

# Guidelines for the construction of a cemented palm oil pit

This guideline gives the dimensions for the “1 drum pit” (75kg of cement) and “2 drums pit” (125 kg of cement). This model can be adapted by adjusting the size of the hole and the proportions of cement.

## Tools and Material

The construction involves locally available materials, except cement which might be hardly available and costly for remote farming families. The construction requires basic masonry knowledge and tools.

Materials	Quantities for 1 drum pit	Quantities for 2 drums pit
Cement (kg)	75 (1.5 bags)	125 (2.5 bags)
Sand (head pans)	15	30
Granite stones (head pans)	35	80
Stones for the floor (head pans)	10	25

Tools		
Measuring tape	Buckets	Hammer
Level	Head pans	Sledge hammer
Strings	Pick axe	
Wooden sticks	Shovel	
Machete	Trowel	

## Steps

### 1. Site selection (15 mn)

It is necessary for the farmer to choose an adequate location to optimize the efficiency of the pit. In order to facilitate the process, it is advisable to locate the pit :

- **Within the palm trees garden** to reduce the constraints of transportation.
- **Near to a water point** (swamp, stream, well) because the process requires a large quantity of water.
- On a **gentle slope** to allow the proper drainage of water.

### 2. Site preparation (15 mn)

Before starting the construction, the site has to be clear of grass, branches and stones.

Tools : machete and the shovel.



Steps

3. First soil marking (15 mn)

This soil marking helps the farmer to visualise the size of the hole he has to dig.

Tools : 4 sticks, hammer, strings, measuring tape.

	1 Drum Pit		2 Drums Pit	
	Length	Width	Length	Width
First marking	7	6	8	6

4. Digging (1-2 Man Days)

Dig the hole following the first marking. The pit has to be gently tilted to drain water (there should be a upper side and a lower one). Regularly check the depth to avoid extra work.

Tools : shovel, pick axe, measuring tape.

	1 Drum Pit		2 Drums Pit	
	Length	Width	Length	Width
Depth (upper side)	1 foot and 9 inches		2 feet and 2 inches	
Depth (lower side)	2 feet and 1 inch		2 feet and 4 inches	



First marking

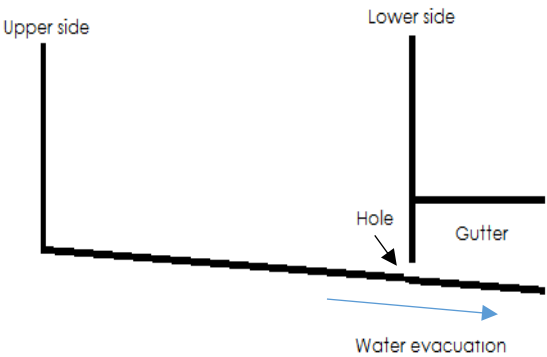


Digging

5. Second marking (15 mn)

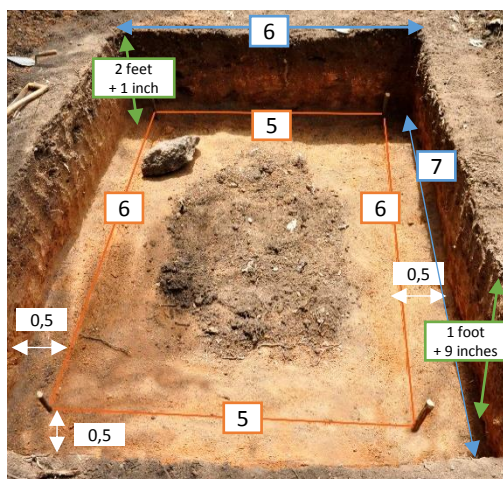
In order build the walls, it is necessary to make a second marking inside the pit, as done for the first marking.

Tools : strings, 4 sticks, hammer, measuring tape.

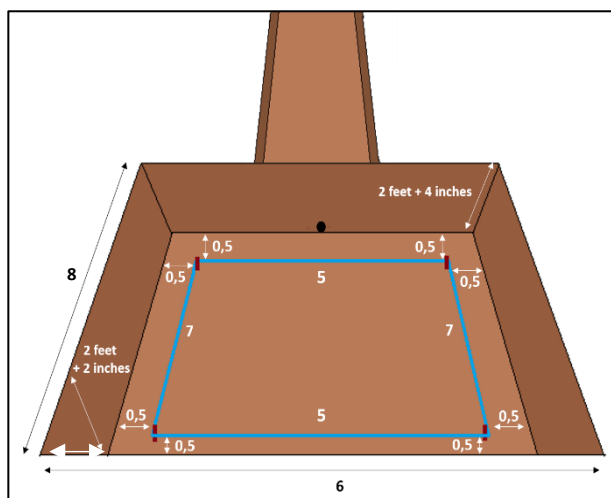


	1 Drum Pit		2 Drums Pit	
	Length	Width	Length	Width
Second marking	6	5	7	5

## Steps



1<sup>st</sup> and 2<sup>nd</sup> marking in feet (1 drum)

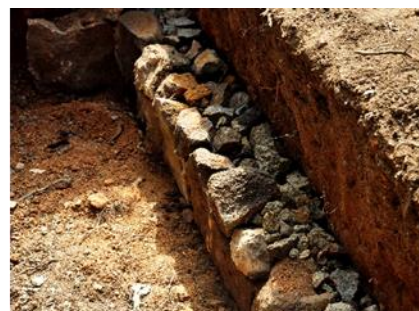
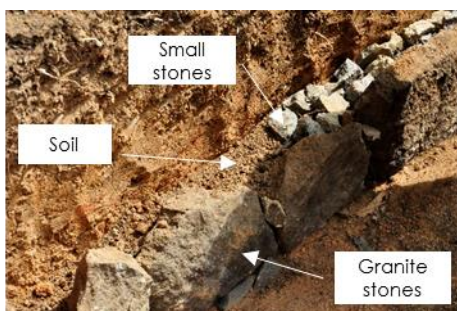


1<sup>st</sup> and 2<sup>nd</sup> marking in feet (2 drums)

### 6. Building the walls (2 – 3 MD)

Select big granite stones, shape them and place them along the 2<sup>nd</sup> marking. They have to be well lined up. If necessary, wedge them with small stones. When the first row is rose, add soil between granite stones and the edge and cover it with small stones. Cover with concrete and repeat the same steps for the next rows up to the top of the pit. Do not forget to let a hole at the bottom of the lower side to join the gutter.

Tools : Sledge hammer, shovel, pick axe, trowel, level .



Construction of the walls

### 7. Building the floor (0,5 MD)

Lay big rough stones on the floor and fill the gaps between them with small stones. Grout the stones with cement to have a strong rough surface.

Tools : Sledge hammer, head pans, shovel, pick axe, trowel.





## Steps

### **8. Plastering (1 MD)**

Prepare concrete by stirring sand, water and cement. Plaster the walls to obtain a smooth surface and finish the plaster between the stones on the floor. The pit has to be waterproof.

Tools : trowels, buckets.

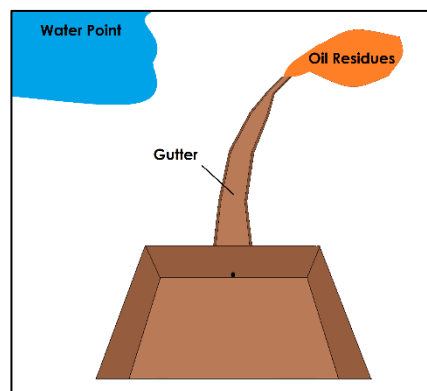


### **9. Digging the gutter**

When it is drying, dig the gutter little by little. To make the hole, use a banana stem or a piece of PVC pipe. Be careful to dig the gutter in the opposite direction of the water point to avoid contamination by oil residues.

### **10. Watering**

During one week, slightly water the pit in order to avoid cracks in the cement (maintaining it wet). Do it early in the morning, before the temperature be too high (if done during the daytime, there is a risk of cracks)



1 Drum Pit



2 Drums Pit

## Steps

### **11. Maintenance**

After some years, the pit can be damaged by rains and intensive use and may require maintenance. Make a small quantity of cement and plaster the walls and the floor to fill the cracks.



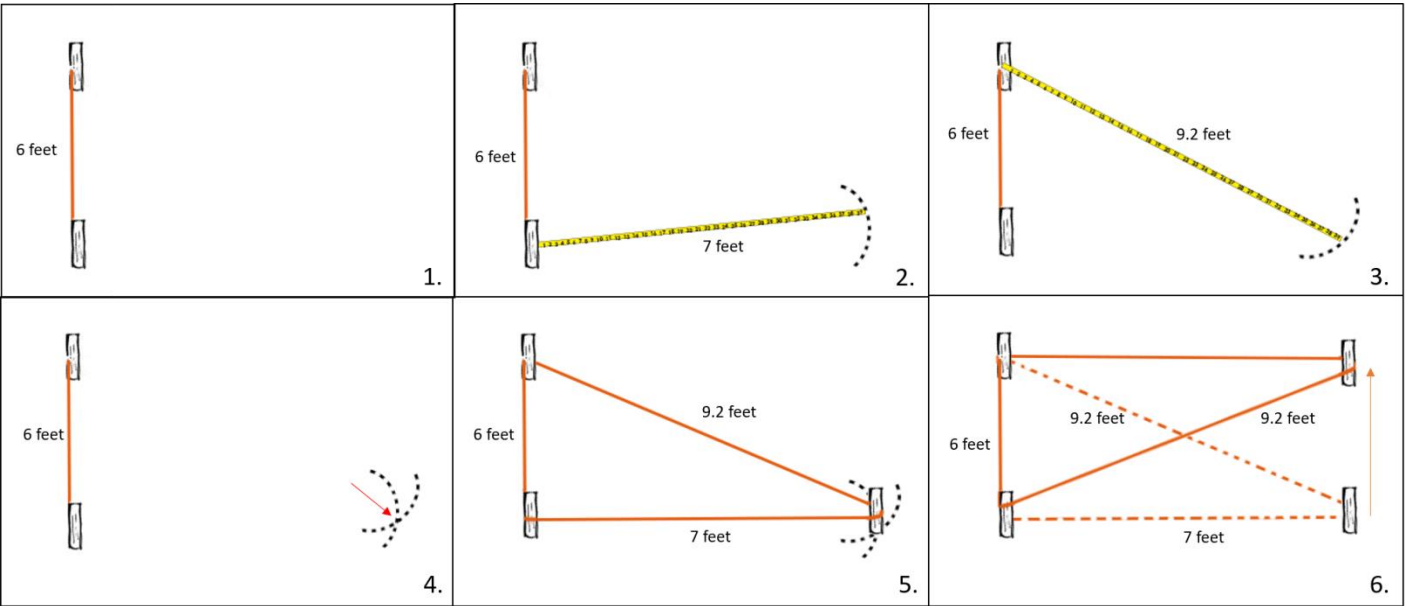
# Appendix 1: how to draw a rectangle

### Materials

- 1 Measuring tape
- 1 string (> 25 feet)
- 4 sticks
- 1 Hammer

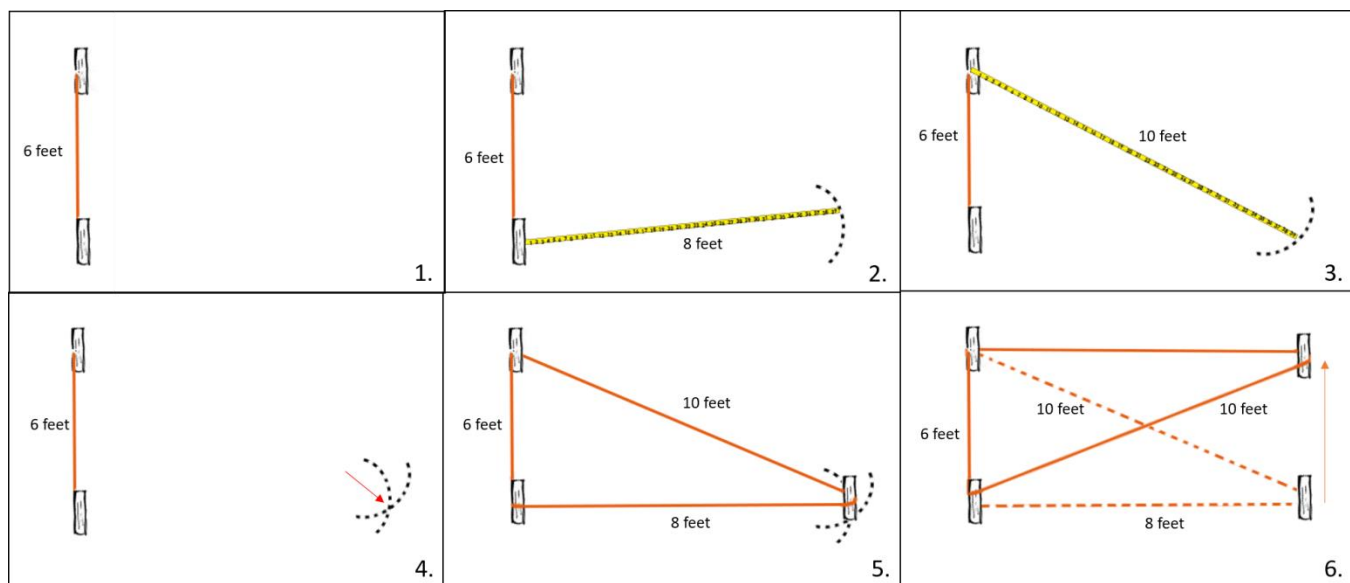
### For 1 drum pit

- Measure the width with the measuring tape (6 feet) and mark it with two sticks. Link them with a string.
- Go to the first stick. Measure the length (7 feet) and move left and right by keeping the measuring tape well stretched. Mark your movement on the ground.
- Go to the second stick. Measure the diagonal (9,2 feet) and move left and right by keeping the measuring tape well stretched. Mark your movement on the ground.
- The two movements you have marked on the ground are crossing each other at one point.
- Put the third stick on this intersection and pass the string around it to mark a triangle.
- Go to the third stick. Remove the string from it and move to the 4<sup>th</sup> corner. Stretch the string well. When the string is well stretched, mark the point and put the fourth stick.



### For 2 drums pits

- Measure the width with the measuring tape (6 feet) and mark it with two sticks. Link them with a string.
- Go to the first stick. Measure the length (8 feet) and move left and right by keeping the measuring tape well stretched. Mark your movement on the ground.
- Go to the second stick. Measure the diagonal (10 feet) and move left and right by keeping the measuring tape well stretched. Mark your movement on the ground.
- The two movements you have marked on the ground are crossing each other at one point.
- Put the third stick on this intersection and pass the string around it to mark a triangle.
- Go to the third stick. Remove the string from it and move to the 4<sup>th</sup> corner. Stretch the string well. When the string is well stretched, mark the point and put the fourth stick.





## Appendix 2: how to process palm oil with the pit

### 1. Boiling the fruits

In the evening, boil the fruits during 2 hours. Then, light off the fire and cover the fruits with a piece of cloth. Let them cooling during the night.

2 hours



### 2. Trampling

The next day, pour the fruits into the pit and step on them.

1 hour (2 people)



### 3. Adding water

Add water into the pit to separate the kernels, the fibres and the palm oil.



### 4. Washing and removing the fibres

Wash the fibres by hands and remove them from the pit.

1 hour (2 people)





## 5. Skimming and Sieving

Collect the palm oil with hands and use a sieve to remove the fibers,

1.5 hours (2 people)



## 6. Boiling of Palm Oil

Boil the blend water + palm oil to remove the water and get pure palm oil.

< 1 hour



## 7. Filtration and Cooling

Take out palm oil from the drum and transfer it into a big pot. Let the oil cooling, it will allow the last fibres to settle down.

30 mn



## 8. Cleaning the pit

Take out kernels and open the hole to remove the water. Wash the pit properly with water.

20 mn

