



San Francisco's Refuse Collection Space Design Guide

INTRODUCTION

The City and County of San Francisco has adopted a variety of policies to advance its goal of zero waste. To support all residents and businesses in meeting these goals, new commercial and residential developments must be built with adequate, appropriate, and accessible space for all generated refuse: recyclables, compostables, and trash. When refuse collection space is well designed, materials can be managed safely and conveniently by haulers, future occupants, and operators. Well-designed refuse collection areas also support widespread and successful participation in trash prevention, recycling, and composting programs.

In 2008, San Francisco's Department of Building Inspection published an Administrative Bulletin (AB-088) outlining the procedures required to assure that adequate areas for collecting and loading recyclable and compostable materials are provided in development projects. AB-088 requires, "the amount of space provided for the collection and storage of recyclable and compostable materials shall be sufficient to allow full recovery of the facility's refuse. Space shall be sufficient to accommodate bins consistent with both current methods and percentages of refuse storage and removal, and with projected needs when full refuse diversion goals are met."

Although AB-088 requires adequate areas for a facility's refuse collection needs, it does not provide specific standards for determining what collection services are necessary for various building types and what is considered adequate. This document supports designers and builders in complying with AB-088 by providing clear guidelines related to space and safety in the design of refuse collection areas for the most common building types in the City and County of San Francisco.

This Design Guide and the accompanying calculator were created by Cascadia Consulting Group in partnership with City and County of San Francisco's Department of the Environment and Recology. They are tools provided for your convenience only. It is impossible to anticipate each project's unique characteristics and therefore this document is intended only as a guideline and not specific advice for your project. While we take every care to ensure the accuracy of the information in this Design Guide, we do not accept responsibility for any inadvertent inaccuracies. Under no circumstances shall the City and County of San Francisco, Cascadia Consulting Group, Inc., or Recology be liable for any actions taken or omissions made from reliance on any information contained herein from whatever source nor shall the City and County of San Francisco, Cascadia Consulting Group, Inc., or Recology be liable for any other consequences from any such reliance.

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Definitions

Collection: Taking physical possession of and removing discarded material from the place of generation for subsequent off-site management of that material.

Collection bin: the receptacle that is provided, designated and emptied by the hauler for the collection of recyclables, compostables or trash.

Collection vehicle: a road vehicle for collecting refuse.

Compactor: mechanical, electrically powered devices used to reduce the size of material through compaction.

Compostables: Any material that can be broken down into, or otherwise become part of usable compost (e.g., soil-conditioning material) in a safe and timely manner as accepted in San Francisco's composting collection program, such as food scraps, soiled paper and plant trimmings.

Curb cut: A solid (usually concrete) ramp graded down from the top surface of a sidewalk to the surface of an adjoining street.

DBI: Department of Building Inspection

Dumpster: metal refuse bins between 1 and 6 cubic yards of capacity. These bins usually have a lid and are lower at the opening across from the hinged side for easy access by refuse generators. The contents of these bins are collected and emptied directly into trucks.

Hauler: A person or company employed in the collection and transport of refuse by road.

Loading dock: An area of a building where goods and vehicles are loaded and unloaded. Loading docks may be exterior, flush with the building envelope, or fully enclosed.

Recyclables: Any material that can be sorted and reconstituted, for the purpose of using the altered form in the manufacture of a new product, as accepted in San Francisco's recycling collection program, such as paper, bottles, cans, and rigid plastics. Recycling does not include burning, incinerating, converting, or otherwise thermally destroying materials.

Refuse: Includes recyclables, compostables, and trash, but not construction and demolition debris or hazardous waste.

Refuse collection service: Collection of recyclables, compostables, and trash from a dwelling or commercial property by a hauler at a level of services sufficient to contain the refuse generated at that dwelling or commercial property and in accordance with San Francisco's requirements for separation of recyclable and compostable materials from other refuse.

Trash: Refuse that is not recyclable or compostable and designated for landfill disposal. The term "trash" does not include hazardous waste or construction and demolition debris.

Zero waste: The conservation of all resources by means of responsible production and consumption, and the reduction, reuse, and recovery of products, packaging, and materials, so no discarded material goes to landfill or high-temperature destruction.

Why is Adequate Refuse Collection Space Important?

A building with well-designed refuse collection space supports the advancement of zero waste, is less expensive to operate, and allows haulers to safely remove discarded material.

SUPPORTS ZERO WASTE

Good design makes it easy to keep discarded materials separated for recycling, composting and trash. When sufficient space is allocated for all three streams in an equally convenient manner, materials will more likely go in the correct bin. When space for recycling and composting are an afterthought and designated to a less accessible or inconvenient location, occupants and operators will be less likely to participate successfully in recycling and composting programs.

OPERATIONAL COST EFFICIENCIES

When sufficient space is not allocated for appropriate refuse collection bins, including equally convenient bins for all three streams with appropriate capacities to contain all materials generated onsite, the resulting building operational costs are often higher. If the space for refuse collection bins is not designed properly, it may require additional sorting time on the part of building staff or zero waste facilitators, require more frequent pickups by haulers or result in extra haulers charges for refuse collection workers to move bins for truck access, and may cause the building to incur charges, fines, or liens due to lack of compliance with San Francisco's zero waste service requirements.

SAFETY

According to the Bureau of Labor Statistics, refuse collection is one of the most fatal civilian occupational activities¹. Furthermore, handling R is one of the greatest sources of occupational injury for building maintenance staff.² When refuse collection space is designated to an area that is difficult or unsafe to access by refuse collection workers or custodial staff, it could cause serious injury or even death.

¹ Of the Civilian Occupation types identified by the Bureau of Labor Statistics, refuse collection work was the 5th most fatal civilian occupation in 2017. <https://www.bls.gov/news.release/pdf/cfoi.pdf>

² Four jobs pose the highest risk of injury and represent 20% of all Workers' Compensation benefit recipients: police/security officers; nursing aides, orderlies, attendants; cleaning service workers and tractor-trailer/heavy truck drivers. <https://www.natlawreview.com/article/workers-compensation-five-most-common-injuries>

Applicable Ordinances and Building Code

DEPARTMENT OF BUILDING INSPECTION, ADMINISTRATIVE BULLETIN 088

The 2008 DBI Administrative Bulletin (AB-088) details procedures for local enforcement of the requirements of the Model Ordinance adopted by the California Integrated Waste Management Board, Resolution 93-57, which applies to the City and County of San Francisco in the absence of a locally adopted ordinance regarding Areas for Collecting and Loading Recyclable Materials in Development Projects.

AB-088 also requires that all areas designated for the collection and loading of recyclables, compostables, and trash shall be integrated into the building design, taking into consideration type, size, and number of collection bins. Collection routes shall conveniently access all recyclables, compostables and trash loading areas, including sufficient vertical and horizontal maneuvering clearances for collection vehicles. Projects shall have convenient path-of-travel and other access for all persons (residents, persons with disabilities, haulers) to collection facilities.

This code applies to the following project types:

- Any new project for which a building permit is required for a commercial, industrial or institutional building, marina, or residential building having five or more living units, where refuse is collected and loaded
- Any new public facility where refuse is collected and loaded, and any improvements for areas of a public facility used for collecting and loading refuse
- A new subdivision or tract of single-family detached homes if refuse is collected and loaded in a location that services five or more living units; Any one of the above types of projects that is existing to which an addition is made that adds 30 percent or more to the existing floor area of the project
- Any one of the above types of projects that is existing to which multiple additions are made over a one-year period that cumulatively add 30 percent or more to the existing floor area of the project
- Any one of the above types of projects, occupied by multiple tenants, to which one or more tenant improvements are made under building permit over a one-year period by any one tenant that adds 30 percent or more to that tenant's leased area, in which case that tenant's leased area shall be provided with sufficient recycling areas

MANDATORY RECYCLING AND COMPOSTING ORDINANCE

This ordinance requires that owners and managers must provide Adequate Refuse Collection Service to tenants, employees, contractors, and customers on their properties. Owners and managers of multifamily or commercial properties must supply bins placed in an appropriate location, to make source separation of refuse convenient for the tenants of the properties.

The collection bins must be of appropriate number and size for the recyclable, compostable, and trash quantities reasonably anticipated to be generated at the location. The bins must bear appropriate signage and be color-coded to identify the type of refuse to be contained—blue for recyclables, green for compostables, and black for trash—and must meet any additional design criteria established by the Department of the Environment. Bins for all three streams must be placed as close together as possible, to provide equally convenient access to users.

PUBLIC WORKS ORDINANCE 179-07

This ordinance requires refuse bins be returned to an enclosed area or other area that blocks views of the bins from the public right-of-way after collection. Any bins used for the collection of recyclables, compostables, or trash are prohibited on the sidewalk, street, or any public right-of-way, except on the day the contents are to be collected by the licensed hauler thereof or after 6:00pm of the day prior to the day of collection. All bins shall be removed from the sidewalk, street, or other dedicated public right-of-way within 24 hours after placing them out for collection and after contents have been collected. Under no circumstances are bins to be stored in plain sight of the public when viewed from any public right-of-way unless placed out for collection.

Recommended Space Allocation and Collection Capacity

This Design Guide applies to all properties, while the accompanying [Adequate Refuse Space Calculator Tool](#) is intended for use on buildings as follows:

- Multi-family residential or mixed-use buildings of 80 or more dwelling units
- Office buildings including mixed-use buildings of 100,000 or more square feet
- Restaurants that occupy space within an office or mixed-use building

If the property fits within one of the three categories above, please provide calculator results to Recology to review design in relation to serviceability.

Convenience & Co-location of Collection Bins

AB-088 requires “areas for recyclable and compostable materials shall be at least as convenient and usable as spaces provided for non-recyclable trash disposal and shall be located in the same areas whenever possible. When separate locations must be provided due to space constraints, the locations for collection of recyclable and compostable materials shall be at least as convenient as trash disposal locations.” Also, “Each dwelling unit in a covered project shall include areas within the dwelling unit designed and designated for storage of recyclable and compostable materials.”

Two relevant studies—one from Seattle by Cascadia Consulting and the other from Vancouver, BC by the Journal of Environmental Planning and Management—found that in multifamily dwellings equally convenient refuse collection bins lead to successful participation in recycling and composting programs. From Seattle, of the 319 large residential buildings surveyed, those buildings with composting collection co-located with recycling and trash on every floor performed better in composting programs. Similar results were found by the study conducted in Vancouver, BC. Those buildings that provided residents with a short trip to the composting bin achieved the highest composting collection rates, independent of the co-location of collection areas.³

³ Alessandra DiGiacomo, David W.-L. Wu, Peter Lenkic, Bud Fraser, Jiaying Zhao & Alan Kingstone (2017): Convenience improves composting and recycling collection rates in high-density residential buildings, Journal of Environmental Planning and Management, DOI: 10.1080/09640568.2017.1305332. <http://dx.doi.org/10.1080/09640568.2017.1305332>

Therefore, convenience that will result in meaningful impacts to recycling and composting behavior, requires the following design elements for each applicable, covered facility:

- Areas designated for refuse collection bins should be large enough to accommodate bins for all three streams – recyclables, compostables and trash.
- Collection bins for occupant’s different refuse rates (i.e., commercial or apartment) in mixed-use buildings must be kept separate.
- Each dwelling unit in a covered project shall include areas within the dwelling unit designed and designated for storage of trash, recyclables and compostables.
- For residential and mixed-use buildings, collection points for all three streams are required on each floor of buildings with three or more floors.

Refuse Collection Space Design Elements

The following section outlines various recommended requirements for the design of a building’s designated refuse collection space.

CLEANING

Refuse collection space should be easy to maintain and keep clean. At a minimum, space shall include a hose bib and proper drainage to allow building operators to wash bins from time to time.

ELECTRICAL

In order to support installation of a compacting unit, 3-phase powering is preferred for most buildings, with a separate circuit for each anticipated compactor.

LOADING DOCK CEILING HEIGHT

Any building requiring dumpster service must have a loading dock ceiling height of 21 feet for a front-loading vehicle to lift the bin and empty it inside. A clear overhead is required to service compactors or debris boxes. If it is necessary to construct a loading dock ceiling height less than 21 feet, contact Recology for review and approval that it will be able to service the building with a lower clearance.

SECURITY (DOORS, LOCKS, LIGHTS, CAMERAS)

When custodial staff and occupants feel safe using a refuse collection area, they are more likely to use the space properly. Security around collection bins ensures health and safety for residents, employees, and haulers. Adequate lighting shall be provided with light sensors. Where required, cameras should be installed for security purposes. Collection bins must be inaccessible by the public to avoid litter and illegal dumping, except when they are required to be set out for collection.

SLOPE

The floor of any designated refuse collection area should be level, with a standard drainage slope of $\frac{1}{4}$ " per foot notwithstanding. When trucks are required to collect directly from the space, pick up from level ground is preferred. In situations where pickup is intended to occur on elevated platforms, contact Recology for review and approval that it will be able to service on an elevated platform.

SURFACE REQUIREMENTS FOR COMPACTORS

A concrete pad should be installed under and in front of each compactor sufficient to accommodate the collection vehicle. The pad surface should be level and of minimum 3,000 pounds per square inch concrete reinforced, 6 inches thick. It is preferred that the concrete pad be flush with the surrounding ground level. To provide accessibility, concrete pad should be positioned to allow 2 feet between the machine and building wall if installed parallel with building. Allow a minimum of 66 feet of clear space from end of pad for collection vehicle.

Collection Vehicle Access Requirements

In order to fully comply with San Francisco's mandatory recycling and composting requirements, new developments must also ensure that collection vehicles can successfully and safely access collection bins for servicing. When new developments in San Francisco have insufficient clearance for vehicle access and bin servicing, they can pose hazards for building structures and facades, as well as collection vehicle drivers or pedestrians. In other cases, buildings without sufficient clearance for interior servicing, bins must be moved outside before a collection event—sometimes great distances—which can lead to noise complaints, create greater potential for illegal dumping, and often adds significant ongoing labor costs for moving bins to the exterior each service day.

Building design should include the following features for collection vehicle access.

COLLECTION VEHICLE TURNING RADIUS CONSIDERATIONS

The approach must be designed to address the vehicle turning radius and how vehicles access a street or building entrance. Access should consider how vehicles turn should the approach be from a narrow one-lane street, alley or driveway. The site layout shall allow for vehicles to enter, collect, and exit the site in a forward motion, without having to back up onto a road or alley, or provides an appropriate turnaround if backup distance is more than 150 feet. Plans are required to include drawings showing the radius of every turn in the trash collection vehicle's route through the development.

CURB CUTS

Openings for curb cuts and width of driveways should be equal.

HEADROOM FOR TRUCK ACCESS

When trucks are required to drive inside a building to access a refuse collection area, truck access entryways must have a minimum of 14'-6" in vertical. If there is any slope or if there is less than 14'-6" vertical clearance at any point along the path of travel, contact Recology for review and approval that it will be able to adequately navigate to the Refuse collection area.

In addition, the refuse collection area must have a minimum of 21'-0" in vertical clearance to conduct collection operations inside the building. If it is necessary to construct a refuse collection area less than 21'-0", contact Recology for review and approval that it will be able to service the building with a lower clearance.

SURFACE LEADING UP TO COLLECTION AREA

The driveway should be paved with asphalt, concrete, or smooth pavers and be able to withstand trucks weighing up to 70,000 lbs. or 35 tons.

User Access

Per AB-088, "Submittal documents accompanying the permit application shall provide sufficient detail to assure compliance with these requirements, including...path-of-travel and other access for persons with disabilities to collection facilities, when required."

Therefore, refuse collection space must be accessible to all occupants of the development, including those with restricted mobility and that users should be able to access all bins inside the amenity without impediment.

Chute Systems

AB-088 requires any chute system for refuse disposal in a covered project must be designed for equal convenience to all users to separate the three refuse streams of trash, recyclables and compostables.

In order to support designers and builders in San Francisco interpret "equal convenience" in the context of chutes, it is helpful to outline research done on this specific topic. In 2018, Cascadia Consulting Group conducted comparative research assessing the benefits and challenges of using chute systems to collect compostable materials in high-rise residential settings on behalf of the Seattle Public Utilities. The research was intended to inform guidelines for appropriate application of different chute system type(s) to meet Seattle Public Utility's standards of equal convenience and effective material recovery for Seattle high-rise residential properties. Cascadia interviewed property managers and maintenance staff at 16 multifamily buildings with various chute systems in Seattle, Bellevue, San Francisco, and Toronto. The following table outlines a summary of the findings by chute type:

System Type	# Properties interviewed*	Benefits		Operational challenges				Rating
		Co-location of all streams	Resident convenience	System malfunction	Stream contamination	Bulky items	Demands on staff time	1 (strong) to 4 (weak)
Diverter chutes	7	✓	✓	✗	✗	✗	✗	3.25
Multiple chutes	6	✓	✓			✗		1.2
Compostables-only chutes	2		✓		✗		✗	2.0
Single chute with post-collection sorting	2	✓	✓			✗	✗	3.0

* One property included in our study had both a diverter chute as well as a multiple-chute system in place. It is counted under both system types in the “# of properties interviewed.”

Therefore, it is the conclusion of the City and County of San Francisco, in order to meet the “equally convenient” requirement for chute systems under AB-088, any covered building constructed with a chute must include three chutes, one designated for each refuse stream, accessible to occupants on each floor.

Other requirements for chute systems include:

- All chutes must be equipped with a shut-off valve.
- Chutes for recyclables must include hoods to minimize potential hazards associated with loose materials (especially glass) falling from chute outlets.
- Residential buildings must have access to non-chute collection of cardboard (either on each floor or in a central collection area).

Additional Information to Include on Plans

- All enclosure parts must be shown to scale.
- Show and label enclosure and include gates, doors or other openings.
- Show bins to scale inside enclosures and indicate size.
- Indicate height of walls.
- If accessibility is required, show accessible path of travel.
- Show slope and distance from enclosure or trash area to truck access point
- Show curb cuts between enclosure and truck access point.
- Show floor drains and connection to sanitary sewer.
- Show any required ventilation system.