BUILDING SERVICES SPPE 3112

WASTE MANAGEMENT

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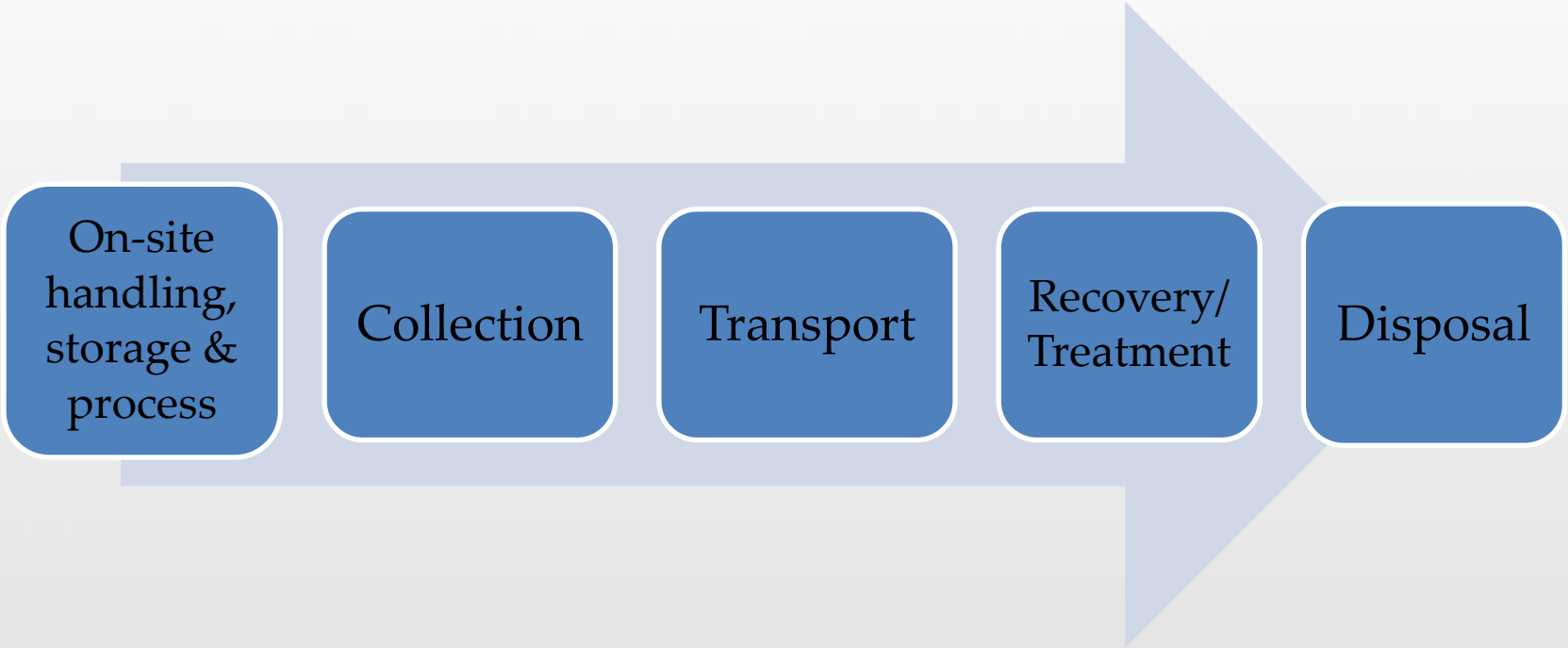
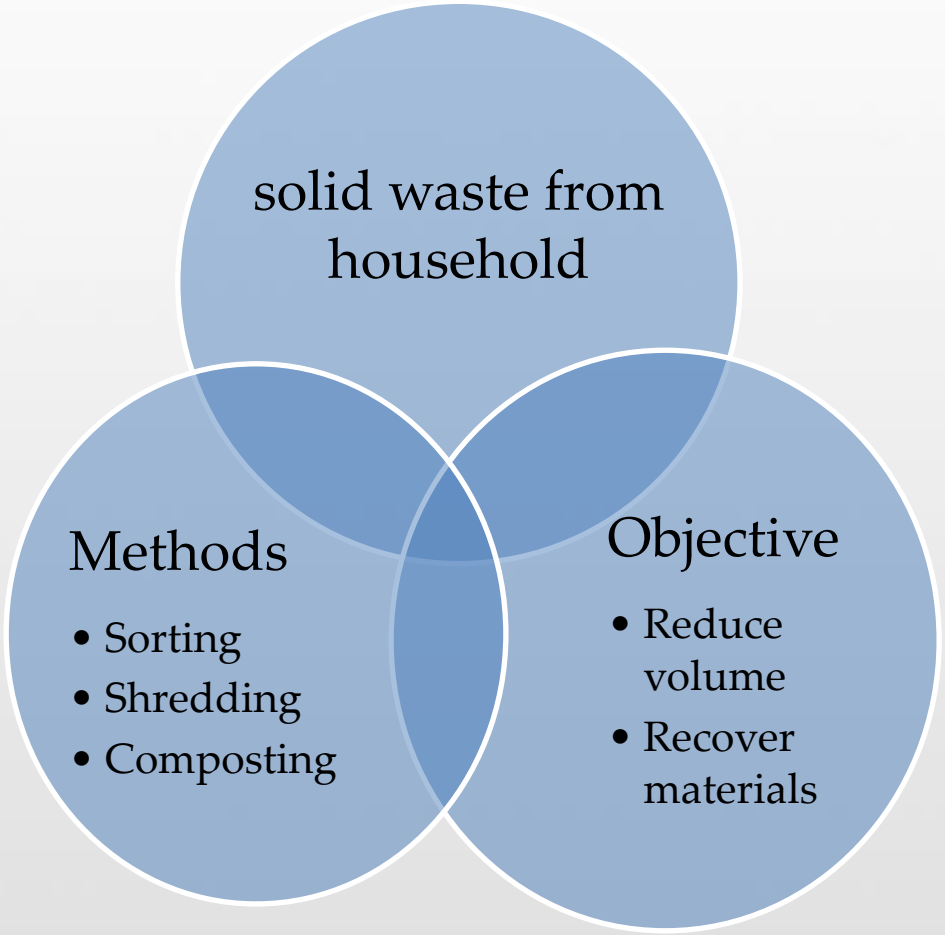
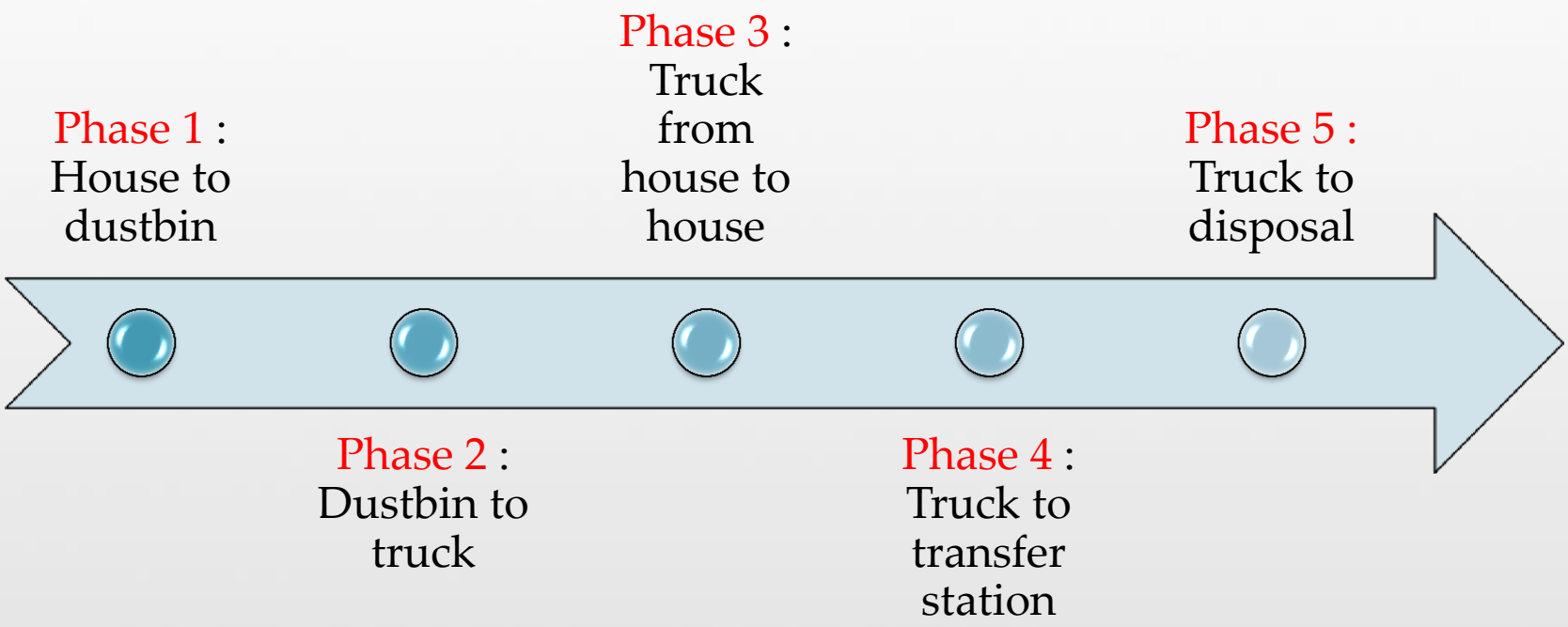
Waste Management System



1. On-site handling, storage and process



2. Collection



Frequency of collection

Garbage	Rubbish	Mixed
Twice a week	Once a week	Twice a week

Important characteristics of an optimum route are:

1. Collection vehicles should not travel twice down the same street, that is, collection path should not overlap.
2. Refuse collection on crowded streets and roads should not occur during morning or afternoon rush hours.
3. Collections should occur in the downhill direction as much as possible, to conserve fuel.
4. The starting point should be close to the collection vehicle garage, and the last collection point should be as close possible to the destination of a filled vehicle (transfer station, incinerator, processing plant, or sanitary landfill).

3. Transfer and transport

Collect waste at central location

Reload into a larger vehicle/storage tank

Transfer to disposal place

4. Recovery/treatment

Secondary sorting of waste

- Eg: plastic, glass, paper, aluminium

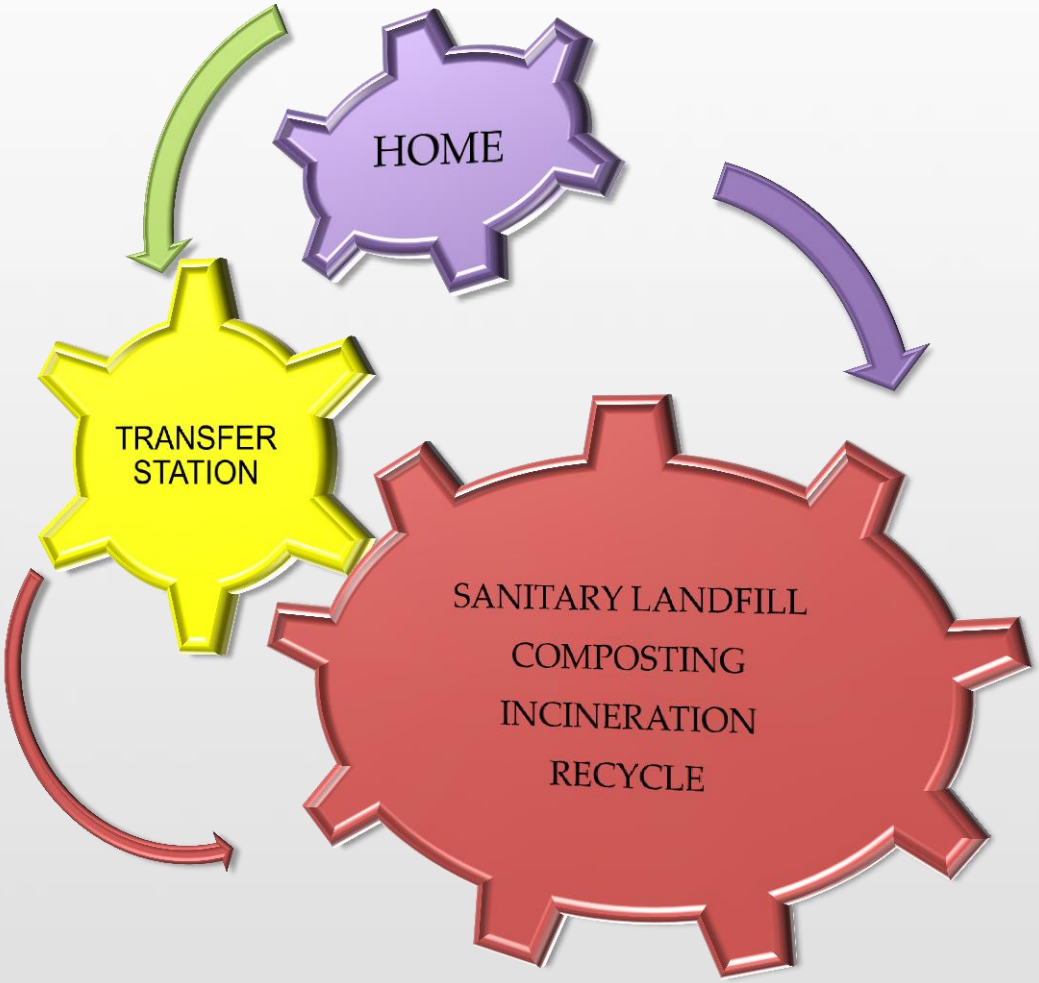
Treatment and recovery of other waste streams

VEHICLE GARAGE

COLLECTION VEHICLE

COLLECTION ROUTINE

WASTE COLLECTION AND TRANSPORT

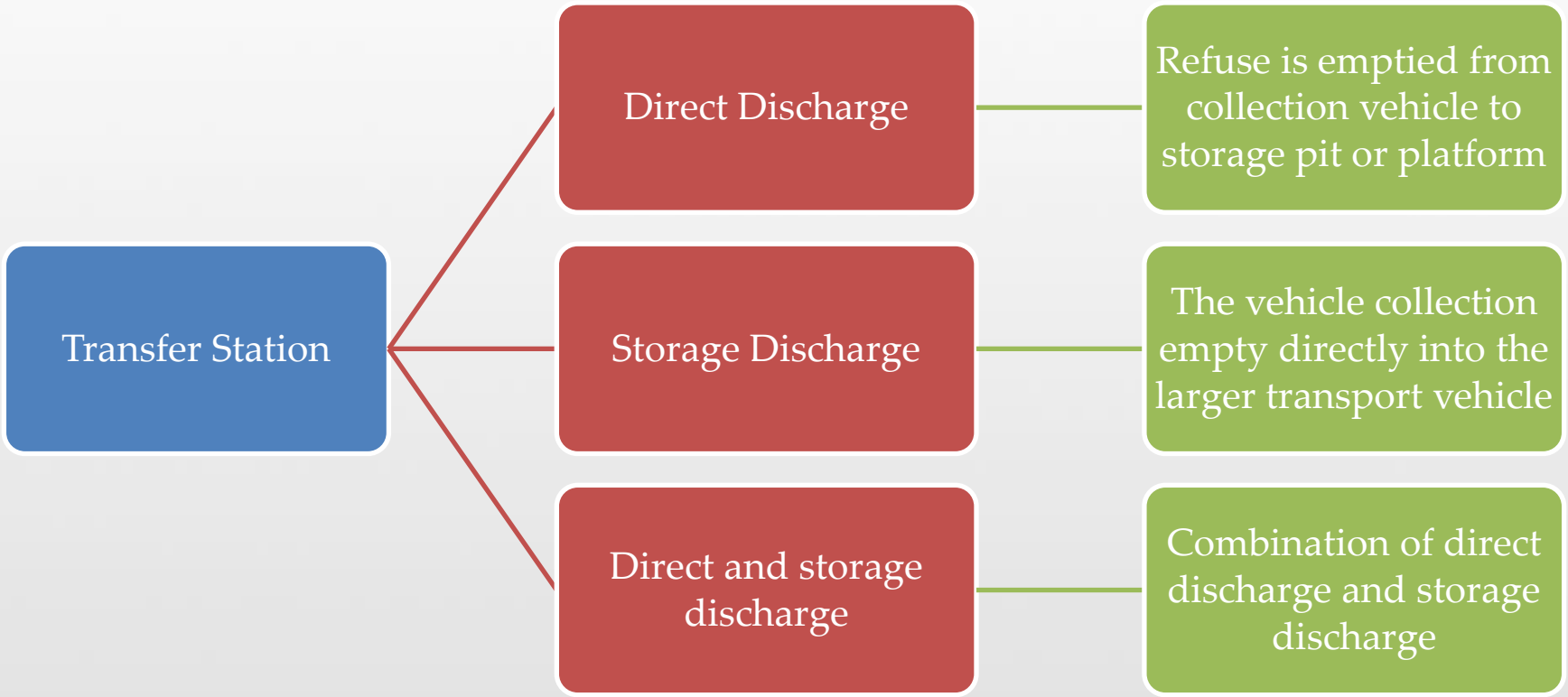


TRANSFER STATION

- It is not always economically feasible for individual collection trucks to haul refuse to the point of processing or disposal.
- To solve this waste transport problem efficiently, one or *more transfer stations* may be used.
- At the transfer station, the waste over the long-haul, distance to the processing or disposal location.

TRANSFER STATION

TYPES OF TRANSFER STATION



5. Disposal

Landfilling

https://en.wikipedia.org/wiki/Landfill_liner#/media/File:Landfill_Hawaii.jpg

Incineration

Dumpsite

https://commons.wikimedia.org/wiki/File:Payatas-Dumpsite_Manila_Philippines01.jpg

Landfill & Dumpsite

- Site for disposal waste material by burial

- Commonly method used to organize waste disposal around the world

http://www.geograph.org.uk/photo/2251054

https://commons.wikimedia.org/wiki/File:Wysypisko.jpg

SANITARY LANDFILL METHODS

Landfills are the physical facilities used for the disposal of residue solid wastes in the surfaces soils of the earth.

Landfilling is the process by which residual solid waste is placed in a landfill

The element that must be considered:

- Layout and design.
- Operation and management
- Reaction occurring in landfills
- The management of landfill gases
- The management of leachate
- Environmental monitoring
- Landfill closure and post closure care.

(source: http://mebig.marmara.edu.tr/Enve330/Chapter11.pdf?)

SITE SELECTION

Factors involved in selection a location for a new sanitary landfill:

- ✓ The site's volume capacity
- ✓ Accessibility
- ✓ Geohydrology conditions.

The total capacity and design life of a new landfill depends on:

- ✓ The size and topography of the site
- ✓ The rate of refuse generation
- ✓ The degree of refuse compaction.

There should be enough volume capacity within the working area of the site, so that the landfill will have a design life of about 25 years.

LANDFILL METHOD

Trench Method

- Uses where the groundwater elevation low.
- Soil stockpiled nearby for use as daily cover material.

Area method

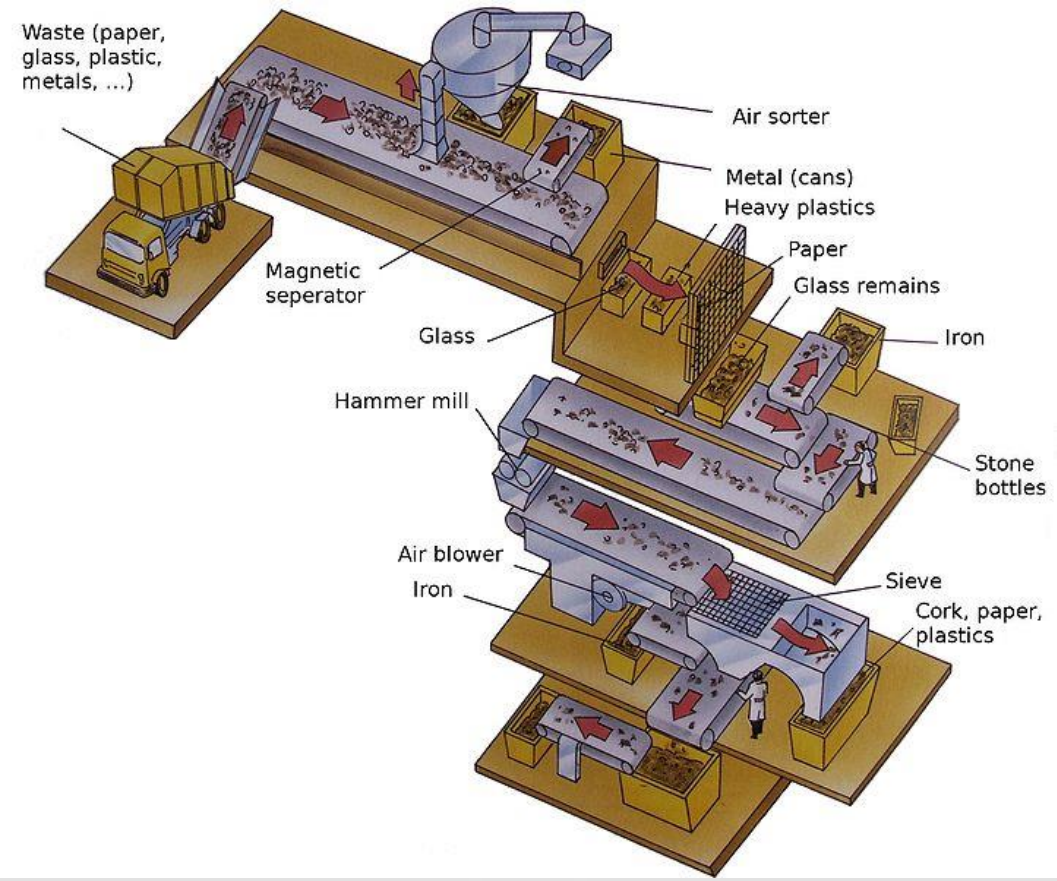
- Used when the land unsuitable for trench method.

COMPLETE LANDFILL

INCINERATION

Combustion of organic substances contain in waste material

Generate electricity and heat



INCINERATION

•Effective method to reduce the volume and weight of solid waste.

•Solid waste is burned in a properly designed furnace, under suitable temperature and operating conditions.

•Incineration does not completely destroy all solid waste.

•Most modern municipal solid waste incinerator are designed for continuous feed operation, as opposed to the less desirable intermitted or batch feed mode to operation. Continuous feed of refuse allows for uniform furnace temperature, which provides more efficient combustion and reduces thermal shock damage to the incinerator components.

INCINERATION PROCESS

1. Inside the furnace, combustion occurs in two phases:
   - primary combustion
   - secondary combustion.
2. primary combustion, moisture is driven off .
3. secondary combustion the remaining unburned gases and particulates, which are entrained in the airstream after primary combustion, are oxidized.
4. Secondary combustion helps to eliminate odors and reduces the amount of unburned particulates in the exhaust gases.
5. The boiler in quench tower converts the heat from combustion into steam.

CHUTE SYSTEM

- Commonly used in tall building(apartment, flat, condominium)
- Can Separate to general waste and recycle waste
- Every floor will have the chute door
- Control by mechanical chute system
- The waste will be compile at the ground level before transfer to disposal area

Advantage

- ✓ Easy to use
- ✓ Minimal Manual handling
- ✓ save time

Disadvantage

- X High cost for maintenance
- X Chute blockage may cause problem
- X Some type unsuitable for food waste collection

CHUTE SYSTEM

CHUTE SYSTEM

REFERENCES

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