MANUEL TECHNIQUE POUR

L'AMELIORATION DES ARCHITECTURES RURALES EN STRUCTURE PORTEUSE EN BOIS

DANS LE DEPARTEMENT DU SUD EST D'HAÏTI

ONU HABITAT
POUR UN MEILLEUR AVENIR URBAIN

aecid

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Materyo lokal yo

6.1 – Bwa

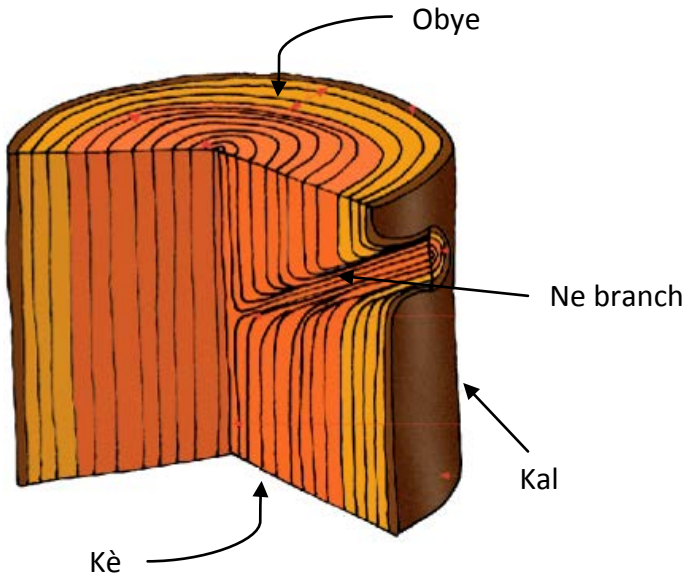
6.2 – Sab ak gravye

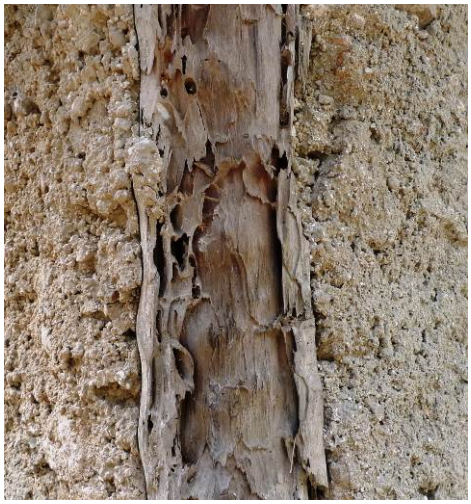
6.3 – Wòch

6.4 – Kol mòtye ak latè

6.1 – Bwa

Propriyete yo





Obye a se parti ki mwen rezistan ak mwen dirab pase kè a. Poudbwa pike li pi fasil. Nou dwe retire pati sa a pou fè poto yo.

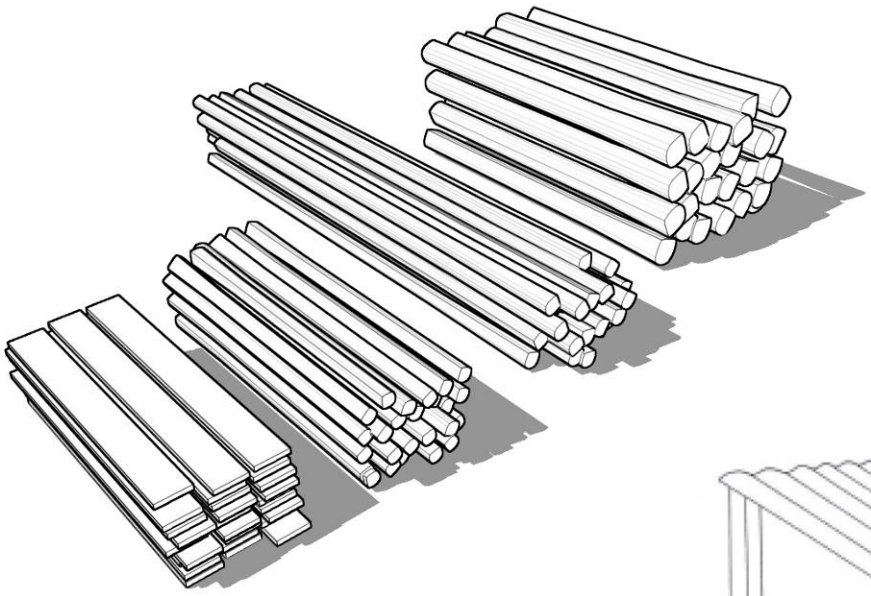
Chechaj

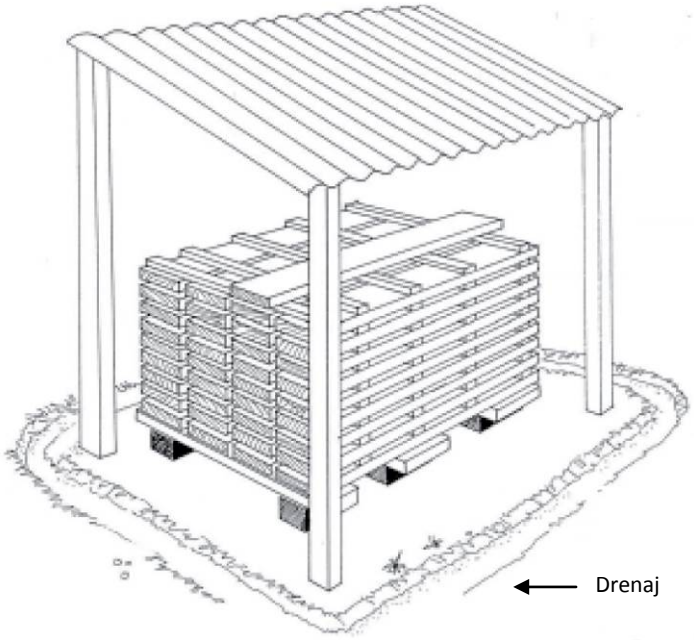
Li empòtan pou bwa cheche byen avan nou itilise'l pou pèmèt li jwenn dimansyon final li.

Preparasyon pyès bwa yo ak ti

Jesyon stok bwa

- Klasifikasyon pa gwosè, fòm ak kalite bwa
- Estoke lwen imidite (lapli, dlo nan tè) e byen vantile ant chak pyès bwa





6.2 – Sab ak gravye

SAB AK GRAVYE SE SKELET MÒTYE AK BETON YO

Gravye : gren ki 5 à 20 mm

Sab : gren ki 0 à 5 mm

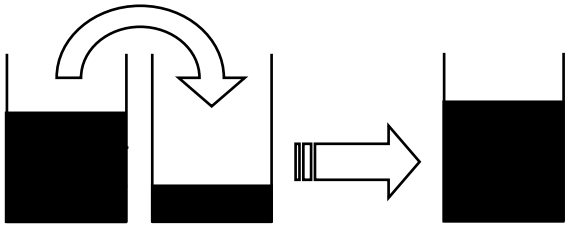
KALITE SAB AK GRAVYE

Ki roulé…

Ki moulen ou kraze

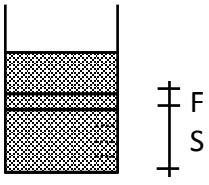
Tif

KANTITE « FINN » OU BYEN ÀJIL NAN SAB



3 pati dlo 1 pati sab sek

Mete dlo nan sab epi souke



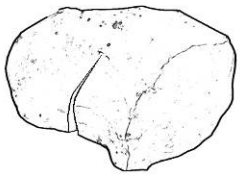
Apre sab desann

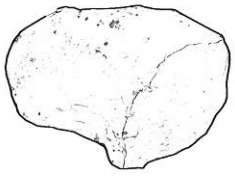
Pwòpte sab

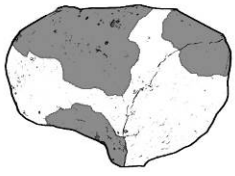
F > 3 S	Ÿ	Sab ki gen anpil « grès »
F < 8 S	Ÿ	Sab ki “mèg” ou byen ki “pwop”

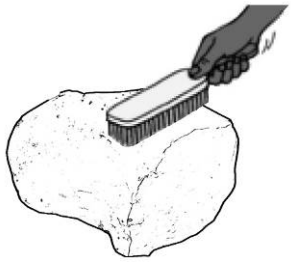
6.3 – Wòch

Byen chwazi wòch yo – Resiklaj



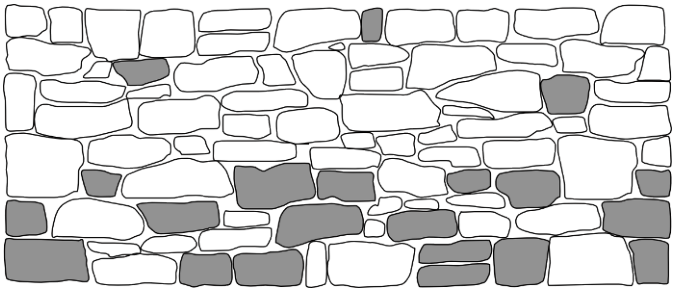


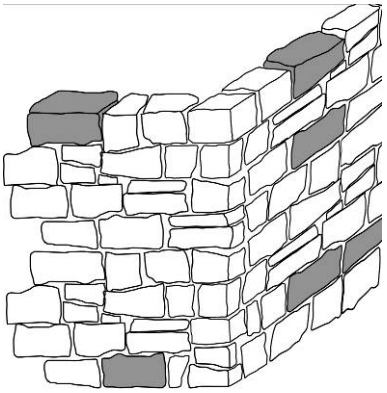




- x Refize wòch ki fragil ou ki gen fant
- x Netoye wòch yo pou yo ka kole pi byen avec mòtye lè nou itilize yo

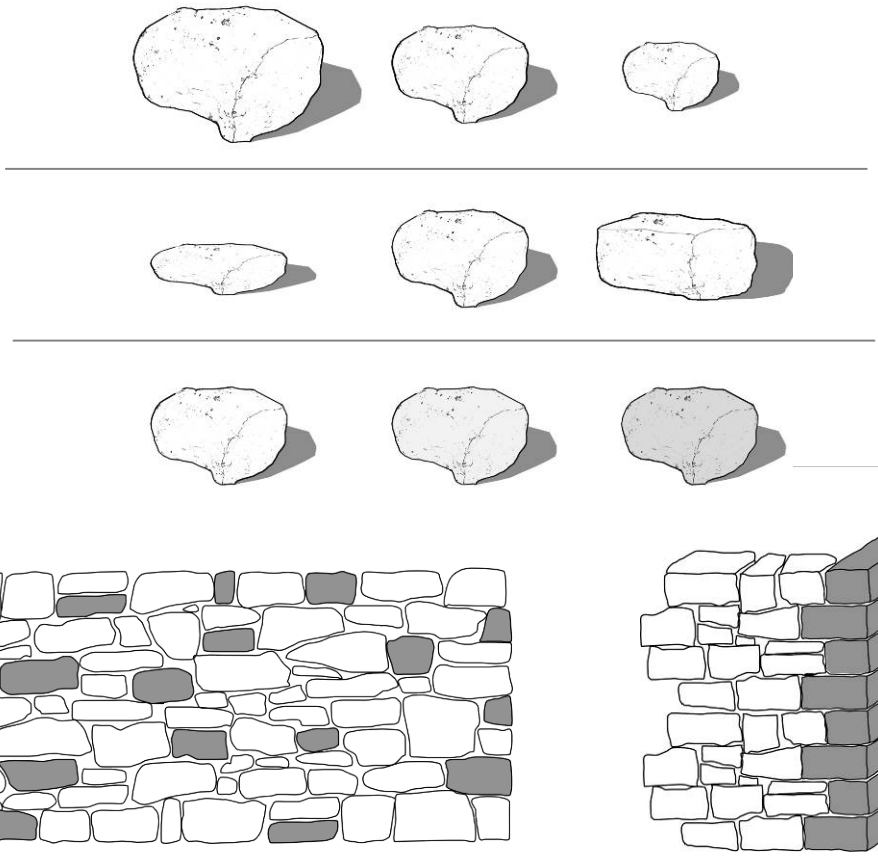
Jesyon stok wòch yo





- x Stokaj o azà
- x Wòch yo ki monte owazà nan mi a malgre kalite yo ak pàti ki pi frajil nan mi a (kwen yo, baz la)

Jesyon stok wòch yo



- Stokaj pa gwosè, fòm ak kalite wòch yo
- Distribisyon wòch nan diferan pozisyon nan mi an selon karakteristik yo (wòch pi byen yo nan kwen yo)

6.4 – Kol mòtye ak latè

Sa ki anndan tè a

Orijin: Latè, tankou yon materyo, sòti nan ewozyon wòch orijinal la. Wòch sa a dezentegre pou bay patikil mineral divès kalite gwosè, ti wòch ou menm àjil.

Epesè tè ki pi anlè li rezève pou agrikilti. Lòt pàti ki pi ba yo yo itilize pou konstriksyon.

Nan epesè tè vegetal la, pàtikil mineral yo yo melanje avek matyè òganik la ki sòti nan dekonpozisyon matyè kap viv.

Oganik

Aktif

Matyè òganik

Inaktif

Ti wòch

Gravye

Sab

Limon

Ajil

Skelèt

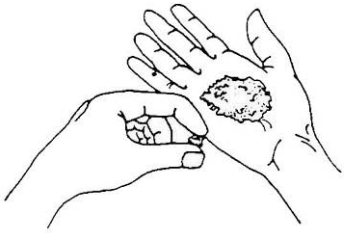
Kòl - Lyan

Latè : tès idantifikasyon yo

JE – TOUCHE – SANTI

Objektif : Idantifye gwosè ak kantite gren yo nan latè a. Sa vle di granularite sol la.

San dlo



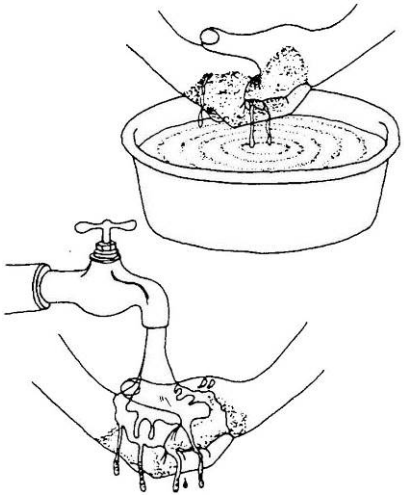
Avek dlo

Rezilta yo
Presans **matyè òganik** - lage yon sant (mwazi) Tè **sablèz** – Tè ki graj, frajil, li kole yon ti kras Tè **limonèz** – tè finn, fasil pou kraze nan yon poud, li kole Tè **àjilèz** - difisil pou kraze, li pa fonn nan dlo fasil, li kole e li finn anpil

LAVE MEN YO

Mete tè a likid sou tout men yo epi lave men yo DOUSMAN avek dlo.

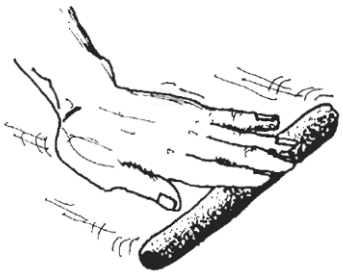
Tè àjilèz se tankou « savon » e li difisil pou rense li. Tè limonèz li tankou farin. Tè sablèz li koule rapid ant dwèt yo e li fasil pou rense li.



Latè : tès idantifikasyon yo

TES SIGA

Objektif : Pou detèmine si tè a kole byen. Tcheke si kantite làjil nan tè a bon.

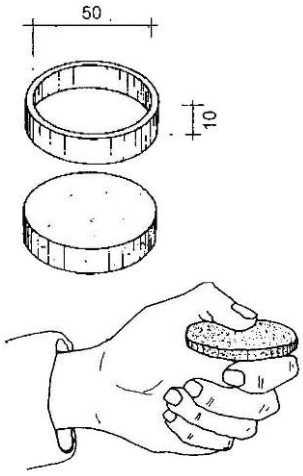


- { Retire patikil yo ki pi gwo pase 5 mm (gravye)
- { Mete dlo e brase tè a. Melanj sa a pa dwe jwenn men sal.
- { Kite tè a 30 mn pou àjil ka reyaji.
- { Sou yon planch, fòme yon sigà 3 cm nan dyamèt ak 30 cm nan longè.
- { Dousman pouse sigà a nan vid.
- { Mezire longè a nan mòso ki tonbe.
- { Repete tès sa a 3 fwa…

Rezilta yo
Mwens pase 5 cm **: Tè ki sablèz anpil**
Plis pase 20 cm **: Tè ki àjilèz anpil**

TES « PASTIY »

Objektif : Teste rezistans a sek. Mezire kantite kontraksyon àjil yo.



- { Kolekte melanj ki sòti nan tès sigà a.
- { Fòme 2 tablèt (« pastiy ») avek yon mòso tib PVC
- { Lè tablèt yo vin chech :
  - 9 Gade si gen kontraksyon (tablèt la vin pi piti)
  - 9 Evalye rezistans tablet yo : eseye kraze li ant dwet pa ou yo

.

Rezilta yo
Pa gen kontraksyon, li fasil pou kraze li nan yon poud
Tè sablèz

Gen kontraksyon, li fasil pou kraze li nan yon poud
Tè limonèz

Anpil kontraksyon, li difisil pou kraze li nan yon poud
Tè àjilèz

Sistèm konstriksyon

7.1 – Sistèm konstriksyon – Deskripsyon jeneral

7.2 – Trase kay la

7.3 – Mòtye ak beton yo

7.4 – Masonri ak wòch

7.5 – Fondasyon

7.6 – Solay kay

7.7 – Chàpant an bwa pou mi yo

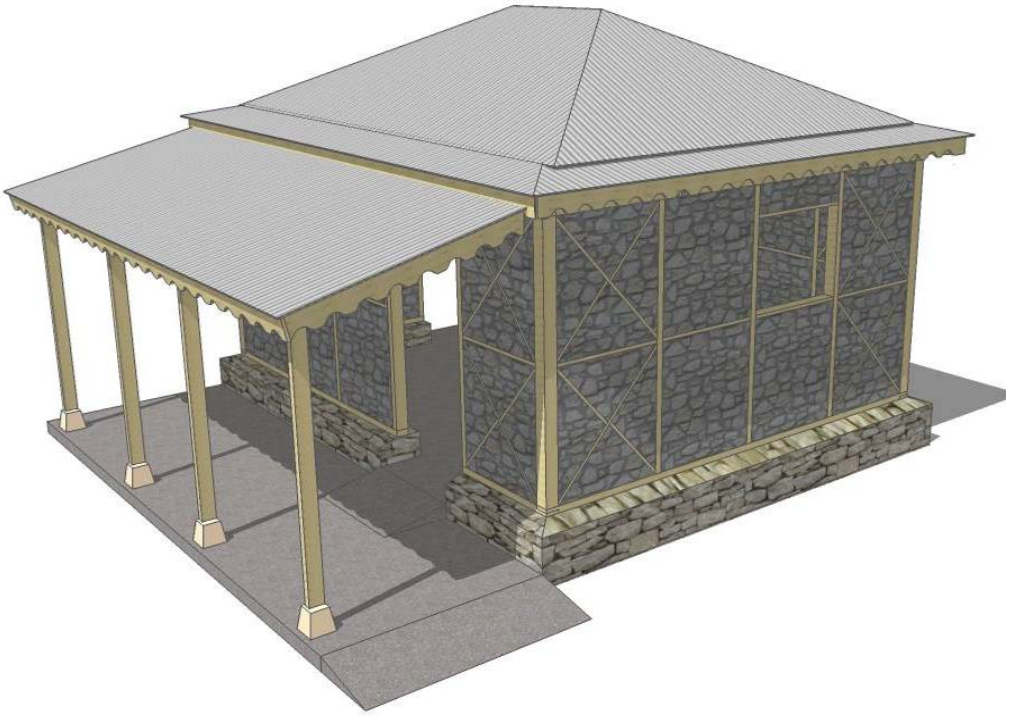
7.8 – Ranplisaj / Abiyaj mi yo

7.9 – Tèt kay la

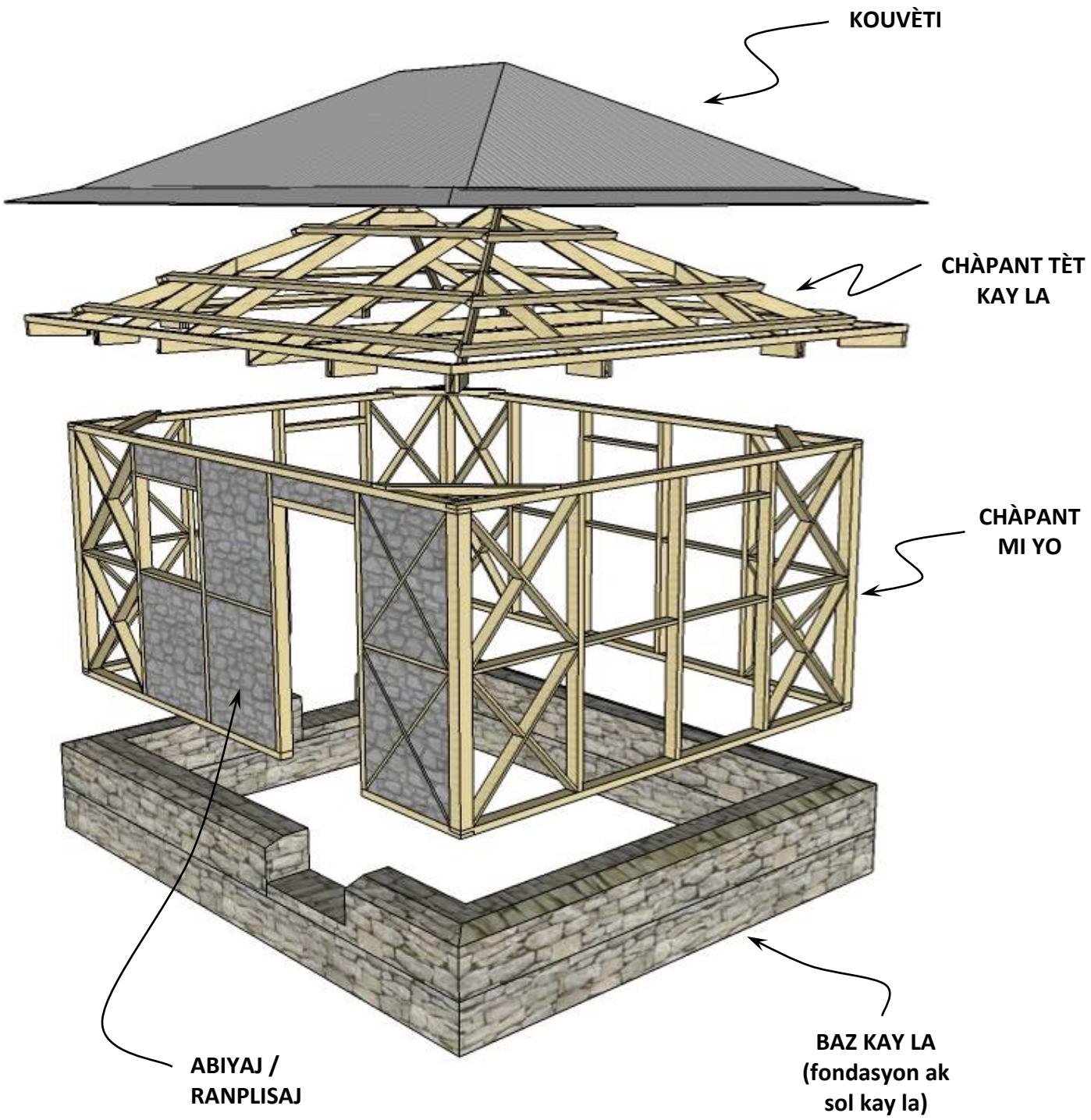
7.10 – Tretman sifàs

7.11 – Tretman alantou kay la

7.1 – Sistèm konstriksyon – Deskripsyon jeneral



Diferan pàti nan kay la



7.2 – Trase kay la

Tcheke dyagonal yo

Mete tout kwosbàyo menm nivo avek yon tiyo dlo transparan

Preparasyon teren an : Netwaye ak trase nivo yo

Anvan w kòmanse konstriksyon an, teren an yo dwe pwòp ak menm nivo, pou plase kay la byen ak pou stoke materyo yo.

Retire tè arab la
anlè a

Retire wòch yo

Retire pyebwa ki jenen ak
rasin yo…

Anplasman kay la

…pa bliye replante
lòt pyebwa

Premye piket ki endike nivo
orizontal la

Nivo dlo a

Tiyo transparan

Sèvi ak yon tiyo transparan an, li trè fasil pou pote nivo orizontal la sou tout lot pwen nan teren an.

Trase a tè

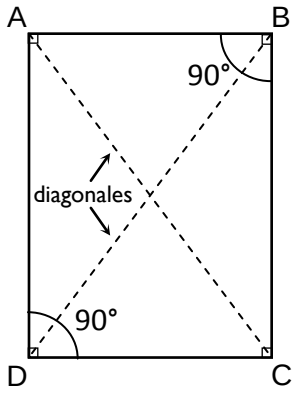
Règ 3-4-5 – Mete kay la ekè

5 mèt

4 mèt

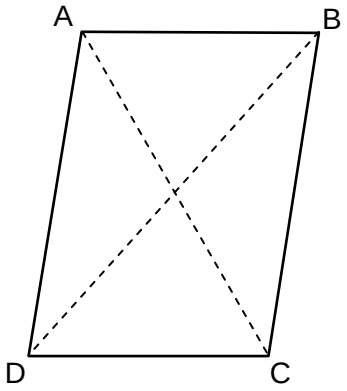
3 mèt

Tcheke diagonal yo



Bon

Pa bon



Ki jan poul yé

Poz kwosbà yo

7.3 – Mòtye ak beton yo

Bon jan teknik pou brase beton ak mòtye

Fè yon pil ak gravye, sab ak siman (oubyen lacho). Pa ajoute dlo.

Brase epi deplase pil la pèl pa pèl, **2 fwa**.

Lè tout gravye, sab ak siman byen melanje, nou ka ajoute dlo.

Epi, rebrase tout pil la ankò ansanm, **2 fwa**.

M7 – 7.3	Mòtye ak beton yo	Fiche info 1

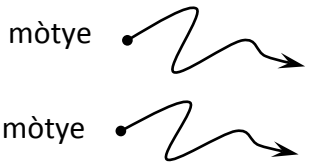
Tès mòtye tè

Objektif : Pou detèmine melanj la ki pi bon avek latè, sab ak / oswa fib (egzanp : pit**).**

- x Prepare mòtye ki gen melanj diferan : pwopòsyon diferan nan sab epi avek fib ou pa. Mete mòtye sou 1 oswa 2 brik, oswa 2 wòch ki plat.
- x Tann pou mòtye byen cheche.

Egzanp melanj :

- Latè a sèlman.
- 4 Tè / 1 Sab
- 4 Tè / 1 Sab + fib
- 2 Tè / 1 Sab
- 2 Tè / 1 Sab + fib
- 1 Tè / 1 Sab
- Etc.



Mouye sipò anvan tap mete mòtye

Rezilta yo :
Chwazi mòtye ki di e ki gen ti kras fant. Se mòtye sa a kap kole pi byen.

Fann twòp
Twòp àjil

BON MELANJ

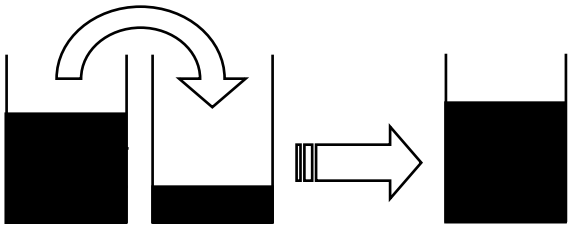
Twò frajil
Twòp sab

Tès melanj sou wòch ki plat yo

Preparasyon mòtye avek pit

Tès melanj mòtye lacho

Pwopòsyon pàtikil finn nan sab la

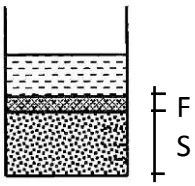


3 pati dlo | 1 pati sab sek | Mete dlo nan sab epi souke

Yon sab ki « gra » li pi bon pase yon sab ki two pwòp :

- Mòtye gen plis souplès, pi fasil poul travay.
- Li amelyore rezistans kont dlo.
- Li posib pou finn yo kolore mòtye.
- Nou mwens bezwen mete lacho.

<u>Atansyon</u> :
Twòp pàtikil finn koze fant.



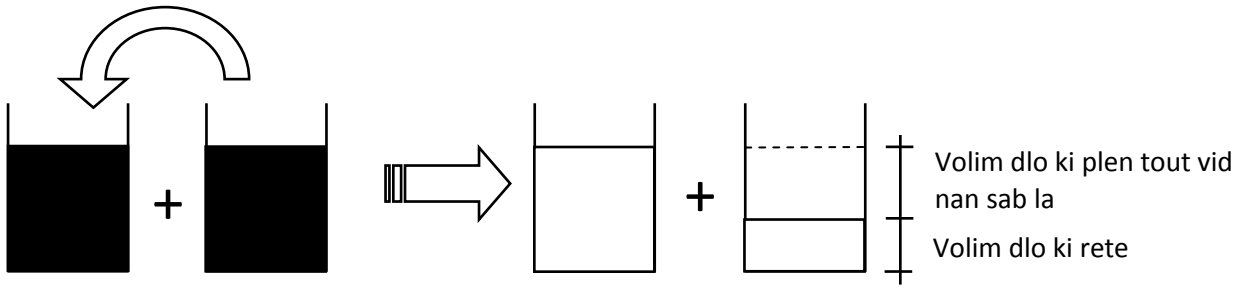
Aprè sab desann

Tès kantite finn :

Rapò	F/S = 1/4	Ÿ	Bon
Rapò	F/S = 1/3	Ÿ	Twò « sal »
Rapò	F/S = 1/5	Ÿ	Twò « pwòp »

Pou konnen pwopòsyon lacho nou bezwen mete : mezire pwopsyon vid ki gen nan sab la

Lacho ta dwe ranpli volim ki vid nan sab la. Pou mezire kantite vid ki nan sab la mete dlo nan yon volim sab jouk li pa gen plas ankò pou dlo a epi kalkile ki kantite dlo ki plen twou vid ki genyen yo nan sab la :



1 pàti sab sek | 1 pàti dlo | Plen dousman ak dlo jouk satirasyon | Volim dlo ki rete

¾ Pwopòsyon vid nan sab la bay pwopòsyon lacho nou bezwen.

Tablo ki bay endikasyon pou kek melanj posib (men tès yo obligatwa menm !)

	Lacho	Simant (pou mòtye batà)	Sab
Mòtye pou masonri wòch	1 vol.	(1/3 vol.)	3 à 7 vol. depann kalite sab la
Rejwentwaman wòch	3 vol.	(1/3 vol.)	3 à 4 vol.
Mòtye pour krepi	1 vol.	(1/3 vol.)	2 à 4 vol.
Mòtye pou andwi	1 vol.	/	4 à 7 vol.

Mòtye ak beton siman yo : Melanj

MOTYE SIMAN YO

Pase sab nan crib, si nou bezwen pou itilisasyon nap fè. Sab dwe byen pwòp.

	Siman	Sab	Ekivalans apeprè an kilo siman pou chak m^3 sab
Mòtye latè stabilize	1 vol.	8 vol. (tè oubyen melanj tèsab)	150 kg/m^3
Mòtye pou masonri wòch **(Atansyon : pas itilize pou ranpli mi ranplisaj an wòch yo)**	1 vol.	6 vol.	250 kg/m^3
Mòtye pou monte blok siman yo	1 vol.	5 vol.	300 kg/m^3
Mòtye pou krepisaj blok siman yo	1 vol.	4 vol.	350 kg/m^3
Mòtye pou andwi blok siman yo	1 vol.	5 vol.	300 kg/m^3
Mòtye pou pàke beton an	1 vol.	4 vol.	350 kg/m^3

BETON SIMAN YO

Gravye diamèt 5/40 mm : se skelèt beton an, yo nan pwopòsyon 2/3 nan volim total la.

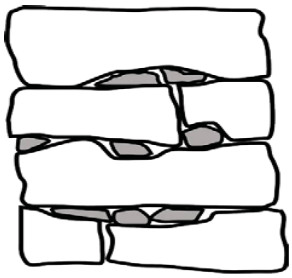
Sab diamèt 0/5 mm : yo plen vid ki nan gravye, yo nan pwopòsyon 1/3 nan volim total la. Yo dwe byen pwòp.

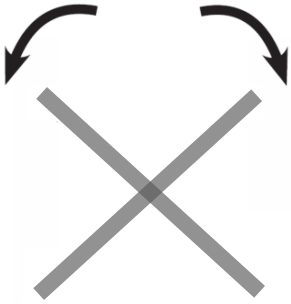
	Siman	Sab	Gravye	Ekivalans apeprè an kg siman pou chak m^3 sab
Beton fonsaj	1 vol.	4 vol.	6 vol.	150 kg/m^3
Beton “siklopeen”	1 vol.	3 vol.	5 vol.	200 kg/m^3
Beton pou ranpli blok yo	1 vol.	4 vol.	6 vol.	150 kg/m^3
Beton kouran	1 vol.	2 vol.	3 vol.	300 kg/m^3

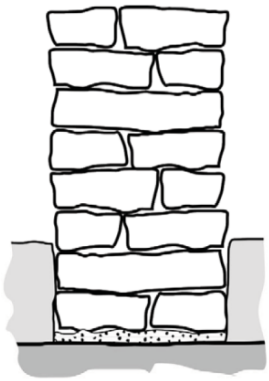
7.4 – Masonri ak wòch

Rezime

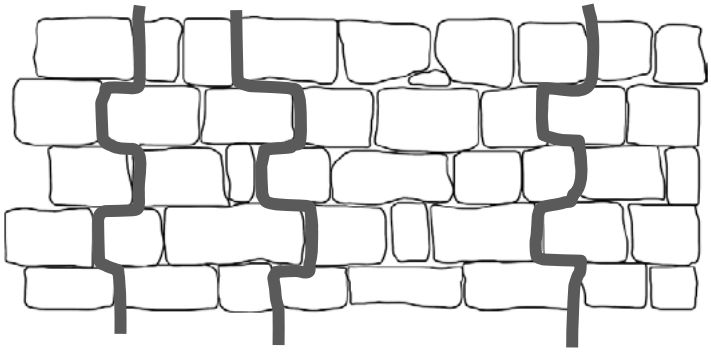
Poze wòch yo byen CHITA
Evite mete anpil mòtye nan jwen yo, pito w mete ti piti wòch pou kale wòch yo.

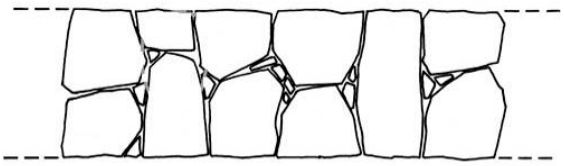






Pa fè jwen file. Altène gwo wòch ak ti wòch epi kwaze jwen yo.
Mete « kle » tout kote nan mi a : se gwo wòch ki fè lajè mi a e ki pèmèt mare mi a.





Kwaze gwo wòch yo ki nan kwen yon ranje sou lòt.
Menm bagay la tou aplike nan mi yo ki nan separasyon.

7.5 - Fondasyon

Misereor – Concert-Action

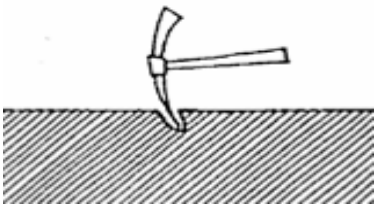
Prensip fondasyon

Dimansyon pou kay senp ki gen yon nivo

Fondasyon an dwe distribiye pwa kay la nan tè a.

Dimansyon li depann de kalite tè ki sipòte li a.

Tablo sa a se sèlman pou bay **endikasyon** nan dimansyon fondasyon yo

TÈ A DI	
TÈ A PA TWÒ DI 	
TÈ A MOU	

Kay avek 1 nivo sèlman

Atansyon !
Kay ki pa gen fondasyon ou ki gen pòv kalite fondasyon se yon kay ki enstab e ki ka tonbe fasil.

Fouy la

Twou fondasyon sèvi tankou kofraj

Atansyon !
Si twou fondasyon an fèt pi làj fondasyon ap koute plis kob.

- **Make** limit fondasyon yo ak yon pikwa.
- **Fouye** byen vètikal e suiv fisèl la byen.
- **Retire** tè arab ki anlè deyò chantye a. Nou pap itilize li nan konstriksyon.
- **Stoke** tè a ki bon tou pre chantye a pou lè wap bezwen pou ranble a ak pou konstriksyon an

EMPÒTAN !

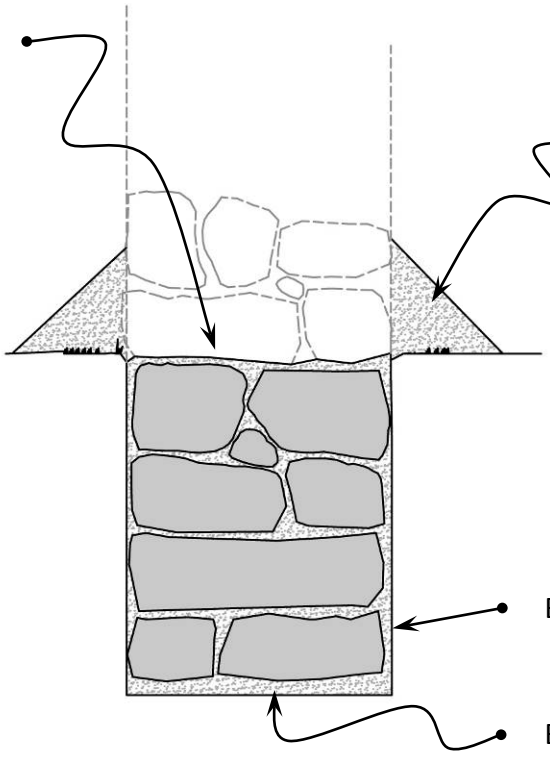
Pa fouye fondasyon an si w pa si wap ranpli'l avan lapli

Si'l pa posib, alò mete nan fon fouy la yon **kouch beton pwòpte** 5 cm avek yon melanj ki 150 kg / m3
(1 Siman / 4 Sab / 6 Gravye).

Fondasyon an masonri ak wòch

Komansman sol kay la

Mete sifas la a nivo ak fisèl la



Ki mòtye nou ka itilize :

Mòtye tè (ak pit si posib)
Mòtye lacho
oubyen batà (lacho + siman)
Mòtye siman (250 kg/m3)

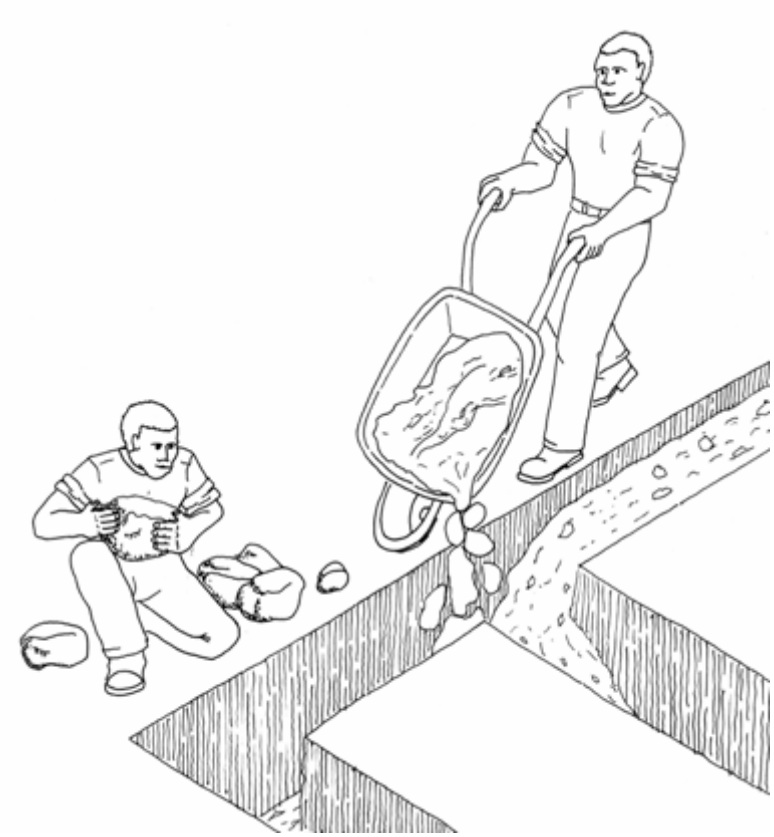
Fason nou fè masonri dwe respekte bon jan reg yo pou mont mi wòch

An pàtikilye :

- x Mete wòch yo byen chita
- x Pa fè jwen file epi mete « kle » tout kote pour mare mi a
- x Evite jwen ki epe, li pa dwe depase 3 cm

Fondasyon beton siklopeen

Lè woch yo twò piti pou fè yon masonri wòch, ou ka mete yo nan yon beton leje. Yo rele sa **beton siklopeen**.



Twou fouy la sèvi tankou kofraj

Woze sifàs la chak jou pandan yon semenn (oubyen kouvril ak tè)

Fè sifas la plat ak mezi depi fisèl la

Mete wòch yo nan beton men evite youn touche ak lòt

Melanj beton a 200 Kg / m^3
1 vol. Siman **/ 3** vol. Sab **/ 5** vol. Gravye

Fè atansyon pou chak wòch kouvri ak beton.

7.6 – Solay kay

DEYÒ

ANNDAN

Ekoulman dlo lapli :
- Li mouye sifàs la
- Li evapore epi cheche apre lapli

Vapè (abitan yo)

DLO KI MOUTE E KI EVAPORE NAN SOL KAY LA.

Mi a bwè dlo ki sòti nan tè a

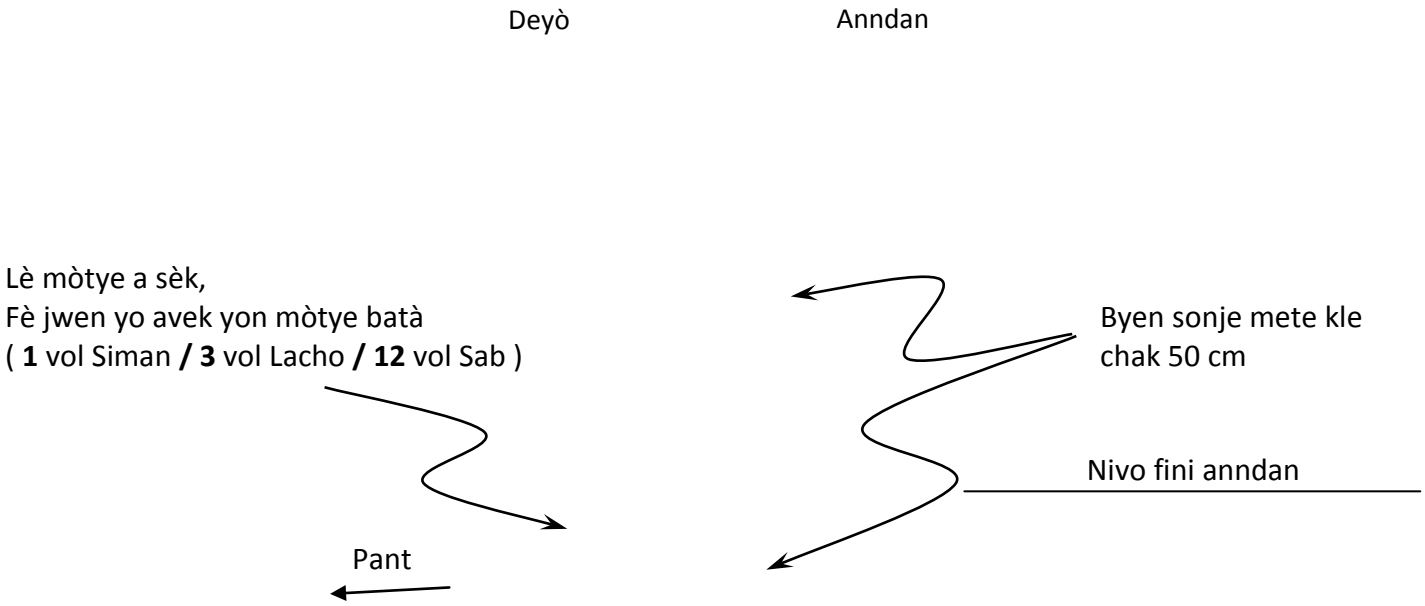
Ilistrasyon prensip « moute kapilè »

Sol ak wòch

Fason nou fè masonri dwe respekte bon jan reg yo pou monte mi wòch.

Li pi bon pou nou itlize mòtye ki soup, sa vle di kip a twò di (ak fib si posib) :

- Tè + Sab (+ pit si nou genyen)
- Tè + Sab + Lacho
- Tè avek yon ti kras siman



Detay pou tali a

Komanse pant la anba lis bas
pou ka kite pwent bwa deyò

Chache wòch ki plat pou fè yon pant
ki pèmèt dlo lapli koule deyò

Sol avek 3 blok siman - Aplikasyon

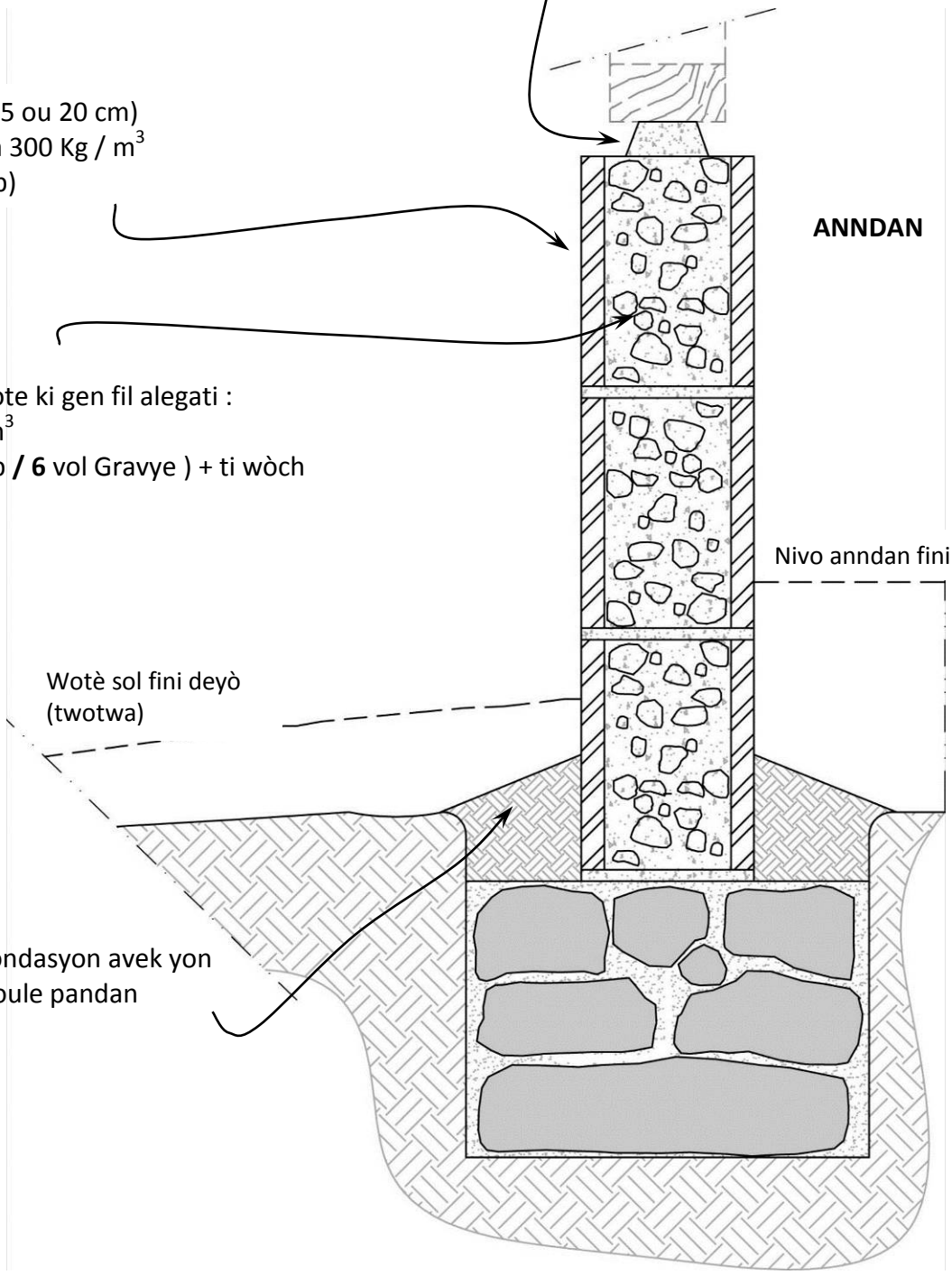
Moute lis bas 1'' anviwon sou ti plo mòtye siman a nivo

Blok beton (40 x 20 x 15 ou 20 cm) poze ak mòtye siman a 300 Kg / m^3
(**1** vol Siman **/ 5** vol Sab)

ANNDAN

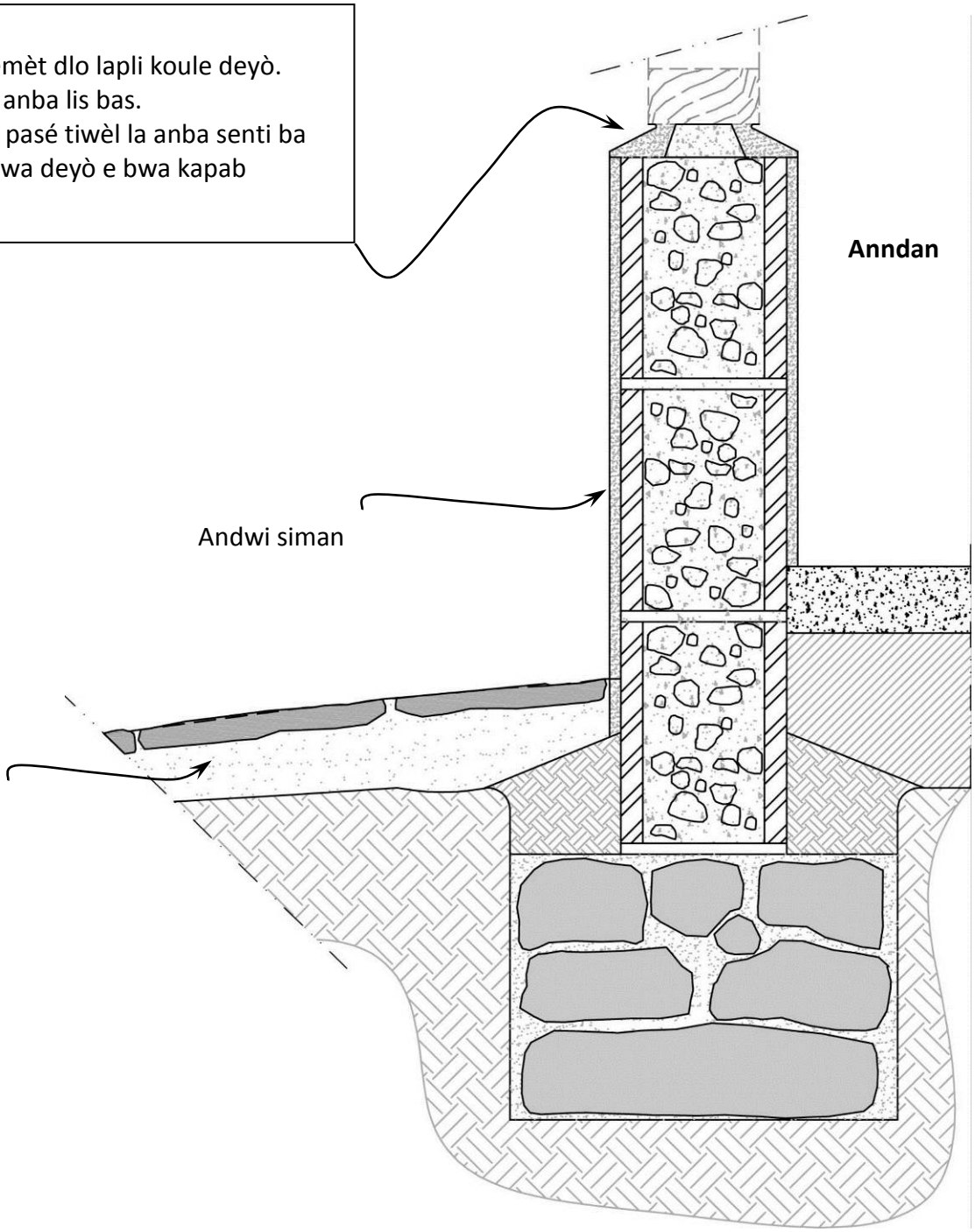
RANPLISAJ BLOK YO :

Plen blok yo omwen kote ki gen fil alegati :
Beton leje a 150 Kg / m^3
(**1** vol Siman **/ 4** vol Sab **/ 6** vol Gravye) + ti wòch



Sol avek 3 blok siman – Andwisaj ak tali

TALI :
Fè yon pant ki pèmèt dlo lapli koule deyò.
Komanse pant la anba lis bas.
Lè mòtye fèk fèt, pasé tiwèl la anba senti ba pou kite pwent bwa deyò e bwa kapab respire.

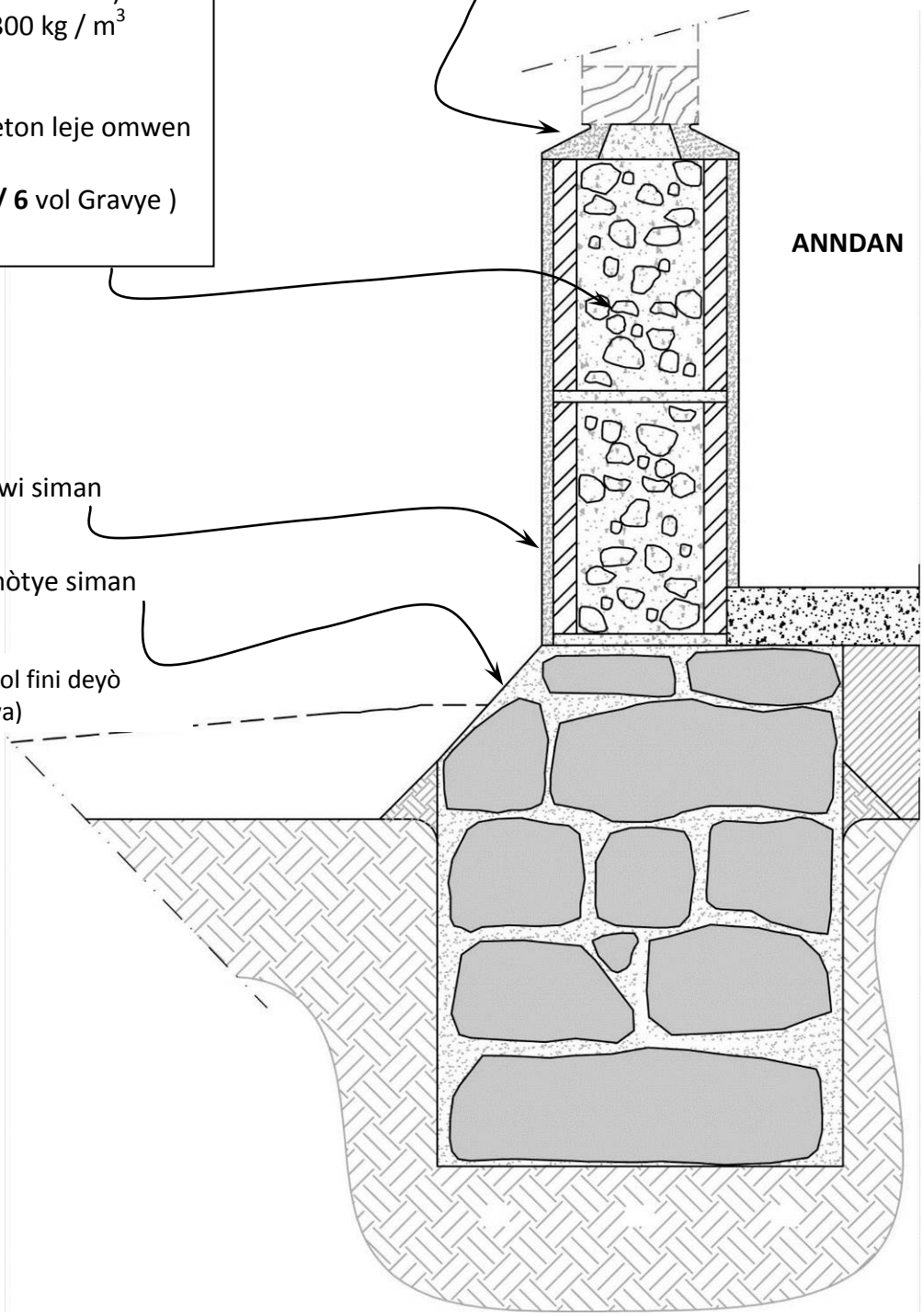


Sol avek 2 blok siman + 15 cm wòch

Fè yon pant ki pèmèt dlo lapli koule deyò.
Komanse pant la anba lis bas pou kite pwent bwa deyò.

Blok beton (40 x 20 x 15 ou 20 cm)
poze ak mòtye siman a 300 kg / m^3
(**1** vol Siman **/ 5** vol Sab)

Plen blok yo avek yon beton leje omwen kote ki gen fil alegati.
(**1** vol Siman **/ 4** vol Sab **/ 6** vol Gravye)
+ ti wòch



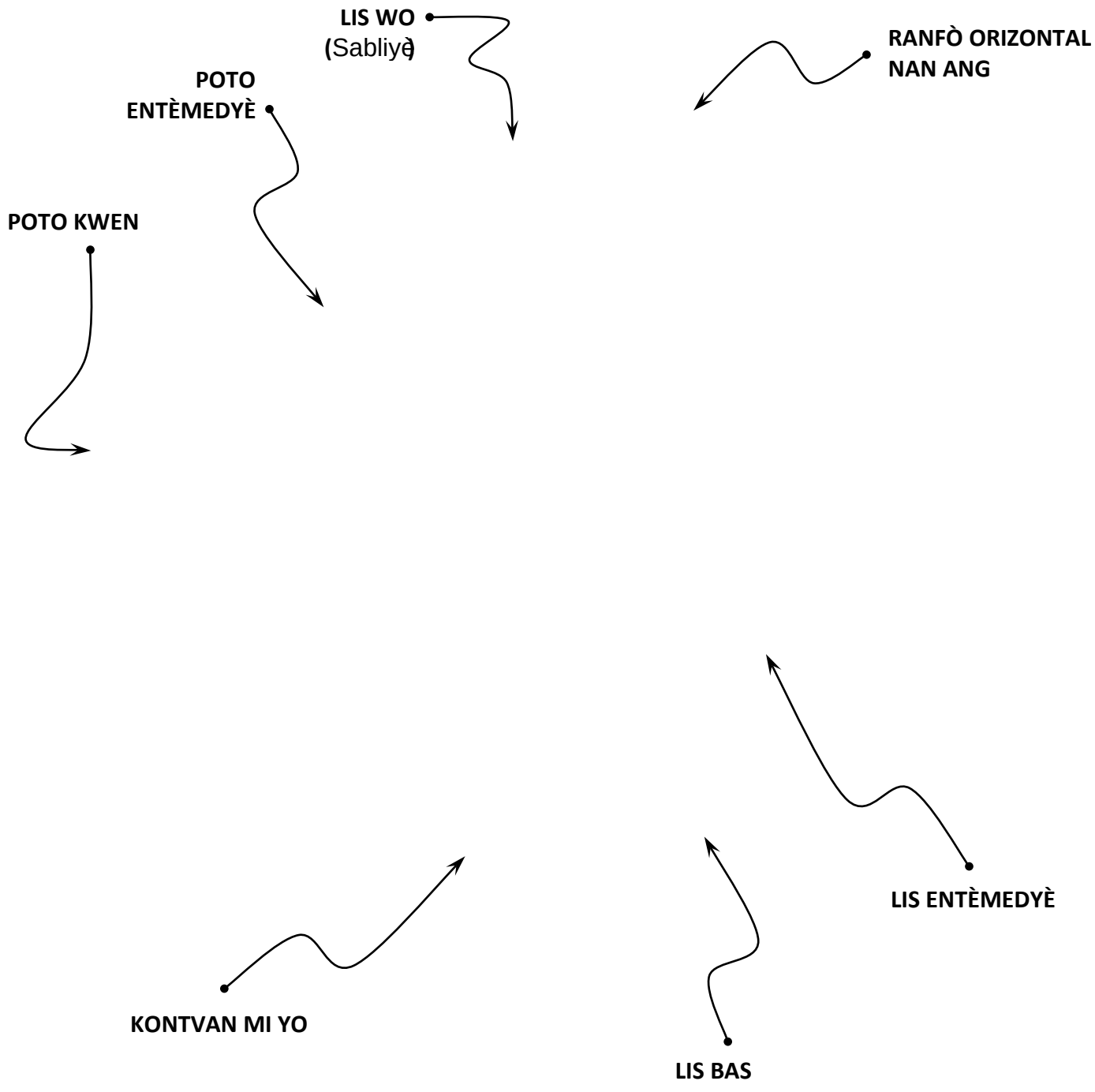
Ranble

Ranble se yon etap esansyel pou pwoteje fondasyon yo, baz mi yo ak anndan kay la kont dlo ki ka antre. Nivo ranble a dwe rive pi wo pase nivo sol teren deyò.

Ranble fèt ak wòch ak gravye pour pèmèt pakèt la byen respire. Nou rele se « lerison ».

7.7 – Chàpant an bwa pou mi yo

Estrikti jeneral



Maraj estrikti an bwa : Fil alegati mare sou poto yo

Mete fil alegati byen mare nan fondasyon nan anplasman chak poto

Deyò Anndan

Fil alegati trese (4 fil) nan fondasyon ak solay kote gen poto

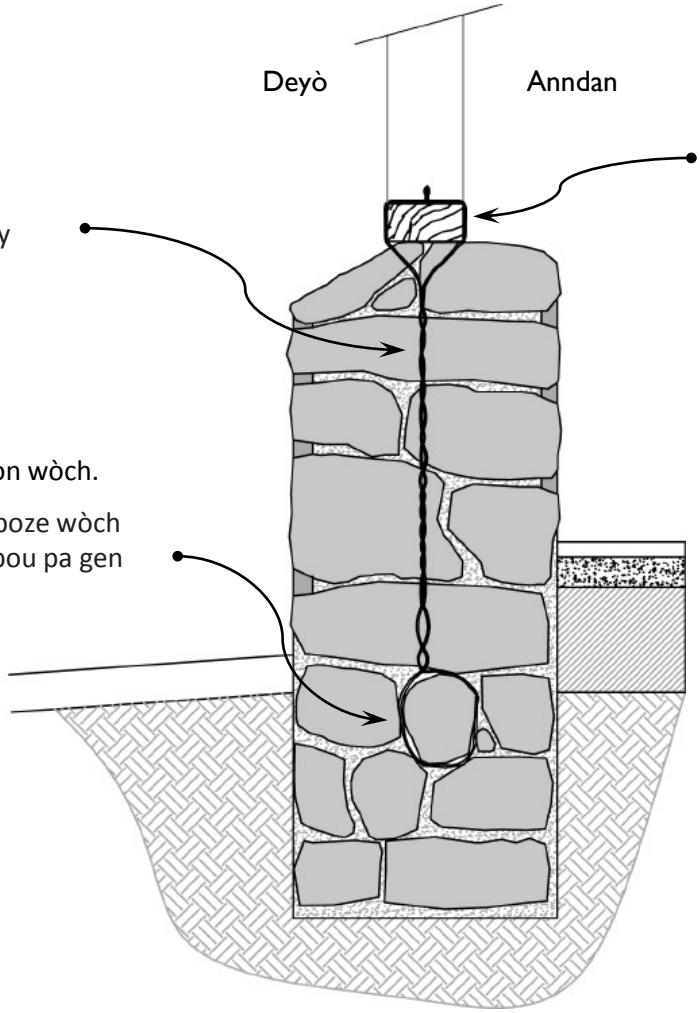
Apre ou mete lis bas ak poto yo, byen mare poto yo avek fil alegati yon kote epi lòt.

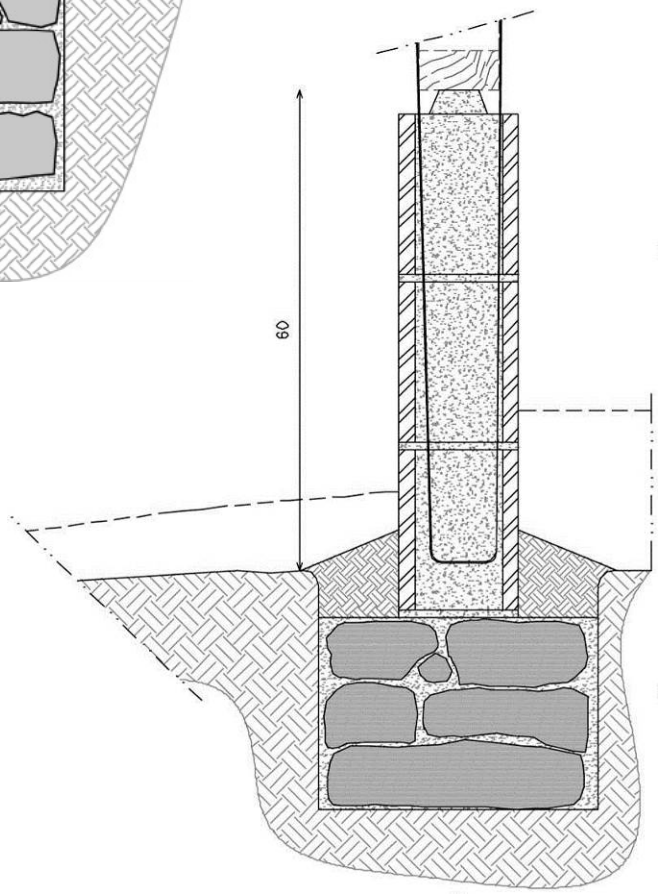
Fil alegati pase anba yon wòch.

Prann prekosyon lè w poze wòch yo kote gen fil alegati pou pa gen jwen file.

Maraj estrikti an bwa : Fil alegati mare sou lis bas

Mete fil alegati byen mare nan fondasyon bò anplasman chak poto





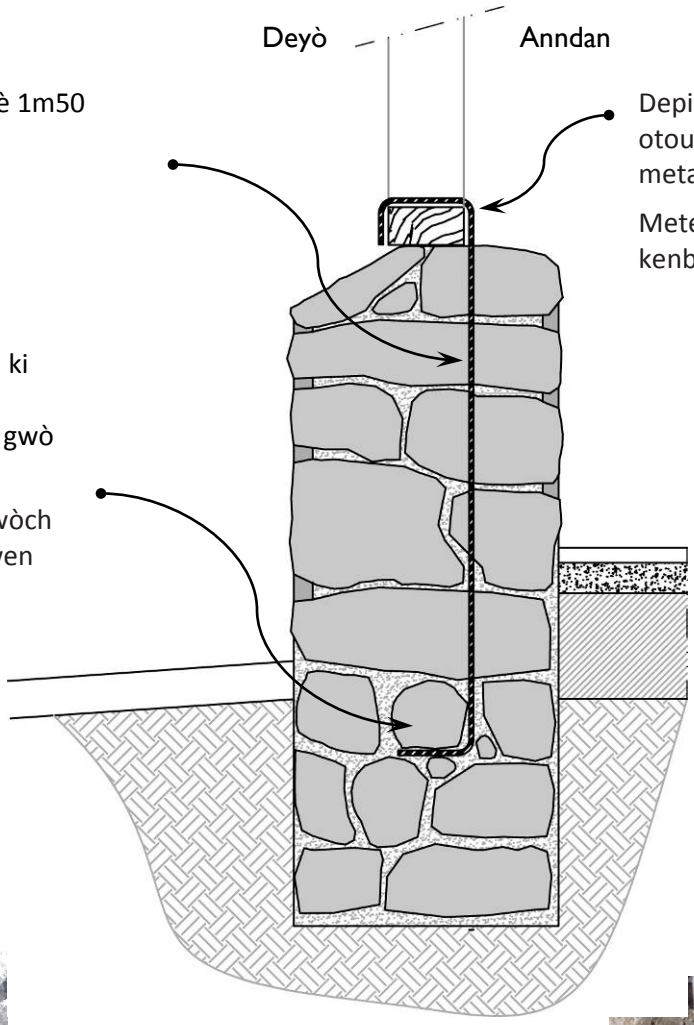
Maraj estrikti an bwa : Fè beton ki pliye sou lis bas

Mete pyes maraj nan ang yo (sòti 30 cm minimòm depi kwen) epi chak 2 oubyen 3 poto.
Evite mete maraj kote nou asanble lis bas ansanm.

Fè beton (1/4” ou plis), longè 1m50 anviwon.
Pwoteje fè a avek minyòm.

Fè a li gen omwen 30 cm (1’) ki pliye anba nan direksyon fondasyon. Li pase anba yon gwò wòch.

Prann prekosyon lè w poze wòch yo kote gen fè pou pa gen jwen file.

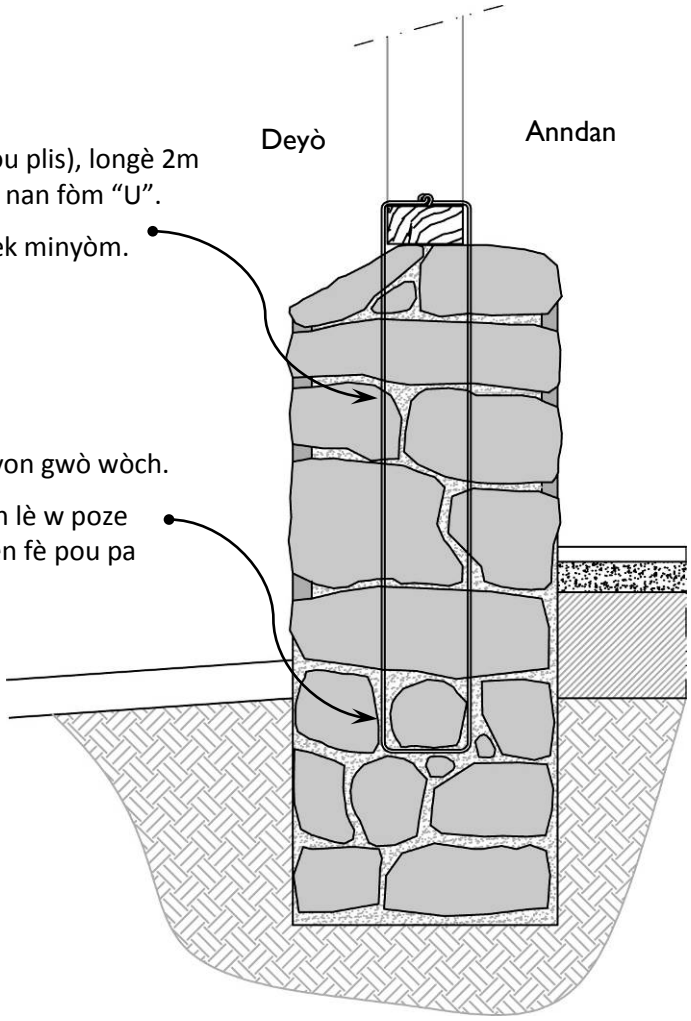


Depi lis bas plase, pliye fè a tout otou de li (ou ka itilize yon tib metalik).

Mete plizyè klou 4’’ ki pliye pou kenbe fè a sou lis bas la.

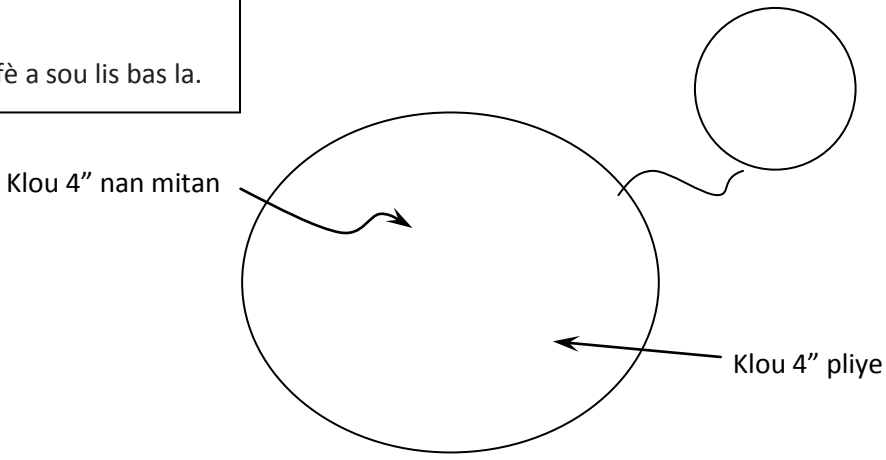
Maraj estrikti an bwa – Fè beton an fòm U ki pliye sou lis bas

Mete pyès maraj nan ang yo (sòti 30 cm minimòm depi kwen) epi chak 2 oubyen 3 poto.
Evite mete maraj kote nou asanble lis bas ansanm.



Depi lis bas plase, pliye 2 kote fè a otou de li (ou ka itilize yon tib metalik).

Itilize klou 4’’ ki pliye pou kenbe fè a sou lis bas la.



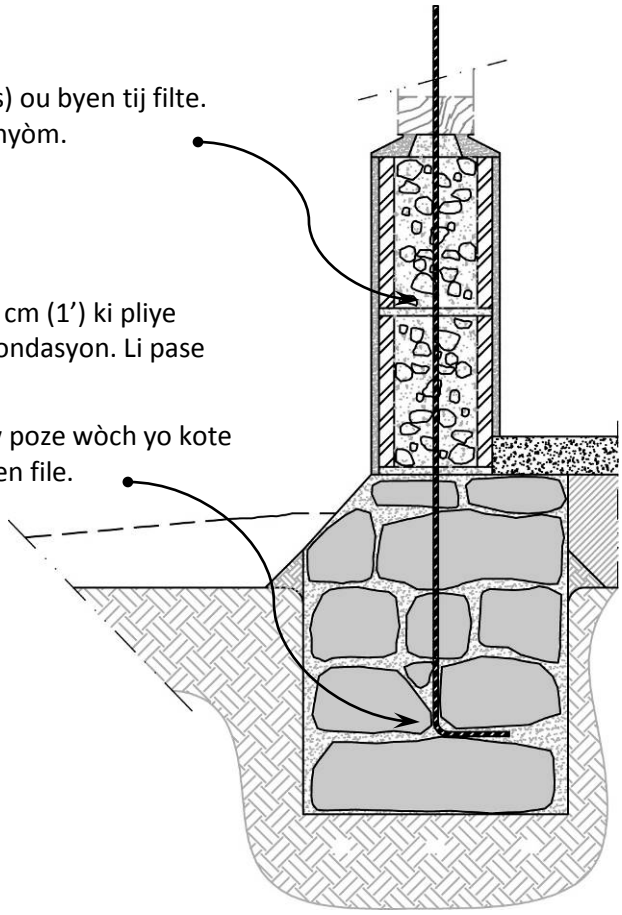
Maraj estrikti an bwa – Fè beton an L ki pase nan mitan lis bas

Mete pyes maraj nan ang yo (sòti 30 cm minimòm depi kwen) epi chak 2 oubyen 3 poto.
Evite mete maraj kote nou asanble lis bas ansanm.

Fè beton (1/4” ou plis) ou byen tij filte.
Pwoteje fè a avek minyòm.

Fè a li gen omwen 30 cm (1’) ki pliye anba nan direksyon fondasyon. Li pase anba yon gwò wòch.

Prann prekosyon lè w poze wòch yo kote gen fè pou pa gen jwen file.

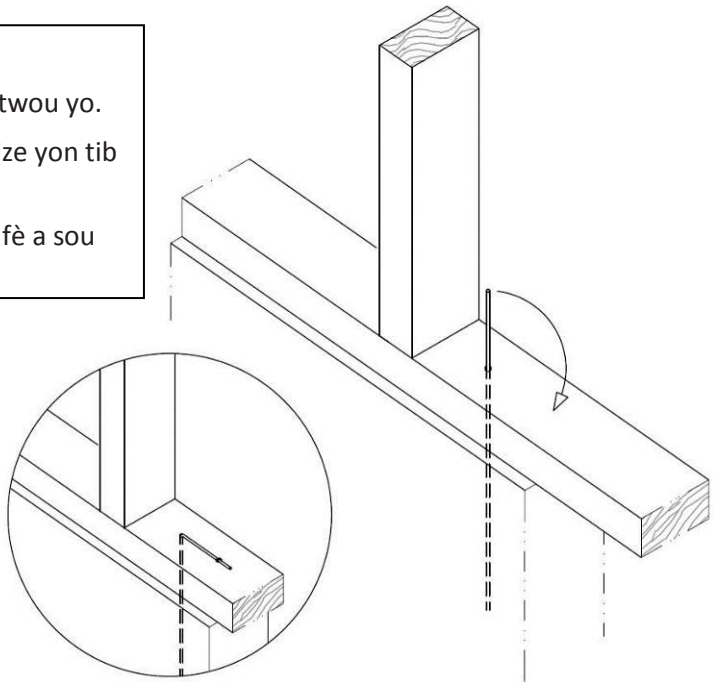


Pèse lis bas kote gen fè ki sòti.

Mete lis bas avek fè ki pase nan twou yo.

Pliye fè a sou lis bas la (ou ka itilize yon tib metalik)

Itilize klou 4’’ ki pliye pou kenbe fè a sou lis bas la.



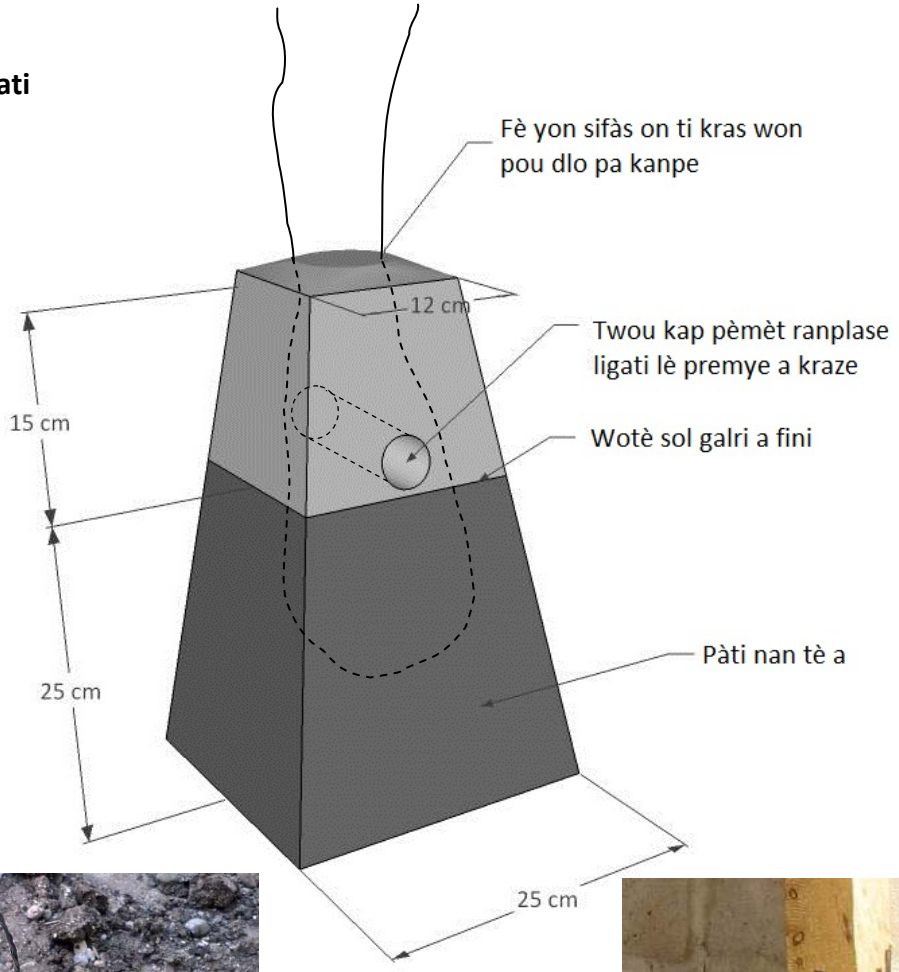
Avek yon tij filte nou ka itilize ekrou ak wondèl pou fiksasyon an avek lis bas la.

Maraj estrikti an bwa – Yon lòt solisyon nan plas sol la : Plo beton

Plo beton prefabrike : Maraj avek fil alegati ou byen strap (plak metalik)

Pou ki sa nou itilize solisyon sa a :
- Pou ranplase yon bouda poto ki pouri ou byen nan plas sol la
- Pou mete anba poto galri yo

Egzanp plo avek fil alegati



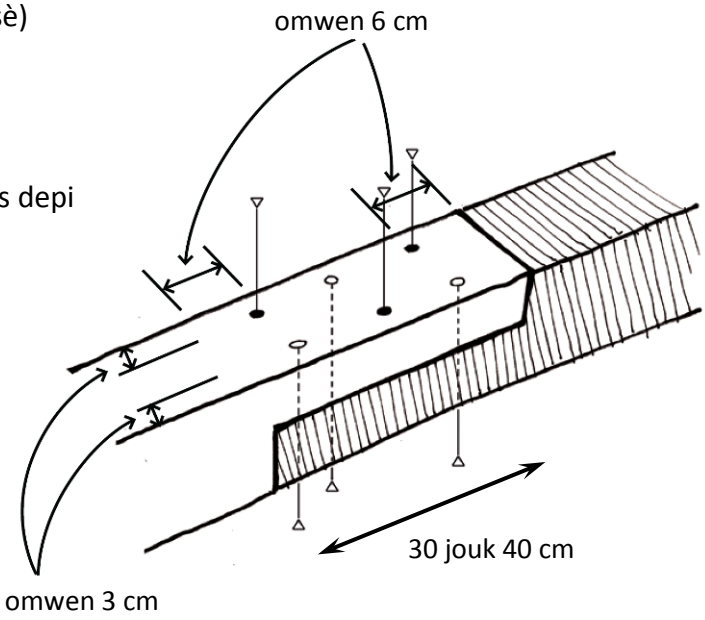
Maraj lis ansanm

KONEKSYON NAN MENM LONGÈ

Asanblaj ki pi fasil se **mibwa** (antay nan mwatye epesè) men, atansyon, pyès bwa yo vinn pi frajil.

Kijan pou'n fikse asanblaj la :

- **Avek klou :** mete 3 klou chak bò e kite yon distans depi limit yo ;
- **Avek cheviy** an bwa di.



KONEKSYON NAN KWEN YO

Se kwen yo ki pi frajil nan konstriksyon. Nou dwe prann prekosyon avec asanblaj mibwa ki se yon koneksyon frajil.

Kite yon longè dèyè asanblaj ki depase.

Nan peyi Ayiti a nou jwenn yon lòt jan asanblaj ki se tankou yon **''Tyè-bwa''**, sa vle di se antay ki pa rive jiske mwatye epesè pyès bwa.

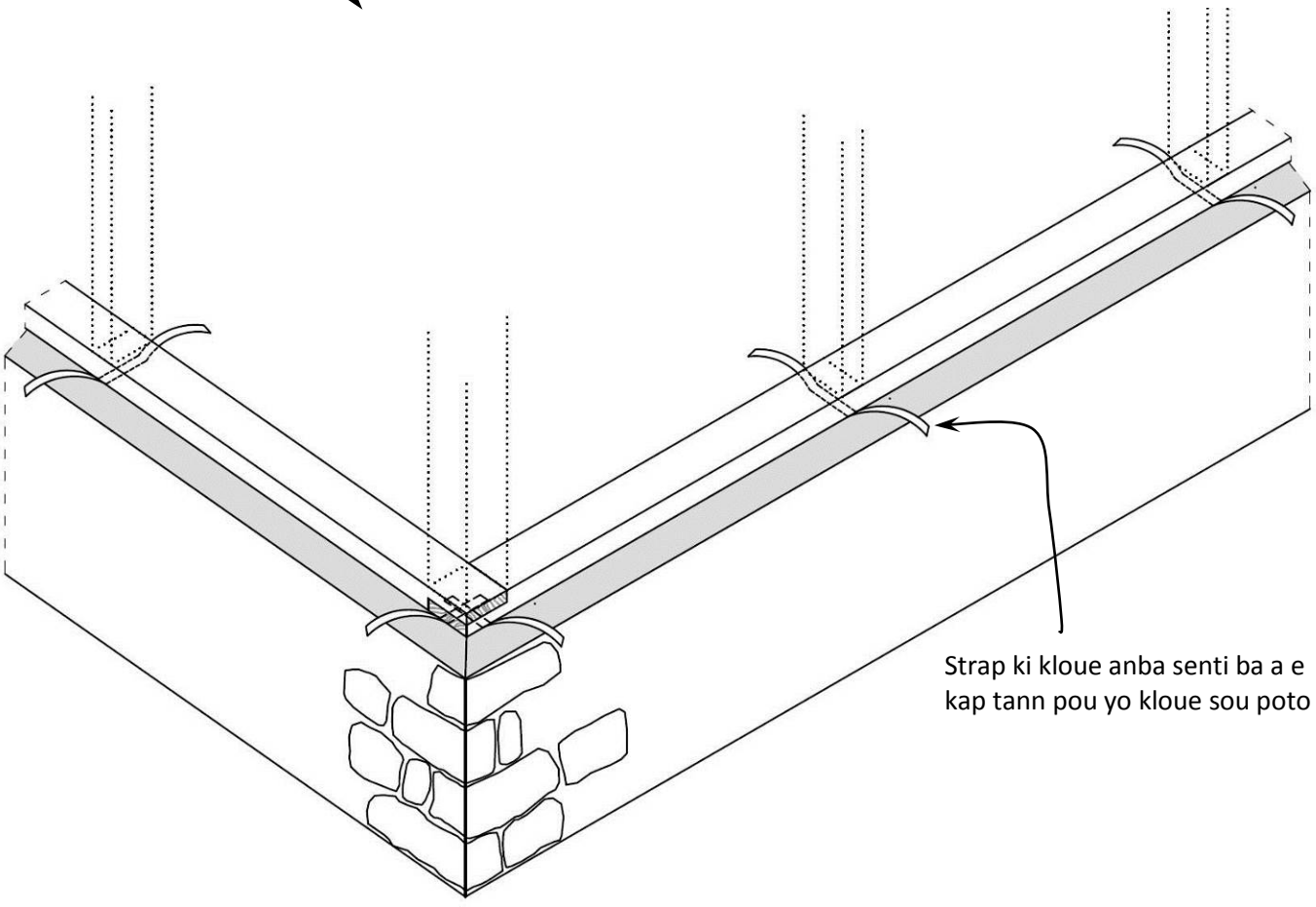
- x Li p`mèt fè yon asanblaj tenon mòtèz avek cheviy avek poto kwen.
- x Epi li pèmèt mete lis wo ki pi kout ki se tankou yon travès, **menm nivo avek lòt travès yo** pou'l ka kenbe plafon an.

Koneksyon poto yo avek lis bas– Strap (plak metalik)

- x Avan nou plase lis bas sou sol kay la, kloue stap anba lis bas kote nap mete poto yo
- x Plase lis bas sou sol kay la

Longè strap yo ki omwen 40 cm (depann de dimansyon lis bas)

Longè strap yo nan kwen ki omwen 25 cm (depann de dimansyon lis bas)

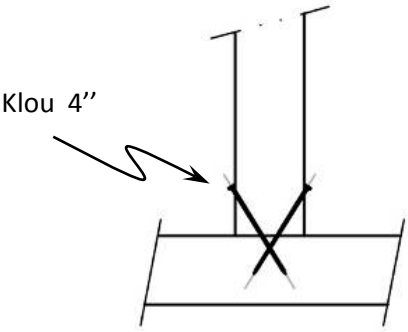


Strap ki kloue anba senti ba a e kap tann pou yo kloue sou poto a.

Koneksyon poto yo avek lis bas ak lis wo – Strap metalik

- Apre nou plase poto yo, kloue stap la chak bò poto a avek 4 klou anviwon.
- Fikse poto yo avek lis bas avek klou 4'' ki panche.

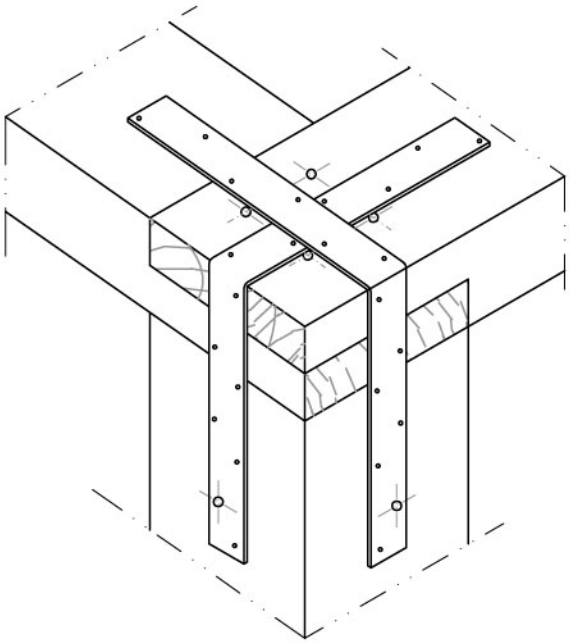
POTO

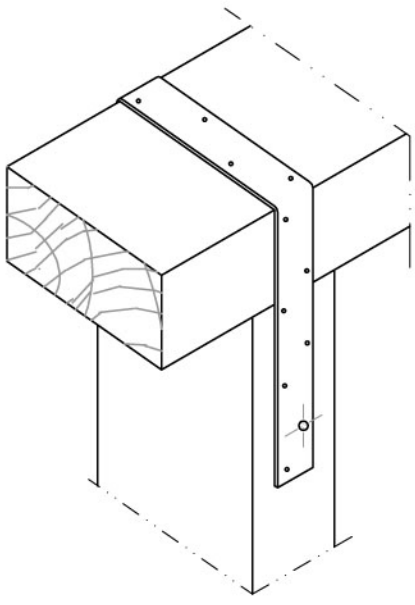


LIS BAS

Longè strap la ki sou poto a dwe pèmèt mete 4 klou (anviwon 10 cm ou byen plis)

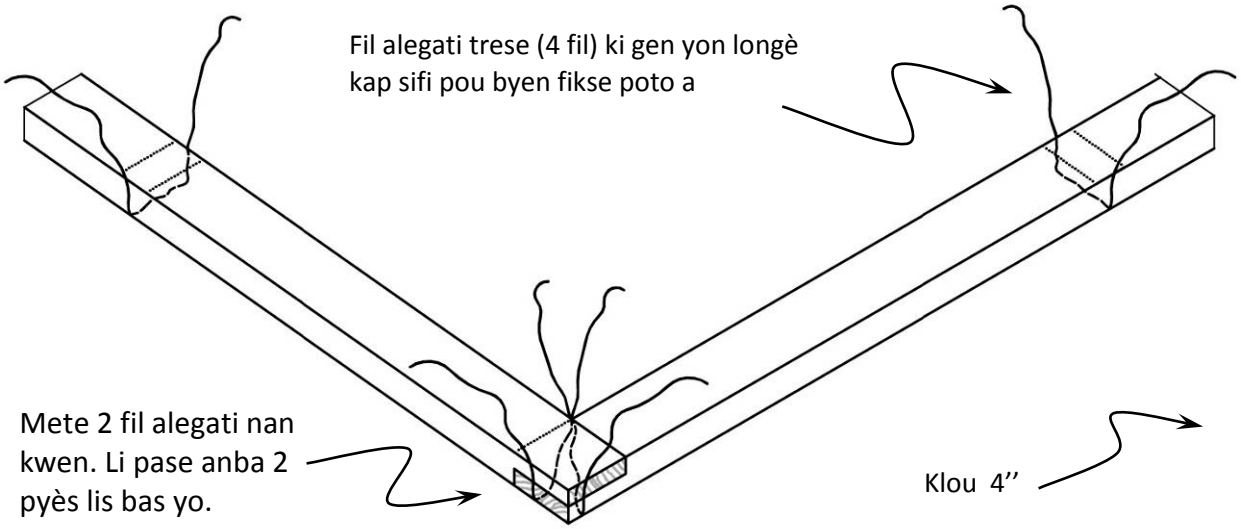
- Apre nou plase lis wo, mete strap sou li kote gen poto.
- Fikse strap yo sou poto yo menm jan nou te fikse lis bas la.



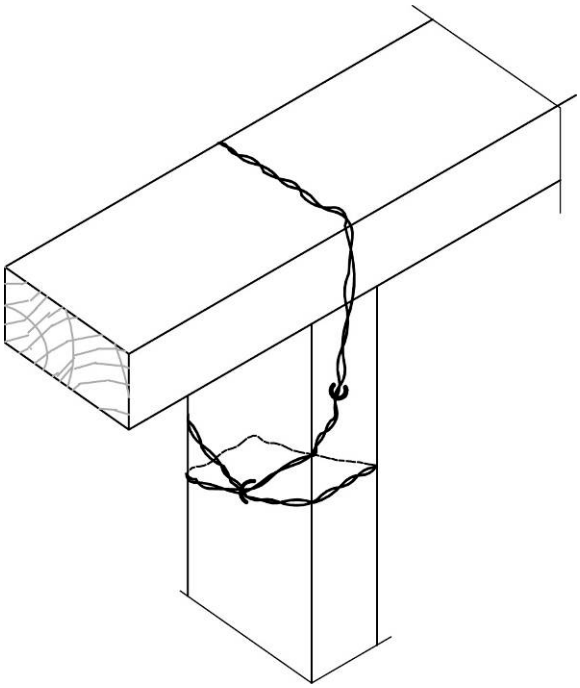


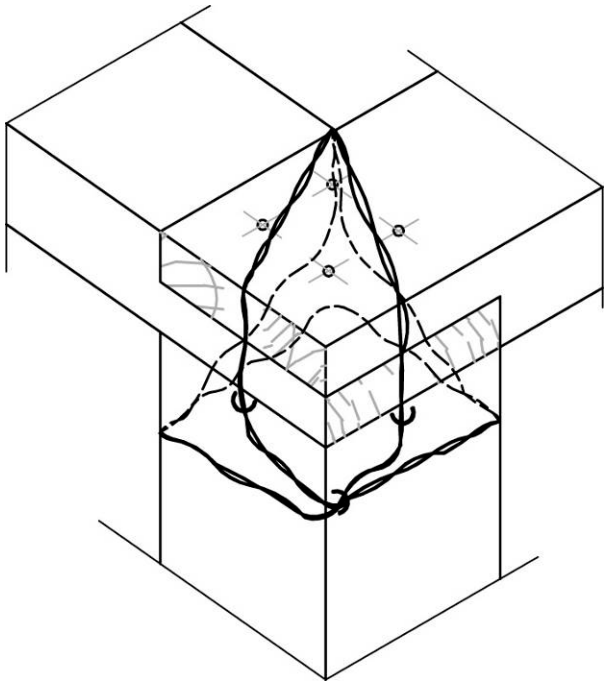
Koneksyon poto yo avek lis bas ak lis wo – Fil alegati

- Avan nou plase lis bas sou sol kay la, plase e kloue fil alegati trese anba lis bas kote nap mete poto yo.
- Fikse poto yo avek lis bas avek klou 4'' ki panche.



- Byen tire epi fikse fil alegati sou poto a avek omwen 4 klou. Tounen tout otou poto a pou'l ka byen kenbe





Koneksyon poto yo avek lis wo – Tenon mòtèz avek cheviy

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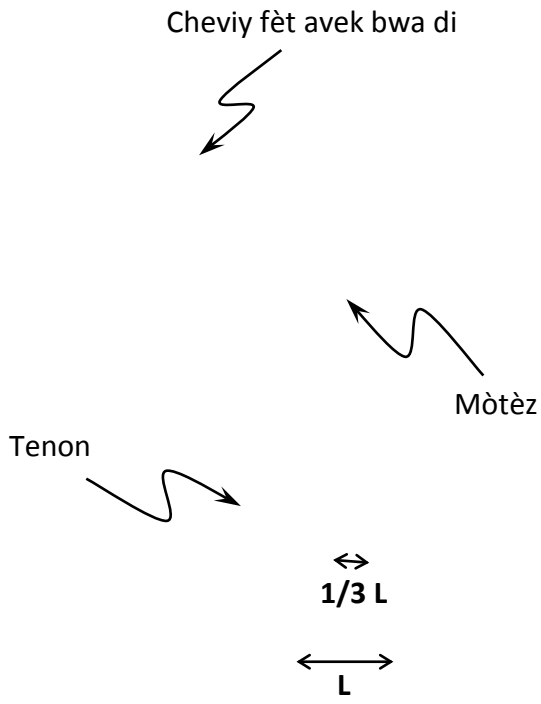

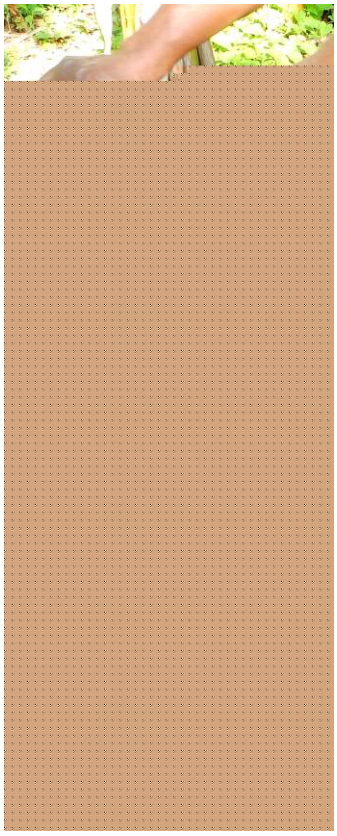

Fè yon twou avek

yon tayè oubyen

avek yon vilbreken

Jodia, moun yo konn ranplase tenon mòtèz avek cheviy pa jan asanblaj nou we sou foto a :