TECHNCIAL MEMORANDUM

ISSUED FOR USE

To:	Kings Mill Development Inc.	**Date:**	June 2, 2023
c:		**Memo No.:**	01
From:	David Walmsley, Walmsley Environmental	**File:**	WE2023-08
Subject:	Waste Management Plan for the Proposed Development at 150 Rutherford Road, Mississauga, Ontario		

1.0 INTRODUCTION

Walmsley Environmental (WE) in association with RWDI Air Inc. (RWDI) was retained by Kings Mill Development Inc. (Kings Mill) to prepare a Waste Management Plan (Plan) to support the development at 150 Rutherford Road, Mississauga ON.

Approval of the application will require that the Region's Waste Management staff sign off on a Waste Management Plan for the development which outlines how the system and infrastructure for the transfer, storage, staging and collection of Blue Box (BB) recyclables and mixed waste will be designed and operated in compliance with Peel's Waste Collection Design Standards Manual, 2020 (WCDSM). In accordance with the Standards Manual, the Region will provide front-end collection of recyclables and garbage subject to the following conditions:

Identified vehicle access and egress routes.

Minimum turning radius of 13 metres (m) from the centre line of turns on the internal laneways.

Minimum internal roadway width of 6 m.

Minimum straight head-on approach to the collection point of 18 m.

Minimum clear height of 7.5 m from the concrete pad comprising the floor of the collection point which must be clear of sprinkler systems and ducts and should be large enough to accommodate the set-out of the required number of bins without jockeying being required for collection.

An area of 10 m^2 for both the storage and set out of bulky items.

Enough space for the storage of both Blue Box (BB) recyclables and garbage bins.

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The Plan, outlined herein, presents the calculated waste material quantity and characteristics that are anticipated to be generated from the development and presents a preliminary plan for the storage and collection of the generated waste materials in compliance with the Region's Waste Collection Design Standards.

1.1 Summary Description of Proposed Development

The development will consist of a high-density residential complex comprised of a 10-storey building containing 301 residential units together with an underground parking facility. Development of the WMP at this stage of the land use approvals process is critical in ensuring that the preliminary design of the complex considers all the factors for the effective, safe development of infrastructure and transfer protocols for the management of residential solid waste which will be acceptable to the Region of Peel.

1.2 Objectives of the Waste Management Plan

The objectives of the Plan are as follows:

To calculate the volume of BB recyclables and garbage that will be collected from residences in the complex once developed.

To determine the number of bins required to provide for the storage and collection of wastes from the building.

To develop a plan, with accompanying drawings in pdf and CAD format, for the receipt, transfer, set out and collection of wastes that provides for the efficient and effective storage, transfer and transport of these materials on each collection day. The drawings illustrate the waste receipt and storage room located on the P1 level of the development, the transfer of recyclables and garbage to the external and shielded staging and collection facility. The Plan will include a drawing which depicts the on-site routing for the collection vehicle including direction and turning radii.

To identify the storage staging and collection of oversized materials within a designated 10m^2 area within both the storage room and the collection facility.

The quantity of waste material, in kg/hh/year, was obtained from the Region of Peel's Waste Management Department. Data on the composition of the waste generated from multi-residential households was obtained from the Continuous Improvement Fund (CIF) Project No.872: "Multi-Residential Audits & Superintendent Training, City of Toronto, 2016". This data was used to calculate anticipated volumetric requirements for the storage of generated materials, as well as for staging prior to collection.

2.0 MATERIAL QUANTITIES, COMPOSITION AND VOLUME

As a first step in the design of the Plan for the development, the quantity of waste materials generated from the residential suites was calculated for BB recyclables and mixed waste. The Region does not require the collection of source-separated organics (SSO) from multi residential developments. Our volumetric calculations, therefore, have been completed for just the BB recyclables and mixed waste (garbage) streams. The garbage stream can be compacted. This will significantly reduce the volume of these materials and, therefore, the number of bins needed for storage, transfer, and collection.

Please be advised that a table is included in the Region's WCDSM, 2020, which identifies the number of 3 yd and 4 yd waste bins needed to accommodate the materials from a specified number of residential units in a multi-residential development. We understand that the data used to establish this information is somewhat dated. The methodology described in the following sections was developed by our team three years ago based on Peel's monitoring data for the generation of Blue Box recyclables, organics, and mixed waste. The calculations undertaken are based on data and factors that are generally accepted in the solid waste sector. We have found that the results have provided an acceptable basis for the waste management planning exercise at this stage in the development-approval process.

2.1 Material Quantities and Composition

The proposed development will create a high-density, residential community comprised of condominium, apartment residences. The quantity of waste generated by each household in a high-density multi-residential community has been identified by the Region in the most-recent year of its annual waste-generation monitoring program (2021) to be 681 kg/hh.

The Region's data has been broken down into total Blue Box (BB) recyclables (fibers, containers, etc.) organics and mixed waste (garbage). Over the 10-year period provided by the Region's data, the composition of the materials has been comprised of about 20% BB recyclables and 80% mixed waste including organics. For the purposes of this Plan, we have projected that the diversion of recyclables from the waste stream will increase to 30%. The quantity of BB recyclables, therefore, would equal 205 kg. per household/year and the quantity of mixed waste would equal 478 kg. per / household.

According to subsection 3.5 (c) of Peel's By-Law to regulate the collection of waste (By-Law 35-2015) the Region collects mixed waste twice per week from multi-residential complexes on the scheduled collection days and according to subsection 3.6 (a) BB recyclables are collected on a weekly basis. The amount of each material type that would be generated on a weekly basis from each apartment suite or household (hh) in the development was determined by multiplying the annual total (in kg.) by the projected % composition and dividing that by 52 weeks.

The calculations are as follows:

BB recyclables, (681 x 0.30/52) = 4 kg / hh/ weekly collection.

Mixed waste, (681 x 0.70/52) = 9.2 kg /hh/ week or about 5 kg / hh per twice-weekly collection.

The quantity of recyclables and mixed waste generated per collection day from the building is as follows:

- BB recyclables: (4 kg/hh/week x 301 hh) = 1,204 kg/weekly collection.
- Mixed waste: (5 kg/hh/collection x 301 hh) = 1,505 kg/collection

These calculations have been used in the volumetric analyses provided in the following section of this Plan.

2.2 Material Volume Calculations

The volume requirements for storage/collection containers for BB recyclables and mixed waste were determined by dividing the weekly amount for recyclables by a density factor for these materials of 70 kg/m^3 and the twice-weekly amount for mixed waste by an uncompacted density factor of 130 kg/m^3 then multiplying by 1,000 to generate a required volume in litres (L). The density factors are based on recently published data. The density of compacted mixed waste was also calculated based on a density factor of 500 kg/m^3.

The calculations are as follows:

- BB recyclables: (1,204/70) x 1,000 = 17.200 L/weekly collection.
- Uncompacted mixed waste: (1,505/130) x 1000 = 11,577 L/ week.
- Compacted mixed waste: (1,505/500) x 1000 = 3.010 L/ week.

Since recyclables and garbage collection will be provided by way of front-end loaders, bins are the container of choice for the development. The size of front-end loaded containers is typically expressed as "cubic yards" or "yd". The storage capacity required to accommodate the BB recyclables and mixed waste generated from the suites in the building has been calculated by dividing the volume in L by 765 to convert the value to cubic yards (yd).

- BB recyclables: 17,200 / 765 = 22 yd^3. per weekly collection which would be accommodated by six, 4 yd bins.
- Uncompacted mixed waste: 11,577 / 765 = 15 yd^3 per week or 7.5 yd^3 per twice-weekly collection which would be accommodated by two, 4 yd bins.
- Compacted mixed waste: 3,010 / 765 = 4 yd^3 per week or about 2 yd^3 per twice-weekly collection which would be accommodated by one, 3 yd bin.

An additional recyclables and uncompacted mixed waste bin have been included in the counts to provide for the continued transfer of the material during each collection day.

3.0 MATERIAL HANDLING-DESIGN CONSIDERATIONS

The waste material handling for the proposed development was evaluated based on the material volume calculations outlined in Section 2.2 of this report as well as the associated requirements set forth in the Region's WCDSM.

3.1 Applicable Waste Collection Standards

The design standards applicable to the subject development are summarized in section 1 of this report. In addition, **Section 4** of the WCDSM, which applies to multi-residential complexes, states that:

- Solid waste from the apartments will be collected in a dedicated room, then transferred to a designated garbage staging and collection facility.
- BB recyclables will not be compacted after having been received via the materials chutes.
- Separate chutes will be provided for BB recyclables and garbage unless a single chute can be equipped with an automated mechanical separation system to direct materials into respective front-end bins. These materials will be received in front-end bins in the dedicated "garbage" room located on Level P1 of the development.
- A concealed collection area will be provided on the development property which will be designed and constructed in compliance with the following requirements:
    - A minimum width and depth of 3 m is required for each front-end bin.
    - A minimum of 10 m^2 is required for the storage and staging of bulky items.

3.2 Material Staging and Collection

3.2.1 Staging

Residents in each of the apartment suites will dispose of their BB recyclables and garbage via a chute-based system. As the materials are received in the garbage room, located on Level P1 of the floor plan, they will be directed to either the recycling or mixed waste front-end bins. There is sufficient space provided for the storage of recyclables and uncompacted mixed waste between collections, However, the Plan identifies the number of 4 yd bins needed to accommodate an uncompacted mixed waste stream since there is insufficient space in the receipt/storage room to accommodate a compactor. On each collection day, the bins will be transported, by building management staff, from the storage to the staging/collection facility (refer to the "Storage and Collection Point for Recyclables and Mixed Waste" which accompanies this document).

The waste materials from the residences will be placed at the designated waste staging concrete pad as identified on the above-referenced drawing, before 7:30 a.m. on the designated waste collection day. Waste materials will be set out in the staging area where the bins will have to be jockeyed for collection. The staging area identified on the drawing provides enough space for the bins as well as room for jockeying the bins into position for collection. There is also enough space to accommodate the 10 m^2 area needed to set out bulky items as required by the Region for collection on a Thursday as required.

3.2.2 Collection

The routing of the collection vehicle has been depicted in the above-referenced drawing. It will enter the site from the driveway and immediately turn into the staging and collection facility. Once materials have been collected, the vehicle will back out of the facility and proceed to the exit. A similar pattern would be followed for the collection of bulky items.

4.0 CONCLUSIONS

The subject Waste Management Plan supports the conclusion that the development at 150 Rutherford Road, as proposed, will provide enough space for the storage, staging and collection of BB recyclables and uncompacted mixed waste from the residential suites. The Plan has not accommodated for the management of source-separated organics (SSO) from the residential suites since the Region does not require this for multi-unit residential developments.

5.0 IN CLOSING

We trust this report meets your present requirements.

Respectfully submitted,
Walmsley Environmental

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