higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

CONCRETE STRUCTURES
NQF LEVEL 3

7 December 2020

This marking guideline consists of 6 pages.

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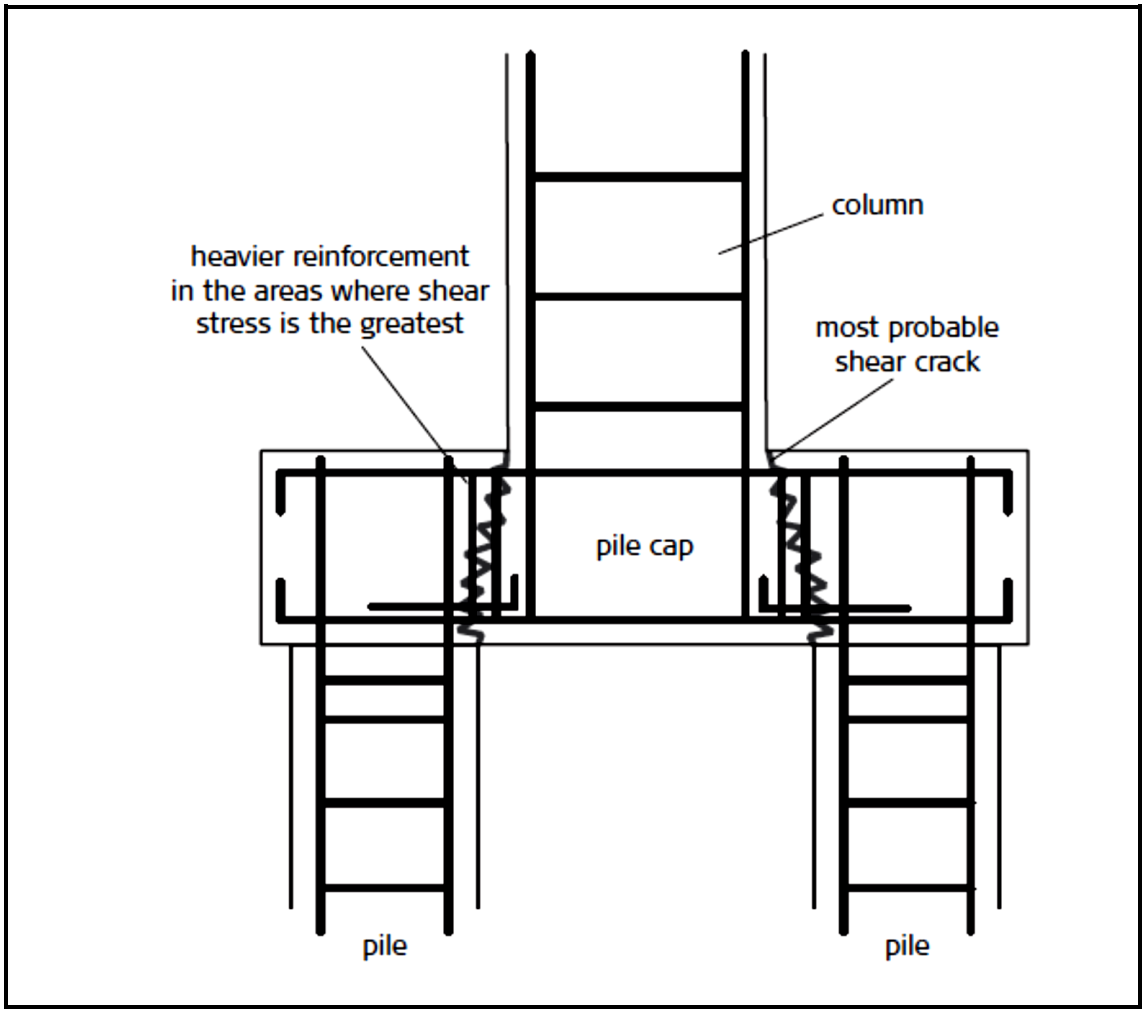
QUESTION 1: THE THEORY AND USE OF REINFORCED CONCRETE

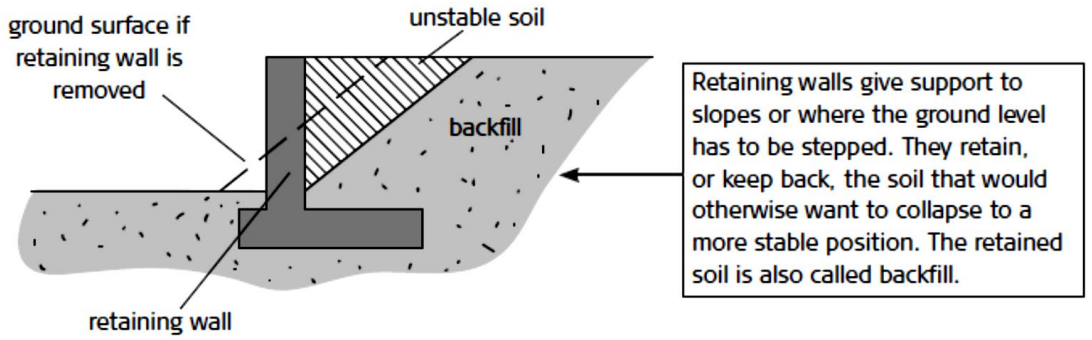
1.1



Correctness: 4
Tittle: 1
Labels: 5 (10)

1.2 A: Tensile
B: Compressive force
C: Shear force (3 × 1) (3)

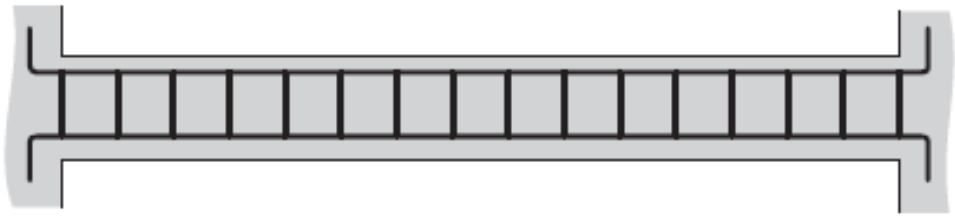
1.3



CANTILEVER RETAINING WALL

Correctness: 2
Title: 1
Labels: 3 (6)

1.4



REINFORCED BEAM

Correctness: 4
Title: 2 (6)

[25]

QUESTION 2: REINFORCED CONCRETE IN CONSTRUCTION

2.1
2.1.1 B
2.1.2 C
2.1.3 D
2.1.4 E
2.1.5 A

(5 × 1) (5)

2.2
- Sheet metal drawing: The sheets are shaped by drawing them over round or curved objects.
- Bars, wire and tube drawing: The metal is drawn through a very strong metal object called a die. It is thick when it enters and long and thin when it exits the die. (2 × 2) (4)

2.3 R: Plain round bars of strength 250 MPa
Y: High-yield deformation steel bars of strength 450 MPa
Z: Types of steel not covered by R or Y
SM: Standard mesh (high-tensile wire of strength 485 MPa)
DM: Design mesh (high-tensile wire of strength 485 MPa) (Any 4 × 2) (8)

2.4
- 8 mm
- 10 mm
- 12 mm
- 16 mm
- 20 mm
- 25 mm
- 32 mm (Any 3 × 1) (3)

2.5
- Fibre should be much stiffer than the matrix.
- Fibre content by volume must be adequate.
- There must be a good fibre-matrix bond.
- Fibre must have a high aspect ratio.
- Fibre length must be sufficient. (5 × 1) (5)

[25]

QUESTION 3: REINFORCING DOCUMENTATION

3.1 & 3.2

A	B	C	D	E	F	G	H			
Member							Bending dimensions			
	Bars per member	Total bars	Type/ diameter	Bar mark	Shape code	Total length	A	B	C	D
6	4	24	Y16	25	32	900	600			
6	6	36	R8	26	32	1 200	800			
1✓	1✓	2✓✓	4✓✓✓✓	2✓✓	2✓✓	2✓✓	2✓✓	= 16		

(5 for headings + 16 for contents) (21)

3.3 3.3.1 Top of grating
3.3.2 Top of concrete
3.3.3 Each face
3.3.4 High chair

(4 × 1) (4)

[25]

QUESTION 4: FABRICATION OF REINFORCING STEEL

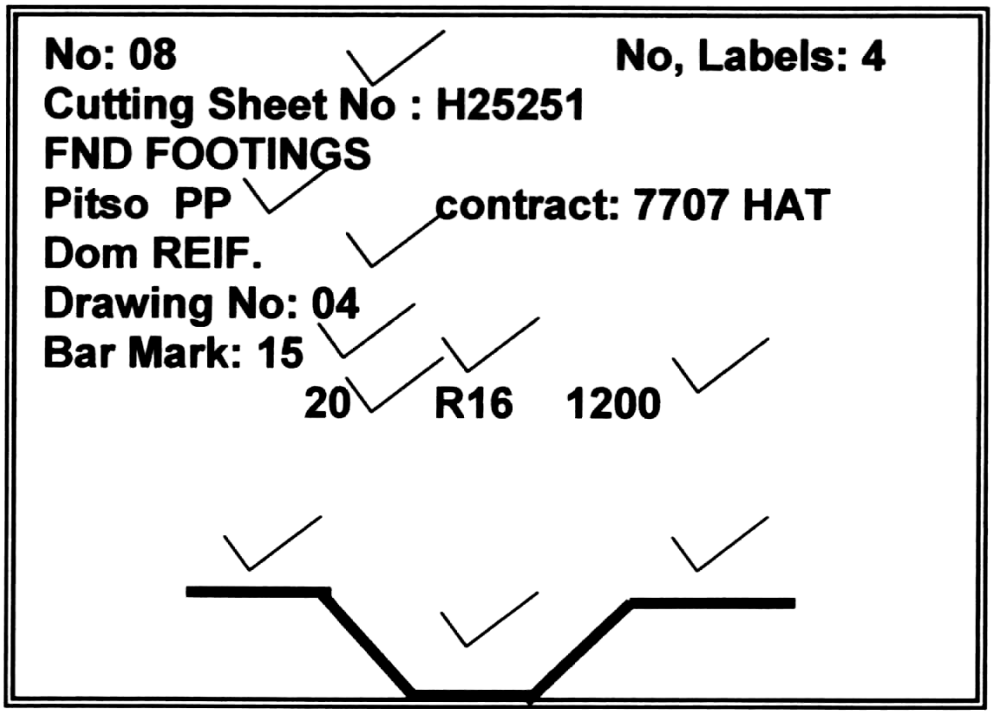
4.1 a: Receiving
b: Cutting
c: Bending
d: Administration
e: Dispatch (5 × 1) (5)

4.2

TYPE OF DOCUMENT	PURPOSE	USED BY	INFORMATION
Cutting and bending sheet	To tell the steel cutter and steel bender✓ how the steel for a particular job must be cut and bent✓ (2)	Yard foreman, steel cutter, steel bender, people who load the bent steel onto the delivery trucks, driver of the delivery truck (1)	Order and job number, diameter, length, shapes and quality of steel, for whom and what the steel is for (1)
Bar label	To label bars of steel where each label gives specific information about a bar of steel (1)	Steel cutter and steel bender, people who load the bent steel onto the truck, people using the steel on site (1)	Cutting and bending number, customer details, drawing reference, bar mark, details, shape information, including diameters, code, lengths (1)
Delivery note	To give information about the steel that will be delivered to a customer/site (1)	Driver who delivers the steel, person who receives the steel delivery (1)	Total mass of the types of steel delivered, shape codes of the different steel bars, customer name, delivery address, order number, date of delivery (1)

(10)

4.3



(10)
[25]

TOTAL: 100

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