No. 9197

Plumbers, Gasfitters and Drainlayers Board

REGISTRATION EXAMINATION, JUNE 2007

# DRAINLAYING

ANSWER SCHEDULE

## ANSWER 1

(a) 1 The position of the sewer connection from any side boundary peg.

2 The depth of the sewer connection [invert level]

(1 mark each) (2 marks)

(b) Any FOUR:

1 Ground level

2 Gradients between pegs

3 Whether ground cover over a drain is available.

4 Invert depths for any section of the drain.

5 Datum

(1 mark each) (4 marks)

(c) 1 Make sure that there is sufficient fall from the lowest point on the site to allow drainage to have the correct fall to the sewer connection.

2 The drainage pipe must have sufficient cover.

(1 mark each) (2 marks)

(d) (i) Means the drawing details are 1/100th the size of the actual.

(1 mark)

(ii) Relates to the amount of fall a drain requires.
(ie: for every 60 metre length of drain there shall be 1m of fall).

(1 mark)

(iii) Relates to positions up or down from the datum level on a building site.

(1 mark)

(iv) The depth to the bottom of the internal diameter of the drain from a fixed level or ground level.

(1 mark)

**Total 12 marks**

## ANSWER 2

(a) Safe slope is the angle of an excavation of a trench wall that will ensure it will not collapse

(1 mark)

(b) **Either ONE**:

Remove ignition keys.

All hydraulic equipment should be at rest on the ground.

(1 mark)

(c) Any FOUR:

1 By shoring up the walls of the trench.

2 Metal cage (Working within)

3 Battering ([Back sides)

4 Benching (Excavation)

5 Sheet piles. (On trench sides)

(Any FOUR, 1 mark each) (4 marks)

(d) An isolating transformer or RCD.

(1 mark)

(e) Double insulated tool

(1 mark)

(f) To maintain life until medical help arrives (to restore heart beat and breathing]

(1 mark)

(g) Tetanus injection and boosters when required.

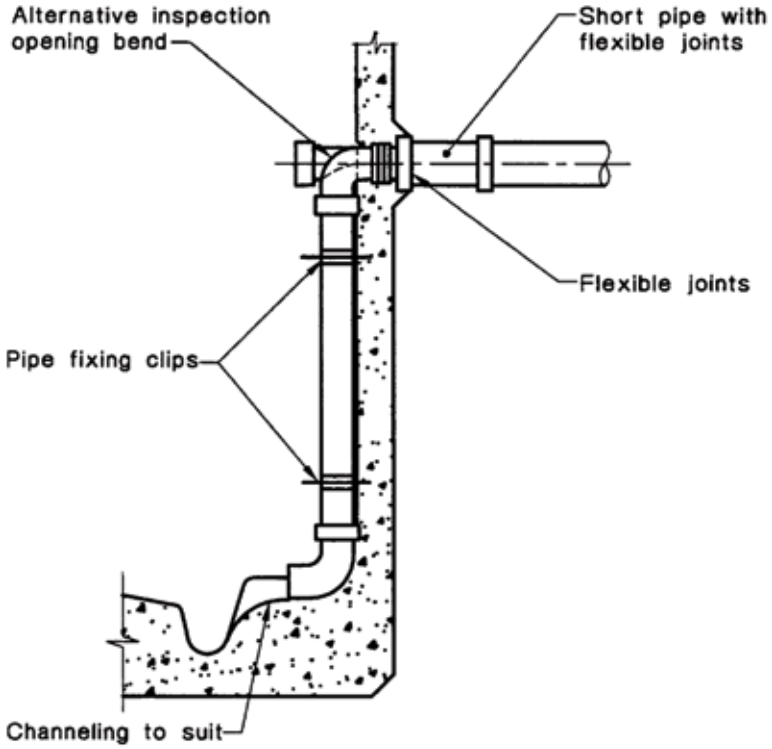
Hepatitis A

Hepatitis B

(1 mark each) (3 marks)

**Total 12 marks**

**ANSWER 3**




1 mark for bend at base

1 mark for pipe fixing clips

1 mark for inspection point [bend or junction]

1 mark for flexible joint in chamber side

1 mark for short pipe with flexible joint (5 marks)

**Total 5 Marks**

## ANSWER 4

(a) A one storey chamber, or chambers, through which **sewage or sullage**, or both are allowed to flow slowly to permit **suspended matter to settle and be retained**, so that organic matter contained therein can be decomposed [digested] by an **anaerobic bacterial action**.
(1 mark for sewage or sullage – 1 mark for settle and retain – 1 mark for bacterial action) (3 marks)

(b) The cascade level is the distance between the **inlet level** and the **outlet level** of a septic tank. (1 mark)

(c) A tank used to **pre-treat sullage**, prior to discharge to a common effluent drainage system. (1 mark)

(d) As soon as possible after installation fill the septic tank with water. (1 mark)

(e) A test carried out to determine the suitability of soils for **absorption (percolation)** trenches, for septic or sullage **disposal systems**.
(1 mark for soil absorption and 1 mark for disposal systems) (2 marks)

**Total 8 Marks**

**Total 12 marks**

## ANSWER 5

(a) Work carried out in connection with the installation, alteration, extension, disconnection, removal, renewal, repair and maintenance of pipes, tanks, appliances, fixtures and fittings generally external to the building, designed or intended to Receive the discharge from a sanitary plumbing system and convey the discharge to a sewer or drain, or to a septic tank, or to a treatment facility and hence to a drain. Collect, convey or dispose of stormwater to a stormwater disposal system.
(2 marks for first section, 1 mark for sanitary and 1 mark for stormwater) (4 marks)

(b) 1 To ensure that sewage does not contaminate the surrounding ground

2 Surface water does not get into the sewer system and overload it.
(1 mark each) (2marks)

(c) (i) A test carried out on pipes and fittings by the internal application of water under a specific head. (1 mark)

(ii) A test for the tracing the flow in a pipe line, or for locating leaks by introducing colouring matter. (1 mark)

(d) (i) At the junction with the live drain or at the property boundary. (1 mark)

(ii) **A purpose made** plug, cap or stopper (1 mark)

(iii) Any TWO:

Can lead to major infiltration of ground water

Leakage of sewage into the surrounding ground

Roots can gain entry into the drain. (2 marks)

(e) (i) As relief in the event of surcharge (Overflow relief gully)

To provide disconnection between waste discharge and the remainder of the sewage installation (Disconnector gully)Prevent escape of foul air from drainage system.

(1 mark each) (2 marks)

(ii) Any TWO:

Within the boundary of the property

External to the building

Internal to the building provided it has an overflow relief piped to the exterior.

(1 mark each) (2 marks)

(iii) 600mm (1 mark)

(iv) Top of water seal to top of gully dish [Overflow level] (1/2 mark each) (1 mark)

**Total 18 marks**

## ANSWER 6

(a) (Formula – Length x width x average depth)

Average depth = 0.820m + 1.650m = (2.47÷ 2)= 1.235 (1 mark)

Volume of trench = 130m x 0.600m x 1.235m = 96.330 $m^3$ (1 mark)

25% of 96.330$m^3$ = 24.082 $m^3$ (1 mark)

Volume + 25% = 96.330 + 24.082 (1 mark)

Answer = 120.412$m^3$ (1 mark)

(b) (Formula – Length x width x depth = volume)

Trench 65m x 0.650m x 0.100m + 30 % 65m x 0.650 x 0.100 = 4.225$m^3$ (1 mark)

30% of 4.225 = 1.2675 (1 mark)

4.225 + 1.2675 = 5.4925$m^3$ (1 mark)

**Total 8 marks**

## ANSWER 7

(a) (i) 1 mark for reinforcement rods

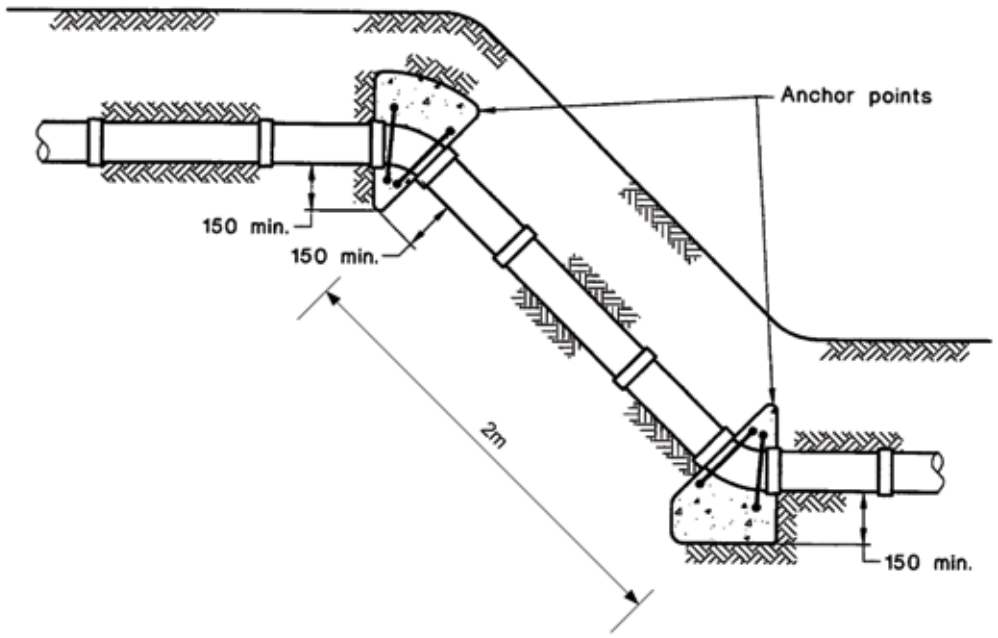
1 mark for 150mm measurements

Half mark each for anchor blocks (3 marks)

(ii) 1 mark for demonstrating keyed into side. (1 mark)

(b) Flexible joints (1 mark)

(c) 3m (1 mark)




**Total 6 Marks**

## ANSWER 8

(a) (i) The main conduit of a drainage system to which **branches are connected**. It is that portion of sewage service on private property normally located in ground and which **conveys or is intended to convey the discharge from all fixtures to the outfall**.

(2 marks)

(ii) Domestic wastes from baths, basins, showers, laundries, and kitchens including floor wastes from these sources. (Excluding human waste).

(1 mark)

(iii) The unintended ingress of ground water and storm water into a sanitary drainage installation.

(1 mark)

(iv) That part of the disposal system receiving surface water or sewage (foul) water from the drainage system.

(1 mark)

(v) Overflow from a sewer or combined sewer caused by overloading, or blockage.Usually used in reference to wet weather infiltration or inflow.

(1 mark)

(vi) A below ground structure with a sealed cover constructed in the line of a sanitary drain, to facilitate maintenance of the drain.

(1 mark)

(b) 1 A sewer gas interceptor trap is used to prevent sewer gases entering private drains.

2 To prevent foreign objects entering the sewer.

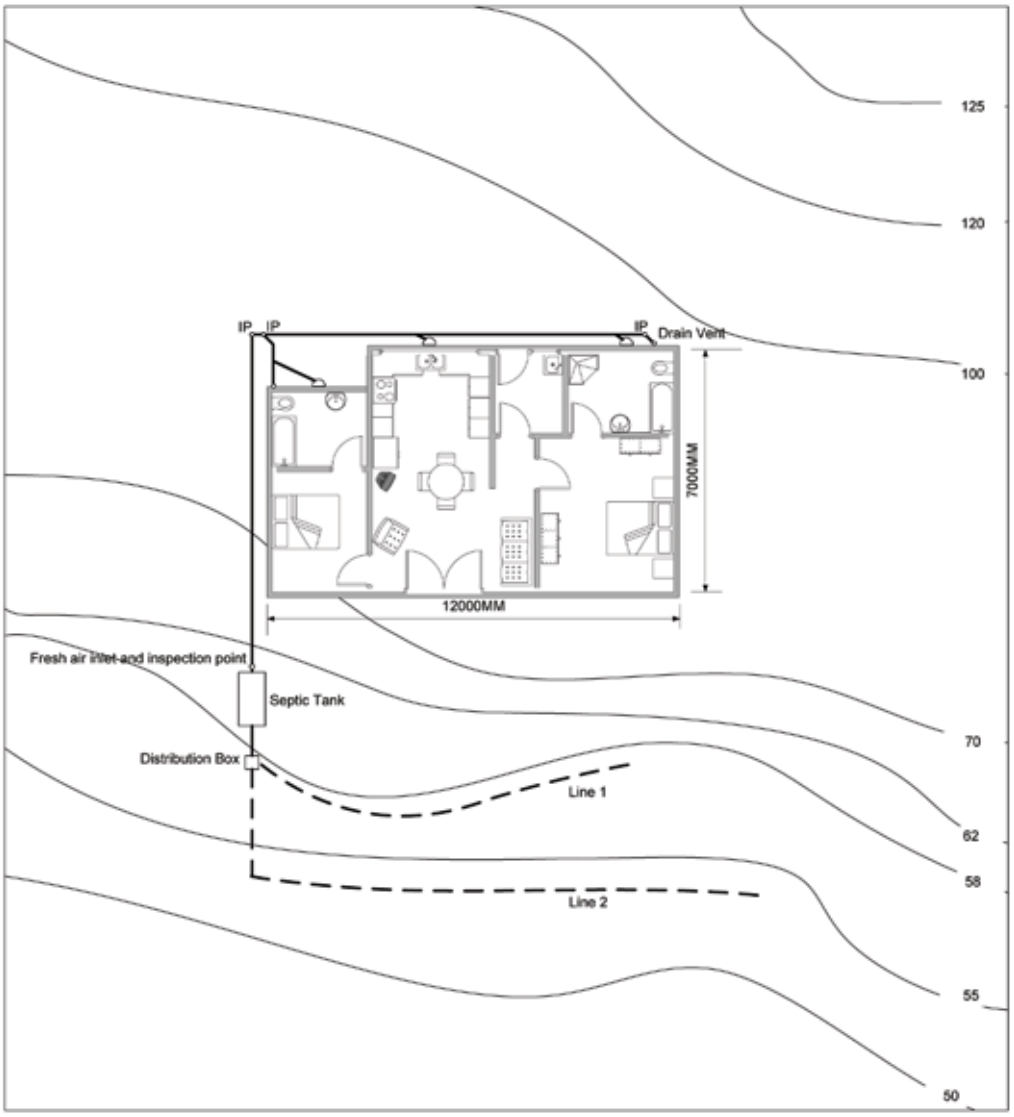
(1 mark each) (2 marks)

(c) The total length along the centre line of a pipe and fittings including all bends.

(1 mark)

**Total 10 marks**

**ANSWER 9**




1 mark for inspections

1 mark for drain vent

1 mark for gully

1 mark for inspection adjacent to septic tank

2 marks for septic tank on low side

1 mark FAI

1 mark for distribution box

2 marks for effluent lines on contour

(10 marks)

**Total 10 marks**

## ANSWER 10

(a) Any FOUR:

1 National Certificate in Drainlaying, or equivalent.

2 Evidence of completion of the theory component of the drainlaying programme.

3 Evidence of where and when the applicant completed their assessment for drainlaying unit standards.

4 Evidence of holding a limited certificate in drainlaying for at least 12 months.

5 Declaration from the supervisor that the applicant has been engaged in drainlaying work for 12 months.

6 Applicants who have entered a training programme after 31 March 2005 must achieve a pass in the Board's registration examination 9197.

(1 mark each) (4 marks)

(b) A person who is dissatisfied with a decision or order of the Board may **within 28 days** after notice of the decision or order has been communicated to him by the Registrar of the Board, **appeal to the High Court** against the **whole or any part of the decision or order [Section 58 of PGD Act 1976].**

(1 mark each) (3 marks)

(c) 1 E1 – Surface water

2 G13 – Foul water

3 G14 – Industrial liquid waste

(half mark for clause and half mark for number) (1 mark each) (3 marks)

(d) Health and Safety in Employment Act

(1 mark)

**Total 11 marks**