



Province of the
EASTERN CAPE
EDUCATION

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Provinsie van die Oos Kaap: Departement van Onderwys
Porafensie Ya Kapa Botjhabela: Lefapha la Thuto

NATIONAL SENIOR CERTIFICATE

GRADE 12

SEPTEMBER 2026

CIVIL TECHNOLOGY: CONSTRUCTION MARKING GUIDELINE

MARKS: 200

TIME: 3 hours

This marking guideline consists of 16 pages including 3 answer sheets.

QUESTION 1: SAFETY, MATERIALS AND TOOLS (GENERIC)

- 1.1 1.1.1 G (1)
- 1.1.2 D (1)
- 1.1.3 F (1)
- 1.1.4 H (1)
- 1.1.5 C (1)
- 1.1.6 B (1)
- 1.1.7 E (1)
- 1.2 TWO safety precautions that must be adhered to when working on a builder's hoist:
- A qualified person must operate the device.
 - The device must never be overloaded.
 - Gates must be shut when the device is being used.
 - Emergency brake mechanism must be installed.
 - Safety measures must be displayed inside the cage.
 - Inspection and maintenance must be carried out regularly.
 - Overhead protection must be provided.
 - Materials and equipment must be stacked firmly and secured properly.
 - The hoist must be inspected weekly by a qualified person
 - Gates and wire components must be at least 1980 mm high.
- ANY TWO OF THE ABOVE** (2 x 1) (2)
- 1.3 Purpose of painting:
- Protect metal, wood and other material against corrosion and decay.
 - Provides a decorative appearance.
 - Protects surface from moisture penetration.
 - Protects surface from rust.
- ANY ONE OF THE ABOVE** (2)
- 1.4 It increases the strength of concrete. (1)
- 1.5 3 m (1)
- 1.6 TWO aspects that scaffolding must adhered to before it is used.
- Inspect the scaffolding to ensure that it is stable in all directions.
 - Able to carry the mass of the load.
 - Free of any defects.
- ANY TWO OF THE ABOVE** (2 x 1) (2)
- 1.7 To ensure stability of the ladder (1)

1.8 ONE method that can be used to prevent corrosion of metals:

- Painting
- Galvanising
- Powder coating
- Electro-plating

ANY ONE OF THE ABOVE

(1 x 1) (1)

1.9 1.9.1 Multi-detector

(1)

1.9.2 Allow it to adjust to the surrounding temperature before switching it on.

(1)

1.9.3 Why the batteries should be removed from the tool if it is not going to be used for a long time:

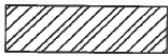
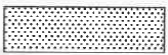
- Prevent batteries from running flat.
- Prevent acid leaks from batteries damaging the tool.

ANY ONE OF THE ABOVE

(1 x 1) (1)

[20]

QUESTION 2: GRAPHICS AND JOINING

- 2.1 2.1.1 NGL (1)
- 2.1.2 FFL (1)
- 2.1.3 DPC (1)
- 2.1.4 WC (1)
- 2.1.5 B (1)
- 2.2 2.2.1 Earth (1)
- 2.2.2 Socket outlet (1)
- 2.2.3 Electricity meter (1)
- 2.2.4 Fluorescent light (1)
- 2.2.5 Distribution board (1)
- 2.3 2.3.1  (2)
- 2.3.2  (2)
- 2.3.3  (2)
- 2.3.4  (2)
- 2.3.5  (2)
- 2.4 Any FIVE details that appear in a site plan:
- The boundaries of the property.
 - The numbers of the adjacent plots (lots).
 - Services to the site, e.g. water, sewerage and power cables.
 - The name of the roads.
 - Description of driveways.
 - Contours
 - Service connections
 - Building lines
 - Building position
 - Drainpipes
 - Storm-water pipes
 - The north point.
 - The scale that is used.
- ANY FIVE OF THE ABOVE** (5 x 1) (5)

- 2.5 **A** – hexagon (1)
- B** – Hex flange (1)
- C** – Square shoulder screw (1)
- 2.6 FOUR details that must be mentioned when purchasing bolts.
- Length of shaft
 - Diameter
 - Type of head
 - Head size (4 x 1) (4)
- 2.7 The sheath (1) of the bolt expands (1) when the bolt is tightened (1). (3)
- 2.8 2.8.1 The hole of accessory A is too large (1) and the rawl bolt can be pulled through the hole when tightened (1). (2)
- 2.8.2 Nut (1)
- 2.8.3 Any TWO good mechanical properties of rawl bolts.
- Good tensile strength
 - Good tensile stress
 - Good load-bearing capacity
- ANY TWO OF THE ABOVE** (2 x 1) (2)
- [40]**

TOTAL SECTION A: 60

QUESTION 3: ROOFS, STAIRCASES AND JOINING (SPECIFIC)

- 3.1 3.1.1 760 mm (1)
- 3.1.2 Sisalation / Fire-proof material (1)
- 3.1.3 300 mm (1)
- 3.1.4 Fibre cement tiles (1)
- 3.1.5 76 x 50 mm / 38 x 38 mm (1)
- 3.2 3.2.1 750 mm (1)
- 3.2.2 2,1 m (1)
- 3.2.3
- All stairs must have handrails / steps must be safe.
 - The regulations as stipulated by local authorities or SANS must be adhered to, when steps are built or cast.
- ANY ONE OF THE ABOVE** (1)
- 3.3 **Rise:** vertical distance between two consecutive threads.
Riser: vertical member between two consecutive threads. (2 x 1) (2)
- 3.4 Pitch board (1)
- 3.5 Balustrades:
- Hold up the handrail.
 - Fills the space between the handrail and string on the open side of a staircase.
 - Prevent people from falling off the staircase. (2 x 1) (2)
- ANY TWO OF THE ABOVE**
- 3.6 **ANSWER SHEET A** (11)
- 3.7 **Double triangular pattern:** Is used to bind walls together. (2 x 1) (2)
- 3.8 **Butterfly pattern:** 900 mm (2 x 1) (2)
- 3.9 3.9.1 Domed top (1)
- 3.9.2 Wing nut (1)
- [30]**

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

- 4.1 4.1.1 **D** – non-acid-resistant or alkali-proof (1)
- 4.1.2 **H** – has the same density throughout (1)
- 4.1.3 **E** – copper is the main ingredient (1)
- 4.1.4 **I** – silver-white in colour (1)
- 4.1.5 **J** – low melting point (1)
- 4.1.6 **G** – used for waste-water systems (1)
- 4.1.7 **A** – seals air and water leaks (1)
- 4.1.8 **F** – reddish brown (1)
- 4.2 Consequences of neglecting to determine the location of services:
- This may affect / hamper / delay the excavation / construction process.
 - It may have unplanned cost implications.
 - Damage to services may occur.
 - Injuries may occur.
- ANY ONE OF THE ABOVE** (1)
- 4.3 Safety precautions at night:
- The excavation must be well-lit at night.
 - Red or Orange warning lights should be visible.
 - Fence off the area.
 - Post visible warning signs.
 - Wear appropriate visible PPE.
- ANY THREE OF THE ABOVE** (3)
- 4.4 4.4.1 The removal of formwork. (1)
- 4.4.2
- Applied to the interior surfaces of the formwork for quick release of the formwork.
 - Ensures that formwork does not stick to the concrete.
- ANY ONE OF THE ABOVE** (1)
- 4.4.3 The bottom board that supports freshly poured concrete. (1)

- 4.5 4.5.1 Members omitted:
- Walling boards
 - Folding wedges / Wedge
 - Struts
- ANY TWO OF THE ABOVE**

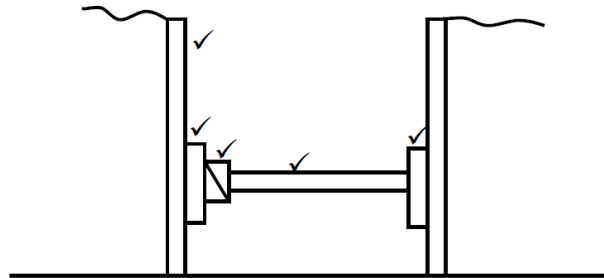
(2 x 1) (2)

Consequence:

- The excavation could collapse.

(1)

4.5.2



ASSESSMENT CRITERIA	MARK
Correctness of drawing:	
Poling boards	1
Walling boards	2
Folding wedges	1
Strut	1
TOTAL:	5

(5)

- 4.6 4.6.1 Formwork for a concrete beam with floor slab.

(1)

- 4.6.2
- A** – Cleats
 - B** – Fixing plate / Kicker plates
 - C** – Shutter board / Soffit board sides
 - D** – Bearer / Head tree
 - E** – Brace / Strut

(5)

- 4.7 4.7.1 Personal Protective Equipment:

- Gloves
- Safety boots / Gumboots / Boots
- Overall
- Safety glasses
- Earmuffs / Earplugs
- Dust mask
- Hard hat / Safety helmet

ANY THREE OF THE ABOVE

(3 x 1) (3)

- 4.7.2 Methods to prevent rusting:

- Remove water from the drum.
- Oil the inside of the drum.
- Store concrete mixer with the opening of drum facing downwards.

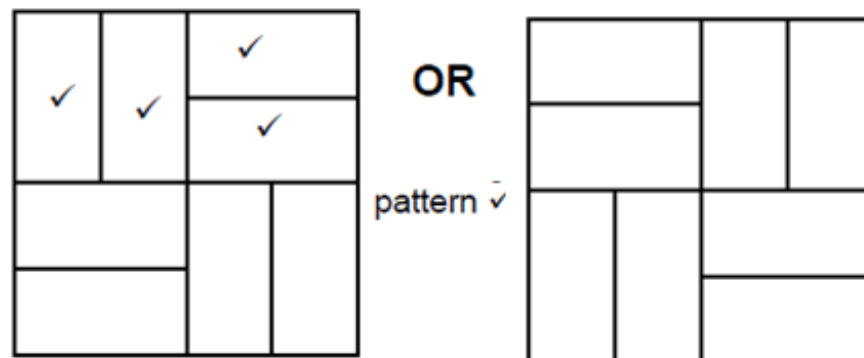
ANY ONE OF THE ABOVE

(1)

- 4.8 Strength – Cube Test
 Workability – Slump Test (2)
- 4.9 24 hours / 7 days / 14 days / 28 days
 ANY ONE OF THE ABOVE (1)
- 4.10 • Non – Ferrous metals
 • Ferrous metals
 • Alloys
 ANY TWO OF THE ABOVE (2 x 1) (2)
- 4.11 Reasons for cladding a wall:
 • To protect walls against weather elements like rainwater and wind.
 • For aesthetical purposes.
 • For functional purposes.
 • For insulation purposes.
 • To cover defects / imperfections
 ANY TWO OF THE ABOVE (2 x 1) (2)
- [40]**

QUESTION 5: BRICKWORK, GRAPHICS, PLASTER AND SCREED (SPECIFIC)

- 5.1 5.1.1 **C** – Wet / Prepare / Clean the wall (1). (2 x 1) (2)
- B** – Apply the plaster (1). (2 x 1) (2)
- D** – Level / Cut the plaster / Removing access
Plaster (Sawing movement) (1). (2 x 1) (2)
- A** – Smoothen / Float / Finish the surface (1). (2 x 1) (2)
- 5.1.2 Any ONE purpose of wetting the wall:
 - If not done, the plaster will not stick properly to the wall.
 - If not done, the plaster will dry out too quickly.
 - If not done, the strength of the plaster will be affected.
ANY ONE OF THE ABOVE (1)
- 5.1.3 Building lime (1)
- 5.2 5.2.1 Any ONE jointing method:
 - River sand / Plaster sand is used as grouting between paving blocks/ bricks
 - Mixture of plaster sand and cement is used as grouting between paving blocks/ bricks.
ANY ONE OF THE ABOVE (1 x 1) (1)
- 5.2.2 The final layer upon which the paving units are laid. (1)
- 5.2.3 Paving is subjected to only pedestrian use. (1)
- 5.3 5.3.1

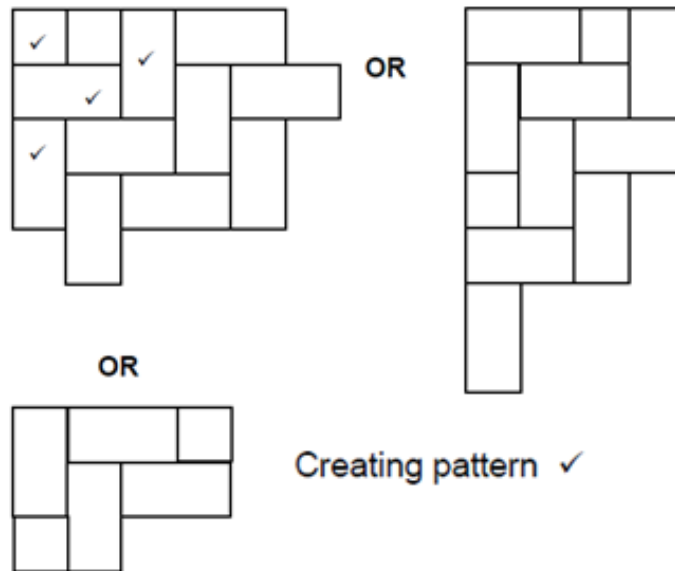


BASKET-WEAVE PAVING PATTERN

ASSESSMENT CRITERIA	MARKS
Vertical first and second full bricks	2
Horizontal first and second full bricks	2
Creating pattern	1
TOTAAL:	5

(5)

5.3.2



HERRINBONE PAVING PATTERN

ASSESSMENT CRITERIA	MARKS
Half brick	1
Full bricks to create pattern	3
Creating pattern	1
TOTAL:	5

(5)

5.4 5.4.1 To hold the two skins (walls) of the cavity wall together. (1)

5.4.2 Any ONE position weep holes must be positioned:

- Above the horizontal damp-proof course of the external wall.
- On the same level as the concrete floor.
- Above the lintel on top of the window/ door opening.
- Minimum 150 mm above NGL

ANY ONE OF THE ABOVE

(1 x 1) (1)

5.4.3 Any ONE purpose of weep holes:

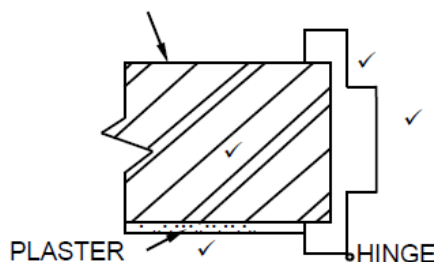
- Water that penetrates the outside wall can drain out through the weep hole.
- For ventilation purposes.

ANY ONE OF THE ABOVE

(1 x 1) (1)

5.5

FACE BRICK



ASSESSMENT CRITERIA	MARK
Face brick wall (Correct hatching)	1
Plaster	1
Steel door frame	2
TOTAL:	4

DOOR FRAME IN FACE BRICK WALL

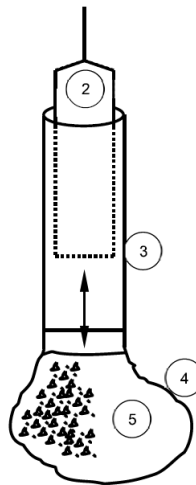
(4)

[30]

QUESTION 6: FORMWORK, REINFORCING, FOUNDATIONS, CONCRETE FLOOR AND QUANTITIES (SPECIFIC)

- 6.1 6.1.1 – **B** constantly wet areas. (1)
- 6.1.2 – **D** A and B only (1)
- 6.1.3 – **A** drop (1)
- 6.1.4 – **C** distribute the load across to more stable ground. (1)
- 6.1.5 – **D** Steel-tube caisson piles/ (1)

6.2



CORRECTNESS OF ENLARGED BASE HAMMERED IN (1)

NO.	ASSESSMENT CRITERIA	MARK
1	Correctness of enlarged concrete base	1
2	Drop hammer	1
3	Steel casing	1
4	Shape of enlarged base	1
5	Symbol for concrete in the base	1
TOTAL:		5

(5)

6.3 Components of a rib and block floor:

- Hollow core blocks
- Precast ribs / Pre-stressed ribs
- Steel mat / Steel mesh / Wire / Reinforcing mesh / Reinforcing steel
- Spacers
- In-situ cast concrete / Concrete

ANY FOUR OF THE ABOVE

(4 x 1) (4)

6.4 The rib-and-block floor can collapse under the weight of the wet concrete. (1)

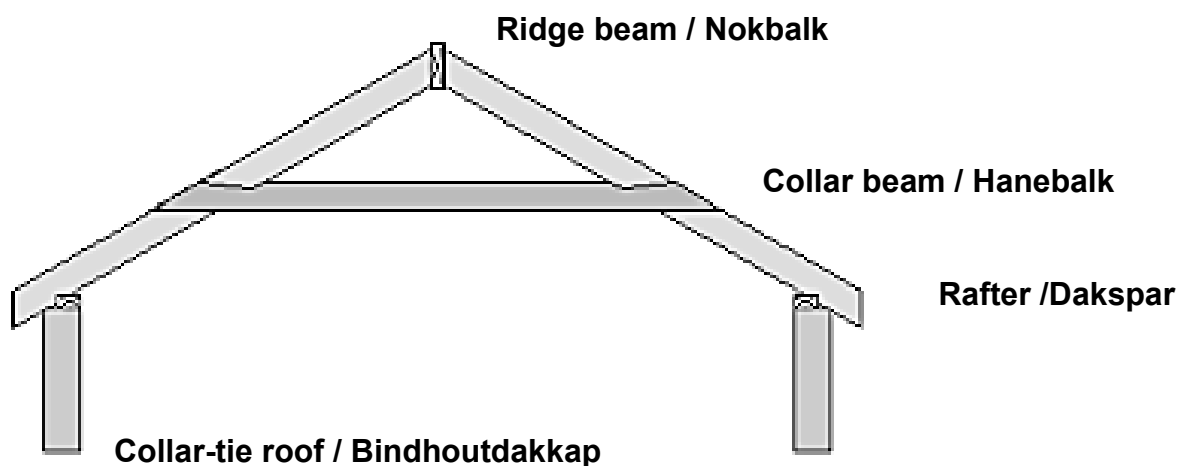
6.5	6.5.1	Number of bars in the group	(1)
	6.5.2	Diameter of the bar	(1)
	6.5.3	Centre-to-centre spacing / Heart spacing	(1)
6.6	ANSWER SHEET B		(12)
6.7	ANSWER SHEET C		(10)
			[40]

TOTAL: 200

ANSWER SHEET	A	CIVIL TECHNOLOGY	NAME and	
			SURNAME:	

- 3.6 Use ANSWER SHEET A and draw in good proportion, a neat sketch of a collar tie roof truss with a pitch of 45° resting on two supporting walls. (11)

ASSESSMENT CRITERIA	MARK	CANDIDATE MARK
Walls	2	
Wallplate	2	
Rafters	2	
Collar beam	1	
Ridge beam correctly drawn	2	
Any ONE label	1	
Proportion of drawing	1	
TOTAL:	11	

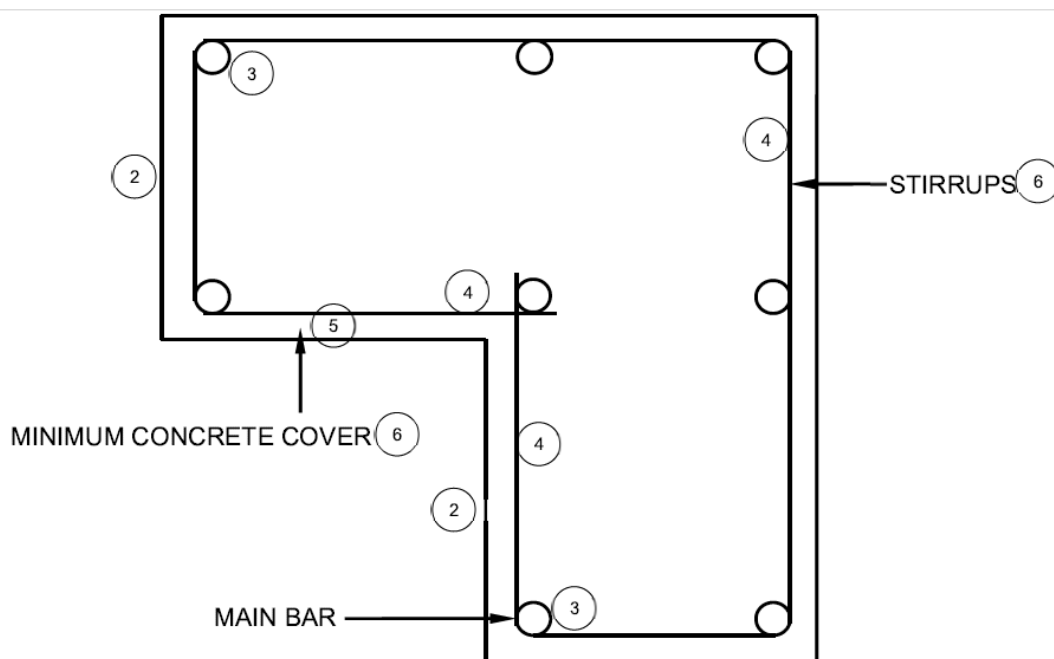


ANSWER SHEET	B	CIVIL TECHNOLOGY	NAME AND SURNAME:	

6.6 FIGURE 6.6 on ANSWER SHEET B shows the outline of the sides of an L-shaped concrete column.

Use ANSWER SHEET B and draw a neat sectional view of the L-shaped reinforced concrete column with 8 main bars, stirrups and minimum concrete cover.

Indicate any TWO labels and the minimum concrete cover. (12)



CORRECTNESS OF L-SHAPED COLUMN (1) (1)

NO.	ASSESSMENT CRITERIA	MARK
1	Correctness of L-shaped column	2
2	Completed column	2
3	8 main bars	
	Correct number of bars	1
	Correct placement of bars	1
4	Stirrups	3
5	Minimum concrete cover (indicated)	1
6	Any TWO labels	2
	TOTAL:	12

ANSWER SHEET	C	CIVIL TECHNOLOGY	NAME AND SURNAME:	

6.7 FIGURE 6.7 below shows the floor plan of a building with a window and a door.

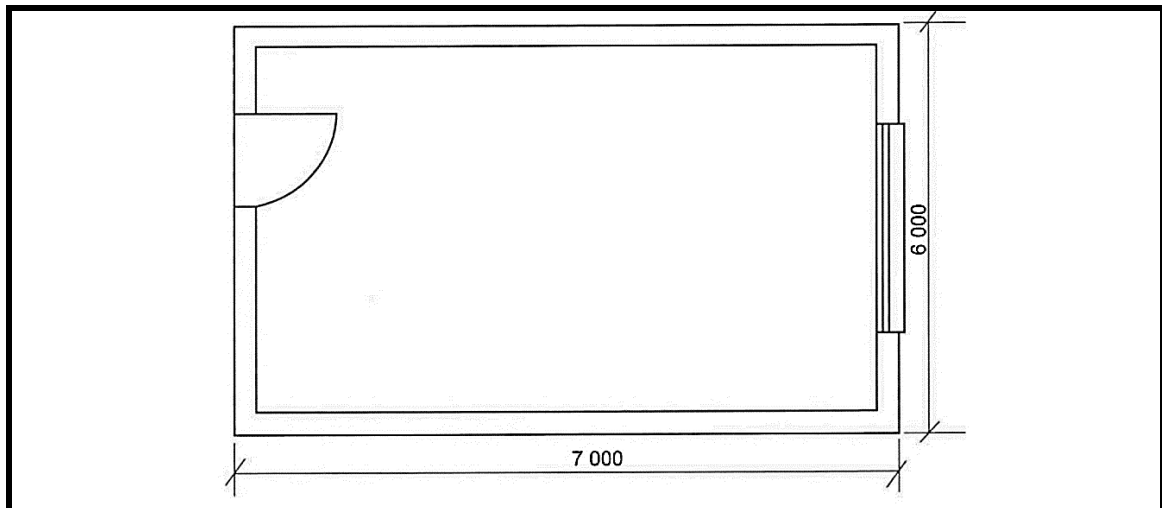


FIGURE 6.7

Use the following specifications:

- The blinding layer is 40 mm thick
- The wall thickness is 220 mm

Use the dimension paper and calculate the volume of the blinding layer.

Round off your answers to TWO decimals.

(9)

NOTE: Marks will be awarded for the current use of the dimension paper.

(1)

A	B	C	D	A	B	C	D
			Correct use of dimension paper ✓				
			Internal dimensions long walls: $7\,000 - (2)220 \checkmark = 6\,560\text{ mm} \checkmark$				
			Internal dimensions of the short walls: $6\,000 - (2)220 \checkmark = 5\,560\text{ mm} \checkmark$				
			Volume of blinding layer:				
1/ ✓	6.56 ✓ 5.56 ✓ <u>0.04</u> ✓	<u>1.46</u>	m ³ ✓				
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