higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

T1380**(E)**(A8)T

NATIONAL CERTIFICATE

PLUMBING THEORY N2

(11022052)

8 April 2019 (X-Paper)
09:00–12:00

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. Sketches must be large, neat and fully labelled.
5. Write neatly and legibly.

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QUESTION 1: COLD WATER SUPPLY

1.1 Name FOUR different types of water. (4)

1.2 Water originates in nature in the form of rain, hail, and snow. The daily heat from the sun causes the water on the surface to evaporate to form clouds and when this process is repeated, it is known as a rain cycle.

With the aid of a line diagram, show at least THREE stages of the hydrological cycle. (6)

1.3 Why do we need to soften water? Give FOUR reasons. (4)

1.4 In the process of water purification, chlorination is the most important stage as the chemicals used are purely meant to kill germs which are very harmful to humans.

1.4.1 List THREE types of chemicals that can be used in the chlorination stage. (3 × 1)

1.4.2 Name THREE types of chlorine chemicals. (3 × 1)

(6)
[20]

QUESTION 2 : HOT WATER SUPPLY

2.1 What is a water pressure reducing valve? (2)

2.2 Name FOUR operating principles of each of the following valves:

2.2.1 Vacuum breakers. (4 × 1)

2.2.2 Temperature and pressure safety valve. (4 × 1) (8)

2.3 Make a neat single-line diagram of TWO electrical geysers that are vertically positioned and interconnected in a hot-water installation. (They are type 3). (8)

2.4 Give TWO disadvantages of solar water heating panels. (2)
[20]

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QUESTION 3: DRAINAGE

3.1 Briefly describe the term *two-pipe system* as it is used in a drain connection. (2)

3.2 With the aid of a flow diagram, illustrate the conventional sewage treatment process that will be found in a sewage treatment plant. (7)

3.3 Give THREE reasons that must indicate why drainage work should be thoroughly tested and approved by the local authority. (6)

3.4 List any FIVE guidelines that must be complied with when laying drain pipes. (no need for sequential order) (5)

3.5 A plan view of a domestic house with an outbuilding is shown on DIAGRAM SHEET 1 (attached). With the aid of a single-line diagram, complete the underground drainage detail which should indicate an effective economical sewage-disposal system. Make use of the one-pipe drain (combined soil and waste water) system.

The following details must be clearly indicated:

3.5.1 Provision for one ventilation pipe

3.5.2 One gulley

3.5.3 Access to facilitate effective cleaning

3.5.4 One inspection eye

Drainage details must be labeled in accordance with the standard abbreviations.

NOTE: Hand the completed DIAGRAM SHEET 1 in with your ANSWER BOOK. Ensure that your EXAMINATION NUMBER is included on the diagram.

(15)
[35]

QUESTION 4: PATTERN DEVELOPMENT

4.1 FIGURE 2 on DIAGRAM SHEET 2 (attached) shows a transition piece that connects a 400 mm × 600 mm rectangular air-conditioning duct to a 300 mm Ø pipe.

4.1.1 Draw the given views to scale 1:10 and determine the true lengths of the sides shown in the front view. (7)

4.1.2 Develop the full pattern of the transition piece, to a scale 1:10.
Do NOT make any allowances for seams. (8)
[15]

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QUESTION 5: CALCULATIONS

DIAGRAM SHEET 3 (attached) shows a hot and cold water layout of a domestic dwelling. The illustration is to be completed with copper tubing and brass compression fittings.

Draw up a list of material, indicating the quantity of each item required to complete the water installation. DO NOT DETERMINE THE QUANTITIES FOR THE COPPER TUBING. **[10]**

TOTAL: 100

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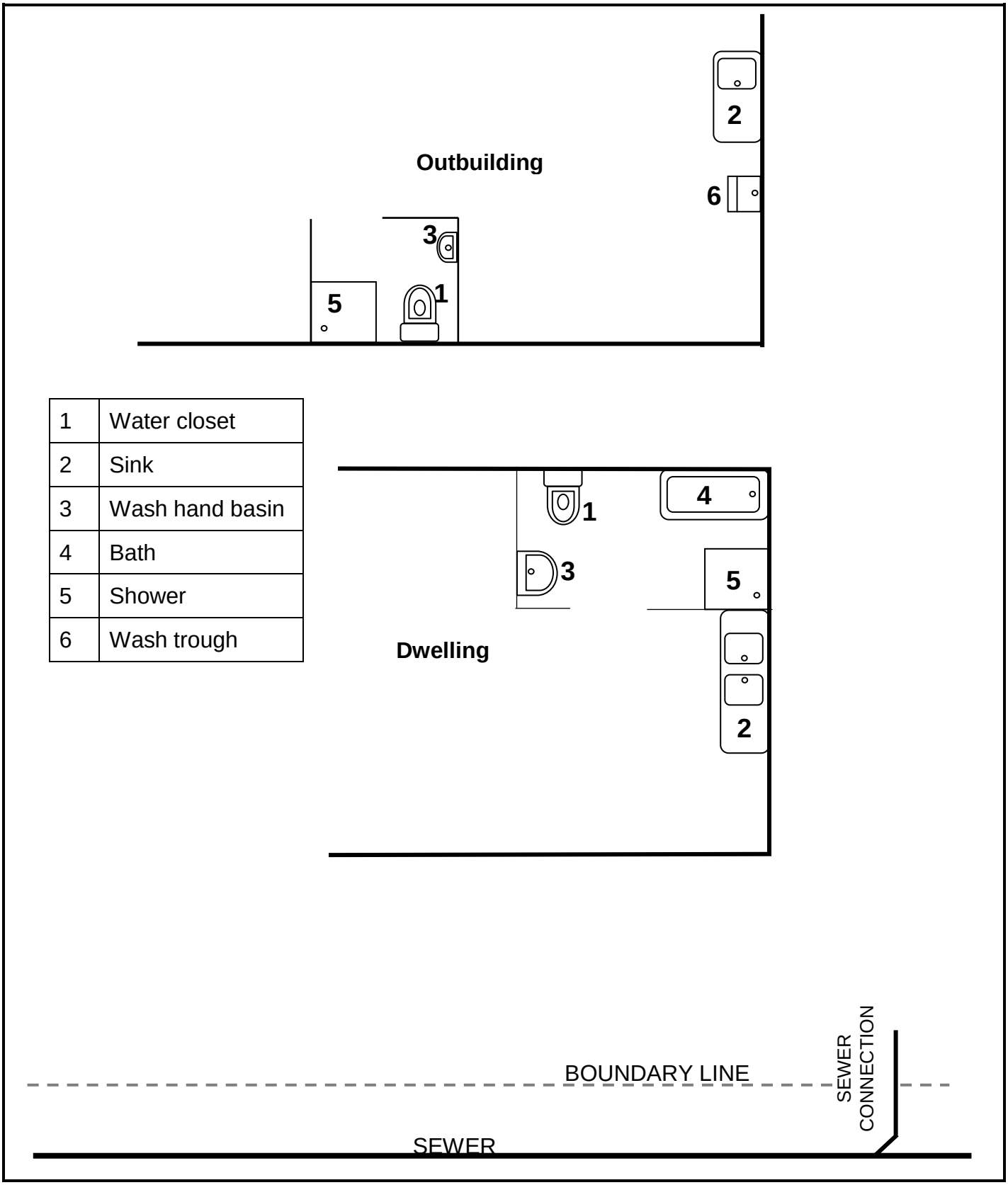
DIAGRAM SHEET 1

EXAMINATION NUMBER:



1	Water closet
2	Sink
3	Wash hand basin
4	Bath
5	Shower
6	Wash trough

FIGURE 1

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DIAGRAM SHEET 2

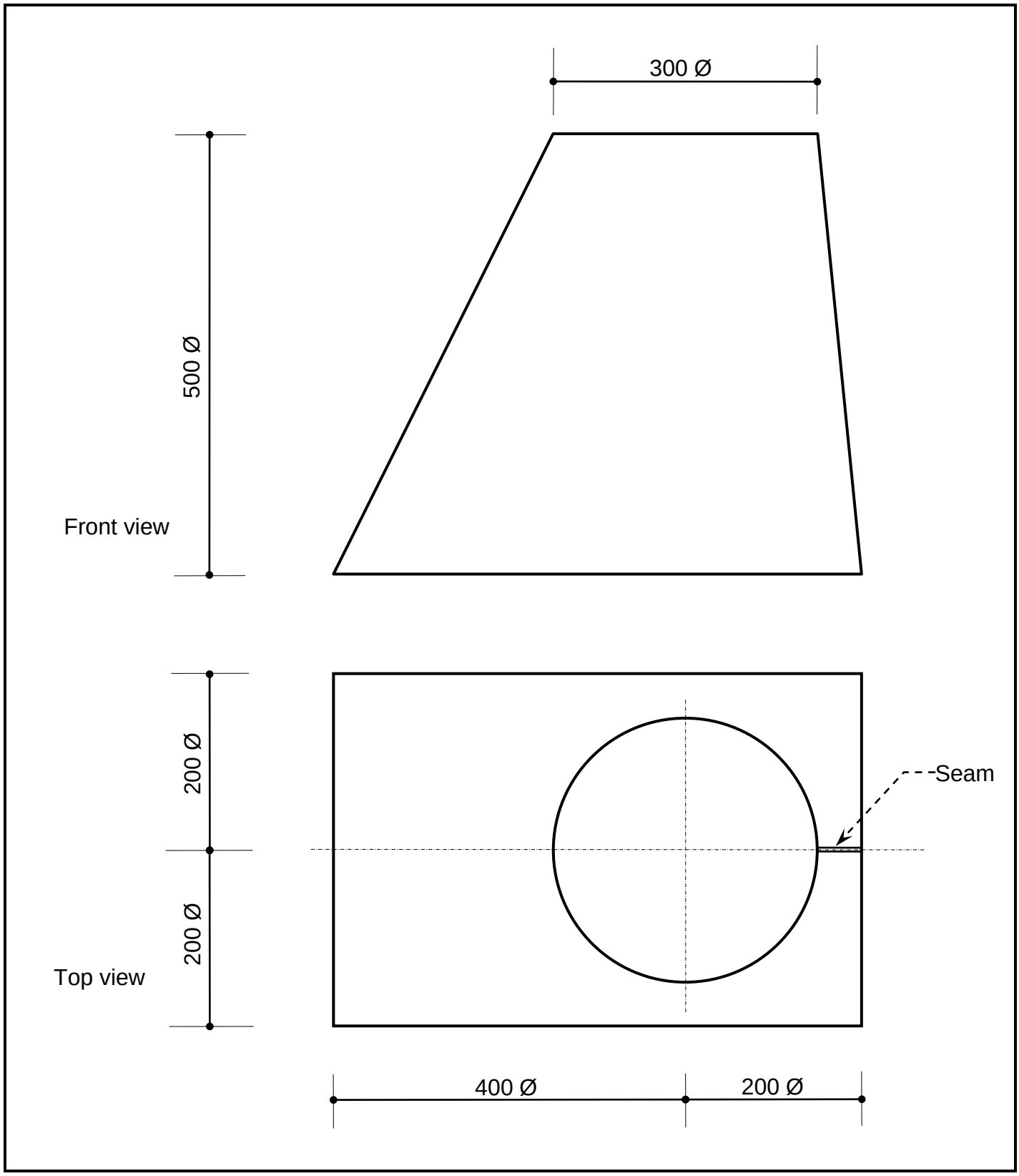

FIGURE 2

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DIAGRAM SHEET 3

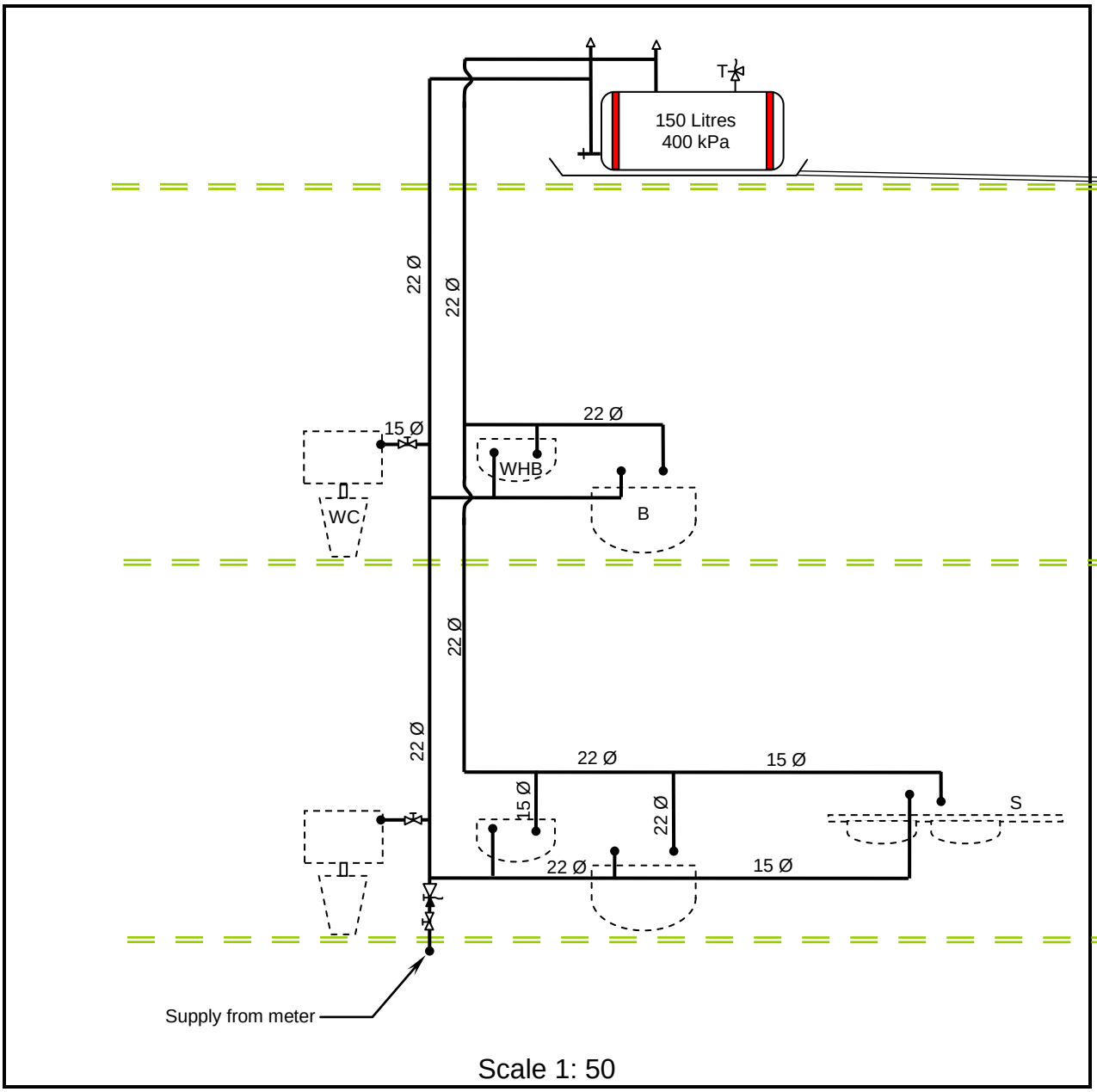

FIGURE 3

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