Designing and Operating Buildings for Zero Waste and Zero Litter

San Mateo Countywide
Water Pollution Prevention Program

June 18, 2019

Peter Schultze-Allen, CPSWQ, LEED-AP

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Outline

- Why Zero Waste **and** Zero Litter?
- Efforts in San Mateo and Santa Clara Counties to Reduce Litter and Waste
- Development trends require new guidance
- Multi-Family Issues and Challenges
- Best Practices and Implementation Tools
- Resources and References
- Extra Slides

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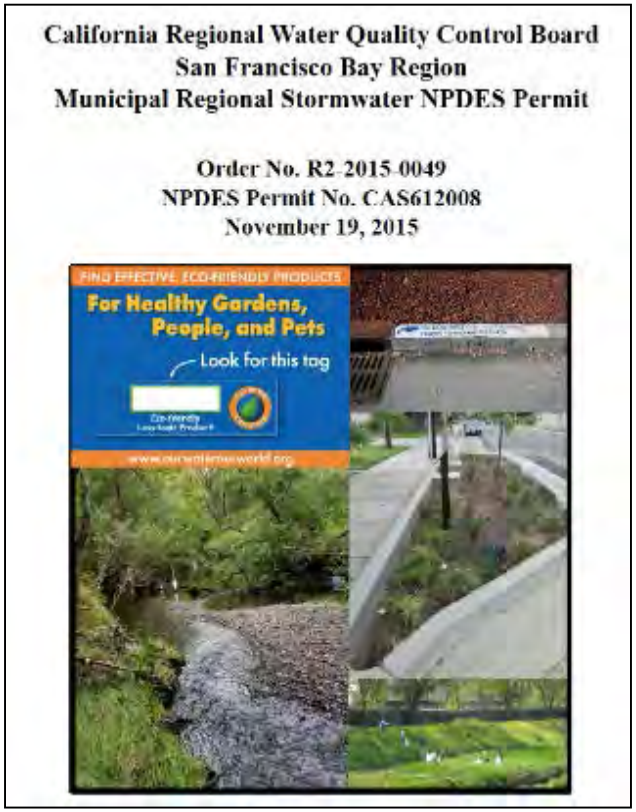
Why Zero Litter?

The Clean Water Act

The Municipal Regional Stormwater Permit has issued a big challenge to Bay Area Municipalities...


California Regional Water Quality Control Board
San Francisco Bay Region
Municipal Regional Stormwater NPDES Permit

Order No. R2-2015-0049
NPDES Permit No. CAS612008
November 19, 2015

Zero litter to the Bay by 2022!*

*the MRP requires “no adverse impact” from litter in stormwater by 2022

Zero Litter & Zero Waste Efforts in San Mateo and Santa Clara Counties

- Both counties have work groups coordinating efforts between franchised haulers and municipal staff to reduce litter, waste, and integrate the goals of the programs & organizations.
- The San Mateo Countywide Stormwater Program (SMCWPPP) created the Multi-Family Dwelling Litter Reduction Toolkit.

SANTA CLARA BASIN WMI WATERSHED MANAGEMENT INITIATIVE

Santa Clara Valley *Urban Runoff* Pollution Prevention Program

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Higher Density Development Typically Requires More Coordination

- Higher density housing – multiple floors - chutes
- Higher density commercial spaces
- Mixed-use buildings may have different customers and rate implications (e.g. residential recyclables or compostables collection may be offered at no additional cost, but commercial customers usually have a charge for services)
- Lot-line buildings require more coordination on design and operation
- Multiple haulers may be servicing a building (fog-renderers, independent-cardboard, non-profits etc.)

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Litter Reduction Toolkit for Multi-Family Dwellings

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Clean Water. Healthy Community.

February 2018

SECTION 3 New MFD Characteristics & Challenges

Design and Construction Challenges

Many of the litter and waste reduction-related design challenges described in Table 1 could be addressed with targeted design review of proposed MFDs. Municipal staff should develop a process to involve the franchised hauler staff in the design review process allowing them to evaluate the draft design for practicability, service-ability and efficiency. Taking advantage of their knowledge and input early in the design review process will likely reduce operational problems for all stakeholders. Design and construction issues to review in the entitlement and building permit approval process include:

- Material disposal systems such as chutes, chute rooms
- The design of indoor and outdoor solid waste materials enclosure areas
- Collection container types
- Collection vehicle types, crew size and access to storage areas
- Bulky and special item disposal, storage and collection
- A Discard Collection Plan with service day collection location(s)
- Providing incentives for reducing waste and contamination

Figure 8 on the next page summarizes the proposed strategy and steps for reviewing new construction project plans, model conditions of approval and incorporating the hauler into the review process.

Multi-family dwelling Litter ISSUES

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Storage

Containers


Collection

Vehicles

Challenges to Addressing Littering at MFDs

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Storage

Containers

Collection

Chutes

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DANGER
CAUTION


DO NOT EMPTY
VACUUM CLEANER
BAG IN BLUE
CONTAINER


RECYCLE


Toter
CAUTION
CUIDADO
3yd
RECYCLE

CHUTE OPTIONS

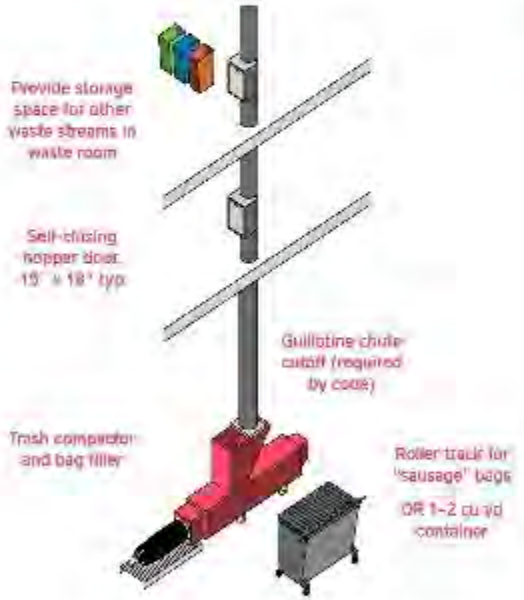
1 Single Chute

Pros:

- Multiple chute doors may be open at one time

Cons:

- Only transports trash (recycling and organics need to be transported by building staff)



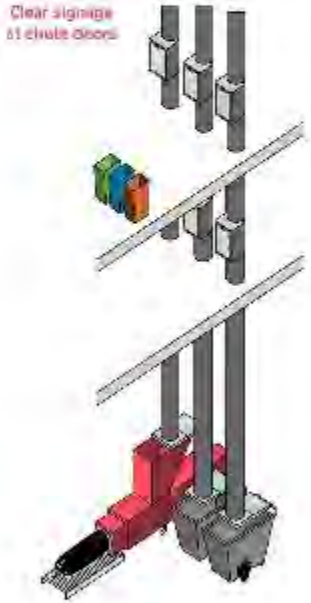
2 Multiple Chutes

Pros:

- Multiple chute doors may be open at one time

Cons:

- Higher cost



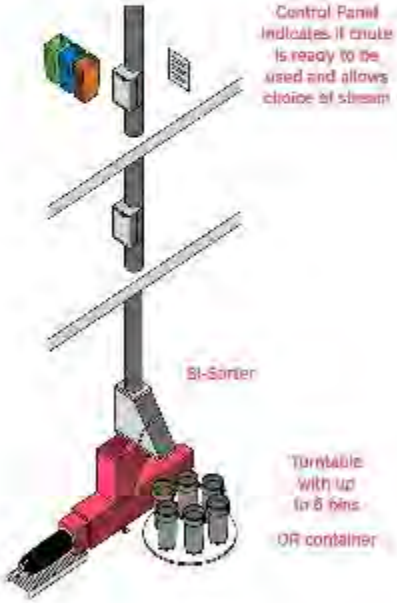
3 Chute with Bi-Sorter/Turntable

Pros:

- Flexibility to add other waste streams with turntable
- Requires less floor area

Cons:

- May be a time delay—only one chute door can be used at a time
- Maintenance required
- Higher cost



4 Chute with Tri-sorter

Pros:

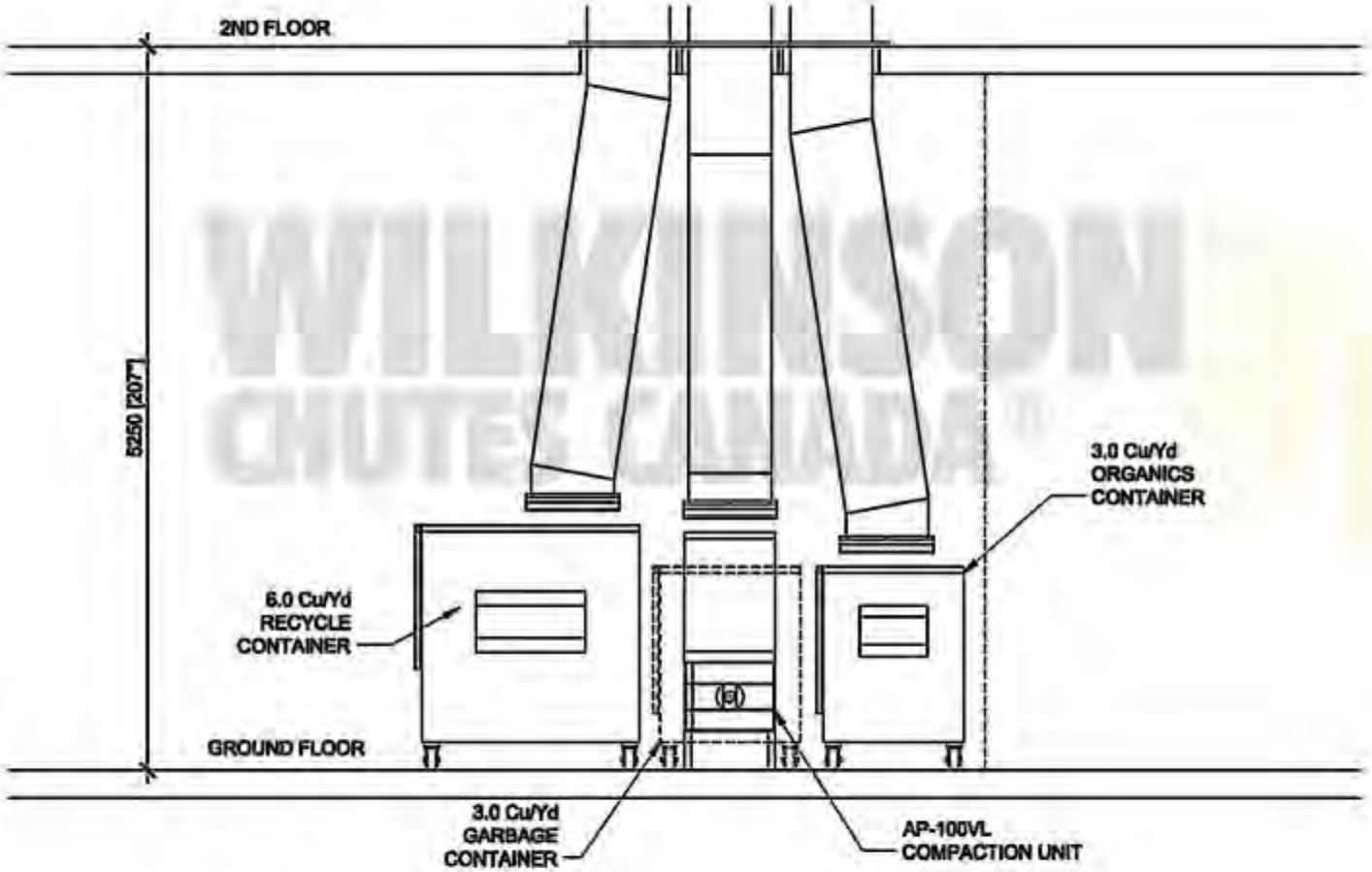
- Requires less floor area

Cons:

- May be a time delay—only one chute door can be used at a time
- Maintenance required
- Higher cost

Bottom of chute container options (see DSNY Rules and BC Requirements):

- **Trash chute:** vertical compactor to sausage bag or 1–2 cu yd container
- **Recycling chutes:** Wheeled bins or tilt trucks or 1–2 cu yd containers (or turntable for Bi-Sorter only)



1 RECYCLING CHUTES SECTION
NTS

WASTE, RECYCLING AND ORGANICS CHUTES SYSTEM SECTION VIEW

NTS	1 OF 1		

WILKINSON CHUTES CANADA®
23 RACINE RD. TORONTO, ONTARIO M9W 2Z4
TEL (416) 746-5547 FAX (416) 743 5632
wchutes@metrogroupcan.com
wchutes@wilkinsonchutes.ca


MATERIAL SELECTION
RECYCLE
GARBAGE
COMPOST
Nu-Recycling Technology, Inc.
TOWER-3
1 YD
1 YD
8523
5527

Best Practices

- Use Entitlement Conditions of Approval to:
  - Require Discard Collection Plan (DCP)
  - Require an Operation & Maintenance Plan
  - Use design guidelines for building systems
  - Require franchised hauler to approve DCP
  - Require equal treatment of discarded materials
- Use Franchise Agreement requirements for litter & overages
- Develop a “Right Size – Right Service” program with hauler

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Discard Collection Plan (DCP)

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Discard Collection Plan

Key Elements:

- Map of property (Internal and External)
- Hauler collection vehicle access routes
- Areas for containers on collection service days
- Enclosure areas for discards (L,R,C,S)
  - Types of collection containers (compactors, bins etc.)
- Internal collection systems (chutes, rooms etc.)
- Special material storage and collection areas
- Tenant/Resident in-unit collection space/areas

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WASTE MANAGEMENT PLAN

1. Plan for tenant disposal and separation

- Waste stream types and quantities
- Location of waste stations
- Types of bins
- Signage

2. Plan for movement of recyclables and waste to central storage

- Responsibility
- Frequency
- Transport containers
- Route

3. Plan for waste storage

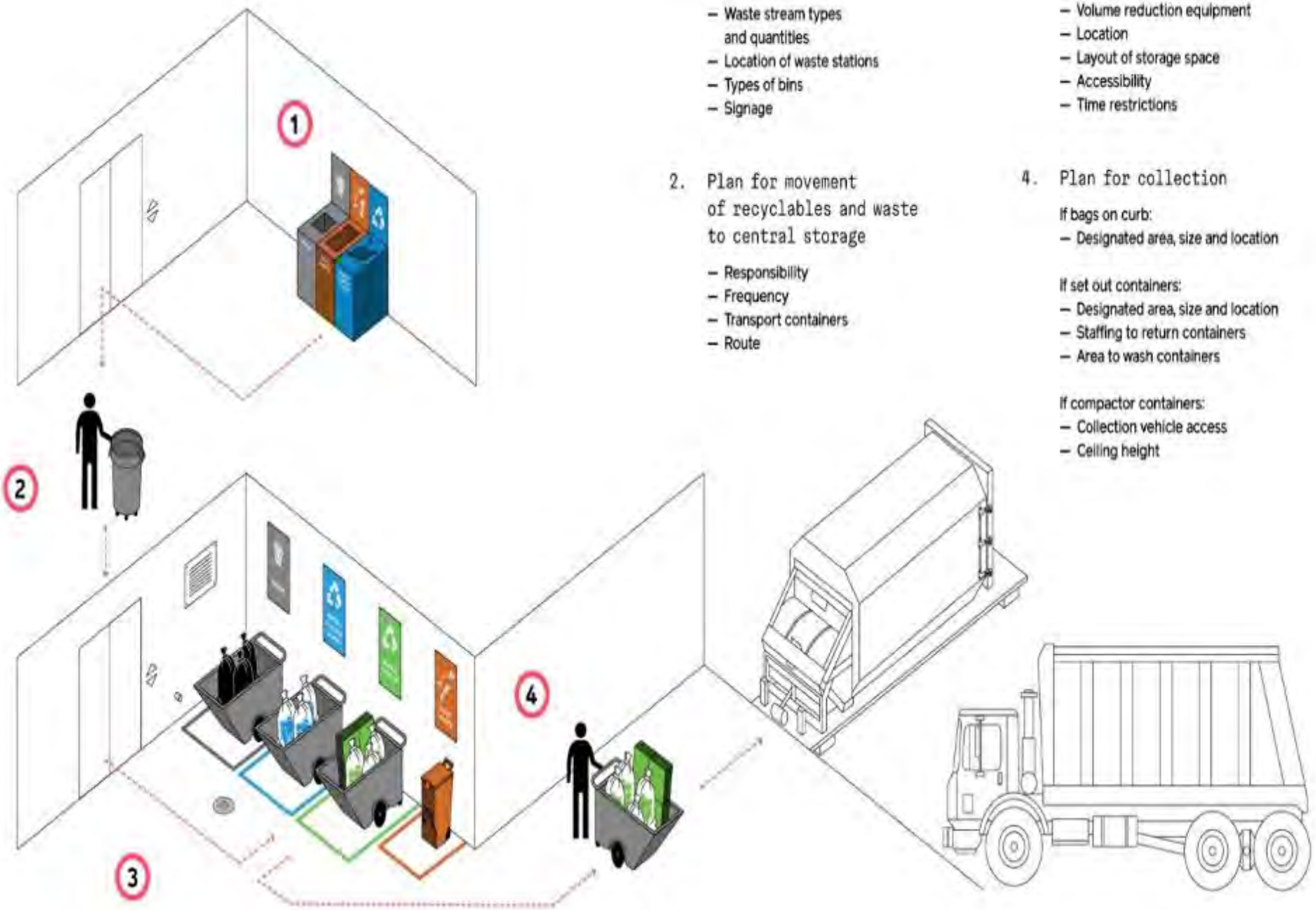
- Calculate area required
- Volume reduction equipment
- Location
- Layout of storage space
- Accessibility
- Time restrictions

4. Plan for collection

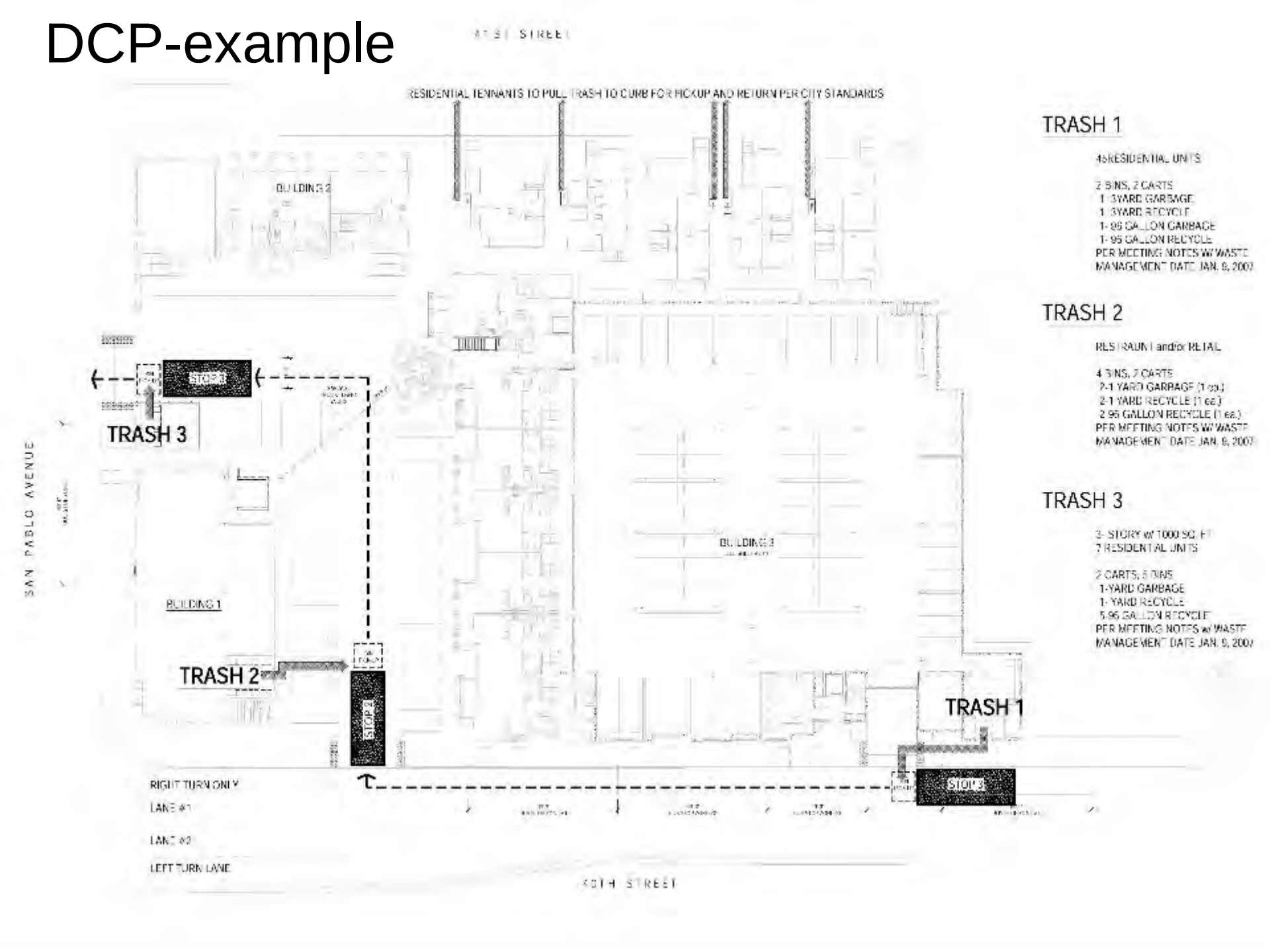
If bags on curb:
- Designated area, size and location

If set out containers:
- Designated area, size and location
- Staffing to return containers
- Area to wash containers

If compactor containers:
- Collection vehicle access
- Ceiling height

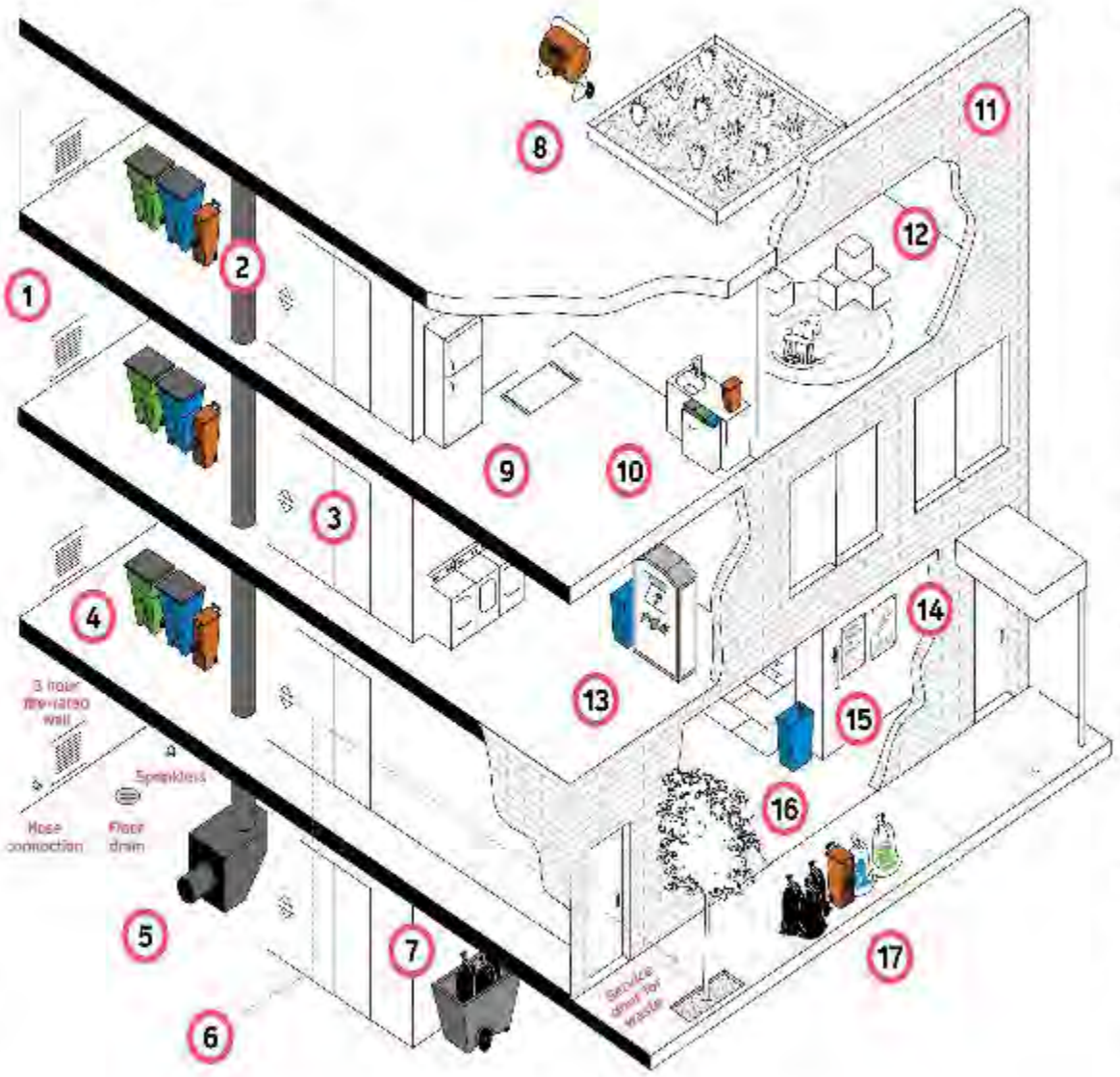


DCP-example


RESIDENTIAL TENNANTS TO PULL TRASH TO CURB FOR PICKUP AND RETURN PER CITY STANDARDS
BUILDING 2
BUILDING 3
BUILDING 1
SAN PABLO AVENUE
TRASH 3
TRASH 2
TRASH 1
STOP 1
STOP 2
STOP 3
RIGHT TURN ONLY
LANE #1
LANE #2
LEFT TURN LANE
40TH STREET
TRASH 1
48RESIDENTIAL UNITS
2 BINS, 2 CARTS
1- 3YARD GARBAGE
1- 3YARD RECYCLE
1- 96 GALLON GARBAGE
1- 96 GALLON RECYCLE
PER MEETING NOTES W/ WASTE MANAGEMENT DATE JAN. 9, 2007
TRASH 2
RESTRAUNT and/or RETAIL
4 BINS, 2 CARTS
2-1 YARD GARBAGE (1 ea.)
2-1 YARD RECYCLE (1 ea.)
2 96 GALLON RECYCLE (1 ea.)
PER MEETING NOTES W/ WASTE MANAGEMENT DATE JAN. 9, 2007
TRASH 3
3- STORY w/ 1000 SQ. FT
7 RESIDENTIAL UNITS
2 CARTS, 5 BINS
1-YARD GARBAGE
1- YARD RECYCLE
5 96 GALLON RECYCLE
PER MEETING NOTES w/ WASTE MANAGEMENT DATE JAN. 9, 2007

RESIDENTIAL BUILDING DESIGN CONSIDERATIONS

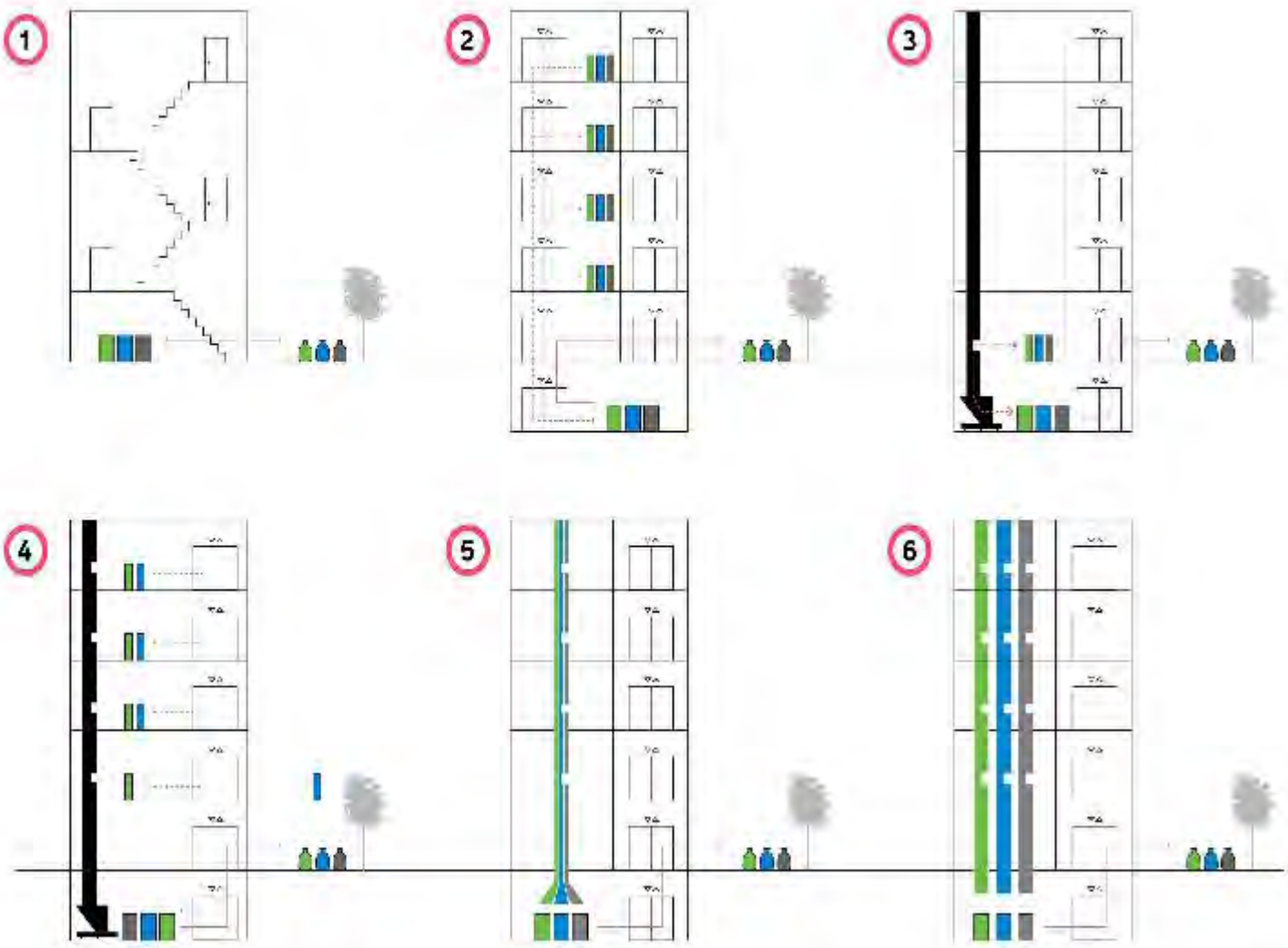
1. Waste room: consider area, ventilation, lighting, signage. 2.03, 2.10
2. Chute and disposal of recycling on every floor required by BC 1213.3 ≥ 5 stories and ≥ 9units)
3. Consider how waste travels vertically (by chute, by residents or by building staff in regular/service elevator). 2.02
4. Provide co-location disposal for all waste streams including organics. Consider other waste streams that may block chutes, e.g., cardboard, textiles, hangers. 2.02
5. Trash compactor required by BC 1213.2 for ≥4 stories and ≥12 units
6. Consider path of waste to curb and staff time required. 2.02, 2.05
7. Waste storage room per BC 1213.1 or BC 707.13.4. Use containers unless room is ratproof and fireproof room per HMC 27-2021. Consider area required, ventilation, and washing of containers. 2.01, 2.03
8. Compost can be made and used on-site in gardens. 2.05



9. Shallow refrigerators and shelves to reduce "lost food," or smart refrigerators. 2.17
10. Pull-out cabinet with bins (all waste streams) and countertop organics bin. 2.08
11. Consider impacts of building materials selection and construction process. Optimize material usage, consider end of life. 2.27-2.35
12. Consider amenities that reduce material consumption (e.g., children's play areas with toys, shared goods library, cleaning service with vacuums). 2.15
13. Provide textile recycling and plastics recycling in laundry room. 2.13
14. Consider possibilities for reuse such as online bulletin boards and donation refrigerators. 2.18
15. Provide feedback on waste generation to residents and staff to change behavior. Consider how to incorporate SAYT back to resident. 2.11
16. Provide paper recycling in mail room and cardboard collection in parcel room. 2.13
17. Provide set out area coordinate with street, trees, furniture, curb cuts and entrance. See NYC Rules for setout. 2.04

RESIDENTIAL TYPOLOGIES

1. Central Location
2. Service Corridor
3. Corridor Chute with Central Recycling
4. Trash Room with Chute and Bins
5. Single Chute with Sorter
6. Multiple Chutes



Require Franchised Hauler to Review and Approve DCP

- Hauler reviews design at entitlement stage before Planning Commission (PC) approval
- Hauler provides comments to design team before jurisdiction sends packet to PC
- Hauler approves final design during building permit plan check stage (before the building permit is approved)
- Require hauler and developer to implement DCP at occupancy and involve municipality when setting up initial system

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Franchise Agreement Requirements

- SMCWPPP Franchise Agreement Recommendations
- Right Size - Right Service program
- Preventing litter during collection
- Overage prevention and billing
- Rate Structure – incenting desired behavior
- Bulky material program and services
- Communication with Hauler
- Diversion and litter reduction goals

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Design Guidelines for Building Systems

- Chute and chute chamber dimensions
- Enclosure dimensions and access
- Collection vehicle access (ceiling height)
- Collection vehicle personnel issues
  - Pavement slope, distance, container weight/size
- Collection vehicle type (FEL, REL, SL)
- Collection vehicle service day assistance
- Storage space for special materials

O&M Plan

- Collection practices
- Storage areas
- Diversion goal
- Education of residents
- Signage maintenance
- Move in and Move out procedures
- Provision of services
- Overflows prohibited – Right Size/Right Service

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Resources for more Information

- SMCWPPP
  - www.Flowstobay.org
  - Multi-Family Dwelling Litter Prevention Toolkit
  - Franchise Agreement Best Practices
- SCVURPPP
  - http://scvurppp.org
  - Zero Litter Initiative - www.scbwmi.org/zli.htm
- StopWaste – Stopwaste Guidelines
- NYC Design Guidelines - www.zerowastedesign.org

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References and Resources

New Development and Garbage Enclosure Guidance
www.recology.com/recology-san-mateo-county/new-development-projects/
www.flowstobay.org/sites/default/files/Model%20COA%20July%202016%20final.pdf
https://sunnyvale.ca.gov/business/planning/permit/nonresidential.htm
https://fremont.gov/DocumentCenter/Home/View/1528
www.stopwaste.org/resource/space-guidelines-recycling-organics-and-refuse-services
www.zerowastedesign.org

Outreach and Behavior Change
www.recology.com/recology-san-mateo-county/sorting-guides-signage/
https://www.cleanwaterprogram.org/multi-family-litter-prevention.html

Set-out rules, Bulky & Special Item Collection & Abandoned Waste in San Mateo County
www.recology.com/recology-san-mateo-county/bulky-items/
www.ssfscavenger.com/residential/bulky-item-collection-program/
www.republicservices.com/residents/bulk-waste
www.recology.com/recology-of-the-coast/pacifica/
www.greenwaste.com/
www.smcsustainability.org/waste-reduction/
www.cityofsanmateo.org/2174/Illegal-Dumping

Franchise Agreements
www.flowstobay.org/Franchise-Agreement-Litter-Practices-Recommendations-20Jan2016.pdf
http://scvurppp-w2k.com/pdfs/1314/Final_BMP-Litter-Trash_Recommendations_060314.pdf

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Space Guidelines for Recycling, Organics and Refuse Services

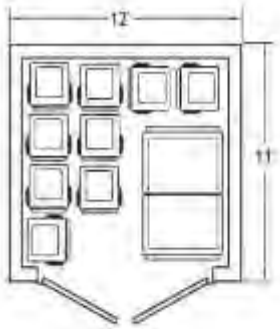
for Designers of Multifamily & Commercial Buildings

STOPWASTE

Fact Sheet

Storage Space Floor Area

Bin sizes can vary in all dimensions; check with the local collection companies for exact dimensions. The typical space needed for a 6 cubic yard bin is about 8' wide, 6' deep (front to back) and 6' tall at the back, sloping down to 4 feet tall at the front[5]. Generally, 4 cubic yard or smaller bins can be provided with wheels, and larger bins cannot, for safety reasons. Bins without wheels will need to be situated so that the collection truck can service them head-on, without moving them. Most 96-gallon carts fit comfortably in a footprint that is 28x36"; they are around 46" tall. Most 64-gallon carts require a 26x30" footprint and are around 42" tall.



Bins and carts typically have hinged lids that must be lifted; these can damage low ceilings. In addition to space for the containers themselves, space is needed to walk among them and shift them around.

Where an enclosure will contain both carts and bins, an area that is 150% of the sum of bin and cart footprints will probably be needed. Enclosures that contain only carts or only bins will require less extra space because the containers fit together more easily.

Continuing with the example above for a multifamily setting, if the 60 units are in three buildings, each with an outdoor enclosure for discards, then each enclosure should hold one 4-cubic yard bin, five 96-gallon recycling carts and four 64-gallon organics carts. The total comes to 128 sq. ft., or less than one standard parking space.

28 sq. ft.	+	5 * 7 sq. ft.	+	4 * 5.5 sq. ft.	=	85 sq. ft.
One 4-Cubic yard garbage bin		Five 96-gallon recycling carts		Four 64-gallon recycling carts		Total Container Footprint

85 sq. ft.	x	1.5	=	128 sq. ft
Total Container Footprint		150% Additional Operation Space		Total Allocated Space

Average Container Footprints

64-gallon cart	5½ sq. ft.
96-gallon cart	7 sq. ft.
4-cubic yard bin	28 sq. ft.
6-cubic yard bin	48 sq. ft.

WASTE HANDLING GUIDELINES

CITY OF
Fremont
Environmental Services Division
July 2015
Available electronically at www.fremont.gov/ehg

2. Multi-Family Residential with Centralized Service Locations
Apartment/Condo/Flats

- Garbage may be collected up to six times per week
  Recycling may be collected up to five times per week.
  Organics may be collected only on Mondays, Wednesdays, and Fridays. Twice a day pick up is not available.

a. Internal Storage Requirements:

i. All residential units need internal storage space to store garbage, recycling, and organics materials (e.g. under kitchen sink or in pantry).

ii. Equal amount of space should be reserved for storage of garbage, recycling, and organics materials.

iii. Chutes:

1. Chute systems must be pre-approved by the Environmental Services Division because of the unique space and access design challenges.

2. Applicant must provide two chute systems side by side, one for garbage and one for recycling. Storage for organics collection must be provided in a centrally located area in the trash room and/or in the trash enclosures. Chutes are not required or recommended for organics.

3. The design and construction of chutes shall conform to the requirements in Fremont Municipal Code, the Fremont Waste Handling Guidelines, and the Site Plan and Architectural Approval standards.

4. Chute vestibule rooms must be distributed to prevent any resident from traveling more than 250 feet to dispose of waste.

Figure 3: Garbage and recycling chutes

5. Chute vestibule rooms must observe requirements of the current California Building Code regarding accessibility to solid waste collection receptacles for persons with disabilities (CCR Title 24, Part 2).

6. Chute systems must comply with current building codes for 2014 fire sprinkler requirements.

Zero Waste

Design Guidelines

Design Strategies and Case Studies for a Zero Waste City

AIA New York
CENTER FOR ARCHITECTURE
Kiss + Cathcart, Architects
foodprint group
CLOSEDLOOPS
With support from
The ROCKEFELLER FOUNDATION

Contact Information

Peter Schultze-Allen, CPSWQ, LEED-AP
pschultze-allen@eoainc.com
510-832-2852 x128

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Equal Treatment of Discarded Materials

- Internal collection of discarded materials must be provided for each stream of materials in an equal manner so that users of the building are not incentivized to landfill materials.
- For example, if chutes are provided, then three chutes must be provided.
- Space for all three materials must be provided in units and in common areas.

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MARATHON


BNRS
COMMINGLED RECYCLABLES
6121
RECYCLE
1yd
5980


McNeilus
5959
Channing
P