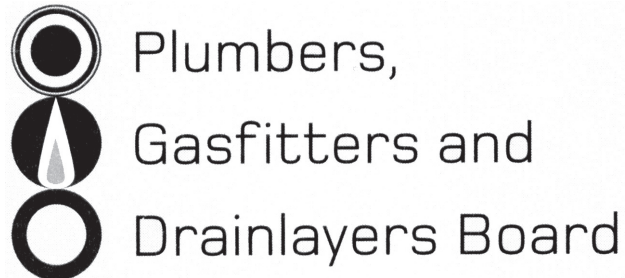


No. 9197



REGISTRATION EXAMINATION, NOVEMBER 2017
TRADESMAN DRAINLAYER

ANSWER SCHEDULE

ANSWER 1

- (a) To prevent movement/displacement of the drain. (1 mark)
- (b) • At the top and bottom.
• At intervals not exceeding 3 m. (2 marks)
- (c) Any THREE (1 mark each)
- Extend across the full width of the trench.
 - Be firmly keyed into the sides of the trench.
 - Extend below the base of the trench for a minimum of 150 mm.
 - Have reinforcing rods.
 - Not covering any flexible joints. (3 marks)

Total 6 marks

ANSWER 2

- (a) Any TWO (1 mark each)
- Pump chambers
 - Main vent when a high level vent is impossible
 - Septic tank.
 - Boundary traps.
 - Holding tank. (2 marks)
- (b) Any TWO (1 mark each)
- Not less than 150 mm above ground level.
 - Not less than 3 m to a building opening or 5 m to an air inlet.
 - Not likely to be damaged, cause injury or be an obstruction. (2 marks)

Total 4 marks

ANSWER 3

- (a) • Submersible macerating pump. (1 mark)
- (b) Any TWO (1 mark each)
- Fat.
 - Fabrics.
 - Sanitary products. (2 marks)

Total 3 marks

ANSWER 4

- (a) • Clean the pipe and line up the plug and pipe. (½ marks)
• Restrain the plug. (1½ marks)
- (b) Any FIVE (1 mark each)
- Chambers/structures.
 - Jump-ups.
 - Where drains enter or exit foundations.
 - Unstable ground.
 - Sewer connections.
 - Grease traps.
 - Where allowance for expansion or contraction is required.
 - Where change of materials occurs.
 - Where settlement is expected. (5 marks)
- (c) • Accept any acceptable flexible joint. (2 marks)

Total 9 marks

ANSWER 5

- (a) Any TWO (2 marks each)

Type of test	Air pressure test (1 mark)
Minimum test pressure	10 kPa (½ mark)
Minimum test time	2 minutes (½ mark)
Type of test	Vacuum test
Minimum test pressure	10 kPa (½ mark)
Minimum test time	2 minutes (½ mark)
Type of test	Hydrostatic test (1 mark)
Minimum test pressure	Not less than 1 m above soffit level, not exceeding 3 m at the lowest point of the test section (½ mark)
Minimum test time	15 minutes (½ mark)

Or answers consistent with New Zealand Building Code clause E1 Surface Water.

(4 marks)

- (b) Any TWO (1 mark each)
- Atmospheric pressure.
 - Temperature.
 - Pipe material. (2 marks)

Total 6 marks

ANSWER 6

(a) $w = 3 \times d$ (1 mark)
 $= 3 \times 450$
 $= 1350 \text{ mm}$ (1 mark)

(2 marks)

(b) • The ground is rock.

(1 mark)

Total 3 marks**ANSWER 7**

(a) Any FOUR (½ mark each)

- Laser level.
- Inclined level.
- Manual level with bubble or smart level.
- Dumpy level.
- Boning rods.
- Water level.

(2 marks)

(b) Any THREE (1 mark each)

Factor	Effect
Slumping/flooding	Rain/surface water
Crumbling	Drying wind
Collapse	Vibration from traffic/machinery/earthquake
Slumping/collapse/crumbling	Dewatering

(3 marks)

Total 5 marks**ANSWER 8**

(a) Name: Reflux valve. (1 mark)

Where used: Any appropriate drainage situation e.g. close to a boundary. (1 mark)

(b) Name: Inspection bend. (1 mark)

Where used: Any appropriate drainage situation e.g. any change of direction of 45° or more. (1 mark)

(c) Name: Inspection junction. (1 mark)

Where used: Any appropriate drainage situation e.g. junction of a drain. (1 mark)

(d) Name: Fresh air inlet/vent. (1 mark)

Where used: Any appropriate drainage situation e.g. boundary trap/septic tank/pump chamber/grease trap. (1 mark)

Total 8 marks

ANSWER 9

Volume = 37.056 m³ (2 marks)
 Compaction = 6.176 m³ (1 mark)
 Total volume = 37.062 m³ (1 mark)

Total 4 marks**ANSWER 10**

Gradient	Fall (mm/m)
1.25%	12.5 (1 mark)
1:60	16.6 (1 mark)
1.50%	15 (1 mark)
1:40	25 (1 mark)

Total 4 marks**ANSWER 11**

- (a) • At the junction with the live drain, the property boundary or the sewer. (1 mark)
- (b) • A cap or plug. (1 mark)
- (c) Any TWO (1 mark each)
- Infiltration of ground water.
 - Leakage of sewage into the surrounding ground.
 - Roots entering the drain.
 - Vermin getting in.
 - Extraneous matter getting in. (2 marks)
- (d) To provide a working space at drain level for maintenance or inspection. (1 mark)

Total 5 marks**ANSWER 12**

Any FOUR (1 mark each)

- Accumulation of explosive gases.
- Seals on traps may not be maintained.
- Foul odours may accumulate.
- Bacteria could multiply under these conditions.
- The flow could be restricted/blockages may occur.
- Lack of drying air.

Total 4 marks

ANSWER 13

Name: Sewer gas interceptor trap/Boundary trap (Buchan trap) (1 mark)

Location: Before a house drain connects to a network utility operator's sewer (1 mark)

Function: Any TWO (1 mark each)

- To separate smells and gases from the sewer and not allow them into the house drain.
- To allow fresh air into the drain.
- To allow for traffic by having the fresh air inlet offset.
- To allow air out of the drain when it is flowing (stopping compression).
- To prevent vermin entering the house drain.
- To provide access for maintenance.

Total 4 marks

ANSWER 14

(a) Any FOUR (1 mark each)

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

(4 marks)

(b) Any FOUR (½ mark each)

- Trench shoring
- Ladders
- Dewatering pumps
- Barriers
- Gas detector
- Certified lifting equipment

(2 marks)

(c) Keep the area well ventilated with a fan to move the dust away from any electrical equipment.

(1 mark)

(d) Any TWO (1 mark each)

- Discharge exhaust fumes away from the trench.
- Shore the trench to prevent collapse.
- Wear hearing protection equipment to minimise the noise from the pump.
- Keep away from the trench to minimise vibration.

(2 marks)

Total 9 marks

ANSWER 15

Any FIVE (1 mark each)

- Grease trap.
- Septic tank.
- At the top of a jump-up at the point of connection.
- At the connection of an inspection shaft to a graded drain.
- Where a vent is connected to a boundary trap riser.
- At the inlet riser of a gully or floor waste gully.

Total 5 marks

ANSWER 16

Section	Fall
B – C	57.75 mm (1 mark)
C – D	66 mm (1 mark)
D – E	140.25 mm (1 mark)
E – F	49.5 mm (1 mark)

Point	Depth
A	Ground Level
B	1.0575 m (1 mark)
C	1.058 m (½ mark)
D	1.124 m (½ mark)
E	1.264 m (½ mark)
F	1.313 m (½ mark)

Total 6 marks

ANSWER 17

Inspection openings shown:

- junctions to foul water fixtures (2).
- bends (5).
- at the boundary.
- at the sewer.
- at the branch drains.

Total 5 marks

SECTION B

1. B 75 mm
2. D 65 mm
3. D 350 mm
4. C WorkSafe
5. B E1 Surface Water
6. D 10.000 m
7. C 1 in 80 or less
8. D 80 mm
9. E 600 mm
10. A The top of the inside of a pipe.

Total 10 marks