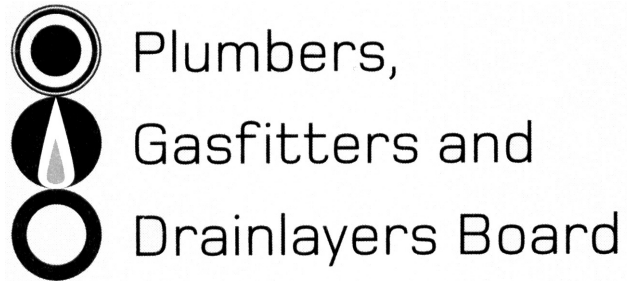


No. 9198



REGISTRATION EXAMINATION, JUNE 2013
CERTIFYING DRAINLAYER

ANSWER SCHEDULE

ANSWER 1

(a) Any ONE

- Pump system (dry or wet well)
- Soak hole
- Bubble up chamber

(1 mark)

(b) Pump system drawing to show

- Chamber
- Pump
- Float switch of similar
- Access or chain to pump for servicing

Soak hole drawing to show

- Filter cloth
- Lid if chamber style
- Size of rocks indicated for chamber or rock filled option
- Inlet at top of soak pit

Bubble up chamber drawing to show

- Access lid
- Concrete seal at base
- Chamber depth < 1 metre
- Inlet 200mm above base
- Outlet at top and at least 150mm below FGL

(5 marks)

Total 6 marks

ANSWER 2

(a) 1500 litres

(1 mark)

(b) Length = $\frac{145 \times 4}{34 \times 0.5}$

= 34.12 metres

(2 marks)

Total 3 marks

ANSWER 3

(a) Any TWO (1 mark each)

- Above ground application
- High water table
- Direct discharge to bodies of water

(2 marks)

(b) Any TWO (1 mark each)

- Chlorination (solid or liquid)
- Ozonation
- Ultra-violet irradiation

(2 marks)

(c) Any FOUR (1 mark each)

- The amount of organic material (suspended solids) in the waste water/the concentration of microorganisms
- The flow rate of the wastewater/contact time with disinfecting agent
- The flow volume of the disinfecting agent
- The temperature
- The turbidity or the waste water (UV option)
- The light transmissivity (UV option)
- The pH of the wastewater (UV option)
- The hardness of the wastewater (UV option)
- The age and cleanliness of the UV bulb if used.

(4 marks)

Total 8 marks

ANSWER 3

Any FOUR (1 mark each)

- Trenches
- Beds
- Evapotranspiration areas
- Mounds
- Drip and spray irrigation.

(other acceptable designs accepted)

Total 4 marks

ANSWER 5

Diagram to show

- Correct gullies or toilet connections
- Correct drain to sewer connections
- Drain not under deck
- Venting
- Correct number and locations of inspection openings

Total 10 marks

ANSWER 6

(a) Diagram to show

Distance from building (1 mark)

Distance from boundary (1 mark)

Three soak pits in suitable locations (3 marks)

(5 marks)

(b) Area of building = 403.24 (2 marks)

Expected rain fall = area of building \times 0.04
= 403.24 \times 0.04
= 16.1296 (1 mark)

Rainfall per downpipe = 16.1296 \div 5
= 3.22592 (1 mark)

Number of soak pits required = 8 \div 3.22592
= 2. (1 mark)

So 3 soak pits required. (1 mark)

(6 marks)

Total 11 marks

ANSWER 7

- (a) Every employer must provide reasonable opportunities for their employees to participate effectively in ongoing processes for the improvement of health and safety in the workplace. (1 mark)
- (b) • If an employer has more than 30 employees
• If an employer has fewer than 30 employees and one or more of these requires the development of an employee participation system (2 marks)
- (c) • The employer (½ mark)
• The employee (½ mark)
• The union representing them (1 mark) (2 marks)
- (d) • The election of health and safety representatives
• Developing processes for ensuring regular and co-operative interaction between employers and employees on health and safety issues. (2 marks)
- (e) The employees and their representatives. (1 mark)

Total 8 marks

ANSWER 8

Any FOUR (1 mark each)

- An excavation that is more than 1.5 metres deep and deeper than it is wide at the top.
- Any work that in connection with asbestos fibres
- Any excavation more than 5 metres deep with a battered slope steeper than 1 horizontal to 2 vertical
- Any work where explosives are used or stored
- Any form of tunnel or drive where workers work underground
- Work that involves lifting loads of 500kg or more by mechanical means (excluding mobile crane, excavator or forklift)
- Where there is a risk of falling 5 metres or more
- Where compressed air/breathing apparatus is being used

Total 4 marks

ANSWER 9

Drawing to show (in the correct locations)

- Drainflow pipe
- Large grade metal (above and below pipe)
- Filter cloth
- Soil

Total 4 marks

ANSWER 10

(a) Waste water from a sanitary fixture that does not include human waste (eg. no discharge from WC pans and/or urinals)

(1 mark)

(b) Any THREE (1 mark each)

- If a network utility operator services the area a permanent connection to the NUO waste water system shall be maintained to redirect grey water to the NUO system
- Unless otherwise permitted grey water shall conveyed to the NUO via a disconnecter gully
- All openings shall be securely sealed and vermin proofed
- Piping shall be installed directly to a treatment/diversion vessel independently of other systems
- Below-ground greywater diversion devices shall be protected from sewage surcharge when connected to a sewer
- All pipework greater than DN80 shall be clearly marked GREYWATER at intervals not exceeding 1 m

(3 marks)

Total 4 marks

ANSWER 11

(a) Foul water section.

Correct vent (1 mark)

Correct ORG (1 mark)

Correct IO (1 mark)

Location of grease trap (1 mark)

Correct fittings discharging to grease trap (1 mark)

Drain attached to correct connection point (1 mark)

Surface water section

Branch drain to downpipe A shown as 90mm (1 mark)

Branch drain to type 2 sumps shown as 150mm (1 mark)

Main drain from boundary to first branch drain 150mm (1 mark)

Drain attached to correct connection point (1 mark)

Design complies with trade practice and is economical (3 marks)

(13 marks)

(b) $175 \times 5 = 875$ litres

(1 mark)

Total 14 marks

ANSWER 12

Area of the trench = 1.59 m² (2 marks)

Volume of the trench = 1.59m² × 3m = 4.77m³ (1 mark)

Compaction = 0.954m³

Volume of backfill = 5.724m³ (1 mark)

Total 4 marks

SECTION B

1. A The principal contractor
2. C If an accident occurred the code of practice is used as an example of good work practice and if not followed could indicate negligence.
3. B When the greywater has been treated
4. B 175 mm
5. A 1:50 (2.00%)
6. E 9.60 m
7. C The Territorial Authority for the location
8. D The branch drain and junction receiving the waste from the gully dish should be removed and the junction replaced with a straight section of pipe.
9. B The main pump should stop.
10. E 30 minutes
11. D 150 mm
12. C Both at the inlet and outlet of the grease trap.
13. D The height difference between the inlet and the outlet.
14. D 3.0m
15. A To stop the waste cooling and fats solidifying on the internal wall of the pipe.
16. C The slope is steep
17. E Re- routing an existing drain around a tree due to damage by tree roots.
18. A Drainlaying work that does not require a building consent from the local territorial authority.
19. A A main through which water or sewage is pumped at pressure.
20. A 25mm

Total 20 marks