higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

CIVIL AND STRUCTURAL STEEL WORK DETAILING

(First paper)

NQF LEVEL 3

XX February 2020

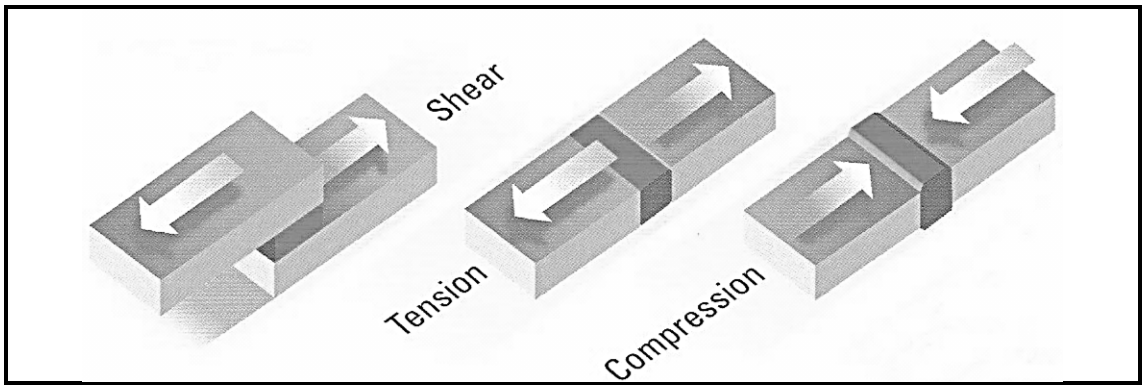
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NOTE TO MARKERS
This marking guideline is not absolute. Consider correct alternative answers.

QUESTION 1: REINFORCED CONCRETE DETAILING

1.1



(3 × 2) (6)

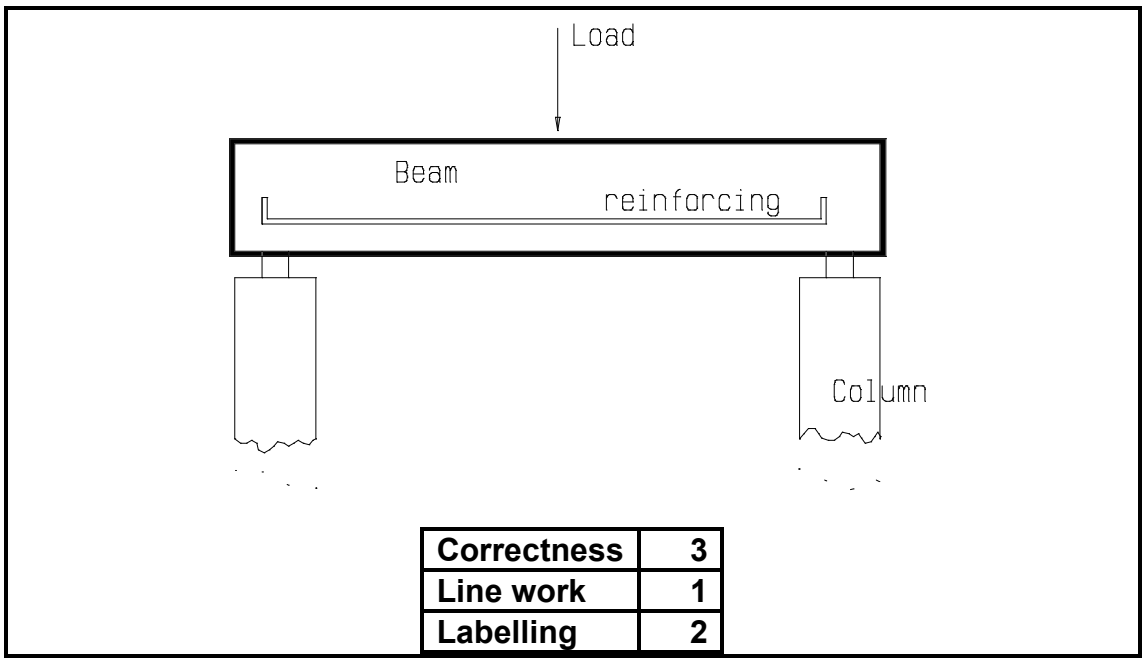
1.2
1.2.1 T1 – first layer from top
1.2.2 T2 – second layer from top
1.2.3 B1 – first layer from bottom
1.2.4 B2 – second layer from bottom

(4 × 1) (4)

1.3
- Steel✓ for taking up tension✓
- Concrete✓ for taking up compression✓ (2 × 2) (4)

1.4 Formwork is a temporary structure used to receive concrete in its plastic form. (2)

1.5



Correctness	**3**
Line work	**1**
Labelling	**2**

(6)

1.6 1.6.1 Steel shaped like a stirrup to hold the longitudinal steel✓ in place for columns and beams✓

1.6.2 A predetermined layer of concrete to protect steel bars from moisture that will rust the steel✓ and from the heat of any fire that could degrade the steel and lead to structural collapse✓

(2 × 2) (4)

1.7
- No difference in the thermal expansion of steel and concrete
- Relatively thin steel bars to reinforce concrete
- Rebars joined easily
- Relatively simple skills required
- Good availability of steel products
- Steel carrying compression
- Good ductility of steel
- Steel very strong compared to other reinforcing material (Any 2 × 2) (4)

[30]

QUESTION 2: STRUCTURAL STEEL WORK DETAILING

2.1
- Warren roof truss
- Fink roof truss
- Prat roof truss (3)

2.2
- Klip-Lok roof sheet profile
- Inverted box rib (IBR) sheeting (galvanised) (2 × 2) (4)

2.3 2.3.1 Holding-down (HD) bolt (2)

2.3.2 A – Projection
B – Pocket
C – Bond length without pocket
D – Bond length without pocket
E – Shank diameter
F – Washer plate

(6 × 1) (6)

2.4
- Easy to install
- Less skill required
- Easy to transport
- No setting period (2 × 2) (4)

2.5 2.5.1 True
2.5.2 True
2.5.3 False
2.5.4 True
2.5.5 False

(5 × 1) (5)

[24]

QUESTION 3: WELDING

3.1
3.1.1 D
3.1.2 C
3.1.3 E
3.1.4 B
3.1.5 A

(5 × 1) (5)

3.2
- Welding hood
- Leather gloves
- Leather apron
- Leather shoes/spats (4)

3.3
- Thickness
- Material
- Welding process
- Extent of penetration required
- Welding distortion
- Cost (Any 5 × 1) (5)

3.4
- Welding method
- Base material
- Filler material
- Flux material
- Joint design (Any 3 × 1) (3)

3.5
- Joins thick materials
- High deposition rate
- Multiple electrodes
- Minimum joint preparation
- Low distortion (Any 2 × 2) (4)

[21]

TOTAL: 75

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