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.

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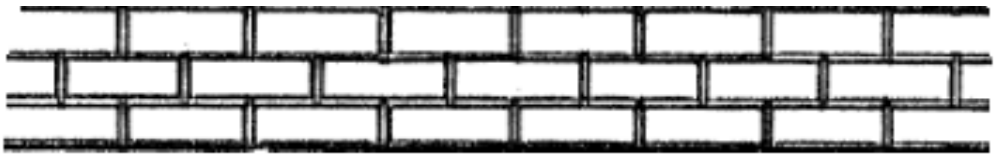
QUESTION 1

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)

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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)

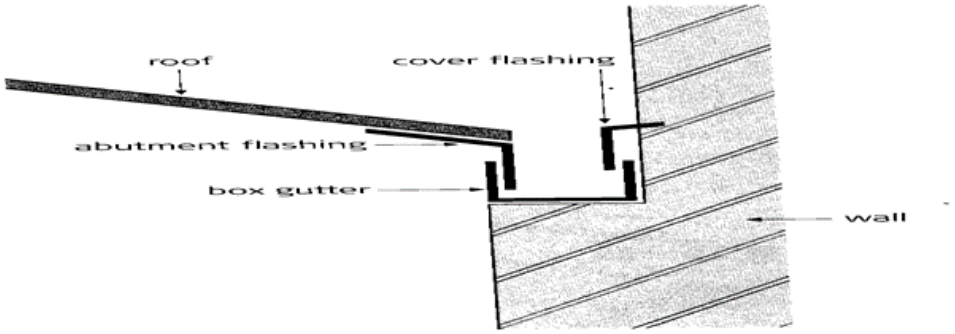
3.7 It drains out water (1)

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)

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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)

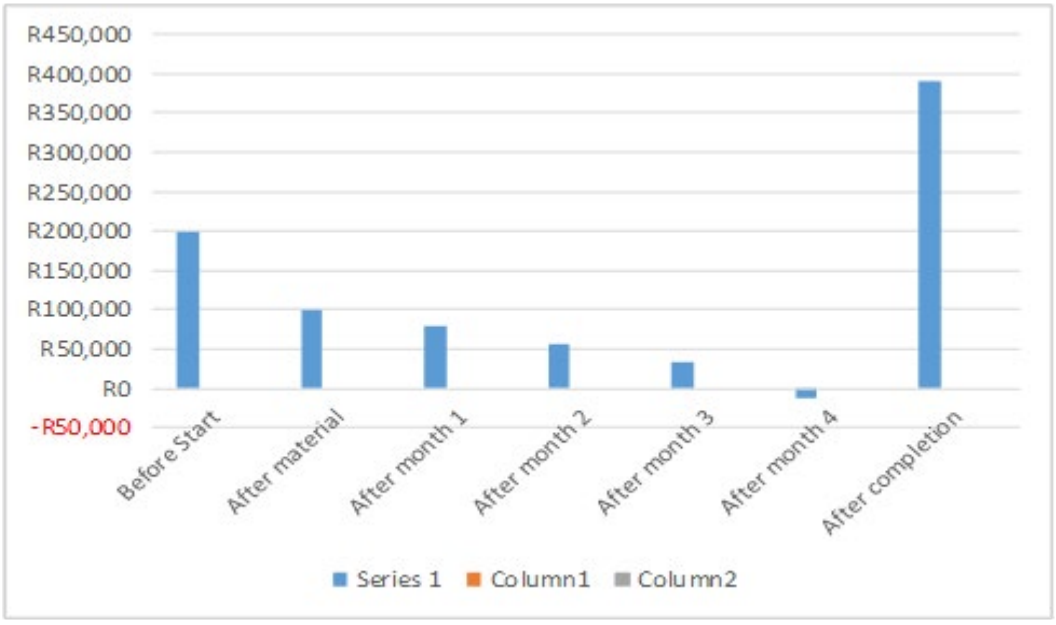
5.9
- Make as few roof penetrations as possible.
- Locate the rafters to which you will be attaching the collectors.
- Seal all roof penetrations with silicone sealant. (3)

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

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