basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATIONS/
NATIONAL SENIOR CERTIFICATE EXAMINATIONS

CIVIL TECHNOLOGY: CONSTRUCTION

MAY/JUNE 2026

MARKS: 200

TIME: 3 hours

This question paper consists of 16 pages and 5 answer sheets.

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REQUIREMENTS

1. Drawing instruments
2. A non-programmable calculator
3. ANSWER BOOK

INSTRUCTIONS AND INFORMATION

1. This question paper consists of SIX questions.
2. Answer ALL the questions.
3. Read ALL the questions carefully.
4. Answer each question as a whole. Do NOT separate subsections of questions.
5. Number the answers correctly according to the numbering system used in this question paper.
6. Start the answer to EACH question on a NEW page.
7. Do NOT write in the margins of the ANSWER BOOK.
8. You may use sketches to illustrate your answers.
9. Write ALL calculations and answers in the ANSWER BOOK or on the attached ANSWER SHEETS.
10. Use the mark allocation as a guide to the length of your answers.
11. Make drawings and sketches in pencil, fully dimensioned and neatly finished off with descriptive titles and notes to conform to the *SANS/SABS Code of Practice for Building Drawings.*
12. For the purpose of this question paper, the size of a brick should be taken as 220 mm x 110 mm x 75 mm.
13. Use your own discretion where dimensions and/or details have been omitted.
14. Answer QUESTIONS 2, 3.7, 4.9, 5.4 and 6.6 on the attached ANSWER SHEETS using drawing instruments, where necessary.
15. Write your CENTRE NUMBER and EXAMINATION NUMBER on every ANSWER SHEET and hand them in with your ANSWER BOOK, whether you have used them or not.
16. Drawings in the question paper are NOT to scale due to electronic transfer.
17. Google Images were used as the source of all photographs and pictures.
18. Write neatly and legibly.

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

Start this question on a NEW page.

1.1 Choose the correct word(s) from those given in brackets. Write only the word(s) next to the question numbers (1.1.1 to 1.1.10) in the ANSWER BOOK, e.g. 1.1.11 Concrete.

1.1.1 Maintenance work on a building hoist should be carried out at least (once a year/twice a year). (1)

1.1.2 A trestle scaffold should not to be used if it exceeds a height of (3 m/2 m). (1)

1.1.3 (Guard rails/Toe boards) must be installed at least 900 mm above the scaffold platform. (1)

1.1.4 A scaffold should be inspected (during bad weather/after bad weather) for it to be used. (1)

1.1.5 The working platform for suspended scaffolds should not exceed (1,6 m/1,8 m) in width. (1)

1.1.6 When working on elevated areas, waste material must be disposed of by (throwing it from a window/using a conveyor belt). (1)

1.1.7 Scaffold frameworks should be inspected at least (once a month/ once a week). (1)

1.1.8 A ladder must be fitted with (non-skid devices/hooks) at the bottom ends of the stiles. (1)

1.1.9 Doors and gates opening directly onto a stairway must have a platform that extends at least (510 mm/375 mm). (1)

1.1.10 The (head/crank) is NOT a part of a bolt. (1)

1.2 Which view below represents the top view of a hex flange?



A **B** **C** **D** (1)

1.3 Rawl bolts are purchased according to specifications. Name any TWO of these specifications. (2)

1.4 As a contractor, you are busy with the final finishes to a bathroom. You have to paint the ceiling.

1.4.1 Name TWO categories of paint. (2)

1.4.2 Explain TWO reasons for painting the ceiling. (2)

1.5 Predict the consequence if the laser level is NOT correctly set up on its tripod. (1)

1.6 Describe what must be done after a laser level was accidently dropped to ensure its accuracy. (1)

1.7 Describe how you will take care of the telescope after using the dumpy level. (1)
[20]

QUESTION 2: GRAPHICS AS MEANS OF COMMUNICATION (GENERIC)

Start this question on a NEW page.

FIGURE A and FIGURE B on the next page show drawings that appear on a building plan. Analyse the drawings and complete the table on ANSWER SHEET 2.

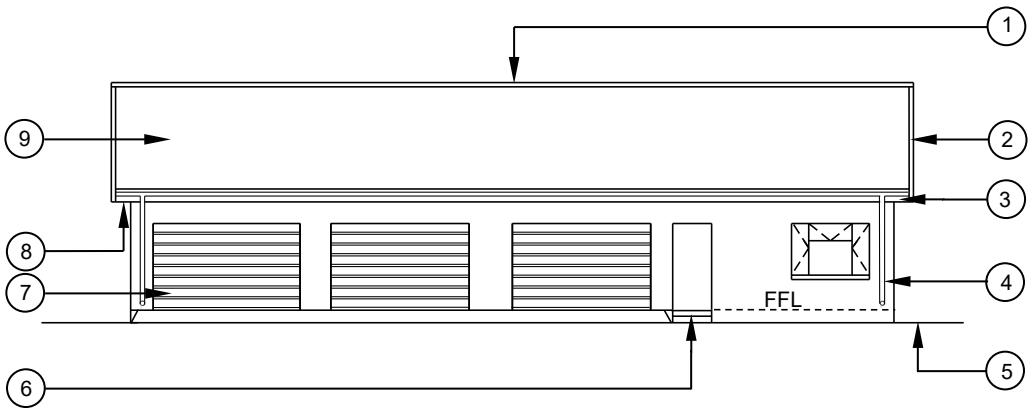


FIGURE A

NOTES:
Contractors must verify all dimensions and levels on site before commencing work.

Architects to be notified of any discrepancies immediately.

Aluminium gutters and downpipes must be fitted to the dwelling.

Roof: Gable roof

Fibre cement window sills must be installed below every window.

Architect's signature ……

Client's signature ……..

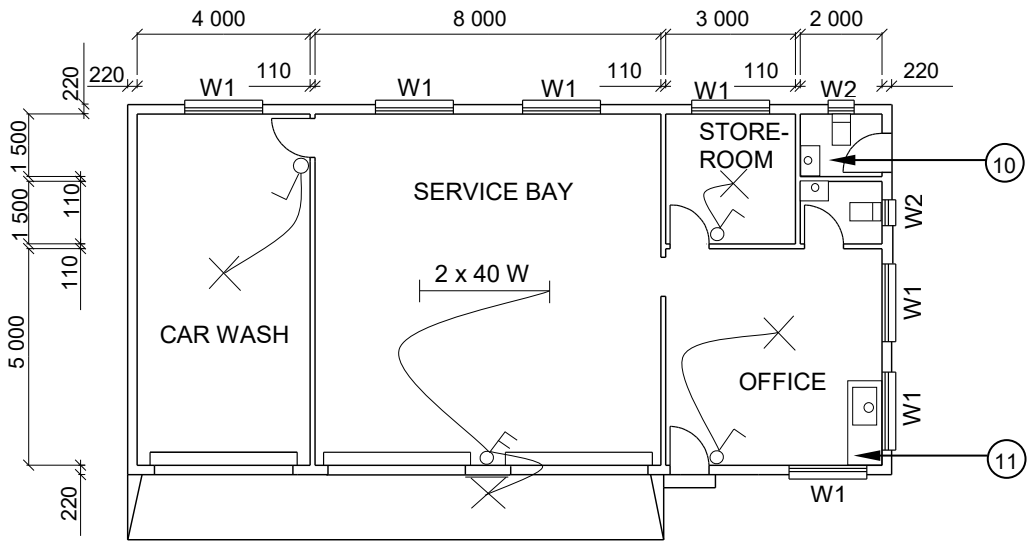
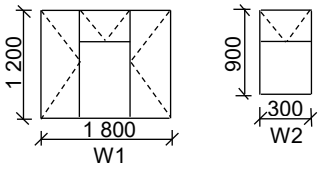


FIGURE B

REVISION 1	DATE: 14/04/2026	DRAWING OF ELECTRICAL WALL PLUGS
PRINTED BY: AFRIQ PRINTERS	DATE OF PRINT: 20/04/2026	
DRAWING TITLE: ELEVATION AND FLOOR PLAN		
PROJECT: PROPOSED DWELLING OF MS DALI ON PLOT 27, MALVA STREET, UMLASI		
PROJECT NO.: GR 288-444	DRAWING NO.: 886P2	
DATE: 12/04/2026	DRAWN: DP FOX	CHECKED: G PHIRI
ELEVATION	SCALE 1 : 100	
FLOOR PLAN	SCALE 1 : 100	
REFERENCE CODE: QP 6 – 2026		

WINDOW SCHEDULE



[40]

QUESTION 3: ROOFS, STAIRCASES AND JOINING (SPECIFIC)

Start this question on a NEW page.

3.1 FIGURE 3.1 below shows a roof construction where clay roof tiles are used.

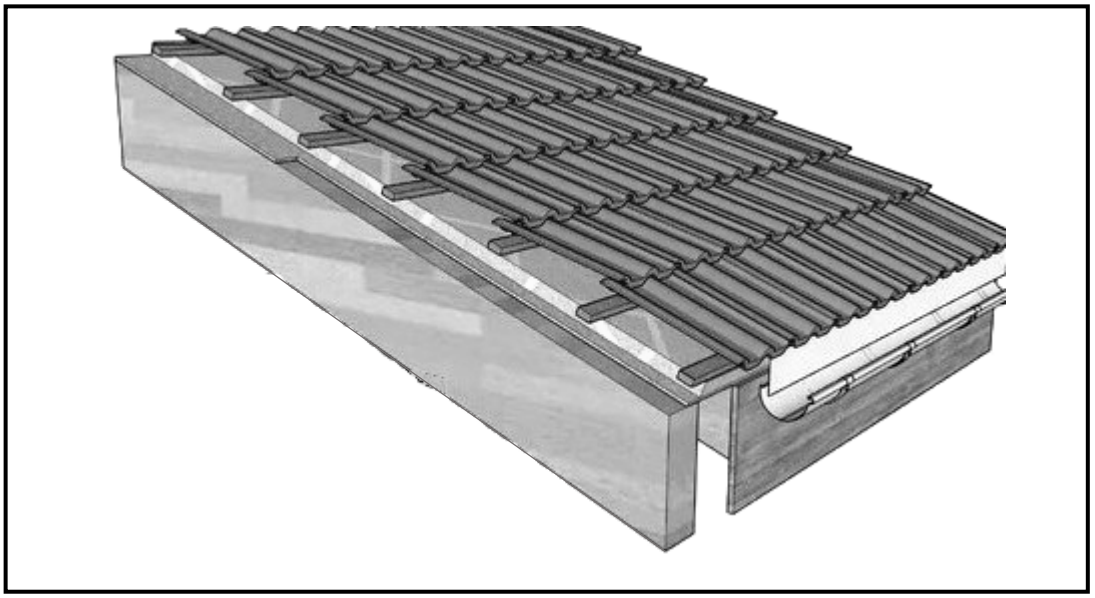


FIGURE 3.1

3.1.1 Name the part that is attached to the rafters to support the concrete roof tiles. (1)

3.1.2 How far apart should the rafters be spaced for concrete roof tiles? (1)

3.1.3 Name the item that you will use under concrete roof tiles to prevent leakages. (1)

3.1.4 Recommend an alternative roof covering to roof tiles AND name the component that can be used to attach the roof covering to the rafters. (2)

3.2 Complete the following sentences by filling in the missing word(s). Write only the word(s) next to the question numbers (3.2.1 to 3.2.6) in the ANSWER BOOK.

3.2.1 The rise of a stair in a house should be between 175 mm and … mm high. (1)

3.2.2 The tread (going) for a public building should be … mm. (1)

3.2.3 A/An … is a timber board used to cover the floor joist and trimmers. (1)

3.2.4 Side-mounted handrails are generally fixed onto a wall face using … (1)

3.2.5 The vertical gaps between the balusters should not be more than … mm. (1)

3.2.6 The regulations, as stipulated by local authorities or the … document, must be met when stairs are built or cast. (1)

3.3 Name TWO types of cast-in anchors. (2)

3.4 At what depth should galvanised straps be embedded into a wall to anchor a roof truss covered with roof sheeting? (1)

3.5 Name TWO types of roof trusses that use a king post in the construction of the truss. (2)

3.6 State the maximum recommended span for a couple roof truss. (1)

3.7 Use ANSWER SHEET 3.7 and draw to scale 1 **:** 20 just more than half of a collar-tie roof truss. Print the labels of any TWO parts of the roof truss.

Use the following specifications:

- The span of the roof is 2 500 mm.
- The overhang is 300 mm.
- The pitch of the roof is 30°.

The members of the roof truss have the following dimensions:

- 114 mm x 38 mm
- 228 mm x 28 mm (13)

[30]

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

Start this question on a NEW page.

4.1 Give ONE word/term for each of the following descriptions. Write only the word/term next to the question numbers (4.1.1 to 4.1.5) in the ANSWER BOOK.

4.1.1 A concrete that has the same density throughout when tested (1)

4.1.2 A type of concrete pump where hoses are linked together, leading to where the concrete needs to be placed (1)

4.1.3 A concrete test that makes use of a cone-shaped mould that is open at both ends (1)

4.1.4 A test that determines the maximum compressive strength of concrete (1)

4.1.5 The process of sprinkling water continuously onto fresh concrete (1)

4.2 FIGURE 4.2 below shows workers working in and around excavations.

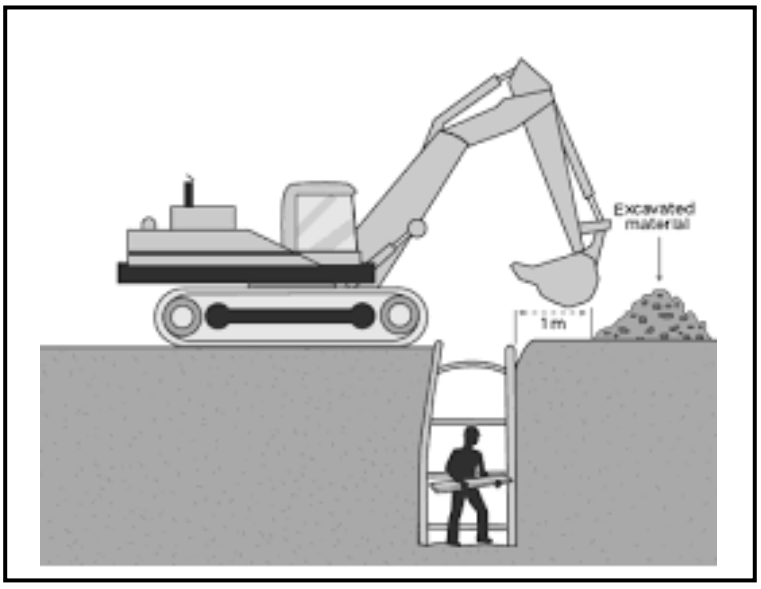


FIGURE 4.2

4.2.1 Predict what could happen to the trench in the picture above if the machine is less than 1 m from the trench. (1)

4.2.2 What is the minimum distance that excavated soil should be kept from a trench? (1)

4.2.3 Explain how the excavator in the picture above could be prevented from coming too close to the trench. (2)

4.2.4 You are asked to work in a trench deeper than 1,5 metres. Name TWO safety precautions you would apply. (2)

4.2.5 Advise on the safety measures that should be applied to the excavated area at the end of each working day. (2)

4.2.6 Before work commences after heavy rain, explain the responsibility of the site manager regarding the excavated trenches. (1)

4.3 Describe in your own words what *formwork* is. (1)

4.4 Name the component that prevents the props from pushing into the ground. (1)

4.5 Name ONE component that can be used to level/adjust the height of the formwork. (1)

4.6 Predict what could happen if soffit boards are not nailed to the side boards. (2)

4.7 FIGURE 4.7 below shows the vertical sectional view of the shuttering for both firm soil and loose soil.

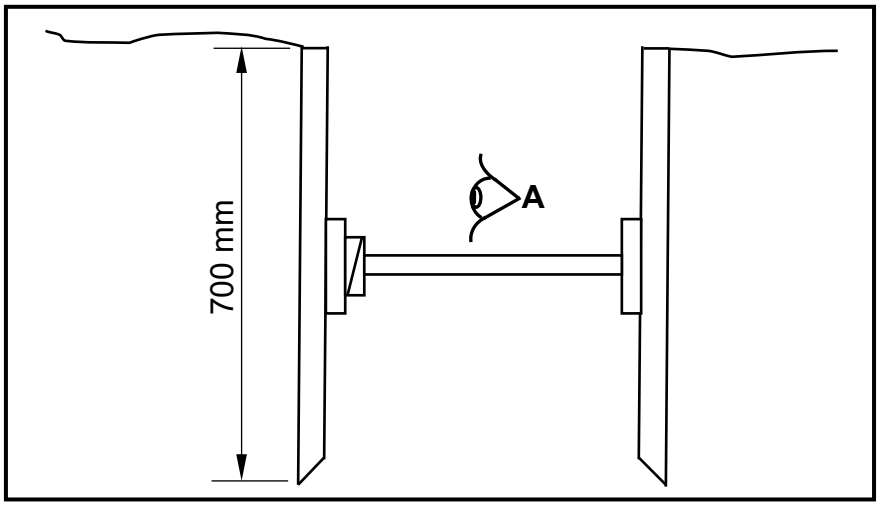


FIGURE 4.7

Using the information above, differentiate between the TWO types of shuttering by drawing sketches in the ANSWER BOOK of the *walling boards* and *poling boards*, as seen from the direction of **A**.

Print the label under EACH drawing. (8)

4.8 FIGURE 4.8 below shows a machine that is used to apply a smooth finish to a concrete floor.



FIGURE 4.8

4.8.1 Identify the machine. (1)

4.8.2 Describe ONE way of making sure that this machine is taken care of before storing it away safely. (1)

4.8.3 Machines like these can be very dangerous when not operated safely. Explain how the operator should handle this machine. (2)

4.9 ANSWER SHEET 4.9 shows an incomplete drawing of the formwork for a concrete beam with a concrete floor slab.

Use ANSWER SHEET 4.9 and draw the omitted members of the formwork for the beam and the floor slab. (9)
[40]

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

Start this question on a NEW page.

5.1 Choose a description from COLUMN B that matches the item in COLUMN A. Write only the letter (A–K) next to the question numbers (5.1.1 to 5.1.8) in the ANSWER BOOK, e.g. 5.1.9 L.

COLUMN A		COLUMN B	
5.1.1	Floating	A	is placed on the dry surface of the concrete
5.1.2	Skimming	B	when preparing the floor to receive screed
5.1.3	Plastering of stop ends	C	acts as waterproofing agent
5.1.4	Screed materials	D	splatter-dash finish
5.1.5	Chipping the floor	E	is laid over fresh concrete
5.1.6	Monolithic screed	F	the process of finishing off plaster after it has been levelled
5.1.7	Admixture to screed	G	straight edges are clamped to the walls
5.1.8	Bonded screed	H	water, cement and sand
		I	bagging finish
		J	the application of a smooth, buttery compound to achieve a high-quality finish
		K	water, lime and sand

(8 x 1) (8)

5.2 FIGURE 5.2 below shows part of a cavity wall.

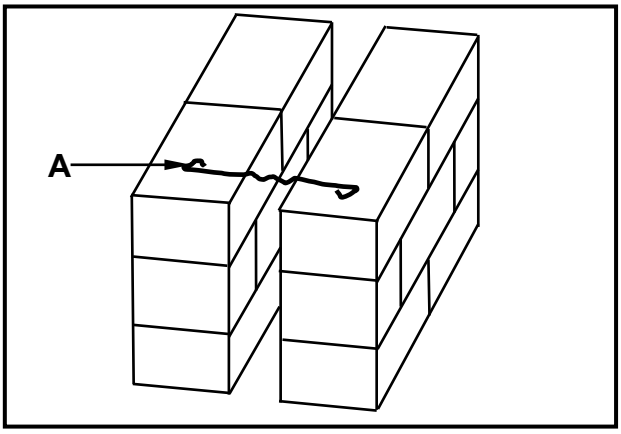


FIGURE 5.2

5.2.1 Name component **A**. (1)

5.2.2 When purchasing component **A**, various types are available. Name ONE type. (1)

5.2.3 Recommend a suitable distance between the skins of the walls. (1)

5.2.4 Explain the benefits of buying a house with cavity walls. (2)

5.2.5 State the position where the weep hole should be placed. (1)

5.2.6 Explain the consequences if the weep holes fail to drain out water. (1)

5.2.7 Why would it be more expensive to build a cavity wall? (2)

5.3 Give TWO reasons for construction failure when laying brick paving. (2)

5.4 Using ANSWER SHEET 5.4, differentiate between a one-and-a-half-brick pier built in *stretcher bond* and one built in *English bond* by means of scale 1 **:** 10 drawings.

Use the following specifications:

- Both piers are 330 x 330 mm.
- The bricks used in the construction of the piers is 220 x 110 mm.

NOTE: Ignore the mortar joints. (11)
[30]

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

Start this question on a NEW page.

6.1 Various options are given as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question numbers (6.1.1 to 6.1.5) in the ANSWER BOOK, e.g. 6.1.6 C.

6.1.1 Shear force in a reinforced concrete beam occurs when the …

A beam is subjected to excessive vertical loads.
B beam bends without breaking.
C beam stretches due to tension.
D reinforcement bars are too close together. (1)

6.1.2 What is the minimum recommended curing period for concrete under normal conditions?

A 2 days
B 5 days
C 7 days
D None of the above-mentioned (1)

6.1.3 Why are ribbed bars preferred over plain round bars in reinforced concrete?

A They improve bond strength with concrete.
B They reduce the need for concrete cover.
C They are easier to cut and bend.
D They are less expensive. (1)

6.1.4 In which situation would pile foundations be unnecessary?

A When building on loose sand
B When building on stable soil
C When there are high water tables
D When building on clay soil (1)

6.1.5 Which safety measure is most important after installing a rib and block floor?

A Increasing the spacing between ribs
B Painting the blocks to prevent moisture absorption
C Using wooden props for permanent support
D Allowing sufficient curing time before loading (1)

6.2 FIGURE 6.2 below illustrates a suspended floor.

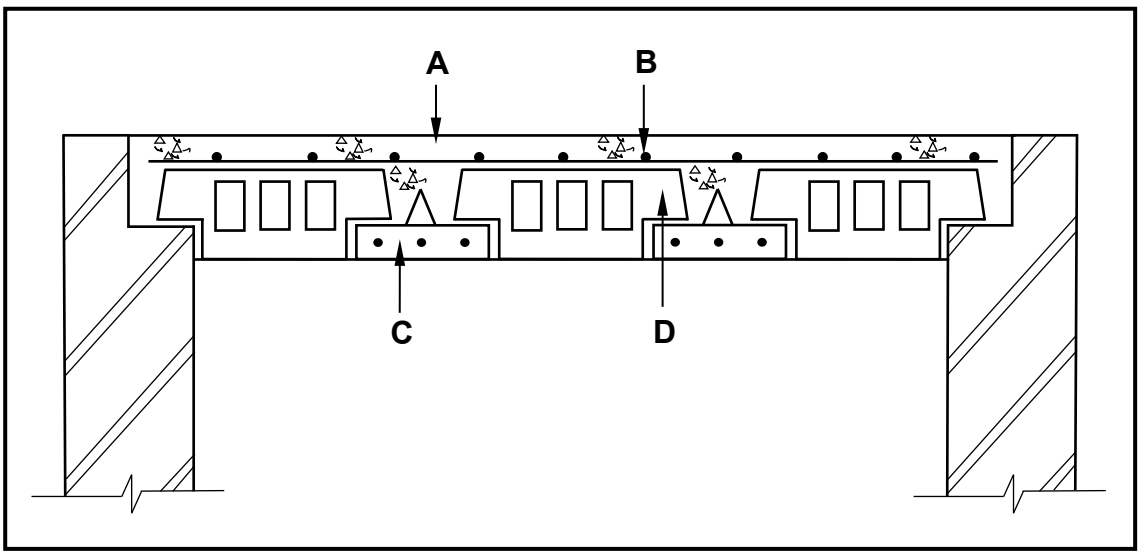


FIGURE 6.2

6.2.1 Name the type of suspended floor. (1)

6.2.2 Identify components **A** to **D**. (4)

6.2.3 Name the supporting member that can be used to prevent the suspended floor from bending during installation. (1)

6.3 Complete the following sentences by filling in the missing word(s). Write only the word(s) next to the question numbers (6.3.1 to 6.3.5) in the ANSWER BOOK.

6.3.1 … bars are placed in the tension zone of a beam to resist tensile forces. (1)

6.3.2 … force occurs when materials are pushed together. (1)

6.3.3 A/An … designs the reinforcement required to strengthen the floor. (1)

6.3.4 High-tensile steel bars have a … tensile strength compared to mild steel. (1)

6.3.5 … is the material that is used to make spacers for use in reinforcing. (1)

6.4 FIGURE 6.4 below shows a sectional view of a reinforced concrete column.

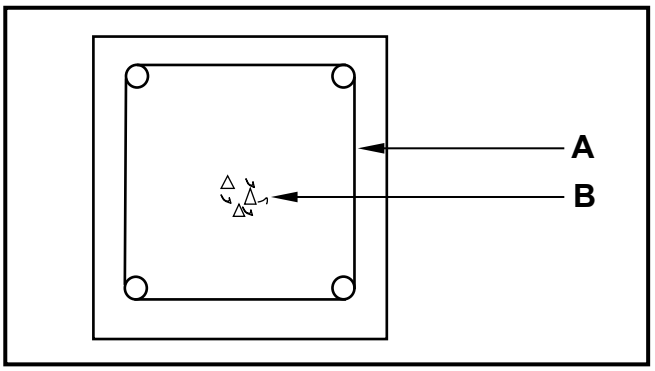


FIGURE 6.4

6.4.1 Identify **A** and **B**. (2)

6.4.2 Explain why the cover depth for reinforcement should be sufficient. (1)

6.4.3 Name TWO methods that can be used to join reinforcing. (2)

6.4.4 Compare, by means of neat sketches, the *shape of anchor bars* with the *shape of shear bars* for reinforced concrete beams. (4)

6.5 One of the classrooms of a school that was built near a river was washed away in a flood due to inadequate strip foundations.

State THREE advantages of using pile foundations for buildings close to a river. (3)

6.6 FIGURE 6.6 below shows the floor plan of a small building.

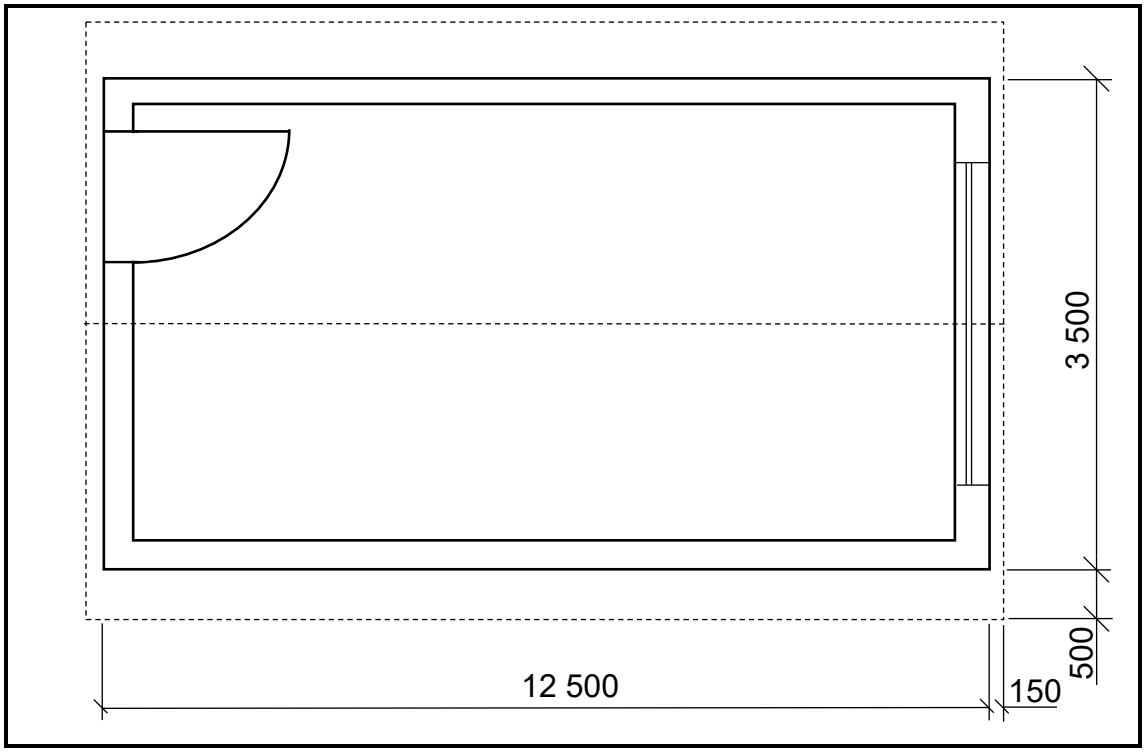


FIGURE 6.6

Use the following specification:

- The walls are 220 mm thick.

Use the dimension paper on ANSWER SHEET 6.6 and calculate the following. Round off your answers to TWO decimal places.

6.6.1 The total area of roof underlay if the length of the rafters is 2 950 mm (8)

6.6.2 The length of the fascia board required (3)

NOTE: A mark will be awarded for the correct use of dimension paper. (1)
[40]

TOTAL: 200

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ANSWER SHEET 2

NO.	QUESTIONS	ANSWERS	MARKS
1.	What elevation is indicated in FIGURE **A**?		1
2.	Identify number **1**.		1
3.	Identify number **2**.		1
4.	Identify number **3**.		1
5.	What does the abbreviation FFL in FIGURE **A** represent?		1
6.	Write down the abbreviation for number **5**.		1
7.	Identify number **6**.		1
8.	Identify number **7** and indicate the total number of this fixture that is installed in the building.		2
9.	What is the distance between the wall and the end of the roof as indicated by number **8** called?		1
10.	Explain the purpose of number **9**.		1
11.	How many one-way double-pole switches are in the dwelling?		1
12.	How many water closets are installed in the building?		1
13.	Name TWO electrical installations that are omitted at number **10**.		2
14.	Identify number **11**.		1
15.	Deduce, from the notes column, the type of roof illustrated in FIGURE **A**.		1

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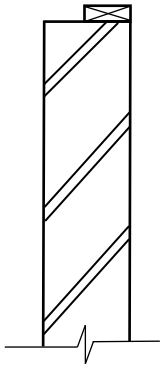
16.	Deduce, from the notes column, what must be installed below each window.		1
17.	From what type of material should number **4** be manufactured?		1
18.	Deduce, from the notes column, the dimensions of window **1**.		2
19.	On which plot will the new dwelling be erected?		1
20.	Draw the symbol for plaster.		2
21.	Draw the symbol for earth fill.		3
22.	Calculate the floor area of the bathrooms that needs to be tiled. Give your answer in square metres and show ALL calculations.		5
23.	Calculate the total length of the wall on the western side of the building. Give your answer in metres and show ALL calculations.		8
		TOTAL:	**40**

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ANSWER SHEET 3.7



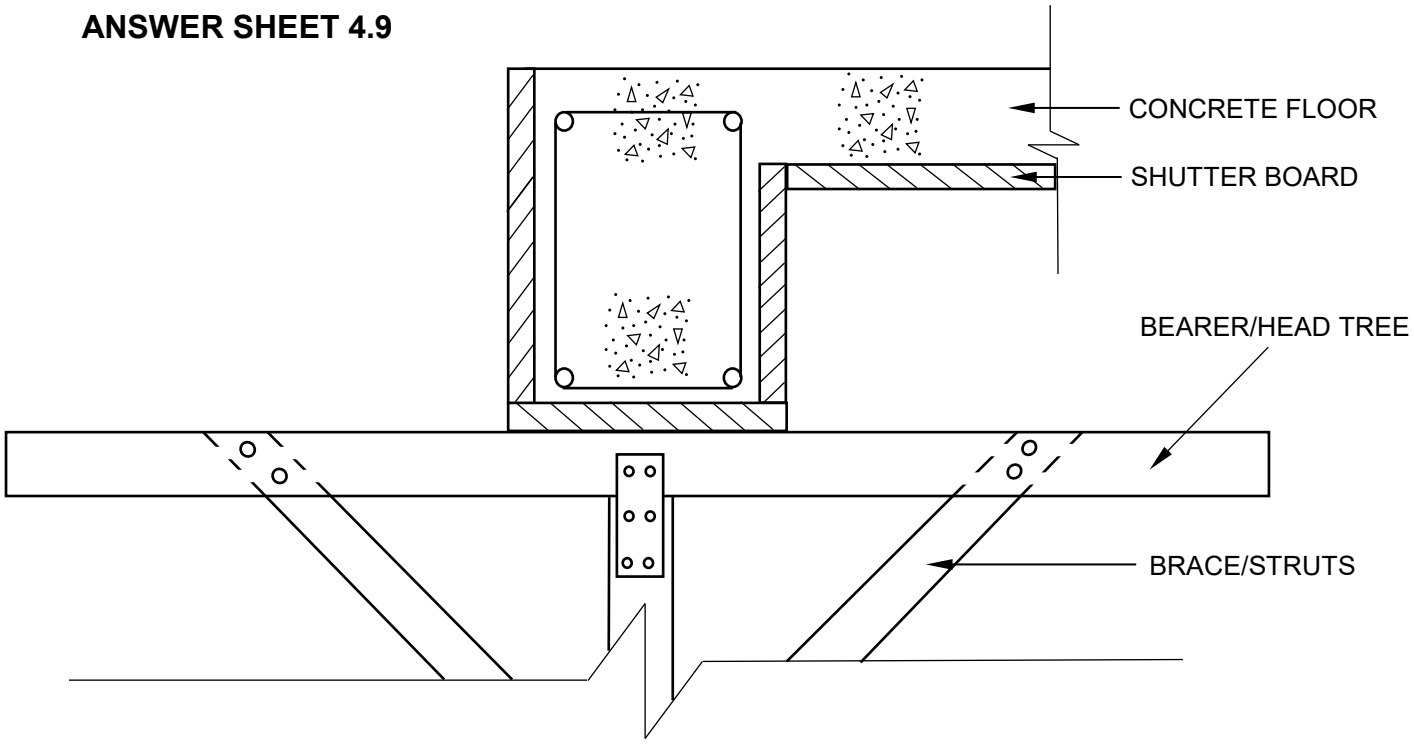
ASSESSMENT CRITERIA		
NO.	**MARK**	**CANDIDATE'S MARK**
1	3	
2	1	
3	2	
4	2	
5	2	
6	1	
7	2	
TOTAL:	**13**	

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EXAMINATION NUMBER:													

ANSWER SHEET 4.9



ASSESSMENT CRITERIA		
NO.	**MARK**	**CANDIDATE'S MARK**
1	1	
2	2	
3	2	
4	2	
5	2	
TOTAL:	**9**	

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EXAMINATION NUMBER:													

ANSWER SHEET 5.4



STRETCHER BOND



ENGLISH BOND

FIGURE 5.4

ASSESSMENT CRITERIA		
NO.	**MARK**	**CANDIDATE'S MARK**
1	4	
2	1	
3	4	
4	2	
TOTAL:	**11**	

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ANSWER SHEET 6.6

DIMENSION PAPER

6.6.1

A	**B**	**C**	**D**

(8)

6.6.2

A	**B**	**C**	**D**
			Correct use of dimension paper

(3)
(1)

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