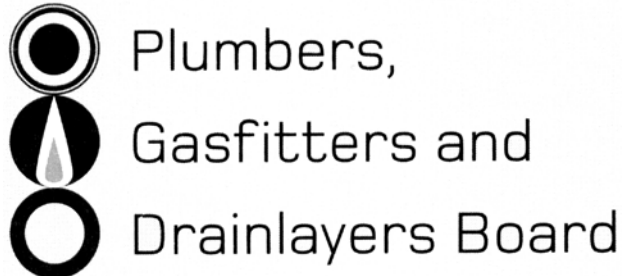


Affix label with Candidate Code
Number here.
If no label, enter candidate
Number if known

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No. 9195



REGISTRATION EXAMINATION, JUNE 2019

CERTIFYING PLUMBER

QUESTION AND ANSWER BOOKLET

Time allowed **THREE** hours

INSTRUCTIONS

Check that the Candidate Code Number on your admission slip is the same as the number on the label at the top of this page.

Do not start writing until you are told to do so by the Supervisor.

Total marks for this examination: 100.

The pass mark for this examination is 60 marks.

Write your answers and draw your sketches in this booklet. If you need more paper, use pages 18-21 at the back of this booklet. Clearly write the question number(s) if any of these pages are used.

All working in calculations must be shown.

Candidates are permitted to use the following in this examination:

Drawing instruments, approved calculators, document(s) provided.

Publications, Acts, Regulations, Codes of Practice, or Standards other than the ones provided are NOT permitted in the examination room.

Check that this booklet has all of 21 pages in the correct order and that none of these pages is blank.

YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION

Candidates that sat this examination in June 2019 were provided with the following documents:

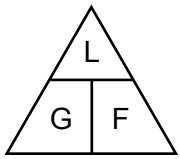
- AS/NZS 3500 Part 2: Sanitary plumbing and drainage
- NZBC clause G1 - Personal Hygiene

USEFUL FORMULAE

Circumference of circle = $2 \times \pi \times R$ or Circumference of circle = $\pi \times D$

Area of circle = $\pi \times R^2$ or Area of circle = $0.7854 \times D^2$

Volume of cylinder = $\pi \times R^2 \times H$ or Volume of cylinder = $0.7854 \times D^2 \times H$



length = L

gradient = 1:G

fall = F

SECTION A

QUESTION 1

- (a) State TWO conditions that would cause a reduced pressure zone backflow prevention device to discharge from the relief valve.

1 _____
2 _____

(2 marks)

- (b) A reduced pressure zone device requires an isolating valve to be fitted on both the inlet and the outlet of the device.

Name TWO other backflow prevention devices that must also have isolating valves installed on both the inlet and the outlet.

1 _____
2 _____

(2 marks)

- (c) (i) Name the pipe material that is NOT permitted to be used between a backflow prevention device and a carbonated drink dispenser.

(1 mark)

- (ii) Give the reason why the material in (i) is not permitted to be used.

(1 mark)

- (d) Give the TWO requirements that must be met when a bypass is fitted to a backflow prevention device installation.

1 _____
2 _____

(2 marks)

Total 8 marks

QUESTION 2

(a) A fire wrap and fire band are to be installed where a plastic water pipe passes through a hollow plaster lined firewall.

(i) Explain the purpose of the fire wrap.

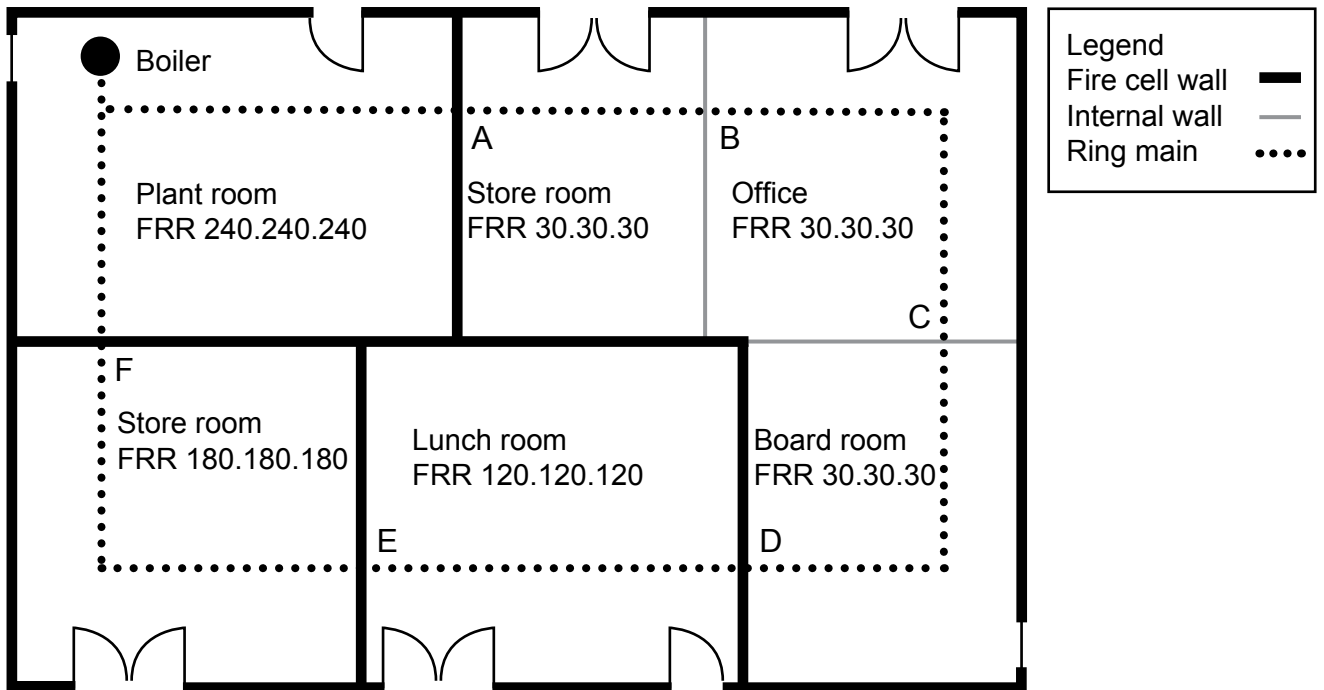
(1 mark)

(ii) Explain the purpose of the fire band.

(1 mark)

QUESTION 2 (cont'd)

(b) The diagram below shows a plastic ring main installed in a building. The Fire Resistance Rating (FRR) for each room is also shown.



Six penetration locations are labelled on the diagram (A-F).

Select only the penetration locations that require fire collars to be installed, and complete the table below for these locations.

Penetration location	Minimum fire collar rating required

(4 marks)

Total 6 marks

QUESTION 3

The plan on the page opposite shows the layout of sanitary fixtures for a proposed dwelling.

The diagram is drawn to a scale of 1:100

The dwelling is to be built on a concrete pad foundation.

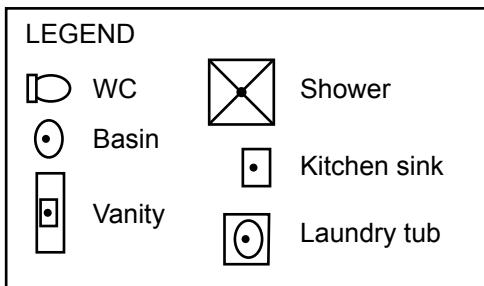
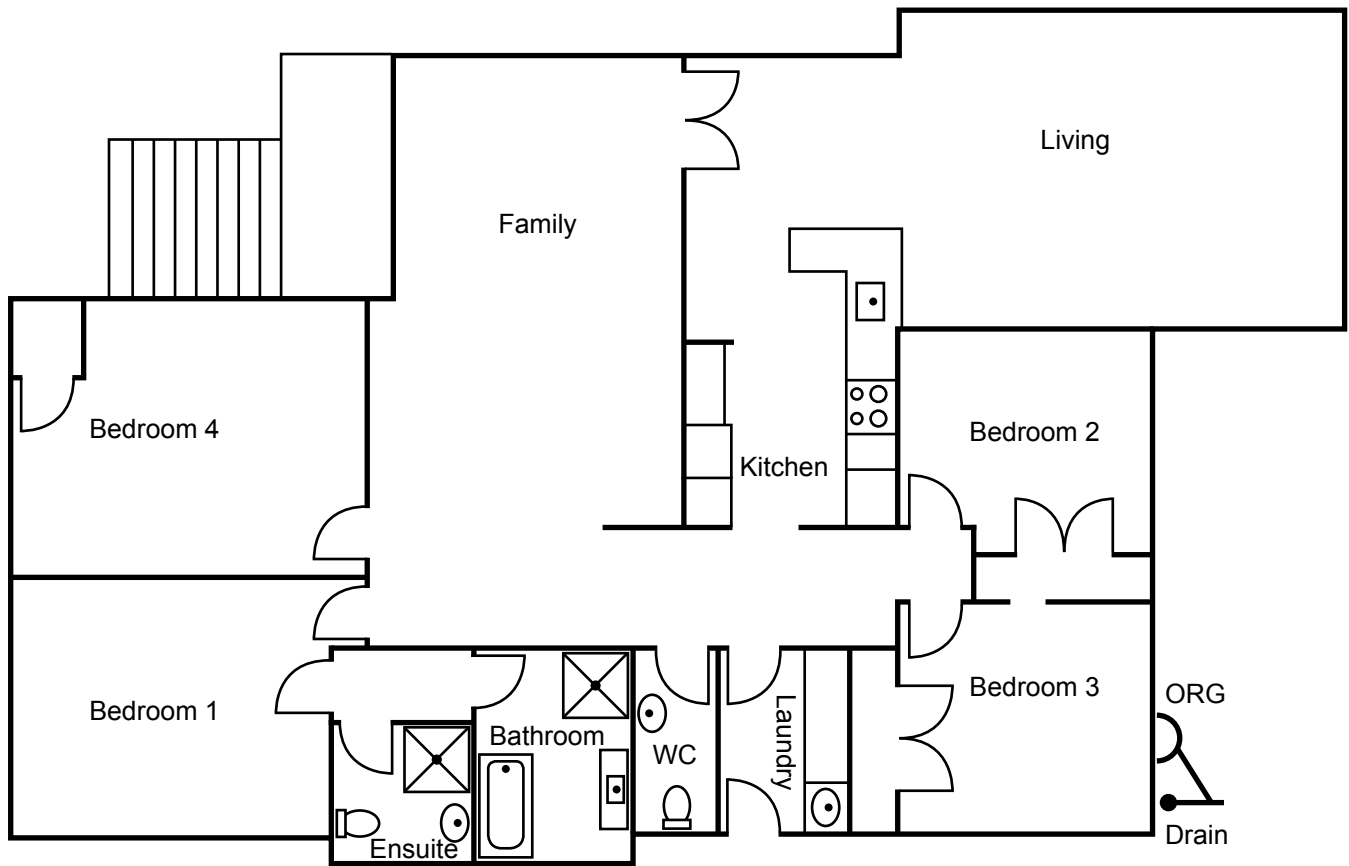
The drainage design for the dwelling has been completed, and the connection point for the sanitary plumbing is as shown on the plan.

The sanitary plumbing system is to comply with the minimum requirements of AS/NZS 3500 Part 2: Sanitary plumbing and drainage.

- (a) On the plan, draw all discharge pipes and show the location of any required vent(s).
- (b) On the plan, show the minimum allowable diameter for each section of discharge and vent pipework.

Total 9 marks

QUESTION 3 (cont'd)



QUESTION 4

(a) List FIVE injuries that would be notifiable events under the Health and Safety at Work Act.

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____

(5 marks)

(b) Name the organisation to which the injuries in (a) must be notified.

(1 mark)

(c) When a notifiable event has occurred the site must be preserved.

List FOUR situations where it is acceptable to disturb the site.

- 1 _____
- 2 _____
- 3 _____
- 4 _____

(4 marks)

Total 10 marks

QUESTION 5

- (a) Name FIVE actions that a PCBU must take to ensure that they are meeting their health and safety responsibilities.

1 _____

2 _____

3 _____

4 _____

5 _____

(5 marks)

- (b) A WorkSafe inspector has audited the health and safety practices of a workplace, and has identified areas that are non-compliant.

State an action that the inspector may take.

(1 mark)

Total 6 marks

QUESTION 6

A sanitary plumbing discharge pipe is to be tested using an air pressure test.

The discharge pipe is 100 mm in diameter and 50 m long.

- (a) Give the steps that must be followed in the testing procedure, including the pressure and/or time where appropriate.

(2 marks)

- (b) Give the results the test must achieve for the pipework to be deemed sound.

(2 marks)

Total 4 marks

QUESTION 7

A grease converter is to be installed in the discharge pipework system of a restaurant.

(a) Describe how a grease converter operates.

(2 marks)

(b) Explain how the required size of a grease converter is determined.

(2 marks)

(c) Give an advantage a grease convertor has compared with a grease trap.

(1 mark)

(d) Give a disadvantage a grease convertor has compared with a grease trap.

(1 mark)

Total 6 marks

QUESTION 8

(a) Name TWO outlets that are permitted to be supplied with non-potable water.

1 _____

2 _____

(2 marks)

(b) Name THREE fixtures that must not be supplied with non-potable water.

1 _____

2 _____

3 _____

(3 marks)

Total 5 marks

QUESTION 9

A section of land is being converted into a camping ground.

The camping ground will have 150 sites, and is to provide separate male and female ablution blocks.

- (a) Complete the table to show the minimum number of people (male and female) the site ablution blocks must cater for to comply with New Zealand Building Code clause G1/AS1 Personal Hygiene.

Total number of occupants	
Design occupancy male	
Design occupancy female	

(1 mark)

- (b) Complete the tables below to show the minimum number of fixtures required for the ablution blocks and how many of those fixtures must be accessible for people with disabilities.

Ablution blocks				
	WC Pans	Urinals	Basins	Showers/baths
Female				
Male				

Disabled access facilities		
WC Pans	Basins	Showers/baths

(13 marks)

Total 14 marks

QUESTION 10

(a) Name TWO methods of ensuring that fluid will circulate around a solar water heating system, and for each method give TWO aspects of the design that will ensure that the system will perform.

Method: _____

Design aspects: _____

1 _____

2 _____

Method: _____

Design aspects: _____

1 _____

2 _____

(6 marks)

(b) Give a benefit of a solar water heating system being indirect (closed loop).

(1 mark)

(c) List FOUR factors that affect the efficiency of a solar water heating system.

1 _____

2 _____

3 _____

4 _____

(2 marks)

Total 9 marks

QUESTION 11

Answer the following in relation to AS/NZS 3500 Part 1: Water services.

(a) State the restriction imposed on the use of braided flexible hoses.

(1 mark)

(b) State the TWO restrictions imposed on the use of galvanised pipes and fittings.

1 _____

2 _____

(2 marks)

(c) The maximum static pressure allowable at an outlet is 500 kPa.

Give THREE reasons for this.

1 _____

2 _____

3 _____

(3 marks)

Total 6 marks

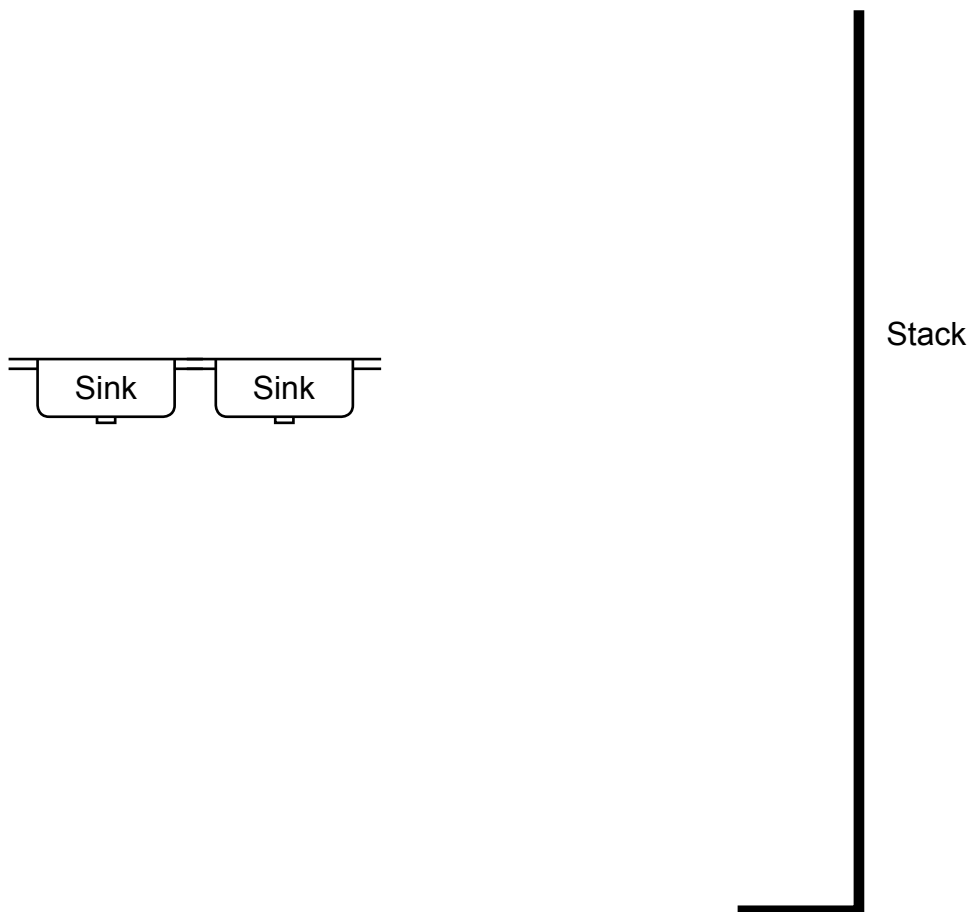
QUESTION 12

The starter diagram below shows a domestic kitchen sink and a 100 mm discharge stack.

The diagram is not to scale.

The stack is 3 storeys high and the sink is not the highest fixture connected to the stack.

- (a) Complete the diagram to show all of the pipework required to connect the sink to the foul water discharge at vents system. An air-admittance valve must not be used, and the installation is to comply with New Zealand Building Code clause G13/AS1 Foul Water.
- (b) Include all measurements on the diagram to indicate the following:
- Minimum diameters and gradients for all pipework on the diagram.
 - Acceptable connection point locations for pipework.



Total 6 marks

SECTION B

Answer the following multiple-choice questions by writing your answer (A, B, C, D or E) in the box provided after each one of the questions.

Each correct answer in this section of the examination is worth 1 mark.

Should your choice of answer be unclear no mark will be awarded.

1. How is the pressure rating for a temperature pressure relief valve installed on a hot water cylinder determined?

- A Must be higher than that of the cold water expansion valve and that of the cylinder.
- B Must be lower than that of the cold water expansion valve and that of the cylinder.
- C Must be higher than that of the cold water expansion valve and lower than that of the cylinder.
- D Must be lower than that of the cold water expansion valve and higher than that of the cylinder.
- E Must be of the same pressure rating as the cold water expansion valve and that of the cylinder.

2. Which of the following is the minimum temperature at which a storage hot water cylinder must be commissioned to obtain to prevent the growth of legionella bacteria?

- A 45°C.
- B 50°C.
- C 55°C.
- D 60°C.
- E 65°C.

3. Within which distance from the top and bottom of a hot water storage cylinder must a seismic restraint be fitted?

- A 100 mm.
- B 125 mm.
- C 150 mm.
- D 175 mm.
- E 200 mm.

4. How many seismic restraint straps must be installed on a 350 litre storage hot water cylinder?

- A 2
- B 3
- C 4
- D 5
- E 6

5. When multiple mains pressure hot water cylinders are being installed and connected via a manifold, which of the cylinders need to be fitted with temperature and pressure relief valves?

- A Only the first cylinder in the installation.
- B Only the last cylinder in the installation.
- C The first cylinder in the installation and every second cylinder thereafter.
- D Every cylinder in the installation.
- E Every third cylinder in the installation.

6. What is the maximum number of 90° bends permitted in a relief valve drain that is 7 metres long?

- A 4
- B 5
- C 6
- D 7
- E 8

7. Which of the following requires the hot water supply to personal hygiene sanitary fixtures to be limited to 45°C?

- A A prison.
- B A restaurant.
- C A domestic dwelling.
- D A laundromat.
- E A kindergarten or preschool.

8. A community care building must store how many litres of water per person for use when the water supply to the building is interrupted?

- A 25
- B 50
- C 75
- D 100
- E 150

9. Which of the following specifies the minimum diameter for an overflow pipe on a safe tray situated under a 180 litre water tank?

- A 25 mm.
- B 40 mm.
- C 50 mm.
- D The same size as the inlet pipe diameter.
- E 2 × the inlet pipe diameter.

10. What colour indicates a non-potable water supply as specified in AS/NZS 3500?

- A Purple.
- B Black.
- C Orange.
- D Green.
- E Red.

11. What is the minimum length of time a trainee must be under direct supervision of a suitably qualified person when completing restricted plumbing work?

- A 3 months.
- B 6 months.
- C 12 months.
- D 18 months.
- E 24 months.

Total 11 marks

For Examiner's use only

Question number	Marks	Marks
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
Section B		
Total		