

**GAUTENG DEPARTMENT OF EDUCATION /
GAUTENGSE DEPARTEMENT VAN ONDERWYS
SENIOR CERTIFICATE EXAMINATION /
SENIORSERTIFIKAAT-EKSAMEN**

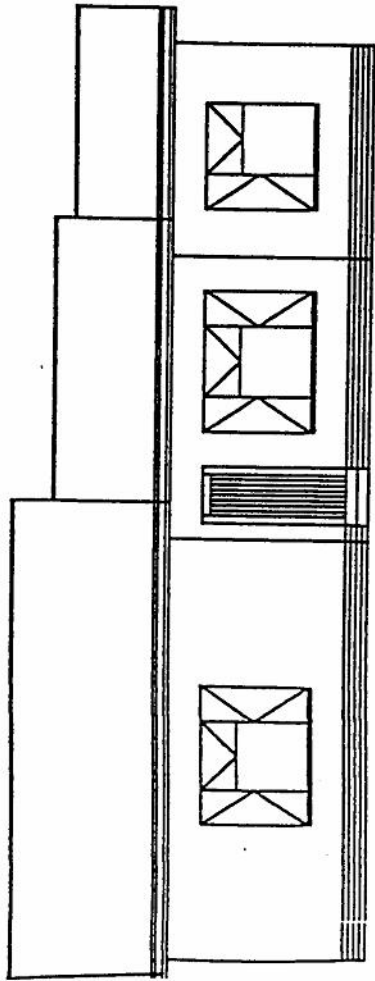
**BUILDING CONSTRUCTION SG
BOUKONSTRUKSIE SG**

POSSIBLE ANSWERS OCT / NOV 2006

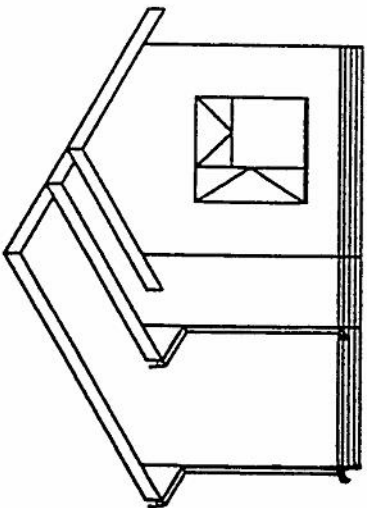
QUESTION 1 / VRAAG 1

NORTH VIEW		NOORD-AANSIG
Correct view	2	<i>Aansig korrek</i>
Roof height auxillary view	4	<i>Dakhoogte-hulpaansig</i>
Roof design	3	<i>Dakontwerp</i>
Substructure	2	<i>Onderbou</i>
Superstructure	2	<i>Bobou</i>
Gutter	2	<i>Geut</i>
Fascia board	2	<i>Fassieplank</i>
Downpipe	2	<i>Afleipyp</i>
Door	2	<i>Deur</i>
Step	2	<i>Trap</i>
Window placing	2	<i>Vensterplasing</i>
Window sill	2	<i>Vensterbanke</i>
Window opening	4	<i>Oopswaairame getoon</i>
Labelling	2	<i>Byskrifte</i>
Line work	2	<i>Lynwerk</i>
Scale	2	<i>Skaal</i>
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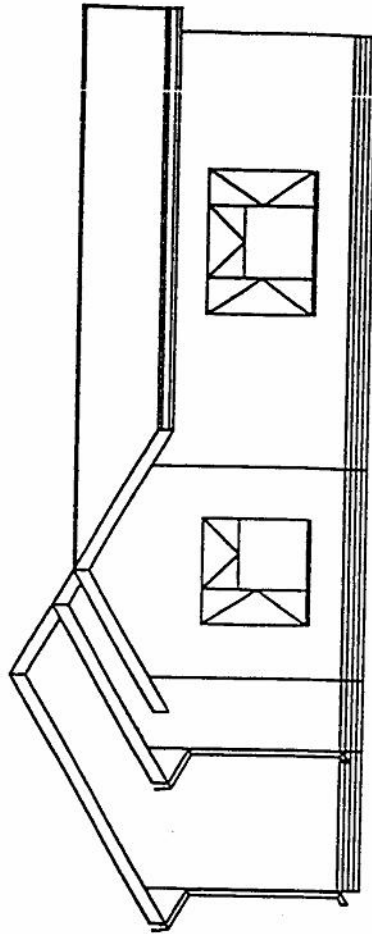
WEST ELEVATION		WES-AANSIG
Correct view	2	<i>Aansig korrek</i>
Roof design	3	<i>Dakontwerp</i>
Ridging	2	<i>Nokplaat</i>
Fascia board	2	<i>Fassieplank</i>
Gutter	2	<i>Geut</i>
Downpipe	2	<i>Afleipyp</i>
Substructure	2	<i>Onderbou</i>
Superstructure	2	<i>Bobou</i>
Neatness	2	<i>Netheid</i>
Line work	2	<i>Lynwerk</i>
Scale	2	<i>Skaal</i>
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NOORD-AANSIG / NORTH ELEVATION



BEPALING VAN DAKHOOGTES
DETERMINE ROOF HEIGHT



WES-AANSIG / WEST ELEVATION

QUESTION 2 / VRAAG 2

BEREKEN LR

L.O.M R.O.M

Neem momente om RR

$$\begin{aligned}
 10 \times LR &= (6 \times 2) + (12 \times 6) + (4 \times 9) \text{ ü} \\
 10 LR &= 12 + 72 + 36 \text{ ü} \\
 10 LR &= 120 \\
 LR &= 12 \text{ kN üü} \qquad (6)
 \end{aligned}$$

BEREKEN RR

L.O.M R.O.M

Neem momente om LR

$$\begin{aligned}
 10 \times RR &= (4 \times 1) + (12 \times 4) + (6 \times 8) \text{ ü} \\
 10 RR &= 4 + 48 + 48 \text{ ü} \\
 10 RR &= 100 \\
 RR &= 10 \text{ kN üü} \qquad (6)
 \end{aligned}$$

TOETS

Opwaartse kragte = Afwaartse kragte

$$\begin{aligned}
 12 \text{ kN} + 10 \text{ kN} &= 4 \text{ kN} + 12 \text{ kN} + 6 \text{ kN} \\
 22 \text{ kN} &= 22 \text{ kN} \qquad (2)
 \end{aligned}$$

$$\begin{aligned}
 \text{BMA} &= LR \times 0 \\
 &= 21 \times 0 \text{ ü} \\
 &= 0 \text{ kN.m ü} \qquad (2)
 \end{aligned}
 \qquad
 \begin{aligned}
 \text{BMB} &= (LR \times 1) \\
 &= (12 \times 1) \text{ ü} \\
 &= 12 \text{ kN.m ü} \qquad (2)
 \end{aligned}$$

$$\begin{aligned}
 \text{BMC} &= (LR \times 4) - (B \times 3) \\
 &= (12 \times 4) - (4 \times 3) \text{ ü} \\
 &= 48 - 12 \\
 &= 36 \text{ kN.m ü} \qquad (3)
 \end{aligned}
 \qquad
 \begin{aligned}
 \text{BMD} &= (LR \times 8) - (C \times 4) - (B \times 7) \\
 &= (12 \times 8) - (12 \times 4) - (4 \times 7) \text{ ü} \\
 &= 96 - 48 - 28 \text{ ü} \\
 &= 20 \text{ kN.m ü} \qquad (3)
 \end{aligned}$$

$$\begin{aligned}
 \text{BME} &= (LR \times 10) - (D \times 2) - (C \times 6) - (B \times 9) \\
 &= (12 \times 10) \text{ ü} - (6 \times 2) \text{ ü} - (12 \times 6) \text{ ü} - (4 \times 9) \text{ ü} \\
 &= 120 - 12 - 72 - 36 \text{ ü} \\
 &= 0 \text{ kN.m ü} \qquad (6)
 \end{aligned}$$

[30]

BEREKEN SKUIFKRAGTE

SKA = LR ü
 = 12 kN ü

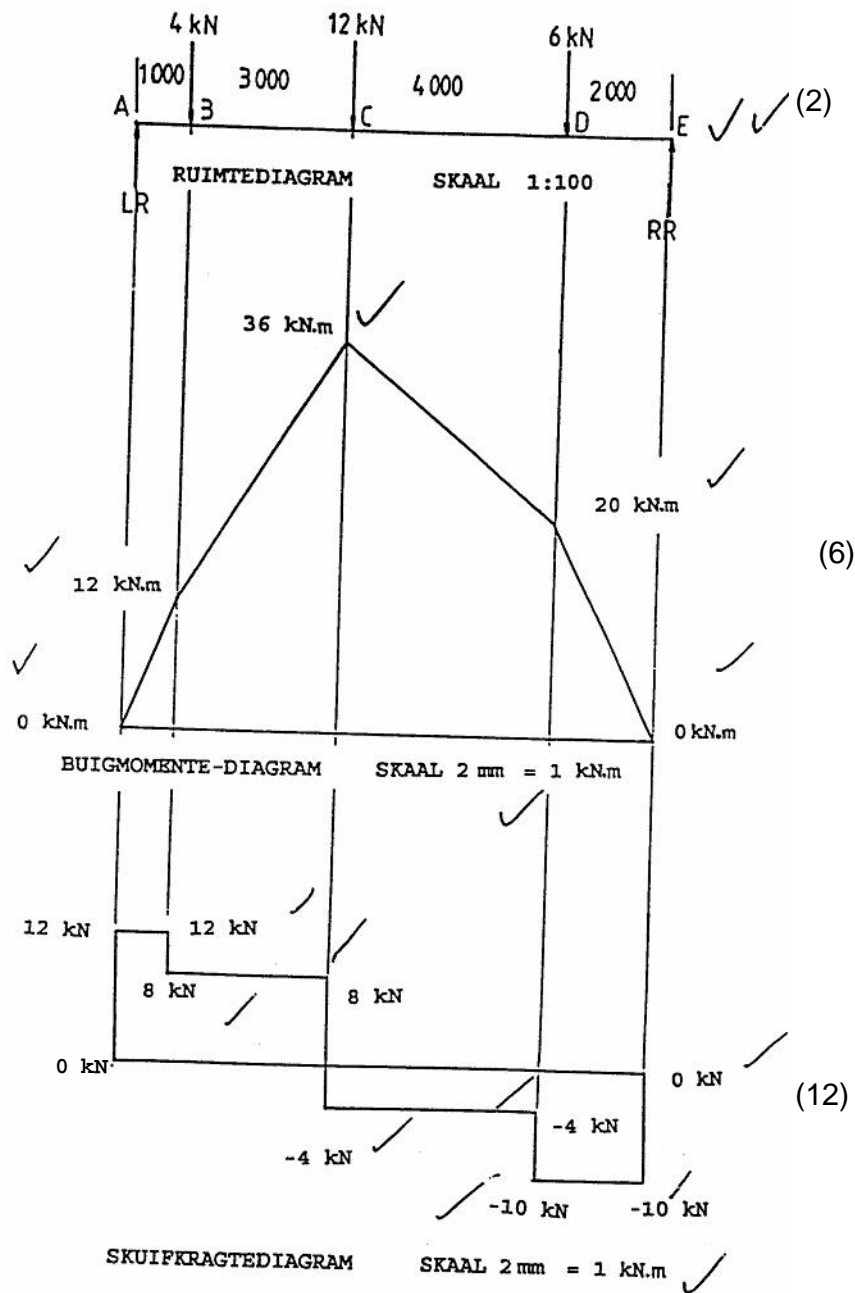
SKB = LR - B
 = 12 - 4 ü
 = 8 kN ü

SKC = LR - B - C
 = 12 - 4 - 12 ü
 = -4 kN ü

SKD = LR - B - C - D
 = 12 - 4 - 12 - 6 ü
 = -10 kN ü

SKE = RR ü
 = 10 kN ü

(10)



[20]

QUESTION 3 / VRAAG 3

- 3.1.1 All staircases, pathways, and gangways, basements and any other places where insufficient lighting may occur must be properly illuminated.
Alle trappe, gange, loopplanke en ander plekke waar gevaar weens swak lig bestaan, moet toereikend verlig wees.
- 3.1.2 Staircases, pathways and gangways should be free from materials, waste or any other obstacles.
Alle trappe, loopgange, en loopplanke moet vry wees van materiaal, afval of ander hindernisse.
- 3.1.3 All openings in floors, hatchways and stairways, or any other opening through or from which persons are liable to fall, must be adequately safeguarded.
Alle openinge in vloere, luikgange en trappe of enige ander opening waardeur of waarvan persone kan val, moet toereikend beveilig wees.
- 3.1.4 Danger areas, where materials and debris are liable to fall on workers, must be adequately fenced off and catch platforms or nets must be provided.
Gevaargebiede waar materiaal op werkers kan val, moet toereikend omhein wees en van toereikende vangplatforms of nette voorsien wees.
- 3.1.5 Hoisting of materials must be done only by means of a hoist or chute.
Slegs hysmasjiene en of glybane moet gebruik word om materiaal op te hys.

TWO MARKS EACH TWEE PUNTE ELK

- 3.2 Common bricks
Gewone stene
- Face bricks
Sierstene
- Fireproof bricks
Vuurvaste stene
- Purpose bricks*
Doelvervaardigde stene
- Selected bricks (Colour or quality)
Uitgesoekte stene (kleur of gehalte)
- Glazed bricks
Geglasuurde stene

ANY FIVE ONE MARK EACH ENIGE VYF EEN PUNT ELK

3.3 Safety precautions *Veiligheidsmaatreëls*

Make sure that the area on and around the machine is free of waste material.
Die gebied op en om die masjien moet skoon van afvalmateriaal wees.

Cutting blades must be checked for sharpness and must be clamped properly.
Lemme moet nagegaan word voordat die masjien aangeskakel word. Lemme moet skerp en stewig vas wees.

All the necessary safety guards must be in position.
Alle skerms moet in posisie wees.

Make sure that all the electrical wiring, switches and connections are in good order.
Alle elektriese drade, skakelaars en konneksies moet in 'n goeie toestand wees.

Use the safety devices supplied with each machine.
Gebruik alle veiligheidstoerusting wat by die masjiene voorsien word.

Assume a safe position when operating a particular machine.
Neem altyd 'n veilige posisie by die masjien in.

Push the wood slowly and evenly through the machine. Do not jerk or force the material.
Stoot altyd die hout egalig en gemaklik deur die masjien. Moenie materiaal stamp of forseer nie.

Do not wear loose clothing.
Moenie loshangende klere dra nie.

Concentrate on the point of action.
Konsentreer op die aksiepunt.

Do not machine second-hand wood.
Moenie tweedehandse hout masjineer nie.

ANY FIVE TWO MARKS EACH

ENIGE VYF TWEE PUNTE ELK

3.4 Appearance *Voorkoms*

Density
Digtheid

Melting point
Smeltpunt

Visible-light transmission
Sigbare lig-transmissie

Solar heat transmission
Sonhittetransmissie

Ultra-violet rays, transmission
Ultravioletstrale-transmissie

Durability
Duursaamheid

Strength
Sterkte

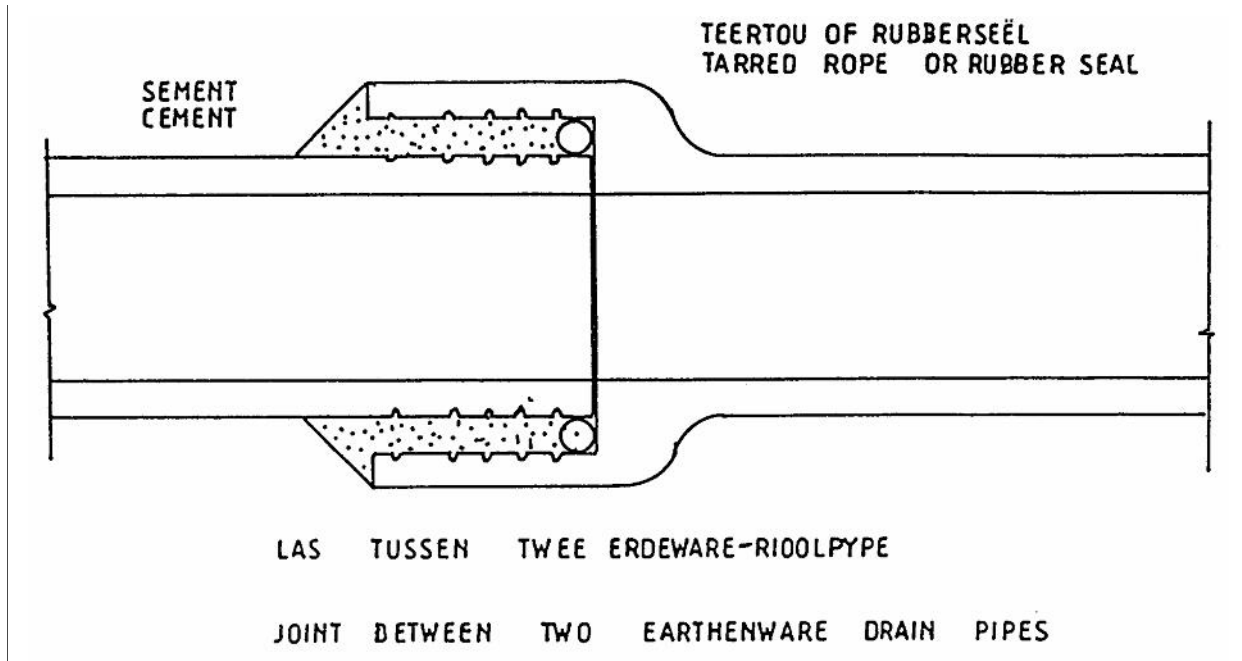
Thermal properties
Termiese eienskappe

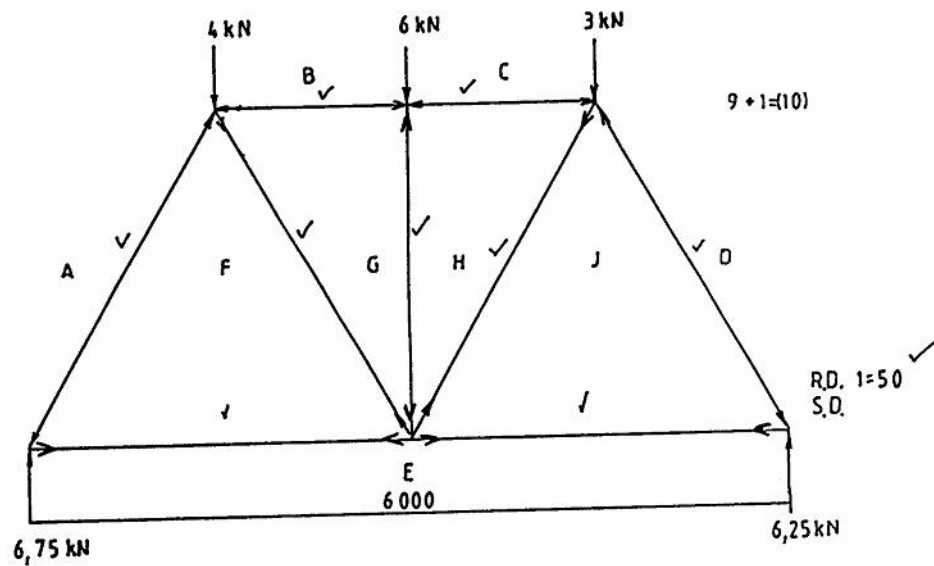
Sound isolation
Klankisolasie

Behaviour in fire.
Gedrag in brand

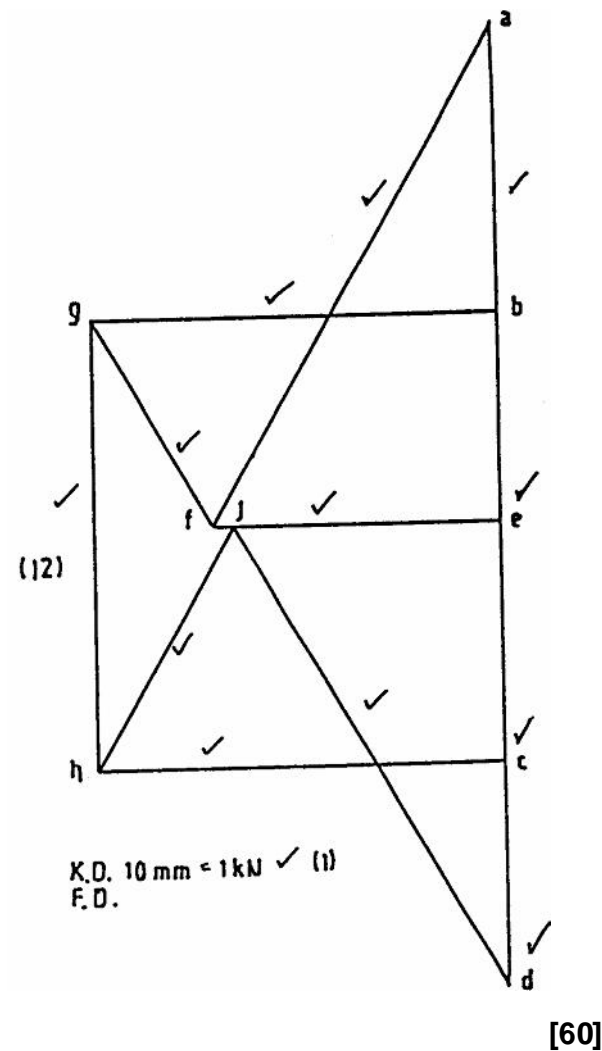
ANY TEN TWO MARKS EACH

ENIGE TIEN TWEE PUNTE ELK





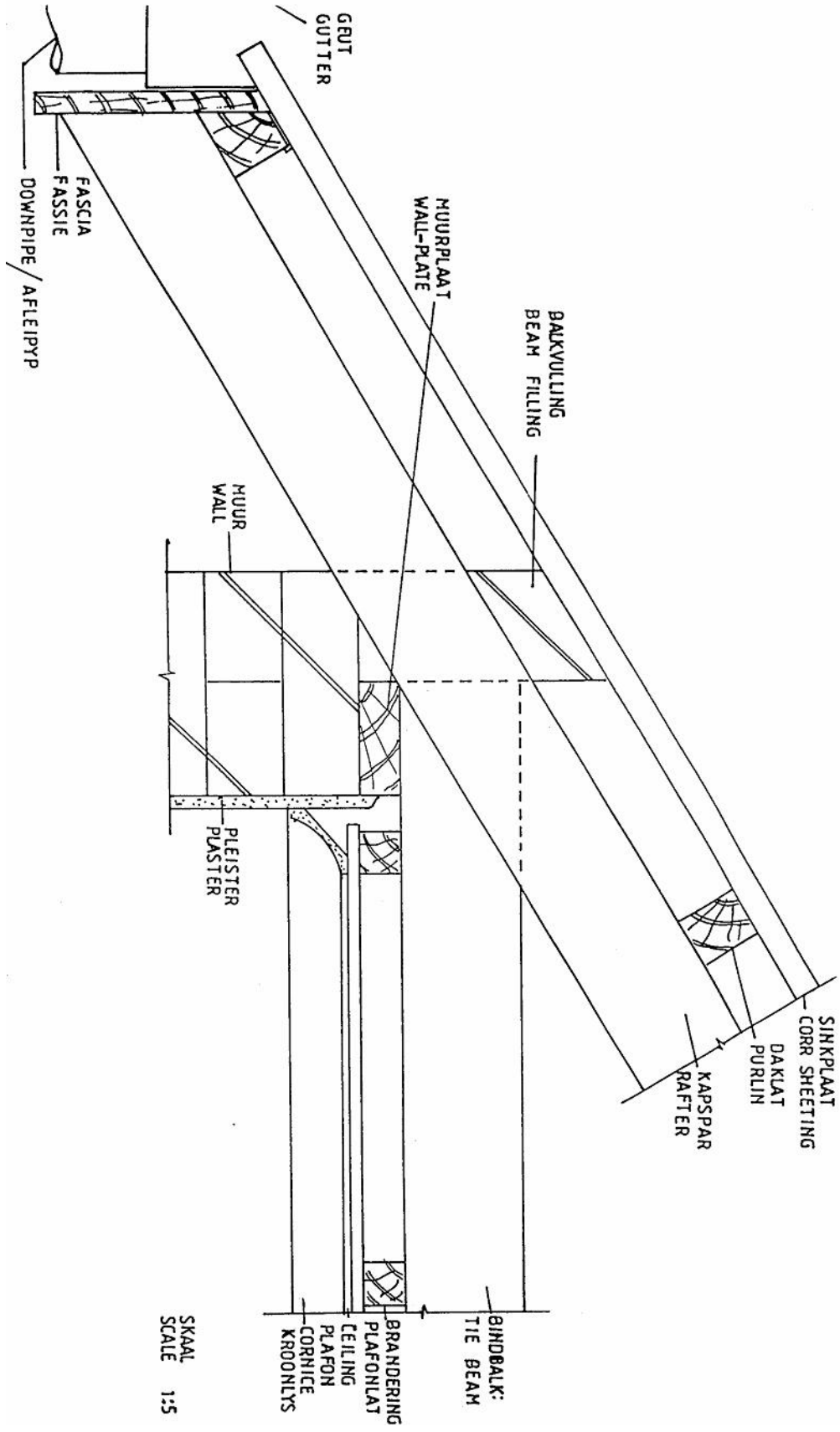
MEMBER / ONDERDEEL	FORCE / KRAG	NATURE / AARD
AF	7,8 kN (3)	STRUT / STUT (1)
BG	5,6 kN (3)	STRUT / STUT (1)
CH	5,6 kN (3)	STRUT / STUT (1)
DJ	7,2 kN (3)	STRUT / STUT (1)
EJ	3,6 kN (3)	TIE / STANG (1)
EF	3,9 kN (3)	TIE / STANG (1)
FG	3,3 kN (3)	TIE / STANG (1)
GH	6 kN (3)	STRUT / STUT (1)
HJ	3,7 kN (3)	TIE / STANG (1)
	[27]	[9]

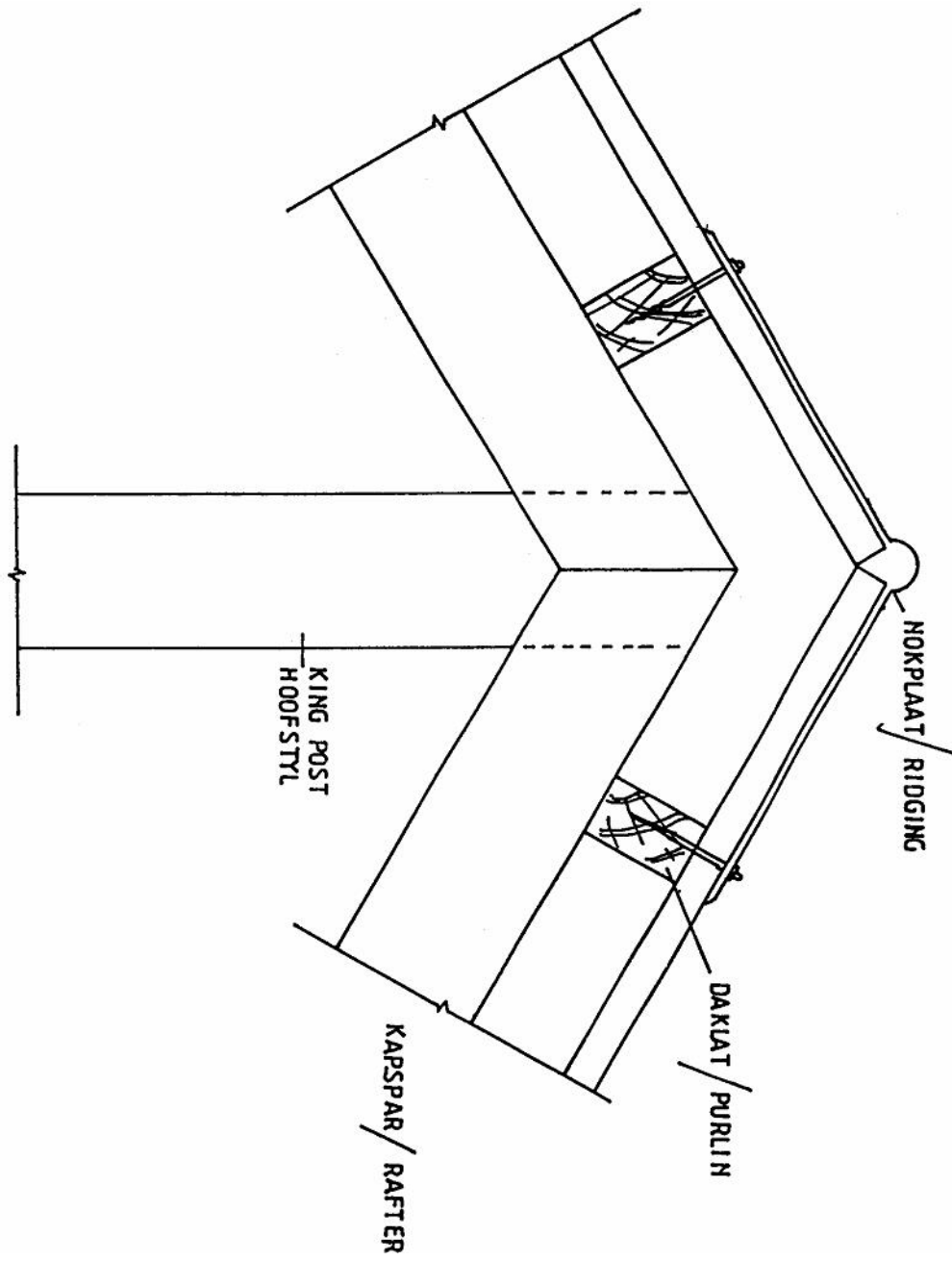


QUESTION 5 / VRAAG 5

Roof		<i>Dakkap</i>
Wall	2	<i>Muur</i>
Wall-plate	2	<i>Muurplaat</i>
Plaster	2	<i>Pleister</i>
Hatching	2	<i>Arsering</i>
Tie beam	2	<i>Bindbalk</i>
Branding	2	<i>Plafonlatte</i>
Ceiling	2	<i>Plafon</i>
Cornice	2	<i>Kroonlys</i>
Rafter	2	<i>Kapspar</i>
Beam filling	2	<i>Balkvulling</i>
Purlins	2	<i>Daklatte</i>
Fascia board	2	<i>Fassieplank</i>
Gutter	2	<i>Geut</i>
Downpipe	2	<i>Afleipyp</i>
Sheeting	2	<i>Sinkplaat</i>
Scale	2	<i>Skaal</i>
Captions	2	<i>Beskrywings</i>
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	35	

Nok		<i>Ridge</i>
King post	2	<i>Hoofstyl</i>
Rafters	4	<i>Kapsparre</i>
Purlins	2	<i>Kaplatte</i>
Sheeting	2	<i>Sinkplate</i>
Ridging	2	<i>Nokplaat</i>
Scale	2	<i>Skaal</i>
Linework	2	<i>Lynwerk</i>
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QUESTION 6 / VRAAG 6**6.1 SEPTIC TANK SEPTIESE TENK**

Manhole lid	2	<i>Mangatdeksel</i>
Sludge	2	<i>Vloevulling</i>
T-junction	2	<i>T-aansluiting</i>
Ground level	2	<i>Grondvlak</i>
Overflow	2	<i>Oorloop</i>
Room 1	2	<i>Kamer 1</i>
Room 2	2	<i>Kamer 2</i>
French drain	2	<i>Stapelriool</i>
Concrete floor	2	<i>Betonvloer</i>
Neatness	2	<i>Netheid</i>
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6.2 WORKING OF SEPTIC TANK

The septic tank is designed in such a way that solid sewer and water flows into the first compartment from under the water surface without disturbing the foam on the top.

The heavier solids sinks to the bottom while the lighter part stays in suspension. The bacteria present in the liquid, attacks the solid sewer, and during this process a gas develops and rises to the top taking tiny solid parts with it and forms a layer of foam.

A crust of foam is formed which act as a humas for the bacteria and larva inside the tank which enlarges the attacking power.

To ensure breeding growth the foam layer must not be disturbed.

Some of the rising solid parts flow into the next compartment where the process is repeated. From the last compartment the content, which is at this stage, a clear liquid, flows into the french drain and seeps into the ground.

WERKING VAN 'N SEPTIESE TENK

Die septiese tenk word so ontwerp dat die riool en water in die eerste kamer onder die watervlak invloei sonder om 'n steuring in die skuimlaag bolangs te veroorsaak.

Die swaarder soliede dele sak af terwyl die ligter dele in suspensie bly.

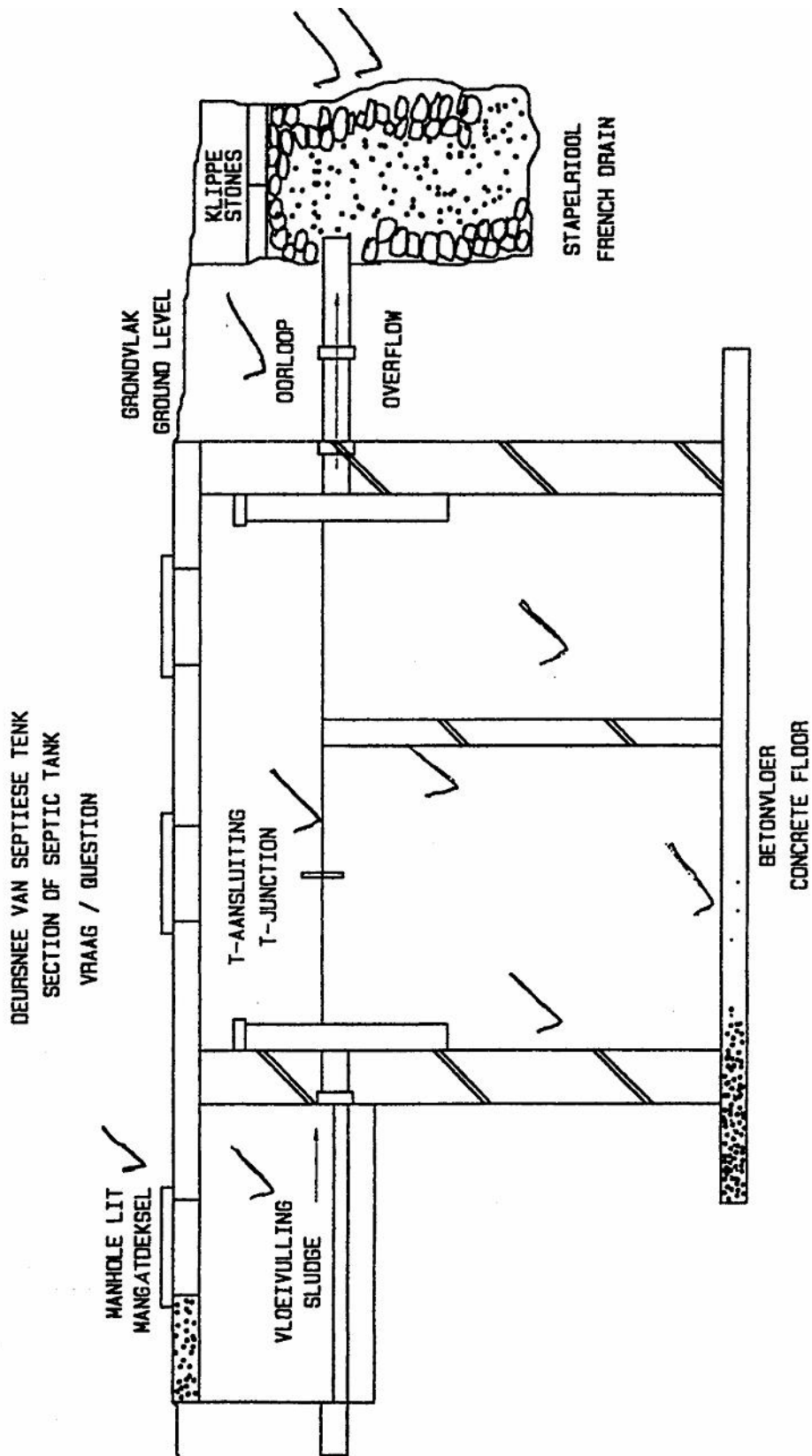
Die bakterieë wat in die vloeistof teenwoordig is, val die vaste stowwe aan en tydens hierdie proses ontwikkel 'n gas wat na die oppervlak styg en sodoende klein deeltjies soliede stof saamneem en 'n skuimlaag vorm.

'n Kors vorm bo-op die oppervlakte en dien as teelaarde vir die bakterieë en larwes in die tenk, wat die aanvalskrag vergroot.

Om groeitoestande te verseker, moet die skuimlaag nie versteur word nie.

Van die soliede deeltjies wat opstyg, vloei oor na die volgende kompartement waar die proses homself herhaal. Vanaf die laaste kompartement vloei die inhoud, wat teen hierdie tyd 'n helderkleurige vloeistof is, na die stapelriool, waar dit in die grond wegsypel.

MARKS AS SHOWN**PUNTE SOOS AANGEDUI**



MARKS AS SHOWN

PUNTE SOOS AANGEDU

QUESTION 7 / VRAAG 7

7.1 Moisture content in wood
Hoeveelheid vog in hout

Defects in wood
Defekte in hout

Grading
Graad van hout

Lengths in which wood is available
Lengtes waar in hout beskikbaar is

Twisting
Buigbaarheid

ONE MARK EACH EEN PUNT ELK

7.2 Concrete is very strong and can resist a very high compressive stress.
Beton is geweldig sterk en kan onder samedrukking 'n hoë drukkrag weerstaan.

Its tensile strength is rather poor, and should be reinforced with steel to resist the tensile stress.
Onder sametrekking breek dit egter maklik en moet met staal bewapen word om die trekspanning te weers taan.

Watertightness
Waterdigtheid

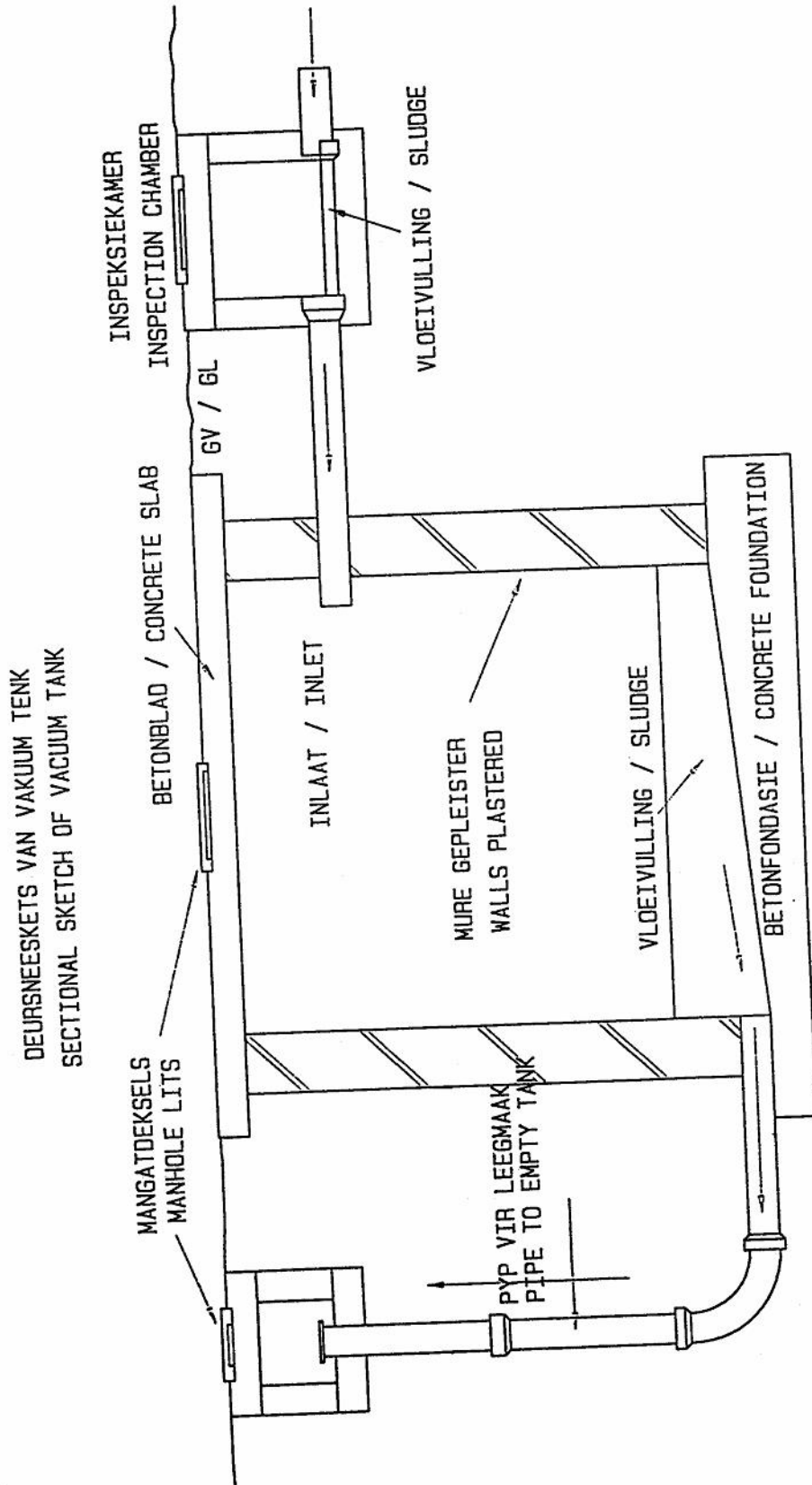
Durability
Duursaamheid

Resistance to weathering
Bestand teen verwering

Resistance to shocks.
Skokbestand

ANY FIVE, ONE MARK EACH ENIGE VYF, EEN PUNT ELK

7.3



DEURSNEEKETS VAN VAKUUM TENK
SECTIONAL SKETCH OF VACUUM TANK

7.4 Formwork *Bekisting*

It must be strong enough to support the weight of the concrete.

Dit moet sterk genoeg wees om die massa van die nat beton te kan dra. (2)

It should not bend to the weight of the concrete or any other load.

Dit behoort nie te buig onder die las van die nat beton of enige ander kragte wat daarop inwerk nie. (2)

It must be erected accurately according to the measurements, sizes and position as the concrete, when wet, is plastic and will take the shape of the formwork.

Dit moet akkuraat volgens maat, grootte en posisie aanmekaar getimmer word, aangesien die nat beton die vorm van die bekisting aan neem. (2)

The joints must be leak-proof to keep the grout in.

Die laste moet lekvry wees, sodat die voegbry nie kan uitloop nie. (2)

The formwork must be of a size to be erected easily by hand or a hoist.

Die grootte van die bekisting moet so wees dat dit maklik met die hand of meganiese hystoerusting in posisie geplaas kan word. (2)

7.5 Roof-covering materials
Dakbedekkingsmateriale

Corrugated iron
Gegolfde sink

Clay tiles
Kleiteëls

Asbestos
Asbes

Grass
Gras

Stone
Klip

Perspex or hardened transparent plastic
Perspex of verharde, deurskynende plastiek

CANDIDATE'S NUMBER / KANDIDAAT SE NOMMER

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ANSWER SHEET SG 702-2/0
 ANTWOORDBLAD SG 702-2/0

