CHAPTER 12
WASTE STORAGE DEPOTS

12.1 INTRODUCTION

This is the third essential step for an appropriate Solid Waste Management System. All the waste collected through Primary Collection System, from the households, shops and establishments has to be taken to the processing or disposal site either directly necessitating a large fleet of vehicles and manpower or through cost effective systems which are designed to ensure that all the waste collected from the sources of waste generation is temporarily stored at a common place called "Waste Storage Depots" and then transported in bulk to the processing or disposal sites. Such temporary arrangement for storage of waste is popularly known as dust bin, Dhalavs,etc. This facility has to be so designed that the system synchronizes with the system of primary collection as well as transportation of waste.

12.2 THE PRESENT SCENARIO

In India, the system of providing waste storage depots is most inefficient, unhygienic and unscientific, posing a serious threat to the public health and environment. In most cities, waste storage depots are of the following types.

1. Open sites,
2. Cement-concrete-cylindrical bins,
3. Masonry bins,
4. Metal rings,
5. Dhalavs, etc.

At some places metallic containers are also placed. Deposition of waste at the open waste storage sites is most unscientific and unhygienic. The waste is just dumped at such sites from the wheel barrows/hand carts and waste remains littered around such sites causing insanitary conditions, foul smells, environmental pollution besides giving unsightly appearance till it is removed as could be seen

from the photographs in Fig. 12.1. This waste also necessitates multiple handling till it is finally disposed off.

FIG. 12.1 OPEN WASTE STORAGE DEPOT

Similar is the position of cylindrical and masonry bins where waste overflows outside the bin as these are poorly designed and not user friendly. Sweepers do not put the waste in such bins and instead throw the waste outside the bin due to wrong design of the handcart and inappropriate size of the bin as shown in the photograph in Fig. 12.2. These bins necessitate multiple as well as manual handling of contaminated waste.

Large concrete bins or "dhalavs" are constructed at some places for bulk storage of waste. These designs are also unsuitable as sanitation workers do not take the waste inside but throw the waste at the entrance blocking the passage. Waste is thus seen more outside the bin than inside. Waste stored at such depots also necessitates multiple handling.

12.3. MEASURES TO IMPROVE THE SITUATION

The solid waste collected from the doorsteps or from the community bins through the primary collection system needs to be unloaded and stored at convenient places for its onward transportation in a cost-effective manner.

Temporary waste storage depots which synchronize with primary collection and transportation system are, therefore, required to be located at suitable sites in lieu of open waste storage sites, and in replacement of cylindrical cement bins, masonry bins, Dhalavs, etc.

FIG. 12.2 USE OF ILL-DESIGNED WASTE STORAGE DEPOTS

12.4 STEPS TO BE TAKEN BY THE LOCAL BODY

The local body, taking into consideration that there is adequate space to place one or more containers of 3 to 10 cu.m size, the proposed waste storage depot would not obstruct the entrance of any building, would not cause hindrance to the traffic, there is adequate space for the movement of vehicles which come to pick up the container, should identify suitable locations at a distance not exceeding 250 metres from the work place of sanitation workers where waste storage depots facilities can be created. As far as practicable, such depots should be created at the existing unhygienic waste storage depot sites to minimize the objections from the people. As soon as such sites are identified, the sites should be prepared in such a way that a large size closed body container/containers can be placed at the site and it becomes possible to bring waste up to such containers easily and transfer the contents from the hand carts. It should also be possible to remove the container or replace with the hydraulic vehicle without causing inconvenience to the people and obstruction to the traffic. Soon thereafter all open waste storage sites should be abolished expeditiously and all dust bins made of cement pipes, metal rings, masonry construction, Dhalavs, etc., should also be replaced in a phased manner by a neat mobile container placed at the site identified for deposition of waste through containerised hand carts/containerised tricycles etc., bringing waste from the door steps, from the community bins and from the streets.

12.5. OPTIONS FOR SELECTION OF CONTAINERS

There are variety of containers, which can be placed at the waste storage depots. The local body may consider one or more options stated below.

- Depending on the quantities of waste likely to be deposited at the temporary waste storage depots, provide one or more large metallic containers (3 to 10 cu.m) with lid as illustrated in Fig. 12.3 at the Waste Storage Depots.

- **Distance between the Depots**

Such depots should be at a distance not exceeding 250 meters from the place of work of the sweepers. The distance between two bins should, therefore, not exceed 500 meters. The distance between the bins can be determined on the basis of the load of garbage/refuse that is likely to be received at the container from the area concerned.

FIG. 12.3 CONTAINERS PLACED AT THE WASTE STORAGE DEPOTS

- **Flooring below the containers**

The bins should be placed on cement concrete or asphalt flooring having a gradual slope towards the road to keep the site clean as shown in the photograph at Fig.12.4 below. The design and specifications for construction of flooring for placing the containers may be seen kept at Annexure-12.1. Rectangular flooring should be done in such a way that the container is kept in the centre as shown in the photograph in Fig. 12.3 and there should be paved space left on both sides of the container to facilitate transfer of waste from the hand cart / tricycle into the container. The flooring should be flush with the border of the road to maintain hygienic conditions and facilitate early transfer of waste from the handcart/tricycle into the container. A catch pit may be provided close by, if storm water drains exist in the city.

FIG. 12.4 CEMENT CONCRETE FLOORING FOR PLACEMENT OF CONTAINER

- At places where due to narrow roads, it may be found difficult to place container as shown above. The container may be placed lengthwise to facilitate loading from the front side only. Transportation of container in such a situation may have to be done from the side of the road as shown in Fig. 12.5.

FIG. 12.5 CONTAINERS PLACED LENGTHWISE ON NARROW STREETS

- In areas where placement of large containers is inconvenient on account of congestion, narrow roads, etc., one or more small containers of 0.5 to 1.00 cu. m. size as illustrated in Fig. 12.6 may be placed on the roads, lanes and by lanes at short distances not exceeding 100 meters. These bins should also be kept on paved flooring as shown in option (1) and cleared daily.

FIG. 12.6 SMALL CONTAINER PLACED AT SHORT INTERVALS IN LIEU OF LARGE CONTAINER

- In highly congested areas where it is difficult to place containers or send out a vehicle to collect waste from such bins, the local body may press into service small waste collection vehicles for direct transfer of waste from the hand cart/tricycles into such vehicles. Such vehicles can be parked at suitable locations/junctions in the congested areas for a few hours in the morning where sweepers can bring the waste easily as can be seen from the photograph in Fig. 12.7.

FIG. 12.7 SMALL WASTE COLLECTION VEHICLES UTILIZED FOR DIRECT TRANSFER OF WASTE

- In small cities where the local body feels that it will be difficult to maintain hydraulic vehicles for transportation of such containers, it should place a low bed Tractor Trolley or containers., which could be towed away by a tractor or a similar prime mover at the temporary waste storage site. The flooring should be paved for placing such trolleys or containers and maintaining hygienic conditions.

12.6 CRITERIA FOR PLACING LARGE SIZE CONTAINERS AT THE WASTE STORAGE DEPOTS

As far as practicable large sized closed body containers may be placed at the temporary waste storage depot to minimise the cost of transportation. The density of Indian waste is generally 500 Kgs./ cu. m. So containers of 1 cu. m. volume would be required per 500 Kgs. of waste depending on the quantity of waste expected to be received at the waste storage depot each day. The container/containers of at least twice the capacity may be placed at such locations to prevent over flow of bins and have freedom to lift the bin at the local body's convenience. For instance, if at one location two towns of waste is expected, depending on the density of waste, a container of 4 cu. m. capacity is necessary to hold the waste. Two containers of 4.0 to 4.5 cu. m. may be placed at such

locations so that there will be no over flow and the container when about to be full, can be lifted.

If the total quantity of waste to be transported in the city each day 100 tonnes i.e. 200 cu.m., the local body should place containers having a total capacity of at least 400 cu.m. This will create 100% spare capacity which will avoid the over flow and enable the local body to transport the containers in any shift or on the alternate day or even twice a week depending on when the container gets full.

Such containers can be made of various designs with a variety of specifications by private sector. What is important is that the container should have the designed capacity, good strength, the loading height less then one metre so that it may not be difficult for sweepers, particularly female sweepers to transfer the contents from the hand carts container into the large container. A typical design and specification for 7cu.metre container may be seen at Annexure-12.2. This design or specification may not be taken as a standard recommended design. It is just an example

12.7 MAINTENANCE OF WASTE STORAGE DEPOTS/CONTAINERS

A periodical inspection should be carried out once in three months of the waste storage depots and any damage caused to the flooring, screen walls, etc. should be repaired.

Waste storage container and hand cart which bring waste to the waste storage depot should be repaired expeditiously as soon as reported by sweepers and they should be given replacement against taking their hand carts / containers for repair so that the work does not hamper.

Large containers generally have a strong frame and the metal sheets of the container get corroded if not well maintained. Annual painting of the container from inside and outside must be carried out for increasing the life and better appearance of containers.

When the metal sheets of large containers give way, the entire container need not be replaced; only the sheet may be repaired or replaced. It is only when it is felt that its main frame has given way and repairing is not possible the entire container may be replaced. A large container should normally last 12 to 8 years.

Hand-carts generally last 4 to 5 years but containers may last only 1 to 2 years. Containers as and when worn out should be replaced maintaining adequate stock of the same in the work-shop or in the solid waste management departmental stores.