

Lecture 10

Improved Storage Structures

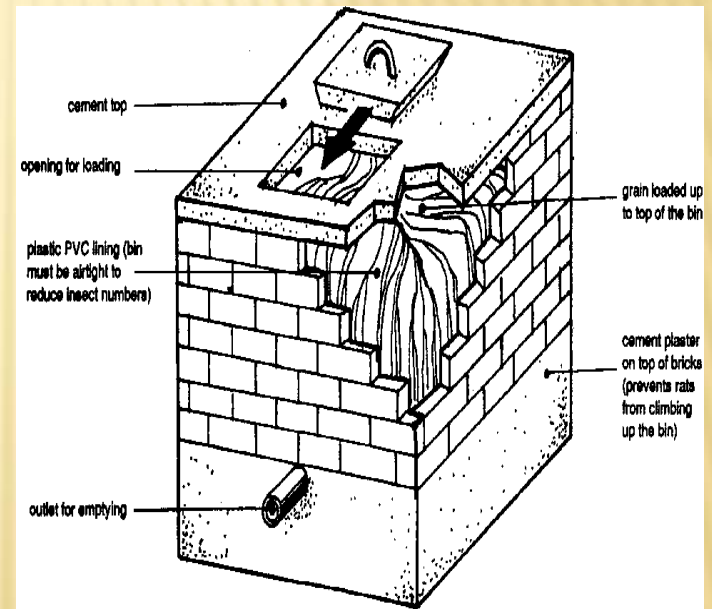
Drying & Storage Engineering
(PFE-304)

Different type of improved storage structure:

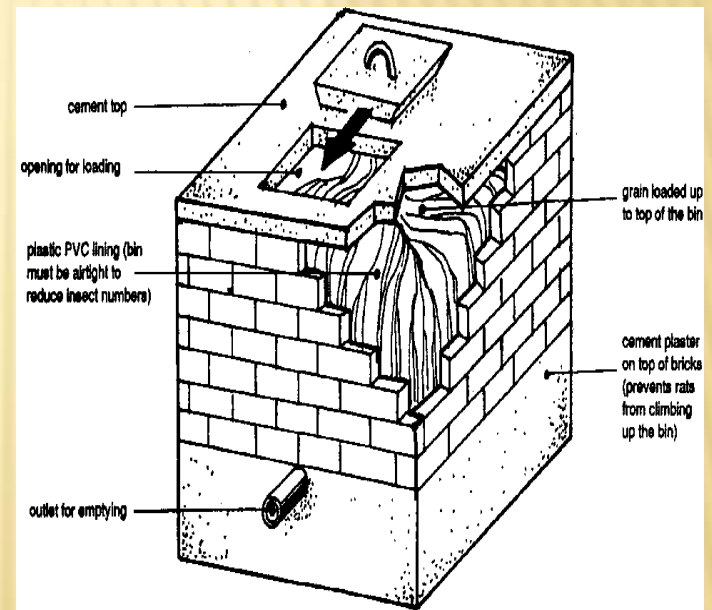
1. Pusa bin
 2. Brick and cement bin
 3. Bunker storage
 4. CAP Storage structure
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1.Pusa bin:

- Pusa bin is like traditional storage structure made of mud.
- To make the storage structure moisture proof as plastic film is used in all inside side of the bin.
- To construct pusa bin first a platform of mud bricks is made.
- On this platform a sheet of 700 gauge plastic is overlaps the platform on all sides by atleast 6 cm.
- Walls are made of kachha bricks and these are sealed with mud plaster.



- When walls are raised to a proper height a wooden frame is placed on it.
- The upper roof is made of burnt bricks.
- For unloading of grains on inclined wooden or steel pipe is fixed in such a way that grains may come out the mouth of pipe is closed by cover.
- The inside of all the four walls and roof are covered by a plastic sheet.
- On the top an open space of about 50 cm*50 cm is left for loading of grains leaving this open space the roof is sealed by mud.



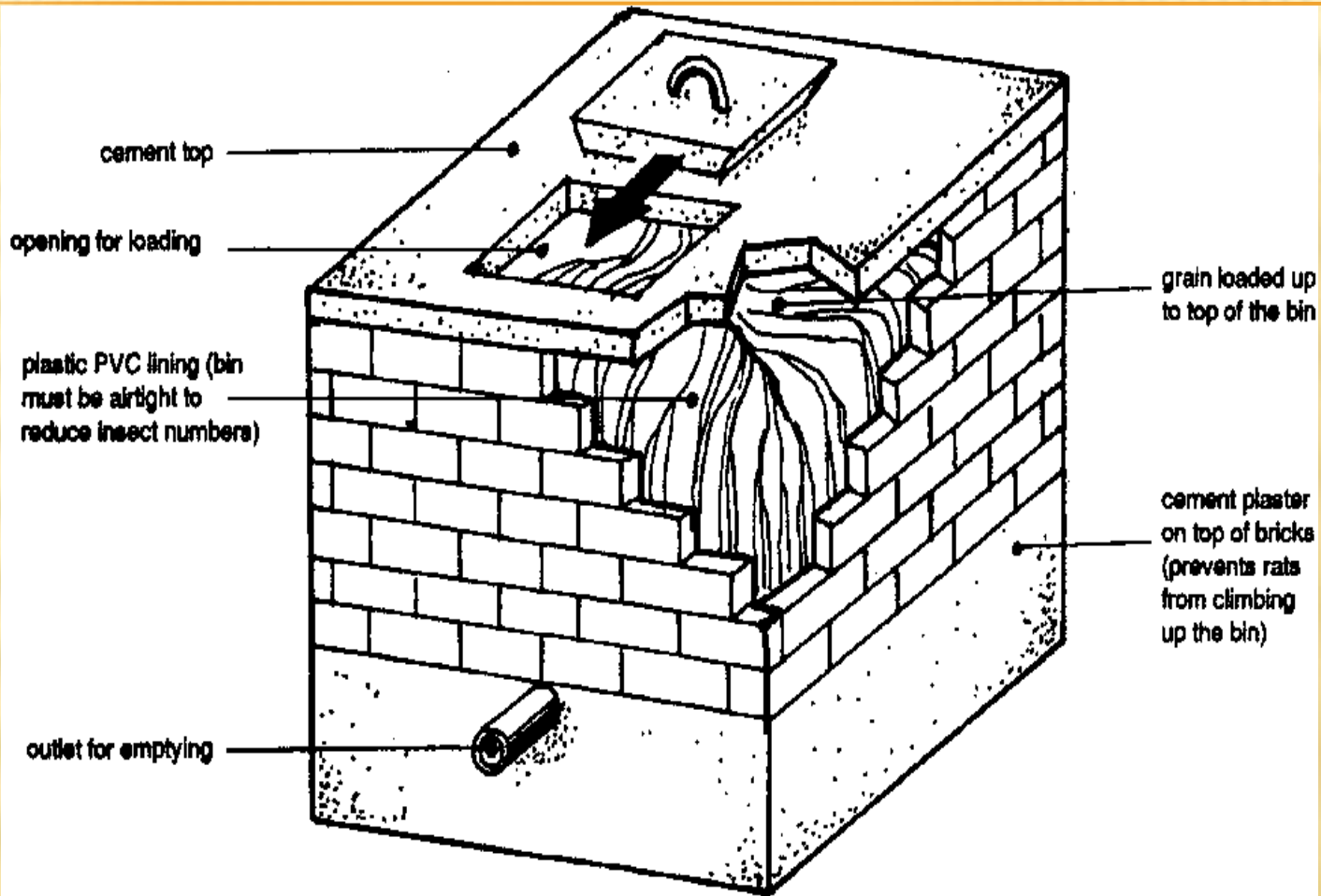


Fig:Pusa Bin

➤ After the bin is filled with grains the top open space is well covered by a plastic sheet so that air may not enter the bin.

❖ **Material requirement for two different capacities of pusa bin:**

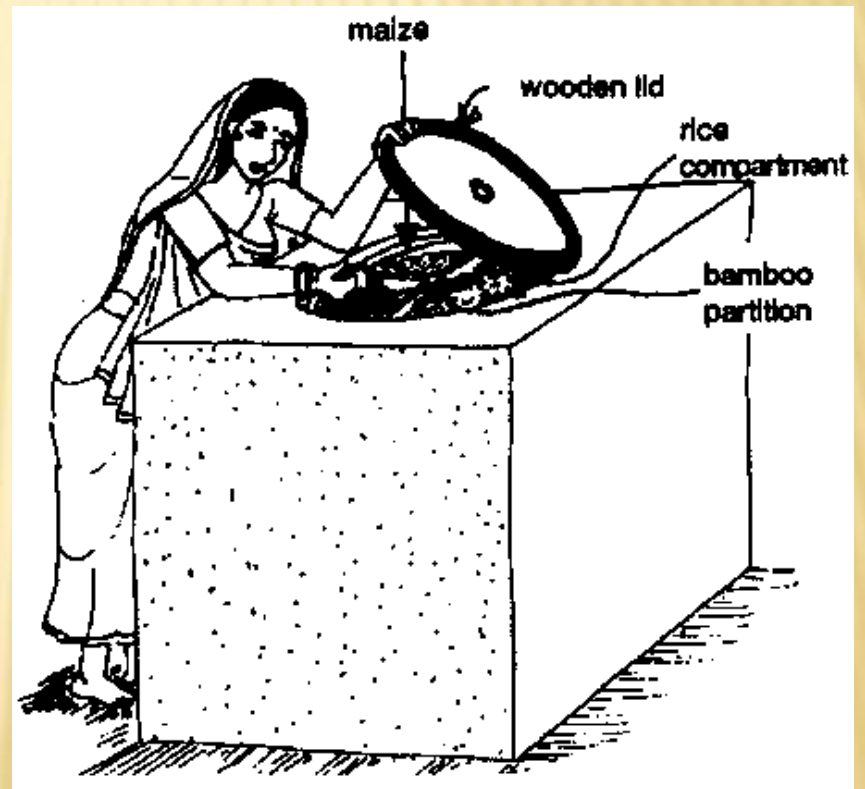
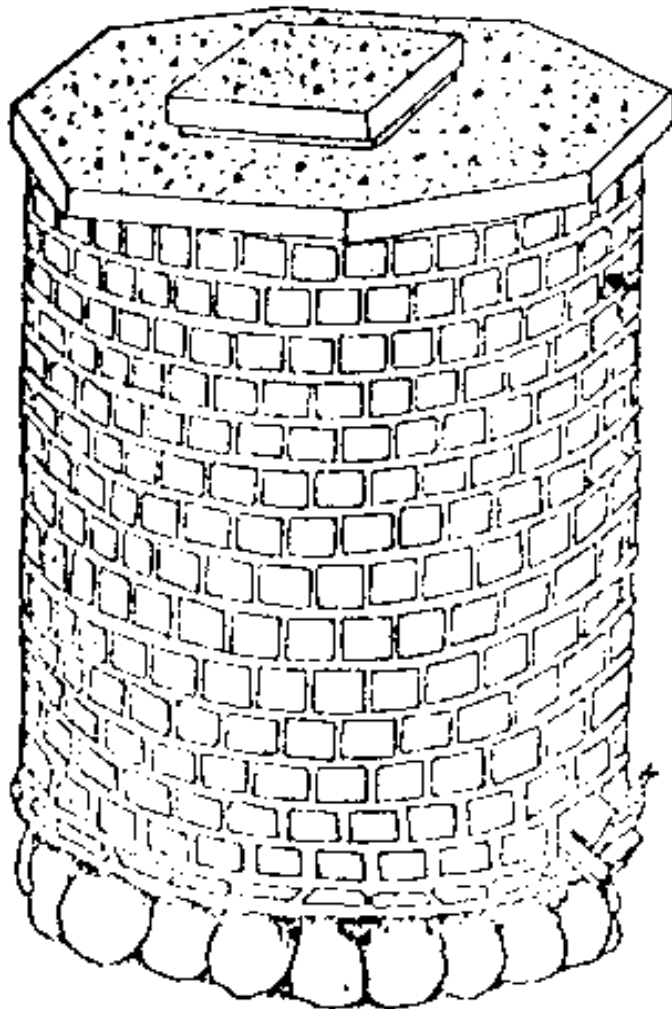
**2 tonne pusa bin: Base 140 x 100 cm height 160cm
plastic sheet 180 cm wid 85 cm long kachha bricks 1150
burnt bricks 100 pipe for outlet.**

**4 tonne pusa bin: Base 172 x 152 cm height 160 cm plastic
sheet 180 cm wide 11.6 cm long kachha bricks 1650 burnt
bricks 21 and pipe for outlet.**

2. Brick and cement bin.

- These storage structures are very strong and the effect of season on these are minimal.
- The bin is made on a platform raised at 60 cm above the ground.
- A ladder is provided on one side of the bin for loading of grains.
- A hole of 60 cm diameter is provided on the roof for loading purpose.
- The walls of the bin are 23 cm thick with cement plaster on both sides.

2. Brick and cement bin.

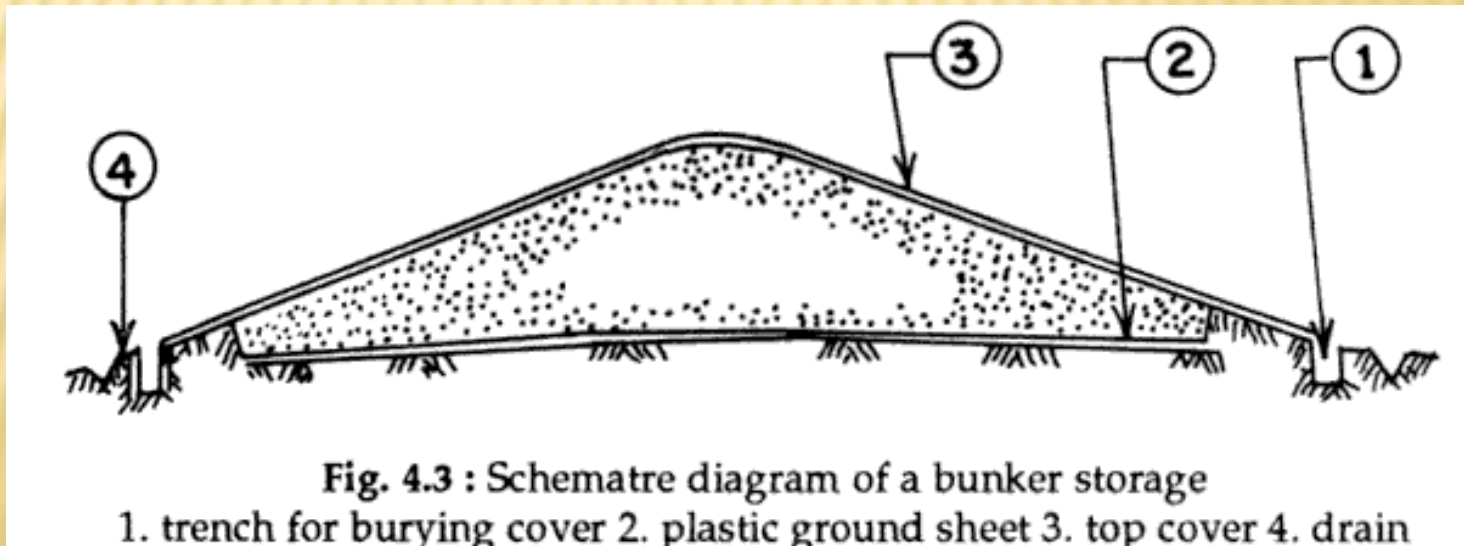


2. Brick and cement bin.

- The roof is made of RCC.
- The base of bin is made inclined and an outlet is provided for unloading of grains.
- The capacity of such bin is between 1.5 to 60 tonnes.
- For cleaning of bin and complete unloading a person can go inside with the help of iron rings steps provided inside the bin.

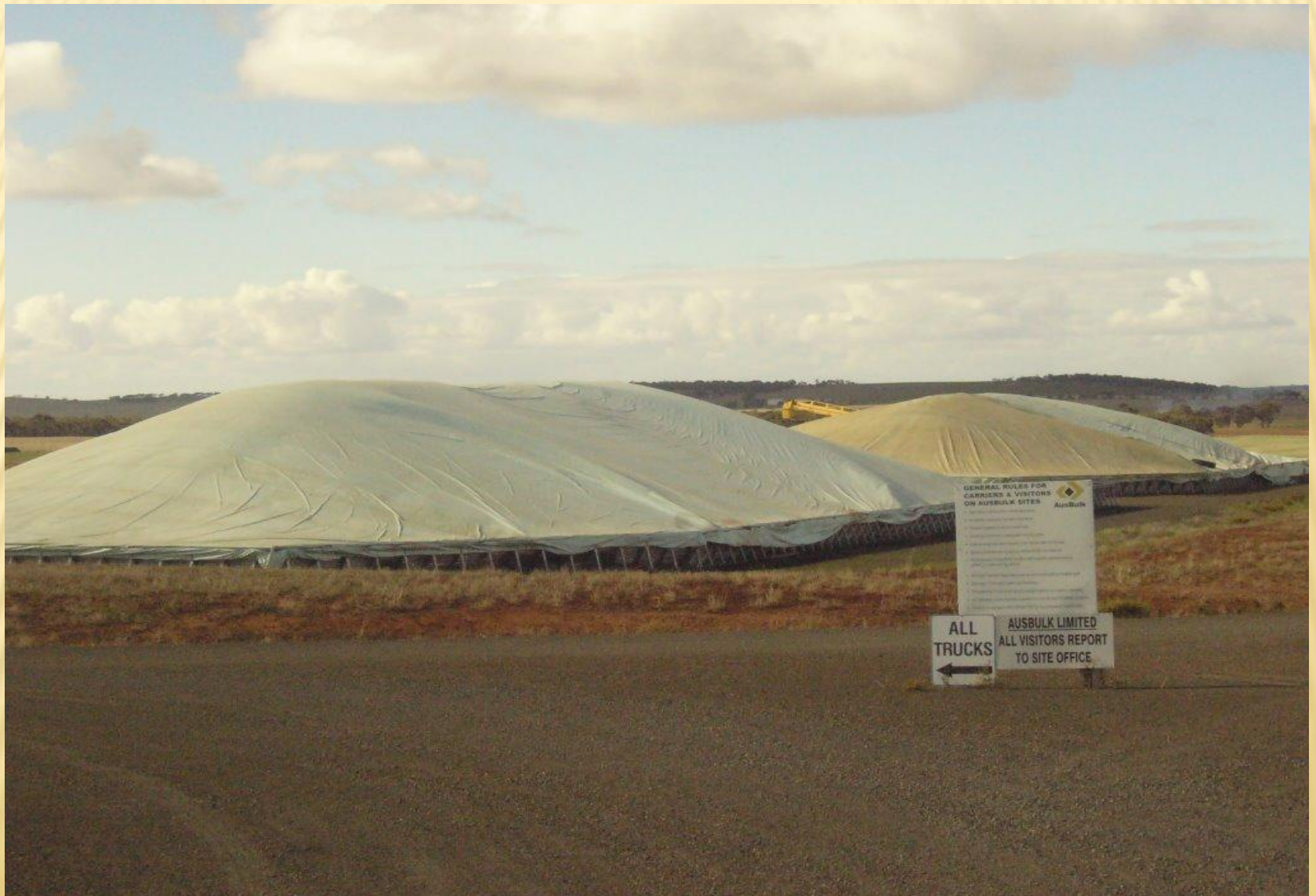
3. Bunker storage:

- This is used for long term storage for a large volume of grains.
- It has proved successful as a means of storing grains safely and economically.
- By controlling insects and moisture levels, the losses can be up to 0.5%









4.CAP STORAGE STRUCTURES:

- The word CAP is used for cover and plinth,plinth from the bottom and cover from the top.
- This type of open storage is considered as transit storage and serves the purpose of storage of food grains in bags for short period.
- This type of storage facility is cheaper as compared to conventional bag storage godowns.
- The cover is rectangular in shape having five sides made from polythelene film of 1000 gauge,leaving the bottom side open.

4.CAP STORAGE STRUCTURES:



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- The cover is used for protecting stack of bags.
- Normally the stack is over a shape of 9.11 x 6.1 m with height of 18 bags high gives the storage capacity of around 150 tonnes.
- The cover having a dimensions of 9.4 x 6.4 x 5.5 m normally weight around 52 kg.
- Sometimes smaller covers are used for covering the stacks in covered varandah of conventional godown such covers are called 'varandah cover'.
- In storage of food grains under varandah covers, the stacks are built to a height upto bags having an average capacity of 24 tonnes.

The following steps are required to be followed in construction of 'CAP' storage.

- I. Select a high elevated ground and make it level.
- II. Wooden sleepers are spread with one or two layers of bamboo mat cover on that top as dunnage.
- III. The gutters are provided all ground the area to drain off rain water easily.
- IV. The stacking is done to the height up to 18 bags on the dunnage and is covered with polythylene
- V. The stacks are covered with polythene covers and tied with ropes to prevent from blowing of high velocity wind.

THANK YOU