

QUESTION 1

- (1) Batter or angle the sides of the trench to a point where the trench will not collapse.
- (2) Provide adequate shoring to the sides of the trench.
- (3) The use of a steel cage or box.
- (4) Make sure there is provision to prevent the build up of water in the trench.
- (5) Provide ladders for safe entry and exit from the trench.
- (6) Safety helmets, clothing.

(Total 6 marks)

QUESTION 2

- (a) (i) To protect persons against accidental electric shock (1 mark)
- (ii) Connect a bonding strip to both sides of the cut prior to cutting. (1 mark)
- (iii) SS shower tray, SS sink bench, metal tub. (1 mark)
- (b) Any THREE:
- hard hat
 - eye protection
 - safety boots
 - ear protection
 - gloves
 - vest
 - first aid kit
- (1 mark each) (3 marks)
- (c) (i) Tempering valve/blending valve - ½ mark
- (ii) Hand basin, bath, shower, bidet (3 required for 1 mark)
- (iii) 55 degrees Celsius – ½ mark
- (2 marks)
- (Total 8 marks)

QUESTION 3

- The potable and non-potable water pipes must be clearly identified by signs and/or colour, and all non-potable water outlets must have appropriate warning signs.
- Installed to prevent the likelihood of cross connection or backflow.

(2 marks)

QUESTION 4

- (a) (1) Chemical action of the water in the pipe.
(2) Chemical action of other substances on the outside of the pipe.
(3) Electrolytic action between the pipe and other materials in contact with the pipe.
(4) Stray electrical current.

(2 marks)

- (b) Prevent the tank tipping and or moving during earthquake

(1 mark)

- (c) The correct pipe size will provide an adequate flow of water jointly at each outlet.

- Reduce velocity.
 Maintain working pressure.

(2 marks)

(Total 5 marks)

QUESTION 5

Any FIVE

- (1) Friction between moving water and the surface of the pipe or fitting which may vary depending on the type of material and condition of pipe.
- (2) Disturbance in the water flow caused by sudden changes in direction (i.e. elbows, tees, etc).
- (3) Disturbance in the water caused by either sudden enlargements or contractions in the pipeline.
- (4) Valves or filters.
- (5) Flow of water at intakes or outlets.
- (6) The pipe length.
- (7) The diameter of the pipe.

(5 marks)

QUESTION 6

- (a) Potable water is water that is fit for human consumption. (1 mark)
- (b) Break tank is a storage tank which incorporates an air gap on the incoming water supply. (1 mark)
- (c) Contaminant is any solid liquid or gas entering or with the potential to enter and pollute the potable water supplies. (1 mark)
- (d) Upstream is the direction against the flow of water in a pipeline relative to a selected point. (1 mark)
- (e) Downstream is the direction with the flow of water in a pipeline relative to a selected point. (1 mark)
- (Total 5 marks)

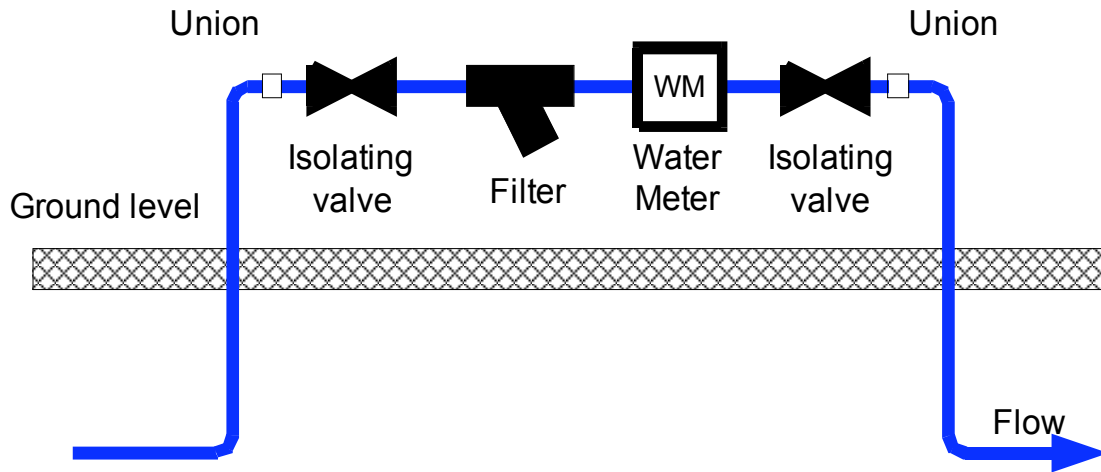
QUESTION 7

- (1) The back flow device must be installed as close as practicable to the potential source of contamination.
- (2) It shall be in an accessible position to allow for regular maintenance and inspection.
- (3) It shall be protected from freezing.
- (4) It shall be located so that no part of the device can become submerged.
- (5) It shall be located so that the pressure differential relief valve outlet is fully ventilated to the atmosphere and any discharge does not cause a nuisance.

(5 marks)

QUESTION 8

- (a) Draw the side elevation of an above ground water meter installation and name all the components. Indicate the direction of flow.



4 marks

- Direction of flow – ½ mark
 - Ground level – ½ mark
 - Each component (in correct positions) ½ mark
- (b)
- A bypass around the water meter should be fitted.
 - A valve locked in the closed position should be fitted on the bypass
 - Or extra meter on bypass

(2 marks)
(Total 6 marks)

QUESTION 10

The socket and lapped flue sections face upwards so condensation or liquid creosote can run down the inner wall of the flue. If the joint was the other way and the condensate was trapped, the cavity would fill up with a corrosive liquid resulting in staining and rapid deterioration of the joint.

(1 mark for up or down)

(1 mark for reason)

(Total 2 marks)

QUESTION 11

- (a) Any FOUR
Temperature,
Humidity,
Volume
Movement and distribution of air,
Eliminate contaminants.

(1 mark each)
(4 marks)

- (b) A water spray is required to wash the air and increase its humidity when required. The water supply to the unit must be provided with adequate backflow protection. The water disposal system may either be drained off to a suitable drainage point or re-circulated.

(3 marks)
(Total 7 marks)

QUESTION 12

- (a) No closer than 3 metres. (1 mark)
- (b) No closer than 3 metres horizontally and at least 0.6 metres above. (2 marks)
- (c) No closer than 150mm above. (1 mark)
- (d) No closer than 3 metres horizontally or vertically. (1 mark)
- (e) No closer than 0.6 metres above or horizontally. (1 mark)
- (f) No closer than 5 metres in any direction. (1 mark)
- (g) No closer than 2 metres above, 0.6m below, or 3 metres horizontally. (3 marks)
- (Total 10 marks)

QUESTION 13

- (a) (1) Outlets from refrigerated compartments, deep freeze units or ice-making machines shall discharge to a tundish.
The tundish may discharge to a floor waste gully. The discharge pipe to be a minimum of DN25 diameter with a maximum length of 10 metres (reference 4.45/4.14 AS/NZS3500.5)
- (2) Alternatively the discharge shall be via a tundish to a waste pipe of a minimum diameter of DN40 which may be either separately trapped or may connect to a fixture trap conditional upon it being connected above the water seal of the trap and the top of the tundish shall be above the flood level rim of the fixture. The pipe discharging over the tundish shall have an air gap at least twice the diameter of the outlet pipe.

(6 marks)

- (b) Each autopsy table shall drain through a flushing floor-waste gully with a DN65 or larger outlet. The water supply to the flushing floor-waste gully shall be from a flush valve or cistern.

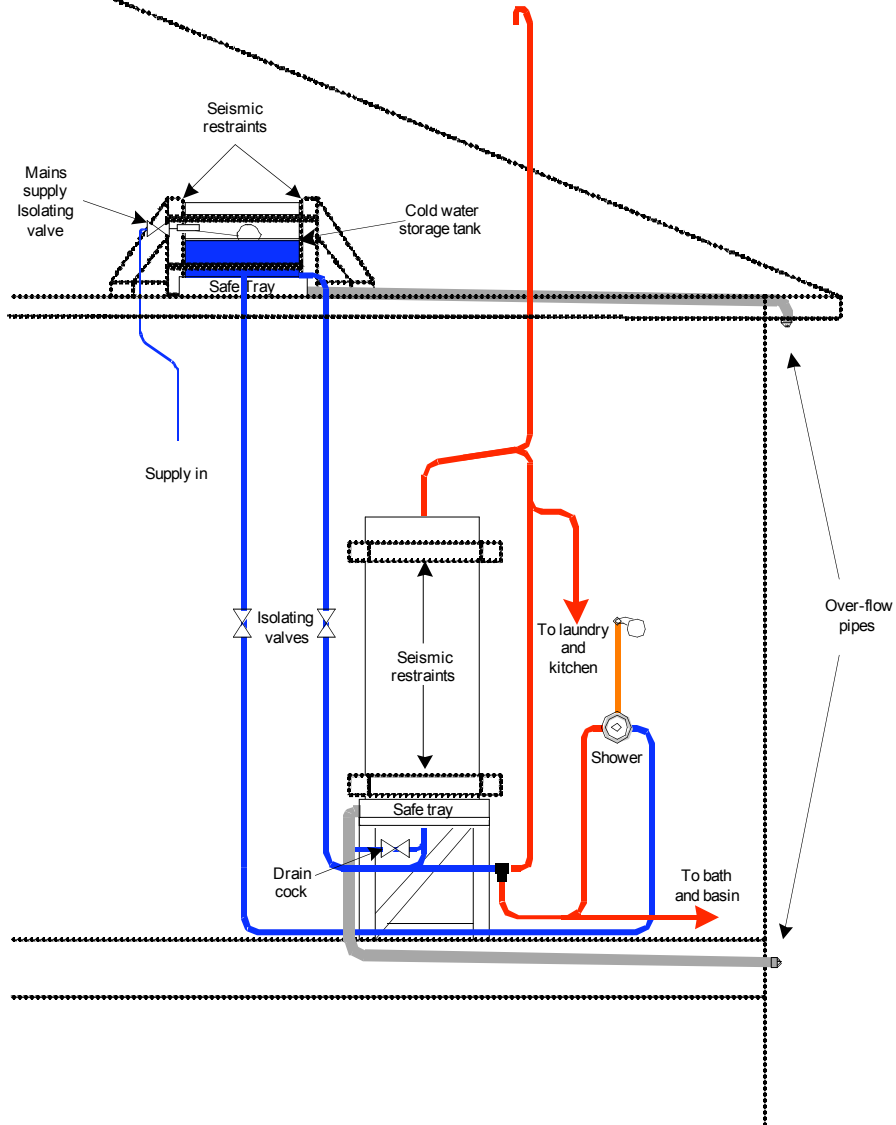
(4 marks)

(Total 10 marks)

QUESTION 14

Using your knowledge of NZBC G12 AS1 neatly draw a diagram showing all valves and associated components of a low pressure, open vented, hot water system that uses a supply tank servicing a single unit that is located in an upper storey of a multiunit complex. The shower mixer is to be equal low pressure.

Note: 2 marks for neatness and accuracy.



Safe trays	2 marks
Seismic restraints	2 marks
Tempering valve	1 mark
Valving	2 marks
Cold supply to shower	1 mark
Cylinder Drain	1 mark
Venting	1 mark
Neatness and clarity	2 marks

(12 marks)

Note: All components must be shown in their correct positions.

QUESTION 15

- (a) Every person must hold a current licence or a limited certificate which must indicate the classification applying to the licence or limited certificate.

(1 mark)

- (b) (i) 24 hours
(ii) 24 hours

(2 marks)

(Total 3 marks)

QUESTION 16

- (a) (1) Obtain National Certificate or serve five years while holding a limited certificate.
(2) Pass the theory examinations.
(3) Apply to the Plumbers Gasfitters and Drainlayers Board.

(3 marks)

- (b) You must make application and pay the prescribed fee to the Plumbers, Gasfitters and Drainlayers Board in order to be issued with a current practising license.

(2 marks)

(Total 5 marks)