

## **Waste Management Consulting Services**

### **Waste and Recycling Program Analysis: Garbage and Recycling Quantity Projections and Equipment Analysis (January 20, 2023 Update)**

**23, 25, 27, 29 and 31 Helene Street North, 53 Queen Street East, and  
70 Park Street East**

Presented to:

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Project No.: DRM 135005

January 20, 2023

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**Subject:** Waste and Recycling Program Analysis: Garbage and Recycling Quantity Projections and Equipment Analysis for 23, 25, 27, 29 and 31 Helene Street North, 53 Queen Street East, and 70 Park Street East

Dear Alex:

We are pleased to present you with our calculations for the projected garbage and recycling volumes and corresponding equipment size requirements to accommodate the needs of 23, 25, 27, 29 and 31 Helene Street North, 53 Queen Street East, and 70 Park Street East Development located in Mississauga (hereafter referred to as 70 Park Street East development).

This report is an update to the previous report issued on December 27, 2022, and incorporates updates to the size of the building and corresponding changes to the equipment needs.

We have carefully developed parameters based on industry standards as well as active research of properties with a similar size and tenant mix.

In a second report, after discussions of the results of this report with the development team, CD SONTER will provide a final report summarising the selected equipment for the property.

Thank you for retaining our services for this project and we look forward to reviewing the report with you at your convenience.

Sincerely,

**CD SONTER**  
*Environmental Consultants*



Joseph Smillie  
Technical Manager, Sustainability Services



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E. & O.E.

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## 1.0 Executive Summary

Waste projections for the main waste streams expected (garbage, cardboard/paper, food/beverage containers, and organics) were calculated for the residential, retail, and daycare components of the 70 Park Street East development. This information was then used to determine the equipment needs for each building's residential and retail area. The equipment from the existing neighbouring residential building will also need to be stored in the waste room of the new development and collected from the same loading dock.

### Residential waste equipment requirements:

The residential waste system will have two waste chutes and a compaction unit at the bottom.

|   | Garbage                        | Mixed Recycling          |
|---|--------------------------------|--------------------------|
| Collection frequency  | 2x per week collection         | 2x per week collection** |
| Residential Bins*   | 11 x3-cu. yd. bins (compacted) | 13 x3-cu. yd. bins       |
| Additional bins stored from the existing residential building | 4 x3-cu. yd. bins (compacted)  | 5 x3-cu. yd. bins        |

\*Each of these totals includes one extra bin so that there is always a spare bin for each stream to be connected to the chute. This ensures that the chute does not need to be closed to the tenants while the full bins are put out for collection by the waste hauler.

\*\*The Waste Collection Design Standards Manual offers only once a week collection for mixed recycling by default as that is what they find buildings need but the region would be willing to increase this to twice a week if needed.

The waste room currently allocated for the residential garbage and recycling are large enough to hold the equipment and will have enough additional space to also store the bins from the existing neighbouring residential building.

The residential space will also need a 10 m<sup>2</sup> waste room for “bulky” waste, such as furniture, as per Region of Peel requirements. Currently a 11.9 m<sup>2</sup> space is available which exceeds the regions' minimal requirements.

Residents should also be provided with a place to bring their larger cardboard boxes that will not fit down the waste chute. This could potentially be stored in the extra space available in the bulky waste room.

The Region of Peel does not currently offer an organic waste collection program for multi-residential buildings and equipment for such a program for residents is not currently planned.

### Retail and daycare equipment needs:

| Component                | Garbage   | Paper/Cardboard Recycling                           | Food/beverage containers Recycling                  | Organics   |
|--------------------------|---|---|---|--|
| Retail and Daycare Total | 3x per week collection<br>3 x3 cu. yd. bins on site | 3x per week collection<br>1 x3 cu. yd. bins on site | 3x per week collection<br>2 x3 cu. yd. bins on site | 3x per week collection<br>5 x32 gallon totes on site |

Space currently available for retail and daycare waste will be sufficient for this equipment.

The retail and daycare waste projections assume that the retail space will be all food service tenants which generate significantly more waste than other retail spaces. This is done so as not to underestimate the waste needs for the retail component of the site.

Upcoming changes to the site plan are expected to change the position of the bulk waste room and increase the size of the staging area.

Programs for the following should also be explored:

- Used grease/cooking oil (required if the retail space will include a restaurant that uses large quantities of oil)
- Electronic waste, fluorescent tubes/bulbs, batteries (optional but recommended)
- Furniture (from retail/daycare spaces) – cannot be recycled but could be donated for reuse or just disposed in landfill.

## 2.0 Introduction

CD Sonter waste retained to provide an analysis of the waste needs of the 70 Park Street East site. This report will provide waste projections and recommended equipment options. Any issues with the site's current planned garbage/recycling spaces will also be noted.

70 Park Street East will consist of a 530-suite residential building with as retail and daycare component.

The expected total floor area of each component of the property is as follows:

|                   | Floor area              |                       | Residential suites |
|-------------------|-------------------------|-----------------------|--------------------|
| Residential area: | 372,541 ft <sup>2</sup> | 34,610 m <sup>2</sup> | 530 suites         |
| Daycare:          | 4,313 ft <sup>2</sup>   | 401 m <sup>2</sup>    | n/a                |
| Retail:           | 4,988 ft <sup>2</sup>   | 463 m <sup>2</sup>    | n/a                |

The major material streams expected to be generated at the site are:

- Garbage
- Mixed paper and cardboard
- Mixed food/beverage containers (cans, glass bottles, plastic bottles and polycoat cartons, including Tetrapak products)
- Organics (food waste)

### 2.1 Residential Waste Needs

Current site plans include two separate waste chutes for the residential suites.

The Region of Peel currently does not offer organics collection for multi-residential buildings, although this could change by the time the building is complete. There are no formal plans to implement organics services for this type of building but there is demand from residents and the region is regularly revisiting this issue. There is also a potential for the province to make organics recycling mandatory, as has been done in Calgary and Metro Vancouver, as part of their "Strategy for a Waste-Free Ontario" (although no formal steps have been taken on this at this time). As such it is recommended that the site either:

1. plan to not have an organics program but leave space for an organics program to be implemented in the future (e.g., ensure that a bi-sorter unit could be installed on one of the two waste chutes to allow for 3 separate waste streams, or leave space for a 3<sup>rd</sup> chute to be added in future if possible).
2. implement an organics program for residential tenants using a private waste hauler.

The residential program will also need to collect the mixed paper, cardboard, and mixed food/beverage containers together as "mixed recycling" in keeping with the services offered by the region.

As such, the main waste material categories that need to be accounted for will be:

- 1) Garbage
- 2) Mixed Recycling

Organics is not currently offered by the Region of Peel so will not be accommodated by the planned residential waste collection system.

The residential space will also need:

- (mandatory) Bulky waste storage area for furniture waste or other oversize items (10 m<sup>2</sup> minimum)
- (optional) Electronic waste, fluorescent lamps, and/or batteries collection. This is optional and only minimal space would be needed for these). If programs for these are not offered on-site then residents should be directed to local facilities or retailers that take these back as they should still not be placed in the garbage.

## **2.2 Retail and Daycare Waste Needs**

Private waste haulers will most likely be needed for the retail and daycare areas. Municipal service is not normally offered for commercial waste, but sometime exceptions are made for very small commercial spaces.

Most private haulers will still accept paper, cardboard and mixed food/beverage containers comingled together. However, due to challenges in the recycling market increasing sorting costs (due higher standards at the recycling facilities the material is shipped to), private waste haulers are expressing their desire to move away from this “co-mingled” recycling and are pushing for food/beverage containers to be collected separately from cardboard/paper products. Waste haulers in future may stop offering co-mingled collection entirely or may charge a premium for this. As such it is recommended that the site plan to keep these separate for the retail and daycare spaces as it will be easier to start off training tenants on this program rather than switching in future. Separating these materials should also keep the paper and cardboard cleaner by minimising chances for this material to be contaminated by food or liquids which would render it non-recyclable. If the waste hauler still offers to collect these mixed together then the site can still opt to have them co-mingled.

As such, there are four main waste material categories that need to be accounted for at the retail and daycare spaces:

- 1) Garbage
- 2) Mixed paper and cardboard
- 3) Mixed food/beverage containers (cans, glass bottles, plastic bottles, and polycoat cartons, including Tetrapak products)
- 4) Organics

An organics program is not currently required for commercial properties under current regulations but information from the Ministry of the Environment suggests that it may become a requirement in the future as it is in Calgary and Metro Vancouver (as per the province’s “Strategy for a Waste-Free Ontario” report). As such, it is recommended that an organics recycling program is implemented to ensure the site is ready for changes in the near future and to divert recyclables from the garbage stream which will enhance the properties diversion performance.

Food service areas will typically generate much more waste per square foot than non-food retail spaces. To not underestimate the potential waste quantities from these areas, waste projections in this report will use the premise that all retail spaces will be food service. These projections can be adjusted once more firm information is available on the expected tenants, but the higher values will still be useful to account for potential future changes to the tenant mix.

The retail and daycare space may also generate some of the following waste streams:

- Used cooking oil collection (if the site will have any food service tenants that use a lot of oil in cooking, e.g., deep fryers).
- Bulky waste (occasional furniture waste or other oversize items)
- Electronic waste (minimal quantities)
- Fluorescent lamps (minimal quantities)
- Batteries collection (minimal quantities)

Electronic waste, fluorescent lamps and batteries may only be generated in very small quantities, but they should still be kept out of the garbage due to the potential harmful chemicals in these. If the site does not offer these collection programs on-site, tenants should be directed to make their own arrangements to use local or private collection facilities or retailers that offer take-back programs to dispose of any of these materials. There will be limits on the amounts of material from commercial sites the public programs or retailer take-back programs will take so if larger quantities are collected then the tenant will need to arrange for a private collection service.

### 3.0 Projected Garbage & Recycling Generation at the Property

Waste projections have been determined based on waste quantities generated in buildings with similar tenant-mix.

Based on experience with similar use buildings, the following diversion rates are used for the different areas of the property in the projections:

|                 |            |
|-----------------|------------|
| Residential     | 26%*       |
| Retail          | 60%        |
| Daycare         | 40%        |
| <b>Overall:</b> | <b>32%</b> |

\* This does not include an organics program and reflects the achievable diversion with the Region of Peel's equipment requirements if twice a week collection is provided for both garbage and recycling (the default for recycling is only once a week). An organics program may enable the property to increase the residential diversion to around 47%. Note that the average diversion for multi-residential buildings can be around 15%, although this likely includes older buildings with poor or no access to recycling facilities. The target without organics is still higher than the "average" building but will be achievable with appropriate cooperation from the tenants (and good communication of the recycling program to them).

Note that many properties can exceed these diversion rates with an appropriate commitment to their recycling program. Conversely, some properties may not achieve these diversion levels due to lack of



tenant participation, particularly at first until building occupants are more familiar with the program. This will of course affect the number of garbage and recycling bins needed at the property

The most cost-effective system will minimise the number of equipment lifts needed with larger capacity or number of containers and a less frequent collection schedule. However, this will also increase the space required for the corresponding equipment so an appropriate balance will need to be achieved. Less frequent collection schedules can also accommodate future increases in waste volumes as collection schedules can simply be increased if containers are filling up faster. This is less of an option if the collection frequency is already at an elevated level.

The residential spaces and the retail spaces are expected to generate waste 7 days a week but the daycare is expected to generate waste only 5 days a week (Monday to Friday). This has been accounted for in the waste projections.

The waste projection figures in this report are approximations and the property may generate slightly less or slightly more than projected depending on how busy the spaces are, and how the individual tenants operate. Sites may see some seasonal variability in waste quantities, and it is also possible that waste volumes will increase in future due to changes in the tenant mix. As such it is important to allow flexibility in the system to allow for potential increases in waste generated (either by ensuring there is extra space for additional bins or by ensuring that the collection frequency could be increased). Conversely if the site finds that the waste generated is lower than projected, equipment or collection frequency can be reduced to optimize service costs. To address this, we recommend ensuring the waste program can accommodate a 30% increase in waste capacity through either additional equipment on-site or increased collection frequency.

### 3.1 Projected Residential Garbage and Recycling Quantities

The projected garbage and recycling quantities have been summarised in the following table:

| Component    | Garbage          | Mixed Recycling |
|--------------|------------------|-----------------|
| Residential* | 204 MT/year      | 72 MT/year      |
|              | 14.2 cu. yd./day | 9.4 cu. yd./day |

\*Figures are based on CD Sonter estimates based on data from similar buildings. The Region of Peel does not provide weight or volume projections in the Waste Collection Design Standards Manual.

Note that the above quantities are non-compacted volumes. If the material is placed in a compactor then the appropriate compaction ratio should be applied to determine how quickly the container will fill up.

If an organics program was implemented, potentially 30% of the garbage total, by weight, could be diverted through an organics program, bringing the overall diversion to almost 50% (depending on participation levels of the residents). This figure accounts for residents missing a certain amount of the organic material when sorting, as part of normal human error, and is therefore a realistic diversion target, if a little on the higher end.

### 3.2 Projected Retail and Daycare Garbage and Recycling Quantities

The projected garbage and recycling quantities have been summarised in the following table:

| Component    | Garbage                | Paper/Cardboard Recycling | Food/beverage containers Recycling | Organics                         |
|--------------|------------------------|---------------------------|------------------------------------|----------------------------------|
| Retail*      | 21 MT/year             | 4 MT/year                 | 6 MT/year                          | 21 MT/year                       |
|              | 1.5 cu. yd./day        | 0.5 cu. yd./day           | 0.9 cu. yd./day                    | 1.3 x 32-gallon totes/day        |
| Daycare*     | 8 MT/year              | 1 MT/year                 | 1 MT/year                          | 3 MT/year                        |
|              | 0.8 cu. yd./day        | 0.2 cu. yd./day           | 0.1 cu. yd./day                    | 0.3 x 32-gallon totes/day        |
| <b>TOTAL</b> | <b>32 MT/year</b>      | <b>6 MT/year</b>          | <b>8 MT/year</b>                   | <b>27 MT/year</b>                |
|              | <b>2.4 cu. yd./day</b> | <b>0.8 cu. yd./day</b>    | <b>1.2 cu. yd./day</b>             | <b>1.7 x 32-gallon totes/day</b> |

\*Figures are based on average CD Sonter data from similar buildings.

Note that the above quantities are non-compacted volumes. If the material is placed in a compactor, then the appropriate compaction ratio should be applied to determine the compacted volume.

It is recommended that the retail and daycare waste be collected together, as part of one service, unless the site needs separate waste services for invoicing purposes. A shared service will avoid the need for separate equipment or rooms to store the material.

## **4.0 Recommended Main Garbage and Recycling Collection Equipment**

Recommended equipment options for the residential and retail component of the building are presented in this section, with each having a separate set of equipment.

All garbage and recycling collection rooms will need to accommodate the following:

- **A floor drain, hose bib, and a nearby electrical outlet, to allow for efficient cleaning of the rooms (rooms for storing electronic waste or other “dry” materials will not need these features).**
- **Doors and corridors to and from any garbage/recycling rooms to the collection areas should account for the size of the selected garbage and recycling equipment that needs to be transported through them. This should include the carts which retail tenants and/or custodial staff may use to transport the waste from their spaces to the waste collection area and forklift trucks or compact tractors that may be needed for some equipment options.**
- **The floor areas that the front-end bins need to travel over must be free of obstacles that could prevent the wheels from passing over them (speed bumps, drainage channels, potholes, curbs, gravel, etc.)**
- **Garbage and recycling rooms must also account for the space that is needed to allow access by staff and to manoeuvre equipment in and out of the room and within the room. Space required will depend on the room’s configuration and type and quantity of equipment.**
- **Appropriate ceiling clearance for vehicle access and pick-up of all garbage and recycling containers should be considered. If the storage area for the garbage and recycling equipment does not have sufficient ceiling clearance for access, then the equipment will need to be moved to a secondary location during collection that meets these requirements.**
- **Ceiling height where the bins are stored should also be large enough to allow the lids on the bins to be fully opened. An indoor height of around 2.5 metres would be needed for most front-end bins.**
- **Residential tenants must not be allowed access to the room at the base of the chutes as they should not have access to the base of the chutes or the connected compactor unit for safety reasons. Therefore, any additional waste collection programs not fed by the chutes that residential tenants will need access to (e.g., bulky waste or electronic waste) cannot be stored in the main waste room at the base of the chutes, unless there is an intermediary drop-off location that is accessible to tenants, with custodial staff moving the material to a space in the secure waste room for longer term storage.**

For the retail waste collection, most major haulers offer Saturday collection, and some also offer Sunday collection. However, it is advisable to arrange retail waste collection so that the site can avoid weekend collection, if possible, to maximise the number of haulers that can service the site, allowing the site to select the hauler offering the best rates.

Some of the key points within the Region of Peel Waste Collection Design Standards Manual for residential waste collection are summarised in Appendix A. It is recommended that the architects and transportation consultants review the original document in more detail for relevant requirements.

Note that municipal waste collection services will not allow their drivers to leave their vehicles to move bins into position in front of their truck. As all residential buildings will have multiple bins put out for collection at a time (for garbage and recycling collection), a member of the building staff will need to be on hand at collection time to move each bin in the staging area into position in front of the truck for lifting.

Site plans used in the diagrams of waste equipment layout came from the January 16, 2023, copy of the site plans provided by IBI Group.

#### 4.1 Recommended Residential Equipment

Current plans call for two waste chutes: one for garbage, one for mixed recycling. This will fulfill the Region of Peel design requirement that developments “must include features that make the Set-out of Recyclable Materials as convenient to each Occupant as that for Garbage”.

Using the waste projections calculated in section 3.1, the corresponding equipment needs have been calculated.

3 cubic yard bins are recommended for garbage and mixed recycling collection and a horizontal compaction mechanism should be added for garbage at the base of the chute to reduce the garbage volume. Three cubic yard front-end bins are the most common container size and type used in residential sites.

These bins will be stored in the room at the base of the chutes on the ground level and will need to be moved to the staging area on the ground floor by the loading dock for collection by the waste hauler’s trucks.

Equipment projections for the new residential building are as follows:

|                             | Garbage                               | Mixed Recycling           |
|-----------------------------|---------------------------------------|---------------------------|
| <b>Collection frequency</b> | 2x per week collection                | 2x per week collection**  |
| <b>Residential Bins*</b>    | <b>11 x3-cu. yd. bins (compacted)</b> | <b>13 x3-cu. yd. bins</b> |

\*Each of these totals includes one extra bin so that there is always a spare bin for each stream to be connected to the chute. This ensures that the chute does not need to be closed to the tenants while the full bins are put out for collection by the waste hauler.

\*\*The Waste Collection Design Standards Manual offers only once a week collection for mixed recycling by default as that is what they find buildings need but the region would be willing to increase this to twice a week if needed.

The waste equipment projections are based on the Region of Peel requirements although these are very close to CD Sonter’s internal equipment projections (CD Sonter figures would call for one more recycling bin). It is recommended that the site follow’s the Region of Peel’s guidelines as this will likely make it easier to satisfy the region when applying for regional service.

The Region of Peel equipment requirements for 3 cubic yard bins are listed in the following table:

| Waste Stream    | Type of bin                      | Number needed as per the Waste Collection Design Standards Manual |
|-----------------|----------------------------------|---|
| Garbage         | 3 cubic yard bin (compacted*)    | 1 bin per 54 residential units                                    |
| Mixed Recycling | 3 cubic yard bin (non-compacted) | 1 bin per 45 residential units                                    |

\*only garbage can be compacted.

As the region has not confirmed if they would offer collection of recycling more than twice a week, it is recommended that the site leave extra room for additional recycling bins in the event that the site is able to exceed the 26% target diversion rate.

Private service is not recommended for the residential component of this site. The Region of Peel does have a mechanism for residential buildings to apply to be allowed private service, but the site would still have to pay the base municipal rates, and it is not clear how likely the region would be to rule in favour of allowing the site to obtain private waste service.

Dimensions for the front-end bins and compaction unit connected to the garbage chute (that the front-end garbage bins connect to) can be found in Appendix B.

Diagrams showing the equipment overlaid on site plans are shown in section 4.1.5.

#### **4.1.1 Residential Organics Recycling Program Option**

Currently the Region of Peel does not offer organics collection for multi-residential buildings at this time (although this could change in future). At this time the site does not plan on implementing an organics recycling program at the property since the region does not offer this service. However, for future reference the quantity of organics that could be expected is presented in the following table.

The information below provides information on the number of containers that would be needed to handle an organics collection program so that the space needed could be accounted for in the site plans.

| <b>Organics service for the residential building</b> |                             |   |
|--|-----------------------------|---|
| <b>With Municipal Service*</b>                       | <b>Collection frequency</b> | 2x per week collection**  |
|  | <b>Number of Bins</b>       | <b>2 x2-cu. yd. bin***</b> (one extra bin should be added to this total so that there is always a spare bin to connect to the chute when the other is out for collection) |
| <b>With Private Service</b>                          | <b>Collection frequency</b> | 2x per week collection**  |
|  | <b>Number of Bins</b>       | <b>14 x32-gallon totes***</b>   |

\* This is based on the premise that the Region of Peel begins offering an organics service and if so, is likely to use front-end bins for collection. However, as this service is not currently offered by the region it is not possible to confirm what equipment or collection requirements they may have, and these figures would need to be updated with the relevant information if/when the region implements such a program.

\*\* twice a week collection is used for this example calculation, but this could be increased to 3x a week if needed, for a 25% reduction in the number of bins needed on site. It is not recommended that the site target collection more frequently than 3x a week unless absolutely necessary as not all private waste haulers will provide weekend, or particularly Sunday, collection service (some will but it would be better to be able to maximise the number of potential waste haulers so that the most competitive rate can be obtained).

\*\*\* Private haulers in the GTA predominantly use 32-gallon totes for organics collection as they do not have enough customers willing or able to use front-end bins for organics collection and therefore do not usually have a truck on the road to service these. However, if a private hauler is found that does offer front-end bin service then front-end bins with private service can of course be used. Due to the weight of organics, it is unlikely a bin larger than 2 cubic yards would be recommended for organics service and the site could also opt to use 1 cubic yard front-end bins (although this is an unusual size that may be difficult to procure).

Note that 32-gallon totes may be too small for a chute system as they would fill up fast and need to be changed for empty bins around three times day. The 32-gallon totes would be better suited to a configuration where tenants bring their organics by hand to a central collection room (not using the chute), although this would obviously be less convenient than a chute-fed system and would likely result in lower participation rates. This would also require that a new resident-accessible room be assigned for these organics bins since residents will not be allowed to access the room with the chute exit and garbage compaction unit.

To connect the front-end organics bins to the chute system a bi-sorter would need to be installed on one of the two chutes. Although either chute could be used it would be recommended that the organics be combined with the chute for garbage as if a resident presses the wrong button on the bi-sorter system and incorrectly sends the organics material to the wrong destination it will only end up in garbage, rather than contaminating the recycling.

By capturing this quantity of organics material, the number of garbage bins will be reduced by only about one third of one 3 cubic yard bin per collection, with twice a week collection (since the garbage is also compacted).

#### **4.1.2 “Bulky Waste” Storage Requirements**

As per the Region of Peel Requirements, a **minimum 10 m<sup>2</sup>** space must be set aside for the collection of oversize waste items at each building. This will be largely furniture, but it can also be any other items that do not fit down the building’s chute system.

This space should be close to the loading dock to allow for easier collection by the waste service provider but must also be accessible to building tenants.

Large double doors or a wide overhead door should also be installed to allow the front-end bins and larger furniture items (e.g., mattresses, or couches) to easily be moved in and out of the rooms. Transportation of these items from the tenant elevators to the bulk/oversize waste room and then to the collection point where the waste hauler truck will pick it up should also be considered to ensure corridors do not have narrow corners or other doorways that would hinder the movement of these materials.

The current site plans include a 11.9 m<sup>2</sup> space labelled for bulk storage on the ground floor beside the loading dock. This will fulfill the space requirement for bulky waste storage. While it is larger than the minimum requirement it is not recommended that the site reduce this space as this space may also need to be used for larger cardboard boxes (see section 4.1.3).

#### **4.1.3 Large Cardboard Box Collection**

Most cardboard boxes much larger than a shoebox will not fit down the waste chute, including most larger pizza boxes (which are recyclable if they are empty of food and only have minimal grease stains). Even if boxes are broken down and flattened, they can open up again while falling down the chute, causing blockages. As such the residents will be required to bring their larger cardboard boxes down by hand to an assigned central location (likely on the ground floor) or cut up the boxes into much smaller pieces.

With increased deliveries from online shopping in recent years, the quantity of cardboard expected is higher than it has been in the past.

Two equipment options are presented for these larger cardboard boxes:

1. If space allows it is recommended that the site leaves one of the mixed recycling front-end bins available in a tenant accessible area on the ground level (perhaps in the bulk/oversize waste room).

- As the bulky waste storage room in the current site plans is larger than the minimum required it will be able to accommodate one of the front-end recycling bins although it will result in less space being available for the furniture and other larger waste items.
- 2. If space is not available for one of these larger bins, then a smaller container, such as a 1-cubic yard plastic cart, will need to be provided instead. Custodial staff will need to empty its contents into one of the main mixed recycling bins, as needed, so the material can be collected by the waste hauler with the other recycling.

As residents are bringing down cardboard, they may also have some other non-recyclable items in the boxes (e.g., packaging material). A small garbage bin should also be available beside the cardboard bin to allow them to separate these materials when dropping off their cardboard. Custodial staff will also need to empty this bin into one of the main garbage bins periodically.

Residents should be encouraged to break down the cardboard boxes to maximize the amount of material that the bin can hold.

Note that this is not something that is explicitly required by the Region of Peel, but it would be needed to deal with the quantity of larger cardboard generated.



#### **4.1.4 Extra Storage Space for Bins from the Neighbouring Residential Building**

It was requested that the site consider also storing waste bins from the neighbouring residential building.

This building has 210 residential suites and as per the Region of Peel guidelines would need:

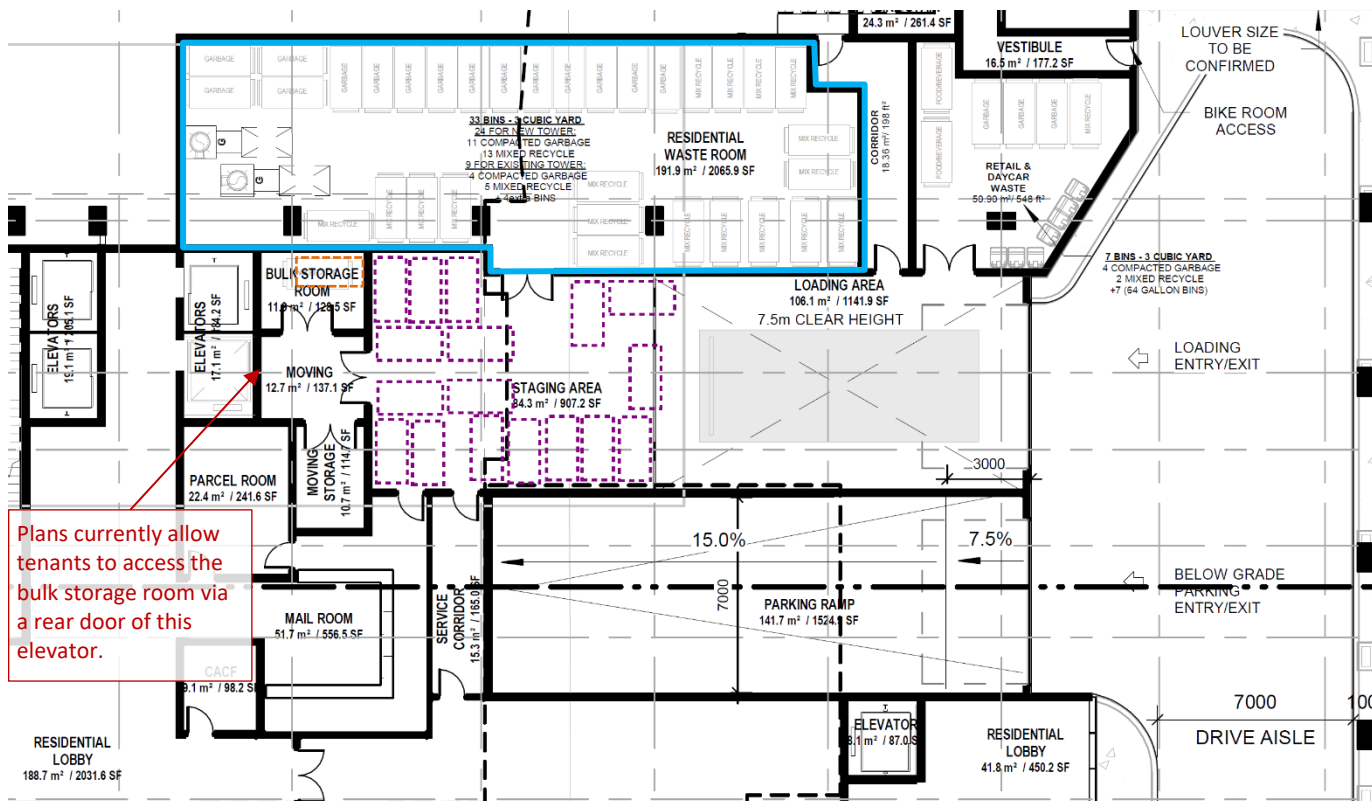
|                      | Garbage                       | Mixed Recycling          |
|----------------------|-------------------------------|--------------------------|
| Collection frequency | 2x per week collection        | 2x per week collection** |
| Residential Bins*    | 4 x3-cu. yd. bins (compacted) | 5 x3-cu. yd. bins        |

\*No extra bins are included here as this is just examining space needed in the new development. An extra bin for each chute in the existing building would still be recommended but would remain in the existing building's space and therefore does not need to be accommodated in this new building.

\*\*The Waste Collection Design Standards Manual offers only once a week collection for mixed recycling by default as that is what they find buildings need but the region would be willing to increase this to twice a week if needed (the number of bins needed stays the same even if collection is increased).

**Therefore, the new development will need storage space for an additional 9 x 3 cubic yard bins if all bins from the existing neighbouring building would need to be stored in the new building.**

#### 4.1.5 Residential Waste Room Layout Diagrams



**Figure 1: Diagram of the residential waste room on the ground floor. The main garbage room is outlined in light blue. The drawings currently show the placement of 33 x 3 cubic yard front-end bins. Space for the bins in the staging area is shown by the dotted purple rectangles showing how up to 17 bins could be accommodated (the total needed if all recycling bins from the new building and the existing building were put out for collection at the same time, which is the highest total number of bins needed with current projections). Placement of a 3 cubic yard bin for large cardboard in the bulk storage room is shown by the dotted orange rectangle (this could be replaced with a smaller bin if building staff can empty the contents into the larger 3 cubic yard bins as needed to free up more space for furniture waste).**

The drawings currently show space for 33 x 3 cubic yard bins, plus 2 bins connected to the chutes in the residential waste room. This is the same as the total number of bins needed for the new development and the existing residential building to the south but does not leave any extra space for additional bins in the even the site generates more waste than expected in future.

The staging area has just enough space for 17 bins (the number of bins that will need to be put out for mixed recycling from the new building and the existing residential bin if both are collected at the same time). The building will need to assign at least two members of the building's staff to move each bins into position in front of the collection truck and then move it out of the way once emptied. As there is only just enough space for the needed bins on the busiest collection day (recycling bin collection day) the staff should move the emptied bins back into the residential waste room as they go, to free up more space for the remaining bins to be moved into and out of position for lifting.

The Bulk storage room is also present directly to the west (left in the diagram) of the loading dock and exceeds the minimum size required by the Region of Peel. However, a couple of items for the bulk waste room will need to be addressed:

- Having the doors of the bulk waste room open outwards, into the corridor, may be a better use of the available storage space as it will eliminate the space taken up by the door swing inside the room.

- The route that the tenants will take to the bulk waste room through the back of the one elevator could be made more convenient for the tenants bringing down their oversize wastes (furniture but also any cardboard boxes that will not fit easily down the chute). Exploring additional options to allow resident access to this room is recommended.

Residential garbage and recycling collection will need to be staggered so they do not occur at the same time. Collection of the residential and retail waste will also need to be staggered so they do not occur at the same time as the residential garbage or recycling. The private hauler will likely offer the most flexibility in when they arrive for collection. As haulers can also arrive late it is important that the next delivery is not scheduled too close to the previous collection. Deliveries that will need access to the loading dock (such as for the retail tenants) will also need to schedule their deliveries around the waste collection schedules.

#### 4.2 Recommended Retail and Daycare Equipment

Using the waste projections calculated in section 3.2, the corresponding equipment needs have been calculated. It is recommended that the retail and daycare use shared equipment. 3 cubic yard bins are recommended for garbage, paper/cardboard recycling, and food/beverage containers recycling as these will have the most efficient volume to footprint ratio while still being relatively easy to move around.

| Component          | Garbage                   | Paper/Cardboard Recycling | Food/beverage containers Recycling | Organics                   |
|--------------------|---------------------------|---------------------------|------------------------------------|----------------------------|
| Retail and Daycare | 3x per week collection    | 3x per week collection    | 3x per week collection             | 3x per week collection     |
| Total              | 3 x3 cu. yd. bins on site | 1 x3 cu. yd. bins on site | 2 x3 cu. yd. bins on site          | 5 x32 gallon totes on site |

Note that current projections are based on the premise that all the retail space is all restaurants and if any of the space is non-food retail then the total equipment needed will be lower.

With private retail service the equipment is typically provided as part of the service so neither the front-end bins nor organics totes will need to be purchased by the property.

Two types of organics service for 32-gallon totes are available:

1. Service where the hauler dumps out the totes and leaves the empty totes behind.
2. Service where the hauler takes the full totes away and leaves clean empty totes behind in their place.

While both organics service options are perfectly viable for this site, the second one is recommended as this will eliminate the need for the site to periodically clean the organics totes. The cost for this second service type will usually be slightly higher and is not offered by all waste haulers.

#### 4.2.1 Retail Waste Room Layout Diagrams

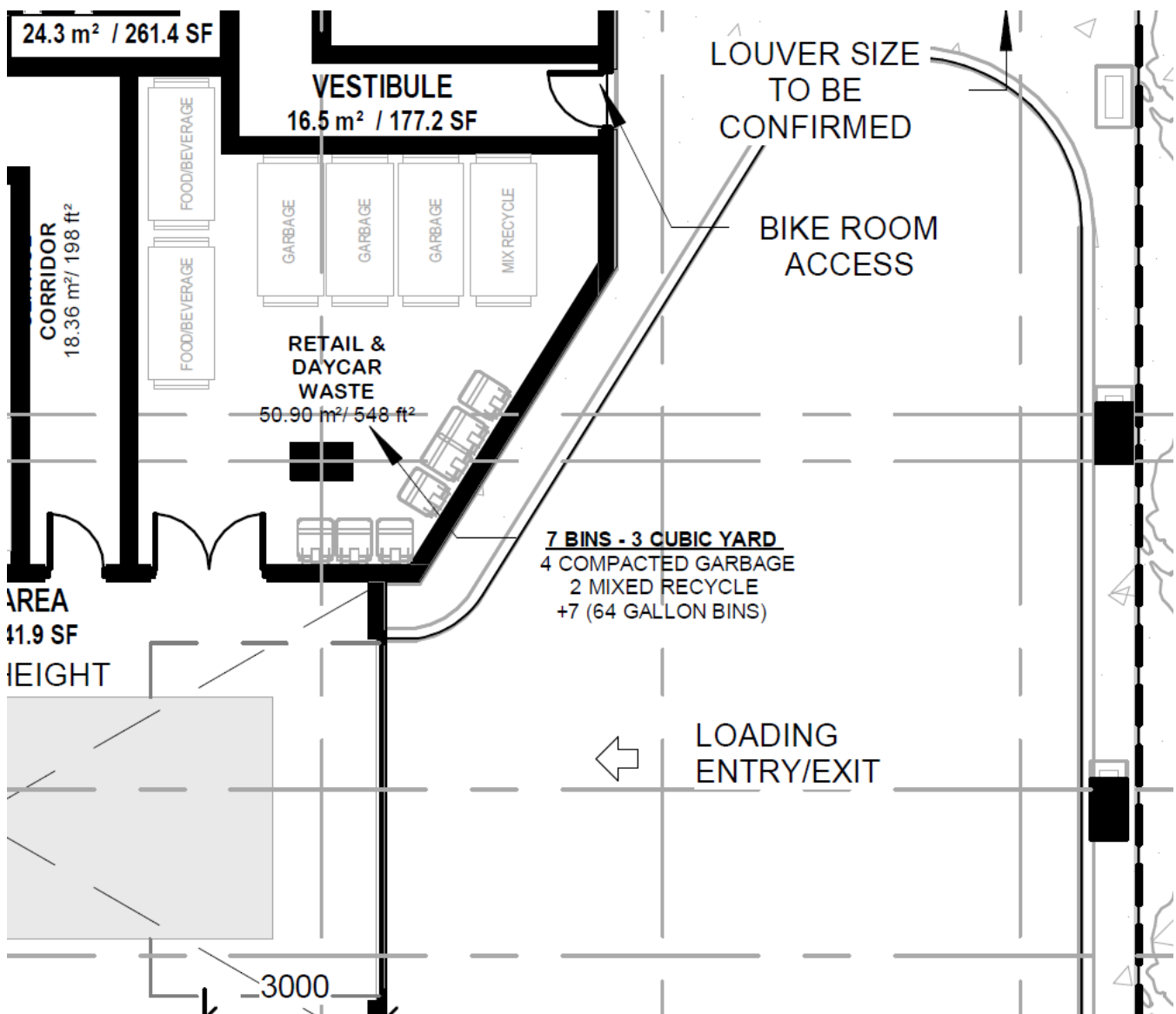


Figure 2: Diagram showing the garbage and recycling rooms for the retail and daycare. This space will be able to comfortably hold up to 6x 3 cubic yard bins and 7 organics totes.

As can be seen in Figure 2 the rooms will be large enough for the needed combined retail/daycare equipment. There is space for more 32 gallon totes than are needed (currently projections anticipate 5 being needed) but likely there would not be enough space to fit a seventh 3-cubic yard bin. There is enough space that this room could also potentially be used for recycling programs for used cooking oil, electronic waste, batteries, or fluorescent lamps (see section 5.0).

## 5.0 Other Recycling Programs and Equipment

Additional space should be reserved for other recycling programs such as:

- Grease/ used cooking oil collection (for food service tenants)
- Electronic waste (e-waste)
- Toner cartridges (may be accepted together with e-waste)
- Light bulbs
- Batteries
- Other hazardous wastes (paints, solvents, cleaners, detergents, oils)

The space required for these programs are small compared to the other daily garbage and recycling wastes. As such it should be easier to find sufficient space for the appropriate equipment, making this a secondary consideration to the main garbage and recycling programs when reserving space, but applicable space should still be worked into the site plans for any of the needed programs.

### 5.1 Used Grease/Cooking Oil Equipment (Retail Only)

Restaurants that have deep fryers or otherwise use a lot of cooking oil will require used cooking oil/grease collection. Space is not currently reserved for equipment to handle this.

Used cooking oil is commonly collected in either 55-gallon drums or approximately 200-gallon black plastic containers (footprint of around a 3.5 ft./1.1 metre by 4.0 ft./1.3 metres, depending on the model). Both of these types of grease containers will result in some spills when used cooking oil is poured into the bins and has a higher potent for spills when the grease is being transported from the restaurant to the container (usually in 10-gallon buckets or similar containers carried by hand). The areas around the bins will also need frequent cleaning due to the small spills that occur when pouring the grease into the bin.

However, a grease tank/caddy system (pictured in Figure 3) is recommended as an alternative to the more common grease bins. A grease tank/caddy system uses a wheeled grease container (caddy) to move the used cooking oil from the fryers in the kitchen to a sealed tank that uses a pump to suck the oil into the tank. Compared to the common bins, a tank/caddy system will:

- Reduce spills and the corresponding liability risks in addition to cleaning costs.
- Reduces chances of injury to building occupants from carrying the heavy buckets of used cooking oil and having to lift these up to pour into the bins (and resulting spills that can occur as a result of this).
- Keep the area around the tank cleaner than the other common bin types.

The initial price for the tank/caddy system is more significant than the common grease bins, but collection costs will be the same or better



Figure 3: Grease tank & caddy system. A version connected directly to a restaurant's fryers is also available that would not need the caddies.

(usually collection is provided at no-cost and sometimes a small rebate is provided for the oil). However, some grease haulers may provide the tank at no charge in exchange for not providing a rebate on the used cooking oil, but this will depend on the volume and condition of oil and the selected grease hauler.

Despite the improvements of the tank/caddy system over the more common grease bins, the site will still need to maintain the system, ensure everyone is trained in using the system correctly, and ensure the area is cleaned as needed.

The larger tanks have a diameter of 34" for the medium (about 200-gallon capacity) and 42" for the large (about 350-gallon capacity) tanks, although these will vary by manufacturer. All units are about 7 ft. tall.

For sites that only expect a relatively small amount of used cooking oil a combined caddy/tank may be the solution (see Figure 4).

If there are multiple grease generating tenants at the site then the site should either:

1. Provide each of these tenants with their own caddy that they are responsible for emptying and cleaning regularly (to prevent food particles clogging up the hose nozzle), or
2. Provide a shared pool of caddies but have custodial staff take responsibility for draining the caddies into the tank.

Past experience has shown that if a shared pool of caddies is provided but tenants are left to ensure they are emptied, the site will find that full caddies will be abandoned, and there will be more issues with ensuring the caddies remain clean.

To better visualise the units, a video of one of the tank and caddy systems in action can be found at the following website link: <https://vimeo.com/81115151>. The unit featured is from Sanimax but all grease haulers should be able to service these systems. Frontline International Inc. is the other large manufacturers of these units, and they operate in a very similar way.

If the site only expects one restaurant tenant, a direct plumbed system to pipe the grease directly from the tenant's fryers and into the tank, bypassing the need for a caddy, may be an option depending on the placement of the retail space in relation to where the grease tank could be installed.

The selected area for the grease tank will need to have parking for the collection truck near enough that the trucks hose will reach. The longest hoses available are 50 ft. (15.2 metres) but some trucks may be equipped with shorter hoses which may limit which local grease haulers can service the site. Therefore, putting the tank as close as possible to where the truck can access it is recommended. The tank can also



**Figure 4: Mobile tank system with pump.** Dimensions of the 74-gallon model are 35" L x 26" W x 39" H (889 mm x 660 mm x 978 mm). Smaller 47-gallon versions of this container are also available. Other manufacturers may have similar models in different sizes.

have its grease extraction pipe put through a nearby wall so that collection can be done from areas on the other side of a wall.

A drain and hot and cold water should be located close to the grease containers as they will need regular cleaning, even with the cleaner grease tank and caddy system. Electrical connections (120 V, 20 A outlets with a dedicated electrical box) will be needed for the grease tank unit.

Note that this is separate from grease suspended in wastewater, which may require a grease trap/grease interceptor. This is beyond the scope of this report and would need to be addressed as part of the site's plumbing systems in keeping with applicable local bylaws.



## 5.2 Electronic Waste, Fluorescent Lamps, Batteries (retail and residential - optional)

Additional space should be allocated for electronic waste collection (e-waste), fluorescent lamp collection, and battery collection. These collection areas would not have to be located directly by the loading dock but should be accessible to the relevant building occupants and to the recyclers when they need to collect the material.

The larger equipment options for this may need to allow for access for a pallet jack or small fork-lift truck, as service providers will often use these to collect the materials. However, it is not expected that this site will need the larger equipment options.

The e-waste, light bulbs and batteries will not be generated in large quantities so a relatively small area can be set aside for these materials and collection by the recycler will only be needed a few times a year. If a smaller area is assigned to these then a more frequent collection will be needed.

It is not mandatory for the residential building to offer these programs, but these materials should be kept out of the garbage. As such if the site does not offer collection programs for these materials, then they should provide additional information on how the residents can dispose of these through local services (including public drop-off locations, or retailers that offer take-back programs) and that retail tenants should arrange with private recyclers to dispose of larger volumes.

### 5.2.1 Electronic Waste (E-Waste)

The property will generate occasional electronic waste from broken or obsolete electronic equipment.

E-waste is usually collected through one of the following methods:

- For larger volumes, 1 cubic metre metal cages or woven nylon cubic sacks are also used in other cases (approximately 3.3 ft., 1 m by 3.3 ft., 1 m, footprint but will vary slightly by model).
- Loose items are stored and then loaded onto standard wood pallets, shrink wrapped and picked up by fork-lift or pump trucks.
- Some sites have also used 32- to 64-gallon totes or similar wheeled bins to collect electronic wastes. Just be aware that the electronic waste can be quite heavy so even smaller bins can become very heavy when full.
- For very small quantities, the material could be stored in a shelving unit with some small 5- to 10-gallon basins for loose smaller items and cables. However, this will require bringing these items to the collection truck by hand (either through building staff or paying the hauler for their additional time)



Figure 5: Examples of electronic waste storage cages (best suited to sites that expect a fair amount of electronic waste such as office environments).

As this site is not expected to generate very much electronic waste, the smaller bin options (64-gallon tote or smaller) should be sufficient to hold several weeks' or months' worth of material. The site will want to opt for an on-call collection schedule, with the recycler contacted once the allocated space or equipment is getting close to being full (considering that it may still be several days after the call is put in before the collection occurs).

Many suppliers will provide equipment as part of their service, or for a small additional charge, and may be insistent on the site using one of their bin options. The site will need to review the selected hauler's equipment options to ensure they have something that is the right size for the site before agreeing to retain them.

Ink and toner cartridges can sometimes be recycled with other electronic waste, but some haulers request that they be kept in separate containers. The ink cartridge supplier may also offer take-back programs as part of their service.

While the current garbage/recycling room is quite crowded there may be space to store a small bin for this in there. If space is not available in that room, it should be relatively easy to find a small corner elsewhere in the building for the needed container.

### 5.2.2 Fluorescent Tubes/Bulbs

Fluorescent light bulbs and tubes are fragile and should be handled with care to prevent breakage. These bulbs are also long lived and so only a very small quantity is expected to be disposed of every week. Several different storage options are available.

The longer fluorescent tubes (most commonly about 4 ft.) are commonly collected in some of the following containers:

- In their original packaging (commonly cardboard boxes of 25 or so bulbs). This would be the best option for this site given the smaller quantities expected.
- In 55-gallon cardboard drums with sleeves for each tube,
- In other custom containers (such as the unit shown in Figure 6).



Figure 6: Aevitas bulb collection box for 4 ft. fluorescent lamps. Approximately 4.5 ft. (1.4 meters) by 4.5 ft. (1.4 meters). Collected by forklift or pump truck. Best suited for larger sites that expect a lot of 4 ft. bulbs

As the larger containers are often collected with the aid of a pallet jack or fork-lift truck it is important that the site consider access routes from the storage location to the loading dock if considering the larger containers.

Smaller containers can be used for smaller bulbs (e.g., spotlights, compact fluorescents, HID bulbs). It is important that these are small so that the bulbs at the bottom are not crushed by the weight of the bulbs above them.

For smaller compact fluorescent (CFL) bulbs and LED bulbs:

- 5- to 10-gallon bins are recommended. Stackable containers in this size will help with storage.

The collection area for the fluorescent bulbs must be kept tidy and possibly in a locked or controlled area to prevent bulbs from being broken due to careless handling.

Bulb crusher machines are also available but are better suited to larger sites. These would need to be operated by building staff only (requiring an intermediary drop-off area for bulbs). However, they do require additional labour to load the bulbs into the bulb crusher and then the property is responsible for arranging for collection of the glass and metal in addition to the hazardous mercury filled filters when the unit is full. Some additional paperwork is required to register as a generator of hazardous wastes to have the mercury filter collected (although some of the organizations that remove the mercury filters will assist with this paperwork).

Note that old incandescent bulbs can be disposed of in the garbage as they do not contain any hazardous chemicals, but these have largely been phased out. Newer LED bulbs do not contain the mercury vapour that fluorescent tubes and bulbs do, but their electronic components do contain trace heavy metals that should not be disposed of in the regular garbage. To be safe it is recommended that all light bulbs are collected as if they contain hazardous mercury vapour as it may not be obvious for people not familiar with the bulbs which category they fall under.

The generation of this material will be inconsistent from week to week, but collection should only be needed every few months (depending on how large the selected containers are). As such, the site may want to opt for an on-call collection schedule with the recycler contacted once the allocated space or equipment is getting close to being full.

### **5.2.3 Batteries**

Occasional batteries will be generated from various battery-operated devices (from both household appliances and building operations devices, such as battery-operated floor scrubbing carts). The quantity generated weekly is expected to be very low.

Recommended battery equipment:

- a couple of 5-gallon buckets will be sufficient to store several weeks of batteries.

Note that batteries are heavy so small containers should be used to prevent containers from being filled to the point that they are too heavy to move by hand.

It should be very straightforward to find space for these small battery recycling bins in the loading dock. Smaller bins can be located at tenant reception desks to collect batteries from each tenant's space before being transported to the loading dock containers.

Handling practices for batteries require that the positive terminals of higher voltage batteries and “button cell” batteries are taped up to prevent any risk of short-circuit. Steps should be taken to ensure that all building occupants follow these guidelines.

The generation of this material will be inconsistent from week to week, but collection should only be needed every few weeks (depending on how large the selected containers are). As such, the site may want to opt for an on-call collection schedule with the recycler contacted once the allocated space or equipment is getting close to being full.

### **5.3 Furniture (retail/daycare)**

Residential furniture is already addressed in section 4.1.2 “Bulky Waste” Storage Requirements.

Furniture may not be generated regularly but due to the size of these items, when they are generated an appropriate storage area should be available to store these items if the site intends to try to have these materials recycled or donated for re-use. No equipment will be needed only space for the furniture items.

These materials will normally not be recyclable but could be donated for reuse if still in good condition.

A program for these materials is not essential. Retail tenants could be asked to store these in their own space and make their own arrangements to dispose of these materials. Leasing a temporary roll-off bin may be necessary if a large quantity of furniture waste needs to be disposed of at one time.

## 6.0 Closure

The current space will be sufficient to hold the needed equipment for the main waste materials from the residential and retail/daycare.

The residential room will be quite full with the garbage and recycling bins from both the new building and the neighbouring existing residential building both stored here, but they will fit. However, the residential waste room will not have space to fit additional organics bins (pending the region begins providing this service in the future).

Resident access to the bulk waste room is currently planned through the rear door of one of the elevators. However, having only one access point that would require waiting for the one elevator is not ideal and with larger cardboard boxes expected to be generated relatively frequently, it is recommended that an alternate route for tenants to take from the ground floor elevator lobby to the bulk room is implemented that bypasses the need to access the elevator rear door.

Given the short distance that the residential and retail bin will need to be moved from the storage room to the staging area a motorised bin caddy may not be needed. However, a motorised bin caddy or compactor tractor may be beneficial to facilitate moving the bins from the existing residential building to the new building's waste storage room.

Assigned space for the following are not currently explicitly noted in the site drawings so should be added to an applicable room (only a small amount of space is expected to be needed for each):

- Used grease/cooking oil (retail): mandatory if the retail space will have a restaurant that cooks with a lot of oil (e.g., has deep-fryers on site), but otherwise would not be needed.
- Electronic waste (residential): a small bin for occasional electronic waste should be placed in an area that is accessible to tenants (e.g., a 64-gallon tote). If space allows this could be added to the bulk waste room or an alternative location could be selected. The selected space would need to be accessible to tenants, unless the site has a system where electronic waste is handed off to building staff, who then move the material to a secure location.
- Electronic waste (retail): a small space should be assigned as only minimal quantities will be expected from a retail area of this size. Likely there would be room in the main retail garbage/recycling room for a small container (e.g., a 32-gallon tote) to collect this.
- Fluorescent tubes/bulbs (for residential spaces): residential tenants will likely not use many fluorescent tubes but will use compact fluorescent bulbs or LED bulbs. As these bulbs usually last for a long time it is unlikely that the residents will generate many of these. A series of smaller, shallow bins that can be stacked would be ideal to hold these and ensuring the bulbs do not get broken under the weight of the bulbs on top of them. To prevent breakage due to careless handling, tenants could drop off their bulbs at a security desk or admin offices where building staff can put them in the assigned bins.
- Batteries (residential): very small quantities expected so a small 5-gallon bucket or two should be able to hold several months worth of batteries. While the space needed is minimal these will need to be stored in an area that is accessible to residents.

- Fluorescent tubes/bulbs (for retail and spaces maintained by building management): tubes should be stored in their original packaging. Other collection bins for the tubes are available but storing them in their old boxes will likely be the simplest option. Small, shallow bins (stackable if possible) can be used to collect any smaller bulbs.

No additional space should need to be marked off for batteries (for retail and building management) as minimal quantities are expected and a 5-gallon bin should be plenty to hold several months worth of material.

No additional space should need to be marked off for retail furniture waste as this material will be generated rarely but would need a large amount of space when it is generated. Rather than having a larger space empty most of the time, retail tenants should be asked to hold their furniture waste and make arrangements for pick-up directly from their space or the building can alternatively offer to assign space for the material on a temporary basis until collection can be arranged.

## 7.0 Statement of Limitations

The information presented in this report is based on information provided to CD SONTER Ltd. The report incorporates details and base figures provided during interviews with client representatives; follow-up discussions and materials made available to CD SONTER Ltd. and information available from regulatory authorities and industry associations. The analysis, conclusions and recommendations are based on the knowledge, experience, professional judgment and best practices of the author(s) and apply specifically and only to conditions existing at the time of writing the report.

There is no warranty expressed or implied that the report uncovers all potential issues associated with the management of waste and recycling at the site. The report has involved the application of a structured methodology and standard of care consistent with industry practices to address the specific project objectives. In providing our analysis and conclusions, we cannot guarantee the completeness or accuracy of information supplied by any third party.

All measurements in this report are approximate and should be confirmed by the engineer or architect teams.

The report has been prepared for the exclusive use of Dream and cannot be copied or re-distributed beyond use as part of the 23, 25, 27, 29 and 31 Helene Street North, 53 Queen Street East, and 70 Park Street East construction project without the expressed written consent of CD SONTER Ltd.

Sincerely,  
CD SONTER  
Environmental Consultants



Joseph Smillie  
Technical Manager, Sustainability Services



Louis Dodaro  
Director, Sustainability Services

E. & O.E.



## Appendix A: Summary of the Region of Peel Waste Collection Design Standards Manual

To qualify for the Region of Peel waste collection services the site must meet the requirements set out in the “Waste Collection Design Standards Manual”. This document can be found at the following link:  
<https://www.peelregion.ca/public-works/design-standards/pdf/waste-collection-design-standards-manual.pdf>

A summary of some of the key elements are listed below but the transportation and architectural teams should review the original document for additional details and context that goes beyond the scope of this report.

### Garbage and Recycling Collection Room:

Recycling Receptacle access must be equally or more convenient than that of Garbage.

Equipment requirements for Multi-residential complexes:

| Waste Stream    | Type of bin                      | Number needed as per the Waste Collection Design Standards Manual |
|-----------------|----------------------------------|---|
| Garbage         | 3 cubic yard bin (compacted*)    | 1 bin per 54 residential units                                    |
| Mixed Recycling | 3 cubic yard bin (non-compacted) | 1 bin per 45 residential units                                    |

\*Non-compacted garbage is also permitted but is not recommended due to the quantity of bins needed to hold the same quantity of waste.

A 10 m<sup>2</sup> room for oversize waste, such as furniture, must be available.

### Loading Area Specifications:

- The loading area must have a solid, level (maximum 2% slope) and reinforced concrete pad.
- The loading area and approach must be able to support a 35-tonne fully-loaded collection vehicle.
- The driver is not required to exit the Waste Collection Vehicle to facilitate collection. Building staff will need to move the bins in and out of position for lifting by the collection truck and must be visible to the Waste Collection vehicle on approach to the site.
- Waste Collection vehicles require a minimum head-on approach of 18 metres.
- The Waste Collection Vehicle is not permitted to: reverse in excess of 15 metres, turn while reversing; or reverse onto a municipal roadway.
- Outside of the Collection Point, a clear height of 4.4 metres is required throughout the route the waste collection truck is to travel
- Grade along the Waste Collection Vehicle access route (not including the collection area) is 8%.
- If a Waste Collection Vehicle is required to drive onto or over a supported structure (such as an air grate, transformer cover, or underground parking garage), the Region must be provided with a letter indicating that the structure can safely support a fully loaded Waste Collection Vehicle weighing 35 tonnes.
- Indoor Collection Point must be a minimum width of 6 metres
- Overhead clearance of 7.5 metres in the collection point.
- Access roads must be a minimum of 6 metres to allow for the passage of the collection truck (2.77 m wide) and allow for the potential for parked vehicles on both sides of the road.
- 13 metre turning radius required for waste collection vehicles.

Appendix B: Information on Front-End Bins and Horizontal Compaction Units

Front-end bin and horizontal compactor unit specifications are presented below.

Front-End Bins:

The ceiling height required to collect 3 cubic yard and under bins is 6.1 metres (20.0 ft.), as per City of Toronto requirements **but is 7.5 metres (24.6 ft.) under the Region of Peel.**



Figure 7: Example of a 3 cubic yard front-end bin model equipped with wheels. The unit pictured has a side opening allowing it to be connected to a horizontal compactor unit.

Overall larger bins will normally have a more efficient volume to footprint ratio, but larger bins will be harder to move due to the weight of the bins and contents.

| Common Front-End Bin Dimensions (exact bin dimensions will vary by model)       |          |            |          |            |                                   |            |  |
|---|----------|------------|----------|------------|-----------------------------------|------------|--|
|   | Length*  |            | Width    |            | Height (not including the wheels) |            |  |
| 2 cubic yard bin (recommended size for residential organics) **                 | 7.0 feet | 2.2 metres | 3.0 feet | 0.9 metres | 3.5 feet                          | 1.1 metres |  |
| 3 cubic yard bin (recommended size for residential garbage and mixed recycling) | 7.0 feet | 2.2 metres | 3.5 feet | 1.1 metres | 4.5 feet                          | 1.4 metres |  |
| 4 cubic yard bin ***  | 7.0 feet | 2.2 metres | 4.5 feet | 1.4 metres | 4.0 feet                          | 1.3 metres |  |

\* Includes 6 inches on each side for the pockets that the forks of the collection truck slide into to lift the bins. Length should be consistent among all models to be compatible with standard front-end lift trucks.

\*\* Extra narrow (and taller) models are also available that have a slightly narrower width of about 2.3 ft (0.72 metres) and may be beneficial if floor space is limited.

\*\*\* Bins larger than 4 cubic yards are available but are not accepted for indoor collection service with the Region of Peel. Larger bins are also harder to move around and therefore are not recommended if they will need to be moved a lot (8 cubic yard bins are the largest size and do not come equipped with wheels at all).

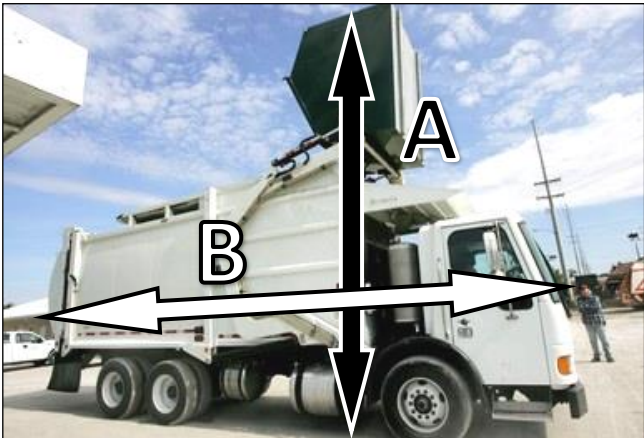


Figure 8: Front end collection truck (vehicle width and length will vary by model). Vertical clearance (A) with a 3 cubic yard bin: 20 feet (6.1 metres) – larger bins will require more clearance. Approximate truck length (B): 39 feet (12 metres). Approximate width of truck: 11 ft. (3.4 metres). Note that regional requirements may insist on higher ceiling limits and the ceiling needed will also increase with the bin size.

The bins will need to be equipped with wheels/casters to allow them to be moved around. The largest wheels available from the vendor are recommended to make movement easier (usually 6-8 inches in diameter). One set should be fixed and the other should swivel. Lockable wheels should be considered if the bins may sit in an area with any kind of slope.

While these can be moved by one person by hand it is recommended that a compact tractor or motorized caddy be used to move the containers over any significant distance and would be required if the bins need to be moved up any sloped surface. When moving bins by hand two people would likely be

needed if complex manoeuvring of the bins is needed (e.g., through narrow spaces).

#### Horizontal Compactor Units for Front End Bins:

Front-end containers will need to be combined with horizontal compaction units connected to the chute for garbage and these are also recommended for recycling bins. These will increase the capacity of the front-end bins connected.

Any areas with compactor units must be locked and not accessible to tenants.

#### Compactor unit specifications:

- A compactor unit will have a compaction ratio of around 2 to 1 (and up to 3 to 1) at least doubling the capacity of each front- end bin.
  - Manufacturers will often claim a 4 to 1 compaction ratio but other than brand new units under ideal conditions this may be an unlikely target.
  - Without regular maintenance, and particularly as the units get older, their effective compaction ratio will decrease.
  - Some municipal regions will budget a 2 to 1 compaction ration when determining pricing and may charge extra if they determine the waste is compacted at a higher ratio than this.
- These units should last around 15 years with regular preventative maintenance and the occasional repairs.
- A 3 Phase electrical connection (208/230/460 Volt at 60Hz) is needed for the compactor unit.



Figure 9: Example of a motorized bin caddy.

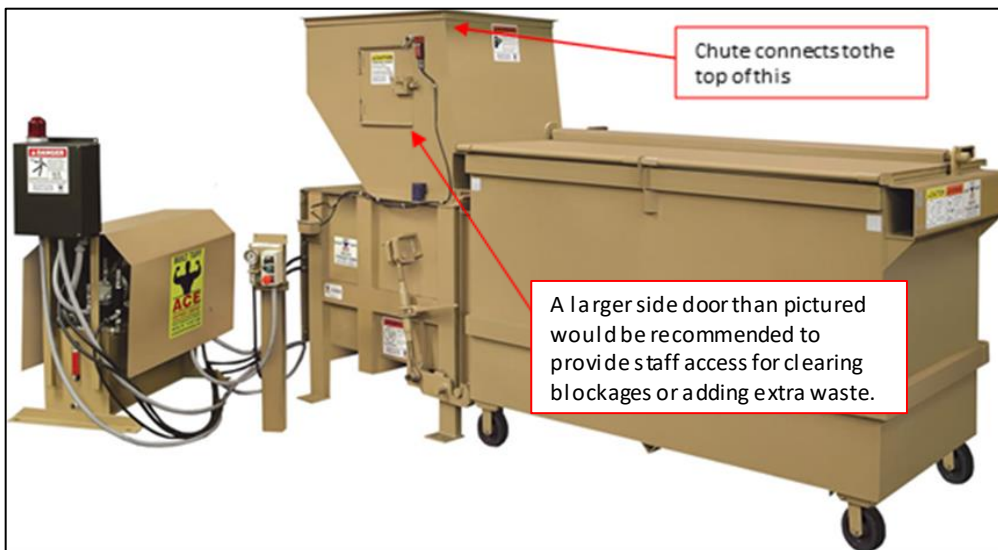


Figure 10: Example of a horizontal compactor unit (middle) connected to a front-end bin (right). The remote power pack is also pictured to the left. These are also often called “apartment compactors” as they are often found in apartment complexes and work well in conjunction with a chute system. Dimensions and exact configurations will vary by model and manufacturer.

Dimensions of an example horizontal compactor unit dimensions is shown in the following diagram.

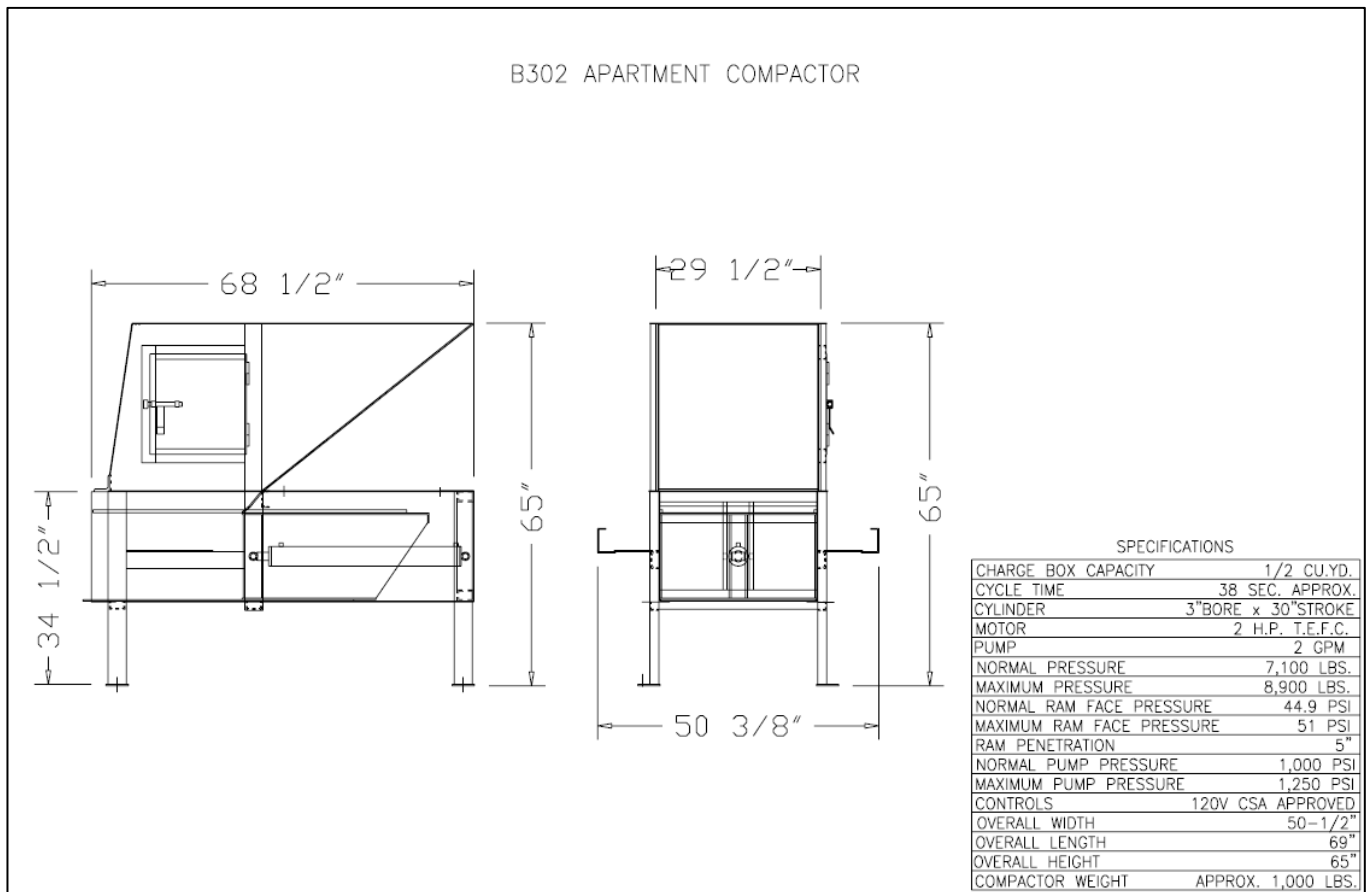


Figure 11: Dimensions of an example horizontal compactor unit. Please note the exact dimensions will vary by manufacturer so if space is limited it is recommended that the site begin the process of a purchasing the unit as soon as possible so that the site plans can account for the exact model that will be installed. Note that the unit pictured below does not show the connected Front-end bin.

The dimensions of an example 3 cubic yard front-end bin are shown in the image below.

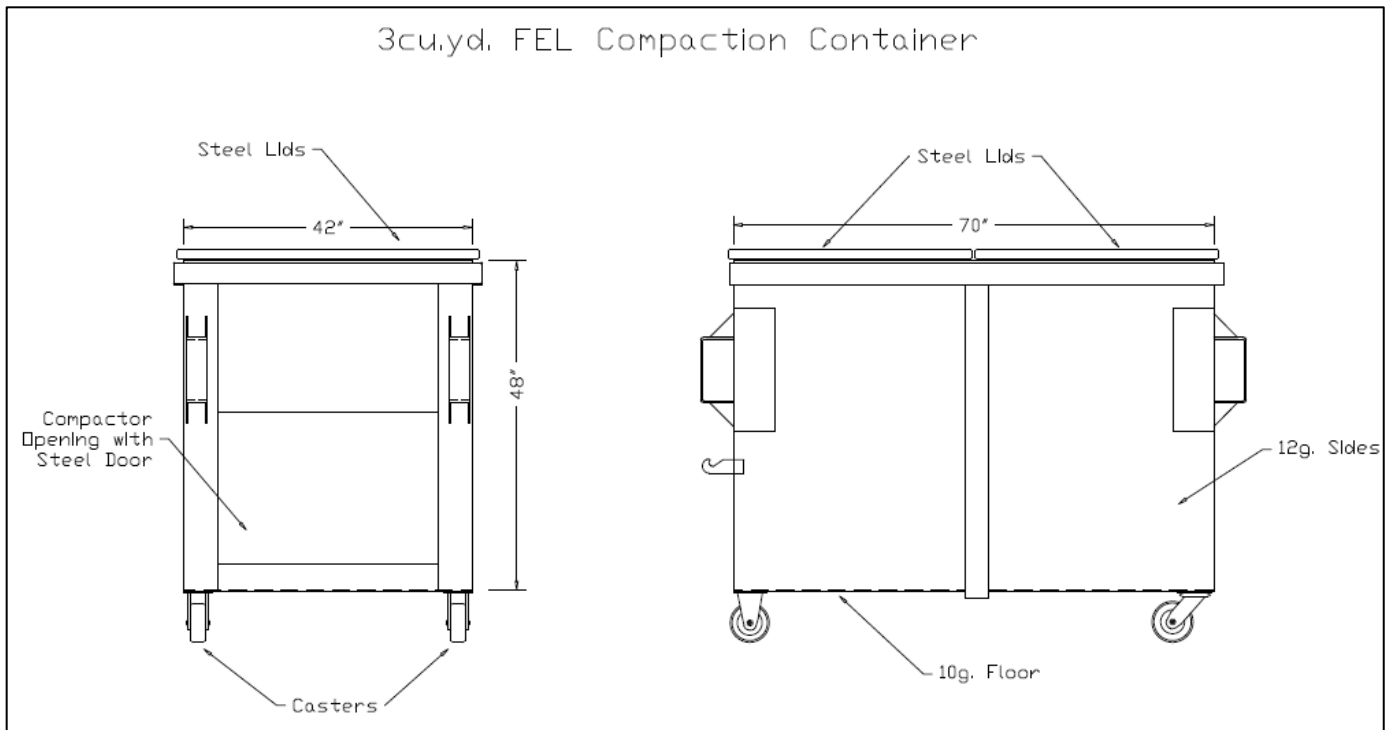


Figure 12: Dimensions of an example 3 cubic yard front-end bin. Please note the exact height and width dimensions will vary by manufacturer and model although the length will be relatively consistent to ensure that all bins are compatible with the standard collection trucks. Note that the above length measurement does not account for the pockets positioned on either side of the unit that the truck's forks connect to when lifting the bin. These will be around 6 inches on each side, bringing the total length to about 82 inches, although exact dimensions will vary by manufacturer. Additionally, the height shown does not account for the wheels, which will add another 6-8 inches to the height, or the lid, which will add another 2 inches or so (for a total height of up to 58 inches).

## Appendix C: 32- to 95-Gallon Totes (Retail Sites)

For the retail spaces organics collection will need to be done with either 32- or 64-gallon totes as private waste haulers in the GTA region do not have trucks set up to service front-end bins with organics.

32-gallon totes are the more common option used by waste haulers and are recommended as they are easier to move around by hand. The 64-gallon totes can be used also but can get too heavy if full of particularly dense organics material (potentially over 300 lbs including the weight of the tote itself).

These organics totes are typically provided by the waste hauler as part of the organics service and will not need to be purchased by the property directly.

95-gallon totes should not be used for organics as they will be much too heavy if full of particularly dense organic material, exceeding the weight capacity of the plastic bin and being too heavy to be moved without mechanical assistance. 95-gallon totes can be used for food and beverage container recycling but are likely too narrow to efficiently accommodate cardboard boxes.

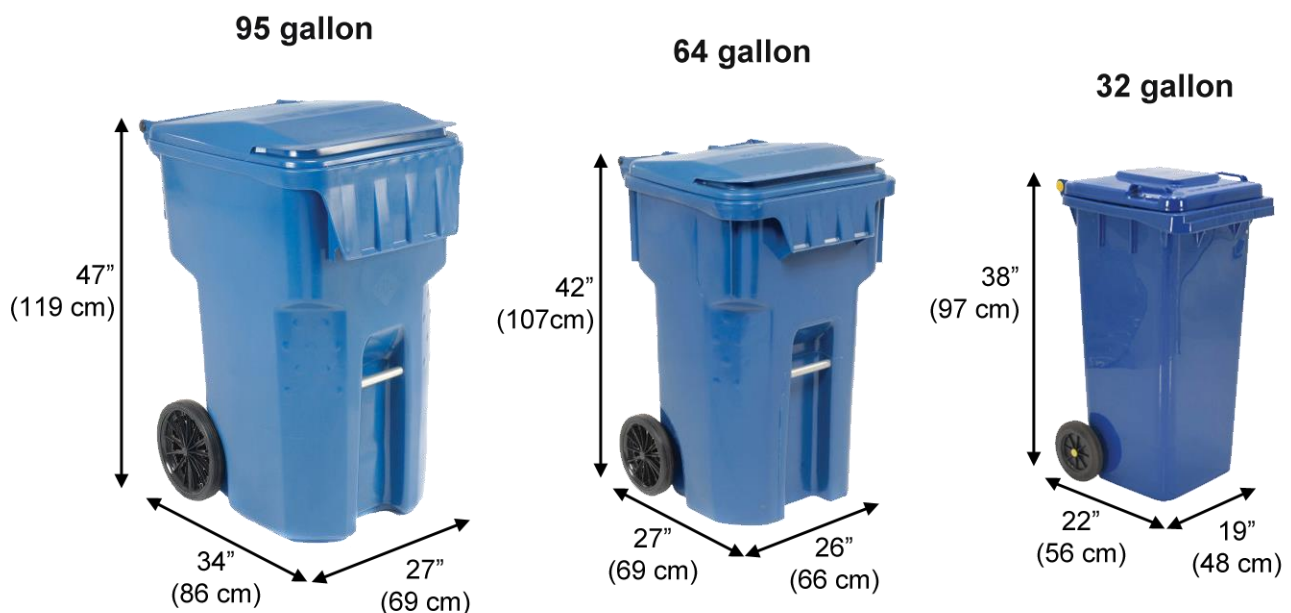


Figure 13: Common dimensions of 32-, 64- and 95- gallon totes. Note that different models may vary from the above dimensions.

To ensure most models can be accommodated it is recommended that space allocations assume a footprint of 2 ft. x 2 ft. for 32-gallon totes, 2.5 ft. x 2.5ft. for 64-gallon totes, and 3 ft. x 3ft. for 95-gallon totes. This allows for a couple of inches between each tote to allow easier access to them and ensures that the site will be able to accommodate almost all different models of these totes.