

## site/ground floor plan

scale 1:100

## SHEET 1

p:\stormwater drawings\051223 86 the avenue

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

### 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

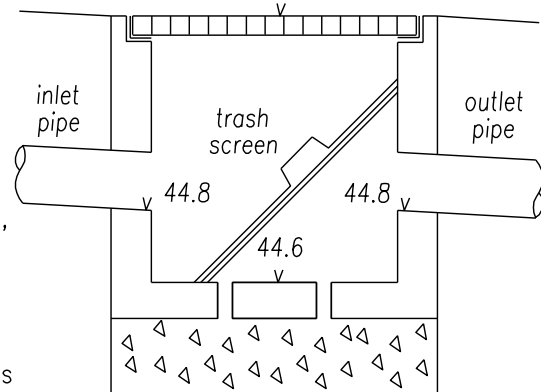
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precast concrete pit  
with light duty weight  
galvanised grate

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

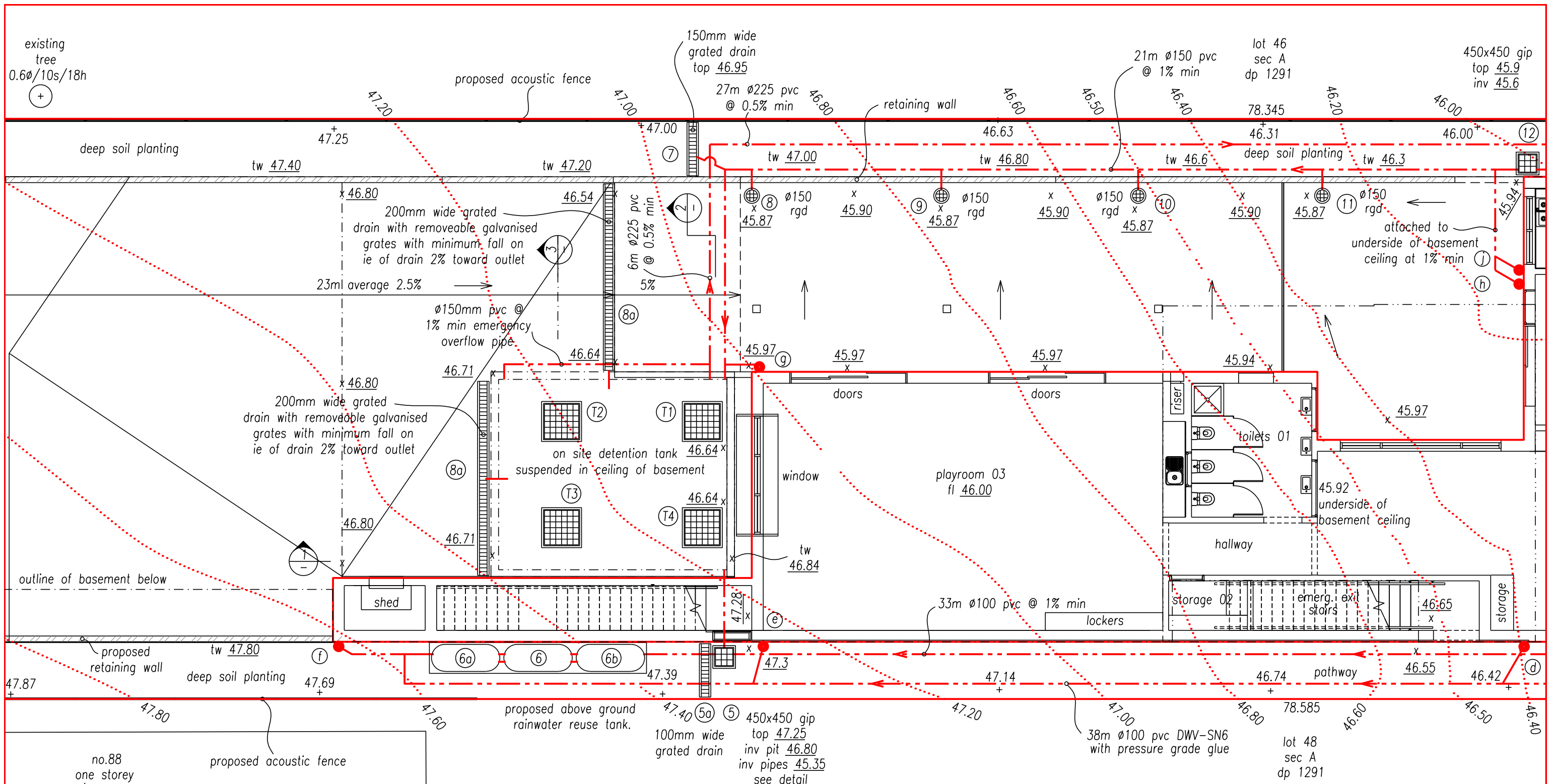
200mm thick bed of 20mm  
dia aggregate to be wrapped  
in bidim a14



sediment & litter  
control pit ②  
not to scale

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

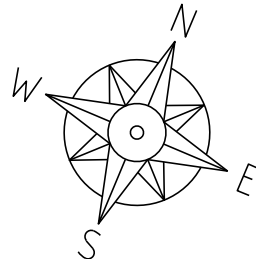
development application issue



site/ground floor plan

scale 1:100

SHEET 2



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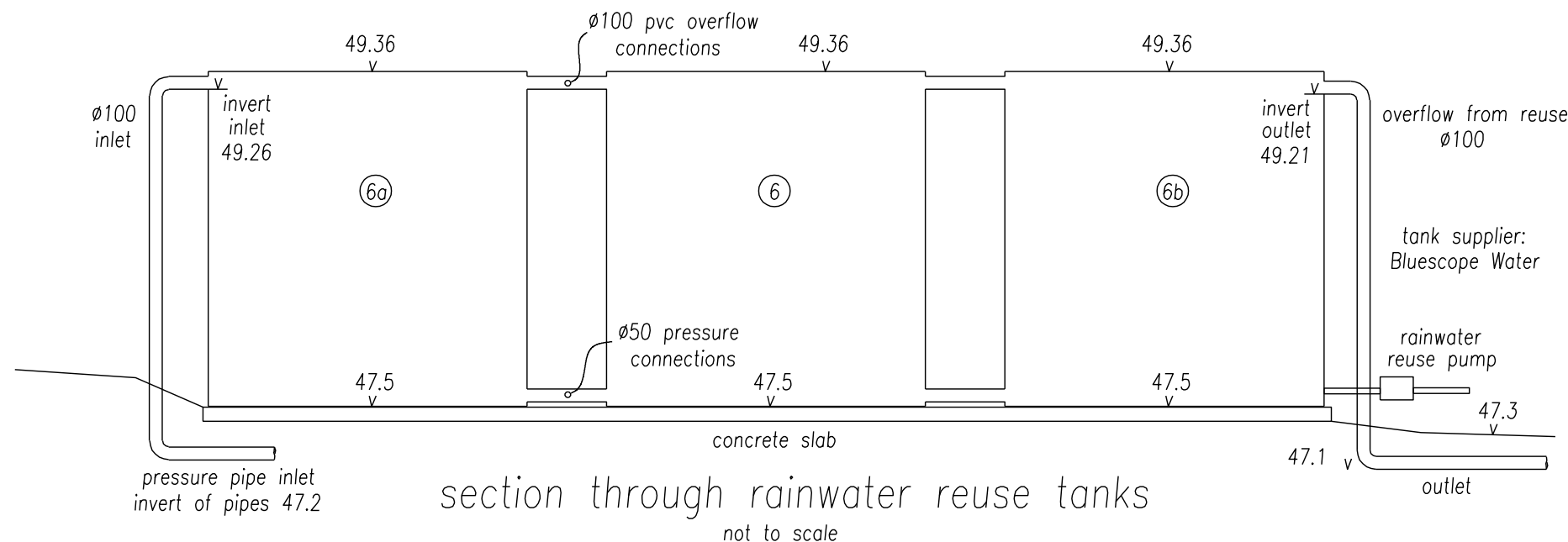
development application issue

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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

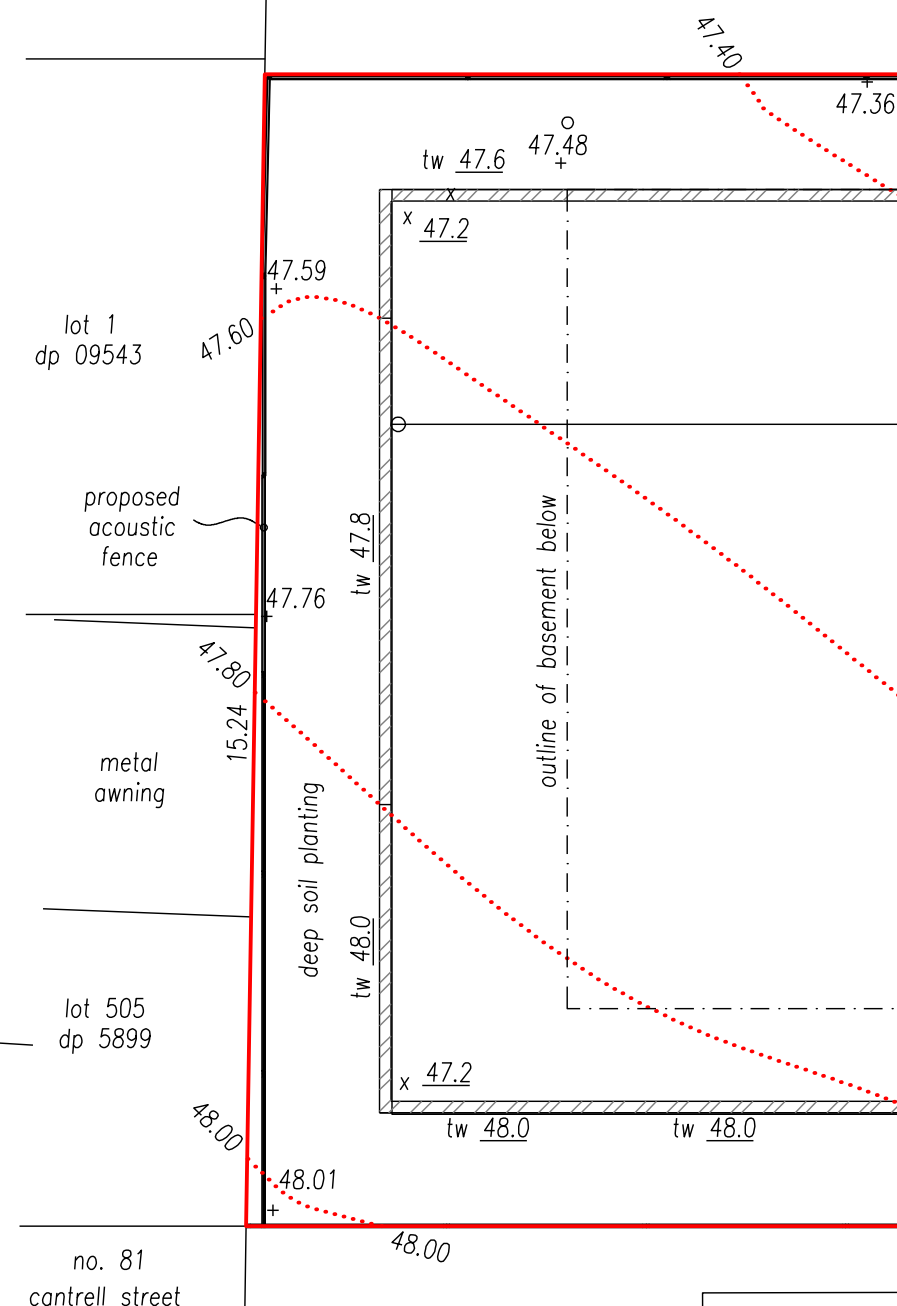
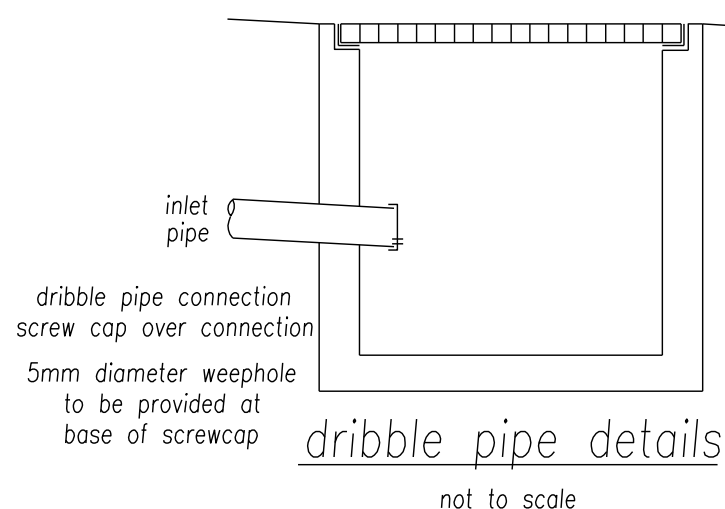
## NOTES

- 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



## SHEET 3

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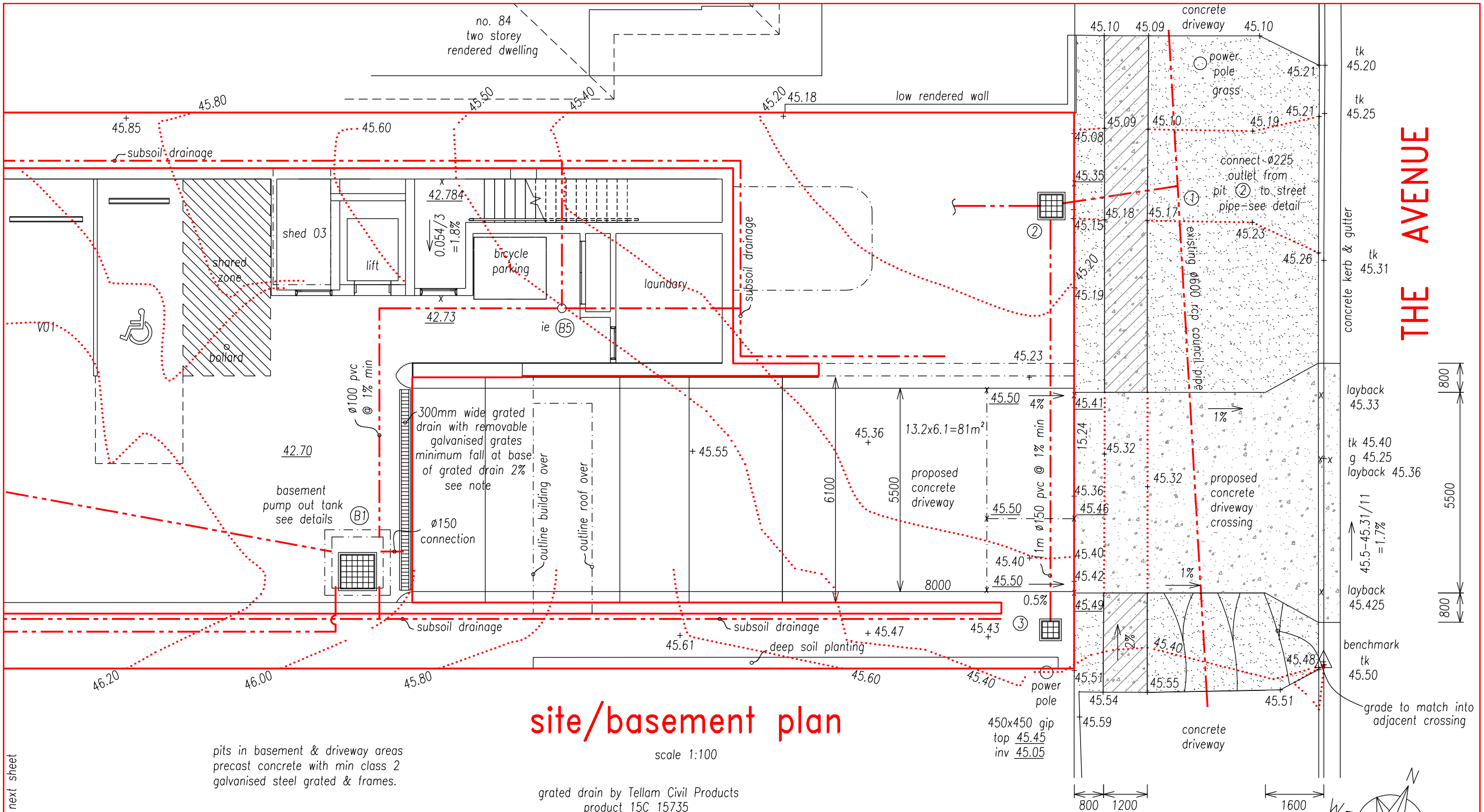
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development application issue

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continued on next sheet





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.  
 $81\text{m}^2 \times 0.2\text{m} = 16.2\text{m}^3$ . pump out tank 2 KL.  
basement floor about  $55 \times 12 + 9 \times 5 = 660 + 40 = 700\text{m}^2$   
 $14.2\text{KL} / 700\text{m}^2 = 20\text{mm}$  average < 200mm OK.

# site/basement plan

scale 1:100

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](http://www.tellam.com.au)

## SHEET 4

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development application issue

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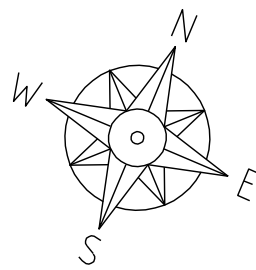
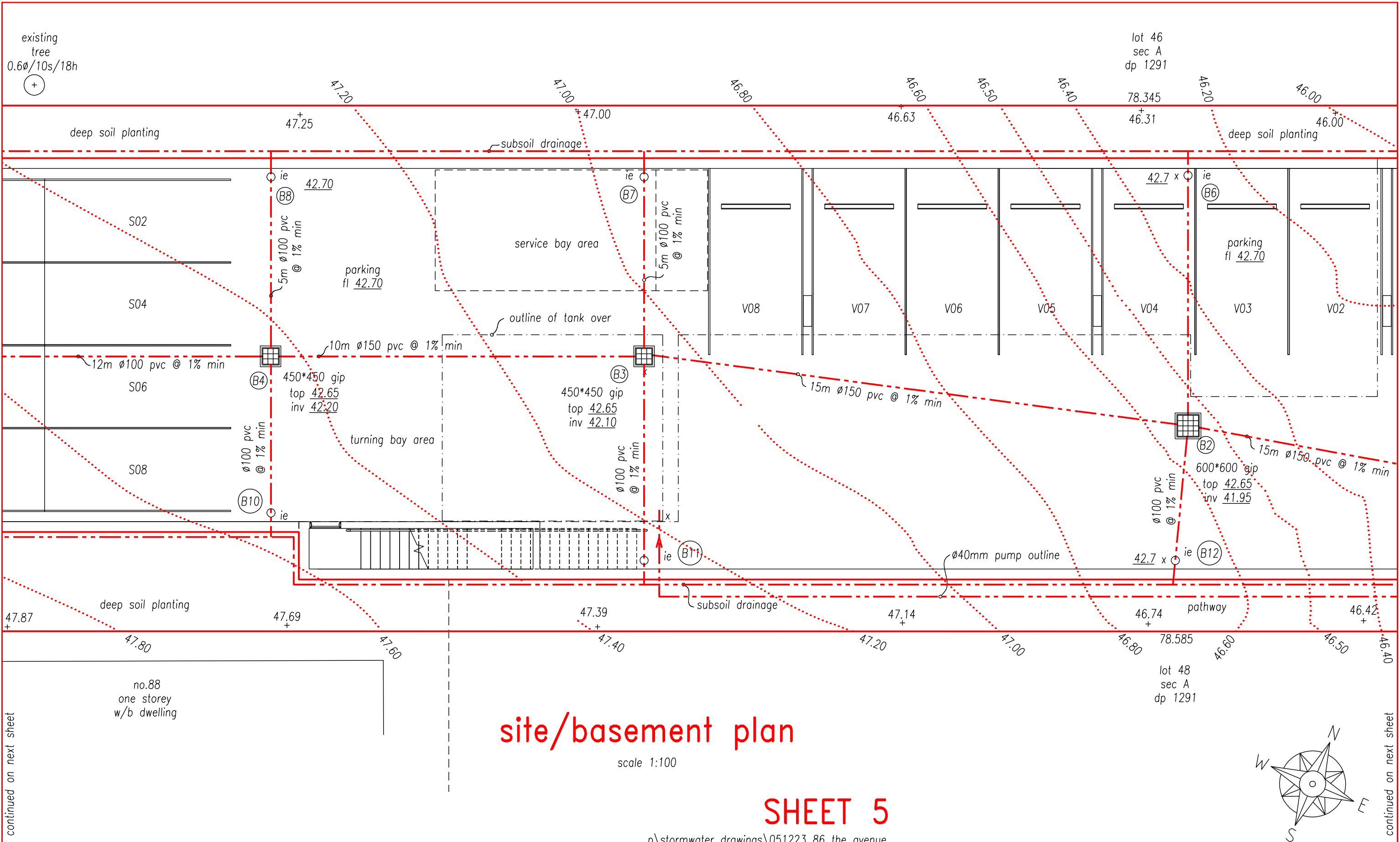
stormwater + civil engineers

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stormwater drainage,  
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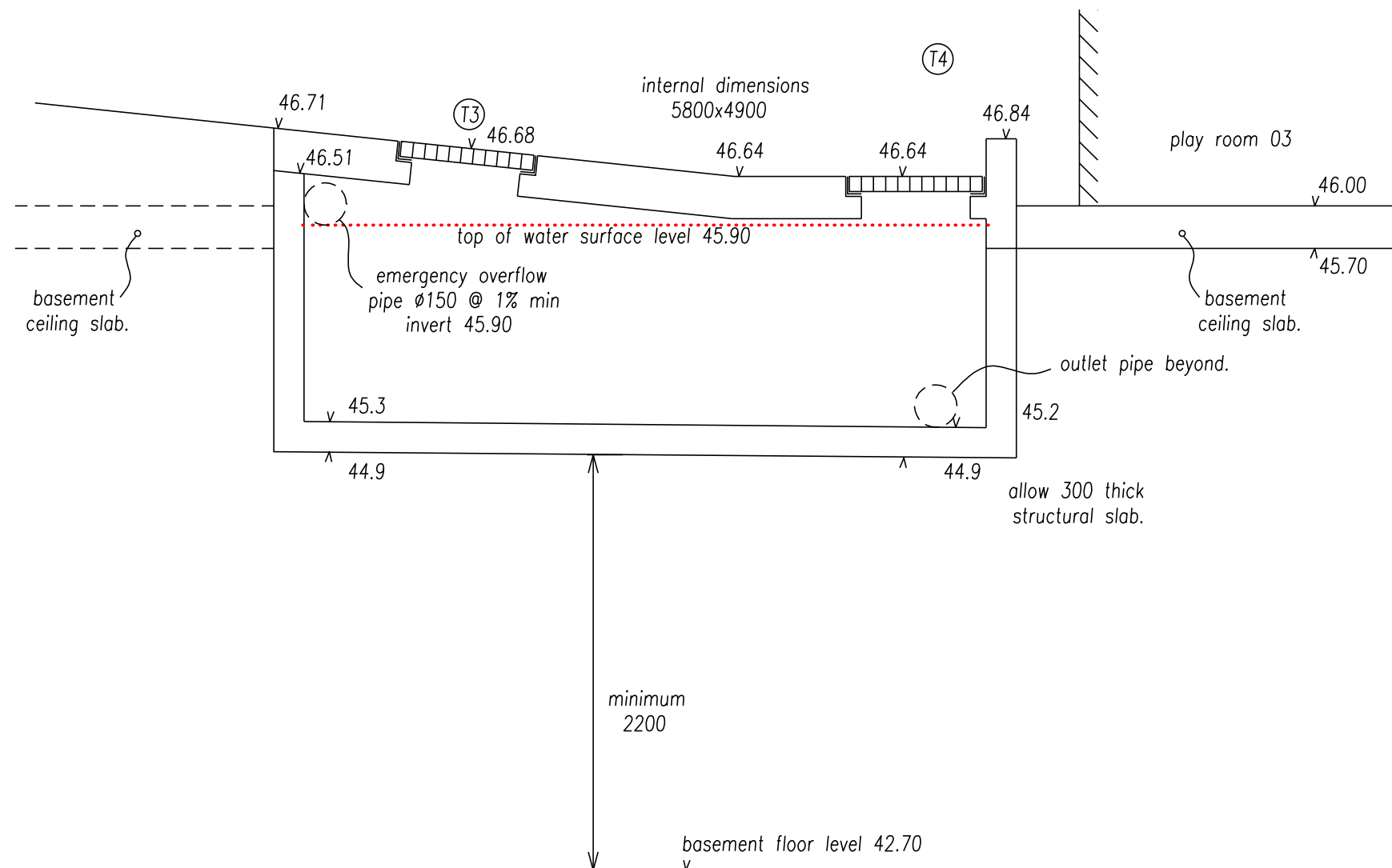
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section through On Site Detention tank  
not to scale



## SHEET 6

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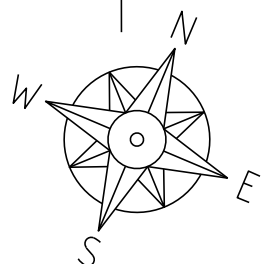
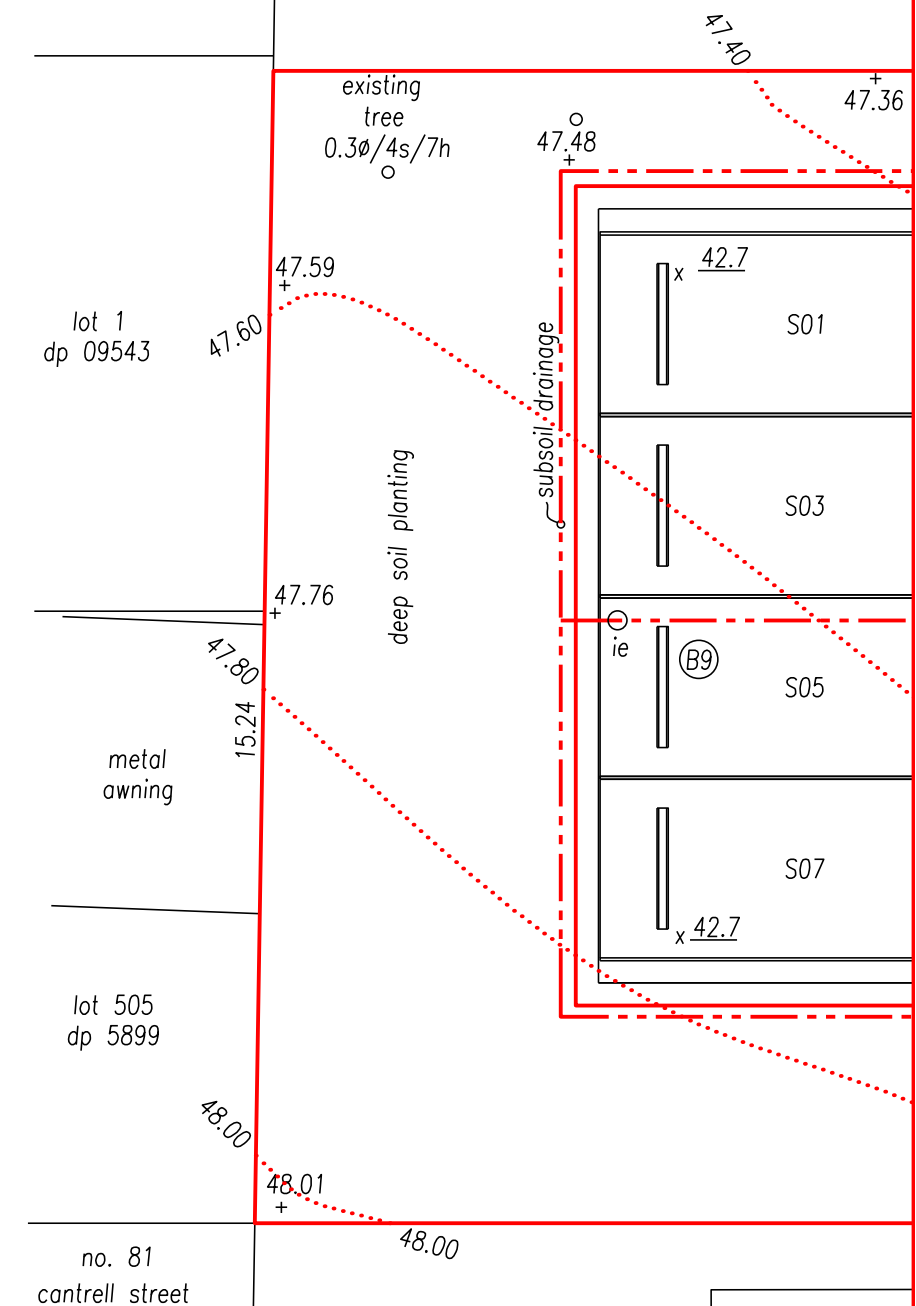
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continued on next sheet

**development application issue**

450x450 gip  
plastic pit  
with galvanised grate

47.25

46.80  
to OSD

Ø150

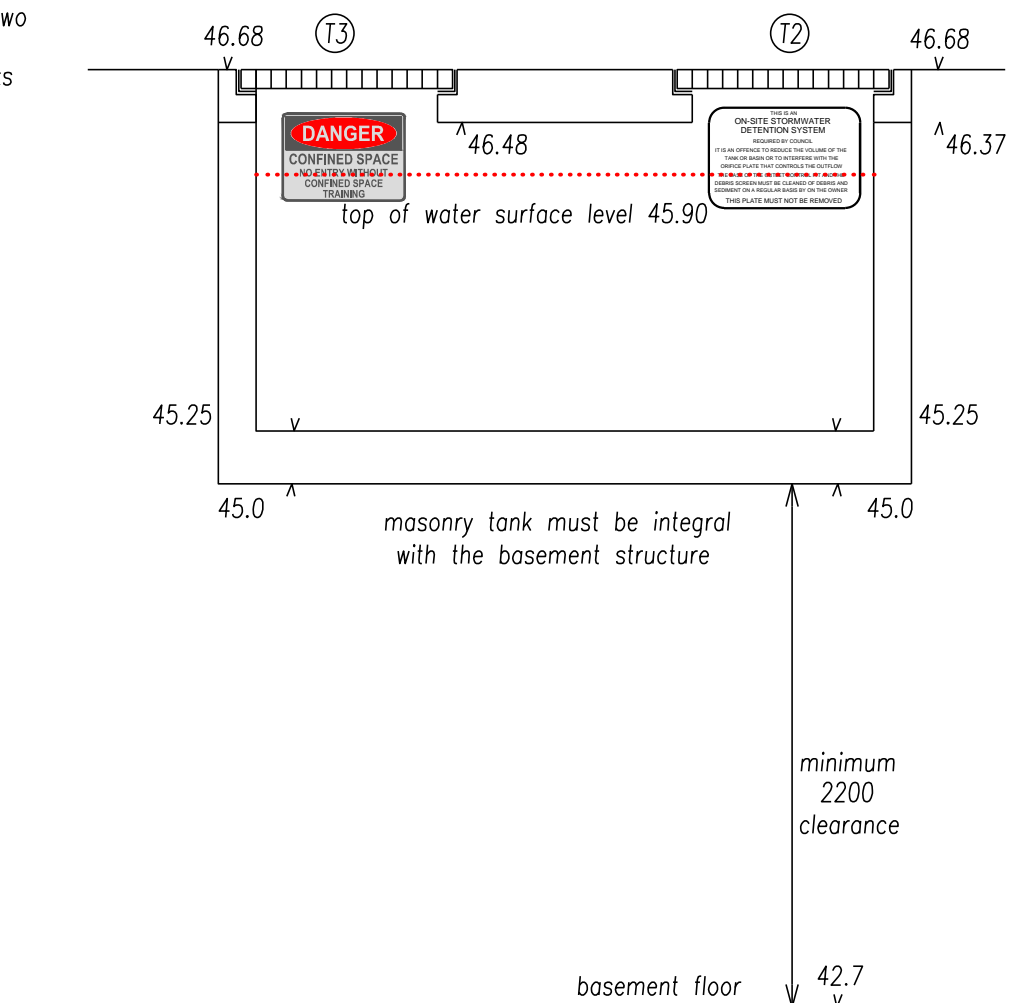
45.35

Ø100

from  
pit (4)

Ø150 to OSD

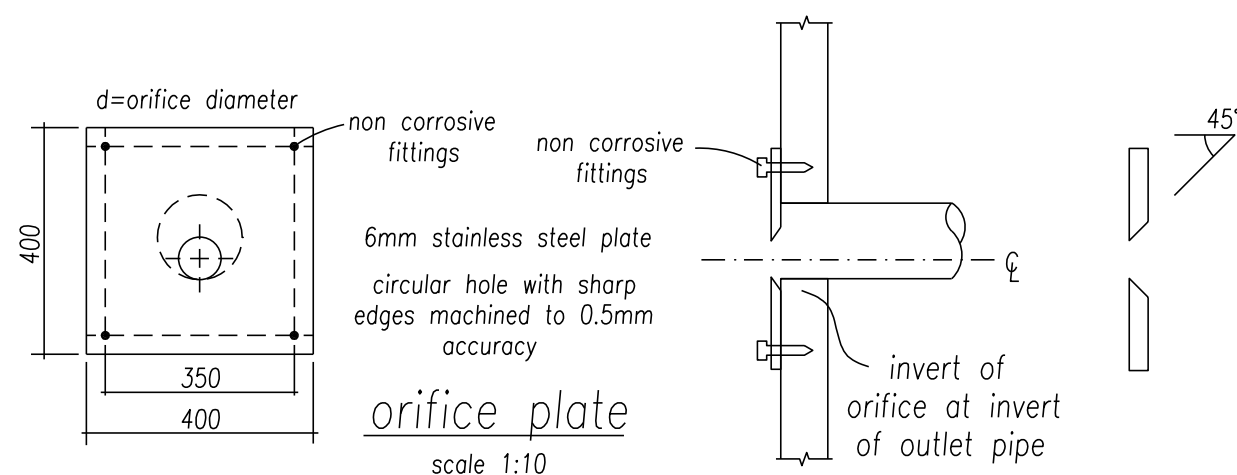
pit ⑤ detail  
not to scale



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



## development application issue

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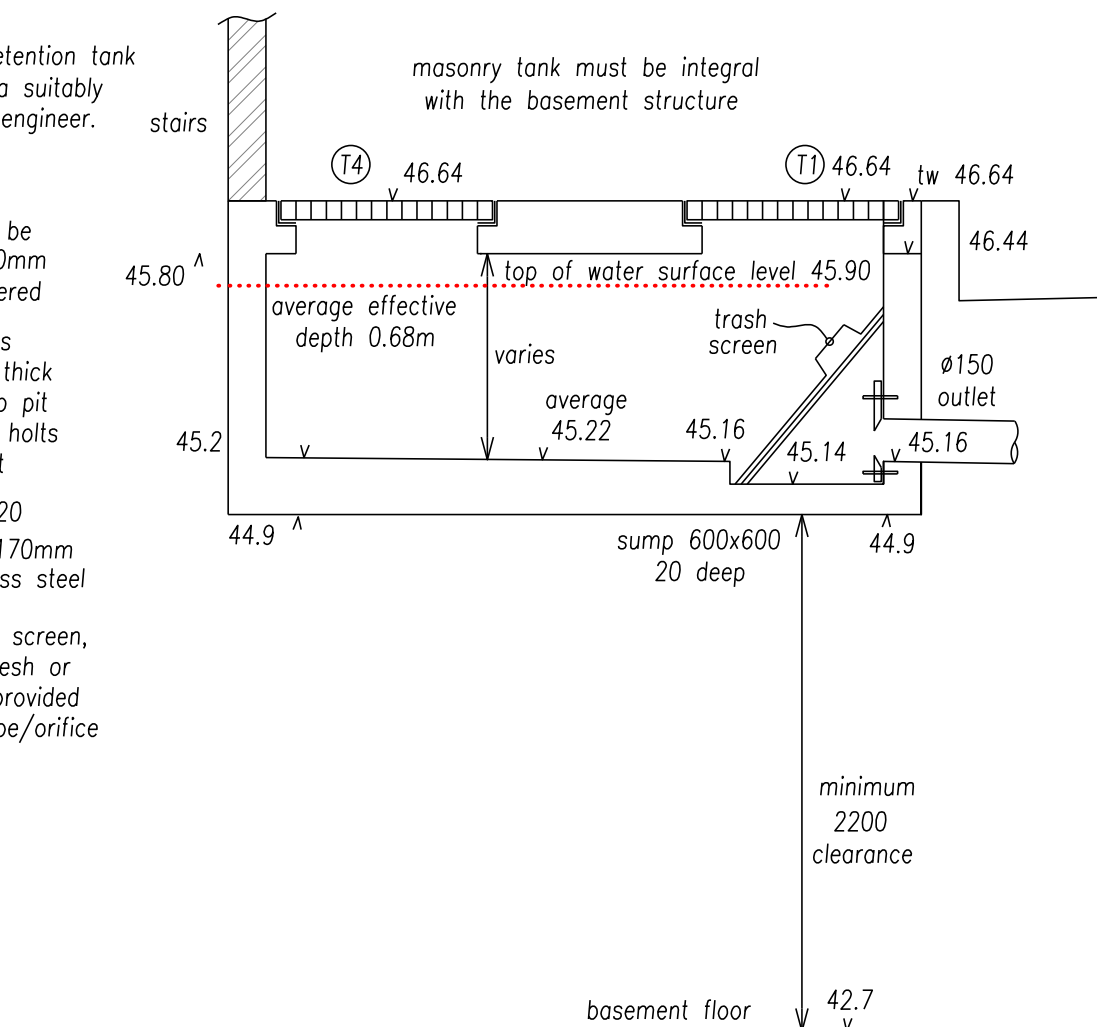
structural details of detention tank  
to be prepared by a suitably  
qualified structural engineer.

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 1195m<sup>2</sup>  
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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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



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

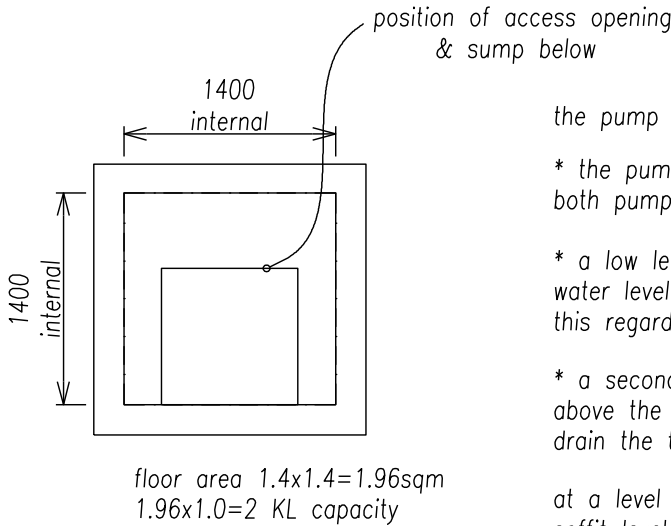
**THIS IS AN  
ON-SITE STORMWATER  
DETENTION SYSTEM**

**REQUIRED BY COUNCIL**

**IT IS AN OFFENCE TO REDUCE THE VOLUME OF THE  
TANK OR BASIN OR TO INTERFERE WITH THE  
ORIFICE PLATE THAT CONTROLS THE OUTFLOW  
THE BASE OF THE OUTLET CONTROL PIT AND THE  
DEBRIS SCREEN MUST BE CLEANED OF DEBRIS AND  
SEDIMENT ON A REGULAR BASIS BY ON THE OWNER**

**THIS PLATE MUST NOT BE REMOVED**

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.



plan view of existing  
pump out tank  
not to scale

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

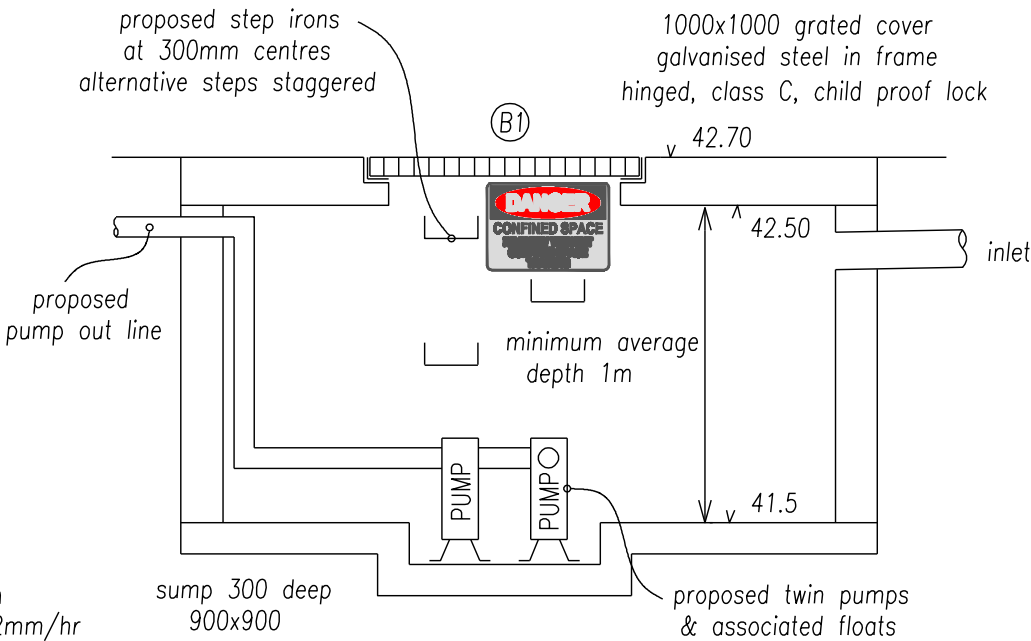
outlet pipe diameter  
per pump suppliers  
specifications (40mm)

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

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.



section through pump out tank  
not to scale

SHEET 8

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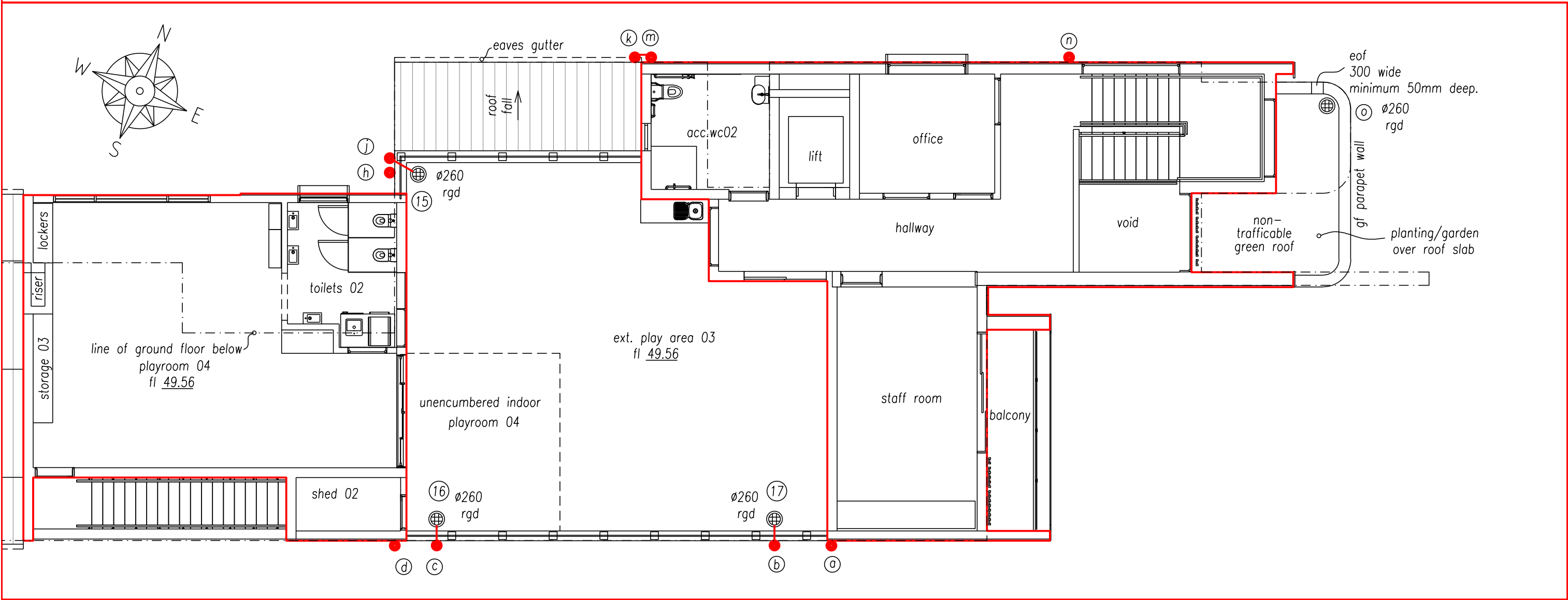
development application issue

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

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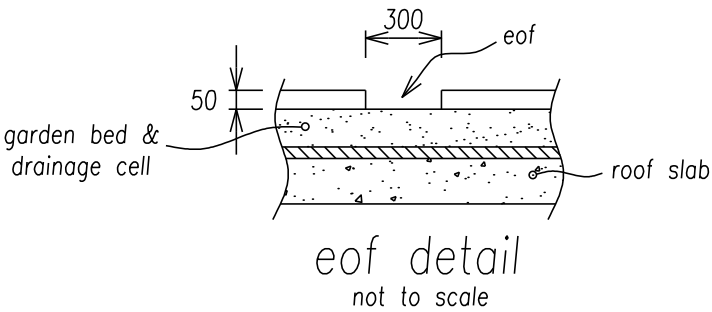
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first floor plan

scale 1:100



SHEET 9

p\stormwater drawings\051223 86 the avenue

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development application issue

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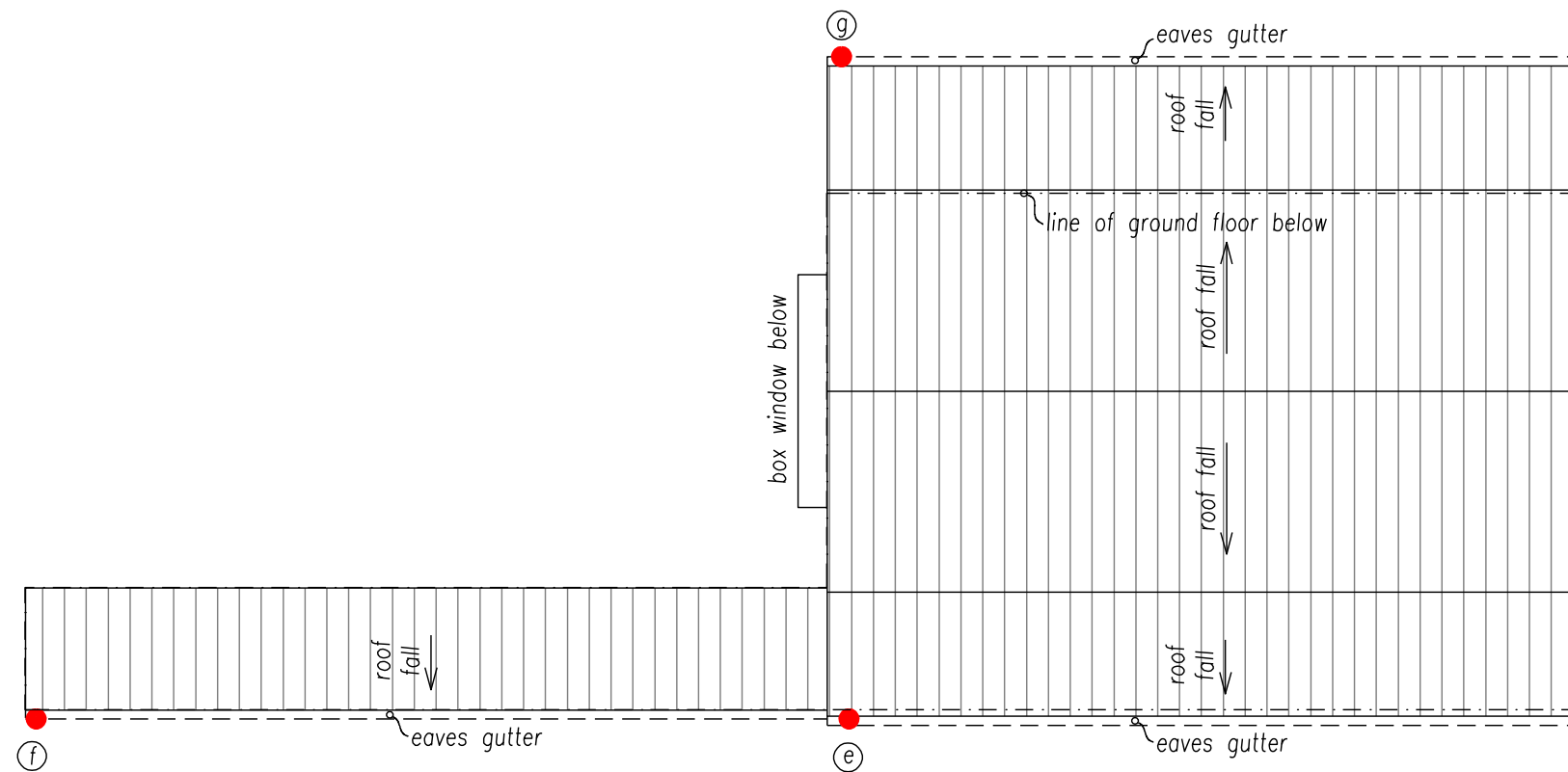
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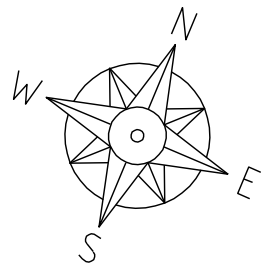
DRAWING No.  
**051223**

stormwater drainage,  
on site detention &  
rainwater reuse

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**SHEET 10**

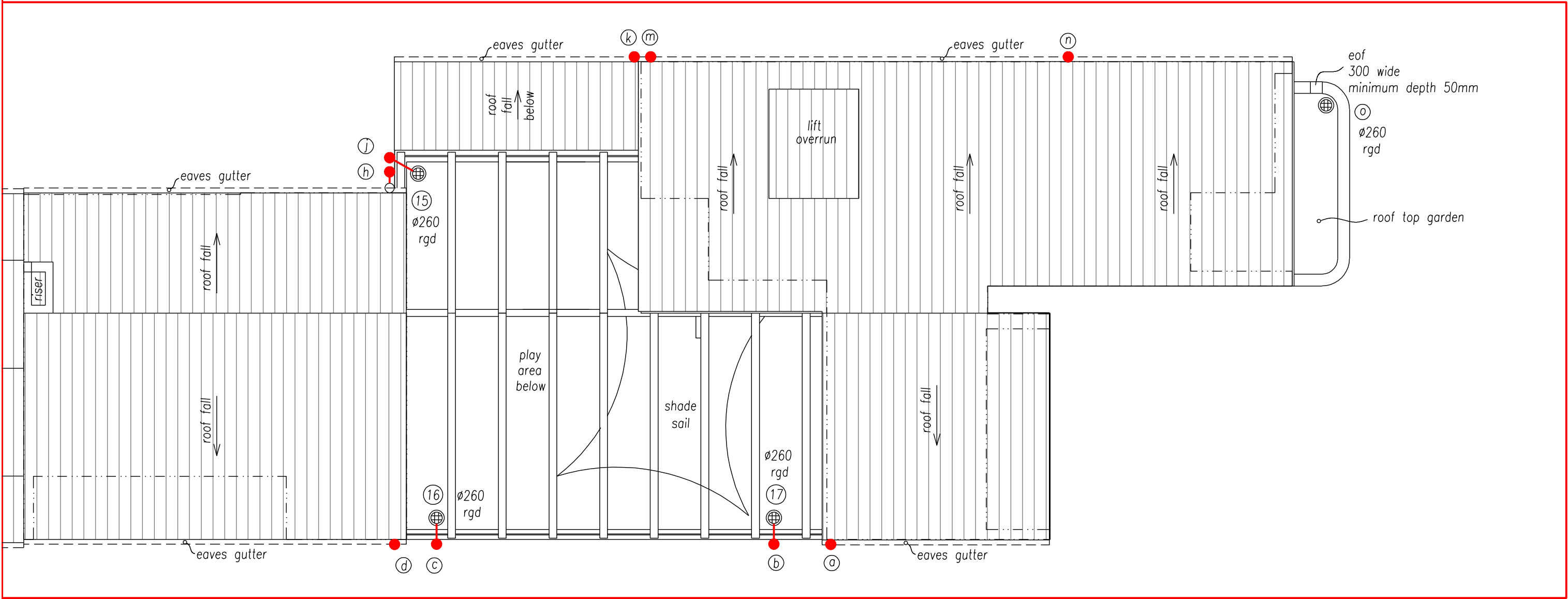


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stormwater drainage,  
on site detention &  
rainwater reuse

## development application issue

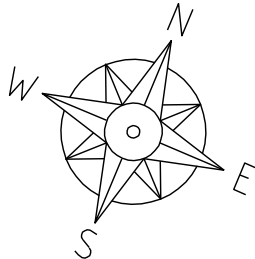


# roof plan

scale 1:100

## SHEET 11

p\stormwater drawings\051223 86 the avenue



development application issue

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continued on next sheet

Summary table for ILSAX results  
developed site data

86 the avenue bankstown childcare  
envision Jan-24

q for orifice				wier flows			
h	q cum/s	diameter		h	q cum/s	rl	q cum/s
0	0.0000	0.17	45.2				45.2
0.24	0.0305	0.17	45.44				45.44
0.48	0.0432	0.17	45.68				45.68
0.72	0.0529	0.17	45.92				45.92
0.79	0.0554	0.17	45.99				0.0529
0.85	0.0574	0.17	46.05	0.09	0.016		45.99
				0.15	0.024		0.0714
							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

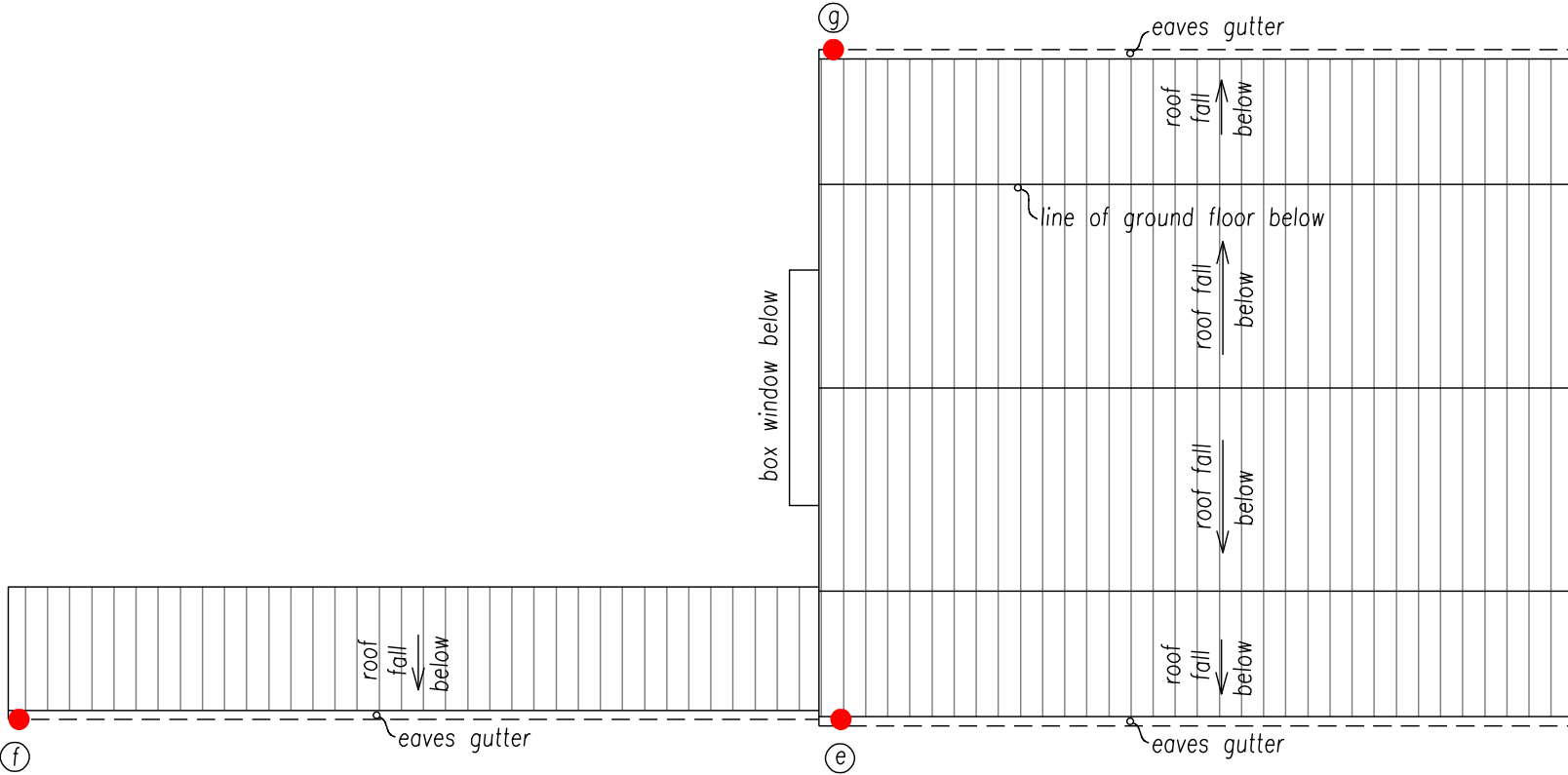
Predeveloped site: 1195 80 3  
fall 3.8%

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

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



roof plan

scale 1:100

SHEET 12

p\stormwater drawings\051223 86 the avenue

development application issue

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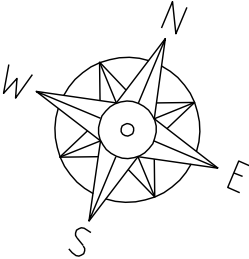
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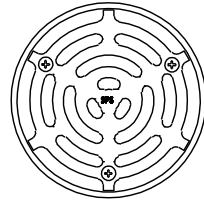
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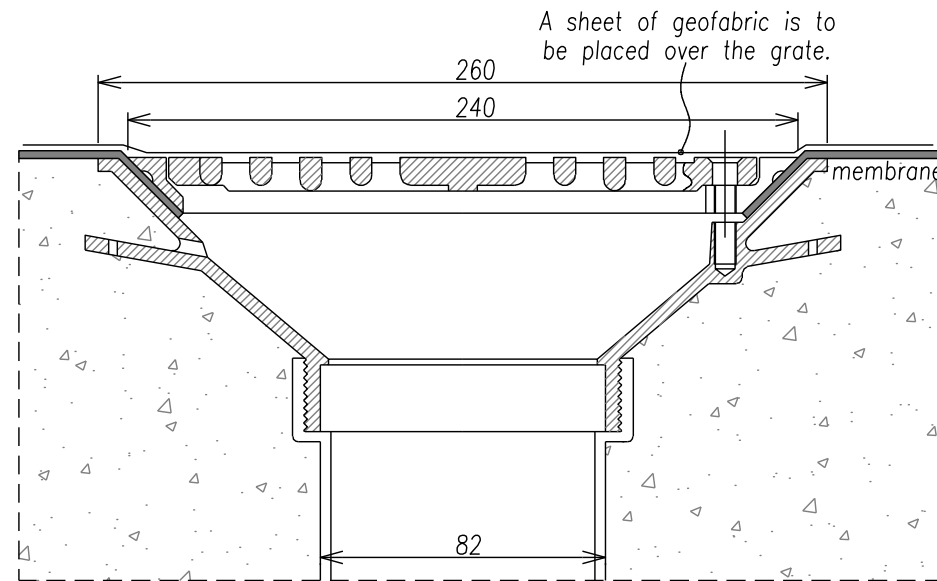


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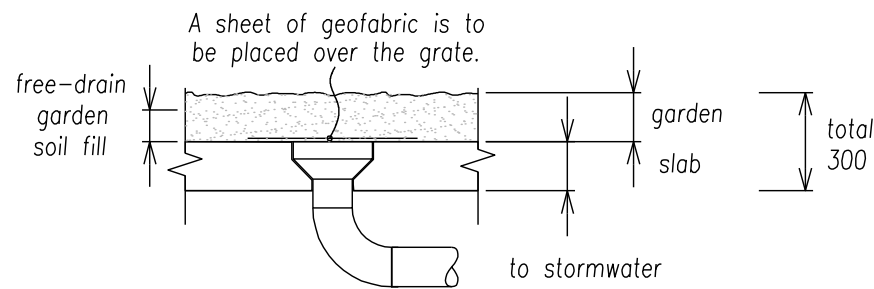




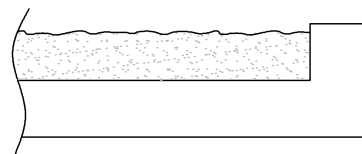
plan view of grate  
not to scale



'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

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Leon Savage  
B.E. Civil, MIE Aust.

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

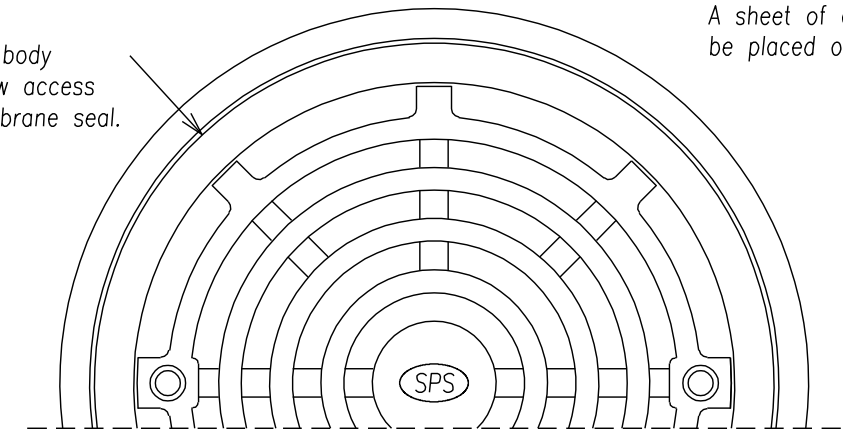
### Specification code:

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:

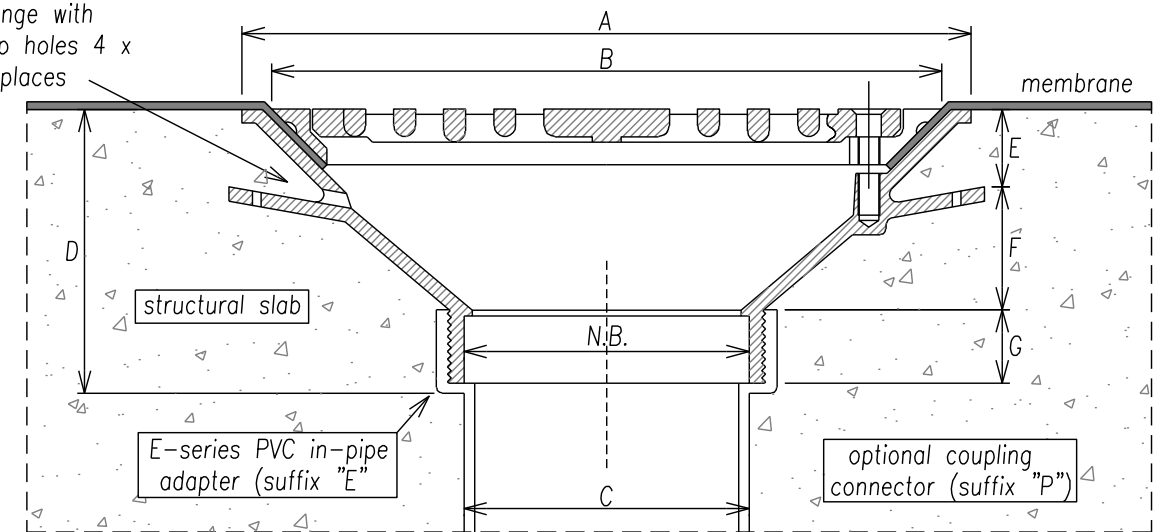
Membraned floors or  
roofs with no further topping,  
eg planter boxes, plant  
rooms, roof decks.  
in this instance, proposed to  
work in shallow garden.  
A sheet of geofabric is to  
be placed over the grate.

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

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