higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

ENGINEERING

T1260(E)(J22)T

AUGUST EXAMINATION

NATIONAL CERTIFICATE

PLUMBING THEORY N2

(11022052)

22 July 2014 (Y-Paper)
13:00–16:00

Candidates need drawing instruments.

Calculators may be used.

This question paper consists of 5 pages and 3 diagram sheets.

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DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE
PLUMBING THEORY N2
TIME: 3 HOURS
MARKS: 100

INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions.
2. Read ALL the questions carefully.
3. Number the answers according to the numbering system used in this question paper.
4. ALL questions, except for QUESTION 3.4 which must be answered on DIAGRAM SHEET 1 (attached), must be done in the ANSWER BOOK.
5. All the sketches and/or diagrams must be done in pencil, neat, reasonably large, in proportion and fully labelled.
6. ALL the abbreviations and symbols MUST comply with the latest National Building Regulations and ALL relevant SABS codes.
7. Rule off across the page on completion of EACH answer.
8. Write neatly and legibly.

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QUESTION 1: COLD-WATER SUPPLY

1.1 Describe the object of filtration during public water purification. (4)

1.2 With the distribution of water to the consumer, the water flows to service reservoirs before entering the reticulation networks.

List THREE functions of a service reservoir. (3)

1.3 Describe the chemical reaction that takes place during the base exchange water softening process. (6)

1.4 Water intended for human consumption must comply with a minimum of acceptable quality standards.

Briefly describe THREE of these general quality requirements for potable water. (3)

1.5 Name the minimum required flow rates and the accompanying pressure values for the following as stipulated by the National Building Regulations:

1.5.1 Fire hose reels

1.5.2 Fire hydrants

(2 x 2) (4)
[20]

QUESTION 2: HOT-WATER SUPPLY

2.1 Briefly explain the working principle of each of the vacuum breakers. (3)

2.2 The pressure of a hot-water installation can be decreased to a specific water pressure rating by installing a pressure control valve.

Describe how a typical pressure control valve works in order to decrease and control the pressure in a hot-water installation. (6)

2.3 Make a neat single-line diagrammatic sketch of two electric vertical geysers (type 3 water heaters) interconnected in a hot-water installation. (8)

2.4 List THREE disadvantages of solar water heating panels. (3)
[20]

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QUESTION 3: DRAINAGE

3.1 Describe the following drainage terms:

3.1.1 Inspection eye (3)

3.1.2 Preliminary treatment of sewage (at sewage treatment plants) (4)

3.1.3 Stub stack system (sanitary wall arrangement) (3)

3.2 Give THREE reasons why drainage work should be thoroughly tested and approved by the local authority. (3)

3.3 The invert level of a drain is 400 mm at the head of the drain. Calculate the invert depth at the first change of direction in the drain. This first section of pipe is 9,5 m long, and has a gradient of 1 : 40. (4)

3.4 The plan view on DIAGRAM SHEET 1 shows a domestic dwelling with an outbuilding in a rural area. The sewage must be conveyed to the septic tank and French drain.

3.4.1 Use the diagram sheet and design in single lines, in accordance with the relevant regulations, an underground drainage layout for the sewage disposal system. (8)

3.4.2 Clearly indicate the following details:

- One gulley (1)
- One ventilation pipe (1)
- Adequate access to the drain (2)
- Standard abbreviations for any THREE sanitary fitments (3)
- Standard abbreviations for any THREE drainage details (3)

[35]

NOTE: Write your examination number in the space provided and place the completed DIAGRAM SHEET in the ANSWER BOOK.

QUESTION 4: SHEET METAL WORK AND FLASHING

Apply the triangulation method and develop, in your ANSWER BOOK, only the full pattern of the transition piece shown on DIAGRAM SHEET 2. Do not show any allowance for seams.
Use scale 1 : 10.

HINT: Turn the page lengthwise. **[15]**

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QUESTION 5: CALCULATIONS

The drawing on DIAGRAM SHEET 3 shows a domestic dwelling with a uPVC sanitary wall arrangement.

List at least TEN pipe fittings that will be required to complete the sanitary installation. **[10]**

TOTAL: 100

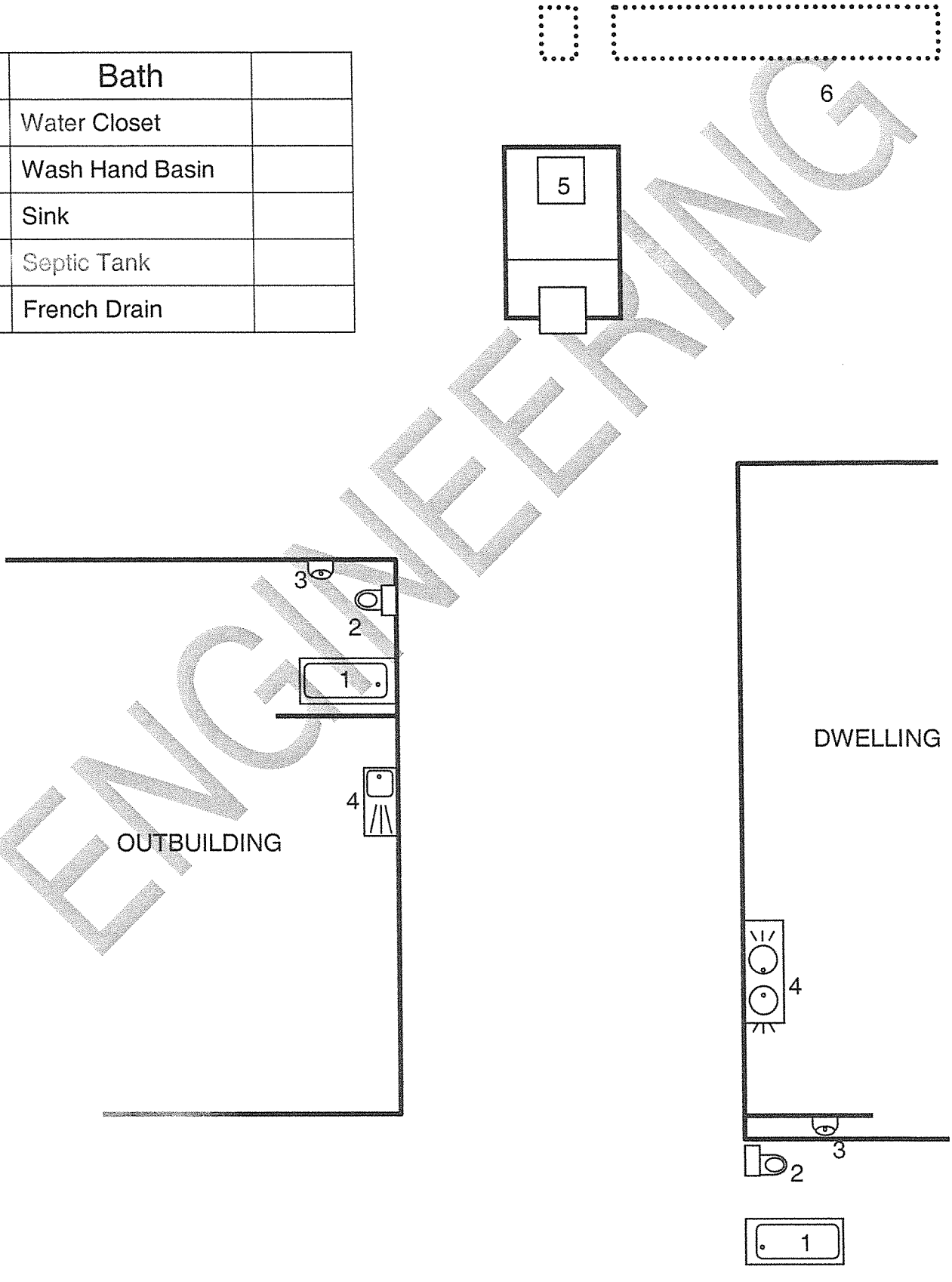
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DIAGRAM SHEET 1

EXAMINATION NUMBER:

1.	Bath	
2.	Water Closet	
3.	Wash Hand Basin	
4.	Sink	
5.	Septic Tank	
6.	French Drain	



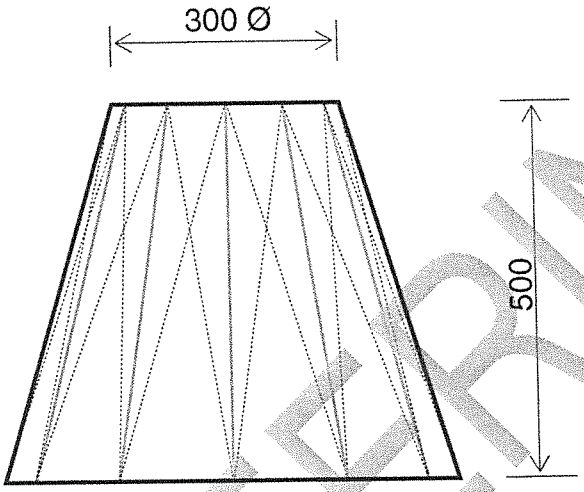
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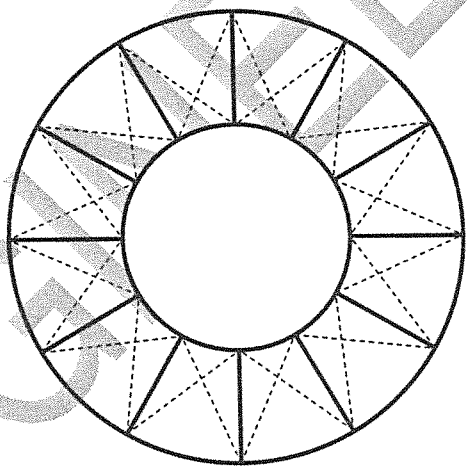
DIAGRAM SHEET 2

EXAMINATION NUMBER:

SIDE VIEW



PLAN VIEW

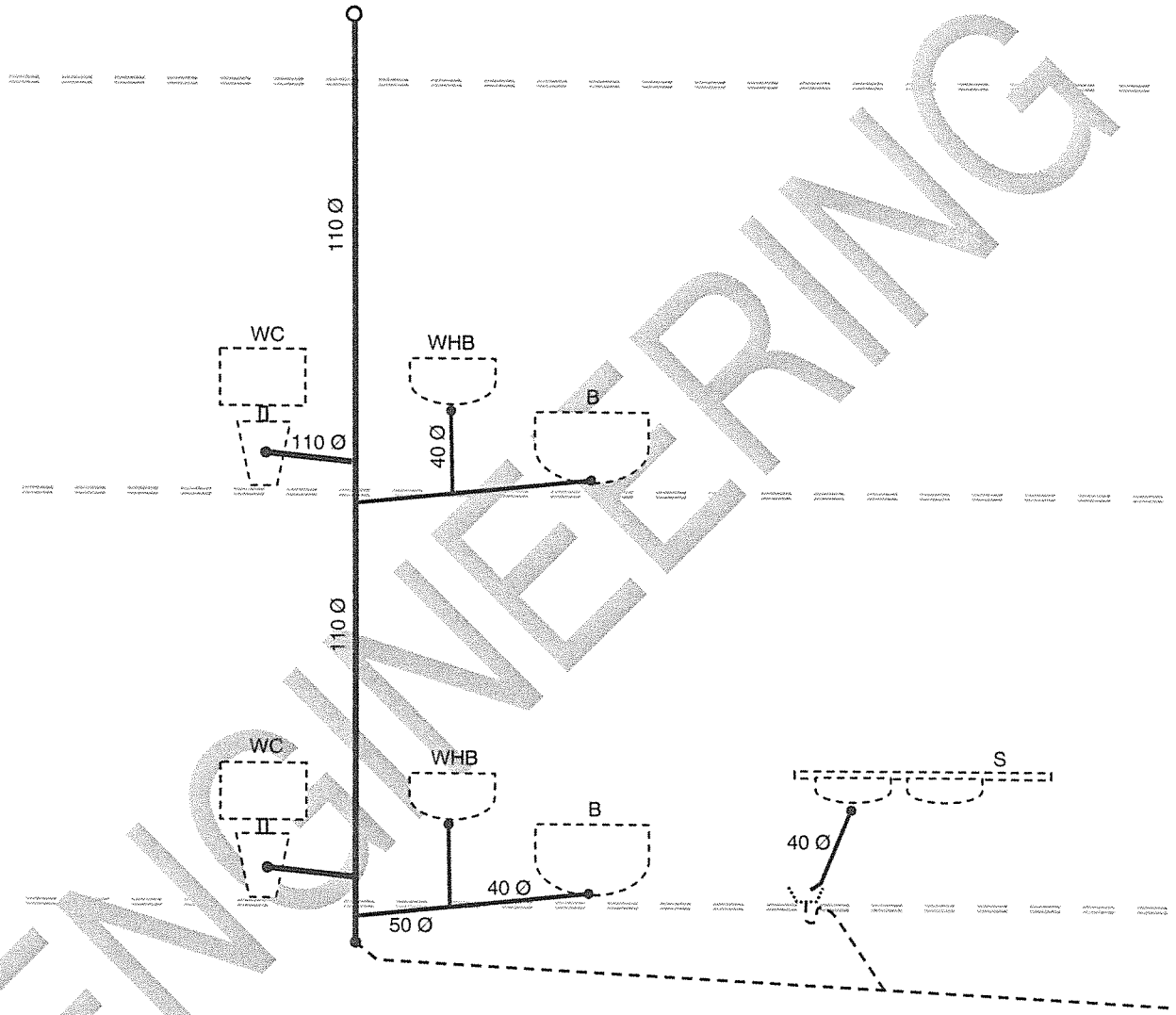


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DIAGRAM SHEET 3

EXAMINATION NUMBER:



Scale 1 : 50

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