



higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

T1140(E)(N22)T
NOVEMBER EXAMINATION
NATIONAL CERTIFICATE
PLUMBING THEORY N2

(11022052)

22 November 2016 (X-Paper)
09:00–12:00

Calculators and drawing instruments may be used.

This question paper consists of 5 pages and 4 diagram sheets.

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 3.5 which must be answered on DIAGRAM SHEET 2 (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 List the THREE stages of the hydrological (water) cycle. (3)
 - 1.2 Name THREE common impurities found in untreated water. (3)
 - 1.3 Describe what is meant by the term *permanent hard water*. (3)
 - 1.4 Describe why it is important that a zone valve should be in a closed position during normal operations. (2)
 - 1.5 Draw a simple flow diagram to illustrate the stages of the public water purification processes. (7)
 - 1.6 Name TWO valves or pipefittings used to prevent backflow of water. (2)
- [20]**

QUESTION 2: HOT-WATER SUPPLY

- 2.1 Briefly explain TWO functions of a vacuum breaker, each installed on the cold-water inlet, and hot-water outlet side of a hot-water geyser. (4)
- 2.2 Name the following symbolic signs used in drawings and sketches of water installations. Write only the name next to the question number (2.2.1—2.2.4) in the ANSWER BOOK.



- 2.3 The drawing on DIAGRAM SHEET 1 (attached) shows a boiler and hot-water cylinder.

Write down the names of the SEVEN indicated components next to the corresponding question number (2.3.1—2.3.7) in the ANSWER BOOK. (7)
 - 2.4 High-pressure geyser installations are fitted with a pressure-control valve on the cold-water inlet pipe.

Describe the function of this valve. (5)
- [20]**

QUESTION 3: DRAINAGE

- 3.1 Describe what is meant by the term *sanitary group*. (3)
- 3.2 Describe how the following stacks are connected to the underground drain in the two-pipe system of arranging sanitary pipework.
- 3.2.1 Soil stack (2)
- 3.2.2 Waste stack (3)
- 3.3 Define what is meant by the term *vent pipe*. (2)
- 3.4 Make a neat, labelled, longitudinal sectional sketch of a typical septic tank. (10)
- 3.5 DIAGRAM SHEET 2 (attached) shows the plan detail of a house with an outbuilding. Complete the underground drainage detail on the DIAGRAM SHEET to ensure an effective economical sewage-disposal system to the septic tank and french drain. Make use of the one-pipe drain (combined soil and waste water) system.
- Clearly indicate at least the following detail:
- 3.5.1 One ventilation pipe
- 3.5.2 One gulley
- 3.5.3 Sufficient access to facilitate cleaning
- 3.5.4 One inspection eye
- 3.5.5 Labels to all the relevant detail by means of standard abbreviations.
- NOTE: Write your examination number in the space provided and place the completed diagram sheet in the ANSWER BOOK.

(15)
[35]**QUESTION 4: SHEET-METAL WORK AND FLASHING**

The sketch on DIAGRAM SHEET 3 shows a branch pipe connecting to a main at an angle of 45°.

Apply the parallel-line method and develop the pattern of the branch pipe and the hole in the main pipe. Do not show any allowances for seams.

Use scale 1 : 10.

[15]

QUESTION 5: CALCULATIONS

The sketch on DIAGRAM SHEET 4 shows a water-supply tank with a diameter of 800 mm and a total depth of 750 mm.

Calculate:

5.1 The maximum volume of water that the tank can hold (in litres). (5)

5.2 The pressure at tap 'A' if the tank is filled with water. (2)

5.3 The pressure at tap 'B' if the tank is filled with water. (3)

NB: Density of water = $1\,000\text{ kg/m}^3$ and $g = 10\text{ m/s}^2$

[10]

TOTAL: 100

DIAGRAM SHEET 1

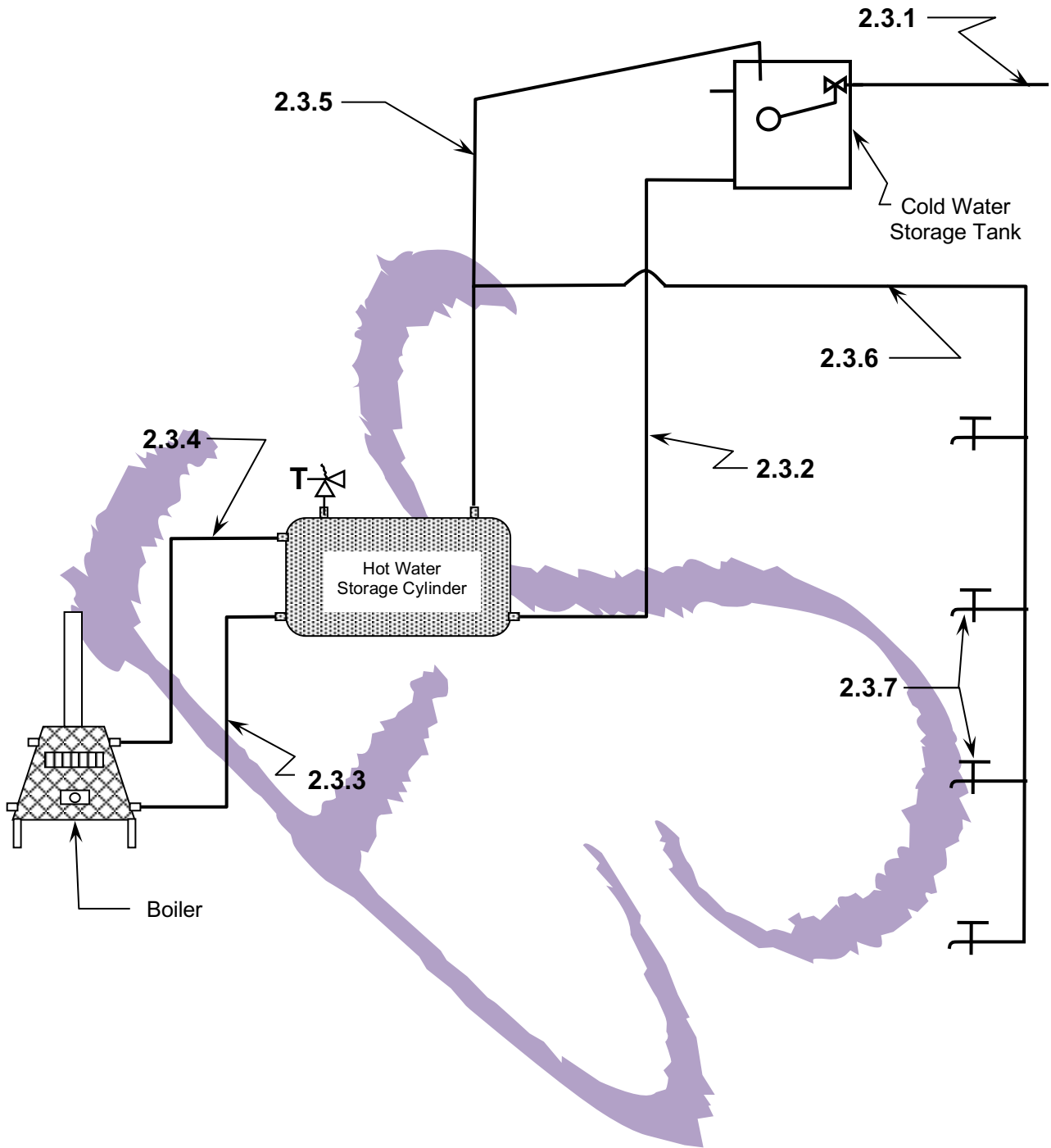


DIAGRAM SHEET 2: QUESTION 3.5

EXAMINATION NUMBER:

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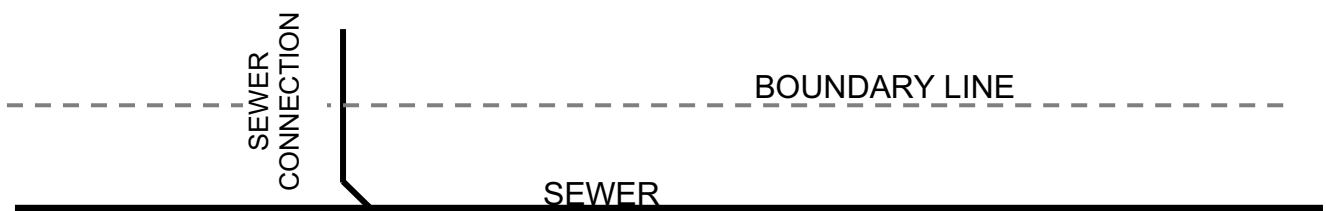
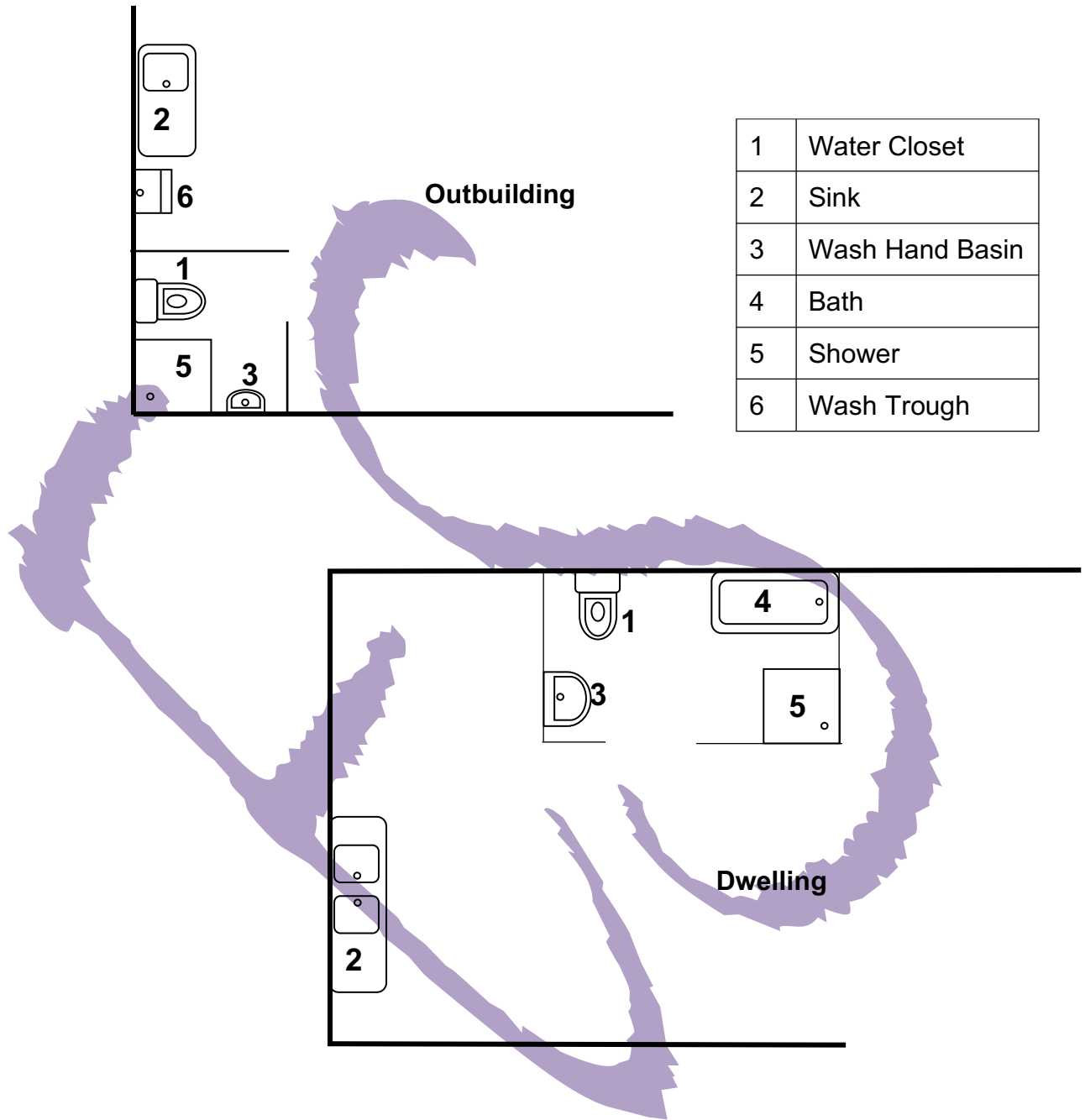


DIAGRAM SHEET 3

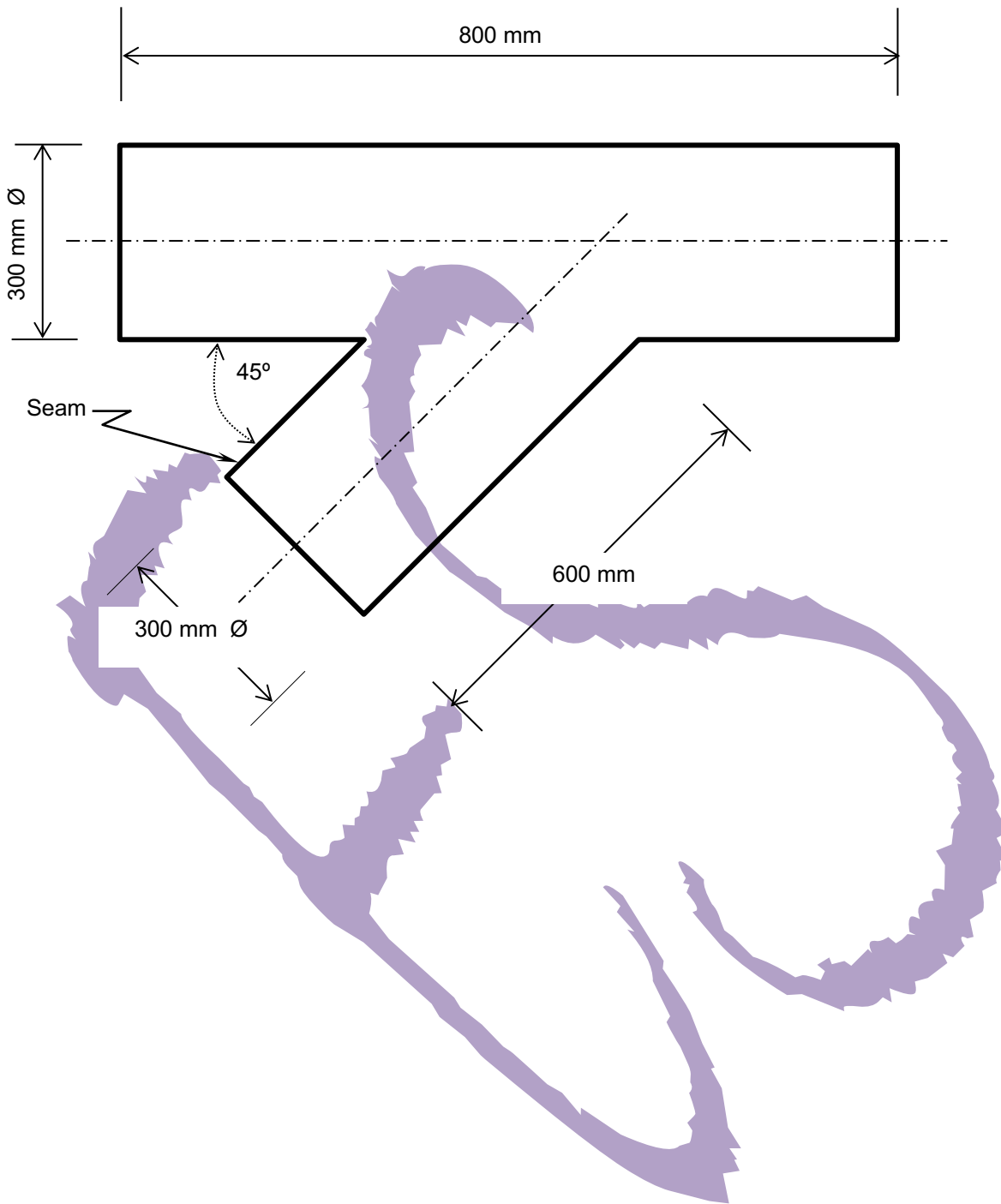


DIAGRAM SHEET 4

