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Basic Education
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SENIOR CERTIFICATE EXAMINATIONS/ NATIONAL SENIOR CERTIFICATE EXAMINATIONS

CIVIL TECHNOLOGY: CONSTRUCTION

MAY/JUNE 2025

MARKING GUIDELINES

MARKS: 200

These marking guidelines consist of 16 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 Powder coating ✓ (1)
- 1.1.2 Annealing ✓ (1)
- 1.1.3 Paint ✓ (1)
- 1.1.4 Weekly ✓ (1)
- 1.1.5 Do not jump from one level to another on the scaffold. ✓ (1)
- 1.1.6 Steel ✓ (1)
- 1.1.7 2 ✓ (1)
- 1.1.8 A material safety data sheet ✓ (1)
- 1.1.9 Two thirds ✓ (1)
- 1.1.10 1 980 mm ✓ (1)
- 1.2 1.2.1 D ✓ (1)
- 1.2.2 To prevent/resist rotation of the bolt/screw. ✓ (1)
- 1.2.3 C; A; B ✓ (1)
- 1.2.4 Thickness/Diameter of Rawl bolt ✓ (1)
- 1.3 Advantages of galvanising:
- Add strength to the original, uncoated metal ✓
 - Galvanised metal is thicker than uncoated metal ✓
 - Galvanised nails and screws prevent staining
 - Galvanising protects the metal against rust/corrosion
 - Galvanising increases the durability of metal
- ANY TWO OF THE ABOVE** (2)
- 1.4 Natural elements:
- Moisture/Water ✓
 - Sunlight
 - Extreme cold
- ANY ONE OF THE ABOVE** (1)
- 1.5 The laser level is used to ensure that the marked positions are level for the shelf. ✓ (1)
- 1.6 • Tripod ✓
- Telescopic staff ✓
- Plumb bob
- 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 Jacaranda Street?	17 080 mm/17,08 m ✓	1
2.	Identify number 1.	Building line ✓	1
3.	Identify number 2.	Sidewalk/Pavement ✓	1
4.	Identify number 3.	Municipal sewer line/Sewer line ✓	1
5.	Identify the number indicating the boundary line.	4/Four ✓	1
6.	Name the colour that must be used to indicate the new dwelling on the site plan.	Red ✓	1
7.	What is omitted at number 6 if the NGL is 300 mm lower than the FFL?	A step/concrete stoep/ramp at the door ✓	1
8.	What type of fencing is used for the boundary wall for plot number 15?	Prefabricated fencing ✓	1
9.	Name TWO materials that can be used for number 7.	• Wood ✓ • Aluminium ✓ • Galvanised metal • Steel • Metal • Nutec • Glass ANY TWO OF THE ABOVE	2
10.	What is wrong with number 8?	The arrow indicating the slope is in the wrong direction ✓	1
11.	Name THREE electrical installations omitted in the house.	• Lights/Ceiling lights/Fluorescent lights/Downlights/Wall mounted lights ✓ • Electrical wiring/Wiring ✓ • Light switch/Shaving socket outlet/Socket outlet ✓ ANY THREE OF THE ABOVE	3
12.	Which plot is on the eastern side of the new dwelling?	Plot number 13/Number 13 ✓	1



13.	Identify the elevation with no windows.	South elevation/South ✓	1
14.	How many rodding eyes are shown on the site plan?	2/Two ✓	1
15.	How many external doors are there on the plan for the house?	3/Three ✓	1
16.	Which street is on the western side of the new dwelling?	Jacaranda Street ✓	1
17.	How many 1 200 mm x 800 mm windows are in the building?	1/One ✓	1
18.	On what date was revision 1 completed?	16/06/2024 ✓	1
19.	Draw the symbol for a wall-mounted urinal.		2
20.	Draw the symbol for a double-pole one-way switch.		3
21.	Draw the symbol for a staircase.		3
22.	Deduce from the notes column the type of globes that will be used in the bedroom.	LED/2 x 6 W ✓	1
23.	In which town will the new dwelling be erected?	Phoenix ✓	1



24.	Calculate the total length of fencing that would be needed to fence plot number 15 . Give your answer in metres and show ALL your calculations.	$24\ 000 \checkmark + 24\ 000 \checkmark + 28\ 000 \checkmark$ $+ 28\ 000\ \text{mm} \checkmark$ $= 104\ 000\ \text{mm} \checkmark$ $= 104 \checkmark\ \text{m}$ OR $24\ \text{m} + 24\ \text{m} + 28\ \text{m} + 28\ \text{m} = 104\ \text{m}$	6
25.	The internal area of the open plan kitchen is $72,94\ \text{m}^2$. Calculate the length of number 5 . Give your answer in mm.	$\underline{72,94}\ \text{m}^2 \checkmark$ $10,42\ \text{m} \checkmark$ $= 7\ \text{m}$ $= 7\ 000 \checkmark\ \text{mm}$ OR $\underline{72\ 940\ 000}\ \text{mm}^2$ $10\ 420\ \text{mm}$ $= 7\ 000\ \text{mm}$	3
		TOTAL:	40

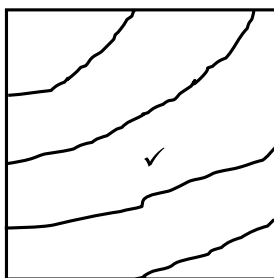


QUESTION 3: ROOFS, STAIRCASES AND JOINING (SPECIFIC)

- 3.1 3.1.1
- Roof trusses ✓
 - Wall plates ✓
- (2)

- 3.1.2 Reason why a baseplate is anchored to concrete:
- To bolt down steel sections to concrete ✓
 - To ensure a stable connection
- ANY ONE OF THE ABOVE** (1)

3.2



BATTEN 38 mm X 38 mm ✓



FOOT BATTEN 38 mm X 50 mm ✓

(4)

- 3.3 2 100 mm/2,1 m ✓ (1)

- 3.4 An apron is used to cover the floor joist and trimmers exposed by the stairwell openings. ✓ (1)

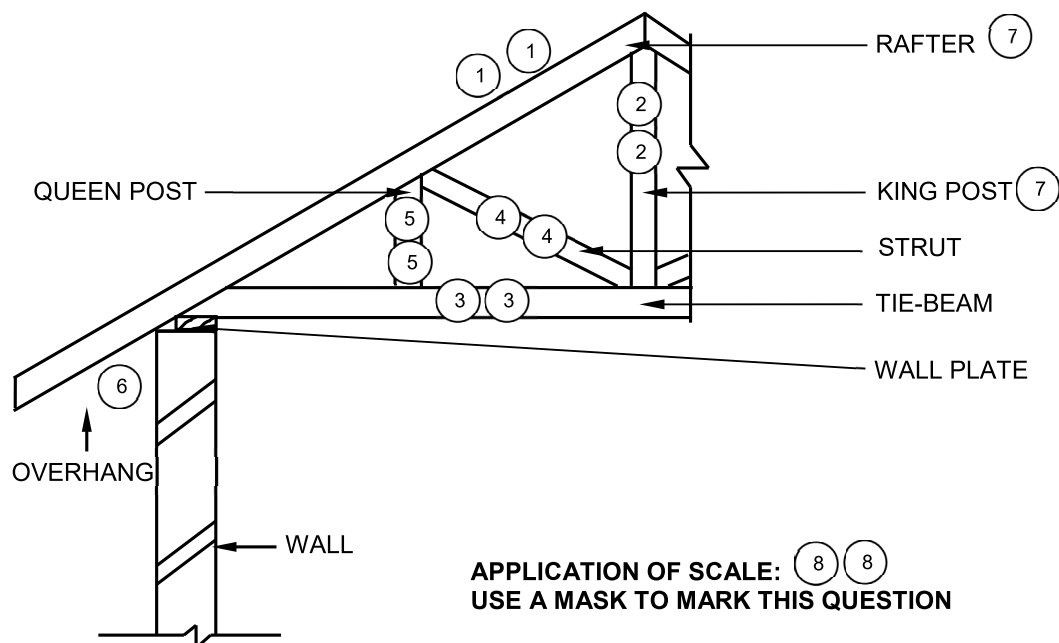
- 3.5 Between 3 to 4 days/3days/4days ✓ (1)

- 3.6 Step/Stair ✓ (1)

- 3.7 Dimensions (schedule) for tread and riser for a public building:
- Tread(going) = 280 mm ✓
 - Riser = 150 mm ✓
- (2)

- 3.8 Balustrade patterns:
- Mopani pattern ✓
 - Transvalia pattern ✓
 - Ultra-modern pattern
 - Space-age pattern
- ANY TWO OF THE ABOVE** (2)

3.9



NO.	ASSESSMENT CRITERIA	MARK
1	Rafter	2
2	King post	2
3	Tie-beam	2
4	Strut	2
5	Queen post	2
6	Overhang	1
7	Any TWO labels	2
8	Application of scale: ALL correct = 2 ONE or TWO incorrect = 1 THREE or more incorrect = 0	2
TOTAL:		15

(15)
[30]

QUESTION 4: EXCAVATIONS, FORMWORK, TOOLS, EQUIPMENT AND MATERIALS (SPECIFIC)

- | | | | |
|-----|-------|---|-----|
| 4.1 | 4.1.1 | Grey cast iron ✓ | (1) |
| | 4.1.2 | Highly toxic ✓ | (1) |
| | 4.1.3 | Brass ✓ | (1) |
| | 4.1.4 | Perspex ✓ | (1) |
| | 4.1.5 | Drainage systems ✓ | (1) |
| 4.2 | 4.2.1 | C ✓ | (1) |
| | 4.2.2 | D ✓ | (1) |
| | 4.2.3 | C✓ | (1) |
| | 4.2.4 | B ✓ | (1) |
| | 4.2.5 | A ✓ | (1) |
| 4.3 | 4.3.1 | Tamping rammer/Rammer ✓ | (1) |
| | 4.3.2 | Taking care of this machine: <ul style="list-style-type: none"> • Lubricate and adjust according to the manufacturer's instructions ✓ • Store in safe dry place ✓ • Service/Inspect rammer regularly ANY TWO OF THE ABOVE | (2) |
| 4.4 | 4.4.1 | Slump test ✓ | (1) |
| | 4.4.2 | Purpose of the slump test: <ul style="list-style-type: none"> • To test the density of the concrete before it is used ✓ • To determine the workability and consistency of the concrete ✓ • To determine the slump of the mixture ✓ | (3) |
| | 4.4.3 | Outcomes of the slump test: <ul style="list-style-type: none"> • True slump/True ✓ • Shear slump/Shear ✓ • Collapsed slump/Collapsed ✓ | (3) |



4.5 Properties of steel shuttering:

- Sturdy enough to bear the load of concrete without collapsing ✓
- Stronger than wood and timber board products ✓
- Easy to remove when concrete has set
- Not as adaptable as timber shuttering
- More expensive than timber shuttering
- Lasts longer than timber shuttering
- Can be used repeatedly
- Watertight seams and joints

ANY TWO OF THE ABOVE

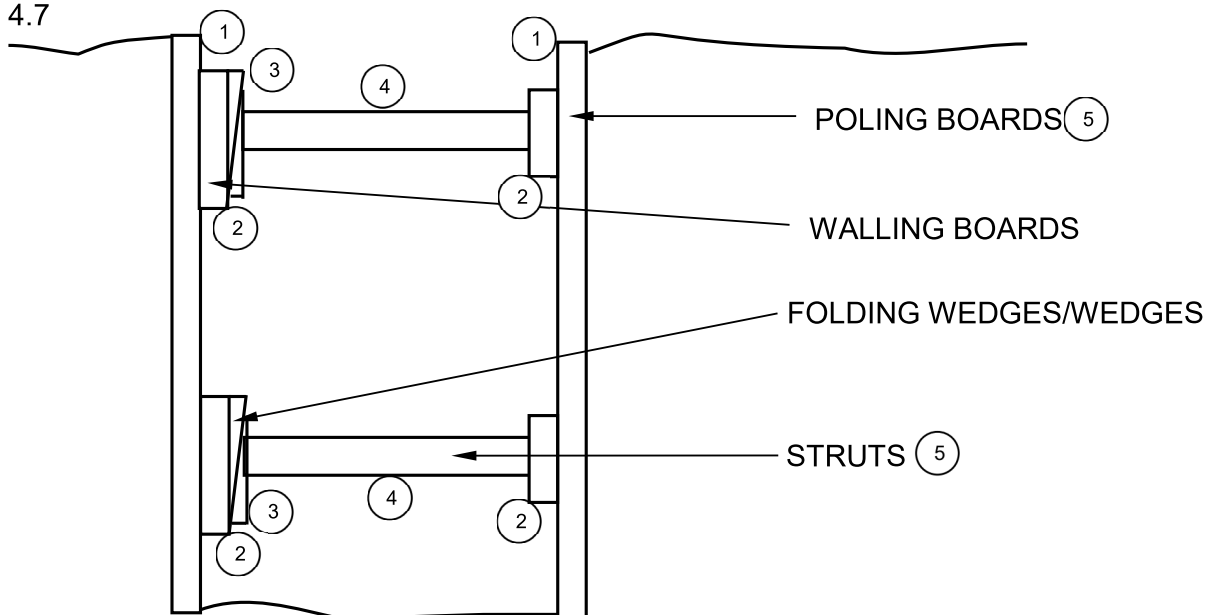
(2)

4.6 • Wedges/Folding wedges ✓

- Adjustable props ✓

(2)

4.7



NO.	ASSESSMENT CRITERIA	MARK
1	Poling boards (1 x left + 1 x right)	2
2	Walling board (2 x top + 2 x bottom)	4
3	Folding wedges/Wedge	2
4	Struts (1x top + 1 x bottom)	2
5	Any TWO Labels	2
TOTAL:		12

(12)

4.8 4.8.1 Formwork for a concrete beam with an attached floor slab ✓

(1)

4.8.2 A- Concrete Floor/Floor ✓

B- Strut/Prop ✓

C- Wedge/Wedges ✓

(3)

[40]

QUESTION 5: PLASTER AND SCREED, BRICKWORK AND GRAPHICS AS MEANS OF COMMUNICATION (SPECIFIC)

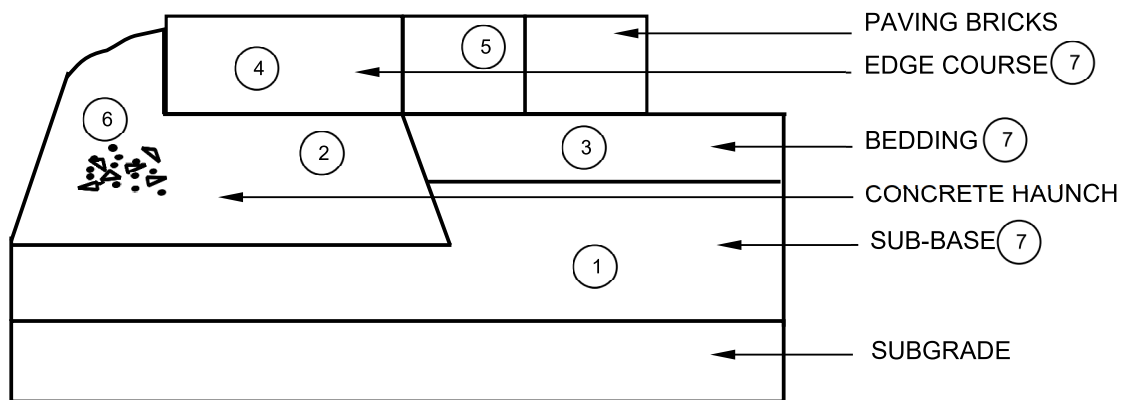
- 5.1 Bagging finish:
Using a hessian cloth ✓/cement bag to paint a thin layer of cement over a face brick wall or surface. ✓ (2)
- 5.2 Wet the levelled plaster with block brush ✓ and use a wooden float to smooth the surface ✓ (2)
- 5.3 Dry layer onto fully set concrete floor:
 - The concrete base should be chipped ✓
 - Remove all rubble ✓
 - Remove all dust ✓
 - Apply bonding agent ✓ (4)
- 5.4 5.4.1 Wall ties make the wall stronger by keeping the inner and outer skins together. ✓ (1)
- 5.4.2 Placement of DPC in a cavity wall:
 - The DPC is installed above the floor inside the wall ✓ and one brick above a lintel. ✓
 - The DPC will be positioned and laid on the concrete slab elevated to the first layer bricks and sloping down to the weep hole for excess water to escape.**ANY ONE OF THE ABOVE** (2)
- 5.4.3



(2)



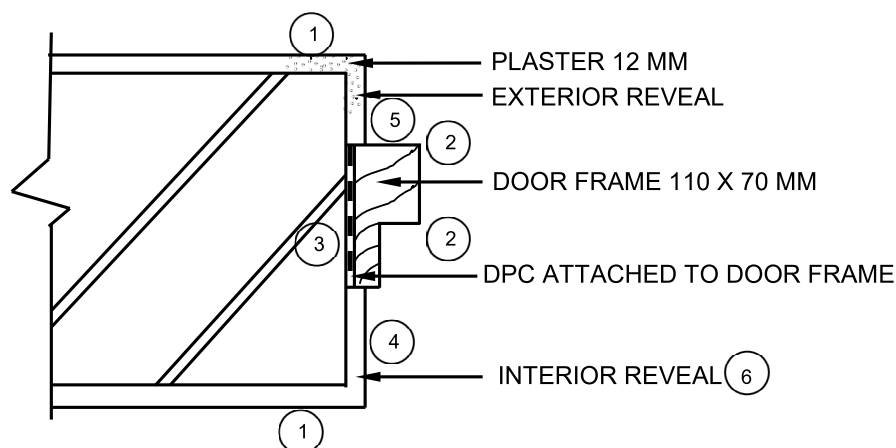
5.5



NO.	ASSESSMENT CRITERIA	MARK
1	Sub-base	1
2	Concrete haunch	1
3	Bedding	1
4	Edge course	1
5	Paving bricks correctly indicated	1
6	Concrete symbol correctly indicated	1
7	Any THREE labels	3
TOTAL:		9

(9)

5.6



NO.	ASSESSMENT CRITERIA	MARK
1	Plaster (1x interior + 1x exterior)	2
2	Timber door frame (1x frame + 1x rebate)	2
3	DPC	1
4	Interior reveal	1
5	Exterior reveal	1
6	Any ONE label	1
TOTAL:		8

(8)

[30]

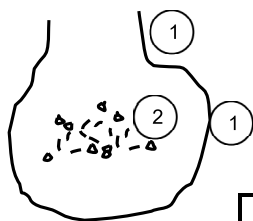


QUESTION 6: REINFORCEMENT IN CONCRETE, FOUNDATIONS, CONCRETE FLOORS AND QUANTITIES (SPECIFIC)

- 6.1 6.1.1 E ✓ (1)
- 6.1.2 A ✓ (1)
- 6.1.3 G ✓ (1)
- 6.1.4 F ✓ (1)
- 6.1.5 C ✓ (1)

- 6.2 6.2.1 **A** – Steel cable/Cable ✓
B – Steel casing/Steel pipe/Steel tube ✓
C – Ground/Natural ground level/NGL/Unstable ground/Undisturbed earth ✓
D – Drop hammer ✓
E – Plug/Dry concrete mixture ✓ (5)

6.2.2



NO.	ASSESSMENT CRITERIA	MARK
1	Enlarged toe	2
2	Concrete symbol	1
TOTAL:		3

(3)

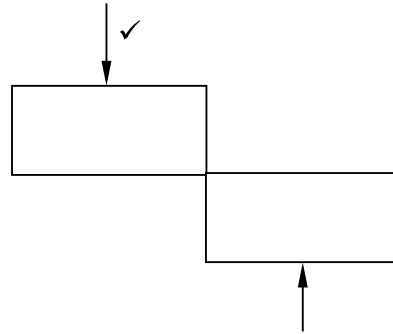
- 6.2.3 The drop hammer hammers/compacts the fresh concrete until it forms a enlarge base. ✓ (1)
- 6.2.4 The steel casing gets removed. ✓ (1)
- 6.2.5 Where the lengths of the piles differ. ✓ (1)
- 6.2.6 Alternative pile:
 • Precast piles ✓
 • Steel tube caisson piles
ANY ONE OF THE ABOVE (1)
- 6.2.7 It keeps the hole for the drop hammer free of falling debris. ✓ (1)
- 6.3 6.3.1 Reinforcing in ribs/Reinforcing ✓ (1)
- 6.3.2 The purpose of A is:
 • To increase the strength of the ribs ✓
 • To resist tensile forces
 • To increase the load-bearing capacity
ANY ONE OF THE ABOVE (1)



6.4



COMPRESSION FORCE ✓



SHEAR FORCE ✓

OR



COMPRESSION FORCE



SHEAR FORCE

(4)

6.5	A	B	C	D	
6.5.1				Internal length of long wall:	
				$= 15\,400 - 2/220 \checkmark = 14\,960 \text{ mm} \checkmark$	
				Internal length of short wall:	
				$= 8\,220 - 2/220 \checkmark = 7\,780 \text{ mm} \checkmark$	
				Screed needed	
	1/ $\checkmark$	14,96 $\checkmark$		Internal dimension of long walls = 14 960 mm	
		7,78 $\checkmark$		Internal dimension of short walls = 7 780 mm	
		0,03 $\checkmark$		Thickness of screed is 30 mm	
			3,49 m ³ $\checkmark$	3,49 m ³ screed is needed	(9)
6.5.2				Area of tiles	
	1/	14,96 $\checkmark$		Internal dimension of long walls = 14 960 mm	
		7,78 $\checkmark$		Internal dimension of short walls = 7 780 mm	
			116,39 m ² $\checkmark$	116,39 m ² area of tiles needed	
				Plus 5% breakage	
				$5/100 \times 116,39 \checkmark = 5,82 \text{ m}^2 \checkmark$	
				$116,39 + 5,82 = 122,2 \text{ m}^2 \checkmark$	(6)
				Correct use of dimension paper $\checkmark$	(1)

OR

6.5.1	A	B	C	D	
				Internal length:	
				$= 15\,400 - 2/220 = 14\,960 \text{ mm}$	
				$= 8\,220 - 2/220 = 7\,780 \text{ mm}$	
	1/	14,96			
		7,78	16,39 m ²	Area of floor	
	1/	16,39			
		0,03	3,49 m ³	Screed needed	
6.5.2				Area of tiles needed + 5% breakage	
				$116,39 + 5,82 = 122,2 \text{ m}^2 \text{ tiles needed}$	
				Correct use of dimension paper	

[40]

TOTAL: 200

