higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

CONCRETE STRUCTURES
NQF LEVEL 4

(12020514)

12 March 2018 (Y-Paper)
13:00–16:00

This question paper consists of 5 pages.

NCV

Copyright reserved

TIME: 3 HOURS
MARKS: 150

INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions.
2. Read ALL the questions carefully.
3. Number the answers according to the numbering system used in this question paper.
4. Write neatly and legibly.

NCV

QUESTION 1

1.1 To prevent reinforcing steel from rusting and to extend the lifespan of such a structure, it is important to perform certain procedures.

Write the answer next to the question number (1.1.1-1.1.3) in the ANSWER BOOK and explain how each of these processes in question (1.1.1-1.1.3) will prevent steel from corroding inside the concrete.

1.1.1 Concrete mix (2)

1.1.2 Concrete cover (2)

1.1.3 Curing (2)

1.2 Discuss FOUR similarities and the difference in methods when offloading epoxy coated rebars and uncoated rebars. (4)
[10]

QUESTION 2

2.1 SIX types of ties are commonly used in industry when tying reinforcing steel.

Illustrate by means of neat labelled sketches the SIX ties and give a reason why you will use each of the specific ties. (24)

2.2 After reinforcing bars are fastened and tightened in place, it must be able to withstand the preparation, casting and compacting activities.

2.2.1 Explain the consequences when a reinforcing cage that is not securely tied together collapses or move during the placing of concrete. (3)

2.2.2 Explain how the incorrect placing and compacting of concrete can damage or deform the reinforcing cage. (3)

2.3 Working with wire can be dangerous.

What safety precautions could be applied to prevent you from cutting yourself with pliers or a sharp end of wire? (2)

2.4 To achieve the required finish when tying reinforcing steel, you must adhere to certain rules.

State THREE important rules that must be adhered to. (3)
[35]

Copyright reserved

QUESTION 3

3.1 List FOUR qualities of a good release agent. (4)

3.2 Contaminated steel could reduce the bond between the reinforcing steel and concrete and can lead to bond failure.

Explain THREE methods that can be used to clean the contaminated rebars. (3)

3.3 Give THREE pre-concrete checks that you will perform to check the correctness of the reinforcing. (3)

[10]

QUESTION 4

4.1 Slump tests are part of the daily routine on a construction site when a specific slump value is specified.

Discuss how you will perform the test under the following headings

4.1.1 Tools and material needed (6)

4.1.2 Performing and measuring of the slump (10)

4.2 Give FOUR guidelines when using a poker vibrator. (4)

4.3 Explain why the *over-casting* of columns can cause construction failure. (5)

[25]

QUESTION 5

5.1 Regulations according to the SANS 2001-CC1:2007 state that formwork and falsework shall remain in place until the concrete has reached at least the strength necessary to prevent plucking of the surface during the removal of the formwork and must be able to support its own mass and any other loads that will be imposed on it at that particular time of construction.

Discuss FIVE factors that could influence the strength of the concrete after the minimum time has lapsed according to regulations. (5)

5.2 Explain FIVE advantages of preventing damages to concrete when striking formwork. (5)

[10]

Copyright reserved

QUESTION 6

6.1 When removing formwork from new or green concrete, it is important not to damage the concrete but it is also important not to damage the formwork material that can be recycled for the next project.

Explain the process that you will follow to prise away wooden formwork panels from the concrete without causing any damage. (5)

6.2 Explain how formwork could get damaged when not in use (5)

[10]

TOTAL: 100

NCV

Copyright reserved