

site/ground floor plan

scale 1:100

SHEET 1

p:\stormwater drawings\051223 86 the avenue

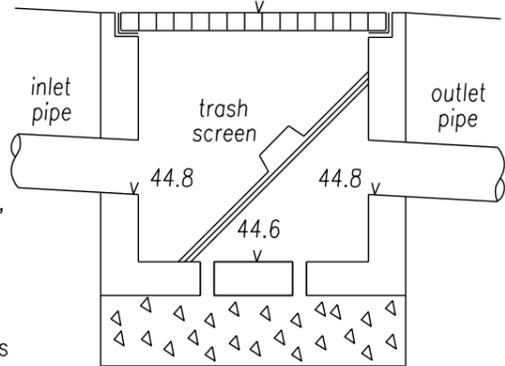
continued on next sheet

precast concrete pit with light duty weight galvanised grate

a grid mesh trash screen, RH3030 Maximesh or equivalent to be provided to protect outlet pipe

4 @ 50mm dia weep holes under floor of pit

200mm thick bed of 20mm dia aggregate to be wrapped in bidim a14



sediment & litter control pit ②
not to scale

L. Savage
Leon Savage
B.E. Civil, MIE Aust.

development application issue

apr 2024	footway levels, north side passage levels, OSD tanks levels & details, roof top garden	D
apr 2024	development application issue	C
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STORMWATER ENGINEERS PTY LTD

stormwater + civil engineers

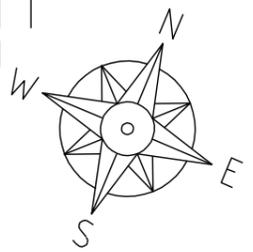
email: aztecengineers@gmail.com
tel 0433 00 1985

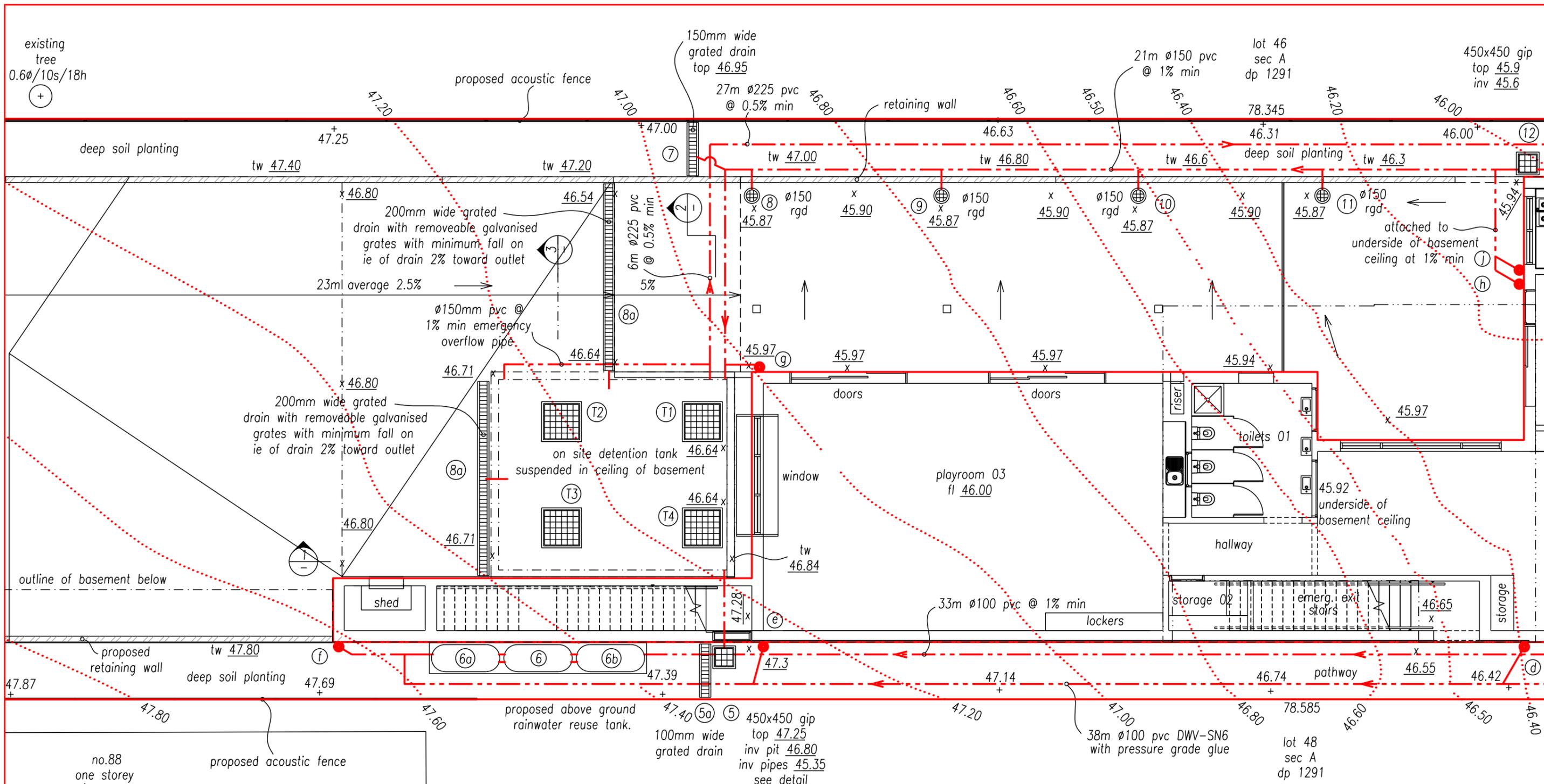
PROJECT :
proposed childcare centre at 86 the avenue, bankstown

DRAWING No.
051223

stormwater drainage, on site detention & rainwater reuse

THE AVENUE

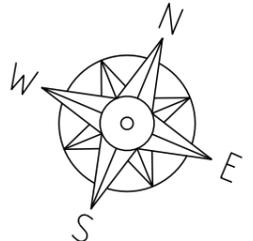




site/ground floor plan

scale 1:100

SHEET 2



continued on next sheet

continued on next sheet

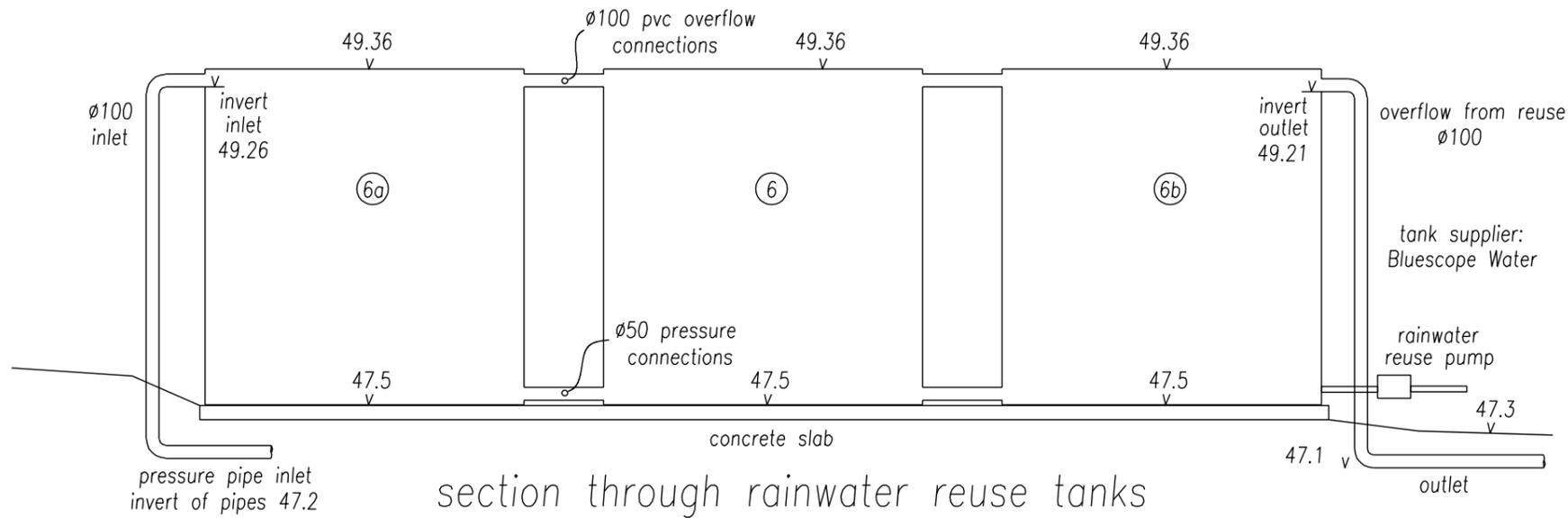
p:\stormwater drawings\051223 86 the avenue

development application issue

Leon Savage
Leon Savage
B.E. Civil, MIE Aust.

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PROJECT : proposed childcare centre at 86 the avenue, bankstown		DRAWING No. 051223	stormwater drainage, on site detention & rainwater reuse



section through rainwater reuse tanks
not to scale

Rainwater Commitments	
item	requirement
rainwater tank size	6000 litres proposed
roof area	about 500sqm
rainwater tank connected to	all toilets & outdoor taps the cold water tap that supplies each clothes washer

reuse required per BASIX na litres
proposed 6000 litres storage
rainwater reuse tanks
per suppliers specifications
3 @ Slimline 2000TA 1800 long 1860 high 710 wide tank system
supplier Bluescope Water

any openings shall be meshed or sealed to prevent access by insects such as mosquitos
pump to be suitably soundproofed

the drainage system & the downpipes & fittings are to be DWV-SN6 pvc pipes with pressure glue specified in AS3500.1:2015

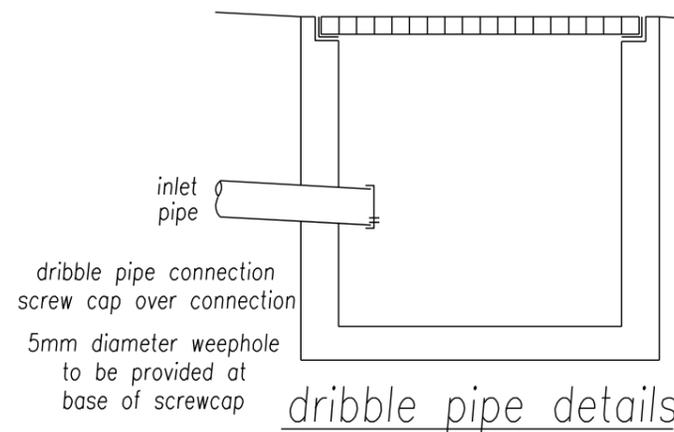
NOTES

- all work to be done to the satisfaction of Bankstown City Council.
- legend:
 - tw top of wall
 - tk top of kerb
 - down pipe
 - fw floor waste
 - gfl garage floor level
 - fl floor level
 - 56.89 existing level
 - 53.81 design level
 - gip grated inlet pit
 - bfl basement floor level
 - jp junction pit
 - ie upvc sewer grade inspection eye
 - dps - downpipe with spreader
 - D.E.B - dropped edge beam
 - rgd - round grated drain
 - eof - emergency over flow
 - ie - inspection eye
- proposed concrete driveway to be constructed in accordance with plans, specifications, and levels issued seperately by council.
- all pipes to be min. 100mm dia unless noted otherwise (uno).
- all pipes to be grade upvc at min 1% uno.

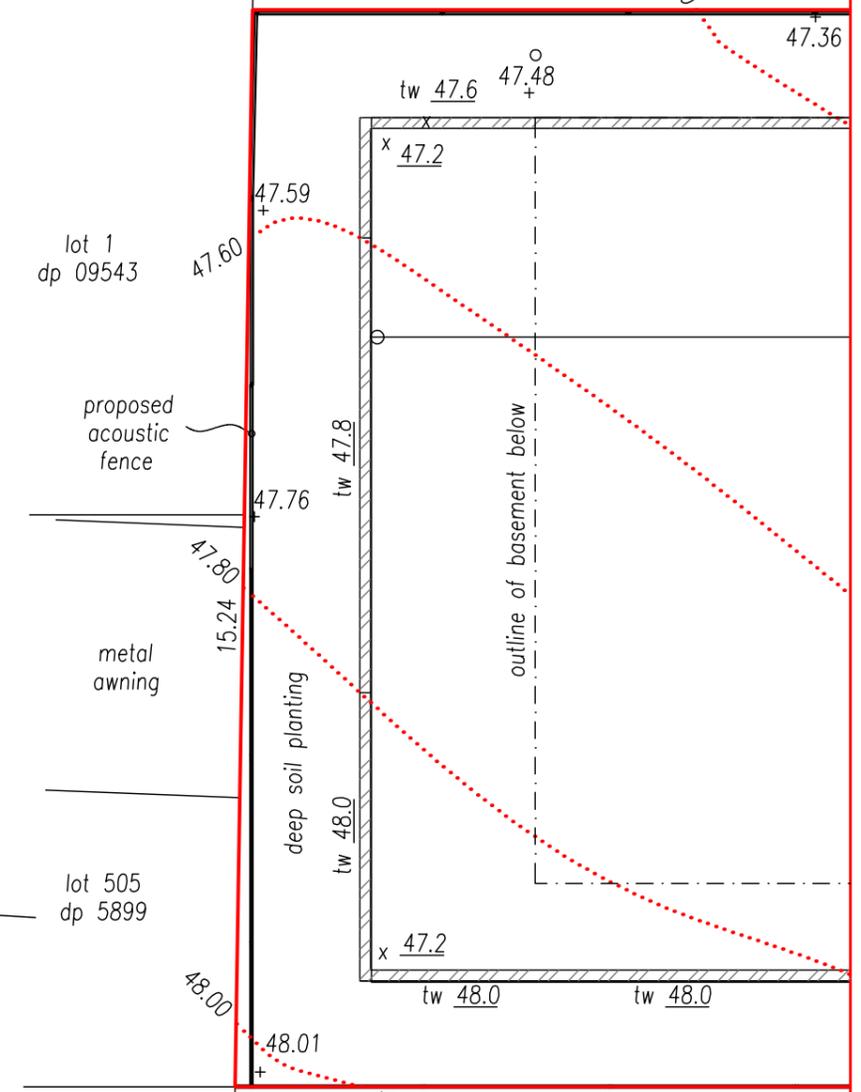
TABLE OF DOWN PIPE INFORMATION

down pipe number	size	surface level	invert level
a	ø90mm	46.00	45.80
b	ø90mm	46.00	45.80
c	ø90mm	46.35	46.15
d	ø90mm	46.40	46.20
e	ø90mm	47.30	47.10
f	ø90mm	-	-
g	ø90mm	45.97	-
h	ø90mm	-	-
j	ø90mm	-	-
k	ø90mm	45.89	45.09
m	ø90mm	45.89	45.09
n	ø90mm	46.50	46.20
o	ø90mm	45.335	45.0

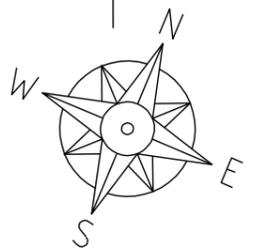
all proposed downpipes to be ø90 pvc SWV-SN6 with pressure grade glue (green glue) in joints



dribble pipe details
not to scale



site plan
scale 1:100



continued on next sheet

SHEET 3

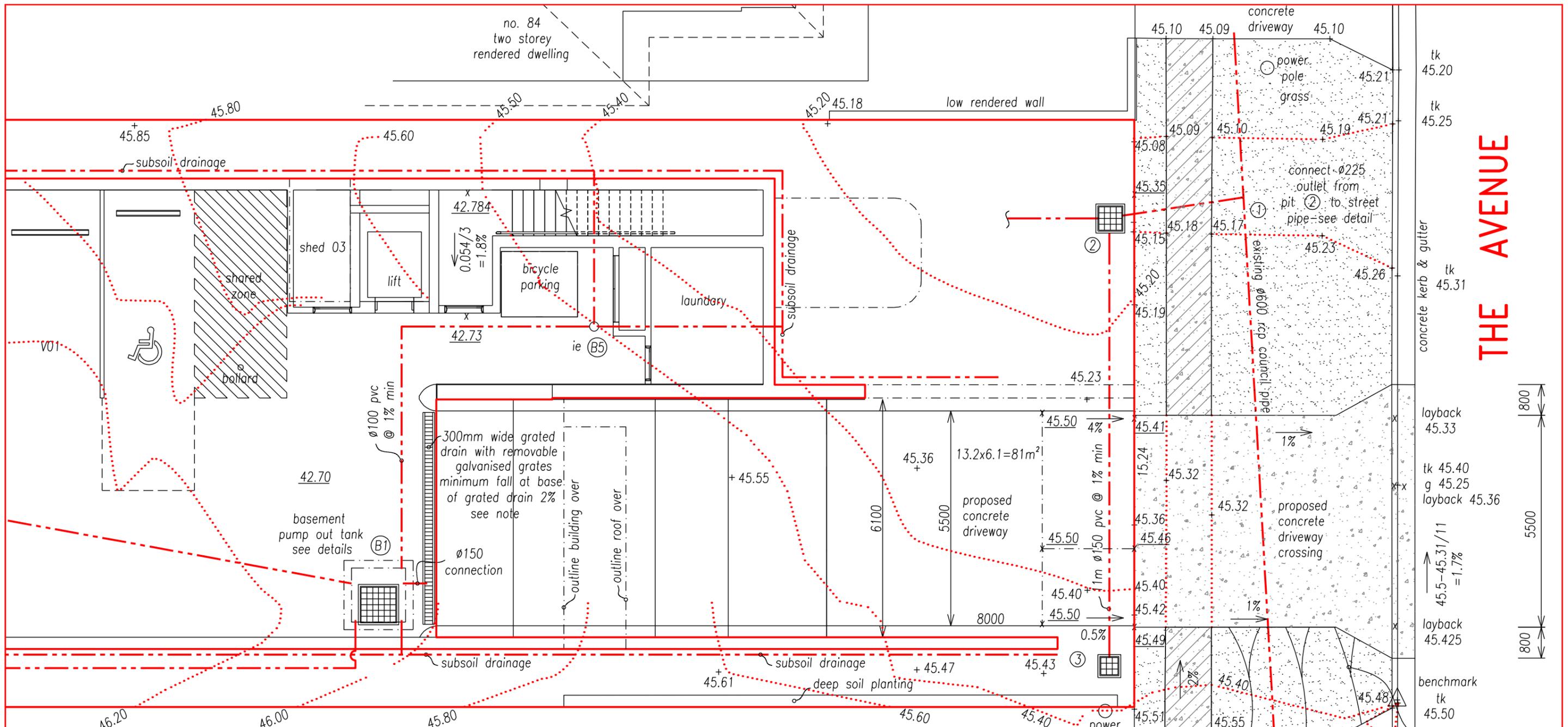
p:\stormwater drawings\051223 86 the avenue

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PROJECT : proposed childcare centre at 86 the avenue, bankstown	DRAWING No. 051223	stormwater drainage, on site detention & rainwater reuse

development application issue

Leon Savage
Leon Savage
B.E. Civil, MIE Aust.



site/basement plan

scale 1:100

continued on next sheet

pits in basement & driveway areas precast concrete with min class 2 galvanised steel grated & frames.

section 9.4.7 Council Policy 2006
 200mm rainfall, 24 hour period, with pump failure.
 $81m^2 \times 0.2m = 16.2m^3$. pump out tank 2 KL.
 basement floor about $55 \times 12 + 9 \times 5 = 660 + 40 = 700m^2$
 $14.2KL / 700m^2 = 20mm$ average < 200mm OK.

grated drain by Tellam Civil Products
 product 15C 15735
 GTG30L 300x1000 LD trench G & F
 clear opening 300x1000 each unit piece
 brisbane 07 3800 7855 www.tellam.com.au

SHEET 4

p:\stormwater drawings\051223 86 the avenue

development application issue

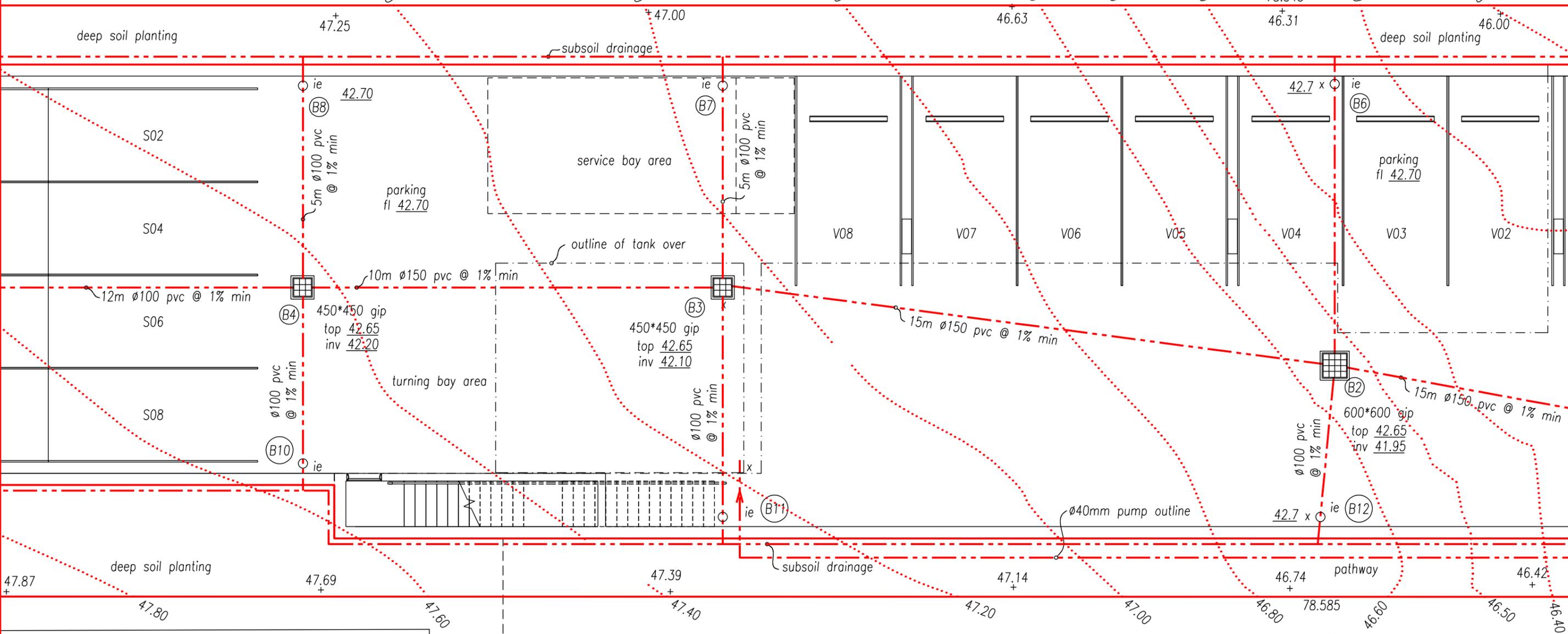
L. Savage
 Leon Savage
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existing tree
0.6ø/10s/18h
⊕

lot 46
sec A
dp 1291



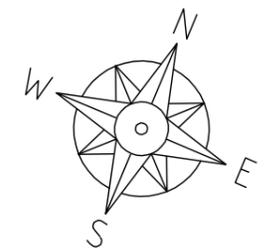
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site/basement plan

scale 1:100

SHEET 5



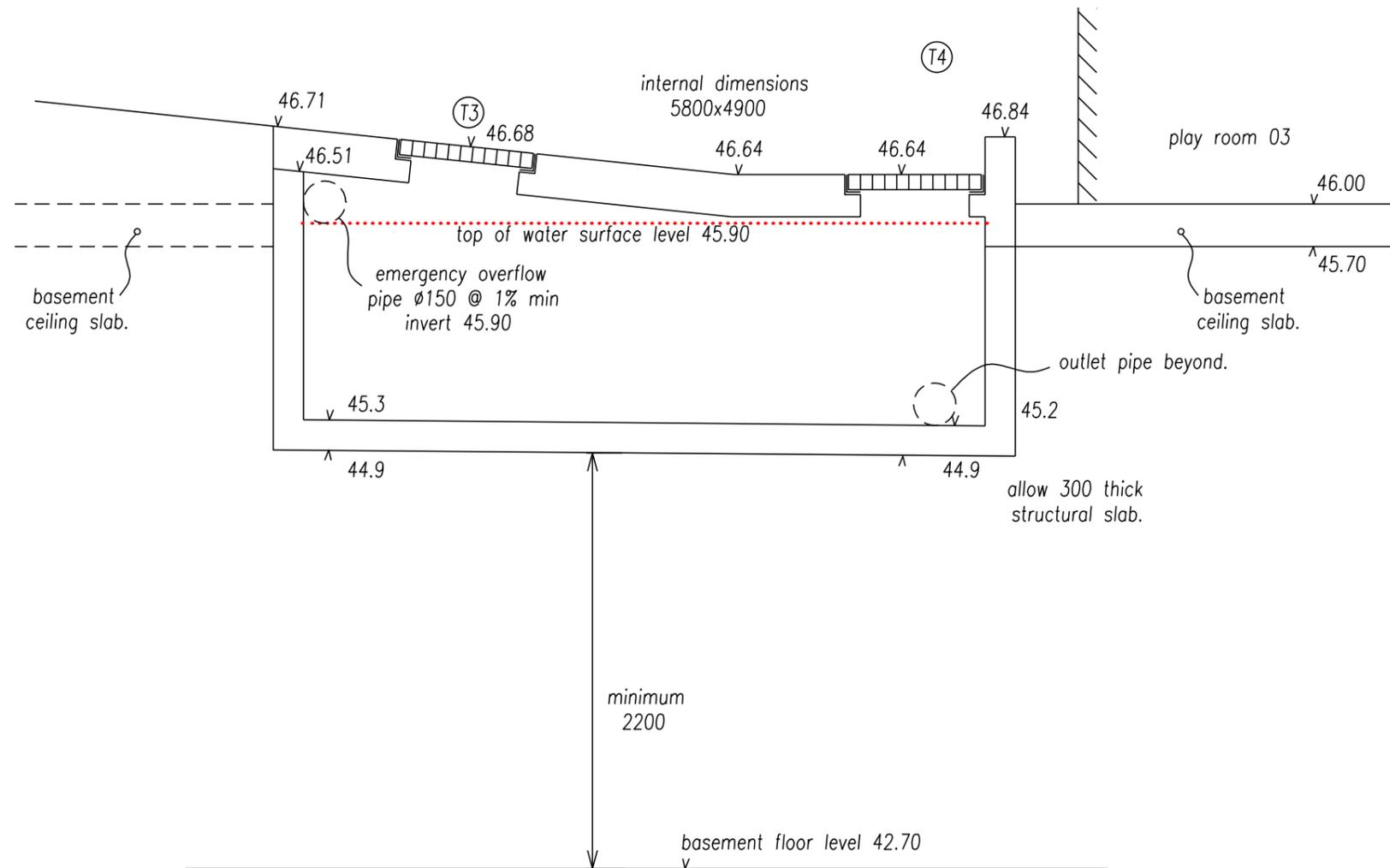
p:\stormwater drawings\051223 86 the avenue

development application issue

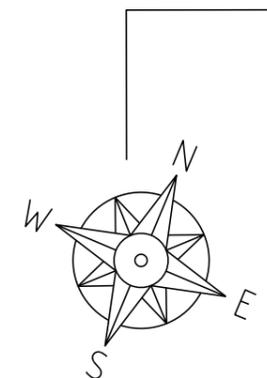
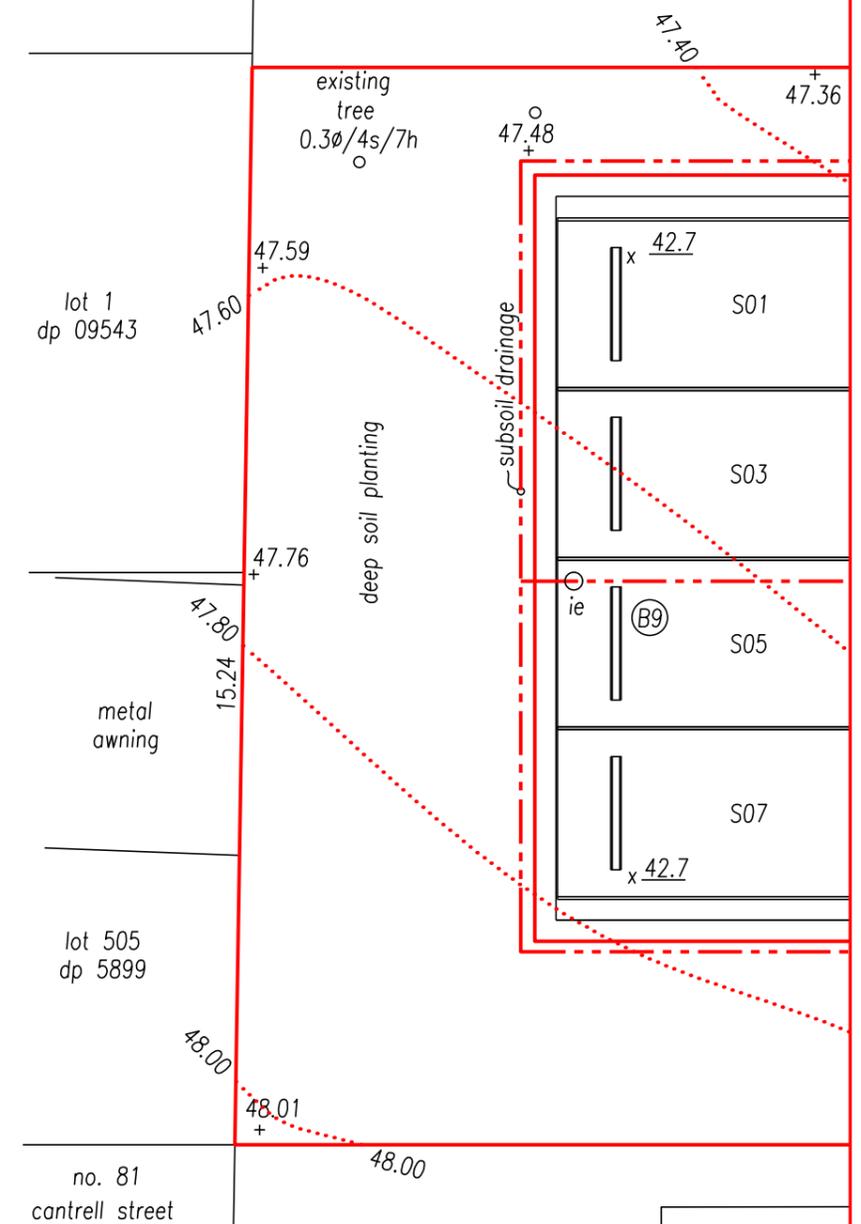
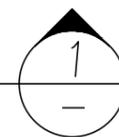
L. Savage
Leon Savage
B.E. Civil, MIE Aust.

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<p>PROJECT : proposed childcare centre at 86 the avenue, bankstown</p>	<p>DRAWING No. 051223</p>	<p>stormwater drainage, on site detention & rainwater reuse</p>



section through On Site Detention tank
not to scale



continued on next sheet

SHEET 6

p\stormwater drawings\051223 86 the avenue

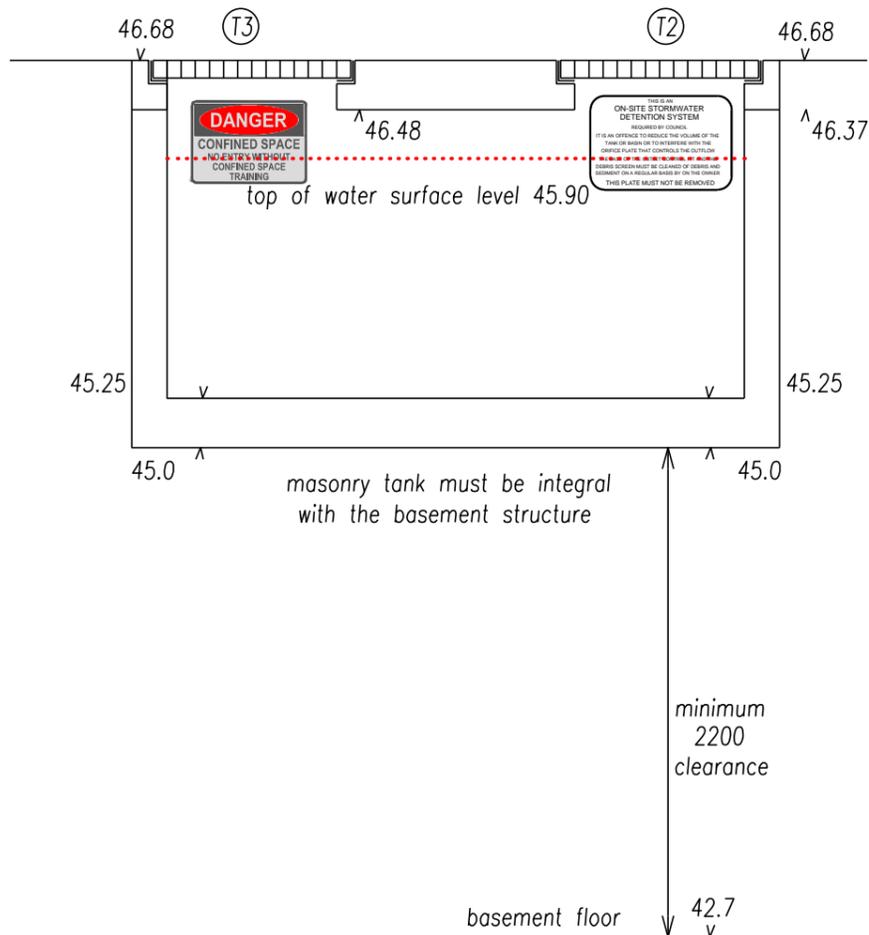
development application issue

Leon Savage
Leon Savage
B.E. Civil, MIE Aust.

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PROJECT :	DRAWING No.	051223	
proposed childcare centre at 86 the avenue, bankstown			
		stormwater drainage, on site detention & rainwater reuse	

1000x1000 light duty
grates & frames over tank
grates to be galvanised,
hinged & split into two
500x1000 halves
with child proof locks

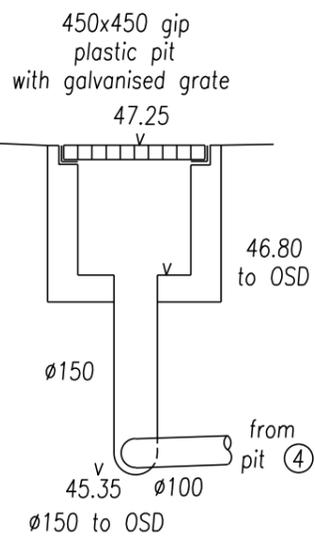


All walls or kerbs forming the detention basin shall be constructed wholly within the property boundaries of the site being developed.

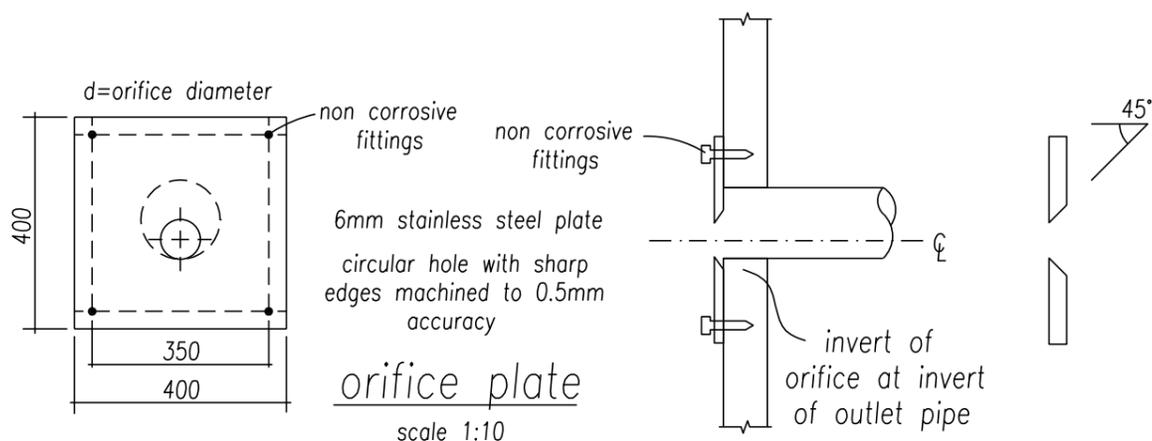
structural details of detention tank
to be prepared by a suitably
qualified structural engineer.

section through On Site Detention tank

not to scale



pit (5) detail
not to scale



orifice plate
scale 1:10

Leon Savage
Leon Savage
B.E. Civil, MIE Aust.

development application issue

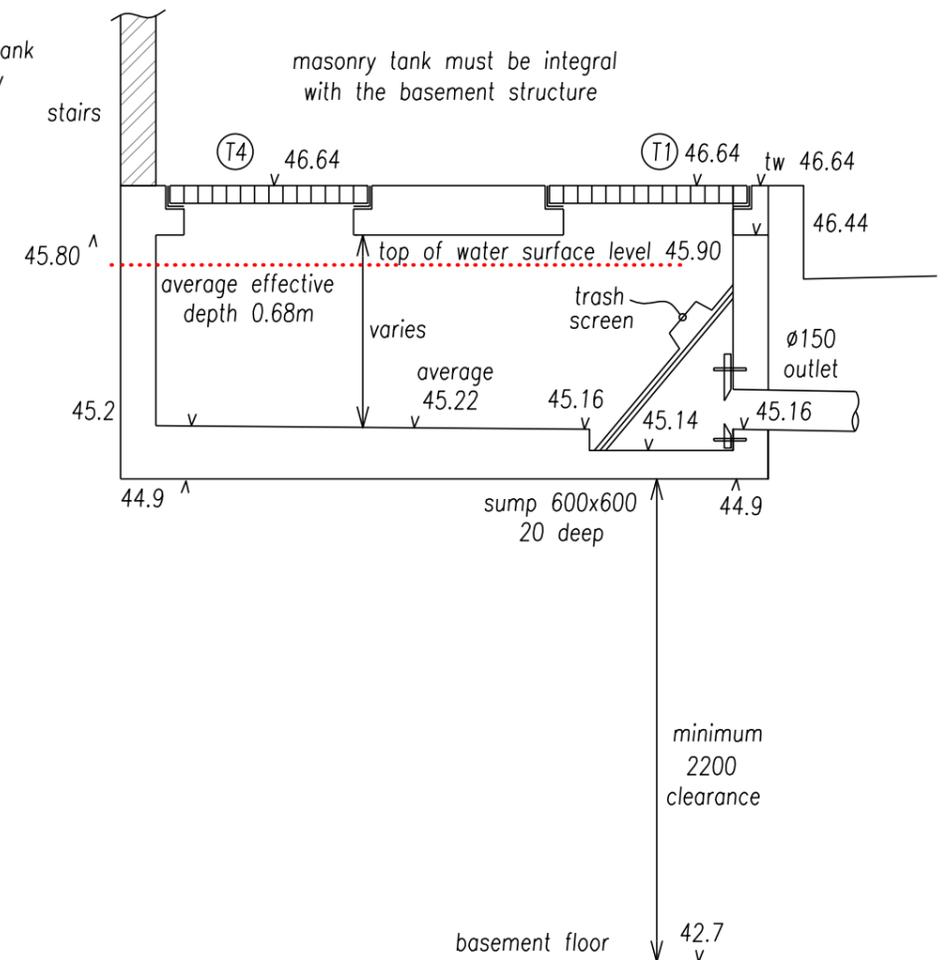
structural details of detention tank
to be prepared by a suitably
qualified structural engineer.

step irons to be
provided at 300mm
centres, staggered

orifice plates
300x300x3mm thick
to be bolted to pit
wall with 4m16 bolts
or equivalent

cl orifice 45.20
orifice diameter 170mm
plate to be stainless steel

a grid mesh trash screen,
RH3030 Maximesh or
equivalent to be provided
to protect outlet pipe/orifice



All walls or kerbs forming the detention basin shall be constructed wholly within the property boundaries of the site being developed.

section through On Site Detention tank

not to scale



site area 1195m²
volume see details
Tank floor area see details
average base level tank 45.22
top of water surface level 45.90
effective height of water 45.90
45.90-45.22=0.68m

SHEET 7

p\stormwater drawings\051223 86 the avenue

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PROJECT :
proposed childcare centre at
86 the avenue, bankstown

DRAWING No.
051223

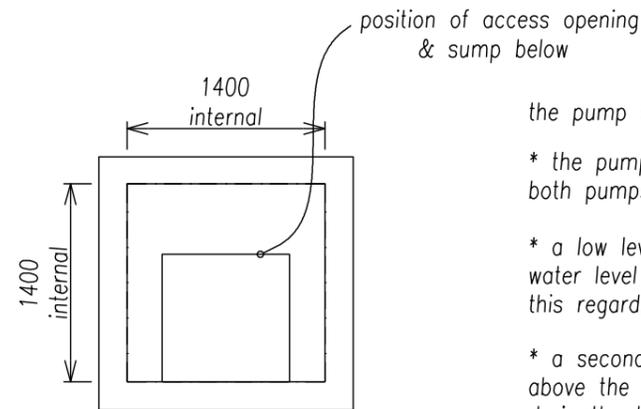
stormwater drainage,
on site detention &
rainwater reuse

Pump out system Design Principles

Minimum requirements for Mechanical Pump-out Systems – The minimum requirements for mechanical pump-out systems for stormwater apply as follows:

- * The pump-out system shall consist of two (2) mechanical pumps, connected in parallel, with each pump being capable of emptying the holding tank at a rate equal to the peak 100-year ARI, 5 minute duration storm event. in this instance, allow a pump out capacity of 15 litres per second per pump
- * The mechanical pump must be capable of draining the surface runoff collected from the roof and impervious areas connected to the tank.
- * The capacity of the holding tank shall be calculated as above the level at which all pumps are automatically brought into operation
- * The minimum capacity (volume) of the holding tank well shall be adequately sized in accordance with AS/NZS3500.3.2-1998, National Plumbing and Drainage, Part 3.2: Stormwater drainage – acceptable solutions, being around 4.7 KL
- * The rising main from the pump system shall be designed and installed in accordance with the pump manufacturer's specification
- * The rising main from the pump system shall discharge to a stilling sump within the property boundary and then gravity fed to the receiving drainage system
- * A one-way valve is to be installed on the rising main outlet. The stilling sump is to be located such that any likely overflow is safely directed to the street and away from adjoining buildings and structures

- * The switching of the pumps shall be arranged so that they operate alternately
- * The pumps shall be provided with automatic level switches so that they operate simultaneously should the capacity of the tank be exceeded
- * An automatic alarm system shall be provided to warn of failure of any part of the pump system
- * The alarm shall have visual indicators and an audible alarm siren
- * A rechargeable battery back-up system for the alarm is to be provided in the event of power failure

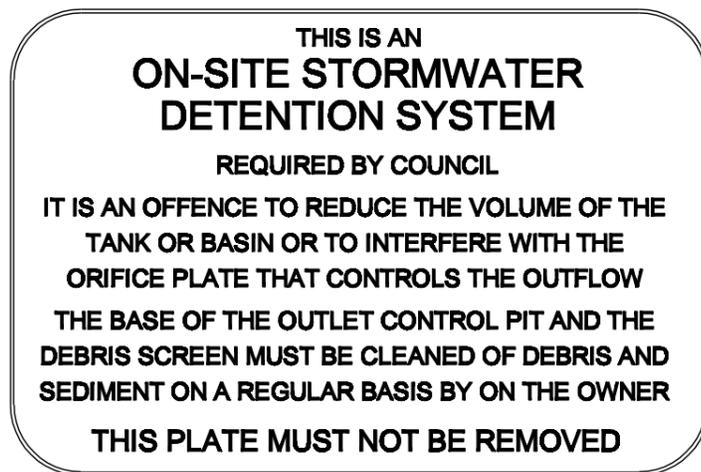


floor area 1.4x1.4=1.96sqm
1.96x1.0=2 KL capacity

plan view of existing pump out tank
not to scale



sign at each entrance to OSD tank & pits deeper than 900mm



The on-site stormwater detention system shall be indicated on the site by fixing a marker plate in a prominent position. This plate is to be of minimum size 150mm x 100mm and is to be made from non-corrosive metal or 4mm think laminated plastic. It is to be fixed to the nearest concrete or permanent surface in a prominent position. The wording on the marker plate is to be as shown.

the pump out system shall be designed to be operated in the following manner:

- * the pumps shall be programmed to work alternatively so as to allow both pumps to have an equal operation load and pump life.
- * a low level float shall be provided to ensure that the minimum required water level is maintained within the sump area of the below ground tank. In this regard, this float will function as an off switch for the pumps.
- * a second float shall be provided at a higher level, approximately 300mm above the minimum water level, whereby one of the pumps will operate and drain the tank to the level of the low-level float.

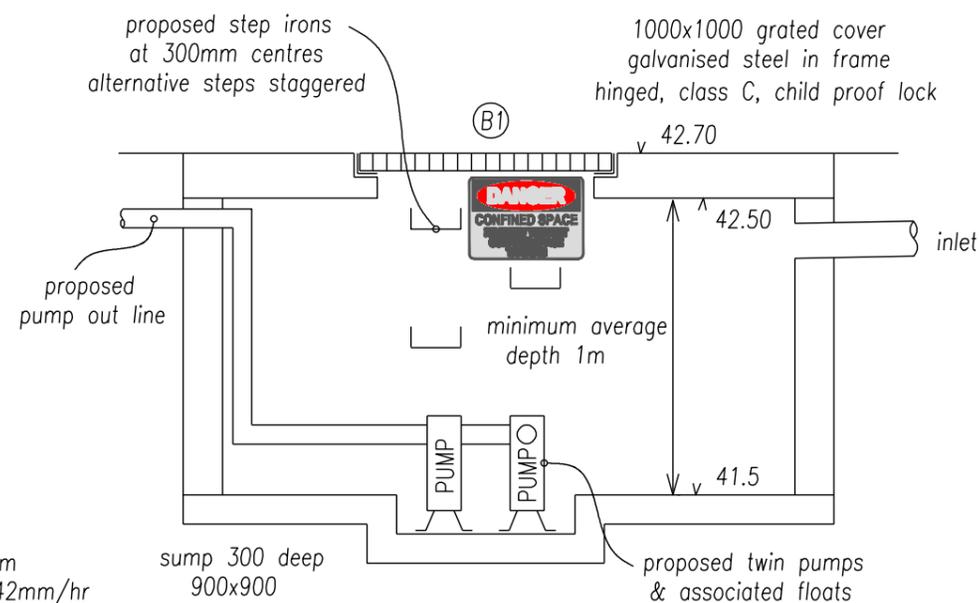
at a level approximately 300mm below the soffit level, the second float shall trigger the second pump to activate simultaneously with the first pump to be operating until the tank emptied to the lower start level.

KS - 03 - pump
188mm high
230mm base
140mm width

KWIKFLO submersible pump kit or similar, pump KS-03 or similar all-pumps 1300 allpumps www.allpumps.com.au

outlet pipe diameter per pump suppliers specifications (40mm)

pump out sump
catchment area 13.2x6.1=81sqm
Intensity 100 year 5 minute 242mm/hr
 $Q=CIA/3600=0.9*242*81/3600=4.9$ l/s
 $4.9*60*5=1500$ litres
volume provided 1500 litres, ok.



section through pump out tank
not to scale

SHEET 8

p\stormwater drawings\051223 86 the avenue

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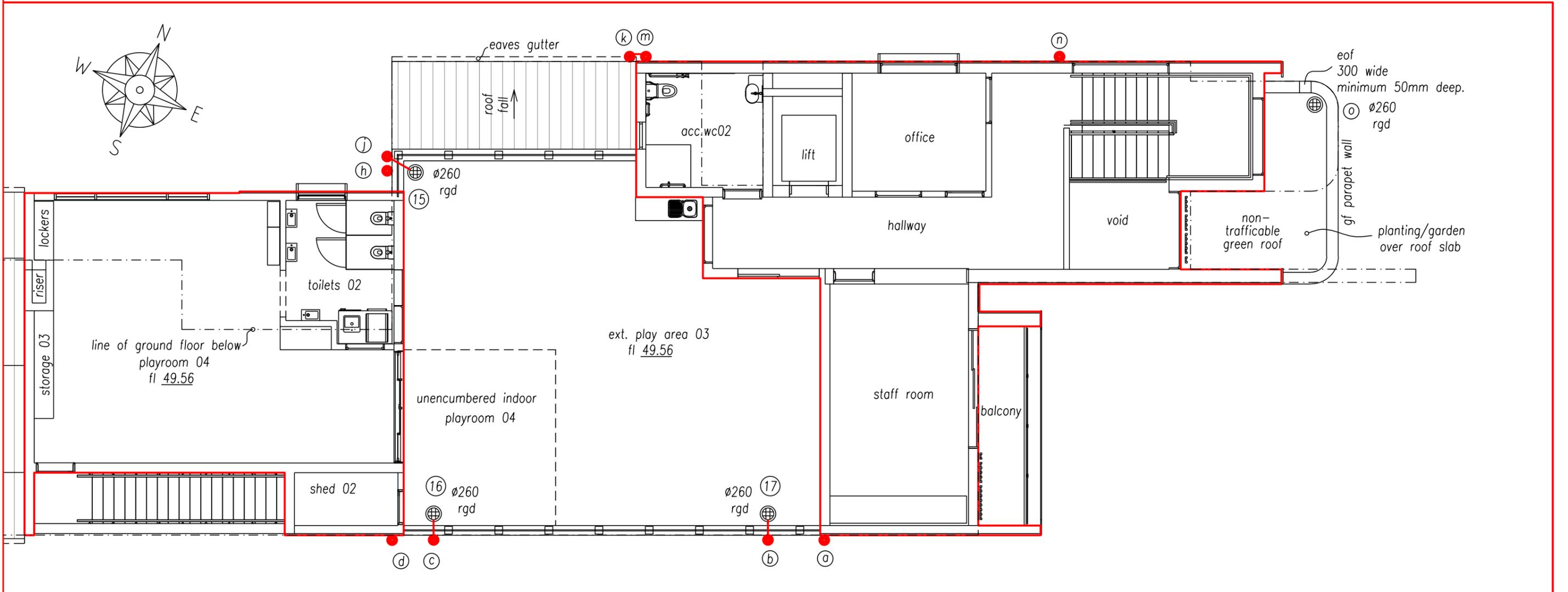
PROJECT :
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DRAWING No.
051223

stormwater drainage, on site detention & rainwater reuse

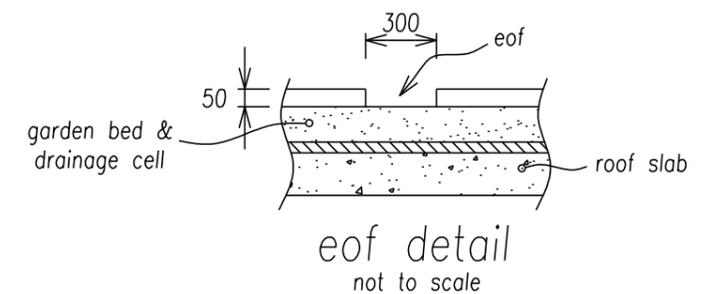
development application issue

L. Savage
Leon Savage
B.E. Civil, MIE Aust.



first floor plan

scale 1:100



continued on next sheet

SHEET 9

p:\stormwater drawings\051223 86 the avenue

development application issue

Leon Savage
Leon Savage
B.E. Civil, MIE Aust.

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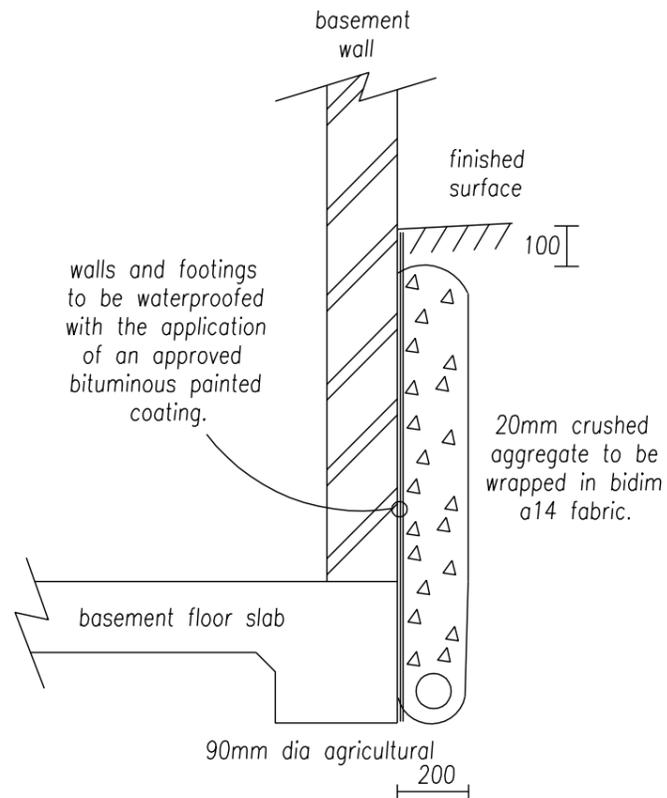
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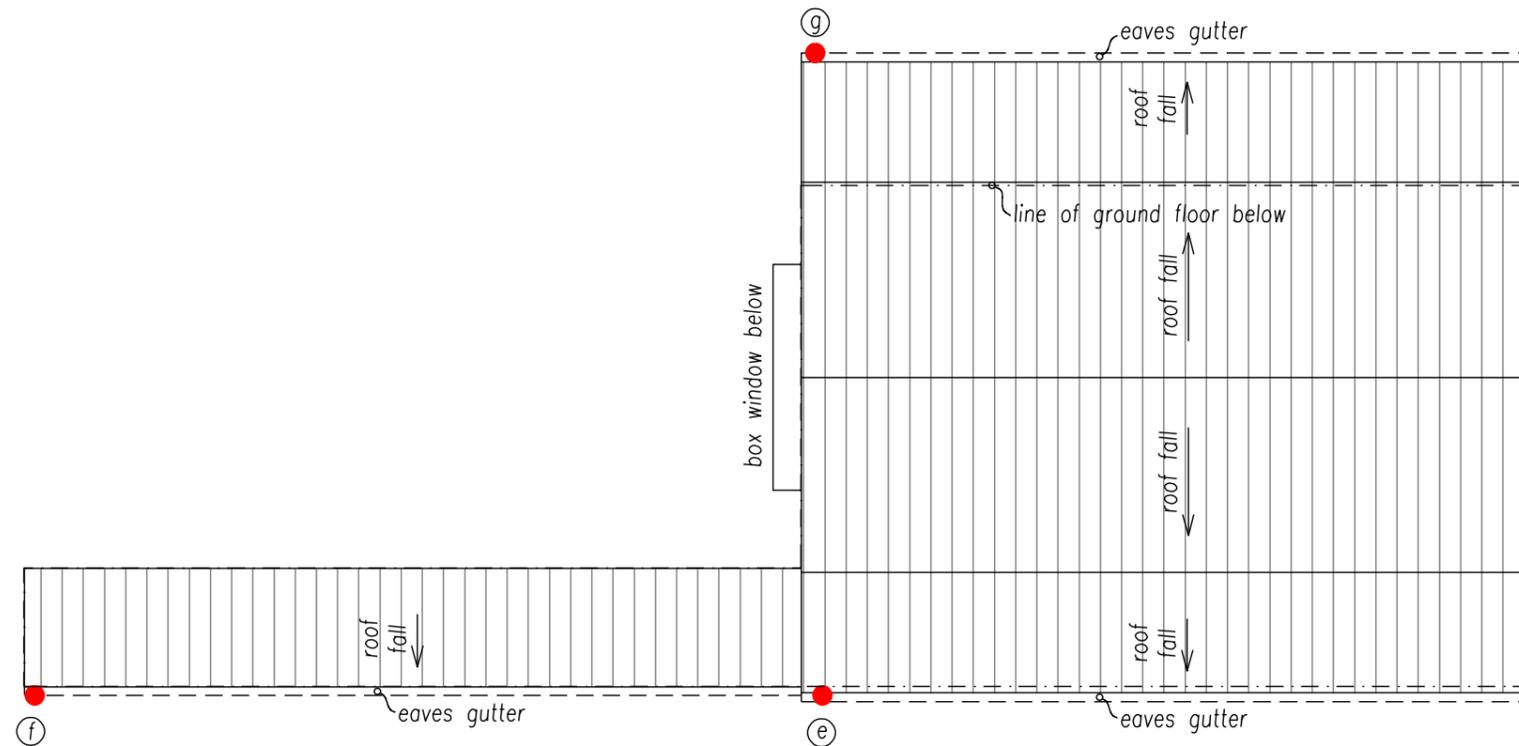
stormwater drainage,
on site detention &
rainwater reuse



typical subsoil drainage and waterproofing for basement walls

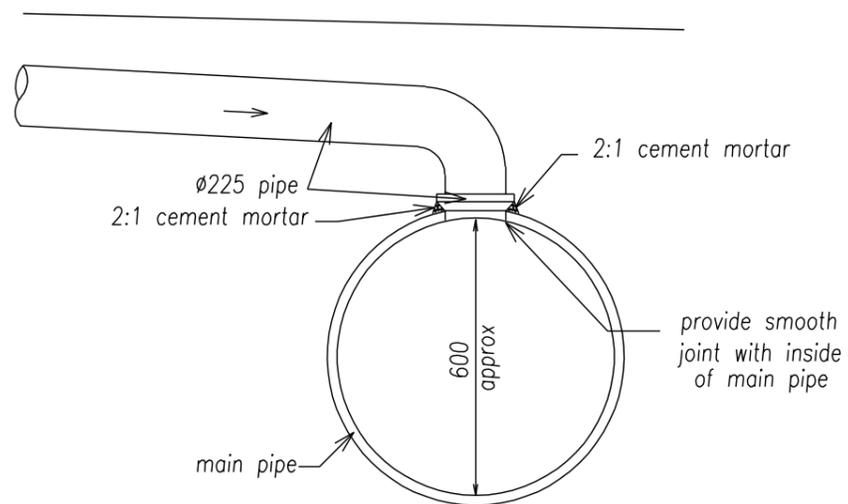
scale 1:20

subsoil drainage system to be determined



first floor plan

scale 1:100



connection detail
not to scale

development application issue

L. Savage
Leon Savage
B.E. Civil, MIE Aust.

SHEET 10

p:\stormwater drawings\051223 86 the avenue

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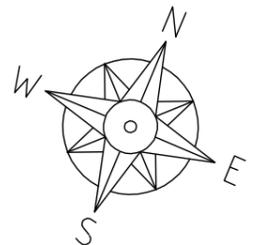
email: aztecengineers@gmail.com

tel 0433 00 1985

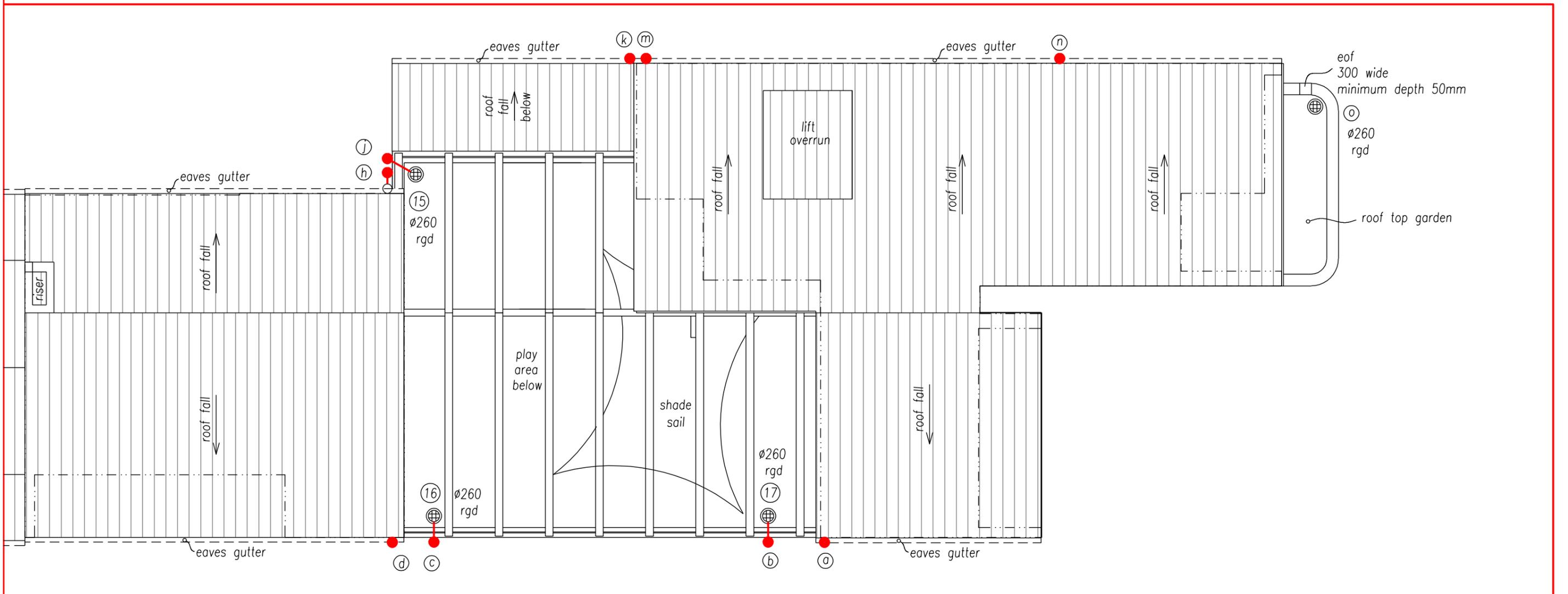
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stormwater drainage,
on site detention &
rainwater reuse



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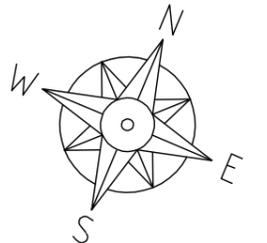
roof plan

scale 1:100

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SHEET 11

p:\stormwater drawings\051223 86 the avenue



development application issue

L. Savage
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B.E. Civil, MIE Aust.

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Summary table for ILSAX results
developed site data

86 the avenue bankstown childcare
envision Jan-24

h	q for orifice		
	q cum/s	diameter	
0	0.0000	0.17	45.2
0.24	0.0305	0.17	45.44
0.48	0.0432	0.17	45.68
0.72	0.0529	0.17	45.92
0.79	0.0554	0.17	45.99
0.85	0.0574	0.17	46.05

wier flows			
h	q cum/s	rl	q cum/s
			45.2
			0.0000
			45.44
			0.0305
			45.68
			0.0432
			45.92
			0.0529
	0.09	0.016	45.99
			0.0714
	0.15	0.024	46.05
			0.0814

h (m)	b (m)	q weir	pipe o/f
0.04	1	0.018	
0.1	1	0.070	0.15 0.024

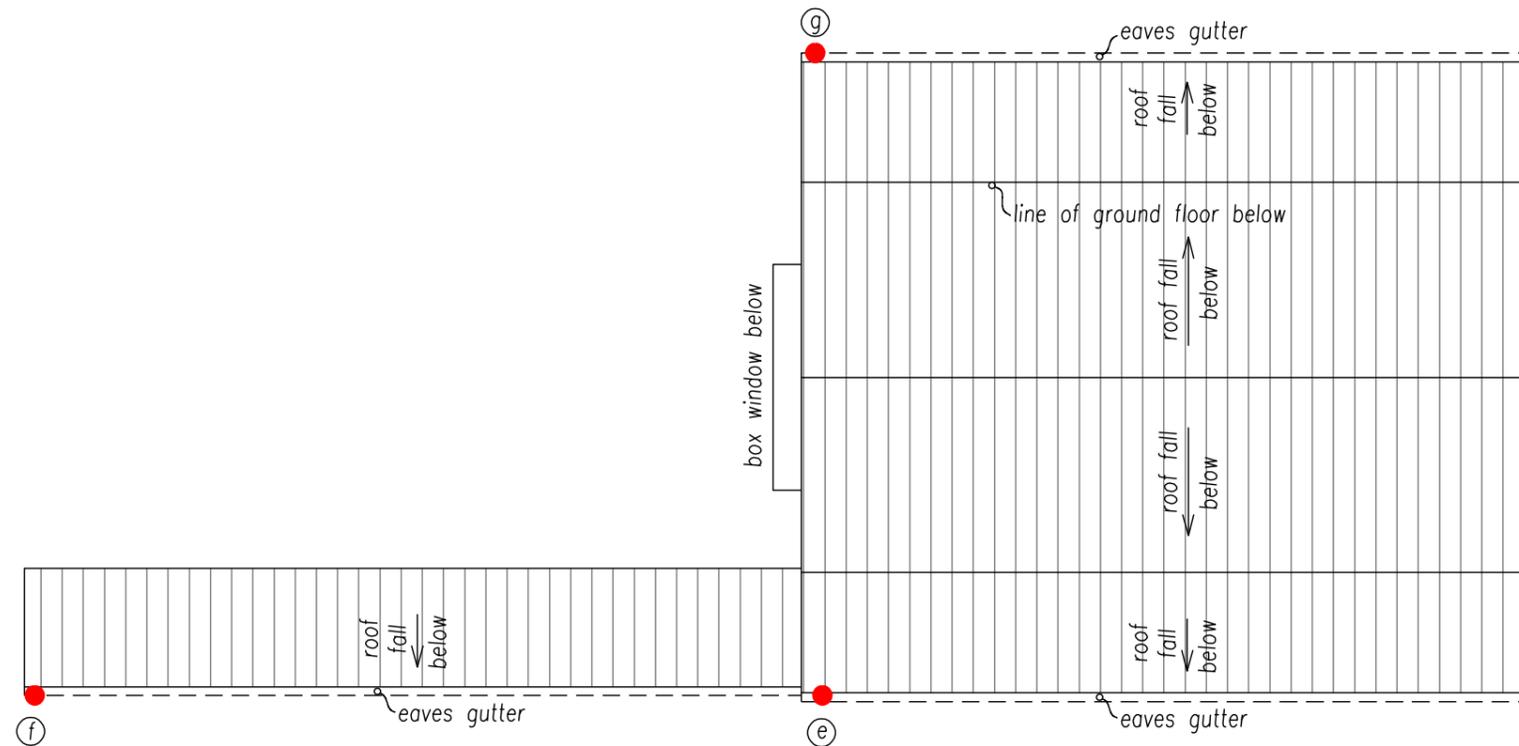
see attached calculation sheets
see attached ILSAX files
see attached engineering plans
site 1195sqm
predeveloped imp 250sqm
post developed imp 900sqm
roof 520sqm

Predeveloped site: 1195 80 3
fall 3.8%

Summary table for ILSAX results
developed site data

5 year event					
Storm (minutes)	Pre develop flows (l/s)	Orifice flow (l/s)	Total post flow (l/s)	Water storage level (m)	Remark
10	45	33	40	45.48	Ok
20	40	31	38	45.45	Ok
30	43	32	39	45.46	Ok
45	35	29	35	45.43	Ok
60	41	31	38	45.45	Ok
120	44	31	37	45.45	Ok

100 year event					
Storm (minutes)	Pre develop flows (l/s)	Orifice flow (l/s)	Total post flow (l/s)	Water storage level (m)	Remark
10	83	47	61	45.79	Ok
20	79	46	57	45.75	Ok
30	65	46	57	45.74	Ok
45	69	44	54	45.71	Ok
60	65	46	58	45.75	Ok
120	75	44	54	45.71	Ok

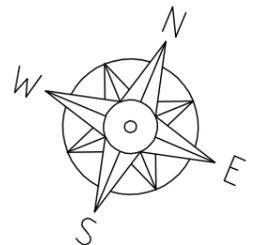


roof plan

scale 1:100

SHEET 12

p:\stormwater drawings\051223 86 the avenue



continued on next sheet

development application issue

L. Savage
Leon Savage
B.E. Civil, MIE Aust.

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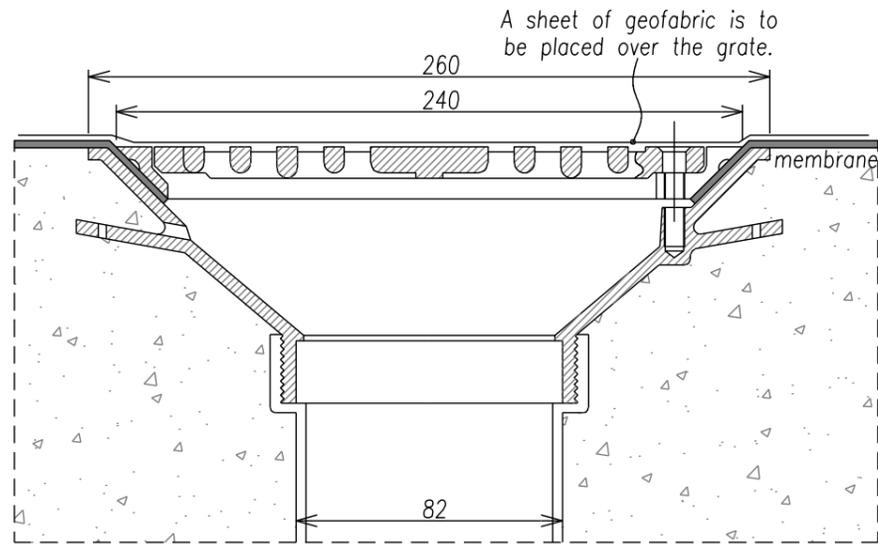
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proposed childcare centre at
86 the avenue, bankstown

DRAWING No.
051223

stormwater drainage,
on site detention &
rainwater reuse

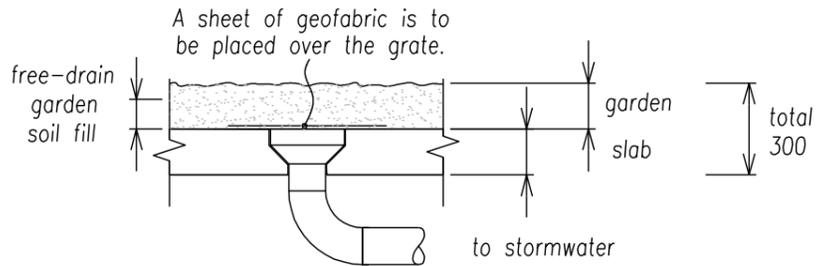


plan view of grate
not to scale

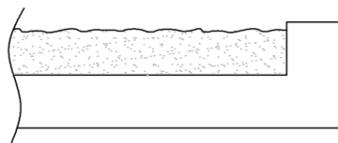


'sps' surface drainage inlet
not to scale

note : refer to manufacturer's specifications and installation guide.



typical planter drainage
not to scale



upturn detail along edges of garden or similar
not to scale

development application issue

SHEET 13

p\stormwater drawings\051223 86 the avenue

L. Savage
Leon Savage
B.E. Civil, MIE Aust.

apr 2024	footway levels, north side passage levels, OSD tanks levels & details, roof top garden	D
apr 2024	development application issue	C
jan 2024	development application issue	B
dec 2023	draft issue only	A

SPS Truflo 80, 100 & 150mm RWO with Flat Grate & Membrane Clamp

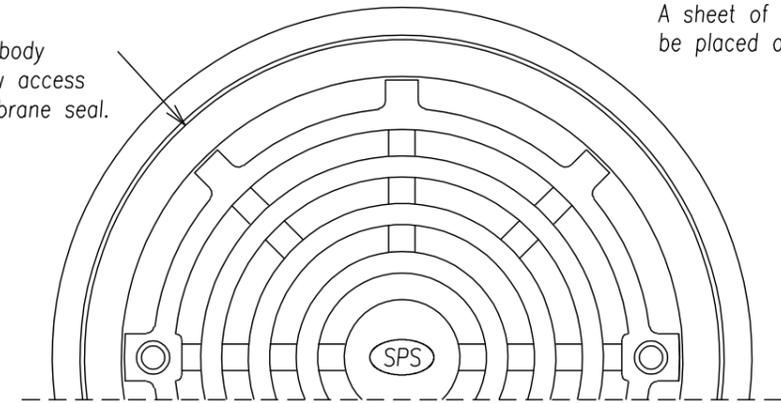
Specification code:

- TIA100F2 (CI body, aluminium flat grate & membrane ring)
- TIB100F2 (CI body, bronze flat grate & membrane ring)
- TBA100F2 (all-bronze assembly)
- for 80mm outlet, use "100/80" instead of "100"
- for 150mm outlet, use "150" instead of "100"

Suggested application:

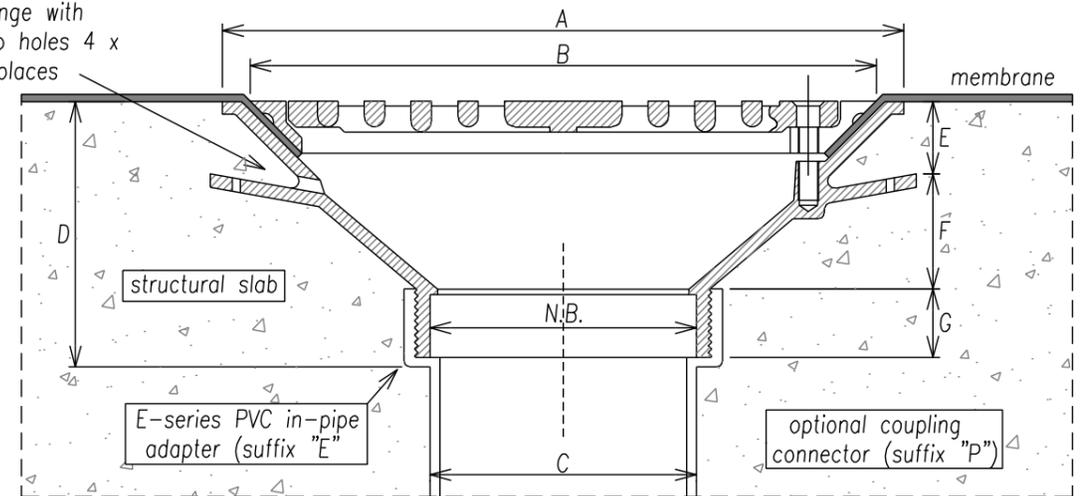
Membraned floors or roofs with no further topping, eg planter boxes, plant rooms, roof decks.
in this instance, proposed to work in shallow garden.
A sheet of geofabric is to be placed over the grate.

Membrane ring fastens to body independently of grate to allow access to sump without breaking membrane seal.



Load Class A - AS 3996-2006

integral puddle flange with weep holes 4 x places



Dimensions (mm)

N.B	A	B	C	D	E	F	G
80	260	240	82	106	28	45	25
100	260	240	103	106	28	45	25
150	260	240	151	86	28	37	25

* For flow rate data please refer to appendix.

Speciality Plumbing Supplies Pty Ltd not to scale

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1.03

STORMWATER ENGINEERS PTY LTD

stormwater + civil engineers

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