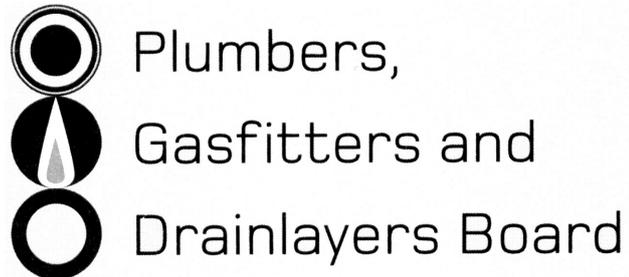


No. 9198



REGISTRATION EXAMINATION, NOVEMBER 2019
CERTIFYING DRAINLAYER

ANSWER SCHEDULE

ANSWER 1

- (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 the road.
 - Any feature that may cause a building to flood.
 - The rainfall volume for a site.
 - The flow capacity of the surface water drainage system.
 - The potential water level if the surface water cannot discharge through the system and backs up.
 - The surrounding ground level (will the excess water be caught until it can travel through the system or will it overflow and bypass the system?).
 - Ground contour.
 - The flow capacity of the surface water drainage system.
 - Maintenance of the flow path.
 - Plants, trees, shrubs etc.

(4 marks)

Total 6 marks

ANSWER 2

- (a) Any TWO (1 mark each)
- Inhalation (breathing into the lungs).
 - Ingestion (swallowing).
 - Absorption through the skin.
- (2 marks)
- (b) Any TWO (1 mark each)
- Dermatitis.
 - Breathing difficulties.
 - Light-headedness.
 - Eye damage.
- (2 marks)
- (c) Any TWO (½ mark each)
- Gloves.
 - Safety glasses.
 - Mask.
- (1 mark)

Total 5 marks

ANSWER 3

Diagram to show:

- a grate
- a sump for grit
- two other chambers
- venting
- separation between the chambers
- outlet at suitable level.

Total 6 marks

ANSWER 4

(a) Any THREE (1 mark each)

- Is large enough for a worker to enter and perform assigned work.
- Has limited entries and exits.
- May contain a hazardous atmosphere, arising from chemicals, sludge or sewage.
- Is constructed so that anyone who enters could be asphyxiated or trapped by walls or floor that converge to a small cross-section, such as a hopper.
- Contains a material, such as sawdust or grain that could engulf anyone who enters.

(3 marks)

(b) Any TWO (1 mark each)

- Work where workers could fall 5 m or more.
- The erection or dismantling of scaffolds from which a person could fall 5 m or more.
- Every excavation which is more than 1.5 m deep and which is deeper than it is wide at the top.
- Any form of tunnel or drive where workers work underground, irrespective of timbering or support.
- Those excavations where the excavated face is steeper than 1 horizontal to 2 vertical.
- Any construction work where explosives are used or stored.
- Work such as diving, where construction workers breathe air or any other gas that has been compressed or is under pressure.
- Any construction work in connection with asbestos fibres.
- 'Restricted work' as defined by the Asbestos regulations is also notifiable work.

(2 marks)

(c) WorkSafe

(1 mark)

(d) Any FIVE (1 mark each)

- Address of work.
- Start date.
- Expected duration of work.
- Category/nature of the work.
- Contact details of person in charge.
- Type of business (PCBU, contractor, sub-contractor)

(5 marks)

(e) Any ONE (1 mark)

- If it is necessary to deal with an emergency arising from damage caused by any earthquake, explosion, fire, flood, lightning, rain, slip, storm, or washout.
- The blockage or breakdown of any drain or sewer.
- The blockage or breakdown of any distribution system or network for electricity, gas, telecommunications, or water.

(1 mark)

Total 12 marks

ANSWER 5

Grease trap	(1 mark)
Correct venting	(2 marks)
Inspection points at boundary	(2 marks)
Inspection junctions	(2 marks)
Surface water correct (not through sumps)	(1 mark)
Economical and practical	(2 marks)

Total 10 marks

ANSWER 6

Septic and effluent systems.

- Septic tank (2 marks)
- Sealed (3 marks)

Drains and inspections.

- Inspection openings (2 marks)

Venting. (2 marks)

- Gully traps (2 marks)
- Economical and practical (1 mark)

Total 12 marks

ANSWER 7

Any FOUR (1 mark each)

- Lay the last section of pipe at as low a gradient as possible.
- Angle the pipe so that the entry into the waterway is less than 45°.
- Increase the diameter of the last section of pipe.
- Rip Rap aprons.
- Stilling basins.
- Drop pools.
- Hydraulic jump basins.
- Baffled aprons.
- Impact energy dissipaters.
- Headwall with baffle blocks.

Total 4 marks

ANSWER 8

Drawing to show two pumps (2 marks)
and any SIX (1 mark each)

- lid
- vent valve
- non-return valve
- inlet junction
- discharge pipe
- flexible joint/union
- three float switches
- ladder in the pit
- ground base
- lifting rope or chain

Total 8 marks

ANSWER 9

Layout of pipework	(2 marks)
Venting	(2 marks)
Correct scale	(1 mark)
Inspection opening	(1 mark)

Total 6 marks

ANSWER 10

(a) Any FOUR (½ mark each)

- Sewer gas.
- Carbon monoxide or exhaust fumes.
- Fuel gas.
- Dust.
- Carbon dioxide.
- Trench collapse.

(2 marks)

(b) Any THREE (1 mark each)

- Contact with dangerous underground services – gas pipe/electricity cables.
- Exposure to falling objects from above the excavation.
- Falling into the excavation.
- Trench collapse.

(3 marks)

- (c) Any FOUR (1 mark each)
- Keep spoil and machinery away from the edge of the trench.
 - Use shoring/trench shield etc.
 - Use a ladder to access and exit the trench.
 - Put up barricades around the perimeter of the trench to prevent objects and people falling into the trench.
 - Monitor the air quality in the trench.
 - Check the soil moisture levels regularly – too dry or too wet can cause trench collapse.
 - Dewatering.
 - Construct the trench with a safe slope. (4 marks)

- (d) Any FOUR (4 marks)
- Oxygen level.
 - Possible toxic fumes.
 - Possible flammable contaminants.
 - Temperature within the chamber.
 - Possible rainfall in catchment area.
 - Tidal movements if the drain is discharging to the sea. (4 marks)

Total 13 marks

ANSWER 11

(a)

Region	Area (m ²)
A	797
B	561
C	405
Total carpark	1763

(4 marks)

- (b) (i) 225 mm (2 marks)

- (ii) 150 mm (2 marks)

Total 8 marks

SECTION B

1. C Extra weight from soil or vehicles near the edge of the trench.
2. A 24 hours.
3. A The company.
4. E 24 hours.
5. E 1:350
6. B 2.0
7. B Drainlayer B.
8. C 24 months.
9. A To recover plant and equipment from the site.
10. A 1.34 m.

Total 10 marks