higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

CIVIL AND STRUCTURAL STEEL WORK DETAILING

(First paper)

NQF LEVEL 3

(12050663)

16 March 2020 (X-paper)
09:00–11:00

REQUIREMENTS: A3 drawing sheet

Calculators and drawing instruments may be used.

This question paper consists of 5 pages.

571Q1S2016

Copyright reserved

TIME: 2 HOURS
MARKS: 75

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. Start each question on a new page.
5. Write neatly and legibly.

Copyright reserved

QUESTION 1: REINFORCED CONCRETE DETAILING

1.1 List the THREE forces acting on concrete by making freehand drawings to explain these forces. (3 × 2) (6)

1.2

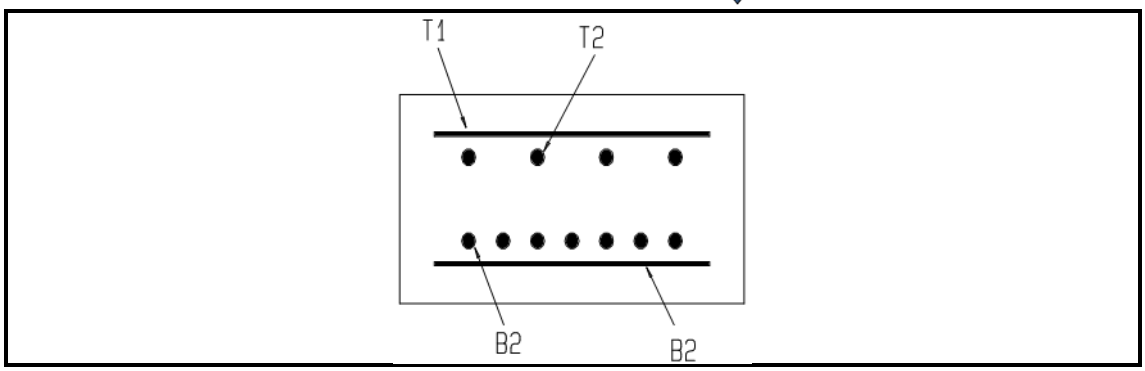


FIGURE 1

Give the meaning of each of the following shown in the reinforcement arrangement in FIGURE 1:

1.2.1 T1

1.2.2 T2

1.2.3 B1

1.2.4 B2

(4 × 1) (4)

1.3 Name TWO materials used in reinforced concrete and give ONE reason for using each. (2 × 2) (4)

1.4 What is *formwork*? (2)

1.5 Make a neat enlarged sketch showing a simple support beam with the first layer of reinforcement from the bottom. (6)

1.6 Briefly define each of the following terms:

1.6.1 Stirrups

1.6.2 Concrete cover

(2 × 2) (4)

1.7 Give TWO advantages of using concrete reinforcements. (4)

[30]

Copyright reserved

QUESTION 2: STRUCTURAL STEEL WORK DETAILING

2.1 Name THREE types of roof trusses. (3)

2.2 Give TWO types of roof sheeting. (2 × 2) (4)

2.3

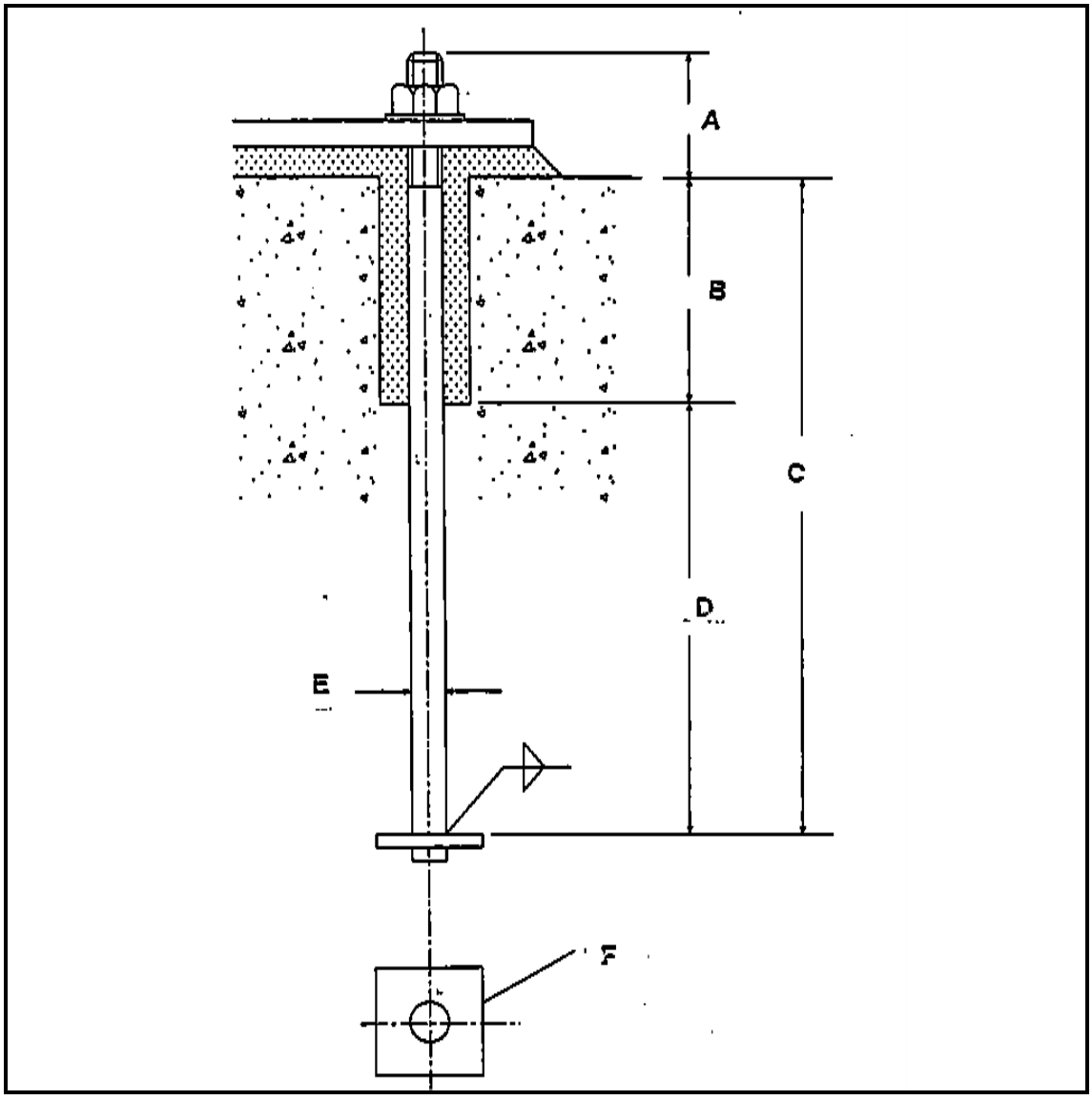


FIGURE 2

2.3.1 Give the name of FIGURE 2. (2)

2.3.2 Label FIGURE 2 by writing only the answer next to the letter (A–F) in the ANSWER BOOK. (6 × 1) (6)

2.4 Give TWO advantages of portal-frame steel structures. (2 × 2) (4)

2.5 Indicate whether the following statements are TRUE or FALSE by writing only 'True' or 'False' next to the question number (2.5.1–2.5.5) in the ANSWER BOOK.

2.5.1 Rafters are the main beams supporting the roof.

2.5.2 False work is a temporary structure used to support a permanent structure while it is not self-supporting.

2.5.3 SANS is the abbreviation for South African National Surveying.

2.5.4 A gusset plate transfers loads between members.

2.5.5 A purlin is the section used to support a heavy column.

(5 × 1) (5)
[24]

QUESTION 3: WELDING

3.1 Choose a description from COLUMN B that matches a term in COLUMN A. Write only the letter (A–E) next to the question number (3.1.1–3.1.5) in the ANSWER BOOK.

COLUMN A		COLUMN B	
3.1.1	Crater	A	crust that results from fusion of an electrode
3.1.2	Electrode	B	straight weld bead with little or no side-to-side movement
3.1.3	Weld pool	C	welding rod
3.1.4	Stringer beads	D	formed at the end of a run when the weld is stopped
3.1.5	Slag	E	molten metal consisting of an electrode filler and base metal

(5 × 1) (5)

3.2 Name FOUR types of clothing to wear during welding operations. (4)

3.3 State FIVE factors that influence the choice of edge preparation. (5)

3.4 List THREE types of joints for welding. (3)

3.5 Give TWO advantages of manual metal arc welding (EWS). (2 × 2) (4)
[21]

TOTAL: 75

Copyright reserved