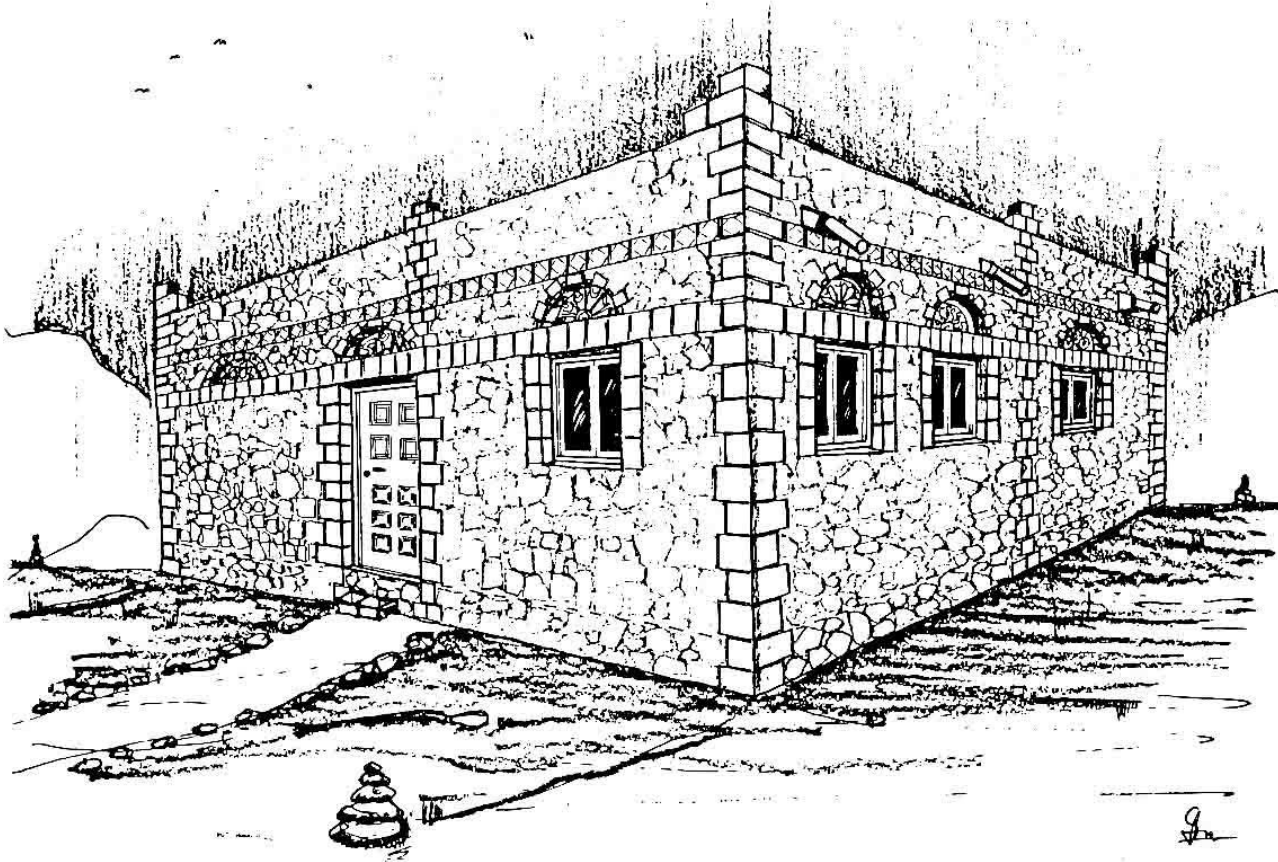


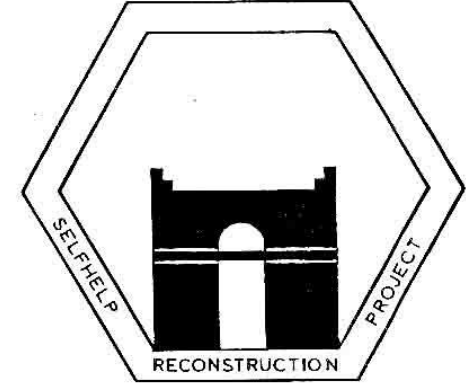
المجلس الأعلى لإعادة التعمير - المكتب التنفيذي ومار
وحدة البناء الذاتي مشروع مغرب عتس



خطوات توضحه مراحل البناء بالاسلوب الذاتي (المرحلة الرابعة) رقم 4

CONSTRUCTION MANUAL SELFHELP HOUSE NO:4 COMPLETION

THE SUPREME COUNCIL FOR
RECONSTRUCTION OF
Earth quakes Affected Areas
The Executive Office



FOREMAN MANUAL
6 - 1985
PART 4 COMPLETION

SJOERD NIENHUIJS
Training Engineer
Dharmar Aided Self Help Reconstruction Project

شورج نينهويس

مهندس تدريب

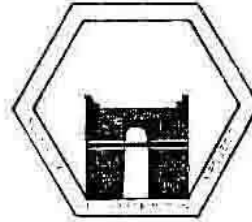
مشروع إعادة تعمير المناطق المتضررة من الزلازل - الاسلوب الذاتي

DHV
DHV Consulting Engineers

مهندسون استشاريون

بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِیْمِ

«وَقُلْ اِعْمَلُوا فِی سَبِیْلِ اللّٰهِ عَمَلًا مَّسْكُومًا وَارْتَبُوا»
صدره بسم العظیم



This foreman manual was originally produced in 1983 and used in the project implementation in 1984 and 1985

ABSTRACT.

Self help construction manual for earthquake resistant stone house. Yemeni architecture using cement U blocks. Foundation design and reinforcement. Step by step picture book in English and Arabic languages. Part of a set of five step by step construction manuals for a basic or core house.

Key words: Yemen, stone, architecture, earthquake, reconstruction, self-help, manual, core house.

The architect

Sjoerd Nienhuys, seismic engineer.

website: www.nienhuys.info

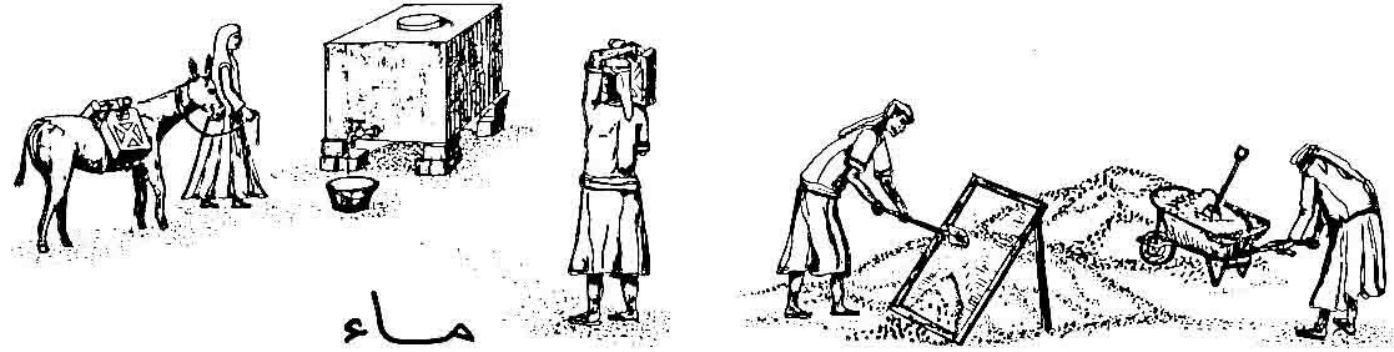
المهندس المعماري

Original production 1983

Digitized 2016

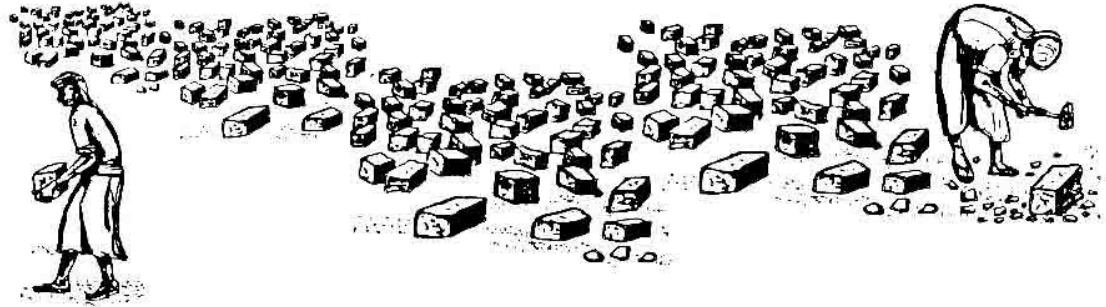
FOREMAN MANUAL
PART 4 - COMPLETION

كري - نيس

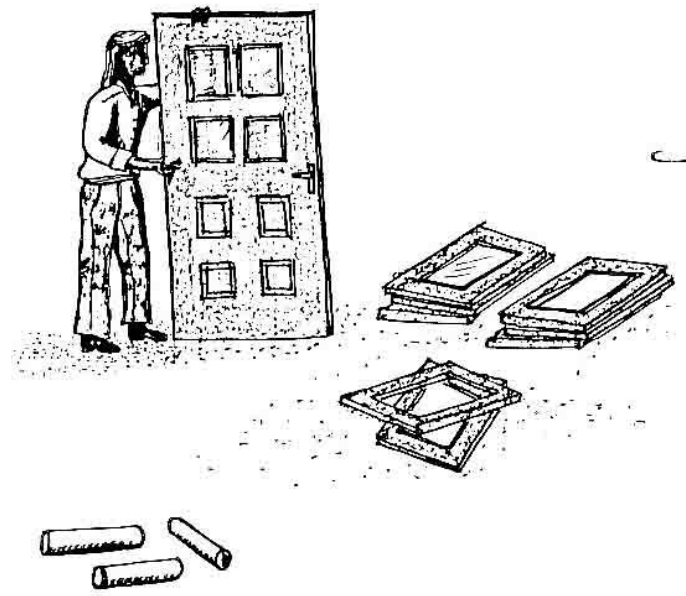


ماء

على المواد لمن تحضير الا حجار والرمل
(نيس) والصى للتخلية والماء والتراب لعمليات
انهاء السطح



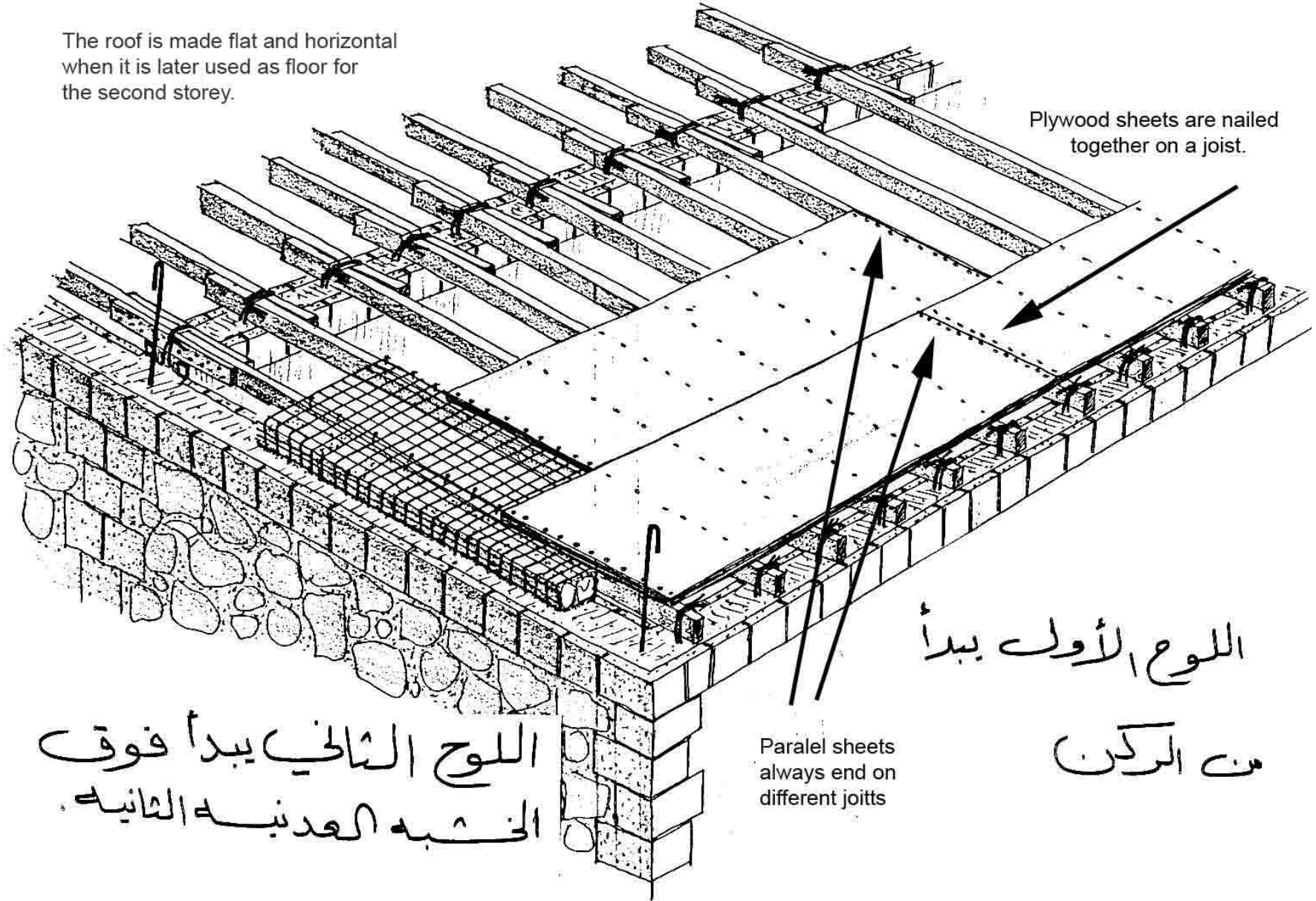
The beneficiary will prepare the stones, sand for masonry, gravel for concrete and water and soil for the roof.



مساعدة الدولة:
 الألواح والمامير والبلاستيك للقف والبلاستيك لتثبيت
 الابواب الخارجية والنبيلك والاسمنت واللكس والابواب
 الداخليه.

The project supplies plywood and steel nailes
 plastic roofing foil and tape fof fixing.
 The doors and the windows
 cement and lime.

The roof is made flat and horizontal when it is later used as floor for the second storey.



Plywood sheets are nailed together on a joist.

اللوح الأول يبدأ
من الركن

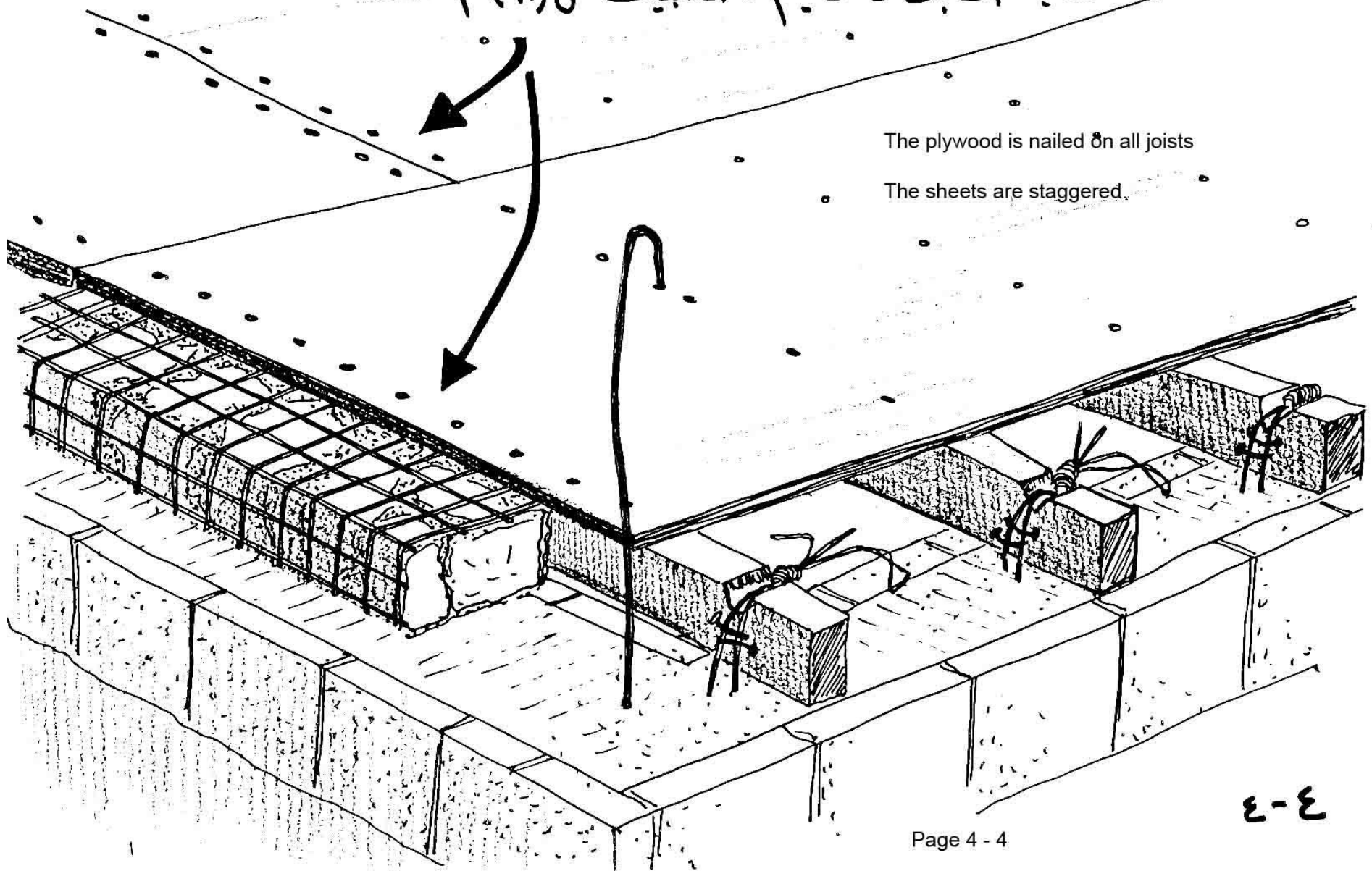
اللوح الثاني يبدأ فوق
الخشب العديبه الثانيه.

Paralel sheets
always end on
different joitts

نهاية البلاكا يتم - التثبيت كل (١.٠) م

The plywood is nailed on all joists

The sheets are staggered.

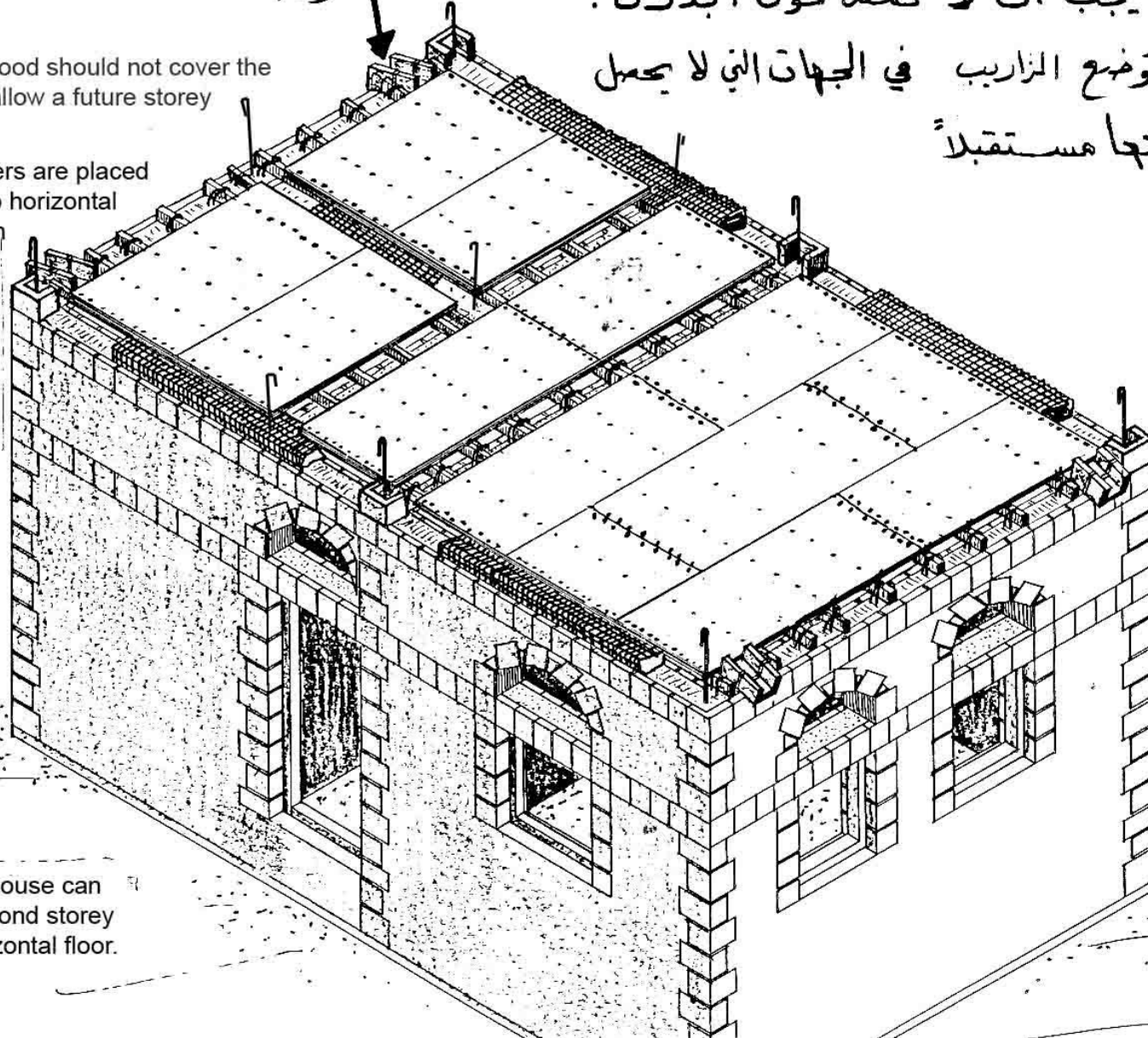


١- الألواح يجب أن لا تمتد فوق الجدران .
٢- يجب ان توضع المزاريب في الجهات التي لا يجعل
بناء من جهتها مستقبلاً

The plywood should not cover the walls to allow a future storey

The gutters are placed where no horizontal extension comes

مزاريب

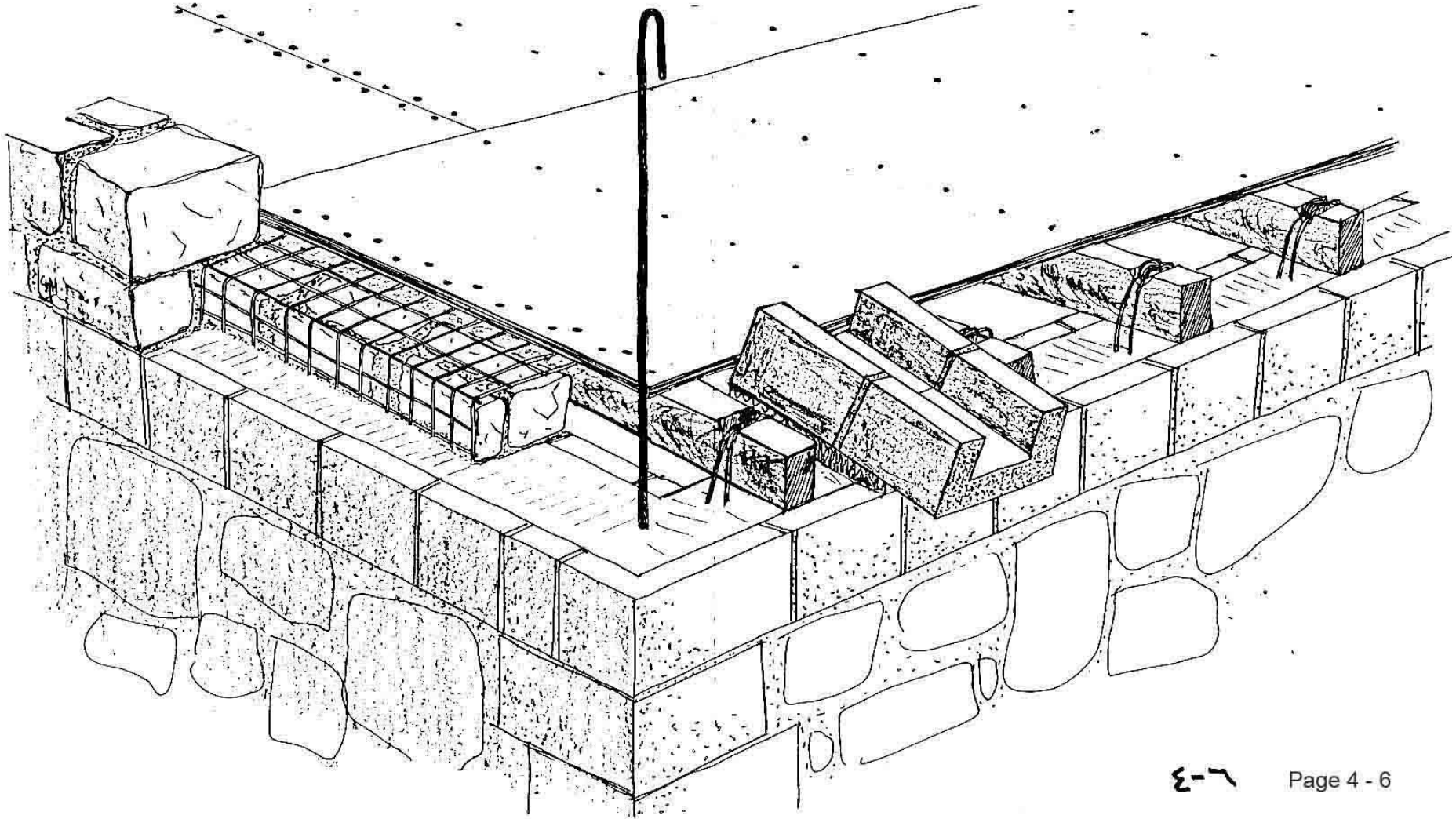


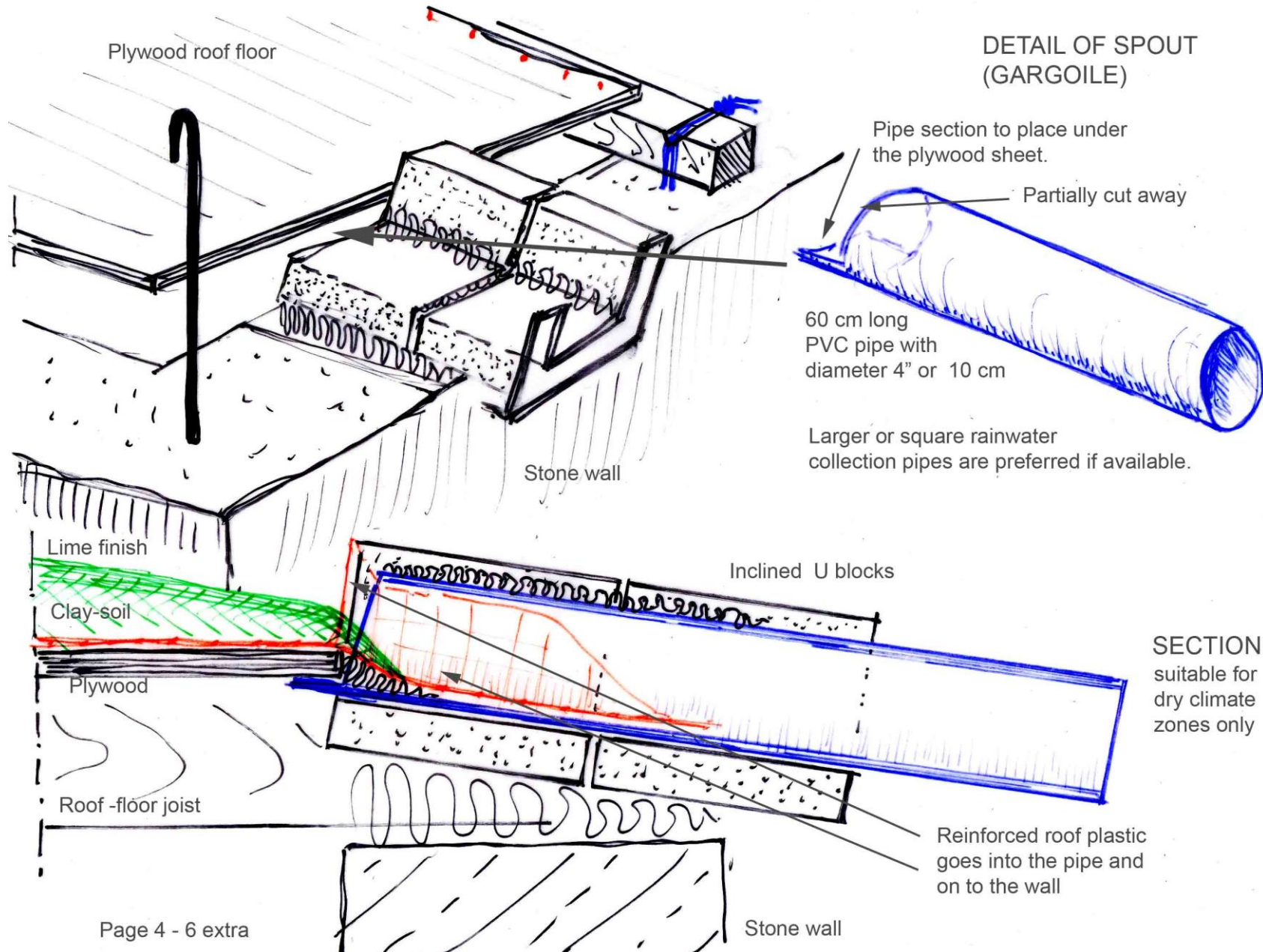
This core house can have a second storey with a horizontal floor.

٤-٥

الجزء الداخلي من البلاط يجب أن يكون مستواه أو أعلى من الألواح
المثبتة على السلم.

The inside of the upper U block must be just below the underside of the plywood.
The u blocks slope down towards the outside.





DETAIL OF SPOUT (GARGOILE)

Pipe section to place under the plywood sheet.

Partially cut away

60 cm long PVC pipe with diameter 4" or 10 cm

Larger or square rainwater collection pipes are preferred if available.

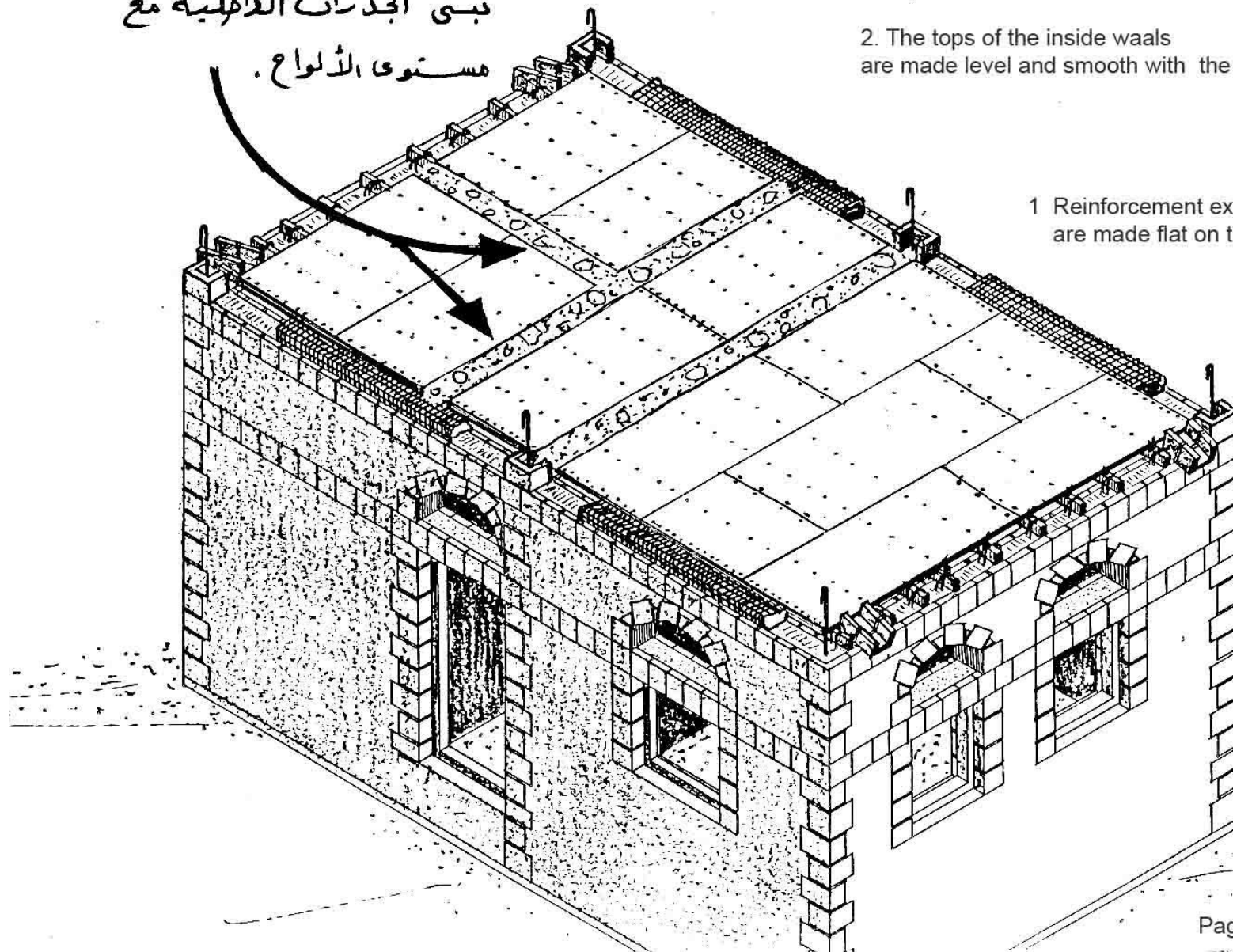
SECTION suitable for dry climate zones only

Reinforced roof plastic goes into the pipe and on to the wall

تبنى الجدران الداخلية مع
مستوى الألواح.

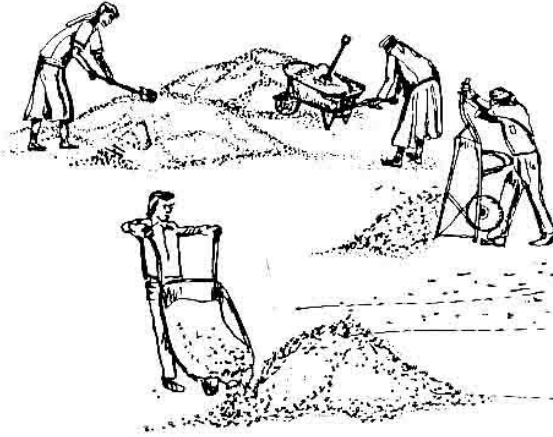
2. The tops of the inside walls
are made level and smooth with the plywood.

1 Reinforcement extensions
are made flat on the wall



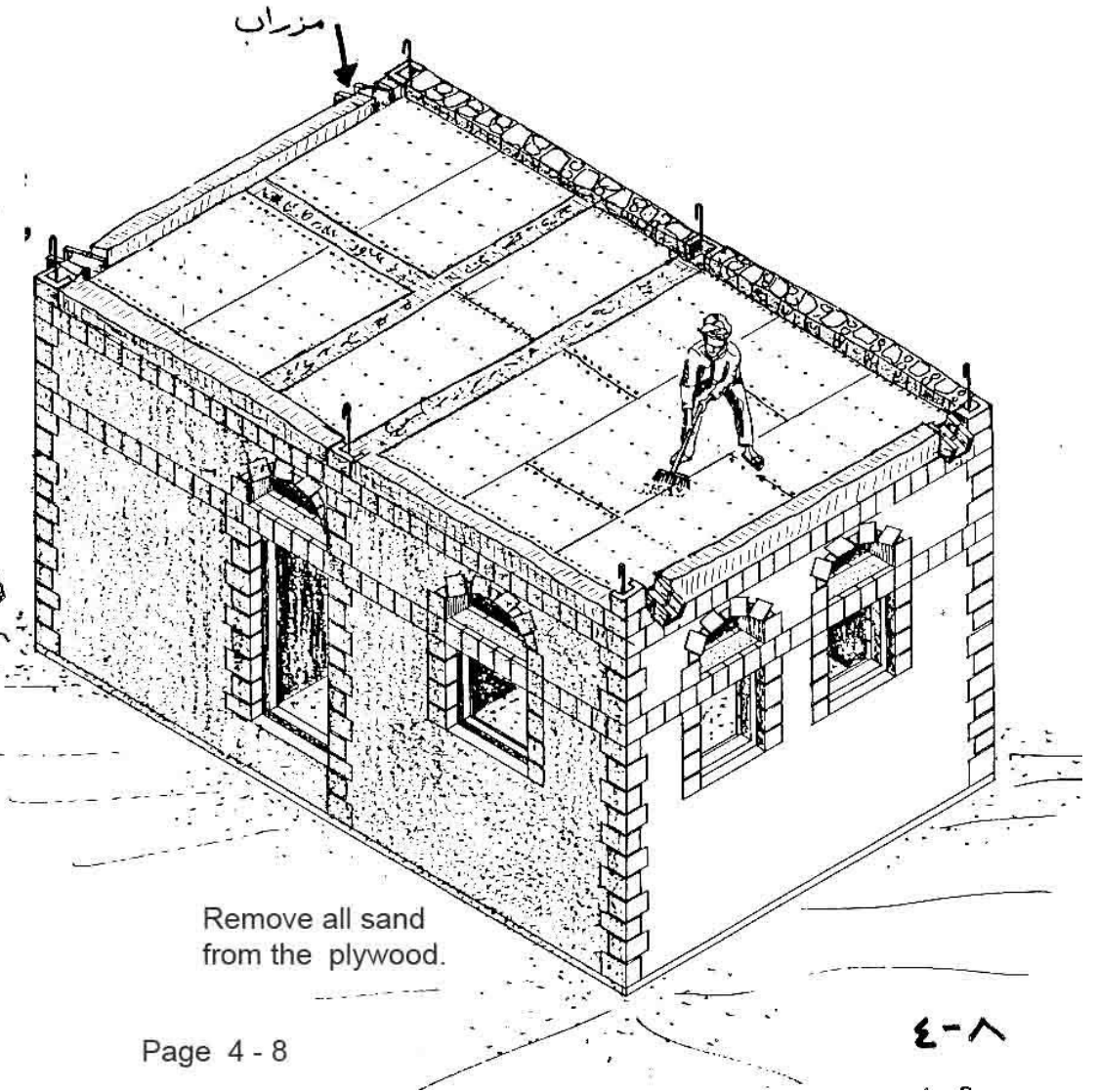
٤-٧

حفر التراب اللازم للسقف.
الجدران الخارجيه يجب أن تكون مرتفعه بمرتبة
عن مستوى السقف.

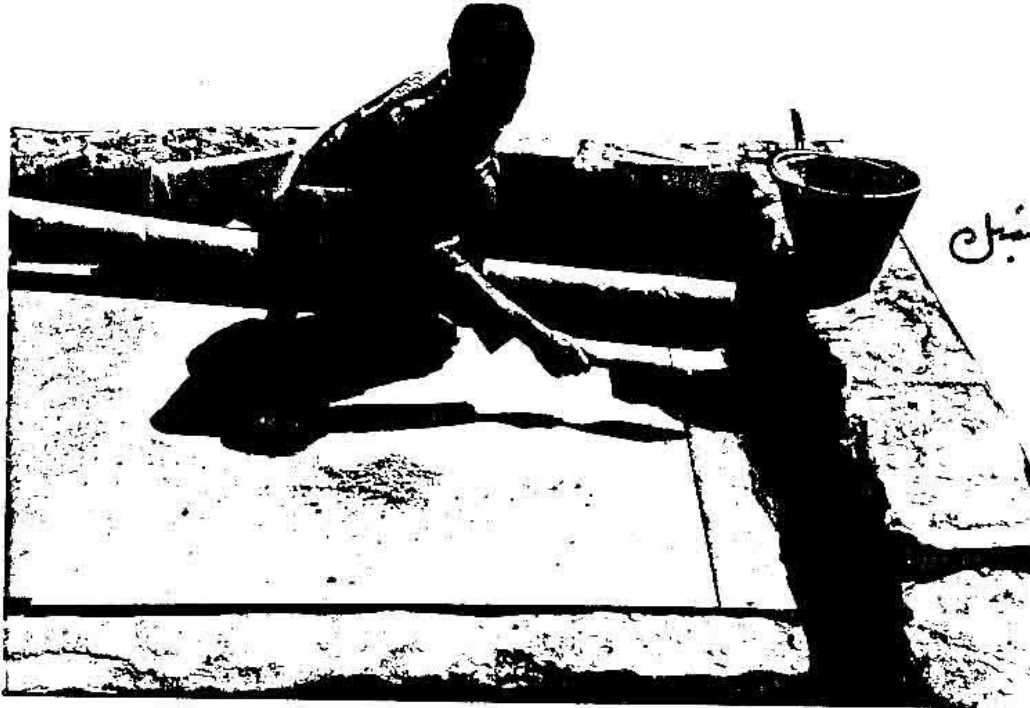


Have the soil ready for covering the roof.

Mason the walls one block higher than the roof



Remove all sand
from the plywood.



يجب تنظيف البلاش قبل وضع البلاستيك
المانك

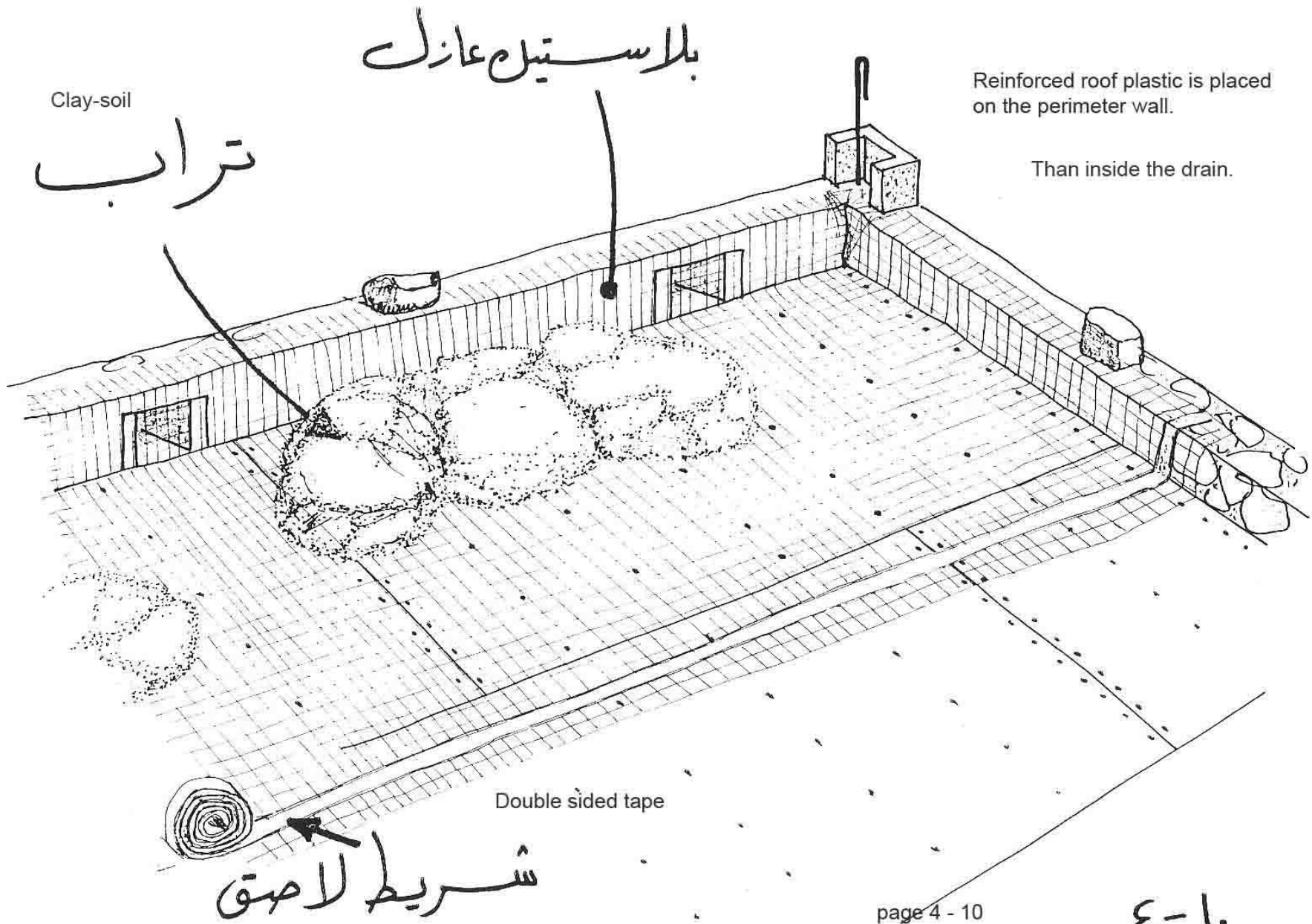
The roof needs carefull cleaning.
no gravel or nails should damage the roofing plastic.



في عمليات إخفاء السطح
يجب أن تكون حافي القدمين
لما هو واضح .

Use bare feet to avoid damaging the roof plastic
Never use shoes on the plastic

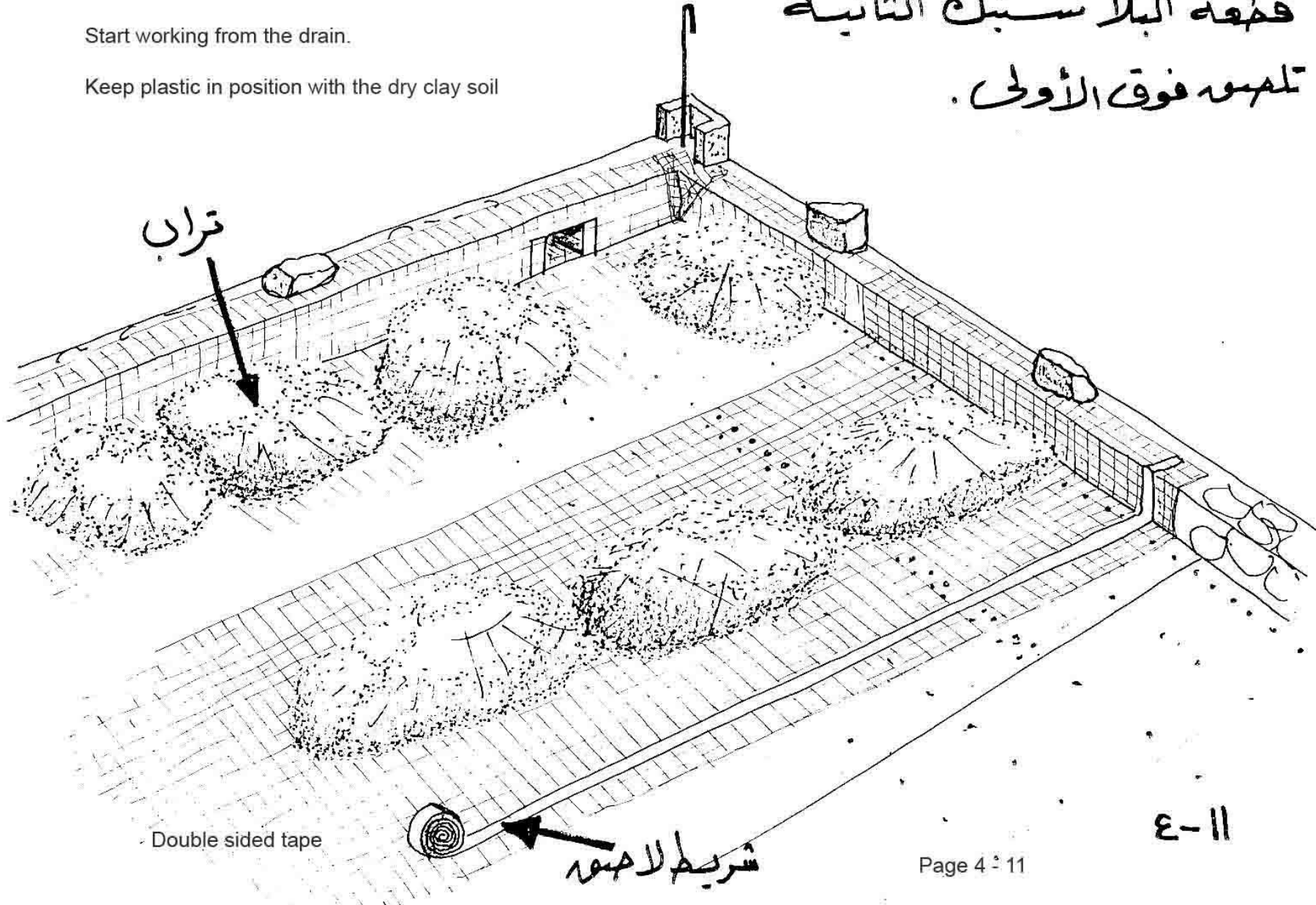




Start working from the drain.

Keep plastic in position with the dry clay soil

قطعة البلاستيك الثانية
تلمسها فوق الأولى.



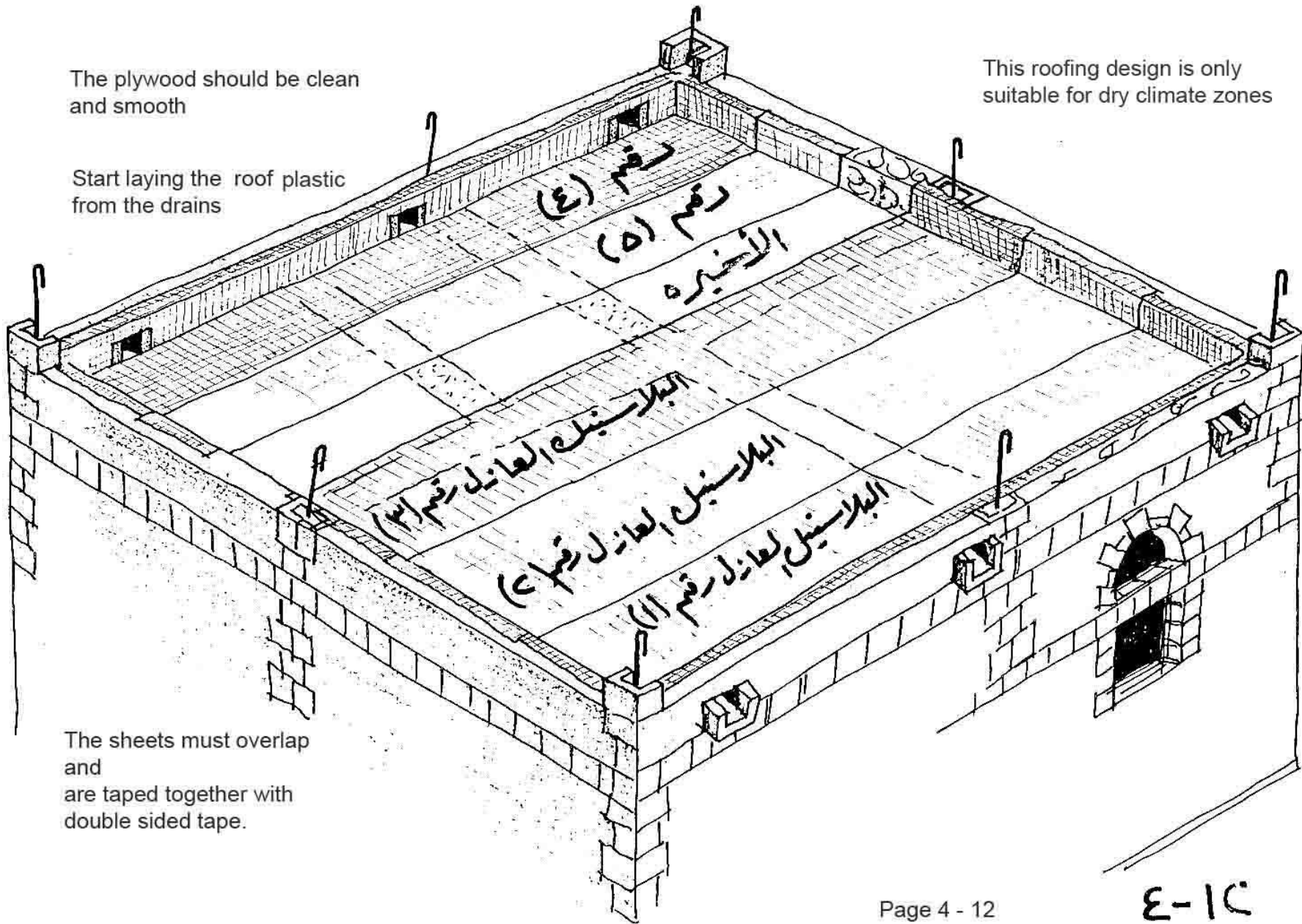
Double sided tape

شريط اللاصق

The plywood should be clean and smooth

Start laying the roof plastic from the drains

This roofing design is only suitable for dry climate zones



The sheets must overlap and are taped together with double sided tape.



في عمليات إنقاذ السطح
يجب أن تكون حافي القدمين
لما هو واضح .

Use bare feet to avoid damaging the roof plastic
Never use shoes on the plastic



The claysoil is sloped, compacted and made smooth

سمل التراب على الجوانب (١٠) سم

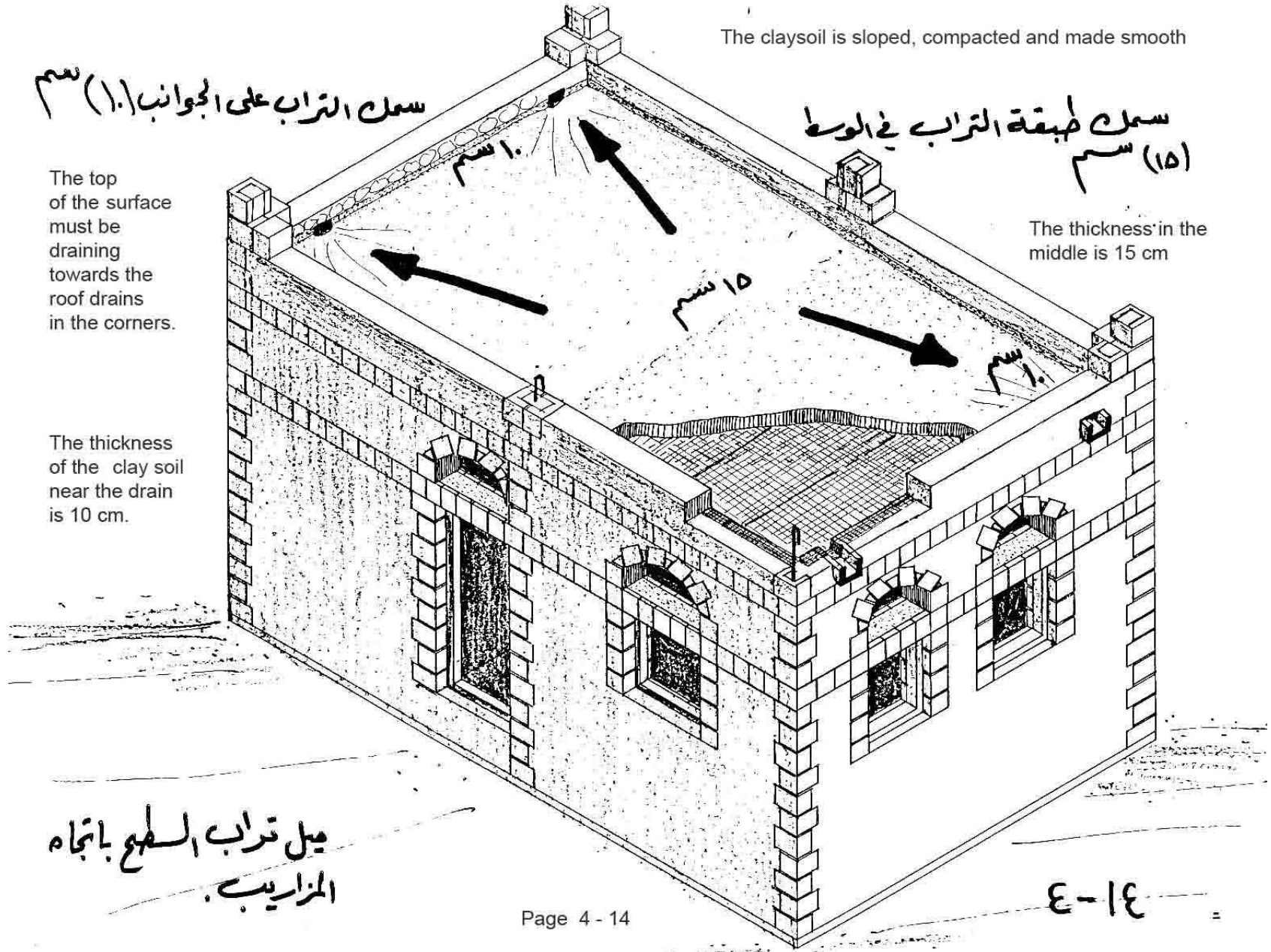
سمل طبقة التراب في الوسط (١٥) سم

The top of the surface must be draining towards the roof drains in the corners.

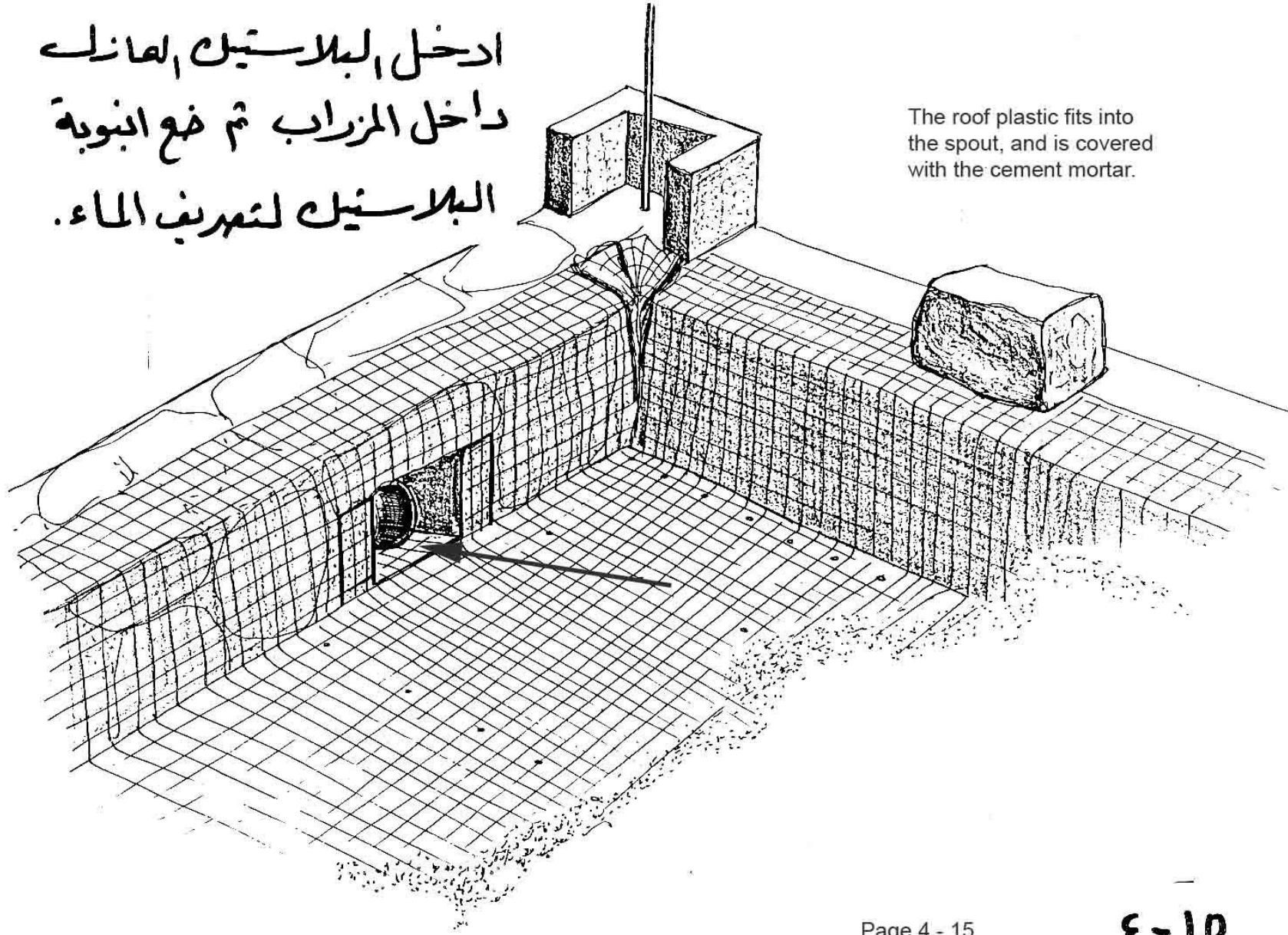
The thickness in the middle is 15 cm

The thickness of the clay soil near the drain is 10 cm.

ميل تراب السطح باتجاه المزاريب.

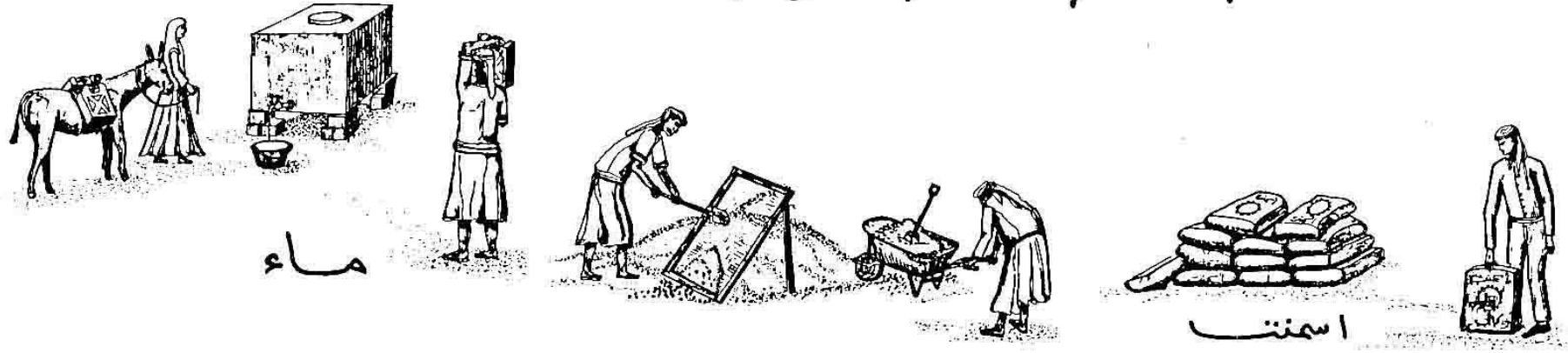


ادخل البلاستيك لعازلك
داخل المزراب ثم ضع ابنوبة
البلاستيك لتعريف الماء.



The roof plastic fits into
the spout, and is covered
with the cement mortar.

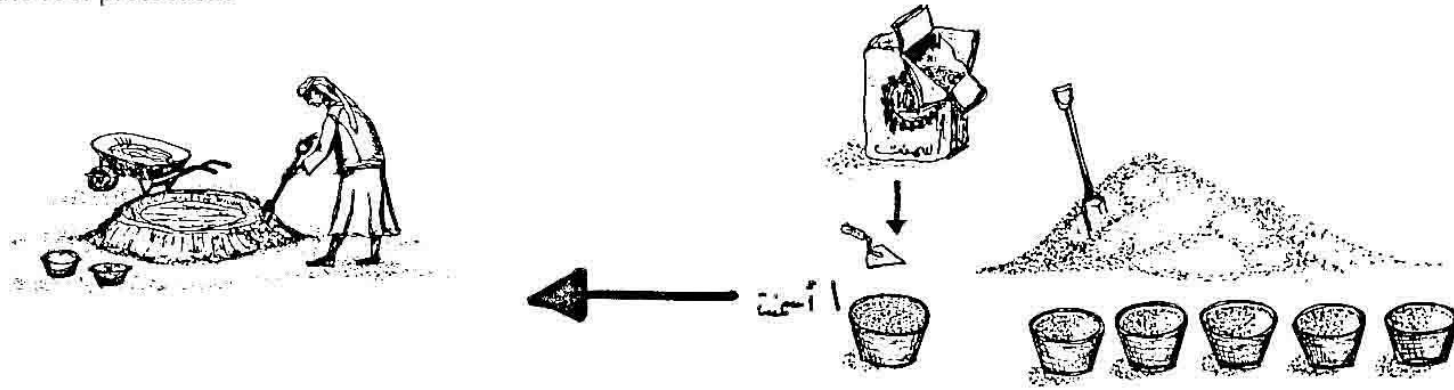
نسب الخلطة لغطاء تراب السقف



ماء

اسمنت

Plaster for the roof protection.



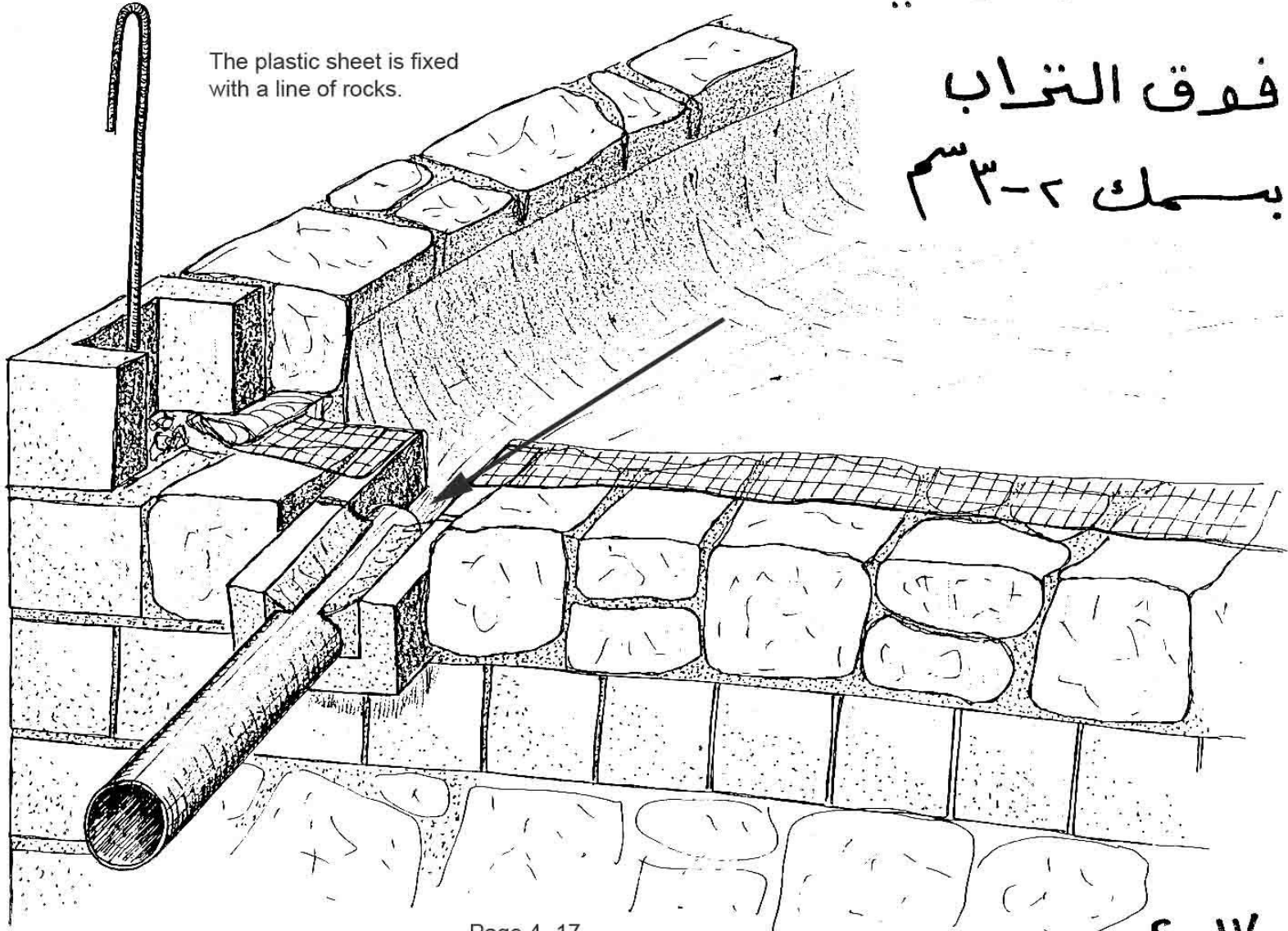
نسب الخلطة :
٥ نيس : ١ اسمنت

Mixture 1 lime and 5 sand

٥ نيس

The plastic roof sheet goes into the plastic pipe.

The plastic sheet is fixed with a line of rocks.



خلطه أسمنتية

فوق التراب

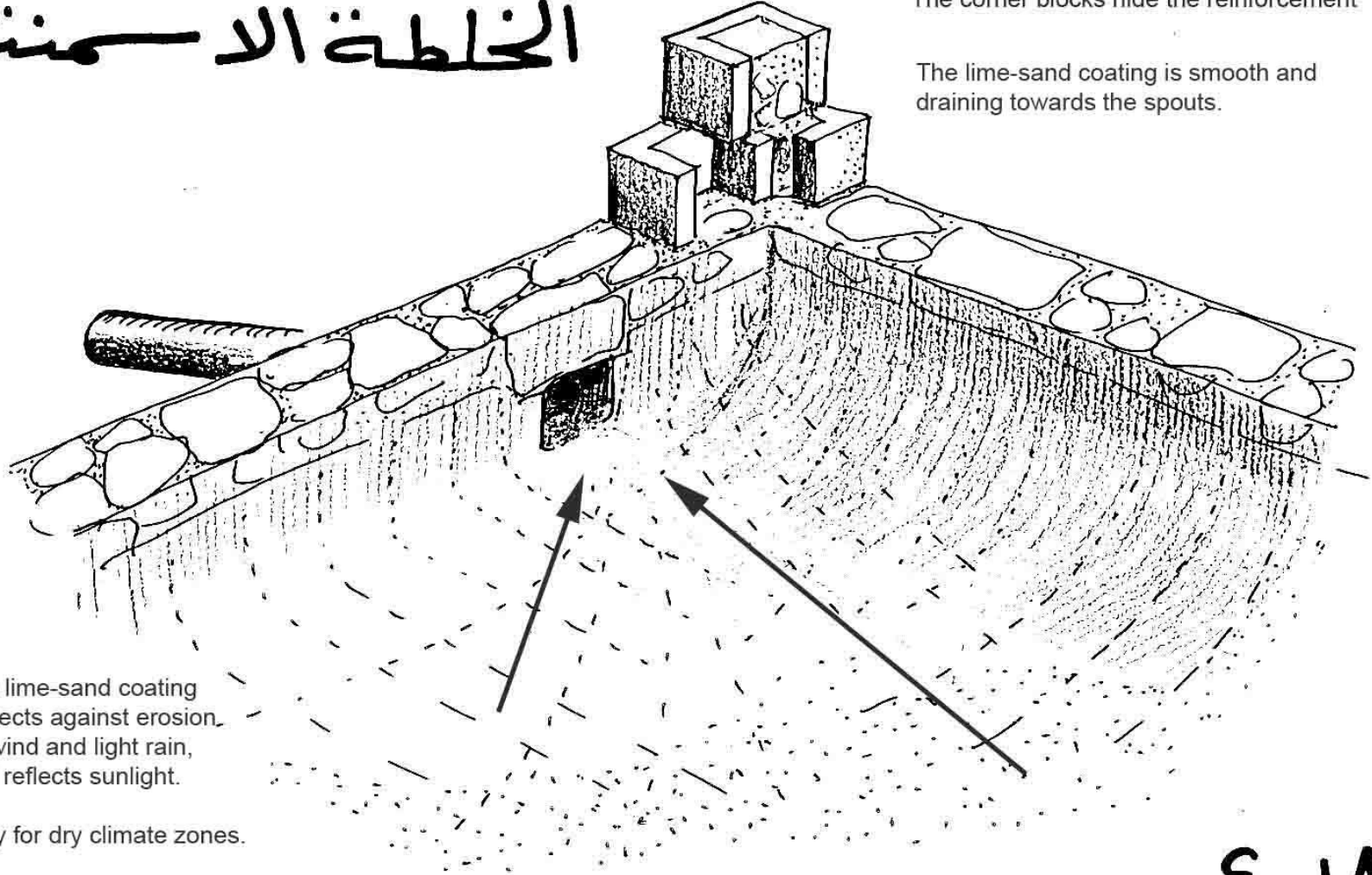
بسمك ٢-٣ سم

طبقة تراب فوق الخلطة الاسمنتية

Roofplastic is draining to the spouts

The corner blocks hide the reinforcement

The lime-sand coating is smooth and draining towards the spouts.

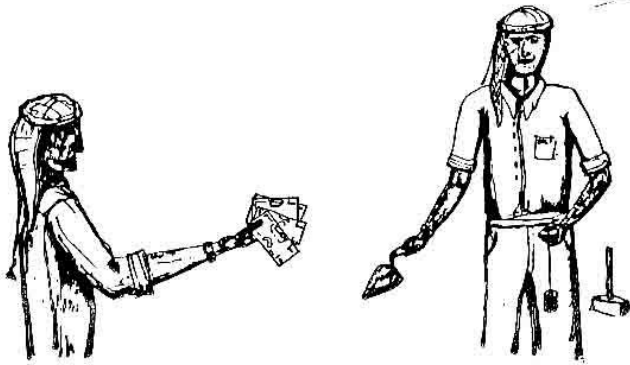
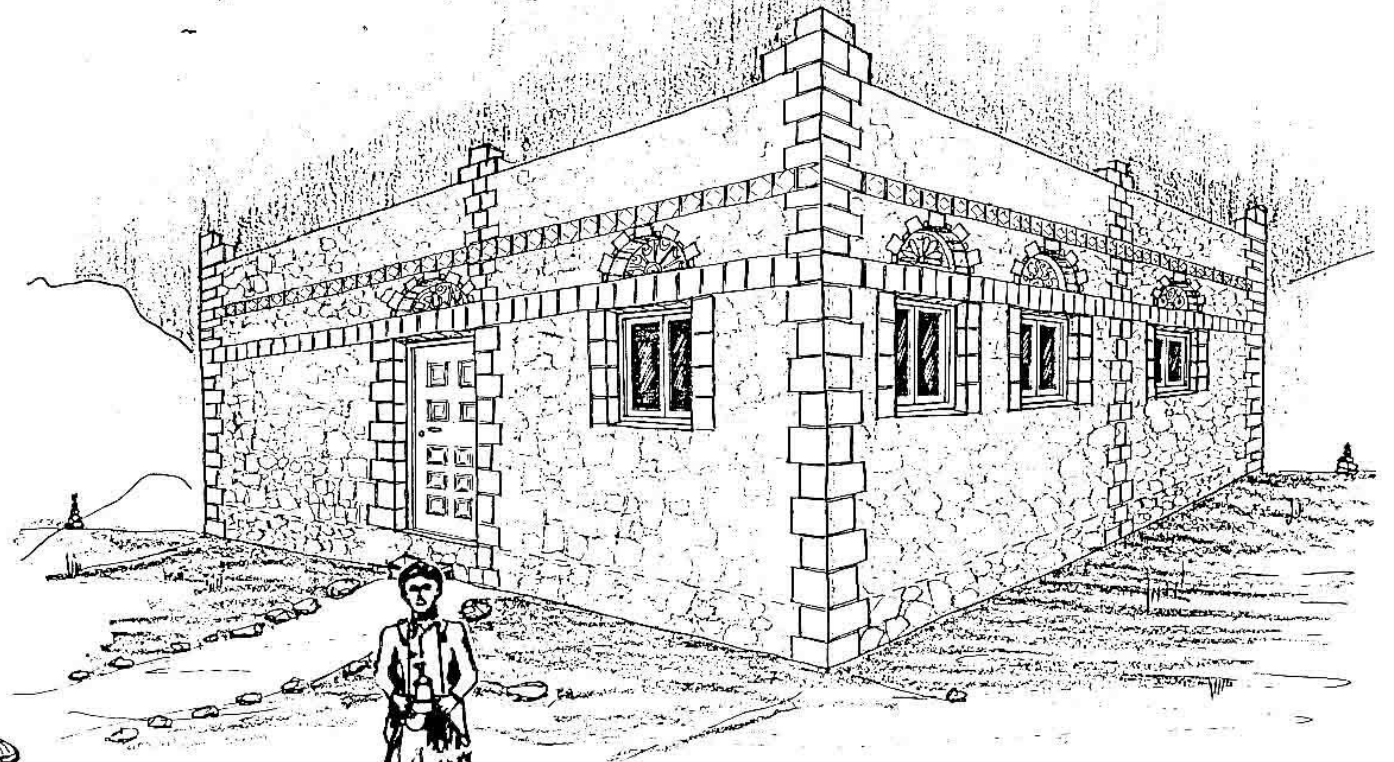


The lime-sand coating protects against erosion, by wind and light rain, and reflects sunlight.

Only for dry climate zones.

بدفع أجر المرحلة الرابعة
بعد تثبيت الشبابيك والباب
الرئيسي (الدارمي).

When the door and the windows
are fitted, the fourth phase
will be paid.



٤-١٩

EXTRA PAGE

The additional thermal insulation becomes more important when the walls are thinner and when the amount of cement in the walls increases. This is the case with the use of only cement blocks.

In climates with cold winters, additional thermal insulation of roofs will increase comfort and reduce heating expenses.

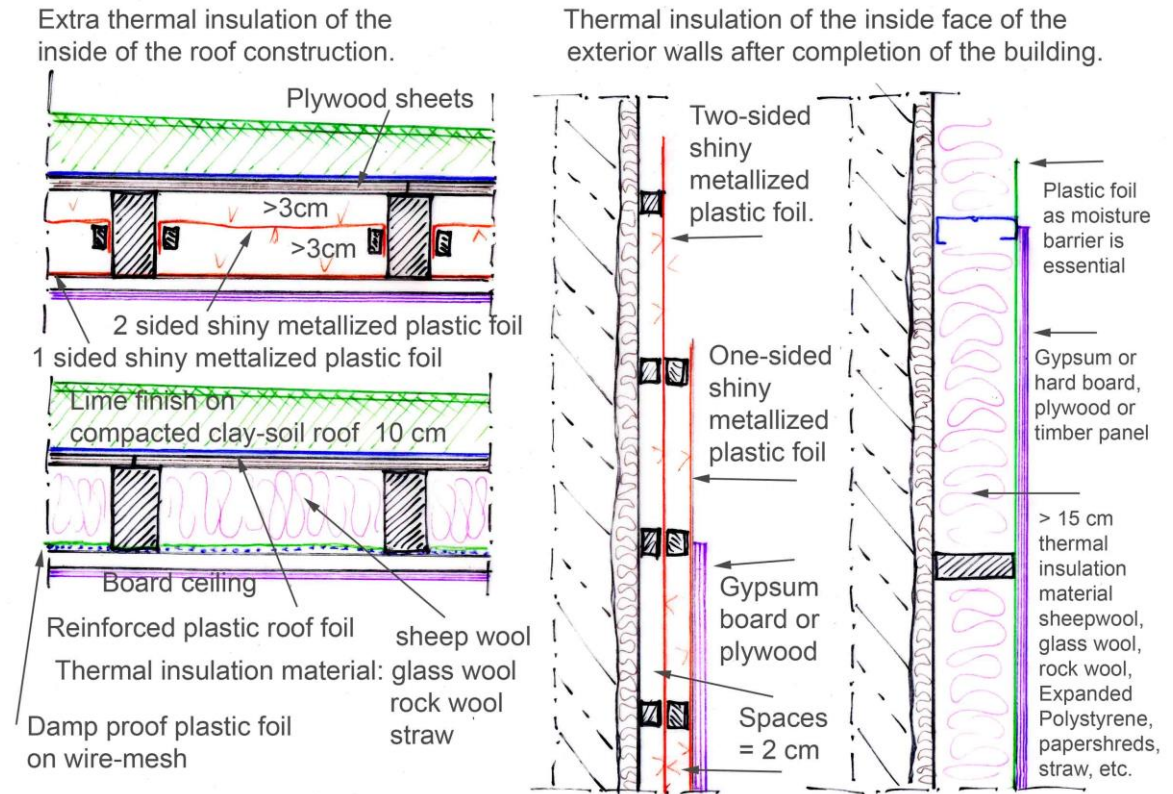
Both types of thermal insulation indicated here have about the same insulation value.

The shiny reflective metalized plastic foil in combination with a 2 x 2 cm air gap has a very high insulation value.

More information about thermal insulation of buildings in stone construction is available on the website www.nienhuys.info and include thermal insulation of floors and windows. Also, information is here available on how to calculate the various insulation designs.

For different climate situations, such as with more rain than in Dhamar, other roof finishing's will be required that are better waterproof. The current clay-soil layer and lime plaster finish will absorb the light rains, after which the roof will dry up again.

Page 4-20



***** End file *****