higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

PLUMBING THEORY N2

1 December 2023

This marking guideline consists of 6 pages.

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QUESTION 1: COLD-WATER SUPPLY

1.1
1.1.1 True
1.1.2 True
1.1.3 False
1.1.4 True
1.1.5 False

(5 × 1) (5)

1.2
1.2.1 Spindle
1.2.2 Gland
1.2.3 Packing
1.2.4 Jumper
1.2.5 Washer
1.2.6 Water out
1.2.7 Water in

(7 × 1) (7)

1.3
- Provides water to the consumer.
- Ensures adequate reserve of water in case of interruptions of the supply from the treatment plant.
- Provides the required pressure head to the water mains.
- Convenient place to regulate and control the water supply and the quality thereof.

(Any 3 × 1) (3)

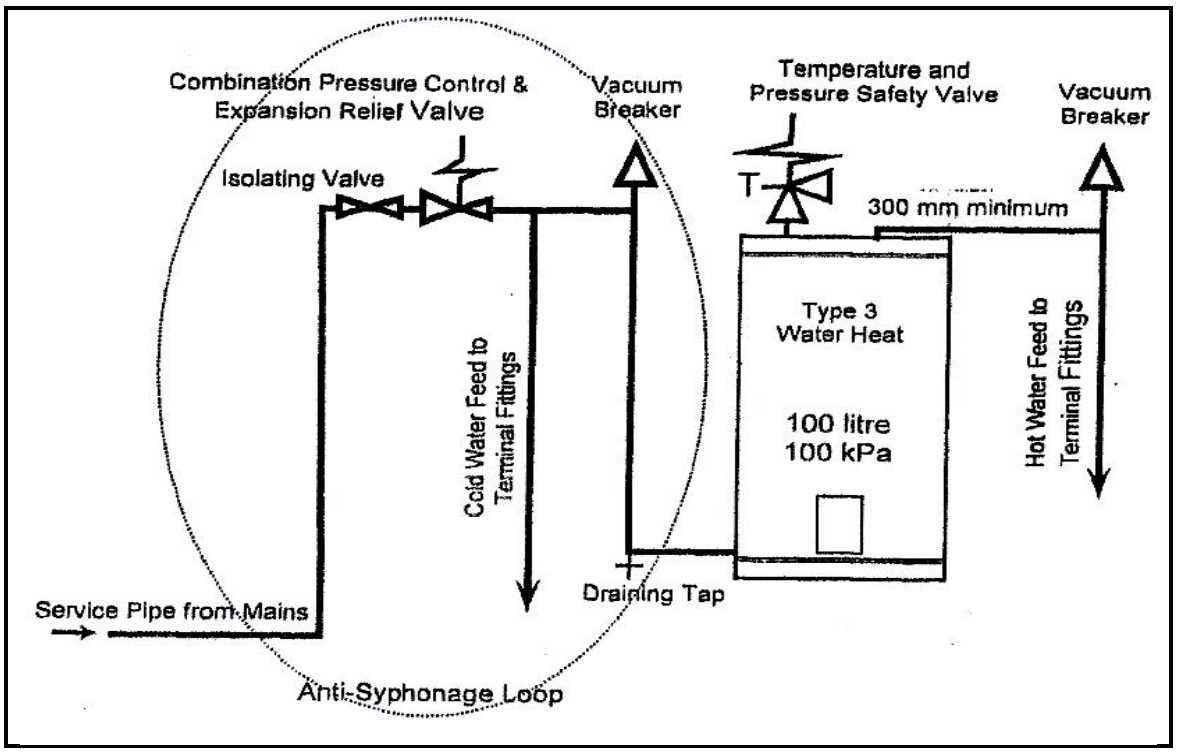
1.4
Effectiveness
Cost and availability
Temperature of the water
Turbidity of the water
Colour of the water
Alkalinity of the water
Level of the Ph of the water

(Any 5 × 1) (5)

[20]

QUESTION 2: HOT-WATER SUPPLY

2.1



ALLOCATION OF MARKS

Correctness	2
Labelling	4
Symbols/valves	2
TOTAL MARKS	8

(8)

2.2
- Hot water is always immediately available.
- It can be installed in a small space.
- It is simple to install.
- No major pipes or valves are required.
- In a push-through geyser the expansion pipe and water draw-off pipe is one common pipe.
- No expansion pipes through the roof or eaves are needed. (Any 4 × 1) (4)

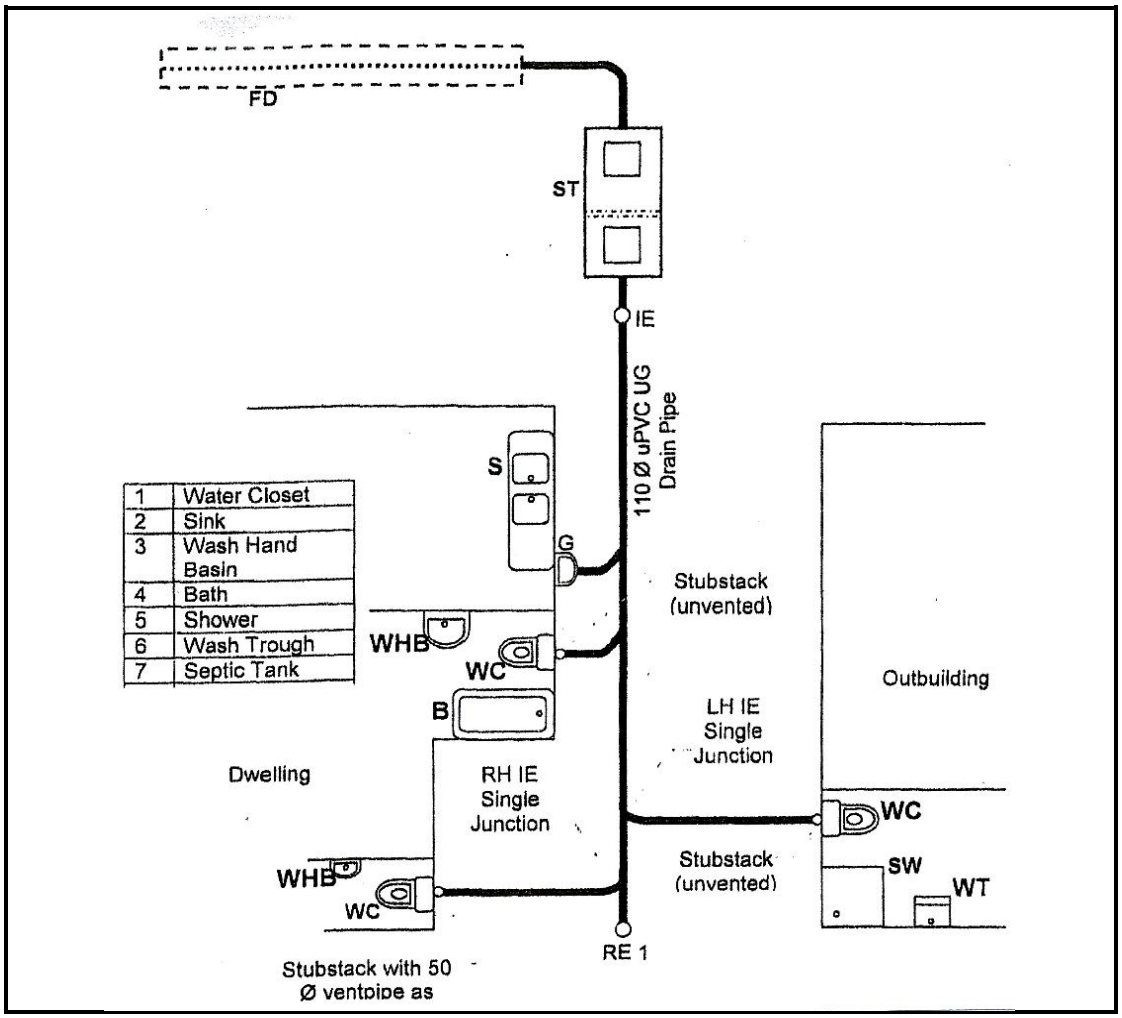
2.3
- A two-pipe system has two main discharge pipes, also known as discharge stacks.✓
- One soil-and-vent pipe discharges soil water into a drain and one waste-and-vent pipe discharges wastewater into a gully.✓
- A two-pipe system is used where there are many sanitary fixtures grouped or arranged together and where such fixtures are far away from one another.✓
- In a one-pipe system all the soil and waste fixtures in the system discharge directly into one discharge stack that is connected directly to the drain.✓
- A single-stack system is basically a one-pipe system where the individual water traps for each soil and waste fixture are not vented individually.✓
- All the soil and waste fixtures discharge directly into one discharge stack.✓ (6)

2.4 A one-pipe system is used so that soil water✓ and wastewater can be discharged into one common discharge stack.✓ (2)

[20]

QUESTION3: DRAINAGE

3.1



(15)

3.2 $\frac{\text{Fall}}{15} = \frac{1}{40}$✓

Fall = 375✓

Invert depth = 600 + fall✓
= 600 + 375✓
= 975 mm✓ (5)

3.3
- Greater degree of access to drain.
- Rodding can be facilitated in both directions.
- Easy to locate.
- Can be used for alignment tests by drainage inspector. (4)

3.4
- The gasses must be allowed to escape.
- A portion of the water must be able to evaporate through the soil.
- Vegetation, especially lawns must be allowed to absorb some of the water.

(Any 1 × 1) (1)

3.5 A French drain is connected to a septic tank so that the liquid flowing out of the septic tank can flow into the French drain.✓ The French drain allows the liquid to become biodegradable, therefore not so harmful to the environment.✓ (2)

3.6 Both manhole and inspection chambers are large cement boxes in the ground with lids, constructed so that people can inspect below-ground drains.✓ A manhole is larger than an inspection chamber and allows a person to climb into it in order to inspect and work on the drain.✓ An inspection chamber is large enough to allow a person to work on a drain but not large enough for a person to climb into it.✓ (3)

3.7
- Preliminary or open test
- Final test inspection (2)

3.8 A drainage installation is vested in the owner of a site✓ and is intended for the reception, conveyance, storage or treatment of sewage✓ and may include sanitary traps, discharge pipes, drains and ventilation pipes.✓ (3)

[35]

QUESTION 4: SHEET METAL WORK AND FLASHINGS

4.1
- Against the parapet wall✓
- Around a chimney wall✓
- Around a vent pipe✓ (Any 2 × 1) (2)

4.2 Vent pipe flashing is the waterproofing that stops rain from leaking through where a vent pipe from a drainage system protrudes from the roof of a building.✓ It is used around the vent pipe where it protrudes from the roof of the building.✓ (2)

4.3
4.3.1 Vent pipe
4.3.2 Frustum of a right cone
4.3.3 Overlap or bead
4.3.4 Base of the vent pipe flashing
4.3.5 The slope or angle of the roof
4.3.6 Welt
4.3.7 Frustum to be soldered onto the base of the vent pipe flashing
(7 × 1) (7)

4.4
- Stepped flashing
- Apron flashing
- Undercloak flashing
- Soakers flashing (4)

[15]

QUESTION 5: CALCULATIONS

5.1 Volume = l × b × h
= 1.4 × 1.4 × (0.9 – 0.15)✓
= 1.4 × 1.4 × 0.75✓
= 1.47 m³✓ (3)

5.2 Mass = Mass of tank × Mass of water
= (D × V) + 250✓
= 1 000 × 1.47 + 250✓
= 1 470 + 250✓
= 1 720 kg✓ (4)

5.3 Total area = Area of base × Area of sides
= (1.4 × 1.4) + 4(1.4 × 0.9)
= 1.96 + 4(1.26)✓
= 1.96 + 5.04✓
= 7 m²✓ (3)
[10]

TOTAL: 100

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