

Commercial and Multi-Family Developments

WASTE MANAGEMENT DESIGN GUIDELINES





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INTRODUCTION

Recycling and waste management are an integral part of the development and planning process for commercial and multi-family buildings. These guidelines assist developers with addressing these service requirements. In particular, disposal bans and waste-diversion targets are in place for the Metro Vancouver region, and expanded recycling is a key component. This results in a corresponding requirement to provide sufficient space in multi-family and commercial complexes for a range of recycling services along with garbage collection.

Recycling and garbage areas that have inadequate space or are poorly designed are difficult to use or access. As well, there has been a shift towards more automated collection, which has impacted the size of collection vehicles, including increased height clearance and turn-radius requirements. The City also requires developers to provide a waste management overlay plan as part of any new development application. These changes affect buildings being developed for multi-family and commercial use, and include requirements for both centralized and curbside collection. It's essential that developers incorporate these requirements into their designs.

These waste management guidelines are intended to assist developers of multi-family and commercial properties to provide for the design of appropriate recycling and waste storage areas that meet government regulations and comply with Metro Vancouver disposal bans.

These guidelines present key strategies and general advice for meeting the City of Richmond's regulations, which will help streamline the development application process by ensuring key requirements are met as part of the initial application. It outlines the general responsibilities for developers in the context of garbage and recycling management, outlines the design guidelines and key criteria to assess as part of design planning, and provides tips and formulas for calculating the space required to ensure sufficient recycling and collection services can be accommodated, as well as space for collection and loading areas.

Please note that this document should be used with, not in place of, all applicable building codes, City standards and other relevant legislation.



GOALS & OBJECTIVES

The goals of effective recycling and garbage arrangements for multi-family and commercial buildings are to provide efficient recycling and garbage services and to achieve targeted waste diversion while minimizing contamination in recycling.

The following objectives support these goals:

- Develop building design to support convenient access to full range of recycling and garbage services.
- Develop building design to ensure sufficient space is allocated for collection of materials, including turn radius and height, length and width clearance for collection vehicles.
- Create efficient centralized collection areas with sufficient space for recycling and garbage containers or other materials that are generated by the business operation (e.g., tires, wood pallets) to help avoid unsightly premises caused by overflowing containers.
- Minimize contamination of recycling by designing areas to accommodate convenient grouping of recycling types and space for instructional materials (e.g., signage).

Did You Know?

Multi-family housing occupants often experience similar barriers related to waste reduction and diversion.

For an overview of these barriers and common solutions, see Attachment 6 on page 45.

GENERAL RESPONSIBILITIES

A developer has three primary responsibilities concerning garbage and recycling management:

1 Ensure Adequate Storage and Collection

A developer is responsible for meeting the property’s needs by:

- providing adequate storage for garbage and recycling;
- ensuring there are collection services in place; and
- ensuring there is sufficient space for access to collection and loading areas.

2 Comply with Disposal Bans

Developers must design their systems so occupants can comply with Metro Vancouver’s enhanced disposal bans. The materials listed below are banned from being disposed of in the garbage and must be recycled instead.

- Auto parts and bodies
- Corrugated cardboard
- Recyclable paper
- Food scraps and yard trimmings
- Containers made of glass, metal, or recyclable plastic (♻️ ♻️ ♻️ ♻️) and composite materials
- Beverage containers
- Clean wood
- Expanded polystyrene packaging
- All product stewardship items

This is a representative list only.
Please refer to metrovanancouver.org/services/solid-waste/recycling-programs/disposal-ban for more information on bans, alternative disposal options and fines.

3 Meet Government Regulations Related to Waste Management

The following are some of the key regulations related to waste management that affect the development and management of multi-family and commercial buildings:

CITY OF RICHMOND BYLAWS [Solid Waste & Recycling Regulation Bylaw 6803](#)

- Outlines the requirements and collection standards for the management of garbage, recycling materials and food scraps from all residential buildings, including City recycling services for mixed containers, mixed paper, and glass jars and bottles.
- Requires that recyclable materials, including food scraps, be separated from the garbage.
- Outlines exemptions from City services and opt-out processes required.
- Addresses noise restrictions and allowable collection hours, materials accepted, weight limitation, correct packaging for collection, etc.

[Public Health Protection Bylaw 6989](#)

- Store waste in such a way as to not provide shelter, refuge or food for rodents.

[Traffic Bylaw 5870, Section 6.2.9](#)

- Ensure recycling and garbage containers are not placed on roadways.

[Drainage, Dyke and Sanitary Sewer System Bylaw 7551, Section 3](#)

- Manage oil and grease from a food sector establishment to ensure no oil or grease is discharged into a sanitary sewer or drainage system within the City.

[Unightly Premises Bylaw 7162](#)

- Ensure property does not become unsightly. This includes preventing garbage from accumulating and removing any accumulations.

For full details on City of Richmond Bylaws, please visit richmond.ca/cityhall/bylaws/chapter

OTHER RELATED REGULATIONS

[BC Public Health Act, Part 3, Div 1\(15\)](#)

- A person must not willingly cause a health hazard, or act in a manner the person knows, or ought to know, will cause a health hazard.

[BC Fire Code 2018 Section 2.4.1.2. Storage Rooms for Combustible Waste Materials](#)

- Where rooms are provided for the storage of combustible waste materials, such rooms shall conform to the British Columbia Building Code.

[BC Building Code 2018, Section 3.5.2.5 except as provided in sentence 3.5.3.3\(9\) and Section 9.10.10.6](#)

- Ensure rooms for temporary storage of combustible refuse such as garbage or waste paper are separated from the remainder of the building by a fire separation with a fire-resistance rating of not less than one hour, and be sprinklered.

[Metro Vancouver Tipping Fee Bylaw and Disposal Bans](#)

- Listing of banned materials that Metro Vancouver disposal facilities do not accept, either because there are already disposal programs set up for these items, or because they are hazardous to waste collection workers, the public and environment.
- At disposal sites, garbage loads are inspected for banned and prohibited materials. Loads that arrive at the disposal sites containing prohibited materials are assessed a minimum surcharge, plus the cost of removal, clean-up or remediation. Loads containing banned materials are assessed a 50% tipping fee surcharge.

[Richmond Fire Protection and Life Safety Bylaw No. 8306, Section 9.2](#)

- Refuse and Recycling Containers, garbage and recycling containers must be made of non-combustible material and must be stored at least 3 metres from any combustible material and from unprotected (no sprinkler) areas around or inside any structure. Self-closing lids are required for all containers.



DESIGN GUIDELINES & CRITERIA

The following eight steps are intended to assist developers with planning for commercial and multi-family buildings. Following these steps will help to accelerate permit processing time by ensuring the development design meets all regulations and developer responsibilities.

SUMMARY OF STEPS

1. Determine type and volume of recycling and garbage that will be generated on site.
2. Determine recycling and garbage collection service provider.
3. Calculate the number and types of containers required.
4. Calculate the storage space required.
5. Design the storage/collection area.
6. Determine access route for collection vehicles and turning radius.
7. Designate the collection/loading area.
8. Develop and submit a waste management overlay plan.

1 Determine Type and Volume of Recycling and Garbage that will be Generated Onsite

The first step involves assessing the types of garbage and recyclable materials that are most likely to be produced by the occupants of the building. In addition to the common items listed here, specialized recyclable items may include: grease, clean wood, hazardous materials or other items banned from disposal in the garbage.

OCCUPANTS MUST HAVE ACCESS TO DISPOSE OF:



The following charts show the approximate waste volume generated for different types of building use.*

Please note the generated rates listed are only general estimates and may vary from actual rates. It is recommended that developers consult with a waste hauler to assist with estimating the anticipated recycling and garbage requirements. Please contact the City for recycling service via email at wmguidelines@richmond.ca.

WASTE CATEGORIES	ESTIMATED VOLUME GENERATED (LITRES/UNIT/WEEK)
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MULTI-FAMILY RESIDENTIAL BUILDING

Garbage	53.00
Glass Jars & Bottles	2.10
Mixed Containers	18.50
Mixed Papers (including cardboard)	42.90
Mixed Papers (excluding cardboard)	15.00
Cardboard	27.50
Food Scraps & Yard Trimmings	14.00

WASTE CATEGORIES	ESTIMATED VOLUME GENERATED (LITRES/ROOM/WEEK)
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HOSPITALITY BUILDING

Garbage	47.50
Mixed Containers	3.50
Mixed Papers	8.30
Cardboard	14.30
Oil/Grease	0.33
Food Scraps & Yard Trimmings	20.00

WASTE CATEGORIES	ESTIMATED VOLUME GENERATED (LITRES/CUBIC METRES/WEEK)			
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COMMERCIAL BUILDINGS:	CHILDCARE / OFFICE BUILDING	INDUSTRIAL/ WAREHOUSE/ RETAIL BUILDING	GROCERY/ FOOD SERVICE ESTABLISHMENT	LARGE VENUES
Garbage	1.00	2.25	1.65	3.10
Mixed Papers	0.65	1.50	2.05	1.50
Mixed Containers	0.375	0.65	2.00	1.70
Cardboard	0.65	2.30	3.75	2.00
Food Scraps & Yard Trimmings	0.57	0.29	2.00	1.86
Oil/Grease	N/A	N/A	0.35	N/A

*Data used with permission from the City of Vancouver.



Did You Know?

Food sector establishments must properly manage used cooking oils and grease to ensure no grease or oil is poured in any sink or floor drain. Proper management includes installing and maintaining grease interceptors and recycling used oil and grease. To learn more, call the Richmond Grease Inspector at 604-247-4609 or the RCBC Recycling Hotline at 604-732-9253.

2 Determine Recycling and Garbage Collection Service Provider

Some garbage and recycling services are provided by the City as a mandatory fee as per Bylaw 6803. Other services may be available as an option from the City, or contracted through private waste haulers.

The following program requirements outline the services that must be offered at all multi-family buildings (townhomes and apartments), mixed use and commercial buildings, as well as service provider options available based on building type.

PROGRAM REQUIREMENTS

COLLECTION TYPE	RECYCLING	CARDBOARD	GARBAGE ¹	ORGANIC
TOWNHOUSE				
Centralized	Mandatory fee City Blue Cart program	Optional cardboard container service from City or private waste hauler	Optional City Garbage Cart program ¹ or private waste hauler	Mandatory City Green Cart service unless City approves exemption to allow use of private waste hauler
Curbside ²	Mandatory fee City Blue Box program ¹	Not applicable (Cardboard is collected through City Blue Box program)	City Garbage Cart program or private waste hauler	Mandatory City Green Cart service unless City approves exemption to allow use of private waste hauler
APARTMENT				
Centralized	Mandatory fee City Blue Cart program	Optional cardboard container service from City or private waste hauler	Optional City Garbage Cart program ¹ or private waste hauler	Mandatory City Green Cart service unless City approves exemption to allow use of private waste hauler

¹ These services are provided by the City and include the Large Item Pick Up program for up to four large items per unit per year.

² Curbside collection can be provided where access is available.



PROGRAM REQUIREMENTS

COLLECTION TYPE	RECYCLING	CARDBOARD	GARBAGE ¹	ORGANIC
MIXED USE – RESIDENTIAL / COMMERCIAL				
Centralized Residential	Mandatory City Blue Cart	Optional cardboard container service from City or private waste hauler	Optional City Garbage Cart program ¹ or private waste hauler	Mandatory City Green Cart service unless City approves exemption to allow use of private waste hauler
Centralized Commercial	City service available if subscribed to City Garbage Cart and Green Cart programs	Optional cardboard container service from City or private waste hauler	Optional City Garbage Cart program or private waste hauler	Optional City Green Cart program or private waste hauler
OFFICE / COMMERCIAL / INSTITUTIONAL				
Centralized	City service available if subscribed to City Garbage and Green Cart service	Optional cardboard large bin service from City or private waste hauler	Optional City Garbage Cart program or private waste hauler	Optional City Green Cart program or private waste hauler

¹ These services are provided by the City and include the Large Item Pick Up program for up to six large items per unit per year.



Did you know?

Richmond’s Large Item Pick Up Program is available to residents with Blue Box and/or City Garbage Cart service. This program provides collection of up to six large items per unit per year. As well, all Richmond residents have access to free drop-off recycling at the Richmond Recycling Depot (visit richmond.ca/depot).

LARGER BUILDING GARBAGE AND CARDBOARD COLLECTION

Larger buildings are more suited to contracted services (front-end loading containers/compactors) for garbage and cardboard collection. For information about general container measurements, size, weight and footprint, see Attachment 3 on page 40.

3 Calculate the Number and Type of Containers Required

The quantity of containers required depends on the type of collection service the building is designed for. Most multi-family buildings will have centralized collection areas, where occupants bring their garbage and recycling to the designated area. It's important for developers to determine the type of collection that will be used when calculating container requirements.

The following is an overview of the types and quantity of containers required, which also assists with designing centralized collection areas with sufficient space. For a detailed guide to estimate the number of containers required for your building, please see Attachment 2 on pages 36-39.

CENTRALIZED COLLECTION

If the building is designed to have centralized collection, ideally, the designated garbage and recycling space is a separate internal storage room. It is essential to calculate how many containers will be required to determine the space required. Please use the guidelines below to calculate the number of bins required for City-provided services.

CURBSIDE (DOOR-TO-DOOR) COLLECTION

City Recycling Collection



**CONTAINERS
RECYCLING CART**
Mixed containers

**MIXED PAPER
RECYCLING CART**
Mixed paper

**GLASS
RECYCLING CART**
Glass jars and bottles

GREEN CART
Food scraps and
yard trimmings

Number of Containers:	1 cart for every 7 units	1 cart for every 7 units	1 cart per recycling room	1 cart for every 25 units 1 kitchen container for each unit
Collection Frequency:	Weekly	Weekly	Weekly	Weekly or twice weekly
Standard Container:	360 litres	360 litres	120 litres	240 litres

The City of Richmond has developed an Excel spreadsheet tool with prebuilt formulas to make it easy to calculate the number of containers required for residential and commercial buildings.

For a copy of this tool with its prebuilt formulas, please contact Environmental Programs at wmguidelines@richmond.ca.

City Garbage Collection



GARBAGE CART
Non-recyclable and non-compostable materials

1 cart for every 5 units
Weekly or twice weekly
360 litres

Private Waste Hauler Garbage Collection Options



FRONT END CONTAINER
Non-recyclable and non-compostable materials

See Attachment 4 on page 41 for private waste hauler collection container details
Contact private waste hauler
Contact private waste hauler



COMPACTOR
Non-recyclable and non-compostable materials

See Attachment 4 on page 41 for private waste hauler collection container details
Contact private waste hauler
Contact private waste hauler

The City does not provide these services. Please contact private waste hauler.

COMMERCIAL GREASE COLLECTION

Oils and grease should never be disposed of down sinks, drains or garburators as the material hardens and builds up on the inside of sewage lines, causing blockages. This can lead to breaks and sewage spills or overflows.

Commercial operators must have proper containers and systems in place to collect and safely dispose of oils, grease and other liquid fats.

Oil and Grease Container Options:



DRUM

- Description:**
- Specially-designed trucks to collect
 - Sits stationary on the ground.

Typical Size: 45 gallon (170 litres)

Full Weight: 180 kg



CONTAINER

- Specially-designed trucks to collect
- Requires room for collection.
- Containers may have wheels to move around.

- 0.9 m tall, 1.7 m wide, 84 cm deep & taper to 56 cm (2.2 yard³)
- 0.9 m tall, 1.7 m wide, 109 cm deep & taper to 81 cm (2.75 yard³)

545 kg – 910 kg



Some townhomes will have City curbside collection, which is similar to collection for single-family homes and involves bringing recycling and garbage containers to the curb for pick-up on a designated day of the week.

City curbside collection services are available for some townhomes. These townhome buildings must have a sufficient turning radius to access containers at each unit. With these services, the City provides the required containers for both garbage and recycling. For curbside collection of garbage and recycling, each unit will receive the following items for their garbage and recyclable materials in between collection.



GARBAGE CART
Non-recyclable and non-compostable materials



BLUE BOX
Mixed containers



MIXED PAPER RECYCLING BAG
Mixed paper



GLASS RECYCLING BIN
Glass jars and bottles



GREEN CART
Food scraps and yard trimmings

Quantity for Each Unit:	1	1	1	1	1 Green Cart 1 kitchen container
Collection Frequency:	Biweekly or weekly	Weekly	Weekly	Weekly	Weekly
Standard Container:	120 litres	68 litres	N/A	22 litres	46.5 litres

Allow 0.684 m² for bin storage within the unit for complexes with door-to-door collection.



4 Calculate the Storage Space Required

CENTRALIZED COLLECTION

Use the formula* below to estimate the total storage space required to house the required number of containers.

NUMBER OF CONTAINERS

Refer to calculation from Step 3.

X

FOOTPRINT OF EACH CONTAINER

For examples of various bin and cart types and their related height and manoeuvre factors, please refer to Attachment 3.

X

MANOEUVRE FACTOR

The manoeuvre factor allocates space required to move the containers inside the storage facility.

A value of 2.00 to 2.25 is recommended.

CURBSIDE (DOOR-TO-DOOR) COLLECTION

Occupants are required to store garbage and recycling containers in their unit (e.g., garage, backyard, etc.). The storage location for these receptacles varies depending on strata bylaws.

Allow for 0.7 m to 0.9 m space between the curb and the garage door.

*Storage space formula courtesy of the City of Vancouver.

5 Design the Storage/Collection Area

A storage facility is designed to allow containers to be easily accessed and moved.

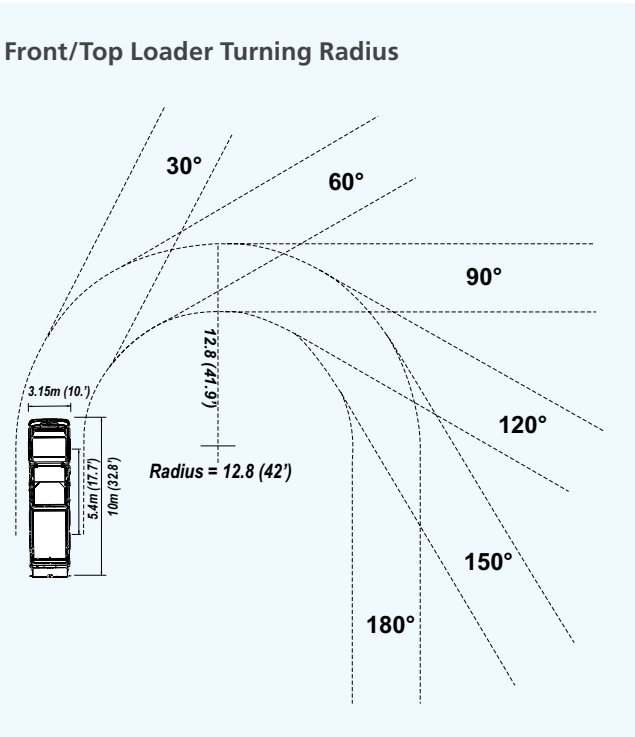
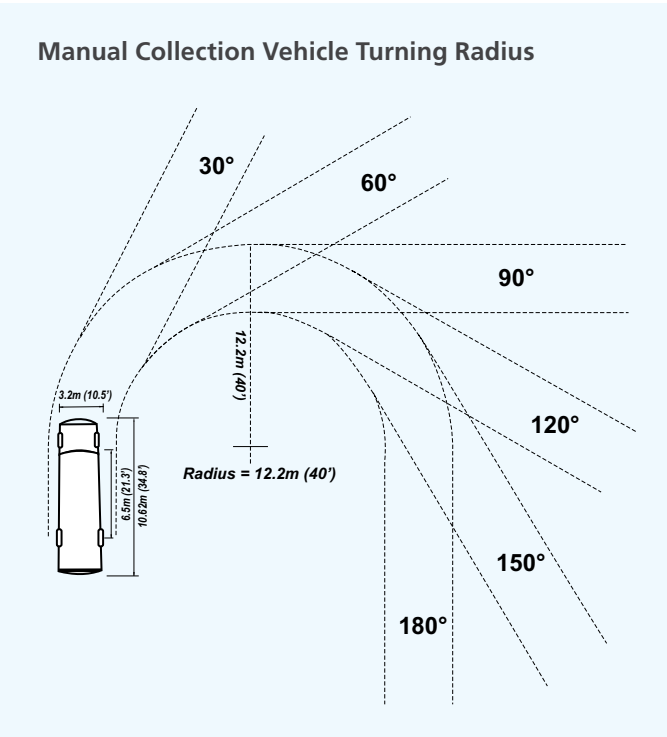
Ideally, there is a separate room designated; however, if a separate room is not feasible, a shed or enclosure is a viable option. In all cases, the area must be large enough to store all recycling and garbage between designated collection days and permit movement of the containers. Designated areas must also meet fire safety requirements. The storage facility should include the following considerations as a minimum standard.

ELEMENT	DESIGN GUIDELINES
Size	- Should be able to accommodate an appropriate number of containers that will not overflow between collection days. - Total area of the facility should be about 2.0 to 2.25 times the physical footprint of the containers to allow for adequate space for manoeuvring
Configuration	- Configure to allow each garbage and recycling container to be individually accessed, removed and replaced without having to take out other containers - No horizontal dimension (width or depth) is less than 2 metres to allow for access to waste containers
Door	Must contain a double door to ensure there is enough space to move the containers
Access for Occupants	Accessible to all occupants of the development, including those with restricted mobility If an auxiliary area is designated for the facility outside the building, the area should be located adjacent for an entry point into the building for easy access by users.
Location	Ideally, recycling facilities are located in close proximity to garbage facilities so that occupants find it as convenient to recycle as it is to dispose of garbage. Within the storage area, recycling and garbage containers should be grouped separately to reduce confusion. The location must be: - Within the legal parcel - Located at ground level, or no more than one storey below grade Location of storage facility should not be: - On publicly owned rights-of-way where it may disrupt traffic circulation patterns - Between a street-facing facade of the structure and the street if the area is located outdoors to promote pedestrian safety - In any required driveways, parking aisles, or parking spaces for the structure (this impedes the use for pedestrians and occupants) - In any location that may block or impede fire exits, public rights-of-way, or pedestrian and vehicular access If a temporary storage facility is required to place recycling and garbage containers for collection, see Attachment 5 on page 44.
Floor	Must have a hard surface (concrete is required if installing a compactor) that is able to withstand a 28-tonne collection truck
Drainage	- Must drain to sanitary sewer - Oil separator required at food services and restaurants
Ventilation	Have adequate ventilation for reduced smell and odour, and be in compliance with the BC Building Code requirements for ventilation
Security	- Be protected from unlawful entry - Be equipped with locked doors or the containers should also be locked if they are accessible from outside the building to avoid illegal dumping
Lighting	Be well lit, both as a security measure and for ease of access. Adequate lighting also discourages improper use of the containers and surrounding area
Rodent Concerns	Be rodent resistant, and ensure that waste is stored in a way to not provide shelter, refuge or food for rodents
Signage	Must have clear signage in garbage and recycling facilities and on containers to ensure that materials go in the appropriate container to help prevent contamination

6 Determine Access Route for Collection Vehicles and Turning Radius

The following design elements address the need to allow a collection vehicle to enter the site, collect the recycling and garbage and exit without having to reverse onto a public road, as this poses risks of pedestrian and vehicle accidents.

ELEMENT	DESIGN GUIDELINES
Entry and Exit	- Allow collection vehicles to enter the site, collect garbage and recycling, leave the site in a forward motion or via the use of a turnabout area allowing for a three-point turn of no less than one truck length - If backing up is the only option, must not compromise building structure, traffic operations and safety
Driveway Access	Minimum width of 6 metres at the points of entrance and exit for the site
Slope	Ensure slope of access does not exceed 6%. Slope grade of 2% for servicing area
Vehicle Access Route Height	Minimum width of 4.5 metres throughout vehicle access route of travel
Vehicle Clearance	Maintain a minimum vehicle height clearance of 4.5 metres throughout the entire access route
Turning Radius	- Provide the collection vehicle a minimum turning radius of 12.5 metres throughout the entire access route. - Building structure, such as an overhang, cannot extend past the turning radius to prevent damage to the building
Signs	Install signs that indicate the vertical clearance



Images courtesy of City of Edmonton

7 Designing Collection/Loading Area

With automated collection and the mix of containers used for garbage and recycling services, loading and collection areas must be able to accommodate a mix of truck sizes and designs. Trucks must have plenty of height clearance and room for their turn radius.

The chart below outlines the minimum dimensions for collection/loading areas. For general details on collection trucks, see pages 24-29. For specific information on collection trucks, contact private service providers.

The following are general guidelines for designing the collection/loading area:

ELEMENT	DESIGN GUIDELINES
Clearance – Front End Bin and Carts Collection (Side loading for recycling carts and front loading for garbage and cardboard front-end bins)	
Clearance	Front End Bin: - Maintain a minimum vehicle servicing clearance: Height: 7.5 m Width: 6 m Length: 15 m All dimensions are unencumbered (e.g., unrestricted by fixtures such as sprinkler systems, meters, surveillance cameras, mirrors, landscaping, etc.) Cart Collection only: - Height: 6.2 m Width: 5.5 m Length: 13 m (Side loading for recycling carts and back loading for garbage and food scraps carts)
Floor	Accommodate a 28-tonne collection vehicle
Size	Dimension of pad should accommodate the number of containers used in the building
Location	- Away from fresh air intakes for the building to discourage odour going into the building - Avoid location that interferes with pedestrian traffic and other vehicular access - Connected to the garbage and recycling storage space or temporary storage area via a level grade or continuous slope of no more than 6%

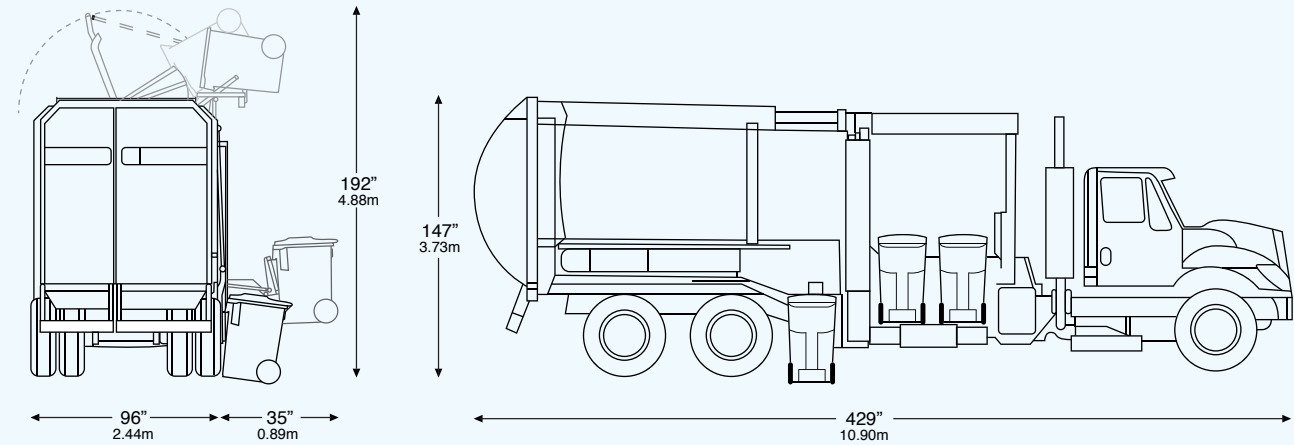


CITY SERVICES

The following figures show the vehicle measurements for City garbage and recycling collection trucks.
Please note: Dimensions are measured to the vehicles’ specifications. Working area buffers and additional overhead clearances are not included in the dimensions shown.

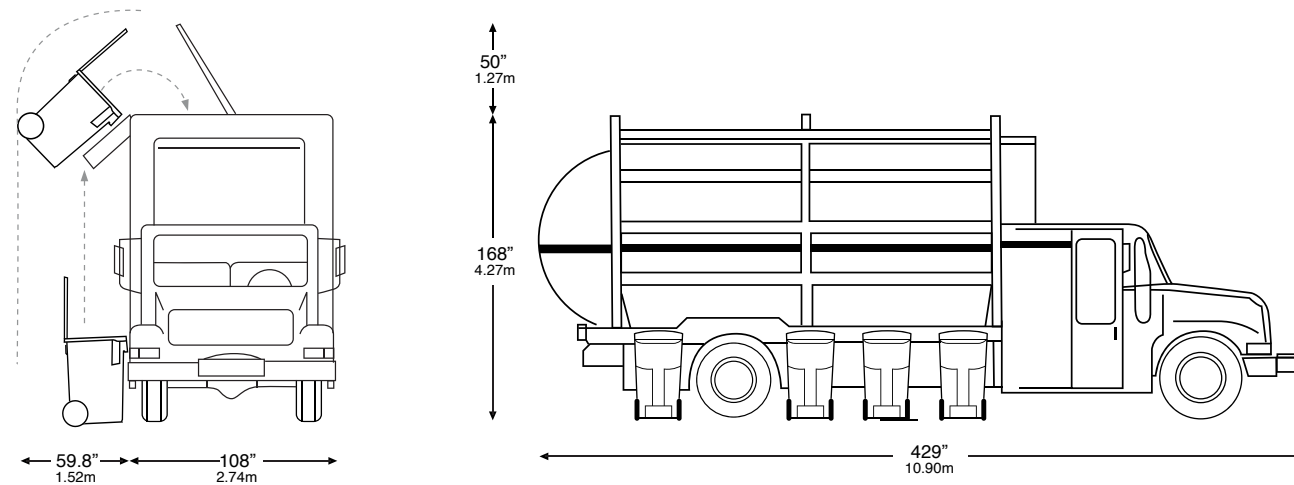
1. Centralized Collection: Blue Cart Recycling
SU9/medium size trucks – side loading

	Truck Specifications	Truck with Bin Specifications
Length	429" / 10.90 m	429" / 10.90 m
Width	96" / 2.44 m	131" / 3.33 m
Height	147" / 3.73 m	192" / 4.88 m



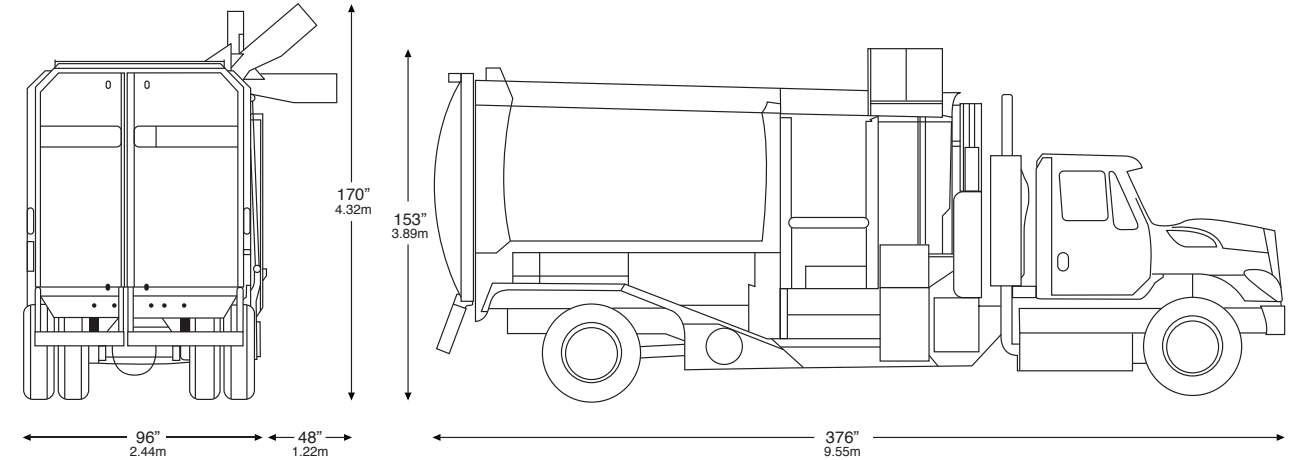
2. Centralized Collection: Blue Cart Recycling
SU9/medium size trucks – side and top loading

	Truck Specifications	Truck with Bin Specifications
Length	429" / 10.90 m	429" / 10.90 m
Width	108" / 2.74 m	168" / 4.27 m
Height	168" / 4.27 m	218" / 5.54 m



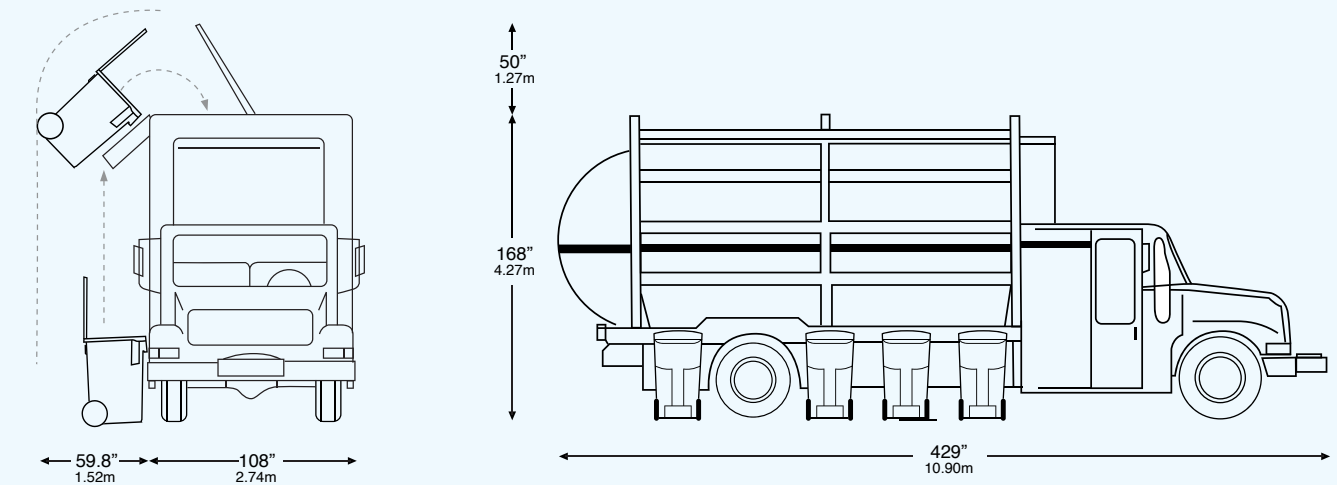
3. Curbside Collection: Blue Box Recycling
SU9/medium size trucks – side loading

	Truck Specifications	Truck with Bin Specifications
Length	376" / 9.55 m	376" / 9.55 m
Width	96" / 2.44 m	144" / 3.66 m
Height	153" / 3.89 m	170" / 4.32 m



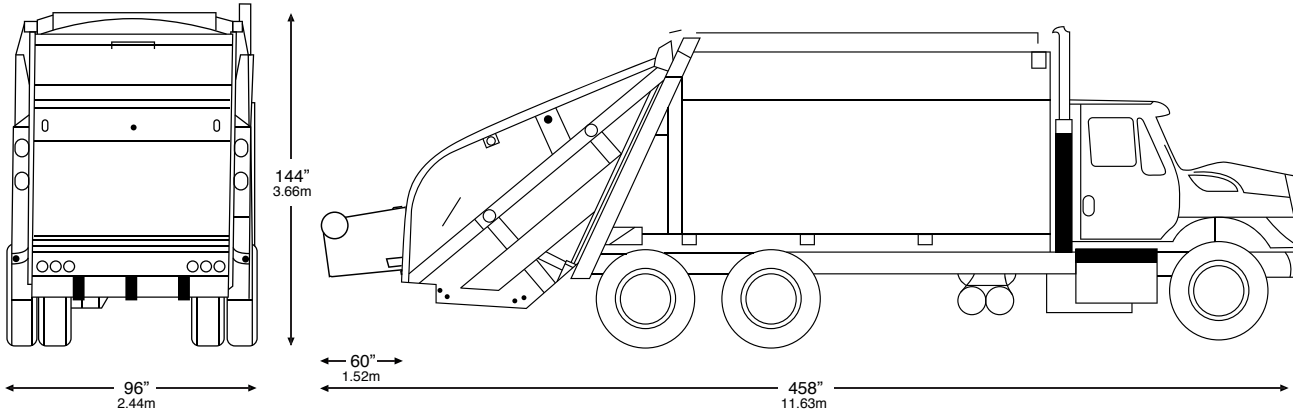
4. Centralized and Curbside Collection: Blue Cart and Blue Box Recycling
SU9/medium size trucks – side and top loading

	Truck Specifications	Truck with Bin Specifications
Length	429" / 10.90 m	429" / 10.90 m
Width	108" / 2.74 m	168" / 4.27 m
Height	168" / 4.27 m	218" / 5.54 m



5. Curbside Collection: Garbage and Food Scraps Recycling
SU9/medium size trucks – rear loading

	Truck Specifications	Truck with Bin Specifications
Length	398" / 10.11 m	458" / 11.63 m
Width	96" / 2.44 m	96" / 2.44 m
Height	144" / 3.66 m	144" / 3.66 m

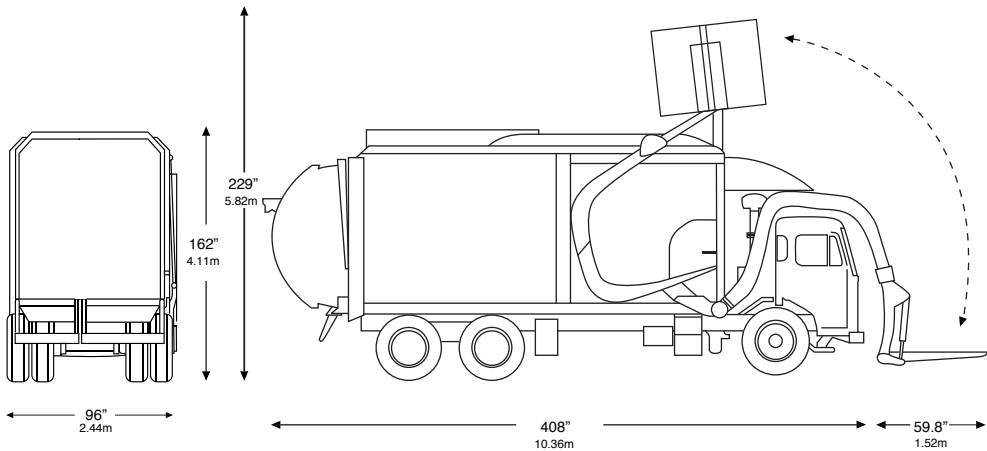


PRIVATE CONTRACTORS

The following figures show examples of vehicle dimensions for some private garbage and recycling collection trucks. Please note: Dimensions are measured to the vehicles' specifications. Working area buffers and additional overhead clearances are not included in the dimensions shown.

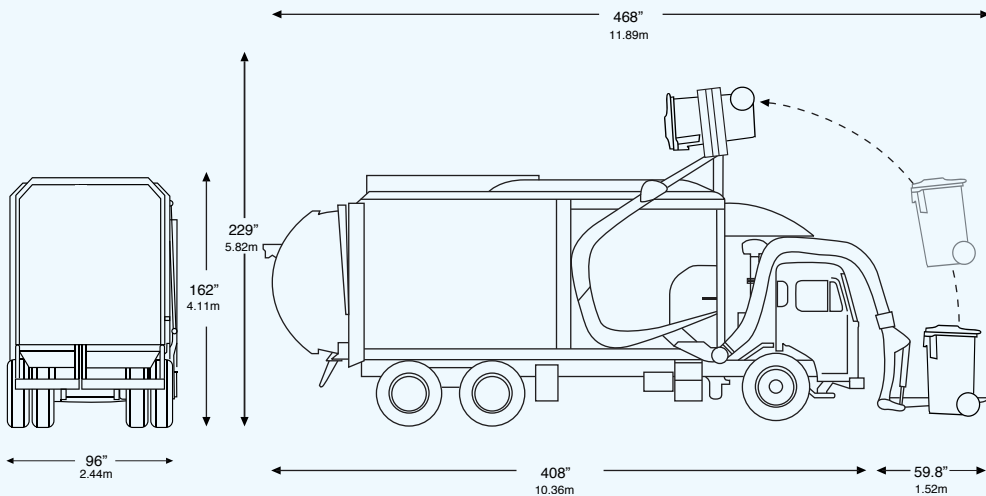
1. Front/Top Load Bin Collection: Garbage and Cardboard
SU9/medium size trucks – front/top loading

	Truck Specifications	Truck with Bin Specifications
Length	408" / 10.36 m	468" / 11.89 m
Width	96" / 2.44 m	96" / 2.44 m
Height	162" / 4.11 m	229" / 5.82 m

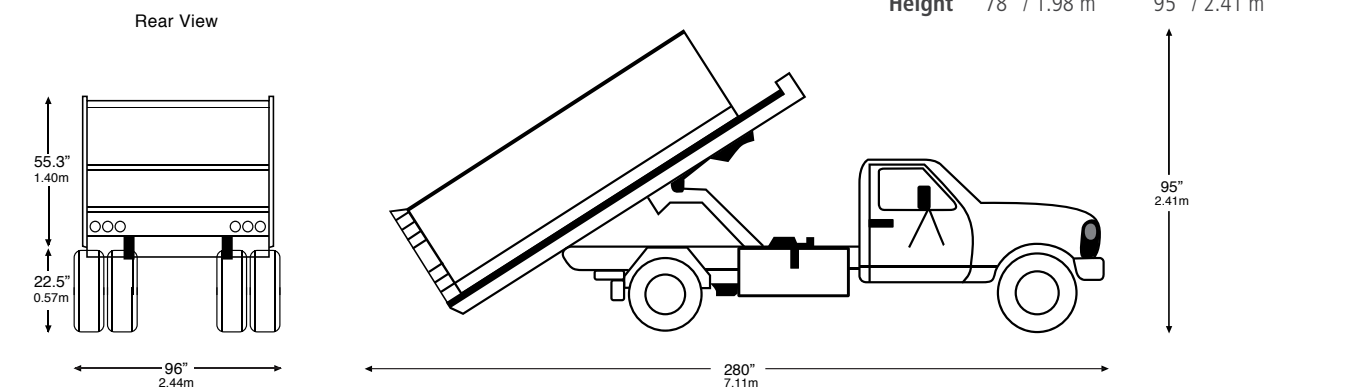


2. Front Load Cart Collection: Garbage and Food Scraps
SU9/medium size trucks – front loading

	Truck Specifications	Truck with Bin Specifications
Length	408" / 10.36 m	468" / 11.89 m
Width	96" / 2.44 m	96" / 2.44 m
Height	162" / 4.11 m	229" / 5.82 m

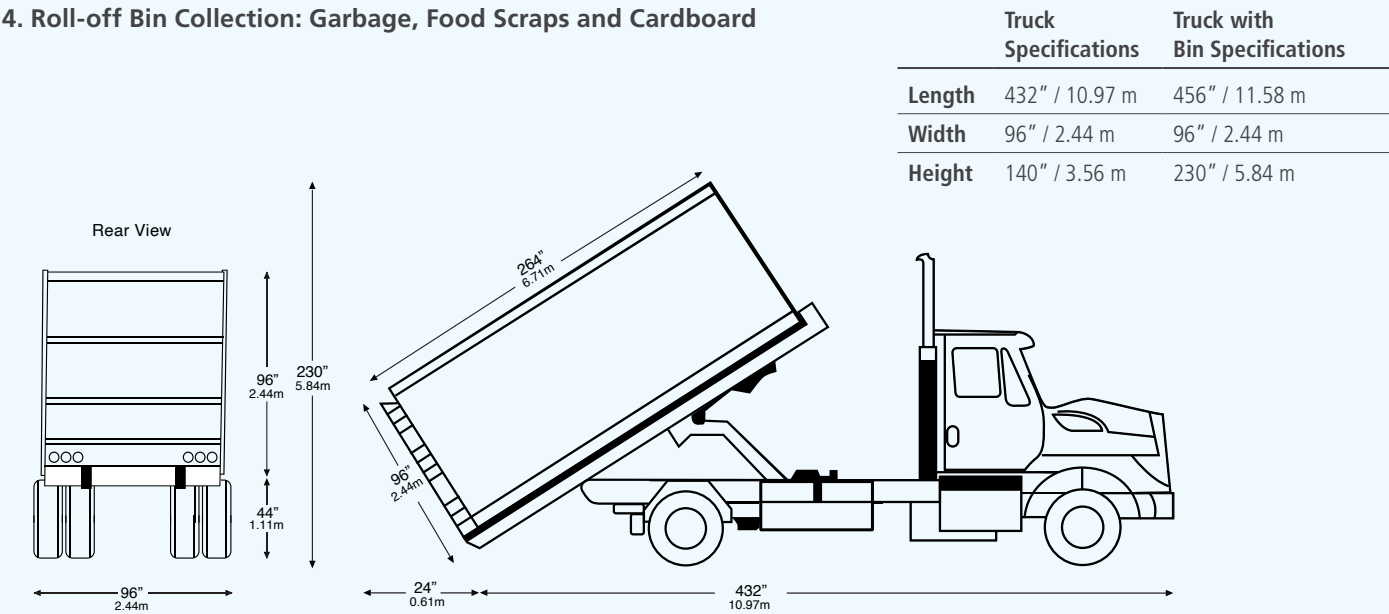


3. Low-profile Roll-off Bin with Compactor Collection:
Garbage and Cardboard

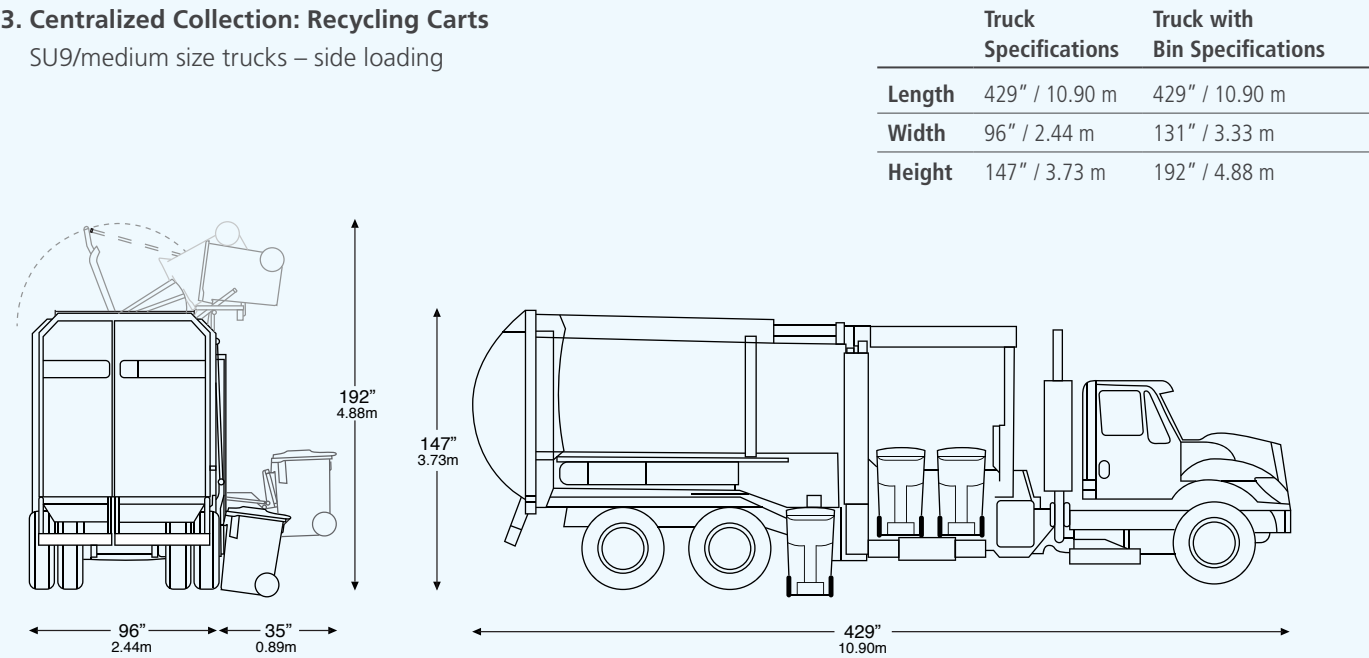


Collection of garbage and/or cardboard using low-profile compactor trucks is provided as part of private collection only and involves a multi-step process. A compactor room is required on site and the smaller “pick-up” like truck is required to load bins from the compactor on site and then haul off site for disposal. The containers then have to be returned to the development. This limits the number of sites that can be serviced in one day by the hauler compared to traditional larger garbage trucks that service multiple locations on one route. As well, the low-profile trucks add trips to the road system to complete the collections service as disposal occurs off site, which typically involves higher collection costs.

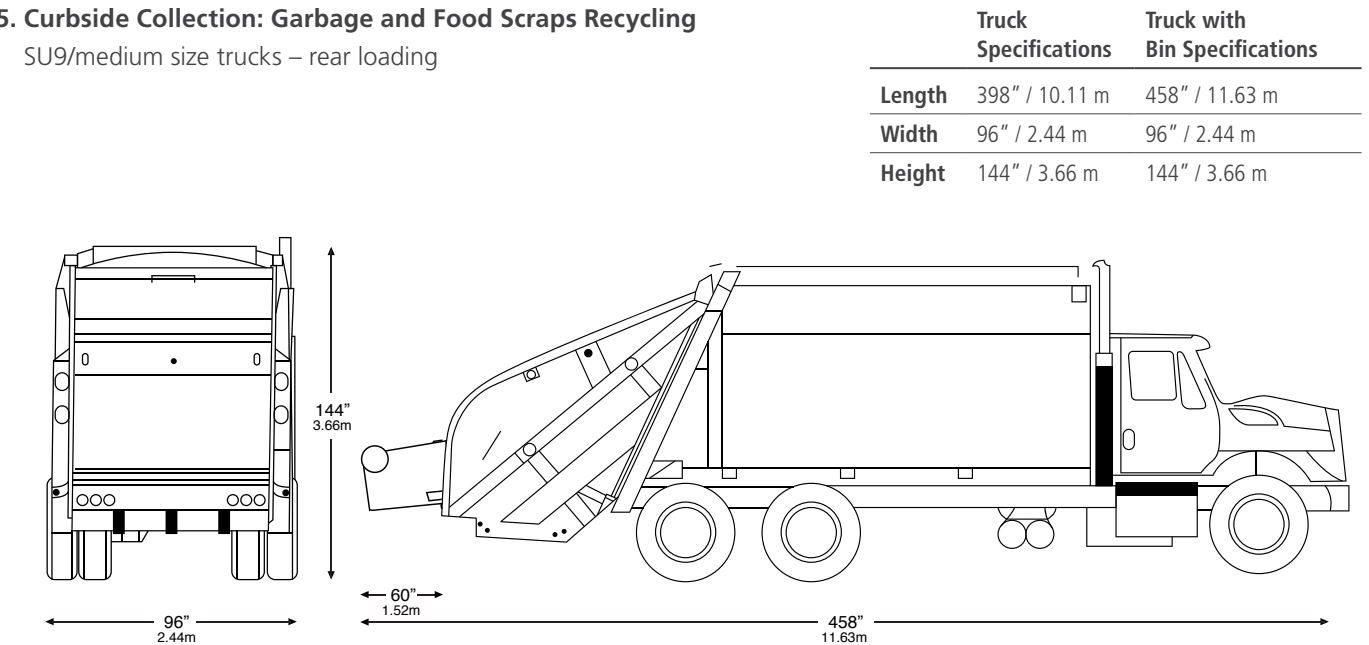
4. Roll-off Bin Collection: Garbage, Food Scraps and Cardboard



3. Centralized Collection: Recycling Carts
SU9/medium size trucks – side loading



5. Curbside Collection: Garbage and Food Scraps Recycling
SU9/medium size trucks – rear loading





8 Develop and Submit a Waste Management Overlay Plan

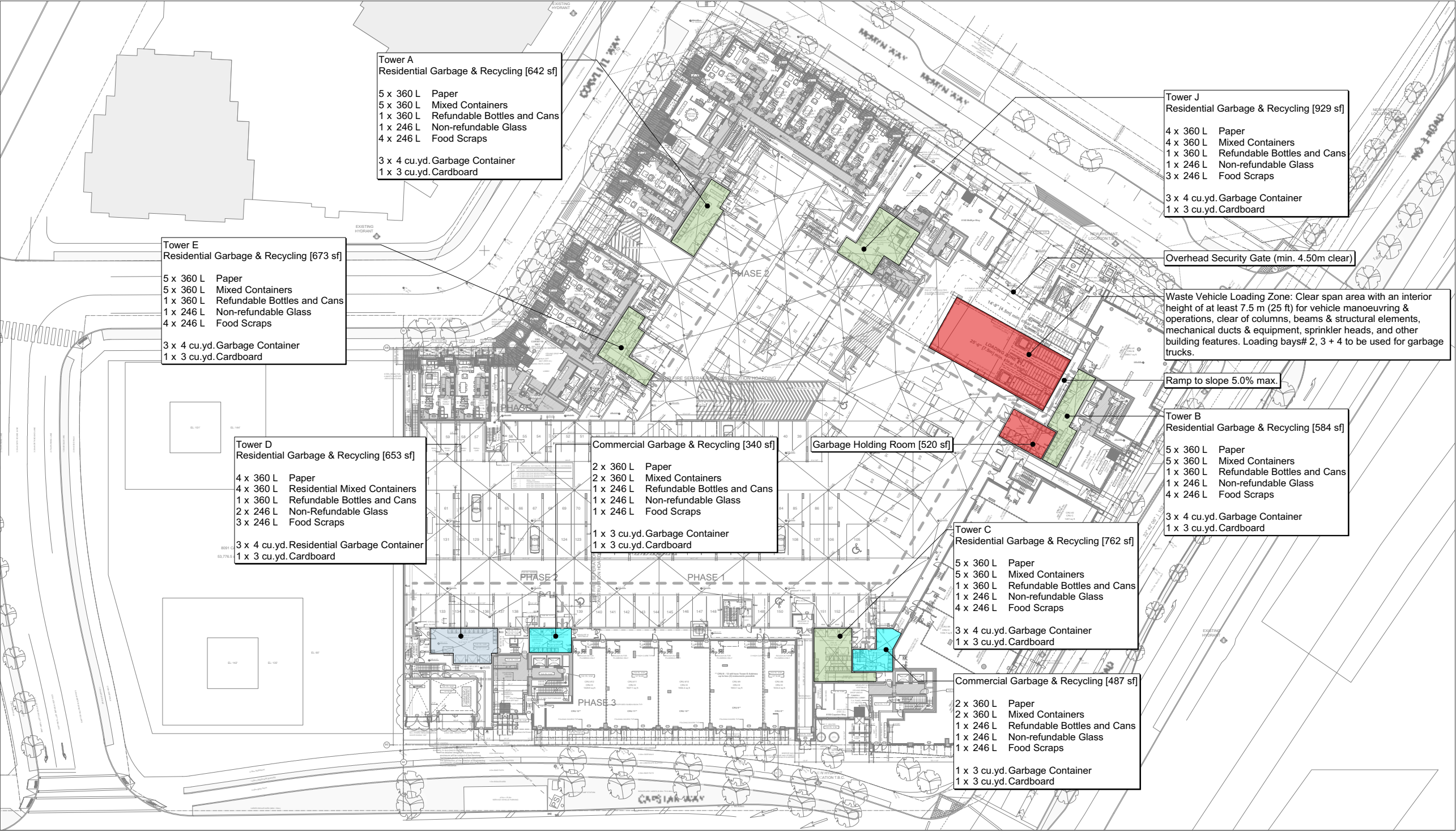
A Waste Management Overlay Plan summarizes all of the requirements outlined in Steps 1 – 7 and highlights the key garbage and recycling components for the design of the building.

This includes showing where the garbage/recycling room(s) and collection/loading area(s) will be located, including truck ingress and egress. The overlay plan must be submitted with a developer's rezoning and/or development application. An example is provided in Attachment 1. This plan should show the functional design of garbage and recycling services (mixed paper, mixed containers, glass jars and bottles, and food scraps) including the following:

- Location of doorway access to the storage areas (permanent and temporary);
- Vertical cross-section of the service area drawing;
- Size, capacity and function of the various types of garbage and recycling storage rooms (permanent and temporary);
- Location and dimensions (including height) of the waste and recycling pick-up areas; and
- Location, dimensions, door sizes, manoeuvring and turning radii of the access routes to the waste and recycling pick-up areas.

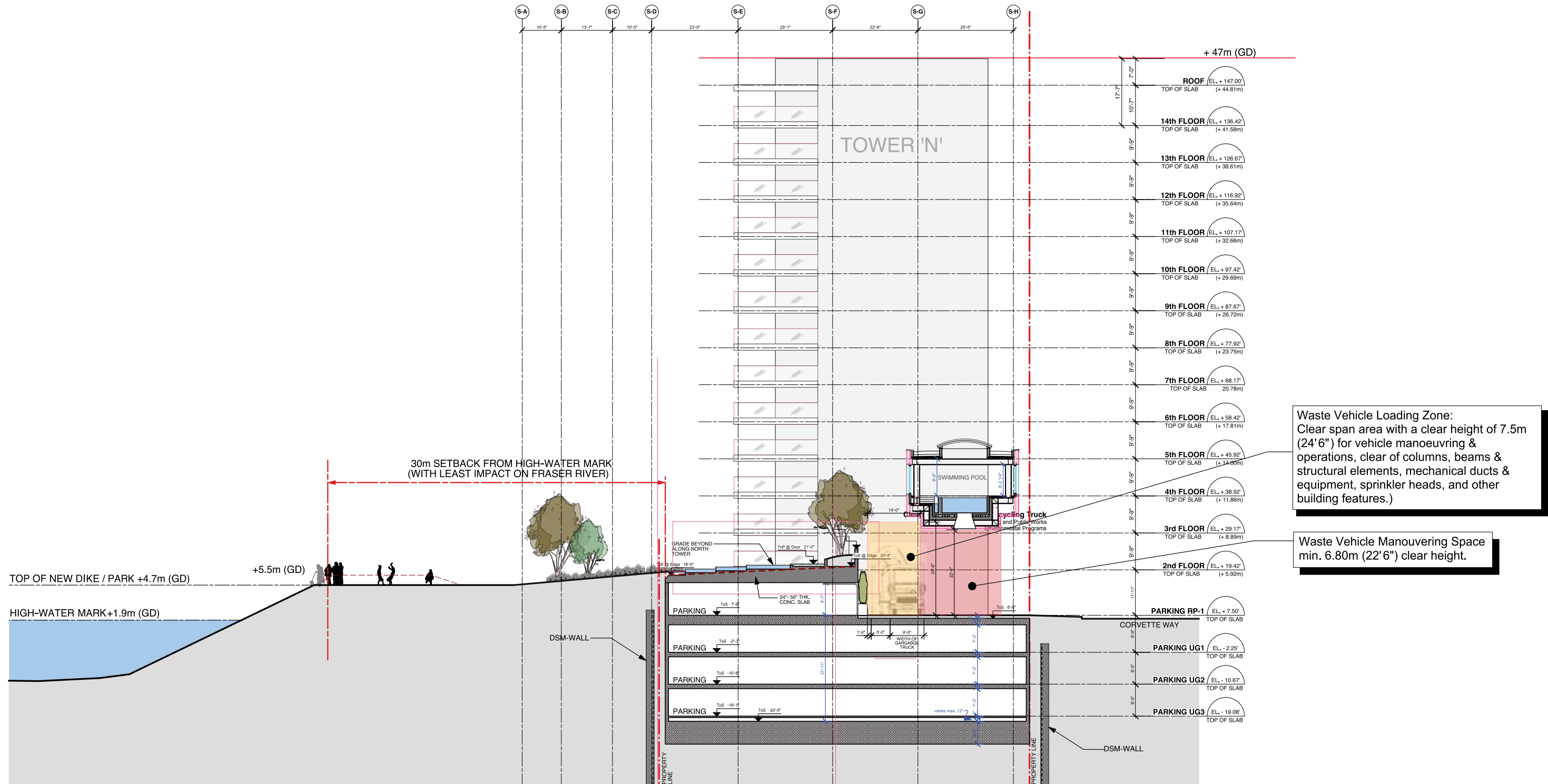
The overlay plan should demonstrate that the developer has addressed all regulations and design requirements, provide a clear overview of how the design provides for effective garbage and recycling services and addresses the City's goals and objectives for waste management in multi-family and commercial buildings.

Example of Waste Management Overlay Plan



Courtesy of Yuanheng Project Management Ltd. & W.T. Leung Architects Inc.

Example of Waste Management Overlay Plan



Courtesy of Yuanheng Project Management Ltd. & W.T. Leung Architects Inc.

Guide to Estimating the Recycling and Garbage Bins
Your Complex Needs for Weekly Collection

RESIDENTIAL BUILDING

NUMBER OF UNITS (2 residents per unit)	MIXED CONTAINERS	MIXED PAPER (Without a Cardboard Bin)	MIXED PAPER (With a Cardboard Bin)	GLASS JARS & BOTTLES	FOOD SCRAPS & YARD TRIMMINGS	CARDBOARD	GARBAGE
	360 LITRE CART (#)			120 LITRE CART (#)	240 LITRE CART (#)	FRONT END BINS (# x SIZE)	
5-10	1	1	N/A	1	1	0	2 x 360 L Carts
11-20	1	2	N/A	1	1	0	4 x 360 L Carts
21-30	1	3	1*	1	1	1 x 3 yd ³ *	6 x 360 L Carts
31-40	2	4	1*	1	2	1 x 3 yd ³ *	2 x 4 yd ³
41-50	2	5	2*	1	2	1 x 3 yd ³ *	2 x 4 yd ³
51-60	3	6*	2	1	3	1 x 3 yd ³	2 x 4 yd ³
61-70	3	7*	2	1	3	1 x 3 yd ³	3 x 4 yd ³
71-80	4	8*	3	1	3	1 x 3 yd ³	3 x 4 yd ³
81-90	4	9*	3	1	4	1 x 3 yd ³	3 x 4 yd ³
91-100	4	10*	3	1	4	1 x 3 yd ³	4 x 4 yd ³
101-110	5	11*	3	1	4	1 x 3 yd ³	4 x 4 yd ³
111-120	5	12*	4	1	5	1 x 3 yd ³	4 x 4 yd ³
121-130	6	13*	4	1	5	1 x 3 yd ³	5 x 4 yd ³
131-140	6	14*	4	1	6	1 x 4 yd ³	5 x 4 yd ³
141-150	6	15*	5	1	6	1 x 4 yd ³	5 x 4 yd ³
151-160	7	16*	5	1	6	1 x 4 yd ³	6 x 4 yd ³
161-170	7	16*	5	1	7	1 x 4 yd ³	6 x 4 yd ³
171-180	8	17*	5	2	7	2 x 3 yd ³	6 x 4 yd ³
181-190	8	18*	6	2	8	2 x 3 yd ³	7 x 4 yd ³
191-200	8	19*	6	2	8	2 x 3 yd ³	7 x 4 yd ³
201-210	9	20*	6	2	8	2 x 3 yd ³	7 x 4 yd ³
211-220	9	21*	7	2	9	2 x 3 yd ³	8 x 4 yd ³
221-230	10	22*	7	2	9	2 x 3 yd ³	8 x 4 yd ³
231-240	10	23*	7	2	9	2 x 3 yd ³	8 x 4 yd ³
241-250	11	24*	7	2	10	2 x 3 yd ³	9 x 4 yd ³
251-260	11	25*	8	2	10	2 x 3 yd ³	9 x 4 yd ³
261-270	11	26*	8	2	11	2 x 3 yd ³	9 x 4 yd ³
271-280	12	27*	8	2	11	**	**
281-290	12	28*	9	2	11	**	**

NUMBER OF RESIDENTIAL UNITS (2 residents per unit)	MIXED CONTAINERS	MIXED PAPER (Without a Cardboard Bin)	MIXED PAPER (With a Cardboard Bin)	GLASS JARS & BOTTLES	FOOD SCRAPS & YARD TRIMMINGS	CARDBOARD	GARBAGE
	360 LITRE CART (#)			120 LITRE CART (#)	240 LITRE CART (#)	FRONT END BINS (# x SIZE)	
291-300	13	29*	9	2	12	**	**
301-310	13	30*	9	2	12	**	**
311-320	13	31*	9	2	12	**	**
321-330	14	32*	10	2	13	**	**
331-340	14	33*	10	2	13	**	**
341-350	15	34*	10	3	14	**	**
351-360	15	35*	11	3	14	**	**
361-370	15	36*	11	3	14	**	**
371-380	16	36*	11	3	15	**	**
381-390	16	37*	12	3	15	**	**
391-400	17	38*	12	3	16	**	**
401-410	17	39*	12	3	16	**	**
411-420	18	40*	12	3	16	**	**
421-430	18	41*	13	3	17	**	**
431-440	18	42*	13	3	17	**	**
441-450	19	43*	13	3	17	**	**
451-460	19	44*	14	4	18	**	**
461-470	20	45*	14	4	18	**	**
471-480	20	46*	14	4	19	**	**
481-490	20	47*	14	4	19	**	**
491-500	21	48*	15	4	19	**	**

* Denotes where it is more space efficient to use an alternative way of storing paper and cardboard, but you or your recycling hauler may choose either approach to suit your operational needs.

** For efficient use of space, a garbage compactor and a cardboard compactor are suggested for large complexes greater than 270 units.

Assumptions:

- 1. Collection is once per week.
- 2. There is an average of two persons occupying each unit.
- 3. There are no on-site compactors (e.g., garbage, cardboard, recycling).
- 4. Some residents flatten their containers and cardboard boxes before putting them in the bin.
- 5. Sufficient height clearance is available for garbage collectors to tip the bins.

Notes

- Consult with a recycling and waste hauler to assist with estimating the number and size of containers required.

Courtesy of Metro Vancouver.

HOSPITALITY LODGING

NUMBER OF GUEST ROOMS	MIXED CONTAINERS	MIXED PAPER (including newspaper)	FOOD SCRAPS	CARDBOARD	GARBAGE	GREASE/ TALLOW
	360 LITRE CART (#)		240 LITRE CART (#)	FRONT END BIN (# x SIZE)		
1-10	1	1	1	1 x 3 yd ³	1 x 3 yd ³	1
11-20	1	1	2	1 x 3 yd ³	1 x 3 yd ³	1
21-30	1	1	3	1 x 3 yd ³	1 x 3 yd ³	1
31-40	1	1	4	1 x 3 yd ³	1 x 3 yd ³	1
41-50	1	1	4	1 x 3 yd ³	1 x 3 yd ³	1
51-60	1	2	5	1 x 3 yd ³	1 x 3 yd ³	1
61-70	1	2	6	1 x 3 yd ³	1 x 4 yd ³	1
71-80	1	2	7	1 x 3 yd ³	1 x 4 yd ³	1
81-90	1	2	8	1 x 3 yd ³	2 x 3 yd ³	2
91-100	1	3	9	1 x 3 yd ³	2 x 3 yd ³	2
101-10,000	*	*	*	*	*	*

* Efficient use of space – roll-off bin with or without compactor.

OFFICE, CHILDCARE & SCHOOL

FLOOR AREA (M²)	MIXED CONTAINERS	MIXED PAPER (including newspaper)	FOOD SCRAPS	CARDBOARD	GARBAGE
	360 LITRE CART (#)		240 LITRE CART (#)	FRONT END BIN (# x SIZE)	
1-500	1	1	1	1 x 3 yd ³	1 x 3 yd ³
501-600	1	1	2	1 x 3 yd ³	1 x 3 yd ³
601-900	1	2	2	1 x 3 yd ³	1 x 3 yd ³
901-1,000	1	2	3	1 x 3 yd ³	1 x 3 yd ³
1,001-2,000	2	4	5	1 x 3 yd ³	1 x 3 yd ³
2,001-3,000	3	6	7	1 x 3 yd ³	1 x 4 yd ³
3,001-4,000	4	7	10	1 x 3 yd ³	2 x 3 yd ³
4,001-5,000	5*	9	12	1 x 4 yd ³	2 x 3 yd ³
5,001-10,000	*	*	*	*	*

*Efficient use of space – roll-off bin with or without compactor.

RETAIL, LIGHT INDUSTRIAL & WAREHOUSE

FLOOR AREA (M²)	MIXED CONTAINERS	MIXED PAPER (including newspaper)	FOOD SCRAPS	CARDBOARD	GARBAGE
	360 LITRE CART (#)		240 LITRE CART (#)	FRONT END BIN (# x SIZE)	
1-200	1	1	1	1 x 3 yd ³	1 x 3 yd ³
201-500	1	2	1	1 x 3 yd ³	1 x 3 yd ³
501-600	1	3	1	1 x 3 yd ³	1 x 3 yd ³
601-700	1	3	1	1 x 3 yd ³	1 x 3 yd ³
701-1,000	1	4	1	1 x 3 yd ³	1 x 3 yd ³
1,001-2,000	4	9	1	1 x 3 yd ³	1 x 3 yd ³
2,001-3,000	6	13	1	1 x 3 yd ³	1 x 4 yd ³
3,001-4,000	7	17	1	1 x 3 yd ³	2 x 3 yd ³
4,001-5,000	9	21	1	1 x 4 yd ³	2 x 3 yd ³
5,001-10,000	*	*	1	*	*

*Efficient use of space – roll-off bin with or without compactor.

RESTAURANT & GROCERY STORE

FLOOR AREA (M²)	MIXED CONTAINERS	MIXED PAPER (including newspaper)	FOOD SCRAPS	CARDBOARD	GARBAGE	GREASE/ TALLOW
	360 LITRE CART (#)		240 LITRE CART (#)	FRONT END BIN (# x SIZE)		
1-100	1	1	1	1 x 3 yd ³	1 x 3 yd ³	1
101-200	1	1	2	1 x 3 yd ³	1 x 3 yd ³	1
201-300	2	2	3	1 x 3 yd ³	1 x 3 yd ³	1
301-400	2	3	4	1 x 3 yd ³	1 x 3 yd ³	1
401-500	3	3	4	1 x 3 yd ³	1 x 3 yd ³	1
501-600	4	4	4	1 x 3 yd ³	1 x 3 yd ³	1
601-700	5	5	6	1 x 3 yd ³	1 x 3 yd ³	2
701-800	5	5	7	1 x 4 yd ³	1 x 3 yd ³	2
801-900	5	5	8	1 x 4 yd ³	1 x 3 yd ³	2
901-1,000	6	6	9	1 x 4 yd ³	1 x 3 yd ³	2
1,001-2,000	11	12	17	3 x 4 yd ³	1 x 4 yd ³	4
2,001-3,000	17	17	17	4 x 4 yd ³	2 x 4 yd ³	6
3,001-4,000	22	23	34	5 x 4 yd ³	2 x 4 yd ³	8
4,001-5,000	28	29	42	6 x 4 yd ³	3 x 4 yd ³	11
5,001-10,000	*	*	*	*	*	*

*Efficient use of space – roll-off bin with or without compactor.

Container Measurements and Storage Space Required

	HEIGHT	LENGTH	WIDTH	FOOTPRINT (Length x Width)	MANOEUVRE FACTOR	STORAGE AREA REQUIRED FOR 1 CONTAINER (Footprint x Manoeuvre Factor)
3 yd ³ Front-end top loading	1.22 m (4')	1.07 m (3.5')	1.83 m (6.0')	1.96 m ²	2.25	4.41 m ²
4 yd ³ Front-end top loading	1.22 m (4')	1.37 m (4.5')	1.83 m (6.0')	2.51 m ²	2.25	5.64 m ²
6 yd ³ Front-end top loading	1.52 m (5')	1.68 m (5.5')	1.83 m (6.0')	3.07 m ²	2.25	6.91 m ²
46.5 L Cart*	0.69 m (2.25')	0.30 m (1')	0.28 m (0.92')	0.084 m ²	N/A	N/A
80 L Cart*	0.88 m (2.88')	0.51 m (1.67')	0.41 m (1.35')	0.21 m ²	2.25	0.47 m ²
120 L Cart*	0.97 m (3.18')	0.57 m (1.87')	0.58 m (1.90')	0.33 m ²	2.25	0.74 m ²
240 L Cart*	1.10 m (3.60')	0.70 m (2.30')	0.66 m (2.16')	0.46 m ²	2.25	1.04 m ²
360 L Cart*	1.17 m (3.84')	0.87 m (2.85')	0.70 m (2.30')	0.61 m ²	2.25	1.37 m ²
Blue Box*	0.37 m (1.22')	0.38 m (1.25')	0.46 m (1.51')	0.17 m ²	N/A	N/A
Glass Recycling Bin*	0.36 m (1.17')	0.36 m (1.18')	0.27 m (0.89')	0.10 m ²	N/A	N/A
Mixed Paper Recycling Bag*	0.66 m (2.17')	N/A	0.46 m (1.51')	N/A	N/A	N/A

FRONT-END TOP LOADING CONTAINERS – ADDITIONAL DIMENSIONS

The dimensions noted above reflect the internal measurement of the container. Please allow for an additional 20.32 cm (8”) in width for the side brackets on the container.

COMPACTORS

Garbage compactors range in size from 4 yd³ to 25 yd³ and connect to various sizes of front-end bins. Models have different space and location requirements. Consult a private service provider for details.

* Based on City of Richmond standard containers.

Useful Conversion Factors

Volume:

- 1 gallon = 0.134 cubic feet
- 1 cubic meter = 35.3 cubic feet
- 1 cubic yard = 764.6 litres
- 3 cubic yard = 6 x 360 L cart

Weight:

- 1 tonne = 1,000 kg
- 1 pound = 0.454 kg

Distance:

- 1 metre = 3.28 feet

Area:

- 1 square metre = 10.76 square feet

General Specifications for Different Waste Containers

The following is a general overview of the various waste containers commonly used for solid waste storage.

The City does not guarantee the accuracy of the dimensions listed below due to the variation between different manufacturers. It is the sole responsibility of the designer to ensure the design of the storage facility can accommodate the waste containers to be used. Please consult with a private contractor to discuss which containers are suitable for different applications.

1. COMPACTOR

TYPE	IDEAL USER	MINIMUM CEILING HEIGHT CLEARANCE	MINIMUM CLEARANCE IN FRONT OF BIN	MINIMUM CLEARANCE OVERHEAD OF BIN
Low-profile compactor	Multi-family buildings	2.1 m	12.2 m long	
Ground-level compactor	Multi-family, commercial and institutional buildings	2.5 m	15.2 m long	7 m high
Commercial compactor	Commercial and institutional buildings	6.1 m	15.2 m long	

Potential Benefits

- Less servicing frequency required compared to other container use
- Can store more volume when compacted
- Less messy; less overflow
- Ideal for large volume generation (more than 100 units)
- Long life span (15-20 years) if properly maintained

Potential Challenges

- Cardboard jams easily if not placed in compactor correctly
- Odour concern if not serviced frequently
- Not suitable for food scraps collection
- Requires electricity, drainage; extra cost required
- Noise/vibration concerns – may need isolator to lessen
- Capital cost may be higher than other types of bins
- Underground storage may have limited space for truck manoeuvre
- Must carry entire compactor container back and forth to dispose waste; limited number of servicing per collection route
- Everyone must be trained to operate the compactor
- Not eligible for Leadership in Energy and Environmental Design® (LEED) points



2. FRONT END CONTAINER

MINIMUM CONCRETE PAD AREA	IDEAL USER	MINIMUM CEILING HEIGHT CLEARANCE	MINIMUM CLEARANCE IN FRONT OF CONTAINER	MINIMUM CLEARANCE OVERHEAD OF CONTAINER
1.07 m x 2.03 m		2.5 m	N/A	6.9 m high

Potential Benefits

- Applicable for most waste streams including cardboard and food scraps
- Capital cost less than a compactor
- Ideal for less than 100 units
- No electricity required to operate
- Easily accessible for most occupants

Potential Challenges

- Require more collection frequency compared to compactors
- Odour concern if not serviced frequently
- Surface damage to concrete pad due to frequent collection
- May cost more than compactor when extra service costs are included



2. CART

MINIMUM CONCRETE PAD AREA	IDEAL USER	MINIMUM CEILING HEIGHT CLEARANCE	MINIMUM CLEARANCE IN FRONT	MINIMUM CLEARANCE OVERHEAD
0.88 m x 0.64 m		2.5 m	N/A	5.29 m high

Potential Benefits

- Smallest footprint compared to a front end bin or a compactor
- Less expensive than a front-end container or a compactor
- Sealed container such that drainage is not a major concern
- No electricity required to operate
- Easier to manoeuvre than large containers

Potential Challenges

- Requires high service frequency compared to larger containers
- Odour may be a concern if not routinely serviced
- Can easily be vandalized or stolen



71.12cm
(28")

76.74cm
(31")

Split Bins

Split bins are recommended where there may be restrictions on storage space as they can store more than one material stream at a time in a single container. Please consult with your private hauler on availability and options for this type of bin.

Temporary Storage Facility Location

Temporary storage facilities are areas where containers are placed during the time of collection; these are not areas for waste disposal to occur.

Temporary storage facilities are recommended when the garbage and recycling storage area is more than 50 m from the loading area as some haulers will not walk more than 50 m from their collection vehicle to access containers. If a temporary storage facility is needed, the Waste Management Overlay Plan should illustrate the location, size and intended pathway to the area.

Considerations for temporary storage facilities:

- Have a level and hard-surfaced floor to withstand the weight of the waste and be easily cleaned.
- Be located at ground level within 50 m of the loading area to facilitate collection.
- Be connected to the loading area and garbage and recycling storage space via a level grade or continuous slope of no more than 6%. A gradient of more than 6% would make it challenging to facilitate movement of wheeled containers.
- Have a footprint equal to at least 50% of the garbage and recycling storage space allocation. This space should be used for waste container storage; therefore, a smaller area than the loading area is sufficient.
- Be configured such that no horizontal dimension (width or depth) is less than 1 m to allow for access for waste containers.

Barriers and Common Solutions to Multi-Family Waste Reduction and Diversion

Since every development is different, it’s important for developers to identify specific challenges for their building and develop solutions that will make it easier for building occupants to maximize recycling and reduce landfill waste. Some of the barriers that a developer (or occupant) may have to overcome include the following:

Size of storage locations

It’s important to allow enough space for multiple types of recycling bins (source separation). Additionally, it is best when all bins are in one location, as it can be inconvenient for occupants if recyclables, food scraps and/or garbage are stored in different locations within the building complex due to lack of space.

Clearance requirements

Collection vehicles require additional height, length and width when dumping materials from carts or containers into the vehicle.

Ambiance of waste storage locations

When waste storage areas are poorly lit, odorous and inconvenient to access they can deter occupants from properly sorting their recyclables.

Temporary tenants

People who live in apartments and condos tend to move more than people who live in houses. Recycling programs in each development can be different so it takes some time for occupants to learn how to properly manage their waste.

Product stewardship and banned materials

Building occupants may not have access to a vehicle to transport stewardship and landfill-banned materials to proper disposal facilities.

Language difficulties

Many people may not understand posters and information written in English.

Some common solutions for these barriers include the following:

- Design and designate a centralized location within the complex so that there is a one-stop disposal for all waste materials.
- Create areas that promote recycling and food scraps programs. This includes putting large and updated signs on and near containers that use images to explain what can and cannot go into them. Ensure that signs are laminated or protected from the elements and posted in well-lit areas.
- Empty and clean carts frequently to reduce odours and deter pests.
- Enlarge the storage area to improve accessibility for collection crews and occupants. Ensure that the dimensions of the access route are large enough for collection vehicles.
- Improve lighting in waste storage areas so that users can see signage and containers for proper sorting and for security.
- Build a sense of community within the building and incorporate community swap/re-use stations into the design. Include space for building tenants to add additional waste streams (e.g., stewardship and banned materials) for additional waste diversion measures and to tailor the waste diversion program to the needs of the development.
- Promote waste diversion programs to help reduce the amount of garbage generated by making food scraps and recycling easier for occupants. This may require decreasing the size of the garbage bin to create more space in the designated waste storage area, but it may save the building money by reducing garbage disposal fees.

HELPFUL LINKS

CITY OF RICHMOND RECYCLING AND GARBAGE COLLECTION

richmond.ca/recycle

METRO VANCOUVER SOLID WASTE SERVICE

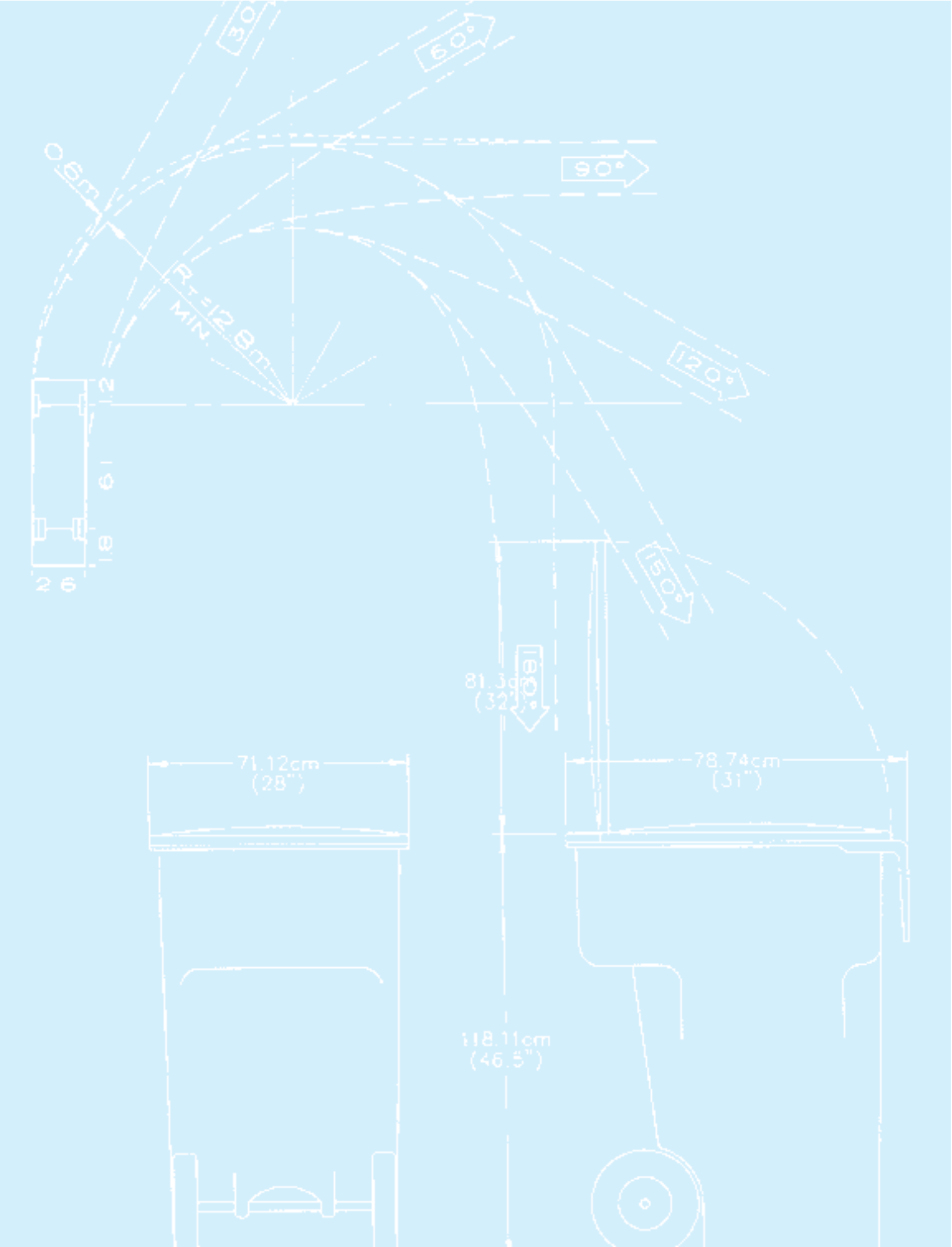
metrovanancouver.org/services/solid-waste/about/Pages/default.aspx

METRO VANCOUVER DISPOSAL BAN PROGRAM

metrovanancouver.org/services/solid-waste/recycling-programs/disposal-ban/Pages/default.aspx

EXTENDED PRODUCER RESPONSIBILITY

gov.bc.ca/gov/content/environment/waste-management/recycling/extended-producer-responsibility





City of Richmond

Environmental Programs

Information Line: 604-276-4010

Email: wmguidelines@richmond.ca

richmond.ca/recycle

Version 2, July 2023