



# Best Practice Guidelines for Design of Storage and Collection Space of Garbage, Recyclable, and Organic Materials in Multi-family Residential, Commercial, and Mixed Use Buildings

## 1. Introduction

Garbage, recycling and organic materials collection are an integral component of the development planning process for multi-family residential, commercial, and mixed use developments. This document is a compilation of best practice guidelines from jurisdictions in British Columbia and was created by GreenStep Solutions Inc. on behalf of the Regional District of Okanagan-Similkameen.

Developers are responsible for designing and locating a suitable and accessible space for the deposit, storage, and collection of garbage and recyclable material. A well-designed storage space will ensure that current and future building occupants can meet local and regional waste diversion goals and regulations. When designing the space, consideration should be given for the future collection of source-separated organics (i.e. food waste). The collection of food waste is a local and regional priority, and food waste will be removed from the garbage stream at some point in the near future.

Definitions used in this document are listed in Appendix A.

## 2. Applicability

**2.1** This document presents best practice guidelines and can be applied to all planning and development permit applications for the new construction or the retrofit of multi-family residential, commercial, and mixed use buildings. Please note that this document should be used with, not in place of, all applicable building codes, municipal standards and other relevant legislation.<sup>1</sup>

**2.2** Building projects should provide space for the shared deposit and collection of garbage and recyclable material that meets the technical specifications pertaining to the size, location, and design as well as occupant access and vehicle access, as outlined in Table 1 below.

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<sup>1</sup> City of Vancouver, 2016

**Table 1.** Types of Projects and the Applicable Sections of this document.<sup>2</sup>

Type of Project	Applicable Sections
<ul style="list-style-type: none"> <li>● <b>New multi-family residential, commercial, or mixed use buildings</b> (all construction involving the erection of a building)</li> </ul>	3. Estimating the Volume of Garbage, Recycling, and Organics generated on-site 4. Calculate the Number of Containers Required 5. Size 6. Location 7. Occupant Access 8. Design 9. Temporary Storage Area, where applicable 10. Loading Area 11. Vehicle Access Route to Loading Area
Definitions of these <b>building alteration projects</b> are listed at the end of Appendix A. <ul style="list-style-type: none"> <li>● Major horizontal additions</li> <li>● Minor horizontal additions</li> <li>● Reconstruction</li> <li>● Change in major occupancy classification</li> <li>● Major renovations</li> <li>● Major vertical additions</li> <li>● Minor vertical additions</li> </ul>	3. Estimating the Volume of Garbage, Recycling, and Organics generated on-site 4. Calculate the Number of Containers Required 5. Size 6. Location 7. Occupant Access 8. Design

### 3. Estimating the Volume of Garbage, Recycling, and Organics generated on-site

**3.1** The following tables show the approximate generation rates of garbage and recycling (Table 2), and food scraps (Table 3) for each building use. These volumes are needed to calculate the number of containers required in the next section. Please note that the rates listed are only general estimates and may vary from actual rates. Please consult with a local waste service provider to assist in estimating the number of containers required.

**Table 2.** Weekly Garbage (including Food Scraps) and Recycling Disposal Volumes for different Building Uses.<sup>3</sup>

Building Use	Measurement (per week)	Garbage Volume	Recycling Volume
Multi-Family Residential*	Litres / Unit	67	63
Hospitality Lodging	Litres / Room	68	26
Commercial – Office	Litres / m <sup>2</sup>	1.6	1.7
Commercial – Retail	Litres / m <sup>2</sup>	2.3	4.5
Commercial – Restaurant**	Litres / m <sup>2</sup>	3.7	7.8
Commercial – Large Venue	Litres / m <sup>2</sup>	5.0	5.2

\* Standard recycle collection is bi-weekly. For biweekly recycle volumes, multiply the recycling disposal volume by 2.

\*\* Grease removal volumes are approximately 0.35 litres per m<sup>2</sup> per week.

<sup>2</sup> Metro Vancouver, 2015

<sup>3</sup> City of Vancouver, 2016

**Table 3.** Estimated Weekly Volume of Food Scraps for different Building Uses.<sup>4</sup>

Building Use	Measurement (per week)	Food Scraps Volume
Multi-Family Residential	Litres / Unit	14
Hospitality Lodging	Litres / Room	20
Commercial – Office	Litres / m <sup>2</sup>	0.57
Commercial – Restaurant/Food	Litres / m <sup>2</sup>	2.0
Commercial – Large Venue	Litres / m <sup>2</sup>	1.9

#### 4. Calculate the Number of Containers Required

**4.1** To calculate the number of waste containers required for a building, the estimated generation rates (in volume) for each stream can be multiplied by the number of units, rooms, or square metres of the building and a total weekly volume of each stream can be estimated. The total estimated volume can help determine what type, what size, and how many bins are needed. Dimensions of front end bins (“bin”) and carts (Figure 1) are shown in Appendix B.



**Figure 1.** A front end bin (left) and a cart’s front and side profile (right).

**4.2** Alternatively, the tables in Appendix C show approximately the required number of containers of each stream for multi-family residential buildings, hospitality lodging buildings, office buildings, retail buildings, restaurant buildings, and large venues, respectively. For mixed use buildings, consider allocating percentages of each building use to calculate the total number of containers needed for the entire building.

#### 5. Size of Garbage and Recycling Storage Space

**5.1** After determining the number of containers that are needed for a building, the size of the garbage and recycling storage space can be calculated using the following formula<sup>5</sup>:

$$\text{Estimated Size of Storage} = \text{Number of Containers} \times \text{Footprint of Each Container} \times \text{Maneuver Factor}$$

<sup>4</sup> City of Vancouver, 2016

<sup>5</sup> City of Vancouver, 2016

The maneuver factor is recommended to be a value between 2 to 2.25<sup>6</sup>. Footprints (i.e. the dimensions of each container) for different types of containers can be found in Appendix B. Alternatively, a building can use the minimum and maximum space requirements shown in Appendix D.

**5.2** When source-separated organics is introduced, **existing buildings** will need to make space for the new organics carts. This may require more frequent collection of garbage, recycling, and/or organic waste so that the garbage and recycling bin sizes can be reduced to make space for the additional carts. Garbage bins that are 2, 4, 6, and 8 cubic yards require approximately the same amount of floor space (assuming there is proper height clearance), so the remaining space needs to be shared between recycling and organics carts. For example, this may require removing a cardboard bin and placing cardboard with mixed paper to make room for the organics carts. These adjustments will vary between buildings and depend on the diversion rates of each building.

## 6. Location of Garbage and Recycling Storage Space<sup>7</sup>

**6.1** The location of garbage and recycling storage space should be:

- a) on the lot of the structure served.
- b) in an area such that noise and odour impacts to building occupants and neighbouring developments are minimized.
- c) at ground level, or no more than one storey below grade.
- d) if not adjacent, the recycling storage space should be close to the garbage storage space.

**6.2** A garbage and recycling storage space should not be located in any of the following positions:

- a) in alleys or other publicly owned rights-of-way where it may disrupt traffic circulation patterns.
- b) between a street-facing facade of the structure and the street if the area is located outdoors.
- c) in any required driveways, parking aisles, or parking spaces for the structure.
- d) in any location that may block or impede fire exits, public rights-of-ways or pedestrian and vehicular access.

**6.3** Notwithstanding the location specifications of sub-sections 6.1 and 6.2, any garbage and recycling storage space should be located so as to comply with applicable building codes, fire codes, safety requirements, or other building requirements of the specific municipality.

## 7. Occupant Access of the Garbage and Recycling Storage Space<sup>8</sup>

**7.1** When designing the garbage and recycling storage space the following criteria should be met to ensure safe and adequate access for all users:

- a) The storage space should be accessible to all occupants of the development, including those with restricted mobility (e.g. wheelchair and scooter users).

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<sup>6</sup> City of Richmond, n.d.

<sup>7</sup> Metro Vancouver, 2015

<sup>8</sup> Metro Vancouver, 2015; City of Vancouver, 2016

- b) The storage space should be clean, well lit, regularly maintained, and conveniently located for users to get access to.
- c) Users should be able to access all containers inside the storage space without impediment.
- d) If an auxiliary area is designated for the storage space outside the building, the area should be located adjacent to an entry point into the building for easy access by the users.

## 8. Design Standards of the Garbage and Recycling Storage Space<sup>9</sup>

**8.1** The garbage and recycling storage space should:

- a) have a level and hard-surfaced floor.
- b) be configured to allow each garbage and recycling storage container to be individually accessible so as to be removed and replaced without having to take out other containers.
- c) be configured such that no horizontal dimension (width or depth) is less than 2 m.
- d) have an entry point no less than 1.5 m in width for multi-family buildings over 25 units and for all commercial developments.
- e) ensure adequate ventilation to the exterior of the building, in compliance with applicable building code requirements for the storage of garbage.
- f) be sufficiently secure to minimize pest and wildlife access through the use of roofs, fencing, locks, and wheels under gate doors.
- g) be protected from pest and wildlife entry through the use of strike-plates, locks, and astragals to close clearance gaps between doors and frames, if the storage area is located indoors.
- h) be well lit, both as a security measure and for ease of access.
- i) consider having windows, as well as white or pale-coloured interior walls, to enhance lighting and safety, if the storage area is enclosed.
- j) where appropriate, consider having access to a covered washing area with a sanitary sewer drain and water supply.

## 9. Temporary Storage Area<sup>10</sup>

**9.1** If the loading area will be located farther than 50 metres from the garbage and recycling storage space, a temporary storage area for garbage and recycling containers can be provided for use on collection days. The temporary storage area can be incorporated in the building plans.

**9.2** The temporary storage area should:

- a) have a level and hard surfaced floor.
- b) be configured such that no horizontal dimension (width or depth) is less than 1 m.
- c) be located at ground level within 50 metres of the loading area to facilitate collection.
- d) be connected to the loading area and garbage and recycling storage space via a level grade or continuous slope of no more than 6%.
- e) have a footprint equal to at least 50% of the garbage and recycling storage space allocation.

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<sup>9</sup> Metro Vancouver, 2015

<sup>10</sup> Metro Vancouver, 2015

- f) be available for garbage and recycling container storage on the day of collection, but may be used for other purposes at other times.

## 10. Loading Area<sup>11</sup>

**10.1** The loading area for the collection vehicle to service any garbage or recycling containers should meet the following minimum design criteria:

- a) be located away from the fresh air intakes for the building.
- b) be connected to the garbage and recycling storage space or temporary storage area via a level grade or continuous slope of no more than 6%, to facilitate movement of wheeled containers from the garbage and recycling storage space or temporary storage area to the loading area for servicing.

**10.2** If the loading area is to be located on the building site, it should also meet the following minimum design criteria:

- a) be directly accessible by a driving surface meeting the Vehicle Access Route specifications.
- b) have an appropriate slope as per applicable building code requirements, to facilitate drainage to the designated storm water management system for the site, and to avoid settling of liquids within the loading area.
- c) be constructed to accommodate the weight of a 28-tonne collection vehicle.
- d) maintain minimum dimensions of 7.5 m high, 6.0 m wide, and 15.0 m long. All dimensions are to be unencumbered (i.e., unrestricted by fixtures such as sprinkler systems, meters, surveillance cameras, mirrors, landscaping, etc.).

## 11. Vehicle Access Route to Loading Area<sup>12</sup>

**11.1** In general, the collection vehicle access route should be designed in such a way to allow a collection vehicle to enter, collect, and exit the site in a forward motion. A collection vehicle backing up onto a road is not preferred.

**11.2** The vehicle access route, whether intended to be indoors or outdoors, should:

- a) be configured in such a way as to allow a collection vehicle to drive up to the loading area, collect the garbage and/or recycling, and leave the site in a forward motion, or via the use of a turnaround area allowing for a three-point turn of not less than one truck length.
- b) be situated in a location that will minimize interface with pedestrian traffic and public vehicular access to the building's main parking area, including underground garage and visitor parking area.
- c) be constructed to accommodate the weight of a 28-tonne collection vehicle.
- d) provide a minimum width of 4.5 m throughout the vehicle access route and access driveways with a minimum width of 6 m at the points of entrance and exit for the site.
- e) maintain a minimum vertical clearance of 4.4 m throughout the entire access route.
- f) provide the collection vehicle a minimum turning radius of 12.5 m throughout the entire access route.
- g) ensure that the slope of the access route does not exceed 6%.

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<sup>11</sup> Metro Vancouver, 2015

<sup>12</sup> Metro Vancouver, 2015

**11.3** Where the collection vehicle must back up onto a road, consideration must be taken for the safety of people, other vehicles, property and equipment. This should be included in the Overlay Plan (Section 12). Designers should request feedback from local waste haulers to determine if the waste haulers would allow service to the property under the specific conditions. The specific road should be a consideration, including:

- a) How busy is it for pedestrians and vehicles?
- b) What is the average speed of the vehicles?
- c) What potential barriers to line of sight on the road may exist, including parked vehicles?

## **12. Create an Overlay Plan<sup>13</sup>**

A Waste Management Overlay Plan summarizes all of the requirements and highlights the key garbage and recycling components for the design of the building. It should include a diagram illustrating the anticipated movement of the collection vehicle through the building site, including dimensions for minimum width, height and turning radii throughout. More information on truck dimensions and turning radius requirements can be found in Appendix E, and sample outdoor enclosures can be found in Appendix F. The overlay plan also includes showing where the garbage/recycling room(s) and collection/loading area(s) will be located and may be submitted with a developer's development application. This plan should show the functional design of garbage and recycling services (mixed paper, mixed containers, and food scraps) and include the following:

- Location of doorway access to the storage areas (permanent and temporary).
- 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 loading areas.
- Location, dimensions, door sizes, maneuvering and turning radii of the access routes to the waste and recycling loading areas.
- Locations where access should not be blocked by bikes, cars, and other obstructions so that all occupants and collection vehicles can access the storage, temporary storage, and loading areas at all times.

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 goals and objectives for waste management in multi-family and commercial buildings.

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<sup>13</sup> City of Richmond, n.d.

### 13. References

City of North Vancouver. (2014, September). *Guidelines for Recycling and Garbage Storage Space and Access in Multiple Unit Residential, Commercial, Industrial and Institutional Developments* [PDF file].

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## Appendix A - Definitions<sup>14</sup>

**Commercial Buildings** refers to the following types of establishments:

**Hospitality Lodging** means a building containing more than six sleeping units wherein accommodation is provided for transient lodgers, and having a public reception or dining area. Accommodations can be without private cooking facilities or with minor ones that do not exceed the following, namely, a two-burner cooktop, a microwave oven, a sink and a small refrigerator

**Large Venue** means a facility dedicated to cultural and recreational uses, conferences, or conventions that can accommodate 2000 (?) or more visitors per day.

**Office Building** means a building where the majority of the space is dedicated to conducting business, clerical, or professional activities, excluding retail and industrial activities, and is generally not open to the public.

**Restaurant** means an eating establishment where food is sold or given to the public for immediate consumption on the premises, but where no provision is made for the consumption of food in motor vehicles that are parked on site.

**Retail Building** means a building or warehouse where goods, wares, merchandise, substances, articles or things are sold for purposes of consumption, use, or resale.

**Container** means any storage container supplied by a waste service provider for the purposes of **garbage, recycling** and organics collection. Examples include front end bin (dumpster), cart (tote), compactor, etc.

**Garbage** means discarded or abandoned materials, substances or objects, not including hazardous materials.

**Garbage Storage Space** means the centralized physical space allocated within a property for communal deposit and collection of **garbage** between collection days.

**Garbage and Recycling Storage Space** means the centralized physical space allocated within a property for communal deposit and collection of **garbage** and targeted **recyclable materials** between collection days.

**Mixed Containers** means plastic containers (jugs, bottles, jars, clamshells, trays, etc.), cartons and paper cups (for hot and cold beverages, milk, ice cream, etc.), aluminum containers (cans, lids, foil wrap, food trays, empty aerosol containers, etc.), and steel containers (cans, containers for pet food, cookies, tea, chocolates, etc.), accepted in a curbside program or at Recycle BC depots.

**Mixed Paper** means newspaper, flyers, magazines, office paper, paper envelopes, notepads, paper gift wrap, greeting cards, shredded paper, corrugated cardboard, boxboard, paper bags, paper egg cartons, etc, accepted in a curbside program or at Recycle BC depots.

**Mixed Use Building** means any building consisting of commercial space, plus 5 or more dwelling units, each of which is occupied, or intended to be occupied, as the home or residence of one household only.

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<sup>14</sup> Metro Vancouver, 2015; City of Vancouver, 2016

**Multi-Family Residential Building** means any building consisting of 5 or more dwelling units, each of which is occupied, or intended to be occupied, as the home or residence of one household only.

**Organics** means food waste that is collected from multi-family residential and commercial buildings for the purposes of composting the material and diverting it from the landfill. This may include yard waste in some cases, but it depends on the composting facility's specifications and restrictions of materials collected.

**Recyclable Material** means a product or substance that has been diverted from disposal, and usually includes the following:

- Mixed containers (plastic and metal)
- Mixed papers (cardboard, boxboard, office paper, newsprint)
- Glass containers (bottles and jars)
- Or other recyclable items listed by Recycle BC (<https://recyclebc.ca/what-can-i-recycle/>)

**Recycling Storage Space** means the centralized physical space allocated within a property for communal deposit and collection of recyclable material between collection days.

**Temporary Storage Area** means a space that is used for the storage of **garbage** and **recyclable materials** containers on collection days.

Table 1 Definitions for **Building Alteration Projects**:

**Major horizontal additions** are horizontal additions which increase the total aggregate floor area by more than the smaller of 25% or 500 m<sup>2</sup>.

**Minor horizontal additions** are horizontal additions that increase the total aggregate floor area by less than the smaller of 25% or 500 m<sup>2</sup>.

**Reconstruction** means any project where extensive renovations are being carried out throughout the building, which involve substantial reconstruction of the interior floor space that exposes the building's structure. Reconstruction may include repair, renovation, alteration or combination thereof.

**Change in major occupancy classification** type projects are limited to a change of use within a building or portion thereof such that the proposed use is outside of the existing major occupancy classification.

**Major renovations** are limited to work within multiple occupied spaces. Major renovations may include re-configuration of the interior space, interconnected floor spaces, and exterior alterations that affect a building's recycling or garbage storage space. However, new mezzanines may not be considered as a major renovation, and are considered to be vertical additions.

**Major vertical additions** are additions that add an additional floor level (mezzanine or storey) to a building that increases the total aggregate floor area by more than the smaller of 25% or 500 m<sup>2</sup>.

**Minor vertical additions** are additions that add an additional floor level (mezzanine or storey) to a building that increases the total aggregate floor area by less than the smaller of 25% or 500 m<sup>2</sup>.

## Appendix B - General Specifications for Different Waste Containers<sup>15</sup>

The following section is a general overview of waste containers that are commonly used for waste and recyclable materials storage. This document does not guarantee the accuracy of the dimensions listed below due to variations between manufacturers. It is the sole responsibility of the designer to ensure the design of the storage amenity can accommodate the waste containers to be used. Please consult with a private waste hauler to discuss which containers are suitable for different applications and to ensure the correct sizes of the containers.

### B.1 Front End Bin (Dumpster) Requirements and Sizes:

When considering garbage containers, designers should be aware of the size of different containers. Every manufacturer has slightly different measurements for their bins and may or may not include in their measurements the width of metal side brackets or additional heights if the container has wheels. For storage space considerations, the side brackets were included in the bin length. The table below presents measurements as general information only.

Minimum concrete pad area	1.5 m x 2.4 m
Minimum ceiling height clearance	2.5 m
Minimum truck clearance (in front/overhead)	15.2 m long / 6.9 m high

Bin size in cubic yards	Common Measurements		
	Length with side pockets	Width	Height (bin only, excludes castors)
2 yd <sup>3</sup> (1,530 L)	2.1 m	1.0 m	0.9 m
3 yd <sup>3</sup> (2,300 L)	2.1 m	1.2 m	1.2 m
4 yd <sup>3</sup> (3,050 L)	2.1 m	1.3 m	1.3 m
6 yd <sup>3</sup> (4,590 L)	2.1 m	1.5 m	1.5 m
8 yd <sup>3</sup> (6,100 L) Commercial use	2.1 m	2.0 m	2.0 m

### B.2 Cart Requirements and Sizes:

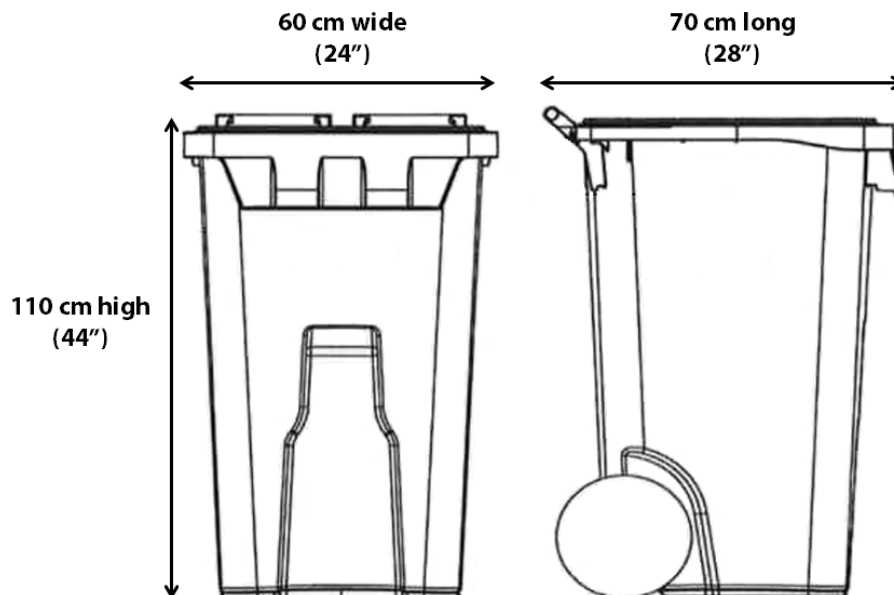
Minimum ceiling height clearance	2.5m
Minimum room size	5m <sup>2</sup> (minimum 1.5m wide)
Minimum truck clearance (in front/overhead)	15.2m long / 6.1m high

Cart Size	Common Measurements		
	Length	Width	Height
120 L (32 gal) cart	0.6 m	0.5 m	1.0 m
240 L (63 gal) cart	0.7 m	0.6 m	1.1 m
360 L (95 gal) cart	0.9 m	0.7 m	1.2 m

<sup>15</sup> City of Vancouver, 2016



**4 Cubic Yard (4,590 L) Front End Bin/Dumpster<sup>16</sup>**



**240 Litre (63 gal) Collection Cart<sup>17</sup>**

<sup>16</sup> <https://www.globalindustrial.ca/p/4-yard-front-loading-dumpster-with-bumpers-blue>

<sup>17</sup> City of Penticton, n.d.

## Appendix C - Number of Containers needed for Different Building Uses

### Multi-family Residential Building<sup>18</sup>

Number of units	Mixed Containers	Mixed Paper (w/o Cardboard Bin)	Mixed Paper, (with Cardboard Bin)	Compostable Organics (high participation)	Cardboard	Garbage (moderate recycling)	Garbage (extensive recycling)
	# of 360 L Cart			# of 240 L Cart	Size of Bin in Cubic Yards (yd <sup>3</sup> )		
5-10	1	1	N/A	1	0	2 yd <sup>3</sup>	2 yd <sup>3</sup>
11-20	1	2	N/A	1	0	3 yd <sup>3</sup>	2 yd <sup>3</sup>
21-30	1	3	1*	1	3 yd <sup>3</sup>	4 yd <sup>3</sup>	2 yd <sup>3</sup>
31-40	2	4	1*	2	3 yd <sup>3</sup>	6 yd <sup>3</sup>	3 yd <sup>3</sup>
41-50	2	5	2*	2	3 yd <sup>3</sup>	8 yd <sup>3</sup>	4 yd <sup>3</sup>
51-60	3	6*	2	3	3 yd <sup>3</sup>	8 yd <sup>3</sup>	4 yd <sup>3</sup>
61-70	3	7*	2	3	3 yd <sup>3</sup>	2 - 6 yd <sup>3</sup>	6 yd <sup>3</sup>
71-80	4	8*	3	3	3 yd <sup>3</sup>	2 - 6 yd <sup>3</sup>	6 yd <sup>3</sup>
81-90	4	9*	3	4	3 yd <sup>3</sup>	2 - 8 yd <sup>3</sup>	6 yd <sup>3</sup>
91-100	4	10*	3	4	3 yd <sup>3</sup>	2 - 8 yd <sup>3</sup>	8 yd <sup>3</sup>
101-110	5	11*	3	4	3 yd <sup>3</sup>	3 - 6 yd <sup>3</sup>	8 yd <sup>3</sup>
111-120	5	12*	4	5	3 yd <sup>3</sup>	3 - 8 yd <sup>3</sup>	8 yd <sup>3</sup>
121-130	6	13*	4	5	3 yd <sup>3</sup>	3 - 8 yd <sup>3</sup>	8 yd <sup>3</sup>
131-140	6	14*	4	6	4 yd <sup>3</sup>	3 - 8 yd <sup>3</sup>	2 - 6 yd <sup>3</sup>
141-150	6	15*	5	6	4 yd <sup>3</sup>	3 - 8 yd <sup>3</sup>	2 - 6 yd <sup>3</sup>
151-160	7	16*	5	6	4 yd <sup>3</sup>	4 - 8 yd <sup>3</sup>	2 - 6 yd <sup>3</sup>
161-170	7	16*	5	7	4 yd <sup>3</sup>	4 - 8 yd <sup>3</sup>	2 - 6 yd <sup>3</sup>
171-180	8	17*	5	7	6 yd <sup>3</sup>	4 - 8 yd <sup>3</sup>	2 - 8 yd <sup>3</sup>
181-190	8	18*	6	8	6 yd <sup>3</sup>	4 - 8 yd <sup>3</sup>	2 - 8 yd <sup>3</sup>
191-200	8	19*	6	8	6 yd <sup>3</sup>	4 - 8 yd <sup>3</sup>	2 - 8 yd <sup>3</sup>
201-210	9	20*	6	8	6 yd <sup>3</sup>	5 - 8 yd <sup>3</sup>	2 - 8 yd <sup>3</sup>
211-220	9	21*	7	9	6 yd <sup>3</sup>	5 - 8 yd <sup>3</sup>	2 - 8 yd <sup>3</sup>
221-230	10	22*	7	9	6 yd <sup>3</sup>	5 - 8 yd <sup>3</sup>	2 - 8 yd <sup>3</sup>
231-240	10	23*	7	9	6 yd <sup>3</sup>	5 - 8 yd <sup>3</sup>	3 - 6 yd <sup>3</sup>
241-250	11	24*	7	10	6 yd <sup>3</sup>	5 - 8 yd <sup>3</sup>	3 - 6 yd <sup>3</sup>
251-260	11	25*	8	10	6 yd <sup>3</sup>	6 - 8 yd <sup>3</sup>	3 - 8 yd <sup>3</sup>
261-270	11	26*	8	11	8 yd <sup>3</sup>	6 - 8 yd <sup>3</sup>	3 - 8 yd <sup>3</sup>
271-280	12	27*	8	11	8 yd <sup>3</sup>	6 - 8 yd <sup>3</sup>	3 - 8 yd <sup>3</sup>
281-290	12	28*	9	11	8 yd <sup>3</sup>	6 - 8 yd <sup>3</sup>	3 - 8 yd <sup>3</sup>
291-300	13	29*	9	12	8 yd <sup>3</sup>	6 - 8 yd <sup>3</sup>	3 - 8 yd <sup>3</sup>

<sup>18</sup> Metro Vancouver, n.d.

Assumptions for the Multi-family Residential Building table above<sup>19</sup>:

- Once per week collection schedule.
- An average of 2 persons occupying each unit.
- No on-site compactors (e.g. garbage, cardboard, recycling).
- Some residents are flattening their containers and cardboard boxes before putting them in the bin.
- Sufficient height clearance is available for collectors to tip garbage bins.
- Multi-stream source separation.

Additional notes for the Multi-family Residential Building table above<sup>20</sup>:

- Currently, there is commingled recycling (i.e. single stream) instead of multi-stream recycling for multi-family residential buildings; add the number of 360 L carts of mixed containers and mixed paper together to get the total number of recycling containers needed.
- Complexes with very active recycling communities may require more recycling bins.
- It is more space-efficient for any single recycling storage area needing 5+ 360 L carts or 6+ 240 L carts for any material to collect that material in bins instead, if the recycling hauler accepts bins.
- Due to their height and weight, 6 and 8 cubic yard bins should only be used where bins are stored outside and easily accessible for collection. Alternatively, more frequent collection of smaller bins or a compactor can be considered.
- For efficient use of space, a garbage compactor and a recycling compactor for paper, cardboard, and mixed containers are suggested for large complexes greater than 240 units, unless recycling bins can be used instead of carts, or collection frequency can be increased beyond once per week.
- Consulting with your recycling and waste hauler to assist you in estimating the number and size of containers required is recommended.
- The asterisk (\*) marks where it is more space-efficient to use the alternative way of storing paper and cardboard, but you or your recycling hauler may choose either approach to suit your operational needs.

### Hospitality Lodging Building<sup>21</sup>

Number of Rooms	Mixed Containers	Newspapers & Mixed Paper	Compostable Organics <sup>2</sup>	Cardboard	Garbage	Grease/ Tallow
	# of 360 L Cart		# of 240 L Cart	Size of Bin (yd <sup>3</sup> )		18.6 L Jug-In- Box (JIB)
1-10	1	1	1	3 yd <sup>3</sup>	3 yd <sup>3</sup>	1
11-20	1	1	2	3 yd <sup>3</sup>	3 yd <sup>3</sup>	1
21-30	1	1	3	3 yd <sup>3</sup>	3 yd <sup>3</sup>	1
31-40	1	1	4	3 yd <sup>3</sup>	3 yd <sup>3</sup>	1
41-50	1	1	4	3 yd <sup>3</sup>	3 yd <sup>3</sup>	1
51-60	1	2	5*	3 yd <sup>3</sup>	3 yd <sup>3</sup>	1
61-70	1	2	6*	3 yd <sup>3</sup>	4 yd <sup>3</sup>	1
71-80	1	2	7*	3 yd <sup>3</sup>	4 yd <sup>3</sup>	2
81-90	1	2	8*	3 yd <sup>3</sup>	2-3 yd <sup>3</sup>	2
91-100	1	3	9*	3 yd <sup>3</sup>	2-3 yd <sup>3</sup>	2

If compostable organics container(s) is provided, garbage container capacity should decrease accordingly.

\* More space efficient to use bins at this point. Please consult with a waste service provider to discuss which containers are suitable.

<sup>19</sup> Metro Vancouver, n.d.

<sup>20</sup> Metro Vancouver, n.d.

<sup>21</sup> City of Vancouver, 2016

## Office Building<sup>22</sup>

Size of Floor Area (m <sup>2</sup> )	Mixed Containers	Newspapers & Mixed Paper	Compostable Organics	Cardboard	Garbage
	# of 360 L Cart		# of 240 L Cart	Size of Bin (yd <sup>3</sup> )	
1-100	1	1	1	3 yd <sup>3</sup>	3 yd <sup>3</sup>
101-200	1	1	1	3 yd <sup>3</sup>	3 yd <sup>3</sup>
201-300	1	1	1	3 yd <sup>3</sup>	3 yd <sup>3</sup>
301-400	1	1	1	3 yd <sup>3</sup>	3 yd <sup>3</sup>
401-500	1	1	1	3 yd <sup>3</sup>	3 yd <sup>3</sup>
501-600	1	1	2	3 yd <sup>3</sup>	3 yd <sup>3</sup>
601-700	1	2	2	3 yd <sup>3</sup>	3 yd <sup>3</sup>
701-800	1	2	2	3 yd <sup>3</sup>	3 yd <sup>3</sup>
801-900	1	2	2	3 yd <sup>3</sup>	3 yd <sup>3</sup>
901-1,000	1	2	3	3 yd <sup>3</sup>	3 yd <sup>3</sup>
1,001-2,000	2	4	5*	3 yd <sup>3</sup>	3 yd <sup>3</sup>
2,001-3,000	3	6	7*	3 yd <sup>3</sup>	4 yd <sup>3</sup>
3,001-4,000	4	7	10*	3 yd <sup>3</sup>	2-3 yd <sup>3</sup>
4,001-5,000	5	9	12*	4 yd <sup>3</sup>	2-3 yd <sup>3</sup>

If compostable organics container(s) is provided, garbage container capacity should decrease accordingly.

\* More space efficient to use bins at this point. Please consult with a waste service provider to discuss suitable containers.

## Retail Building<sup>23</sup>

Size of Floor Area (m <sup>2</sup> )	Mixed Containers	Newspapers & Mixed Paper	Cardboard	Garbage
	# of 360 L Cart		Size of Bin (yd <sup>3</sup> )	
1-100	1	1	3 yd <sup>3</sup>	3 yd <sup>3</sup>
101-200	1	1	3 yd <sup>3</sup>	3 yd <sup>3</sup>
201-300	1	2	3 yd <sup>3</sup>	3 yd <sup>3</sup>
301-400	1	2	3 yd <sup>3</sup>	3 yd <sup>3</sup>
401-500	1	2	3 yd <sup>3</sup>	3 yd <sup>3</sup>
501-600	1	3	3 yd <sup>3</sup>	3 yd <sup>3</sup>
601-700	2	3	3 yd <sup>3</sup>	3 yd <sup>3</sup>
701-800	2	4*	3 yd <sup>3</sup>	3 yd <sup>3</sup>
801-900	2	4*	3 yd <sup>3</sup>	3 yd <sup>3</sup>
901-1,000	2	4*	3 yd <sup>3</sup>	3 yd <sup>3</sup>
1,001-2,000	4*	9*	2-3 yd <sup>3</sup>	2-3 yd <sup>3</sup>
2,001-3,000	6*	13*	3-3 yd <sup>3</sup>	2-4 yd <sup>3</sup>
3,001-4,000	7*	17*	3-4 yd <sup>3</sup>	3-4 yd <sup>3</sup>
4,001-5,000	9*	21*	4-4 yd <sup>3</sup>	4-4 yd <sup>3</sup>

\* More space efficient to use bins at this point. Please consult with a waste service provider to discuss which containers are suitable.

<sup>22</sup> City of Vancouver, 2016

<sup>23</sup> City of Vancouver, 2016

## Restaurant Building<sup>24</sup>

Size of Floor Area (m <sup>2</sup> )	Mixed Containers	Newspapers & Mixed Paper	Compostable Organics <sup>2</sup>	Cardboard	Garbage	Grease/Tallow
	# of 360 L Cart		# of 240 L Cart	Size of Bin (yd <sup>3</sup> )		45 gal Drum
1-100	1	1	1	3 yd <sup>3</sup>	3 yd <sup>3</sup>	1
101-200	1	1	2	3 yd <sup>3</sup>	3 yd <sup>3</sup>	1
201-300	2	2	3	3 yd <sup>3</sup>	3 yd <sup>3</sup>	1
301-400	2	3	4	3 yd <sup>3</sup>	3 yd <sup>3</sup>	1
401-500	3	3	4	3 yd <sup>3</sup>	3 yd <sup>3</sup>	1
501-600	4*	4*	5*	3 yd <sup>3</sup>	3 yd <sup>3</sup>	1
601-700	4*	4*	6*	3 yd <sup>3</sup>	3 yd <sup>3</sup>	2
701-800	5*	5*	7*	4 yd <sup>3</sup>	3 yd <sup>3</sup>	2
801-900	5*	5*	8*	4 yd <sup>3</sup>	3 yd <sup>3</sup>	2
901-1,000	6*	6*	9*	4 yd <sup>3</sup>	3 yd <sup>3</sup>	2
1,001-2,000	11*	12*	17*	3-4 yd <sup>3</sup>	4 yd <sup>3</sup>	4
2,001-3,000	17*	17*	25*	4-4 yd <sup>3</sup> *	2-4 yd <sup>3</sup>	6
3,001-4,000	22*	23*	34*	5-4 yd <sup>3</sup> *	2-4 yd <sup>3</sup>	8
4,001-5,000	28*	29*	42*	6-4 yd <sup>3</sup> *	3-4 yd <sup>3</sup>	11

If compostable organics container(s) is provided, garbage container capacity should decrease accordingly.

\* More space efficient to use bins and or compactors at this point. Please consult with a waste service provider to discuss which containers are suitable.

## Large Venue<sup>25</sup>

Size of Floor Area (m <sup>2</sup> )	Mixed Containers	Newspapers & Mixed Paper	Compostable Organics <sup>2</sup>	Cardboard	Garbage
	# of 360 L Cart		# of 240 L Cart	Size of Bin (yd <sup>3</sup> )	
1-100	1	1	1	3 yd <sup>3</sup>	3 yd <sup>3</sup>
101-200	1	1	2	3 yd <sup>3</sup>	3 yd <sup>3</sup>
201-300	2	2	3	3 yd <sup>3</sup>	3 yd <sup>3</sup>
301-400	2	2	3	3 yd <sup>3</sup>	3 yd <sup>3</sup>
401-500	3	2	4	3 yd <sup>3</sup>	3 yd <sup>3</sup>
501-600	3	3	5	3 yd <sup>3</sup>	3 yd <sup>3</sup>
601-700	4*	3	6*	3 yd <sup>3</sup>	3 yd <sup>3</sup>
701-800	4*	4*	6*	3 yd <sup>3</sup>	3 yd <sup>3</sup>
801-900	5*	4*	7*	3 yd <sup>3</sup>	3 yd <sup>3</sup>
901-1,000	5*	4*	8*	3 yd <sup>3</sup>	4 yd <sup>3</sup>
1,001-2,000	10*	9*	16*	2-3 yd <sup>3</sup>	2-4 yd <sup>3</sup>
2,001-3,000	14*	13*	24*	2-4 yd <sup>3</sup>	3-4 yd <sup>3</sup>
3,001-4,000	19*	17*	31*	3-4 yd <sup>3</sup>	4-4 yd <sup>3</sup> *
4,001-5,000	24*	21*	39*	4-4 yd <sup>3</sup> *	5-4 yd <sup>3</sup> *

If compostable organics container(s) is provided, garbage container capacity should decrease accordingly.

\* More space efficient to use bins and or compactors at this point. Please consult with a waste service provider to discuss which containers are suitable.

<sup>24</sup> City of Vancouver, 2016

<sup>25</sup> City of Vancouver, 2016



## Appendix D - Minimum and Maximum Garbage and Recycling Storage Space Requirements<sup>26</sup>

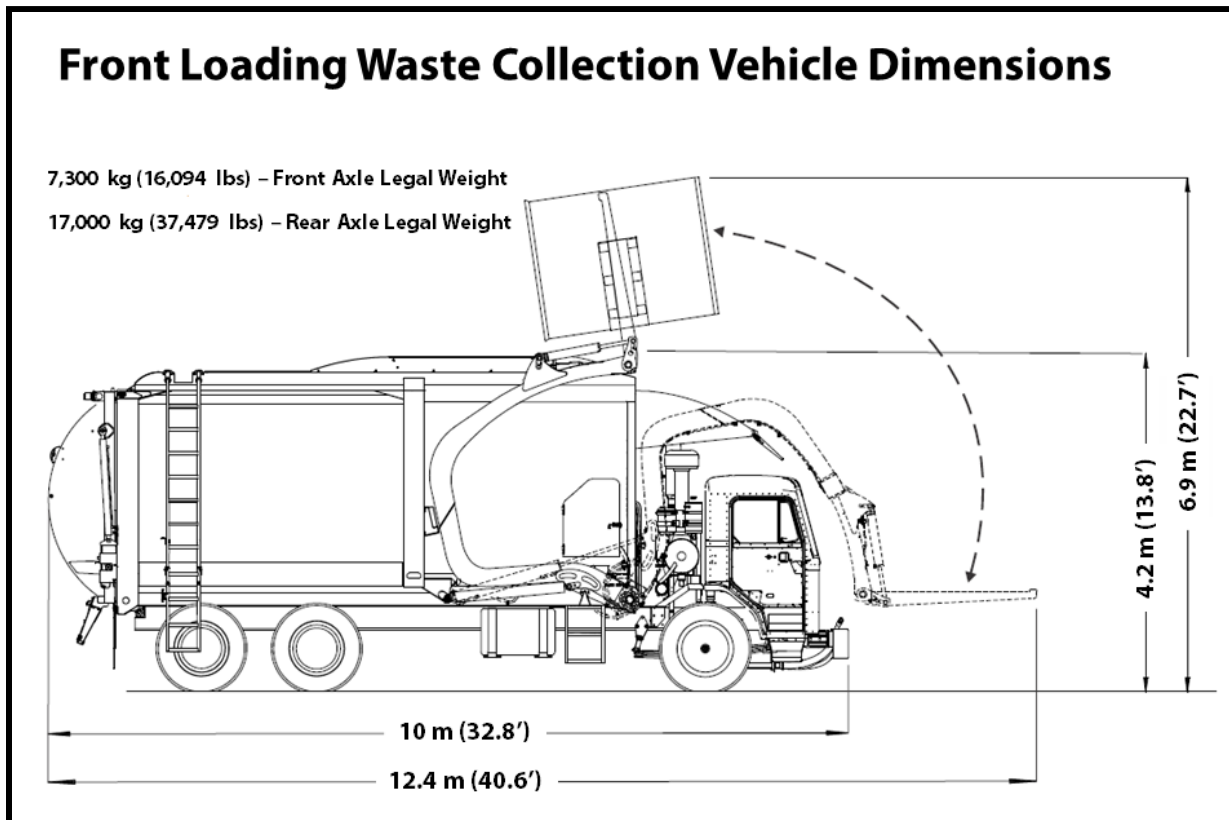
Building Use	Space Requirement	Minimum	Maximum
Multi-Family Residential (≥ 5 units)	0.486m <sup>2</sup> per unit (5.23 ft <sup>2</sup> per unit)	11m <sup>2</sup> (118.4 ft <sup>2</sup> )	0.486 m <sup>2</sup> per unit (5.23 ft <sup>2</sup> per unit) In addition to minimum area required
Hospitality Lodging	0.384 m <sup>2</sup> per room (4.13 ft <sup>2</sup> per room)	10 m <sup>2</sup> (107.6 ft <sup>2</sup> )	100 m <sup>2</sup> (1076.4 ft <sup>2</sup> ), at which collection frequency can be increased beyond once per seven days
Commercial – Retail	0.023 m <sup>2</sup> per m <sup>2</sup> (0.248 ft <sup>2</sup> per ft <sup>2</sup> )	8 m <sup>2</sup> (86.1 ft <sup>2</sup> )	90 m <sup>2</sup> (968.8 ft <sup>2</sup> ), at which collection frequency can be increased beyond once per seven days
Commercial – Office	0.010 m <sup>2</sup> per m <sup>2</sup> (0.108 ft <sup>2</sup> per ft <sup>2</sup> )	8 m <sup>2</sup> (86.1 ft <sup>2</sup> )	120 m <sup>2</sup> (1291.7 ft <sup>2</sup> ), at which collection frequency can be increased beyond once per seven days
Commercial – Restaurant	0.026 m <sup>2</sup> per m <sup>2</sup> (0.28 ft <sup>2</sup> per ft <sup>2</sup> )	5 m <sup>2</sup> (53.8 ft <sup>2</sup> )	75 m <sup>2</sup> (807.3 ft <sup>2</sup> ), at which collection frequency can be increased beyond once per seven days
Commercial – large Venue	0.018 m <sup>2</sup> per m <sup>2</sup> (0.194 ft <sup>2</sup> per ft <sup>2</sup> )	6.5 m <sup>2</sup> (70 ft <sup>2</sup> )	100 m <sup>2</sup> (1076.4 ft <sup>2</sup> ), at which collection frequency can be increased beyond once per seven days
Mixed Use	Should provide separate recycling and garbage storage spaces for both residential and commercial components, as per the space allocation required above. When the future commercial use is not known, the recycling and garbage storage space should be equal to the space needed for the potential commercial use with the highest storage needs.		
Industrial and Institutional	Should provide adequate recycling and garbage storage space in the building design, to ensure that waste management needs of the building's planned use are met.		
Existing Buildings	The recycling and garbage area specifications will not apply retroactively to existing buildings. Instead, the guidelines will act as a resource should strata councils seek information on best waste management practices.		
Alternative Solutions	If evidence is submitted in connection with an application for acceptance for an alternative solution to satisfy one or more of the space requirements, the Planning Manager(?), or their designate, may accept an alternate solution if they are of the opinion that the evidence submitted demonstrates that the alternative solution will address the general intent of the space requirements while addressing site-specific challenges.		

<sup>26</sup> City of North Vancouver, 2014

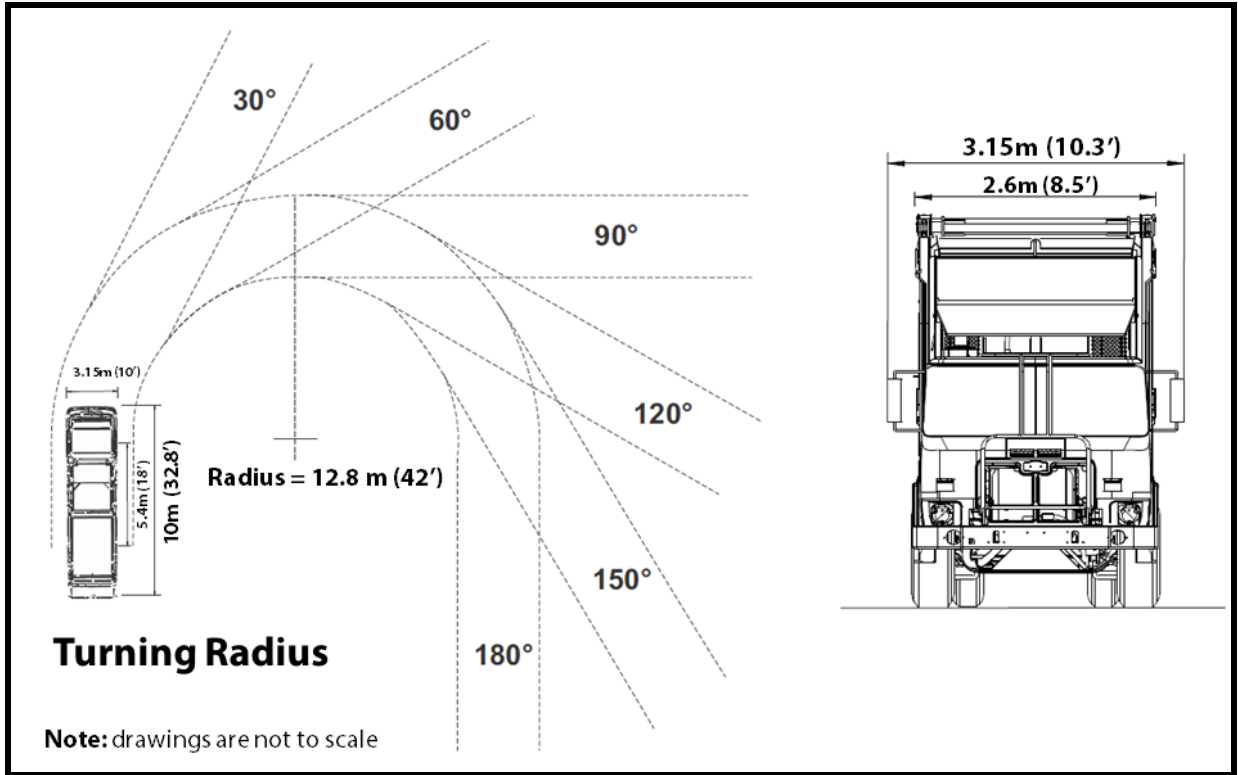
## Appendix E - Collection Vehicles<sup>27</sup>

The storage amenity and loading area designs should accommodate the dimensions of the collection vehicles. The following table shows approximate dimensions only. Please consult a private hauler to confirm vehicle requirements.

Typical Collection Truck Dimensions (approximate)	
Length	10.0 m – 12.4 m
Width	3.2 m
Minimum inside turning radius	10.0 m
Minimum outside turning radius	12.8 m
Height clearance	6.5 m – 7.5 m
Width clearance	4.0 m
Length clearance	15.2 m

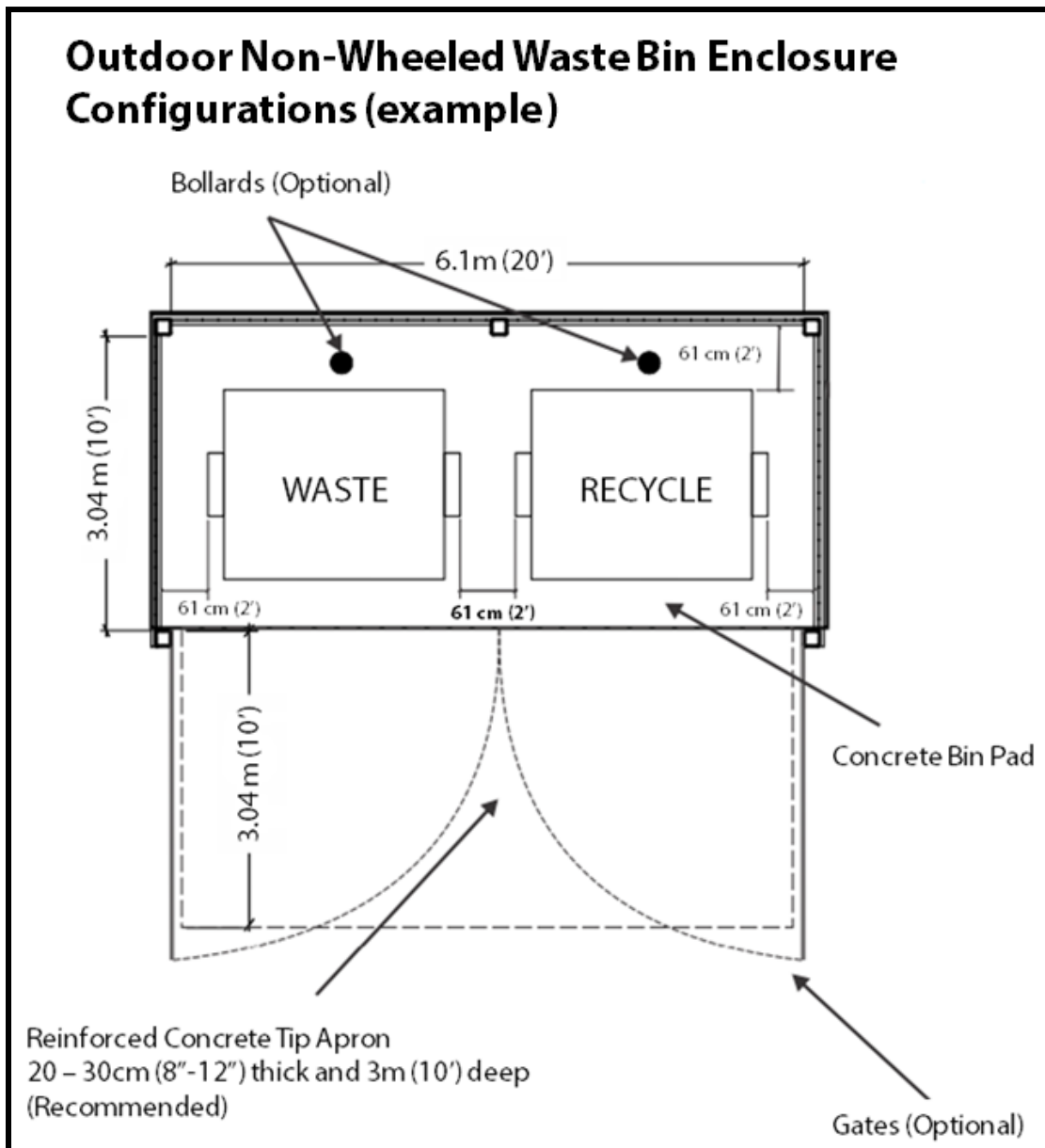


<sup>27</sup> Courtesy to City of Edmonton in City of Vancouver, 2016



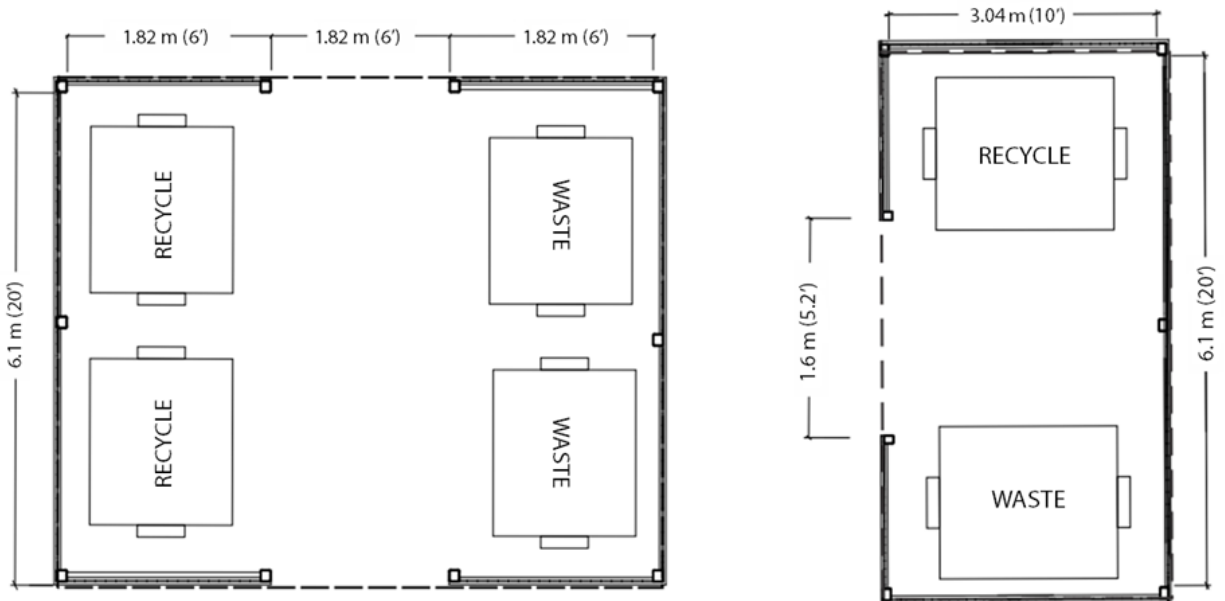
## Appendix F - Outdoor Waste Bin Enclosure Configurations<sup>28</sup>

The following are examples of enclosures that can be used for bins that are wheeled or non-wheeled.



<sup>28</sup> Unknown source from City of Penticton, n.d.

## Outdoor Wheeled Waste Bin Enclosure Configurations (examples)



- Measurements denote internal working space.
- Transition from waste storage area to service area should be smooth and at grade with no lip or curb.

