

1. INTRODUCTION

1.1. GENERAL

- 1.1.1. The applicant proposed the 'Social Welfare Facilities' (RCHE) in 'Green Belt' & 'Village' zone at various lots in Lai Chi Shan, Tai Po (hereinafter referred to as 'Proposed Development').
- 1.1.2. BeeXergy Consulting Limited was commissioned by R Lee Architects Limited to undertake the Environmental Assessment (EA) Report supporting its planning application under Section 16 of the Town Planning Ordinance (TPO) for the Proposed Development. Latest architectural drawings and technical information on the Project Site were provided by the Project Architect and is presented in **Appendix 1.1**.

1.2. PROJECT DESCRIPTION

- 1.2.1. The Project Site is located in Lots 364 S.A RP, ss.1-2, S.B RP, ss.1-5, 365, 804 RP, S.A-S.C, 946 RP, 963 RP, S.B, S.D, S.E RP, ss.1, S.F, S.G and government lands D.D. 22 Lai Chi Shan, Tai Po, with an area of approximately 2,035m². It is currently bounded by low rise squatters, village houses and high-rise residential developments in Lai Chi Shan. Currently, the Project Site is zoned as 'Green Belt' and 'Village' under the approved Tai Po Outline Zoning Plan No. S/TP/32. Yet, these lands are abandoned, and no agricultural activities have been found for years. **Figure 1.1** shows the location of the Project Site and its environs.
- 1.2.2. The Proposed Development is a 7-storey RCHE, comprising about 335 bedspaces. It is scheduled to be completed by the end of Year 2031. The master layout plan and section plan of the Proposed Development are provided in **Appendix 1.1**. The key development parameters are summarised in **Table 1.1**.

Table 1.1 Key Development Parameters of the Proposed Development

Parameters	Value
Project Site Area	2034.94m ²
Proposed Plot Ratio	3.25
Maximum Gross Floor Area	6,614.47m ²
Proposed Building Height	58.34mPD
Absolute Height of Building	24.0m
Proposed Number of Storey	7
Proposed Number of Beds	335
Completion Date	End of Year 2031

1.3. EIAO IMPLICATIONS

- 1.3.1. The Proposed Development does not fall into any Designated Project (DP) under

Schedule 2 or Schedule 3 of the Environmental Impact Assessment Ordinance (EIAO) (CAP.499). Thus, an Environmental Permit (EP) under the EIAO is not required.

1.4. STRUCTURE OF THE REPORT

- 1.4.1. The description of the Project is introduced in this section. Sections 2 to 7 detail the relevant legislation, environmental conditions, assessment criteria, methodology and results and recommended mitigation measures of each environmental aspect, including Air Quality Impact (Section 2), Road Traffic Noise Impact (Section 3), Fixed Noise Impact (Section 4), Water Quality Impact (Section 5), Waste Management Implication (Section 6) and Land Contamination Review (Section 7). Section 8 summarises the conclusion of the EAS.

2. AIR QUALITY IMPACT

2.1. INTRODUCTION

2.1.1. This section identifies the potential air quality impact associated with the construction and operation phases of the Proposed Development. It also recommends practical pollution control and mitigation measures, where necessary.

2.2. RELEVANT LEGISLATION, STANDARDS AND GUIDELINES

Hong Kong's Air Quality Objectives (AQOs)

2.2.1. The principal legislation for the management of air quality in Hong Kong is the Air Pollution Control Ordinance (APCO) (CAP.311). Under the APCO, the AQOs stipulate the statutory limits for air pollutants and the maximum allowable number of exceedances over specific time periods. The prevailing AQOs presented in **Table 2.1** has been applied in this Air Quality Impact Assessment (AQIA).

Table 2.1. Hong Kong's Air Quality Objectives

Pollutant	Averaging Time	Concentration Limit ^[1] ($\mu\text{g}/\text{m}^3$)	Number of Exceedances Allowed Per Calendar Year
Nitrogen Dioxide (NO_2)	1-hour	200	18
	24-hour	120	9
	Annual	40	-
Sulphur Dioxide (SO_2)	10-minute	500	3
	24-hour	40	3
Respirable Suspended Particulates (RSP) ^[2]	24-hour	75	9
	Annual	30	-
Fine Suspended Particulates (FSP) ^[3]	24-hour	37.5	18
	Annual	15	-
Carbon Monoxide (CO)	1-hour	30,000	0
	8-hour	10,000	0
	24-hour	4,000	0
Ozone (O_3)	8-hour	160	9
	Peak Season	100	-
Lead (Pb)	Annual	0.5	N/A
Notes: [1] All measurements of the concentration of gaseous air pollutants (i.e. SO_2 , NO_2 , O_3 and CO) are to be adjusted to a reference temperature of 293K and a reference pressure of 101.325kPa. [2] RSP means suspended particles in air with a nominal aerodynamic diameter of $10\mu\text{m}$ or less. [3] FSP means suspended particles in air with a nominal aerodynamic diameter of $2.5\mu\text{m}$ or less.			

Hong Kong Planning Standards and Guidelines (HKPSG)

- 2.2.2. Environmental requirements to be considered in land use planning are outlined in Chapter 9 of HKPSG, which provides recommendations on suitable locations for development and sensitive users, provision of environmental facilities and design, layout, phasing and operational controls to minimise adverse environmental impacts. It also lists out environmental factors influencing the land use planning and recommends buffer distances for land uses.
- 2.2.3. The minimum buffer distances from different types of open roads and industrial emissions to the air sensitive uses as recommended in Table 3.1 of Chapter 9 of HKPSG are extracted in **Table 2.2** below.
- 2.2.4. Sewage treatment works can create an odour nuisance to neighbouring uses. Suitable buffer and landscaping features should be provided to minimise environmental and visual impacts on adjacent sensitive uses. The required buffer distance varies considerably, depending on the types of treatment facilities and whether or not the treatment works are enclosed. A buffer distance of at least 200m is required to minimise potential odour nuisance according to Chapter 9 of HKPSG.

Table 2.2. HKPSG Recommended Buffer Distance

Pollution Source	Parameter	Buffer Distance	Permitted Uses
Roads and Highways	<u>Type of Road</u>		
	Trunk Road and Primary Distributor	>20m	Active recreation open spaces
		3–20m	Passive recreation open spaces
		<3m	Amenity Areas
	District Distributor	>10m	Active recreation open spaces
		<10m	Passive recreation open spaces
	Local Distributor	>5m	Active recreation open spaces
		<5m	Passive recreation open spaces
	Under Flyover	N/A	Passive recreation open spaces
Industrial Areas	<u>Difference in Height between Industrial Chimney Exit and the Site</u>		
	< 20m	> 200m	Active recreation open spaces
		5 – 200m	Passive recreation open spaces
	20 – 30m (*)	> 100m	Active recreation open spaces
		5 – 100m	Passive recreation open spaces
	30 – 40m	> 50m	Active recreation open spaces
		5 – 50m	Passive recreation open spaces
	> 40m	> 10m	Active and passive recreation open spaces
Odour Source	-	200m	-

Pollution Source	Parameter	Buffer Distance	Permitted Uses
Notes: [1] In situations where the height of chimneys is not known, use the set of guidelines marked with an asterisk (*) for preliminary planning purpose and refine as and when more information is available. [2] The buffer distance is the horizontal, shortest distance from the boundary of the industrial lot, the position of existing chimneys or the edge of road kerb, to the boundary of open space sites. [3] The guidelines are generally applicable to major industrial areas but not individual large industrial establishments which are likely to be significant air pollution sources. [4] Amenity areas are permitted in any situation.			

Other Regulations and Guidelines

Air Pollution Control (Construction Dust) Regulation

- 2.2.5. Notifiable and regulatory works are under the control of Air Pollution Control (Construction Dust) Regulation. Notifiable works include site formation, reclamation, demolition, foundation and superstructure construction for buildings and road construction. Regulatory works include building renovation, road opening and resurfacing slope stabilization, and other activities including stockpiling, dusty material handling, excavation, concrete production, etc. Contractors and site agents are required to adopt construction dust suppression measures to reduce dust emission to the acceptable level.
- 2.2.6. The Regulation requires that advance notice for any notifiable work shall be given to the Environmental Protection Department (EPD), and the contractor shall ensure that both notifiable works and regulatory works will be conducted in accordance with the Schedule of the Regulation, which provides dust control and suppression measures

Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation

- 2.2.7. Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation specifies that all Non-road Mobile Machinery (NRMMS), except those exempted, used in specified activities and locations including construction sites, container terminals and back up facilities, restricted areas of the airport, designated waste disposal facilities and specified processes are required to comply with the prescribed emission standards.

Air Pollution Control (Fuel Restriction) Regulations

- 2.2.8. In order to minimise SO₂ emission from construction plants and equipment, the Air Pollution Control (Fuel Restriction) Regulations imposes the legal control on the type of fuels allowed for use and their sulphur contents in commercial and industrial processes, which stipulates that liquid fuel with a sulphur content of less than 0.001% by weight and viscosity less than 6 Centistokes at 40°C should be fulfilled.

Control of Air Pollution in Car Parks (ProPECC PN2/96)

- 2.2.9. This Practice Note provides guidance on the control of air pollution in car parks

including air quality guidelines required for the protection of public health, and factors that should be considered in the design and operation of car parks in order to achieve the required air quality standard.

2.3. BASELINE CONDITIONS

2.3.1. The local air quality is likely to be primarily influenced by vehicular emissions from nearby vehicular roads (i.e. Tat Wan Road) in the vicinity of the Project Site.

Measured Background Air Quality

2.3.2. The nearest EPD's Air Quality Monitoring Station (AQMS) from the Proposed Development is located at Tai Po Government Offices Building in Tai Po. The latest 5 years concentrations (Year 2021 to Year 2025) of NO₂, SO₂, RSP, FSP and O₃ recorded at this AQMS are presented in **Table 2.3**.

Table 2.3. Concentrations of Air Pollutants Measured at the EPD's Tai Po AQMS in the Past 5 Years (Year 2021 to Year 2025)

Pollutant	Averaging Time	AQO ^[2]	Pollutant Concentration (µg/m ³) ^{[1] [3]}				
			2021	2022	2023	2024	2025
NO ₂	19 th Highest 1-hour	200 (18)	115	93	95	107	113
	10 th Highest 24-hour	120 (9)	65	49	51	53	59
	Annual	40	32	27	27	28	29
SO ₂	4 th Highest 10-minute	500 (3)	15	12	27	8	16
	4 th Highest 24-hour	40 (3)	8	5	4	6	8
RSP	10 th Highest 24-hour	75 (9)	60	48	53	59	57
	Annual	30	26	21	25	24	24
FSP	19 th Highest 24-hour	37.5 (18)	32	30	30	33	32
	Annual	15	<u>16</u>	14	15 ^[4]	<u>16</u>	15 ^[4]
O ₃	10 th Highest 8-hour	160 (9)	<u>168</u>	<u>188</u>	<u>163</u>	<u>171</u>	<u>169</u>
	Peak season	100	<u>101</u>	99	96	<u>106</u>	<u>107</u>
Notes: [1] The AQMS data are extracted from EPD's Smart Air Modelling Platform (SAMP-v2.1) website. Data for CO is not monitored in Tai Po AQMS. [2] Data in brackets () means allowed exceedance of AQOs per calendar year. [3] <u>Underlined</u> value means exceedance of AQOs. [4] No exceedance for Annual FSP for the particular year.							

2.3.3. The NO₂, SO₂, RSP and 24-hour average FSP concentrations from Year 2021 to Year 2025 are below their respective prevailing AQOs. Annual average FSP concentrations in Year 2021 and Year 2024 has exceeded the annual FSP AQO. Besides, 8-hour average O₃ concentration in Year 2021 to Year 2025 has exceeded the 8-hour O₃ AQO, and the peak season O₃ concentration in Year 2021, Year 2024 and Year 2025 have exceeded the peak season O₃ AQO. Nevertheless, O₃ is considered a regional issue in Hong Kong rather than a local issue.

2.3.4. As such, most criteria pollutant concentrations generally complied with the AQOs from Year 2021 to Year 2025.

Predicted Future Background Air Quality

2.3.5. Apart from the EPD's AQMS data, reference is also made to the PATH-v3.0, which is developed by EPD to simulate air quality over Hong Kong. The Proposed Development falls within the PATH Grid (39,46). The pollutants concentration data predicted by PATH-v3.0 in Year 2030 L1 (i.e. the nearest available year to the tentative operation year – Year 2031) are summarised in **Table 2.4**.

Table 2.4. Background Concentrations of Air Pollutants in Year 2030 L1 Predicted by the PATH-v3.0 Model

Pollutant	Averaging Time	AQO [2]	Pollutant Concentration (µg/m ³) [1] [3]			
			(39,45)	(39,46)	(39,47)	(40,46)
NO ₂	19 th Highest 1-hour	200 (18)	40.02	43.33	50.18	41.12
	10 th Highest 24-hour	120 (9)	15.29	18.17	19.63	17.21
	Annual	40	8.56	11.38	13.27	10.57
SO ₂	4 th Highest 10-minute	500 (3)	22.81	25.47	23.72	23.47
	4 th Highest 24-hour	40 (3)	6.82	6.86	6.94	6.93
RSP	10 th Highest 24-hour	75 (9)	47.38	49.47	50.19	49.33
	Annual	30	18.51	19.66	19.99	19.22
FSP	19 th Highest 24-hour	37.5 (18)	28.42	29.91	30.18	28.84
	Annual	15	11.21	12.18	12.45	11.74
O ₃	10 th Highest 8-hour	160 (9)	<u>168.97</u>	<u>167.53</u>	<u>173.01</u>	<u>168.82</u>
	Peak season	100	<u>121.28</u>	<u>119.10</u>	<u>121.85</u>	<u>120.35</u>
CO	1 st Highest	30,000 (0)	527.64	543.32	535.73	519.56

Pollutant	Averaging Time	AQO ^[2]	Pollutant Concentration ($\mu\text{g}/\text{m}^3$) ^{[1] [3]}			
			(39,45)	(39,46)	(39,47)	(40,46)
	1-hour					
	1 st Highest 8-hour	10,000 (0)	482.72	490.91	498.09	488.68
	1 st Highest 24-hour	4,000 (0)	451.87	460.53	458.77	451.40
Notes: [1] The PATH data are extracted from EPD's Smart Air Modelling Platform (SAMP-v2.1) website. [2] Data in brackets () means allowance of AQOs per calendar year. [3] <u>Underlined</u> value means exceedance of AQOs.						

2.3.6. As shown in **Table 2.4**, except for O₃, the predicted background concentrations of NO₂, SO₂, RSP, FSP and CO in the relevant PATH grid in Year 2030 are below the relevant AQO criteria.

2.4. ASSESSMENT AREA AND AIR SENSITIVE RECEIVERS

2.4.1. The Assessment Area for AQIA covers an area of 500m radius from the Project Site, as shown in **Figure 2.1**.

2.4.2. The Proposed Development is a Government, Institution or Community (G/IC) use (i.e. RCHE) and shall be considered as an identified Air Sensitive Receiver (ASR). Openable windows along the entire façade of the building, serving 1/F office area and 2/F to 6/F dormitory units, are identified as representative ASR within the Proposed Development. Furthermore, given the potential for extended stays, the garden at the rooftop is also identified as a representative ASR within the Proposed Development. The detailed location of these facilities (i.e. air sensitive uses within the Proposed Development) can refer to the **Appendix 1.1**.

2.4.3. In addition, representative ASRs outside of the Proposed Development have also been identified and are summarised in **Table 2.5**. The identified representative ASRs outside of the Proposed Development are also shown in **Figure 2.1**.

Table 2.5. Identified Representative Air Sensitive Receivers outside of the Proposed Development

ASR ID	Description	Type of Use	Existing/ Planned	Approx. Shortest Distance from Proposed Development (m)	Approx. Building Height (m)
A01	Sunshine Garden	Village	Existing	<5	9
A02	5 Lai Chi Shan	Village	Existing	25	10
A03	The Regent	Residential	Existing	45	42
A04	73 Lai Chi Shan	Village	Existing	30	4

ASR ID	Description	Type of Use	Existing/ Planned	Approx. Shortest Distance from Proposed Development (m)	Approx. Building Height (m)
A05	73A Lai Chi Shan	Village	Existing	30	4
A06	125 Sheung Wun Yiu	Village	Existing	60	4
A07	53 Sheung Wun Yiu	Village	Existing	60	4
A08	69A Lai Chi Shan	Village	Existing	5	6
A09	1 Ha Wun Yiu	Village	Existing	85	10
A10	Kinky Fort	Village	Existing	20	10
A11	72 Lai Chi Shan	Village	Existing	<5	4

2.5. IDENTIFICATION OF AIR EMISSION SOURCES AND EVALUATION OF ENVIRONMENTAL IMPACTS

Construction Phase

- 2.5.1. Potential air quality impacts to the nearby ASRs from the Proposed Development are mainly related to fugitive dust nuisance from the construction activities as well as air pollutant emissions from construction machinery and construction trucks.
- 2.5.2. Construction work activities such as site clearance, site formation and earthworks are classified as 'notifiable' and 'regulatory' work under the Air Pollution Control (Construction Dust) Regulation. Temporary dust nuisance will be generated due to piling and superstructure works for the construction of the Proposed Development. The construction of the Proposed Development will be on a small scale considering the area size of the Proposed Development is approximately 2,035m². The quantity of excavated materials to be generated from the construction works, including minor slope excavation, is anticipated to be very limited with approximate 5,000m³. Fugitive dust emissions from piling and superstructure activities are also expected to be limited with the proper implementation of good site practices. Hence, the potential dust emissions associated with the construction works will be limited.
- 2.5.3. Considering limited dust emissions from the construction works and with the implementation of the dust control measures stipulated under the Air Pollution Control (Construction Dust) Regulation, together with proper site management and good housekeeping, adverse air quality impact arising from fugitive dust emissions at nearby ASRs during construction of the Proposed Development is not anticipated.
- 2.5.4. Due to the relatively small scale of the construction works for the Proposed Development, an approximately 8-10 numbers of construction machinery and an approximately 2 numbers of construction trucks are to be deployed on-site. Gaseous emissions, such as NO₂, SO₂ and CO and particulates (including RSP and FSP)

exhaust from the limited number of construction machinery and construction trucks are considered to be minimal. In addition, requirements stipulated in the Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation and the use of ultra-low sulphur diesel (ULSD) with sulphur content not exceeding 0.001% by weight as fuel under Air Pollution Control (Fuel Restriction) Regulations will also be followed to control potential air pollutant emissions from NRMMs during the construction phase. Hence, adverse air quality impact due to the operation of the construction machinery and trucks during construction phase is not anticipated.

- 2.5.5. With the implementation of appropriate air quality control measures and the requirements as listed in the Regulations under APCO to control the air pollutant emissions, adverse air quality impact is not anticipated during construction phase.

Operation Phase

Vehicular Emissions

- 2.5.6. Potential air quality impacts during the operation phase of the Proposed Development are expected from vehicular emissions on surrounding roads. The nearest named public roads - Tat Wan Road is situated 40m northwest of the Project Site, while existing public access road to Tat Wan Road is situated immediately northwest and directly connected to the Project Site. The 5m buffer area from the road kerb of the existing public access road does not encroach into the building block and garden areas designated for long-duration stays within the Project Site (see **Figure 2.2**). As such, it is expected that no adverse impact from vehicular emission from surrounding roads and existing public access road.

- 2.5.7. For the access road within the Project Site, it is a private access road with access control. It is expected that the vehicles entering to the Proposed Development is limited. Thus, it has been excluded from the vehicular emission assessment.

- 2.5.8. Potential air quality impacts may also arise from the operation of the proposed carpark within the Proposed Development. The carpark will be designed and operated in accordance with the requirements listed in ProPECC PN2/96 Control of Air Pollution in Car Parks published by EPD. Notwithstanding the above, the carpark will provide a limited parking spaces (i.e. 8 numbers of parking spaces), primarily designated for service vehicles (e.g. ambulances, shuttle mini-buses, and vehicles for disabled transportation). As such vehicular emissions generated from the proposed carpark within the Proposed Development are anticipated to be limited.

- 2.5.9. In view of the above, adverse air quality impact from vehicular emissions (including surrounding roads, existing public access road, proposed private access road and proposed carpark) during the operation phase are not anticipated.

Industrial and Odour Emissions

2.5.10. Based on desktop study and site survey conducted on 25 February 2026, the Proposed Development is currently surrounded by village house, residential buildings and green belts. No chimney stack nor odour sources is observed and identified within the 500m Assessment Area from the Proposed Development. Also, no chimney **nor odour sources** will be proposed within the Proposed Development. Therefore, adverse air quality impact from industrial emission **and odour impact from odour emissions** during the operation phase is not anticipated.

2.6. CUMULATIVE IMPACTS

2.6.1. The construction period of the Project is tentatively until end of Year 2031. Concurrent projects in the vicinity of the Project Site that may have the potential to interact have been identified and presented in **Table 2.6** and **Figure 2.1**.

Table 2.6. Summary of the Concurrent Projects in the Vicinity of the Project Site

Concurrent Project	Description	Construction Period	Approximate Shortest Distance from Proposed Development (m)
Site formation and infrastructure works for public housing development at To Yuen Tung, Tai Po	Development of public housing sites to alleviate territorial housing needs	Year 2024 to Year 2033	~400
Related references: https://www.cedd.gov.hk/eng/our-projects/major-projects/index-id-138.html https://www.districtcouncils.gov.hk/tp/doc/2020_2023/en/committee_meetings_doc/PHWC/20121/PHW_28_2021.pdf			

2.6.2. The site formation and infrastructure works for public housing development at To Yuen Tung, Tai Po is considered to have sufficient separation distance from the Proposed Development (**~400m**). During the construction phase, the development mainly involve piling and superstructure works. Thus, the associated fugitive dust emissions, air and odour emissions are expected to be limited with proper implementation of good site practices. Cumulative air quality impact from construction works at the aforementioned development to the Proposed Development is expected to be limited. During the operation phase, no air nor odour emissions from the mentioned public housing development are anticipated, and thus adverse air quality impact from the operation of mentioned public housing development to the Proposed Development is not expected.

2.7. MITIGATION MEASURES

Construction Phase

2.7.1. To ensure that air pollutant emissions are controlled during the construction phase,

relevant air quality control requirements stipulated in Air Pollution Control (Construction Dust) Regulation, Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation and Air Pollution Control (Fuel Restriction) Regulations should be implemented.

2.7.2. Any potential dust impact and watering mitigation would be subject to the actual site condition. In addition to the watering, dust control measures as recommended in the Air Pollution Control (Construction Dust) Regulation (where applicable), typical control measures listed below are also recommended to implement:

- The designated haul road should be hard paved to minimise fugitive dust emission;
- Locate the haul road away from those nearby ASRs as far as possible;
- Active works areas should be water sprayed with water browser or sprayed manually hourly during construction period. The Contractor should ensure that the amount of water spraying is just enough to dampen the exposed surfaces without over-watering which could result in surface water runoff;
- Any excavated dusty materials or stockpile of dusty materials should be covered entirely by impervious sheeting or sprayed with water so as to maintain the entire surface wet, and recovered or backfilled or reinstated as soon as possible;
- Dusty materials remaining after a stockpile is removed should be wetted with water;
- The area where vehicle washing takes place and the section of the road between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcore or similar;
- The Contractor(s) shall only transport adequate amount of fill materials to the Project Site to minimise stockpiling of fill materials on-site, thus reducing fugitive dust emission due to wind erosion;
- Should temporary stockpiling of dusty materials be required, it shall be either covered entirely by impervious sheeting, placed in an area sheltered on the top and the 3 sides; or sprayed with water so as to maintain the entire surface wet;
- All dusty materials shall be sprayed with water prior to any loading, unloading or transfer operation so as to maintain the dusty material wet;
- Vehicle speed to be limited to 10km/hour except on completed access roads;
- Every vehicle should be washed to remove any dusty materials from its body and wheels immediately before leaving the construction site;
- The load of dusty materials carried by vehicle leaving the construction site should be covered entirely by clean impervious sheeting to ensure that the dusty materials

do not leak from the vehicle;

- Restricting height from which materials are to be dropped as far as practicable to minimise the fugitive dust arising from loading/unloading activities;
- Every stock of more than 20 bags of cement or dry pulverized fuel ash shall be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides;
- Cement, pulverized fuel ash or any other dusty materials collected by fabric filters or other air pollution control system or equipment shall be disposed of in totally enclosed containers;
- Regular maintenance of construction equipment deployed on-site should be conducted to minimise gaseous and prevent black smoke emission;
- Hoarding of not less than 2.4m high from ground level shall be provided along the site boundary except for a site entrance or exit to minimise dust nuisance to the nearby sensitive receivers. For locations with ASRs in immediate proximity to the Project Site, higher hoarding shall be erected;
- Avoid dusty works or placing stockpiles near to nearby ASRs as far as possible;
- Minimisation of unpaved, exposed earth by immediate covering/ permanent paving as soon as the works have been completed;
- Regular site audit shall be conducted to ensure all the mitigation measures are properly implemented;
- Electric power supply shall be provided for on-site machinery as far as practicable;
- Electrified NRMMS shall be provided as far as practicable; and
- NRMMS exempted from regulatory control shall be avoided as far as practicable

Operation Phase

2.7.3. Adverse air quality impact is not anticipated during the operation phase. Thus, no mitigation measure is required.

2.8. CONCLUSION

With the implementation of appropriate mitigation measures as mentioned in **Section 2.6**, adverse air quality impacts during the construction phase and operation phase of the Proposed Development are not anticipated.

3. ROAD TRAFFIC NOISE IMPACT ASSESSMENT

3.1. INTRODUCTION

- 3.1.1. This section has been prepared to assess the impact of road traffic noise on noise sensitive receivers (NSRs) at the Proposed Development and, where applicable, to propose mitigation measures to reduce that impact.

3.2. ASSESSMENT CRITERIA

- 3.2.1. To be further inputted upon receiving traffic forecast data.

3.3. NOISE ASSESSMENT POINTS

- 3.3.1. Noise Assessment Points (NAPs) have been provided to all noise sensitive uses with openable windows/doors of habitable rooms within the Proposed Development.
- 3.3.2. The isolation rooms will not be used for diagnostic purposes. They are intended to provide a separated resting space for users who feel unwell. Thus, these rooms will not be considered as NAPs.

3.4. ASSESSMENT METHODOLOGY

- 3.4.1. To be further inputted upon receiving traffic forecast data.

3.5. ASSESSMENT RESULTS

- 3.5.1. To be further inputted upon receiving traffic forecast data.

3.6. CONCLUSION

- 3.6.1. To be further inputted upon receiving traffic forecast data.

4. FIXED PLANT NOISE IMPACT ASSESSMENT

4.1. INTRODUCTION

- 4.1.1. This study aims to evaluate the potential fixed plant noise impacts in the vicinity of the Project Site on the Proposed Development. Where applicable, noise mitigation measures will be recommended.

4.2. LEGISLATIONS, STANDARDS AND GUIDELINES

- 4.2.1. The Technical Memorandum for the Assessment of Noise from Places Other Than Domestic Premises, Public Places or Construction Sites (IND-TM) stipulates the appropriate Acceptable Noise Level (ANL) for fixed noise sources. The ANL is dependent on the Area Sensitivity Rating (ASR) of an NSR, as defined in Table 1 of the IND-TM (reproduced in **Table 4.1**). The ASR of an NSR is determined by the type of area where the NSR is located and the presence of any influencing factors (IFs) such as major roads (i.e. a road with an annual average daily traffic flow in excess of 30,000) and industrial areas.

Table 4.1 Area Sensitivity Ratings

Type of Area Containing NSR	Degree to which NSR is affected by IF		
	Not Affected	Indirectly Affected	Directly Affected
Rural area, including country parks or village type developments	A	B	B
Low density residential area consisting of low-rise or isolated high-rise developments	A	B	C
Urban area	B	C	C
Area other than those above	B	B	C

- 4.2.2. HKPSG also states that in order to plan for a better environment, all planned fixed noise sources should be located and designed that when assessed in accordance with the IND-TM, the level of the intruding noise at the façade of the nearest existing sensitive use should be at least 5dB(A) below the appropriate ANL shown in Table 2 of IND-TM or, in the case of the background being 5dB(A) lower than the ANL, should not be higher than the background. The ANLs stipulated in the IND-TM are provided in **Table 4.2**.

Table 4.2 Applicable ANLs for Fixed Noise

Time Period	Area Sensitivity Rating		
	A	B	C
Day (0700 to 1900 hours)	60	65	70
Evening (1900 to 2300 hours)			

Time Period	Area Sensitivity Rating		
	A	B	C
Night (2300 to 0700 hours)	50	55	60

- 4.2.3. The Project Site is located in an area contains mainly village type developments, with some high-rise residential developments in the east of the Proposed Development. The type of area where the representative NSRs at the Proposed Development located shall be classified as “Area other than those above”. According to the Annual Traffic Census 2024 published by the Transport Department (TD), the annual average daily traffic (AADT) flow on Tolo Highway within the 300m Assessment Area from the Proposed Development exceeded 30,000 vehicles. Yet, Tolo Highway is located at the north of the Project Site with ~215m distance, and there are noise barriers at the sections near Lai Chi Shan. Thus, the Project Site is affected indirectly by Tolo Highway. As such, an Area Sensitivity Rating of “B” has been assigned to the NSRs.

4.3. ASSESSMENT AREA AND NOISE SENSITIVE RECEIVERS

- 4.3.1. Representative Noise Sensitive Receivers (NSRs) in the vicinity of the Proposed Development have been identified and listed in **Table 4.3**. The locations of identified NSRs have been indicated in **Figure 4.2**. The nearest identified NSR is N01 Sunshine Garden, which is less than 5m away from the Proposed Development.

Table 4.3. Identified Representative Noise Sensitive Receivers in the Vicinity of the Proposed Development

NSR ID	Description	Type of Use	Existing/ Planned	Approximate Shortest Distance from Proposed Development (m)
N01	Sunshine Garden	Village	Existing	<5
N02	5 Lai Chi Shan	Village	Existing	25
N03	The Regent	Residential	Existing	45
N04	73 Lai Chi Shan	Village	Existing	30
N05	73A Lai Chi Shan	Village	Existing	30
N06	125 Sheung Wun Yiu	Village	Existing	60
N07	53 Sheung Wun Yiu	Village	Existing	60
N08	69A Lai Chi Shan	Village	Existing	5
N09	1 Ha Wun Yiu	Village	Existing	85
N10	Kinky Fort	Village	Existing	20

4.4. IDENTIFICATION AND EVALUATION OF FIXED NOISE IMPACT

Identified Existing Fixed Noise Sources

- 4.4.1. Based on desktop review and on-site survey conducted on 25 February 2026, a car workshop named Auto Body Shop (好運汽車服務有限公司) is located around 110m from the Project Site. The location of this car workshop is indicated in **Figure 4.1**. During the on-site survey, no audible noise is noted from the car workshop. Also, there are existing village houses located only about 30m away. Hence, the car workshop is not considered as a significant fixed plant noise source to the Proposed Development.
- 4.4.2. No other potential fixed plant noise sources are found within 300m from the Project Site. Therefore, the Proposed Development is not subject to adverse fixed plant noise impact.

Fixed Noise Sources from the Proposed Development

- 4.4.3. To prevent fixed plant noise from the Proposed Development from affecting nearby NSRs, potential noise sources from the Proposed Development (e.g. transformer rooms, switch rooms, pump rooms etc.) shall be designed such that the noise emissions comply with the relevant criteria set out in Chapter 9 of the HKPSG.
- 4.4.4. Provisions shall be made to control the fixed noise sources by suitable at source noise control measures such as silencers, acoustic louvers and enclosures, when necessary. As such, it is anticipated that the fixed plant noise impact on the surrounding NSRs due to the operation of the Proposed Development will not exceed the relevant noise criteria under the HKPSG and NCO.

4.5. CONCLUSION

- 4.5.1. Since there are no significant fixed noise sources in the vicinity of the Proposed Development, the Proposed Development is not subject to adverse fixed noise impact.
- 4.5.2. Provisions such as silencers, acoustic louvers, and enclosures shall be provided where necessary to control the fixed plant noise sources at the Proposed Development. With appropriate measures in place, the fixed plant noise from the Proposed Development is expected to comply with the applicable HKPSG and NCO noise criteria for the surrounding NSRs.

5. WATER QUALITY IMPACT

5.1. INTRODUCTION

5.1.1. This section identifies the potential water quality impact associated with the construction phase and operation phase of the Proposed Development. Recommendations for mitigation measures have been made, where necessary, to minimise the potential water quality impacts to an acceptable level.

5.2. RELEVANT LEGISLATION, STANDARDS AND GUIDELINES

5.2.1. Relevant legislations, standards and guidelines governing water quality in Hong Kong include the following:

- Water Pollution Control Ordinance (WPCO) (CAP.358);
- Chapter 9 of Hong Kong Planning Standards and Guidelines (HKPSG);
- Technical Memorandum on Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters (TM-DSS);
- Drainage Plans subject to Comment by the Environmental Protection Department - Building (Standards of Sanitary Fitments, Plumbing, Drainage Works and Latrines) Regulations (ProPECC PN1/23); and
- Construction Site Drainage (ProPECC PN2/24).

Water Pollution Control Ordinance (WPCO)

5.2.2. The WPCO provides the major statutory framework for the protection and control of water quality in Hong Kong. According to the Ordinance and its subsidiary legislations, Hong Kong waters are divided into ten Water Control Zones (WCZs). Corresponding statements of Water Quality Objectives (WQOs) are stipulated for different water regimes (marine waters, inland waters, bathing beaches subzones, secondary contact recreation subzones and fish culture subzones) in each WCZ based on their beneficial uses. The Proposed Development is in the catchment of the Tolo Harbour and Channel WCZ. The WQOs for watercourses in Tolo Harbour and Channel WCZ are presented in **Table 5.1**.

Table 5.1. Summary of Water Quality Objectives for Watercourses in Tolo Harbour and Channel WCZ

Parameters	Criteria	Subzone
Aesthetic Appearance	Waste discharges shall not cause the water to contain substances that settle to form objectionable deposits;	All Watercourses
	Waste discharges shall not cause the water to contain substances that float	

Parameters	Criteria	Subzone
	as debris, scum, oil or other matter to form nuisances;	
	Waste discharges shall not cause water to contain substances that produce objectionable colour, odours, taste or turbidity;	
	Waste discharges shall not cause water to contain substances that injure or are toxic or produce adverse physiological responses in humans, animals or plants; or	
	Waste discharges shall not cause water to contain substances that are conducive to undesirable aquatic life or a nuisance to aquatic life.	
E. coli	Should not exceed 1000 cfu per 100 mL, calculated as the running median of the most recent 5 consecutive samples taken at intervals of between 7 and 21 days.	Inland Waters in Shing Mun (A, C, D, E, H, I) subzones, Tai Po (B, C) subzones and other watercourses.
	Should not exceed 0 cfu per 100 mL, calculated as the running median of the most recent 5 consecutive samples taken at intervals of between 7 and 21 days.	Inland Waters in Shing Mun (B, F, G) subzones, Lam Tsuen (C, D) subzones and Tai Po subzone A.
Colour	Waste discharge shall not cause the colour of water to exceed 30 Hazen units.	Inland Waters in Shing Mun (B, F, G) subzones, Lam Tsuen (C, D) subzones and Tai Po subzone A.
	Waste discharge shall not cause the colour of water to exceed 50 Hazen units.	Inland Waters in Shing Mun (A, C, D, E, H, I) subzones, Tai Po (B, C) subzones and other watercourses.
pH	To be in the range of 6.0 – 9.0	Inland Waters in Shing Mun (D, E, I) subzones and other watercourses.
	To be in the range of 6.5 – 8.5	Inland Waters in Shing Mun (A, B, C, F, G, H) subzones, Lam Tsuen (C, D) subzones and Tai Po (A, B,

Parameters	Criteria	Subzone
		C) subzones.
Temperature	Not to exceed ± 2 °C daily temperature range due to waste discharge	All Watercourses
Suspended solids (SS)	Waste discharges shall not cause the annual median of suspended solids to exceed 25 milligrams per litre.	Inland Waters in Shing Mun (D, E, I) subzones and other watercourses.
	Waste discharges shall not cause the annual median of suspended solids to exceed 20 milligrams per litre.	Inland Waters in Shing Mun (A, B, C, F, G, H) subzones, Lam Tsuen (C, D) subzones and Tai Po (A, B, C) subzones.
Dissolve Oxygen (DO)	Not less than 4 mg/L or 40% saturation at any time.	Waste discharges shall not cause the level of dissolved oxygen in waters of the subzone to be less than 4 milligrams per litre or 40% saturation (at 15 degrees Celsius) at any time.
5-day biochemical oxygen demand (BOD ₅)	Waste discharges shall not cause the 5-day biochemical oxygen demand to exceed 5 milligrams per litre.	Inland Waters in Shing Mun (A, C, D, E, H, I) subzones, Tai Po (B, C) subzones and other watercourses
	Waste discharges shall not cause the 5-day biochemical oxygen demand to exceed 3 milligrams per litre.	Inland Waters in Shing Mun (B, F, G) subzones, Lam Tsuen (C, D) subzones and Tai Po subzone A.
Chemical oxygen demand (COD)	Waste discharges shall not cause the chemical oxygen demand to exceed 15 milligrams per litre.	Inland Waters in Shing Mun (B, F, G) subzones, Lam Tsuen (C, D) subzones and Tai Po subzone A.
	Waste discharges shall not cause the chemical oxygen demand to exceed 30 milligrams per litre.	Inland Waters in Shing Mun (A, C, D, E, H, I) subzones, Tai Po (B, C) subzones and other watercourses
Ammoniacal nitrogen	The un-ionised ammoniacal nitrogen level should not be more than 0.5 milligram per litre at any time.	All Watercourses
Toxicants	Waste discharges shall not cause the toxicants in water to attain such a level as to produce significant toxic effects in humans, fish or any other aquatic organisms, with due regard to biologically cumulative effects in food chains and to toxicant interactions with	All Watercourses

Parameters	Criteria	Subzone
	each other.	
Source: Statement of Water Quality Objectives for Watercourses (Tolo Harbour and Channel Water Control Zone)		

Hong Kong Planning Standards and Guidelines (HKPSG)

- 5.2.3. Chapter 9 of HKPSG provides environmental considerations for land use planning. Site selection for development, sensitive uses, provision of environmental facilities, and design, layout, phasing and operational controls to minimise adverse environmental impacts, etc., are covered in the chapter. Other factors affecting land use planning to be taken into account are listed and suitable buffer distances for land uses are recommended.

Technical Memorandum on Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters (TM-DSS)

- 5.2.4. Discharges of effluents into WCZs are controlled by the WPCO through a licensing system. The TM-DSS sets limits for effluent discharge, covering the physical, chemical, and microbial quality of effluents. Any effluent from the construction and operation of the Project must comply with relevant standards for effluents discharged into the foul sewers, inland/inshore/marine waters of the Tolo Harbour and Channel WCZ.

Drainage Plans subject to Comment by the Environmental Protection Department - Building (Standards of Sanitary Fitments, Plumbing, Drainage Works and Latrines) Regulations (ProPECC PN1/23)

- 5.2.5. The ProPECC PN1/23 provides guidelines and practices for handling, treatment and disposal of various effluent discharges to stormwater drains and foul sewers. The design of site drainage and disposal of various site effluents generated within the new development area should follow the relevant guidelines and practices as given in the ProPECC PN1/23.

Construction Site Drainage (ProPECC PN2/24)

- 5.2.6. EPD has issued ProPECC PN2/24 that controls site runoff and wastewater generated during the construction phase of the Project. It provides guidelines for handling and disposal of construction discharges. Practices given in the ProPECC PN2/24 shall be followed as far as possible during the construction phase to minimise potential water quality impacts due to construction site drainage.

5.3. DESCRIPTION OF THE ENVIRONMENT

- 5.3.1. The Assessment Area for the Water Quality Impact Assessment (WQIA) covers an area

of 500m radius from the Project Site, as shown in **Figure 5.1**.

- 5.3.2. Based on the desktop study, the Proposed Development is situated inland and is at least 1.6km northeast from the nearest marine water (i.e. Tolo Harbour). Yet, Tai Po River is the only bodies of water identified, where located 25m west of the Project Site, and is identified as Water Sensitive Receiver (WSR). The location of WSR is presented in **Figure 5.1** and the details are listed in **Table 5.2**.

Table 5.2. Identified Representative Water Sensitive Receivers

WSR ID	Description	Nature	Existing/Planned	Approximate Shortest Distance from Proposed Development (m)
W01	Tai Po River	Channelized watercourse	Existing	25

5.4. IDENTIFICATION OF POTENTIAL WATER POLLUTION SOURCES AND EVALUATION OF ENVIRONMENTAL IMPACTS

Construction Phase

- 5.4.1. Potential sources of water quality impact associated with activities during the construction phase of the Proposed Development include:
- General construction activities;
 - Construction site runoff;
 - Accidental spillage; and
 - Sewage effluent from the construction workforce.
- 5.4.2. Water would be used in various construction activities and wastewater would be generated in the construction process. Such processes may include general cleaning and washing, dust suppression and wheel washing. Wastewater from these processes generally contains high levels of suspended sediment and should not be discharged into the environment without treatment. The wastewater would generally be collected and stored for disposal after necessary treatment. With proper collection, storage, treatment and disposal, adverse water quality impact from the construction wastewater is not expected.
- 5.4.3. Site clearance would require the removal of surface vegetation or existing man-made cover. Exposed soil is prone to erosion and would result in an increase in sediment load in the drainage system. Unprotected earth working areas and stockpiles could also lead to elevated levels of sediment in stormwater/runoff in case of rainstorms. Release of site runoff, if uncontrolled, would lead to an increase in suspended solid

levels in the drainage system and the receiving marine water. With the implementation of applicable mitigation measures listed in **Section 5.5**, adverse water quality impact from the construction site runoff is not expected.

5.4.4. Various chemicals, such as lubricants and fuel, would be used for the construction of Proposed Development. In case of a chemical spillage, spilled chemicals may contaminate soil and/or make their way into the drainage system and affect the water quality of the receiving water. These chemicals should generally be stored and applied at designated areas within the Project Site. Suitable clean-up kits and equipment should be prepared onsite to ensure spilt chemicals can be contained and removed as soon as possible. Chemical waste generated from normal operation and spillage events should be stored at the designated place for proper disposal by a licensed contractor. With the implementation of proper control over storage, application, clean up after spillage (if any) and disposal, adverse water quality impact from the chemical spillage is not expected.

5.4.5. Construction workforce would generate domestic sewage. In general, appropriate numbers of chemical toilets would be provided by a licensed contractor to serve the construction workers over the construction site to prevent direct disposal of sewage into the water environment. Adverse water quality impact from sewage generated by the construction workforce is not expected.

Operation Phase

5.4.6. Potential sources of water quality impact associated with activities during the operation phase of the Proposed Development include:

- Sewage generated from the Proposed Development; and
- Stormwater runoff.

5.4.7. Sewage generated from the Proposed Development will be collected **to the nearest public sewerage system**. All sewage discharged shall comply with the TM-DSS under the WPCO. Hence, no adverse sewerage impact is expected. A separate Sewerage Impact Assessment (SIA) has been conducted under this Study.

5.4.8. Stormwater runoff from the paved surfaces within the Proposed Development will be directed to a managed stormwater drainage system. Appropriate drainage system, equipped with necessary pollution control devices, such as silt trap and oil and grease separators, would be provided. Mitigation measures listed in **Section 5.5**, such as the installation of silt traps in the stormwater drainage system can effectively reduce the potential impacts of these pollutants on drainage water quality. Good practices recommended under ProPECC PN1/23 could also be referenced for the design of the drainage system. Hence, no adverse drainage water quality impact due to stormwater runoff during operation phase is expected. A separate Drainage Impact

Assessment has been conducted under this Study.

5.5. MITIGATION MEASURES

Construction Phase

5.5.1. Suitable control measures stipulated in ProPECC PN2/24 should be implemented. These practices include but are not limited to the following:

- Surface run-off from construction sites should be discharged into storm drains via adequately designed sand/silt removal facilities such as sand traps, silt traps and sediment basins. Channels and/or earth bunds or sandbag barriers should be provided on-site to properly direct stormwater to such silt removal facilities. Perimeter channels at site boundaries should be provided where necessary to intercept storm run-off from outside the site so that it will not wash across the site. Catchpits and perimeter channels should be constructed in advance of earthworks;
- Silt removal facilities, channels and manholes should be maintained, and the deposited silt and grit should be removed regularly, at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times;
- Construction works should be programmed to minimise soil excavation works in rainy seasons (April to September). If excavation in soil cannot be avoided in these months or at any time of year when rainstorms are likely, for the purpose of preventing soil erosion, temporarily exposed slope surfaces should be covered e.g. by tarpaulin. Intercepting channels should be provided (e.g. along the crest/edge of excavation) to prevent storm runoff from washing across exposed soil surfaces. Arrangements should always be in place to ensure that adequate surface protection measures can be safely carried out well before the arrival of a rainstorm;
- Earthworks final surfaces should be well compacted, and the subsequent permanent work or surface protection should be carried out immediately after the final surfaces are formed to prevent erosion caused by rainstorms. Appropriate drainage like intercepting channels should be provided where necessary;
- Measures should be taken to minimise the ingress of rainwater into trenches. If excavation of trenches in wet seasons is necessary, they should be dug and backfilled in short sections. Rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities;
- Open stockpiles of construction materials (e.g. aggregates, sand and fill material) on sites should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the washing away of

construction materials, soil, silt or debris into any drainage system;

- Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system, and to prevent storm run-off from getting into foul sewers. Discharge of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul sewerage system;
- All construction vehicles and construction machinery should be cleaned before they leave a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. A wheel washing bay should be provided at every site exit if practicable and wash-water should have sand and silt settled out or removed before discharging into storm drains. The section of construction road between the wheel washing bay and the public road should be paved with backfall to reduce vehicle tracking of soil and to prevent site runoff from entering public road drains;
- Wastewater generated from building construction activities including concreting, cleaning of works and similar activities should not be discharged into the stormwater drainage system. If the wastewater is to be discharged into foul sewers, it should undergo the removal of settleable solids in a silt removal facility, and pH adjustment as necessary;
- Acidic wastewater generated from acid cleaning, etching, pickling and similar activities should be neutralized to within the pH range of 6 to 10 before discharging into foul sewers. If there is no public foul sewer in the vicinity, the neutralized wastewater should be tankered off-site for disposal into foul sewers or treated to a standard acceptable to storm drains and the receiving waters; and
- Sufficient number of chemical toilets should be required for each works area. These toilets should be regularly cleaned, maintained and emptied by a licensed contractor.

5.5.2. In case any discharge of effluent from the construction site is required, a discharge licence for discharge of effluent should be applied under the WPCO. Runoff and wastewater generated from the project works areas should be treated to comply with the discharge quality stipulated in the WPCO discharge licence before discharge.

Operation Phase

5.5.3. During the operation phase, all sewage arising from the Proposed Development will be collected and conveyed to **the nearest public sewerage system**. No specific mitigation measures are required for sewage arising from the Proposed Development. A Sewerage Impact Assessment (SIA) will be undertaken separately under this Study.

5.5.4. A surface water drainage system should be installed to collect and convey the road surface runoff to the existing drainage system downstream. The design of mitigation

measures for the drainage system during the operation phase shall take account of the guidelines as presented in ProPECC PN1/23. Best Management Practices (BMPs) should be implemented to control run-off. The drainage system should be designed to avoid flooding with devices and facilities to control sedimentation and runoff quality, prevent 'first flush' pollution, and eliminate pollutant discharge into poor flushing water downstream. Manholes, as well as stormwater gullies and ditches provided at the Project Site should be regularly inspected and cleaned. Additional inspection and cleansing should be carried out before forthcoming heavy rainfall. A Drainage Impact Assessment (DIA) will be undertaken separately under this Study.

5.6. CONCLUSION

- 5.6.1. No adverse impact of water quality during construction phase is anticipated provided that the recommended mitigation measures listed in **Section 5.5** are properly implemented. No adverse impact on nearby WSRs during the operation phase will be anticipated. Preliminary SIA and DIA will be prepared separately under this Study.

6. WASTE MANAGEMENT

6.1. INTRODUCTION

6.1.1. This Section identifies the potential waste arisings from the construction phase and operation phase of the Proposed Development and the potential environmental impacts associated with the storage, handling, transportation and disposal of the waste.

6.2. ENVIRONMENTAL LEGISLATION AND GUIDELINES

6.2.1. The relevant legislation, standards and guidelines related to the study for the assessment of waste management implications include:

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

Other Relevant Guidelines and Documents

6.2.2. Other relevant guidelines/ circulars applicable to waste management and disposal for this Project include:

- A Guide to the Chemical Waste Control Scheme;
- A Guide to the Registration of Chemical Waste Producers;
- Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes;
- Public Dumps (Works Branch Technical Circular (WBTC) No.2/93);
- Public Filling Facilities (WBTC No.2/93B);
- Fill Management (WBTC No.12/2000);
- Specification Facilitating the Use of Recycled Aggregates (WBTC No.12/2002);
- Environmental Management on Construction Sites (Environmental, Transport and Works Bureau Technical Circular (Works) (ETWB TC(W)) No.19/2005);
- Trip Ticket System for Disposal of Construction and Demolition Materials (Development Bureau Technical Circular (Works) (DEVB TC(W)) No.6/2010);
- Enhanced Specification for Site Cleanliness and Tidiness (DEVB TC(W))

No.8/2010);

- Management of Construction and Demolition Materials (CEDD TC No.11/2019);
- Monitoring of Solid Waste in Hong Kong – Waste Statistics for 2023;
- Chapter 9 of Hong Kong Planning Standards and Guidelines (HKPSG);
- Guidelines on Yard Waste Reduction and Treatment ;and
- Tree Preservation (DEVB TC(W) No.4/2020).

6.3. ASSESSMENT METHODOLOGY

6.3.1. The assessment of potential environmental impacts associated with wastes generated from the construction phase and operation phase of the Proposed Development includes the following tasks:

- Identification/ estimation of the types and quantities of waste arising from construction and operation activities of the Proposed Development;
- Evaluation of opportunities for waste reduction, re-use and recycling on-site or off-site;
- Identification of delivery/disposal options, transportation routing and frequency for each type of waste;
- Assessment of potential impacts from the handling, collection, transportation and reuse/delivery/disposal of wastes with respect to potential hazards, air and odour emissions, noise, wastewater discharge and public transport; and
- Proposing of mitigation measures and evaluation of residual impacts.
- The waste management hierarchy has been applied in the assessment and development of mitigation measures for waste arising from the Project, which comprises the following in order of descending preference: Avoidance; Minimisation; Recycling/ reuse; Treatment; and Disposal.

6.4. EXPECTED WASTE ARISING DURING CONSTRUCTION PHASE

6.4.1. During the construction phase, the main activities, such as site excavation and superstructure works, will result in the generation of waste. The typical waste types associated with these activities are summarised below:

- Excavated materials from site excavation works;
- Construction and demolition (C&D) materials from site clearance and

superstructure works;

- Chemical waste from maintenance of construction equipment; and
- General refuse from construction workforce.

Excavated Materials from Site Excavation Works

6.4.2. The Proposed Development will involve minor excavation for slope. An approximate of 1000m² slope area and 5,000m³ inert C&D materials will be excavated. The excavation area and the estimated quantity of inert materials generated is considered limited. The surplus excavated material will be all delivered to public fill reception facilities (e.g. Tseung Kwan O Area 137 Fill Bank or Tuen Mun Area 38 Fill Bank). The designation of inert C&D materials delivery is subject to the designation by the Public Fill Committee (PFC) according to DEVB TC(W) No.6/2010.

6.4.3. With the proper implementation of good construction site practice and mitigation measures described in **Section 6.6**, adverse environmental impacts from the handling, transportation and delivery of excavated materials are not anticipated. The additional traffic generated due to off-site delivery of the small amount of excavated materials is expected to be very limited, which will not cause any traffic impact concern.

C&D Materials from Demolition of Existing Buildings, Site Clearance, Superstructure Works

6.4.4. C&D materials generated from site clearance and superstructure works would be primarily inert (e.g. broken concrete, asphalt and granular materials etc.) and non-inert (e.g. bamboo, timber, paper and plastic etc.). A total of 2,000m³ C&D materials from site clearance is expected, which comprises of 1,800m³ inert and 200m³ non-inert materials ^[1].

6.4.5. The gross floor area (GFA) of the Proposed Development is approximately 6,615m². Based on the generation rate of 0.1m³/m² of gross floor area (GFA) constructed ^[2] with 90% of the total C&D waste composed of inert waste, it is estimated that the volume of C&D materials for the construction of new buildings and structures is 662m³, in which 595m³ is inert and 67m³ is non-inert C&D materials.

6.4.6. Non-inert C&D waste will mainly be generated from tree felling during site clearance,

^[1] Based on the 'Monitoring of Solid Waste in Hong Kong, 2024' published by EPD, 67% of the C&D materials were received at public fill reception facilities, while 23% were transferred to projects for direct use inert waste. Thus, 90% of the C&D materials would be assumed to be inert C&D materials. The quantity of inert C&D materials that have been re-used on-site were not taken into account in the assumption above.

^[2] The C&D material generation rate of 0.1m³ per 1m² of GFA is referenced from the 'Reduction of Construction Waste Final Report' (PolyU, 1993).

which will be sorted for reuse and recycling as much as possible before disposal to landfill. The proposed project will involve the removal of 16 nos. of trees. Upon separation of yard waste from C&D materials, on-site reuse will be considered as much as possible, and the remainder will be delivered to Y-Park in Tuen Mun for recycling and beneficial use. Other surplus non-inert C&D materials would be disposed of the landfills as the last resort. The designated disposal site of non-inert C&D materials shall be confirmed with EPD.

- 6.4.7. With the proper implementation of good construction site practice and mitigation measures described in **Section 6.6**, adverse environmental impacts from the handling, transportation and delivery of C&D waste from superstructure work are not anticipated. The additional traffic generated due to off-site delivery of the small amount of C&D waste from superstructure work is expected to be limited, which will not cause any traffic impact concern.

Chemical Waste

- 6.4.8. Chemical waste, as defined under the Waste Disposal (Chemical Waste) (General) Regulation. Regulation includes any unwanted substances specified under Schedule 1 of the Regulation. Substances likely to be generated from the construction works are listed below.
- Used paint, engine oils, hydraulic fluids and waste fuel;
 - Spent mineral oils/cleaning fluids from mechanical machinery; and
 - Spent solvents/ solutions from equipment cleaning activities.
- 6.4.9. Chemical wastes will pose environmental, health and safety hazards if they are not stored and disposed properly as outlined in the Waste Disposal (Chemical Waste) (General) Regulation and the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes.
- 6.4.10. The amount of chemical waste generated from the construction activities will be dependent on the contractor's on-site maintenance activities and the quantities of plant and equipment utilised. Where the construction processes produce chemical waste, the Contractor shall register with EPD as a chemical waste producer and duly follow the requirement in Waste Disposal (Chemical Waste) (General) Regulation. With respect to the scale of the construction activities, it is anticipated that the quantity of chemical waste to be generated will be very small (i.e. less than 5L/day). Storage, handling, transport and disposal of chemical waste should be arranged in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Waste. The chemical waste will be collected by a licensed chemical waste collector and delivered to the licensed chemical waste treatment facilities for disposal (e.g. Chemical Waste Treatment Facility (CWTC) in Tsing Yi).

6.4.11. With the incorporation of suitable arrangements for the storage, handling, transportation and disposal of chemical wastes under the requirements stated in the Waste Disposal (Chemical Waste) (General) Regulation and the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes, no adverse environmental impacts will be resulted from the handling, transportation and disposal of chemical waste.

General Refuse

6.4.12. The presence of a construction site with workers and associated site office will result in the generation of general refuse (mainly consists of food waste, plastic bottles, aluminium cans and wastepaper) which requires off-site disposal.

6.4.13. Assuming a maximum of 50 workers working at any one time and a waste generation rate of about 0.65kg/person/day, the amount of general refuse that would be generated is approximately 32.5kg/day. Such refuse will be properly managed by suitable waste collectors to prevent intentional or accidental release into the surrounding environment. Recycling bins will be provided on site to facilitate the recovery of recyclable materials. The contractor shall employ a reliable waste collector to remove the non-recyclable general refuse from the site to the designated landfill on a regular basis and deliver the recyclables to the local specialised recycling companies.

6.4.14. Given the small quantity of general refuse to be transferred, adverse impact on the capacity of waste collection, transfer and disposal facilities is not anticipated as the amount of general refuse is limited. With the implementation of mitigation measures recommended in **Section 6.6**, the generation of general refuse could be minimised, and no adverse environmental impact is expected.

Summary of Waste Quantity Estimation During Construction Phase

6.4.15. A summary of waste quantity estimation during the construction phase is summarised in **Table 6.1**.

Table 6.1 Summary of Waste Quantity Estimation during Construction Phase

Activities	Waste Type	Estimated Quantity of Materials			Disposal/ Delivery Outlet
		Generated	Reused On-site	Disposed/ Delivered Off-site	
Excavated Materials from Site Excavation	Inert C&D	5,000m ³	On-site reuse as much as possible	5,000m ³	Fill Bank
C&D Materials	Inert C&D	1,800m ³	On-site	1,800m ³	Fill Bank

Activities	Waste Type	Estimated Quantity of Materials			Disposal/ Delivery Outlet
		Generated	Reused On-site	Disposed/ Delivered Off-site	
from Demolition of Temporary Structure, Site Clearance			reuse as much as possible		
	Non-inert C&D	200m ³	-	200m ³	Recyclables to recyclers; non-recyclables to landfill
C&D Materials from Superstructure Works	Inert C&D	595m ³	On-site reuse as much as possible	595m ³	Fill Bank
	Non-inert C&D	67m ³	-	67m ³	Recyclables to recyclers; non-recyclables to landfill
General Construction Activities	Chemical Waste	less than 5L/day	-	less than 5L/day	Disposal to CWTC or other chemical waste treatment facilities
	General Refuse	32.5kg/day	-	32.5kg/day	Recyclables to recyclers; non-recyclables to landfill

6.5. EXPECTED WASTE ARISING DURING OPERATION PHASE

General Refuse

- 6.5.1. Since the Proposed Development is a RCHE, during the operation phase, the waste generated would mostly be the waste generated by elderly residents and during operation of RCHE. This includes mixed refuse such as plastic, wastepaper, aluminium cans and food packaging. With reference to the Monitoring of Solid Waste in Hong Kong – Waste Statistic 2024 published by EPD, the disposal rate of domestic waste is 0.86kg/person/day, and the recovery rate of domestic waste is 22%. By calculation, the generation rate, disposal rate and recovery rate are 1.10kg/person/day, 0.86kg/person/day and 0.24kg/person/day, respectively. The estimated amount of general refuse generated by the elderly residents is therefore approximately 391kg/day,

with a population of 355 persons (i.e. 355 beds provided in RCHE).

- 6.5.2. Besides, it is estimated 56 persons of staff operating RCHE. With reference to the Monitoring of Solid Waste in Hong Kong – Waste Statistic 2024 published by EPD, the disposal rate of commercial waste is 0.53kg/person/day, and the recovery rate of domestic waste is 48%. By calculation, the generation rate, disposal rate and recovery rate are 1.02kg/person/day, 0.53kg/person/day and 0.49kg/person/day, respectively. The estimated amount of general refuse generated by the staff is therefore approximately 58kg/day.
- 6.5.3. The total general refuse generated from the Proposed Development is therefore 449kg/day. General refuse will be recycled as far as possible through the placement of recycling bins throughout the Proposed Development. As part of the Proposed Development daily operation, general refuse is expected to be collected on daily basis and delivered to the refuse collection point regularly by waste collector, to avoid odour nuisance and/or pest/vermin problem and be disposed of at landfills. With the proper implementation of these waste management measures, no adverse environmental impact associated with waste management is expected during operation phase.

Chemical Waste

- 6.5.4. Chemical waste will be generated from various routine maintenance and servicing activities for electrical, mechanical or plant equipment in the Proposed Development. Chemical waste such as waste lubricating oil, contaminated rags, used solvents and spent chemicals are expected to be generated from these activities. It is anticipated that the total quantity of chemical waste produced by these activities would be insignificant with a few cubic meters per month.
- 6.5.5. These aforementioned chemical wastes may pose environmental, health and safety hazards if not stored and should be disposed of in an appropriate manner as stipulated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes and Waste Disposal (Chemical Waste) (General) Regulation. A licensed chemical waste collector should be deployed to special handle, transport and dispose of the chemical wastes at the CWTC or other licensed facilities, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.
- 6.5.6. With the incorporation of suitable arrangements for the storage, handling, transportation and disposal of chemical wastes under the requirements stated in the Waste Disposal (Chemical Waste) (General) Regulation and the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes, no adverse environmental impacts will result from the handling, transportation and disposal of chemical waste from the Proposed Development.

Clinical Waste

- 6.5.7. Clinical waste (such as culture and stocks, sharp boxes, infectious wastes, dressing and other wastes dribbling and caked with blood, etc.) is potentially infectious and bio-hazardous and shall be segregated from general refuse and collected separately for proper disposal. It is difficult to quantify the amount of clinical waste that will arise from this stage since it will be dependent on the amount of clinical equipment utilised, and medical activities involved.
- 6.5.8. Clinical waste generated from the RCHE during the operation phase of the Proposed Development may pose environmental, health and safety hazards if not stored and should be disposed of in an appropriate manner as stipulated in the Waste Disposal (Clinical Waste) (General) Regulation. The clinical waste will be collected at a designated refuse collection room within the Proposed Development for further collection. A licensed clinical waste collector should be deployed to special handle, transport and dispose of the clinical wastes at the CWTC or other licensed facilities, in accordance with the Code of Practice for the Management of Clinical Waste - Major Clinical Waste – Small Clinical Waste Producers and Waste Collectors and Waste Disposal (Chemical Waste) (General) Regulation.
- 6.5.9. With the implementation of mitigation measures and control requirements for clinical waste recommended in below sections, no adverse environmental impacts will result from the handling, transportation and disposal of clinical waste from the Proposed Development.

Summary of Waste Quantity Estimation During Operation Phase

- 6.5.10. A summary of waste quantity estimation during the operation phase is summarised in **Table 6.2**.

Table 6.2 Summary of Waste Quantity Estimation during Operation Phase

Waste Type	Estimated Quantity of Materials	Disposal/ Delivery Outlet
General Refuse	449kg/day	Recyclables: Deliver to specialised recycling companies by waste collectors; Non-Recyclables: Dispose of at the refuse collection point by waste collectors daily.
Chemical Waste	A few m ³ /month	Disposal to CWTC or other Chemical Waste Treatment Facilities
Clinical Waste	Depend on medical activities	Disposal to CWTC or other Clinical Waste Treatment Facilities

6.6. MITIGATION MEASURES FOR CONSTRUCTION PHASE

- 6.6.1. The assessment indicated that with the implementation of the proposed waste management practices, no adverse environmental impacts are envisaged for the handling, collection and delivery/disposal of waste arising during the construction phase of the Proposed Development.
- 6.6.2. This Section further describes the good practices to avoid or further reduce the potential environmental impacts associated with the handling, collection and disposal of various types of waste.

Good Site Practices

- 6.6.3. Adverse waste management implications are not expected, provided that good site practices are strictly implemented. The following good site practices are recommended throughout the construction activities:
- Nomination of an approved personnel, such as a site manager, to be responsible for the implementation of 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 site cleanliness, appropriate waste management procedures and concepts of waste reduction, reuse and recycling;
 - Provision of sufficient waste disposal points and regular collection for disposal;
 - Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers;
 - Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; and
 - A Waste Management Plan (WMP) should be prepared by the contractor and submitted to the Engineer for approval.

Waste Reduction Measures

- 6.6.4. Amount of waste generation can be significant reduced through good management and control. Waste reduction is best achieved at the planning and design phase, as well as by ensuring the implementation of good site practices.

Storage, Collection and Transportation of Waste

- 6.6.5. Storage, collection and transportation of waste on site may induce adverse environmental implications if not properly managed. The following recommendation should be implemented to minimise the impacts:
- Waste such as soil should be handled and stored well to ensure secure

containment;

- Yard Waste should be cut and shred to meet the collection requirements of the recycling outlet (i.e. Y-Park);
- Stockpiling area should be provided with covers and water spraying system to prevent materials from wind-blown or being washed away;
- Different locations should be designated to stockpile each material to enhance reuse;
- Sufficient waste disposal points will be provided and collection of waste for disposal will be arranged regularly;
- Waste will be transported in enclosed containers or skips to minimise windblown litter and dust/ odour nuisance during the transportation of waste; and
- Waste collection trucks shall be equipped with GPS or an equivalent system for real-tracking the off-site delivery of inert and non-inert C&D materials and a trip-ticket system should be adopted.

Measures for the Reduction of Construction Waste Generation

- 6.6.6. C&D materials arose will be segregated on-site into public fill and C&D waste and stored in different containers or skips to facilitate reuse of the public fill and proper disposal of the C&D waste. Specific areas of the site will be designated for such segregation and storage if immediate use is not practicable.
- 6.6.7. During inclement weather (e.g., heavy rain or typhoon), the storage area of C&D waste shall be covered by an impermeable sheeting to minimise polluted runoff. Prefabrication will be adopted as far as practicable to reduce the construction waste.

Management for Construction Materials Disposal

- 6.6.8. All C&D materials generated will be sorted by the contractor into different categories on-site for recycling and reuse as fill materials as far as practicable prior to delivery at public filling reception facilities and landfills.
- 6.6.9. The contractor(s) shall open a billing account with the EPD in accordance with the Waste Disposal (Charges for Disposal of Construction Waste) Regulation.
- 6.6.10. Permitted waste hauliers will be used to collect and transport waste to the appropriate disposal points. To minimise windblown litter and dust during transportation, waste shall be transported in enclosed containers/compartment, or the skip shall be covered.

Measures for the Management of Chemical Waste

- 6.6.11. The contractor(s) will register as a chemical waste producer with the EPD. Chemical waste will be handled in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes as listed below to minimise any danger to

health of risk and pollution to the environment. Chemical waste will be disposed of via a licensed chemical waste collector; and to a facility licensed to receive chemical waste, such as the CWTC which also offers a chemical waste collection service and can supply the necessary storage containers.

Measures for the Management of General Refuse

- 6.6.12. General refuse will be stored in enclosed bins separately from other waste. The general refuse will be delivered to the landfill separately from other types of waste, on a daily basis to reduce odour, pest and litter impacts.
- 6.6.13. Recycling bins will be provided at strategic locations within the construction site to facilitate recovery of recyclable materials (including aluminium can, wastepaper, glass bottles and plastic bottles) from the construction of the Proposed Development. Materials recovered will be sold for recycling.
- 6.6.14. Permitted waste hauliers will be used to collect and transport waste to the appropriate disposal points. To minimise windblown litter and dust during transportation, waste shall be transported in sealed refuse collection vehicles.

6.7. MITIGATION MEASURES FOR OPERATION PHASE

- 6.7.1. Sufficient recycling containers are recommended to be provided at suitable locations of the Proposed Development to encourage collection of recyclable wastes, such as aluminium cans, plastics and wastepaper. Segregation of food waste with the provision of collection points at the Proposed Development and facilitation of recycling of food waste will also be considered and exercised as far as practicable. The feasibility of providing separate recycling bins for food waste will be explored in later stages.
- 6.7.2. Recyclables will be collected by a licensed collector and recycled at recycling facilities. Other non-recyclable general refuse would be collected by licensed collector daily and delivered to refuse collection point.

6.8. SUMMARY

- 6.8.1. Types and volume of waste generated during the construction and operation phases of the Proposed Development have been evaluated. Various waste management measures and good site practices are in place to properly manage the waste generated during construction phase and operation phase of the Proposed Development.
- 6.8.2. With the proper implementation of the waste management / mitigation measures, adverse environmental impact arising from the handling, storage, transportation or delivery/ disposal of the waste generated by the Proposed Development is not anticipated.

7. LAND CONTAMINATION REVIEW

7.1. INTRODUCTION

7.1.1. (to be provided)

8. CONCLUSION

8.1.1. The potential environmental impacts arising from the Proposed Development have been identified and evaluated in the EA.

8.1.2. In terms of air quality aspects, with the implementation of the recommended mitigation measures and good site practice, no adverse air quality impact during the construction phase is anticipated. During operation phase, no adverse air quality impacts from air emissions generated from surrounding and within the Proposed Development are anticipated.

8.1.3. Conclusion of road traffic noise impact assessment to be provided.

8.1.4. Regarding the fixed noise impact assessment, no adverse fixed noise impact associated with existing fixed noise sources nearby and planned fixed noise sources on the Proposed Development is anticipated.

8.1.5. With respect to water quality impact, no adverse water quality impact is anticipated during construction phase, provided that the recommended mitigation measures are properly implemented. In addition, no adverse water quality impact is anticipated during operation phase. In addition, preliminary SIA and DIA will be prepared separately under this Study.

8.1.6. With proper implementation of the waste management and its mitigation measures, adverse impact arising from the handling, storage, transportation or delivery/disposal of the waste generated by the Proposed Development during construction phase and operation phase are not anticipated.

8.1.7. Conclusion of land contamination review to be provided.

8.1.8. Overall, with the implementation of the recommended environmental mitigation measures, no adverse environmental impacts are anticipated by or occur on the Proposed Development during construction phase and operation phase.