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# basic education

Department:  
Basic Education  
**REPUBLIC OF SOUTH AFRICA**

## **NATIONAL SENIOR CERTIFICATE**

**GRADE 12**

**CIVIL TECHNOLOGY: CIVIL SERVICES**

**NOVEMBER 2024**

**MARKING GUIDELINES**

**MARKS: 200**

**These marking guidelines consist of 18 pages.**

## INSTRUCTIONS FOR MARKERS

### 1. Markers should:

- Familiarise themselves with the question and answer before evaluating the responses of candidates.
- Always interpret the responses of the candidates within the context of the question.
- Consider any relevant and acceptable answer during pre-marking but should strictly adhere to the answers after finalisation of the marking guideline.
- There are TWO approaches to answering questions; these are (1) to describe and (2) to explain.
  1. If a candidate is required to explain e.g., a process in 4 steps, only the first 4 responses should be considered.
  2. However, if for example candidate is required to explain or describe a process, we need to consider that that candidates may write a long description, not necessarily well organised. In this case the marker needs to evaluate the complete statement to judge if the candidate explained the required outcome satisfactorily and allocate marks on merit.
- Mark what the candidate wrote and do not interpret or predict responses.
- Indicate the tick or cross right at the position where the mark needs to be awarded or where the candidate made the error.
- Accept the letter corresponding with the correct answer as well as the answer written in full in multiple-choice questions or similar questions.
- Accept incorrect spelling in answers unless the spelling changes the meaning of the answer.
- If a learner writes two or more answers separated by a slash (/) mark only the first response, unless the additional answer/s are different names for the same item e.g., Yale lock/Night latch. In this case, the answer for the response should be awarded and the slash (/) should NOT be considered as an additional answer.

### 2. For calculations:

- A mark is only awarded if the correct unit is written next to the answer. If the question states that the answer must be in a specific unit, a mark will ONLY be awarded if the answer has the correct unit as indicated in the question.
- Marks will only be allocated for the correct values if the candidates add instead of multiply. NO marks will be awarded for the calculations and the answer.
- Where an incorrect answer is correctly carried over, the marker must recalculate the values, using the incorrect answer from the first calculation. If correctly used, the candidate should receive the full marks for subsequent calculations.
- Alternative methods of calculations must be considered, provided that the correct answer is obtained.
- For the calculation of quantities marks will be awarded for the correct use of the dimension paper.

**3. When marking drawings:**

- The member for which the mark should be awarded should be drawn correctly in the correct position to receive a mark.
- A member incorrectly drawn but wrongfully repeated in another position will be awarded the mark for the repeated incorrect member provided that the marking guideline provide for TWO or more marks for that member (positive marking).
- Marks can only be awarded for a label if the label is correctly indicating the correct member. Do not consider labels for members of which the labels were provided on the answer sheet.
- Scale drawings should always be marked using an appropriate mask.
- If the incorrect/wrong drawing was drawn, the candidate can be awarded for only what was provided for on the marking guideline.
- If a line diagram or an orthographic view instead of a pictorial drawing (isometric/oblique/perspective) is drawn, the first assessment criteria for each member will be marked wrong, but marks will be awarded for the subsequent members if TWO or more marks are awarded for the same member.
- If candidates draw/give more information than what is required, mark strictly according to the assessment criteria.

**4. Incorrect numbering of questions:**

- If a candidate numbered an incorrectly, but the answer is in the correct position according to the sequence of the questions in the question paper, circle then the incorrect numbering and mark the response.
- If questions were answered randomly not following the same sequence as in the question paper and the learner numbered incorrectly, the response should NOT be marked.

**5. Duplication of responses and questions answered in the correct place:**

- If a question is answered twice, mark the first response.
- If a question should be answered on an answer sheet and the candidate answered it on both the answer sheet and in the answer book, mark the response on the answer sheet and cancel the response in the answer book.
- If the question was answered in the answer book instead of on the answer sheet, mark the response in the answer book according to the assessment criteria on the marking guideline.

**QUESTION 1: OHSA, MATERIALS, TOOLS, EQUIPMENT AND JOINING (GENERIC)**

- |     |  |   |     |
|-----|--|---|-----|
| 1.1 | 1.1.1  | 3 m ✓   | (1) |
|     | 1.1.2  | 3 m ✓   | (1) |
|     | 1.1.3  | Fire-fighting measures ✓  | (1) |
|     | 1.1.4  | ensure that the ladder does not protrude excessively ✓  | (1) |
|     | 1.1.5  | Powder coating ✓  | (1) |
|     | 1.1.6  | the thickness of under size parts can be increased ✓  | (1) |
|     | 1.1.7  | head and pin ✓  | (1) |
|     | 1.1.8  | preventing backing off ✓  | (1) |
|     | 1.1.9  | wood preservatives ✓  | (1) |
|     | 1.1.10                                       | spiral ✓  | (1) |
| 1.2 | B ✓  |   | (1) |
| 1.3 | Diameter of thread/Size of Rawl bolt ✓       |   | (1) |
| 1.4 | Properties and advantages of cured concrete: |   |     |
|     | 1.4.1  | <ul style="list-style-type: none"> <li>Improves the protection of the steel reinforcement ✓</li> <li>Improves the protection against rust</li> </ul> <b>ANY ONE OF THE ABOVE</b>  | (1) |
|     | 1.4.2  | Cured concrete can carry more weight. ✓   | (1) |
| 1.5 | A multi-detector can be used:                |   |     |
|     |  | <ul style="list-style-type: none"> <li>to detect materials in or behind a wall/carpentry/plumbing/construction surface. ✓</li> <li>to determine distances to and from an object.</li> </ul> <b>ANY ONE OF THE ABOVE</b> |     |
|     | A laser level can be used:                   |   |     |
|     |  | <ul style="list-style-type: none"> <li>to indicate horizontal and/or vertical levels/heights/slopes. ✓</li> </ul>   | (2) |

## 1.6 Uses of dumpy level:

- Determine differences between levels and vertical heights ✓
- Determine levels ✓
- Determine slopes
- Determine horizontal angles/angles
- Setting out of buildings
- Transferring levels and heights
- Determine the distance from the dumpy level to an object/telescopic staff

**ANY TWO OF THE ABOVE****(2)**

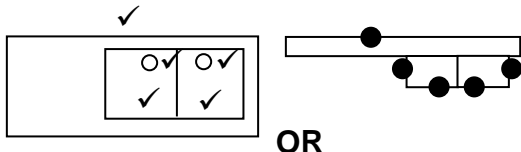
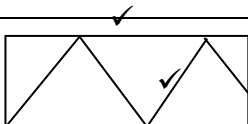
## 1.7 Caring for the telescopic staff:

- The staff must always be folded when it is transported ✓
- Keep it in a bag to prevent damage/scratching of the graduation during transportation ✓
- Ensure that the plastic or metal clips are in working order to keep the sections in position
- Clean after use
- Store in a safe dry place

**ANY TWO OF THE ABOVE****(2)****[20]**

**QUESTION 2: GRAPHICS AS MEANS OF COMMUNICATION (GENERIC)**

NO.	QUESTIONS	ANSWERS	MARKS
1.	What is the measurement of the dwelling facing Hibiscus Street?	12 000 mm/12 m ✓	1
2.	Identify number 1.	Manhole/MH ✓	1
3.	Identify the number indicating the building line.	4 ✓	1
4.	Identify number 2.	Boundary line ✓	1
5.	Identify number 3.	Driveway/Entrance/Exit ✓	1
6.	Write down the abbreviation for number 5.	RE ✓	1
7.	Explain the purpose of number 6.	Garage door: To enter/close/secure the garage ✓	1
8.	How many fluorescent tubes are used in number 7?	1 x 40W /1/One ✓	1
9.	How many one-way switch single-pole switches are in the dwelling?	4/Four ✓	1
10.	How many built-in cupboards are in the dwelling?	2/Two ✓	1
11.	What is omitted in terms of electrical installation in the bedrooms?	Switch socket outlets/Socket outlets/Wall plugs ✓	1
12.	Name TWO access points into the dwelling.	Access points: <ul style="list-style-type: none"> <li>Sliding door/Lounge door/Door at Number 8/Number 8 ✓</li> <li>Garage doors/Rollup door/Door at Number 6/Number 6 ✓</li> </ul>	2
13.	How do you know in which direction the door at number 8 will open?	By the direction of an arrow ✓	1
14.	Name ONE other fixture that can be installed in the bathroom indicated by number 9.	Bath/Bidet/Urinal/Vanity/Bathroom cabinet/Wash hand basin/Basin/Extractor fan/Heated towel rail ✓ (Abbreviations is NOT accepted)	1
15.	Identify number 10.	Hot-water cylinder ✓	1

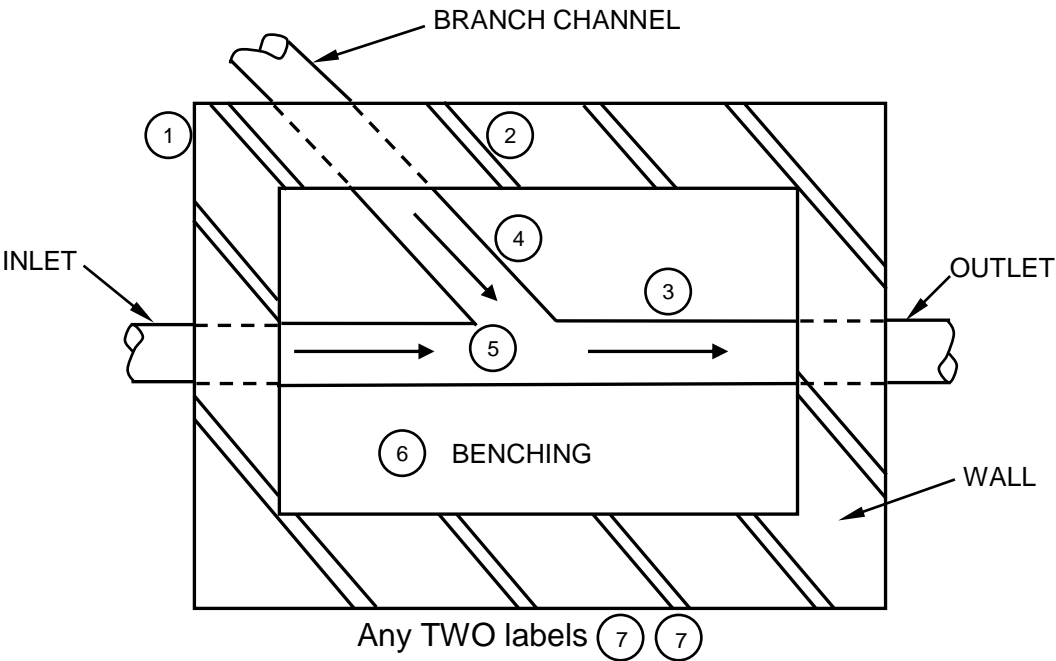
16.	Which plot is on the eastern side of plot number 23?	Plot number 27/Number 27/27 ✓	1
17.	How many inside doors are in the building?	4/Four ✓	1
18.	How many 2 600 mm x 1 400 mm windows are in the building?	3/Three ✓	1
19.	Who checked the drawing of the new dwelling?	P Bot ✓	1
20.	Why will it be difficult to enter the dwelling at number 8 if the NGL is 300 mm lower than the FFL?	No step ✓ No porch/stoep No ramp The door is at a higher level	1
21.	Who was responsible for the printing of the building plan?	Frog printers ✓	1
22.	Deduce from the notes column the date that revision 1 took place.	14/04/2024 ✓	1
23.	In which town will the new dwelling be erected?	Malubu ✓	1
24.	Draw the symbol for a sink unit – double.		5
25.	Draw the symbol for hardcore filling.		2
26.	Calculate the metres of clear-view fencing that would be needed to fence plot number 23, excluding the driveway. Give your answer in metres and show all calculations.	$25\,000 \checkmark + 25\,000 \checkmark + 30\,000 \checkmark + 30\,000 \checkmark - 4\,000 \text{ mm} \checkmark$ $= 106\,000 \text{ mm} = 106 \checkmark \text{ m}$ <b>OR</b> $25 + 25 + 30 + 30 - 4 = 106 \text{ m}$	6
27.	The internal area of the garage is 39,6 m <sup>2</sup> . Calculate the internal length of number 11. Give your answer in mm and show all calculations.	$\underline{39,6 \text{ m}^2} \checkmark = 6,6 \text{ m}$ $6 \text{ m} \checkmark$ $= 6\,600 \text{ mm} \checkmark$ <b>OR</b> $\underline{39\,600\,000 \text{ mm}^2}$ $6\,000 \text{ mm}$ $= 6\,600 \text{ mm}$	3
		<b>TOTAL:</b>	<b>40</b>



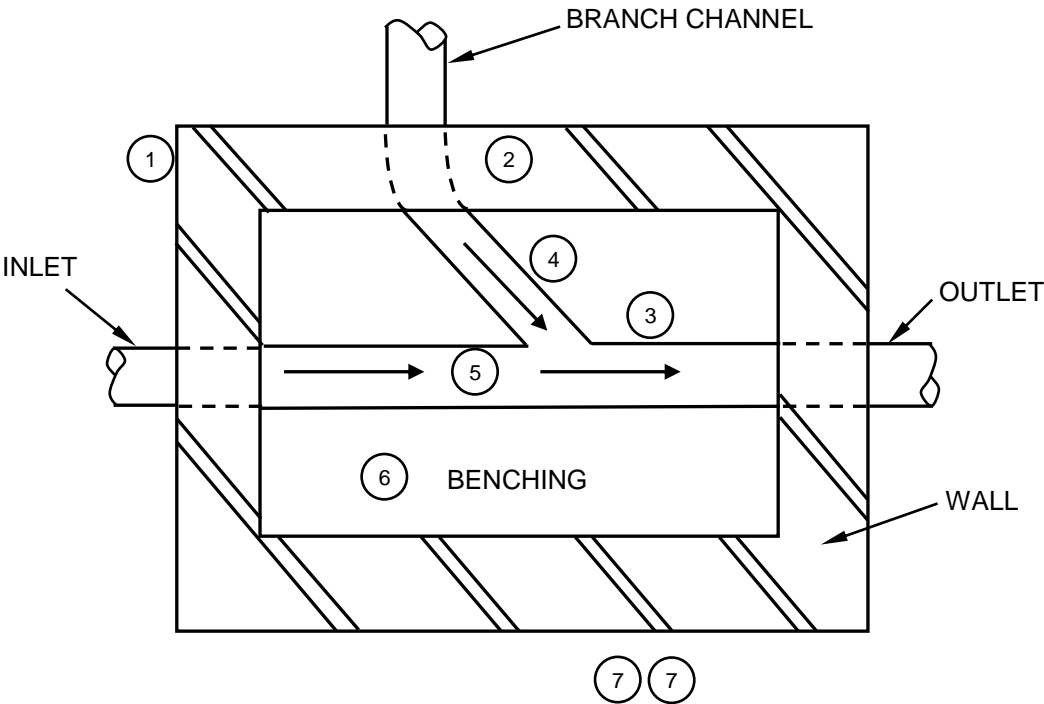
**QUESTION 3: CONSTRUCTION ASSOCIATED WITH CIVIL SERVICES, OHSA  
AND QUANTITIES (SPECIFIC)**

3.1	3.1.1	Incidence board ✓	(1)
	3.1.2	Concrete lid ✓	(1)
	3.1.3	Wedge ✓	(1)
	3.1.4	1:90 ✓	(1)
	3.1.5	Queen closer ✓	(1)
3.2	3.2.1	Safety harness ✓	(1)
	3.2.2	Extractor fan/Blower/Fan/Ventilation ✓	(1)
	3.2.3	Respiratory mask/Respirator/Breathing apparatus ✓	(1)

3.3



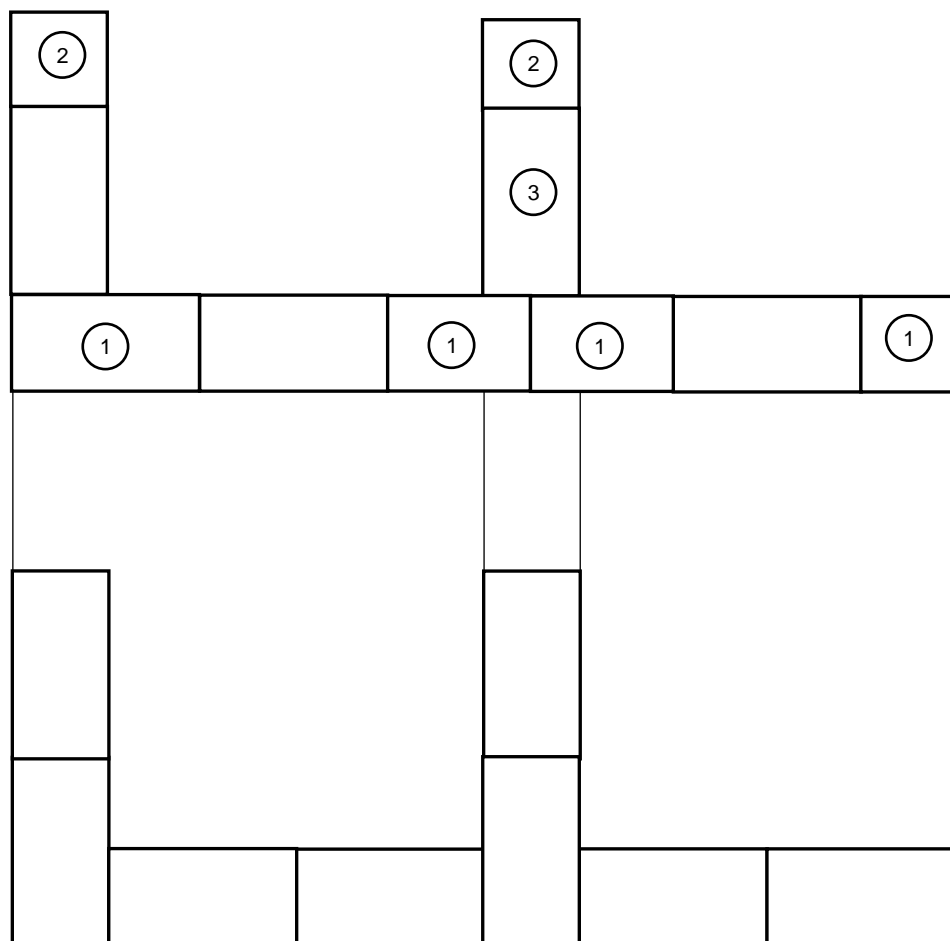
**DRAWING/BRANCH CHANNEL CAN BE ROTATED IN ANY DIRECTION  
OR**



NO.	ASSESSMENT CRITERIA	MARK
1	Walls	1
2	Hatching	1
3	Straight channel	1
4	Branch channel	1
5	Direction of flow	1
6	Benching labelled	1
7	Any TWO labels	2
TOTAL:		8

- 3.4      3.4.1      Rodding eye ✓ (1)
- 3.4.2      1 ✓ (1)
- 3.4.3      110/100 mm ✓ (1)
- 3.4.4      PVC ✓ (1)
- 3.4.5      1 ✓ (1)
- 3.4.6      3 pipes of 6 m lengths ✓ (1)
- 3.4.7      Straight coupling double socket/Kimberley socket ✓ (1)

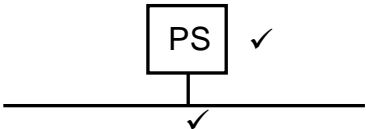

3.5



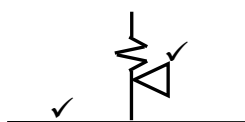
NO.	ASSESSMENT CRITERIA	MARK
1	Stretcher course	4
2	$\frac{1}{2}$ Bricks	2
3	Any full brick	1
TOTAL:		7

(7)  
[30]

**QUESTION 4: COLD- AND HOT-WATER SUPPLY, TOOLS, EQUIPMENT AND MATERIALS (SPECIFIC)**

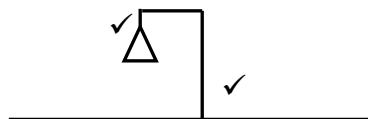
- 4.1 4.1.1 Mechanisms to open a full-way valve:  
 A - is opened with a wheel/hand wheel that move the tapered gate up and down ✓  
 B - is opened with hand lever/lever that rotates the ball ✓ (2)
- 4.1.2 Open and closing mechanism inside full-way valve:  
 Full-way valve with wheel: Gate ✓  
 Full-way valve with lever handle: Ball ✓ (2)
- 4.2 4.2.1 Pipe-thread cutting machine ✓ (1)
- 4.2.2 Use of the pipe-tread cutting machine:  
 • To thread pipes ✓  
 • To cut pipes ✓  
 • To thread nuts  
 • To thread bolts  
**ANY TWO OF THE ABOVE** (2)
- 4.2.3 Grease/Lubricant oil/Oil ✓ (1)
- 4.3 4.3.1 Airlocks ✓ (1)
- 4.3.2 Airlock preventions:  
 • Pipes should be installed horizontally with an upwards slope in the direction of flow/Pipes should be installed correctly ✓  
 • Install vent valves in the pipeline. ✓  
 • Do not install a small diameter feed pipe to a bigger diameter pipe  
**ANY TWO OF THE ABOVE** (2)
- 4.4 4.4.1 Element / Heating element ✓ (1)
- 4.4.2 Anode ✓ (1)
- 4.4.3 The thermostat regulates ✓ the temperature of the water ✓  
 OR  
 The thermostat switches the heating element on or off (2)
- 4.5 4.5.1
- 
OR

- (2)

4.5.2



(2)

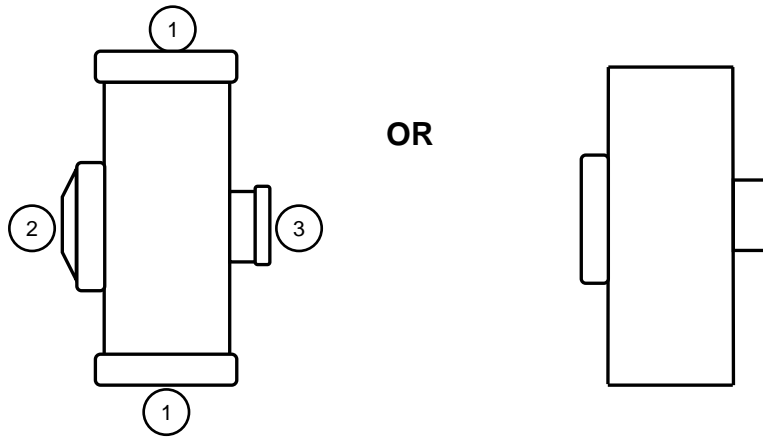
4.5.3



(2)

- |     |       |  |     |
|-----|-------|--|-----|
| 4.6 | 4.6.1 | A - Cold water inlet pipe/Pipe for cold water supply/Inlet ✓<br>B - Hot water outlet pipe/Pipe for hot water supply/Outlet ✓   | (2) |
|     | 4.6.2 | The purpose of the pressure reducing valve is to: <ul style="list-style-type: none"> <li>• lower the incoming water pressure ✓</li> <li>• balance the water pressure of the hot- and cold-water supply ✓</li> </ul>                                      | (2) |
|     | 4.6.3 | Safety valve/Temperature and pressure safety valve/TP Valve ✓  | (1) |
|     | 4.6.4 | The drip tray: <ul style="list-style-type: none"> <li>• collects water if the geyser leaks ✓</li> <li>• prevents water damage to the building</li> <li>• pipe connected to drip tray allows water to flow outside</li> </ul> <b>ANY ONE OF THE ABOVE</b> | (1) |
|     | 4.6.5 | Vacuum breaker ✓   | (1) |
| 4.7 | 4.7.1 | F ✓  | (1) |
|     | 4.7.2 | B ✓  | (1) |
|     | 4.7.3 | A ✓  | (1) |
|     | 4.7.4 | G ✓  | (1) |
|     | 4.7.5 | H ✓  | (1) |
| 4.8 | 4.8.1 | Dezincification ✓  | (1) |
|     | 4.8.2 | Electrolytic reaction ✓  | (1) |
|     | 4.8.3 | Galvanic corrosion ✓   | (1) |

4.9

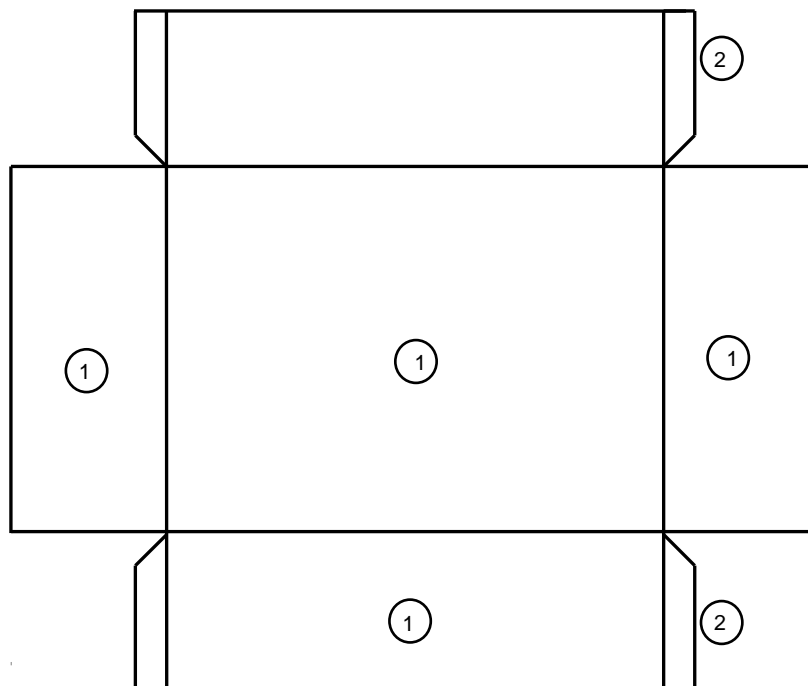


NO.	ASSESSMENT CRITERIA	MARK
1	110 mm Soil pipe	2
2	Inspection eye	1
3	90° Reducing socket for waste pipe	1
<b>TOTAL:</b>		<b>4</b>

(4)  
[40]

**QUESTION 5: GRAPHICS AS MEANS OF COMMUNICATION, ROOF WORK AND STORM WATER (SPECIFIC)**

5.1

**PICTORIAL VIEW NOT ACCEPTED**

NO.	ASSESSMENT CRITERIA	MARK
1	Development of stopped end	4
2	Edges/Seams	2
	<b>TOTAL:</b>	<b>6</b>

(6)

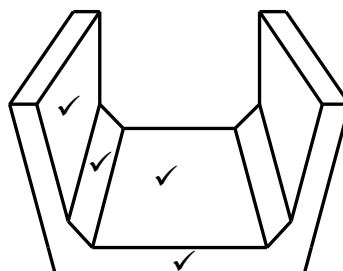
5.2 Method of channelling storm water:

- Roof gutters/Gutters ✓
- Rainwater down pipe/Down pipe
- Channels/Surface channels
- Inclined surfaces
- Roadside gutters
- Road kerbs
- Storm water drains
- Furrows

**ANY ONE OF THE ABOVE**

(1)

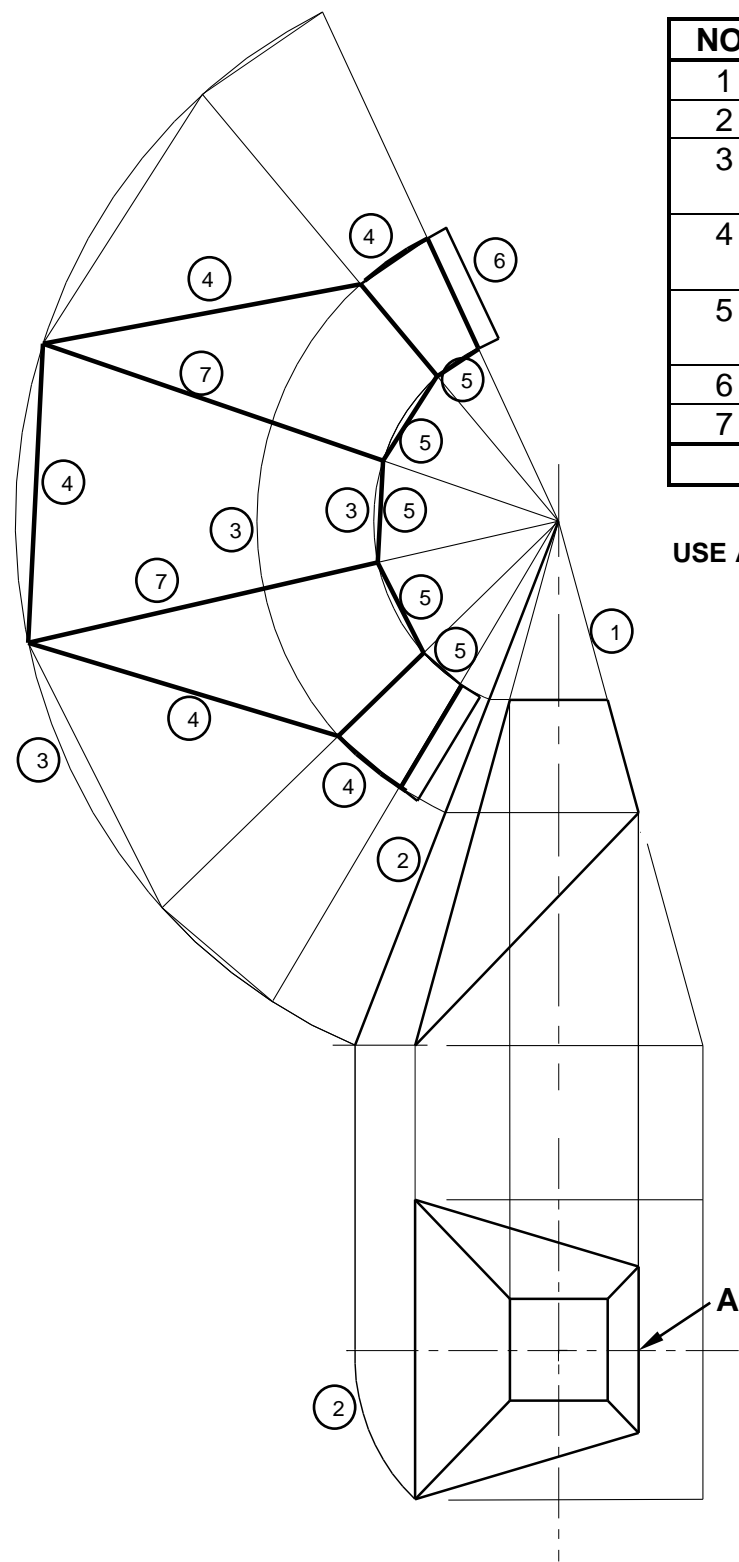
5.3



Precast open channel

(4)

5.4



NO.	ASSESSMENT CRITERIA	MARK
1	Projection lines to apex	1
2	Determine true length	2
3	Projection lines and arcs from pyramid	3
4	Development of base of pyramid	5
5	Development of top of pyramid	5
6	3 mm seams (any ONE)	1
7	Folding lines (any TWO)	2
TOTAL:		19

USE A MASK TO MARK THIS QUESTION

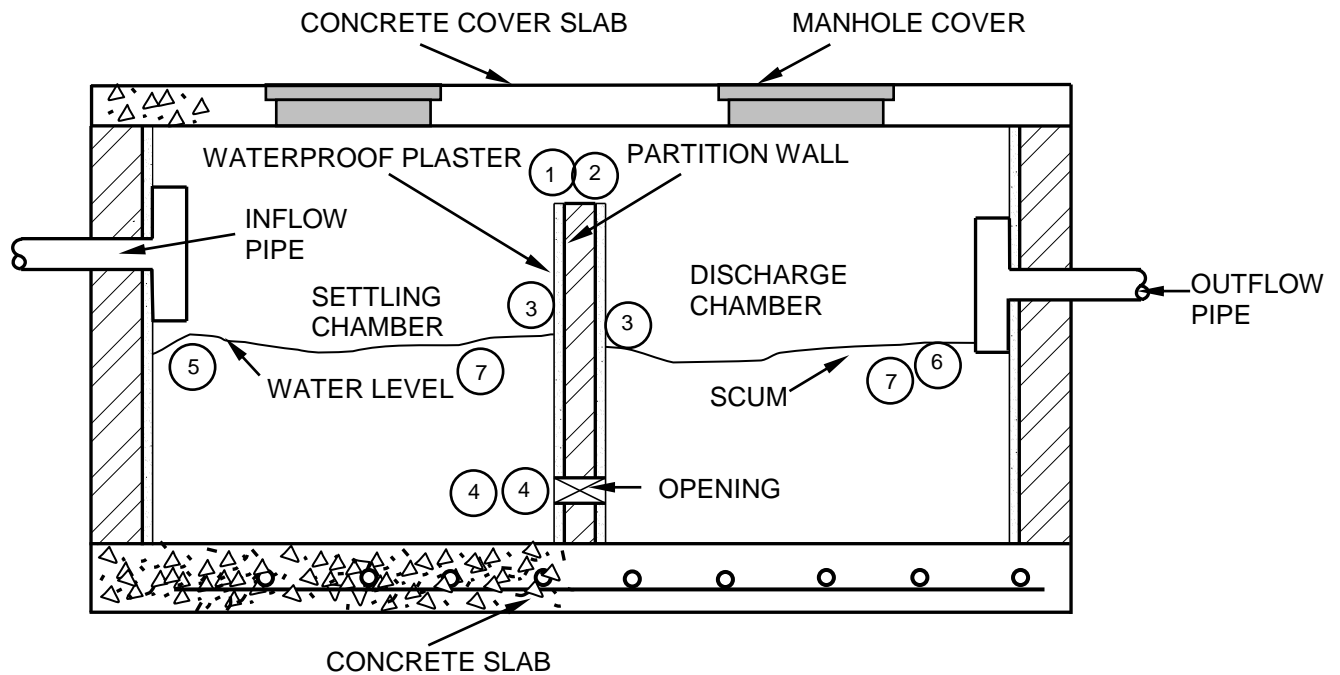
(19)  
[30]



**QUESTION 6: SEWERAGE, SANITARY FITTINGS AND JOINING (SPECIFIC)**

- 6.1      6.1.1      B ✓ (1)
- 6.1.2      D ✓ (1)
- 6.1.3      A ✓ (1)
- 6.1.4      C ✓ (1)
- 6.1.5      D ✓ (1)
- 6.2      6.2.1      Single-bowl urinal /Single stall urinal ✓ (1)
- 6.2.2      A – Flush valve/Automatic flush valve/Push button valve/Flush ✓  
                     B – P-trap/Metal trap/Earthenware trap ✓ (2)
- 6.2.3      The flush valve:  
                     • releases water when pressed or after movement ✓  
                     • flushes/cleans the urinal  
                     **ANY ONE OF THE ABOVE** (1)
- 6.2.4      Removable mesh guard/Urinal mat/Any object that can prevent  
                     foreign matter to enter the urinal can be accepted ✓ (1)
- 6.3      6.3.1      Pointed head/Head/Soldering iron/Non-electrical soldering iron ✓ (1)
- 6.3.2      The head is made of copper because:  
                     • copper is a good conductor of heat ✓  
                     • copper retains heat well  
                     **ANY ONE OF THE ABOVE** (1)
- 6.3.3      The soldering stick has a composition of tin and lead. ✓ (1)
- 6.3.4      Reasons for applying flux:  
                     • Cleans the joint/surface ✓  
                     • Prevents oxidation/rust ✓  
                     • Promotes the flow of solder/capillary action  
                     **ANY TWO OF THE ABOVE** (2)
- 6.4      The process of joining PVC pipes to a straight coupler using a solvent:  
             • Use sandpaper to remove wax surface of the pipe and coupler and create a  
                     chamfer. ✓  
             • Clean ends of the pipes and the coupler. ✓  
             • Apply solvent/PVC weld to outside of the pipes. ✓  
             • Push in coupler over the pipes and clean excess solvent from the joint. ✓ (4)

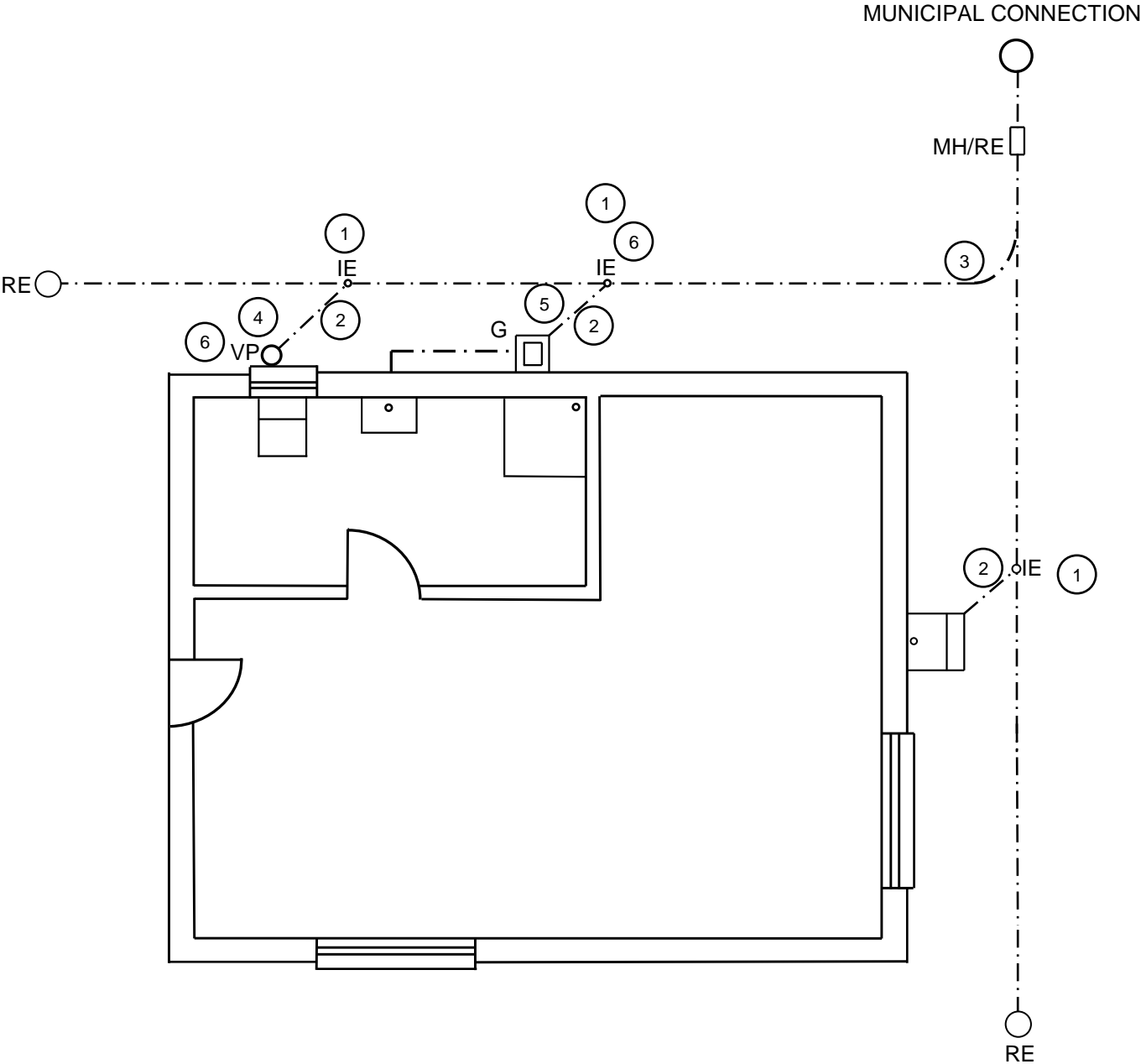
6.5



NO.	ASSESSMENT CRITERIA	MARK
1	Partition wall	1
2	Hatching of partition wall	1
3	Plaster on both sides of partitioning wall	2
4	Opening in partition wall	2
5	Indicating water level	1
6	Indicating scum	1
7	Labels: Water level Scum	2
<b>TOTAL:</b>		<b>10</b>

6.6

NO.	ASSESSMENT CRITERIA	MARK
1	Inspection eyes	3
2	Branch pipes - 45°	3
3	Junction of the main sewer lines quarter round/45°	1
4	Vent pipe correct position	1
5	Gully	1
6	Abbreviations – IE and VP	2
TOTAL:		11



[40]

TOTAL: 200