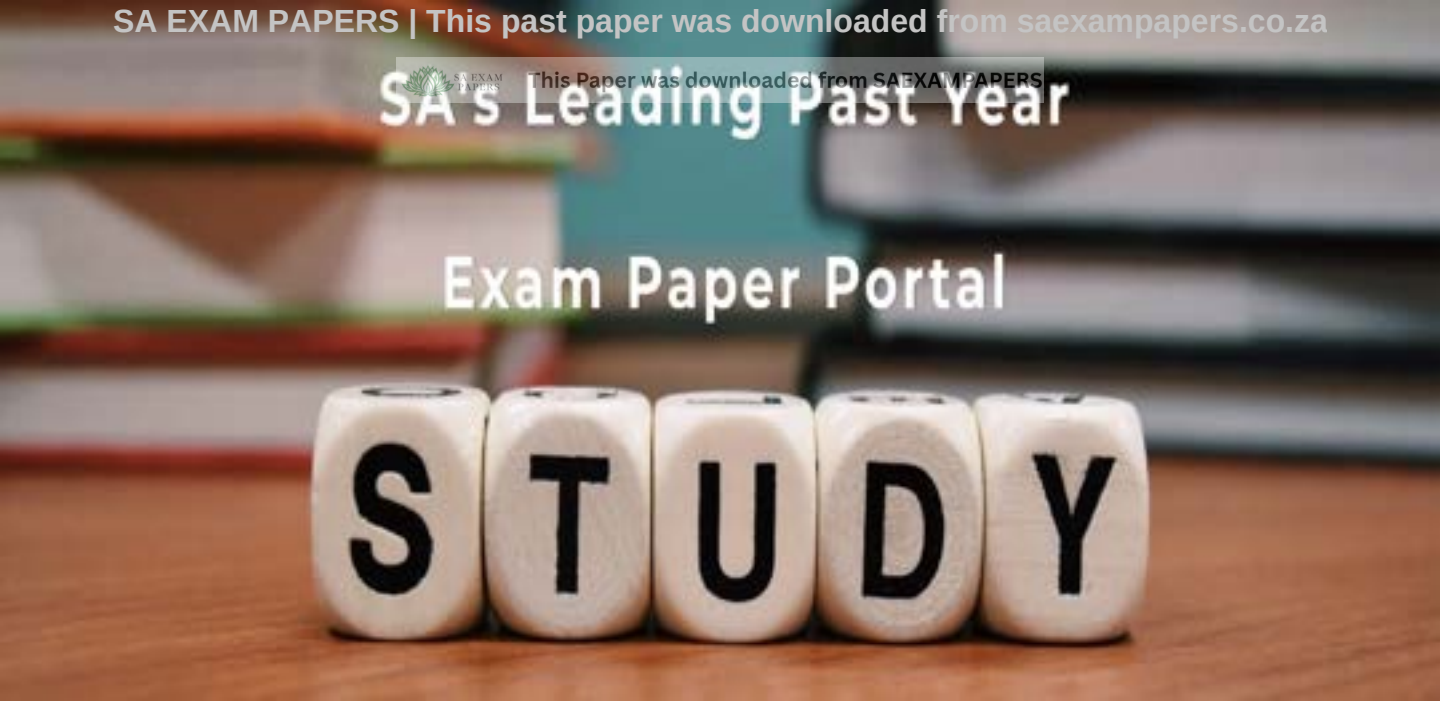


Province of the
EASTERN CAPE
EDUCATION

Iphondo leMpuma Kapa: Isebe leMfundo
Provinsie van die Oos Kaap: Department van Onderwys
Porafensie Ya Kapa Botjahabela: Lefapha la Thuto

NATIONAL SENIOR CERTIFICATE

GRADE 12

SEPTEMBER 2025

CIVIL TECHNOLOGY: CIVIL SERVICES MARKING GUIDELINE

MARKS: 200

This marking guideline consists of 13 pages and 2 answer sheets.

QUESTION 1: SAFETY AND MATERIAL (GENERIC)

1.1	1.1.1	760 mm x 560 mm		(1)
	1.1.2	3,7 m		(1)
	1.1.3	30°		(1)
	1.1.4	50°		(1)
	1.1.5	510 mm		(1)

1.2 Any TWO materials that ladders are generally made of:
- Wood
- Aluminium
- Fibreglass (2 x 1) (2)

1.3
- Lifting medium
- Power type (2 x 1) (2)

1.4 Water-based – provides an elastic, flexible finish (1)
Oil-base – provides a hard, durable finish (1) (2 x 1) (2)

1.5 Any THREE properties of the curing process of concrete.
- Surface of cured concrete is durable.
- Improves the protection of the steel reinforcement.
- Curing allows concrete to achieve optimal strength and hardness.
- Avoids cracking where the surface dries out quickly.
- Improves abrasion resistance. (3 x 1) (3)

1.6 THREE advantages of electroplating.
- Protects metal against corrosion.
- Improves the engineering and mechanical properties of metal.
- May also be used to increase the thickness of undersized parts. (3 x 1) (3)

1.7 Process of applying a plastic finish / coating in powder form (1), using a compressed air spray-gun (1). (2)

1.8 Zinc (1)

[20]

QUESTION 2: GRAPHICS, JOINING AND EQUIPMENT (GENERIC)

2.1 FIGURE 2.1 on page A:

2.1.1	Outside door at 2.1.A	(2)
2.1.2	Window at 1.1.B	(2)
2.1.3	Water closet at 2.1.C	(2)
2.1.4	Wash basin at 2.1.D	(2)
2.1.5	Single sink unit at 2.1.E	(2)
2.1.6	One-way switch – single pole at 2.1.F	(2)
2.1.7	Fluorescent light at 2.1.G	(2)
2.1.8	Socket outlet at 2.1.H	(2)
2.1.9	Grease trap at 2.1.I	(2)
2.1.10	Wall-mounted light at 2.1.J	(2)

2.2 2.2.1 A – Laser level
B – Telescopic staff
C – Tripod (3)

2.2.2 Any TWO below:
- Place the laser level in its case directly after use
- Do not bump the instruments against objects or drop it
- It must be properly calibrated
- It must be handled carefully (2 x 1) (2)

2.3 2.3.1 The reading on the staff is 1,5 m (1)

2.3.2 Minimum = 30 m
Maximum = 200 m (2)

2.4 2.4.1 Use a dry, soft cloth, not a cleaning agent or solvent. (1)

2.4.2 Remove batteries. (1)

2.5 **A** Nut with built-in washer (1)

B Wing nut (1)

C Domed nut (1)

2.6 2.6.1 Rawl bolt (1)

2.6.2 **A** – Drill a hole to the required diameter and depth. (1)

B – Remove debris and clean the hole thoroughly with a brush or by blowing it. (1)

C – Remove the bolt and washer, insert the shield and place the fixture over the hole. (1)

D – Insert the bolt with washer through the fixture and tighten to the recommended torque. (1)

2.6.3 Any TWO below:

- It is a strong fastener that resist pull-out failure
- Rawl bolts have excellent carrying capacity and tolerance to a variance in the hole size
- Excellent mechanical properties, such as tensile strength and yield stress. (2)

[40]

TOTAL SECTION A: 60

QUESTION 3: SAFETY, MATERIAL AND CONSTRUCTION (SPECIFIC)

3.1 3.1.1 Similar answer:
- Prevents material or persons falling in
- Identifies a danger zone (1)

3.1.2 Similar answer:
- Pipe for extractor fan or blower
- Provides manhole worker of clean air (1)

3.1.3 When (1) dangerous fumes/gases are (2) present in the manhole/ confined spaces. (2)

3.1.4 Respirator (1)

3.2 TWO safety measures when manhole covers are removed:
- Area must be cordoned off
- Warning signs must be posted (2 x 1) (2)

3.3 Conditions that poses (1) a threat and may cause (1) harm/injury/death. (2)

3.4 3.4.1 True (1)

3.4.2 True (1)

3.4.3 True (1)

3.4.4 False (1)

3.4.5 False (1)

3.5 Causes accelerated corrosion. (1)

3.6 Electrochemical process (1) between two dissimilar metals/alloys (1) (1)

3.7 3.7.1 Manhole (1)

3.7.2 Benching/Haunching (1)

3.7.3 TWO purposes of part **A**:
- Ensure that sewage spills slide back
- Prevent rats to settle down there (2 x 1) (2)

3.7.4 Any THREE positions:
- Before municipal connection
- Every 20 to 25 m in a straight drain line
- At all changes of direction
- At all changes of levels
- At all important junctions (3 x 1) (3)

3.7.5 Climb in and out. (1)

3.8 3.8.1 **A** – Boning rod
B – Sight rail (2)

3.8.2 ✓ ✓
40 mm x 8 = 320 mm (2)

3.9 3.9.1 Not be placed near the edges of the excavation. (1)

3.9.2 Red warning lights (1)
[30]

QUESTION 4: COLD WATER SUPPLY, WARM WATER SUPPLY AND TOOLS (SPECIFIC)

4.1 Any THREE:
- Colourless
- Free from suspended material
- Free from harmful bacteria
- Pleasant taste
- Moderately hard (3 x 1) (3)

4.2 Enable the local authority (1) to calculate the water consumption.(1) (2)

4.3 4.3.1 Stopcock (1)

4.3.2 Full-way valve (1)

4.3.3 Bibcock (1)

4.3.4 Non-return valve (1)

4.4 4.4.1 Ø 40 / 50 mm (1)

4.4.2 Ø 110 mm (1)

4.5 135° (1)

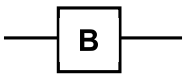
4.6 4.6.1 **A** - Electronic tap with sensor
B - Demand pillar tap (2)

4.6.2 To save water usage. (1)

4.6.3 Water only flows (1) as long as the top button is depressed. (1) (2)

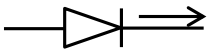
4.7 Johnson coupling (1)

4.8 4.8.1 Balancing device



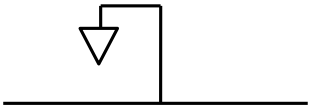
(2)

4.8.2 Non-return valve



(2)

4.8.3 Shower



(2)

4.9	4.9.1	D		(1)
	4.9.2	E		(1)
	4.9.3	G		(1)
	4.9.4	B		(1)
	4.9.5	C		(1)
4.10	4.10.1	50 mm		(1)
	4.10.2	300 mm		(1)
	4.10.3	1 000 mm		(1)
	4.10.4	covered		(1)
4.11	An indication that the pressure-control valve (1) is faulty. (1)			(2)
4.12	4.12.1	Centrifugal pump		(1)
	4.12.2	**A** – Vane **B** – Discharge nozzle **C** – Impeller		(3)
	4.12.3	Any ONE use: - To pump/move liquids/slurries / etc. through pipes - To convert rotational kinetic energy of a spinning impeller to hydrodynamic energy.	(1 x 1)	(1)
				[40]

QUESTION 5: DRAINAGE AND QUANTITIES (SPECIFIC)

5.1 Waste-water – Comes from sink/bath/washbasin/shower.
Soiled water – Comes from water closet. (2)

5.2 5.2.1 False (1)

5.2.2 False (1)

5.2.3 True (1)

5.2.4 True (1)

5.3 Any similar answer:
So that sewerage can flow freely/not cause obstructions. (1)

5.4 Any TWO advantages:
- Long lengths available
- Light in weight
- Easy to join (2 x 1) (2)

5.5 Where ground movement might occur/where leakages must be prevented. (1)

5.6 50 kPa (1)

5.7 5.7.1 Socket (1)

5.7.2 Socket-and-spigot joint (1)

5.7.3 Keeps out groundwater/sandy soil/roots of trees/seal pipes. (1)

5.8 5.8.1 Vent valve/Air admittance valve (1)

5.8.2 Valve opens and (1) reduces the vacuum and allows (1) air into the system so that (1) the water can flow away freely/without releasing gases into the building. (1) (4)

5.9 When the ground slopes steeply/When the maximum gradient cannot be applied. (1)

5.10 5.10.1 Plunger (1)

5.10.2 Fill the sink with 3 to 5 cm of water. (1) Place the plunger over the opening. (1) Pump the plunger vigorously down. (1) (3)

5.11 To make it free from bacteria/safe for consumption. (1)

5.12 5.12.1 PVC (1)

5.12.2 PVC (1)

5.12.3 PVC (1)

5.12.4 1 (1)

5.12.5 1 (1)

5.12.6 110 mm (1)

5.12.7 110 mm (1)

5.12.8 110 mm (1)

5.12.9 ± 6 600 mm (1)

5.12.10 ± 2 200 mm (1)

5.13 5.13.1 ✓ ✓ ✓
$s^3 = 0,9 \times 0,9 \times 0,9 = 0,729\ m^3$ (3)

5.13.2 ✓
$0,729\ m^3 \times 1\ 000 = 729\ \ell$ ✓ (2)

[40]

QUESTION 6: GRAPHIC COMMUNICATION, ROOF WORK, STORMWATER AND JOINING (SPECIFIC)

6.1 FIGURE 6.1 on ANSWER SHEET B shows the top and front elevations of a cylindrical pipe with a 45° cut-off.
Draw the development of the pipe on ANSWER SHEET B.
Show ALL construction lines. (21)

6.2 To seal off the gutter at the ends. (1)

6.3 Channel water away from a building / Prevents erosion under downpipe. (1)

6.4 Prevent water from damaging buildings / foundations. (1)

6.5 6.5.1 Pipe cutter (1)

6.5.2 Cutting wheel (1)

6.6 6.6.1 True (1)

6.6.2 False (1)

6.6.3 False (1)

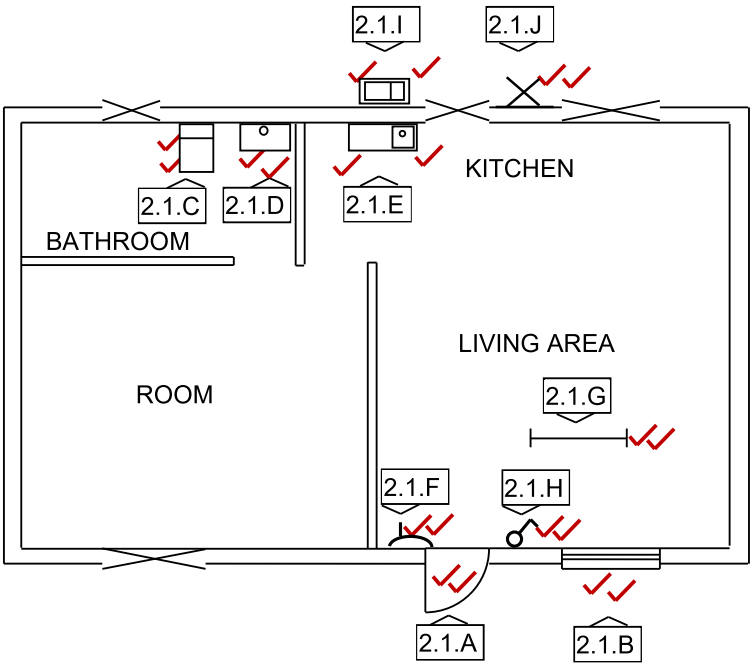
6.6.4 False (1)

[30]

TOTAAL: 200

ANSWER SHEET	A	CIVIL TECHNOLOGY GENERIC	NAME AND SURNAME:	

2.1 Use the information on sheet A and complete the floor plan on scale 1 : 100. (20)



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Wash basin at 2.1.D	2	
Single sink unit at 2.1.E	2	
One-way switch – single pole at 2.1.F	2	
Fluorescent light at 2.1.G	2	
Socket outlet at 2.1.H	2	
Grease trap at 2.1.I	2	
Wall-mounted light at 2.1.J	2	
TOTAL	**20**	

ANSWER SHEET	B	CIVIL TECHNOLOGY SPECIFIC	NAME AND SURNAME:	

6.1 FIGURE 6.1 on ANSWER SHEET B shows the top and front elevations of a cylindrical pipe with a 45° cut-off.
Draw the development of the pipe on ANSWER SHEET B.
Show ALL construction lines. (21)

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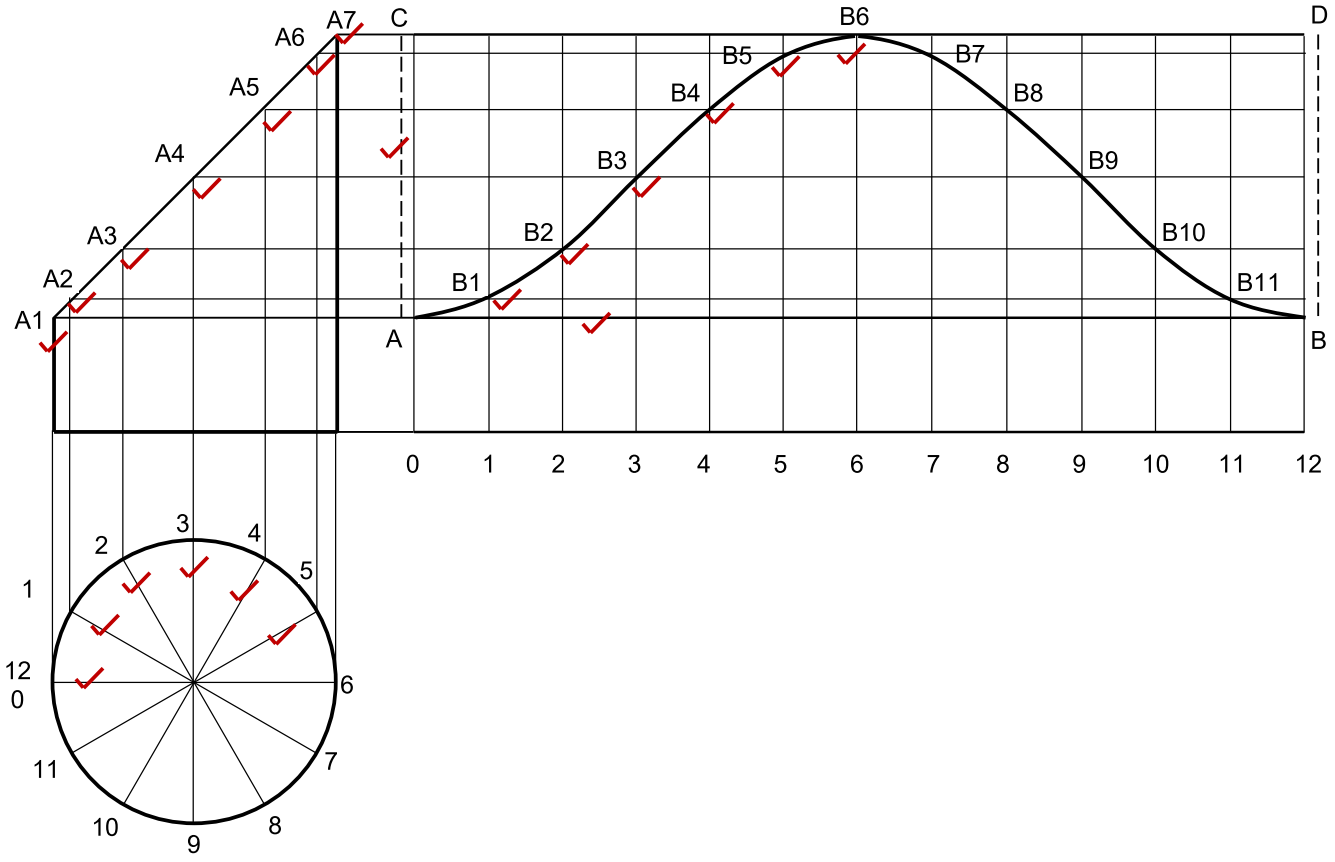

Base line A-B	1	
Seam lines A-C and B-D	1	
Dividing lines 0-12 on top view	6	
Vertical and horizontal construction lines A1-A7	7	
Intersection points and development lines B1-B11	6	
TOTAL	**21**	