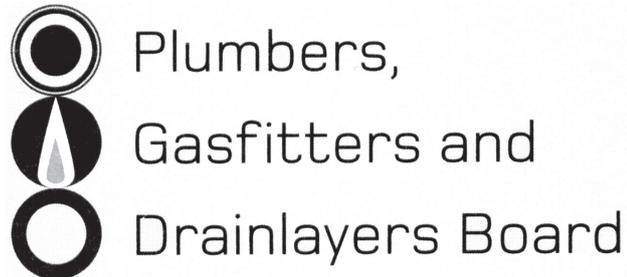


No. 9197



REGISTRATION EXAMINATION, JUNE 2010  
**LICENSED DRAINLAYER**

**ANSWER SCHEDULE**



## ANSWER 1

- (a) (i) A build-up of non toxic gases displaces air (oxygen) for breathing causing Suffocation. (2 marks)
- (ii) Any TWO:  
Feeling faint or weak  
Unconsciousness  
Skin colour becomes blue/grey. (2 marks)  
Difficulty breathing (2 marks)
- (iii) Can cause tissue and brain damage.  
Death.  
Unconsciousness. (2 marks)
- (b) Any THREE:  
Test air in the manhole for toxic or other harmful gases. (2 marks)  
Arrange a buddy to supervise the descent from above (½ mark)  
Wear protective clothing (½ mark)  
Wear a harness with a retrieval rope. (½ mark)
- (c) Double insulated tool. (1 mark)

**Total 10 Marks**

## ANSWER 2

- (a) (i) DN 50mm  
(ii) DN 40 mm  
(iii) DN 65mm (1 mark each), (3 marks)
- (b) (i) Any liquid, materials or remnants discharged from trade or industrial premises. (1 mark)
- (ii) Prohibited Industrial Liquid Waste (trade waste) are any poisons or flammable substance or wastes above 60°. (Any TWO ½ mark each), (1 mark)
- (iii) To safeguard the environment, the sewage system and the people that maintain and service the sewage system. (1 mark)
- (iv) A holding chamber that is large enough to hold expected discharge until the sewer flows normally again. (2 marks)

**Total 8 Marks**

### ANSWER 3

(Formula: Volume = Length x width x average depth)

Average depth =  $0.820\text{m} + 1.650\text{m} = (2.47 \div 2) = 1.235$  (1 mark)

Volume of trench =  $130\text{m} \times 0.600\text{m} \times 1.235\text{m} = 96.330 \text{ m}^3$  (1 mark)

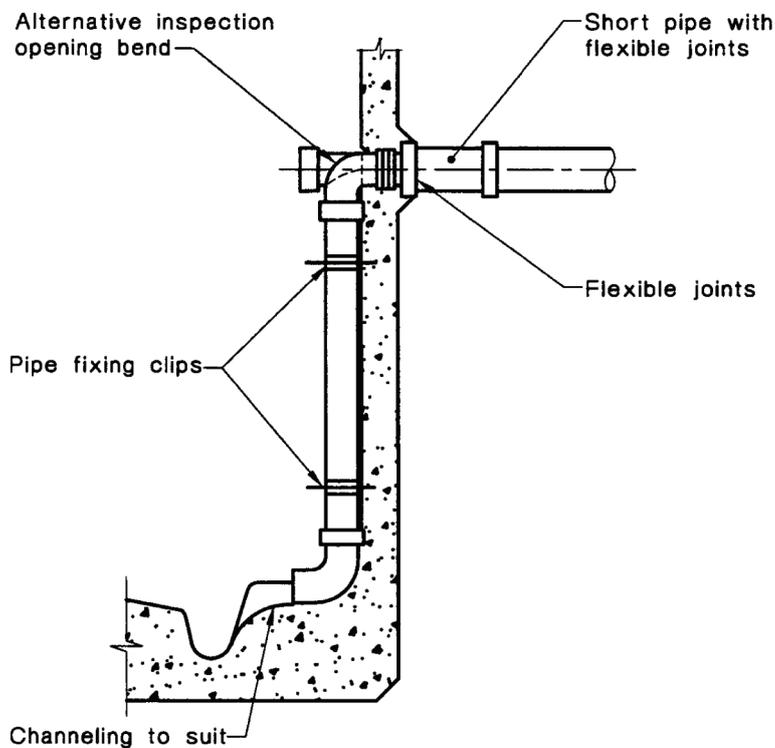
25% of  $96.330\text{m}^3 = 24.082 \text{ m}^3$  (1 mark)

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

Answer =  $120.412\text{m}^3$  (1 mark)

**Total 5 Marks**

### ANSWER 4



1 mark for bend at base

1 mark for pipe fixing clips

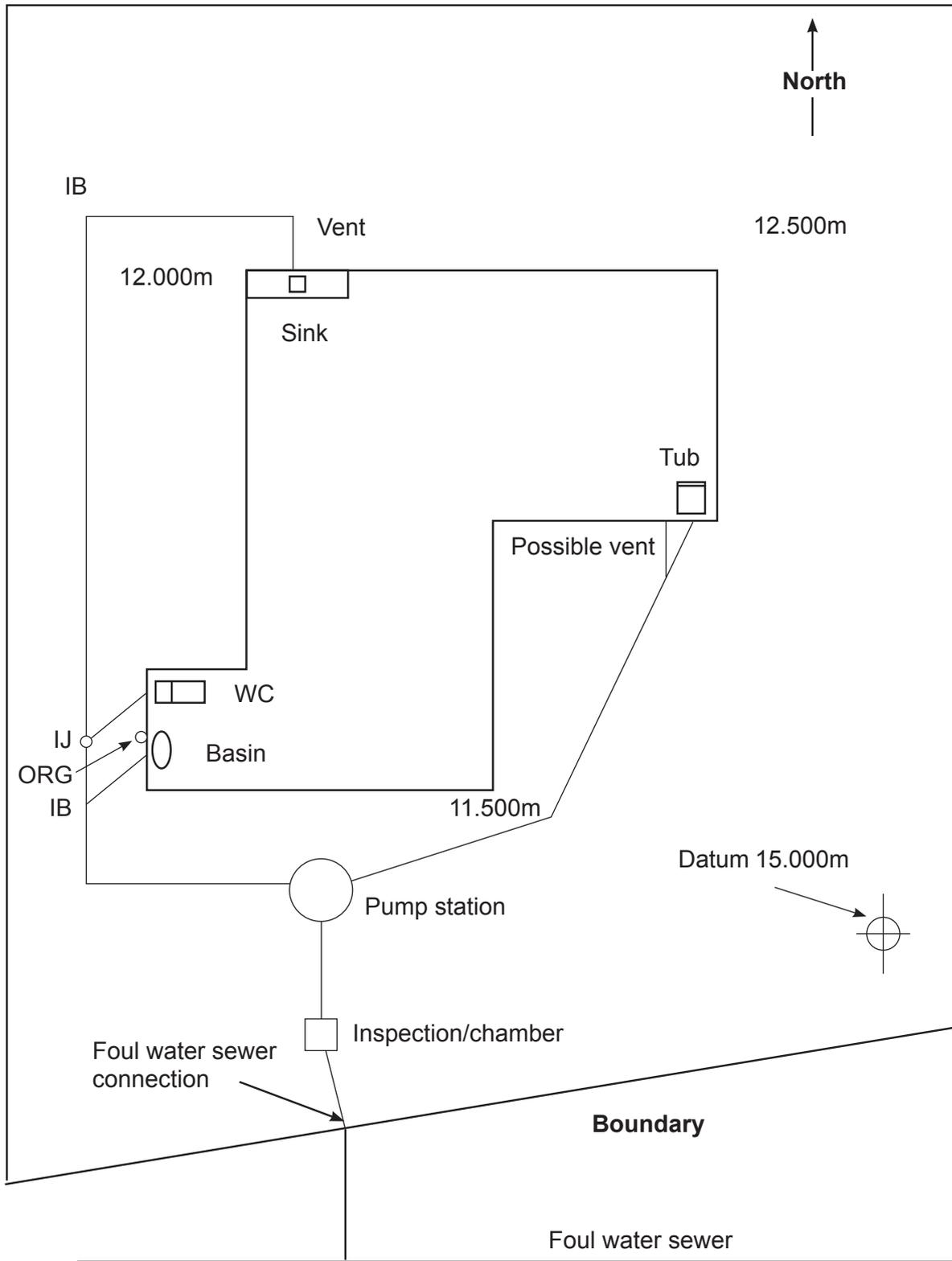
1 mark for inspection point [bend or junction]

1 mark for flexible joint in chamber side

1 mark for short pipe with flexible joint

**Total 5 Marks**

**ANSWER 5**



1 mark for ORG

1 mark for vent.

2 marks for pumping station.

1 mark for inspection at boundary or chamber to allow for gravity fed to foul water connection.

**Total 5 marks**

## ANSWER 6

(a) (i) Two flexible joints (1 mark)

Not less than 600mm apart. (1 mark)

(ii) The penetration to wall is to be made watertight. (1 mark)

(b) Extraneous water (1 mark)

Soil, sand, rock 1 mark (only one accepted)

Contents of a septic tank (1 mark)

Any other substance, the discharge of which would impede the operation of the sewer. (1 mark)

(Any three 1 mark each) (3 marks)

(c) (i) Any THREE

1 Plan

2 Specification

3 Soil report

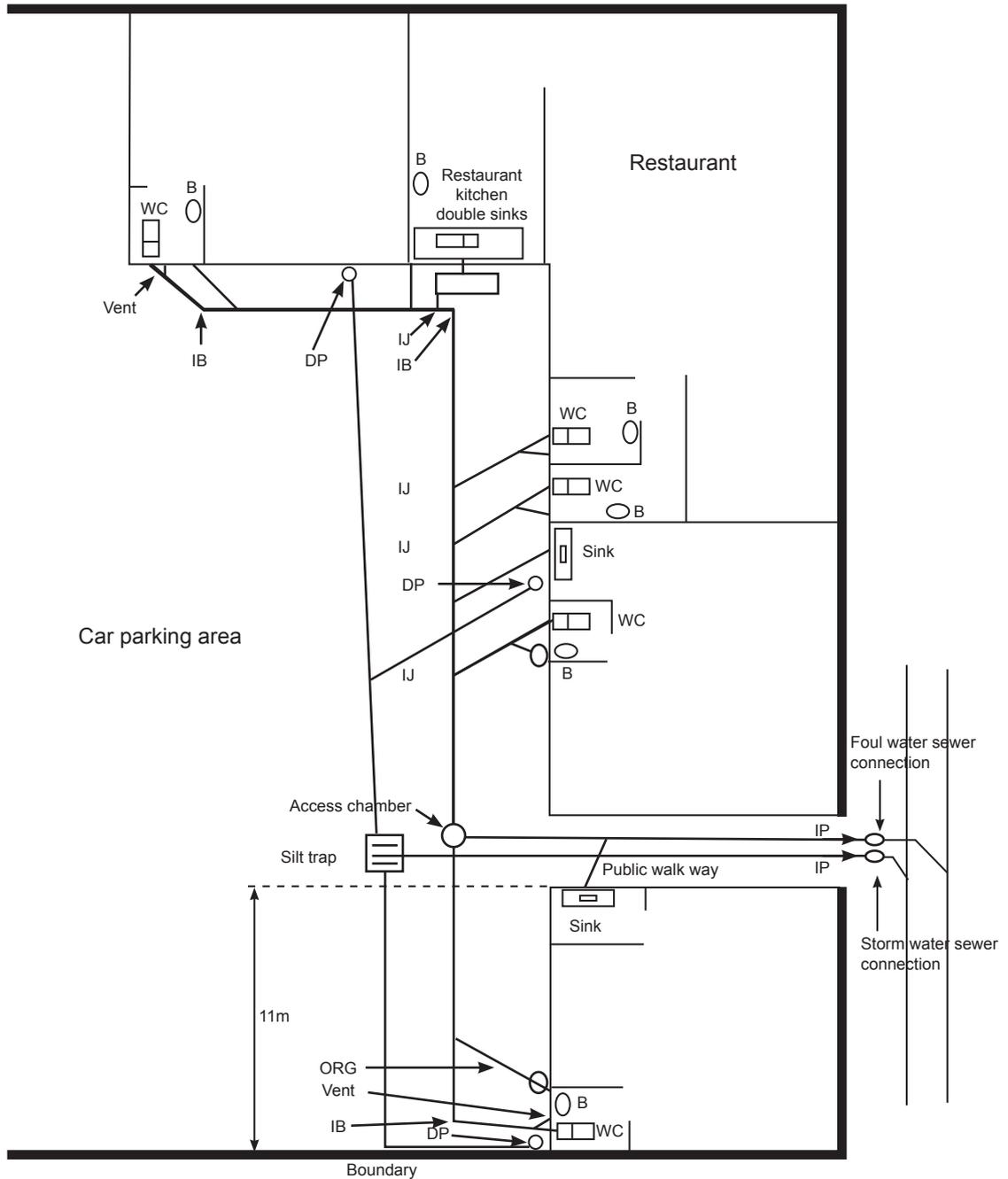
4 All calculations showing proposed method to protect the installation.

(1 mark each) (3 marks)

(ii) Appropriately qualified engineer. (1 mark)

**Total 10 marks**

**ANSWER 7**



**Foul Water**

- 1 mark for vent at head of drain
- 1 mark for vent on branch drain
- 1 mark for overflow relief gully
- ½ mark each for inspection junctions or bends (total 3 marks)
- 1 mark for inspection prior to joining sewer.
- 2 marks for grease trap
- 1 mark if all fixtures are covered.
- 1 mark if correctly labelled

**Storm water**

- 1 mark for inspection prior to joining sewer
- 2 marks for silt trap
- 1 mark if all DP go to silt trap or storm water drain

**Total 15 marks**

## ANSWER 8

(a) (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)

(b) (i) 600mm (1 mark)

(ii) Top of water seal to top of gully dish [Overflow level].  
(½ mark each), (1 mark)

(c) Any FOUR:

1 Within the boundaries of the property

2 External to the building

3 So that the top of the gully is accessible

4 Where the discharge will be noticeable

5 With clear access for more than two metres above the top of gully grate

6 Not be enclosed

7 Under hose tap if not receiving discharge.

(4 marks)

**Total 10 marks**

## ANSWER 9

- (a) Wet inspection chamber has a working space at drain level through which the drain passes as an open channel.

Dry inspection chamber has a working space at drain level through which the drain passes incorporating an inspection point.

(2 marks)

- (b) (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)

- (c) Any TWO:

1 To prevent sewer gases entering private drains.

2 To prevent foreign objects entering the sewer.

3 To provide a point for ventilation of the drain.

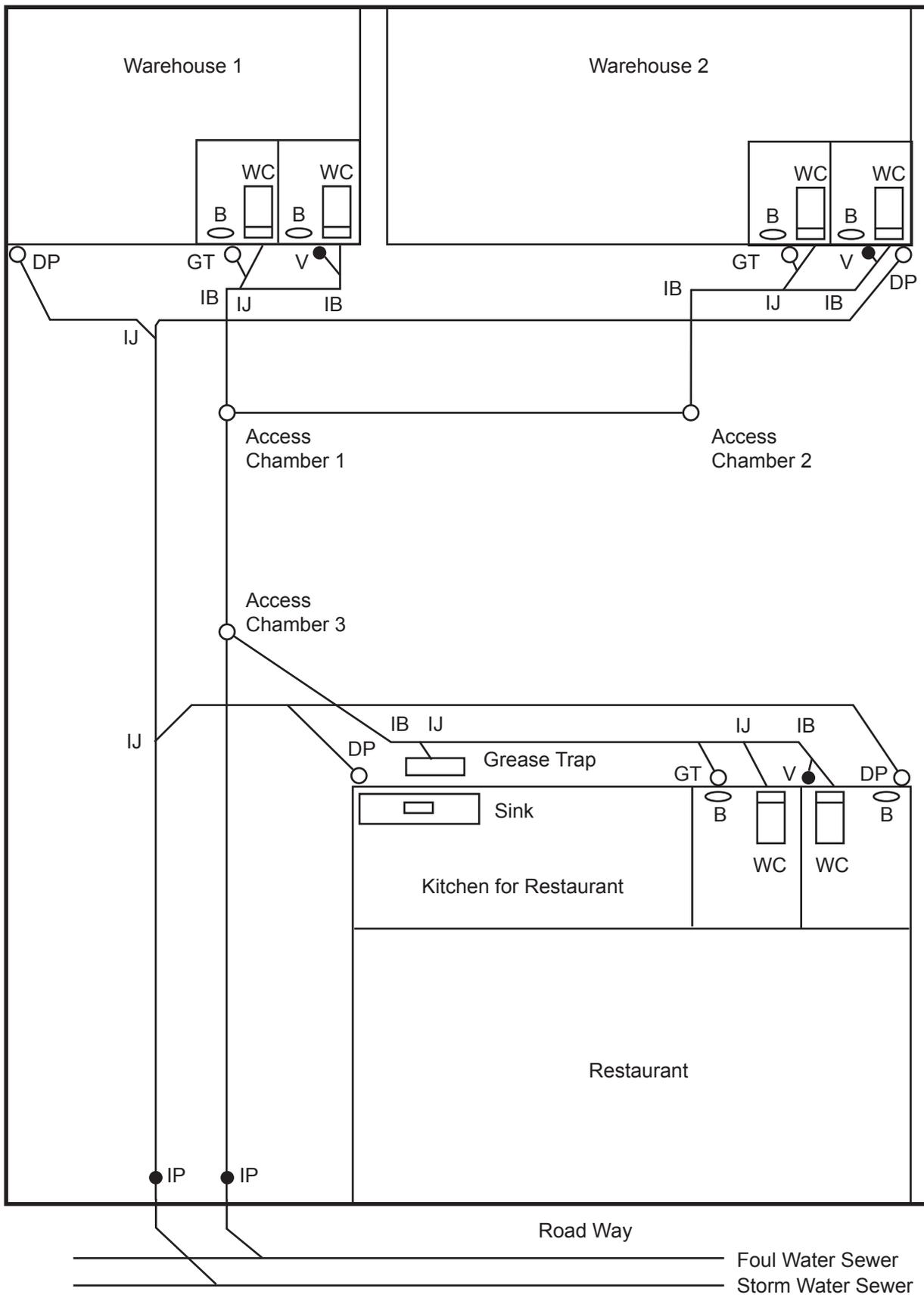
(1 mark each), (2 marks)

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

(1 mark)

**Total 12 marks**

ANSWER 10



Foul water:	Ware house 1	(½ mark for vent, ½ mark for gully, ½ mark for inspections), (1 mark)
	Warehouse 2	(½ mark for vent, ½ mark for gully, ½ mark for inspections), (1 mark)
	Restaurant.	(½ mark for vent, ½ mark for gully, ½ mark for inspections), (2 marks) (2 marks for grease trap) (1 mark for drains to correct chambers) (1 mark for inspection at boundary)
	Stormwater.	(1 mark for inspection at boundary) (1 mark for all joined in direction of flow)

**Total 10 marks**

## ANSWER 11

- (a) Any FOUR:
- Age if under 20 years
  - The work they are to do (description)
  - Date commenced work
  - Hours of employment
  - Wages paid (4 marks)
- (b) (i) Completed application form. (1 mark)
- (ii) Directly supervise the trainee for a period of not less than 2 years  
( $\frac{1}{2}$  mark for supervise the trainee and  $\frac{1}{2}$  mark for 2 years) (1 mark)
- (c) 1 E1 – Surface water
- 2 G14 – Industrial liquid waste  
( $\frac{1}{2}$  mark for number,  $\frac{1}{2}$  mark for name) (2 marks)
- (d) Licensed drainlayers
- Holders of a current limited certificate to work at drainlaying under the supervision of a registered and licensed drainlayer  
(1 mark each), (2 marks)

**Total 10 marks**