higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

ROADS
NQF LEVEL 3

21 November 2024

This marking guideline consists of 5 pages.

Copyright reserved

QUESTION 1

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 False
1.1.8 False
1.1.9 False
1.1.10 True

(10 × 1) (10)

1.2
1.2.1 The channel used to direct the flow of water into culverts and under minor bridges.

1.2.2 The drain built at an angle to the direction of the road to divert water from the side drain.

1.2.3 A longitudinal drain built at the base of the cut slope and at the base of the fill.

1.2.4 Part of the network of drains built and positioned to catch and remove any subsoil water.

1.2.5 A material in a pavement that cannot be broken with the tines of a road grader ripper.

(5 × 2) (10)
[20]

QUESTION 2

2.1
- Reduction in noise pollution
- Improvement
- Comfort and durability (3)

2.2
- Binder distributor
- Chip spreader
- Rollers
- Dredger
- Front-end loader
- Tipper trucks (Any 5 × 1) (5)

2.3
- Crushing value
- Fact value
- Polishing value
- Faking index
- ALD (average least dimension) (5)

2.4 Is the process whereby a compaction plant is used to farce the soil particles together. (2)
[15]

QUESTION 3

3.1
- To provide consistent rules for all the drivers.
- To be understand by any drivers.
- To give you warning about the event ahead.
- To give the motorist safety during heavy traffic on road.
- To keep pedestrians and cyclist safe a road. (5)

3.2
- Control signs
- Command signs
- Prohibition signs
- Reservation signs
- Comprehensive signs
- De-restriction signs (Any 5 × 1) (5)

[10]

QUESTION 4

4.1 Where there is a change in the slope/gradient of the road.
- Sag curves.
- Crest curves. (4)

4.2 Is the length of road ahead that is visible to the driver. Because it allows drivers to see any hazards on the road with enough time to act safety to either move around the hazards or to stop. (4)

4.3
- The string method
- Quarter method
- Tangent method
- Off-set method (4)

4.4
- Place the tripod in position and extend the legs to the desired height.
- Anchor the tripod by pressing down along the legs of the tripod to guarantee that the tripod feet are firmly placed into the ground.
- Make sure that the tripod is level by watering that the position of the tripod is horizontal.
- Place the level on the tripod.
- Make sure that the circular bubble is centered by adjusting the levelling foot screws.
- Adjust the crosshairs so that they are centered on the level staff.
- Focus on the staff once the exact alignment is obtained.
- Using the tilting screw, centre the tubular bubble and note the staff reading.

(Any 5 × 1) (5)

Copyright reserved

4.5
- Set up the theodolite that is levelled and centered.
- Point the telescope towards the object of the sight.
- Look through the telescope and focus on the target and make sure the target is visible.
- Look into the reading microscope.
- Adjust the mirror until the light is reflected into the instrument to take clear and accurate reading.
- Twist the eye piece to make the focus clear. (Any 5 × 1) (5)

4.6
- Optical micrometer
- Screw
- Plate tube
- Movable head
- Mirror
- Telescope (Any 3 × 1) (3)

[25]

QUESTION 5

5.1
- Static compaction: This is where soil is compressed under heavy loads for a long period of time.
- Dynamic compaction: This is where the soil is compacted using a vibration or tapping action. (4)

5.2

5.2.1
- It relies on deadweight of the machine to carry out compaction.
- Distribute deadweight loads to the ground; large diameter steel drum wheels.

5.2.2
- This can be self-propelled or towed behind another vehicle like a bulldozer or track.
- Both the frequency and amplitude of the vibration can be adjusted on most models.

5.2.3
- Self-propelled or towed steel roller ranging from 2-20 mm tones.
- It can be unstable for uniformed sand, silty sand and sift clay.

5.2.4
- This is a massive square weight that is towed.
- Can be effectively compact between 2-4 m in uniform sand that has low moisture content.

5.2.5
- This uses water for ballast to increase the machinery weight.
- This has smaller wheels made of rubber, usually seven with the front and rear treads interlocked.

(5 × 2) (10)

5.3

Soil	Plant to be used	Reason
Silty sand & clay	5.3.1 Tamping roller	5.3.4 High water content needed for compaction.
Granular materials	5.3.2 Tamping vibrator	5.3.5 These offer various strength depending on the type of grade.
Crushed stone	5.3.3 Vibrating smooth roller drum	5.3.6 Compacted well. Then it is saturated with water and rolled with a static roller to bring fines to the surface.

(6)

5.4
5.4.1 Poor
5.4.2 Excellent
5.4.3 Poor
5.4.4 Good
5.4.5 Very poor

(5 × 1) (5)

5.5
- The modified AASHTO test.
- The sand replacement test.
- The California bearing ration.
- The relative density test. (4)

5.6
- 152,4 mm diameter mould that is 152,4 mm high with detachable base plate that is usually fixed onto a concrete block weighing at least 200 kg.
- 25,4 mm spacer plate that is firmly attached to the base plate and fits inside the bottom of the mould so that the effective depth of the mould is 127 mm.
- 50,8 mm diameter tamper that weighs 4,536 kg and is fitted into a sheath to give a 457,2 mm drop.
- 300 mm long straight edge. (Any 1 × 1) (1)

[30]

TOTAL: 100

Copyright reserved