



**higher education  
& training**

Department:  
Higher Education and Training  
**REPUBLIC OF SOUTH AFRICA**

# **MARKING GUIDELINE**

**NATIONAL CERTIFICATE (VOCATIONAL)**

**NOVEMBER 2010**

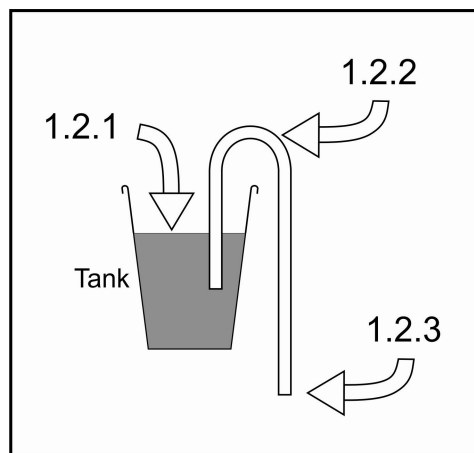
**PLUMBING  
NQF LEVEL 3**

**23 NOVEMBER 2010**

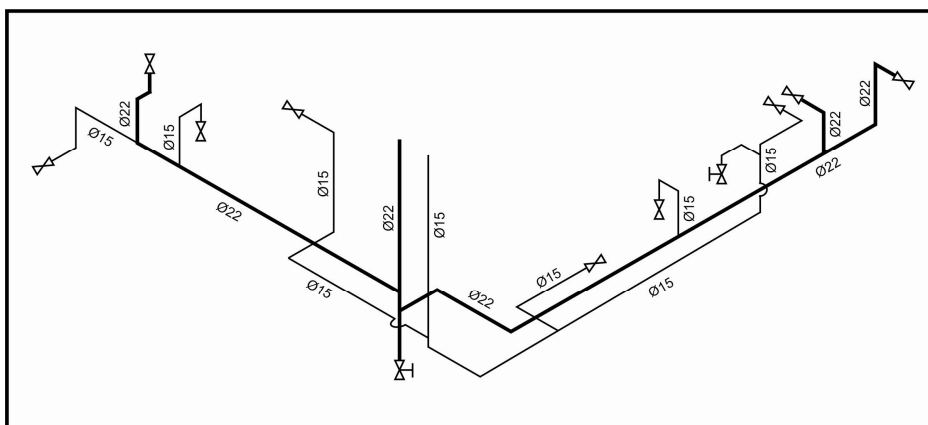
This memorandum consists of 8 pages.

**QUESTION 1: COLD WATER RETICULATION**

- 1.1
- To stop or prevent solid or other strange objects from entering the water system and
  - Causing blockages or polluting the components downstream. (2)
- 1.2
- 1.2.1 The atmospheric pressure is pushing down on the surface level of the water. ✓✓
- 1.2.2 The air pressure in the crown of the inverted U-tube is lower than the atmospheric pressure on the water surface in the tank. ✓✓
- 1.2.3 Water is flowing out of the longer end of the tube. ✓ (5)



- 1.3
- ✓ To what material the pipe is to be secured.
  - ✓ The pipe size.
  - ✓ The pipe material.
  - ✓ The direction of the pipe (horizontally or vertically)
  - ✓ The location where it must be secured.
- Any correct THREE x 1 mark (3)**



**FIGURE 2**

DESCRIPTION	QUANTITY
Valve DZR type Ø 22mm	9
Stopcock DZR type Ø 22mm	2
Fittings DZR compression type	
Equal tee Ø 22mm	3
Unequal tee [or reducing tee] 22 x 15 x 22	1
Unequal tee [or reducing tee] 22 x 22 x 15	2
Elbow 90° Ø 22mm	7
Reducing coupler straight 15 x 22 copper x FI	7
Capillary type fittings	
Equal tee Ø 15mm	3
Elbow Ø 15mm	17
Crossover Ø 15mm	2

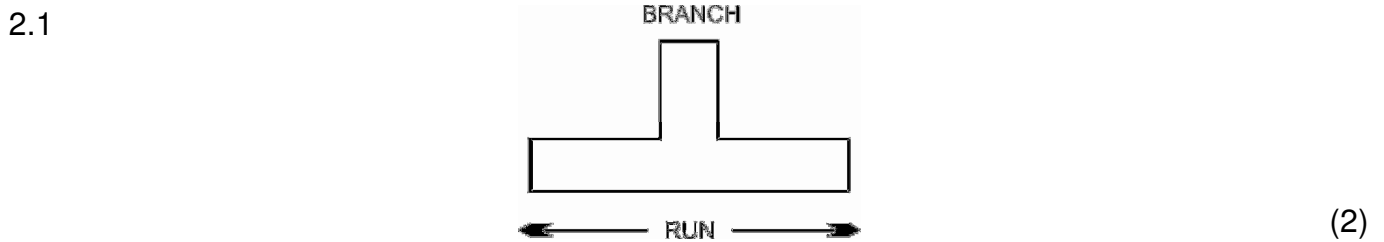
Allocate one mark for a correct description AND quantity.

Do not penalise the candidate if the following item is also listed as a compression type fitting:

- Straight coupler 22 x FI Qty x 4

(10)  
[20]

**QUESTION 2: HOT WATER RETICULATION**



- 2.2
- It has a simple design.
  - It has low maintenance costs.
  - It's easier to install than other geysers.
  - It doesn't require an expansion pipe through the roof.
  - It doesn't need an extra supply tank.
  - It is cheaper than other geysers.
  - It doesn't take up a lot of space.

Any THREE x 1 mark (3)

2.3 2.3.1 Vacuum breaker (or vacuum control valve).

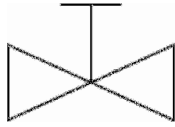
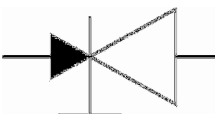


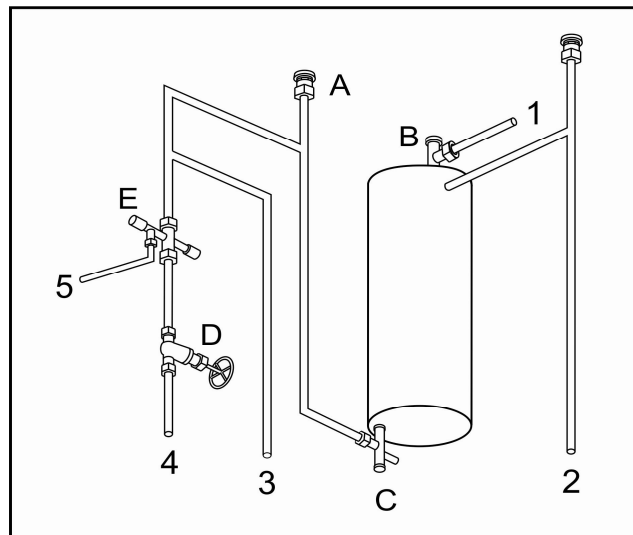
2.3.2 Temperature and pressure safety valve.



2.3.3 Drain cock

No symbol (1)

- |        |  |   |     |
|--------|--|---|-----|
| 2.3.4  | Stopcock.  |  | (2) |
| 2.3.5  | Combined pressure control and expansion control valve.             |  | (2) |
| 2.3.6  | Discharge pipe leading to outside of building.                     |   | (1) |
| 2.3.7  | Hot water feed to taps, mixer taps and showers.                    |   | (1) |
| 2.3.8  | Balanced cold water feed to taps, showers, mixer taps and cisterns |   | (1) |
| 2.3.9  | Mains cold water supply.   |   | (1) |
| 2.3.10 | Discharge pipe leading to outside of building.                     |   | (1) |

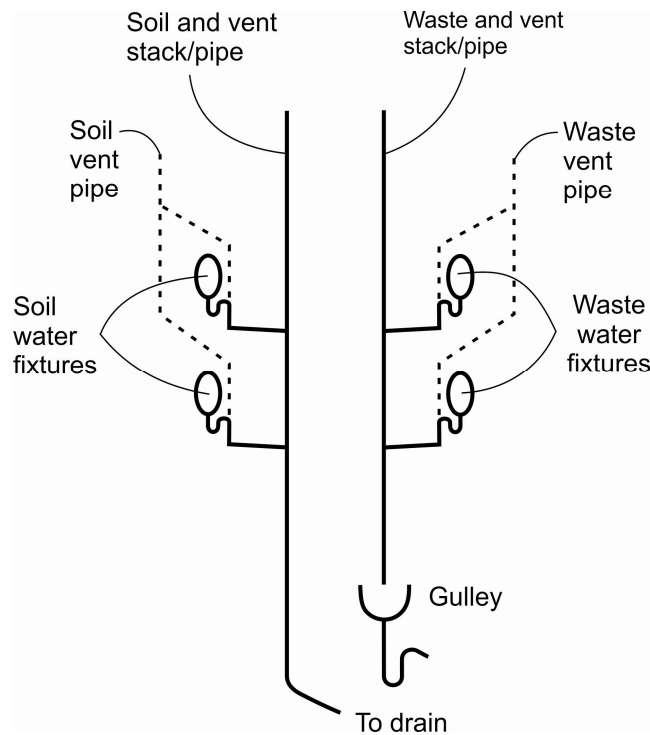


- |     |        |             |
|-----|--------|-------------|
| 2.4 | 100kPa | (1)         |
|     |        | <b>[20]</b> |

**QUESTION 3: ABOVE GROUND DRAINAGE SYSTEMS**

- |     |   |     |
|-----|---|-----|
| 3.1 | <ul style="list-style-type: none"> <li>• It is the principle of connecting the individual water seal traps, from a sanitary fixture, ✓</li> <li>• to a ventilated drain or other ventilated pipe which ✓</li> <li>• leads into the open air. ✓</li> </ul> | (3) |
| 3.2 | <ul style="list-style-type: none"> <li>• To protect the water seal of a trap against negative pressure or ✓</li> <li>• back siphonage. ✓</li> </ul>   | (2) |

3.3



Allocate one mark for each correct label (8)

- 3.4
- It is cheaper because it requires fewer pipes. ✓
  - It looks better from outside because of the fewer pipes ✓
- (2)  
**[15]**

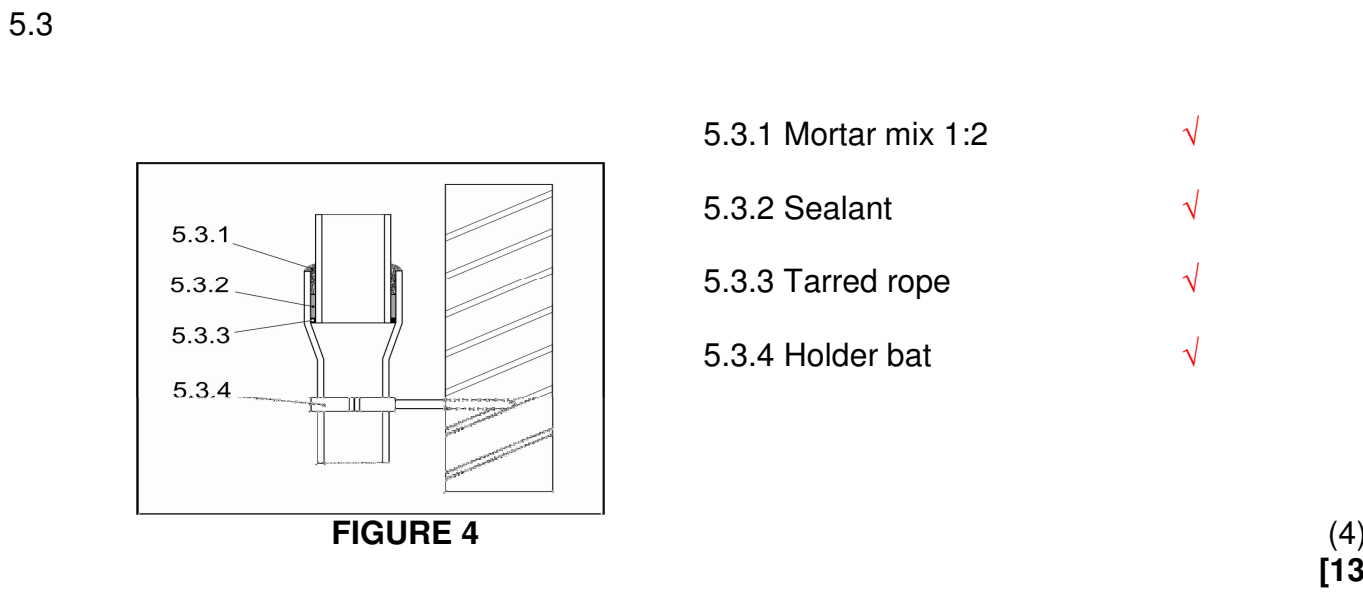
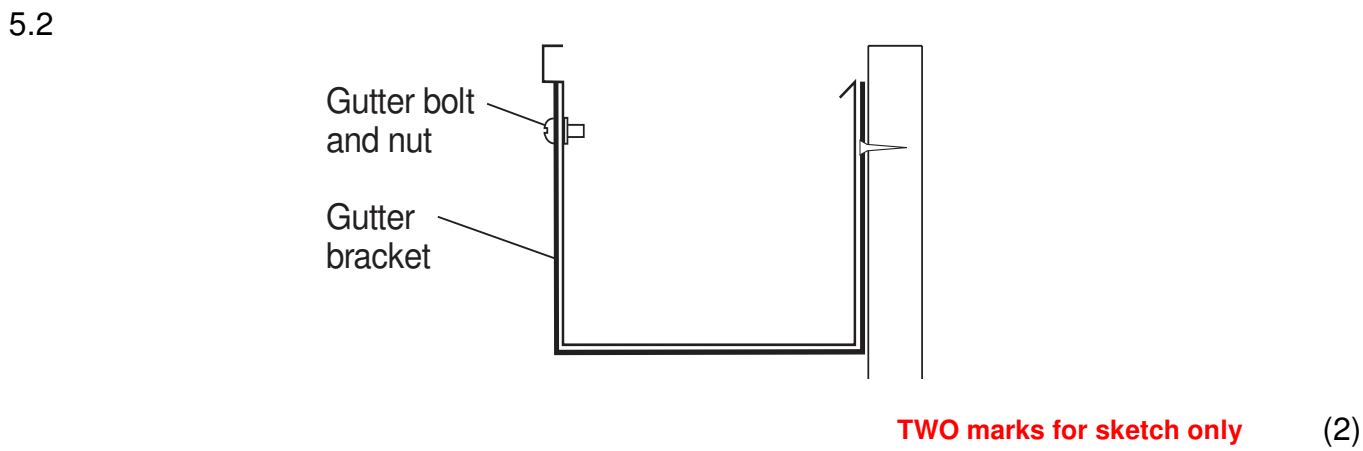
**QUESTION 4: SANITARY INSTALLATION**

- 4.1 A fungus-free silicon (1)
- 4.2
- Knock out the required holes for the taps. ✓
  - Fit the taps. ✓
  - Place basin upside down on a soft material. ✓
  - Fit and tighten the tap washers and nuts. ✓
- (4)
- 4.3 Apply a mixture of putty and PVA paint between the grating outlet and the sink outlet. (2)
- 4.4 42 mm (40 mm) Or (32 mm internal diameter) (1)
- 4.5
- Bottle trap.
  - P – trap
- (2)
- 4.6
- Bolt it down using fixation bolts.
  - Apply a mortar to the underside of the pan
- (2)
- 4.7
- Pressed steel hanger brackets.
  - Single or double semi concealed cast iron brackets.
  - Concealed wall brackets
- (2)

**[14]**

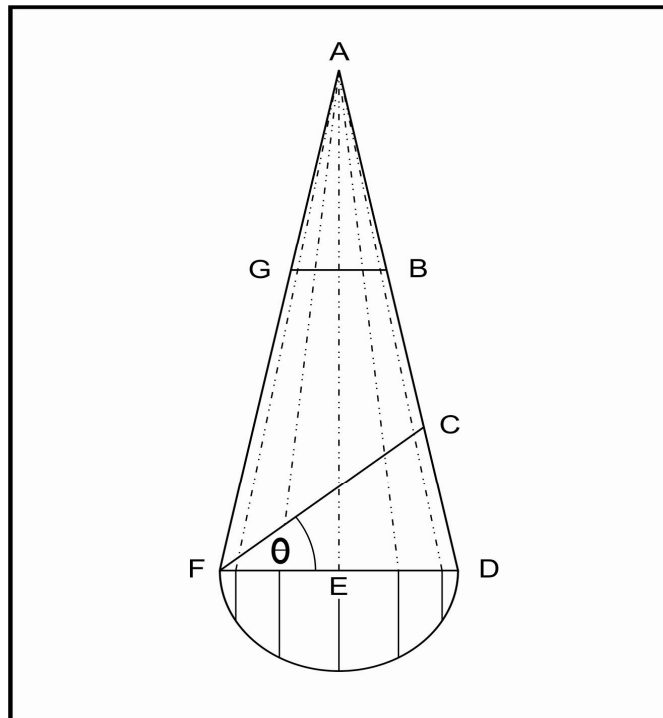
**QUESTION 5: RAIN WATER SYSTEMS**

- 5.1
- Fit the first bracket to the one side of the fascia as high as possible. ✓
  - Measure the length of the gutter and calculate its vertical fall. ✓
  - Fit the last bracket in position on the other end of the fascia. ✓
  - Stretch a fish line or the plumb bob line between these two brackets. ✓
  - Calculate the number of brackets that should go between the end ✓
  - The maximum distance between the brackets is 1m. ✓
  - Mark the position of all the brackets and fix them to the fascia using the line as height gauge. ✓
  - Remove the line. ✓
- (7)



**QUESTION 6: VENT PIPE FLASHING**

- 6.1
- Galvanised mild steel.
  - Copper sheeting.
  - Lead sheeting.
  - Aluminium sheeting.
- (4)
- 6.2
- |       |                                     |                               |   |
|-------|-------------------------------------|-------------------------------|---|
| 6.2.1 | What does line AE represent?        | • Height (or length) of cone. | ✓ |
| 6.2.2 | What does line FD represent?        | • Baseline of cone.           | ✓ |
| 6.2.3 | What does line FC represent?        | • Base of frustum.            | ✓ |
| 6.2.4 | What does line FG represent?        | • Seam                        | ✓ |
| 6.2.5 | What does line GB represent?        | • Diameter of vent pipe.      | ✓ |
| 6.2.6 | What does angle $\theta$ represent? | • Roof slope or angle.        | ✓ |
- (6)



**FIGURE 5**

[10]

**QUESTION 7: TRENCHING, EXCAVATION AND TRENCH SUPPORT**

- Set up the dumpy level in the position where the right angled corner must be.
- Aim the dumpy level down the line of the first leg of the corner and set the cross hairs on a measuring staff held vertically upright by an assistant.
- Drive the first peg into the ground to mark the position of the one leg of the right angled corner.
- Rotate the dumpy level 90 degrees into the direction of the right angled corner.
- Move the measuring staff around until it is clearly visible through the dumpy level and on the cross hairs.
- With the measuring staff upright, drive a second peg into the ground on that spot to indicate the second leg of the right angled corner.
- Use a plumb bob to determine the centre of the dumpy level where you drive a third peg into the ground.
- The three pegs will form a 90 degree angle.

**[8]****TOTAL: 100**