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

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No. 9198

Plumbers, Gasfitters and Drainlayers Board

REGISTRATION EXAMINATION, NOVEMBER 2019

CERTIFYING DRAINLAYER

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 22–25 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 25 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

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) Define secondary flow path as it applies to drainlaying.

_____

(1 mark) ☐

(b) State the purpose of a secondary flow path.

_____

(1 mark) ☐

(c) List FOUR factors that may have an effect on a secondary flow path.

1 _____

2 _____

3 _____

4 _____

(4 marks) ☐

Total 6 marks ☐

QUESTION 2

(a) Give TWO ways in which solvent cement can enter the body.

1 _____

2 _____

(2 marks)

(b) Give TWO effects solvent cement can have on the body.

1 _____

2 _____

(2 marks)

(c) List TWO items of safety equipment that should be worn when working with solvent cement.

1 _____

2 _____

(1 mark)

Total 5 marks

QUESTION 3

Sketch a diagram showing a petrol trap suitable for use on the forecourt of a service station, and label its main features.

Total 6 marks

QUESTION 4

(a) Give THREE characteristics of a work site that determine that the site will be classified as a confined space.

1 _____

2 _____

3 _____

(3 marks)

(b) Give TWO examples of situations where working in a confined space may become particular hazardous work.

1 _____

2 _____

(2 marks)

(c) Name the agency that must be contacted if the situation in (b) is classified as particular hazardous work.

_____

(1 mark)

(d) Give FIVE items of information that are to be provided on a Particular Hazardous Work Notification Form.

1 _____

2 _____

3 _____

4 _____

5 _____

(5 marks)

QUESTION 4 (cont'd)

(e) Give a situation where particular hazardous work may be performed prior to sending the notification form in (d).

_____

(1 mark)

Total 12 marks

QUESTION 5

The drawing on the opposite page shows a plan of two shops and a restaurant with a parking area.

- The parking area has a sealed surface.
- Foul water drainage is to connect to the appropriate sewer connection.
- All components of the foul water system are to be external to the building.
- Surface water from the car park area and surface water from the roof are to combine and discharge at the network utility operator's surface water connection point.

On the plan, draw and label the foul water and surface water drainage systems. Include all required pipe work, bends, junctions, fittings, traps, inspections and ventilation points.

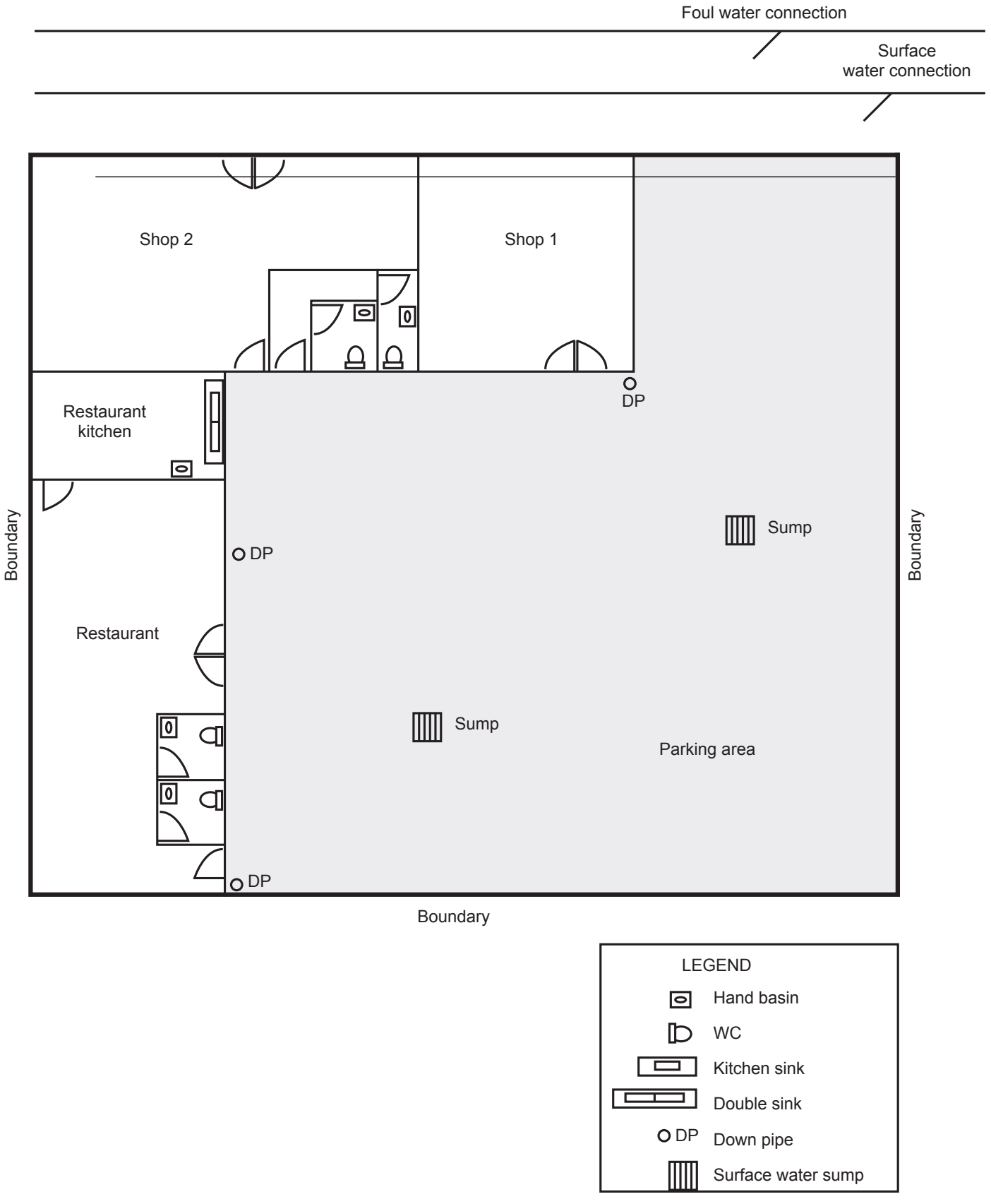
Sizing of pipework is not required.

The drainage systems are to comply with the minimum requirements of AS/NZS 3500 Part 2: Sanitary plumbing and drainage, and NZBC E1/AS1.

The plan must be economical and practical.

Total 10 marks

QUESTION 5 (cont'd)



QUESTION 6

The diagram on the opposite page shows a site containing an ablution block and an effluent field.

The plan also shows the proposed location of the effluent field for the waste from the ablution block.

The plan has been drawn to a scale of 1:200

All drainage is to be outside the building foundations.

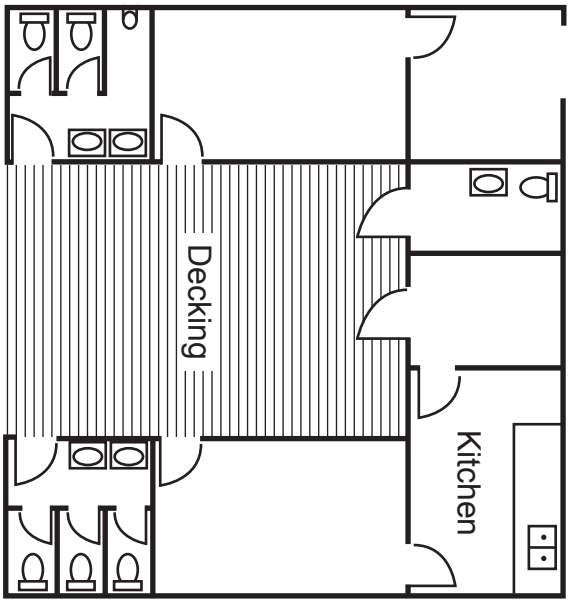
Complete the site plan to show the completed foul water drainage and effluent disposal system for the site. Label all components.

Sizing of pipework is not required.

The completed system is to comply with the minimum requirements of AS/NZS 3500 Part 2: Sanitary plumbing and drainage and AS/NZS 1547 On-site domestic wastewater management.

Total 12 marks

QUESTION 6 (cont'd)



Effluent field area

QUESTION 7

A surface water drain is to discharge into a stream.

Name FOUR methods that may be used to protect the stream from scouring.

1 _____

2 _____

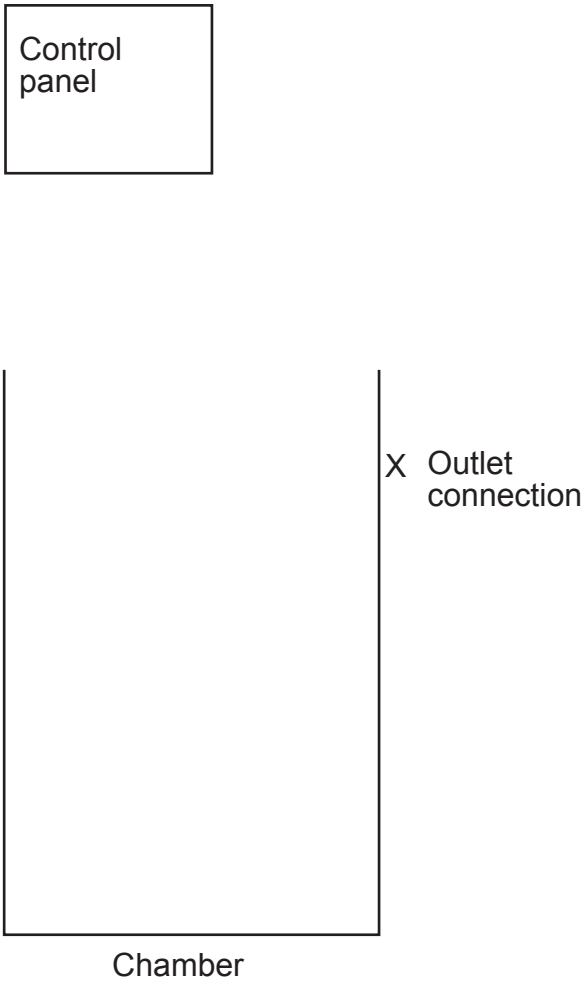
3 _____

4 _____

Total 4 marks

QUESTION 8

(a) The diagram below shows part of a wet well duplex surface water pumping system.



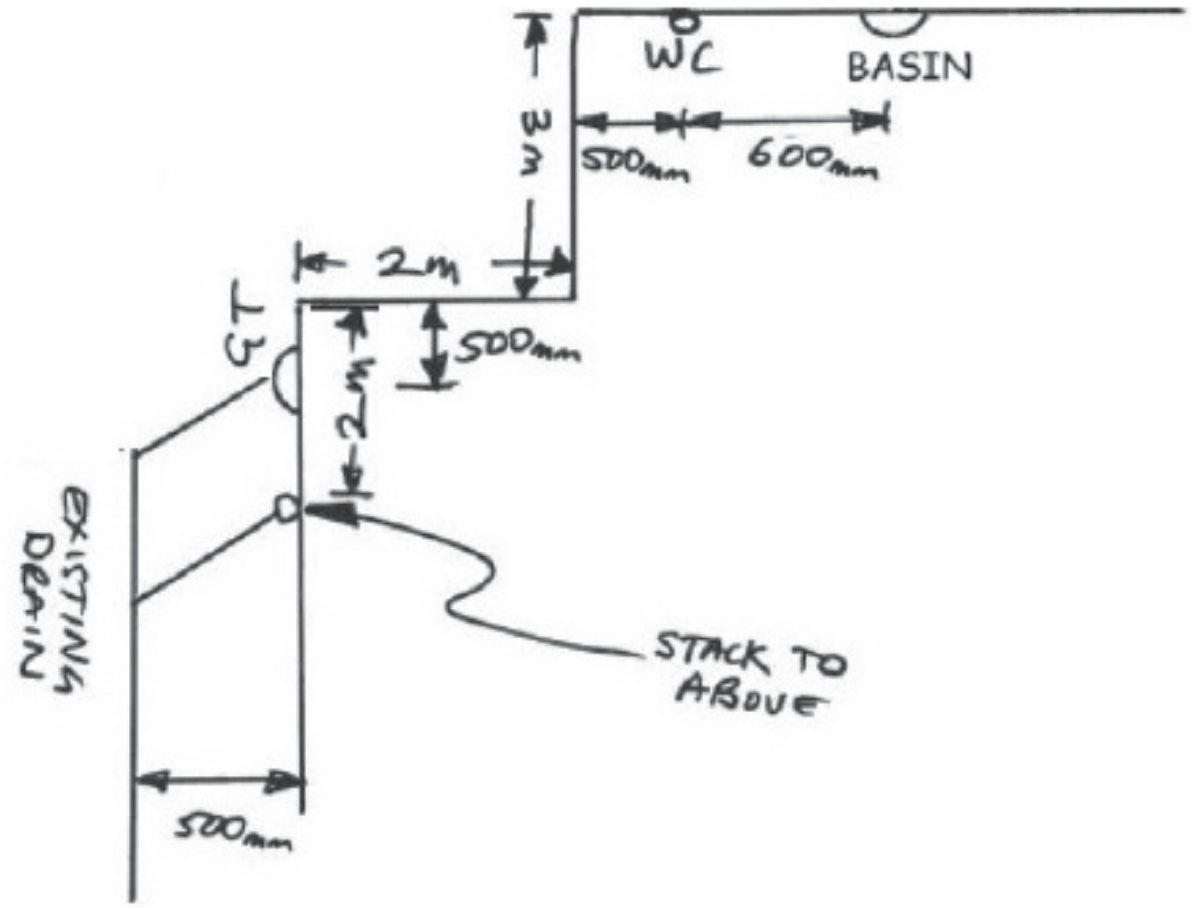
Complete the diagram to show the pipework and the components for the system to operate effectively.

Total 8 marks

QUESTION 9

A home owner has provided a sketch as shown below showing part of the existing foul water drain and the proposed location of a new WC pan and basin in a dwelling. The dwelling has a concrete pad foundation.

On the opposite page, draw the sketch to a scale of 1:50, including the additional foul water drainage pipework required for the property to obtain a certificate of compliance.



Total 6 marks

QUESTION 9 (cont'd)

QUESTION 10

(a) Name FOUR hazards that may affect breathing when excavating or laying drains.

1 _____

2 _____

3 _____

4 _____

(2 marks)

(b) Other than hazards which may affect breathing, give THREE other hazards that may be present when working in an excavation.

1 _____

2 _____

3 _____

(3 marks)

(c) Give FOUR actions that could be taken to reduce the risk of an accident when working in an excavation.

1 _____

2 _____

3 _____

4 _____

(4 marks)

QUESTION 10 (cont'd)

(d) A drainlayer is going to enter an access chamber on a surface water drain.

Give FOUR conditions that should be checked before the drainlayer enters the access chamber.

1 _____

2 _____

3 _____

4 _____

(4 marks)

Total 13 marks

QUESTION 11

The site plan on the opposite page shows a site containing a warehouse, a sealed carpark and a grassed area. The plan has been drawn to a scale of 1:500. Three areas of the carpark, A, B and C, separated by the dotted lines on the diagram, have been identified.

Rainfall intensity for the site = 100 mm/hr
Modified rainfall = 60 mm/hr

(a) Complete the following table for each of the regions A, B, and C and the total area of the carpark.

Region	Area (m^2)
A	
B	
C	
Total carpark	

(4 marks)

(b) (i) Determine the size of the drain required at X (the network utility operator's connection point).

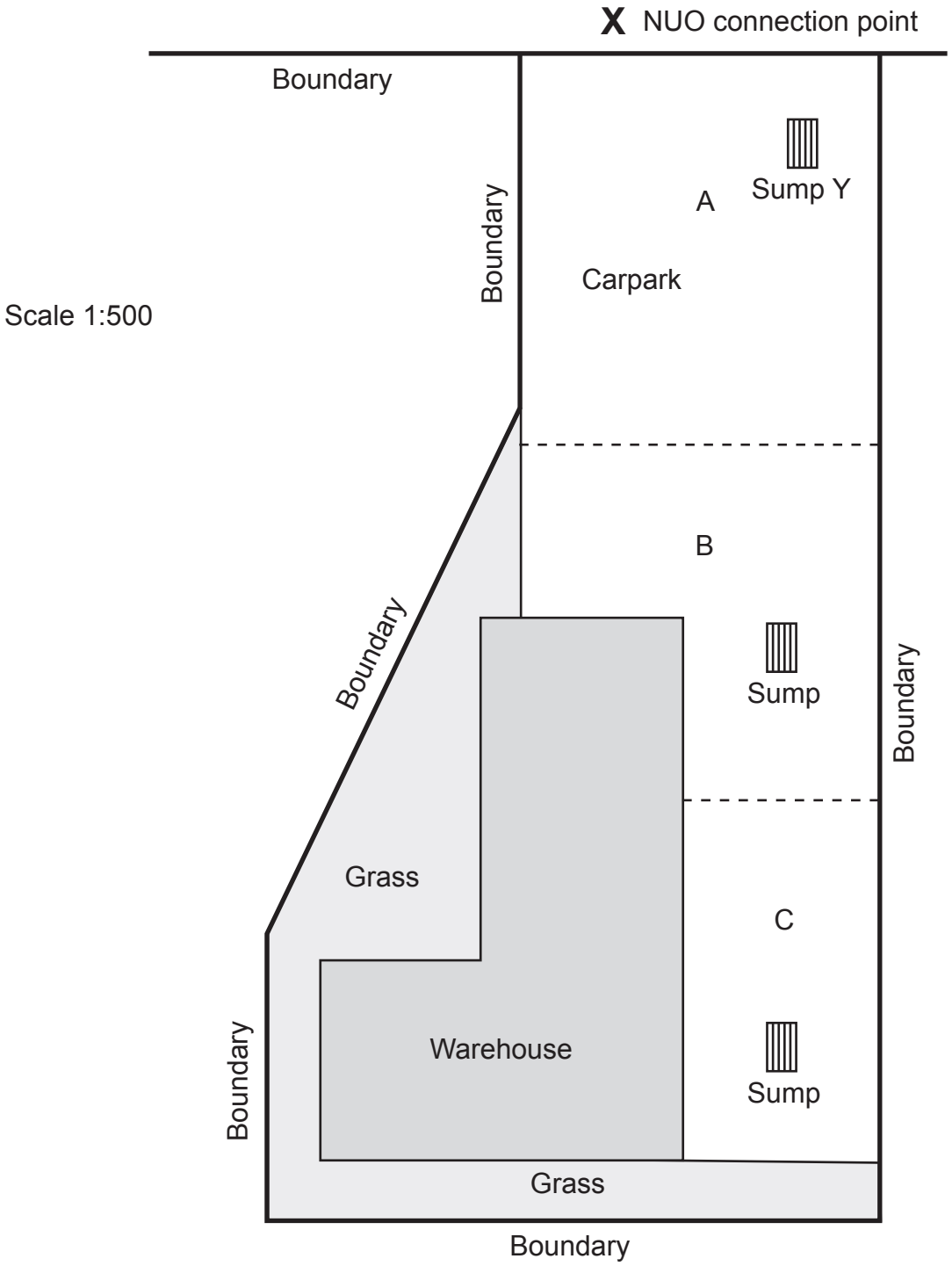
(2 marks)

(ii) Determine the size of the drain required to serve sump Y.

(2 marks)

Total 8 marks

QUESTION 11 (cont'd)



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. What is meant by the term surcharge load in relation to shoring a trench?

   A. The amount of ground water in the area of the trench.

   B. Slippage of soil along bedding planes applying extra forces on the shoring.

   C. Extra weight from soil or vehicles near the edge of the trench.

   D. The removal of ground water via well-pointing changing the structure of the soil.

   E. Building foundations within 1 m of a trench.

   ☐

2. How much notice must be given before particular hazardous work is to be carried out?

   A. 24 hours.

   B. 48 hours.

   C. 72 hours.

   D. 5 working days.

   E. 10 working days.

   ☐

3. A company has been engaged to carry out drainlaying work.

   Which party is classed as a PCBU and has the primary health and safety duty under the Health and Safety at Work Act?

   A. The company.

   B. The company's health and safety representative.

   C. The owner of the property where work takes place.

   D. The tradespeople doing the work.

   E. The company's directors.

   ☐

4. For what length of time should a ceramic surface water drain be soaked before a leakage test complying with New Zealand Building Code clause E1/VM1 Surface Water is carried out?

   A. 15 minutes.

   B. 30 minutes.

   C. 4 hours.

   D. 12 hours.

   E. 24 hours.

   ☐

5. What is the minimum allowable gradient for a 225 mm surface water drain?

   A. 1:90

   B. 1:120

   C. 1:250

   D. 1:300

   E. 1:350

   ☐

6. How many ml per m of pipe length is it acceptable for a 100 mm surface water drain pipe to lose per hour during a water test carried out to comply with New Zealand Building Code clause E1/VM1 Surface Water?

   A. 1.2

   B. 2.0

   C. 2.5

   D. 3.0

   E. 5.0

   ☐

7. Drainlayer A has requested the assistance of a tradesman drainlayer employed by Drainlayer B.

   Who is responsible for ensuring that the tradesman drainlayer is capable of completing the proposed work competently?

   A. Drainlayer A.

   B. Drainlayer B.

   C. The licensed employee drainlayer.

   D. The Ministry of Business, Innovation and Employment.

   E. WorkSafe New Zealand.

   ☐

8. A certifying drainlayer has employed a labourer who has just uplifted an exemption to perform restricted drainlaying.

   For what length of time must the labourer work in the presence of the certifying drainlayer?

   A. 6 months.

   B. 12 months.

   C. 24 months.

   D. 36 months.

   E. Until such time as the trainee achieves registration.

   ☐

9. Which of the following is NOT an acceptable reason to disturb the scene of an accident that has resulted in serious harm?

   A. To recover plant and equipment from the site.

   B. To save a life.

   C. To prevent suffering of an injured person.

   D. To maintain public access to services (e.g. gas and electricity).

   E. To prevent serious damage to property.

   ☐

10. A rectangular chamber must provide 9 m^3 of storage volume. The base measures 2.4 m × 2.8 m internally. What minimum depth will the chamber need to have?

A. 1.34 m.

B. 1.73 m.

C. 3.21 m.

D. 3.75 m.

E. 3.80 m.

☐

Total 10 marks ☐

This page is available for additional working or answers

Question number _____

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Question number	Marks	Marks
1		
2		
3		
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6		
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Section B		
Total		