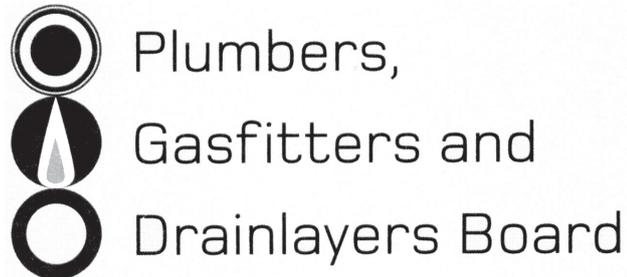


No. 9197



REGISTRATION EXAMINATION, JUNE 2015
LICENSED DRAINLAYER

ANSWER SCHEDULE

ANSWER 1

- (a) Wet and soft.
Sand pit.
Clay.
Gravel. (3 marks)
- (b) Clay that is prone to large volume changes that are directly related to changes in water content. (2 marks)
- Total 5 marks**

ANSWER 2

- (a) Holds water all the time as new water flows in the stored water is pushed out. (1 mark)
- (b) Water not contained or stored that enters the system and falls through to the outfall. (1 mark)
- (c) The path that surcharge will follow if the drain were to be blocked or overloaded. (1 mark)
- Total 3 marks**

ANSWER 3

- (a) Damage can occur to the internal surface of the drains. Thrust is required.
- (b) Silt and gravel may be in the discharge.
- Total 2 marks**

ANSWER 4

- A: Volume = $0.7854 \times 0.100 \times 0.100 \times 50$ (1 mark)
= 0.3927 m^3 (1 mark)
= 392.7 litres (1 mark)
Allow 10% volume = $392.7 + 39.3 = 432.0$ litres (1 mark)
With 10% allowance weight = 432 kg (1 mark)
- Total 5 marks**

ANSWER 5

Any FOUR (1 mark each)

- Boundary markers
- Outfall/NUO connection point
- Topography
- Datum
- Building features

Total 4 marks

ANSWER 6

- (a) Trench collapse, electrocution, suffocation or poisoning. (1 mark)
- (b) Make the area safe to work in, it is important that a double accident does not occur, turn off electricity, support or remove any crushing load. (1 mark)
- (c) • Sewer gas
• Carbon monoxide or exhaust fumes
• Fuel gas
• Dust
• Carbon dioxide (2 marks)
- (d) Any FOUR (½ mark each)
- Trench shoring
 - Ladders
 - Dewatering pumps
 - Barriers
 - Gas detector
 - Certified lifting equipment
 - First aid box
 - Harness (2 marks)
- (e) Any ONE (1 mark)
- Keep the area well ventilated with a fan to move the dust away from any electrical equipment.
 - Use a wet saw or grinder. (1 mark)
- (f) • Motor will not discharge exhaust fumes into the trench.
• Check that dewatering does not make the trench walls unstable.
• Ventilate the trench. (2 marks)
- (g) • Erect barriers.
• Erect signs.
• Install lights.
• Cover trench. (3 marks)

Total 12 marks

ANSWER 7

- (a) The quantity of extra material required to backfill a compacted trench due to the fill compressing. (2 marks)
- (b) It is the amount of effluent soils can dispose of / accept. (1 mark)
- (c) Percolation test or soil structure test. (1 mark)
- (d) To make sure the soil will be able to cope with the expected effluent discharge rate. (1 mark)
- (e) • To prevent gravel, silt and floating debris from entering the drain.
• To prevent gravel, silt and floating debris scouring the drain. (2 marks)
- Total 6 marks**

ANSWER 8

- (a) • Corrosive properties.
• Temperature.
• Suspended solids.
• Volume. (3 marks)
- (b) Any TWO (1 mark each)
• High level alarm, alerting the consumer.
• Duplex (back-up) pump.
• Water interlock system. (2 marks)
- Total 5 marks**

ANSWER 9

Any FOUR (1 mark each)

- Pipes straight.
- Pipes at correct grade.
- Joints are correctly made (primer obvious, no bulging rings, all ties completed).
- Pipes not damaged.
- Inspection caps in place.
- Plugs for testing purposes are installed.
- No trench collapse with debris.
- Pipes are continually supported.

Total 4 marks

ANSWER 10

- (a) • Adding more cement.
• Using quarry aggregate. (1 mark)
- (b) A mix of concrete that is supplied and certified to be a particular grade. (1 mark)
- Total 2 marks**

ANSWER 11

| Gradient | Gradient as % | Fall mm per m |
|----------|---------------|---------------|
| 1 in 80 | 1.25 | 12.5 |
| 1 in 60 | 1.65 | 16.5 |
| 1 in 120 | 0.83 | 8.3 |
| 1 in 200 | 0.5 | 5 |

Total 4 marks

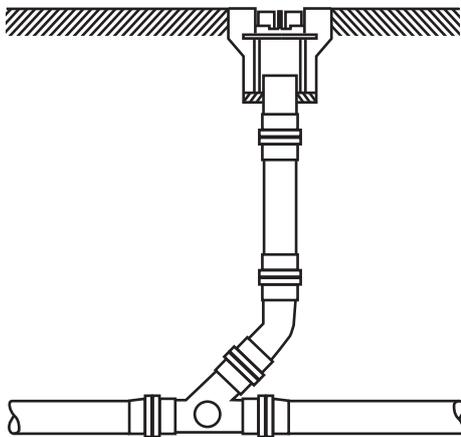
ANSWER 12

(a) Neutralizing traps/systems are designed receive and dilute or neutralize corrosive and harmful chemical wastes before allowing it to be discharged into the public sewer. (2 marks)

- (b)
- Hospitals.
 - Industrial plants.
 - Pesticides.
- (3 marks)

Total 5 marks

ANSWER 13

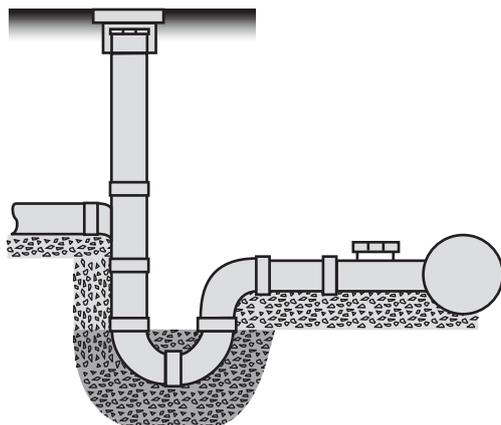


(1 mark each)

Name
Rodding Point.

Situation
For access in a sealed area or inside a building.

Function
Access point for cleaning. (3 marks)



(1 mark each)

Name
boundary trap.

Situation
Before a house drain connects to a NUO sewer.

Function
To separate smells and gases from the sewer and not allow them into the house drain. (3 marks)

Total 6 marks

ANSWER 14

- Extraneous water.
- Soil, sand, rock.
- Contents of a septic tank.
- Any other substance, the discharge of which would impede the operation of the sewer.

Total 3 marks**ANSWER 15**

- Vacuum.
- Water.
- High pressure air.
- Low pressure air.

Total 3 marks**ANSWER 16**

- (a) Water that has been used for sanitation but does not include any soil or human waste.
- (b) Water that contains human waste.
- (c) Clean drinking quality water.
- (d) Water – rain or from a pond or river which flows over the earth's surface.

Total 4 marks**ANSWER 17**

Marks deducted where inaccuracies occurred.

Total 7 marks**ANSWER 18**

| Section | Total length of the section (m) | Total fall of the section (mm) |
|---------|---------------------------------|--------------------------------|
| A - B | 19.9 | 241 |
| B - E | 8.8 | 110 |
| C - D | 7 | 87 |
| D - E | 9 | 112 |
| E - F | 7 | 87 |
| A - F | 34.3 | 435 |
| C - F | 23 | 287 |

(measurements based on printed paper)

Total 7 marks

SECTION B

1. B A system that removes ground water before excavation.
2. C WorkSafe New Zealand.
3. B E1 Surface Water.
4. C To allow for settling of soil around the drain.
5. D 10.0 m
6. C 1.5 m.
7. A Dumpy/builder's level.
8. D On the outside of the spigot and the inside of the socket.
9. C 500 mm.
10. D 250 mm.

Total 10 marks