



Province of the
EASTERN CAPE
EDUCATION

**NATIONAL
SENIOR CERTIFIKATE**

GRADE 11

NOVEMBER 2020

**CIVIL TECHNOLOGY: CIVIL SERVICES
MARKING GUIDELINE
(EXEMPLAR)**

MARKS: 200

This marking guideline consists of 13 pages.




QUESTION 1: SAFETY AND MATERIALS (GENERIC)

- 1.1 Hard hat (1)
- 1.2 A tie can get stuck in the moving parts and cause injuries (1)
- 1.3 1.3.1 False (1)
- 1.3.2 False (1)
- 1.3.3 True (1)
- 1.3.4 True (1)
- 1.4 Storing of materials on site.
- 1.4.1 Any ONE area on which materials can be placed:
• Shelves
• Pallets (1 x 1) (1)
- 1.4.2 Any ONE reason why heaps of sand and stone should be covered with plastic.
• To keep it clean
• To prevent being washed away during rainfalls
(Similar answer) (1 x 1) (1)
- 1.4.3 To prevent the materials from mixing (1)
- 1.5 $1\ 800\ \text{mm} \div 3\ (1) = 600\ \text{mm}\ (1)$ (2)
- 1.6 Reinforced concrete contains steel reinforcement bars (1)
- 1.7 Any ONE purpose of coarse aggregate in a concrete mixture:
• Provides volume stability to the concrete
• Economical – forms the bulk of the mixture
• Lowers the shrinkage potential of the concrete (1 x 1) (1)
- 1.8 Lime (1)
- 1.9 Screed (1)
- 1.10 Hardwood (1) and softwood (1) (2)
- 1.11 Any ONE use of plywood:
• Bottoms of drawers
• Wall panelling
• Door panels
• Cupboard panels
• Interior balustrades / railings
• Framing (1 x 1) (1)

- 1.12 1.12.1 Non-ferrous metal (1)
- 1.12.2 Ferrous metal (1)
- 1.13 Any ONE use of lead in the building environment:
- Batteries
 - Cable sheaths
 - Lead pipes
- (Similar answer) (1 x 1) (1)
- 1.14 Any ONE use of stainless steel in the building environment:
- Sinks
 - Wash tubs / baths
 - Water taps
 - Water traps
 - Extractor fans
- (Similar answer) (1 x 1) (1)
- 1.15
- Dry-fit the parts to make sure the pipes are fitted in the right direction (1)
 - Apply a light coat of PVC glue to the fitting and the pipe (1)
 - Slightly twist and push parts into position (1) (3)
- 1.16 3 mm (1)
- 1.17 Any TWO uses of translucent glass:
- Bathroom / toilet windowpanes
 - Glass bricks for walls
 - Doors
 - Urban furniture and appliances (2 x 1) (2)
- 1.18 Thermoplastic (1) and thermosetting plastic (1) (2)
- [30]**

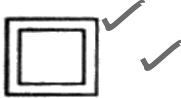
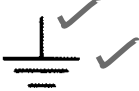

QUESTION 2: EQUIPMENT, TOOLS AND GRAPHICS (GENERIC)

- 2.1 Prevent rust (1)
- 2.2 Cold chisel is used to cut holes / grooves in concrete / brickwork / metal (1)
Bolster is used to cut bricks (1) (2)
- 2.3 Name the tools in FIGURES 2.3.1 to 2.3.3 and name ONE use of each.
- 2.3.1 Pick (1)
- Any ONE use (1):
- Loosening hard ground during excavations
 - Breaking up rock (2)
- 2.3.2 Block brush (1)
- Any ONE use (1):
- Moistening plaster
 - Dampening surfaces / concrete (2)
- 2.3.3 Plane (1)
- Any ONE use (1):
- Planing timber
 - Smoothing rough surfaces on timber (2)
- 2.4 2.4.1 Spirit level (1)
- 2.4.2 Test if the head is horizontal (1) and if the stiles are installed vertically (1) (2)
- 2.4.3 Any TWO precautions for the spirit level:
- Wipe clean after use
 - Not allow plaster / cement to dry on it
 - Store in a dry place (2 x 1) (2)
- 2.5 2.5.1 Portable circular saw (1)
- 2.5.2 Any TWO uses:
- Cutting wood
 - Cutting other materials with specific blades
 - Cutting rebates (2 x 1) (2)
- 2.6 2.6.1 To include more information (1)
- 2.6.2 To highlight details (1) that may not be clearly understood (1) (2)
- 2.6.3 Open eave (1)

- 2.6.4 A – DPC (1)
B – Beam filling / half brick wall (1)
C – Facia board / plank (1)
D – Single brick wall (1)
E – Ceiling / cornice (1) (5)
- 2.6.5 Prevents dust / vermin / etc. from entering underneath the roof (1)
- 2.6.6 Fixing gutters (1)
- 2.7 To ensure that the horizontal and vertical external measurements (1)
correspond with the individually internal measurements (1) (2)
- 2.8 Bottom (1) on the right-hand side of drawing sheet (1) (2)
- 2.9 1 : 100 (1)
- 2.10 2.10.1 Natural ground level (1)
- 2.10.2 Finished floor level (1)
- 2.11 2.11.1  (2)
- 2.11.2  (2)
- 2.11.3  (1)

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QUESTION 3: QUANTITIES, JOINING AND GRAPHICS (GENERIC)

- 3.1 3.1.1 Site plan (1)
- 3.1.2 123 (1)
- 3.1.3 Boundary wall (1)
- 3.1.4 B = Manhole C = Rodding eye (2)
- 3.2 ONE use of PVC glue:
 • To bond PVC pipes (1)
- 3.3 PVC adhesive (1)
- 3.4 3.4.1  (2)
- 3.4.2  (2)
- 3.4.3  (2)
- 3.5 The application steps for PVA adhesive:
 (1) Dry-fit parts to make sure the pipes are fitted in the right direction
 (2) Apply a light coat of PVC glue to the fitting and the pipe
 (3) Slightly twist and push parts into position (3)
- 3.6 Any THREE precautions when using contact glue:
 • Be careful not to allow the adhesive to dry fully before assembly
 • Do not wait too long before assembling the parts
 • The glue should not be applied too quickly (3 x 1) (3)
- 3.7 Any FIVE uses of silicone:
 • Basic sealant against air and water leakage
 • Textile uses
 • Enhances materials
 • Used in aviation
 • Construction repairs
 • Electronics (5 x 1) (5)

3.8 Any TWO properties of EACH of the following adhesives

3.8.1 Silicone

- Heat resistant
- Conductive or insulating
- Rubbery
- Low heat conductivity
- Resist chemicals / low chemical reaction
- Low toxicity
- Waterproof / repels water (2 x 1) (2)

3.8.2 Contact glue

- Adheres well to most materials (plastics, rubber, paper, wood, etc.)
- Sticks to most non-porous materials
- Rubbery and has a creamy colour
- Flammable
- Water-resistant
- Dries quickly and adheres / sticks immediately (2 x 1) (2)

3.8.3 PVA glue

- Water-based
- For interior and exterior use
- White or yellowish colour before it dries, clear when dry
- Yellow PVA is not completely clear on drying
- Super strong when used on wood
- Dries quickly
- Inexpensive (2 x 1) (2)

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QUESTION 4: SAFETY, MATERIAL, EQUIPMENT AND JOINING (SPECIFIC)

- 4.1 (1) Sewerage seeps into the ground and (1) flows / seeps through ground water to rivers and dams (2)
- 4.2 (1) It contains untreated / waste matter / human waste which (1) contains harmful micro-organisms / bacteria / viruses / parasites (2)
- 4.3 Rinse the wound with cold water. (1)
- 4.4 Any THREE uses of ceramic products in a house:
- Floor tiles
 - Wall ties
 - Baths, washbasins, water closets
 - Materials that are resistant to high temperatures (3 x 1) (3)
- 4.5 4.5.1 Manhole covers – Cast iron (1)
- 4.5.2 Sinks – Stainless steel (1)
- 4.5.3 Pressure control valves – Bronze (1)
- 4.5.4 Vacuum breakers – Bronze (1)
- 4.5.5 Hot-water pipes – Copper (1)
- 4.6 4.6.1 Tightening of bolts C Spanners
- 4.6.2 Clamping work pieces to be sawed E Bench vice
- 4.6.3 Forming the new head of a rivet A Ball-peen hammer (3 x 1) (3)
- 4.7 Any TWO maintenance measures:
- Oil moving parts
 - Service regularly
 - Not overloading the machine
 - Rollers kept some distance apart when not in use (2 x 1) (2)
- 4.8 Name the TWO methods of bending low-pressure polythene pipes:
- Fill pipe with sand, heat and bend
 - Pipe-bending spring (2 x 1) (2)

- 4.9 4.9.1 Pipe cutter (1)
- 4.9.2 Cut copper pipes/galvanised pipes (1)
- 4.9.3 (1) Cutter wheel on cutting line
(2) Rotate clockwise and (3) anticlockwise
(4) Tighten the cutter until the pipe is cut (4)
- 4.10 (1) Prevents rattling (2) when water passes through the pipes / Movement causes stress on joints and can spring leaks (2)
- 4.11 Provides watertight joints (1)
- 4.12 Allows it to break when the rivet is installed (1)

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QUESTION 5: GRAPHICS, CONSTRUCTION AND JOINING (SPECIFIC)

- 5.1 Use your drawing instruments and divide the line XY on ANSWER SHEET 1 into six equal parts. Show all construction lines. (3)
- 5.2 FIGURE 5.2 on ANSWER SHEET 1 shows the top and side views of a 250 x 250 mm square pipe with a length of 500 mm. The joint of the pipe is in the middle of side AD.
- Use ANSWER SHEET 1 and develop and draw the development of the pipe on scale 1 : 10. (11)
- 5.3 Similar answer:
(1) The hardening of concrete is retarded (2) when the temperature is below 5°. (2)
- 5.4 150 mm (1)
- 5.5 5.5.1 False (1)
5.5.2 False (1)
5.5.3 False (1)
- 5.6 (1) First make use of a chopping action and (2) then a sawing motion (2)
- 5.7 Name TWO reasons for floating concrete:
• Creates a smooth surface
• Removes marks
• Helps with the compacting
• Forces pieces of gravel below the surface (2 x 1) (2)
- 5.8 Name TWO properties of this kind of sand:
• Dry
• Fine
• Compacted (2 x 1) (2)
- 5.9 (1) The ends of the pipes must be clean and square.
(2) Heat the ends by using a temperature-controlled apparatus.
(3) Press the melted ends together and
(4) apply the pressure while the pipes are cooling down. (4)

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QUESTION 6: COLD- AND HOT WATER SUPPLY, DRAINAGE AND SANITARY FITMENTS (SPECIFIC)

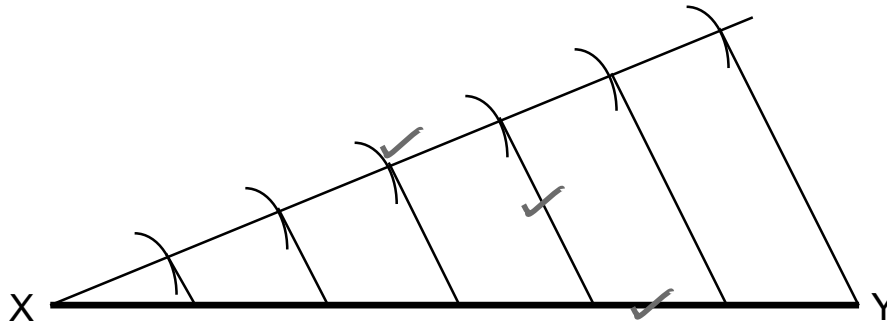
- 6.1 6.1.1 A – Stopcock
B – Water meter (2)
- 6.1.2 Measures the volume of water used (1)
- 6.1.3 C – Main water supply
D – Water supply pipe (2)
- 6.1.4 15 mm (1)
- 6.1.5 Prevents freezing and direct loads on the pipe (2)
- 6.2 Any THREE disadvantages of galvanised pipe for water supply:
• Difficult to bend
• Contains lead, inevitable to corrosion
• Sediment can collect in the pipes
• Difficult to get rid of rust (3 x 1) (3)
- 6.3 6.3.1 45°-elbow (1)
- 6.3.2 Copper pipe (1)
- 6.3.3 Soldering or brazing (1)
- 6.4 6.4.1 Pipe joint – Butt-welded (1)
- 6.4.2 Pipe joint – Flanched and bolted (1)
- 6.4.3 Water-level control valve (1)
- 6.5 Similar answer.
(1) As the cold water heats up, it rises (2) therefore the cold water must enter from the bottom (2)
- 6.6 (1) It senses the water temperature and switches on the element when the water is too cold and (2) switches off again when the water is too hot (2)
- 6.7 (1) Hot water rises to the top (2) letting the cold water in from the bottom (2)
- 6.8 6.8.1 Element (1)
- 6.8.2 300 mm (1)
- 6.8.3 50 mm (1)

- 6.9 Any TWO reasons why hot water pipes from geysers must be isolated:
- Prevents heat loss
 - Prevents freezing during winter months (2 x 1) (2)
- 6.10 Allow storm water to seep through (1)
- 6.11 Any similar answer.
- Prevents structural damage
 - May lead to cracks
 - May lead to foundation damage (1)
- 6.12 (1) It must be done in such a manner that the disconnection (2) will not be a danger to health. (2)
- 6.13 6.13.1 Rainwater pipe (1)
- 6.13.2 Septic tank (1)
- 6.13.3 Hand wash basin (1)
- 6.14 (1) Because less piping is used, less labour and (2) material is needed. (2)
- 6.15 A – Siphon pipe
B – Diaphragm
C – Plunger piston (3)
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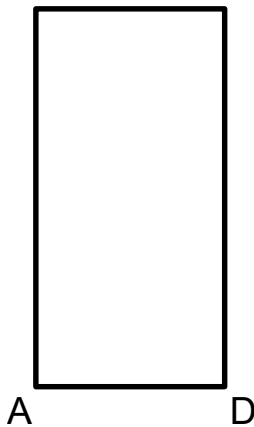
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ANSWER SHEET 1	CIVIL TECHNOLOGY CIVIL SERVICES	NAME: _____

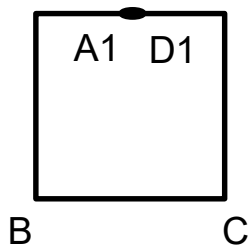
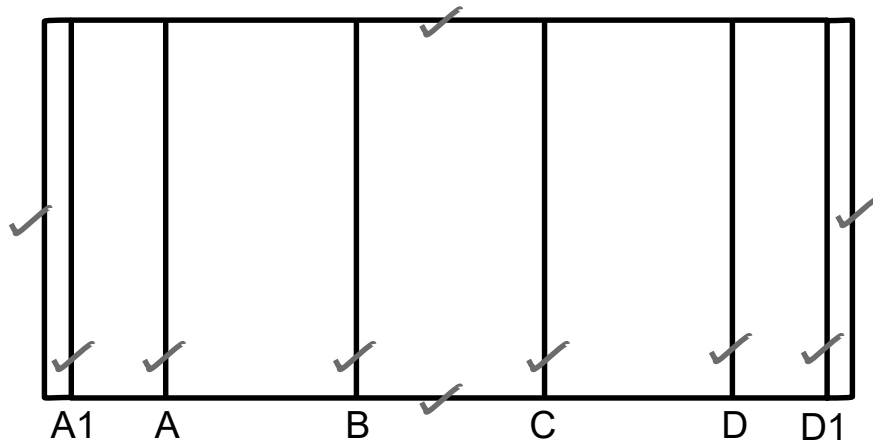
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SIDE ELEVATION



PLAN VIEW

Baseline	2	
Corner lines	6	
Joint allowance	2	
Scale	1	
TOTAL	11	