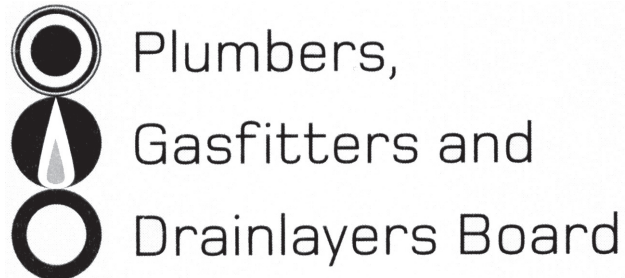


No. 9198



REGISTRATION EXAMINATION, NOVEMBER 2020
CERTIFYING DRAINLAYER

ANSWER SCHEDULE

ANSWER 1

Any SIX (½ 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 500 kg or more by mechanical means.
- Where there is a risk of falling 5 metres or more.
- Where compressed air/breathing apparatus is being used. (3 marks)

(b) Pressures at large diameters can become highly dangerous. (1 mark)

(c) Any FIVE (1 mark each)

- Asbestos.
- Sewage.
- Pesticides, solvents and other toxic chemicals.
- Petroleum based products.
- Animal products, remains and manure.
- Household waste. (5 marks)

(d) Any FOUR (1 mark each)

- Trench shoring.
- Ladders.
- Dewatering pumps.
- Barriers.
- Gas detector.
- Certified lifting equipment.
- First aid box.
- Lighting. (4 marks)

Total 13 marks

ANSWER 2

(a)

Category	Minimum time	Situation
Easy to access and replace	5 years	Gully dishes
Moderately difficult to access and replace	15 years	In grassed areas
Difficult to access and replace	50 years	Under concrete

(6 marks)

- (b)
- Building consent authority.
 - Owner or designer. (2 marks)

Total 8 marks

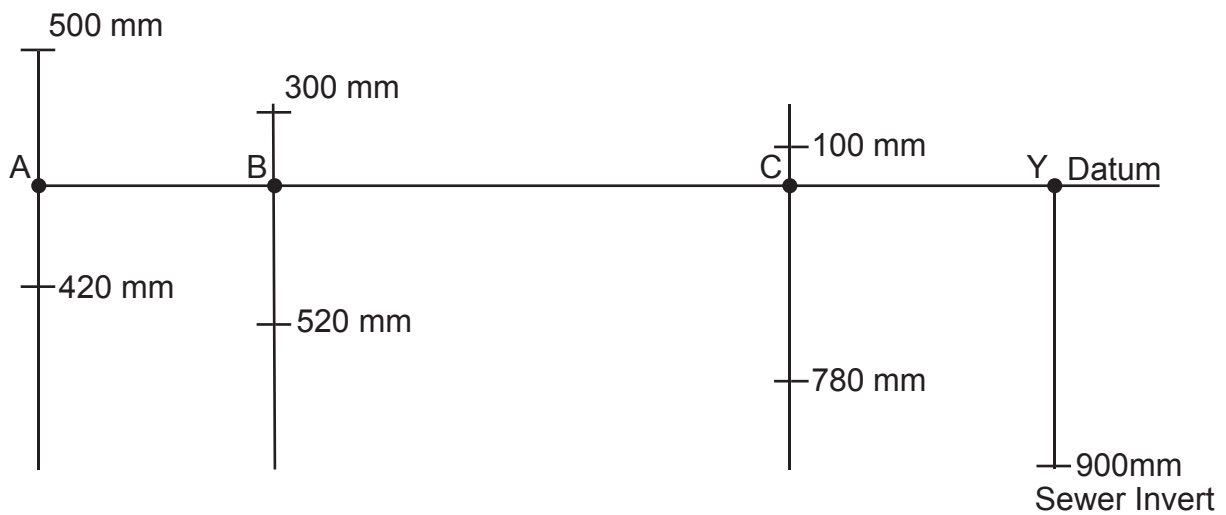
ANSWER 3

- Bubble up chamber
Where there is only a slight rise required to connect to the TA's sewer, and suitable ground contour.
- Soak pit
Where no power is available and there is adequate space to allow for the installation of the soak pit.
- Pump system
Where power is able to be supplied, limited space is available and the height difference is large.
Answers are indicative only

Total 9 marks

ANSWER 4

(a)



(8 marks)

(b)

A	B	C	D
920 mm	820 mm	880 mm	900 mm

(4 marks)

(c) 1:1.2 OR 8.3%

(3 marks)

Total 15 marks

ANSWER 5

Volume of box culvert = $2.2 \times 2.1 \times 3 = 13.86 \text{ m}^3$

Volume of trench = $\frac{1}{2} (3.2 + 2.2) \times 2.3 \times 3 = 18.63 \text{ m}^3$

Volume to be filled = $18.63 - 13.86 = 4.77 \text{ m}^3$

Allowance for compaction = 20% of $4.77 = 0.95 \text{ m}^3$

Volume of backfill material required = $4.77 + 0.95 = 5.72 \text{ m}^3$

Total 4 marks

ANSWER 6

(a) 30 minutes. (1 mark)

(b) 2 ml per h \times 300 mm diameter for 57 metres long
= $2 \times 300 \times 57000 = 34200 \text{ ml/h}$ (1 mark)
 $34200 \div 2 = 17100 \text{ ml}$ (1 mark)
 $17100 \div 1000 = 17.1 \text{ litres}$ (1 mark)
(3 marks)

(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

ANSWER 7

(a) Any ONE (1 mark)
• When the ground has poor drainage.
• High water table. (1 mark)

(b) Diagram showing (1 mark each)
• Plantings
• Filter cloth.
• Top soil.
• Effluent discharge pipe.
• Graded gravel/sands etc. (5 marks)

(c) Any THREE (1 mark each)
• Make sure any plants in the area are suitable.
• Do not allow stock or heavy machinery/vehicles to have access to the mounds.
• Have the septic tank pumped out regularly.
• Do not flush unsuitable products into the system.
• Ensure surface water is diverted from the mound. (3 marks)

(d) Any THREE (1 mark each)

- Gravity soakage trenches.
- Drip line.
- Low pressure (dose loading) effluent distribution.
- Engineer or approved designers system such as chambers in sand areas, sand filter above soak pits etc.

(3 marks)

Total 12 marks

ANSWER 8

Inspection points (2 marks)

Access points (2 marks)

Vents (2) (2 marks)

Gully dish (1 mark)

Total 7 marks

ANSWER 9

Branch drain to downpipe A shown as 90 mm.

(2 marks)

Branch drains to type 2 sumps shown as 150 mm.

(2 marks)

Drain consistent with trade practice and is economical.

(2 marks)

Total 6 marks

ANSWER 10

Using 50 m rule

Inspection openings in correct positions

(three locations, 2 marks each) (6 marks)

OR

Using 100 m rule

Inspection chambers or access chambers in correct positions

(6 marks)

Total 6 marks

ANSWER 11

Over-excavate and backfill with appropriate metals.

(2 marks)

Use concrete benching.

(2 marks)

Total 4 marks

SECTION B

1. C To supply oxygen to the bacteria within the tank.
2. D The height difference between the inlet and the outlet.
3. C 24 months.
4. D 500 mm.
5. 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.
6. A To allow a drain to be laid on a neighbouring property.
7. D 500 mm.
8. E 0.90
9. C Cover the pipe with 50 mm of overlay followed by 75 mm of concrete paving.
10. B A tank designed to hold surface water for re-use as a water supply on the property.

Total 10 marks

