**GAUTENG DEPARTMENT OF EDUCATION**
**SENIOR CERTIFICATE EXAMINATION**

**BRICKLAYING AND PLASTERING SG**

## QUESTION 1

1.1 Lime stone and shale mixed together (2)
Mixture fired at high temperature where clinkers are formed (2)
The clinkers are ground to a fine powder (2)
**[6]**

1.2 1.2.1 A window projecting beyond the normal face of the surrounding wall. (4)
1.2.2 A retaining wall that lies back at a slight angle to the vertical. (4)
1.2.3 A manhole required when land is too steep to accept normal fall of sewer. (4)
1.2.4 Accepted in place of manhole for inspection of sewer. (4)
1.2.5 Course of headers, course of stretchers – strongest bond. (4)
**[20]**

1.3
- Ordinary Portland Cement
- Rapid Hardening Cement
- Portland Blastfurnace Cement
- Portland Cement 15 SL
- Sulphate Resistant Cement
- High Alumina Cement
- White Cement

(Five of the above) 1x5=**[5]**

1.4
- Use a hammer and chisel to remove all the lumps of hardening mortar. (2)
- Wet the wall and mix the mortar. (2)
- Starting at the top, lay on a horizontal band of mortar (screed). (1)
- Lay on a second screed along the bottom of the wall. (2)
- Next, apply two vertical screeds at either end of the wall. (2)
- Check that the plaster thickness is approximately 15 mm. (2)
- Next, rule the horizontal screed down to the level of plumb vertical screed. (2)
- Fill in between the screed. (1)
- Rule level. (1)
- Use a block brush and a bucket of water to wet the wall. (2)
- Use a wooden float to float the wall surface smooth. (2)

**[19]**
**[50]**

## QUESTION 2

2.1
- Overall impression (4)
- Roof (3)
- Eaves (3)
- Rainwater goods (4)
- Foundation (3)
- Floor (3)
- Dpc (2)
- Screed (2)
- Dpc regulation (2)
- Linework (2)
- Details & Dimensions (2)
- Neatness (2)
- Scale (2)

**[36]**

2.2
- Overall impression (4)
- Structural method detail (3)
- Method of flashing & detail (3)
- Scale (2)
- Neatness (2)

**[14]**

## QUESTION 3

3.1 Where soil is not suitable for septic tank and where pollution of water supply can take place. (6)

3.2
- Work from previously obtained invert levels positioned by use of DUMPY LEVEL. (4)
- Set up sight rail strandline where the trench is to be excavated. (4)
- These rails are at the upper and lower ends of the proposed trench. The rails are levelled at a predetermined height above invert levels. (4)
- Excavate trench to required working width and approximate depth. (4)
- Use boning rods between sight rails, sighting over and between the rails with boning rods being used to obtain the correct depth. (4)
- Work up and down trench with rods until the bottom of the trench is even and to the required falls. (4)

3.3
- Isometric view of trench (5)
- Correctness (20)
- Detail (2)
- Neatness (2)

3.4 1. Clay earthenware pipes (1)
2. Cast iron pipes (1)
3. Pitch fibre pipes (1)
4. Asbestos pipes (1)
5. PVC pipes (1)
**[5]**

## QUESTION 4

4.1 (a) The bearing capacity of the sub-soil, immediately beneath the structure, is insufficient to carry the imposed loading with reinforced pad or strip foundations. (4)
(b) Unacceptable settlement would occur with other foundation types. (4)
(c) It is the most economical solution when compared with other methods to overcome foundation problems e.g. raft foundation. (4)
(d) Problems with ground water would occur if other foundation methods were used. (4)
(e) Short piled foundations are used as an alternative to deep strip foundations when the subsoil is shrinkable clay. (4)
**[20]**

4.2 Precast piles are cast and cured before driving whilst "in-situ" piles are cast in an opening already formed opening. **[6]**

4.3 Vertical section through a compressed pile.
- Overall impression (3)
- Detail (14)
- Neatness (3)

**[20]**

4.4 4.4.1 Transporting them over a great distance may be costly or, if formed on the site, the space required for casting and curing may be ill-afforded. (4)

4.4.2 If proved to be too long or too short after being driven, the cutting down or splicing (far lengthening) causes additional expense and delay. (4)

4.4.3 Because of the height of the pile-driving frame (15 m is common height) the piles cannot be used when the height available is restricted. (4)

4.4.4 Because of the vibration produced when driving, they cannot be used on sites closely adjacent to existing buildings as the noise created during this operation may be very annoying to those living or working in the vicinity. (4)
**[16]**

## QUESTION 5

5.1
- Bricks must have minimum compressive strength of 7 mPa. (2)
- Bricks should have a low water absorption. (2)
- They must be uniform in shape and size. (2)
- They must be well burnt. (2)
- Must have a nil or low efflorescence. (2)

**[10]**

5.2
- Bricks with holes in them stick better to the mortar, as the mortar is forced up into the holes when the brick is laid. (3)
- The holes make the brick lighter-more bricks can go on a load. (3)
- The holes allow the brick to dry faster. (3)
- The holes allow the heat in the kiln to pass through the brick resulting in a better burnt brick. (3)

**[12]**

5.3 Sand is added to the mortar mix to increase the volume, and to reduce the possibility of cracking. (4)

5.4
- Hard hat (3)
- Overalls (3)
- Safety boots (3)

**[9]**

5.5 Concrete is a mixture of cement, stone, sand and water. (3)

5.6
- Retains form in place. (3)
- Ponding of water. (3)
- Sprinkling or spraying of water. (3)
- Covering with waterproof material. (3)
- Liquid curing compound. (3)

**[12]**

## QUESTION 6

Area of walls

= (2L x 2B) x H (2)
= [2 x 6 + 2(3 – 0.440) 3 ] (3)
= [12 + 2 x 2.56 ] 3 (3)
= 17.12 x 3 (1)
= 51,36 $m^2$ (1)

Area of door

= L x B (1)
= 2.5 x 2 (1)
= 5 $m^2$ (1)

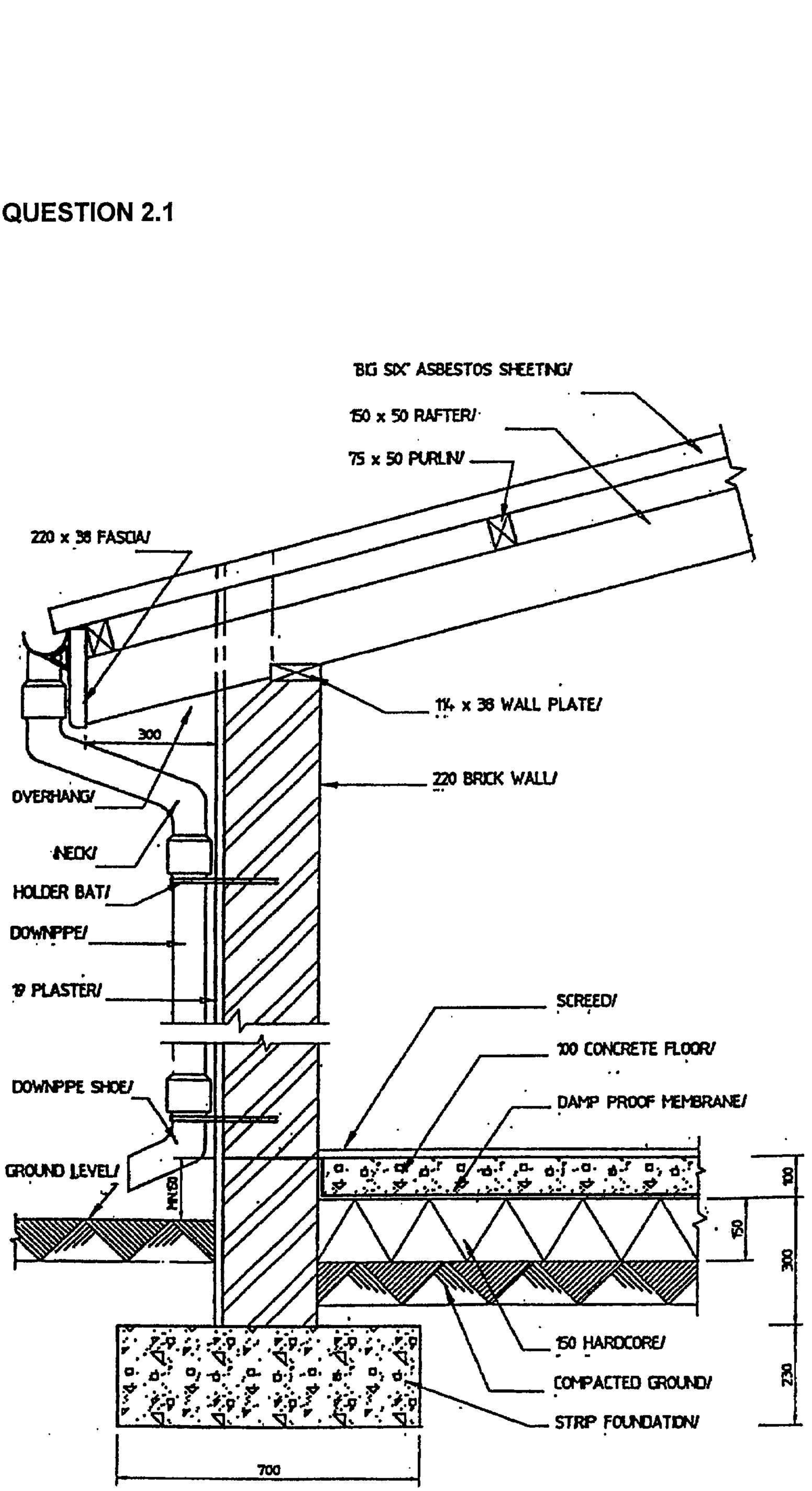
Area of window

= L x B (1)
= 1.5 x 1 (1)
1.5 $m^2$ (1)

| | | | |
|---|---|---|---|
| Area of brickwork | = | Area of walls - Area of openings | (3) |
| | = | 51.36 – 6.5 | (2) |
| | = | 44.86 $m^2$ | (1) |
| Number of bricks | = | 44.86 $m^2$ x 110/$m^2$ | (2) |
| | = | 4934.6 | (1) |
| | = | 4935 bricks | (2) |
| | | | **[27]** |

**TOTAL: 300**

## ANSWER QUESTION 2.1



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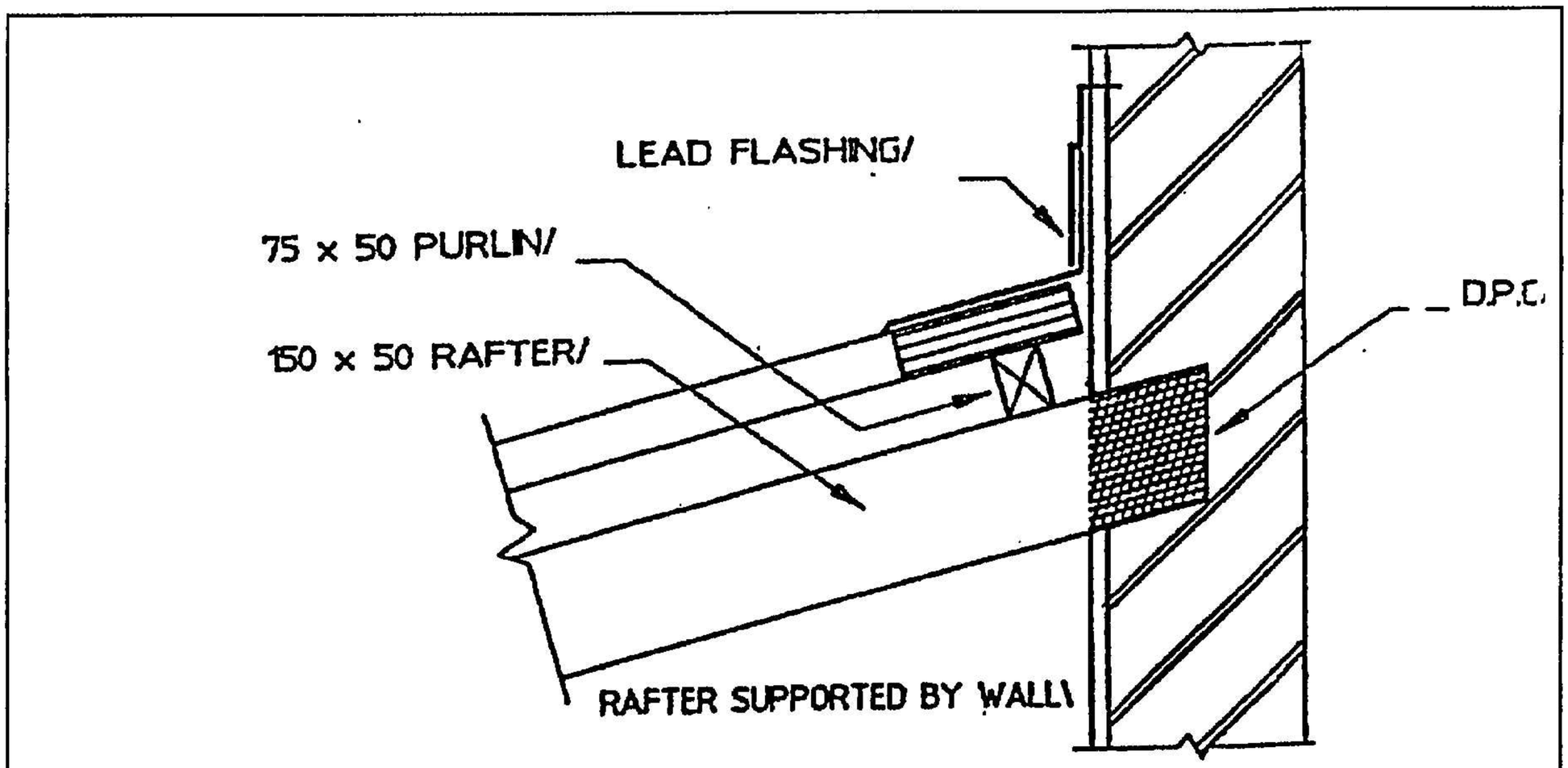
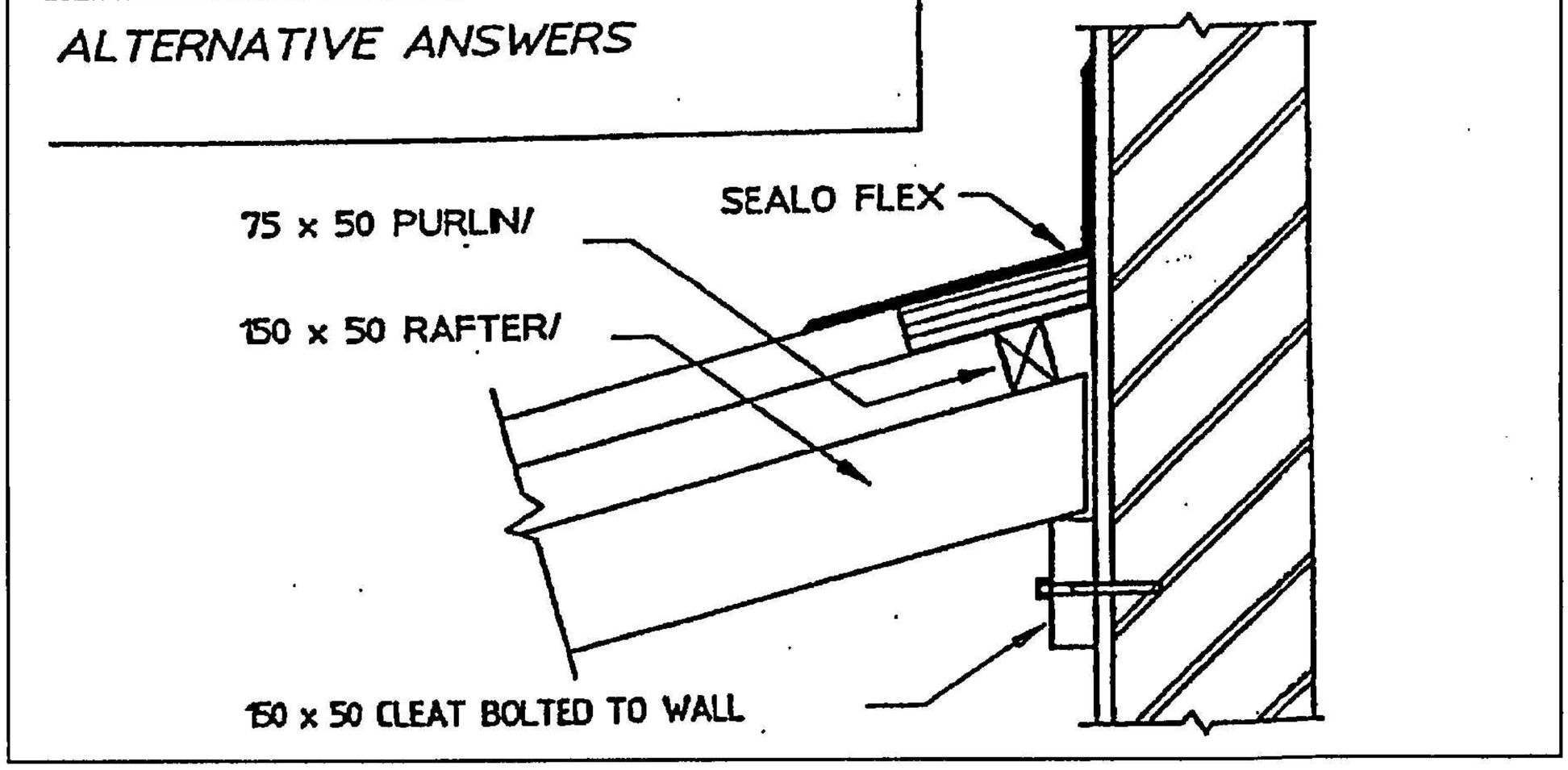
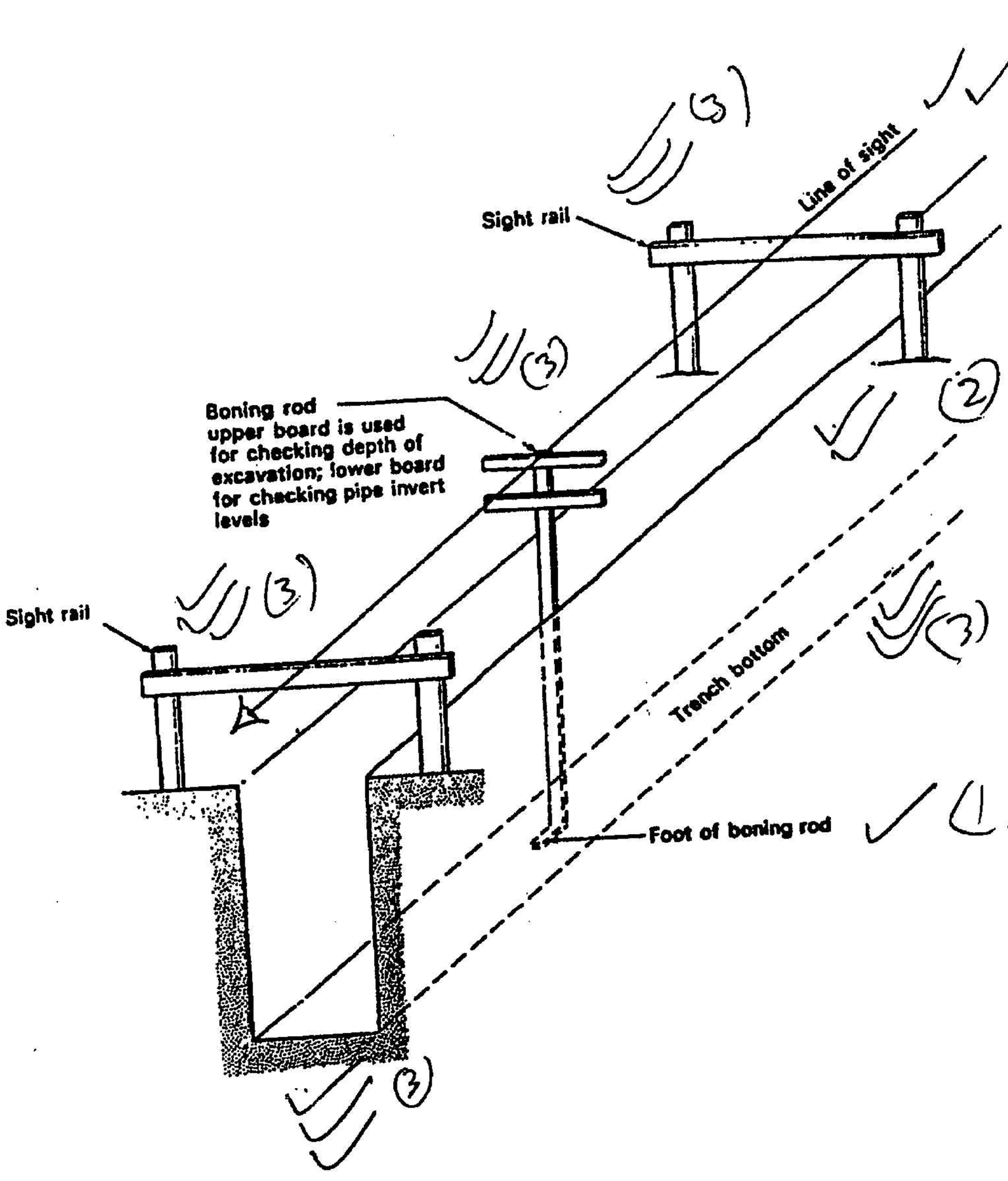


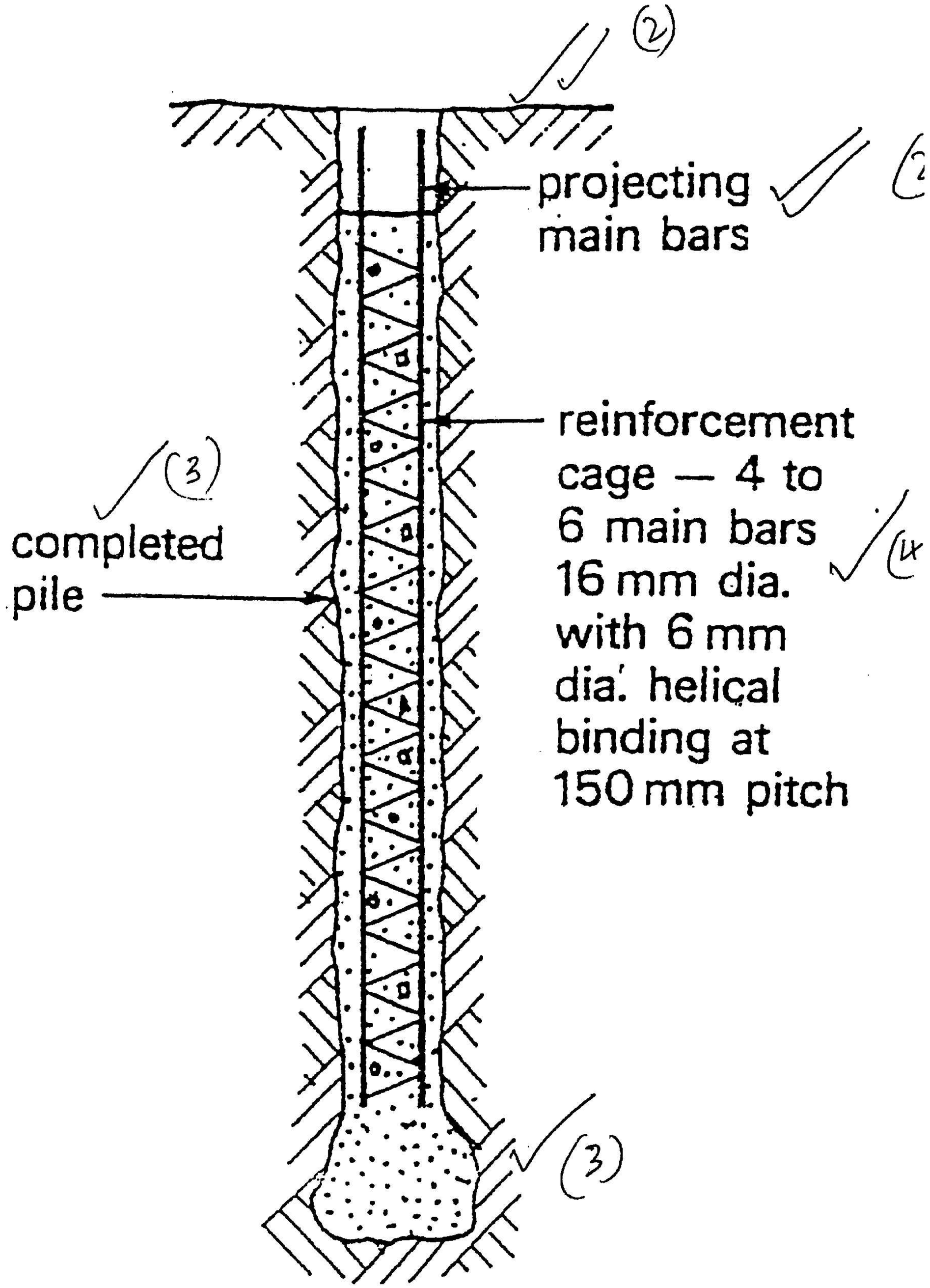

*ALTERNATIVE ANSWERS*



**ANSWER QUESTION 2.3**



**ANTWOORD VRAAG 3.3**




**END**

**GAUTENGSE DEPARTEMENT VAN ONDERWYS**
**SENIORSERTIFIKAAT-EKSAMEN**

**STEENMESSEL EN PLEISTERWERK SG**

## VRAAG 1

1.1 Kalksteen en skalie word saam gemeng. (2)
Mengsel word teen 'n hoë temperatuur gebrand tot klinkers. (2)
Die klinkers word nou tot 'n fyn poeier gemaal. (2)
**[6]**

1.2 1.2.1 'n Venster wat uitstaan verby die normale muurvlak. (4)
1.2.2 'n Keermuur wat vertikaal effens na agter terughel. (4)
1.2.3 'n Mangat wat benodig word wanneer die grond te steil is om 'n normale val vir die riool te verkry. (4)
1.2.4 Word aanvaar in die plek van 'n mangat vir die inspeksie van 'n riool. (4)
1.2.5 'n Laag kopstene opgevolg deur 'n laag strykstene – Die sterkste verband. (4)
**[20]**

1.3
- Gewone Portland sement
- Snelhard sement
- Portland hoogoondsement
- Portland sement 15 SL
- Sulfaatbestande sement
- Hoog alluinaardryke sement (alumina)
- Wit sement

(Vyf van bogenoemde) 1x5=**[5]**

1.4
- Gebruik 'n hamer en 'n beitel om die oortollige harde mortel te verwyder. (2)
- Maak die muur nat en meng die mortel. (2)
- Beginende van bo, lê 'n horisontale gidslaag. (1)
- Lê nog 'n gidslaag aan die onderkant van die muur. (2)
- Lê twee vertikale gidslae aan beide kante van die muur. (2)
- Kyk dat die pleisterdikte ongeveer 15 mm is. (2)
- Rei die horisontale gidslaag af na die waterpasvlak van die vertikale gidslaag. (2)
- Pleister tussen die gidslae. (1)
- Rei af tot waterpasvlak. (1)
- Gebruik 'n koolborsel en 'n emmer water om die muur te benat. (2)
- Gebruik 'n houtstrykplank om die muuroppervlakte glad af te stryk. (2)

**[19]**
**[50]**

## VRAAG 2

| | | | |
|---|---|---|---|
| 2.1 | • | Totale indruk | (4) |
| | • | Dak | (3) |
| | • | Dakrand | (3) |
| | • | Reënwater toebehore | (4) |
| | • | Fondament | (3) |
| | • | Vloer | (3) |
| | • | Voglaag | (2) |
| | • | Gidsplak | (2) |
| | • | Voglaag regulasie | (2) |
| | • | Lynwerk | (2) |
| | • | Detail afmetings | (2) |
| | • | Netheid | (2) |
| | • | Skaal | (2) |
| | | | **[36]** |

| | | | |
|---|---|---|---|
| 2.2 | • | Totale indruk | (4) |
| | • | Strukturele metode detail | (3) |
| | • | Metode van voegskortdetail | (3) |
| | • | Skaal | (2) |
| | • | Netheid | (2) |
| | | | **[14]** |

## VRAAG 3

3.1 Wanneer die grond nie geskik is vir 'n septiese tenk nie en waar waterbesoedeling plaas kan vind. (6)

| | | | |
|---|---|---|---|
| 3.2 | • | Werk vanaf voorafverkryde bodemhoogtes deur die gebruik van 'n bukswaterpas. | (4) |
| | • | Stel die korrelhout stringdraad waar die sloot gegrawe moet word. | (4) |
| | • | Houte is aan die bo- en onderkante van die voorgestelde sloot aangebring. Die korrelhoute is op 'n voorafbepaalde hoogte bokant die bodemhoogte aangebring. | (4) |
| | • | Grawe die sloot tot die verlangde werkswydte en benaderde diepte. | (4) |
| | • | Gebruik korrelstokke tussen die korrelhoute, korrel oor en tussen die stokke om die korrekte diepte te verkry. | (4) |
| | • | Werk heen en weer in die sloot met die stokke tot die bodem van die sloot gelyk is en dit die verlangde val het. | (4) |

| | | | |
|---|---|---|---|
| 3.3 | • | Isometriese aansig van sloot | (5) |
| | • | Korrektheid | (20) |
| | • | Detail | (2) |
| | • | Netheid | **[27]** |

3.4 1. Klei of erdewarepype (1)
2. Gietysterpype (1)
3. Pikveselpype (1)
4. Asbespype (1)
5. PVC pype (Polivinielchloried) (1)
**[5]**

## VRAAG 4

4.1 (a) Die dravermoë van die ondergrond direk onder die struktuur is onvoldoende om die opgelegde lading met opvulling of 'n strookfondament te dra. (4)

(b) Onaanvaarbare versakking sal plaasvind met ander tipe fondamente. (4)

(c) Dit is die mees ekonomiese oplossing in vergelyking met ander metodes om probleme met fondamente, onder andere vlotfondamente, te oorbrug. (4)

(d) Probleme met water uit die grond sal ontstaan as ander fondamentmetodes gebruik word. (4)

(e) Kort heipaalfondamente word as alternatief vir diep strookfondamente gebruik wanneer die ondergrond krimpbare klei is. (4)
**[20]**

4.2 Voorafgegiete heipale word klaar gegiet, nabehandel en verhard voor indrywing terwyl in-situ heipale op die terrein in 'n vooraf gevormde opening gegiet word. **[6]**

4.3 'n Vertikale snit deur 'n drukheipaal.
- Totale indrukke (3)
- Detail (14)
- Netheid (3)

**[20]**

4.4 4.4.1 Vervoer oor groot afstande kan baie duur wees of, indien dit op die perseel vervaardig word, word groot spasie vereis vir die giet daarvan en nabehandeling kan onbekostigbaar wees. (4)

4.4.2 Indien té kort of té lank na indrywing,kan die verkorting of splitaswerk die oorsaak wees van bykomende koste en vertraging. (4)

4.4.3 Omdat die hoogte van die heipaalindrywingsraam (15 m is normale hoogte) kan die pale nie gebruik word waar die hoogte beperk is nie. (4)

4.4.4 As gevolg van die vibrasie wat deur indrywing veroorsaak word, kan die heipale nie gebruik word op persele wat aan nabygeleë geboue grens nie. Die geraas gedurende die operasie mag 'n ergernis wees vir die wat in die omgewing woon of werksaam is. (4)
**[16]**

## VRAAG 5

5.1
- Stene moet die minimum druksterkte van 7 mPa hê. (2)
- Stene moet 'n lae absorpsievermoë hê. (2)
- Hulle moet egalig van vorm en grootte wees. (2)
- Hulle moet gebrand wees. (2)
- Moet geen of 'n lae skimmelvlak bevat. (2)

**[10]**

5.2
- Stene met perforasies klou beter aan die mortel, omdat die mortel in die perforasies ingeforseer word as die steen gelê word. (3)
- Die stene is baie ligter as gevolg van die perforasies en meer kan op 'n vrag gelaai word. (3)
- Stene met perforasies word vinniger droog. (3)
- Die perforasies laat die hitte in die oond daardeur trek en sodoende word 'n beter gebrande steen verkry. (3)

**[12]**

5.3 Sand word by 'n betonmengsel gevoeg om die volume te vergroot en verklein die moontlikheid van krake. (4)

5.4
- 'n Harde hoed (3)
- 'n Oorpak (3)
- Veiligheidsskoene (3)

**[9]**

5.5 Beton is 'n mengsel van sement, klip, sand en water. (3)

5.6
- Behou die bedekking in sy plek. (3)
- Opdamming van water. (3)
- Sprinkel of sproei van water. (3)
- Bedekking met waterdigte materiaal. (3)
- 'n Vloeistof nabehandelingsmiddel. (3)

**[12]**

## VRAAG 6

Oppervlakte van mure:

= (2L x 2B) x H (2)
= [2 x 6 + 2(3 – 0.440) 3 ] (3)
= [12 + 2 x 2.56 ] 3 (3)
= 17.12 x 3 (1)
= 51,36 $m^2$ (1)

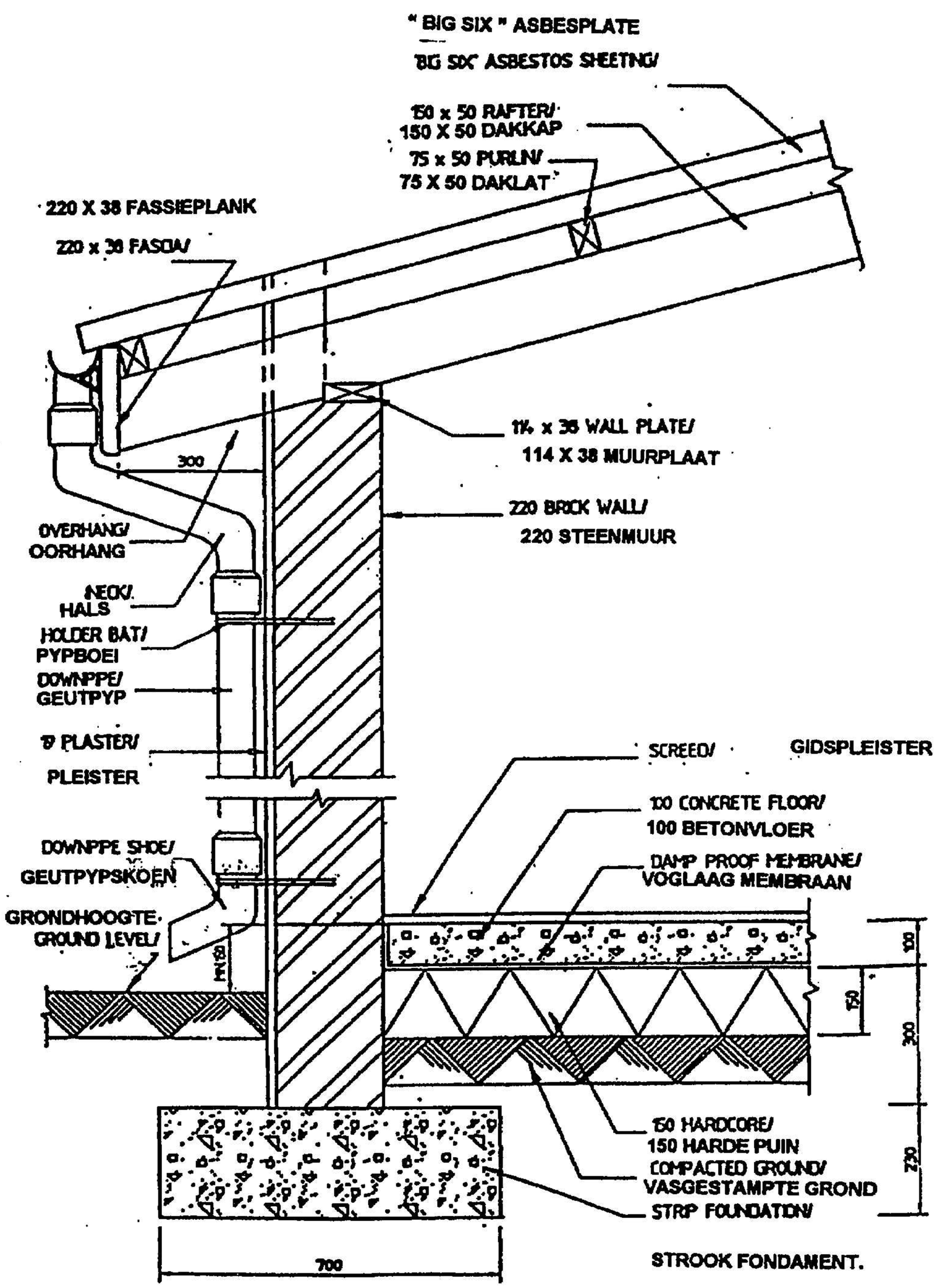
Oppervlakte van deur:

= L x B (1)
= 2.5 x 2 (1)
= 5 $m^2$ (1)

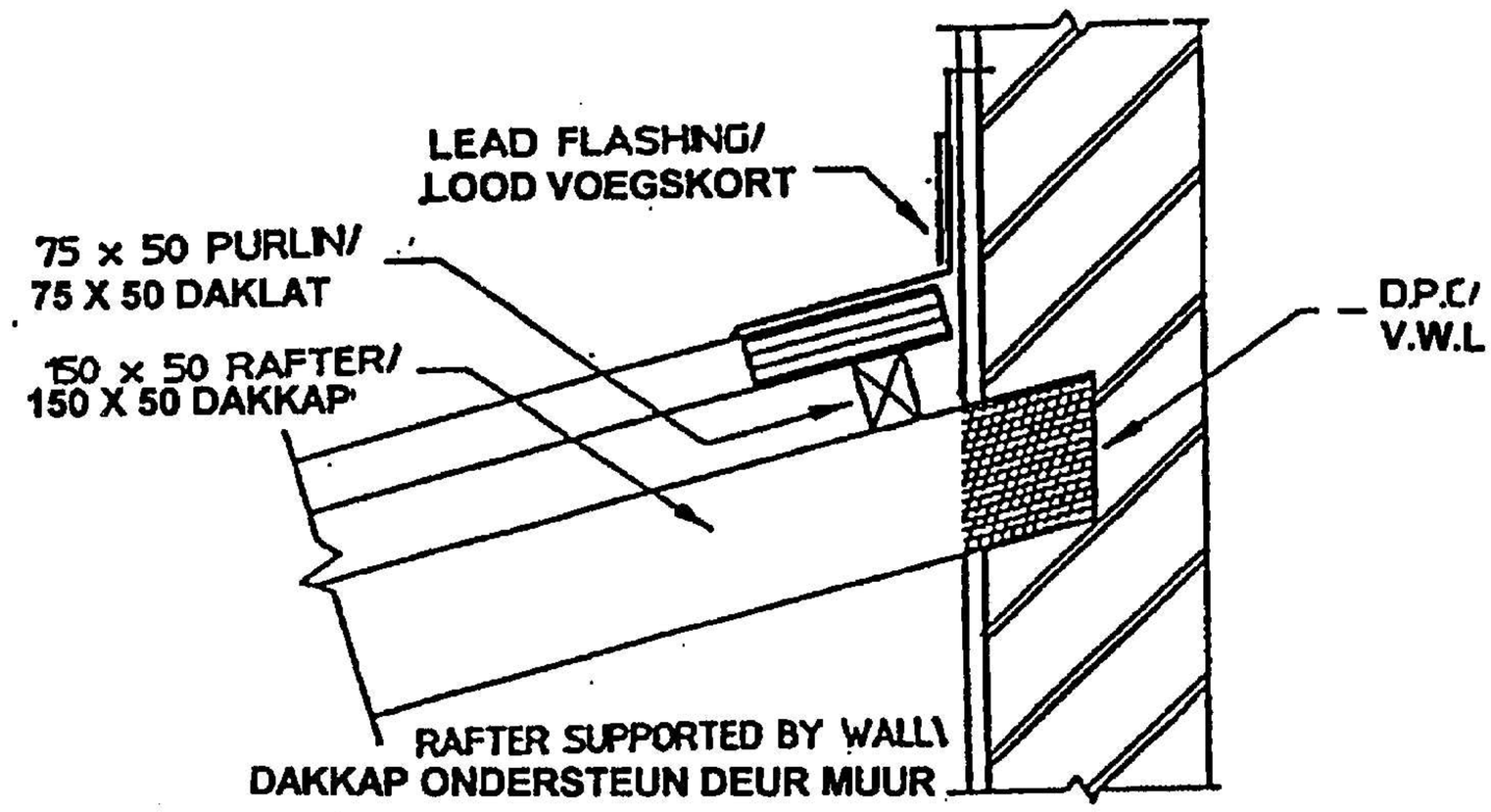
| | | | | |
|---|---|---|---|---|
| Oppervlakte van venster: | | = | L x B | (1) |
| | | = | 1.5 x 1 | (1) |
| | | | 1.5 $m^2$ | (1) |
| Oppervlakte van mure: | = | Oppv. van mure – opperv. van opening | | (3) |
| | = | 51.36 – 6.5 | | (2) |
| | = | 44.86 $m^2$ | | (1) |
| Aantal stene | = | 44.86 $m^2$ x 110/$m^2$ | | (2) |
| | = | 4934.6 | | (1) |
| | = | 4935 stene | | (2) |
| | | | | **[27]** |

**TOTAAL: 300**

## ANTWOORD VRAAG 2.1

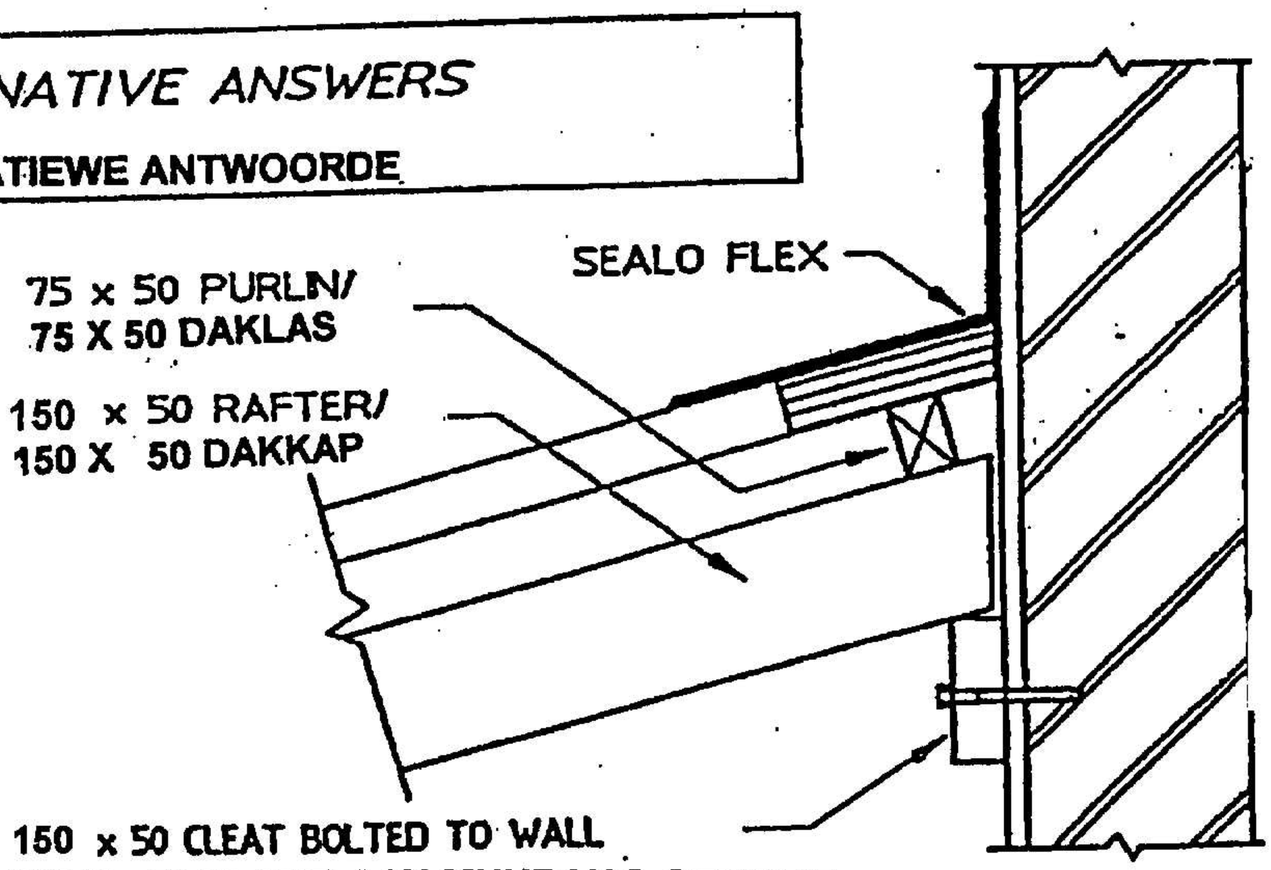


## ANTWOORD VRAAG 2.2

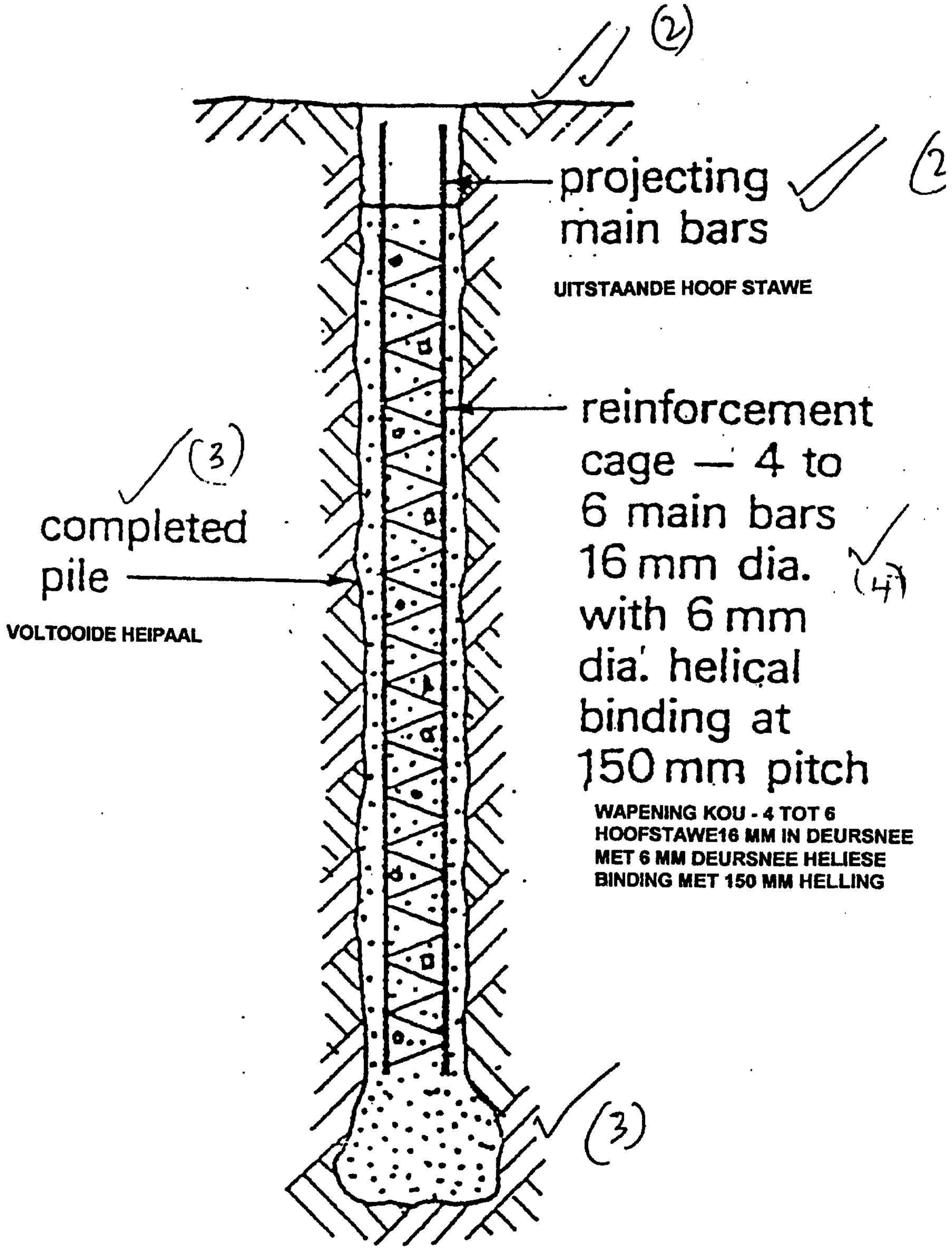



*ALTERNATIVE ANSWERS*

**ALTERNATIEWE ANTWOORDE**



**ANTWOORD VRAAG 3.3**




**EINDE**