higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

ROADS

NQF LEVEL 3

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This marking guideline consists of 5 pages.

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QUESTION 1: FURTHER ROAD BUILDING TERMINOLOGY

1.1

1.1.1 False
1.1.2 True
1.1.3 True
1.1.4 True
1.1.5 True
1.1.6 True
1.1.7 True
1.1.8 True
1.1.9 False
1.1.10 False

(10 × 1) (10)

1.2

1.2.1 Fill – material that is used to fill the part of the road above the roadbed, between the side slopes of the road.

1.2.2 Subsoil drain – is part of a network that is built and positioned to catch and remove any subsoil water.

1.2.3 Road shoulder – is the surface between the outer edge of the travelled way and the slopes of the shoulder breakpoint.

1.2.4 Roadbed – is the natural material that a fill or pavement layers will be built on.

1.2.5 Camber/cross fall – is the straight section of the road built with a slope from the middle out towards the edge of the shoulder.

(Any 5 × 2) (10)
[20]

QUESTION 2: INTRODUCTION TO ROAD SURFACING

2.1
- to improve safety
- comfort and durability
- to reduce noise pollution (3)

2.2
- Binder distributor
- Water sprinkler
- Rotary broom
- Hand broom
- Strings
- Reinforced paper

(Any 4 × 1) (4)

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2.3
- Place the mat or reinforced paper across the road base at the prime starting
- point and at the finishing point.
- Make sure that the operator knows the application rate.
- Lightly spray water over the surface of the base and let penetrate.
- Check the temperature of the prime.
- Check the volume of the primer in the distributor with a dipstick
- If the spray temperature is correct and water has penetrated, the operator of
- the distributor can start to spray prime. (Any 5 × 1) (5)

2.4
- slipform pavement
- paver spreader
- slipform paver (3)

[15]

QUESTION 3: ROAD FURNITURE

3.1
- regulatory signs
- warning signs
- guidance signs (3)

3.2
- control signs
- command signs
- prohibition signs
- reservation signs
- comprehensive signs
- exclusive secondary message signs
- derestriction signs

(Any 5 × 1) (5)

3.3
- bolts
- Spencer block
- guardrail (2)

[10]

QUESTION 4: ROAD SURVEYING

4.1 **Horizontal curve**
- simple curve
- compound curve

Vertical curve
- sag curve
- crest curve (4)

4.2
- where there is a bend or road curve
- where there is a hill or slope on the road (2)

4.3
- string method
- quarter method
- tangent method
- offset method (4)

4.4
- Always use the two known points at A and B to begin constructing the horizontal curve.
- Draw a line that joins A and B. Bisect the cord AB at point D.
- Construct a line vertically from D to point C. Line CD is the same length as line DB. Point C is known as the point of intersection.
- Join point A to point C and bisect line AC at point E. Join point C and bisect BC at point F.
- Draw a perpendicular line from point E. Join G. Draw a perpendicular line from point F to point H. (5)

4.5
- Place a tripod over a station.
- Take a theodolite out of its case and attach it to the tripod head.
- Observe the station through the optical plummet.
- Adjust the length of two tripod legs at the same time while keeping the third
- firmly in the ground.
- Use the plate level to level the instrument exactly. (5)

4.6
- centring the theodolite
- levelling the theodolite
- removing parallax (3)

4.7
- It can level the ground accurately.
- It is the instrument that levels the ground the fastest. (2)

[25]

QUESTION 5: EARTHWORKS

5.1

5.1.1 Pad foot roller
5.1.2 Vibratory roller
5.1.3 Pneumatic roller
5.1.4 Smooth drum roller
5.1.5 Grid roller
5.1.6 Impact roller

(6 × 1) (6)

5.2 5.2.1 Cohesive soil is a type of soil that naturally sticks together.
- clay soil (4)

5.2.2 Non-cohesive soil does not stick together naturally.
- sand (4)

5.3
- plate compactor
- rammer compactor
- hand stamper
- Bomag compactor (4)

5.4
- modified AASTHO
- sand replacement density test
- California bearing ratio
- relative density test (4)

5.5 Modified AASHTO
- 152,4 mm diameter mould
- base plate weighing at least 200 kg

Sand replacement test
- 300 mm steel ruler
- 5 litre container, sealable

California bearing ratio test
- container
- moist bag

Relative density
- glass stirring rod
- spatula or spoon

(8 × 1) (8)
[30]

TOTAL: 100

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