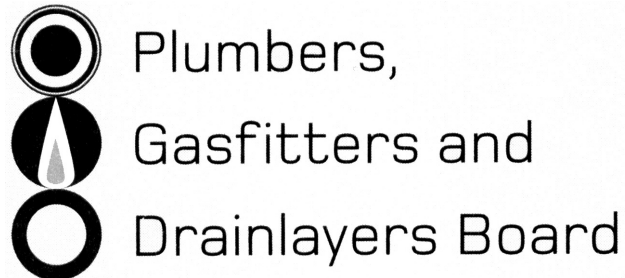


No. 9197



REGISTRATION EXAMINATION, JUNE 2011  
**LICENSED DRAINLAYER**

**ANSWER SCHEDULE**

## ANSWER 1

(a) To contain stormwater until it can be absorbed by the surrounding soil. (1 mark)

(b) To stop soil particles being washed into the soak pit and lessening the storage capacity. (1 mark)

(c) 
$$\text{Depth} = \frac{12}{1.5 \times 1.5 \times 0.7854}$$

Depth = 6.79 m (2 marks)

**Total 4 Marks**

## ANSWER 2

- A Name: Aerated chamber.  
Function: To supply oxygen to the aerobic bacteria within the septic tank.  
Advantage: To allow the effluent to be further treated (therefore cleaner) by the aerobic bacteria before leaving the tank.
- B Name: Dosing chamber (pump, siphon, tip bucket).  
Function: To dose the system by discharging a set volume of effluent into the disposal system.  
Advantage: Spreads the load over the entire disposal field, stops the first section of the field absorbing all the effluent whilst the far end of the field remains dry.
- C Name: Distribution box (diverting, diverter or valve box).  
Function: To allow the effluent to be diverted to different disposal fields.  
Advantage: Allows parts of the effluent field to 'rest' and recover.
- D Name: Dripline effluent disposal field.  
Function: To transfer effluent to the surrounding soil/mulch.  
Advantage: Driplines not as reliant on good quality soil, can be flushed out if blocked, ability to irrigate.

(1 mark each)

**Total 12 Marks**

## ANSWER 3

- (a) A removable cap at ground level through which access may be made for cleaning and inspecting the drainage system.
- (b) A chamber which is installed in the drain and incorporates features to intercept and retain silt, gravel and other debris.
- (c) A chamber which is installed in the drain and incorporates features to intercept and retain floatable debris.
- (d) An section of drain used to channel water under a road, railway etc.

**Total 4 Marks**

#### ANSWER 4

A Detention tank is one that only slows the flow of stormwater and discharges at a controlled rate.  
A Retention tank is a tank where the stormwater is 'retained' in the tank so that it can be used for household use, the overflow is then run off to the council stormwater system.

**Total 2 Marks**

#### ANSWER 5

- (a)
  - Low pressure air test.
  - High pressure air test.
  - Water test. (3 marks)

- (b)
  - To stop ground water entering the drainage system.
  - To stop foul water leeching into surrounding. (1 mark)

- (c)  $35 \times 0.65 \times 0.9$   
 $= 20.475 \text{ m}^3$  (2 marks)

**Total 6 Marks**

#### ANSWER 6

Point	Fall	Depth
A		300 mm
B	66	366.40 mm to 366 (% fall = 66)
C	24.75	391.30 mm to 390.75 (% fall = 24.75)
D	99	490.90 mm to 489.75 (% fall = 99)
E	33	524.10 mm to 522.75 (% fall = 33)

**Total 8 Marks**

## ANSWER 7

- (a) Any TWO:
- Lack of oxygen/asphyxiation.
  - Poisonous gases.
  - Flammable gases.
- (2 marks)
- (b) Any FOUR:
- Remove sources of ignition.
  - Wear respiratory devices.
  - Keep area well ventilated.
  - Use gas detection equipment.
- (4 marks)
- (c)
- Must cross at an angle of not less than 45°
  - Separated from other services vertically by at least 100 mm
  - The drain must be marked for 1m either side of and 150mm above the service with appropriate tape.

(3 marks)

**Total 9 Marks**

## ANSWER 8

### Foul water section.

Correct T.V.

Correct ORG.

IO at boundary/sewer.

IO at changes of direction.

IO at soil junctions.

Location of grease trap.

Size of grease trap.

Correct fittings discharging too grease trap.

### Stormwater section

Show the minimum size drain for the following.

Branch drain serving downpipe A. 90 mm

Branch drain serving the Type 2 surface water sump. 150 mm

Main drain from boundary to first branch drain. 150 mm

Drains connecting to incorrect connection points. (1 mark each)

Design complies with trade practice and is economical.

E.g. not too many IOs – e.g. At T.V. or Gully Traps.

(3 marks)

**Total 15 Mark**

## ANSWER 9

- (a) Any SIX ( $\frac{1}{2}$  mark each):
- Must be located within the property boundary.
  - Must be installed 25 mm above paved surfaces.
  - Must be installed 100 mm above unpaved surfaces.
  - Must have a grating that allows surcharge.
  - Must have an outlet diameter of at least 100 mm.
  - Must have at least one pipe discharging into the gully trap.
  - Waste pipes connections into the gully trap must be watertight.
  - Must have compacted base (G13) or a concrete base (AS3500) for support under the gully trap.
  - Waste pipe outlets must be 20 mm above the water seal.
  - Waste pipe outlets must be 20 mm below the grating.
  - The maximum depth from grating to water seal is 600 mm.
  - Must be installed in a visible location. (3 marks)
- (b) To provide a point of overflow in the event of a blockage in the drain or sewer. (1 mark)
- Total 4 Marks**

## ANSWER 10

- Any FOUR ( $\frac{1}{2}$  mark each):
- Must be straight.
  - Must be of an even gradient.
  - If passing through concrete the pipe must be sleeved.
  - Must have 50 mm clearance from top of pipe to underside of concrete slab.
  - The drain must meet the 50 year durability requirement of NZBC Clause B2.
  - Sufficient access points must be included in the drain.

**Total 2 Marks**

## ANSWER 11

- (a) Drawing to include any EIGHT (1 mark each):
- 2 Pumps
  - Pumps are to be submersible
  - Devices to turn pumps on and off
  - High level alarm sensor
  - Isolating valves on pump outlets at ground level
  - Chain/guide for removing pumps for service
  - Vent
  - Inlet/outlet
  - Check valves
  - Mechanical disconnection of pump from discharge line. (8 marks)
- (b) A wet well installation has submersible pumps installed at the base of the chamber. A dry well installation has pumps installed above the liquid level with pipes extending into the liquid. (2 marks)
- Total 10 Marks**

## ANSWER 12

(a) When the depth of the main drain is considerable lower than a branch drain. (1 mark)

(b) Any TWO:

- It must be supported with a concrete footing.
- An inspection opening/junction must be provided at the top of the vertical section.
- The vertical section must be protected and supported during installation and backfilling.

(2 marks)

(c) Any TWO:

- At the top of a jump-up.
- At the connection of an inspection shaft to a graded drain.
- At the connection of a drain to a boundary trap riser.
- Where a vent is connected to a boundary trap riser.
- As the inlet riser of a gully or floor waste gully.
- As an inspection opening.
- At the top of a jump-up in a drain, in lieu of a bend and inspection opening.

(½ mark each, 1 mark)

**Total 4 Marks**

## SECTION B

1. C Dumpy/Builders Level.
2. D On the outside of the spigot and the inside of the socket.
3. A The pipe can be used for conveying grey water.
4. D 1:2
5. E 60 minutes.
6. A 500.
7. B Hacksaw.
8. A A pump that is designed to be completely covered by the liquid it is pumping.
9. B A system that removes ground water before excavation.
10. D 3.000 metres.
11. B 100 litres.
12. C The Department of Labour (OSH).
13. E 2.500 metres.
14. B E1 Surface Water.
15. D 1.500 metres.
16. C To allow for the settling of soil around the drain.
17. A Where the drain enters the sewer system.
18. B 1310.
19. D 10.000 metres.
20. C 1.500 metres.

**Total 20 Marks**