higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

ROADS
NQF LEVEL 4

28 November 2023

This marking guideline consists of 6 pages.

Copyright reserved

QUESTION 1

1.1 1.1.1 Aquaplaning will occur when a thin layer of water is present or builds up √ between the tyres and the road surface.√ (2)

1.1.2 This will lead to loss of traction/grip √
Will prevent the vehicle from responding to the drivers control √ when steering, accelerating or braking.√ (3)

1.2 1.2.1 Kerbs
- Urban roads
- Lower mobility roads
- Cross roads
- Junctions
- Bridges
- Separating a road from a walkway
- Erosion protection at the side of a road
- Road edge cover
- Catchment or collection structures. (Any 2 x 1) (2)

1.2.2 Drifts
- Along areas with a stream crossing a road
- Streams that have minimal water flow (2)

1.3
- Front
- Back
- End
- Base
- Diaphragm (Any 3 x 1) (3)

1.4 Foundation surface
- Must be level
- Graded to elevations shown in construction drawings
- Must be smooth
- Free from any surface irregularities
- Free from loose material
- Free from any vegetation (Any 4 x 1) (4)

1.5 1.5.1 Soil strength
- The removal or release of air spaces/voids in the soil
- Increases the load capacity of the soil (2)

1.5.2 Voids (air space) and moisture content.
- No matter how much compaction was done, soil will still have air spaces/voids in the soil
- Soil will still contain moisture
- Moisture between the air spaces will loosen and weaken the soil. (Any 2 x 1) (2)

Copyright reserved

1.6
- Checking the different elements regularly
- Routine maintenance
- Routine cleaning operations
- Checking the functionality regularly
- Repair broken parts regularly (Any 4 x 1) (4)

1.7
- Square shafts
- Rectangular shafts
- Circular/round shafts (Any 2 x 1) (2)

1.8
- Reinforcement/stabilization
- Drainage
- Filtration
- Separation (4)

[30]

QUESTION 2

2.1 2.1.1 Rigid pavements
- Reinforced √concrete√ (2)

2.1.2 Flexible pavements
- Bituminous material√ or asphalt√ (2)

2.2 To check the consistency √of cured concrete√ (2)

2.3
- Herringbone pattern
- Basket weave pattern
- Stretcher bond pattern (3)

2.4
- Selected
- Uniformly graded
- Clean
- Correct moisture content (Any 2 x 1) (2)

2.5
- It provides good drainage.
- It provides reference levelling when laying bricks.
- It provides pavement support.
- It helps to lock to interlock with the pavement.
- It ensures that the laying course material does not wash away.
- It provides a good aesthetic appearance. (Any 4 × 1) (4)

2.6
- Use a knife or screwdriver to gently remove the sand around the concrete blocks.
- Lift out the damaged concrete blocks using two screwdrivers.
- When the first block is removed remove the other blocks.
- Carry out maintenance on the concrete block pavement.

Copyright reserved

- After maintenance is complete, excavation work should be backfilled with bedding sand at the same density as the original.
- Level out the sub-base layer.
- Replace broken paving blocks.
- Fill joints with jointing sand. (Any 5 × 1) (5)

2.7
- Thermal insulated gloves
- Loose clothing with closed collar
- Long sleeve shirts
- Metal toed safety boots
- Face protection
- Eye protection (Any 3 × 1) (3)

2.8 2.8.1 Bitumen is a viscous/sticky√ or solid√ dark brown material or substance.√ (Any 2 × 1) (2)

2.8.2 Obtained from the distillation √of a very specific quality crude oils √ during the production of petroleum fuels. √ (3)

2.9
- Good aggregates interlock.
- Low permeability.
- Strength and stiffness are derived from binder and aggregate structure.
- Relatively high binder contents provide good durability.
- Best used in areas of heavy traffic where rutting and fatigue and cracking are of concern. (Any 4 × 1) (4)

2.10
- Batch or mixing plant (2)
- Mobile asphalt plant

2.11 Consists of the application of liquid asphalt material √ to cover a road surface or parking lot. √ (2)

2.12
- To provide a waterproof barrier
- Prevent water infiltrating through the road surface
- To protect the sub-layers
- Provide good surface drainage
- To produce an all-weather road surface
- To improve safety by minimizing loose stone aggregate
- To add additional strength to the road
- T provide a smooth uniform appearance
- To provide non-skid driving conditions (Any 4 × 1) (4)

[40]

QUESTION 3

3.1 3.1.1 Edge breaks.
- Damage caused to the edge of the road
- Damage caused due to insufficient lateral support from the road shoulder (2)

3.1.2

Potholes
- Surface failures within the surface layer
- Forming a hole in the surface layer

(2)

3.1.3

Partial patching in the surface layer, failures such as:
- Raveling
- Rutting
- Potholes
- Cracks

(Any 2 × 1) (2)

3.2
- To provide a message to the road user
- To provide guidance
- To command attention
- To convey a clear simple meaning
- To command respect
- To give adequate time to respond

(Any 4 × 1) (4)

3.3
- Grass cutting
- Clear and control invader plants
- Improve visibility
- Culvert cleaning
- Cleaning and clearing water ways
- Cleaning and clearing bridges
- Cleaning surface drains
- Erosion control
- Fence and boundary repair

(Any 5 × 1) (5)

3.4 3.4.1 Road maintenance
- To slow down the deterioration of the road
- To preserve and extend the service life of the road

(2)

3.4.2 Road rehabilitation
- Reverses/minimizes the effect of deterioration
- Adding or replacing materials in the existing road surface
- Removal of sections of the existing road
- Restoration of original slope
- Restoration of original drainage

(Any 2 × 1) (2)

3.4.3 Road reconstruction
- Complete replacement of the road structure
- Apply new pavement construction methods

(2)

3.5
- To keep the roads safe at all times
- To prevent and minimize potential accidents and damage to vehicles. (2)

3.6 PPC overlays will provide
- A relatively thin wearing course
- Highly durable wearing course
- Good structural capacity (3)

3.7 In situations where spalling √and cracking of concrete √is beyond repair (2)

3.8 Joints are provided
- To accommodate expansion
- To accommodate contraction
- Linear movement due to temperature variations (Any 2 x 1) (2)

[30]

TOTAL: 100