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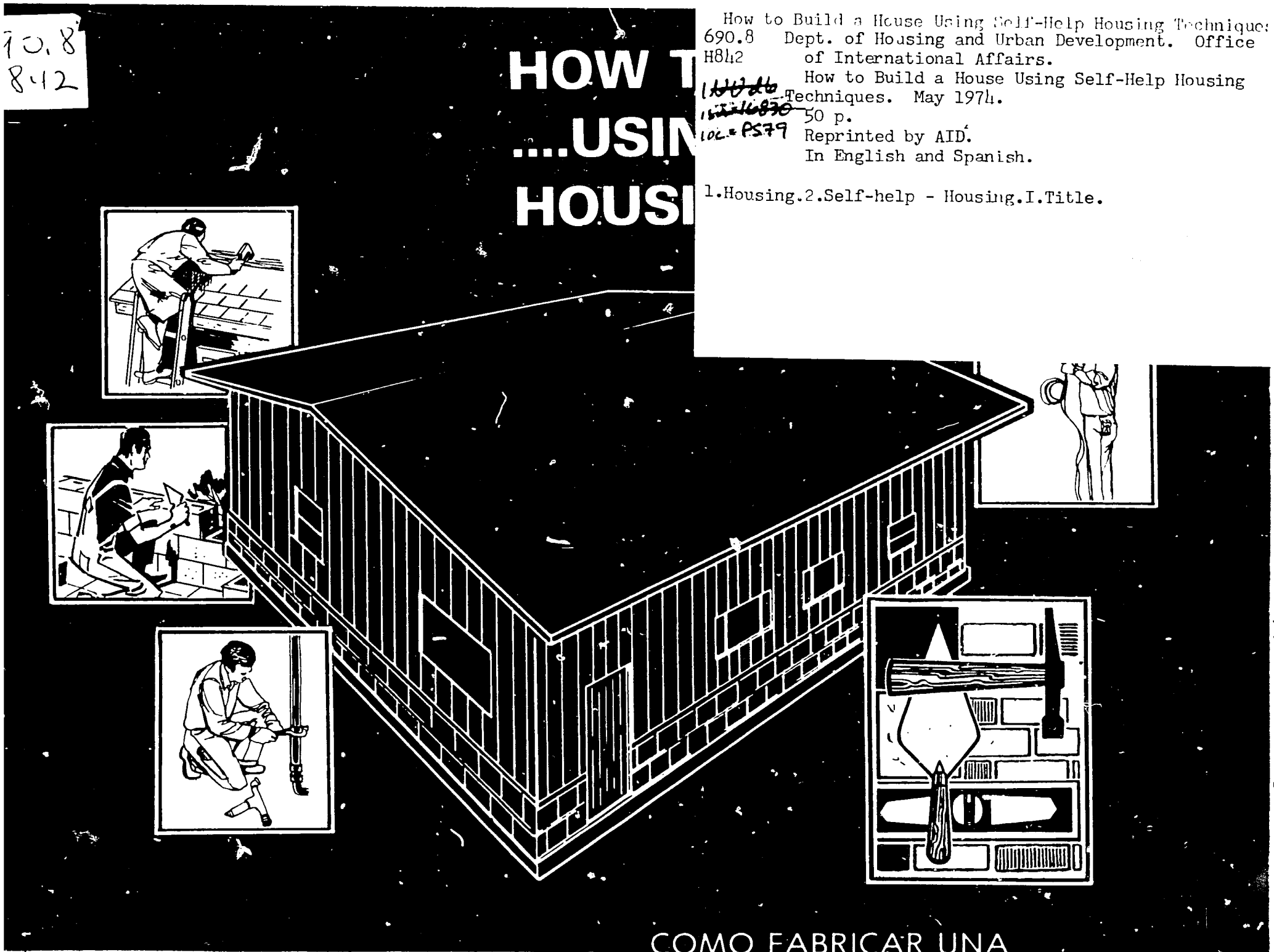
How to Build a House Using Self-Help Housing Techniques
Dept. of Housing and Urban Development. Office of International Affairs.
How to Build a House Using Self-Help Housing Techniques. May 1974.
50 p.
Reprinted by AID.
In English and Spanish.

1.Housing.2.Self-help - Housing.I.Title.



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SUBJECT - Manual, How to Build a House Using Self-Help Housing Techniques

REFERENCE -

The Office of International Affairs, Department of Housing and Urban Development, with support from LA/DR, has produced a manual which presents graphically and with captions in English and Spanish, basic methods used in building a home. This manual has been conceived as a basic handbook for guiding either individuals or groups in building or adding to a home. Particularly, it is intended for use in the field by those involved in self-help home building or home improvement projects.

A copy of this manual is sent herewith for perusal by Missions. We would appreciate receiving any suggestions Missions may have on the beneficial use of this manual in the field and on its possible improvement. Missions may request additional copies through LA/DR/UI, according to their needs.

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JOSEPH J. SISCO

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PAGE 1 OF 2

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The Office of International Affairs, Department of Housing and Urban Development, has published this manual on self-help housing in the interests of the dissemination of information and knowledge of interest to U.S. domestic and other low income family needs. The techniques presented are not necessarily representative of construction in any given geographical area.

MAY 1974

You can build your own house!

This manual is designed as a graphic means of demonstrating the basic methods and techniques used in building a home, whether it be a one room cabin or a more complicated dwelling with an electric, plumbing and sewage system. It has been conceived as a basic technology handbook for use by either individuals or groups of individuals who have the goal of building, or adding to, a home of their own, and for those involved in self-help home building or home improvement projects.
Much of the graphics material has been reproduced from a manual on the same subject produced by the Inter-American Institute for Housing located in Bogota, Columbia, in collaboration with the National University of Columbia, and the Institute for Territorial Credit, the Colombian Government agency for the development of low cost housing.

! Usted puede fabricar su propia casa!

Este manual ha sido disenado con el objeto de demostrar en forma grafica, los metodos y tecnicas basicos que se utilizan en construir una casa; sea esta del tipo de cabana de un cuarto o de un tipo de vivienda mas complicado - con electricidad, instalacion de canerias y sistema de alcantarillado. Esta manual ha sido concebido como un texto basico y tecnologico para ser utilizado ya sea individualmente o por grupos de individuos cuyo objetivo se encamine a construir, o agregar en parte, su propia casa, y para aquellos involucrados en construcciones de casa - por su propia ayuda - o proyectos de mejoras de viviendas.
Gran parte del material grafico ha sido reproducido de un manual que trata sobre la misma materia presentado por el Instituto Inter-Americano de Viviendas ubicado en Bogota, Columbia, en colaboracion con la Universidad Nacional de Columbia, el Instituto de Credito Territorial, y por la agencia de desarrollo de viviendas de bajo costo del Gobierno de Columbia.

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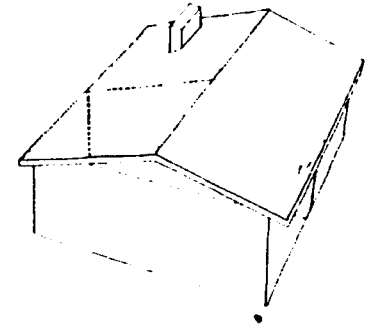
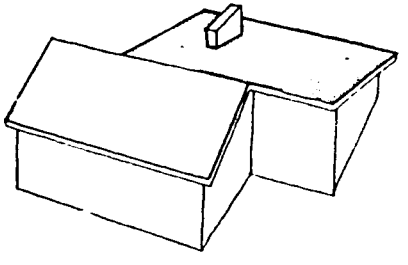
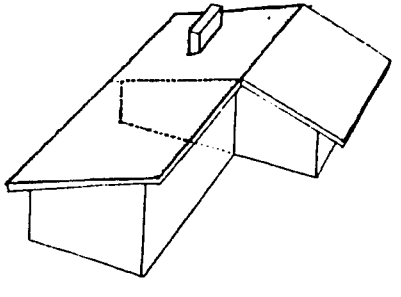
Shelter Types
Tipos de Casas

Units for Rainy Climates

Casas para Clima Húmedo

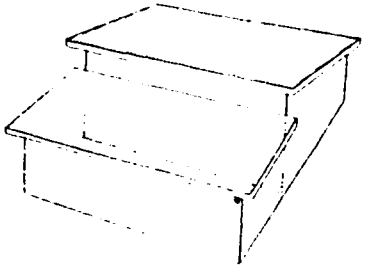


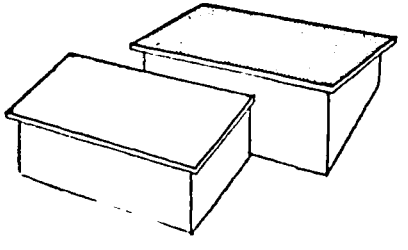


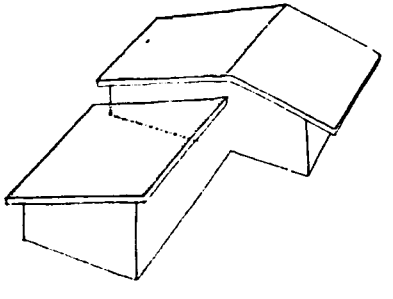


Units on Sloped Terrain

Casas en Desnivel

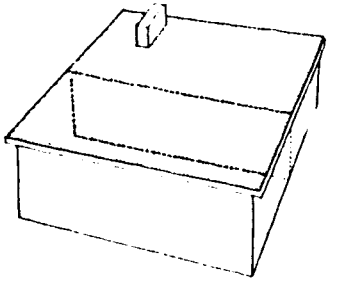


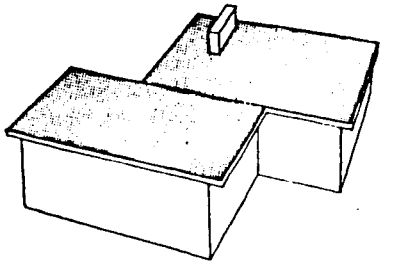


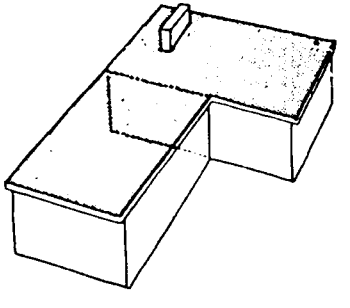


Units for Hot Climates

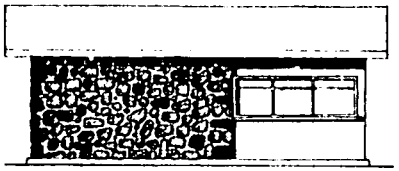
Casas en Clima Caliente

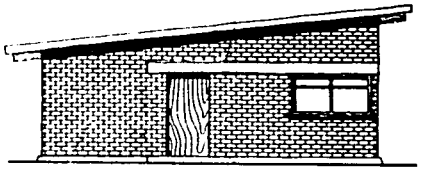


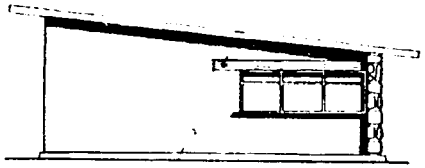


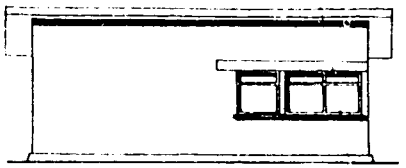


Units for Temperate Zones
Casas en Clima Templado

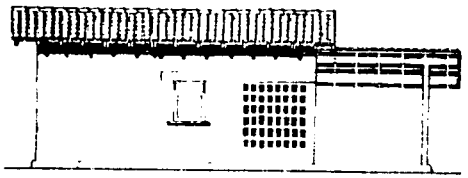


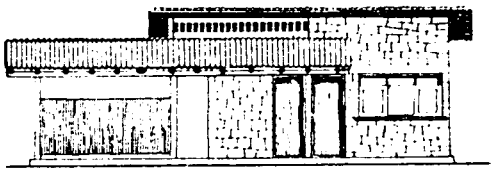


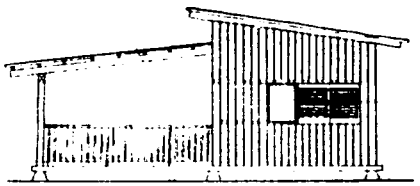


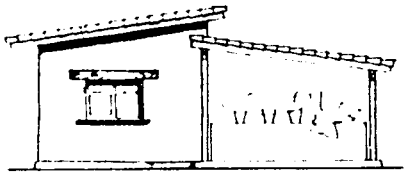


Units for Hot, Humid Zones
Casas en Clima Caliente Húmedo









Parts of a House
Los Cuartos de una Casa

Kitchen
Cocina

Shows Space Required for Equipment and Circulation
Muestra del Epacio Necesario para Muebles y Circulación

Dining Room
Comedor

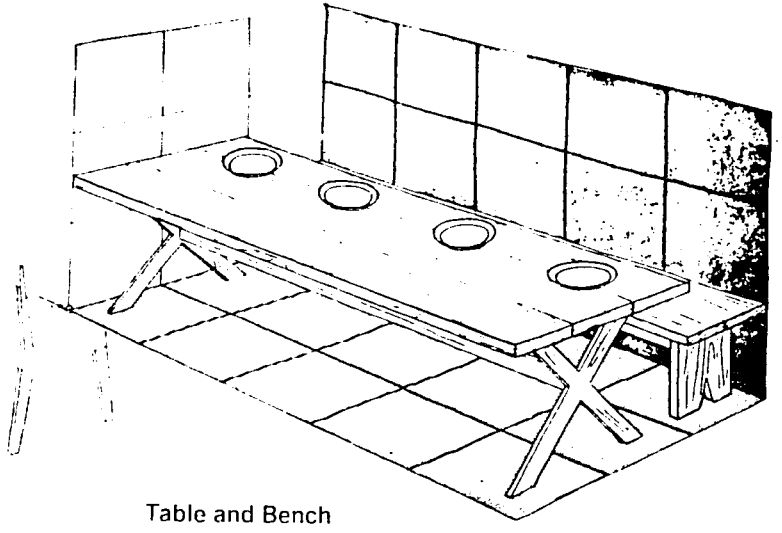
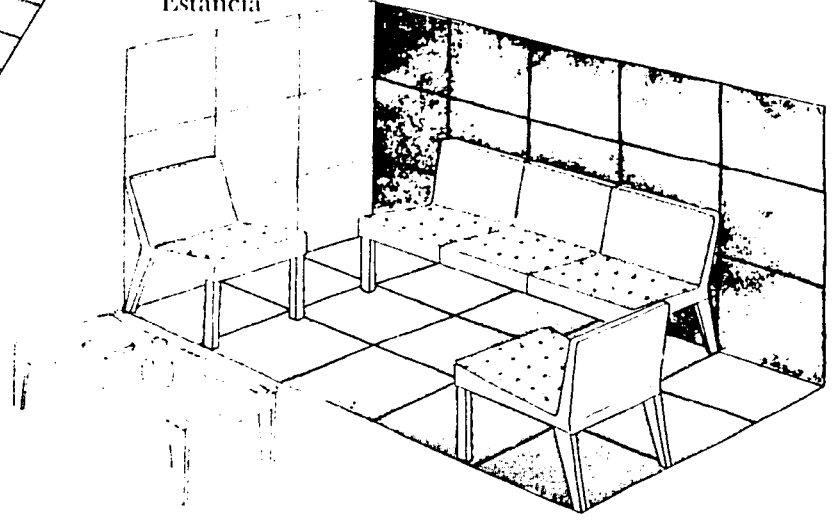


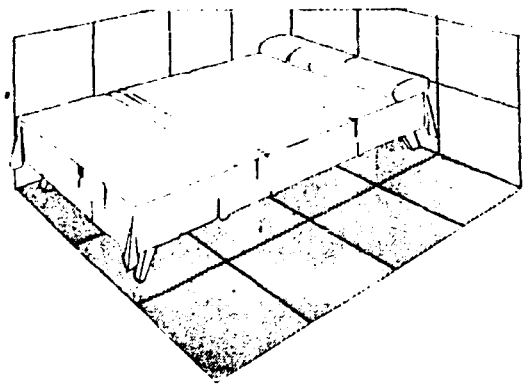
Table and Bench
Mesa, Banco-Silla

Living Room
Estancia

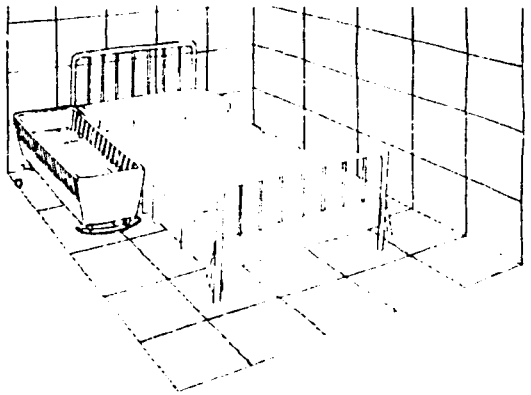


Couch and Table
Sofá y Mesa

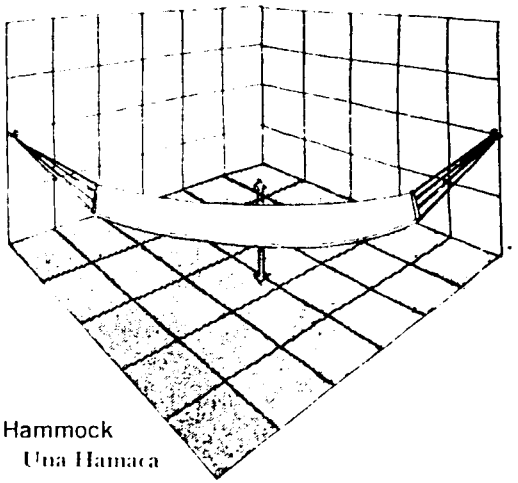
Bedroom
Las Camas



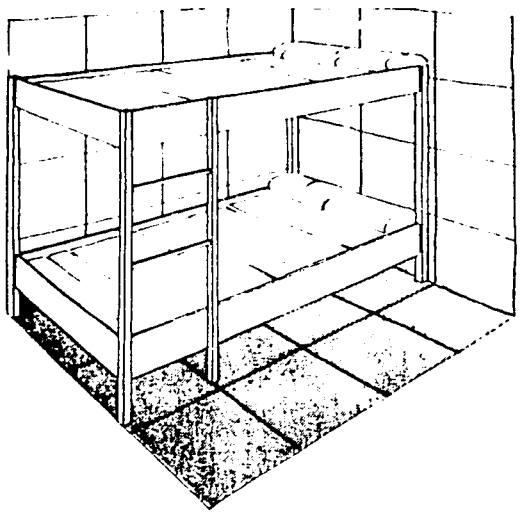
Single Bed Space
Espacio para Cama Individual



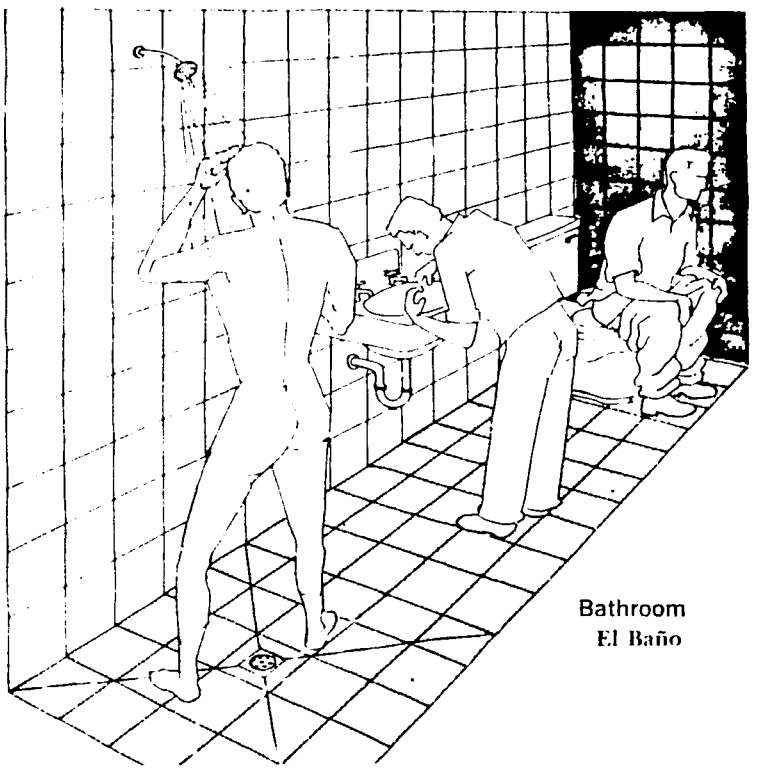
Bed with Crib
Espacio para Cama Mediana y Cuna



Hammock
Una Hamaca

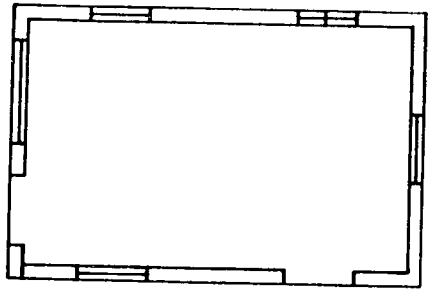


Bunks
Espacio para Dos Literas

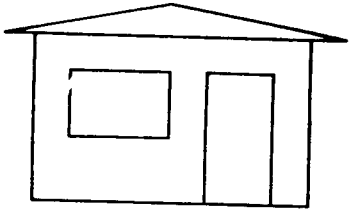


Bathroom
El Baño

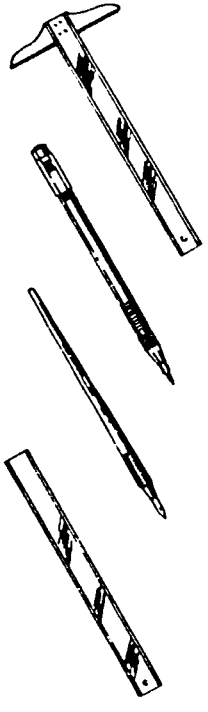
The Drawing
El Plan

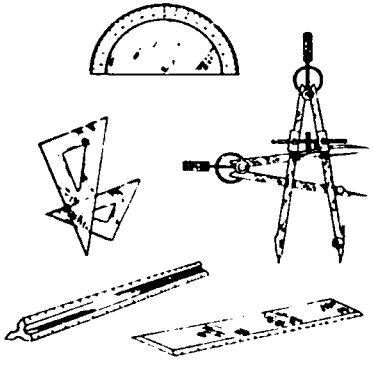


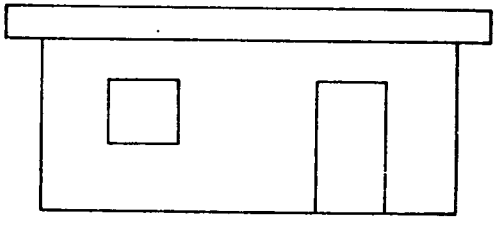
View from Above
Vista de Arriba



Side View (Left)
Vista de Izquierda



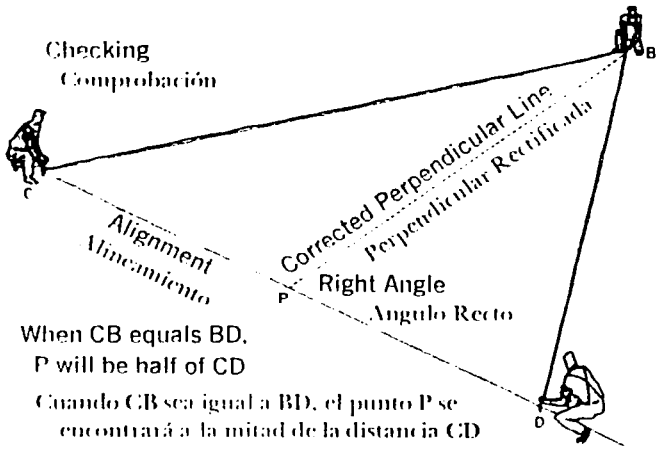




Front View
Vista de Enfrente

Laying Out a Building
Contorno de la Construccion

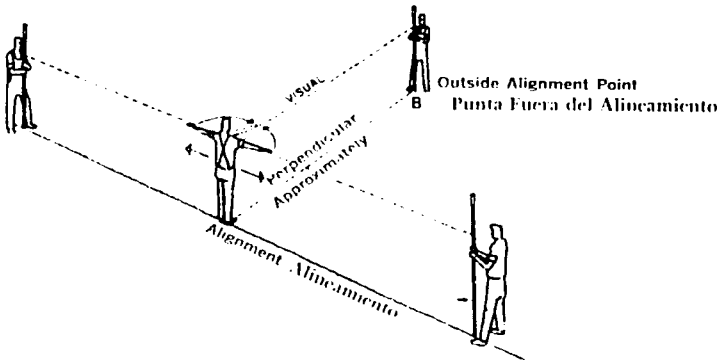
Checking
Comprobación



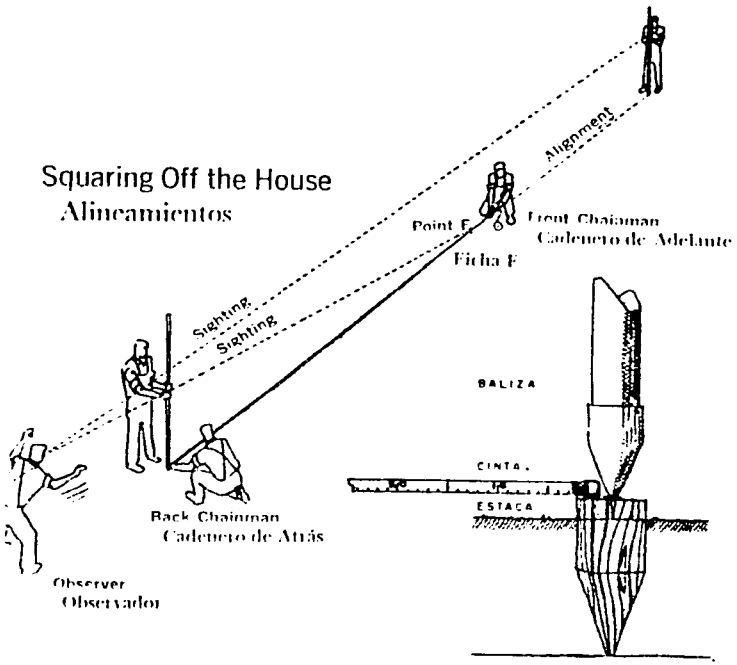
When CB equals BD,
P will be half of CD

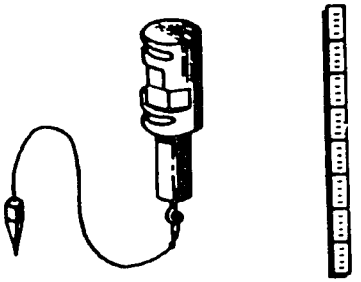
Cuando CB sea igual a BD, el punto P se encontrará a la mitad de la distancia CD

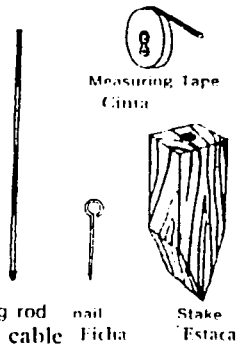
Squaring the Layout
Localización de la Casa

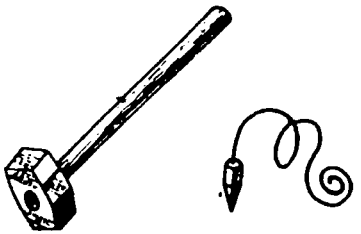


Squaring Off the House
Alineamientos

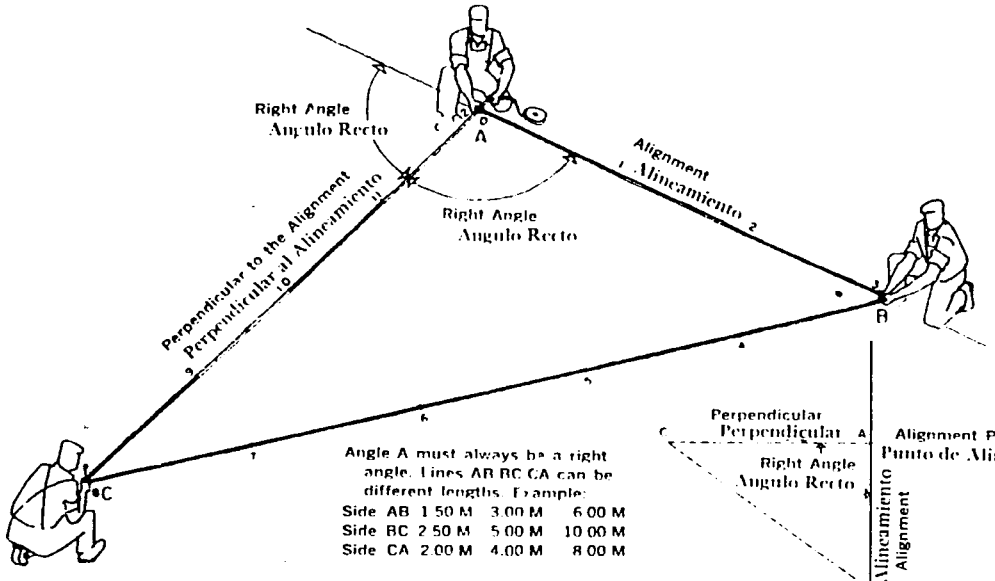








Layout and Levelling
Contorno y Nivelación

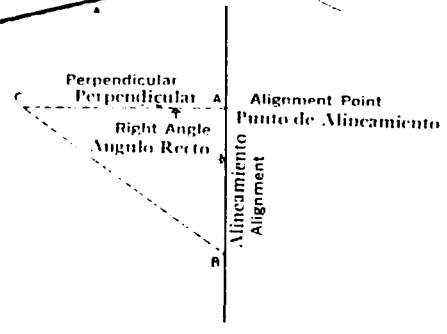


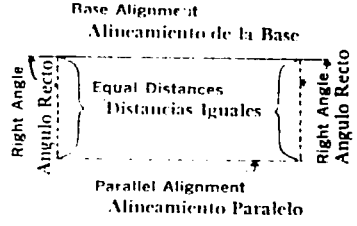
Angle A must always be a right angle. Lines AB BC CA can be different lengths. Example:

Side AB	1.50 M	3.00 M	6.00 M
Side BC	2.50 M	5.00 M	10.00 M
Side CA	2.00 M	4.00 M	8.00 M

El ángulo en A siempre será recto. Las distancias AB BC CA pueden variar según convenga. Ejemplo:

Lado AB	1.50 M	3.00 M	6.00 M
Lado BC	2.50 M	5.00 M	10.00 M
Lado CA	2.00 M	4.00 M	8.00 M





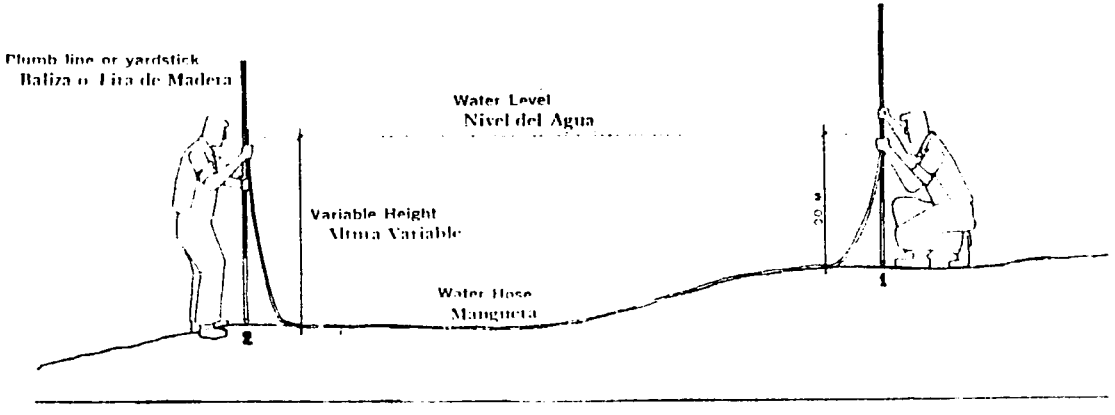
Tools
Utensilios

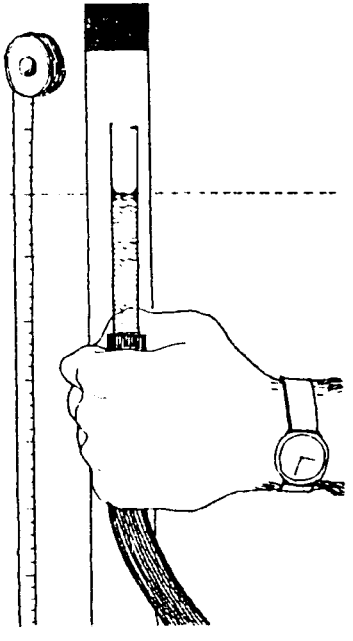
Plumb Line
Baliza

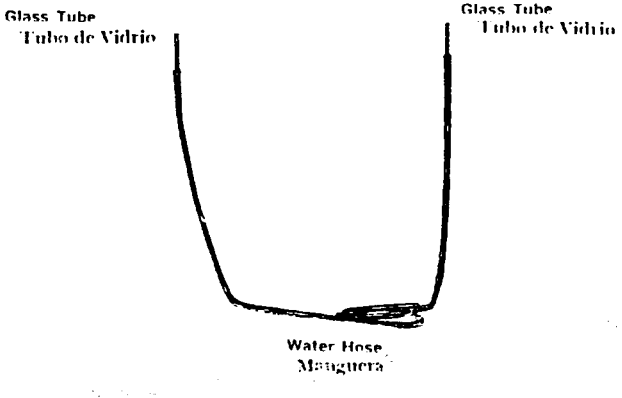
Metric Tape
Cinta Métrica

Establishing a level between two points

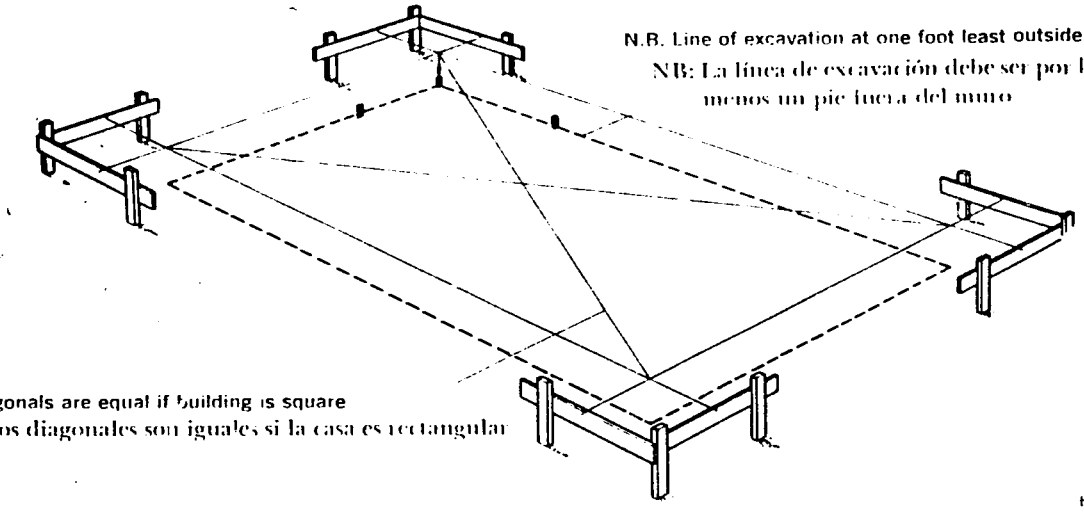
Nivelación entre dos puntos



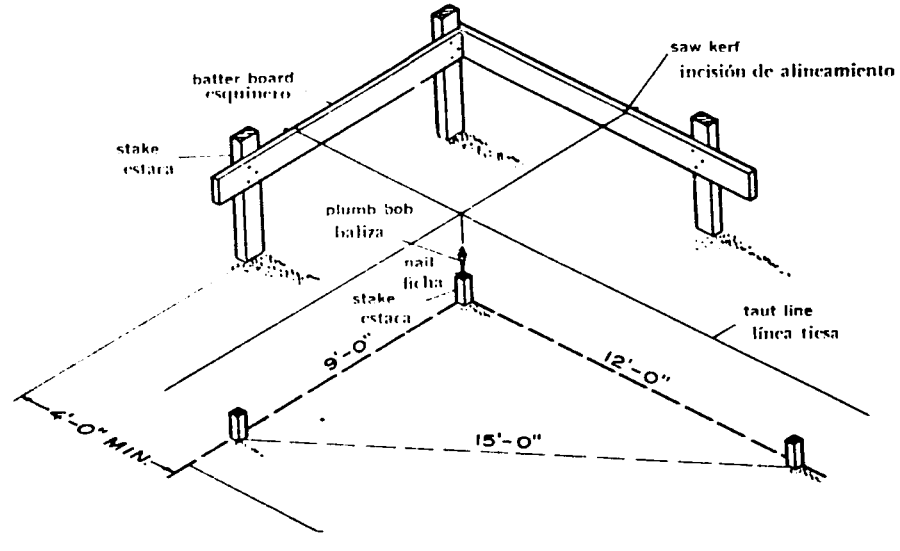




Staking and Laying Out the House
Apuntando y Localizando la Casa

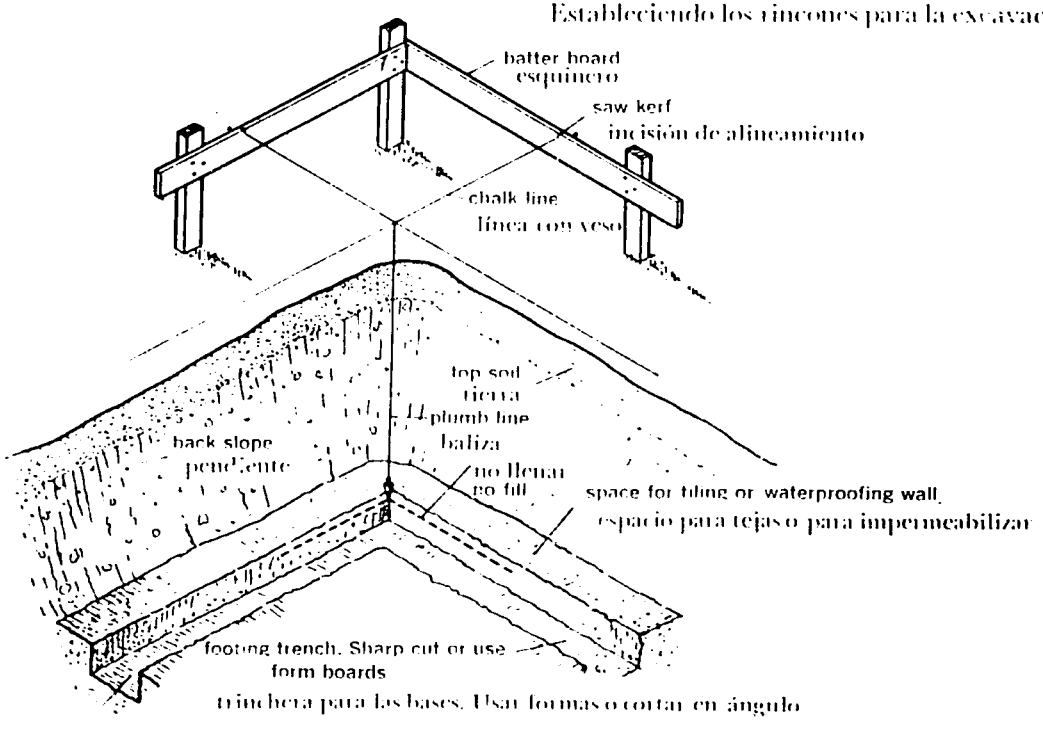


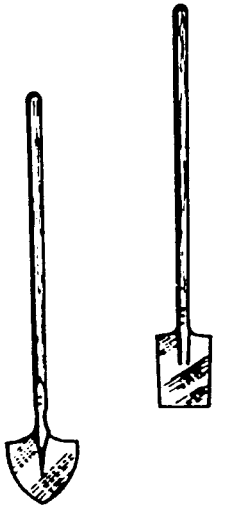
Outside line of foundation wall
Línea externa de la fundación

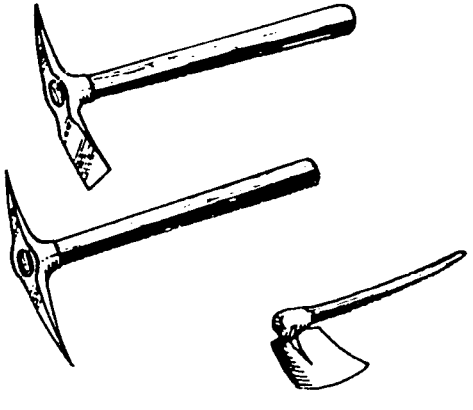


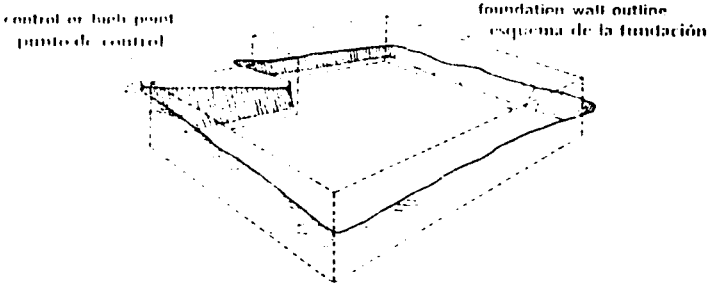
Establishing corners for excavation and footings

Estableciendo los rincones para la excavación y las bases





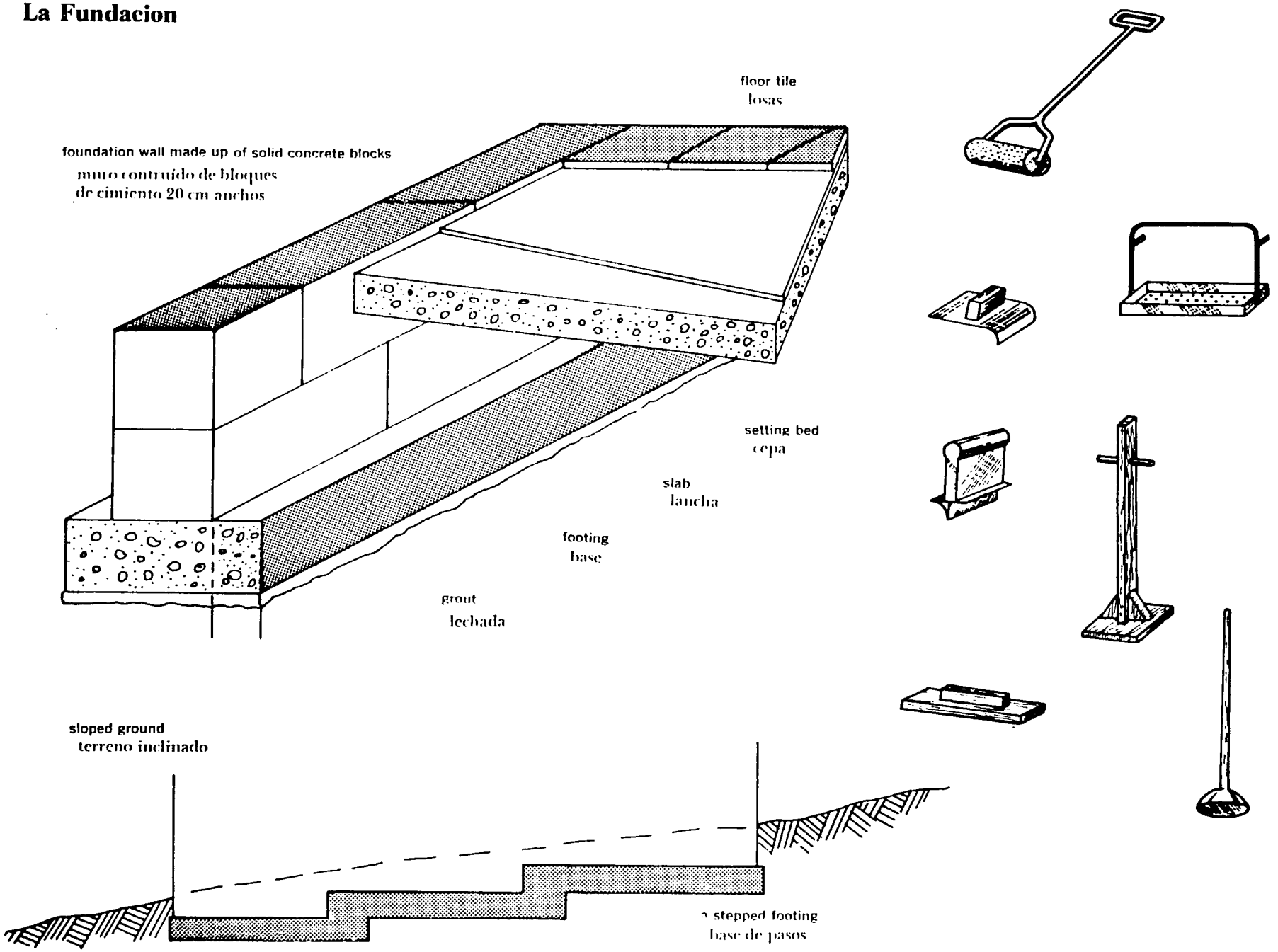


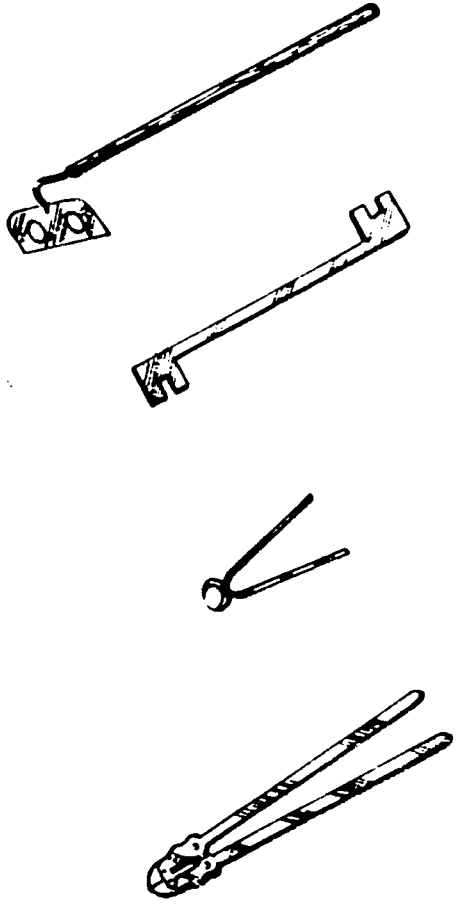


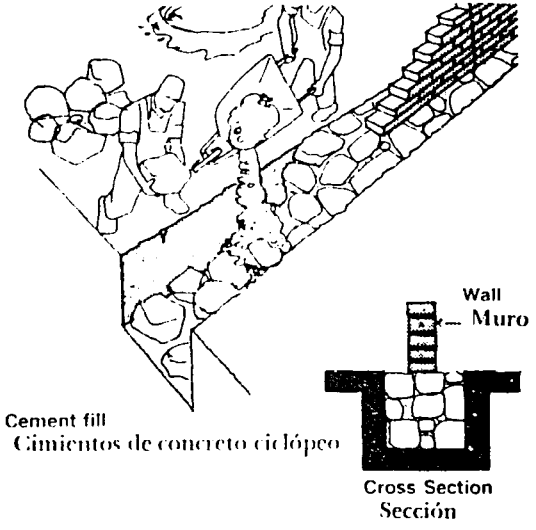
Establishing Depth of Excavation

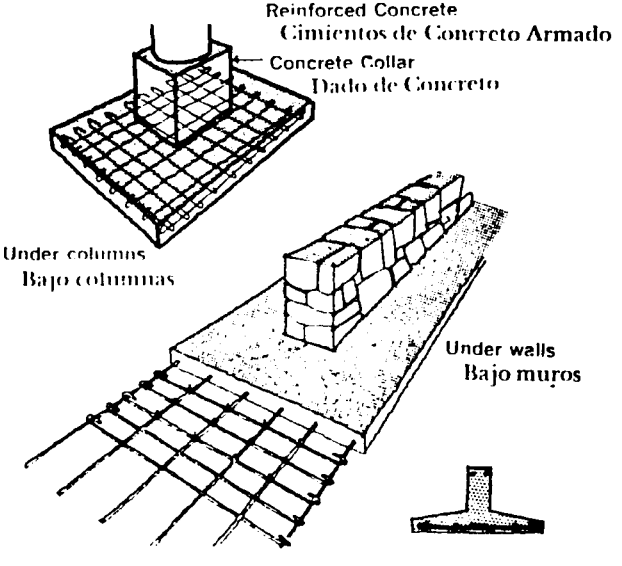
Estableciendo la profundidad de la excavación

The Foundation
La Fundacion

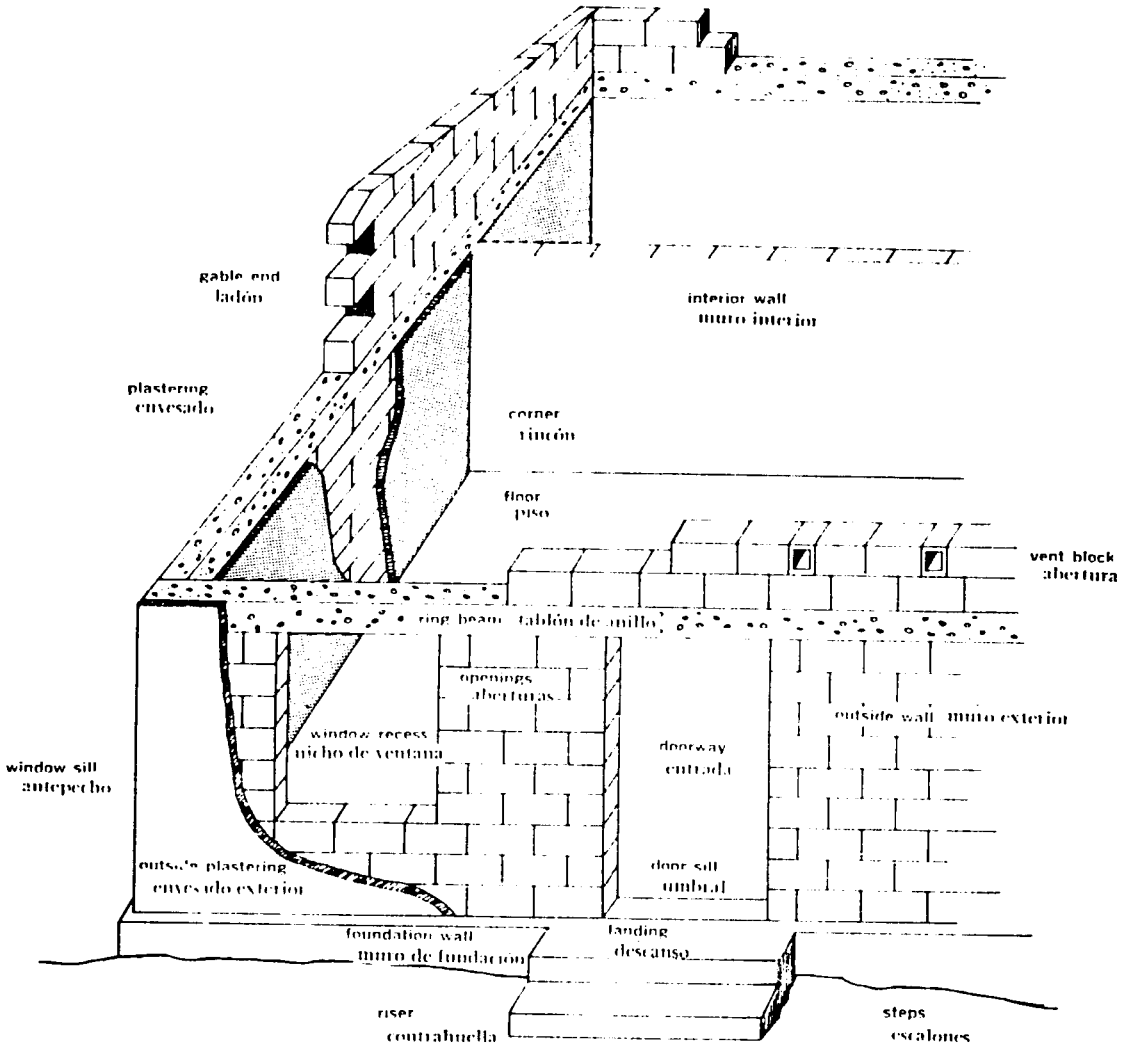




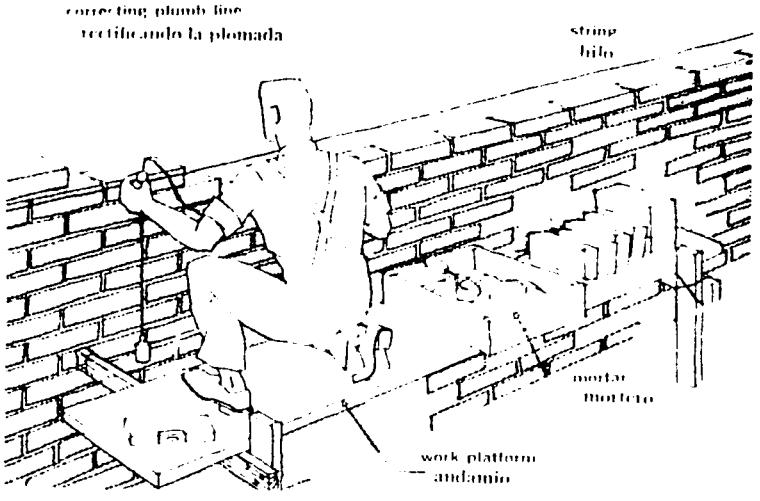

Wall
Muro
Cement fill
Cimientos de concreto ciclópeo
Cross Section
Sección

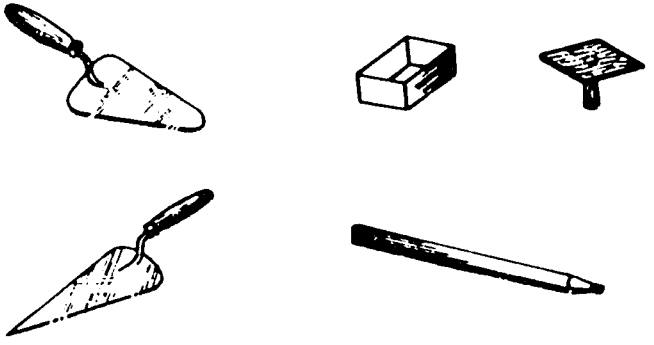

Reinforced Concrete
Cimientos de Concreto Armado
Concrete Collar
Dado de Concreto
Under columns
Bajo columnas
Under walls
Bajo muros

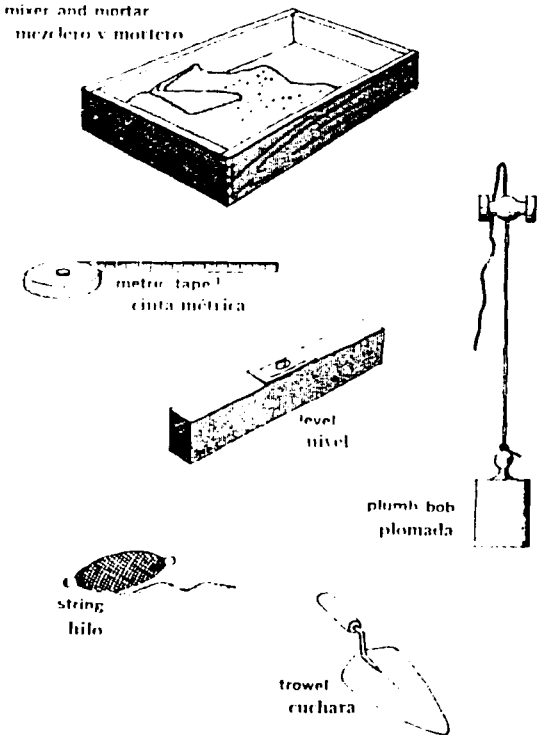
The Walls
Los Muros

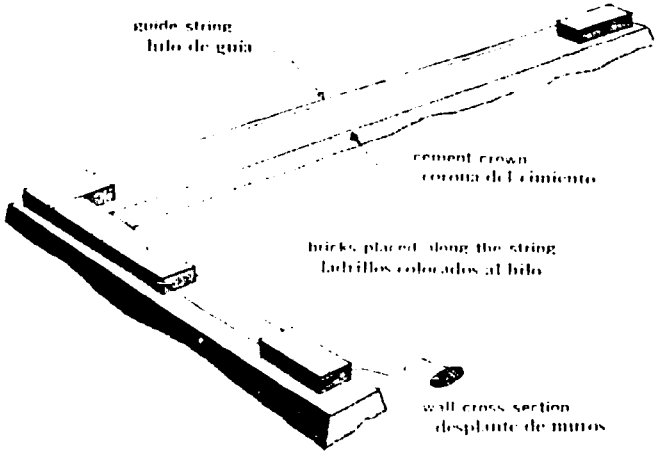


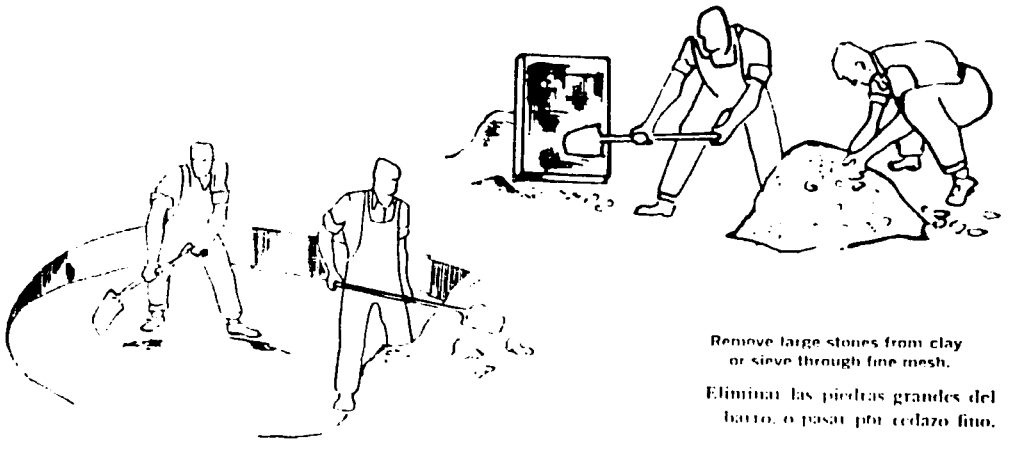
Brick or Cement Block Walls
Muros de Ladrillo







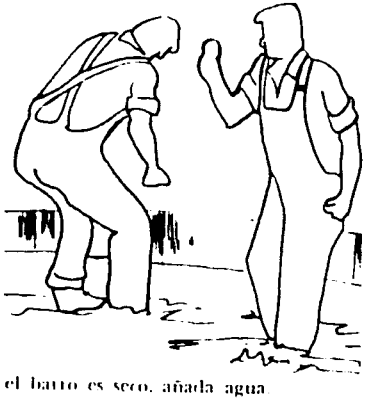




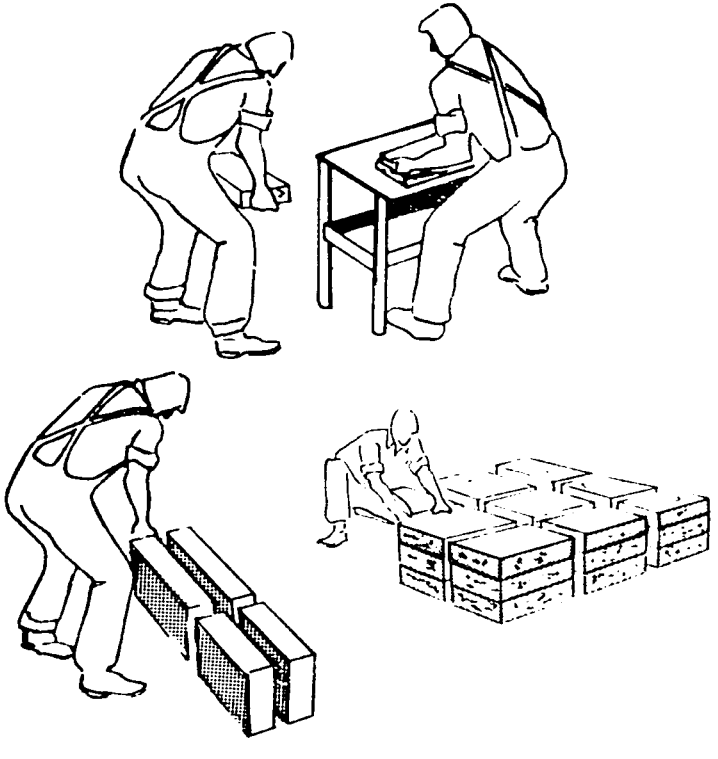
Remove large stones from clay or sieve through fine mesh.

Eliminar las piedras grandes del barro, o pasar por cedazo fino.

If not moist, add water. Cover to retard evaporation. To mold, place 4 inches of clay in level, lined pit. Tramp throroughly, turn and tramp again.

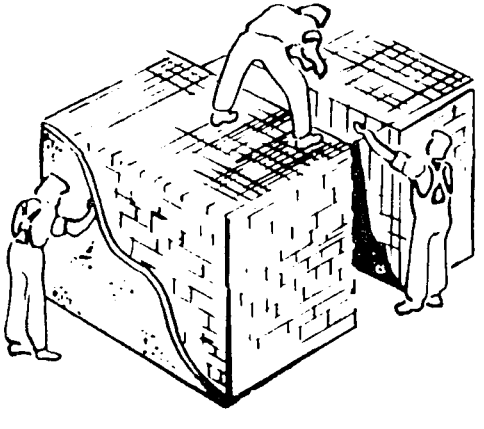


Si el barro es seco, añada agua. Cubrir para atrasar evaporación. Para moldar, poni 4" de barro en hoyo nivelado y forrado con masonería. Mezcle completamente, voltee y mezcle de nuevo.



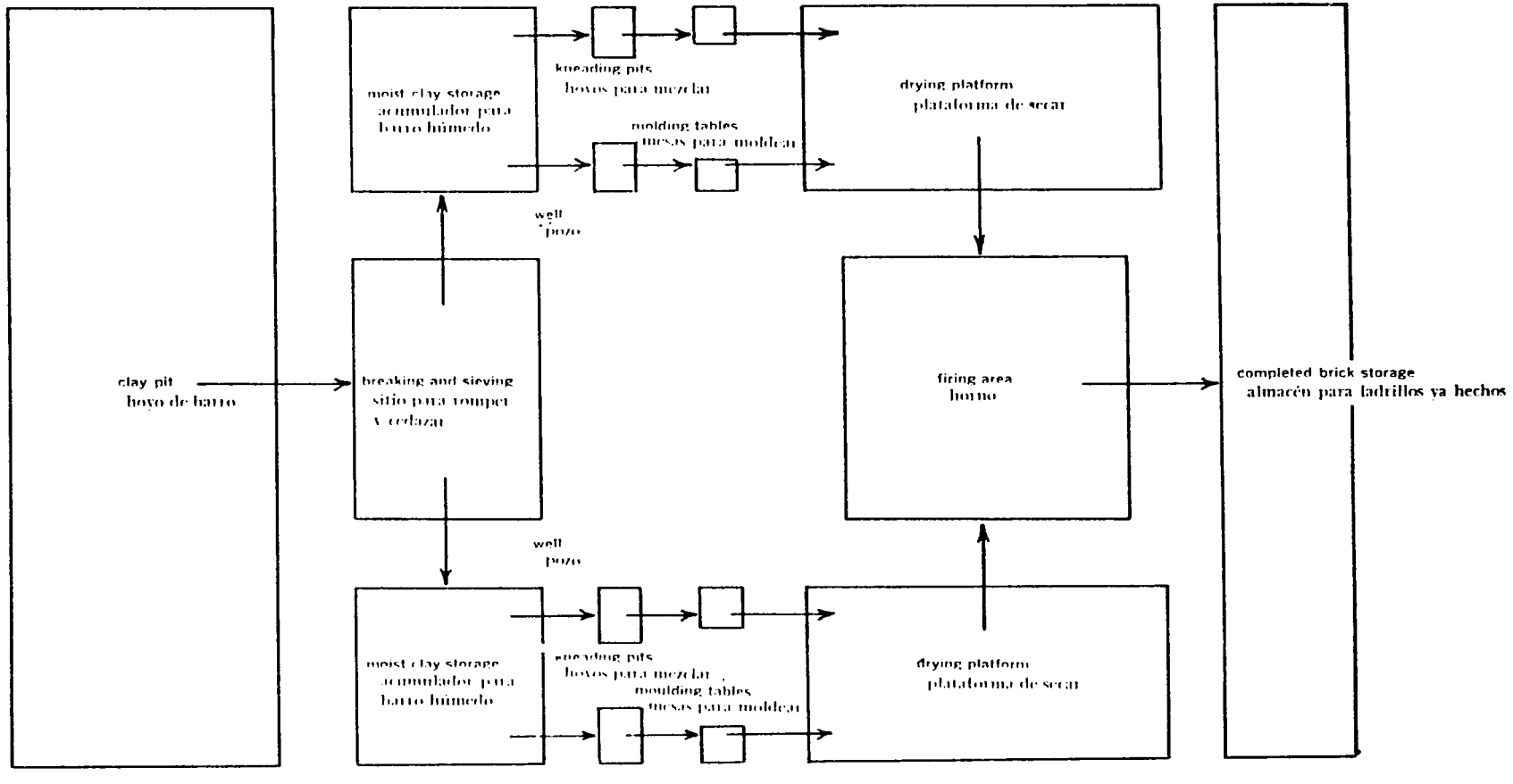
On metal covered table, form bricks in wood mold. Then take off mold and place bricks in drying area. Stack bricks a finger apart on level platform and cover to slow drying. In 3 to 7 days (depending on drying speed), stack to make room for new production. Cover again to complete drying before firing.

Sobre una mesa cubierta de metal forme ladrillos en un molde de madera. Despues saque el molde, y ponga los ladrillos hechos en otra area para secar. Amontone los ladrillos un dedo separado sobre un tablado nivelado y cubra para atrasar el secamiento. Entre 3 a 7 dias (dependiendo de la rapidez del secamiento) amontone los ladrillos para dejar espacio para nueva producción. Cubre otra vez para completar el secamiento antes de ponerlos al fuego.



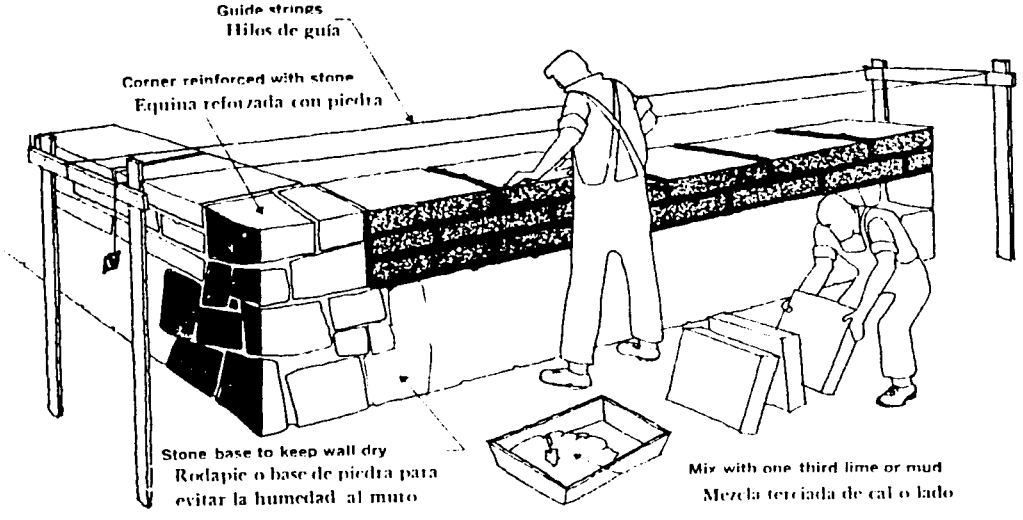
To fire, stack bricks a finger width apart, alternating headers and stretchers, providing minimum touching area and greatest stability. Stack bricks to form rough vaulted tunnels in the kiln. Cover outside of kiln with heavy layers of clay and previously fired bricks (when possible).

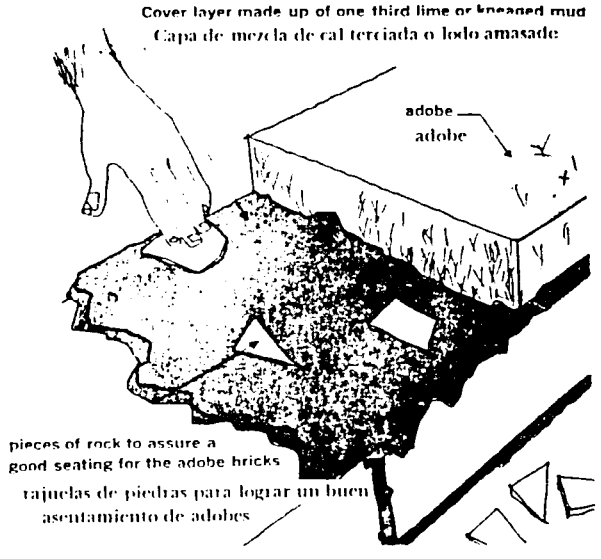
Para ponerlos al fuego, amontone los ladrillos un dedo separado, alternado a tizón o al hilo dejando el menos espacio posible entre ellos, y formando tudos arqueados túneles en el horno. Cubre el horno con capas espesas de barro y ladrillos previamente cocinados (cuando posible).

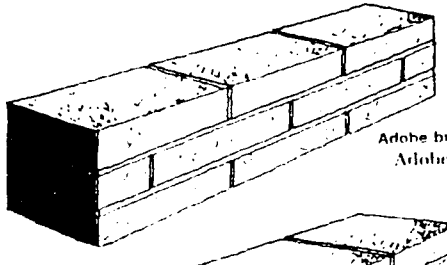


Work Sequence To Make Bricks
Lugares de Trabajo Para Hacer Ladrillos

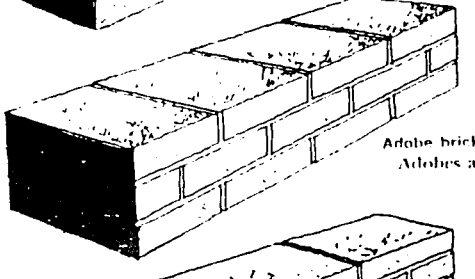
Adobe Walls
Muros de Adobe



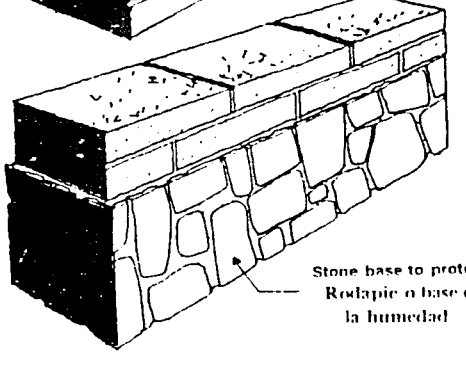




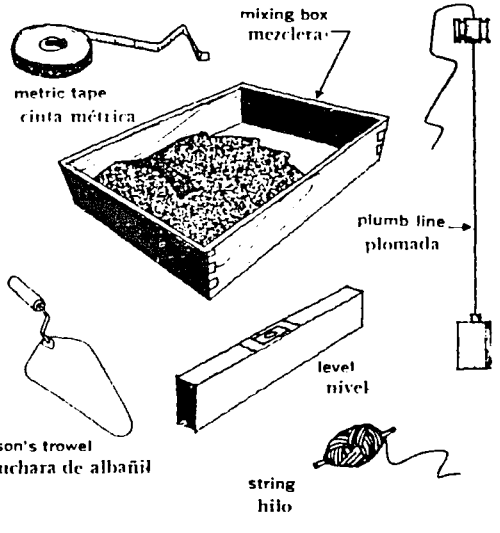
Adobe bricks set on narrow edge
Adobes aparejados al hilo



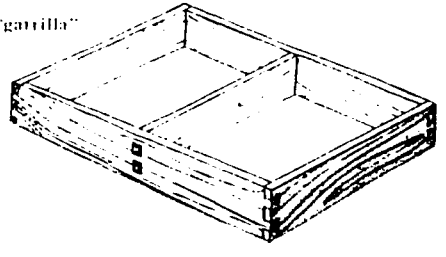
Adobe bricks set lengthwise
Adobes aparejados a tizón

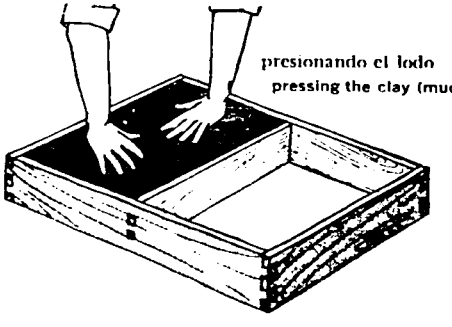


Stone base to protect wall from humidity
Rodapie o base de piedra para protejer al muro de la humedad



Making Adobe Bricks
Ladrillos de Adobe

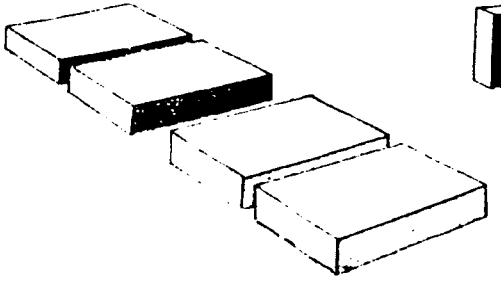




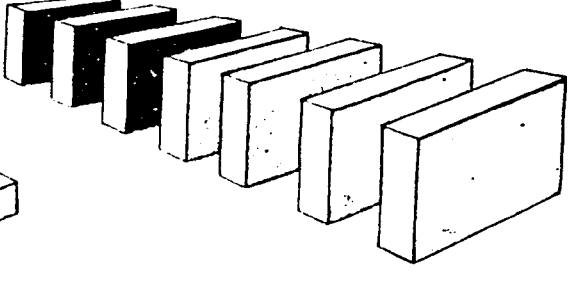
molding adobe bricks is done with wood forms, as shown, having the following dimensions: 40 cms long; 30 cms wide; 8 cms deep. Another good size is: 40 cms long; 20 cms wide; 8 cms deep.

el moldeo de los adobes se hace en formas de madera, como el de la figura, con las siguientes dimensiones: 40 cms largo; 30 cms ancho; 8 cms alto. Otro tamaño muy conveniente es: 40 cms largo, 20 cms ancho, 8 cms alto.

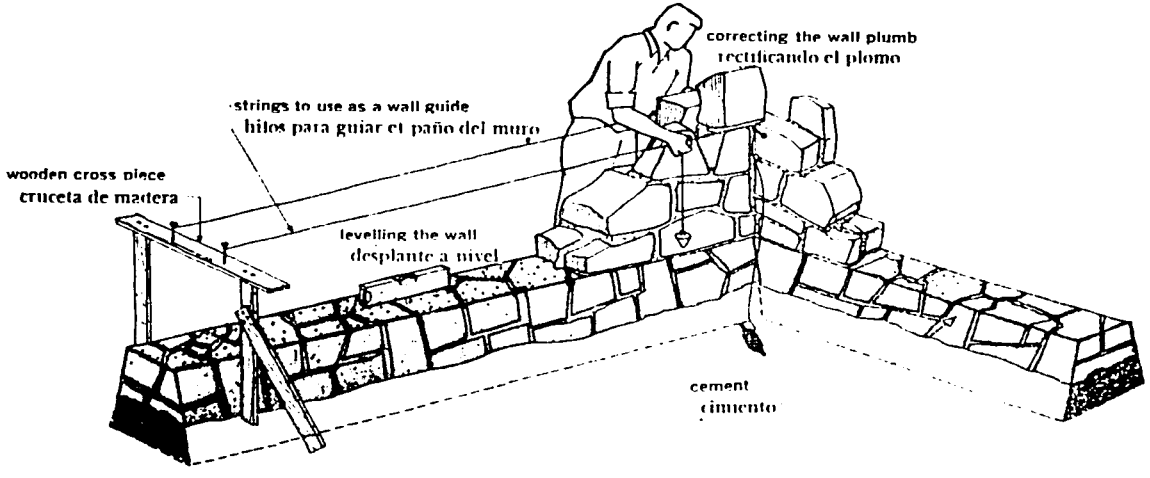
supply of recently made adobe bricks
reposo de adobes recién hechos

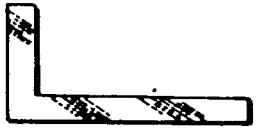


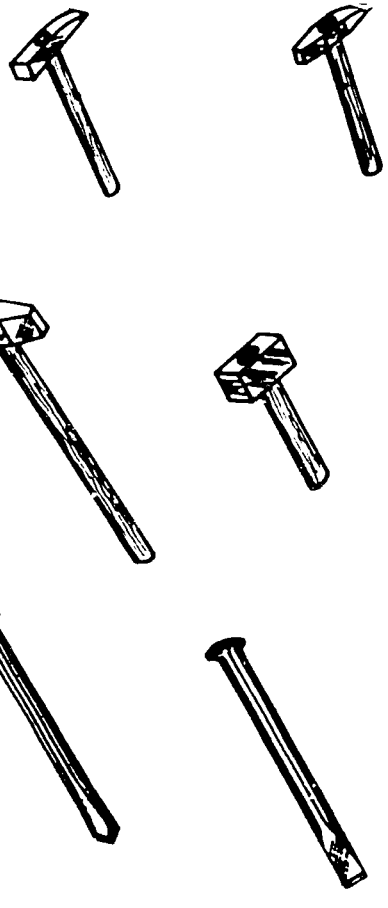
pieces in drying position
colocación de las piezas para secar

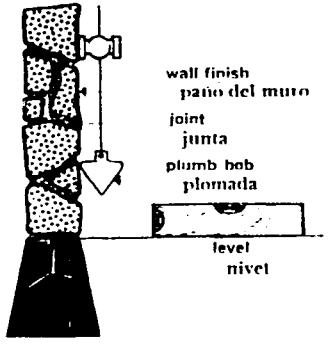


Stone Walls
Muros de Madera

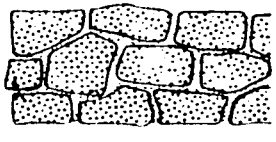




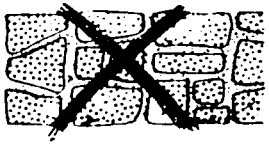




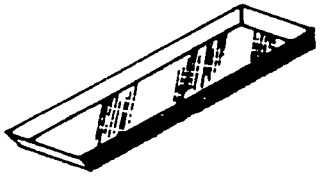
joints should alternate vertically and horizontally: correct
juntas cuatrapeadas: correcto

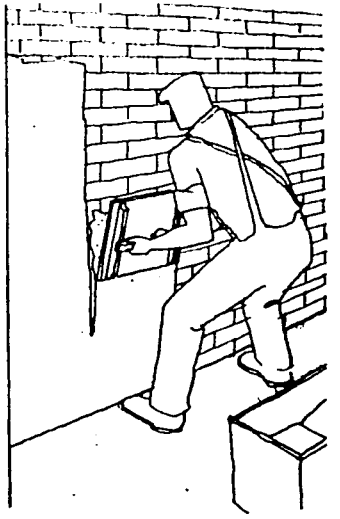


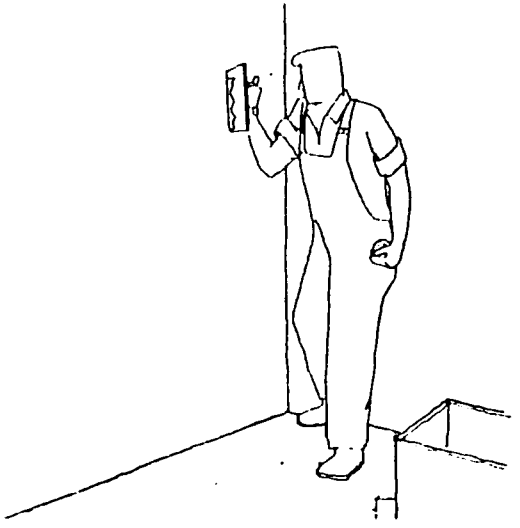
joints incorrectly laid
juntas no cuatrapeadas: incorrecto

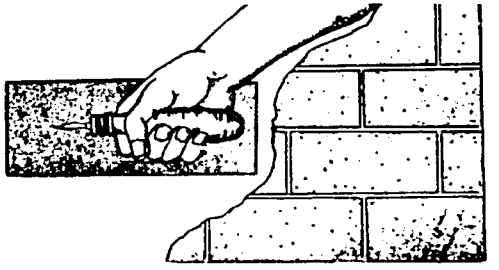


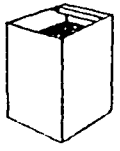
Using Plaster to Finish the Walls
Aplanado de Yeso





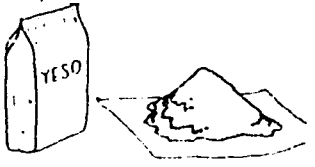






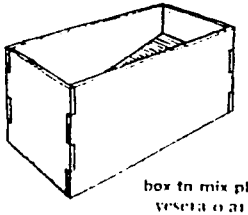
30 liters water
30 lts. agua

Proportions:
Proporción:

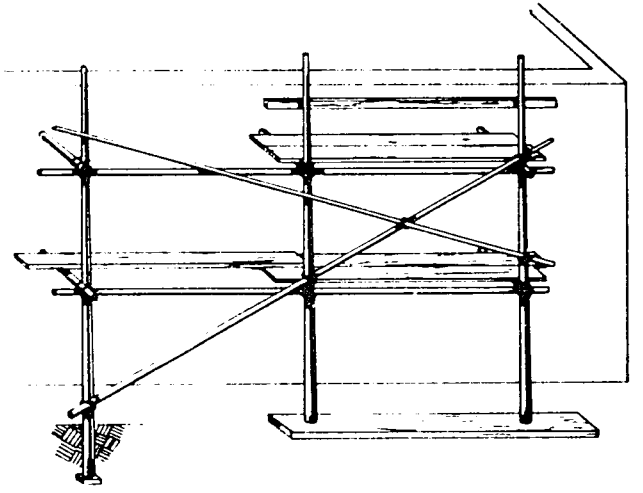


40 kgs. plaster
40 kgs. yeso

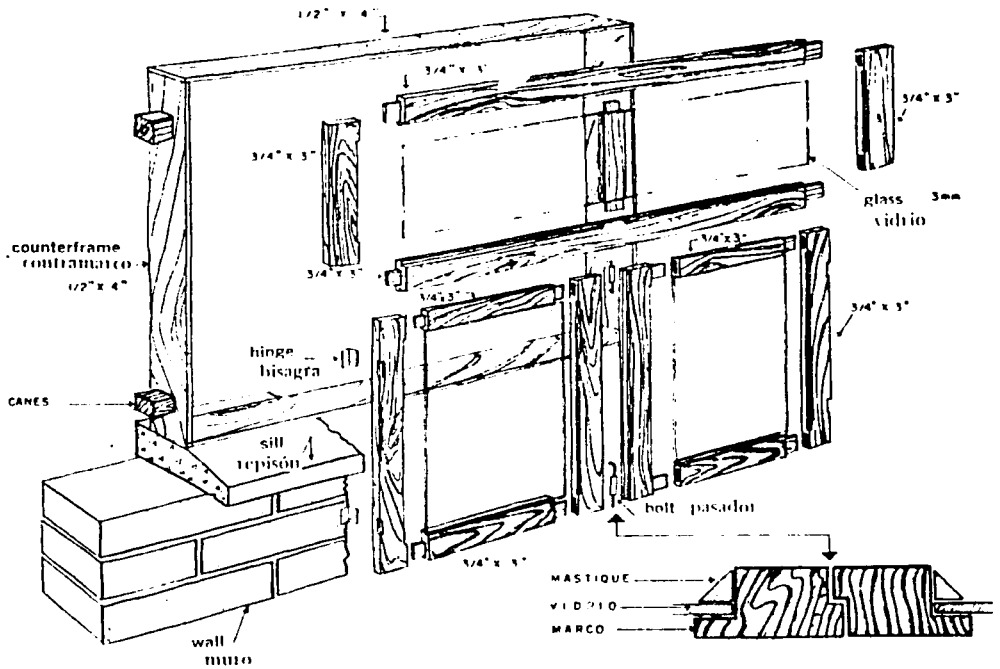
2 kgs. cement
2 kgs. cemento

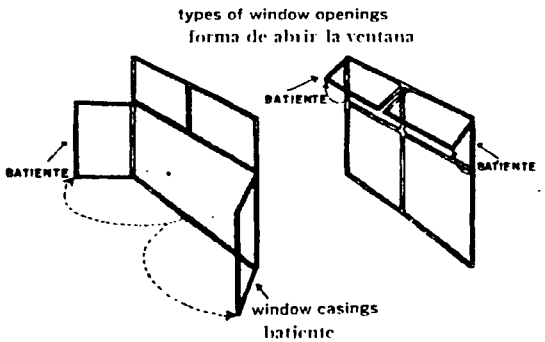


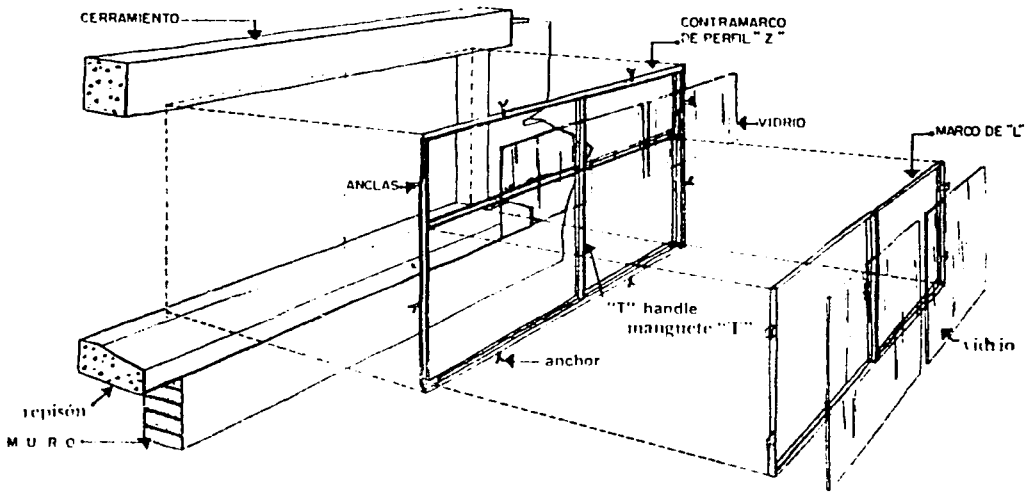
box to mix plaster
vesera o artesa



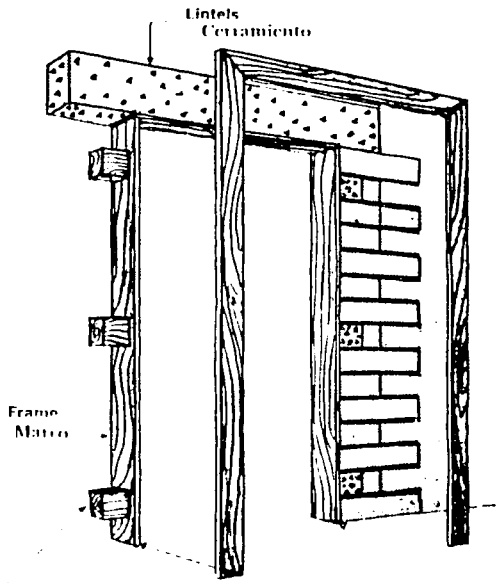
Windows (wood and metal)
Ventanas (de madera y hierro)



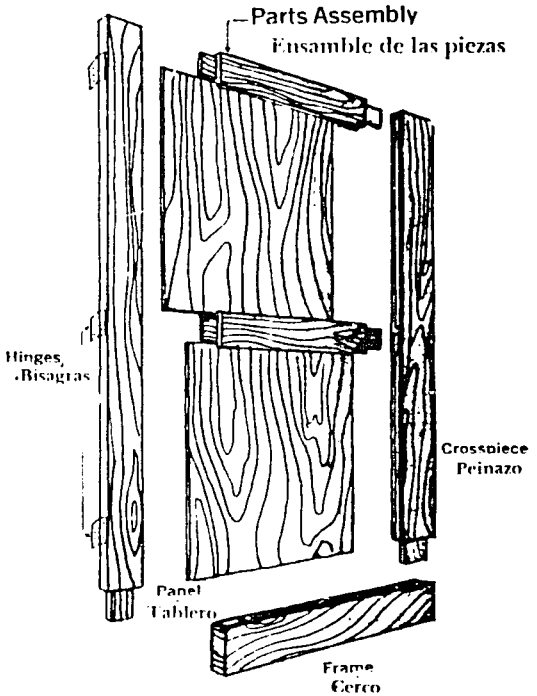


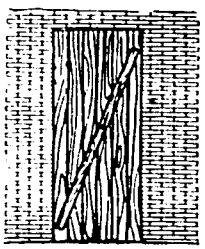


Doors
Puertas

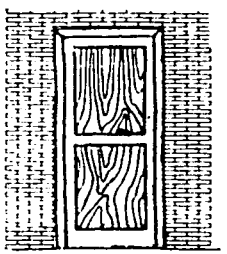


Pegs to attach door to wall
Canes que se empotran para fijar al muro



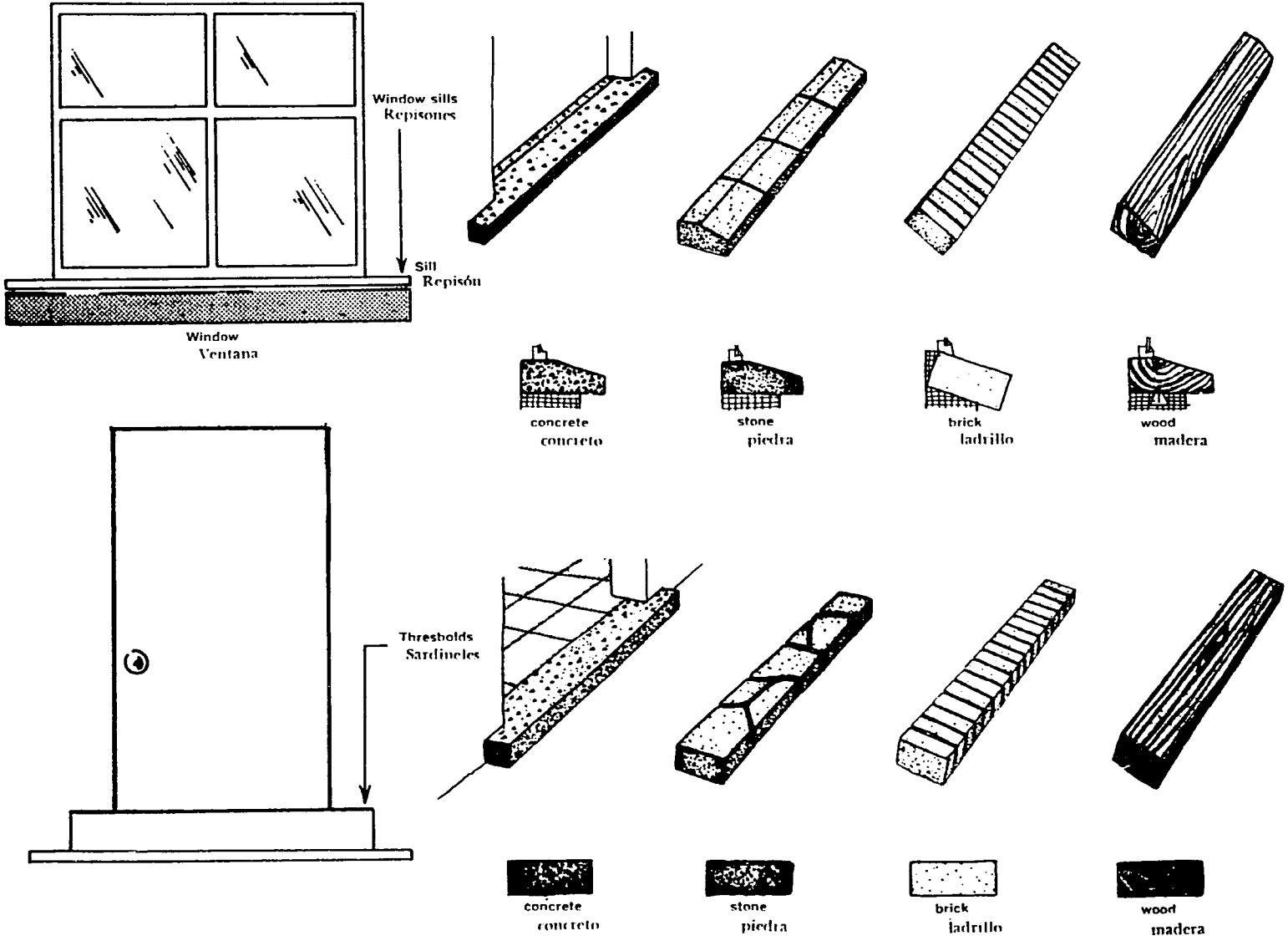


Plank Door
Puerta de Tablones

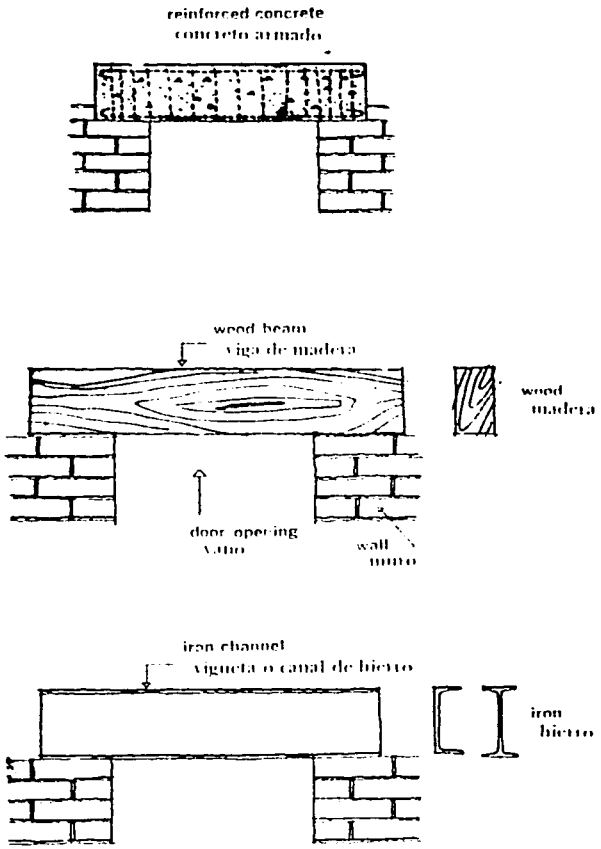


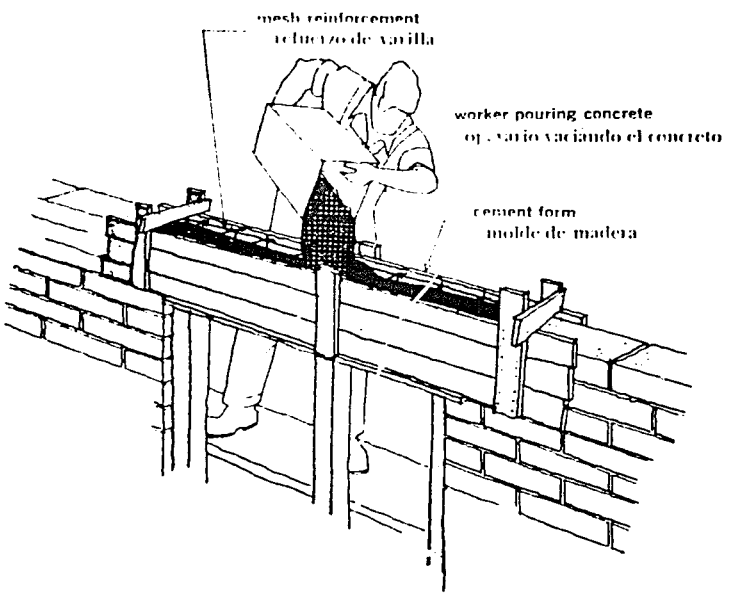
Panel door
Puerta entablerada

Thresholds and Window Sills
Sardineles y Repisones



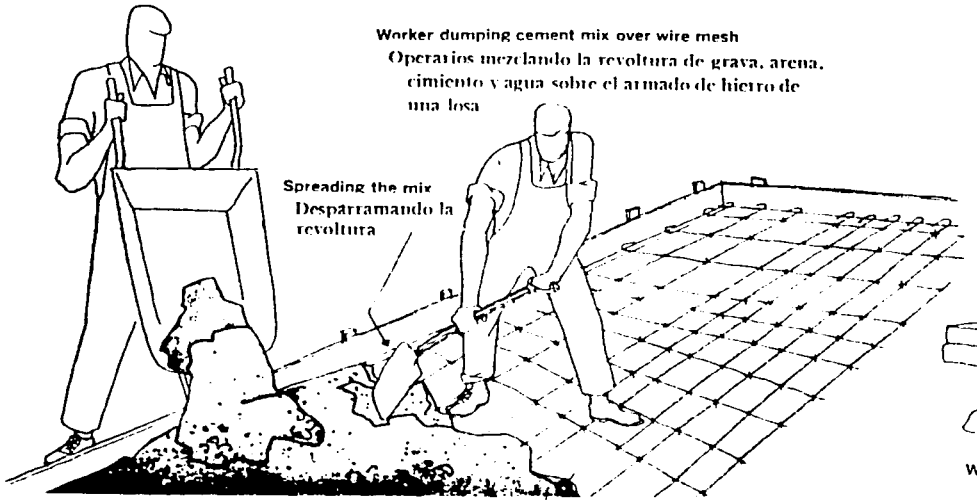
Windows and Doors
Ventanas y Puertas



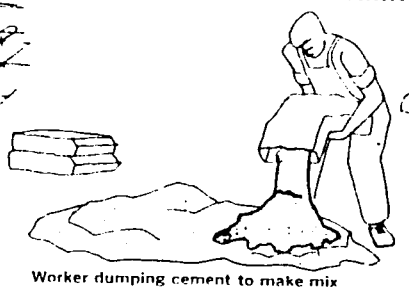


The Floors
Los Pisos

Concrete
Cimiento



Mixing Concrete
Mezclando el cimiento

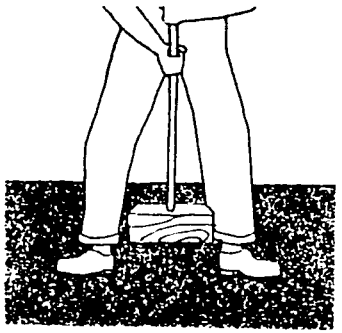


Worker dumping cement to make mix
Operario depositando el cimiento sobre la arena para mezclar

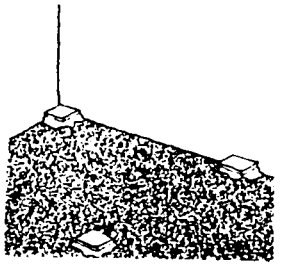
Worker mixing cement and sand
Operario mezclando el cimiento y arena

simple concrete floor over tamped earth
piso de cimiento sobre suelo apisonado

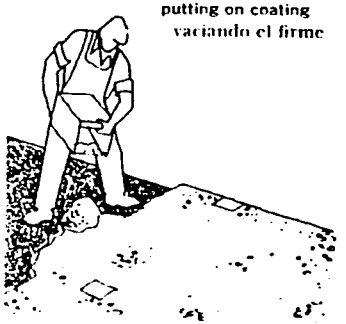
worker tamping ground
operario apisonando



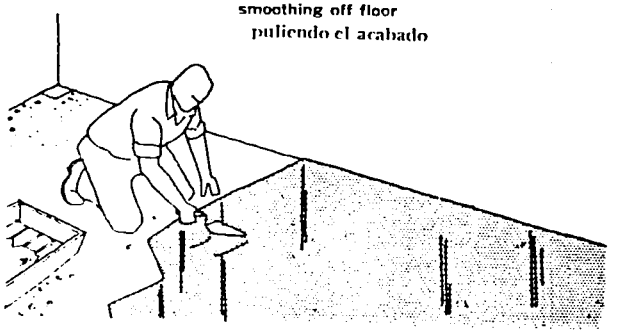
establishing floor level by placing markers
colocación de "maestras"



putting on coating
vaciando el firme

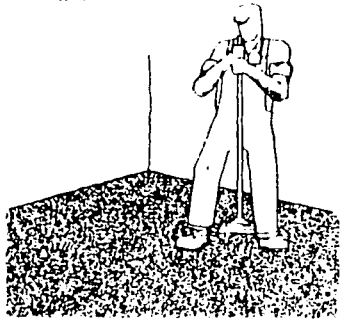


smoothing off floor
puliendo el acabado

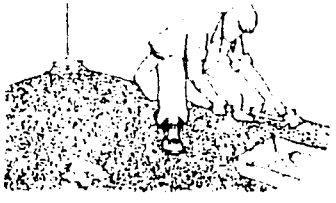


Stone Floors
Pisos de Piedra Laja

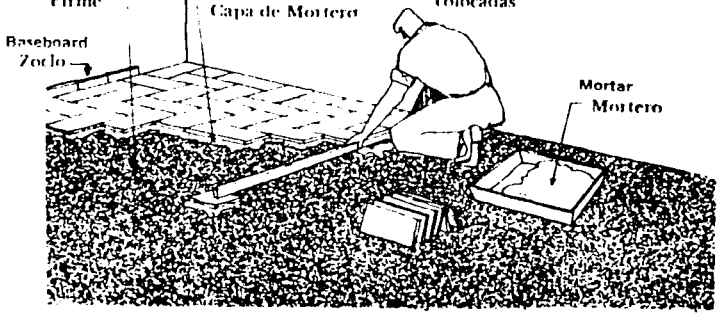
Worker tamping ground for cement layer
Operario apisonando el suelo para tender el firme de cimiento



Worker placing markers
Operario colocando las muestras que servirán de guía para colocar las piezas del piso terminado

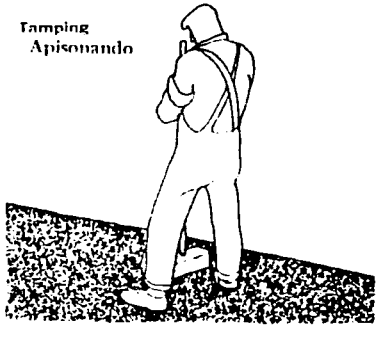


Correcting the level of the pieces laid down with a board
Rectificando con una regla el nivel de las piezas colocadas

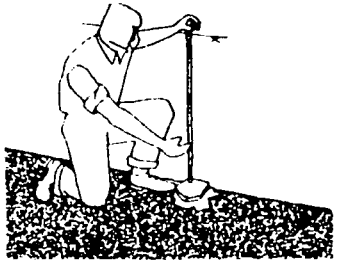


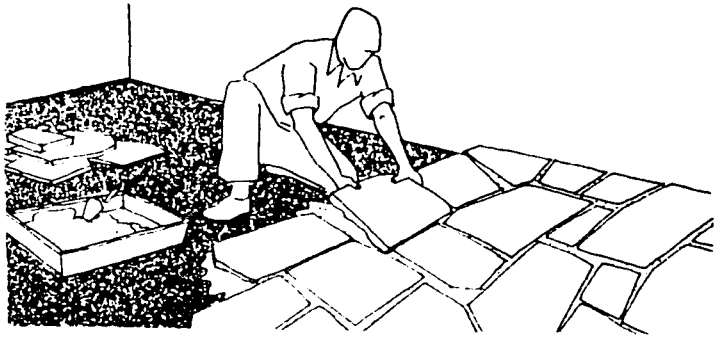
Flagstone Floor
Pisos de Piedra

Tamping
Apisonando

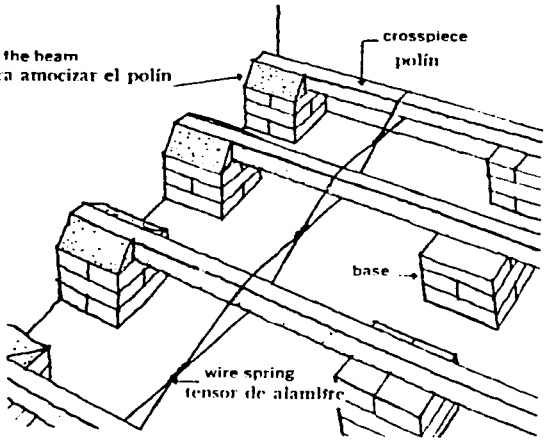


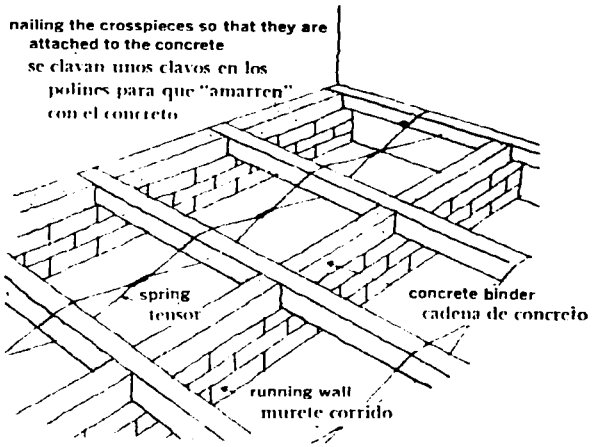
Correcting the level of the finished floor
Rectificando el nivel de piso acabado

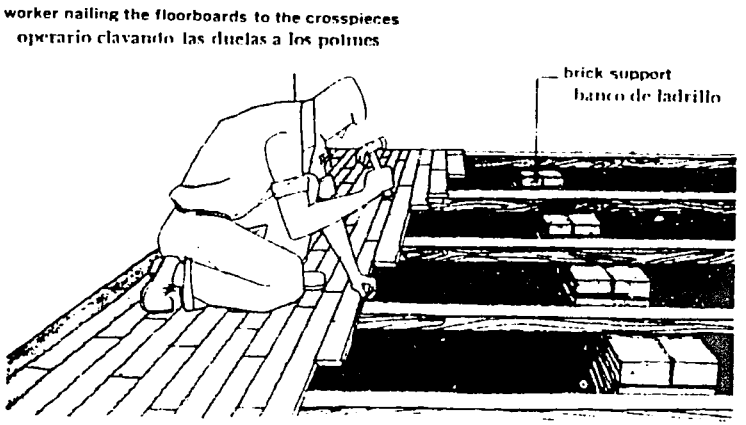


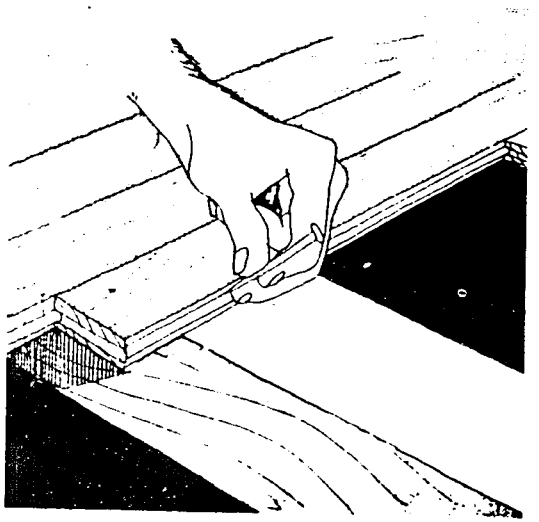


Wood Floor
Pisos de Madera

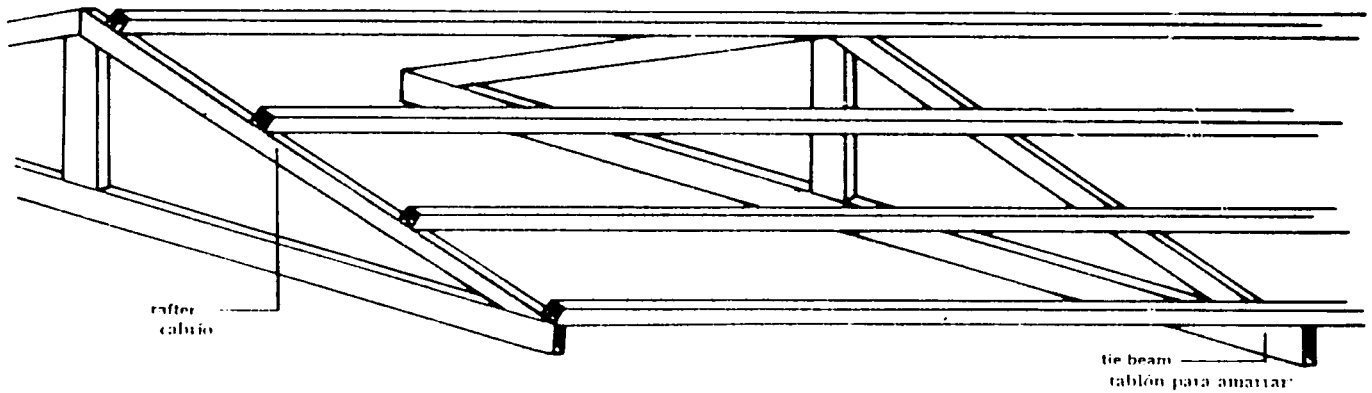


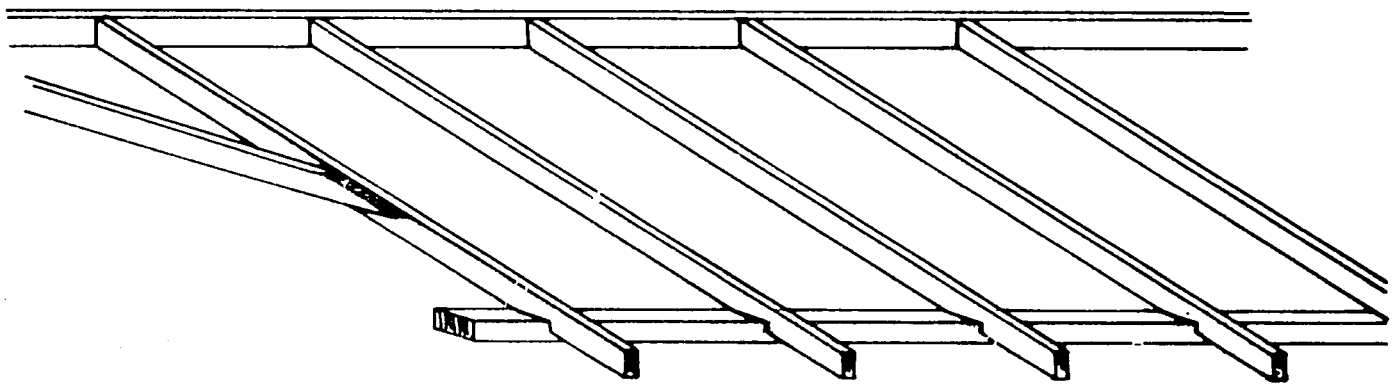


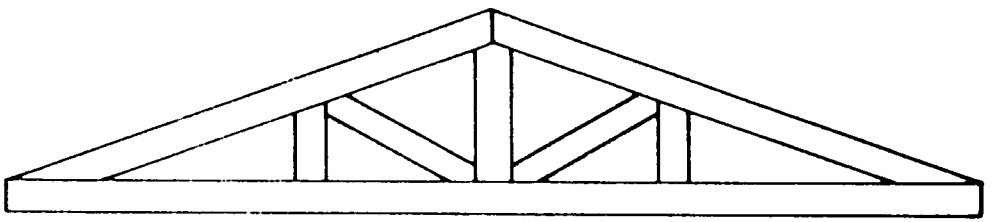




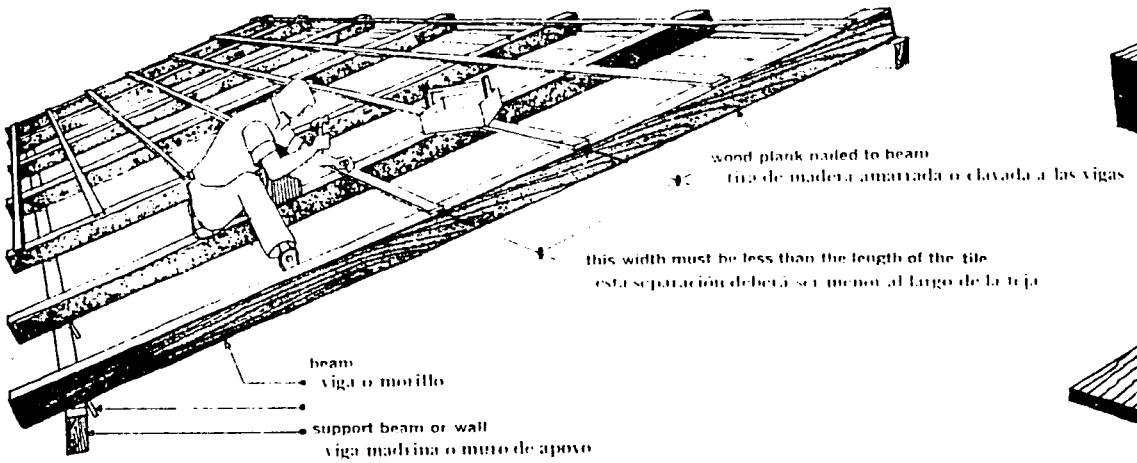
The Roof
El Techo

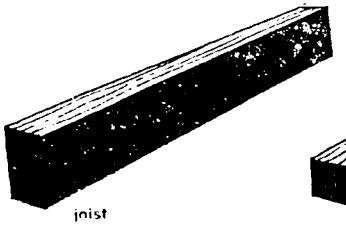


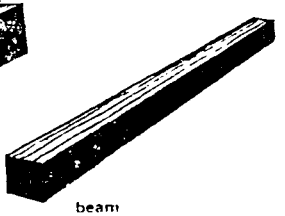


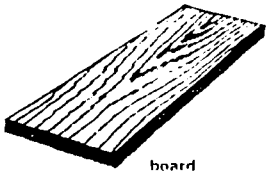


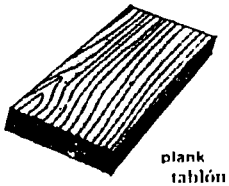
Clay Tile Roof
Techo con Tejas de Barro

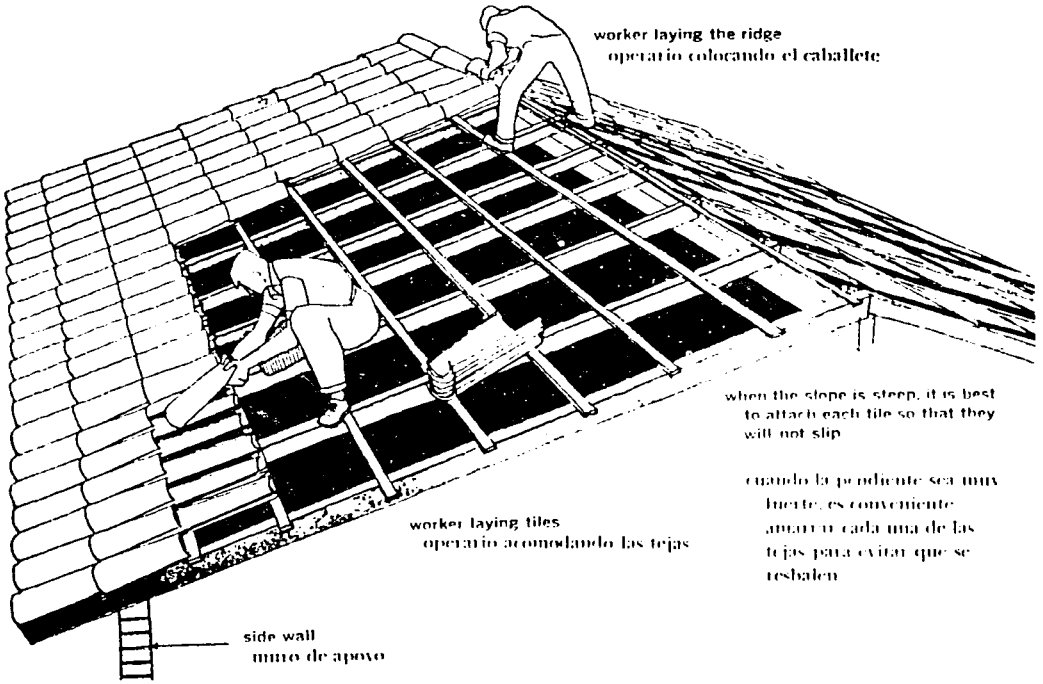


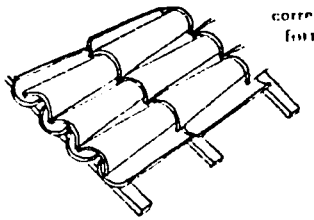


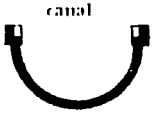






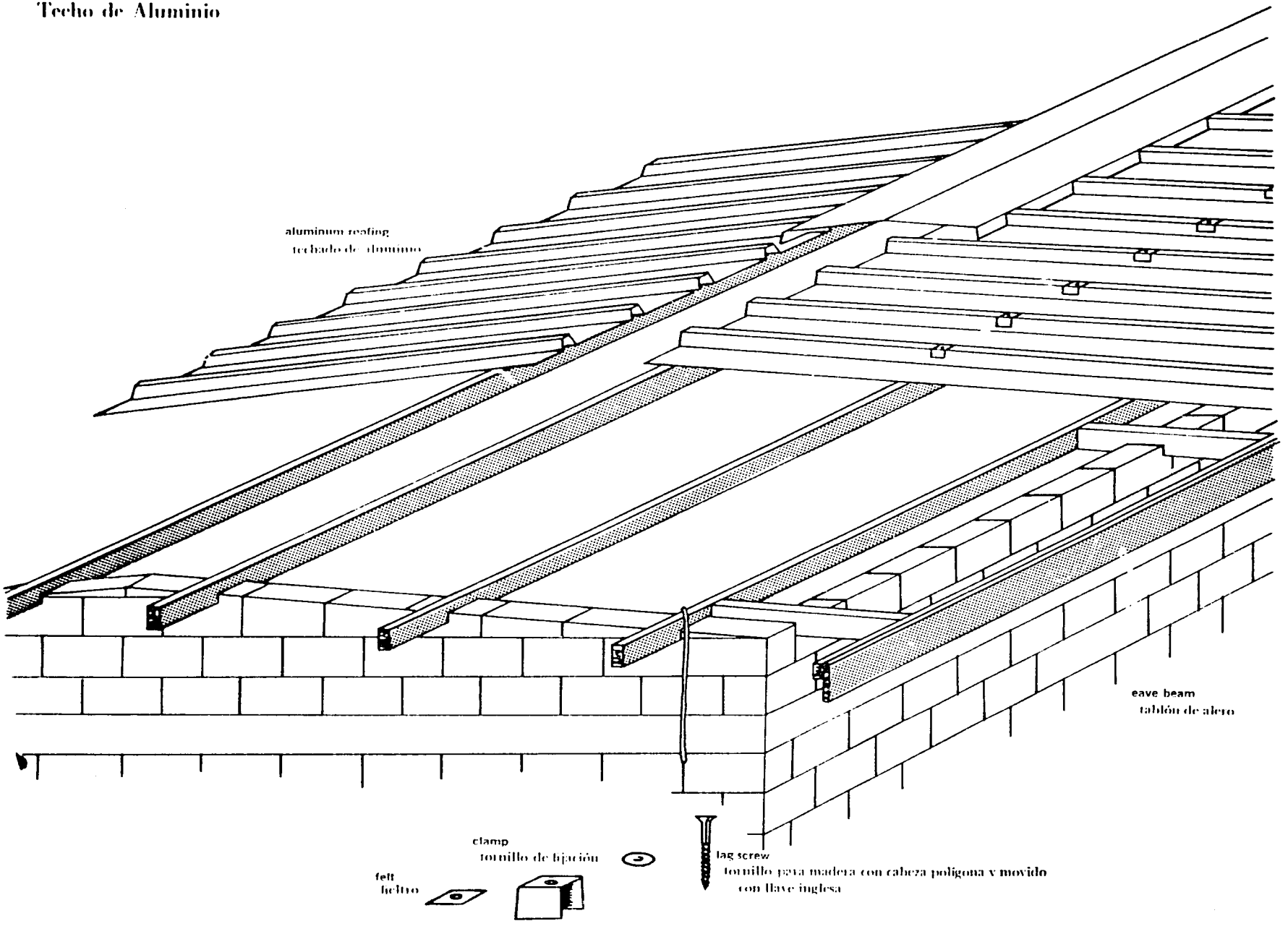






Aluminum Roof

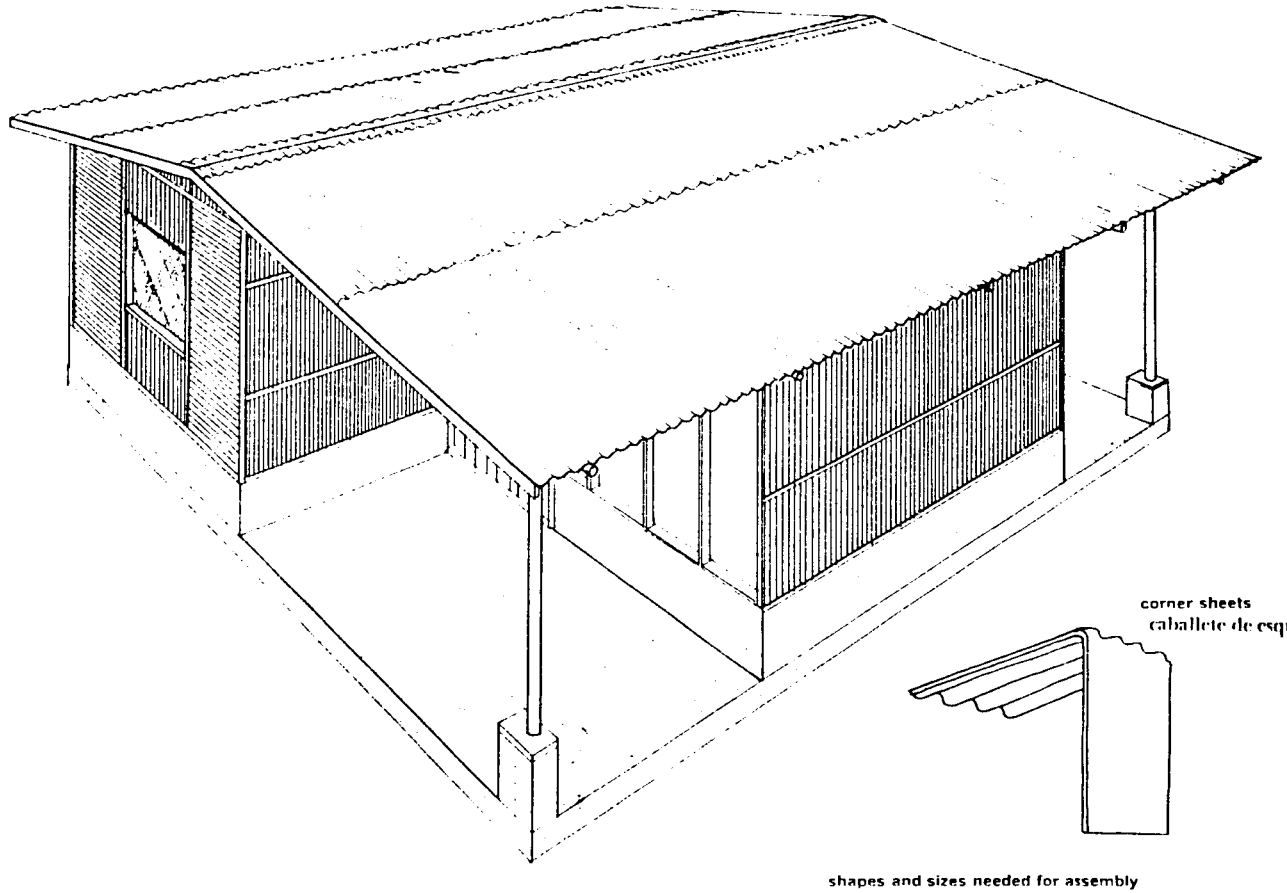
Techo de Aluminio



Asbestos Roof
Techo de Asbestos

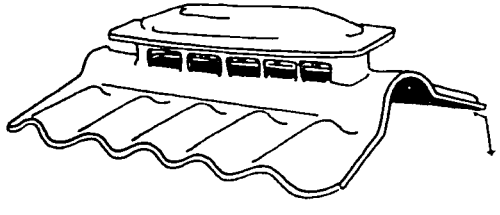
Asbestos-cement sheets are made industrially by a method which mixes these two materials, and produces sheets of different thicknesses and sizes. These sheets are used for house roofs or industrial and store roofs. They are water and fireproof, good as insulation against both heat and cold, and their resistance to rot and deformity make them very useful in building.

Las láminas de asbestos-cemento están hechas por un procedimiento industrial que mezcla estos dos materiales produciendo placas duras de diferentes espesores y dimensiones. Estas láminas se usan indistintamente para techar casas y locales industriales o para bodegas. Sus cualidades impermeables, incombustibles, aislantes de calor y el frío del medio ambiente, su indeformibilidad, su imputrescibilidad y su resistencia las hacen ser de gran utilidad para la construcción.

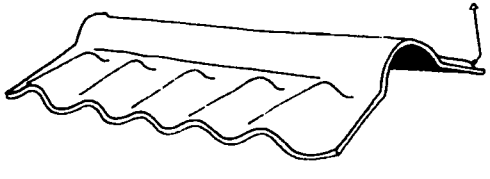


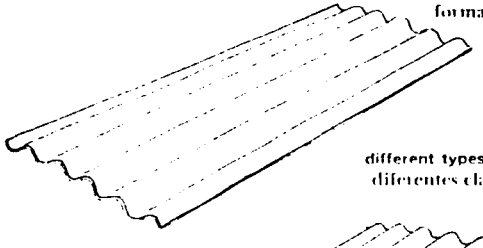
corner sheets
caballete de esquina

shapes and sizes needed for assembly
formas y tamaños necesitados para construir

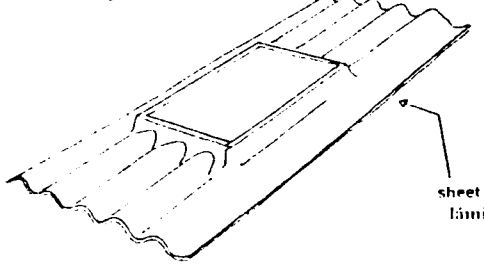


ridge sheets
caballete de centro

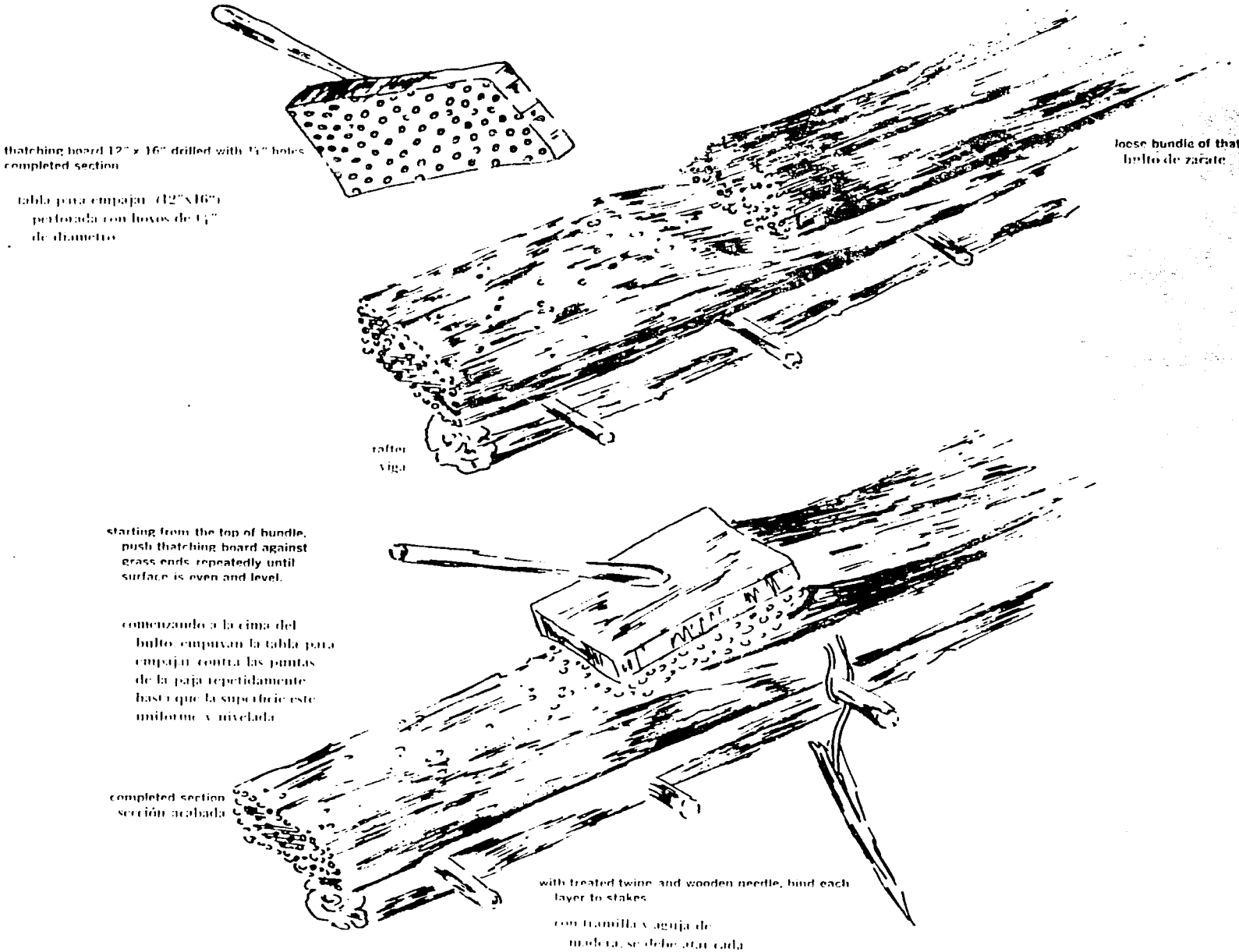




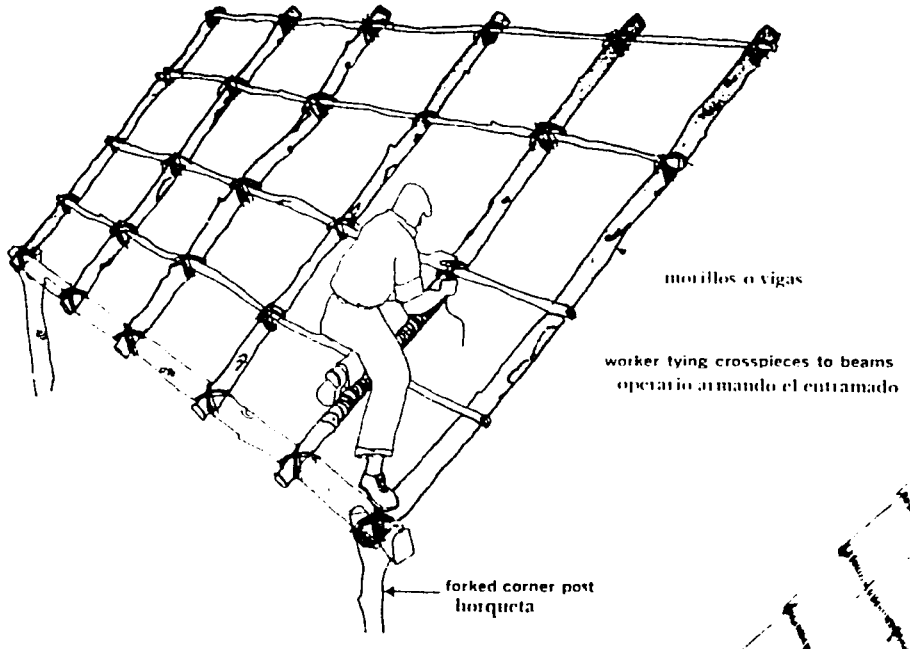
different types of sheets
diferentes clases de láminas

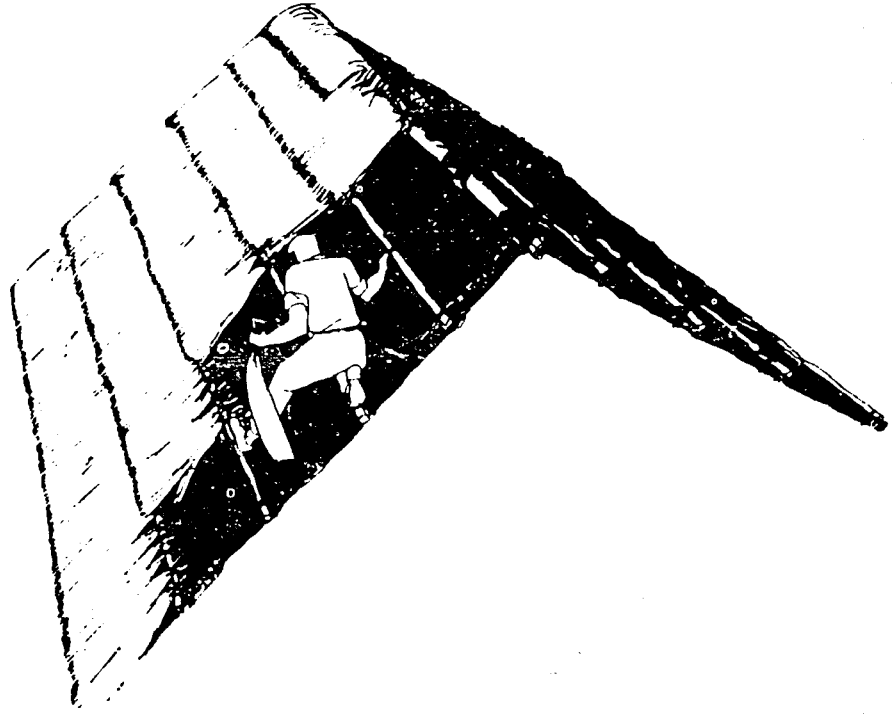


sheet with skylight
lámina con tragaluz

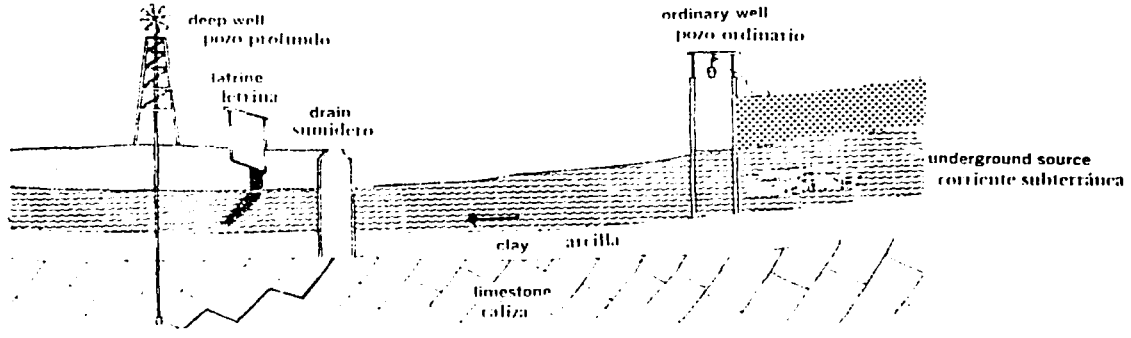

thatching board 12" x 16" drilled with ¼" holes
completed section
tabla para empajar (12"x16")
perforada con huecos de ¼"
de diametro
loose bundle of thatch grass
bulto de zarate
rafter
viga
starting from the top of bundle,
push thatching board against
grass ends repeatedly until
surface is even and level.
comenzando a la cima del
bulto empujan la tabla para
empajar contra las puntas
de la paja repetidamente
hasta que la superficie este
uniforme y nivelada
completed section
sección acabada
with treated twine and wooden needle, bind each
layer to stakes
con tramilla y aguja de
madera, se debe atar cada
capa a las estacas

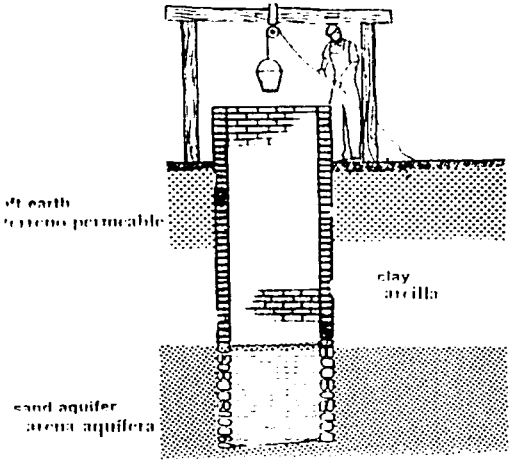
Thatched Roof
Techo de Zacate

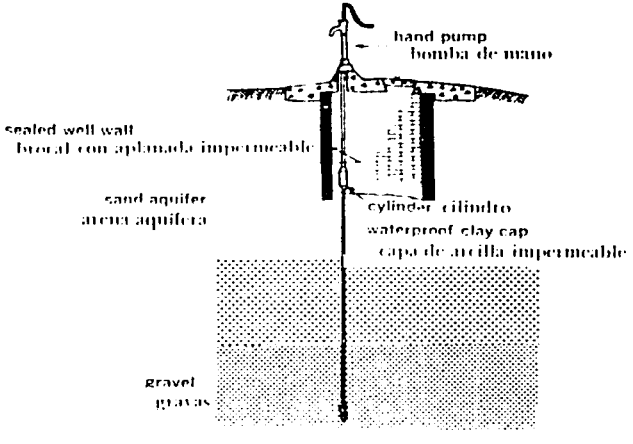




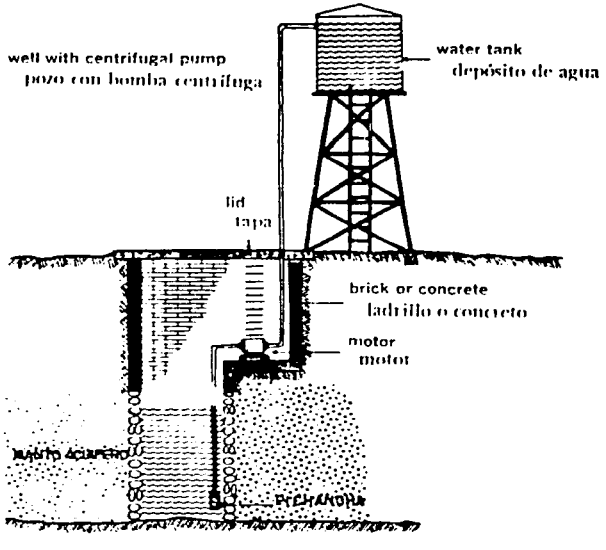
Water Supply Systems
Agua Para Usos Domesticos



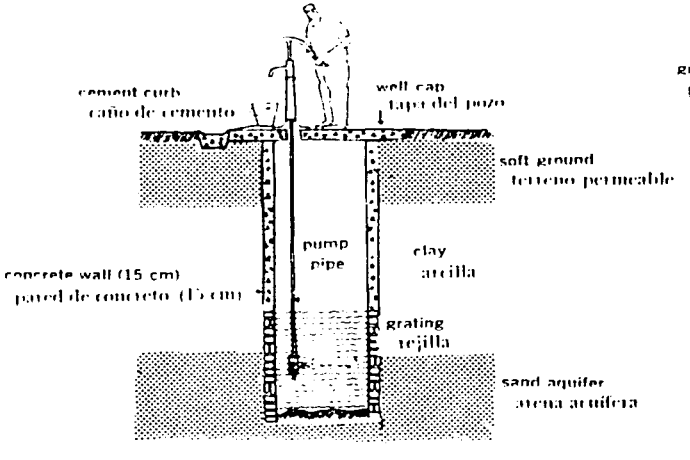




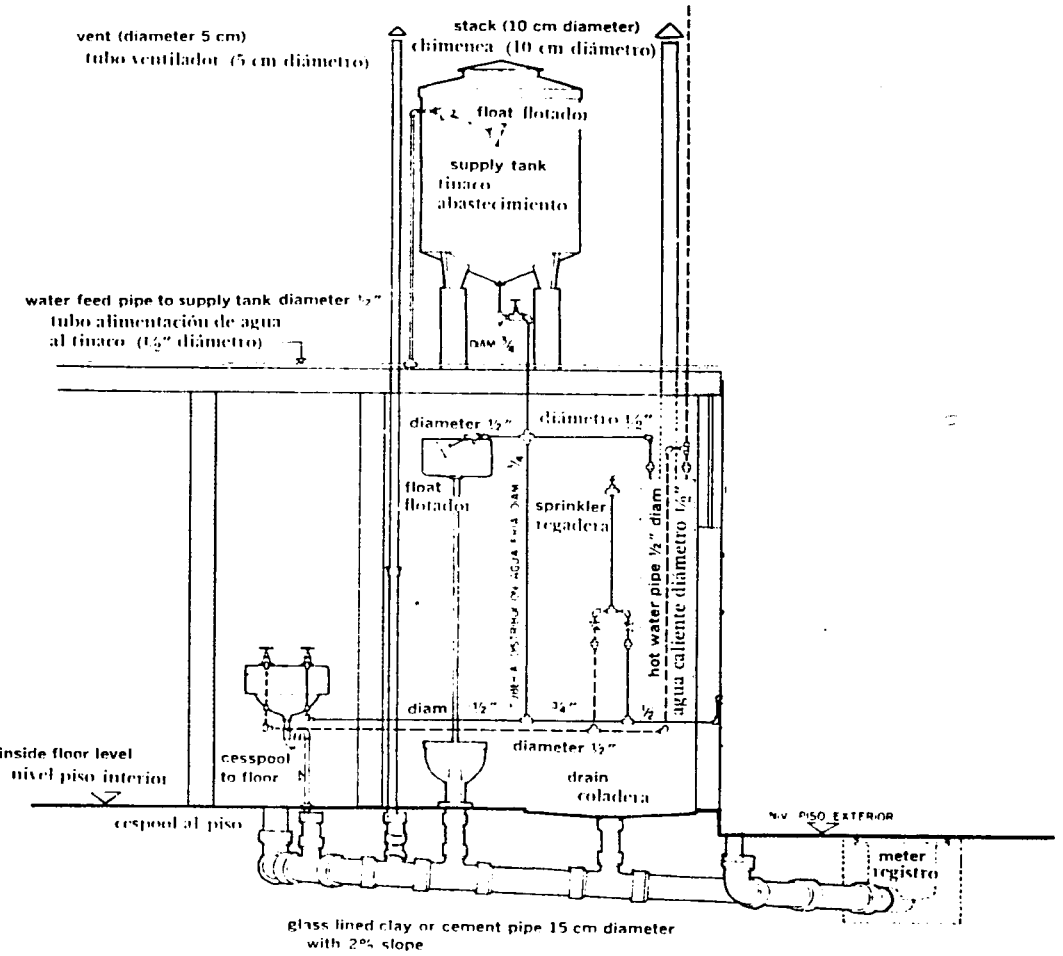
sealed well
pozo ordinario



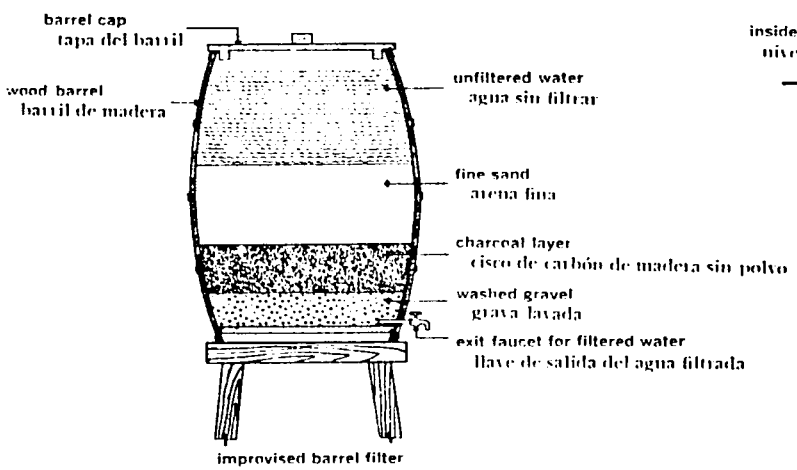
dug well
pozo perforado



House Plumbing System
Instalación y Drenaje

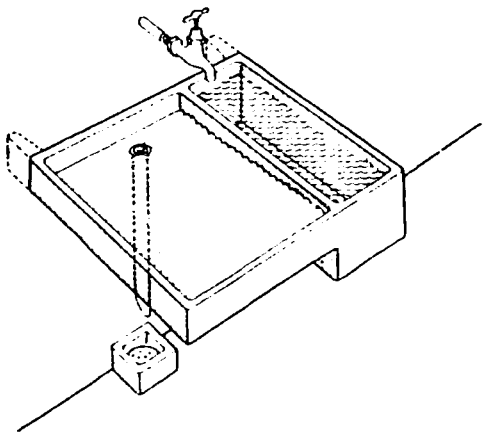


Water Purification Methods
Filtros Domésticos



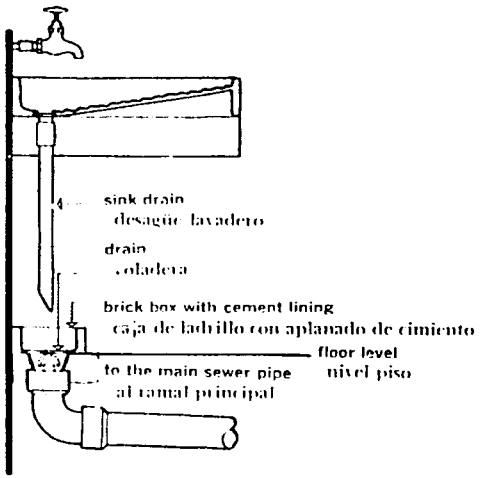
improvised barrel filter
filtro improvisado en un barril

Plumbing
Tubería

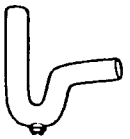


prefabricated concrete sink
lavadero prefabricado de cimiento

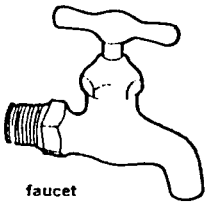
Kitchen
Cocina



double lead trap with meter
cespool doble de plomo con registro

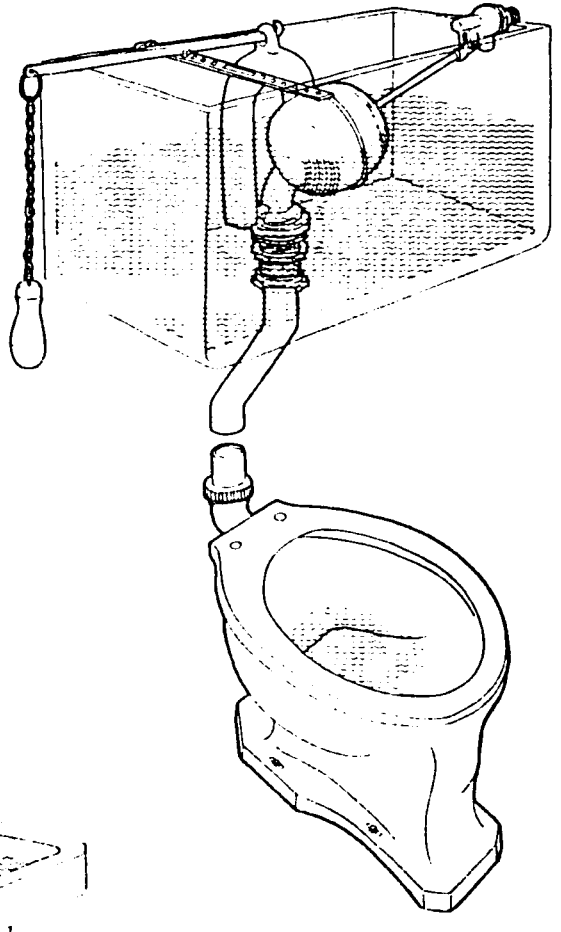


simple lead trap with meter
cespool sencillo de plomo con registro

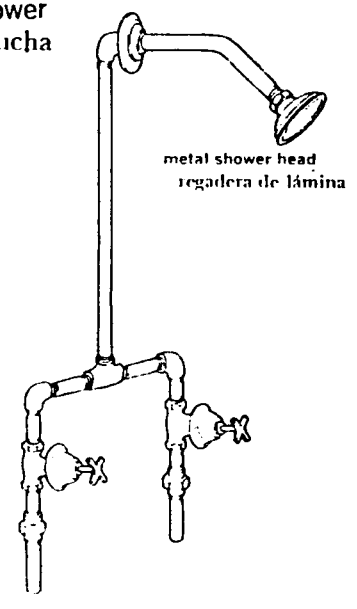


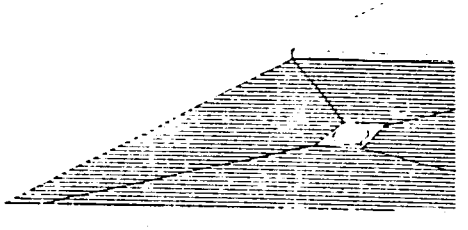
faucet
llave de nariz

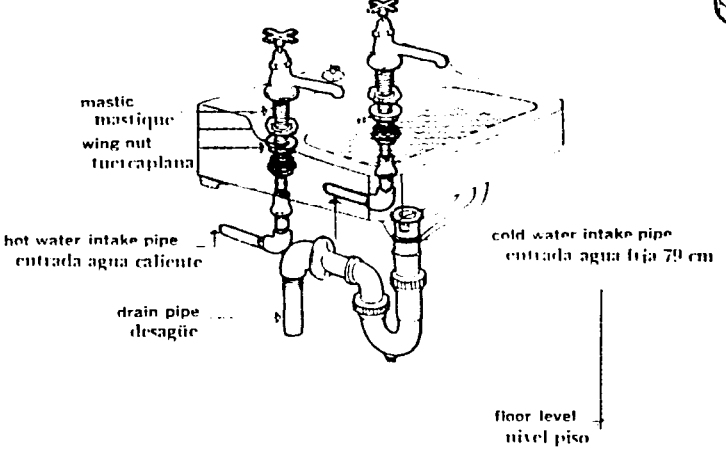
Bathroom
Baño



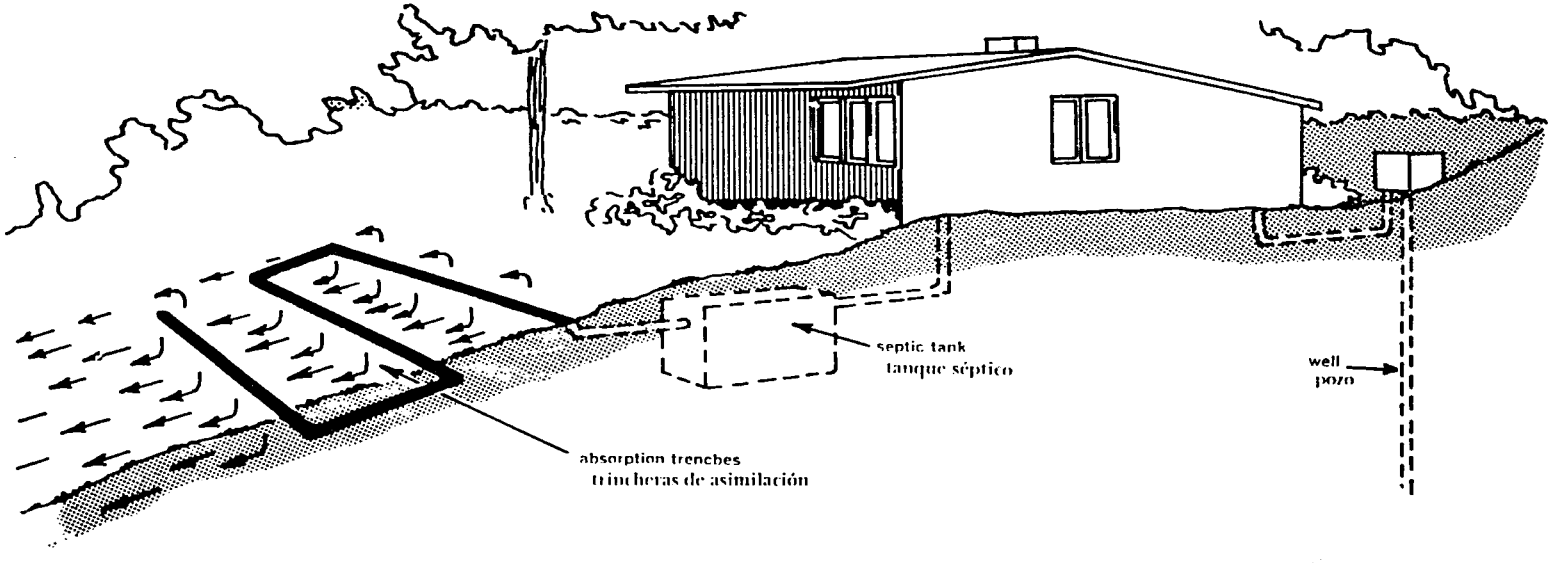
Shower
Ducha







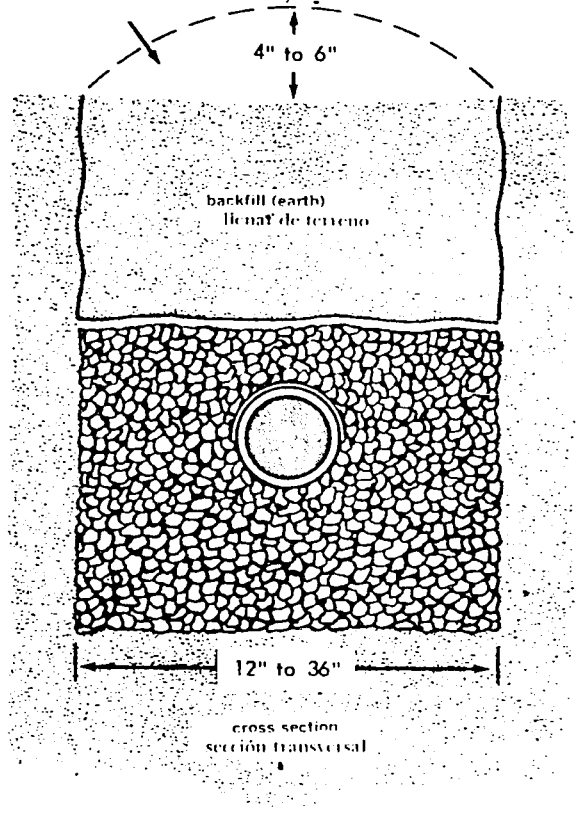
Sewerage Disposal Systems
Alcantarillado-Letrinas



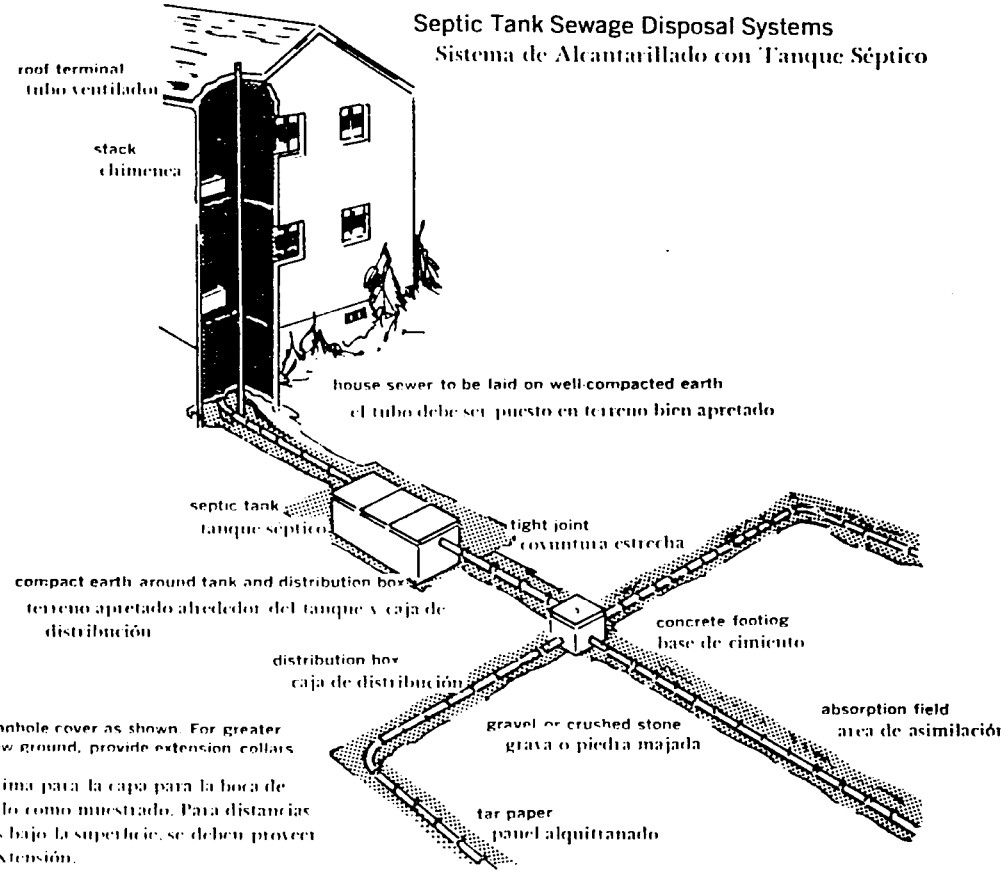
the well should be at a higher level than the septic tank system to protect it from sewage contamination

el pozo debe ser más alto que el alcantarillado para protección contra contaminación

Absorption Trench and Lateral
Trinchera de Asimilación y Lateral



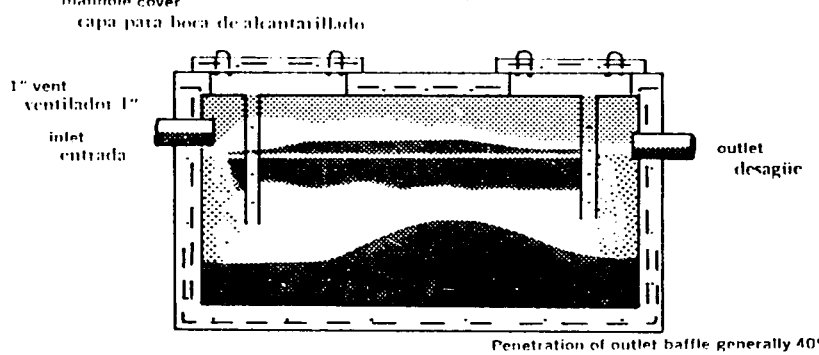
Septic Tank Sewage Disposal Systems
Sistema de Alcantarillado con Tanque Séptico



Household Septic Tank
Tanque Séptico para Uso Doméstico

Maximum for manhole cover as shown. For greater distances below ground, provide extension collars

Distancia máxima para la capa para la boca de alcantarillado como muestrado. Para distancias más grandes bajo la superficie, se deben proveer cuellos de extensión.

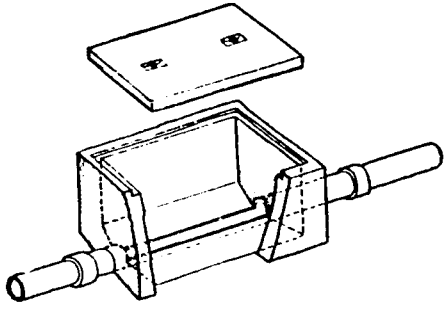


Penetration of outlet baffle generally 40% of liquid depth (for rectangular tanks)

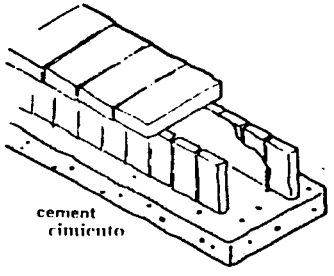
Penetración del ventilador generalmente 40% de la hondura del liquido (tanques rectangulares)

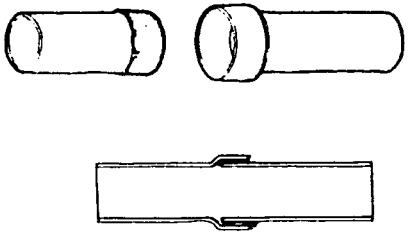
NB: make inlet at least 1-3" above outlet

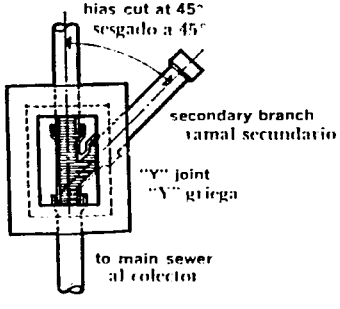
NB: la entrada debe ser 1-3" sobre el desagüe



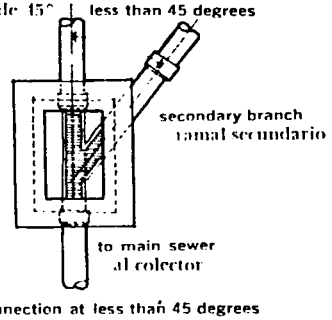
side view of junction box
corte en perspectiva de un registro



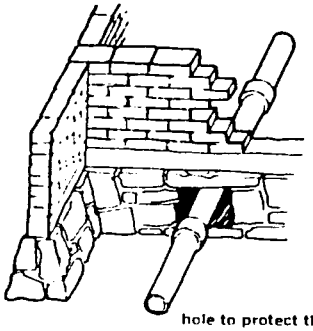


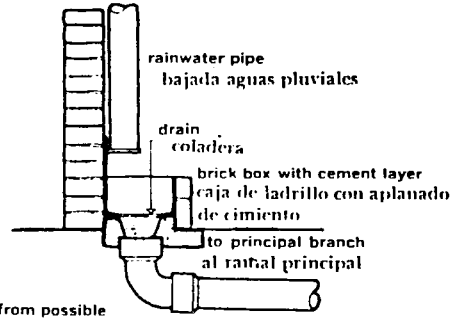


principal branch entry into junction box
ramal principal de entrada al registro
menos de 45° less than 45 degrees

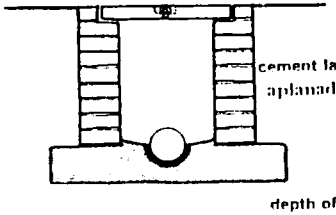


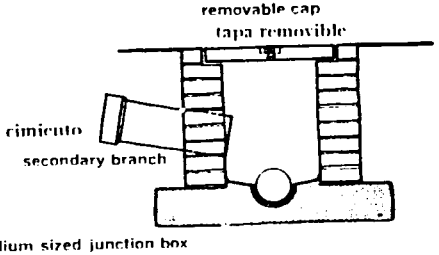
connection at less than 45 degrees
conexión a menos de 45°



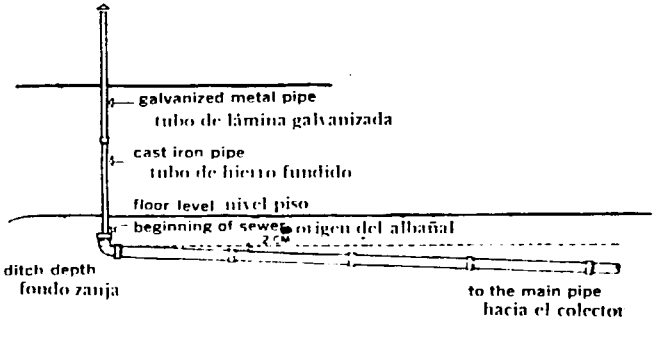


hole to protect the sewer from possible collapse
Hueco para proteger el albañal de posibles hundimientos



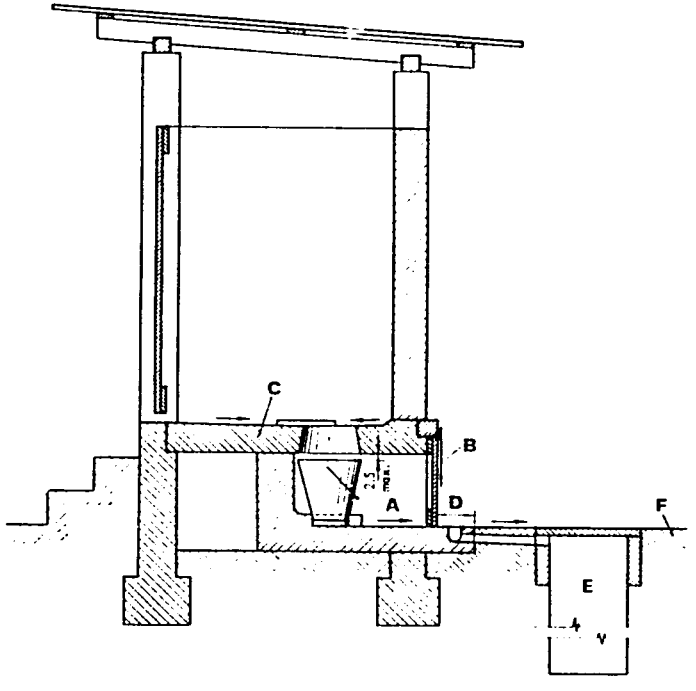


depth of medium sized junction box
fondo de registro con medio tubo



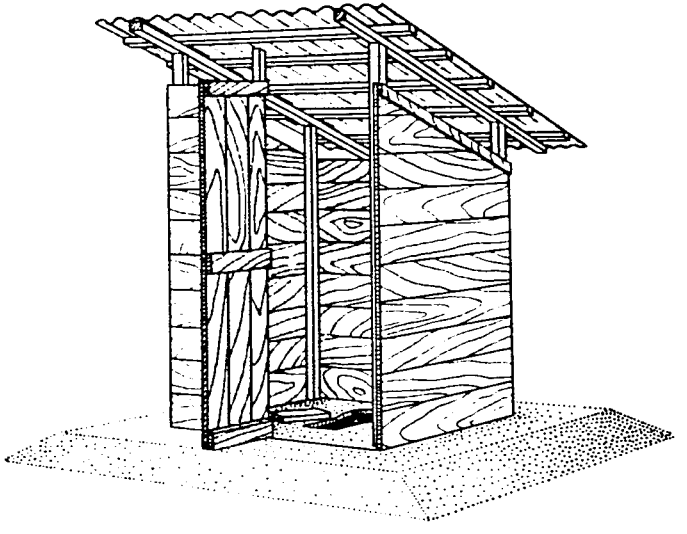
Outhouses or Latrines
Alcantarillado-Letrinas

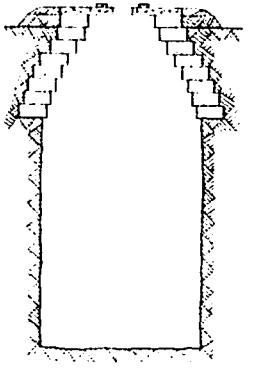
Bucket Latrine
Letrina a Pozal



latrine of cut lumber with corrugated metal or asbestos cement roof

letrina de tabladas con techo de metal acanalado o asbestos-cimiento



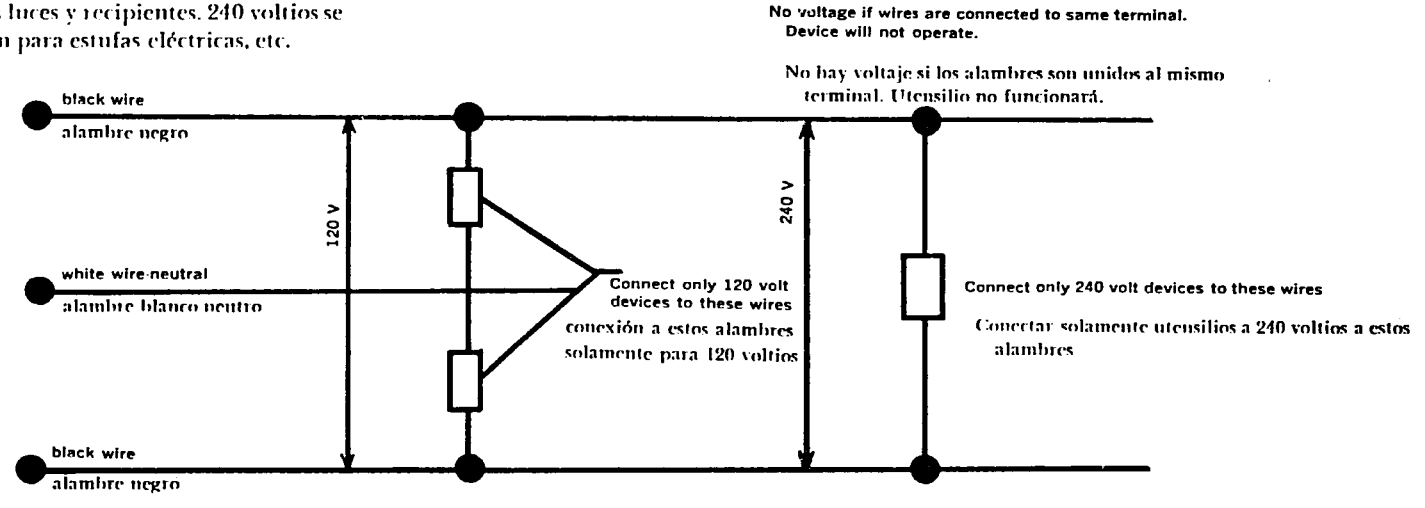


Large volume pit
Hueco con volumen grande

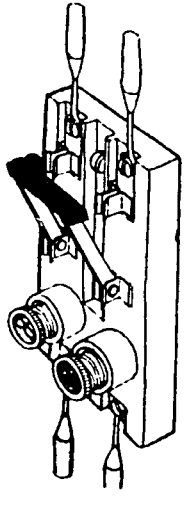
Electrical Systems
Sistemas Electricos

A three wire system is used in homes to provide both 120 and 240 volts. 120 volts is used for lights and small appliances. 240 is used for large appliances such as electric stoves, water heaters, etc.

Un sistema a tres alambres se emplea en casas para 120 and 240 voltios. Se emplean 120 voltios para las luces y recipientes. 240 voltios se emplean para estufas eléctricas, etc.



Switch Box
Toma de Corriente



fuse
tapón fusible

two-fuse circuitbreaker
interruptor de navajas con fusibles, dos polos

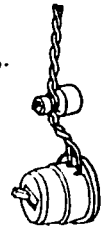
for inside installation
a la instalación interior

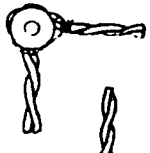
current intake
toma de corriente

contact
contacto

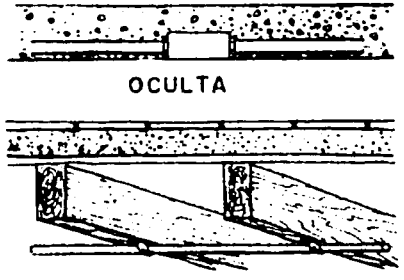
contact
contacto

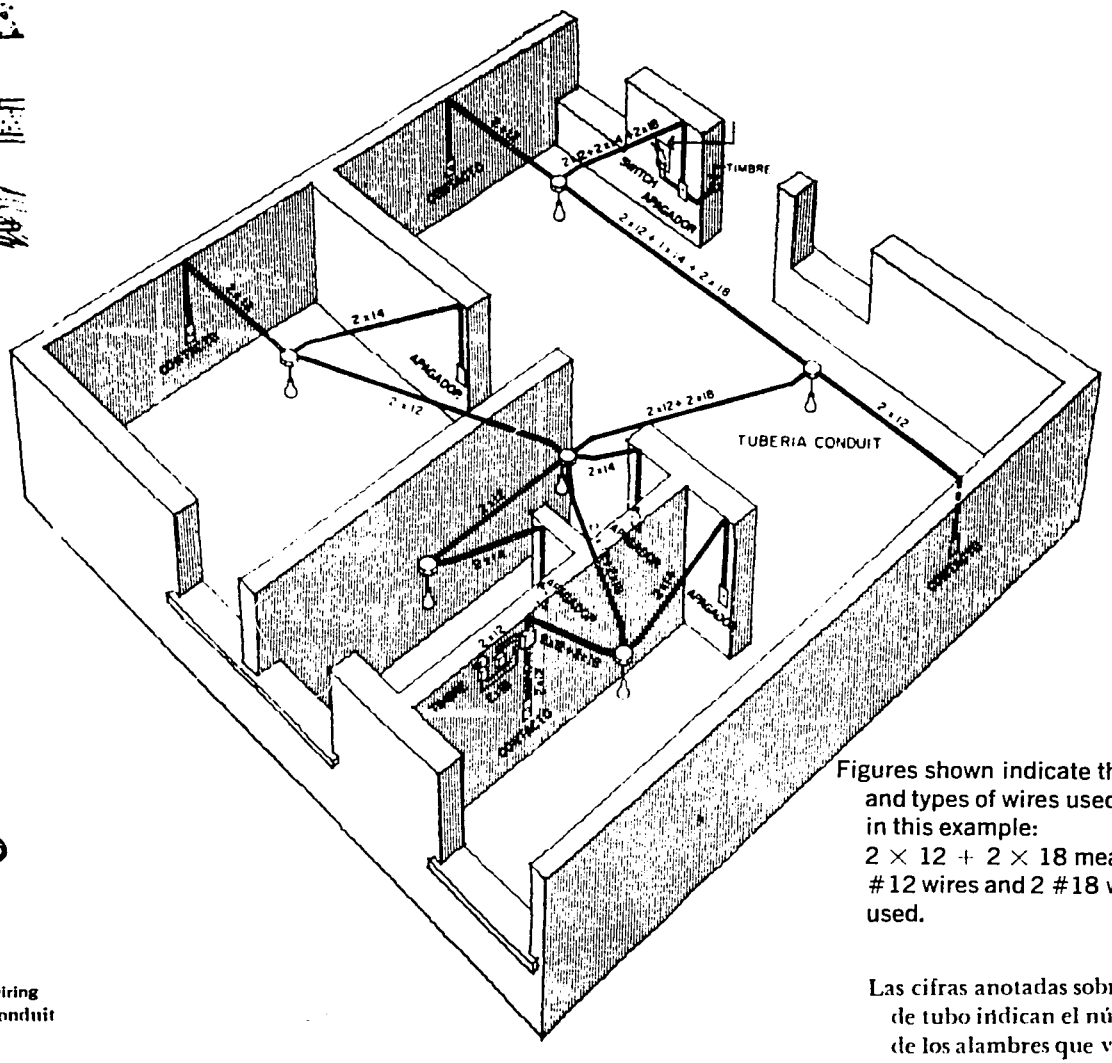
contact
contacto

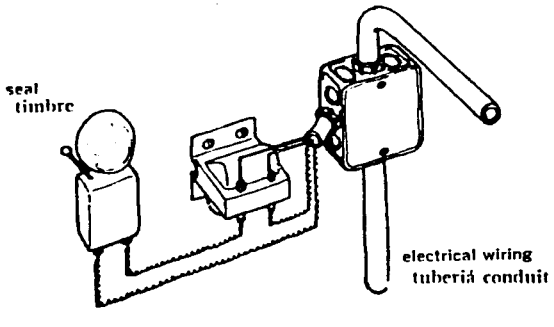




attaching the wires to the insulators
amarre de cordón en aisladores

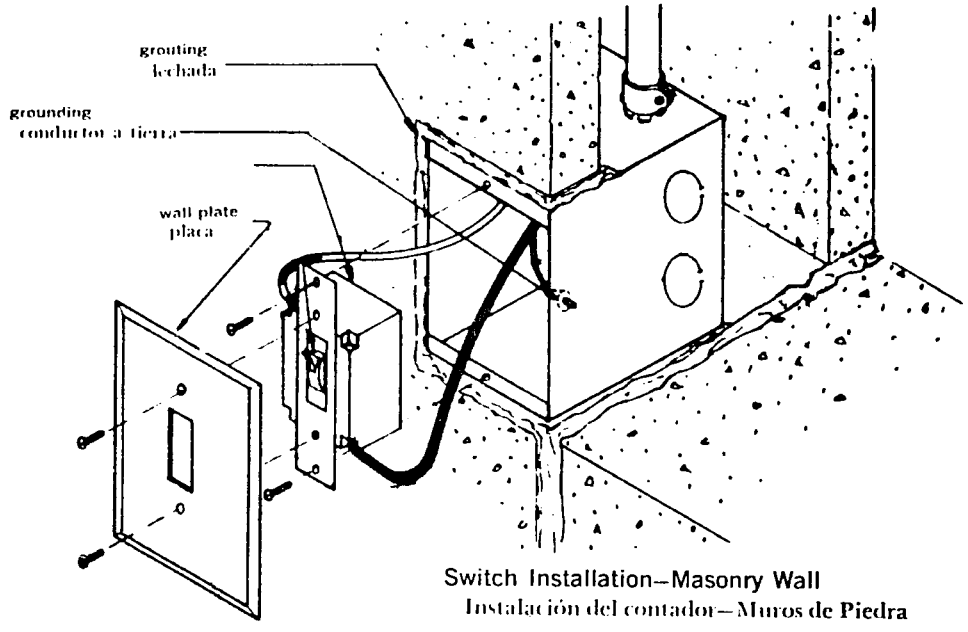




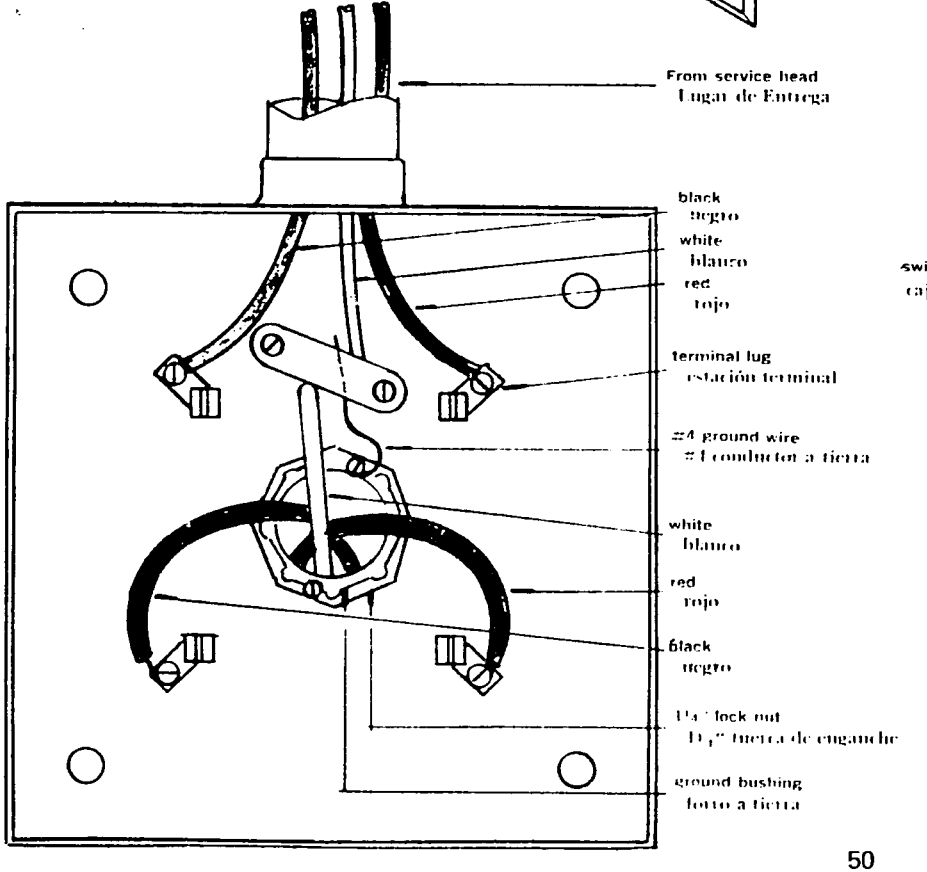


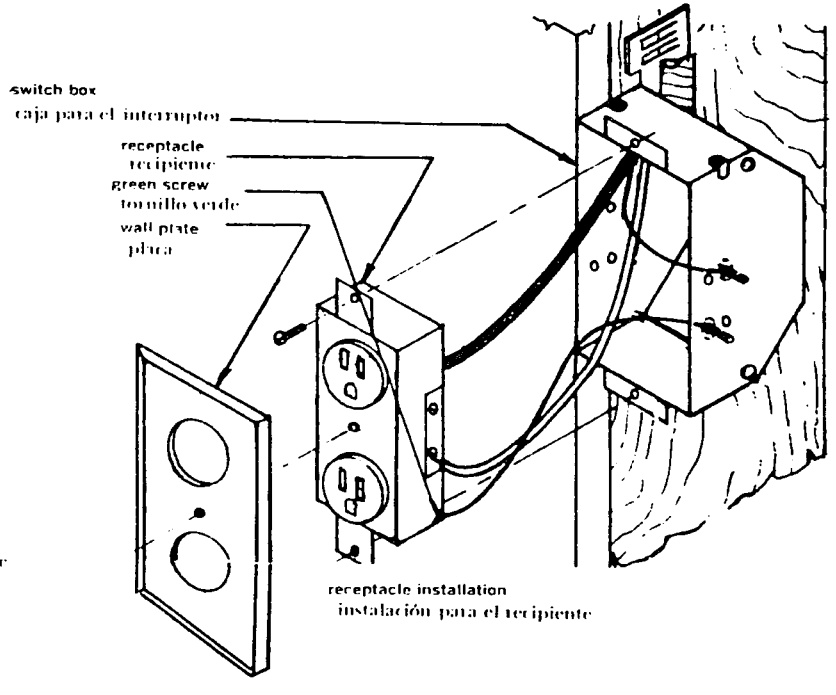
Figures shown indicate the number and types of wires used in this example:
2 × 12 + 2 × 18 means that two #12 wires and 2 #18 wires were used.

Las cifras anotadas sobre cada tramo de tubo indican el número y calibre de los alambres que van en ese tramo (ejemplo: 2 × 12 + 2 × 18 significa que se pondrán 2 alambres del 12 y 2 alambres del 18.)



Switch Installation—Masonry Wall
Instalación del contador—Muros de Piedra





receptacle installation
instalación para el recipiente