Design Considerations for Trash and Recycling Systems

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Contents

Introduction

Purpose: The purpose of this guide is to provide supplemental information for Land Use Code Section *3.2.5 - Trash and Recycling Enclosures* and to assist in designing sustainable and successful waste collection infrastructure and related programs. Waste and recycling collection is often one of the last considerations when planning a new development, but when treated as an afterthought it can create major problems for everyone involved and hinder sustainability efforts for the entire life of the development. The Fort Collins community has adopted goals to be a zero-waste city and has continually expressed a desire to recycle. It often surprises developers and property managers who are new to Fort Collins to learn about the volume of materials that get recycled. Similar developments that may be operating successfully in other parts of the country will likely need to be tailored to meet these expectations of the Fort Collins community and to meet our Land Use Code requirements. All the information and requirements shared in this guidance document are based on lessons learned locally.

Applicability: Land Use Code Section *3.2.5 – Trash and Recycling Enclosures* applies to the following developments:

1. New commercial structures;
2. New residential structures using a common collection system for waste disposal;
3. Commercial structures that are proposed to be enlarged by more than 25%;
4. Residential structures using a common collection system for waste disposal that are proposed to be enlarged by more than 25%;
5. Commercial structures where a change of use is proposed; and
6. All newly constructed enclosures.

Submittal Requirements: As you prepare to submit your project there are several elements of your project's waste collection system that must be incorporated into the project planning set:

1. Trash and recycling enclosures, staging areas, and internal collection room details, shown in plan and elevation view. Elevations must be provided for all exterior sides as applicable. Details must be drawn separately from the site plan at a scale that is sufficient to provide clear and complete design information. These details should be grouped together in the planning set. All drawing details, dimensions, labeling, and notes should be organized so that the information is easily understandable.

2. Plan view details should illustrate sufficient access, circulation and function for both residents/employees and service providers. Details should label and show overall dimensions, the widths of the pedestrian entrance and service gates, all proposed containers labeling their intended usage and capacity (i.e. "3 cubic yard recycle" or : "2 cubic yard trash") and all functional components such as drains, bollards, wheel stops, curbs and ramps.

3. Elevation view details should graphically show proposed materials and colors, label all design components, and provide any other specifications for all components. Elevations should also describe wall and gate construction including recessed and projected material patterns, base and top treatments and other design features. Include labeling, detail enlargements and cross sections if needed to adequately describe the depth of materials and construction intent.

4. The access route for trash and recycling haulers to service the development should be labeled showing all forward and reversing operations. Turn radii, height and width restrictions are listed in the specifications section of this manual. For areas where the hauling path requires the hauler to manually maneuver containers because the truck access point is separated from the storage location, the hauling path should also be depicted and labeled.

Determining Waste Streams

The first step in planning your development's waste collection infrastructure will be to determine all waste streams (i.e., trash, recycle, compost, scrap metal, etc.) that your proposed use, or any planned future uses, will generate and how much of each they will produce. At a minimum the Land Use Code requires adequate space for both trash and recycling, but your development may have additional waste streams for which you should plan.

Type of development	Possible Streams (in addition to trash)
Residential	Recycle (Required)
	Compost
Restaurant	Recycle (Required)
	Compost
	Waste Cooking Oil
	Linen Service
Grocer	Recycle (Required)
	Compost (Required)
	Waste Cooking Oil
Industrial	Recycle (Required)
	Compost
	Scrap Metal
	Waste Cooking Oil
Office	Recycle (Required)
Retail	Recycle (Required)
	Separated Cardboard

Waste Collection Methods

Once you have determined the types of materials your development is likely to produce, you will need to decide what types of containers will be used to collect trash, waste cooking oil, recyclable, and compostable materials; and how these materials will be moved from their point of generation to where they will be stored and collected. Below you will find common collection methods:

Carts: Carts are primarily used for the collection of trash, recyclable, and compostable materials at low density single-family properties, but may also be suitable at low volume generating commercial and multi-family properties (primarily the 96-gallon size). Carts are available in various sizes (32, 64, and 96 gallon). In most cases, though, carts are not an efficient method of collecting trash or recyclables at commercial and multi-family properties. Carts quickly overflow, especially when used to collect cardboard (which is required to be recycled per Fort Collins Municipal Code) and can cause nuisance issues and code violations from overflowing containers and litter.

Carts can be a preferred collection container for compostables, since compostables can get quite heavy in larger quantities. If you are interested in compost collection service for your location, contact potential service providers to understand their collection options before designing your enclosure for a particular size cart or dumpster.

Dumpsters: Dumpsters come in a variety of shapes and capacities (2 cubic yards to 8 cubic yards) and can be used to collect trash, recyclable, and compostable materials at commercial, institutional, and multi-family properties. Dumpster size and truck access information can be found in the specifications section of this document.

Compactors: Compactors can be used for trash and recyclable materials and are highly recommended for commercial, institutional, and multi-family properties generating higher volumes. Compactors come in a variety of sizes and capacities -- everything from the large compactors that are common at grocery and big box stores to smaller compactors that attach to rolling dumpsters that can be stored in smaller internal collection rooms. Compactors are usually a great long-term investment, whether purchased or leased. They often save money because they allow for decreased service frequency to your development. Contact local trash and recycling haulers for more information on compactors including specifications, pricing, and availability.

Large exterior compactor:

Internal compactor:

Chutes: For multi-story buildings (commercial, institutional, or residential) chutes can be an efficient method for bringing materials to lower levels with little effort on the part of residents, building maintenance and janitorial staff. Many developments, especially multi-family properties, have proposed and tried complex collection methods that involve carts being stored on each floor that are transported by building maintenance or janitorial staff and then emptied in a centralized location. These approaches are labor intensive, often cause overflow issues, and often fail to meet the minimum code requirements while in operation.

- *Chute design*: For building designers choosing to use chutes for their waste collection system, please be aware that a separate recycling chute is required adjacent to every trash chute. The two chutes can share one fire-rated shaft, which helps decrease costs. The recycling chute must be the same size or larger as the trash chute. Both chutes must be appropriately labeled as "Landfill" or "Recycle".

Valet Collection Service: Many multi-family developments have proposed valet trash and recycling services where residents set their trash and recycling outside their unit for building maintenance or janitorial staff to collect and deposit in a centralized location. Please be aware that while not specifically prohibited, valet collection service requires careful planning and approval from the City and Poudre Fire Authority. In general, no valet collection service will be approved that allows residents to place combustible materials within an emergency exit corridor. Any proposal to provide valet collection services must be documented in the plan set. If approved, valet service must be available for both trash and recyclable material.

Enclosures & Collection Rooms

Location & Accessibility: When deciding on the location for trash and recycling enclosures or internal collection rooms there are two important factors to consider:

- *Distance from residential or commercial units*: Convenient access to trash and recycling must be provided for every proposed residential or commercial unit. Enclosures and internal collection rooms should be no more than 150' from residential units or 200' from commercial units. Developments often will need to build multiple enclosures dispersed throughout the site.

- *Service Provider Accessibility*:
  - Service providers must have safe and efficient access to all enclosures and internal collection rooms. Plans must document the proposed path for service providers to access enclosures / collection rooms. This includes following all applicable turn radii, width, and height restrictions for the type of container/service vehicle that will be servicing the development. See details in the specifications section of this document.
  - If any enclosure or internal collection room is not positioned to allow truck access immediately adjacent to it, the path the service provider or building maintenance staff

will be required to maneuver the containers over must be documented on the plans. The path must be:

- free of obstructions that would prevent a wheeled container from rolling smoothly
- have a maximum grade of 5% in the direction of travel and 2% cross slope
- surfaced with concrete cement (concrete pavers are not acceptable)

- The site should be laid out to avoid dead-end drives without a proper turn-around for the service vehicle. Dead-end drives result in excessive backing for service vehicles, increasing risk or property damage or injury and can create nuisances for residents and employees (due to the service vehicles' back-up alarms).

Space Allocation & Service Frequency:

- *Space Allocation*: Determining how much space is needed for trash, recyclable and compostable materials can be a complex issue. To answer this question, it is first necessary to find out how much material will be generated per week and how many times the service provider will collect the materials each week.

  For multi-family properties, the City has developed a calculator that can estimate the amount of materials generated per week based on the number of bedrooms. The calculator shows how different service frequency, type and number of containers can be used to address the projected volume. The multi-family calculator can be found at fcgov.com/developmentreview/trash-recycling-enclosures.

  Since commercial waste streams vary so much, we do not have a calculator available for these types of developments. If you are unsure of how much volume to anticipate we recommend looking at comparable local developments for guidance. The City's Waste Reduction and Recycling staff is also available to assist by contacting the City's Environmental Services Department at 970-416-6600.

Multi-family Calculator

City of Fort Collins - Multi-Family Unit Calculator

Enter Container Information

Number of trash pick-ups per week:		
Number of Trash Recepticles		
# of Carts:	Size:	Volume per week:
	96 gallon	0.00
# of Dumpsters:	Size:	
	2 cubic yards	0
	3 cubic yards	0
	4 cubic yards	0
	6 cubic yards	0
	8 cubic yards	0
Total trash bin capacity:		0.00
Total trash volume per week:		0.00
Additional trash volume needed:		0.00

Enter Number of Bedrooms

Number of Bedrooms:	

The purpose of this calculator is to help Multi-Family complexes determine an appropriate volume of trash and recycling service based on the total number of bedrooms. To start, please fill out the yellow sections of this calculator. To determine an approproate number and size of containers you will need to try different combinations of containers and service frequency until the additional volume of trash/recycling needed is no longer highlighted red. To minimize cost and disturbances to residents it is a good rule of thumb to not exceed 3 weekly pickups.

Trash:	0.00
Recycling:	0.00

Number of recycle pick-ups per week:		
Number of Recycle Recepticles		
# of Carts:	Size:	Volume per week:
	96 gallon	0.00
# of Dumpsters:	Size:	
	2 cubic yards	0
	3 cubic yards	0
	4 cubic yards	0
	6 cubic yards	0
	8 cubic yards	0
Total recycling bin capacity:		0.00
Total recycling volume per week:		0.00
Additional recycle volume needed:		0.00

- *Service Frequency*: Service frequency is usually a primary factor when determining cost of service. By decreasing service frequency, your development will
  - save money
  - reduce the risk of property damage/injury from heavy truck traffic and servicing operations
  - reduce nuisance issues associated with servicing (noise from servicing/reverse alarms, disrupted traffic flow, etc.).

  Designing an enclosure for a greater number and size of containers is encouraged because it is the primary method to decrease service frequency. Service frequency, along with anticipated container type and size, must be described on the plans.

Construction: Enclosures and internal collection rooms must be built of durable materials that can hold up to the frequent use and harsh conditions to which they will be exposed. Enclosures are required to be built of durable materials such as concrete, masonry, or metal and must be constructed on a concrete cement pad. Wood may only be used to finish the exterior of an enclosure. Wood should not be the primary material used for the enclosure. Gates and associated hinges, latches, etc. are required to be built of durable materials such as metal. The enclosure design shall be compatible with the structure to which it is associated. Below you will find some specific elements to consider.

Wall Protection: Enclosures and internal collection rooms must provide methods to protect the interior walls from being damaged by the heavy containers. Common methods to protect the walls include:

- For rolling dumpsters (sizes 4 cubic yard and less)
  - Angle iron can be secured to the pad and positioned to stop the wheels from rolling before the container hits the enclosure walls. Due to its low cost and effectiveness this is the recommended method for rolling dumpsters
  - Curbing can also be installed along the inside edge of the enclosure to achieve the same protection
  - Additional internal framing or "bumpers" can be secured to the walls at the height of the widest part of the dumpster to absorb the impact from dumpsters and prevent damage to the wall. This method can be very effective, however is not recommended because the height they would need to be installed at differs greatly between the variety of dumpsters that will likely occupy the enclosure or collection room throughout its life.
- For stationary dumpsters (usually 6+ cubic yards)
  - Bollards are the recommended wall protection method for stationary dumpsters. These types of dumpster are serviced by the truck lifting the dumpster up and setting it back down within its enclosure, and damage can occur at a variety of heights. The bollard protects the wall throughout the height of the bollard, whereas other methods only protect a dumpster from being rolled into the wall.

Angle iron

Bollards

Lighting and Safety: Unfortunately, enclosures can be an attractive location for illegal dumping, loitering and other unintended activity. While not required, it is highly encouraged to provide lighting for all trash and recycling enclosures, especially those at multi-family properties, or commercial properties that are likely to do business after sunset. In some instances, these potential issues could be mitigated by designing the enclosure walls to be partially transparent. While the enclosure still needs to provide sufficient screening of the dumpsters from view, allowing some light to pass through will decrease the likelihood of attracting illicit behavior, and is especially a good idea in locations where lighting is not possible.

Partially transparent walls

Partially transparent walls

Roofs: Roofs are required on enclosures used to store waste cooking oil (see the Waste Cooking Oil Collection section for more information) and can also provide benefits for general use enclosures. Sheltering enclosures from rain and snow prevents unintended contaminated run-off from dumpsters and debris and provides safer conditions for users and service providers without snow and ice buildup. Roofs also screen dumpsters from view of upstairs windows which may be of benefit for proposed multi-story developments or other multi-story development within view. Roofs prevent the common issue of users throwing materials over the wall rather than entering the enclosure, which can cause issues with litter and materials being disposed of in the incorrect bin.

Enclosure with roof

Waste Cooking Oil Collection: Anyone who has ever worked in a restaurant or spent time around a waste cooking oil collection container can relate to the odor and spilled oil associated with these collection containers. As with any other waste container, waste cooking oil containers are required to be within enclosures. With even the most careful restaurant employees, residual oil builds up on and around the container, potentially flowing into the stormwater system. This can lead to environmentally harmful and expensive remediation required by the development. For these reasons, the Land Use Code has specific requirements for waste cooking oil container enclosures.

- *Indoor collection system*: The primary recommendation is to create an indoor collection system for waste cooking oil. These systems include a tank that can be serviced either from inside the building, or from the exterior of the building through a plumbed access point. These systems are efficient, save employee time and potential injury from transporting the oil, save the mess of an exterior oil container, and eliminate the need to build an enclosure to the cooking oil requirements. Multiple companies are available to design and build these systems. Local waste cooking oil haulers are a good resource for more information on the design and implementation of these systems.
- *Cooking oil enclosure*: If you decide to use a traditional waste cooking oil container in an enclosure, it must
    - Prevent the oil container from being tipped over accidently or purposefully (yes, this happens)
        - The container may be secured in place, enclosed separately, or separated from other containers with bollards or another physical barrier.
    - Prevent rainwater from carrying away residual oil

      A roof must be installed on enclosures storing waste cooking oil unless an alternative and functional method to prevent rainwater from carrying away residual oil is demonstrated and approved by the City.

Specifications

Container Types & Sizes:

In the table below, you will see a list of available container sizes/capacities, the average size of the container (this will vary between service providers), the type of vehicles that service each container and what type of access is needed to the container. If the access is labeled as "rolling" it means the container is able to be wheeled from its storage location to the truck for servicing, where as "stationary" containers need space for the service vehicle to pull up immediately to the front of the container in its storage location.

Carts:

Size/Capacity	*Avg. Dimensions*	*Service Vehicle*	*Access*
Small (.16 c.y. or 32 gal)	2' W x 2' D	Front, side or rear load	Rolling
Medium (.3 c.y. or 64 gal)	2.5' W x 2.5' D	Front, side or rear load	Rolling
Large (.5 c.y. or 96 gal)	2.5' W x 3' D	Front, side or rear load	Rolling

Dumpsters:

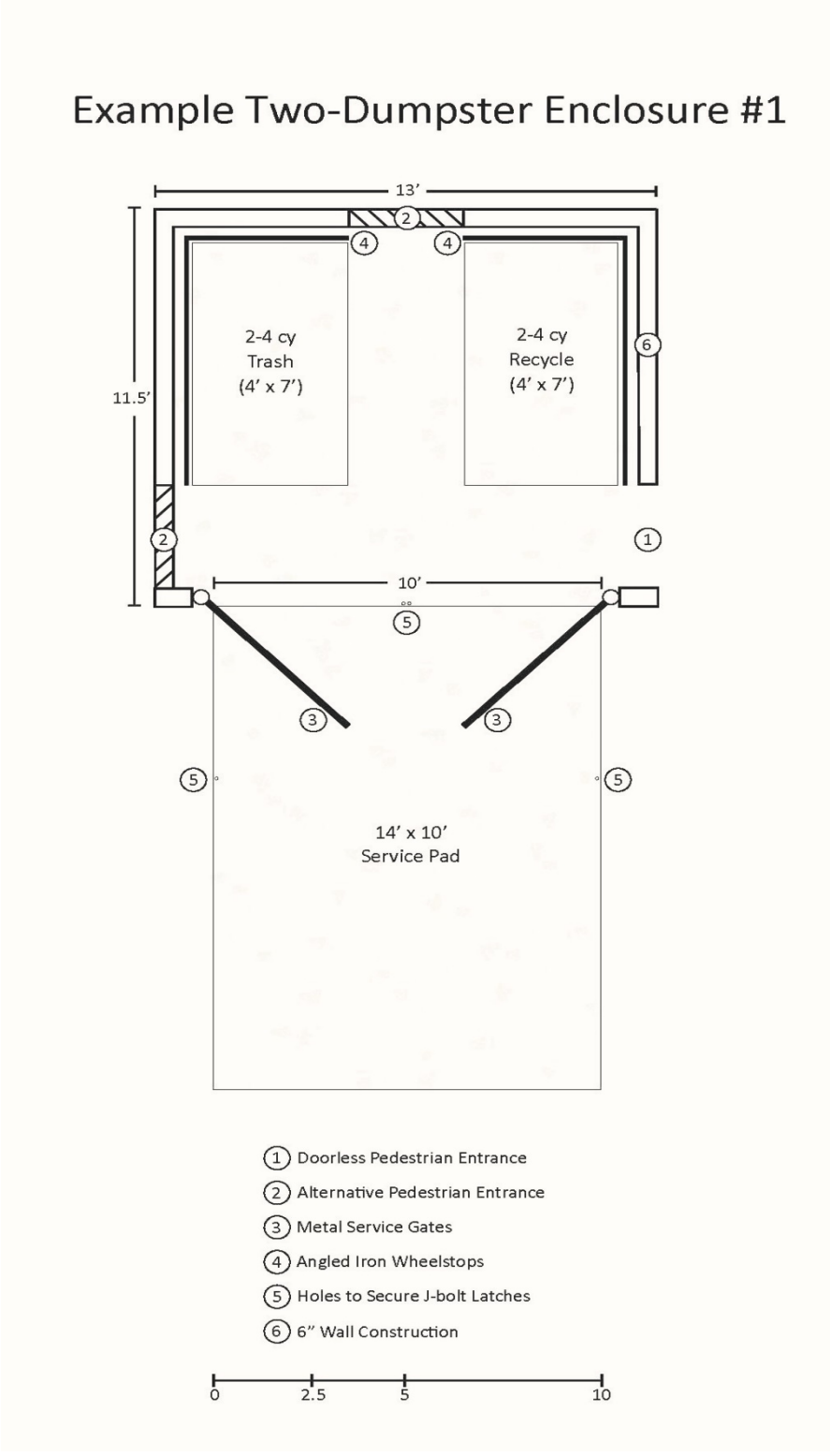
Size/Capacity	*Avg. Dimensions*	*Service Vehicle*	*Access*
2 Cubic Yard	3.5' W x 7' D	Front or rear load	Rolling
3 Cubic Yard	4' W x 7' D	Front or rear load	Rolling/Stationary
4 Cubic Yard	4' W x 7' D	Front or rear load	Rolling/Stationary
6 Cubic Yard	5.5' W x 7' D	Front-load	Stationary
8 Cubic Yard	5.5' W x 6' D	Front-load	Stationary

Truck Access Requirements (height/width restrictions, turn radii):

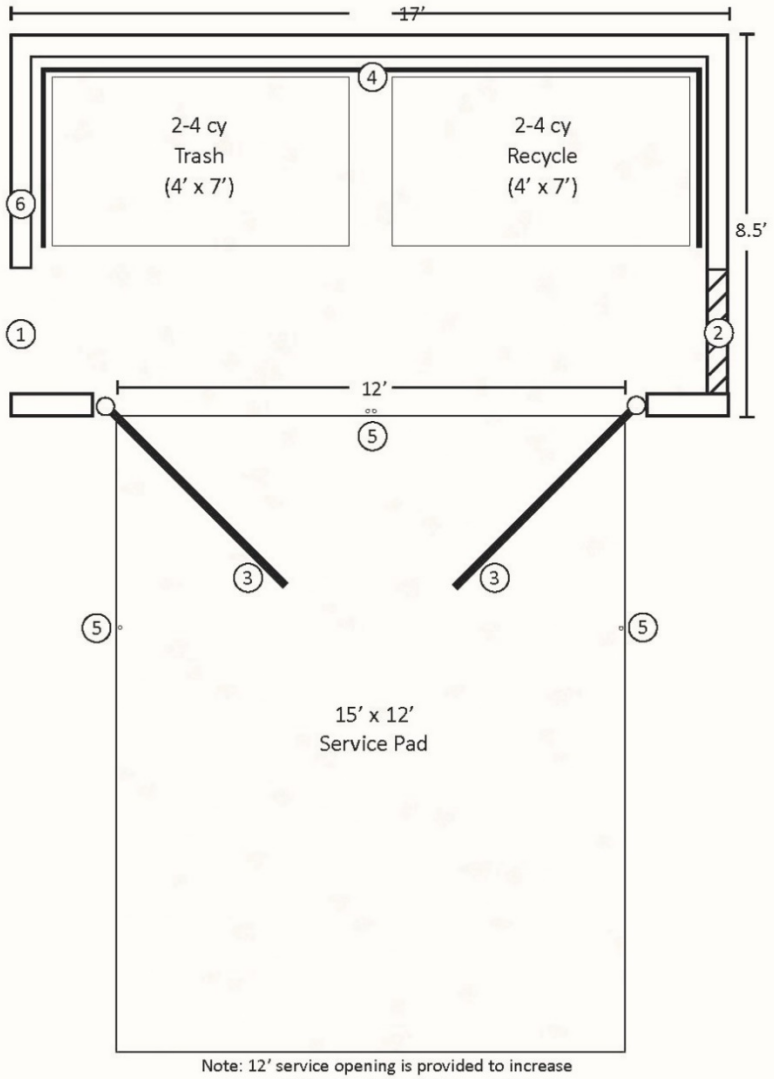
Truck Type	*Turn Radius*	*Overhead Clearance (Driving)*	*Overhead Clearance (Servicing)*	*Width Clearance*	*Unobstructed Approach Length*
Front-load					
can serve 2, 3, 4, 6 or 8 c.y. dumpsters	SAE: 38.2' Adjusted: 42.7' 90° turn radius: 45' 180° turn radius: 90' Curb to curb 86.5' Wall to wall 100.4'	13.6'	24'	13'	40'
Rear-load					
can serve 2, 3 or 4 c.y. dumpsters	SAE: 30.7' Adjusted: 34.4' Curb to curb 69.9' Wall to wall 81.5'	12'	24'	13'	30'

***Compactors*:** Check with your hauler for options and specifications

Example Enclosure Plans

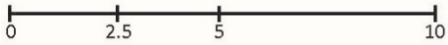


Example Two-Dumpster Enclosure #2

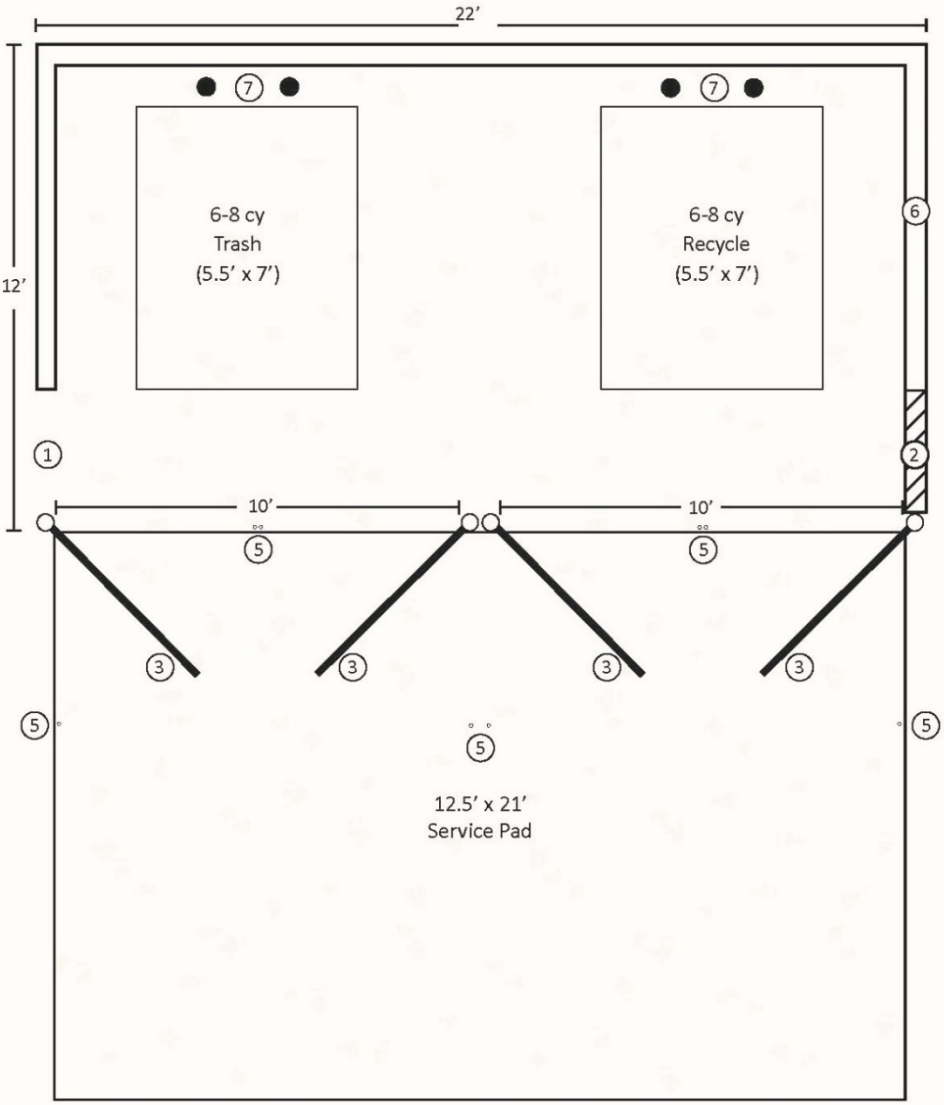


Note: 12' service opening is provided to increase manuevarbility of containers. This could also be accomplished by adding depth. If so, 10' opening could be used.

1. Doorless Pedestrian Entrance
2. Alternative Pedestrian Entrance
3. Metal Service Gates
4. Angled Iron Wheelstops
5. Holes to Secure J-bolt Latches
6. 6" Wall Construction



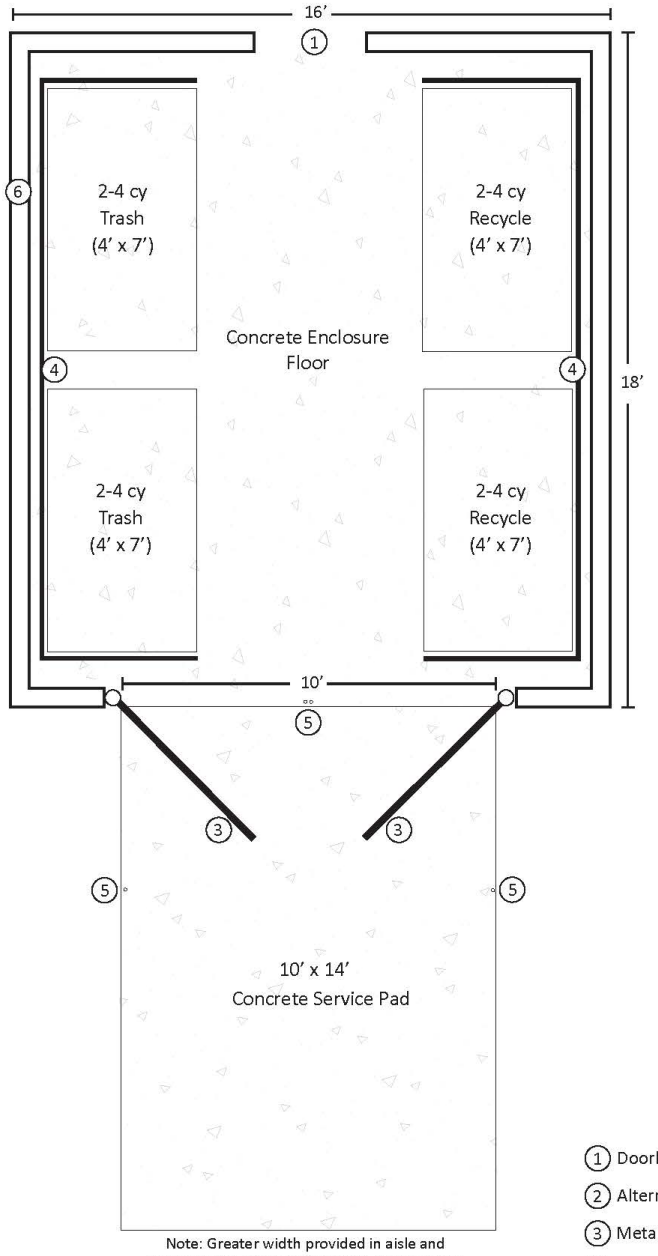
Example Two-Dumpster Enclosure #3



1. Doorless Pedestrian Entrance
2. Alternative Pedestrian Entrance
3. Metal Service Gates
4. Angled Iron Wheelstops
5. Holes to Secure J-bolt Latches
6. 6" Wall Construction
7. 6" Bollards

0 2.5 5 10

Example#4: 4-Dumpster Enclosure



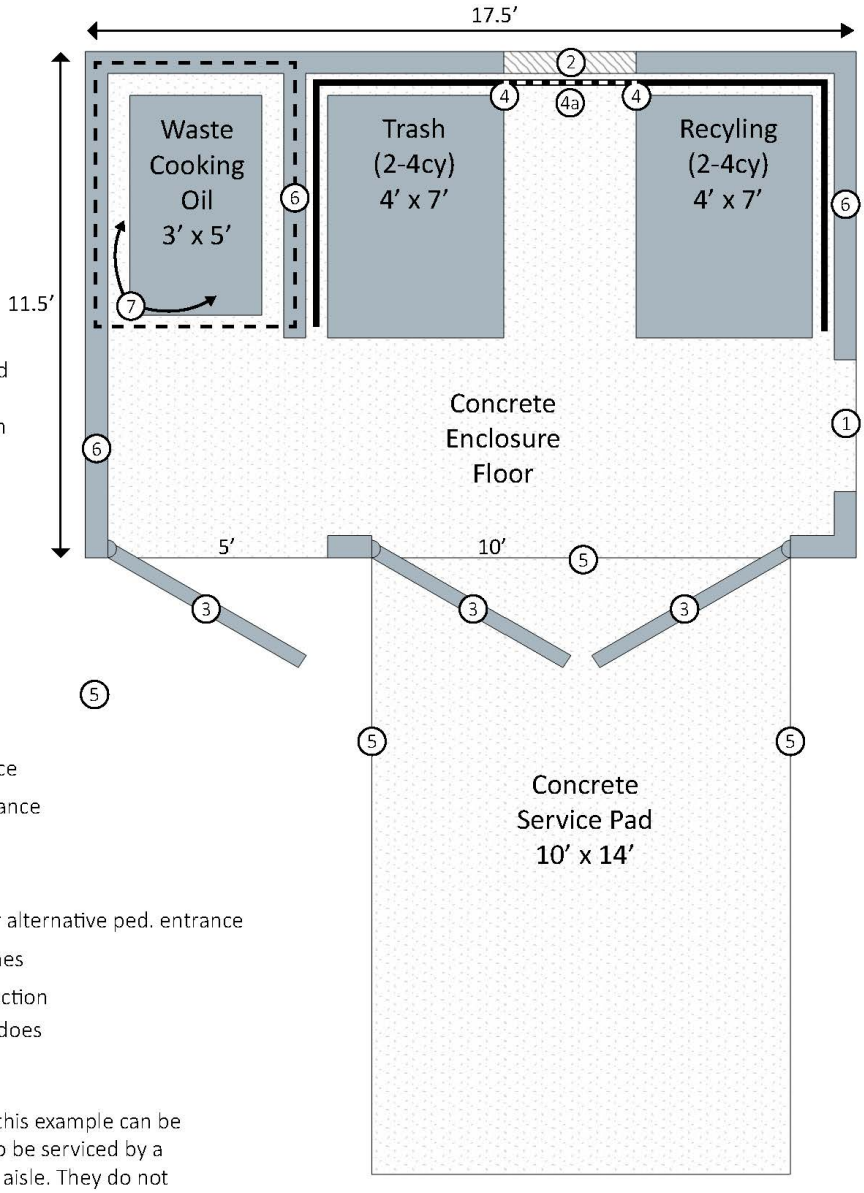
Note: Greater width provided in aisle and between dumpsters to help with maneuvering rear dumpsters.

Note: The size of dumpsters in this enclosure can be serviced by a truck driving past it in the drive aisle. They do not require front-load access.

1. Doorless Pedestrian Entrance
2. Alternative Pedestrian Entrance
3. Metal Service Gates
4. Angled Iron Wheelstops
5. Holes to Secure J-bolt Latches
6. 6" CMU Block Wall Construction

0 2.5 5 10

Example enclosure #5:
Two-Dumpsters and Cooking Oil Vertical Option



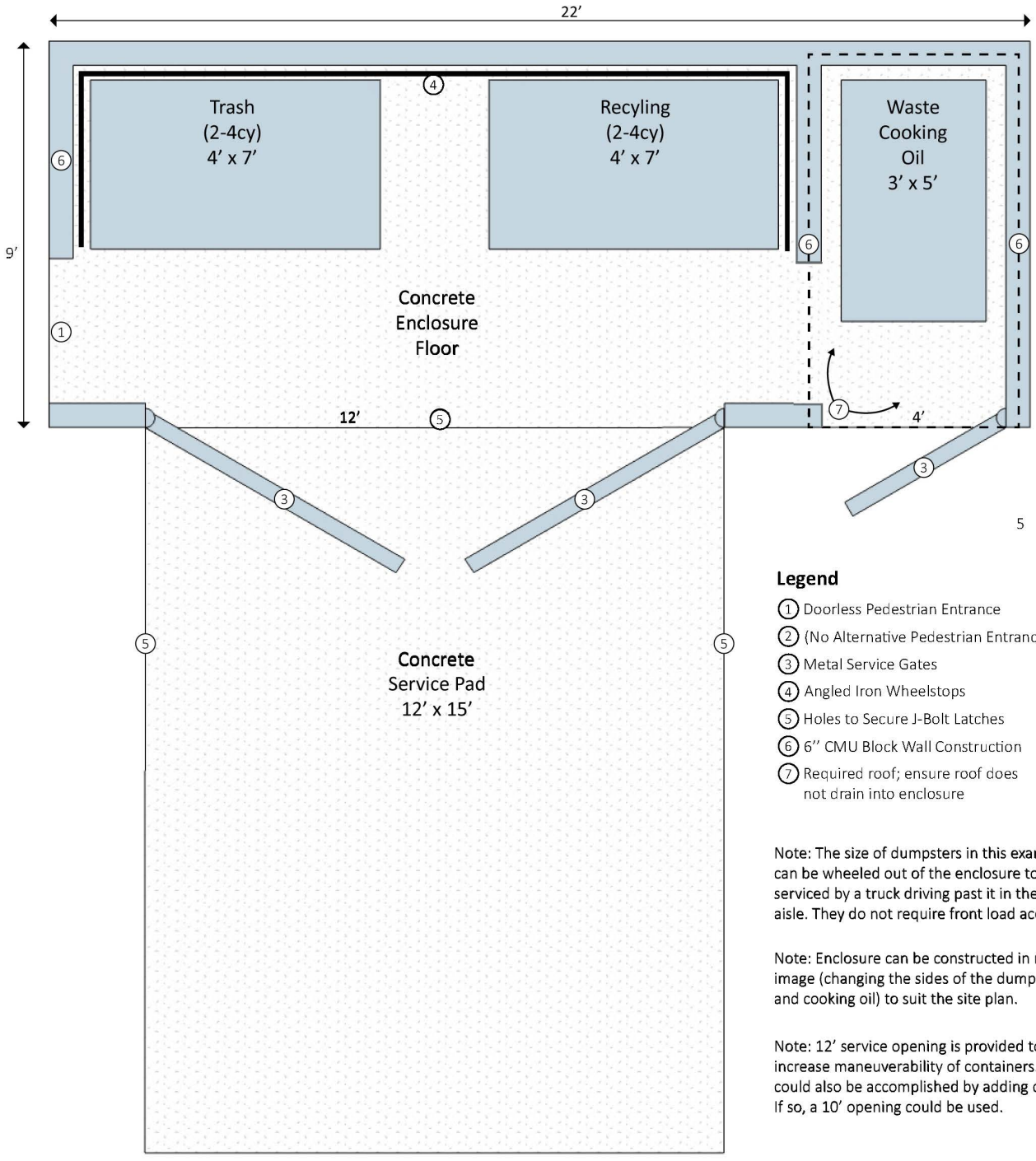
Note: Not recommended to add a second pedestrian entrance next to waste cooking oil, which may result in tracking spilled cooking oil across enclosure surface.

Legend

1. Doorless Pedestrian Entrance
2. Alternative Pedestrian Entrance
3. Metal Service Gates
4. Angled Iron Wheelstops
4a. No Angle Iron necessary for alternative ped. entrance
5. Holes to Secure J-Bolt Latches
6. 6'' CMU Block Wall Construction
7. Required roof; ensure roof does not drain into enclosure

Note: The size of dumpsters in this example can be wheeled out of the enclosure to be serviced by a truck driving past it in the drive aisle. They do not require front load access.

Example enclosure #6:
Two-Dumpsters and Cooking Oil Horizontal Option



Note: The size of dumpsters in this example can be wheeled out of the enclosure to be serviced by a truck driving past it in the drive aisle. They do not require front load access.

Note: Enclosure can be constructed in mirror image (changing the sides of the dumpsters and cooking oil) to suit the site plan.

Note: 12' service opening is provided to increase maneuverability of containers. This could also be accomplished by adding depth. If so, a 10' opening could be used.

Additional Enclosure Ideas

Gate within a gate: sometimes it can be difficult to provide space for both a separate pedestrian entrance and the main service gates. Here is a local example of a "gate within a gate". As you can see, this enclosure meets Land Use Code requirements by providing two large gates for the service provider to use when moving dumpsters in and out of the enclosure, while within one of the gates a smaller pedestrian door allows for easy and efficient access for users disposing of their trash and recycling. This solution should only be used when a gateless walk-in access is infeasible.

Gate within a gate

Gate within a gate

Garage-style enclosure: instead of building a typical enclosure, this development simply built a 2-car garage to be used as an enclosure. It is well built, functional and allows pedestrians use a traditional door while the service provider uses the exterior keypad to open the garage door and access the containers. This option can meet all the requirements discussed in this manual and has multiple added benefits: it can easily be secured with keypads for both service providers and users, which prevents illegal dumping; the roof prevents rain and snow from creating unintended stormwater run-off from dumpsters and debris; and provides safer conditions for users and service providers with reduced snow and ice buildup. Additionally, as mentioned above, roofs screen the dumpsters from upper-level windows and the building is more attractive than a typical trash enclosure.

Garage Style Enclosure

Garage Style Enclosure

Trash and Recycling Enclosure Common Mistakes

***Problems to avoid*:** We all learn as we go along, and the examples provided in this section are shared with the intent of helping to prevent similar issues in the future.

***Inaccessible or non-functional pedestrian access*:** The Land Use Code requires every enclosure to not only have a pedestrian entrance, but to provide an unobstructed pathway to each container within the enclosure from that pedestrian entrance. When such a pathway is not provided, it forces the users to either:

1) Use which ever container is accessible
    - No matter whether it is trash or recycling, either contaminating the recycling or wasting recyclable material.
    - The accessible bin fills quickly while the inaccessible bin hardly fills, resulting in wasted service costs (paying to service the empty container and potential overflow charges on the full container).
2) Use the main service gates
    - Which can be challenging to open/close, functionally results in users leaving them open at all times defeating the purpose of an enclosure.
3) To attempt to throw debris over the enclosure walls
    - With equal chance of hitting the trash, recycle or the ground, which results in litter in the enclosure and trash / recycling ending up in the incorrect bin.

Example of Inaccessible Pathway

Example of Inaccessible Pathway

Example of Inaccessible Pathway

Challenging servicing conditions: The photos below show enclosures or internal collection rooms where the dumpster must be wheeled out to be serviced, but the conditions prevent staff from safely doing so. These examples help demonstrate why the Land Use Code requires that all paths that dumpsters will be rolled over must be concrete cement with maximum allowable slopes.

This photo shows an enclosure that cannot be serviced because of the gravel in front of the main service gates. Dumpsters can weigh up to 400 pounds and are simply too heavy to wheel over any material other than concrete cement. Asphalt is equally problematic as heavy dumpsters will sink into the warm asphalt in the summer heat.

Challenging Service Conditions

This photo shows an internal collection room that requires wheeling heavy dumpsters down a steep ramp. This arrangement is dangerous – staff can easily lose control of heavy dumpsters (Staff at this location have had this happen. Thankfully, no one was injured, but it took hours to get the runaway dumpsters right side up and cleaned up.)

***Enclosure is too small*:** When enclosures are too small for the site's needs, containers are often moved into parking lots, which take up parking, can be dangerous if the bins are blown by the wind, encourages illegal dumping, and generally defeats the purpose of the enclosure. For this reason, it is strongly recommended to carefully consider anticipated volumes and equipment specifications during enclosure design.

Enclosure is too small

Enclosure is too small

Staging areas: The Land Use Code requires all staging areas to be enclosed and follow all the same requirements as any other enclosure. It does not allow containers to be set out at the curb for pick up as would typically be done with single-family residential cart service. Whereas residential carts are serviced once per week, commercial and multi-family locations are often serviced multiple times per week, with trash and recycling being serviced on separate days. It is quite possible to have containers in a service staging area every day of the week. The photos below show how containers being set out for pick up can be problematic.

Poor Staging Area

This photo shows a large multi-family development where the service provider is forced to block both the bike lane and sidewalk when servicing the bins because no off-street location is provided. This is especially challenging because Municipal Code prohibits trash and recycling from being collected prior to 7am in residential areas (because of the noise impact). There is heavy pedestrian traffic during daytime hours at this location, creating an unsafe situation for all involved.

Poor Staging Area

The photo shows dumpsters being staged adjacent to residential balconies and parking, generating nuisance complaints from residents.

Land Use Code Language

For reference, this is the land use code language pertaining to enclosures:

3.2.5 - Trash and Recycling Enclosures.

(A) *Purpose*. The purpose of this standard is to ensure the provision of areas, compatible with surrounding land uses, for the collection, separation, storage, loading and pickup of trash, waste cooking oil, compostable and recyclable materials. This standard is supplemented by the Enclosure Design Considerations and Guidance Document issued by the Director and available from the Department.

(B) *Applicability*. The following developments must provide adequately sized, conveniently located, and easily accessible areas to accommodate the specific trash, compostable and recyclable materials and waste cooking oil needs of the proposed use and future uses that are likely to occupy the development:

(1) New commercial structures;

(2) New residential structures using a common collection system for waste disposal;

(3) Commercial structures that are proposed to be enlarged by more than twenty-five (25) percent;

(4) Residential structures using a common collection system for waste disposal that are proposed to be enlarged by more than twenty-five (25) percent;

(5) Commercial structures where a change of use is proposed; and

(6) All newly constructed enclosures.

(C) *General Standards*.

(1) Areas for the collection and storage of trash, waste cooking oil, and compostable, recyclable and other materials (linen service containers, returnable crates and pallets, and other similar containers) must be enclosed so that they are screened from public view. Enclosures must be constructed of durable materials such as masonry and shall be compatible with the structure to which it is associated.

(2) Areas for the collection and storage of trash, waste cooking oil, and compostable, recyclable and other materials must be adequate in size, number and location to readily serve the reasonably anticipated needs of the development's occupants.

(3) Development plans must include labeled drawings of all proposed enclosures, internal trash and recycling rooms, staging areas and the like and include all proposed dumpsters, containers, bins and other receptacles and label the capacity of each. Proposed recycling capacity must be at least fifty (50) percent of the proposed trash capacity.

(4) To provide equal access for trash, compostable and recyclable materials, space allotted for the collection and storage of compostable/recyclable materials must be adequate in size and provided everywhere space for trash is provided in a functional manner.

(5) Areas for the collection and storage of trash, waste cooking oil, and compostable, recyclable and other materials must be designed to allow walk-in access for pedestrians separate from the service opening that is at least thirty-two (32) inches wide and provides unobstructed and convenient access to all dumpsters, containers, bins, and other receptacles. Where possible, pedestrian entrances are encouraged to provide door-less entry unless reasonable circumstances (preventing illicit activities/usage, regulated waste streams, and the like) are demonstrated that would necessitate doors. If doors are used, they must provide safe and efficient access.

(6) Areas for the collection and storage of trash, waste cooking oil, and compostable, recyclable and other materials must provide a service opening that is at least ten (10) feet for haulers to efficiently maneuver dumpsters, containers, bins and other receptacles unless an alternative and functional method is demonstrated on the plan. Enclosures must provide service gates unless an alternative and functional method is demonstrated on the plans that adequately screen the enclosure from view. Service gates must be constructed of metal or other comparable durable material, and must be finished to complement the enclosure. Service gates must be free of obstructions that would prevent them from opening fully, must have a method to be secured by hardware in both closed and fully open positions, and must be properly maintained so they may be operated easily and smoothly.

(7) Areas for the collection and storage of trash, waste cooking oil, and compostable, recyclable and other materials, must include bollards, angle-iron, curbing, metal framing or other effective method to protect the interior walls of the enclosure from being damaged by dumpsters, containers, bins, and other receptacles.

(8) Areas for the collection and storage of trash, waste cooking oil, and compostable, recyclable and other materials must be designed to provide adequate, safe and efficient accessibility for haulers and service vehicles, including but not limited to front-load, rear-load, side-load, and roll off trucks and trucks used to pump waste cooking oil. Development plans must label the route the hauler will take to service the development and must comply with necessary turning radii, width, and height restrictions for the type of collection vehicles that will service the development.

(9) To ensure wheeled service dumpsters, containers, bins and other receptacles can be rolled smoothly and to prevent damage to the surfaces they will be wheeled over, enclosures must be situated on a service pad that extends beyond the service gates at their fully open position at least the width of the widest proposed dumpster, container, bin and other receptacles plus an additional two (2) feet. If the truck access point is separated from the storage location, a serviceable route that is free of obstructions must be provided and shall not exceed a maximum grade of five (5) percent in the direction of travel and two (2) percent cross slope. Areas for the collection and storage of trash, waste cooking oil, and compostable, recyclable and other materials, service pads and serviceable routes must be constructed of cement concrete. For

offsite conditions such as existing public alleyways, this standard will only apply to the extent reasonably feasible.

(10) To provide equal access to trash and recyclable materials, multi-story buildings utilizing trash chutes must include a recycling chute of the same size or larger than the trash chute. Anywhere a trash chute is provided a recycling chute must also be provided adjacent to it. Chutes must be appropriately labeled "Landfill" and "Recycle" as appropriate.

(11) Where proposed uses and future uses that are likely to occupy the development will generate waste cooking oil, internal waste cooking oil collection systems are encouraged. All areas used to store waste cooking oil must include measures to prevent spills and contamination of the stormwater system. Waste cooking oil containers must be secured in place, enclosed separately, or separated from other containers with bollards or another physical barrier. To prevent rain water from carrying residual waste cooking oil into the stormwater system, all areas used to store waste cooking oil must include a roof unless an alternative and functional method is demonstrated on the plans.