Province of the
EASTERN CAPE
EDUCATION

NATIONAL SENIOR CERTIFICATE

GRADE 12

SEPTEMBER 2023

CIVIL TECHNOLOGY: CIVIL SERVICES MARKING GUIDELINE

MARKS: 200

This marking guideline consists of 12 pages, including 2 answer sheets.

QUESTION 1: SAFETY AND MATERIALS (GENERIC)

1.1 The purpose of the OHS Act is to ensure the health of the workers **or** their right to a working environment free of hazards. (1)

1.2 Unsafe acts (1) and unsafe conditions (1) (2)

1.3 Any ONE reason for inspecting a scaffold:
- To ensure it is stable in all directions
- To ensure it is able to carry the mass of the load
- To ensure it is free of any defects (1 x 1) (1)

1.4 1.4.1 **A** – Guardrail

B – Kickboard **OR** toe-board

C – Base (3 x 1) (3)

1.4.2 Independent scaffolding (1)

1.4.3 1 m **OR** 1 000 mm (1)

1.5 1.5.1 Any ONE way to transport waste material from higher levels:
- Chute
- Conveyor belt
- Lift **OR** hoist (1 x 1) (1)

1.5.2 Safety net **OR** a catch platform (1)

1.6 1.6.1 False (1)

1.6.2 True (1)

1.6.3 False (1)

1.6.4 False (1)

1.7 Water-based paint (1) and oil-based paint (1) (2)

1.8 It protects the metal against rust / corrosion. (1)

1.9 Any TWO advantages of curing (concrete):
- Allow adhesive bonding
- Prevent the concrete from drying out too quickly
- Assures the effective hardening of the concrete (2 x 1) (2)

[20]

QUESTION 2: GRAPHICS, JOINING AND EQUIPMENT (GENERIC)

2.1
- Window numbers
- Door swings
- Names of rooms
- Stair directions
- Sliding doors
- Floor covering (6 x 1) (6)

2.2 FIGURE 2.2 on ANSWER SHEET A shows the incomplete elevation of a building.
Complete the elevation by drawing in the following parts on scale 1 : 50.

2.2.1 A window with a length of 1 800 mm and a height of 900 mm.
The window is built in 700 mm from the right-hand side and one-third of the right-hand side of the window can open. (7)

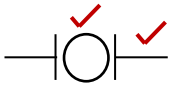
2.2.2 A door according to standard measurements, 900 mm from the left-hand side of the building. The door opens to the left. There is one step to the ground level. (5)

2.2.3 The barge board against the gable end. (2)

2.3 2.3.1 Unfinished wood (1)

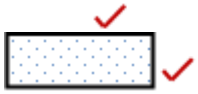
2.3.2 Two-way switch (1)

2.4 2.4.1 Water meter



(2)

2.4.2 Plaster



(2)

2.4.3 Invert level

(2)

2.5 When driven into place (1) it cannot be turned. (1) (2)

2.6 **R-RBL** – Anchor name

M06 – Thread diameter

18 – Thickness (3 x 1) (3)

2.7 To set the telescope of the instrument level. (1)

2.8 **A** – Vertical hair

B – Horizontal hair

C – Stage hairs (3 x 1) (3)

2.9 Any TWO uses:
- Determine differences between levels and vertical heights
- Determine slopes
- Setting out buildings
- Transfer of levels and heights (2 x 1) (2)

2.8 It can affect the measuring function of the tool. (1)
[40]

TOTAL SECTION A: 60

QUESTION 3: SAFETY, MATERIAL AND CONSTRUCTION (SPECIFIC)

3.1 Similar answer:
Must take all reasonable steps to ensure the worker's safety / supply safety equipment. (1)

3.2 Similar answer:
If the workers are overcome by gasses / injured, they can be pulled out. (1)

3.3 **A** – Rope grab

B – Locking snap hook

C – D-clip (3 x 1) (3)

3.4 Name TWO safety methods:
- The area must be cordoned off.
- Warning signs must be posted. (2 x 1) (2)

3.5 Contractor (1)

3.6 3.6.1 True (1)

3.6.2 True (1)

3.6.3 True (1)

3.6.4 False (1)

3.6.5 False (1)

3.7 Scale or corrosion products from a metal surface (1) is removed by (1) subjecting it as an electrode to (1) an electric current (1) in an electrolytic bath. (1) (5)

3.8 3.8.1 220 (215) mm (1)

3.8.2 Stretcher bond (1)

3.8.3 Single brick wall (1)

3.9 Any TWO:
- Grade
- Level
- Line (2)

3.10 *Hard ground*: The sides of the excavation is sturdy enough (1) and do not need support. (1)
Firm ground: The sides of the excavation may cave in (1) and must be supported by poling boards. (1) (2 x 2) (4)

3.11 3.11.1 150 mm (1)

3.11.2 300 mm (1)

3.11.3 Rollers (1)

[30]

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

4.1 Prevents water from leaking from the spindle. (1)

4.2 Any THREE:
- Water service pipe at the meter box
- Water supply to the water closet cistern
- Water supply to the geyser
- Regulating taps at showers (3 x 1) (3)

4.3 4.3.1 Full-way valve (1)

4.3.2 Stopcock (1)

4.3.3 Full-way valve / Pillar tap / Bibcock (1)

4.4 4.4.1 Ball valve (1)

4.4.2 **A** – Diaphragm

B – Nozzle

C – Plunger

D – Silencing tube (4 x 1) (4)

4.4.3 Cisterns / Storage tanks (1)

4.4.4 It releases the water at the bottom of the cistern (1) thus reducing the splashing noises. (1) (1)

4.5 Non-return valve (1)

4.6 The water will flow for as long as (1) the top button is depressed. (1) (2)

4.7 TWO types water saving shower heads:
- Low-flow shower head
- Electronic shower head (2 x 1) (2)

4.8 4.8.1 **A** – Service pipe

B – Solar heat absorber

C – Vent

D – Hot-water feed

E – Hot-water storage tank (5 x 1) (5)

4.8.2 10° (1)

4.8.3 North receives the most sun. (1)

4.9 4.9.1 False (1)

4.9.2 True (1)

4.9.3 True (1)

4.9.4 True (1)

4.9.5 False (1)

4.10 It extracts heat from the surrounding air, (1) thus enabling it to heat the refrigerant. (1) The refrigerant (1) is then compressed, (1) which causes the temperature to rise even further (1). The hot liquid runs through a heat exchanger (1) in which the water is heated. (1) (6)

4.11 4.11.1 To clean drain pipes. (1)

4.11.2 Any TWO:

- Do not force
- Use it for the specific application
- Do not use it if the on/off switch does not work
- Disconnect the plug before any adjustments
- Do maintenance
- Keep parts in good operating conditions (2 x 1) (2)

[40]

QUESTION 5: DRAINAGE AND QUANTITIES (SPECIFIC)

5.1 It prevents gasses (1) fromentering the building. (1) (2)

5.2 5.2.1 **A** – Inspection eye

B – Soil-water pipe

C – Pipe bend

D – Gully

E – Trap (5 x 1) (5)

5.2.2 Cleaning / Removing blockages. (1)

5.2.3 40 / 50 mm (1)

5.2.4 Close off bad odours (1)

5.3 5.3.1 Rodding eye (1)

5.3.2 It is used where the ground slopes (1) to accomplish sufficient flow (1) and for cleaning purposes. (1) (3)

5.3.3 TWO disadvantages:
- It can be cleaned in only one direction.
- Expensive (2)

5.4 When the ground slopes steeply (1) to the connection point (1) and the maximum gradient cannot be applied. (1) (3)

5.5 5.5.1 **A** – Coarse sand

B – Distribution pipe

C – Gravel filling

D – Inspection pipe (4 x 1) (4)

5.5.2 It may pollute groundwater. (1)

5.5.3 The system can be saturated (1) and resulting in pollution. (1) (2)

5.6 5.6.1 Brown (1)

5.6.2 No colour (1)

5.6.3 Black (1)

5.7 To ensure that the water carries the solid matter away easily. (1)

5.8 5.8.1 Copper (1)

5.8.2 1 (1)

5.8.3 Copper (1)

5.8.4 2 (1)

5.8.5 Copper (1)

5.8.6 Aluminium / Plastic (1)

5.8.7 Polycop (1)

5.8.8 15 mm (1)

5.8.9 3 (1)

5.8.10 22 mm x 15 mm (1)

[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 elevation of a cone. Draw the development of the cone according to the radial-line method on ANSWER SHEET B. Show ALL construction lines. (7)

6.2 **A** – Holderbat

B – Downpipe

C – Rain water shoe (3 x 1) (3)

6.3 6.3.1 False (1)

6.3.2 False (1)

6.3.3 True (1)

6.3.4 True (1)

6.4
- Fine-tooth saw
- Mitre box (2 x 1) (2)

6.5 Stop ends / End caps (1)

6.6 Any TWO:
- Copper
- Galvanised sheet metal
- Lead
- Bitumastic patents
- Rubber sealant (2 x 1) (2)

6.7 It is placed underneath the downpipe (1) to channel the water away from the house. (1) (2)

6.8 TWO types of material:
- Chemicals
- Solid waste (2 x 1) (2)

6.9 Prevent unnecessary accumulation of dampness (1) under the building. (1) (2)

6.10 6.10.1 B (1)

6.10.2 D (1)

6.10.3 E (1)

6.10.4 G (1)

6.10.5 A (1)
[30]

TOTAL: 200

ANSWER SHEET **A**	CIVIL TECHNOLOGY GENERIC	NAME: _____

2.2 FIGURE 2.2 on ANSWER SHEET A shows the incomplete elevation of a building. Complete the elevation by drawing in the following parts on scale 1 : 50.

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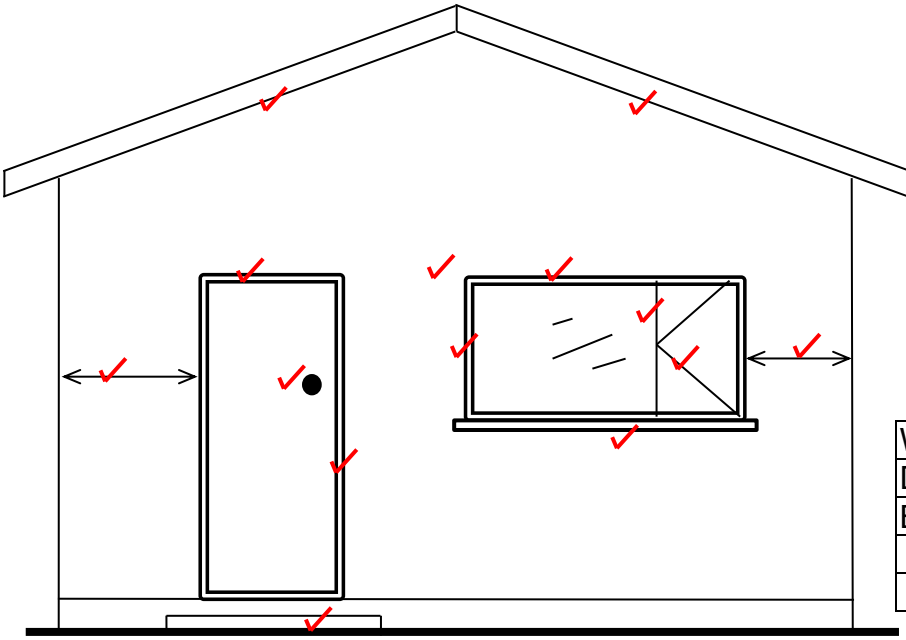
2.2.3 The barge board against the gable end. (2)

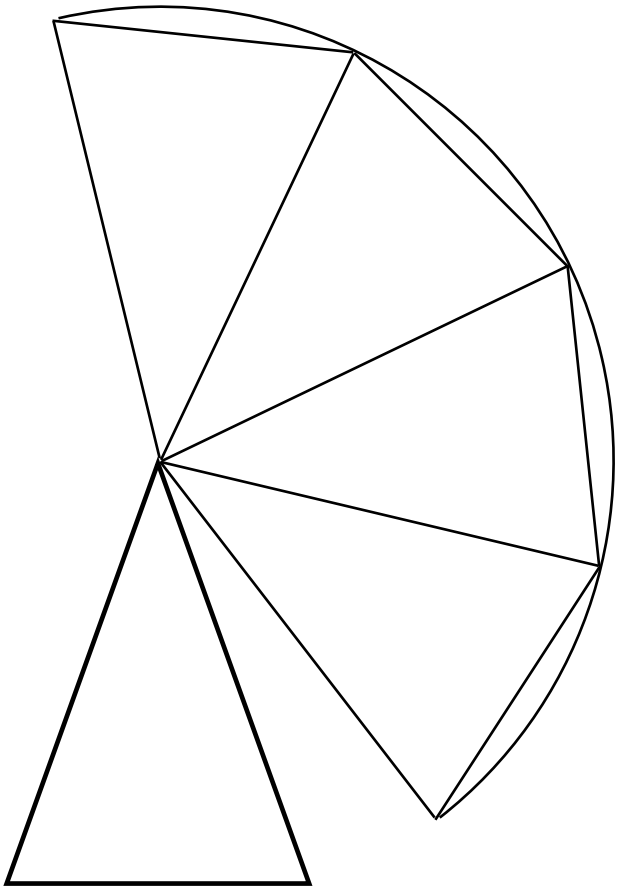


Window	7	
Door	5	
Barge board	2	
TOTAL:	**14**	

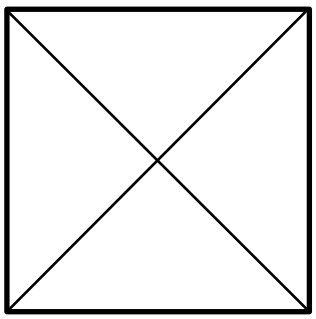
FIGURE 2.2

ANSWER SHEET **B**	**CIVIL TECHNOLOGY CIVIL SERVICES**	**NAME:** _____

6.1 FIGURE 6.1 on ANSWER SHEET B shows the top and front elevation of a cone. Draw the development of the cone according to the radial-line method on ANSWER SHEET B. Show ALL construction lines.



FRONT ELEVATION



TOP ELEVATION

FIGURE 6.1

Halve circle 1 to 5	2	
Pattern lines A–1 to A–5	5	
TOTAL	**7**	

(7)