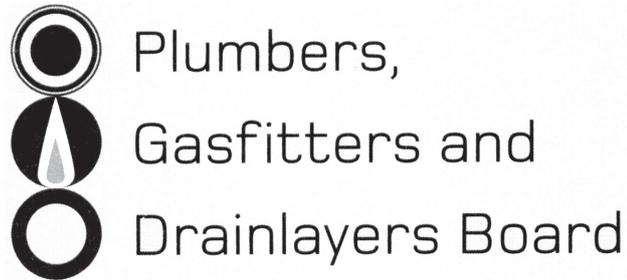


No. 9195



REGISTRATION EXAMINATION, NOVEMBER 2010
CERTIFYING PLUMBER

ANSWER SCHEDULE

ANSWER 1

(a) E1 Surface Water (1 mark)

(b) E2 External Moisture (1 mark)

Total 2 marks

ANSWER 2

Spreaders shall not be used on masonry tile roofs when there is no underlay installed.

Total 1 mark

ANSWER 3

(a) High hazard has the potential to cause death (1 mark)

(b) Medium hazard has the potential to endanger health (1 mark)

(c) Low hazard has the potential to cause a nuisance but not endanger health or cause injury (1 mark)

Total 2 marks

ANSWER 4

(a) Back-pressure is usually caused by (but not limited to) a downstream pumping system increasing the pressure of the drawn water above the pressure of the supply pipework. (2 marks)

(b) Back-siphonage can occur when there is a negative or sub-atmospheric pressure in the supply piping. This is usually caused by the supply main being damaged or disconnected for service. (2 marks)

Total 4 marks

ANSWER 5

Any FOUR (½ mark each)

Number of people in the home
Collector area
Collector
Thermostat setting
Environmental factors (climate)
Variable usage
Direction of the collector
Tilt of the collector
Shade
Distance from collector to storage unit

Total 2 marks

ANSWER 6

Correct use of tundishes [Incorrect (unsafe) use maximum 2 marks.] (1 mark)
Hot pipework (1 mark)
Cold pipework (1 mark)
Balanced flow (1 mark)
Combined drain to FWG (1 mark)
Isolation valves on hot outlets (1 mark)

Total 6 marks

ANSWER 7

- Non-return valve (1 mark)
- Filter (1 mark)
- Isolating valve (1 mark)

Total 2 marks

ANSWER 8

Any TWO – (1 mark each)

1. One purpose is to avoid stirring up sediment or sludge from the bottom of the storage cylinder, which can cause discoloration of the water.
2. An excessive inlet flow can stir up the cylinder contents and upset stratification so that hot and cold water mix, leaving only a warm water supply to outlets, or the cold water entering the cylinder may head straight for the hot water outlet in a single stream that penetrates all strata, this can result in cold water coming out of the hot tap.
3. Overheating can occur when small amounts of hot water are drawn off. Each time a hot tap is opened or a solenoid on a washing machine or similar device is opened for a short period cold water entering the inlet can immediately hit the thermostat probe thus cooling it, with the thermostat responding by immediately and unnecessarily activating the energy source before it is necessary. This can cause a condition known as stacking where the water at the top of the cylinder becomes overheated and may cause excessive temperature relief venting.
4. Preventing corrosion of the cylinder from stray electrical currents.

Total 2 marks

ANSWER 9

Pressure relief valve	(1 mark)
Cold direct to isolating valve	(1 mark)
Cold from isolating to correct cylinder connection	(1 mark)
Hot pipe from cylinder to spout	(1 mark)

[If dangerous installation drawn 0 marks]

Total 4 marks

ANSWER 10

- (a) They must be installed in an accessible location (1 mark)
- (b) Must only be used for non-drinking water, (1 mark)
Can only be used in above ground applications (1 mark)
- (c) Reduce likelihood of water hammer (1 mark)
Reduce damage to fixtures and fittings (1 mark)
Prevent excessive noise. (1 mark)
- (d) It must have warning tape installed above the pipe which states
'THE PIPE BELOW IS NON-DRINKING WATER' (2 marks)
- (e) 600 mm (1 mark)

Total 9 marks

ANSWER 11

Calculate the loading units and flow rates for each apartment.

$$\text{Pressure drop} = 35 - (12 + 10)$$

$$\text{Pressure drop} = 13 \text{ m}$$

(1 mark)

Bottom apartment = 54 loading units and a psfr of 0.64.

(1 mark)

Middle apartment = 36 loading units and a psfr of 0.52.

(1 mark)

Top apartment = 18 loading units with a psfr of 0.36.

(1 mark)

Reference table C.1 from AS3500 Part 1 pressure drop = table 15 metres head

Index run, bottom apartment = 25 mm and an inlet pipe to the apartment of 20 mm

(1 mark)

Index run, middle apartment = 20 mm and an inlet pipe to the apartment of 20 mm

(1 mark)

Index run, top apartment = 20 mm and an inlet pipe to the apartment of 20 mm

(1 mark)

Total 7 marks

ANSWER 12

$$L = 38 \text{ mm}$$

(1 mark)

$$q = \sqrt{\frac{23 \times 20^5}{25 \times 38 \times 10^5}}$$

(1 mark)

$$q = \sqrt{\frac{73\,600\,000}{95\,000\,000}}$$

(1 mark)

$$q = \sqrt{0.7747}$$

(1 mark)

$$q = 0.88 \text{ litres per second.}$$

(1 mark)

Total 5 marks

ANSWER 13

As foul water in one sink may contaminate the other sink being used for food preparation.

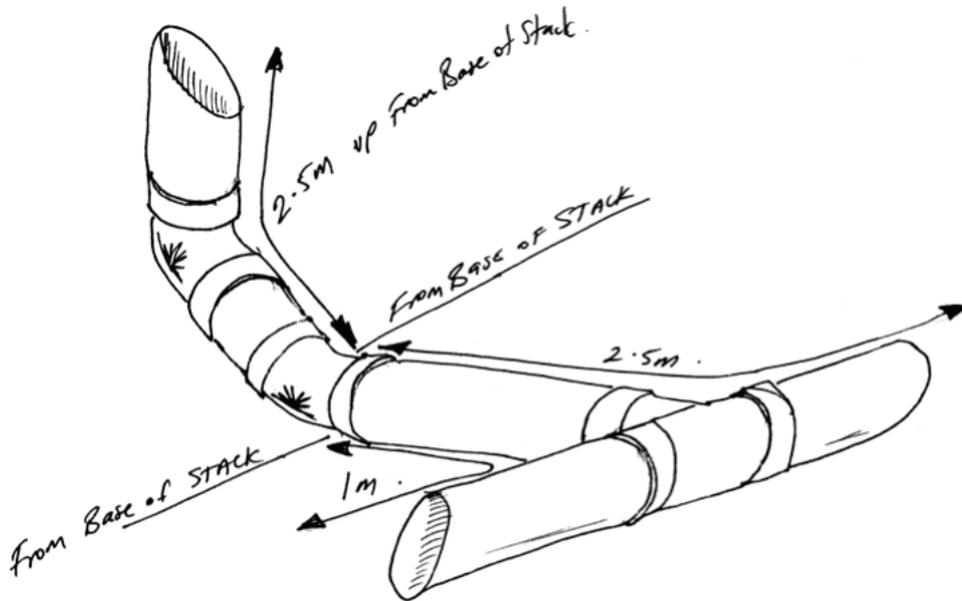
Total 1 mark

ANSWER 14

Because AAVs only allow air into and not out of the system. Therefore it would be possible that foul gases could accumulate in the system.

Total 1 mark

ANSWER 15

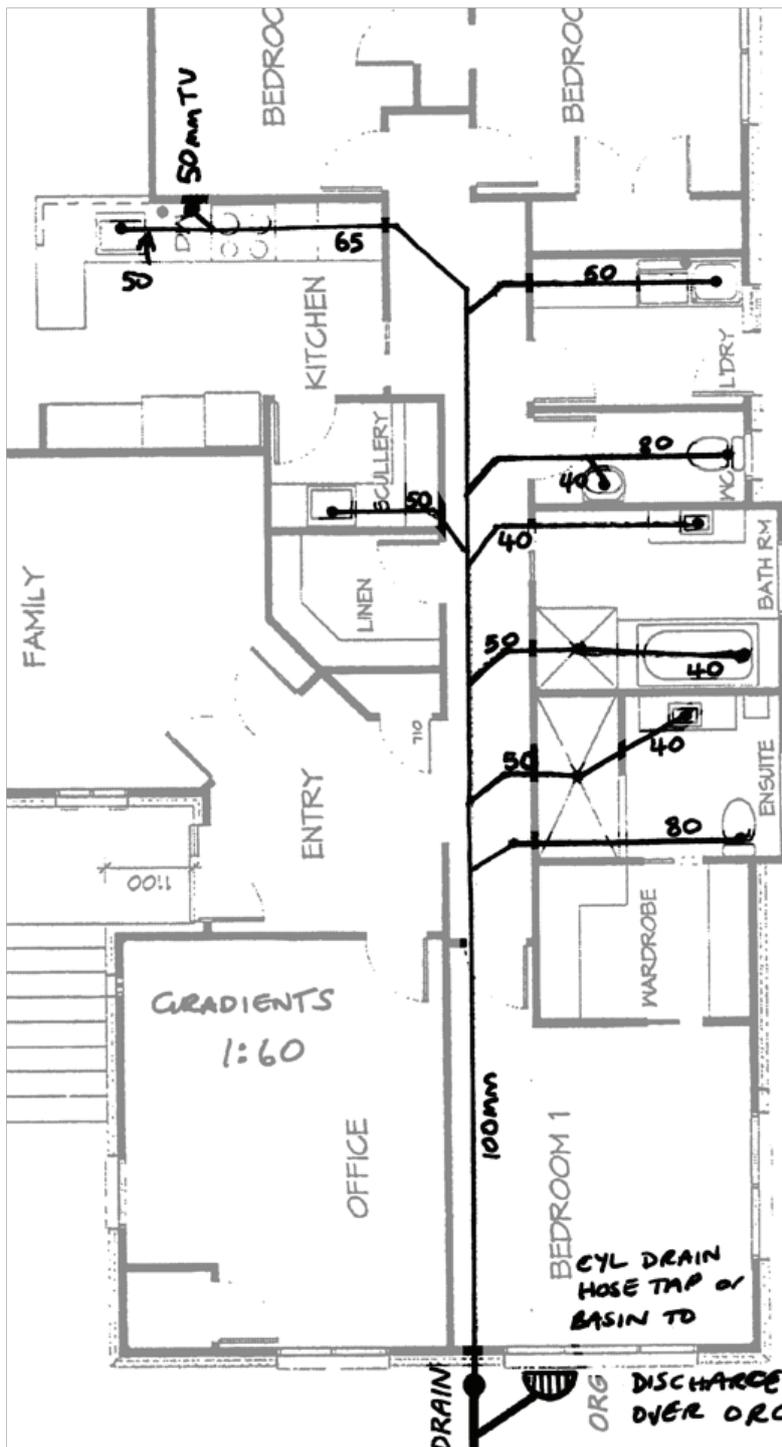


- Base of stack up drain – 1 metre (1 mark)
 - Base of stack down drain – 2.5 metres (1 mark)
 - Vertical measurement from base of stack – 2.5 metres (3 marks)
- Total 5 marks**

ANSWER 16

Common discharge pipe	WC	U	WHB	CS	Mark
Maximum fixtures per floor	5	5	5	1	½ each
Minimum diameter shown on stack	100	65	50	40 or 50	½ each
Maximum length	10	10	4.5	2.5	1 each
Minimum gradient	1.65%	2.5%	2.5	2.5%	½ each
Maximum gradient	5%	5%	5%	5%	½ each

ANSWER 17



Marking Schedule

- Correct use of FWG – basin in main bathroom is over 2.5 m away from FWG so will have to run to drain separately (2 marks)
- Correct connections to drain (2 marks)
- Venting requirements – main drain vent situated in correct area (2 marks)
- Overflow relief gully has charging pipe or hose tap above (1 mark)
- Diameters of foul water pipes and vents (2 marks)
- Correct gradient of drain pipes shown (minimum for all 1:60) (1 mark)

Total 10 marks

ANSWER 18

Any THREE (1 mark each)

- At base of stack
- On alternate floors
- Above the junction of the highest discharge pipe on that floor
- On every floor if the stack is subjected to discharge above 60°C e.g. Commercial dishwashers.

Total 3 marks

SECTION B

1. B 9 litres per minute.
2. B 100 mm.
3. A 3 m/s.
4. A When the bypass has the identical rating as the device being bypassed.
5. B Every year.
6. E Where polluted air could enter the pipework.
7. C AS/NZS 2845.1
8. E Independently Qualified Person (IQP).
9. D A urinal.
10. A 25 m².
11. B 450 mm.
12. D 4000 mm².
13. B 150 mm.
14. B 3
15. D Every cylinder in the installation.
16. E 10 litres.
17. D The building owner.
18. B 50 litres.
19. B 342.

