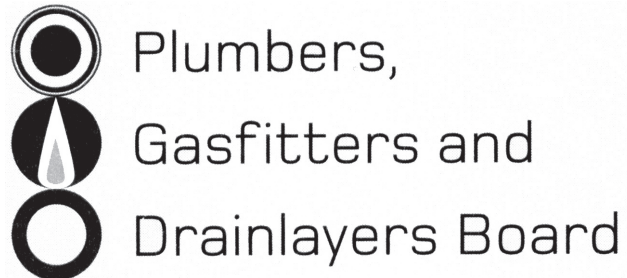


No. 9195



REGISTRATION EXAMINATION, JUNE 2010
CERTIFYING PLUMBER

ANSWER SCHEDULE

ANSWER 1

- (a)
- 1 The object, key duties and responsibilities of the HS in E Act.
 - 2 Systems and practices for promoting constructive employee participation in health and safety issues.
 - 3 How to communicate in good faith, effectively and regularly with employers, unions and employees including the use of Hazard Notices.
 - 4 How to effectively represent the views of employees.
 - 5 How to promote and foster positive health and safety management practices in the workplace.
 - 6 Hazard management including all practicable steps to identify, assess and control hazards.
 - 7 Occupational safety and health matters relating to the provision of information, training, supervision, emergencies and incidents.
 - 8 How to investigate near misses, injuries and incidents.
 - 9 How to promote the health and safety interests of employees who have been harmed at work and need assistance with rehabilitation.
 - 10 How to deal constructively with the Occupational Safety and Health Service where needed.

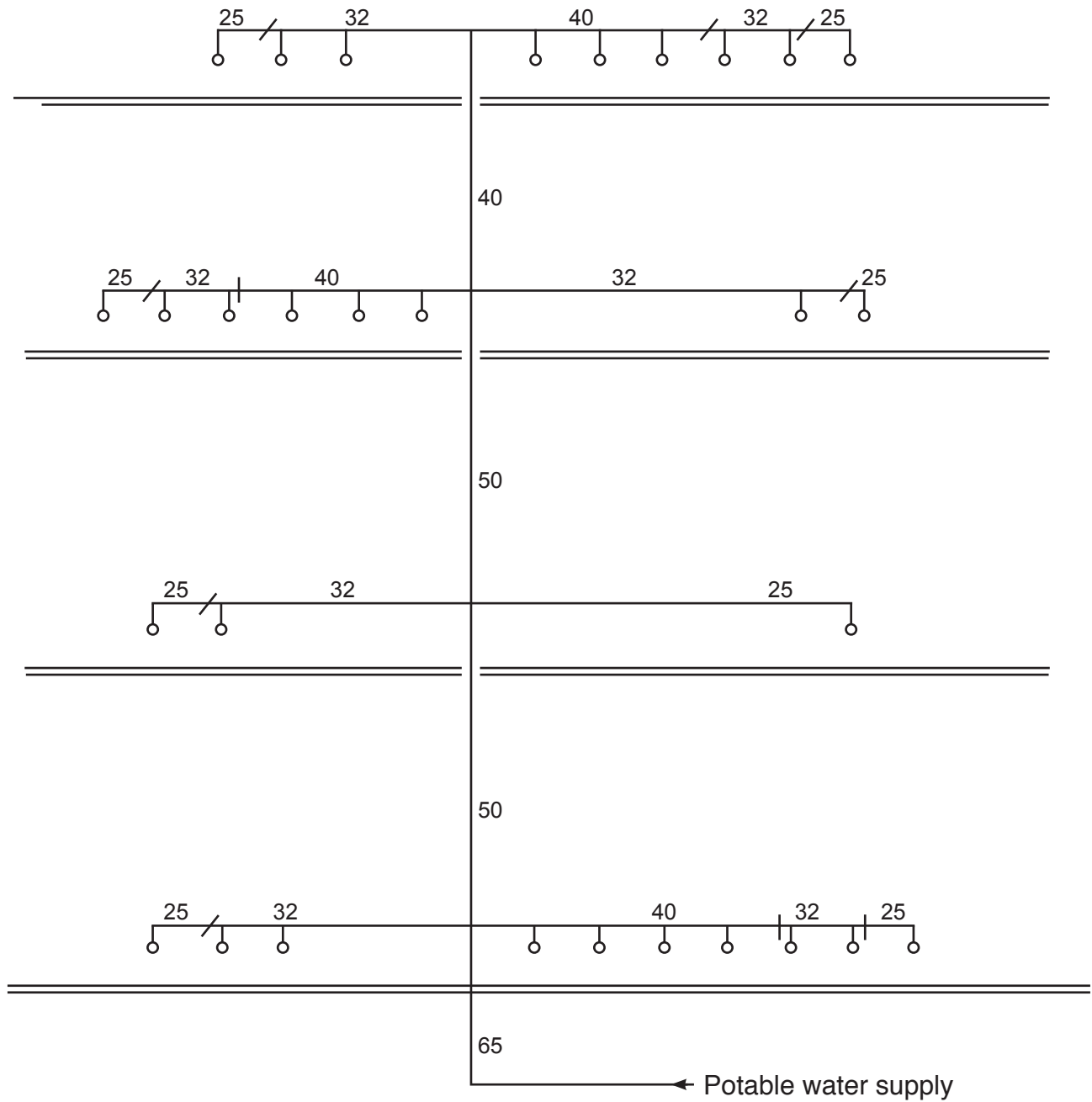
(7 marks)

- (b) To prevent contamination of public water supplies.

(1 mark)

Total 8 marks

ANSWER 2



Vertical riser correct sizes

(2 marks)

Each horizontal lateral correct

(1 mark each)

Total 10 marks

ANSWER 3

(a) Any EIGHT:

- 1 The capacity of the storage tank shall be calculated so as to provide no less than 50 litres per person occupying the building
- 2 The water tank shall have an overflow pipe to discharge any overflow to a visible place within the same property that does not create a nuisance. The outlet of the overflow pipe shall not permit the entry of birds or vermin and to be 40mm dia min.
- 3 The provision of a safe tray is necessary if water is to be prevented from penetrating another household unit within the same building. It is always wise to provide for a safe tray in your design.
- 4 Storage tanks must be provided with removable covers to prevent contamination, the entry of vermin and condensation if in a roof space
- 5 Covers must be removable to allow access for inspection and maintenance and there must be a minimum height clearance of 350mm above the cover for easy access
- 6 Storage water tanks must be adequately supported
- 7 Where fittings and pipework are attached to the water tank, pass through the support platform, the floor or any other fixed structure clearance shall be provided between the fitting or pipe and the structure. Where the clearance could allow the passage of moisture or vermin it shall be sealed with a flexible membrane
- 8 Seismically restrained
- 9 No restrictions on inlet or outlet pipes within 300mm of tank (G12)
- 10 25mm air gap

(8 marks)

(b) $Q = 0.03 \times 12 + 0.4554\sqrt{12}$ (1 mark)

$$= 0.36 + 0.4554 \times 3.464$$

$$= 0.36 + 1.578$$

$$= 1.938 \text{ l/s} \quad (1 \text{ mark})$$

(2 marks)

Total 10 marks

ANSWER 4

- (a) Testing of backflow prevention devices must be carried out by an independently qualified person (IQP) who is acceptable to the Local Authority. The Building Code requires that an IQP have no financial interest in the building to which the device is installed. Unless the IQP is a suitable Licensed Plumber he cannot undertake maintenance of the appliance. (3 marks)

- (b) At least once a year.
The owner shall arrange the inspection (1 mark)

- (c) To prevent any liquid that is likely to be injurious to health entering a potable public water supply system.

The minimum air-gap is 25 mm or two times the inlet pipe diameter whichever is the greater. (2 marks)

- (d) (i) Any THREE:

An appropriate backflow device must be installed to protect the network utility operator's drinking (potable) water supply.

Where the rainwater is only being used for flushing cisterns a backflow prevention device or an air gap within the cistern must be provided to prevent contamination of the drinking (potable) water supply.

A suitable device must be provided on the pipeline from the rainwater tank to prevent water flowing into the rainwater tank.

Suitable identification to avoid cross-contamination.

Not below foul water pipes (3 marks)

- (ii) The minimum air gap must be provided. (1 mark)

Total 10 marks

ANSWER 5

- (a) 1 It must be located not less than 150mm above the highest outlet (measured from the highest outlet to the lowest part of the valve body).
- 2 There must be no valves located downstream of the device.
- 3 Under normal operation it must not be continuously pressurised for more than 12 hours.
- 4 It must be installed vertically with the air ports at the top.
- 5 It must have free ventilation to the air ports at all times.

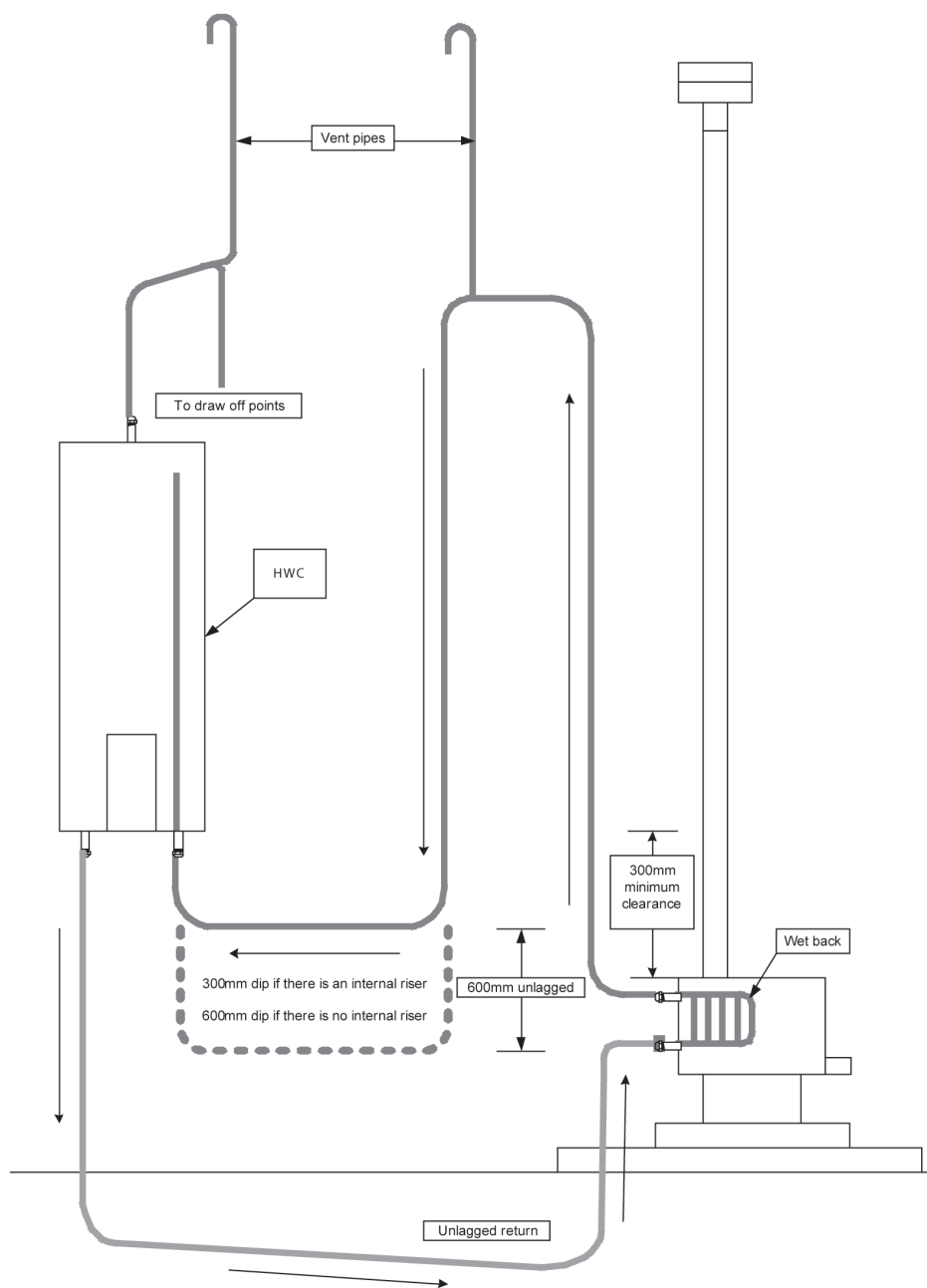
(5 marks)

- (b) 1 Operate the device by turning on the fixture. The poppet (float) must close on the increase in pressure.
- 2 Operate the device by turning off the fixture. The poppet (float) must open on the decrease in pressure.

(2 marks)

Total 7 marks

ANSWER 6



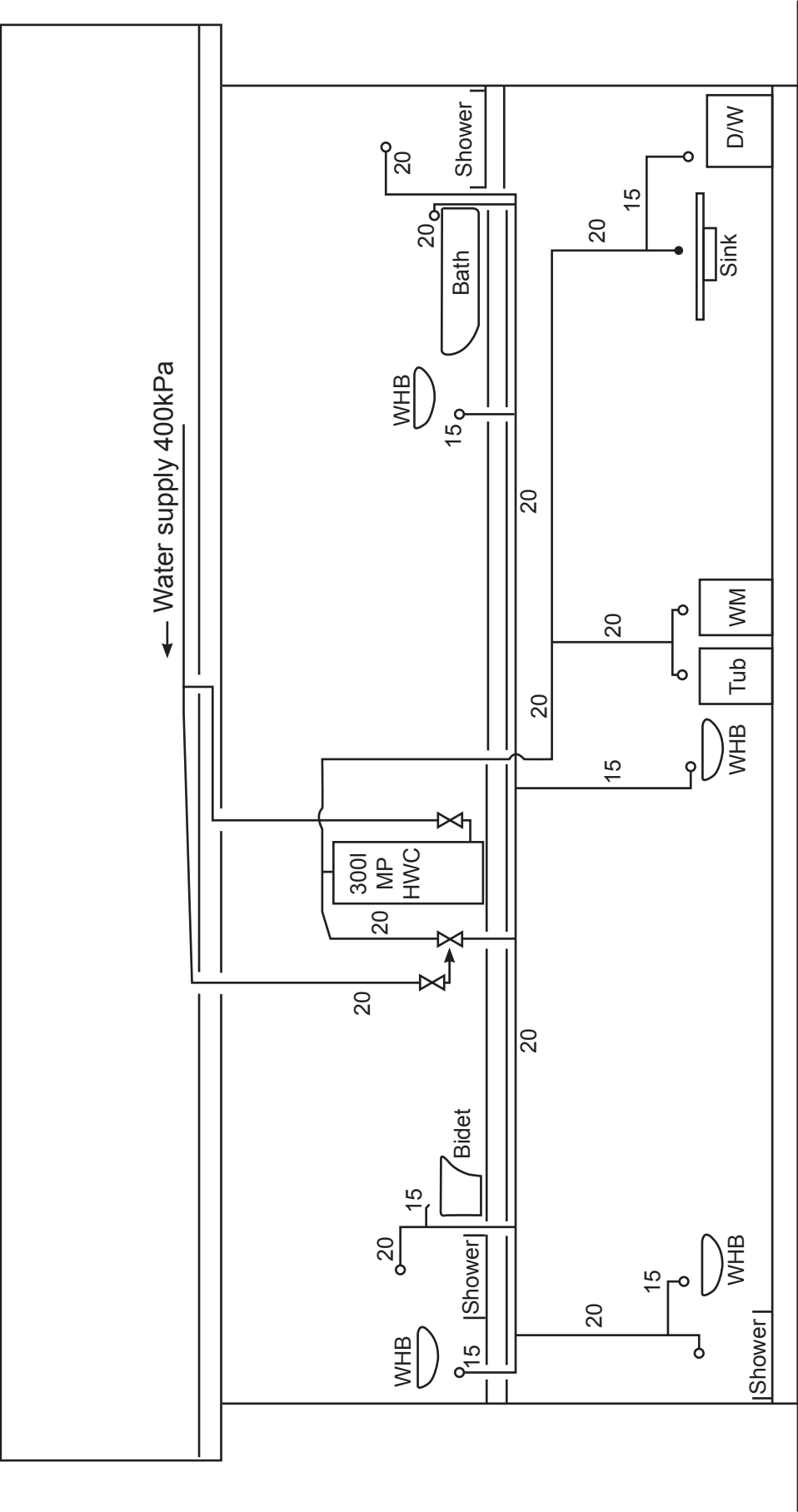
- | | |
|--|------------------------------|
| (i) The storage unit | (1 mark) |
| (ii) The wet back heat exchanger | (1 mark) |
| (iii) Pipework including grades | (flow 1 mark, return 1 mark) |
| (iv) The recommended heights between the storage cylinder and the wet-back | (1 mark) |
| (v) Correct venting | (1/2 mark each, 1 mark) |
| (vi) Lagging requirements | (1 mark) |

No valves or obstructions shall be installed in the piping (primary and return) between the heat source and the storage tank – zero marks awarded if this is done.

Not an over and under system – zero marks

Total 7 marks

ANSWER 7



Total 10 marks

ANSWER 8

(a) Any FIVE:

- 1 The completed reticulation (excluding the water heater or storage vessel) must be tested at a pressure of 1500kPa for not less than 30 minutes.
- 2 Before testing the heating medium must be isolated.
- 3 It may also be necessary to isolate fixtures, appliances and valves to prevent them being damaged by pressure during testing.
- 4 Testing must be carried out before pipework is concealed or insulated.
- 5 The complete system (including valves, pumps and other equipment) must be tested under normal working conditions for not less than 48 hours and visually checked for leaks.
- 6 All safe trays and safe wastes shall be tested with water to ensure that they do not leak under full flow conditions.
- 7 All drain pipes from expansion control and temperature and pressure relief valves and all vent pipes must be tested with water to ensure that they are unobstructed and are open to the atmosphere.

(1 mark each), (5 marks)

(b) Any THREE:

- (i) Protected from external corrosion and abrasion. (i.e. wrapped in Denso tape)
- (ii) Have provision for expansion and contraction. (Thermal movement)
- (iii) Pipes should be sealed where they pass through a vapour barrier.
- (iv) Must achieve a 50 year durability.
- (v) Minimum 75mm below concrete.
- (vi) Joint kept to a minimum.
- (vii) Exit from slab at 90°.
- (viii) Lagging must be waterproof.

(Any three 1 mark each)

Total 8 marks

ANSWER 9

- (a) The purpose of an untrapped floor waste is to provide for accidental spillage or overflow from sanitary fixtures or appliances.

(2 marks)

- (b) Any THREE:

The floor waste pipe must discharge to the outside of the building to the open air.

The floor waste pipe should terminate with a suitable vermin-proof flap or grill to prevent the passage of rodents.

Discharge to safe location.

Must have removable grating.

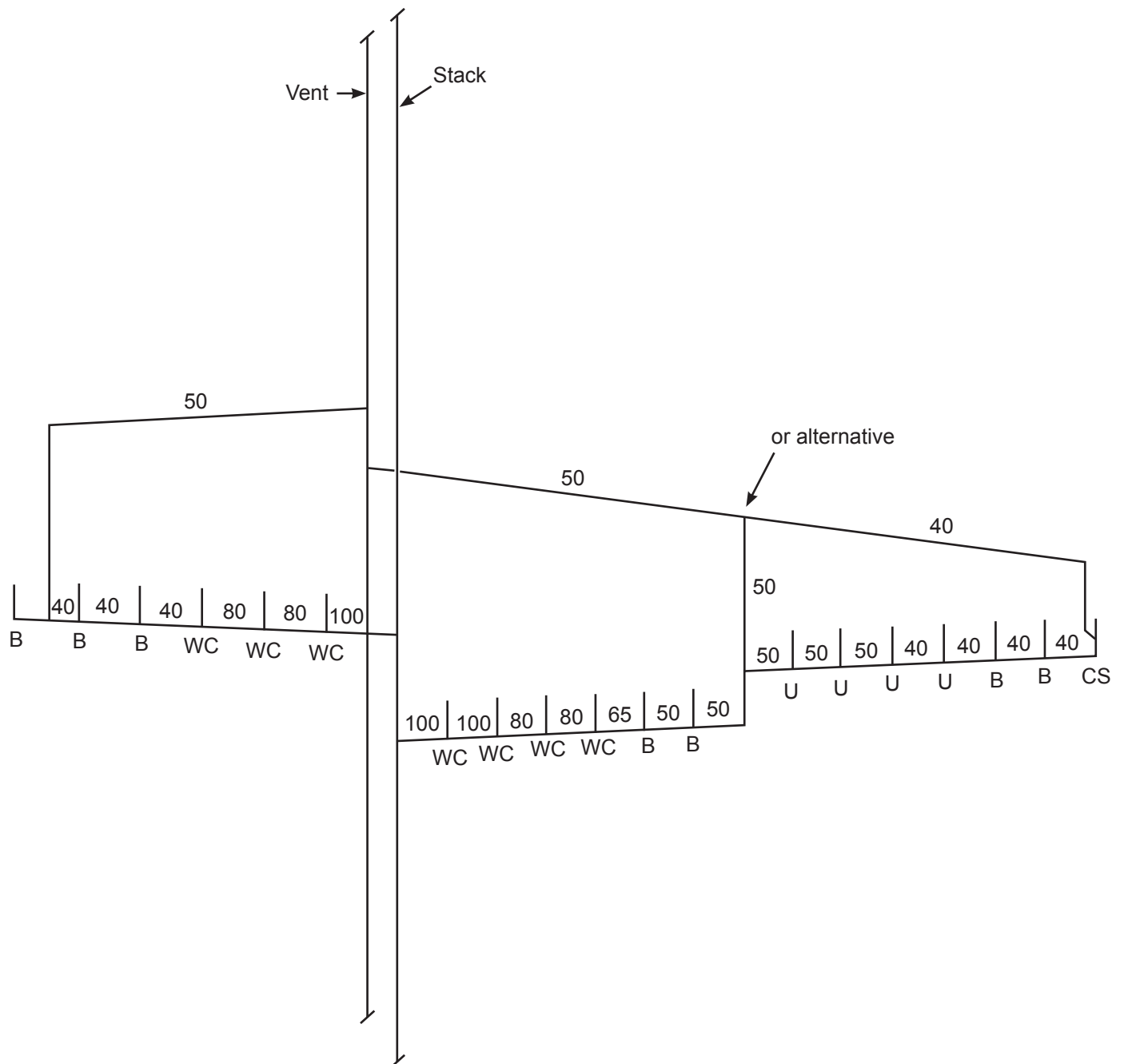
Not connected to foul water system.

Must be minimum 40mm.

(Any THREE) (3 marks)

Total 5 marks

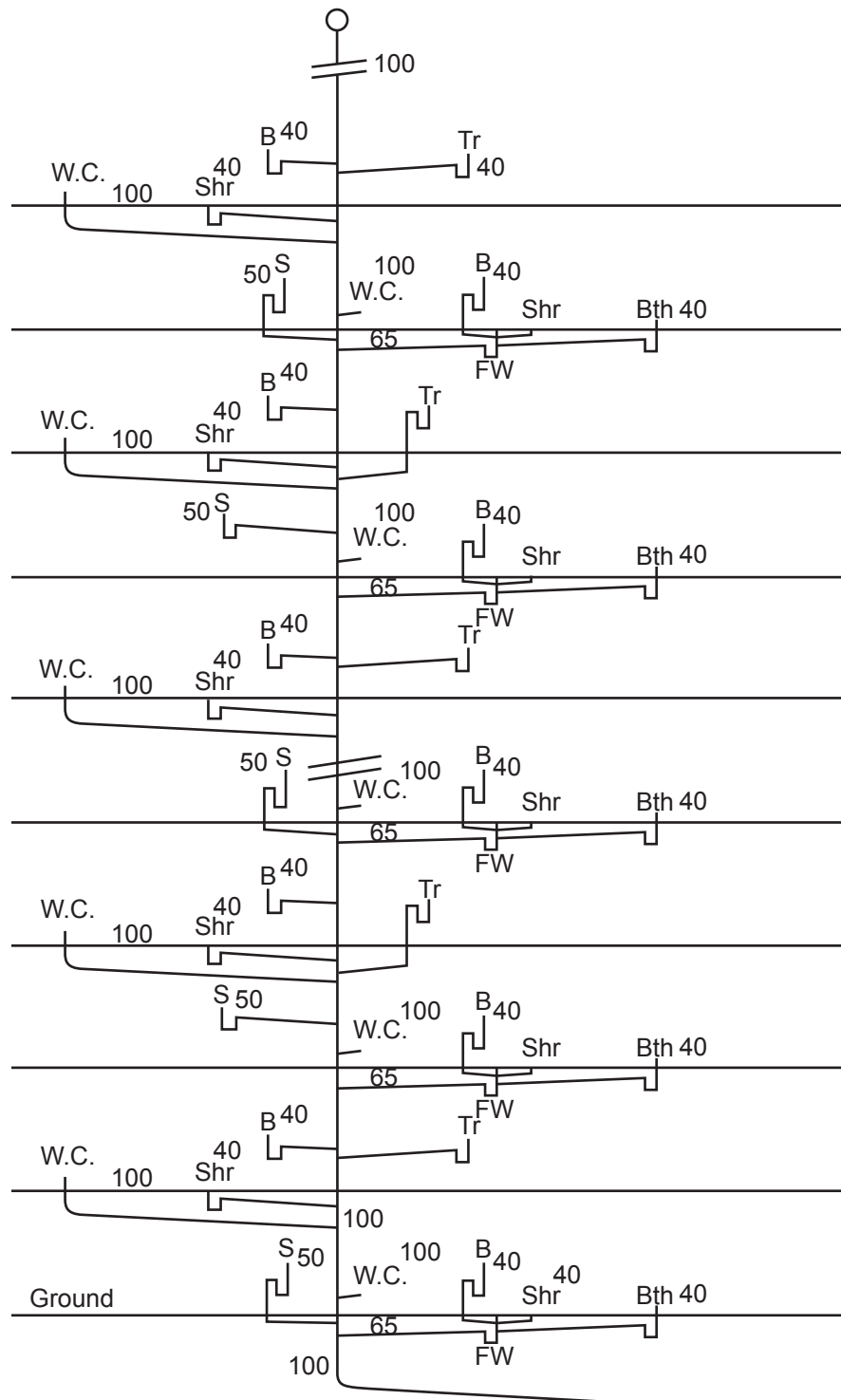
ANSWER 10



- (a) (3 marks)
- (b) (3 marks)
- (c) (4 marks)

Total 10 marks

ANSWER 11



LEGEND

| | |
|------|--------------|
| B | Basin |
| Bth | Bath |
| FW | Floor waste |
| Shr | Shower |
| Tr | Trough |
| W.C. | Water closet |

Total 10 marks

ANSWER 12

- (a) $6.5 \times 26.5 \times 0.012 \times 4 = 8.268\text{m}^3$ (1 mark) (2 marks total)

8268 litres

or 8.268 cubic metres (1 mark)

Note: Fig 15 – NZBC E1 AS1 page 43
Table 5 – NZBC E1 AS1 page 42

NB. For future use make vertical grid lines darker.

- (b) 150mm Diameter (1 mark)

- (c) Roof area = $26.5 \times 6.5 = 172.25\text{m}^2$

Therefore: gutter cross sectional area = 16000mm^2

Accept up to 17000 mm^2

(2 marks)

Total 5 marks

