

Chapter 7

Handling and Separation, Storage and Processing at Source



Handling & Separation at Source

- *Waste handling* refers to the activities associated with managing SW until they are placed in the containers used for their storage before collection.
- *Separation* of waste components, such as waste paper, cardboard, aluminum cans, glass and plastic containers at the source is one of the *most positive* and *effective* ways to achieve recovery and reuse of these materials.
 - ✓ Storage within home and periodically transfer to larger containers
 - ✓ Placing directly in containers





Handling & Separation at Source

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Persons responsible for and auxiliary equipment used in the handling and separation of solid waste at the source

Source	Persons responsible	Auxiliary equipment and facilities
Residential		
Low-rise	Residents, tenants	Household compactors, large-wheeled containers, small-wheeled handcarts
Medium-rise	Tenants, building maintenance crews, janitorial services, unit managers	Gravity chutes, service elevators, collection carts, pneumatic conveyors
High-rise	Tenants, building maintenance crews, janitorial services	Gravity chutes, service elevators, collection carts, pneumatic conveyors
Commercial	Employees, janitorial services	Wheeled or castered collection carts, container trains, burlap drop cloths, service elevators, conveyors, pneumatic conveyors
Industrial	Employees, janitorial services	Wheeled or castered collection carts, container trains, service elevators, conveyors
Open areas	Owners, park officers, municipal employees	Vandalproof containers
Treatment plant sites	Plant operators	Various conveyors and other manually operated equipment and facilities
Agricultural	Owners, workers	Varies with the individual commodity



Auxiliary Equipment and Facilities

Small-wheeled handcarts

Large-wheeled handcarts



Household compactors

Large-wheeled containers



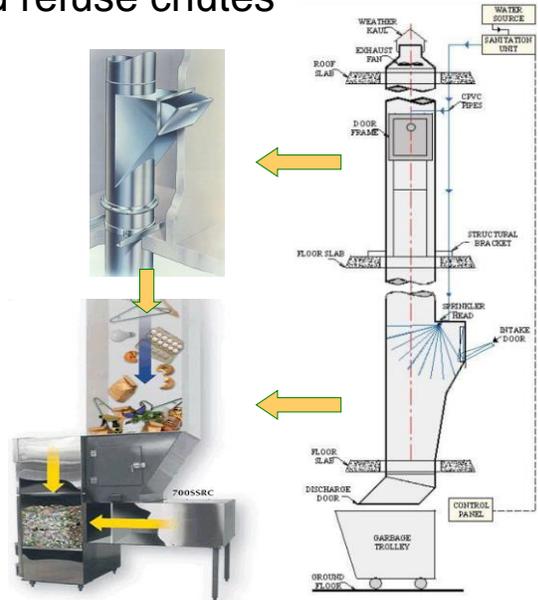
Triple capacity handcarts



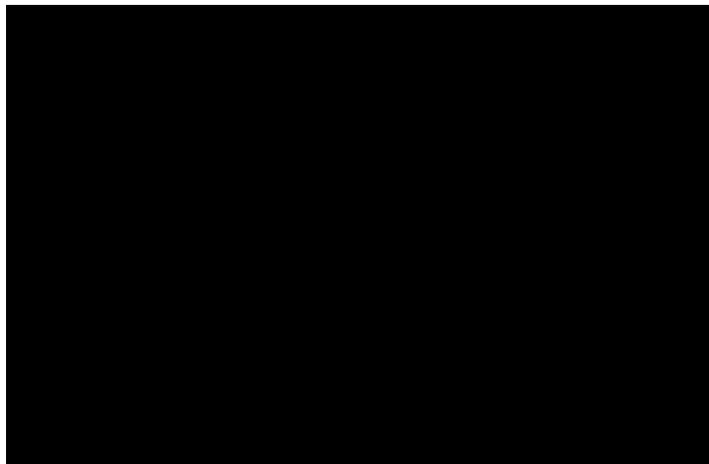


Gravity feed refuse chutes

- o Convenient, simple and low cost method of controlling the disposal of refuse in **mid- or high-rise** residential and commercial buildings

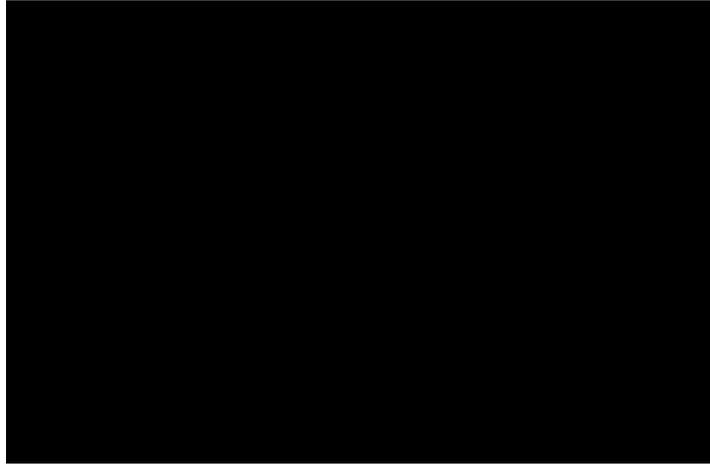


Gravity feed refuse chutes





Gravity feed refuse chutes



Separation & Storage at Source

Small-wheeled handcart



Packaging materials

Plastic container



Kitchen waste

Carboard box



Paper & Cardboard



Glass

Plastic bag



Plastics & Metals



Separation & Storage at Source

- *Factors that must be considered in on-site storage*
 - Effects of storage on the waste components
 - Type of container to be used
 - Container location
 - Public health and aesthetics
- *Effects of storage on waste components*
 - Biological decomposition (putrefaction)
 - Absorption of fluids
 - Contamination of waste components



Example 7.1 Comparison of residential waste separation programs

The effectiveness of MSW separation programs depends on the type of system used for the collection of separated wastes. Compare the following two systems.

In system 1

- Newspaper (25% of total amount of paper) is placed in Container#1
- Aluminum cans, glass and plastics are placed in Container#2
- The remaining wastes are placed in Container#3

The separated materials, placed in special containers are collected at the curb.

In system 2

- All paper and cardboard materials are placed in Container#1
- All plastic, glass, tin cans, aluminum, and any other metals are placed in Container#2
- Garden wastes are placed in Container#3
- All remaining waste materials are placed Container#4.

Example 7.1 Comparison of residential waste separation programs

Assume 80% of available material is separated and participation rate is 100 %.

Component	Recycling System 1			Recycling System 2		
	As generated, %	Container No	Separated for recycle, %	As generated, %	Container No	Separated for recycle, %
Organic						
Food wastes	9	#3		9	#4	
Paper	34	#1	6.8	34	#1	27.2
Cardboard	6	#3		6	#1	4.8
Plastics	7	#2	5.6	7	#2	5.6
Textiles	2	#3		2	#4	
Rubber	0.5	#3		0.5	#4	
Leather	0.5	#3		0.5	#4	
Yard wastes	18.5	#3		18.5	#3	14.8
Wood	2	#3		2	#4	
Inorganic						
Glass	8	#2	6.4	8	#2	6.4
Tin cans	6	#3		6	#2	4.8
Aluminum	0.5	#2	0.4	0.5	#2	0.4
Other metal	3	#3		3	#2	2.4
Dirt, ash, etc	3	#3		3	#4	
Total	100		19.2	100		66.4

Example 7.1 Comparison of residential waste separation programs

Comments

- As shown in the computation table, the amount of material separated for recycling, with system 1 is 19.2% versus 66.4% for system 2.
- If the participation rate were to drop to 50%, the corresponding amounts are 9.6% versus 33.2%.
- Using system 1, it will be difficult to achieve the 25% recycling goal without a high degree of homeowner participation.
- Additional separation, possibly at a MRF, will be required to reach the 50% goal.
- Using system 2, both the 25% and 50% diversion goals are achievable with a reasonable amount of homeowner participation.



Examples

- [Example 7-3](#) Effect of home separation of waste on energy content of as collected residential MSW.
- [Example 7-4](#) Effect of home compactors on volume of collected solid wastes.