

## 8. Waste Management Implication

### 8.1 Introduction

This section identifies the potential waste arising from the construction and operation activities of the Project and evaluates the potential environmental impacts that may result from waste generated. Mitigation measures and good site practices, including waste handling, storage and disposal, are recommended with reference to applicable waste legislation and management guidelines to minimise potential waste management impacts.

### 8.2 Waste Management Legislations, Standards and Guidelines

#### 8.2.1 Environmental Impact Assessment Ordinance

The criteria and guidelines for assessing waste management implications are outlined respectively in Annexes 7 and 15 of the EIAO-TM.

The following legislation relates to the handling, treatment and disposal of wastes in Hong Kong and has been used in assessing potential impacts:

- Waste Disposal Ordinance (Cap. 354)
- Waste Disposal (Chemical Waste) (General) Regulation (Cap. 354C)
- Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N)
- Public Health and Municipal Services Ordinance (Cap. 132) - Public Cleansing and Prevention of Nuisances Regulation
- Land (Miscellaneous Provisions) Ordinance (Cap. 28)

#### 8.2.2 Waste Disposal Ordinance

The Waste Disposal Ordinance (WDO) prohibits the unauthorised disposal of wastes. Construction waste is defined as any substance, matter or thing that is generated from construction work and abandoned, whether or not it has been processed or stockpiled before being abandoned, but does not include any sludge, screenings or matter removed in or generated from any desludging, desilting or dredging works. Under the WDO, wastes can be disposed of only at designated waste disposal facilities.

#### 8.2.3 Waste Disposal (Chemical Waste) (General) Regulation

Under the WDO, the Chemical Waste (General) Regulation provides regulations for chemical waste control, and administers the possession, storage, collection, transport and disposal of chemical wastes.

According to the Waste Disposal (Chemical Waste) (General) Regulation, all producers of chemical waste must register with EPD and treat their wastes, either utilising on-site plant licensed by EPD, or arranging for a licensed collector to transport the wastes to a licensed facility. The Regulation also prescribes the storage facilities to be provided on site, including labelling and warning signs, and requires the preparation of

written procedures and training to deal with emergencies such as spillages, leakages or accidents arising from the storage of chemical wastes.

The EPD has also issued a 'guideline' document, the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes (1992), which details how the Contractor should comply with the regulations on chemical wastes.

#### **8.2.4 Waste Disposal (Charges for Disposal of Construction Waste) Regulation**

Under the Waste Disposal (Charges for Disposal of Construction Waste) Regulation, enacted in January 2006, construction waste delivered to a landfill for disposal must not contain more than 50% by weight of inert material. Construction waste delivered to a sorting facility for disposal must contain more than 50% by weight of inert material, and construction waste delivered to a public fill reception facility for disposal must consist entirely of inert material.

#### **8.2.5 Public Health and Municipal Services Ordinance**

The Public Cleansing and Prevention of Nuisances Regulation provides control on illegal tipping of wastes on unauthorised (unlicensed) sites.

#### **8.2.6 Land (Miscellaneous Provisions) Ordinance**

The Land (Miscellaneous Provisions) Ordinance requires that dumping licenses be obtained by individuals or companies who deliver public fill to public filling areas. The CEDD issues the licences under delegated powers from the Director of Lands. The current policy related to dumping of C&D material is documented in the Works Branch Technical Circular No. 2/93 – Public Dumps. C&D materials that are wholly inert, namely public fill, should not be disposed of to landfill, but taken to fill banks or public filling areas.

### **8.3 Assessment Methodology**

The criteria for assessing waste management implications are outlined in Annex 7 of the EIAO-TM. The methods for assessing potential waste management impacts during construction and operation phases of the Project follow those presented in Annex 15 of the EIAO-TM and include the following:

#### **8.3.1 Analysis of Activities and Waste Generation**

- Identify the quantity, quality and timing of waste arising as a result of the construction and operation activities of the Project;
- Adopt appropriate design, general layout, construction methods and programme to minimise the generation of inert C&D materials and maximise the use of inert C&D materials for other construction works.

#### **8.3.2 Development of Proposals for Waste Management**

- Prior to considering the disposal options for various types of wastes, opportunities for reducing waste generation, on-site or off-site re-use and recycling should be fully evaluated.
- Identify measures / proposals for potential floating refuse issues

- Estimate the types and quantities of the wastes required to be disposed of.
- Identify the disposal methods / options for each type of waste.
- Identify the transportation routings and the frequency of the trucks/vessels involved.
- Assess the potential impacts from the management of solid waste with respect to potential hazards, air and odour emissions, noise, wastewater discharges, ecology and public transport.

## **8.4 Identification, Prediction and Evaluation of Environmental Impact**

### **8.4.1 Construction Phase**

The activities to be carried out for construction of the Project would generate a variety of wastes that can be divided into different key categories based on their composition and ultimate method of disposal. The identified waste types include:

- Construction and demolition (C&D) materials;
- Chemical waste;
- General refuse; and
- Floating Refuse

Each type of the above waste arising is described below, together with an evaluation of the potential environmental impacts associated with the waste generation, handling, storage, transport and disposal.

A recent site investigation (SI) has been carried out and no marine sediment was identified in any boreholes within the Project area. As confirmed by the engineering scheme design, the lowest excavation level of basement is +7 mPD, which is above the original sea bed level, therefore, no excavation/ dredging of sediment will be encountered in this Project.

#### **8.4.1.1 Construction and Demolition (C&D) Materials**

##### Key sources of C&D materials

It is anticipated that the majority of C&D materials will be generated from the following key construction activities:

- Cutting / excavation on the hill slopes for the new section of the Emergency Vehicular Access Road (EVA);
- Excavation of ground for foundation works;
- Site formation works;
- Building construction and superstructure works.

### ***C&D Materials from Excavation, Foundation and Site Formation***

The excavation, foundation and site formation works will be the major source of C&D materials generated by the Project. It is estimated that the total amount of C&D materials to be generated would be approximately 86,300 m<sup>3</sup>, in which about 13,900 m<sup>3</sup> would be rock, and about 71,900 m<sup>3</sup> would be soil and the remaining 500 m<sup>3</sup> would be non-inert C&D material, as shown in **Table 8.1**. The C&D material is mainly generated from excavation, foundation and site formation in year 2014 to 2016.

### ***C&D Materials from New Building Construction***

C&D materials will also be generated from construction of new buildings and other superstructures. The C&D materials arising from the construction works will comprise inert (brick, broken concrete, soil etc.) and non-inert (packaging material, paper, wood etc.) materials.

It is estimated that the total amount of C&D materials to be generated would be approximately 12,000 m<sup>3</sup>, in which about 8,500 m<sup>3</sup> would be soil, about 1,500 m<sup>3</sup> would be broken concrete, bricks and the remaining 2,000 m<sup>3</sup> would be non-inert C&D material, as shown in **Table 8.1**. The C&D material is mainly generated from construction of buildings and superstructures in year 2015 to 2017.

Table 8.1: Estimated of C&D Materials to be Generated by the Project

Key Sources of C&D Materials	Estimated Quantity of Inert C&D Materials Generated ( in-situ volume, m <sup>3</sup> )			Estimated Quantity of Non-inert C&D Materials Generated ( in-situ volume, m <sup>3</sup> )
	Soft Materials (e.g. soil)	Rocks	Hard Materials (e.g. broken concrete, brick, etc.)	
Excavation of hill slopes, foundation and site formation	71,900	13,900	0	500
New building construction and superstructure works	8,500	0	1,500	2,000
<b>Total</b>	<b>80,400</b>	<b>13,900</b>	<b>1,500</b>	<b>2,500</b>

### On-site reuse of C&D materials as fill materials

The inert materials should be segregated from the C&D materials on-site for reuse as far as practicable. In order to minimise the impact resulting from collection and transportation of C&D material for off-site disposal, the C&D material that could be reused on-site as fill materials as far as practicable. It is estimated that the Project would require a total of 23,300 m<sup>3</sup> of fill materials for construction phase as shown in **Table 8.2**.

It should be noted that temporary stockpiling of the inert C&D materials generated from 2014 to 2016 would be required in order to facilitate the subsequent reuse of such materials. The indicative location of temporary stockpiling area is shown in **Figure 8.1**.

### Off-site reuse or disposal of surplus C&D materials

The surplus inert C&D materials generated could be reused by other projects in Hong Kong. During the detailed design stage, further alternative disposal arrangement (e.g. other potential projects that could receive inert C&D materials from the Project) shall be continuously explored and identified. If no potential

projects could receive the surplus inert C&D materials, the remaining inert C&D materials could be disposed of at the Government's Public Fill Reception Facilities (PFRFs) for beneficial use by any other projects in Hong Kong. Hence, the forecast quantities for yearly generation, on-site reuse and disposal of inert C&D materials at PFRFs are as summarised in **Table 8.2** below.

Taking the peak yearly amount of surplus materials requiring off-site delivery at 2015, it is estimated that up to around 29 vehicle-trips per day would be needed for off-site delivery of the surplus inert C&D materials by dump trucks (each with a loading capacity of about 6 m<sup>3</sup>) via Wong Chuk Hang Road. Given this small daily number of vehicle-trips, the extra traffic loading on Wong Chuk Hang Road would be negligible.

Table 8.2: Estimates of Surplus Inert C&D Materials to be Re-used On-site and Delivered Off-site

Year	Estimated Amount of Inert C&D Materials to be Generated by the Project (in-situ volume, m <sup>3</sup> )	Inert C&D Materials to be Reused On-site (in-situ volume, m <sup>3</sup> )	Surplus C&D Materials to be Delivered Off-site (in-situ volume, m <sup>3</sup> )
2014	21,500	5,700	15,800
2015	71,300	17,100	54,200
2016	2,000	500	1,500
2017	1,000	0	1,000
<b>Total</b>	<b>95,800</b>	<b>23,300</b>	<b>72,500</b>

Liaison with the CEDD Public Fill Committee (PFC) on the management of C&D materials will be required before the commencement of construction work. No construction work is allowed to proceed until all issues on management of C&D materials have been resolved and all relevant arrangements have been endorsed by the relevant authorities including PFC and EPD.

The Contractor should separate the non-inert C&D materials from the inert C&D materials on-site. Any recyclable materials (e.g., metal) should be segregated from the non-inert C&D materials for collection by reputable licensed recyclers. The remaining non-recyclable waste materials will be disposed of at designated landfill sites by a reputable licensed waste collector.

The non-inert C&D materials (with the recyclable materials segregated for recycling) will be delivered to designated landfill sites by dump trucks through Wong Chuk Hang Road. With a loading capacity of about 6 m<sup>3</sup> per dump truck, it can be estimated that up to about 1 vehicle-trip per day would be required for delivery of the non-inert C&D materials, which would not impose significant traffic loading on Wong Chuk Hang Road. The storage, handling, transport and disposal of non-inert C&D materials, if not managed properly, would have the potential to create visual, dust and water quality impacts.

With careful planning for reuse of C&D materials on-site and proper implementation of good construction site practice and mitigation measures recommended, potential dust, noise and water quality impacts associated with on-site handling and transportation of C&D materials are not anticipated.

#### 8.4.1.2 Chemical Waste

Chemical wastes arising during the construction phase may pose environmental, health and safety hazards if not stored and disposed of in an appropriate manner as stipulated in the Waste Disposal (Chemical Waste) (General) Regulations. The potential hazards include:

- Toxic effects to workers;

- Adverse impacts on water quality from spills; and
- Fire hazards.

The maintenance and servicing of construction plant and equipment may generate some chemical wastes such as used solvents, contaminated rags and waste lubricating oil. It is difficult to quantify the amount of chemical waste that will arise from the construction activities since it will be dependent on the Contractor's on-site maintenance requirements and the amount of plant utilised. However, it is anticipated that the quantity of chemical waste, such as waste lubricating oil and solvents produced from plant maintenance, will be small and in the order of a few cubic metres per month. The amount of chemical waste to be generated will be quantified in the Waste Management Plan to be prepared by the Contractor for the site.

Materials classified as chemical wastes will require special handling and storage arrangements before removal for off-site disposal at the approved Chemical Waste Treatment Facility or recycling by licensed facilities. Mitigation and control requirements for chemical wastes are detailed in **Section 8.5.1.4**. Provided that the handling, storage and disposal of chemical wastes are in accordance with these requirements, adverse environmental impacts are not expected.

#### 8.4.1.3 General Refuse

The construction workforce will generate refuse comprising food scraps, waste paper and empty containers etc. Such refuse will be properly managed so that intentional or accidental release to the surrounding environment will be avoided. Disposal of refuse at sites other than approved waste transfer or disposal facilities will be prohibited. Effective collection of site wastes will be required to prevent waste materials being blown around by wind, flushed or leached into the marine environment, or creating an odour nuisance or pest/ vermin problem. Waste storage areas will be well maintained and cleaned regularly. The daily arising of general refuse from the construction workforce can be estimated based on a generation rate of 0.65 kg per worker per day.

The maximum number of construction workers to be employed for each year from 2014 is stated in **Table 8.3**. Based on a generation rate of 0.65 kg per worker per day, the maximum daily arising of general refuse during the construction period would be approximately 260 kg and this waste can be effectively controlled by normal measures. Corresponding to this maximum daily volume, up to around 1 vehicle-trip per day would be needed for delivery of the general refuse by dump trucks (each with a loading capacity of about 6 m<sup>3</sup>) to the designated landfill sites via Wong Chuk Hang Road. Given this small daily number of vehicle-trips, the extra traffic loading on Wong Chuk Hang Road would be negligible.

Table 8.3: Estimation of Maximum Number of Construction Workers during Construction Phase

Construction Year	Maximum Number of Construction Workers	Maximum Daily Arising of General Refuse (kg/day)
2014	100	65
2015	400	260
2016	400	260
2017	50	33

With the implementation of good waste management practices at the site as detailed in **Section 8.5.1.5**, adverse environmental impacts are not expected to arise from the storage, handling and transportation of the general refuse from construction workforce.

#### 8.4.1.4 Floating Refuse

Floating refuse may wash up onto the Project area through the effect of currents and wind, with waste then trapped and accumulated on the artificial seawall. According to the current condition of seawall, the shoreline is clean and free from floating refuse. The floating refuse wash up onto the Project area is negligible.

During construction phase, the construction workforce may also generate floating refuse while working along the coast area, i.e. food scraps, waste paper and empty containers etc. Such refuse will be properly managed so that intentional or accidental release to the surrounding environment will be avoided. Disposal of refuse at sites other than approved waste transfer or disposal facilities will be prohibited. Proper education to the construction workforce and provide general refuse collection points on site can minimise the refuse contaminate the marine environment. With the proper education and regular checking of any refuse trapped or accumulated along the artificial seawall, no adverse environmental impacts associate with floating refuse are anticipated.

#### 8.4.1.5 Summary

**Table 8.4** presents a summary of all key types of waste arising during the construction phase of the Project. **Table 8.5** presents a summary of the methods by which wastes arising are avoided or reduced through consideration of alternative design options and / or construction methods.



Table 8.4: Summary of Waste Arising during Construction Phase

Waste Type	Key Sources of Waste Generation	Timing of Waste Generation	Estimated Quantity of Waste Generation	Waste Reuse or Disposal
Inert C&D Materials	Excavation of hill slopes, foundation and site formation; new building construction and superstructure works	Tentatively from 2014 to 2017	About 95,800 m <sup>3</sup> in total	About 23,300 m <sup>3</sup> of the inert C&D materials generated would be reused on-site as fill materials.  The remaining 72,500 m <sup>3</sup> would be delivered off-site to any identified projects that would need fill materials and/or to the government's PFRF for beneficial use by other projects in Hong Kong
Non-inert C&D Materials	Excavation of hill slopes, foundation and site formation; new building construction and superstructure works	Tentatively from 2014 to 2017	About 2,500 m <sup>3</sup> in total	The non-inert C&D material will be disposal of at landfills after on-site sorting and segregation of recyclable materials
General Refuse	Food scraps, waste paper, empty containers, etc. generated from the site workforce	Tentatively from 2014 to 2017	0.65 kg per worker per day, the maximum daily arising of general refuse during the construction period would be approximately 260 kg	Encourage segregation of recyclable materials (e.g., paper, tin-cans, etc.) for collection by outside recyclers  Refuse station for compaction and containerisation and then to landfill for disposal
Chemical Waste	Used cleansing fluids, solvents, lubricating oil, waste fuel, etc., from maintenance and servicing of construction plant and equipment	Tentatively from 2014 to 2017	Anticipated as small quantity To be quantified in the site Waste Management Plan to be prepared by the Contractor	Disposal of at the Chemical Waste Treatment Centre or other licensed recycling facilities
Floating Refuse	Floating refuse trapped or accumulated in the artificial seawall	Tentatively from 2014 to 2017	Negligible	Collection by a reputable waste collector for disposal at designated landfill (if any)sites

Table 8.5: Summary of Waste Avoidance / Reduction through Alternative Design Options / Construction Methods

Design / Works Component	Design Option / Construction Segment	Waste Avoidance / Reduction Mechanism
EVA	Adoption of the existing EVA as far as practicable	Minimise site excavation for new sections EVA and minimise the amount of excavated materials to be generated
Building structures	Placement of fill in areas where proposed building structure is above existing ground level.	May utilise cut material generated from construction as fill material
Excavation of hill slopes	Earth retaining structures and temporary cut slopes	Small volumes of excavation is required to minimise waste generation.



Design / Works Component	Design Option / Construction Segment	Waste Avoidance / Reduction Mechanism
Excavation works	Excavation lateral support system	Excavation extent and potential ground water intrusion is minimised by the use of diaphragm wall
Superstructure works	Precast concrete	Less C&D waste will be generated. Construction of concrete panels is carried out off-site and potential environmental impact could be minimised

#### 8.4.2 Operation Phase

The Project is anticipated to involve the following waste generating activities during operation phase:

- Recreational activities;
- Retail stores within the Project; and
- Restaurants within the Project.

The following types of wastes would be generated from abovementioned activities:

- General refuse;
- Chemical waste; and
- Floating refuse.

Each type of the above waste arising is discussed below:

##### 8.4.2.1 General Refuse

General refuse (such as food scraps, waste paper, empty containers and packaging, etc.) from operation of the Project will mainly be generated from recreational activities, retail stores and restaurants within the Project. Such refuse will be properly managed by suitable waste collectors so that intentional or accidental release to the surrounding environment will not occur.

The amounts of general refuse generation during the operation phase have been preliminarily estimated based on the population intake estimates prepared for the Development Plan of the Project, and are summarised in **Table 8.6**.

Table 8.6: Estimation of General Refuse Generation during Operation Phase

Item	Population intake estimate	Waste classification <sup>(1)</sup>	Per capita disposal rate <sup>(2)</sup>	Estimated Waste Generation
Daily Average of Visitors	4,655	Commercial waste	0.33 kg/ person/ day*	1,536 kg/day
Total Employment Population	1,602	Commercial waste	0.33 kg/ person/ day*	529 kg/day

Source: (1) Appendix 1: Classification of Solid Waste and Monitoring Methodology, in *Monitoring of Solid Waste in Hong Kong – Waste Statistic for 2011*

(2) Plate 2.1 and Plate 2.7, in *Monitoring of Solid Waste in Hong Kong – Waste Statistic for 2011*

Note: \*Calculated from percentage of commercial waste over total municipal solid waste, based on municipal solid waste disposal rate

Corresponding to this waste volume and with a loading capacity of about 12 ton per refuse collection vehicle (RCV), it can be estimated that up to around 1 vehicle-trip per day would be needed for delivery of the general refuse by RCV to the designated landfill sites, which will be via Wong Chuk Hang Road. Given this small daily number of vehicle-trips, the extra traffic loading on Wong Chuk Hang Road would be negligible.

Storage of general refuse would generate odour nuisance and visual impact if they are not managed in a proper manner. Vermin and pests may also be attracted if the waste containers are not cleaned or maintained properly and frequently. Therefore, the general refuse should be temporarily stored in proper containers with covers to avoid adverse impact to the surroundings. To reduce waste and improve recycling, it is expected that waste such as waste paper, plastics and aluminium can be segregated for off-site recycling. A reputable licensed waste collector should be employed to collect the general refuse daily for disposal at designated landfill sites. With proper implementation of waste management practices, the environmental impact from handling and disposal of general refuse would not be anticipated.

#### **8.4.2.2 Chemical Waste**

Chemical waste will be generated from various routine maintenance and servicing activities for air conditioning system, emergency generators and other electrical and mechanical equipment. Chemical waste such as waste lubricating oil, contaminated rags, waste paint, used solvents and spent chemicals are expected to be generated from these activities. It is difficult to quantify the amount of chemical waste that will arise from those activities at this stage since it will be dependent on the equipment maintenance requirements and the amount of equipment utilised.

Chemical wastes arising during the operation phase may pose environmental, health and safety hazards if not stored and disposed of in an appropriate manner as stipulated in the Waste Disposal (Chemical Waste) (General) Regulations. The potential hazards include:

- Toxic effects to workers;
- Adverse impacts on water quality and wildlife from spills; and
- Fire hazards.

Chemical wastes will require special handling and storage arrangements in accordance with the relevant regulations before off-site disposal at the approved Chemical Waste Treatment Facility or recycling by licensed facilities. Mitigation and control requirements for chemical wastes are detailed in **Section 8.5.2.2**. Provided that the handling, storage and disposal of chemical wastes will be in accordance with these requirements, adverse environmental impacts will not be expected.

#### **8.4.2.3 Floating Refuse**

Floating refuse may wash up onto the Project area through the effect of currents and wind, with waste then trapped and accumulated on the artificial seawall of the Project boundary. According to the current condition of seawall, the shoreline is clean and free from floating refuse. Therefore, it is anticipated that the floating refuse wash up onto the Project area during operation phase is anticipated to be negligible.

General refuse collection containers will be provided to minimise the refuse contaminate the marine environment. With the implementation of mitigation measures and regular checking of any refuse trapped or accumulated along the artificial seawall, no adverse environmental impacts associate with floating refuse are anticipated.

## **8.5 Mitigation of Adverse Environmental Impact**

### **8.5.1 Construction Phase**

#### **8.5.1.1 Good Site Practices**

Adverse impacts related to waste management such as dust, odour, noise and wastewater discharge will not be expected to arise, provided that good site practices will be strictly followed. Recommendations for good site practices during the construction activities include:

- Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site
- Training of site personnel in proper waste management and chemical handling procedures
- Provision of sufficient waste disposal points and regular collection of waste
- Appropriate measures to minimise windblown litter and dust/odour during transportation of waste by either covering trucks or by transporting wastes in enclosed containers
- Stockpiles of C&D materials should be kept covered by impervious sheets to avoid wind-blown dust.
- All dusty materials including C&D materials should be sprayed with water immediately prior to any loading transfer operation so as to keep the dusty material wet during material handling at the stockpile areas
- Provision of wheel washing facilities before the trucks leaving the works area so as to minimise dust introduction to public roads
- Well planned delivery programme for offsite disposal such that adverse environmental impact from transporting the inert or non-inert C&D materials is not anticipated

#### **8.5.1.2 Waste Reduction Measures**

Good management and control can prevent the generation of a significant amount of waste. Waste reduction is best achieved at the planning and design stage, as well as by ensuring the implementation of good site practices. Recommendations to achieve waste reduction include:

- Sort inert C&D materials to recover any recyclable portions such as metals
- Segregation and storage of different types of waste in different containers or skips or stockpiles to enhance reuse or recycling of materials and their proper disposal
- Encourage collection of recyclable waste such as waste paper and aluminium cans by providing separate labelled bins to enable such waste to be segregated from other general refuse generated by the work force
- Proper site practices to minimise the potential for damage or contamination of inert C&D materials

- Plan the use of construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste

In addition to the above measures, specific mitigation measures are recommended below for the identified waste arising to minimise environmental impacts during handling, transportation and disposal of these wastes.

#### **8.5.1.3 Inert and Non-inert C&D materials**

In order to minimise impacts resulting from collection and transportation of inert C&D materials for off-site disposal, the inert C&D materials should be reused on-site as fill material as far as practicable. In addition, inert C&D materials generated from excavation works could be reused as fill materials in local projects that require public fill for reclamation.

The surplus inert C&D materials will be disposed of at the Government's PFRFs for beneficial use by other projects in Hong Kong.

The C&D materials generated from general site clearance should be sorted on site to segregate any inert materials for reuse or disposal of at PFRFs whereas the non-inert materials will be disposed of at the designated landfill site.

In order to monitor the disposal of inert and non-inert C&D materials at respectively PFRFs and the designated landfill site, and to control fly-tipping, it is recommended that the Contractor should follow the DEVB Technical Circular (Works) No. 6/2010 for Trip Ticket System for Disposal of Construction & Demolition Materials issued by Development Bureau. In addition, it is also recommended that the Contractor should prepare and implement a Waste Management Plan detailing their various waste arising and waste management practices in accordance with the relevant requirements of the ETWB Technical Circular (Works) No. 19/2005 Environmental Management on Construction Site.

#### **8.5.1.4 Chemical Waste**

If chemical wastes are produced at the construction site, the Contractor will 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". Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidising, irritant, toxic, harmful, corrosive, etc. The Contractor should use a licensed collector to transport and dispose of the chemical wastes at the approved Chemical Waste Treatment Centre or other licensed recycling facilities, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.

Potential environmental impacts arising from the handling activities (including storage, collection, transportation and disposal of chemical waste) are expected to be minimal with the implementation of appropriate mitigation measures as recommended.

#### **8.5.1.5 General Refuse**

General refuse should be stored in enclosed bins or compaction units separated from inert C&D materials. A reputable waste collector should be employed by the Contractor to remove general refuse from the site,

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separately from inert C&D materials. Preferably an enclosed and covered area should be provided to reduce the occurrence of 'wind blown' light material.

#### **8.5.1.6 Floating Refuse**

Provide general refuse collection points on site can minimise the refuse contaminate the marine environment. The construction contractors will be required to regularly check and clean any refuse trapped or accumulated along the artificial seawall. Such refuse will then be stored and disposed of together with the general refuse.

### **8.5.2 Operation Phase**

#### **8.5.2.1 General Refuse**

General refuse should be collected on daily basis and delivered to the refuse collection point accordingly. A reputable waste collector should be employed to remove general refuse regularly to avoid odour nuisance or pest/vermin problem. Sufficient recycling containers are recommended to be provided at suitable locations of the Project to encourage recycling of such waste as aluminium cans, plastics and waste paper.

#### **8.5.2.2 Chemical Waste**

If chemical wastes are expected to be produced during the operation phase, the Project Proponent should register with the EPD as a chemical waste producer and follow the guidelines stated in the "Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes". Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidising, irritant, toxic, harmful, corrosive, etc. Licensed collector should be deployed to transport and dispose of the chemical wastes at the approved Chemical Waste Treatment Centre or other licensed recycling facilities, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.

#### **8.5.2.3 Floating Refuse**

Regular inspection should be carried out along the artificial seawall of the Project boundary for any entrapment or accumulation of floating refuse. Where an appreciable amount of floating refuse is found on the artificial seawall during the inspection, the locations of such refuse will be recorded and arrangements with the project proponent will immediately be made to collect and clear the refuse from the seawall.

## **8.6 Evaluation of Residual Impact**

With the implementation of the recommended mitigation measures for the handling, transportation and disposal of the identified waste arising, residual impacts are not anticipated during both construction and operation phases of the Project.

## **8.7 Conclusion**

### **8.7.1 Construction Phase**

The major waste types generated by the construction activities will include C&D materials from excavation of hill slopes, foundation and site formation as well as from construction of new buildings and superstructures works; chemical waste from maintenance and servicing of construction plant and equipment; general refuse from the workforce and floating refuse trapped / accumulated on the artificial seawall. Provided that all these identified wastes are handled, transported and disposed of in strict accordance with the relevant legislative and recommended requirements and that the recommended good site practices and mitigation measures are properly implemented, no adverse environmental impact is expected during the construction phase.

### **8.7.2 Operation Phase**

During the operation phase, the key waste types generated will include general refuse from recreational activities, retail stores and restaurants within the Project; as well as chemical waste from routine servicing and maintenance activities for different E&M equipment. There would also be entrapment or accumulation of floating refuse on the artificial seawall of the Project but it is anticipated to be negligible. Provided that all these wastes are handled, transported and disposed of in strict accordance with the relevant legislative requirements and the recommended mitigation measures are properly implemented, no adverse environmental impact is expected during the operation phase.