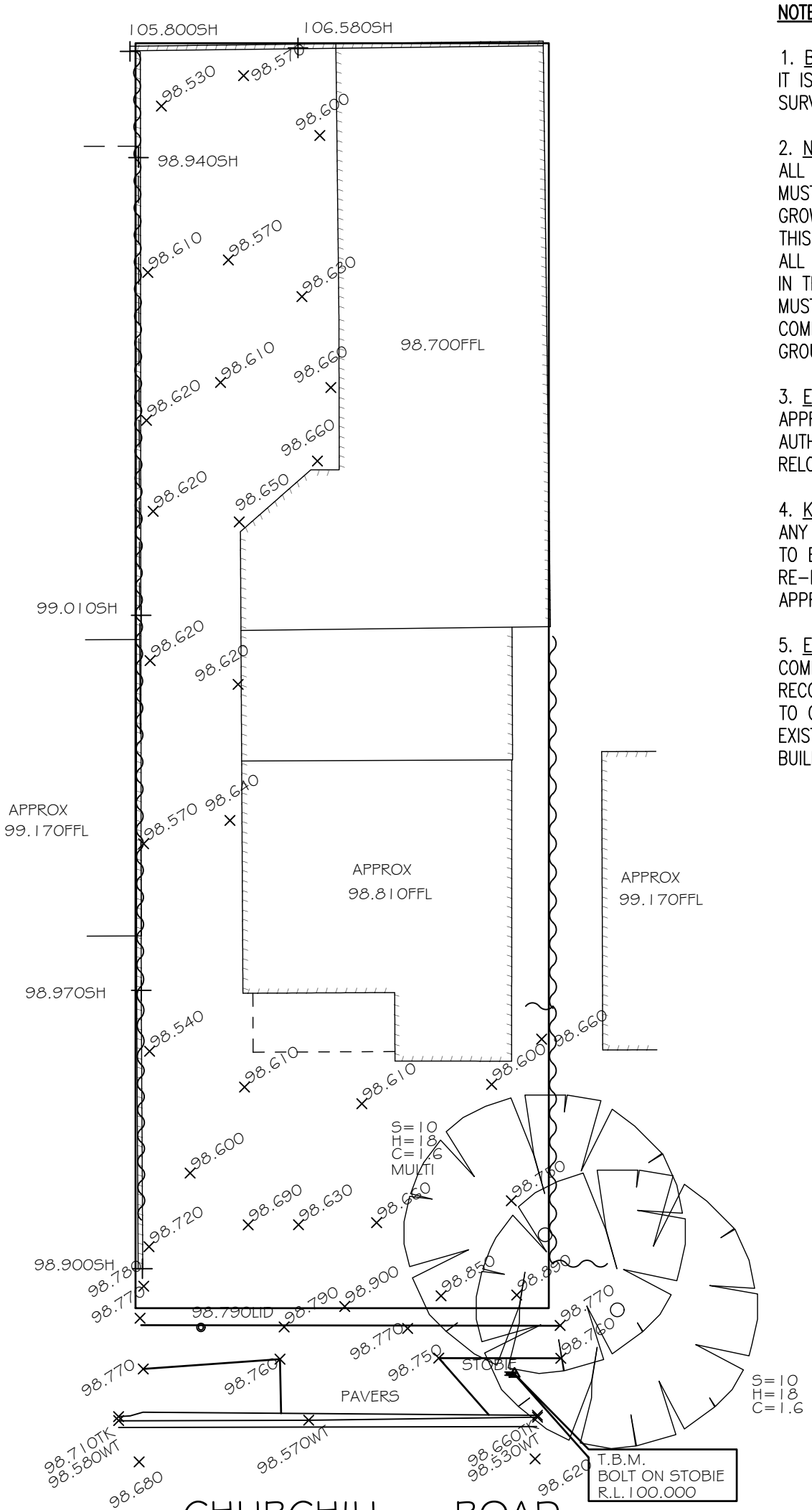


NOTES:

1. BOUNDARY NOTE:
IT IS STRONGLY RECOMMENDED THAT AN IDENTIFICATION SURVEY BE DONE TO ESTABLISH TRUE BOUNDARIES.

2. NOTE: SITE IS VEGETATED. COMPLETE REMOVAL OF ALL TREES LOCATED WITHIN THE BUILDING PLATFORM MUST BE REMOVED SO AS NOT TO ALLOW ANY FUTURE GROWTH.
THIS REMOVAL PROCESS MUST INCLUDE THE BASE AND ALL MAJOR ROOT SYSTEMS OF EACH TREE. ANY VOIDS IN THE GROUND AFTER THE REMOVAL OF THE TREE MUST BE BACKFILLED WITH CLEAN MATERIAL TO A COMPACTION SIMILAR TO THE SURROUNDING NATURAL GROUND.

3. EXISTING SERVICES NOTE:
APPROVAL MAY NEED TO BE SOUGHT FROM RELEVANT AUTHORITIES FOR ANY EXISTING SERVICES TO BE RELOCATED.

4. KERB NOTE:
ANY ABANDONED PORTION OF ENTRANCEWAY INVERT IS TO BE RESTORED WITH KERB & WATERTABLE, INCLUDING RE-INSTATEMENT OF FOOTPATH AND VERGE WHERE APPROPRIATE, AS PER COUNCILS GUIDELINES.

5. EXISTING STRUCTURES NOTE: PRIOR TO THE COMMENCEMENT OF SITE EARTHWORKS, IT IS RECOMMENDED THAT ADDITIONAL SITE LEVELS BE TAKEN TO CONFIRM REQUIRED BENCH LEVEL ONCE ALL EXISTING STRUCTURES HAVE BEEN REMOVED OVER THE BUILDING SITE.

NOTE: REFER TO ALL CIVIL DRAWINGS S03-1 TO S03-??.

EXISTING CONTOUR PLAN.

SCALE 1:200

SITE SURVEY NOTE: SITE SURVEY DONE BY OTHERS.

Issue	Date	Revision
A	14.05.24	FOR PLANNING APPROVAL.

Drawing Title: EXISTING CONTOUR PLAN.
Sheet Size: A3

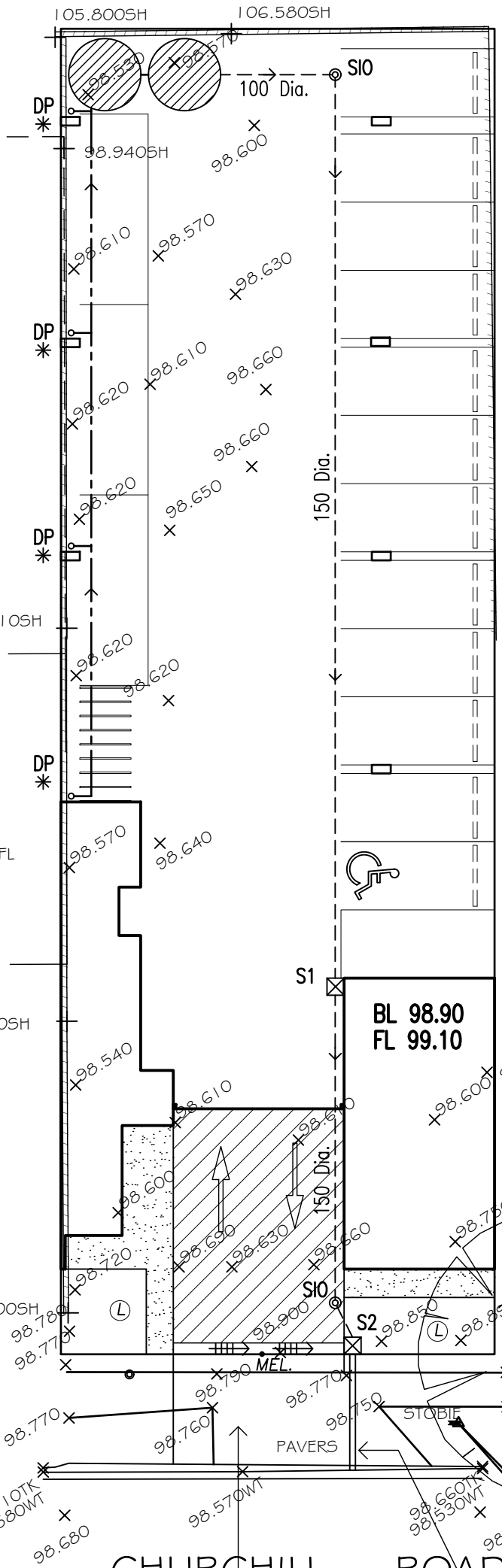
Project:
PROPOSED APARTMENTS.
AT 212 CHURCHILL ROAD,
PROSPECT. S.A.
FOR PINDER.

Designed T.D.
Drawn T.D.
Checked R.T.
Date 14.05.24

SSC
Structural Stability Consulting Pty. Ltd.
34 Hutchinson Street,
Mt. Barker SA 5251
Mobile: 0416 013 684
rami@structuralstability.com.au

Project Number: S24063
Drawing Number: S03-1
Issue: A

EXISTING FENCE NOTE:
EXISTING FENCE HAS BEEN DELETED FOR DIAGRAMMATIC REASONS ONLY.
BUILDER TO DECIDE FINAL FENCE OUTCOME.



CHURCHILL ROAD

BOUNDARY NOTE:
DUE CARE TO BE TAKEN WHEN CONSTRUCTING NEW BUILDING NEAR/ON BOUNDARIES.

ALTERATIONS TO CROSS-OVER AS PER COUNCIL GUIDELINES.
NOTE: DUE TO EXISTING FOOTPATH, CROSSOVER MUST RETAIN EXISTING LEVELS.
PROVIDE SMOOTH TRANSITIONS BETWEEN NEW AND EXISTING..

DRAIN S/WATER TO STREET WATERTABLE AS PER COUNCILS GUIDELINES.

LEGEND:

∘ DP ✳	SEALED DP DRAINING TO RAINWATER TANK.
NOTE: DOWNPIPE LOCATIONS ARE PRELIMINARY ONLY, AND WILL BE FINALISED AT A LATER DATE.	
_ _ _ _ _ ..... Dia.	DIAMETER AS SHOWN uPVC STORMWATER DRAIN. FALL 1 IN 100 MIN.
—·—·—·—	90mm uPVC DIAMETER SEALED STORMWATER DRAIN.
NOTE: PROVIDE ADEQUATE PROTECTION OR COVER TO STORMWATER PIPES, WHERE SUBJECTED TO VEHICULAR LOADING.	
• 90.00	FINISHED PAVING LEVELS.
• MEL.	MATCH EXISTING LEVEL. PROVIDE SMOOTH TRANSITIONS BETWEEN NEW AND EXISTING.
	SELECTED PAVING TO PERIMETER: 900mm MIN. WIDE PATH. GRADE AWAY FROM BUILDING TOWARDS LANDSCAPED AREAS.
	200x75mm GALV. HEAVY DUTY GRATED STORMWATER CHANNEL ACROSS DRIVEWAY. FALL 1 IN 200.
SIO ◎	SURFACE INSPECTION OPENING.
	PROPRIETARY TYPE WHEEL STOP.
⊠ S..	450mm SQUARE (APPROX). APPROVED VEHICULAR SUMP WITH GRATED COVER. CONNECT TO STORMWATER RUN AS SHOWN.
Ⓛ	LANDSCAPED AREA.
	RAINWATER TANKS. 2/10000 LITRES MINIMUM. PROVIDE 55mm DIAMETER ORIFICE PIPE TO EACH TANK. LOCATION OF TANKS AS SHOWN, BUT CAN BE RELOCATED DEPENDING ON SHAPE/ACCESS, AS LONG AS INTEGRITY OF DRAINAGE LAYOUT IS MAINTAINED.
	TRAFFICABLE PAVING. CONCRETE PAVING. REFER DETAILS ON NEXT DRAWING.

7

SITEWORKS AND DRAINAGE PLAN.

SCALE 1:200

SITE SURVEY NOTE: SITE SURVEY DONE BY OTHERS.

Issue	Date	Revision
A	14.05.24	FOR PLANNING APPROVAL.

Drawing Title: SITEWORKS AND DRAINAGE PLAN.
Sheet Size: A3

Project: PROPOSED APARTMENTS.

AT 212 CHURCHILL ROAD,
PROSPECT. S.A.
FOR PINDER.

Designed T.D.
Drawn T.D.
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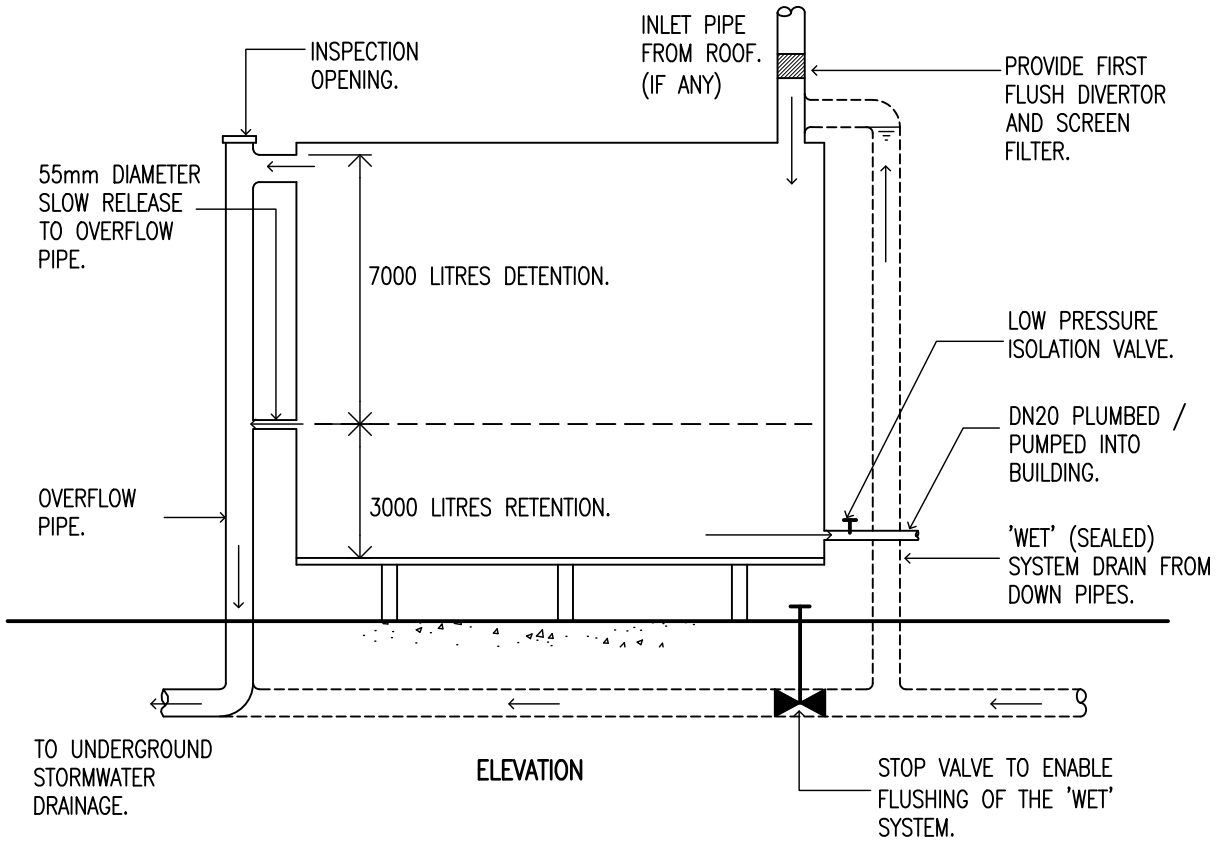
Project Number	Drawing Number	Issue
S24063	S03-2	A



ELEVATION

DIAGRAMMATIC (ONLY) ELEVATION OF TANK SYSTEM.

NOTE:
ALL DETAILS AS PER RELEVANT AUTHORITIES.

NOTE: THE INLET AND OVERFLOW OF THE TANK MUST BE FITTED WITH MOSQUITO PROOF, NON–DEGRADABLE SCREENS FORMED FROM 0.315mm DIAMETER MATERIAL AND HAVE A MINIMUM OF 6x7 OPENINGS SQUARE CENTIMETRE.

NOTES:

1. STORMWATER NOTE:

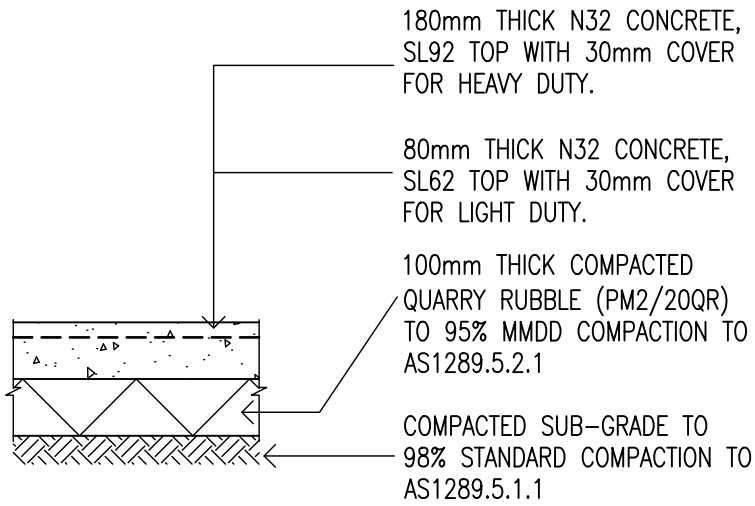
RAINWATER TANKS WILL ACHIEVE COMPLIANCE WITH STORMWATER MANAGEMENT OVERLAY DTS/DPF 1.1, AND ADDITIONAL CALCULATIONS IN REPORT BY FOLLOWING:

– EACH TANK TO BE 10000 LITRES TOTAL (COMPRISING 3000 LITRES RETENTION / 7000 LITRES DETENTION).
– WILL BE CONNECTED TO NO LESS THAN 60% OF THE BUILDING ROOF AREA,
– WILL BE CONNECTED TO AT LEAST ONE TOILET AND EITHER THE LAUNDRY COLD WATER OUTLETS OR HOT WATER SERVICE,
– WILL INCLUDE A 55mm DIAMETER SLOW RELEASE ORIFICE AT THE BOTTOM OF THE DETENTION COMPONENT OF THE TANK.

LOCATION OF TANKS AS SHOWN, BUT CAN BE RELOCATED DEPENDING ON SHAPE/ACCESS, AS LONG AS INTEGRITY OF DRAINAGE LAYOUT IS MAINTAINED.

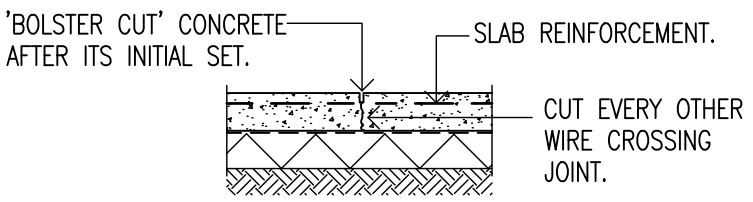
2. STORMWATER LAYOUT IS INDICATIVE ONLY, AND MAY CHANGE TO SUIT SITE CONDITIONS.
THE INTEGRITY OF THE STORMWATER DRAINAGE DESIGN SHALL BE MAINTAINED AT ALL TIMES.

3. REFER TO ARCHITECTURAL SITE PLAN FOR ALL SET OUT DIMENSIONS, LANDSCAPING AND ADDITIONAL DETAILS.



CONCRETE PAVEMENT DETAIL.

NTS.



TOOLED JOINT DETAIL.

PROVIDE JOINT EVERY 3m EACH WAY.

SUMP SCHEDULE.

SUMP NUMBER	TOP RL	OUTLET IL	INLET IL	SIZE	NOTES
S1	98.97	98.25	98.30	450x450	INSTALL OCEAN GUARD POLLUTANT FILTER TO SUMP AS PER OCEAN PROTECT MANUFACTURERS SPECIFICATIONS.
S2	98.85	TO SUIT FOOTPATH	98.13	450x450	'WET' SUMP WITH COVER, AND GRAVEL BASE. NOTE: THIS SUMP WILL NEED PERIODIC CLEANING AND MAINTAINING TO ENSURE EFFECTIVENESS.

Issue	Date	Revision
A	14.05.24	FOR PLANNING APPROVAL.

Drawing Title: NOTES AND DETAILS.
Sheet Size: A3

Project: PROPOSED APARTMENTS.

AT 212 CHURCHILL ROAD,
PROSPECT. S.A.
FOR PINDER.

Designed T.D.
Drawn T.D.
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Project Number	Drawing Number	Issue
S24063	S03–3	A

DETENTION CALCULATIONS

Job Number: **S24063**
Address: **212 Churchill Road, Prospect**

LEGEND

- a cell shaded this colour means you need to enter data here.
- a cell with no shading means the value is calculated by a formula
- shows the critical storm duration and storage volume for detention analysis

PRE - DEVELOPMENT CONDITION

Step 1. Determine the pre development peak outflow from the site. This calculation is based on the pre-development condition (use existing survey data)

Pre Development peak outflow

Design intensity	80.86	mm/hr	5 yr, 5 minute ARI storm	Select this intensity from the relevant IFD chart for Council specified DESIGN STORM
Total site Area	0.0710	Ha	Total area of the site	

Determine weighted coefficient of runoff for the entire site (determined from existing pervious and impervious areas - use survey data)

	C	Area (Ha)
Existing Roofed area	0.9	0.0354
Existing Paved area	0.8	0.0205
Existing pervious (landscaped) area	0.2	0.0151
WEIGHTED COEFF OF RUNOFF (Cw)	0.72	0.071

Pre development flow **11.52 L/s**

Thus, this is the maximum allowable outflow from the site from the new dev. (eg. from roofs, paved or landscaped areas). All flows from future development of the site must be limited to this value.

POST DEVELOPMENT CONDITION

Step 2. Determine the expected runoff from each component of the proposed development of the site (eg. detained roof, un-detained roof, un-detained paving and un-detained (or detained) landscaping/grassed/pervious areas.

2.A Size the DETENTION tanks to detain some (or all) of the roof runoff

All of the roof water will be directed to DETENTION tanks. The outflow from this tank is controlled by an orifice plate. It is assumed that detained water can only flow out of this tank at one rate (calculation is shown on sheet 4). However, overflow water will go into the stormwater system.
The maximum detention flow from the tank is:
Max flow, Q (orifice) **4.61 L/s** set by orifice outlet (refer sheet 4)

Water flows into the tank at a higher rate than it flows out. Therefore the volume of water builds up inside the tank. The calculation below determines the minimum volume required to detain this higher flow for the duration of the DESIGN STORM (which is determined below also).

Determine the volume of the tank required to detain the post development roof runoff:

C (roof)	0.9		This is an assumed coefficient of runoff for roof areas.
Roof Area	0.067	Ha	This is the area of roof plumbed via. downpipes to flow into the detention tank (refer S & D plan).

The following spreadsheet determines the minimum detention tank size required to detain the runoff from the design storm for CRITICAL STORM DURATION.
The results for this storm are shown highlighted in yellow.
NOTE: Remember to enter the correct IFD data for the site location and design storm

			Post development		Orifice outflow		Post development		
duration (min)	duration (s)	Intensity **100 year** (mm/hr)	Flow, Q (L/s) CIA	Total storm Volume (Litres)	Max Outflow Rate (L/s)	Max Volume (Litres)	Storage Volume Required (L)	Storage Volume (m^3)	
5	300	185.61	31.1	9327	4.61	1384	7943	7.9	
6	360	171.95	28.8	10369	4.61	1661	8708	8.7	
7	420	160.69	26.9	11305	4.61	1938	9367	9.4	
8	480	151.16	25.3	12153	4.61	2215	9939	9.9	
9	540	142.96	23.9	12931	4.61	2491	10439	10.4	
10	600	135.8	22.7	13648	4.61	2768	10880	10.9	
11	660	129.47	21.7	14313	4.61	3045	11268	11.3	
12	720	123.82	20.7	14933	4.61	3322	11611	11.6	
13	780	118.75	19.9	15515	4.61	3599	11916	11.9	
14	840	114.15	19.1	16061	4.61	3875	12185	12.2	
15	900	109.96	18.4	16576	4.61	4152	12424	12.4	
16	960	106.13	17.8	17066	4.61	4429	12637	12.6	
17	1020	102.61	17.2	17531	4.61	4706	12825	12.8	
18	1080	99.35	16.6	17972	4.61	4983	12990	13.0	
20	1200	93.52	15.7	18798	4.61	5536	13261	13.3	
25	1500	81.95	13.7	20590	4.61	6920	13670	13.7	
30	1800	73.28	12.3	22094	4.61	8305	13789	13.8	CRITICAL STORM DURATION AND MIN. TANK SIZE
35	2100	66.5	11.1	23391	4.61	9689	13703	13.7	
40	2400	61.03	10.2	24534	4.61	11073	13461	13.5	
45	2700	56.52	9.5	25561	4.61	12457	13104	13.1	
50	3000	52.71	8.8	26487	4.61	13841	12646	12.6	
55	3300	49.46	8.3	27339	4.61	15225	12114	12.1	
60	3600	46.64	7.8	28124	4.61	16609	11515	11.5	
75	4500	40.16	6.7	30271	4.61	20761	9509	9.5	
90	5400	35.48	5.9	32092	4.61	24914	7178	7.2	
120	7200	29.1	4.9	35095	4.61	33218	1877	1.9	
							13789	13.8	

2B. Size the DETENTION tanks to detain the surface stormwater runoff

All of the surface stormwater will be directed to DETENTION tanks. The outflow from this pipe is controlled by a restriction orifice
Water flows from this tank at :

Max flow, Q **1.00 L/s**

Water flows into the tank at a higher rate than it flows out. Therefore the volume of water builds up inside the tank. The calculation below determines the minimum volume required to detain this higher flow for the duration of the DESIGN STORM (which is determined below also).

Determine the volume of the pipe required to detain the post development surface and undetained roof runoff:

	C	Area (Ha)
Undetained Roofed area	0.9	0
New Paved area	0.8	0.0021
New pervious (landscaped) area	0.2	0.0019
WEIGHTED COEFF OF RUNOFF (Cw)	0.52	0.004

The following spreadsheet determines the minimum detention tank size required to detain the runoff from the design storm for CRITICAL STORM DURATION.
The results for this storm are shown highlighted in yellow.
NOTE: Remember to enter the correct IFD data for the site location and design storm

			Post development		Pipe outflow		Post development		
duration (min)	duration (s)	Intensity **100 year** (mm/hr)	Flow, Q (L/s) CIA	Total storm Volume (Litres)	Max Outflow Rate (L/s)	Max Volume (Litres)	Storage Volume Required (L)	Storage Volume (m^3)	
5	300	185.61	1.1	319	1.00	300	19	0.0	CRITICAL STORM DURATION AND MIN. TANK SIZE
6	360	171.95	1.0	354	1.00	360	-6	0.0	
7	420	160.69	0.9	386	1.00	420	-34	0.0	
8	480	151.16	0.9	415	1.00	480	-65	-0.1	
9	540	142.96	0.8	442	1.00	540	-98	-0.1	
10	600	135.8	0.8	466	1.00	600	-134	-0.1	
11	660	129.47	0.7	489	1.00	660	-171	-0.2	
12	720	123.82	0.7	510	1.00	720	-210	-0.2	
13	780	118.75	0.7	530	1.00	780	-250	-0.2	
14	840	114.15	0.7	549	1.00	840	-291	-0.3	
15	900	109.96	0.6	566	1.00	900	-334	-0.3	
16	960	106.13	0.6	583	1.00	960	-377	-0.4	
17	1020	102.61	0.6	599	1.00	1020	-421	-0.4	
18	1080	99.35	0.6	614	1.00	1080	-466	-0.5	
20	1200	93.52	0.5	642	1.00	1200	-558	-0.6	
25	1500	81.95	0.5	703	1.00	1500	-797	-0.8	
30	1800	73.28	0.4	755	1.00	1800	-1045	-1.0	
35	2100	66.5	0.4	799	1.00	2100	-1301	-1.3	
40	2400	61.03	0.3	838	1.00	2400	-1562	-1.6	
45	2700	56.52	0.3	873	1.00	2700	-1827	-1.8	
50	3000	52.71	0.3	905	1.00	3000	-2095	-2.1	
55	3300	49.46	0.3	934	1.00	3300	-2366	-2.4	
60	3600	46.64	0.3	961	1.00	3600	-2639	-2.6	
75	4500	40.16	0.2	1034	1.00	4500	-3466	-3.5	
90	5400	35.48	0.2	1096	1.00	5400	-4304	-4.3	
120	7200	29.1	0.2	1199	1.00	7200	-6001	-6.0	
							19	0.0	

CONCLUSION: NO TANK REQUIRED FOR SURFACE RUNOFF

Step 3. Check to see if the sum of the flows from all parts of the site (post development) is less than or equal to the maximum allowable pre-development flow.

DETENTION CALCULATION SUMMARY SHEET

Pre development condition: (Step 1)

Maximum Outflow for the site **11.5 L/s**

Post development condition: (Step 2)

Maximum flows:
Detained roof area (connected to tank) = 9.23 L/s (2 tanks at 4.61 L/s each)
Un-detained roof area and 0.00 L/s
Pavement and landscaped area = 1.00 L/s

TOTAL maximum peak flow = **10.23 L/s**

Check if less than the pre-development peak flow: OK

Detention Tank Sizing

Input Values

Orifice Outflow

Detention Tank Height	0.5	m
Orifice Plate Diameter	55	mm
A	0.00238	m^2
Friction loss Coefficient,k	0.62	
V	3.13	m/s
Q	**4.61**	**l/s**