



**higher education
& training**

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE PLUMBING THEORY N2

6 August 2021

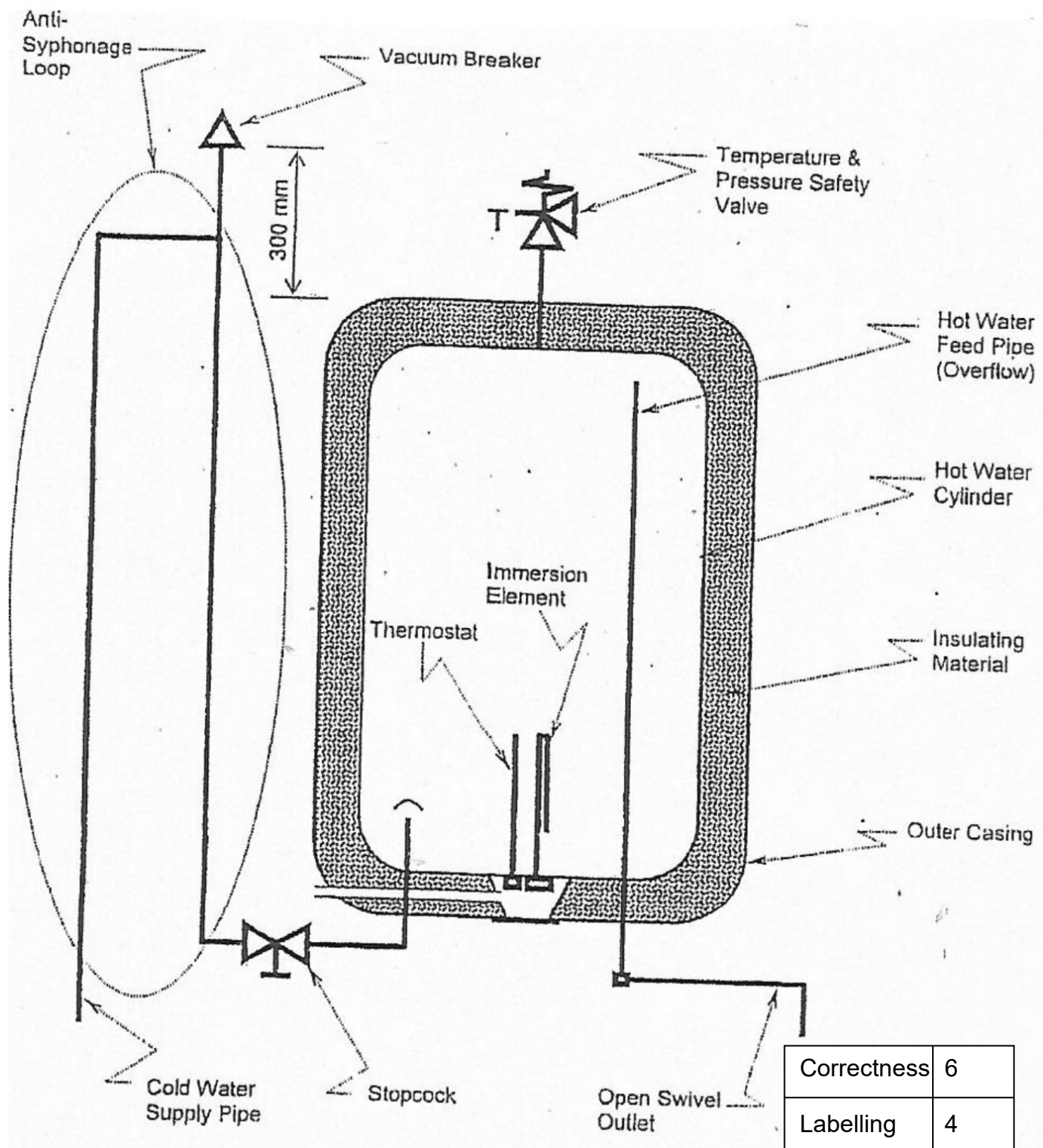
This marking guideline consists of 7 pages.

QUESTION 1: COLD-WATER SUPPLY

- | | | | | |
|-----|--------|-------|----------|------|
| 1.1 | 1.1.1 | True | | |
| | 1.1.2 | False | | |
| | 1.1.3 | True | | |
| | 1.1.4 | False | | |
| | 1.1.5 | True | | |
| | 1.1.6 | False | | |
| | 1.1.7 | True | | |
| | 1.1.8 | True | | |
| | 1.1.9 | False | | |
| | 1.1.10 | True | | |
| | | | (10 × 1) | (10) |
-
- | | | | | |
|-----|----------------------------|--|--|-----|
| 1.2 | Water should be: | | | |
| | • Safe to drink | | | |
| | • Free of taste | | | |
| | • Free of odour | | | |
| | • Attractive in appearance | | | (4) |
-
- | | | | | |
|-----|--------------------------------------------------------------------------------------------------------------------|--|--|-----|
| 1.3 | A pressure zone refers to the reticulation networks✓ that are supplied from a <u>specific service reservoir</u> .✓ | | | (2) |
|-----|--------------------------------------------------------------------------------------------------------------------|--|--|-----|
-
- | | | | | |
|-----|---------------------------------------------------------------------------------------------------------------------------------|--|--|-----|
| 1.4 | Temporary hardness is caused by bicarbonates✓ of calcium and/or <u>magnesium</u> ✓ held in <u>solution by carbon dioxide</u> .✓ | | | (3) |
|-----|---------------------------------------------------------------------------------------------------------------------------------|--|--|-----|
-
- | | | | | |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----|-------------|
| 1.5 | <ul style="list-style-type: none"> • Algae, which releases characteristic odours and tastes. • Disinfecting chlorine, which may produce objectionable taste unless chlorination is well managed. • Carbon dioxide that enables water to take up calcium, magnesium and lead into solution. • Disease-producing organisms of enteric origin. • Organic matter that produces odours and taste such as the odour of hydrogen sulphide upon decomposition. | (Any ONE) | (1) | |
| | | | | [20] |

QUESTION 2: HOT-WATER SUPPLY

2.1



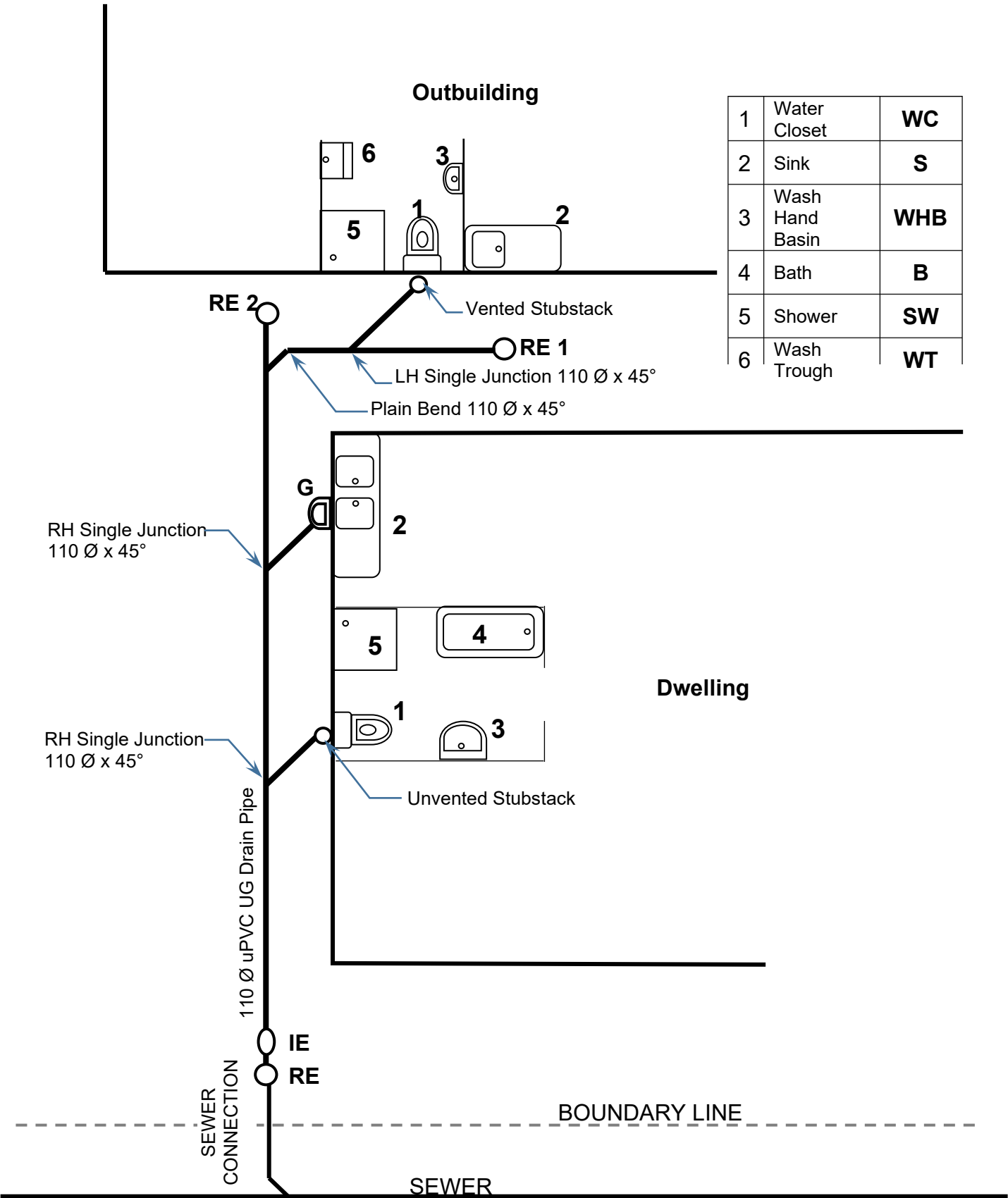
(10)

2.2	2.2.1	Yellow		
	2.2.2	Red		
	2.2.3	Orange		
			(3 × 1)	(3)
2.3	<ul style="list-style-type: none"> To reduce the incoming main pressure. To control the pressure when the system is not in use. To pre-set the pressure rating and to maintain it. 			(3)
2.4	Advantages:			
	<ul style="list-style-type: none"> It reduces labour and material costs. The valve is easily accessible for repairs. 			
	Disadvantages:			
	<ul style="list-style-type: none"> It is costly to replace. If sand grains filter through the supply system, the pressure-reducing valve starts malfunctioning. 			
			(2 × 2)	(4)
				[20]

QUESTION 3: DRAINAGE

3.1	<ul style="list-style-type: none"> Drain is laid according to approved plan. The alignment is true. The invert depths are correct. Drain has effective self-cleansing gradient. Soil cover will be at least 300 mm. Sufficient access is provided. Rodding eyes and gullies are properly compacted and supported. Drain is laid on a solid base. 			(Any 6 × 1)	(6)
3.2	3.2.1	Access branch connection			
	3.2.2	Sink			
	3.2.3	Rodding eye			
	3.2.4	Gulley			
	3.2.5	Septic tank			
			(5 × 1)	(5)	
3.3	To prevent pathogenic gasses, unpleasant odours and cockroaches from entering the building via the sanitary fitment.				(3)

3.4



- 3.5
- Each test hole shall have a diameter of approximately 150 mm and shall have a depth of approximately 400 mm.
 - Remove all loose materials from the test holes.
 - Line each test hole with a polyester filter fabric and cover its bottom with a 50 mm layer of pea sized gravel.
 - Fill the test holes with water to a depth of 300 mm above the layer.
 - Maintain the level for at least 8 hours until the percolation rate of the soil becomes constant.
 - Measure the percolation rate as prescribed in SABS 0250-2.

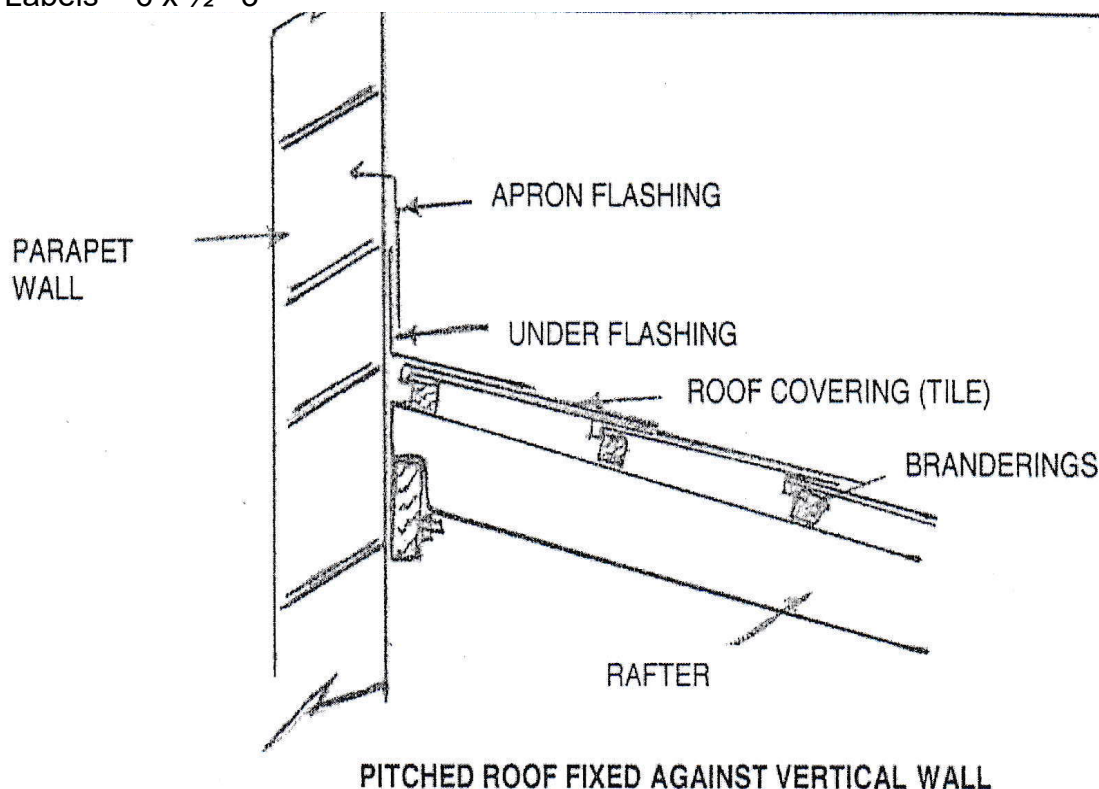
(6)
[35]

QUESTION 4: SHEET-METAL WORK AND FLASHING

- 4.1 Flashing is a strip of material that covers a join between the roof and the brickwork✓ for waterproofing.✓

(2)

- 4.2 Sketch = 5
Labels = $6 \times \frac{1}{2} = 3$



(8)

- 4.3
- Between the brickwork of a chimney stack and the roof.
 - Around vent pipes.
 - At the bottom of dormer windows and the roof.
 - Around skylights and the roof and
 - Where parapet walls extend up next to the roof.

(5)

[15]

QUESTION 5: CALCULATIONS

5.1 Fall of pipe = Length x Fall ratio
 = $10 \text{ m} \times \frac{1}{28}$ ✓
 = 0,357 m ✓
 = 357 mm ✓

Invert level depth of pipe = $357 + 370$ ✓
 = 727 mm ✓

(5)

5.2 Material required = Area of side × Area of base ✓
 = $\pi \times \text{diameter} \times \text{height} + \pi \times (\text{radius})^2$ ✓
 = $(\pi \times 1,3 \times 0,9) + (\pi \times 0,65 \times 0,65)$ ✓
 = $3,676 + 1,327$ ✓
 = 5,003 m² ✓

(5)

[10]**TOTAL: 100**