



higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

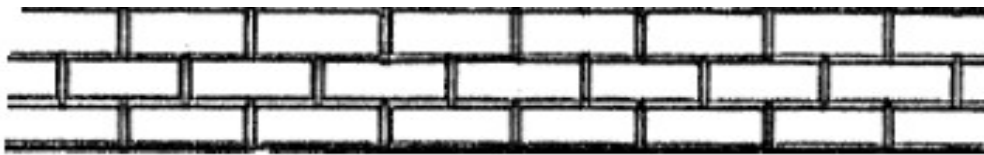
**PLUMBING
NQF LEVEL 4**

22 November 2024

This marking guideline consists of 6 pages.

QUESTION 1

1.1

**THREE COURSE STRETCHER BOND**

(3)

1.2

- 222 mm long
- 106 mm wide
- 73 mm high

(3)

1.3

- Done in 20 mm thick 1:3 cement mortar
- Finished smooth and true with steel trowel and
- Rounded at the corners and edges

(3)

1.4

The invert level is the bottom or lowest level of the inside of the pipe.

(1)

[10]**QUESTION 2**

2.1

Site datum is a fixed measurement on the building site to be used as a reference or starting point for measuring all the invert levels of the drain.

(2)

2.2

- Set up warning lights or other visible lights so that at night the boundary of the excavation is clearly visible.
- Make sure that every excavation, including ones that are shored, is inspected.

(2)

2.3

- The invert level of a drain pipe is the vertical distance measured from site datum to the inside of the bottom of the pipe.
- All necessary invert levels, as well as site datum, will be given on the layout plan and the detailed sectional drawing of the drain.
- Invert level should also be shown at every junction and change of direction of the drain.

(3)

2.4

- Putting in appropriate items down toilet and sinks.
- External items getting into the drain. Leave stone and debris.
- Tree roots, pipe structures issues on paints.

(Any 2 × 1)

(2)

2.5

15 m

(1)

2.6

- Hard
- Firm
- Moderately
- Loose and wet

(4)

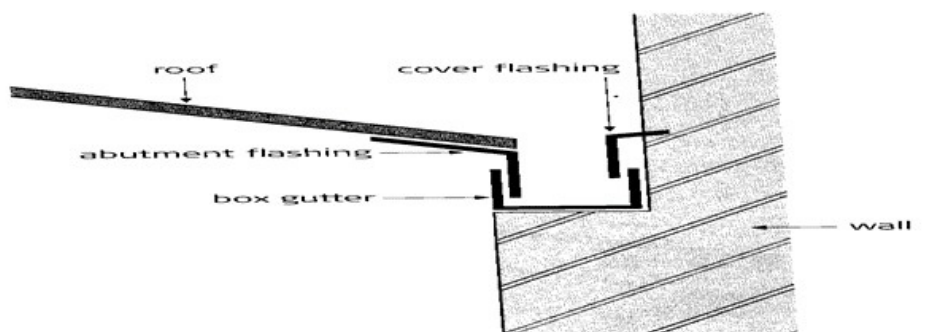
- 2.7
- At the beginning of the drainage area
 - Where a pipe bends
 - If the pipe is very long
 - Where a pipe joins another pipe
 - Rodding eye
 - Manhole
 - Access fitting or
 - Highest point of the drainage system
 - 90° turn, 90° junctions, drain junction and changes of direction (Any 5 × 1) (5)
- 2.8 The main purpose of an air test is to test for leaks in a drainage system. (1)
[20]

QUESTION 3

- 3.1 It will prevent leaks (1)
- 3.2 To look pretty (1)
- 3.3 600 kPa (1)
- 3.4
- Cut out the leaking piece of pipe.
 - Measure the length of the pipe that you have to remove.
 - Cut the new pipe 2 mm shorter than the piece you have removed.
 - Use a slip socket larger than the pipe to hold the old and new pipe together.
 - Use sand paper to clean the ends of all the copper pipe
 - Apply flux to both the inside of the socket and the outside of the pipe.
 - Fix the pieces together.
 - Use blow torch to heat up the pipe.
 - Remove any excess flux after the joint has been soldered. (9)
- 3.5
- Remove the entire section of pipe between two couplings and screw a new section into the existing structure or
 - Remove only the broken bit and replace it by fitting with new couplings to hold the new section. (2)
- 3.6 It is to heat water (1)
- 3.7 It drains out water (1)
- 3.8
- Hacksaw
 - File
 - Tape measure (3)
- 3.9 A plunger (1)
[20]

QUESTION 4

4.1

**BOX GUTTER**

(5)

- 4.2
- Apply bituminous paint, ✓ alkali-resistant lacquer or zinc ✓ chromate paint can be used.

- Use a moisture-proof membrane (DPM) ✓ such as plastic film. ✓

(4)

- 4.3 We use abutment flashing where the roof meets the box gutter.

(1)

- 4.4
- Apron flashing
 - Step flashing
 - A back gutter

(3)

- 4.5 Soakers are pieces of metal that are used to waterproof between the wall and the roof covering.

(2)

[15]**QUESTION 5**

- 5.1
- | | |
|-------|---------------------|
| 5.1.1 | Energy from the sun |
| 5.1.2 | Feel every day |
| 5.1.3 | Makes us hot |
| 5.1.4 | Radiant energy |
| 5.1.5 | Life giving energy |
| 5.1.6 | Sources of energy |
| 5.1.7 | Run out |
| 5.1.8 | Harmful by-product |

(8 × ½)

(4)

- 5.2 Radiant energy is sent out in the form of waves

(2)

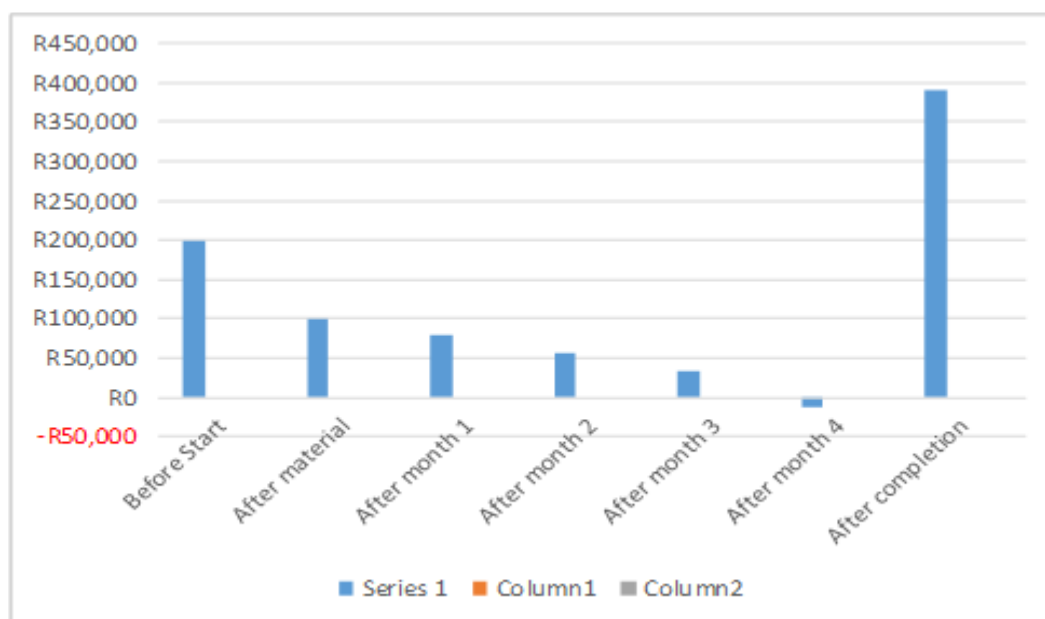
- 5.3
- Glazed flat-plate collectors are insulated weatherproof boxes that contain a dark absorber plate under one or more glasses or plastic (polymer). ✓
 - There are flow tubes or channels in the plate through which the water circulates and is heated in the process. ✓
 - Unglazed flat plate collector has a darker absorber plate made of metal or polymer. ✓
 - They have no cover or enclosure and are typically used for solar pool heating. ✓

(4)

- 5.4 • The integral-collector storage system (ICS)
 • Thermosyphon system (2)
- 5.5 • Active solar water heaters
 • Passive solar water heaters (2)
- 5.6 It needs back up system to provide hot water on cloudy days and during periods of increased demand (2)
- 5.7 A demand water heater is a heater which the water is heated at the time of demand. (2)
- 5.8 This will limit the amount of radiation the system receives (2)
- 5.9 • Make as few roof penetrations as possible.
 • Locate the rafters to which you will be attaching the collectors.
 • Seal all roof penetrations with silicone sealant. (3)
- 5.10 So that when the pump is turned off, the glycol will not flow backwards around the loop. (2)
- [25]**

QUESTION 6

- 6.1 In order to find out whether the business is viable. (1)
- 6.2



- Before starts: 200 000
- After material: R100 000
- After month 1: R78 000
- After month 2: R56 000
- After month 3: R34 000
- After month 4: -R12 000
- After completion: R390 000 (7)

6.3 A clause is a part of a legal business document covering a particular subject of the document. (2)
[10]

TOTAL: 100