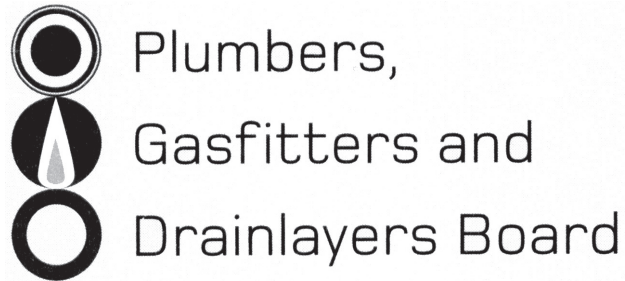


No. 9198



REGISTRATION EXAMINATION, NOVEMBER 2022
CERTIFYING DRAINLAYER

ANSWER SCHEDULE

ANSWER 1

- (a) Any ONE:
- Pump system (dry or wet well).
 - Bubble up chamber.
 - Displacement system (reverse fall system). (2 marks)
- (b) Pump system drawing to show:
- Chamber. (1 mark)
 - Pump. (1 mark)
 - Float switch of similar. (1 mark)
 - Access or chain to pump for servicing. (1 mark)
- Bubble up chamber drawing to show:
- Access lid. (½ mark)
 - Concrete seal at base. (½ mark)
 - Chamber depth < 1 metre. (1 mark)
 - Inlet 200 mm above base. (1 mark)
 - Outlet at top and at least 150 mm below FGL. (1 mark)
- Displacement system drawing showing:
- Inlet and outlet points. (1 mark)
 - Direction of fall. (1 mark)
 - Flushing point. (2 marks)
- (4 marks)
Total 6 marks

ANSWER 2

- (a) Any THREE (1 mark each):
- Harmful gases from the soil or machinery.
 - Contact with dangerous underground services – gas pipe/electricity cables.
 - Exposure to falling objects from above the excavation.
 - Falling into the excavation. (3 marks)
- (b) • The angle of a slope where the material in the face will remain stable under all anticipated conditions of work and weather. (1 mark)
- (c) Any THREE (1 mark each):
- The soil type.
 - Ground moisture content.
 - Weather conditions.
 - Ground vibrations in the area (traffic etc). (3 marks)
- Total 7 marks**

ANSWER 3

(a) • Work that does not require a building consent. (1 mark)

(b) Any FOUR (1 mark each):

- Opening an existing access point to clear a blockage and resealing that access point.
- A kitchen benchtop is replaced and the kitchen sink is moved to an adjacent wall. The existing gully trap servicing the kitchen needs to be shifted a short distance to receive the discharge from the repositioned sink wastepipe.
- A toilet pan has been repositioned in an existing bathroom and it is reconnected into the existing drain at a different point.
- Installing a new access or rodding point for unblocking drains.
- Installing a short extension to a storm-water drain to collect water from a new downpipe.
- Connecting a new gully trap on an existing drain to receive discharge from a redirected waste pipe.
- Sealing off a branch drain following the removal of sanitary fixtures from an outbuilding associated with a dwelling.
- Extending, for a short distance, the drain from a dwelling to connect to a new council sewer lateral installed at the boundary by the NUO due to the original lateral being damaged by tree roots (provided no new connections to a NUO system are made).

(4 marks)

(c) Any FOUR (½ mark each):

- Certifying drainlayer.
- Tradesman drainlayer.
- Journeyman drainlayer.
- Trainee drainlayer.
- Exempted person under supervision.
- Provisional drainlaying licence holder.

(2 marks)

Total 7 marks

ANSWER 4

(a) Diagram to show:

- no vent on A. (1 mark)
- no vent on B. (1 mark)
- main vent on C OR on F. (1 mark)
- vent in correct location on D. (1 mark)
- vent in correct location on E. (1 mark)

(5 marks)

(b)

Drain	Minimum diameter (mm)	Minimum gradient
A	100	1.65%
B	65	2.5%
C	65	2.5%
D	65	2.5%
E	100	1.25%
F	100	1.45%

Other designs are possible.

(6 marks)

Total 11 marks

ANSWER 5

(a) Diagram to show:

- Baffle. (1 mark)
- Tight fitting lid. (1 mark)
- Inspection points (2). (1 mark)
- Cascade. (1 mark)

(4 marks)

(b) Diagram to show:

- Vents (2). (1 mark)
- Gully dish. (1 mark)
- 3 m between building and grease trap. (1 mark)

(3 marks)

- (c) • 5 litres per person for whom seating is provided but not less than 100 litres. (2 marks)

Total 9 marks

ANSWER 6

- (a) Any TWO (1 mark each):
- Work in any pit, shaft, trench, or other excavation in which any person is required to work in a space more than 1.5 metres deep and having a depth greater than the horizontal width at the top.
 - Work in any drive, excavation, or heading in which any person is required to work with a ground cover overhead.
 - Work in any excavation in which any face has a vertical height of more than 5 metres and an average slope steeper than a ratio of 1 horizontal to 2 vertical.
 - When explosives are used or stored. (2 marks)
- (b)
- Address of work.
 - Start date.
 - Expected duration of work.
 - Nature of the work.
 - Contact details of person in charge. (5 marks)

Total 7 marks

ANSWER 7

- (a) • Any surface water that overflows from a drainage system (down a secondary or overland flow path). (1 mark)
- (b) • To protect buildings from flooding. (1 mark)
- (c) Any FOUR (1 mark each)
- Existing structures.
 - Finished floor levels.
 - Height of the crown of a road.
 - Any feature that may cause a building to flood.
 - Expected rainfall in the catchment area. (4 marks)

Total 6 marks

ANSWER 8

Marks for:

- Dosing system (pump, tip-bucket, etc). (1 mark)
- Septic tank inspection openings (2). (½ mark each)
- Septic tank fresh air inlet. (1 mark)

Right hand drain

- Plain Y to gully trap. (1 mark)
- Vent. (1 mark)
- WC inspection opening Y. (1 mark)

Left hand drain

- WCs inspection openings Ys. (1 mark)
- 2 × 45s + 1 inspection opening. (1 mark)
- Basins plain Y. (1 mark)
- Vent and WCs. (1 mark)

Total 10 marks

ANSWER 9

- (a) • A main through which water or sewage is pumped at pressure. (1 mark)

(b) Any TWO (1 mark each):

- Inspection chamber.
- Boundary trap shaft.
- A stack below the lowest fixture connection on any floor.
- A drain or combined discharge pipe, provided the connection is at least 2.5 m from any other connection.
- Downstream of a reflux valve or at least 2.5 m upstream of a reflux valve.
- A minimum of 1 m downstream of a boundary trap.
- Direct to the network utility operator's sewer where approved by the network utility operator.

(2 mark)

(c) Any TWO (1 mark each):

- Clipped to the wall
- Each end is to have a 90° bend
- The top bend must incorporate an inspection opening
- If more than two are installed in a circular chamber it must be larger than 1.2m diameter

(2 marks)

Total 5 marks

ANSWER 10

Pipe sections		
Pipe section	Distance (m)	Fall (mm)
A – B	6.4	105.6 – 107 (½ mark)
B – C	8.2	135.3 – 137 (½ mark)
C – D	2.2	36.3 – 36.7 (½ mark)
C – E	10.6	175 – 177 (½ mark)

Total 6 marks**ANSWER 11**

(a)

Employee	Licence category	Minimum period 'in the presence of'
New apprentice	Trainee	12 months
Unskilled labourer	Exemption under supervision	24 months
Provisional License Holder	Journeyman or Exemption under supervision	0 for Journeyman 24 months for Exemption under supervision

(1 mark each, 6 marks)

- (b)
- Direct. (1 mark)
 - General. (1 mark)
 - Broad. (1 mark)

(3 marks)

Total 9 marks

ANSWER 12

- (a) • 30 minutes. (1 mark)
- (b) • 2 ml per hour × 200 mm diameter × 65 metres long
• $2 \times 200 \times 65 = 26,000$ ml (1 mark)
• $26,000 \div 2 = 13,000$ ml (1 mark)
= 13 litres (1 mark)
- (c) • Low pressure air test.
• High pressure air test. (1 mark)
- (d) • The pipe needs to be thoroughly soaked for 24 hours prior to starting the test. (1 mark)

Total 6 marks

SECTION B

1. C 149
2. C 420 kg
3. C 1:90
4. A 1:50 (2.00%).
5. E 50 years.
6. C To supply oxygen to the bacteria within the tank.
7. A To allow a drain to be laid within a neighbouring property.
8. C be decreased
9. C Extra weight from soil or vehicles near the edge of the trench.
10. A 24 hours.

Total 10 marks