higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

CONCRETE STRUCTURES
NQF LEVEL 4

XX FEBRUARY 2020

This marking guideline consists of 5 pages.

Copyright reserved

QUESTION 1

1.1 True
1.2 True
1.3 False
1.4 False
1.5 True
1.6 True
1.7 True
1.8 False
1.9 True
1.10 True

(10 × 1) **[10]**

QUESTION 2

2.1 2.1.1 Crown:✓ Usually these ties are used to tie together bars that might spring apart, such as those found in heavy base mats.✓

2.1.2 Hairpin:✓ Hairpin ties secure the cage completely before the concrete is placed in the formwork.✓

2.1.3 Ring hairpin:✓ These ties prevent slipping and are good for walls.✓

2.1.4 Splice:✓ Splice ties are used to tie lap splices together. Lap splices are joints used where two bars overlap.✓

2.1.5 Slash:✓ They are used to tie together the area between main ties, such as a slab at the bottom or top slabs and bases.✓

2.1.6 Ring slash:✓ These ties prevent horizontal bars from slipping down and are good for walls.✓

(6 × 2) (12)

2.2 It is a wire used to tie reinforcement bars together. (2)

2.3
- To tie reinforcement steel together as it is malleable.
- Always pull the wire binding tight so that the reinforcement stays in position.
- It must be able to resist movement when loads are placed on it.
- Create a firm tight tie if the bending wire is malleable enough to easily bend around the reinforcement steel
- It is thick enough not to break when stressed.
- One can easily cut the black annealed wire with pliers or bend it by hand.

(5 × 2) (10)

2.4 Tying wire nip✓ and bar tie twister✓ (2)

2.5
- Eye protection or goggles
- Overalls
- Safety boots
- Helmet
- Gloves (5)

2.6
- To ensure that the embedded portion does not extend into the specified minimum cover
- They should terminate at a distance of not less than the specified minimum cover from the formed surface of the concrete. (2 × 2) (4)

[35]

QUESTION 3

3.1
- The number of bars in the set
- The bar mark
- The bar type and size
- The bar spacing
- The bar location
- The bar centre to centre (Any 5 × 1) (5)

3.2
3.2.1 Plain round mild steel bars, of strength 250 MPA
3.2.2 High-yield deformed steel bars, of strength 450 MPA
3.2.3 Types of steel not covered by R or Y
3.2.4 Standard mesh
3.2.5 Design mesh (high-tensile wire, of strength 485 MPA)
(5 × 1) (5)

[10]

QUESTION 4

4.1
- Some water could evaporate from the mix and this could lead to a decrease in slump.
- Concrete temperature may increase due to friction.
- Some entrained air may be lost from air-entrained concrete.
- If the aggregate is soft, grinding will occur that produces a fine material and reduces workability. (4)

4.2
- Set the mix so that it is level.
- Do not overload the mixer.
- Replace worn blades.
- Regularly adjust the blades of the pan mixer to operate in the right position.
- Run the mixer at the correct speed.
- Discharge the complete batch before starting the next batch.
- Clean the mixer thoroughly after each use. (Any 6 × 1) (6)

Copyright reserved

4.3 4.3.1 1,5 cubic metres
4.3.2 1 minute
4.3.2 20 seconds
4.3.4 10 minutes
4.3.5 6 minutes

(5 × 1) (5)

4.4 Plastic settlement cracking is the result of bleeding that negatively affects the strength and durability of concrete structures. (2)

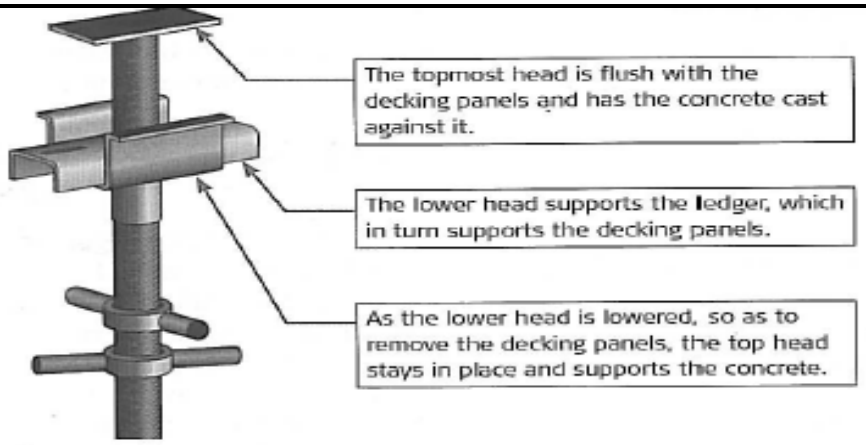
4.5
- Avoid overworking the surface
- Remove laitance
- Vacuum dewatering
- Re-vibrate (4)

4.6 4.6.1 Blowholes: unwanted individual cavities, usually less than 10 mm on the surface of the concrete.

4.6.2 Bleeding: occurs when some of the mixing water rises to the surface of the concrete as the solid material settles.

(2 × 2) (4)
[25]

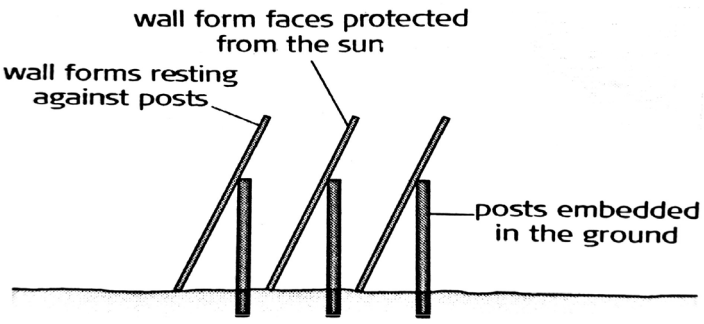
QUESTION 5



Mark allocation
Correctness = 4
Label = 6 **[10]**

QUESTION 6

6.1



Mark allocation
Correctness = 3
Label = 3 (6)

6.2
- Do not store timber where passing traffic on site (construction vehicles or workers) could accidentally bump into and damage the forms.
- Prevent construction workers from bumping or storing heavy objects on timber.
- Store timber where rain cannot damage it.
- Store wooden forms out of the sun that could warp the timber.
- Store the forms in such a way that they cannot fall and become damaged.
- Store stacked formwork so that it does not tip over injuring passing construction workers. (Any 4 × 1) (4)

[10]

TOTAL: 100

Copyright reserved