

Appendix 11

Waste Management Assessment

Rezoning From “Residential (Group C)2” and “Open Space” Zones to “Residential (Group C)4” Zone for a Proposed Residential Development at Lot Nos. 519 RP (Part) and 520 RP in D.D. 110 and the Adjoining Government Land, Shek Kong, Yuen Long, New Territories

Waste Management Assessment

Prepared for:

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Report No.:

22605-W1 Rev B

Date:

17 October 2025

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1. INTRODUCTION

- 1.1 Westwood Hong & Associates Ltd (WHA) was commissioned to conduct a Waste Management Assessment on the proposed residential development at DD110 on Kam Tin Road in Yuen Long (the “proposed Development”).
- 1.2 This report identifies the key waste management issues arising during construction and operation phase of the proposed Development. The major wastes would be construction and demolition (C&D) materials generated from excavation works. For wastes arising during operation phase of the proposed development would be mainly municipal wastes. Mitigation measures and good site practice, including waste handling, storage and disposal, are recommended with reference to the applicable legislation and guidelines.

2. STATUTORY LEGISLATION

- 2.1 Waste collection and disposal are covered by the Waste Disposal Ordinance (Cap. 354) (WDO). Under the WDO, wastes can only be disposed of at designated waste disposal facilities licensed by EPD. The WDO also stipulates the requirements for issuing licenses for the collection and transportation of wastes. The contractor would be responsible for the disposal of waste.
- 2.2 The following legislation relates to the handling, treatment and disposal of wastes in the Hong Kong SAR and has been used in assessing potential environmental impacts:
 - Waste Disposal Ordinance (Cap. 354)
 - Waste Disposal (Chemical Waste) (General) Regulation (Cap. 354C)
 - Waste Disposal (Charges for Disposal of Construction Waste) (Cap. 354N)
 - Land (Miscellaneous Provisions) Ordinance (Cap. 28)
 - Public Health and Municipal Services Ordinance (Cap. 132) – Public Cleansing and Prevention of Nuisances Regulation
- 2.3 Table 2.1 summarises other documents and guidelines related to waste management and disposal that will be followed by the proposed Development:-

Table 2.1 Other Relevant Documents and Guidelines to be Followed

Bureau / Department	Documents / Guidelines / Technical Circulars
EPD	• Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes • A Guide to the Registration of Chemical Waste Producers • A Guide to the Chemical Waste Control Scheme
CEDD	• CEDD TC No. 11/2019, Management of Construction and Demolition Materials
PlanD	• Environmental Guidelines for Planning in Hong Kong (2014), Hong Kong Planning Standards and Guidelines
Buildings Department	• ADV-19, Practice Note for Authorized Persons, Registered Structural Engineers and Registered Geotechnical Engineers – Construction and Demolition Waste
Development Bureau	• DEVB TC(W) No. 6/2010, Trip Ticket System for Disposal of Construction & Demolition Materials (2010) • Works Branch Technical Circular No. 2/93, Public Dumps

3. ASSESSMENT METHODOLOGY

3.1 The assessment methodology for reviewing the waste management implications during construction and operation phases include:-

- Identification/estimation of the types and quantities of waste arising from Project;
- Addressing impacts caused by handling (including stockpiling, labelling, packaging, and storage), collection, transportation and reuse/disposal of wastes in detail and propose appropriate mitigation measures;
- Adoption of waste management hierarchy with priorities towards waste reduction, on-site or off-site reuse, and recycling;
- Estimation of the types and quantities of wastes required to be disposed of and their disposal method; and
- Assessment of the impacts on the capacity of waste collection, transfer, and disposal facilities.

4. POTENTIAL IMPACTS AND MITIGATION MEASURES DURING CONSTRUCTION PHASE

Quantity of Waste

- 4.1 Since there is no structure at the development site, no demolition works would be involved for the proposed Development. The construction works of the proposed Development mainly include site excavation, site foundation works and superstructure construction.
- 4.2 Construction & Demolition (C&D) materials generated from the construction of the proposed development which comprise inert and non-inert C&D materials. The inert portion, such as soil, rock, concrete etc, namely inert C&D materials, could be reused on-site as filling materials or off-site as public fill at public fill reception facilities. The non-inert portion, such as timber formwork, paper, vegetation, etc, namely non-inert C&D materials will be reused or recycled as far as possible prior to disposal at landfill, and landfill disposal will be considered as the last resort for waste handling. Specifically, timber/woody materials will be sent to Y-Park before disposal at landfill.
- 4.3 The estimated quantity of C&D materials for site excavation, foundation works and superstructure construction are provided in Table 4.1.

Table 4.1 Estimated Quantity of Waste to be Generated

Development Stage	Waste Type	Total Amount Generated (m ³)	Total Amount Reused/ Recycled (m ³)	Total Amount Disposed (m ³)	Recommended Outlets
Site Excavation [1]	Inert C&D Material	5627	5627	-	To be reused on-site for site formation
	Non-Inert C&D Materials	423	13	410	- To be reused on-site for site formation or recycled before disposal to NENT Landfill. - Timber/woody materials to be sent to Y-Park before disposal to NENT Landfill
Site Foundation Work [2]	Inert C&D Material	239	239	-	To be reused on-site for site formation
	Non-Inert C&D Materials	18	13	5	- To be reused on-site for site formation or recycled before disposal to NENT Landfill. - Timber/woody materials to be sent to Y-Park before disposal to NENT Landfill
Superstructure Construction [2] [3]	Inert C&D Material	559	559	-	To be reused on-site for site formation
	Non-Inert C&D Materials	42	29	13	- To be reused on-site for site formation or recycled before disposal to NENT Landfill. - Timber/woody materials to be sent to Y-Park before disposal to NENT Landfill
General Refuse from Workforce	43 tons [4]	-	2 tons	41 tons	To be disposed to NENT Landfill. And the reused part to be collected by recycler.
Chemical Waste	-	A few hundred kilograms / litres per month	-	A few hundred kilograms / litres per month	To be collected by a licensed chemical waste collector and treated in the Chemical Waste Treatment Centre.

Note:

- [1] Development Site Area is 8,580m², only storm water storage tank (5,000m³) and part of the sewerage treatment plant (with area 350m² and 3m below ground) will be located at basement level which required excavation, and will generate mainly excavated soil (inert C&D materials). Excavated sediment is not anticipated.
- [2] According to the Hong Kong Polytechnic (March 1993) Reduction of Construction Waste Final Report, waste generation rate is 0.1m³ per 1m² of GFA constructed. The GFA of the proposed Development is 8,580m², there would be 858m³ total C&D materials generated from building construction (i.e. site foundation work and superstructure construction).
- [3] Wood from formworks and packaging is included in superstructure construction.
- [4] It is assumed that the generation rate of general refuse is 0.65kg per worker per day. With approximately 65 workers and 1,000 construction days, there would be total 42,250kg general refuse generated throughout the construction period.

Construction & Demolition Waste

- 4.4 The reuse and recycling of C&D materials on-site will be maximized. Stockpiling areas of inert C&D materials on-site will be provided for subsequent backfilling and reuse on site. For topsoil, they would be reused for site formation and roadworks. For vegetation, felled trees, twigs and branches would be reused as much on-site as far as possible. The C&D materials to be reused on site would stockpile by enclosing and covering, particularly during inclement weather.
- 4.5 Measures have been introduced in ADV-19 to enhance the management of C&D materials and to minimize its generation at source. The enhancement measures include the identification of opportunities to prevent waste during both the project planning and design stage as well as construction stage, and preparing of a Waste Management Plan (WMP) to ensure that measures are implemented during the construction stage for reduction of C&D materials. The WMP will be submitted to the Project Engineer / Architect / Authorized Persons for approval according to ADV-19.
- 4.6 A trip-ticket system according to the ADV-19 will be implemented during the construction phase to monitor the disposal of C&D materials and solid wastes at the public fill reception facilities and landfills and to control by fly-tipping. All dump trucks engaged on-site for delivery of inert and non-inert C&D material from the site to the designated disposal location, including PFRFs, landfill etc., should be equipped with GPS or equivalent system for tracking and monitoring of their travel routings and parking locations by the Contractor to prohibit illegal dumping and landfilling of materials. The data collected by GPS or equivalent system should be recorded properly for checking and analysis the travel routing and parking locations of dump truck engaged on-site.
- 4.7 The Contractor will adopt good housekeeping practices such as waste segregation prior to disposal. Stockpiling and segregating areas will be provided at the site. Waste storage areas will be well maintained and cleaned regularly.
- 4.8 Whenever there are excess recyclable construction materials, including bricks, plastics and metals, re-use and recycling will be carried out for waste minimisation. Other recyclable inert C&D materials such as concrete, asphalt, etc. will be sorted and treated as necessary for on-site usage. Non-inert C&D materials will be sorted and delivered to or collected by registered recycle collectors for proper recycling of the waste. Specifically, non-inert C&D materials such as timber and woody materials, which would be significantly generated during site clearance since the development site is predominantly rural in character, will be sent to the Yard Waste Recycling

Centre in Y-Park for recycling prior to disposal at the designated landfill site. C&D materials will be stored on-site before re-use or disposal where possible. Available site area to allow on-site sorting and storage areas will be provided at locations away from public areas.

- 4.9 It is presently anticipated that some of the C&D materials will need to be transported off-site for re-use, recycling and disposal by trucks. With the implementation of the dust and noise control / mitigation measures, such as proper handling and packaging of wastes according to good practices and guidelines for different types of waste, covering and stockpiling materials to avoid dust and other nuisance impacts from truck movements, these secondary environmental factors are not expected to be a concern.
- 4.10 The storage, handling, transport and disposal of all C&D materials, if not managed properly, would have the potential to create visual, dust and water quality impacts. With proper implementation of good construction site practice and mitigation measures recommended in above sections, potential dust, noise and water quality impacts associated with on-site handling and transportation of all C&D materials are not anticipated.

Chemical Waste

- 4.11 Chemical waste from maintenance and servicing of construction equipment/ plant may be generated. If chemical waste is produced, the Contractor would be required to register with the EPD as a Chemical Waste Producer, and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes.
- 4.12 Appropriate containers with proper labels should be used for storage of chemical wastes. Chemical wastes should be collected and delivered to designated outlet by a licensed collector. Chemical wastes (i.e. limited to spent lubricant oil) should be recycled at an appropriate facility as far as possible, while the chemical wastes that cannot be recycled should be disposed of at either the Chemical Waste Treatment Centre (CWTC) at Tsing Yi, or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.
- 4.13 Any unused chemicals or those with remaining functional capacity should be collected for reuse as far as possible.

General Refuse

- 4.14 General refuse such as food scraps, wastepaper, empty containers, etc. would be generated from the workforce during construction phase. Such refuse will be properly managed so intentional or accidental release to the surrounding environment does not occur. Effective collection of site wastes would be required to prevent waste materials from being blown around by wind, flushed or leached into nearby waters, or creating an odour nuisance or pest and vermin problem. Specifically for food waste, which is the main source of generating unpleasant odour and causing environmental hygiene concern, it would be classified as recyclables and separated from other waste, in order to facilitate the recycling of food waste on-site and off-site. Waste storage areas will be well maintained and cleaned regularly. Table 4.1 shows the estimated quantity of general refuse from workforce to be generated during the construction phase. Recycling will be conducted for the general refuse prior to landfill disposal.
- 4.15 General refuse will be stored in enclosed bins or compaction units separate from C&D materials. A reputable waste collector will be employed by the Contractor to remove general refuse from the Site, separately from C&D materials. Preferably an enclosed and covered area will be provided to reduce the occurrence of “windblown” light materials.
- 4.16 With the implementation of the recommended waste management practices at the site, no adverse environmental impact arising from the storage, handling and transportation of refuse is anticipated.

5. POTENTIAL IMPACTS AND MITIGATION MEASURES DURING OPERATION PHASE

- 5.1 The proposed Development consists of 6 residential low-rise blocks and clubhouses, the major type of wastes generated from the operation phase is general refuse. General refuse will be removed on regular basis to minimize odour, pest and litter impacts. Recycling would be proposed prior to landfill disposal. To promote recycling of wastepaper, aluminum cans and plastic bottles, the recycling bins (such as those available from EPD) will be clearly labelled and placed at convenient locations. The recyclable materials will then be collected by reliable waste recycling agents on a regular basis. Waste generated will be disposed to public landfill, either West New Territories Landfill or North East New Territories Landfill.
- 5.2 Based on the Monitoring of Solid Waste in Hong Kong – Waste Statistics for 2023, the municipal solid waste disposed per capita per day was 1.44 kg/person/day, and the municipal solid waste generated per capita per day was 2.15 kg/person/day. The proposed Development consists of 6 residential low-rise blocks with building height of 6 storeys, with a total of 240 residential units. The estimated overall population intake in the proposed Development will be around 648 persons, which is derived by assuming 2.7 persons per flat as per the average household size in the 2021 Population Census published by the Census and Statistics Department. Including the employment population with approximately 100 persons, the estimated quantities of municipal solid waste anticipated during the operation phase will be 1,608 kg/day. According to the Plate 3.2 of Waste Statistics for 2023, the recovery rate of municipal solid waste is 33%. It is therefore estimated that 33% of municipal solid waste (i.e. 531 kg/day) could be reused and recycled.

6. CONCLUSION

- 6.1 With the implementation of control measures in Sections 4 and 5, adverse waste management implication is not anticipated during construction and operation phases.