifice with level at least 150 mm below the return pipe, (refer Section 4.2.8)	/			
20(d) The return pipe from the storage is at least 150 mm in diameter (refer Section 4.2.8)	/			
20(e) The return pipe flap valve is consistent with Figure 4.3	/			
20(f) If an orifice control is specified, is it consistent with the requirements set out in Section 4.2.3?	/			
If YES, see: Plan No. 11242 for stainless steel plate specification, thickness and fixing to pit wall	/			
20(g) The overflow weir is fitted with a basket (refer Section 6.3). There is a surface grate above the basket to facilitate inspection and maintenance	/			
20(h) The high early discharge (HED) characteristics are consistent with the requirements set out in Section 4.2.3 including calculations for overflow depth to storage <sup>iv</sup> .	/			
If YES, see: Plan No. 11242 for height of discharge to storage relative to permissible site discharge (PSD)	/			
Accompanying weir calculations in Attachment E	/			
Plan No. 11242 showing majority of site drainage system connecting to the DCP & the volume of the DCP is small compared to the volume of the storage	/			
20(i) The screen design is consistent with Section 4.2.5	/			
If YES, see: Plan No. 11242 for screen type, area and orientation	/			
Plan No. 11242 for fabrication note re aperture orientation	/			
Plan No. 11242 for fixing and handle details	/			
Plan No. 11242 showing how all inflows to the DCP are on the upstream side of the screen protecting the orifice	/			
20(j) The outlet pipe from the DCP has a capacity at least twice the PSD (refer Section 4.2.4)	/			
If YES, see calculations in Attachment E	/			

<sup>iv</sup> Weir calculations clarified



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

**B9B. OSD DETAILED DESIGN SUBMISSION<sup>iii</sup>**

This form may be completed by the stormwater designer and submitted to Council/Principal Certifying Authority (PCA) together with the design plan/s and any necessary attachments if form B9A is not used.

PROJECT ADDRESS: 116 KINGS LAND RD. REGENTS PARK

PROJECT APPLICANT: \_\_\_\_\_

**OSD DESIGNER DETAILS:**

Company Name: M M PARAH Civil/Structural P/L

Address: 129 Hampden Rd STE. WENTWORTHVILLE

Telephone No.: 0411780327 Fax No: \_\_\_\_\_

Accreditation organisation: Institution of Engineers Australia

Accreditation Reference: 1146394

Name and signature of designer: \_\_\_\_\_

MONZER  
(Print Name)

Date: 20/03/2018

Items submitted: \_\_\_\_\_

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

**COUNCIL REVIEW DETAILS:**

Council Review Officer's Name: \_\_\_\_\_

Review officer's comments: \_\_\_\_\_

Signature of Review Officer: \_\_\_\_\_ Date: \_\_\_\_\_

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

<sup>iii</sup> Form number changed to reflect new shorter checklist in third edition



- DCP
- V/A
- ☒ 4. Copies (Refer to number of copies as outlined in Council's Development Application Submission Checklist) of the fully detailed OSD Drawing at a scale of 1:100 are provided (where development site size, excluding section details, requires more than two A1 drawing sheets at 1:100 scale, the drawing may be reduced in scale to 1:200).
  - ☒ 5. Four (4) copies of<sup>2</sup> the OSD Design Summary Calculations are attached. The correct Permissible Site Discharge (PSD) and Site Storage Requirement (SSR) values have been used (see OSD Policy for Values).
  - ☒ 6. Site layout on the stormwater and OSD drawing corresponds with, and compliments, Architectural and Landscape Drawings.
  - ☒ 7. Roof Plan of all proposed buildings is provided.
  - ☒ 8. Downpipe locations are clearly indicated for all proposed buildings.
  - ☒ 9. All stormwater pipes are clearly shown, **ie thicker linetype**, from downpipes and pits to the outlet connection point into Council's drainage system/kerb & gutter.
  - ☒ 10. The site stormwater connection point into Council's drainage system/kerb & gutter is indicated on the drawing along with its invert level.
  - ☒ 11. All pipe sizes and grades are indicated **adjacent** to all pipes proposed on the site.
  - ☒ 12. All pit sizes, surface and invert levels are indicated adjacent to all pits proposed on the site. (Note :- minimum pit size 450mm x 450mm)
  - ☒ 13. All walls, kerbs or crests proposed on the site are indicated along with their respective levels. (eg top of wall level)
  - ☒ 14. Retaining walls forming above ground storage basin/s are of watertight construction (ie: Masonry/Brick) and a typical section detail is provided.
  - ☒ 15. Finished surface levels are indicated within all courtyards/driveways/detention storage areas.
  - ☒ 16. The stormwater outlet pipe is connected into the kerb and gutter at a distance, no further than 45 degrees from the property boundary.
  - ☒ 17. A 1.2m high pool type fence/suitable barrier or railing has been provided where a vertical drop into an above ground basin exceeds 500mm.
  - ☒ 18. All services within the site and footpath area are accurately indicated on the stormwater and OSD drawing.
  - ☒ 19. All vehicular crossings proposed are located a minimum of 1.0m clear of power poles and 1.2m clear of large Telstra manholes, where relevant.
  - ☒ 20. Size and layout of the vehicular crossing complies with Council's vehicular crossing policy.
  - ☒ 21. Detailed cross-section of the discharge control unit/below ground tank is in accordance with the Council Standard Section details. (Note: The Council's Standard Sections are attached in Appendix B of the OSD policy).
  - ☒ 22. Typical section detail of a surface inlet pit is provided.
  - ☒ 23. A minimum grade of 1% has been provided on the base of the above ground detention basin located in landscaped/turfed areas to a grated collection pit.
  - ☒ 24. Sub-soil drainage is indicated within above ground detention basins located in landscaped areas. ( Note :- Subsoil drainage shall connect to the collection pits of the detention basin )



- ☒ 25. Areas of the site that by-pass the detention system/s are clearly delineated on the Hydraulic Drawing.
- ☒ 26. Finished floor levels of dwellings are a minimum of 300mm above the top of water level of the OSD and garages are a minimum of 100mm above the top of water level of the OSD.
- ☒ 27. Satisfactory access is provided within the front setback area and/or rear courtyard into the detention storage area/s with maximum 1 in 4 batters or steps.
- ☒ 28. Convenient access from the front setback to the rear courtyard area of the development, and vice-versa, is provided for the lawn mower and garbage bins.
- ☒ 29. A notation has been provided on the OSD drawing, stating:-  
*All walls forming the detention basin shall be constructed wholly within the property boundaries of the site being developed.*
- ☒ 30. Notation has been included on the stormwater and OSD drawing to ensure landscaped areas within the OSD storage areas are mulched with decorative Rock Mulch. (ie non floatable).
- ☒ 31. All trees to remain on the subject site or those on neighbouring properties which overhang or are within 5m of the site boundaries of the subject site are to be accurately located and indicated on the OSD Drawing.
- ☒ 32. No filling or excavation is proposed within required protection zone of trees to remain.

## **CHECKLIST - PART 2**

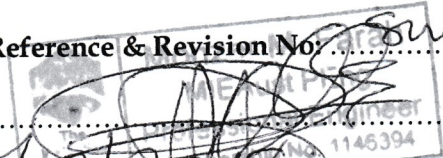
The Design Engineer shall complete the following in relation to the matters that are relevant to the development site or proposed stormwater and OSD system. Any items that are ticked below shall be addressed through the submitted OSD drawing or the submission of additional details (refer to Holroyd Council OSD policy for specific requirements).

- ☐ 1. The orifice outlet of the proposed detention system will function as a drowned discharge outlet, ie. submerged.
- ☐ 2. The site is located in/or adjacent to a low point in the catchment area or a Council drainage easement/open channel is located within or adjoins the site or the upstream catchment is greater than 0.5 Ha.
- ☐ 3. Localised overland flows generated in a 1 in 100 year ARI storm event currently drain through site.
- ☒ 4. An easement is required through an adjoining property/properties in order to drain the sites On Site Detention/Stormwater system.
- ☒ 5. The proposed development requires a pump out system for the basement level.

Designer: M.M. FARAH

Accreditation: Civil/Structural PE PANG NIE ANCH

Drawing Reference & Revision No: SDW - 116 KINGSLAND

Signed:    
 (Professional Engineer No. 1145394)

Date: 25/03/2018 DA No: .....

# FORMER HOLROYD COUNCIL

## Stormwater and On Site Detention Drawing Submission Checklist

### General

Council requires the submission of fully detailed On Site Detention (OSD) drawings to assist in determining the likely impacts that the development may have on the existing natural and built environments, both public and private. This will include any impacts on existing stormwater systems, overland flow and flooding conditions and those impacts on the assessment of the proposal with regard to Councils' Development Control Plans.

The purpose of this Checklist is to function as a supplement to the checklists within the Upper Parramatta River Catchment Trust OSD handbook. It will ensure that OSD and stormwater drawings submitted to Council contain the necessary and correct information and details which will enable an expedient assessment to be carried out by Council's officers to expedite the assessment process.

Prior to completing this Checklist, the Design Engineer shall read and be familiar with Council's Stormwater and OSD Policy.

**\*\*\* Please note: It is imperative that the Design Engineer carefully reads the Checklist as inaccurate or incomplete checklists may result in delays with processing or possible refusal of the Development Application. \*\*\***

All details and information contained in this Checklist shall be submitted and/or shown on the stormwater drainage and OSD drawings.

N/A shall be indicated adjacent to any details or information that are not relevant to the proposed stormwater drainage or OSD proposal.

No boxes in any of the following checklists that are relevant, shall be left blank or without an N/A adjacent to the box.

Note that in certain circumstances, Council may request additional information for clarity.

### CHECKLIST - PART 1

- ☒ 1. A completed Upper Parramatta River Catchment Trust "On-Site-Detention Concept Plan and Detailed Design submission checklist" has been completed and submitted. (Please attach UPRCT checklist to this document)
- ☒ 2. The designer is suitably accredited to carry out the design. Name, signature and qualification of the designing engineer are indicated on the drawings.
- ☒ 3. The proposed OSD system/s complies with Council's Policy on Stormwater and OSD.