

VRAAG 1 / QUESTION 1

1.1.1 Horisontale hoeke
Horizontal angles

1.1.2 Horisontale afstande
Horizontal distances

1.1.3 Vertikale afstande
Vertical distances

EEN PUNT ELK / ONE MARK EACH

(3)

1.2.1 Alle trappe, gange, loopplanke, kelders en ander plekke waar gevaar weens swak lig bestaan, toereikend verlig wees.

All staircases, pathways, and gangways, basements and any other places where insufficient lighting may occur, be properly illuminated.

1.2.2 Alle trappe, loopgange, en loopplanke vry wees van materiaal, afval of ander hindernisse.

Staircases, pathways and gangways should be free from materials, waste or any other obstacles.

1.2.3 Alle openinge in vloere, luikgange en trappe of enige ander opening waardeur of waarvan persone kan val, toereikend beskut is.

All openings in floors, hatchways and stairways, or any other opening through or from which persons are liable to fall, must be adequately safeguarded.

1.2.4 Gevaargebiede waar materiaal op werkers kan val, van toereikende vangplatvorms of nette voorsien is.

Danger areas, where materials and debris are liable to fall on workers, must be adequately fenced off and catch platvorms or nets must be provided

1.2.5 Slegs hysmasjiene en of glybane gebruik word om materiaal op te hys.

Hoisting of materials must be done only by means of a hoist or chute.

**TWEE PUNTE ELK.
TWO MARKS EACH**

(10)

1.3.1 Uitgrawings waartoe die publiek toegang kan hê, moet afgekamp word met 'n heining van ten minste 600 mm hoog. 'n Rooi lig moet gedurende die nag die gevaargebied aandui.

Excavations which are accessible to the public must be fenced off with a barrier or fence at least 600 mm high and provided with a red warning light at night.

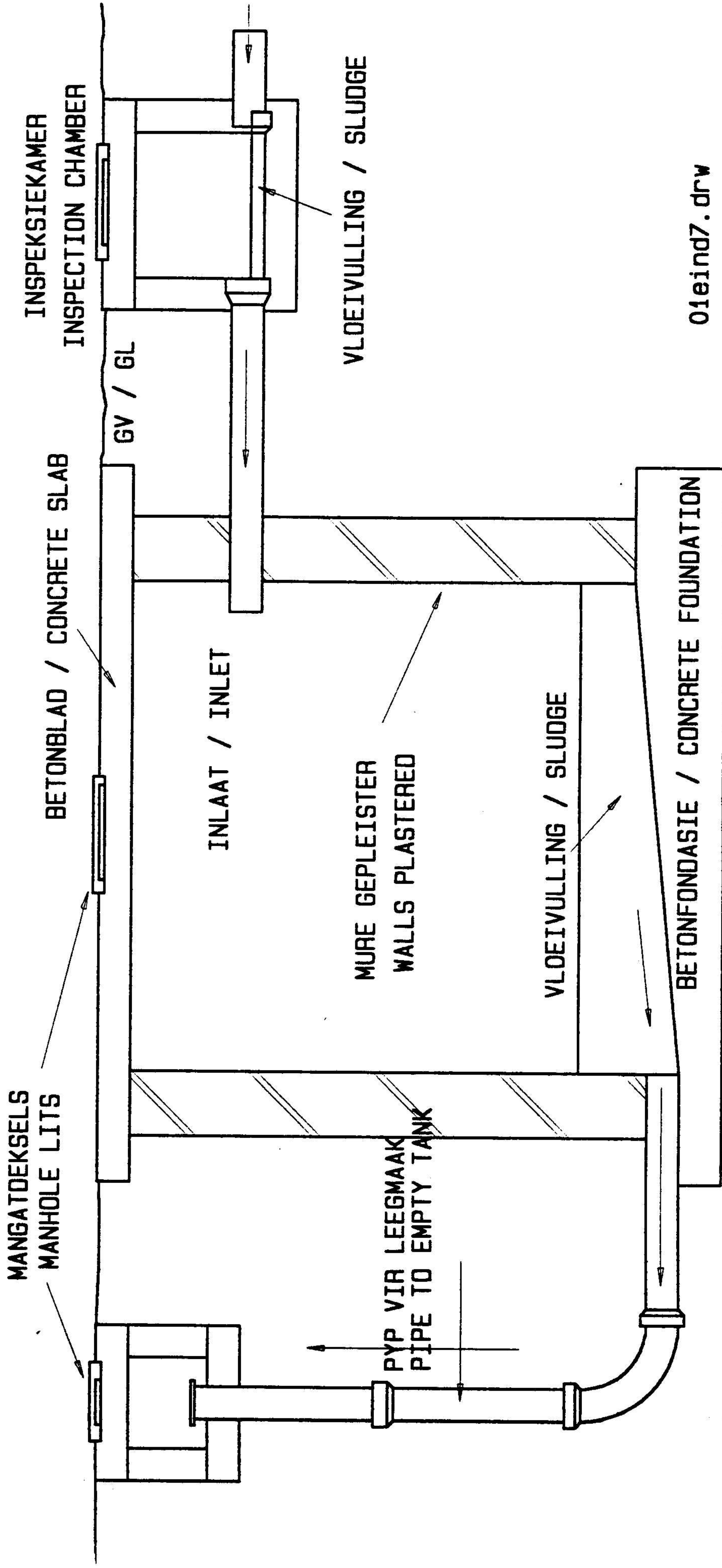
- 1.3.2 Wanneer die uitgrawings dieper as 1,5 m is, moet bouers die kante daarvan behoorlik stut en skoon afwerk, voordat met die werk in die uitgrawings begin word. Hierdie voorsorgmaatreël geld nie wanneer die uitgrawings in soliede rots is nie waar die kante van die uitgrawingwalle se val van so 'n aard is dat dit 'n natuurlike helling met die grond vorm nie.

When excavations are deeper than 1,5 m, builders must shore or grade the sides properly before they require persons to work in the excavations. This, however, is not required where the excavation is in solid rock or where the sides of the excavation are sloped to the natural angle of response of the earth.
(6)

- 1.4.1 Steiers moet deur 'n kenner opgerig word.
Scaffolding must be erected by an expert.
- 1.4.2 Hout vir steierwerk moet skoon gesaag wees en nie geverf word nie.
Wood for scaffolding must be clean sawn and not painted to cover defects.
- 1.4.3 Steier planke moet by kortelinge oorvleuel om valle te voorkom.
Scaffolding boards must overlap on the putlogs to prevent falls.
- 1.4.4 Steiers moet droog gehou word, nattigheid kan 'n mens laat gly.
The surface of the boards must be kept dry. Dampness can cause slippery conditions.
- 1.4.5 Planke moet stewig vas wees om verskuiwing te voorkom.
Scaffold boards must be secured properly to prevent it from sliding.
- 1.4.6 Steiers mag nie oorlaai word nie.
Scaffolding must not be overloaded.
- 1.4.7 Geen stene of los gereedskap mag op 'n steier rond lê nie.
There must be no loose bricks or tools lying on the scaffolding.
- 1.4.8 Steiers moet stewig en sterk wees sodat dit nie wieg nie.
Scaffolding must be bold and strong, not to sway.
- 1.4.9 Steiers moet so na as moontlik aan die muur opgerig word.
Scaffolding must be erected as near to the wall as possible.
- 1.4.10 Steierplanke moet van voetplate voorsien wees.
Scaffolding must have base plates. (10)

ENIGE VYF. TWEE PUNTE ELK. / ANY FIVE. TWO MARKS EACH

DEURSNEE SKETS VAN VAKUUM TENK
SECTIONAL SKETCH OF VACUUM TANK



01eind7.drw

- 1.5.1 Moet sterk genoeg wees om die massa van die nat beton te dra.
Should be strong enough to support the load of the wet concrete.
- 1.5.2 Behoort nie te buig onder die las van die nat beton nie.
It must not be able to deflect under the load of wet concrete.
- 1.5.3 Moet akkuraat volgens maat aanmekaar gesit wees.
It must be accurately set out.
- 1.5.4 Die lasse van die bekisting behoort lekvry te wees sodat voegbry nie kan ontsnap nie.
It must have grout-tight joints. Grout leakage can cause honeycombing of the surface.
- 1.5.5 Die ontwerp van die bekisting moet sodanig wees dat dit maklik opgerig kan word en maklik uitmekaar gehaal kan word.
The design of the formwork units should be such that they can easily be assembled and dismantled.

TWEE PUNTE ELK. TWO MARKS EACH (10)

1.6 VAKUUMTENK / VACUUM TANK

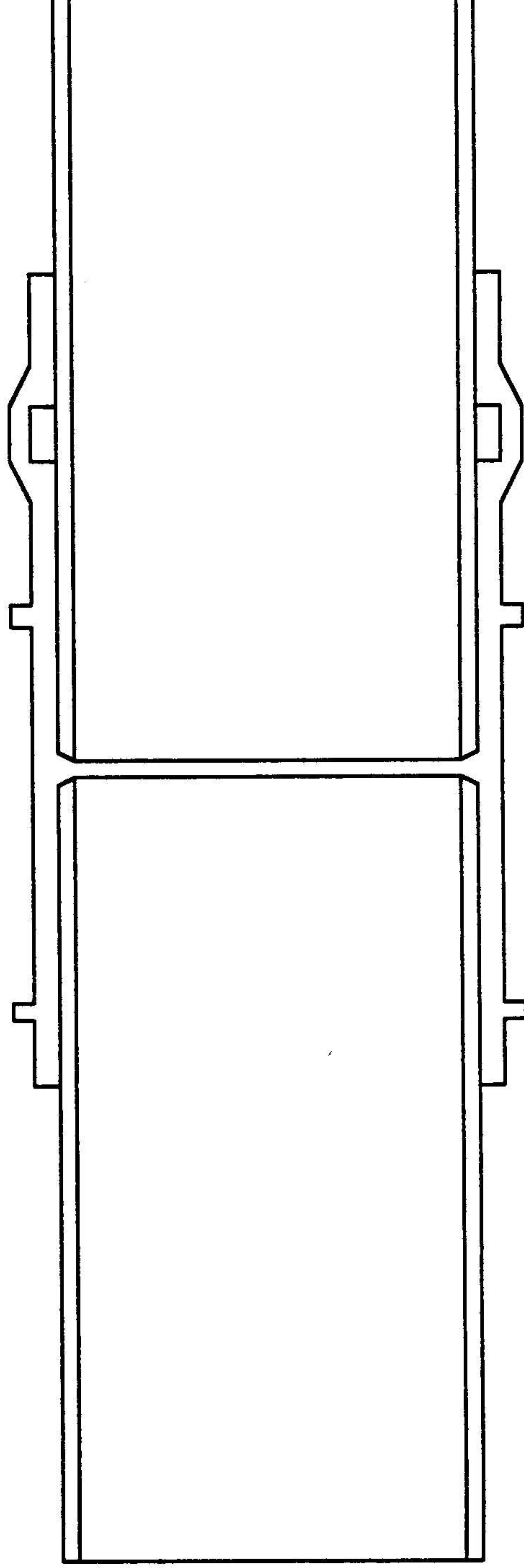
Feite	=	11	<i>Facts</i>
Korrektheid	=	2	<i>Correctness</i>
Totaal	=	13	<i>Total</i>

1.7 PYPLASSE / PIPE JOINTS
LAS TUSSEN TWEE PVC RIOOLPYPE
JOINT BETWEEN TWO PVC DRAIN PIPES.

(10)
[60]

VRAAG / QUESTION 1.7

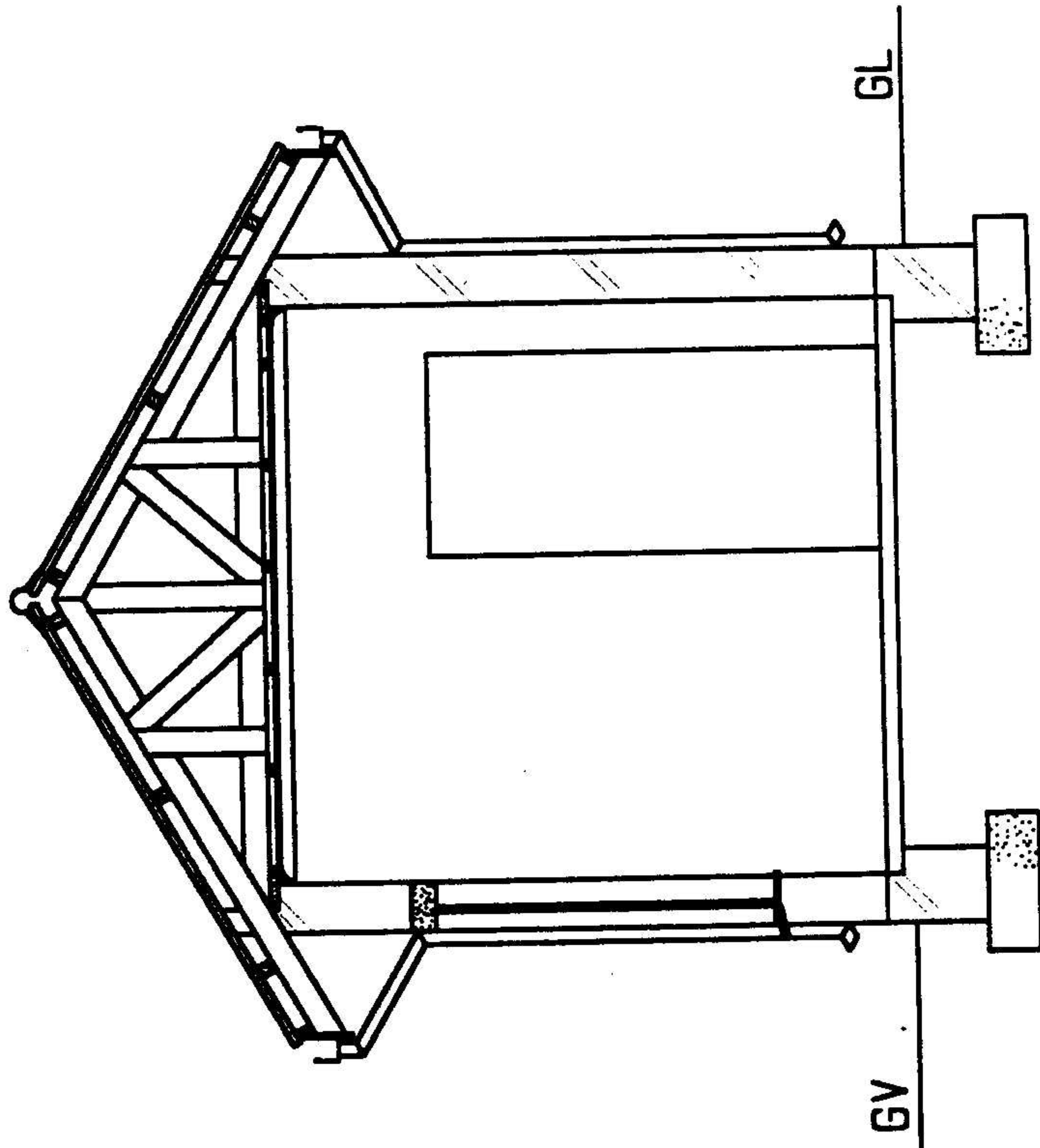
LAS TUSSEN TWEE PVC PYPE / JOINT BETWEEN TWO PVC PIPES



LAS VASGEGOM AAN PYP / JOINT GLUED TO PIPE RUBBERSEEL / RUBBER SEAL

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VRAAG 2.1 / QUESTION 2.1



	VRAAG 2.1 / QUESTION 2.1	
1	Fondasie / Foundation 610 x 230	2
2	Onderbou / Substructure 450 mm	2
3	Grondvlak / Ground level	2
4	V.W.L. / D.P.C	2
5	Bobou / Superstructure 2700 mm	4
6	Venster snit / Window section	2
7	Vensterbank / Window sill	2
8	Latei / Lintol	2
9	Deur / Door	2
10	Dakkonstruksie / Roof construction	6
11	Dakbedekking / Roof covering	2
12	Fassieplank / Fascia board	2
13	Balkvulling / Beam filling	2
14	Nokplaat / Ridge plate	2
15	Daklatten / Purlins	2
16	Oorhang / Overhang	2
17	Geute / Gutters	2
18	Afleiptype / Downpipes	2
19	Plafonlatten / Branderings	2
20	Plafon / Ceiling	2
21	Kroonlids / Cornice	2
22	Skaal / Scale	2
	Totaal / Total	50

VRAAG / QUESTION 2 (SNIT VAN HUIS / SECTION OF HOUSE)

2.1.1	Fondasie 610 mm X 230 mm	:2	<i>Foundation 610 mm x 230 mm</i>
2.1.2	Onderbou 450 mm	:2	<i>Substructure 450 mm</i>
2.1.3	Grondvlak	:2	<i>Ground level</i>
2.1.4	V.W.L	:2	<i>D.P.C</i>
2.1.5	Bobou snit	:4	<i>Superstructure section</i>
2.1.6	Venster snit	:2	<i>Window section</i>
2.1.7	Vensterbank	:2	<i>Window sill</i>
2.1.8	Latei	:2	<i>Lintol</i>
2.1.9	Deur	:2	<i>Door</i>
2.1.10	Dakkonstruksie snit	:6	<i>Roof construction section</i>
2.1.11	Dakbedekking	:2	<i>Roof covering</i>
2.1.12	Fassieplank	:2	<i>Fascia board</i>
2.1.13	Balkvulling	:2	<i>Beam filling</i>
2.1.14	Nokplaat	:2	<i>Ridge plate</i>
2.1.15	Daklatte 76 x 50 mm	:2	<i>Purlins 76 x 50 mm</i>
2.1.16	Oorhang	:2	<i>Overhang</i>
2.1.17	Geute 100 mm x 100 mm	:2	<i>Gutters 100 mm x 100 mm</i>
2.1.18	Afleipype 75 mm	:2	<i>Downpipes 75 mm</i>
2.1.19	Plafonlatte	:2	<i>Branderling</i>
2.1.20	Plafon	:2	<i>Ceiling</i>
2.1.21	Kroonlys	:2	<i>Cornice</i>
2.1.22	Skaal 1:50	:2	<i>Scale 1:50</i>
		50	

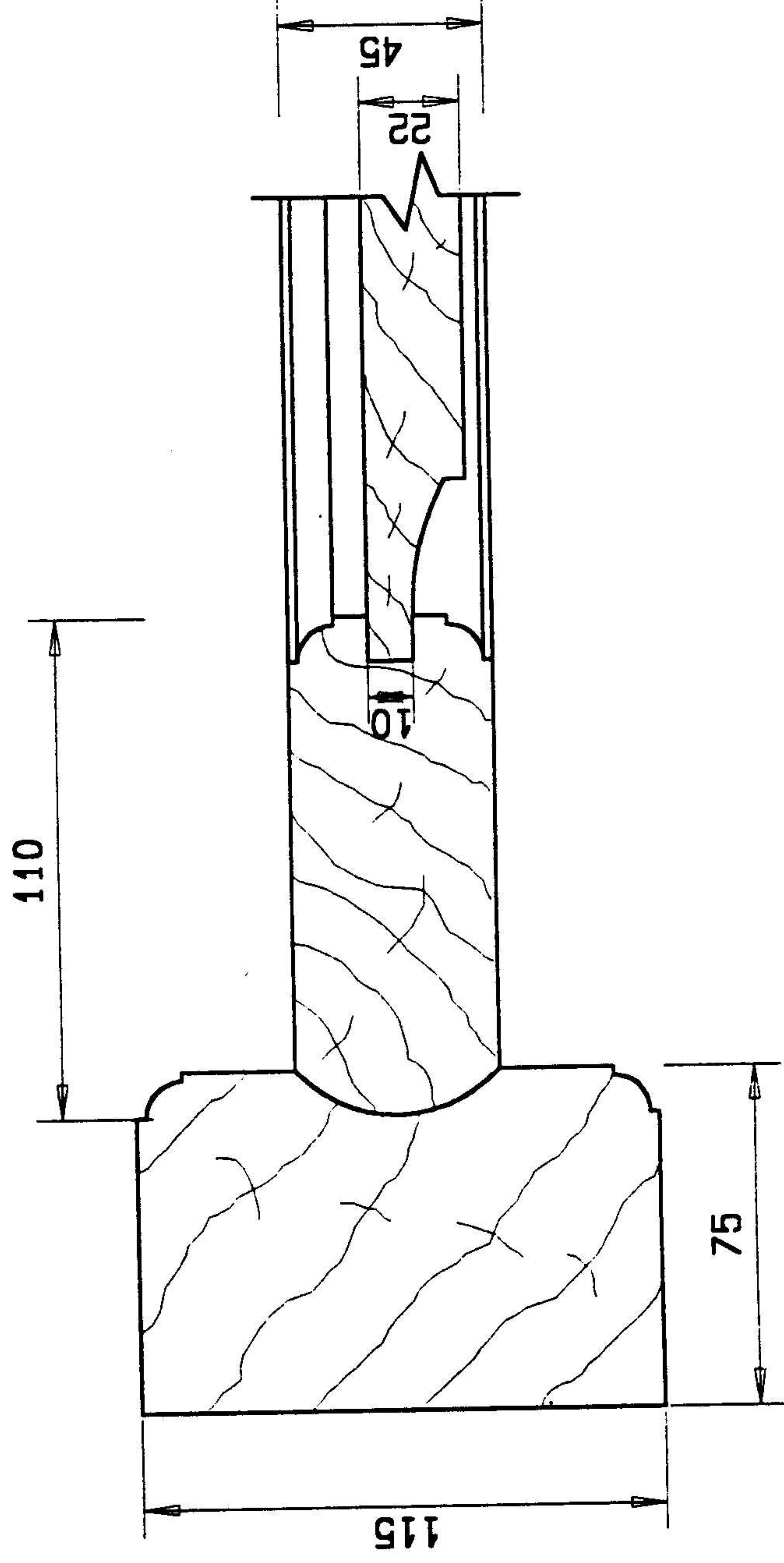
2.2.1	Kosynstyl	: 2	<i>Frame stile</i>
2.2.2	Deurraamstyl	: 2	<i>Door frame stile</i>
2.2.3	Soliede paneel	: 2	<i>Solid panel</i>
2.2.4	Afmetings en byskrifte	: 2	<i>Labels and dimensions</i>
2.2.5	Korrektheid	: 2	<i>Correctness</i>
		10	

TOTAAL / TOTAL = 60

VRAAG / QUESTION 2.2

HORISONTALE SNIT DEUR DIE KOSYNSTYL, DEURRAAMSTYL EN SOLIEDE PANEEL
HORIZONTAL SECTION THROUGH THE FRAME STYLE, DOOR FRAME STYLE AND SOLID PANEL

SKAAL / SCALE 1:2



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VRAAG 3 QUESTION 3

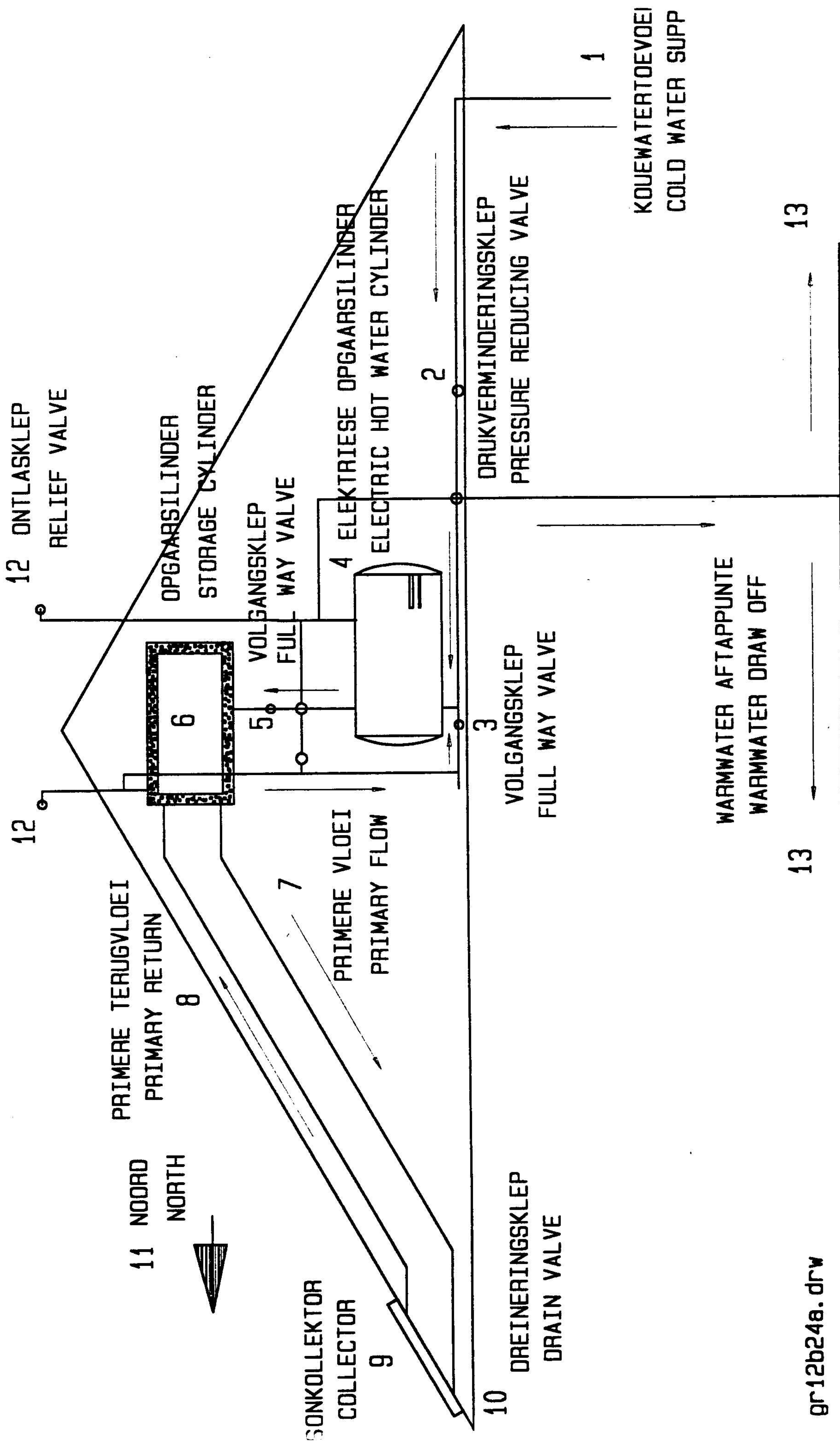
3.1.1	Kouewatertoevoer	: 2	Cold water supply
3.1.2	Drukverminderingsklep	: 2	Pressure reducing valve
3.1.3	Volgansklep	: 2	Full way valve
3.1.4	Elektriese opgaarsilinder	: 2	Electric hot water cylinder
3.1.5	Volgansklep	: 2	Full way valve
3.1.6	Opgaarsilinder	: 2	Storage cylinder
3.1.7	Primere vloei	: 2	Primary flow
3.1.8	Primere terugvloei	: 2	Primary return
3.1.9	Sonkollektor	: 2	Collector
3.1.10	Dreineringsklep	: 2	Drain valve
3.1.11	Noord	: 2	North
3.1.12	Ontlasklep	: 2	Relief valve
3.1.13	Warmwater aftappunte	: 2	Warmwater draw off
3.1.14	Pylpunte vir vloei	: 2	Arrows for direction of flow
3.1.15	Pyppe in posisie	: 2	Pipes in position
		30	

3.2.1.1	Kosynstyle 115 x 75 mm	: 4	Frame stiles 115 x 75 mm
3.2.1.2	Deurstyle 115 x 45 mm	: 4	Door stiles 115 x 45 mm
3.2.1.3	Verhewe kussing paneel 22 dik	: 2	Raised and fielded panel 22 thick
3.2.1.4	Arsering vir snit	: 1	Hatching for section
3.2.1.5	Skaal 1:5	: 1	Scale 1:5
		12	

3.2.2.1	Kalfreling 115 x 75 mm	: 4	Transome 115 x 75 mm
3.2.2.2	Bo-reling van deur 115 x 45	: 4	Top rail of door 115 x 45 mm
3.2.2.3	Onderreling van bolig 60 x 45	: 4	Bottom rail of fanlight
3.2.2.4	Verhewe paneel 22 dik	: 2	Raised panel 22 thick
3.2.2.5	Glas paneel	: 2	Glass panel
3.2.2.6	Skaal 1:2	: 2	Scale 1:2
		18	

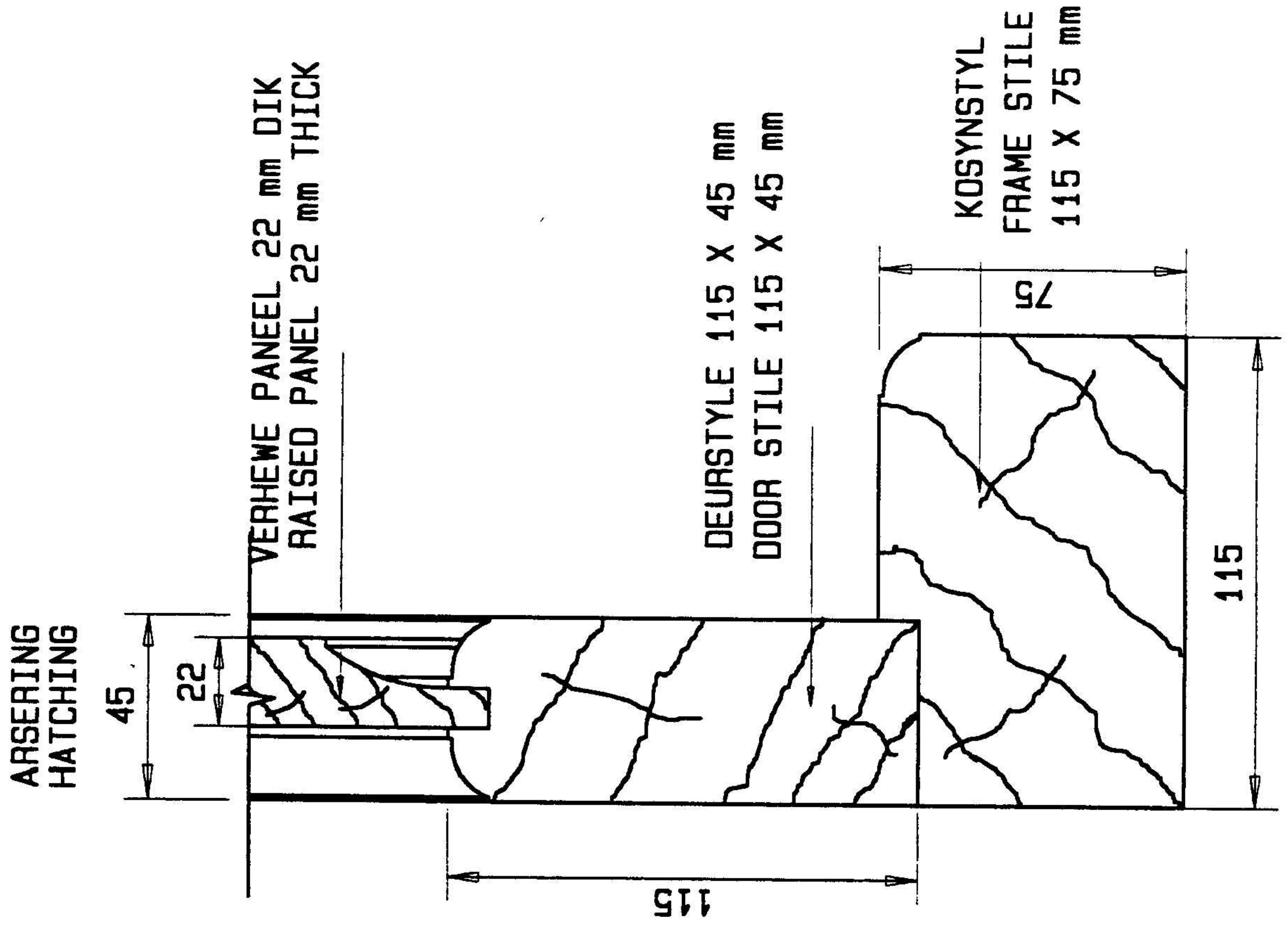
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VRAAG 3.1
QUESTION 3.1

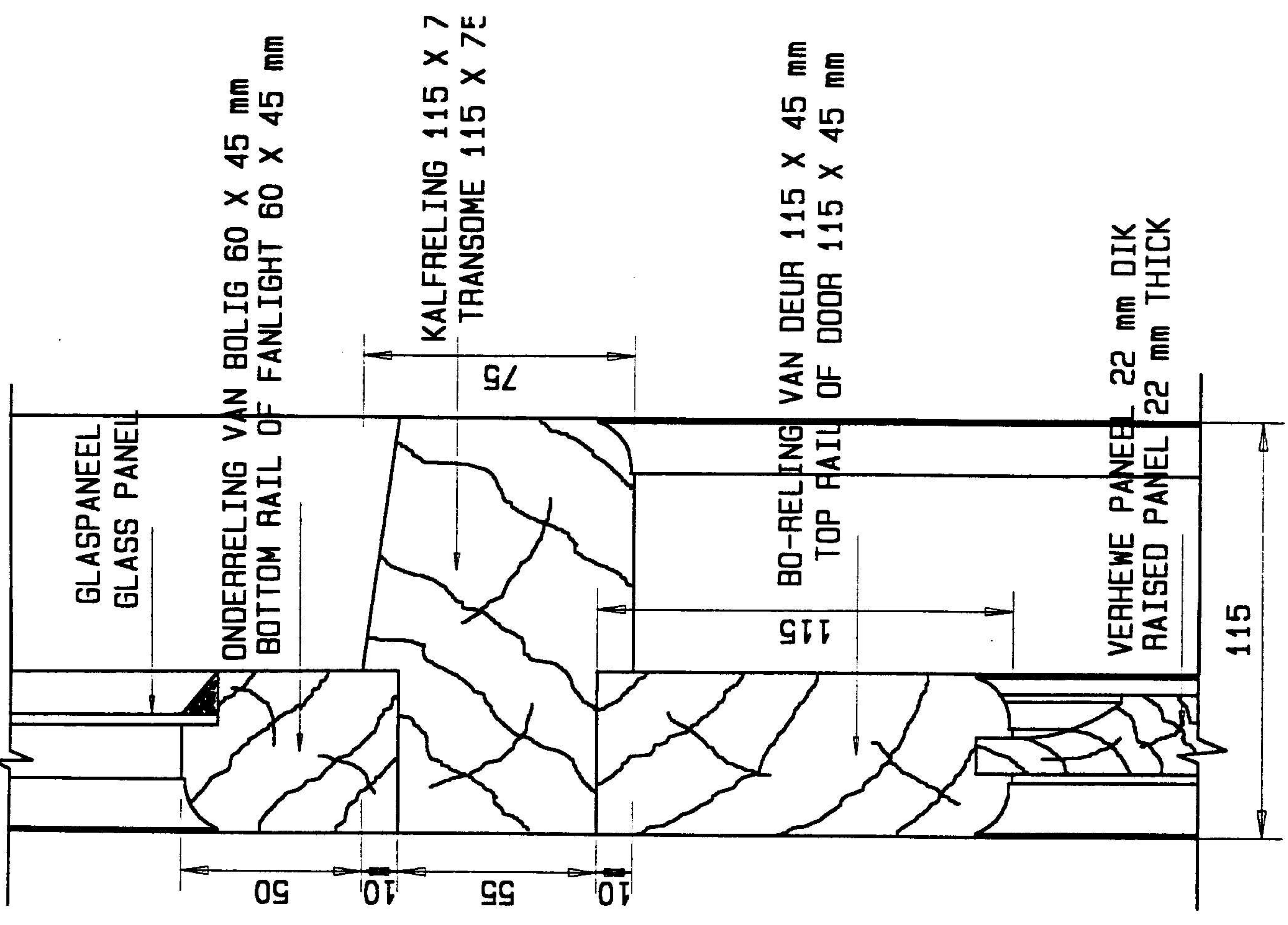


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VRAAG / QUESTION 3.2.1
SKAAL / SCALE 1:2



VRAAG / QUESTION 3.2.2
SKAAL / SCALE 1:2



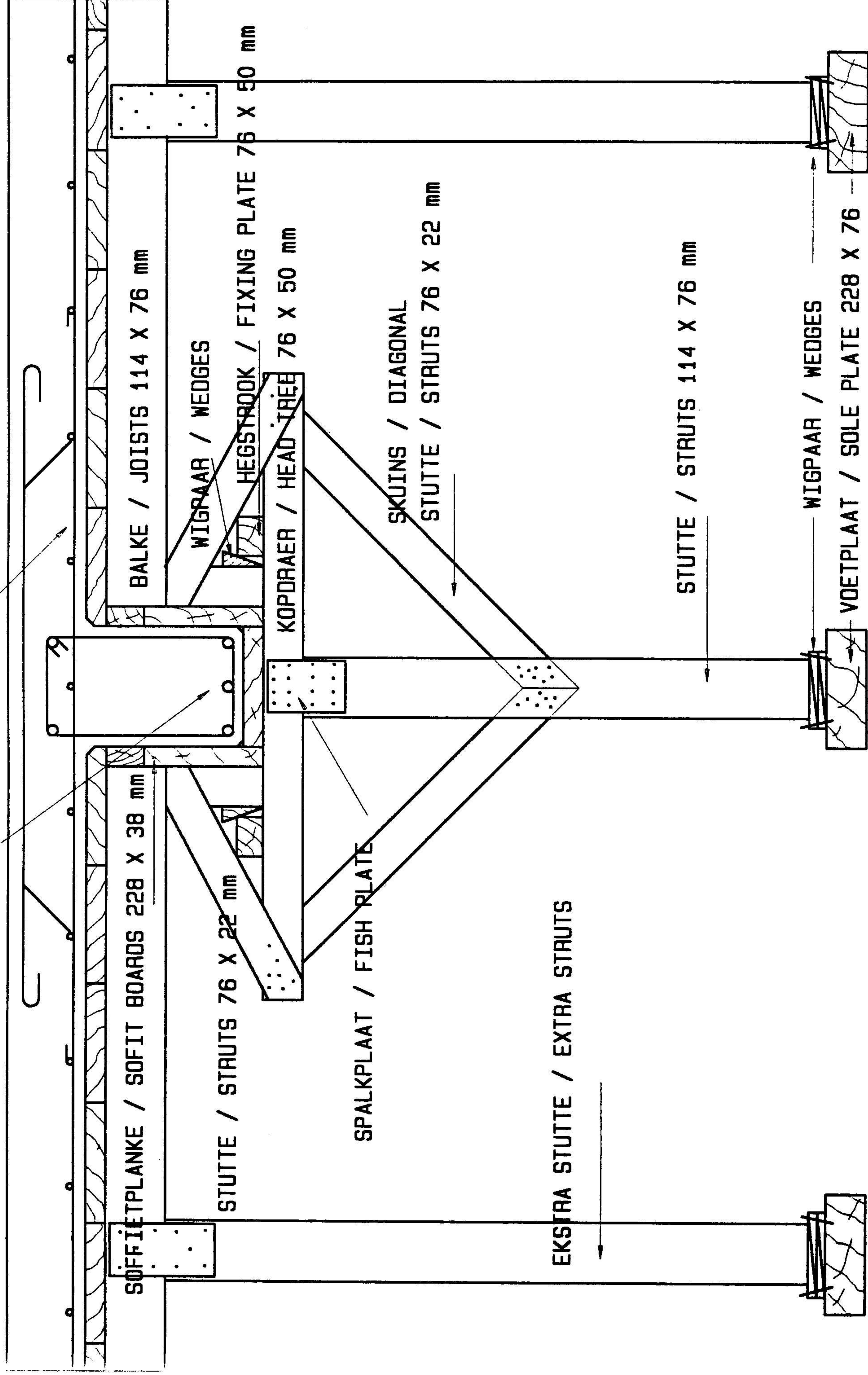
VRAAG / QUESTION 4

BETONBALK EN VLOER / CONCRETE BEAM AND FLOOR

4.1	BALK	: 6	BEAM
4.2	VLOER	: 6	FLOOR
4.3	SOFFIETPLANKE	: 5	SOFFIT BOARDS
4.4	BALKE 114 x 76 mm	: 4	JOISTS 114 x 76 mm
4.5	KLAMPE 76 x 50 mm	: 2	CLEATS 76 x 50 mm
4.6	KOPDRAER 76 x 50 mm	: 2	HEAD TREE 76 x 50 mm
4.7	STUT 114 x 76 mm	: 2	STRUTS 114 x 76 mm
4.8	STUTTE 76 x 22 mm	: 2	STRUTS 76 x 22 mm
4.9	SPALKPLAAT	: 2	FISH PLATE
4.10	VOETPLAAT 228 x 76 mm	: 2	SOLE PLATE 228 x 76 mm
4.11	WIGPAAR	: 2	WEDGES
4.12	HEGSTROOK 76 x 50 mm	: 2	FIXING PLATE 76 x 50 mm
4.13	WIGPAAR	: 2	WEDGES
4.14	EKSTRA STUTTE	: 2	EXTRA STRUTS
4.15	BALK BEWAPENING	: 6	BEAM REINFORCEMENT
4.16	BLAD BEWAPENING	: 6	SLAB REINFORCEMENT
4.17	DETAIL	: 2	DETAIL
4.18	SKAAL	: 2	SCALE
4.19	AFMETINGS EN BYSKRIF	: 3	TABLES AND DIMENSIONS.
		60	

BALKBEWAPENING / BEAM REINFORCEMENT

BLADBEWAPENING / SLAB REINFORCEMENT



AFMETINGS EN BYSKRIFTE / LABLES AND MEASUREMENTS

DETAIL / DETAIL

SKAAL / SCALE 1:10

VRAAG / QUESTION 4.1

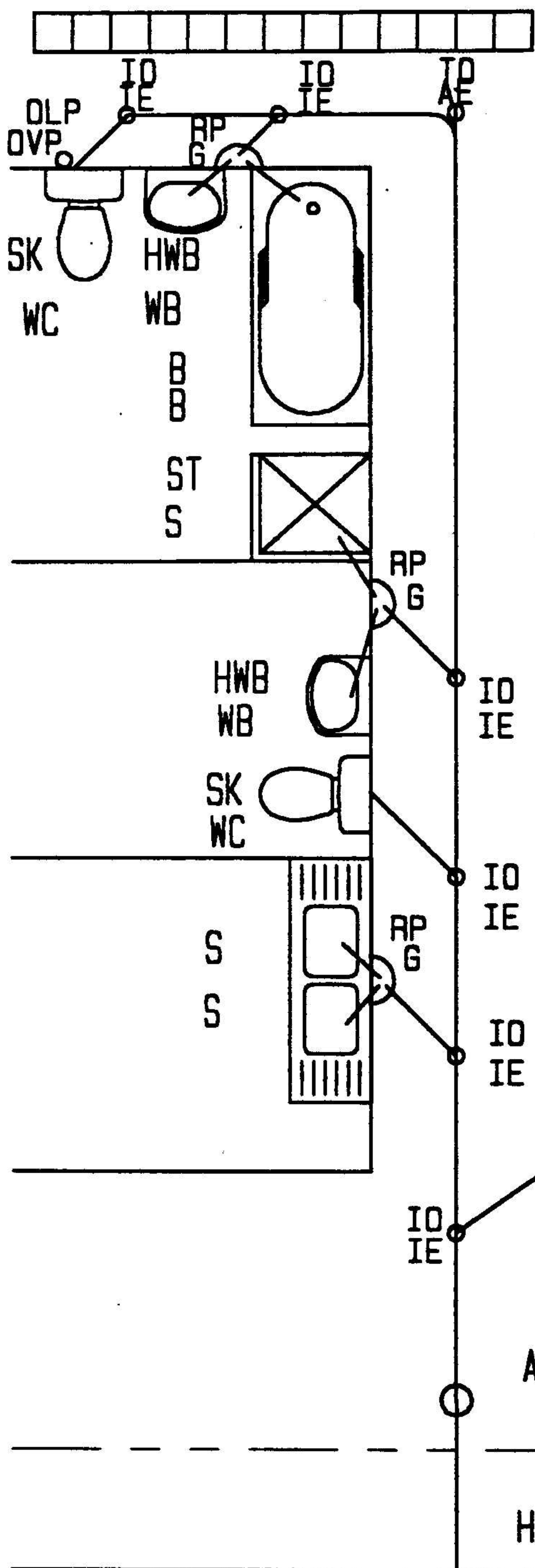
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			EKSAMENNOMMER :
			EXAMINATION NUMBER :
			ANTWOORDBLAD SG
			ANSWER SHEET SG
			5.1.1 DIE ONDERBOU / THE SUBSTRUCTURE
			HARTLYN VAN ONDERBOU BUITEMUUR.
			CENTRE LINE FOR SUBSTRUCTURE OUTSIDE WALL.
			2 / 9 000 = 18 000
			2 / 6 000 = 12 000
			SUBTOTAAL = 30 000
			SUB TOTAL
			MINUS 4 / 220 = - 880
			MINUS 4 /
			TOTAAL / TOTAL = 29 120 mm
			HARTLYN IS 29,12 m LANK.
			CENTRE LINE IS m LONG.
			HARTLYN VAN ONDERBOU BINNEMUUR.
			CENTRE LINE FOR SUBSTRUCTURE INTERIOR WALL.
			6 000 - 2/220 = 5560 mm
			TOTALE LENGTE VAN DIE HARTLYN VIR ONDERBOU =
			TOTAL LENGTH OF CENTRE LINE FOR SUBSTRUCTURE =
			29,12 m + 5,56 m = 34,68 m
1 /	34,68		OPPERVLAKTE VAN DIE ONDERBOU = 15,606
	0,45	15,606	AREA OF SUBSTRUCTURE
2 /	15,606		HOVEELHEID STENE NODIG VIR DIE ONDERBOU AS
	50	1560,6	ONDERBOU 450 mm HOOG IS EN DAAR IS 50 STENE PER
			VIERKANTE METER VIR 'n HALFSTEENMUUR.
			AMOUNT OF BRICKS REQUIRED FOR SUBSTRUCTURE
			IS SUBSTRUCTURE IS 450 mm HIGH AND THERE ARE
			50 BRICKS PER SQUARE METRE FOR A HALF BRICK WALL.
			= 1560,6
			5.1.2 DIE BOBOU / THE SUPERSTRUCTURE
			HARTLYN VAN BOBOU BUITEMUUR
			CENTRE LINE FOR SUPERSTRUCTURE OUTSIDE WALL
			2 / 9 000 = 18 000
			2 / 6 000 = 12 000
			SUBTOTAAL = 30 000
			SUB TOTAL
			MINUS 4 / 220 = - 880
			MINUS 4 /
			TOTAAL / TOTAL = 29 120
			HARTLYN VAN BOBOU BUITEMUUR
			CENTRE LINE OF SUPERSTRUCTURE OUTSIDE WALL
			= 29,12 m LANK
			m LONG.

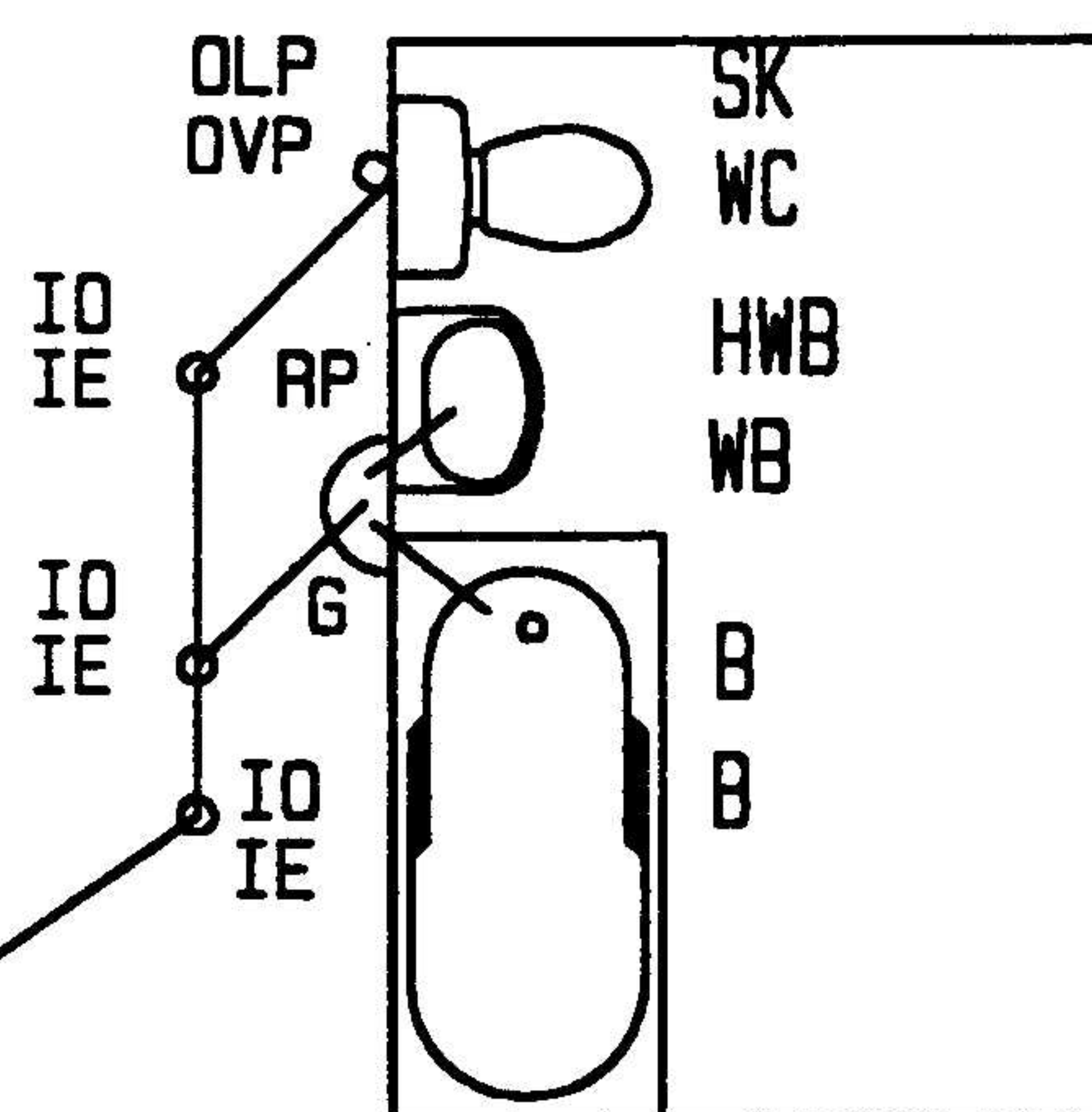
			EKSAMENNOMMER :
			EXAMINATION NUMBER :
11	<u>29,12</u>		OPPERVLAKTE VAN BOBOU BUITEMUUR = <u>78,624</u>
	<u>2,7</u>	<u>78,624</u>	AREA OF SUPERSTRUCTURE OUTSIDE WALL =
			HARTLYN VAN BOBOU BINNEMUUR
			CENTRE LINE OF SUPERSTRUCTURE INTERIOR WALL
			6 000 - <u>2/220</u> = <u>5560</u>
			HARTLYN VAN BINNEMUUR = <u>5,56</u> m LANK.
			CENTRE LINE FOR INTERIOR WALL m LONG
11	<u>5,56</u>		OPPERVLAKTE VAN BOBOU BINNEMUUR = <u>15,012 m²</u>
	<u>2,7</u>	<u>15,012</u>	AREA OF SUPERSTRUCTURE INTERIOR WALL =
			HOEVEELHEID STENE VIR BOBOU AS BOBOU 2,7m HOOG
			IS EN DAAR IS 50 STENE PER VIERKANTE METER VIR
			'n HALFSTEENMUUR.
			AMOUNT OF BRICKS FOR SUPERSTRUCTURE IF THE
			SUPERSTRUCTURE IS 2,7m HIGH AND THERE ARE
			50 BRICKS PER SQUARE METRE FOR A HALF BRICK WALL.
<u>1/</u>	<u>15,012</u>		BOBOU BINNEMUUR = <u>750,6</u> STENE
	50	<u>750,6</u>	SUPERSTRUCTURE INTERIOR WALL BRICKS.
<u>2/</u>	<u>78,624</u>		BOBOU BUITEMUUR = <u>7862,4</u> STENE.
	50	<u>7862,4</u>	SUPERSTRUCTURE OUTSIDE WALL BRICKS.
			OPENINGE IN BOBOU / OPENINGS IN SUPERSTRUCTURE
			OPPERVLAKTE VAN OPENINGE / AREA OF OPENINGS
<u>2/</u>	2		VENSTER A / WINDOW A
	1.5	<u>6</u>	2 m X 1,5 m = <u>3m²</u>
<u>2/</u>	0.9		VENSTER B / WINDOW B
	1.5	<u>2,7</u>	0,9 m X 1,5 m = <u>1,35m²</u>
<u>1/</u>	2		DEUR C / DOOR C
	1	<u>2</u>	2 m X 1 m = <u>2m²</u>
<u>1/</u>	2		DEUR D / DOOR D
	1	<u>2</u>	2 m X 1 m = <u>2m²</u>
			HOEVEELHEID STENE WAT WEGVAL BY OPENINGE
			AS DAAR 50 STENE PER VIERKANTE METER IS VIR
			'n HALFSTEENMUUR.
			AMOUNT OF BRICKS THAT FALL AWAY AT OPENINGS
			IF THERE ARE 50 BRICKS PER SQUARE METRE FOR
			A HALF BRICK WALL.

Sheet2

			EKSAMENNOMMER :
			EXAMINATION NUMBER :
2 /	<u>6</u>		VENSTER A / WINDOW A = <u>600</u> STENE / BRICKS.
	<u>50</u>	<u>600</u>	
2 /	<u>2,7</u>		VENSTER B / WINDOW B = <u>270</u> STENE / BRICKS.
	<u>50</u>	<u>270</u>	
2 /	<u>2</u>		DEUR C / DOOR C = <u>200</u> STENE / BRICKS.
	<u>50</u>	<u>200</u>	
1 /	<u>2</u>		DEUR D / DOOR D = <u>100</u> STENE / BRICKS.
	<u>50</u>	<u>100</u>	
			TOTAAL / TOTAL = <u>1340</u> STENE / BRICKS.
			TOTALE HOEVEELHEID STENE VIR GEBOU
			TOTAL AMOUNT OF BRICKS FOR THE BUILDING
			ONDERBOU / SUBSTRUCTURE = <u>1560,6</u>
			BOBOU BUITEMUUR = <u>7862,4</u>
			SUPERSTRUCTURE OUTSIDE WALL
			BOBOU BINNEMUUR = <u>750,6</u>
			SUPERSTRUCTURE INTERIOR WALL
			SUBTOTAAL / SUB TOTAL = <u>10173,6</u>
			MINUS OPENINGE / OPENINGS = <u>-1340</u>
			TOTAAL / TOTAL = <u>8833,6</u>
			TOTAAL + 5 % VIR VERMORSING = <u>9276</u>
			TOTAL + 5 % FOR WASTAGE



ANTWOORDBLAD SG 702-2/1 (2)
ANSWER SHEET SG 702-2/1 (2)



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VRAAG / QUESTION 6

Neem momente om P / *Take moments about P*

LOM = ROM

$$\begin{aligned}
 Q \times 10 \text{ m} &= (6 \text{ kN} \times 2 \text{ m}) + (12 \text{ kN} \times 5 \text{ m}) + (6 \text{ kN} \times 8 \text{ m}) \\
 &= 12 + 60 + 48 \text{ kN.m} \\
 Q &= \frac{120 \text{ kN.m}}{10 \text{ m}} \\
 Q &= 12 \text{ kN}
 \end{aligned}$$

Neem momente om Q / *Take moments about Q*

LOM = ROM

$$\begin{aligned}
 P \times 10 \text{ m} &= (6 \text{ kN} \times 2 \text{ m}) + (12 \text{ kN} \times 5 \text{ m}) + (6 \text{ kN} \times 8 \text{ m}) \\
 &= 12 + 60 + 48 \text{ kN.m} \\
 P &= \frac{120 \text{ kN.m}}{10 \text{ m}} \\
 P &= 12 \text{ kN}
 \end{aligned}$$

Toets / *Test*

Opwaartse kragte = Afwaartse kragte

Forces up = Forces down

$$P + Q = 6 + 12 + 6 \text{ kN}$$

$$24 = 24 \text{ kN}$$

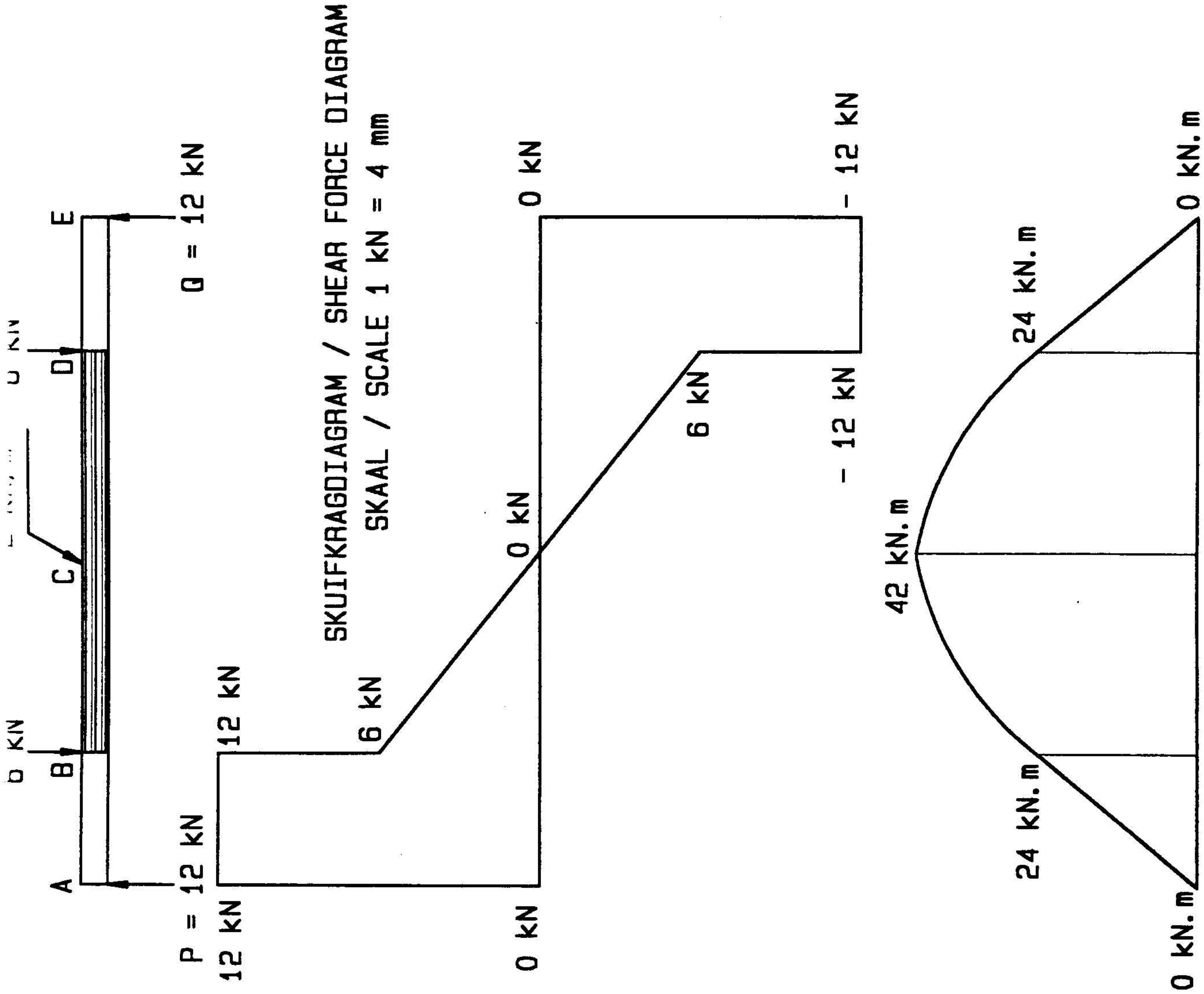
SKUIFKRAGTE BY ; / *SHEAR FORCES AT ;*

A-	=	0 kN	A	=	P
				=	12 kN
B-	=	12 kN	B	=	12 - 6 kN
				=	6 kN
C	=	12 - 6 - 6 kN			
	=	0 kN			
D-	=	12 - 6 - 12 kN	D	=	12 - 6 - 12 - 6 kN
	=	- 6 kN		=	-12 kN
E-	=	12 - 6 - 12 - 6 kN	E	=	12 - 6 - 12 - 6 + 12 kN
	=	-12 kN		=	0 kN

BUIGMOMENTE BY ; / *BENDING MOMENTS AT ;*

A	=	P x 0 m	=	0 kN.m
B	=	(12 x 2 m)	=	24 kN.m
C	=	(12 x 5 m) - (6 x 3 m)		
	=	60 - 18 kN.m	=	42 kN.m
D	=	(12 x 8 m) - (6 x 6 m) - (12 x 3 m)		
	=	96 - 36 - 36 kN.m	=	24 kN.m
E	=	(12 x 10) - (6 x 8 m) - (12 x 5) - (6 x 2)		
	=	120 - 48 - 60 - 12 kN.m	=	0 kN.m

VRAAG / QUESTION 6	
Momente / Moments P & Q = 14 Toets / Test = 3	
Skui fkragte / Shear forces = 16	
Buigmomente / Bending moments = 12	
S.K diagram / S.F diagram = 9	
B.M diagram / B.M diagram = 6	
TOTAAL / TOTAL = 60	

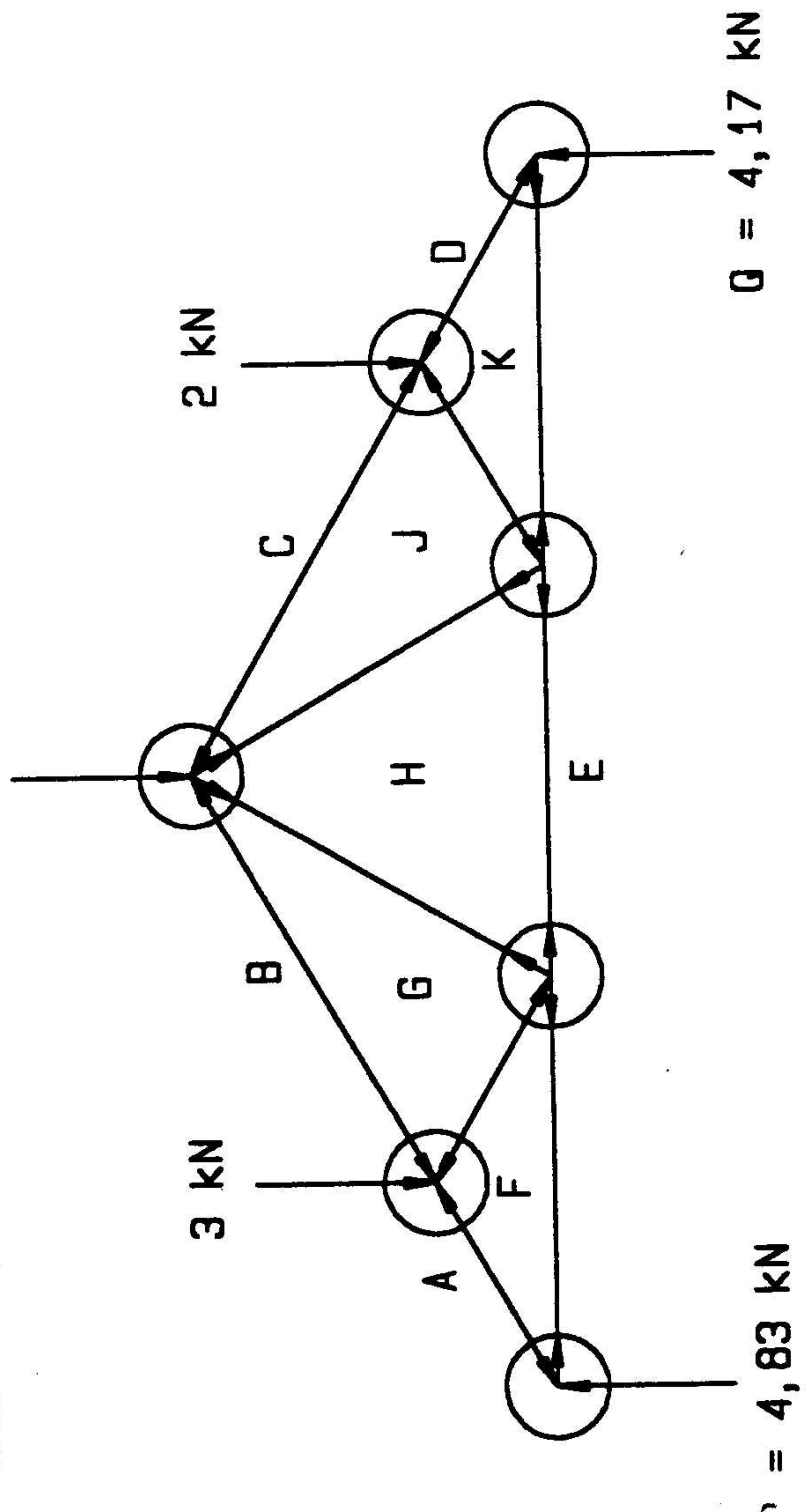


02EIND4.DRW

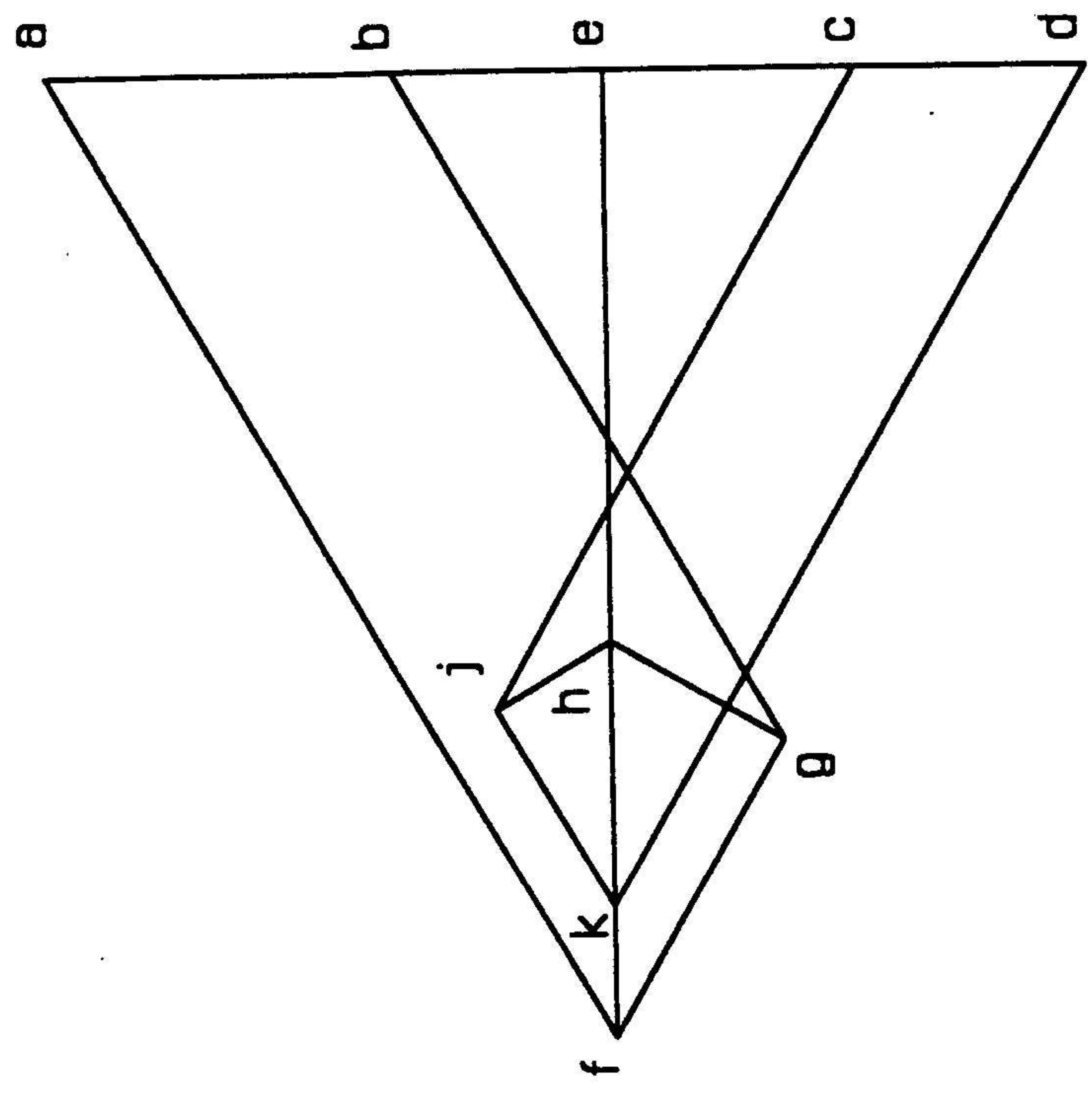
BUIGMOMENTDIAGRAM / BENDING MOMENT DIAGRAM

SKAAL / SCALE 1 kN.m = 1 mm

VRAAG 7 / QUESTION 7



ONDERDEEL MEMBER	AARD FORCE	KRAG NATURE
AF	9,67 kN	STUT / STRUT
EF	8,37 kN	STANG / TIE
FG	3,00 kN	STUT / STRUT
BG	6,67 kN	STUT / STRUT
GH	1,73 kN	STANG / TIE
EH	4,91 kN	STANG / TIE
HJ	1,15 kN	STANG / TIE
CJ	6,33 kN	STUT / STRUT
JK	2,00 kN	STUT / STRUT
DK	8,33 kN	STUT / STRUT
EK	7,22 kN	STANG / TIE



PUNTE INDELING / MARK ALLOCATION	
RUIMTEDIAGRAM / SPACE DIAGRAM	3
KRAGTE / FORCES	22
VEKTORDIAGRAM / VECTOR DIAGRAM	11
SKAAL / SCALE	2
AARD / NATURE	11
PYLPUNTE / ARROWS	11
TOTAAL / TOTAL	60

02EIND15. DRW