higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

PLUMBING
NQF LEVEL 3

XX February 2020

This marking guideline consists of 7 pages.

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QUESTION 1: COLD-WATER RETICULATION

1.1 The advantage of using an isometric drawing to calculate materials is that in a pipe arrangement, where pipes change direction,✓ it makes it a lot easier to count the number of fittings✓ and valves that will be required.✓ (3)

1.2
- Underground soil conditions affecting pipe work
- Unexpected obstacles like large rocks
- Underground root systems of trees in the area
- Paving or road surfacing where pipes must be laid
- Pipe ducts in buildings
- Existing concrete floors and slabs
- Different types of external walls
- Roof trusses in the way
- Limited ceiling space
- Historical buildings where installations must match existing pipework

(Any 6 × 1) (6)

1.3 Design velocity is the required speed of water flow that will meet the water-supply requirements of a specific pipe installation. (2)

1.4 The static pressure of a water supply is the water pressure in the system when no water is flowing, in other words, when all the terminal fittings are closed. (2)

1.5
- Ensures a more constant flow rate throughout the network
- Ensures a more constant water pressure throughout the network
- Prevents dead legs that prevent build-up of stagnant water (Any 2 × 1) (2)

1.6
- Safe to drink
- Attractive in appearance (sparkling)
- Free of taste and odour
- Various household uses (Any 3 × 1) (3)

1.7 Minimum depth 750 mm✓ and maximum depth 1 350 mm✓ (2)

[20]

QUESTION 2: HOT-WATER RETICULATION

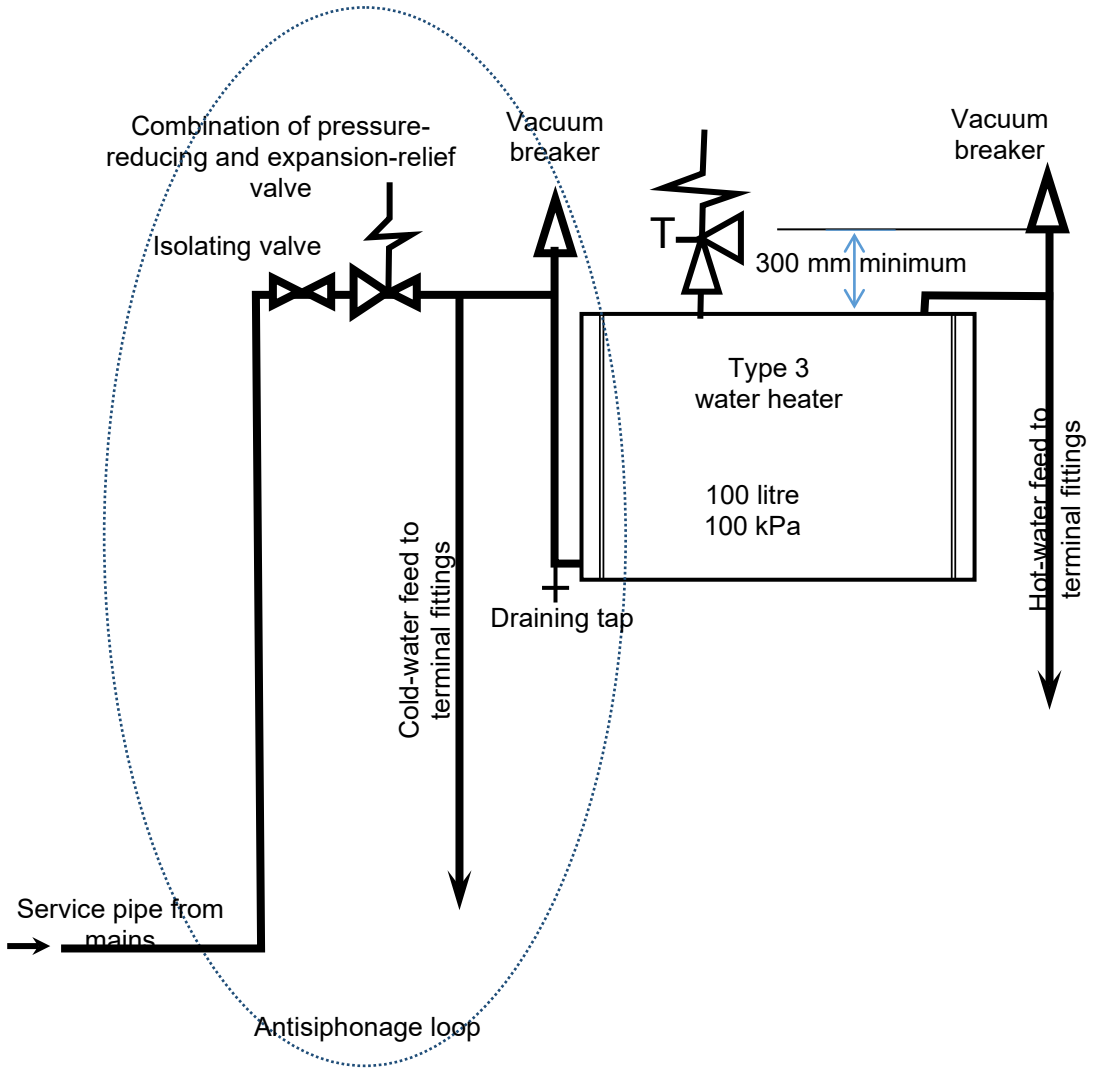
2.1 2.1.1 Stopcock/Isolating valve
2.1.2 Vacuum breaker
2.1.3 Combination of pressure-reducing and -relief valve
2.1.4 Temperature and pressure-safety valve

(4 × 1) (4)

2.2
- Hot water almost immediately available
- Small and compact and can be installed in small spaces
- Simple to install
- No major pipes or valves required
- Expansion pipe and water draw-off pipe is one common pipe
- No expansion pipes through roof or eaves needed (Any 4 × 1) (4)

2.3 A pressure-control valve reduces the incoming mains pressure✓ to a present pressure rating✓ and maintains and controls this pressure when the system is not in use.✓ (3)

2.4



(9)
[20]

QUESTION 3: ABOVE-GROUND DRAINAGE SYSTEMS

3.1 Trap venting occurs when water seal traps and ventilation pipes are used in a drainage system to ensure that smelly and dangerous gasses,✓ which build up in the system,✓ are released outside the building.✓ These gasses should not come back into the building through shower drains, plug holes or toilets.✓ (4)

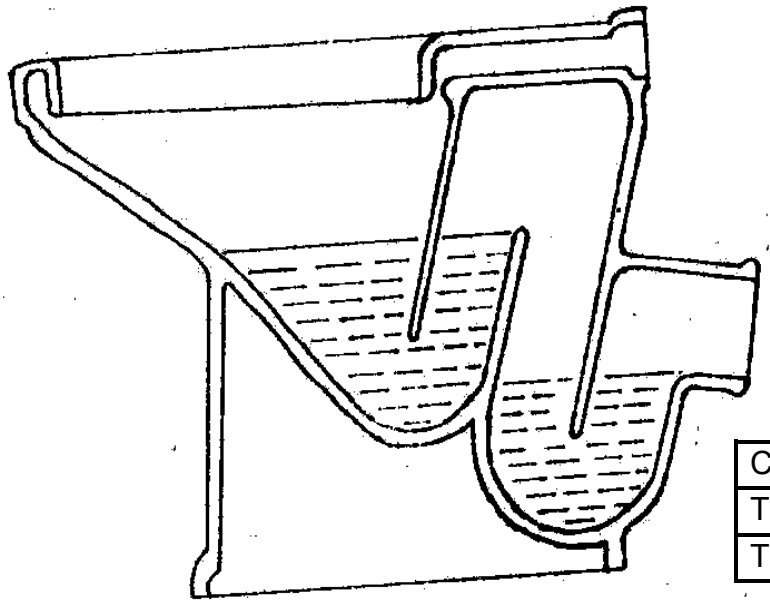
3.2 In a one-pipe system all the soil-water fixtures and waste-water fixtures discharge into a single stack connected directly to the drain. In a two-pipe system all waste fixtures discharge separately into an open waste stack that discharges into a gully and all soil fixtures discharge directly into the drain.
(3 + 3) (6)

3.3 A water-seal trap is the curved section of a drain pipe that always holds some water.✓ This water prevents foul air in the drain from rising and entering the building.✓ The water seal trap is usually connected directly to a sanitary fixture.✓ The water seal is the water that remains inside a water-seal trap after water has been discharged from a sanitary fixture.✓ This water seal must be inside the curve or bend of the trap✓ and must be deep enough to prevent any air from the drain to pass through the bend in the trap.✓
(Any 5 × 1) (5)
[15]

QUESTION 4: SANITARY INSTALLATION

4.1 A splashback is a vertical section of a sink that fits against the wall to stop water that splashes from the sink from reaching the wall.✓ It is much easier to clean the splashback than the wall✓ and it also keeps the wall or plaster dry.✓ (3)

4.2



Correctness	3
Traps	2
Title	1

DOUBLE-TRAP WC PAN (6)

4.3 Suitable bedding will prevent the bath from breaking when someone stands inside it, especially if it is made of fibreglass. (2)

4.4 4.4.1 A toilet is used to catch and dispose of human waste.

4.4.2 A bidet is used for personal hygiene after using a toilet. A bidet looks like a shallow toilet and usually has mixing taps and a spout that is aimed towards the middle of the bidet pan. Bidets are usually fitted with pop-up waste-water outlets.

(2 × 2) (4)
[15]

QUESTION 5: RAINWATER SYSTEM

5.1 A fascia bracket is a special bracket that fastens the gutter to the fascia board and supports the gutter. (2)

5.2 1:350 to 1:600 – Gutters must be installed with the right gradient (slope) towards the downpipe to ensure that there is no water left in the gutter after rainfall. (3)

5.3
- Modified impact and UV (ultraviolet) stability
- White in colour and designed for high-impact performance and stability against harsh climatic (weather) conditions
- Corrosion-resistant therefore unaffected by coastal atmosphere and resistant to industrial pollution
- Lightweight to transport and easy to install
- Excellent flow characteristics that allow for low maintenance and trouble-free performance (Any 4 × 1) (4)

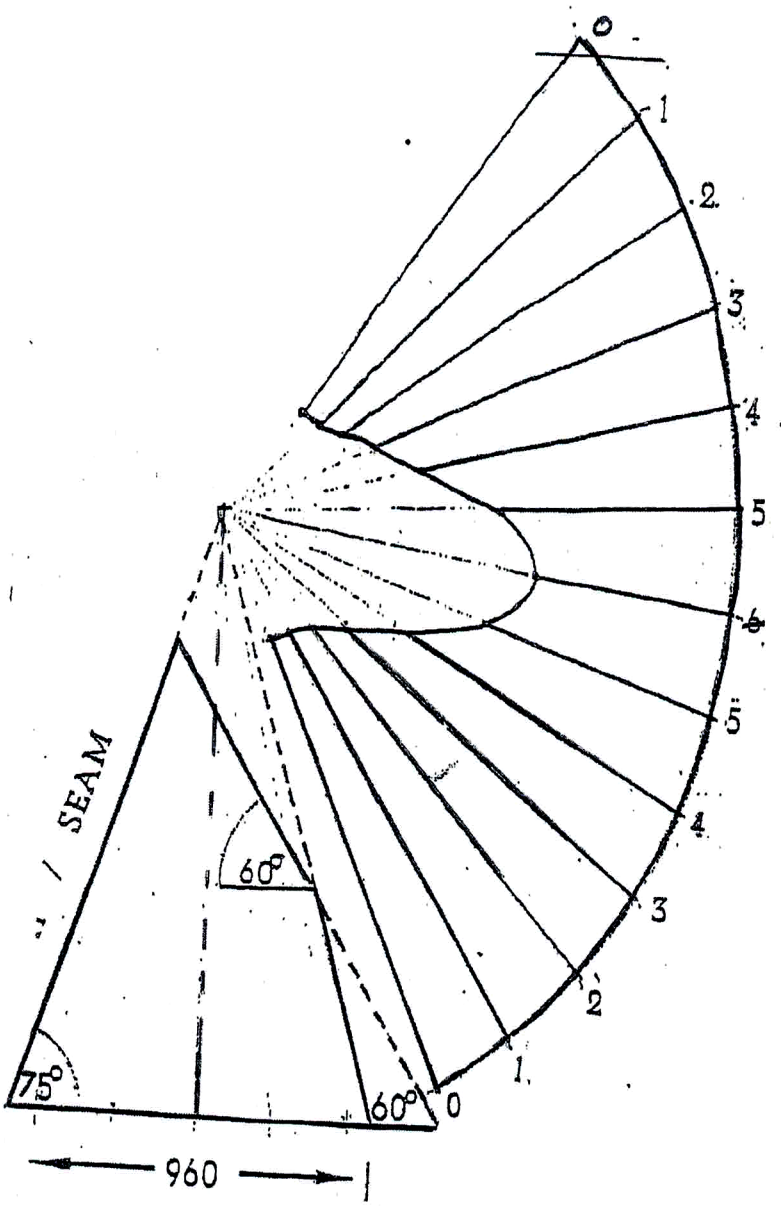
5.4
- Solder and pop rivet joint
- Gutter sealant and a pop-riveted joint
- Expansion or slip joint (3)

5.5 5.5.1 A gutter stop prevents rainwater in the gutter from flowing down at the end of the gutter.

5.5.2 A downpipe shoe is used to discharge and direct water away from the external wall of a building.

(2 × 2) (4)
[16]

QUESTION 6: VENT-PIPE FLUSHING



FRONT ELEVATION

Elevations	2
Scale	1
Neatness	1
Pattern	6

[10]

QUESTION 7: TRENCHING, EXCAVATION AND TRENCH SUPPORT

7.1 Excavating trenches can be very dangerous if the right safety procedures and regulations set out in the Occupational Health and Safety Act are not followed. People can fall into excavations and become buried or trapped due to the dislodgement of the soil in the excavation. Therefore, the sides of the excavation must be properly supported. (2)

7.2
- Timber wedge
- Timber strut
- Wooden waling
- Horizontal sheeting
- Vertical sheeting
- Poling board (Any 2 × 1) (2)

[4]

TOTAL: 100

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