Appendix 4: Environmental Assessment

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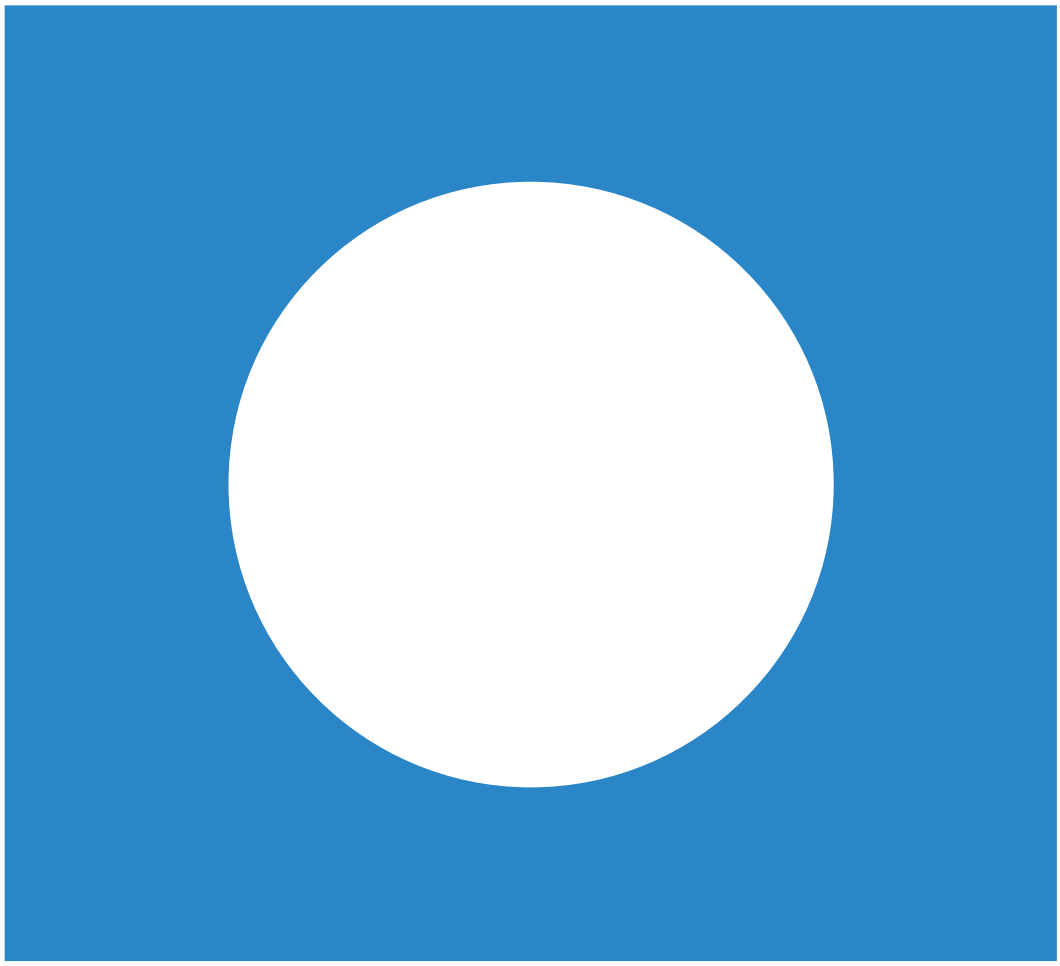

To Amend the Notes of the "Comprehensive Development to include Wetland Restoration Area" Zone for a Proposed Comprehensive Development at Wo Shang Wai, Yuen Long, Lots 77 and 50 S.A in DD101

Environmental Assessment (Rev.B)

January 2025

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Background

This application is made under section 12A of the Town Planning Ordinance, to rezone the Application Site on the draft Mai Po and Fairview Park Outline Zoning Plan ("OZP") No. S/YL-MP/7. The rezoning application aims to increase the plot ratio ("PR") from 0.4 (i.e. maximum permissible PR on the OZP) to 1.3, with a maximum building height ("BH") adjusted to not more than 10-storeys and not exceeding +42mPD by amending the Notes of the current "Other Specified Uses (Comprehensive Development to include Wetland Restoration Area)" ("OU(CDWRA)") zone.

The Applicant, Profit Point Enterprises Limited, proposes to increase the development intensity, and revise the layout and form of the housing developments in the Application Site, in response to the drastic changes in the development site context and planning circumstances of the area. This proposed comprehensive residential development comprises of club house, landscaped open spaces, car parks, residential care homes for elderly (RCHE).

The Application Site is located at Wo Shang Wai, Yuen Long. It is generally bounded by Castle Peak Road – Mai Po and San Tin Highway to the east, fishponds to the north, residential developments, namely Royal Palms and Palm Springs to the south, and Wo Shang Wai Village to the southeast.

Indicative Development Parameters

Application Site Area (Approx.)	**207, 408m^2**
Areas of the Site (Approx.)	
Wetland	47,400m^2
Communal Open Space	21,203m^2
Communal Landscape and Communal Perimeter Landscape	39,072m^2
Communal Streetside Landscape	2,988m^2
Communal Water Body	5,103m^2
Private Garden	15,444m^2
Domestic Buildings and Clubhouse	42,078m^2
Internal Road/Driveway	34,120m^2
Domestic Components	
Plot Ratio Domestic Non-Domestic	1.3 1.28 0.02
Maximum Domestic GFA (Approx.)	265,847m^2
Maximum Non-Domestic GFA (Approx.)	3,800m^2
Site Coverage (not more than)	25%
Total Number of Units	3,751
Average Unit Size (Approx.)	74.45m^2
Ancillary Recreational Facilities (Approx.)	11,581 m^2
Estimated Population	9,998*

Completion Year	2031

Remarks:
* Based on person per plat ration of 2.8

Mott MacDonald Hong Kong Limited (MMHK) was commissioned by Profit Point Enterprises Ltd to conduct an Environmental Assessment (EA) to assesses the potential environmental impacts resulting from the construction and operation of the Project, specifically due to the proposed changes in the layout of the residential development.

Meanwhile, two options are also being considered for offsite sewerage conveyance to handle the sewage generated from the Development during the operational phase. The two options are (1) construction of a sewerage pipeline to the new San Tin Lok Ma Chau Effluent Polishing Plant and adopting a temporary on-site sewage treatment plant until the San Tin Lok Ma Chau Effluent Polishing Plant is commissioned; and (2) construction of a sewerage pipeline to connect to the existing Nam San Wai Sewage Pumping station for discharge to Yuen Long Sewage Treatment Plant. The feasibility of these two options will be determined in the later stage and the potential environmental impacts arise from these two options will be assessed in the updated Environmental Impact Assessment.

1 Air Quality Impact

1.1 Introduction

This section assesses the potential air quality impacts resulting from the construction and operation of the Project, specifically due to the proposed changes in the layout of the residential development.

1.2 Legislation, Standards, Guidelines and Criteria

The following legislation and regulations provide the standards and guidelines for evaluation of air quality impacts and the type of works that are subject to air pollution control:

- Air Pollution Control Ordinance;
- Air Pollution Control (Construction Dust) Regulation;
- Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation;
- Air Pollution Control (Fuel Restriction) Regulation;
- Recommended Pollution Control Clauses for Construction Contracts;
- Environmental Impact Assessment Ordinance and Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM); and
- Hong Kong Planning Standards and Guidelines (HKPSG).

Air Pollution Control Ordinance

The principal legislation for the management of air quality is the APCO. The APCO specifies Air Quality Objectives (AQOs) which stipulate the statutory limits of air pollutants and the maximum allowable numbers of exceedances over specific periods. The prevailing AQOs which have been effective since 1st January 2022 are listed in **Table 1.1** below.

Table 1.1: Air Quality Objectives

Pollutant	Averaging time	Concentration[i] ($\mu g/m^3$)	Number of exceedances allowed
Sulphur Dioxide (SO_2)	10-minute	500	3
	24-hour	50	3
Respirable Suspended Particulates (PM_{10}) [ii]	24-hour	100	9
	Annual	50	Not applicable
Fine Suspended Particulates ($PM_{2.5}$) [iii]	24-hour	50	35
	Annual	25	Not applicable
Nitrogen Dioxide (NO_2)	1-hour	200	18
	Annual	40	Not applicable
Ozone (O_3)	8-hour	160	9
Carbon Monoxide (CO)	1-hour	30,000	0
	8-hour	10,000	0
Lead (Pb)	Annual	0.5	Not applicable

Notes:

[i]. All measurements of the concentration of gaseous air pollutants, i.e., sulphur dioxide, nitrogen dioxide, ozone and carbon monoxide, are to be adjusted to a reference temperature of 293 Kelvin and a reference pressure of 101.325 kilopascal.

[ii]. Respirable suspended particulates mean suspended particles in air with a nominal aerodynamic diameter of 10 µm or less.

[iii]. Fine suspended particulates mean suspended particles in air with a nominal aerodynamic diameter of 2.5 µm or less.

Air Pollution Control (Construction Dust) Regulation

The Air Pollution Control (Construction Dust) Regulation enacted under the APCO defines notifiable and regulatory works activities that are subject to construction dust control. Notifiable works are site formation, reclamation, demolition of a building, construction of foundation and superstructure for a building, and road construction work. Regulatory works are renovation of building, road opening or resurfacing work, slope stabilisation work, and any work involving stockpiling, loading and unloading of dusty material, transfer of dusty material using belt conveyor system, etc.

Notifiable works require that advance notice of activities shall be given to EPD. The Air Pollution Control (Construction Dust) Regulation also requires the works contractor to ensure that both notifiable works and regulatory works are conducted in accordance with the Schedule of Regulation, which provides dust control and suppression measures.

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

The Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation controls the emissions from non-road vehicle and regulated machines to be used in construction sites. The regulated machines must comply with the emission standards of Stage IIIA of the European Union (EU) or equivalent, while non-road vehicles must comply with the prevailing emission standards for newly registered road vehicles, which is Euro V. Upon confirmation of their compliance with the emission requirement, EPD will issue them with an approval label.

According to the regulation, mobile machine and equipment (regulated machines) means any mobile machine or transportable industrial equipment that is powered by an internal combustion engine with a rated engine power output that is greater than 19 kW but less than or equal to 560 kW. Non-road Mobile Machinery (NRMM) is intended to be used in a private road that is within an area wholly or mainly used for the carrying on of construction work/industry. The regulated machines include crawler cranes, excavators, etc., while non-road vehicles include private cars, goods vehicles, etc. Therefore, this regulation is applicable to the NRMM to be deployed for construction activities of the Project.

Air Pollution Control (Fuel Restriction) Regulation

The Air Pollution Control (Fuel Restriction) Regulation specifies the legal control on the type of fuels to be allowed for use and the sulphur contents of the fuels. Apart from Shatin district, the fuels to be used should comply the following respective requirements:

- Gaseous fuel; and
- Liquid fuel with a sulphur content not exceeding 0.005% by weight and a viscosity not more than 6centistokes at 40°C, such as Ultra Low Sulphur Diesel ("ULSD")

Recommended Pollution Control Clauses (RPCC) for Construction Contracts

The RPCC for construction contracts provide generally good engineering practices to minimise inconvenience and environmental nuisance to nearby sensitive receivers during the construction phase of the development. Some modifications may be required to suit different site conditions.

Technical Memorandum on Environmental Impact Assessment Process

The criteria and guidelines for evaluating air quality impacts are laid out in Section 1 of Annex 4 and Annex 12 respectively of the EIAO-TM. Section 1 of Annex 4 stipulates the criteria for evaluating air quality impacts. This includes meeting the Air Quality Objectives (AQOs) and other standards established under the APCO, and the 5-second average odour concentration of 5 odour units (ou/m^3). Annex 12 provides the guidelines for conducting air quality assessments under the Environmental Impact Assessment (EIA) process, including determination of Air Sensitive Receivers (ASRs), assessment methodology as well as impact prediction and assessment.

Hong Kong Planning Standards and Guidelines

According to Table 3.1 in Chapter 9 of the Hong Kong Planning Standards and Guidelines (HKPSG), guidelines on the buffer distances for air sensitive usage from vehicular emissions and industrial emissions have been recommended. The type of pollution source, associated parameters and their respective minimum buffer distances for open space sites are given in **Table 1.2**. The HKPSG buffer distances recommended for "active and passive recreational uses" have been adopted as references for residential uses in this assessment.

Table 1.2: Guidelines on Usage of Open Space Site

Pollutant Source	Parameter	Buffer Distance (m)	Permitted Uses
Road and Highways	*Type of Road:*		
	Trunk Road and Primary Distributor (PD)	>20	Active and passive recreational uses
		3-20	Passive recreational uses
		<3	Amenity areas
	District Distributor (DD)	>10	Active and passive recreational uses
		<10	Passive recreational uses
	Local Distributor (LD)	>5	Active and passive recreational uses
		<5	Passive recreational uses
	Under Flyovers	--	Passive recreational uses
Industrial Areas	*Difference in Height between Industrial Chimney Exit and the Site:*		
	<20m	>200	Active and passive recreational uses
		5-200	Passive recreational uses
	20-30m (*)	>100	Active and passive recreational uses
		5-100	Passive recreational uses
	30-40m	>50	Active and passive recreational uses
		5-50	Passive recreational uses
	>40m	>10	Active and passive recreational uses

Notes:
[i]. The buffer distance refers to the horizontal, shortest distance from the edge of road kerb or the position of existing chimneys, to the boundary of open space sites.
[ii]. In situations where the height of chimneys is not known, the set of guidelines marked with an asterisk are used for preliminary planning purposes and refined as and when more information is available.

1.3 Assessment Methodology

1.3.1 Construction Phase

Activities anticipated during the construction phase that could potentially give rise to fugitive dust emissions include site formation and construction of on-site infrastructure (roads/drains) and residential units. Other potential sources of air quality impacts may include exhaust emissions from construction vehicles and machinery and odour generated from excavation of fishpond deposits. No concurrent projects were identified in the vicinity of the Project.

1.3.2 Operational Phase

Potential air quality impacts during the operational phase could be attributed to vehicular emissions from existing road traffic and project induced traffic emissions, as well as odour from the existing sewage treatment plants (STP) in the vicinity. A site survey was conducted on 13 June 2024, during which no active chimney was identified within 200m from the site boundary.

1.4 Baseline Conditions / Sensitive Receivers

1.4.1 Baseline Conditions

Historical background air quality has been referenced from EPD's general air quality monitoring station (AQMS) located in Yuen Long, which is closest to the Project site. The recent five years' monitoring data (Year 2019 - 2023) recorded at the AQMS in Yuen Long is presented in **Table 1.3**.

Table 1.3: Historical Air Quality from EPD's General Monitoring Station at Yuen Long

Pollutant	Averaging Period	Concentration (µg/m^3)						Corresponding AQOs (µg/m^3)
		2019	2020	2021	2022	2023	5-year annual average	
Respirable Suspended Particulates (RSP or PM_{10})	24-hour - 10th highest	83	77	73	56	59	70	100
	Annual	37	30	30	25	26	30	50
Fine Suspended Particulates (FSP or $PM_{2.5}$)	24-hour - 36th highest	34	28	31	30	30	31	50
	Annual	20	16	17	16	16	17	25
Nitrogen Dioxide (NO_2)	1-hour - 19th highest	161	135	148	122	130	139	200
	Annual	**44**	32	40	37	37	38	40
Sulphur Dioxide (SO_2)	10-minute - 4th highest	42	26	24	21	20	27	500
	24-hour - 4th highest	11	10	14	7	10	10	50
Ozone (O_3)	8-hour - 10th highest	**200**	154	**178**	**194**	155	**176**	160
Carbon Monoxide (CO)	1-hour	2,150	1,530	2,090	1,700	1,580	1,810	30,000
	8-hour	1,903	1,279	1,591	1,519	1,273	1,513	10,000

Notes:
[i]. Data extracted from EPD's Smart Air Modelling Platform (SAMP) v2.0.
[ii]. Monitoring results that exceeded prevailing AQO criteria are shown in **bold** characters.
[iii]. Lead is not measured at Yuen Long AQMS.

The predicted future background air pollutant concentrations within the Assessment Area are extracted from the relevant grids of the Pollutants in the Atmosphere and their Transport over Hong Kong (PATH) v.3.0 model for Year 2030, the nearest to the year of population intake of the Project (2031) and are summarised in **Table 1.4** below.

Table 1.4: Future Background Air Quality from PATH for Year 2030

Pollutant	Averaging Period	Concentration (µg/m^3)		Corresponding AQO (µg/m^3)
		(28,51)	(28,52)	
NO_2	1-hour – 19th Highest	74	78	200
	Annual	15	15	40
RSP / PM_{10}	24-hour – 10th Highest	54	54	100
	Annual	21	21	50
FSP / $PM_{2.5}$	24-hour – 36th Highest	27	28	50
	Annual	13	13	25
SO2	10-min – 4th Highest	24	24	500

	24-hour – 4th Highest	7	7	50
Ozone (O_3)	8-hour – 10th highest	**186**	**182**	160
Carbon Monoxide (CO)	1-hour	526	526	30,000
	8-hour	495	496	10,000

Notes:
[i]. Data extracted from EPD's Smart Air Modelling Platform (SAMP) v2.0.
[ii]. Monitoring results that exceeded prevailing AQO criteria are shown in **bold** characters.

As shown in **Table 1.4**, the future background levels of pollutants (except for ozone) would be below their corresponding AQOs in 2030. The improvement in future ambient air quality can be attributed to the government's commitment to implement various planned emission reduction measures, as published on EPD's website.

1.4.2 Air Sensitive Receivers

Representative ASRs within 500m of the site boundary have been identified according to the criteria set out in the EIAO-TM through site inspections and a review of land use plans. ASRs and their horizontal distance from the Project site boundary have been identified and are summarized in **Table 1.5**. Locations of the ASRs are shown in **Figure 1.1**.

Table 1.5: Locations of Representative Air Sensitive Receivers

ID	Receiver Description	Usage	Construction Phase	Operation Phase	Approx. Horizontal Distance to the Site Boundary (m)
ASR1	Royal Palms	Residential	✓	✓	23
ASR2a	Palm Springs	Residential	✓	✓	21
ASR2b			✓	✓	16
ASR3	Wo Shang Wai Village	Residential	✓	✓	51
ASR4	Village House of Mai Po San Tsuen	Residential	✓	✓	107
ASR5	Proposed Comprehensive Development at Wo Shang Wai (Project Site)	Residential	×	✓	--

1.5 Evaluation of Air Quality Impact

1.5.1 Construction Phase

The entire site will be divided into six portions, corresponding to six phases of residential development. Construction will be carried out in phases, starting from the northwestern portion and progressing towards the northeastern portion, followed by the southern portion. The population intake year for all six phases of the residential development is 2031.

Fugitive dust could be generated during the construction of the Project as a result of construction activities like material handling, excavation, vehicles movement and erosion of unpaved area and stockpiles. The estimated total amount of construction and demolition (C&D) materials to be disposed off-site for the construction period is about 462,700 m^3, of which 361,400 m^3 would be inert C&D materials while 101,300 m^3 would be non-inert C&D materials. For details, please refer to **Section 4**.

Dust generation could be effectively minimized by providing covers to dusty materials in order to prevent erosion, and dust could be suppressed by regular site watering. The highest number of dump trucks is expected to be around 25-50 per day, assuming 25 dump trucks shall be travelling on the haul road and 25 numbers will be stationary at various work phases for load/ unloading works. The speed of the trucks within site will be controlled to 10 kph to reduce air quality impact

and for safe movement around the site. In addition, site hoarding shall be provided at the site boundary as a control measure. The potential air quality impact is anticipated to be short-term and with appropriate dust control measures as stipulated in the Air Pollution Control (Construction Dust) Regulation under the APCO, adverse air quality impact would not be expected.

The Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation came into effect to control the emissions from diesel powered engines and limit the amount of diesel-powered mechanical equipment to be used on-site during the construction phase.

The number of diesel-powered machinery to be used at the site is subject to site conditions and detailed construction methods. It is noted however that the works will be phased and there would be no population intake within any of the six phases of the residential development until the construction works of all phases are completed. According to the Air Pollution Control (Fuel Restriction) Regulations, liquid fuel with a sulphur content of less than 0.005% by weight should be used. Under the effects of the two regulations, emissions of gaseous pollutants from the operation of on-site diesel-powered mechanical equipment are considered to be minimal.

No concrete batching plants will be provided on-site. Concrete will be brought into the site in "ready-mixed" state or in pre-cast sections. Given the relatively flat site, no rock crushing will be necessary.

Apart from the implementation of control measures, an EM&A programme will be undertaken to monitor the dust impacts associated with construction to ensure no adverse construction air quality impacts on the adjacent ASRs and to verify the effectiveness of the control measures. In conclusion, adverse air quality impact during the construction stage is not anticipated given the proper control measures recommended in **Section 1.6.1**and the EM&A programme.

Since the proposed Project site was derived from fishponds, pond deposits underlay a majority of the Project site. Pond deposits are a mixture of organic material and may release odour for a short duration if excavated. In order to minimise the odour nuisance to surrounding environment, the following control measures are recommended:

- all malodorous excavated material should be placed as far as possible from any ASRs;
- the malodourous materials will be immediately contained in watertight containers on-site and transported off-site by trucks for disposal at a strategic landfill within one day. Sufficient number of containers will be provided;
- During transportation, odorous materials on the trucks should be properly covered by tarpaulin sheets;
- Limited number of ponds shall be excavated at a time and the duration of the works at each pond shall also be limited; and
- Frequent site inspections shall be conducted to monitor odour impact.

With proper planning and measures in place, potential odour impact is considered to be short-term and controllable.

1.5.2 Operational Phase

Impacts arising from the operation of this Project could primarily attribute to vehicular emissions that may affect the proposed development itself and identified ASRs off-site. Vehicular emission impacts from the major roads, San Tin Highway and Castle Peak Road are considered insignificant, as the nearest Project sensitive receivers are more than 162m from these major roads. Based on the Annual Traffic Census 2023, the road type of San Tin Highway and Castle Peak Road - Mai Po are expressway (EX) and rural road (RR), respectively. According to the information provided by the Project's Traffic Consultant and agreed upon by the Transport Department (TD), the road leading to the project site (i.e., Mai Po South Road) is classified as a

feeder road, which is similar to a local distributor under the road types listed in the HKPSG as advised by the Project's Traffic Consultant. The email correspondence between the Project's Traffic Consultant and the TD is presented in **Appendix 1.1**, and the corresponding buffer zones for each road type are shown in **Figure 1.1**. No air-sensitive uses of the proposed development including openable window, fresh air intake and recreational use in the open space shall be located within the buffer zones.

The HKPSG buffer distance requirement is met from all the surrounding roads for the proposed development. Based on the traffic forecast of Mai Po South Road (the road leading to the Project site) provided by the Project's Traffic Consultant, more than 90% of vehicles inside the Project site during peak hours will be private cars. The rest of the vehicle types will be light goods vehicles and a small number of heavy vehicles, such as refuse collection vehicles, would also appear within the Project site. In addition, Mai Po South Road is designated as a private road, mainly serving as an access road for the proposed development. No public transport service (including public transport interchange (PTI) and transport lay-by) will be provided within the proposed development. The vehicular emission impact is therefore limited, and adverse vehicular emission impact to nearby ASRs and the proposed development from Project induced traffic is not expected. A proposed car park will be located at the basement of the residential development. Reference shall be made to ProPECC PN 2/96 "*Control of Air Pollution in Car Parks*" for its design and operation. There will be 2,134 residential car parking spaces, 235 for visitors, 27 accessible parking spaces, 212 motorcycle parking spaces, 173 bicycle parking spaces and only 47 loading/ unloading bays, which may be used for passenger boarding / alighting, goods vehicles, etc.. Hence, no adverse air quality impact is expected from the proposed basement car park. The exhaust of the car park will be located away from any nearby ASRs, as far as possible. Therefore, the potential vehicular emission impact is not anticipated to be significant.

The planned STLMC EPP and food waste pre-treatment facilities is located over 500m away from the nearest air-sensitive uses of the proposed development, as indicated in **Figure 1.1**. Therefore, odour impact from the STLMC EPP is not anticipated.

Within the 500m Assessment Area, two existing private STPs located more than 200m from the Project site, as shown in **Figure 1.1**, serve the Palm Springs and Royal Palms residential developments. The population sizes of both Palm Springs and Royal Palms are about 3,300 and 1,700, respectively. According to the previously approved Section 16 submissions, no sewage odour was detected when conducting site surveys at the Project site over 15 months from April 2005 to June 2006, and on 21 July 2023. A recent site survey was conducted on 13 June 2024 during which no odour was also detected around the site boundary of the proposed development and the site boundaries of both existing STPs.

1.6 Mitigation Measures

1.6.1 Construction Phase

To ensure compliance with the AQOs at the ASRs at all times, it is recommended to include good site practice in the contract clauses to minimize cumulative construction air quality impact, and to implement a dust monitoring and audit programme to ensure proper implementation of the identified mitigation measures. All the relevant control measures stipulated in the Air Pollution Control (Construction Dust) Regulation would be fully implemented. Mitigation measures include:

- use of effective dust screens, sheeting or netting to be provided to enclose dry scaffolding which may be provided from the ground floor level of the building or if a canopy is provided at the first floor level, from the first floor level, up to the highest level of the scaffolding where scaffolding is erected around the perimeter of a building under construction;
- dump trucks for material transport should be totally enclosed using impervious sheeting;

- 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 within 24 hours of the excavation or unloading;
- 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 e.g., concrete, bituminous materials, hardcore or similar;
- the portion of road leading only to a construction site that is within 30m of a designated vehicle entrance or exit should be kept clear of dusty materials;
- stockpile of dusty materials to 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 to 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 10 kph except on completed access roads;
- every vehicle should be washed to remove any dusty materials from its body and wheels before leaving the construction site;
- the load of dusty materials carried by vehicles leaving the construction site should be covered entirely by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicles;
- the working area of excavation should be sprayed with water immediately before, during and immediately after (as necessary) the operations so as to maintain the entire surface wet;
- deploy electrified NRMMs as far as practicable;
- use of exempted NRMMs should be avoided as far as practicable;
- regular maintenance of construction equipment deployed on-site should be conducted;
- all malodorous excavated material should be placed as far as possible from any ASRs;
- the stockpiled malodorous materials should be kept in watertight container on site and transported off site within 24 hours; and
- during transportation, these odorous materials on the trucks should be properly covered by tarpaulin sheets.

1.6.2 Operational Phase

As the potential impacts in terms of air quality during the operational phase will be insignificant, no specific mitigation measures are required.

1.7 Evaluation of Residual Impact

No adverse residual impact is anticipated for the construction and operational phases of the Project.

1.8 Environmental Monitoring and Audit

Although the proposed Project is not expected to generate excessive dust levels, an environmental monitoring and audit program is recommended to ensure compliance with air quality criteria and the proper implementation of mitigation measures. Details are discussed in the EM&A Manual of the approved EIA report.

1.9 Conclusion

Through proper implementation of control measures, construction dust and gaseous emissions can be controlled at source to acceptable levels and hence no adverse construction air quality impacts are anticipated.

During the operational stage, no adverse impact is anticipated.

2 Noise Impact

2.1 Introduction

This section reviews the noise impact assessment findings from the previously approved Section 16 submission (Application No.: A/YL-MP/344) and identifies any changes or additional noise impacts that may arise due to the proposed changes to the layout of the residential portion.

2.2 Legislation, Standards, Guidelines and Criteria

2.2.1 Construction Phase

ProPECC PN1/24 offers guidance on the existing control on noise from construction activities under the Noise Control Ordinance (NCO) and Environmental Impact Assessment Ordinance (EIAO). It also outlines the requirements and recommendations on the practices for minimizing construction noise. The noise generated by construction activities for the project during non-restricted hours (7 a.m. to 7 p.m. on any day that is not a Sunday or general holiday) should be minimized to the greatest extent practicable. Additionally, the construction noise at the facade of the respective noise-sensitive receivers should not exceed the following noise levels.

Table 2.1: Relevant Noise Standard for Daytime Construction Activities

Noise Sensitive Receivers	Leq(30min) dB(A)
All domestic premises	75
Educational institutions (including kindergartens and nurseries	70 (65 during examinations)

Notes:
[i] The above noise standards apply to uses, why rely on opened windows for ventilation
[ii] The above standards shall be viewed as the maximum permissible noise levels assessed at 1 m from the external façade.

2.2.2 Operational Phase

Road Traffic Noise Criteria

With reference to the guideline in Table 4.1 of Chapter 9 of the HKPSG, the summary of relevant noise criteria regarding road traffic noise is given in below.

Table 2.2: Relevant Road Traffic Noise Standard for Planning Purposes

Uses	Road Traffic Noise, L10 (1 Hour), dB(A)
All domestic premises	70

Notes:
[i] The above standards apply to uses which rely on opened windows for ventilation.
[ii] The above standards should be viewed as the maximum permissible noise levels assessed at 1m from the external façade

Fixed Noise Assessment Criteria

As stated by Section 4.2.13 of Chapter 9 of the HKPSG, noise assessments for fixed noise sources would normally be conducted in accordance with the Technical Memorandum for the Assessment of Noise from Places Other Than Domestic Premises, Public Places or Construction Sites (IND-TM) under the Noise Control Ordinance (NCO). The IND-TM lays down statutory Acceptable Noise Levels (ANLs). The level of the intruding noise at the facade of the nearest sensitive use should be at least 5 dB(A) below the appropriate ANL shown in Table 3 of the IND-

TM or, in the case of the background being 5 dB(A) lower than the ANL, should not be higher than the background. In accordance with IND-TIM, the ANLs for the Noise Sensitive Receivers (NSRs) are determined with consideration of the Area Sensitivity Rating (ASR). The ASR depends on the type of area and the degree of impact that Influencing Factors (IF) have on the NSRs. **Table 2.3** Shows the considerations for determining the appropriate ASR for different NSRs.

Table 2.3: Area Sensitivity Ratings

Type of Area Containing NSR	Degree to which NSR is affected by IF		
	Not Affected[(c)]	Indirectly Affected[(d)]	Directly Affected[(e)]
(i) Rural area, including country parks[(a)] or village type developments	A	B	B
(ii) Low density residential area consisting of low-rise or isolated high-rise developments	A	B	C
(iii) Urban area[(b)]	B	C	C
(iv) Area other than those above	B	B	C

Definitions:

a) "Country park" means an area that is designated as a country park pursuant to section 14 of the Country Parks Ordinance.
b) "Urban area" means an area of high density, diverse development including a mixture of such elements as industrial activities, major trade or commercial activities and residential premises.
c) "Not Affected" means that the NSR is at such a location that noise generated by the IF is not noticeable at the NSR.
d) "Indirectly Affected" means that the NSR is at such a location that noise generated by the IF, whilst noticeable at the NSR, is not a dominant feature of the noise climate of the NSR.
e) "Directly Affected" means that the NSR is at such a location that noise generated by the IF is readily noticeable at the NSR and is a dominant feature of the noise climate of the NSR.

The appropriate ANL, in dB(A), for a given NSR may be determined from , having regard to the appropriate ASR and the time period under consideration.

Table 2.4: Acceptable Noise Levels (ANLs)

Time Period	Area Sensitivity Rating		
	A	B	C
Day (0700 to 1900 hours)	60	65	70
Evening (1900 to 2300 hours)			
Night (2300 to 0700 hours)	50	55	60

Notes:
[i] The above standards apply to uses which rely on opened windows for ventilation.
[ii] The above standards should be viewed as the maximum permissible noise levels assessed at 1m from the external façade.

The proposed development in Wo Shang Wai is situated adjacent to low density residential areas, which include low-rise private residential units such as Royal Palms and Palm Spring. The proposed development consists of numbers of 6 to 10 storey mid-rise residential towers and 3 storey houses in this S12A planning application. Therefore, when determining the type of area containing NSR, the Site is considered to be located in low density residential area consisting of low-rise or isolated high-rise development in accordance with IND-TM. In addition, the type of area containing NSR is not considered to be urban areas because the Site is not within the area of San Tin / Lok Ma Chau Development Node.

For the degree to which NSR is affected by IF, San Tin Highway (STH) is considered to be an IF since STH is an expressway that has Annual Average Daily Traffic (AADT) greater than 30,000. Since there is certain separation distance from the Site to the STH, the majority of the area of the proposed development would not be directly affected by the IF. Therefore, Area Sensitivity Rating

(ASR) "B" would be adopted in this planning application. Hence, the Acceptable Noise Levels (ANL) should be 65 dB(A) in daytime period and 55 dB(A) for nighttime period.

In accordance with Table 4.1 of chapter 9 of HKPSG, the noise standards of planned fixed noise sources should be 5 dB(A) below the appropriate the ANL shown in IND-TM. For this reason, the planning noise criteria for planned fixed noise sources should be 60 dB(A) in daytime period and 50 dB(A) for nighttime period, or the prevailing background noise level, whichever is lower.

2.3 Identification of Potential Noise Impacts

The Assessment Area for the noise impact assessment has included all areas within 300m from the boundary of the Project site boundary as shown in **Figure 2.1**. Major land use within the Assessment Area includes residential developments such as Royal Palms, Palm Springs, Mai Po San Tsuen and Wo Shang Wai village, and roads such as Castle Peak Road, San Tin Highway and San Tam Road.

The potential noise impacts associated with the construction and operational phases of the proposed development are identified and described in this section.

2.3.1 Construction Phase

Potential construction noise impact would be associated with the uses of Powered Mechanical Equipment (PME) for various construction activities of the Project. The construction activities mainly divided into 3 main categories sequentially - (1) Site Clearance, (2) Substructure Works and (3) Superstructure Works.

The construction activities for the proposed development are divided into 6 Phases. It is assumed that all the Phases (Phase 1 to Phase 6) would be under construction at the same time in the assessment and the haul road would be equally distributed for each phase as shown in **Figure 2.2.**

Non-percussive piling shall be used for the foundation works at the subject development site. No noisy operations are expected during the 'finishing' activity of each phase as such activities are mostly confined to the inside of the already constructed houses. The above statement is the same as previously approved Section 16 submission.

The potential noise impact during the construction phase of the development was assessed quantitatively as detailed in **Section 2.6.1**.

2.3.2 Operational Phase

2.3.2.1 Road Traffic Noise

Road traffic on nearby road network is the dominant noise source within the Assessment Area. There is potential road traffic noise impact on the proposed development.

2.3.2.2 Fixed Noise Sources

Existing Fixed Noise Sources

Based on the approved EIA report (Ref. no. AEIAR-217/2018A), STP in Royal Palms and the Mai Po Ventilation Building of the XRL near the site entrance were identified within the Assessment Area. According to the latest site surveys conducted on 6 and 7 November 2024, a total of five fixed noise sources were identified, including Mai Po Substation and Mai Po Floodwater Pumping Station, STP in Palm Springs, STP in Royal Palms and Mai Po Ventilation Building. The information of the site visits is recorded in **Appendix 2.1**. Furthermore, no additional planned fixed plant has been identified since the previously approved Section 16 submission.

Planned Fixed Noise Sources

E&M buildings and one permanent on-site sewage treatment plant were proposed in the previous Section 16 submission which the plants within the buildings will be entirely enclosed and confined, hence, no adverse noise impact was concluded. According to the tentative layout, E&M buildings will be provided on-site. Given that the E&M buildings will be entirely enclosed and confined, no adverse fixed noise impact from the planned fixed noise sources is expected.

The operation noise impact assessment was detailed in **Section 2.6.2**.

2.4 Determination of Noise Sensitive Receivers

NSRs have been identified within the Assessment Area. These NSRs included all existing NSRs as well as planned/committed noise sensitive developments and uses earmarked on the relevant Outline Zoning Plans and development layout plans.

According to Planning Department's record, no planning application or rezoning application for residential development or other noise sensitive uses is identified in the nearby Other Specified Uses (OU) and Village (V) zones. The adjacent OU zone is being used for the Mai Po Ventilation Building of XRL Project.

Any future planned residential uses of these sites require the approval from Town Planning Board and application for such uses likely have to go through the EIA process. Therefore, there are currently no known planned sensitive uses in the OU. As New Territories Exempted Houses in V zone are always permitted, representative noise sensitive receiver at the V zone in the vicinity of the proposed development is included in this assessment.

The uses and designation of the noise sensitive receivers within the Assessment Area are shown in **Table 2.5**. The assessment points for construction noise impact assessment are shown in **Figure 2.2** and summarised in **Table 2.6**.

During the operation phase of the development, NSRs will be subject to the noise impact from road traffic and fixed plant sources. As determined in the approved EIA of the proposed development (Register No. AEIAR-120/2008), the NSRs mostly affected by road traffic noise are those located close to the site access road connecting San Tin Highway. For the fixed plant noise impact, the most affected NSRs are those located nearby the XRL ventilation building (i.e. major fixed noise source). The assessment points identified for operation phase assessment are shown in **Figure 2.3a** and **Figure 2.3b** and summarised in **Table 2.7** and **Table 2.8**, respectively.

Table 2.5: Noise Sensitive Receivers Identified within the Assessment Area

Designation	Uses
Proposed Comprehensive Development at Wo Shang Wai (Project Site)	Residential
Palm Springs	Residential
Royal Palms	Residential
Wo Shang Wai Village	Residential
Mai Po San Tsuen	Residential
Scenic Heights	Residential
St Lorraine English Kindergarten	Educational

Table 2.6: Horizontal Distances between the Representative NSRs and the Notional Source Position of Each Phase for Construction Phase

NSR ID	Uses	Locations / Descriptions	No. of storeys	Horizontal distance between NSRs and the notional source position of each phase, m ^					
				1	2	3	4	5	6

NSR1	Residential	House No. 5, Cherry Path, Palm Springs	3	84	220	389	577	287	414
NSR2	Residential	House No. 5, Camelia Path, Palm Springs	3	73	223	402	591	262	404
NSR3	Residential	House No. 1, Pinaceae Drive	3	85	259	439	626	218	386
NSR4	Residential	House No. 17, Wo Shang Wai Village	3	154	211	329	456	89	190
NSR5	Residential	House No. 1, Narcissus Path, Royal Palms	3	133	187	289	418	54	150
NSR6	Residential	House No. 25, Narcissus Path, Royal Palms	3	184	217	278	375	65	67
NSR7	Educational	St Lorraine English Kindergarten	3	278	321	381	457	173	167
NSR8	Residential	House No. 61, Narcissus Path, Royal Palms	3	282	294	292	335	162	66
NSR9	Residential	House No. 1, Marin Avenue, Royal Palms	3	301	269	175	173	216	69
NSR10	Residential	House No. 1, Ventura Avenue, Royal Palms	3	294	243	93	82	239	82
NSR11	Residential	House No. 202, Mai Po San Tsuen	3	577	519	340	167	518	368
NSR12	Residential	House No. 330, Mai Po San Tsuen	3	548	498	304	148	510	366
NSR13	Residential	Block A1, Scenic Heights	3	721	669	513	311	637	491

Note: (^) – For Phase 1, the horizontal distance between the NSRs and (i) the notional source position, or (ii) the notional source position of Phase 1 development area at the west of the site, whichever is the shortest, was adopted as conservative approach.

Table 2.7: Representative NSRs for Operation Phase (Road Traffic Noise)

NSR ID	Description	Uses	No. of storeys
TN1	3-Storey House	Residential	3
TN2	Tower C2-1	Residential	10
TN3	Tower C2-1	Residential	10
TN4	Tower C2-1	Residential	10
TN5	Tower C2-2	Residential	10
TN6	Tower C2-2	Residential	10
TN7	Tower C2-2	Residential	10
TN8	Tower C2-3	Residential	10
TN9	Tower C2-3	Residential	10
TN10	Tower C2-3	Residential	10
TN11	Tower C2-4	Residential	10
TN12	Tower C2-4	Residential	10
TN13	Tower C2-4	Residential	10
TN14	Tower C2-5	Residential	10
TN15	Tower C2-5	Residential	10
TN16	Tower C2-5	Residential	10
TN17	Tower C2-5	Residential	10

NSR ID	Description	Uses	No. of storeys
TN18	Tower C2-5	Residential	10
TN19	Tower C1-22	Residential	6
TN20	Tower D2-8	Residential	6
TN21	Tower D2-7	Residential	6
TN22	Tower D1-7	Residential	6
TN23	Tower D2-6	Residential	6
TN24	Tower C2-6	Residential	6
TN25	Tower C2-6	Residential	6

Table 2.8: Representative NSRs for Operation Phase (Fixed Plant Noise)

NSR ID	Description	Uses	No. of storeys
FN1	Tower C2-5	Residential	10
FN2	Tower C2-5	Residential	10
FN3	Tower C2-4	Residential	10
FN4	Tower C2-3	Residential	10
FN5	Tower C2-2	Residential	10
FN6	Tower C2-1	Residential	10
FN7	3-Storey House	Residential	3

2.5 Assessment Methodology

2.5.1 Construction Phase

Construction noise levels are predicted at the identified NSRs for both the foundation and superstructure work stages in order to assess the project feasibility during the planning stage and to identify if there are any potential constraints on the works programme or the use of construction equipment.

The methodology for the construction noise assessment other than percussive piling is based on the procedures set out in the GW-TM, as summarised below:

- To identify the affected NSRs within the Study Area;
- To identify the phasing of construction work and, locations and required number of construction plant items;
- To obtain the sound power levels in dB(A) of the construction equipment from the GW-TM;
- To determine the distance from the effective noise source location (or "notional source position") to the NSRs and distance attenuation (from geometric spreading and other absorption effects where appropriate), barrier corrections and reflection corrections at the NSR as prescribed in the GW-TM;
- To calculate the Corrected Noise Level (CNL) which will be generated by the construction works at the NSRs; and
- To propose direct mitigation measures, if necessary, to minimise the impact by the construction work in order to comply with the stipulated noise limits.

Construction Phases

Construction of the Project will commence in 2027 with the residential development ready for occupation in 2031. The entire site will be divided into 6 portions i.e., 6 residential development phases. It is assumed that construction works will be carried out at the same time as conservative approach. All the phases will be completed before the population intake.

Non-restriction Hours

No evening or night time (7pm to 7am the next day) construction work is anticipated. Therefore, potential construction noise impacts during restricted hours were not assessed. The potential noise impacts on the nearby NSRs arising from the construction works during non-restricted hours (7am to 7pm) were assessed. Notwithstanding the above, for any construction works to be carried out during the restricted hours, the Contractor will be required to submit CNP application to Noise Control Authority and has the responsibility to ensure compliance with the condition of CNP, if need.

Construction Plant Inventory

A typical plant inventory for the major construction works provided by the project team was shown in **Appendix 2.2.**

Whilst it is possible that the future appointed Contractor may propose a different plant inventory, this assessment has been undertaken on the anticipated plant to allow early identification of any potential noise problem and to ensure there are practicable and sufficient noise mitigation measures that can be implemented to alleviate adverse noise impacts during the planning stage. The Contractor will be required to provide an updated Construction Noise Mitigation Plan (CNMP) with details of the updated plant inventory and mitigation measures to achieve acceptable noise levels on the nearby NSRs.

2.5.2 Operational Phase

Road Traffic Noise

The road traffic noise level at the identified noise sensitive receivers were predicted based on the maximum projection of road traffic flow within 15 years upon the last phase occupation of the proposed residential development which is 2046. The traffic flow project in year 2046 as shown in **Table 2.9** is adopted.

Table 2.9: Traffic Flow Forecast of Road Networks (Year 2046) (1)

Index No.	Road Name	Direction	Road Speed (km/hr)	AM Peak		PM Peak	
				Total Flows(2) (Veh/hr)	HV% (3)	Total Flows(2) (Veh/hr)	HV% (3)
1	Mai Po South Road	EB	50	350	9%	150	9%
		WB	50	250	11%	200	9%
2	Castle Peak Road – Mai Po	2-way	50	750	21%	600	28%
3	San Tin Highway	NB	100	5100	39%	4600	38%
4	San Tin Highway	SB	100	5300	36%	5300	28%
5	San Tam Road	2-way	50	400	36%	350	28%
6	San Tam Road	2-way	50	450	33%	350	31%
7	San Tam Road	2-way	50	500	27%	400	22%
8	Ko Hang Road	2-way	50	50	30%	50	27%
9	Maple Po Gardens 1st St	2-way	50	150	16%	100	9%
10	Maple Po Gardens 1st St	2-way	50	100	16%	100	4%
11	Maple Po Gardens 5th St	2-way	50	50	11%	50	18%
12	Castle Peak Road – Mai Po	2-way	50	500	35%	500	43%
13	Mai Po Road	2-way	50	100	35%	50	28%
14	Royal Palms Boulevard	2-way	50	450	15%	400	11%

Notes:
1. The forecast data is provided by the traffic consultant;
2. Traffic flows are rounded up to the nearest 50 veh/hr;
3. Heavy vehicles include all category of motor vehicles except private car, taxi and motorcycle;
4. AM Peak is selected for assessment as worst-case scenario.

The road traffic noise calculation procedures prescribed in the "Calculation of Road Traffic Noise (1988)" (CRTN) published by the Department of Transport, UK have been adopted in this assessment. The traffic noise modelling was carried out using proprietary traffic noise model software "RoadNoise", which implements the CRTN procedures. **Figure 2.4** shows the computer plot of the input features in the noise model.

Fixed Noise

With reference to the previously approved Section 16 submission, the existing STP at Royal Palms and Mai Po Ventilation Building were identified as the potential fixed noise sources. According to the latest site surveys conducted on 6 and 7 November 2024, a total of five fixed noise sources were identified, including Mai Po Substation and Mai Po Floodwater Pumping Station, STP in Palm Springs, STP in Royal Palms and Mai Po Ventilation Building. The information of the site visits is recorded in **Appendix 2.1**. As for the planned fixed noise sources (e.g., E&M Buildings) under the Project, it is similar to those previously approved in the Section

16 submission. Details of all the identified existing and planned fixed noise sources are presented below –

i. Existing Sewage Treatment Plant at Royal Palms

Within the Assessment Area, there is an existing STP at the entrance of Royal Palms at the northeast corner of the Project site. The STP at Royal Palms is located 184m from the Project site boundary. The location of the STP is shown in **Figure 2.3b**. With reference to the previously approved Section 16 submission, the noise level at 3m from the said plant is 56dB(A). The plant operates 24 hours a day and it is assumed that the operating noise is steady throughout the day.

The worst-case fixed plant noise level at the Project site was predicted using standard acoustics principles and practices. The predicted noise level at the Project Boundary is 20 dB(A) [56 - 20*log (184/3)] without background noise level superimposed which is far below the noise criteria for day and evening time (i.e., 65dB(A)) and night time (i.e., 55dB(A)). As such, it is anticipated that there will be no significant noise impact from this fixed plant.

ii. Existing Mai Po Ventilation Building (MPVB)

The noise data of the MPVB has been updated (compared to previously approved Section 16 submission) based on the Commissioning Test Report submitted under EP-349/2009/N for the Hong Kong Section of Guangzhou - Shenzhen - Hong Kong Express Rail Link (XRL), the calculated SWLs of the MPVB ventilation openings have been adopted for assessment. The location of the louvres on the MPVB is shown in **Figure 2.3b**. Pages extracted from the Commissioning Test Report regarding the SWLs and louvre location of the MPVB are included in **Appendix 2.3**.

iii. Existing Mai Po Substation

Within the Assessment Area, there is a substation adjacent to the transitional Housing – The STEP, as shown in **Figure 2.3b**. The Mai Po Substation is located 322m from the Project site boundary, and they are separated by the San Tin Highway. Based on the site observation, equipment that generates noise appeared to be enclosed in a building structure. No noticeable noise was observed. Given the considerable separation distance and the site observation made, it is anticipated that the fixed noise impact from the existing Mai Po Substation will be insignificant.

iv. Existing Sewage Treatment Plant at Palm Springs

Within the Assessment Area, there is an existing STP at the western boundary of Palm Springs, as shown in **Figure 2.3b**. The STP at Palm Springs is located 239m from the Project site boundary. Based on the site observation, no noticeable noise was identified. Given the considerable separation distance and the site observation made, it is anticipated that the fixed noise impact from the existing STP at Palm Springs will be insignificant.

v. Existing Mai Po Floodwater Pumping Station

Within the Assessment Area, there is an existing floodwater pumping station adjacent to Mai Po San Tsuen, as shown in **Figure 2.3b**. The Mai Po Floodwater Pumping Station is located approximately 267m from the Project site boundary. Based on the site observation, equipment that generates noise appeared to be enclosed in a building structure. No noticeable noise was observed. Given the considerable separation distance and the site observation made, it is anticipated that the fixed noise impact from the Mai Po Floodwater Pumping Station will be insignificant.

vi. Planned E&M Buildings (from Project)

With reference to the current MLP, there will be E&M buildings, as shown in **Figure 2.3b**. The E&M buildings will be small in scale and the plants within the building will be entirely enclosed

and confined. Hence, the noise impact from this fixed plant is anticipated as insignificant and will not be considered in this assessment.

2.6 Prediction and Evaluation of Noise Impact

2.6.1 Construction Phase

Construction Noise

With the adoption of the approved mitigation measure (i.e. noise barrier) during the construction phase in the latest EP (EP-311/2008/E) as shown in **Figure 2.5** and adopting of QPME / Quiet Construction Method as shown in **Table 2.11**, the maximum predicted construction noise levels at the identified NSRs are summarised in **Table 2.10**. The cross-section drawings between the existing temporary noise barriers for construction phase and selected NSRs have been provided in **Figure 2.7** and **Figure 2.8**. A detailed noise calculation is provided in **Appendix 2.4**.

Table 2.10: Maximum Predicted Construction Noise Levels at Representative NSRs

NSR	Maximum Predicted Construction Noise Level, dB(A)	Daytime Construction Noise Criteria, dB(A)
NSR 1	63	75
NSR 2	64	75
NSR 3	63	75
NSR 4	64	75
NSR 5	67	75
NSR 6	67	75
NSR 7	60	70 (65 for examination period)
NSR 8	65	75
NSR 9	65	75
NSR 10	67	75
NSR 11	58	75
NSR 12	69	75
NSR 13	54	75

Table 2.11: QPME / Quiet Construction Method for Construction Phase

QPME / Quiet Construction Method	Description	SWL, dB(A)
Hydraulic Crusher	Replace traditional excavated-mounted breaker	94
Excavator, wheeled/tracked	Replace Regular PME [QPME ID: EPD-12299]	92
Bulldozer, tracked	Replace Regular PME [QPME ID: EPD-12694]	108
Crane, mobile	Replace Regular PME [QPME ID: EPD-12240]	101

The maximum predicted construction noise levels at the representative NSRs range from $L_{eq(30mins)}$ 54 dB(A) to 69 dB(A). The assessment results indicate that construction noise levels at all identified NSRs are expected to comply with the construction noise criteria for domestic premises and educational institution. Therefore, no additional mitigation measures due to the design changes are required.

2.6.2 Operational Phase

Road Traffic Noise

Table 2.12 summarises the predicted noise levels at the representative NSRs, and noise exceedance was observed. Mitigation measure is required to alleviate the predicted road traffic noise impact.

Table 2.12: Predicted Road Traffic Noise Levels at Representative NSRs (Base Case)

NSR ID	Uses	Max. Predicted Noise Levels, $L_{10(1hour)}$, dB(A)	Noise Criteria, $L_{10(1hour)}$, dB(A)	Noise Exceedance? [Y/N]
TN1	Residential	69	70	N
TN2	Residential	**71**	70	Y
TN3	Residential	**71**	70	Y
TN4	Residential	70	70	N
TN5	Residential	**71**	70	Y
TN6	Residential	**71**	70	Y
TN7	Residential	69	70	N
TN8	Residential	69	70	N
TN9	Residential	**72**	70	Y
TN10	Residential	69	70	N
TN11	Residential	70	70	N
TN12	Residential	**72**	70	Y
TN13	Residential	69	70	N
TN14	Residential	69	70	N
TN15	Residential	**73**	70	Y
TN16	Residential	**75**	70	Y
TN17	Residential	67	70	N
TN18	Residential	**74**	70	Y
TN19	Residential	51	70	N
TN20	Residential	53	70	N
TN21	Residential	60	70	N
TN22	Residential	62	70	N
TN23	Residential	56	70	N
TN24	Residential	66	70	N
TN25	Residential	67	70	N

Note:

[i]. **Bold** figures denote exceedance of relevant noise criteria.

Fixed Noise Sources

The potential fixed plant noise impact at the representative NSRs is assessed and the results are shown in **Table 2.13**. The detailed noise calculation is given in **Appendix 2.5**.

Table 2.13: Predicted Fixed Noise Level at Representative NSRs

NSR ID	Predicted Noise Level, dB(A)			
	Daytime	Daytime Criterion	Night-time	Night-time Criterion
FN1	39	65	39	55
FN2	41	65	41	55

NSR ID	Predicted Noise Level, dB(A)			
	Daytime	Daytime Criterion	Night-time	Night-time Criterion
FN3	41	65	41	55
FN4	40	65	39	55
FN5	39	65	38	55
FN6	37	65	36	55
FN7	35	65	34	55

Note:
[i]. **Bold** figures denote exceedance of relevant noise criteria.

No exceedances in fixed plant noise impact are predicted; therefore, no mitigation measures are necessary.

2.7 Mitigation Measures

2.7.1 Construction Phase

Construction noise assessment results show that, with the uses of QPME and noise barriers as recommended in the approved EIA of this Project, the maximum construction noise levels at all of the representative NSRs are predicted to comply with the construction noise criterion of $L_{eq(30mins)}$ 75dB(A) for domestic premises and 70 dB(A) for educational institution as stipulated in the EIAO–TM.

In addition to the measures recommended in the approved EIA of this Project, practical mitigation measures should be implemented to further alleviate the potential noise impact. It is expected that with suitable on-site supervision in limiting the number of powered mechanical equipment and good site practices, the construction noise impact can be further reduced. The following mitigation measures are recommended to further alleviate the construction noise impact:-

- Scheduling of work - The Contractor will be required to determine the number and type of construction equipment taking into account the use of quiet plant while devising a feasible work programme.
- Sitting of facilities - This includes avoiding simultaneous operation of noisy equipment; retaining existing features that can act as a noise barrier until the last phase; and erecting, as early as possible, any new structures which will have the effect of screening noise sources. Such screens can reduce noise levels by 15dB(A) or more. Noisy equipment should always be sited as far as possible from noise sensitive receivers. Consideration should also be given to the use of structures such as site offices and stores as noise barriers.
- Use of quiet Powered Mechanical Equipment (QPME) - The contractor should be requested, as far as possible, to use quiet PME, which has a lower SWL compared to one specified in GW–TM. This is one of the most effective measures to reduce noise emission at source and is increasingly practicable because of the availability of quiet equipment in the market.

Good site practices and noise management can further reduce the noise impact of the construction sites' activities on nearby NSRs. The following measures should be followed during each phase of construction:

- Only well-maintained plant should be operated on-site, and the plant should be serviced regularly during the construction programme;
- Machines and plant that may be intermittent in use should be shut down between work periods or should be throttled back to a minimum;
- Plant known to emit noise strongly in one direction, should, where possible, be oriented so that the noise is directed away from nearby NSRs;

- Silencers or mufflers on construction equipment should be utilised and should be properly maintained during the construction period;
- Mobile plant should be sited as far away from NSRs as possible;
- Material stockpiles and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities; and
- The Contractor shall at all times comply with all current statutory environmental legislation.

To ensure the proper implementation of mitigation measures, a Construction Noise Management Plan (CNMP) should be prepared and submitted. The future contractor will be required through contract specifications to provide and implement sufficient direct mitigation measures with reference to the recommendations in the approved EIA and this EA or the future detailed design to achieve acceptable noise levels on the nearby NSRs. The CNMP shall identify the inventory of noise sources and assess the effectiveness and practically of all mitigation measures to minimize the construction noise impact. The CNMP should further explore and maximize the use of quiet construction methods / equipment as far as practicable. The CNMP should also confirm and summarise the mitigation measures to be implemented for the Project. The CNMP shall be submitted three months prior to the issue of tender for the construction of the Project and shall be included in the construction tender document.

2.7.2 Operational Phase

Road Traffic Noise

Table 2.12 indicates that exceedance of the relevant noise criteria is predicted at the noise sensitive facades TN2, TN3, TN5, TN6, TN9, TN12, TN15, TN16 and TN18. Hence mitigation measure is necessary to minimise the noise impact.

With reference to "Practice Note for the Planning of Residential Developments Against Road Traffic Noise (ProPECC PN 4/23)", acoustic window (AW) and enhanced acoustic balcony (EAB) are proven to be capable of reducing the noise inside the flats by at least 6 dB(A)[1], even in different configurations and dimensions to suit the individual needs, and at the same time allowing adequate natural ventilation.

The maximum traffic noise exceedance is 5 dB(A). Since AW can generally provide a notional noise reduction of about 6dB(A), it is recommended that those blocks (i.e. Tower C2-1, Tower C2-2, Tower C2-3, Tower C2-4, Tower C2-5) with exceedance up to 5 dB(A) will be provided with acoustic windows at the affected facades (i.e. facades in the vicinity of TN2, TN3, TN5, TN6, TN9, TN12, TN15, TN16 and TN18), as indicated in **Figure 2.6.**

With the implementation of the acoustic windows at the affected façades, the predicted road traffic noise levels at the representative NSRs are summarised in **Table 2.14** below, which are all in compliance with the noise criterion.

With reference to the latest EP under Wo Shang Wai (Figure 7 of EP-311/2008/E), the mitigation measures included a noise barrier integrated with E&M Building of total 5.5.m high and a 1m extend exterior wall. Given that the layout has been changed, the 1m extend exterior wall and E&M Building of total 5.5.m high would not be applied in this assessment.

[1] Based on the Practice Note on Application of Innovative Noise Mitigation Designs in Planning Private Residential Developments against Road Traffic Noise Impact and the findings from noise impact assessment reports prepared for private residential developments in the past.

Table 2.14: Predicted Road Traffic Noise Levels at NSRs with Exceedance in Base Case (Mitigated)

NSR ID	Mitigation Measures	Predicted Noise Levels, $L_{10(1hour)}$, dB(A)	Noise Criteria, $L_{10(1hour)}$, dB(A)	Noise Exceedance? [Y/N]
TN2	Residential	≤70	70	N
TN3	Residential	≤70	70	N
TN5	Residential	≤70	70	N
TN6	Residential	≤70	70	N
TN9	Residential	≤70	70	N
TN12	Residential	≤70	70	N
TN15	Residential	≤70	70	N
TN16	Residential	≤70	70	N
TN18	Residential	≤70	70	N

Fixed Noise Sources

According to **Table 2.13**, all NSRs comply with the relevant noise criteria. Therefore, no mitigation measures are necessary.

According to the latest EP under Wo Shang Wai (Figure 6 of EP-311/2008/E), the mitigation measures included 9.5m and 6.5m high noise barriers. Based on the above calculation (i.e. with adopting the latest noise data of MPVB from the Commissioning Test Report under EP-349/2009/N), both 9.5m and 6.5m high noise barriers mentioned in the VEP are not necessary in this assessment.

2.8 Conclusion

2.8.1 Construction Phase

With the implementation of noise mitigation measures during the construction phase, noise levels at the NSRs will comply with the noise criteria. Therefore, no residual noise impact is anticipated.

2.8.2 Operational Phase

For mitigating the potential traffic noise impact, it is recommended to adopt acoustic windows at the affected façades of the noise sensitive receivers. With this recommended measure in place, no adverse road traffic noise impacts are anticipated.

For fixed plant noise impact during the operational phase, no potential noise impacts are anticipated from the fixed noise source of XRL MPVB.

3 Water Quality Impact

3.1 Introduction

This section assesses the potential water quality impacts resulting from the construction and operation of the Project, specifically due to the proposed changes in the layout of the residential development.

3.2 Legislation, Standards, Guidelines and Criteria

Water quality impacts have been assessed with reference to the relevant environmental legislation and standards, which are the same as those adopted in the previously approved Section 16 submission. The following relevant pieces of legislation and associated guidance are applicable to the evaluation of water quality impacts associated with the Project.

- Water Pollution Control Ordinance (WPCO) (Cap. 358);
- Technical Memorandum for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters (WPCO, Cap. 358, S.21);
- Town Planning Board Guidelines No. 12C;
- Environmental Impact Assessment Ordinance (Cap. 499., S.16), Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM), Annexes 6 and 14;
- Marine Water Quality in Hong Kong in 2023;
- River Water Quality in Hong Kong in 2023;
- Hong Kong Planning Standard and Guidelines (Chapter 9);
- Practice Note for Professional Persons ProPECC PN 1/23 "Drainage Plan subject to Comment by the Environmental Protection Department, Building (Standards of Sanitary Fitments, Plumbing, Drainage Works and Latrines) Regulations 40(1), 40(2), 41(1) and 90;
- Practice Note for Professional Persons ProPECC PN 2/23 "Construction Site Drainage"; and
- Environmental, Transport and Works Bureau Technical Circular (Works) No.5/2005" Protection of natural streams/rivers from adverse impacts arising from construction works, ETWB TC (Works) No. 5/2005.

3.3 Existing Environment and Sensitive Receivers

Existing Environment

Baseline conditions of the Project site was identified as part of the previously approved Section 16 submission, which remain unchanged. The direction of water flow in the water ditches and drainage channels are basically from south to north diverting to the Shenzhen River in the Deep Bay Water Control Zone (WCZ). The Water Quality Objectives for Deep Bay WCZ are listed in **Table 3.1**.

Table 3.1: Summary of Water Quality Objectives for Deep Bay WCZ

Parameter	Objectives	Part(s) of Zone
Aesthetic Appearance	Waste discharges shall cause no objectionable odours or discolouration of the water.	Whole zone
	Tarry residues, floating wood, articles made of glass, plastic, rubber or of any other substances should be absent.	
	Mineral oil should not be visible on the surface. Surfactants should not give rise to a lasting foam.	

Parameter	Objectives	Part(s) of Zone
	There should be no recognisable sewage-derived debris.	
	Floating, submerged and semi-submerged objects of a size likely to interfere with the free movement of vessels, or cause damage to vessels, should be absent.	
	Waste discharges shall not cause the water to contain substances which settle to form objectionable deposits.	
Bacteria	The level of Escherichia coli should not exceed 610 per 100 mL, calculated as the geometric mean of all samples collected in one calendar year.	Secondary Contact Recreation Subzone and Mariculture Subzone
	The level of Escherichia coli should be zero per 100 mL, calculated as the running median of the most recent 5 consecutive samples taken at intervals of between 7 and 21 days.	Yuen Long & Kam Tin (Upper) Subzone, Beas Subzone, Indus Subzone, Ganges Subzone and Water Gathering Ground Subzones
	The level of Escherichia coli should not exceed 1 000 per 100 mL, calculated as the running median of the most recent 5 consecutive samples taken at intervals of between 7 and 21 days.	Yuen Long & Kam Tin (Lower) Subzone and other inland waters
	The level of Escherichia coli should not exceed 180 per 100 mL, calculated as the geometric mean of all samples collected from March to October inclusive in one calendar year. Samples should be taken at least 3 times in a calendar month at intervals of between 3 and 14 days.	Yung Long Bathing Beach Subzone
Colour	Waste discharges shall not cause the colour of water to exceed 30 Hazen units.	Yuen Long & Kam Tin (Upper) Subzone, Beas Subzone, Indus Subzone, Ganges Subzone and Water Gathering Ground Subzones
	Waste discharges shall not cause the colour of water to exceed 50 Hazen units.	Yuen Long & Kam Tin (Lower) Subzone and other inland waters
Dissolved Oxygen	Waste discharges shall not cause the level of dissolved oxygen to fall below 4 milligrams per litre for 90% of the sampling occasions during the year; values should be taken at 1 metre below surface.	Inner Marine Subzone excepting Mariculture Subzone
	Waste discharges shall not cause the level of dissolved oxygen to fall below 4 milligrams per litre for 90% of the sampling occasions during the year; values should be calculated as water column average (arithmetic mean of at least 2 measurements at 1 metre below surface and 1 metre above seabed). In addition, the concentration of dissolved oxygen should not be less than 2 milligrams per litre within 2 metres of the seabed for 90% of the sampling occasions during the year.	Outer Marine Subzone excepting Mariculture Subzone
	The dissolved oxygen level should not be less than 5 milligrams per litre for 90% of the sampling occasions during the year; values should be taken at 1 metre below surface.	Mariculture Subzone
	Waste discharges shall not cause the level of dissolved oxygen to be less than 4 milligrams per litre.	Yuen Long & Kam Tin (Upper and Lower) Subzones, Beas Subzone, Indus Subzone, Ganges Subzone, Water Gathering Ground Subzones and other inland waters of the Zone
pH	The pH of the water should be within the range of 6.5–8.5 units. In addition, waste discharges shall not cause the natural pH range to be extended by more than 0.2 units.	Marine waters excepting Yung Long Bathing Beach Subzone
	Waste discharges shall not cause the pH of the water to exceed the range of 6.5–8.5 units.	Yuen Long & Kam Tin (Upper and Lower) Subzones, Beas Subzone, Indus Subzone, Ganges Subzone and Water Gathering Ground Subzones

Parameter	Objectives	Part(s) of Zone
	The pH of the water should be within the range of 6.0–9.0 units.	Other inland waters
	The pH of the water should be within the range of 6.0–9.0 units for 95% of samples. In addition, waste discharges shall not cause the natural pH range to be extended by more than 0.5 units.	Yung Long Bathing Beach Subzone
Temperature	Waste discharges shall not cause the natural daily temperature range to change by more than 2.0°C.	Whole zone
Salinity	Waste discharges shall not cause the natural ambient salinity level to change by more than 10%.	Whole zone
Suspended Solids	Waste discharges shall neither cause the natural ambient level to be raised by 30% nor give rise to accumulation of suspended solids which may adversely affect aquatic communities.	Marine waters
	Waste discharges shall not cause the annual median of suspended solids to exceed 20 milligrams per litre.	Yuen Long & Kam Tin (Upper and Lower) Subzones, Beas Subzone, Ganges Subzone, Indus Subzone, Water Gathering Ground Subzones and other inland waters
Ammonia	The un-ionized ammoniacal nitrogen level should not be more than 0.021 milligram per litre, calculated as the annual average (arithmetic mean).	Whole zone
Nutrients	(a) Nutrients shall not be present in quantities sufficient to cause excessive or nuisance growth of algae or other aquatic plants.	Inner and Outer Marine Subzones
	Without limiting the generality of objective (a) above, the level of inorganic nitrogen should not exceed 0.7 milligram per litre, expressed as annual mean.	Inner Marine Subzone
	Without limiting the generality of objective (a) above, the level of inorganic nitrogen should not exceed 0.5 milligram per litre, expressed as annual water column average (arithmetic mean of at least 2 measurements at 1 metre below surface and 1 metre above seabed).	Outer Marine Subzone
Five-Day Biochemical Oxygen Demand	Waste discharges shall not cause the 5-day biochemical oxygen demand to exceed 3 milligrams per litre.	Yuen Long & Kam Tin (Upper) Subzone, Beas Subzone, Indus Subzone, Ganges Subzone and Water Gathering Ground Subzones
	Waste discharges shall not cause the 5-day biochemical oxygen demand to exceed 5 milligrams per litre.	Yuen Long & Kam Tin (Lower) Subzone and other inland waters
Chemical Oxygen Demand	Waste discharges shall not cause the chemical oxygen demand to exceed 15 milligrams per litre.	Yuen Long & Kam Tin (Upper) Subzone, Beas Subzone, Indus Subzone, Ganges Subzone and Water Gathering Ground Subzones
	Waste discharges shall not cause the chemical oxygen demand to exceed 30 milligrams per litre.	Yuen Long & Kam Tin (Lower) Subzone and other inland waters
Toxins	Waste discharges shall not cause the toxins in water to attain such levels as to produce significant toxic carcinogenic, mutagenic or teratogenic effects in humans, fish or any other aquatic organisms, with due regard to biologically cumulative effects in food chains and to toxicant interactions with each other.	Whole Zone
	Waste discharges shall not cause a risk to any beneficial uses of the aquatic environment.	Whole Zone
Phenol	Phenols shall not be present in such quantities as to produce a specific odour, or in concentration greater than 0.05 milligrams per litre as C_6H_5OH.	Yung Long Bathing Beach Subzone

Parameter	Objectives	Part(s) of Zone
Turbidity	Waste discharges shall not reduce light transmission substantially from the normal level.	Yung Long Bathing Beach Subzone

Source: Statement of Water Quality Objectives (Deep Bay Water Control Zone). Water Pollution Control Ordinance (Cap. 358R), 1997.

The existing water pollution sources include the runoff from adjacent agricultural activities, effluent from fish-cum-duck activities at the northern boundary of the Project site and the disposal of domestic sewage from the adjacent developments. The routine marine water quality monitoring data collected by EPD in 2023 has been reviewed for the monitoring stations (DM1 and DM2) at Deep Bay WCZ. The location of the representative marine water quality monitoring stations are shown in **Figure 3.1**. The summary of water quality for Inner Deep Bay WCZ in 2023 is presented in **Table 3.2**. The overall WQO compliance rate for the Inner Deep Bay WCZ was 53% in 2023, as compared with a ten-year average of 47% in 2009-2018. Overall, with the measures under the Deep Bay Water Pollution Control Joint Implementation Programme taken progressively by the governments of Hong Kong and Shenzhen, there have been significant water quality improvements in Deep Bay. In particular, there has been full compliance of the NH_3-N WQO in the past seven years. Although Deep Bay, as compared with other WCZs, shows higher nutrient levels with annual depth-averaged TIN levels exceeding the respective TIN WQOs, a noticeable long-term decrease in TIN levels since mid-2000s has been seen.

Table 3.2: Summary of Marine Water Quality for the Inner Deep Bay WCZ in 2023

Parameters	DM1	DM2
Temperature (^oC)	25.6 (19.0 – 31.7)	25.5 (19.0 – 31.4)
Salinity	18.6 (9.7 – 23.3)	20.5 (11.5 – 25.5)
Dissolved Oxygen (mg/L)	5.2 (3.7 – 7.7)	5.4 (3.7 – 7.6)
Dissolved Oxygen (% Saturation)	70 (54 – 112)	74 (55 – 111)
pH	7.4 (7.1 – 7.8)	7.4 (6.8 – 7.8)
Secchi Disc Depth (m)	1.2 (0.9 – 1.6)	1.1 (0.8 – 1.5)
Turbidity (NTU)	27.2 (6.0 – 52.2)	29.1 (7.2 – 55.7)
Suspended Solids (mg/L)	28.3 (15.0 -61.0)	35.5 (15.0 – 72.0)
BOD_5 (mg/L)	1.0 (0.5 – 1.8)	1.0 (0.1 – 2.5)
Ammonia Nitrogen (mg/L)	0.397 (0.170 -0.810)	0.282 (0.076 – 0.860)
Unionised Ammonia (mg/L)	0.006 (0.001 – 0.012)	0.004 (<0.001 – 0.016)
Nitrite Nitrogen (mg/L)	0.118 (0.043 – 0.350)	0.094 (0.035 – 0.280)
Nitrate Nitrogen (mg/L)	0.883 (0.580 – 1.300)	0.724 (0.250 – 1.100)
Total Inorganic Nitrogen (mg/L)	1.40 (0.83 – 1.82)	1.14 (0.60 – 2.04)
Total Kjeldahl Nitrogen (mg/L)	0.76 (0.40 – 0.98)	0.64 (0.31 – 1.00)
Total Nitrogen (mg/L)	1.76 (1.24 – 2.20)	1.50 (0.97 – 2.18)
Orthophosphate Phosphorus (mg/L)	0.123 (0.069 – 0.170)	0.119 (0.049 – 0.320)

Parameters	DM1	DM2
Total Phosphorus (mg/L)	0.20 (0.14 – 0.27)	0.19 (0.14 – 0.35)
Silica (as SiO_2)(mg/L)	5.38 (1.90 – 10.00)	4.43 (1.00 – 11.00)
Chlorophyl l-a (µg/L)	3.5 (1.7 – 6.0)	5.5 (1.4 – 13.0)
E.coli (cfu/100mL)	310 (24 - 3,300)	380 (21 – 80,000)
Faecal Coliforms (cfu/100mL)	640 (44 – 10,000)	730 (40 – 220,000)

Source: Marine Water Quality in Hong Kong in 2023 (EPD)
*Note:
[i]. Data presented are in annual arithmetic means of depth-average results, except for *E.coli* and faecal coliforms which are in annual geometric means.
[ii]. Figures in brackets are annual ranges.

The routine river water quality monitoring data collected by EPD in 2023 has been reviewed for the nearest monitoring location to Wo Shang Wai at Fairview Park Nullah (FVR1). The location of the river water quality monitoring station is shown in **Figure 3.1**. This nullah is a short concrete channel within the Fairview Park residential development, which shares the same drainage basin as the southern part of the Project site. The summary of the River Water Quality at Nearby Fairview Park Nullah in the Deep Bay Water Control Zones in 2023 is presented in **Table 3.3**. It is observed that compliance with river water quality objectives in the Fairview Park Nullah is improving from 47% in 2002 to 73% in 2023. The WQI grading remained "Fair' in 2023 (EPD, 2023).

Table 3.3: Summary of River Water Quality at Nearby Fairview Park Nullah in the Deep Bay Water Control Zones in 2023

Parameters	FVR1
Dissolved Oxygen (mg/L)	5.4 (3.7 – 11.7)
pH	7.4 (7.1 – 8.5)
Suspended Solids (mg/L)	11.5 (6.8 – 22.0)
BOD_5 (mg/L)	6.9 (3.0 – 13.0)
COD (mg/L)	30 (9 – 70)
Oil & Grease (mg /L)	<0.5 (<0.5 – <0.5)
E.coli (cfu/100mL)	25,146 (2,900 – 120,00)
Faecal Coliforms (cfu/100mL)	71,882 (14,000 – 440,000)
Ammonia-nitrogen (mg/L)	1.450 (0.450 – 2.800)
Nitrate-nitrogen (mg/L)	0.760 (0.340 – 1.200)
Total Kjeldahl Nitrogen (mg/L)	2.40 (0.92 – 4.00)
Orthophosphate Phosphorus (mg/L)	0.275 (0.095 – 0.530)
Total Phosphorus (mg/L)	0.45 (0.12 – 0.73)
Sulphide (mg/L)	<0.02 (<0.02 – 0.04)
Aluminium (µg/L)	<50 (<50 - <50)
Cadmium (µg/L)	<0.1 (<0.1 - <0.1)

Parameters	FVR1
Chromium (µg/L)	<1 (<1 – 1)
Copper (µg/L)	2 (<1 – 2)
Lead (µg/L)	<1 (<1 - <1)
Zinc (µg/L)	10 (<10 – 20)
Flow (m^3/s)	NM

Source: River Water Quality in Hong Kong in 2023 (EPD)
*Note:
[i]. Data presented are in annual medians of monthly samples, except those for *E.coli* which are in annual geometric means.
[ii]. Figures in brackets are annual ranges.
[iii]. NM indicates no measurement taken.

Water Sensitive Receivers (WSRs)

The existing or potential beneficial uses that are sensitive to water pollution include the fishponds in active use in the Conservation Area (CA) adjacent to the Project site and the drainage channel connecting to the water ditch at the northern boundary of the Project site. The Deep Bay Water Control Zone, the Ramsar Site and Mai Po Nature Reserve are the indirect sensitive receivers. The WSRs are listed in **Table 3.4** and locations are shown in **Figure 3.2**.

Table 3.4: Water Sensitive Receivers Identified within the Assessment Area

ID	WSR	Type	Description	Estimated distance from the Project Site (m)
WSR1	Fishponds near Tam Kon Chau Road	Fishpond	Active Fishponds	0m
WSR2	Pond near Wo Shang Wai Village	Pond	Individual pond, disconnected to river system	15m
WSR3	Ponds next to Palm Springs	Pond	Individual ponds, disconnected to river system	122m
WSR4	Ponds inside Palm Springs	Pond	Individual ponds, disconnected to river system	152m
WSR5	Pond near Palm Canyon Drive	Pond	Individual pond, disconnected to river system	295m
WSR6	Pond near Cypress Drive	Pond	Individual pond, disconnected to river system	474m
WSR7	Water Ditch around Tam Kon Chau Road	Water Ditch	Individual water ditch, disconnected to river system	0m
WSR8	Water Ditch near Camelia Path	Water Ditch	Water ditch downstream to Shan Pui River	137m
WSR9	Channels next to Palm Canyon Drive	Channel	Individual channels	45m
WSR10	Channel next to Castle Peak Road	Channel	Individual channel	330m

ID	WSR	Type	Description	Estimated distance from the Project Site (m)
WSR11	Channels next to Sam Tam Road	Channel	Individual channels	139m
WSR12	Channels around the pond near Cypress Drive	Channel	Individual channels	460m
WSR13	Channels around the ponds near Palm Springs	Channel	Individual channels	250m
WSR14	Channel next to Mai Po Floodwater Pumping Station	Channel	Individual channel	307m

3.4 Assessment Methodology

The findings from the previously approved Section 16 submission have been reviewed to identify any changes to the previous assessment due to the proposed change in layout of the residential portion, and any additional water quality impacts that need to be addressed. Where appropriate, additional mitigation measures are recommended to mitigation potential water quality impacts.

3.5 Evaluation of Water Quality Impact

3.5.1 Construction Phase

3.5.1.1 Review of Previously Identified Impacts

The previously approved Section 16 submission identified the following key potential impacts to water quality during the construction phase:

- Diversion of existing water ditches and marsh;
- Draining of existing water ditches;
- Soil excavation and stockpiling;
- Chemical waste from plant and equipment; and
- Domestic effluent.

3.5.1.2 Evaluation of Impacts due to the Proposed Change in Residential Units

The proposed change in the layout of the development portion has changed the construction activities associated with the Project, but there are no expected significant changes to the previously identified water quality impacts during the construction phase.

3.5.2 Operational Phase

3.5.2.1 Review of Previously Identified Impacts

The previously approved Section 16 submission identified the following key potential impacts to water quality during operation phase:

- Wastewater pollution;
- Diversion of existing water ditches and marsh; and
- Changes in hydrology.

3.5.2.2 Evaluation of Impacts

For the previously identified potential impacts during the operation phase, the volume of sewage generated by the Project would change because of the proposed change in the layout of the

residential development portion and an increase in the design population. Other previously identified impacts would not be affected. New potential impacts arising from the offsite sewerage conveyance options would be assessed in the updated EIA.

Wastewater Pollution

As mentioned in the previously approved Section 16 submission, a permanent on-site sewage treatment plant (STP) will be established. However, no permanent on-site STP will be constructed under the proposed layout in the current Section 12A application. Instead, all sewage generated by the project will be conveyed to the public sewers, either via a new connection to the existing Nam Sang Wai sewage pumping station that discharges to the Yuen Long Sewage Treatment Plant (YLSTW), or via a new connection constructed as part of the San Tin / Lok Ma Chau Development Node and ultimately directed to the San Tin / Lok Ma Chau Effluent Polishing Plant (STLMC EPP).

The total population (resident and staff) is projected to be 10,193, and the average dry weather flow (ADWF) volume of sewage is 3,788.04 m^3/day.

For the option of discharging to the planned STLMC EPP, in the event that the population intake for the Development occurs before the commissioning of the STLMC EPP, a temporary on-site STP with tertiary level treatment will be established during the interim period until the STLMC EPP is commissioned. Effluent from the STP will be treated to meet the Group C Inland Waters' discharge standard under the Technical Memorandum for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters before discharge to Mai Po Tributary.

Diversion of Existing Water Ditches and Marsh

As evaluated in the previously approved Section 16 submission, the existing water ditches and marsh within the Project site mainly act as discharge points for the surface runoff generated within the Project site to the Mai Po River in the north. They will be filled in order to facilitate the construction of the site formation for the proposed Development. An internal drainage network underneath the future road system within the proposed development will be provided to collect the surface runoff generated within the Project site. The proposed internal drainage network will have sufficient capacity to cater for the runoff generated from the proposed Development, to replace the existing water ditches and marsh. The proposed internal drainage network and box culvert are shown in **Figure 3.3**. No potential impacts are identified during the operation phase.

Change in Hydrology

The proposed development will generate additional surface runoff due to the construction of additional paved areas, roads and facilities associated with the residential development. The additional runoff will be discharged to Mai Po River in the north of the Project site via the internal drainage system under the future internal road network. In the previously approved Section 16 application, the estimated peak runoff generated is 14.26 m^3/s under a 50-year storm. Based on the flow data obtained in the latest Drainage Impact Assessment under this Section 12A application, the estimated peak runoff generated is 14.95 m^3/s under a 50-year storm. Since the increase in the surface runoff is insignificant, no adverse effect on the existing aquatic organisms or water quality in the drainage system is anticipated.

3.6 Mitigation Measures

3.6.1 Construction Phase

The previously approved Section 16 submission identified mitigation measures to be implemented to minimise potential water quality impacts due to construction activities of the Project. As there are no changes to the identified water quality impacts due to the proposed change in layout of residential portion, the previously identified good site practices and mitigation measures remain

valid, and no changes to the previously identified mitigation measures for construction phase are required. Good site practices outlined in ProPECC PN 2/23 and ETWB TC (Works) No. 5/2005 should be adopted to minimise runoff from construction works areas. The following measures are recommended to minimise the impacts of construction on water quality.

- Temporary site drainage facilities and perimeter channels shall be designed and implemented by Contractor prior to commencement of construction to convey surface runoff to silt removal facilities. The design of the silt /sand removal traps and sediment basins shall follow the design in ProPECC PN 2/23;
- Runoff into the excavation areas during rainstorm events shall be minimised as far as practicable. Any wastewater pumped out of the excavation areas shall be treated to remove suspended solids prior to discharge;
- No discharge of silty water into the drainage channel within and in the vicinity of the site;
- Maintenance and inspection of the drainage system and sediment removal facilities should be carried out regularly to remove any sediment and blockages, especially when rainstorms are forecast;
- Stockpiles of construction materials should be properly covered and located away from any natural stream/river;
- Construction debris and spoil should be covered up and/or properly disposed of as soon as possible to avoid being washed into nearby steam/river by rain;
- Construction effluent, site run-off and sewage should be properly collected and/or treated. Wastewater from a construction site should be managed with the following approach in descending order: (1) minimisation of wastewater generation; (2) reuse and recycle; (3) treatment. Proper locations for discharge outlets of wastewater treatment facilities well away from the natural stream/river should be identified;
- Adequate lateral support may need to be erected in order to prevent soil/mud from slipping into the stream/river, but without unduly impeding the flow during heavy rain;
- Manholes (including those constructed as part of the Project) should be adequately covered and temporarily sealed at all times;
- Temporary access road should be protected by crushed stone or gravel;
- Intercepting channels should be provided to prevent storm runoff from washing across exposed soil surfaces;
- Trenches should be dug and backfilled in short sections. Measures should be taken to minimize the ingress of rainwater into trenches when rainstorms are likely;
- Any soil contaminated with chemicals/oils shall be removed from site and the void created shall be filled with suitable materials;
- Suitable containers shall be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport;
- Chemical waste containers shall be labelled with appropriate warning signs in English and Chinese to avoid accidents. There shall also be clear instructions showing what action to take in the event of an accidental;
- Storage areas shall be selected at safe locations on site and adequate space shall be allocated to the storage area;
- Any construction plant which causes pollution to the water system due to leakage of oil or fuel shall be removed off-site immediately;
- Spillage or leakage of chemical waste to be controlled using suitable absorbent materials;
- Chemicals will always be stored on drip trays or in bunded areas where the volume is 110% of the stored volume;

- Regular clearance of domestic waste generated in the temporary sanitary facilities to avoid waste water spillage; and
- Temporary sanitary facilities to be provided for on-site workers during construction.

3.6.2 Operational Phase

Under this Section 12A application, no permanent on-site STP will be constructed, as proposed in the previously approved Section 16 submission. Instead, all sewage generated during the Project's operational phase will be conveyed either via a new connection to the existing Nam Sang Wai sewage pumping station that discharges to the YLSTW, or via a new connection to the public sewer to be constructed as part of the San Tin / Lok Ma Chau Development Node. In case the population intake for the Development occurs before the commissioning of the STLMC EPP, a temporary on-site STP with tertiary level treatment will be established during the interim period until the STLMC EPP is commissioned.

With the implementation of the recommended mitigation measures, the chances of any direct discharge of untreated sewage effluent into surrounding rivers or ponds will be adequately minimised, and no adverse water quality impact is anticipated.

3.7 Evaluation of Residual Impact

With the implementation of the recommended mitigation measures, no adverse water quality impacts are expected during the construction and operation phases, and no residual impact on water quality is anticipated.

3.8 Environmental Monitoring and Audit

A water quality monitoring and site auditing programme has been recommended in the previously approved Section 16 submission to ensure mitigation measures during the construction phase will be implemented. No changes to the water quality monitoring and site auditing programme are required.

3.9 Conclusion

The proposed change in the layout of the development portion has changed the construction activities associated with the Project, but there are no expected significant changes to the previously identified water quality impacts during the construction phase. Thus, through proper implementation of water pollution mitigation measures, no adverse impact is anticipated.

During the operation phase, all sewage generated by the project will be conveyed to the public sewers either via Nam Sang Wai sewage pumping station to YLSTW or via the planned STLMC EPP with temporary on-site STP to cater the population intake prior to STLMC EPP commissioning if necessary.

With the implementation of the appropriate mitigation measures during the construction and operation phases, no adverse water quality impact is anticipated.

4 Waste Management Implications

4.1 Introduction

This section identifies the potential waste attributing to the phase of construction and operation of the Project and evaluates the potential environmental impacts that may result from waste generated. Mitigation measures and good site practices on waste handling, storage and disposal, are suggested with reference to applicable waste legislation and management guidelines with a view to mitigate potential waste management impacts.

4.2 Legislation, Standards, Guidelines and Criteria

The following legislation which relates to the handling, storage and disposal of wastes in Hong Kong are relevant in the assessment of waste management implication:

- 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);
- Public Health and Municipal Services Ordinance – Public Cleansing and Prevention of Nuisances Regulation (Cap. 132BK); and
- Dumping at Sea Ordinance (Cap. 466)

Waste Disposal Ordinance (Cap. 354)

The Waste Disposal Ordinance (WDO) is the principal piece of legislation for management and control of waste disposal in Hong Kong. The 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, waste can be disposed of only at designated waste disposal facilities licensed by the Environmental Protection Department (EPD).

Waste Disposal (Chemical Waste) (General) Regulation (Cap. 354C)

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 Environmental Protection Department (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, which details how the Contractor should comply with the regulations on chemical wastes.

Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N)

Under the Waste Disposal (Charges for Disposal of Construction Waste) Regulation, 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, whereas construction waste delivered to a public fill reception facility for disposal must consist entirely of inert material.

Land (Miscellaneous Provisions) Ordinance (Cap. 28)

The inert portion of Construction and Demolition (C&D) materials may be taken to Public Fill Reception Facilities (PFRFs) operated by the Civil Engineering and Development Department (CEDD). PFRFs usually form part of land reclamation schemes. 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. 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.

Public Health and Municipal Services Ordinance – Public Cleansing and Prevention of Nuisances Regulation (Cap. 132BK)

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

Dumping at Sea Ordinance (Cap. 466)

This Ordinance came into operation in April 1995 and empowers the Director of Environmental Protection (DEP) to control the disposal and incineration of substances and particles at sea for the protection of the marine environment. Under the Ordinance, a dumping permit from the DEP is required for the disposal of regulated substances within and outside the waters of Hong Kong. The permit contains terms and conditions which include the following specifications, but not limited to:

- Type and quantity of substances permitted to be dumped;
- Location of the disposal grounds;
- Requirement of equipment for monitoring the disposal operations; and
- Environmental monitoring requirements.

Marine disposal of any dredged/excavated sediment is subject to control under the Dumping at Sea Ordinance (DASO). Dredged/excavated sediment destined for marine disposal is classified based on its contaminant levels with reference to the *Administrative Guidance - Management Framework for Disposal of Dredged/ Excavated Sedimen*t. The *Administrative Guidance* stipulated a set of sediment quality criteria or Chemical Exceedance Levels (CEL) for contaminants including metals, metalloid and organic pollutants.

ETWB TCW No. 19/2005 Environmental Management on Construction Sites

The ETWB TCW No. 19/2005 Environmental Management on Construction Sites introduces measures to enhance waste management on construction sites. The circular sets out the policies and procedures that require the contractors to prepare and implement an Environmental Management Plan (EMP), which includes the Waste Management Plan (WMP) to encourage on-site sorting of C&D materials and to minimise generation of C&D materials during the course of construction.

Other Relevant Environmental Guidelines

Other environmental relevant circulars/guidelines applicable to waste management practices for this Project include:

- WBTC No. 2/93, Public Dumps
- WBTC No 2/93B, Public Filling Facilities
- WBTC No. 16/96, Wet Soil in Public Dumps
- WBTC Nos. 4/98 and 4/98A, Use of Public Fill in Reclamation and Earth Filling Project
- WBTC No. 12/2000, Fill Management
- WBTC No. 19/2001, Metallic Site Hoardings and Signboards
- WBTC No. 12/2002, Specification Facilitating the Use of Recycled Aggregates
- DEVB TCW No. 06/2010, Trip-ticket System for Disposal of Construction and Demolition Material
- DEVB TCW No. 08/2010, Enhanced Specification for Site Cleanliness and Tidiness
- DEVB TCW No. 02/2011, Encouraging Use of Recycled and other Green Materials in Public Works Projects
- DEVB TCW No. 09/2011, Enhanced Control Measures for Management of Public Fill
- CEDD TC No. 11/2019, Management of Construction and Demolition Materials
- Administrative Guidance - Management Framework for Disposal of Dredged/ Excavated Sediment
- Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes

4.3 Assessment Methodology

The methods for assessing potential waste management impacts during construction and operation phases include the following:

- Identify the types and quantity of waste arising as a result of the phase of the construction and operation activities of the Project;
- Assess the potential environmental impacts associated with the waste generation, handling, storage, transport and disposal;
- Identify the opportunities for reducing waste generation, on-site or off-site reuse and recycling prior to considering the disposal options for each type of waste; and
- Identify the disposal options for each type of waste impact associated with the storage, collection, transfer, and disposal of waste.

4.4 Identification and Evaluation of Waste Management Implications

The waste implication during construction and operational phase due to the development of the Project has been assessed and presented in the following sub-sections.

4.4.1 Construction Phase

The main activities which would potentially result in the generation of waste include:

- Site formation and substructure works; and
- Construction of new buildings and infrastructures.

A variety of type of wastes would be generated during construction phase that can be divided into the following distinct categories based on their compositions:

- Construction and demolition (C&D) materials;
- Excavated sediment (including marine deposit and pond mud);
- Chemical waste; and
- General refuse.

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

4.4.1.1 C&D Materials

The estimated amount of C&D Materials to be generated during construction phase is summarized in **Table 4.1**.

Table 4.1: Estimated Amount of Different Types of Wastes to be Generated During the Construction Phase

Activities	Quantity of waste to be generated (m^3)		Inert C&D Material Reused On-Site (m^3)	Disposed Offsite (m^3)		Tentative Disposal Period
	Inert C&D Material [i] (m^3)	Non-inert C&D Material [ii] (m^3)		Inert	Non-inert	
Site clearance, site formation and construction of infrastructures	383,000	95,800	40,200	342,800	95,800	Year 2027 & 2028
Construction of new buildings	21,900	5,500	3,300	18,600	5,500	Year 2027 - 2031
Total	**404,900**	**101,300**	**43,500**	**361,400**	**101,300**	

Notes:
[i]. Inert C&D material: e.g. soil, sand, clay, crushed concrete, asphalt, bitumen, brick, tile
[ii]. Non-inert C&D material: e.g. bamboo, timber, paper, glass, steel, and plastic

C&D Materials from Site Clearance, Site Formation and Construction of Infrastructures

C&D materials, comprising both inert and non-inert portions, would be generated from site clearance of ground surface, as well as excavation works during site formation. It is estimated that around 478,800 m^3 of C&D material (inert portion of 383,000 m^3 and non-inert portion of 95,800 m^3) will be generated. The quantities of material generated is shown in **Table 4.1**.

Based on the best available design, it is estimated that around 40,200 m^3 of inert C&D materials will be reused on-site subjected to site constraints, while 342,800 m^3 of inert C&D materials are expected to be delivered to the public fill reception facility. The estimated amount of non-inert C&D materials is approximately 95,800 m^3, which will be disposed of at landfill.

C&D Materials from Construction of New Buildings

C&D materials would also be generated from the construction of new buildings. The inert portion of the C&D materials is referred to broken concrete, rock etc. to be delivered to the public fill reception facility and the non-inert portion including packing materials and general refuse is referred to construction waste and would be disposed of at landfill.

In accordance with the "Reduction of Construction Waste Final Report, Hong Kong Polytechnic University (March 1993)", a C&D materials generation rate of 0.1 m^3 per 1 m^2 of GFA is adopted. It is estimated that approximately total 27,400 m^3 of C&D materials would be generated from construction of the buildings of the Project.

The estimated amount of C&D materials to be generated during the construction of new buildings is summarized in **Table 4.2**.

Table 4.2: Summary of C&D Materials Volumes Generated During Construction of New Buildings

Total estimated GFA (m^2)	Total C&D material generated (m^3) [i]	Inert C&D material (m^3) [ii][iii]	Non-inert C&D material (m^3) [ii][iv]
265,800	26,600	21,200	5,400

Notes:

[i]. Reduction of Construction Waste Final Report, Hong Kong Polytechnic University (March 1993)

[ii]. Approximately ratio for (inert waste): (non-inert waste) is 8:2 "Monitoring of Solid Waste in Hong Kong, 1997" by EPD

[iii]. The inert waste mainly is Artificial Hard Material (AHM) which includes, but not limited to, broken concrete, asphalt, bitumen and granular materials, etc.

[iv]. "Non-inert C&D material" includes, but not limited to, bamboo, timber, paper and plastic, etc.

It is expected that approximately 21,200 m^3 would be inert material which are envisaged to be delivered to the public fill reception facility and 5,400 m^3 would be non-inert material to be disposed of at landfill.

All inert C&D materials will need to be carefully stockpiled if it cannot be reused or removed directly to avoid dust and other nuisance impacts. The Contractor should separate non-inert C&D materials from inert C&D materials on-site. All segregated recyclable materials (e.g., metal) should be collected by reputable recyclers. The remaining non-inert C&D materials should be disposed of at designated landfill by dump trucks.

4.4.1.2 Excavated Sediment

Based on the existing ground investigation (GI) information, land-based sediment (including marine deposit and pond mud) is anticipated within the proposed residential development. The major source of excavated sediment comes from basement construction of the proposed residential development.

To minimize the amount of excavated sediment, the extent of the residential development basement had been reviewed and the excavation level had been optimized, with the aim to minimize the disturbance of the existing sediment. Such that the design scheme presented in this report has been evaluated with optimized basement extent to minimize excavation of excavated sediment as far as possible.

The estimated quantities of sediment to be excavated from the Project construction are shown in **Table 4.3**.

Table 4.3: Estimated Amount of Excavated Sediment

Quantity of Excavated Sediment (m^3)	Quantity of Excavated Sediment to be Reused On-Site (m^3)	Quantity of Sediment to be Disposed Off-site or Re-use in Other Projects (m^3)
77,400	77,400	0

Note:

[i]. The treatment methodology, reuse mode, post-treatment testing requirements and acceptance criteria will be endorsed by the Architect/ Engineer.

Reuse of Excavated Sediment

Based on the best available design, all excavated sediment is proposed to be reused on-site, such as profiling and backfilling materials or other on-site reuse options under the Project.

Prior to commencement of construction, sampling and testing for sediment will be conducted by the Contractor for the concerned excavation area in accordance with *Administrative Guidance - Management Framework for Disposal of Dredged/ Excavated Sediment*. Based on the testing results, the sediment would be categorized in accordance with the *Administrative Guidance*.

Subjected to the testing result, excavated sediment treatment will be undertaken prior to reuse. The treatment methodology, reuse mode, post-treatment testing requirements and acceptance criteria will be endorsed by the Architect/Engineer.

Offsite Disposal or Offsite Re-use of Excavated Sediment

Based on the best available design, all excavated sediment will be reused onsite and no offsite disposal will be required. However, as subjected to further studies in subsequent design stage, should surplus sediment be excavated and onsite reuse option be not feasible, the project proponent will explore sediment re-use opportunities of other projects in HK. Meanwhile, the project proponent shall carry out the sampling and testing at the excavation area in accordance with the *Administrative Guidance - Management Framework for Disposal of Dredged/ Excavated Sediment* to determine the sediment quality. The project proponent shall prepare the Sediment Sampling and Testing Plan (SSTP) and submit to EPD for agreement. The testing results shall also be submitted to EPD for agreement prior to the commencement of construction in this area. The sediment would be categorized by the testing results in accordance with the *Administrative Guidance*.

Offsite disposal of sediment to the marine disposal facilities should be the last resort, and if required, the disposal methods for the surplus excavated sediment will be decided by the classification for the excavated materials based on their testing results in accordance with the *Administrative Guidance*.

The recommended mitigation measures for handling of excavated sediment are discussed in **Section 4.5**. No adverse waste management implications are anticipated if the recommended mitigation measures are implemented.

4.4.1.3 Chemical Waste

The maintenance and servicing of construction plant and equipment may generate some chemical wastes such as used solvents, cleaning fluids 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 few hundred litres 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. For the disposal of chemical wastes, the Contractor would be required to register with the EPD as a Chemical Waste Producer and to follow the requirements stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes.

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) Regulation.

The potential hazards include:

- Toxic effects to workers;
- Adverse impacts on water quality from spills and associated adverse impacts on marine biota; and
- Fire hazards.

Materials classified as chemical wastes will require special handling and storage arrangements before removal for off-site disposal/treatment at the approved Chemical Waste Treatment Centre (CWTC) or licensed chemical waste treatment facilities. Wherever possible opportunities should be taken to reuse and recycle materials. Provided that the handling, storage and disposal of

chemical wastes are in accordance with these requirements, adverse environmental impacts are not expected.

4.4.1.4 General Refuse

The construction workforce will generate refuse comprising food scraps, waste paper aluminium cans and plastic bottles during construction period.

Release of general refuse into watercourses is not permitted as introduction of these wastes is likely to have detrimental effects on water quality in the area. Effective collection of site waste would be required to prevent waste materials being blown around by wind, flushed or leached into the stream environment, and odour nuisance. The site may also attract pests and vermin if the waste storage area is not well maintained and cleaned regularly.

The number of work force to be employed for the Project is not available at this stage, but it is anticipated to be not to be over 300 staff at one time. Based on the generation rate of 0.65kg/person/day, the total refuse generated per day would be less than 200 kg.

Recyclable materials (i.e., paper, plastic bottles and aluminium cans) will be separated for recycling in order to reduce the amount of general refuse to be disposed of at landfill. Adequate number of enclosed waste containers will be provided to avoid over-spillage of waste. Reputable waste collector should be employed to collect the general refuse for disposal at designated landfill sites on a regular basis.

Provided that the mitigation measures are adopted, the potential environmental impacts caused by the storage, handling transport and disposal of general refuse are expected to be minimal. Mitigation measures to minimise potential environmental impacts are recommended in **Section 4.5**.

With the implementation of good waste management practices at the site as detailed in **Section 4.5**, adverse environmental impacts are not expected to arise from the storage, handling and transportation of the general refuse from construction workforce.

4.4.1.5 Storage and Collection of Waste

Adoption of barging points and conveyor belt system for waste handling is not anticipated for the Project. Stockpiling areas would be set up on-site to handle waste generated during construction phase. Mitigation measures stipulated in **Section 4.5** will be implemented.

4.4.1.6 Transportation Arrangement for Waste Disposal During Construction Phase

Land transport should be used to deliver and dispose of the waste generated from the Project sites to the designated disposal outlets. It is expected that around 33 vehicle trips per day for transporting waste during the construction phase of the Project. The tentative transportation routings for the disposal of various types of wastes generated during the construction phase are shown in **Table 4.4**.

The transportation routings may change subject to the actual traffic conditions of the roads. Nevertheless, with the implementation of appropriate mitigation measures (e.g. using water-tight containers and covered trucks), no adverse environmental impacts are expected due to the transportation of waste.

Table 4.4: Tentative Transportation Routings for Waste Disposal During the Construction Phase

Type of Waste	Disposal Outlet	Tentative Transportation Routing
Non-inert C&D Materials	North East New Territories (NENT) Landfill (tentatively selected)	Via Castle Peak Road, New Territories Circular Road and Heung Yuen Wai Highway
Surplus Inert C&D Materials	Public fill reception facility in Tuen Mun Area 38 (tentatively selected)	Via Castle Peak Road, New Territories Circular Road and Lung Mun Road
Chemical Waste	Chemical Waste Treatment Centre	Via Castle Peak Road, New Territories Circular Road and Tsing Sha Highway
General Refuse	NENT Landfill (tentatively selected)	Via Castle Peak Road, New Territories Circular Road and Heung Yuen Wai Highway

4.4.2 Operational Phase

In view of the uses in the operational phase of the Project, which includes residential establishment, generation of the following categories of waste are anticipated:

- General refuse; and
- Chemical waste.

4.4.2.1 General Refuse

Municipal Solid Waste (MSW) comprises of solid waste from households, commercial and industrial sources. With reference to the latest data from "Monitoring of Solid Waste in Hong Kong 2022" by EPD, the MSW disposal rate was 1.51 kg/person/day in Year 2022, and the recovery rate for recycling was 32%. By calculation, the MSW generation rate, disposal rate and recycle rate were 2.22 kg/person/day, 1.51 kg/person/day and 0.71 kg/person/day in 2022 respectively.

The estimated MSW is summarised in **Table 4.5** based on planned populations.

Table 4.5: Estimated Quantities of MSW During the Operational Phase

Estimated MSW from Residential Population				
Residential Population	Generated (tpd)	Disposal (tpd)	Recycle (tpd)	Food Waste Disposal (tpd)
10,000	22.2	15.1	7.1	6.6

Notes:
[i]. Based on MSW generation, disposal and recycling rate in 2022.
[ii]. tpd = tonne per day.
[iii]. Non-Residential Population include employment population and visitors.
[iv]. With reference to the latest data from "Monitoring of Solid Waste in Hong Kong 2022" by EPD, the food waste composition of MSW disposed of was 29.7%.

General refuse would be temporarily stored in refuse collection room in each building at the ground floor for localized refuse collection and the waste would be transferred to a central collection point. Waste recycling facilities / containers are recommended to be included in the central collection point so that waste could be sorted to recover materials (such as paper and cardboards, plastics, metals and glass etc.) as far as possible, before being collected by refuse transfer vehicles. Different containers should be provided for the storage of different recyclable materials. To avoid potential odour nuisance to the residents during transport of waste, enclosed waste collection vehicles should be used, and the collection route and time should be properly planned. At least daily collection should be arranged by the waste collector.

In order to facilitate recycling, a 4-bin recycling system for paper, metals, plastics and glass should be adopted together with a general refuse bin. They should be placed in prominent places to promote waste separation at source. All recyclable materials should be collected by recyclers.

To facilitate waste recovery of food waste, installation of food waste collection facilities such as food waste recycling machines for composting treatment, proper handling and delivery to Organic Resources Recovery Centre (ORRC) should be explored.

With the implementation of a proper waste handling system, environmental impacts associated with waste storage, collection and transportation are not anticipated.

4.4.2.2 Chemical Waste

Paints, lubricants and used batteries may be generated during maintenance activities on the road networks within the site. It is anticipated that the total quantity of chemical waste such as acids, alkalis and organic solvent produced by maintenance activities would be insignificant with a few cubic meters per month.

To minimise potential environmental hazard due to waste handling, localized chemical waste storage areas should be located close to the source of waste generation for temporary storage. Drum-type containers with proper labelling should be used to collect chemical wastes for storage at the designated areas.

Registration as chemical waste producers with EPD should be made by the chemical waste producers prior to operation. All chemical wastes generated should be dealt with according to the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes under the provisions of the Waste Disposal (Chemical Waste) (General) Regulation. Collection and disposal of chemical waste shall comply with the Waste Disposal Ordinance.

With the implementation of mitigation measures described in **Section 4.5**, potential environmental impacts (including potential hazard, air and odour emissions, noise, wastewater discharge and public transport) are not expected.

4.4.2.3 Transportation Arrangement for Waste Disposal during Operation Phase

Land transport should be used to deliver and dispose of the waste generated from the Project site to the designated disposal outlets. It is expected that approximately 7 vehicle trips per day will be required to transport the generated waste during the operation phase. The tentative transportation routings for the disposal of various types of wastes generated during the operation phase are shown in **Table 4.6**. The transportation routings may change subject to the actual traffic conditions of the roads. Nevertheless, with the implementation of appropriate mitigation measures provided in **Section 4.5**, no adverse environmental impacts are expected due to the transportation of waste.

Table 4.6: Tentative Transportation Routings for Waste Disposal During the Operation Phase

Type of Waste	Disposal Outlet	Tentative Transportation Routing
Chemical Waste	Chemical Waste Treatment Centre	Via Castle Peak Road, New Territories Circular Road and Tsing Sha Highway
General Refuse	NENT Landfill (Tentatively selected)	Via Castle Peak Road, New Territories Circular Road and Heung Yuen Wai Highway
Food Waste	O·PARK1 (Tentatively selected)	Via Castle Peak Road, Tsing Long Highway, Tsing Ma Bridge and North Lantau Highway

4.5 Mitigation Measures

4.5.1 Construction Phase

The mitigation measures for construction phase are recommended based on the waste management hierarchy principles. Recommendations of good site practices, waste reduction measures as well as the waste transportation, storage and collection are described in following sub-sections.

4.5.1.1 Good Site Practices

Adverse impacts related to waste management are not expected to arise, provided that good site practices are 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 and effective disposal to appropriate facilities;
- Training of site personnel in proper waste management and chemical handling procedures;
- Provision of sufficient waste disposal points and regular collection of waste for disposal;
- Minimisation of windblown litter and dust/odour during transportation of waste by transporting wastes in enclosed containers;
- Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors;
- An EMP should be prepared by the Contractor with reference to the requirements in ETWB TCW No. 19/2005 and should be submitted to the Architect/ Engineer for approval before construction;
- A WMP, as part of EMP, should be submitted to the Architect/ Engineer for approval prior to the commencement of construction works; and
- Well planned delivery programme for offsite disposal such that adverse environmental impact from transporting the C&D materials is not anticipated.

In order to monitor the disposal of C&D material at landfills and public fill reception facilities, as appropriate, and to control fly tipping, a trip-ticket system should be included as one of the contractual requirements to be implemented by the Contractor. Warning signs should also be displayed to remind the designated disposal sites. Reference shall be made to DEVB TCW No. 6/2010 for details.

4.5.1.2 Waste Reduction Measures

Good management and control could 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 non-inert C&D materials to recover any recyclable portions;
- 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;
- Any unused chemicals or those with remaining functional capacity shall be recycled;
- Maximising the use of reusable steel formwork to reduce the amount of C&D material;
- 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;

- Prior to disposal of non-inert C&D material, it is recommended that wood, steel and other metals shall be separated for re-use and / or recycling to minimise the quantity of waste to be disposed of to landfill;
- It is recommended that yard waste shall be separated from C&D material for recycling through delivered to Y-park so as to minimise the quantity of waste to be disposed at landfill site;
- Proper storage and site practices to minimise the potential for damage or contamination of inert C&D materials;
- Provide training to workers on the importance of appropriate waste management procedures, including waste reduction, reuse and recycling;
- Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste; and
- Minimise over ordering of concrete, mortars and cement grout by doing careful check before ordering.

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.

4.5.1.3 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, separately from C&D materials. An enclosed and covered area is preferred to reduce the occurrence of 'wind blown' light material.

4.5.1.4 Construction and Demolition Material

In order to minimise impacts resulting from collection and transportation of C&D material for off-site disposal, the inert C&D materials should be reused on-site as far as practicable. Any surplus inert C&D materials will be disposed of at the Government's public fill reception facilities for beneficial use by other projects in Hong Kong.

The Contractor shall record the amount of wastes generated, recycled, and disposed of (including the disposal sites). A trip ticket system (i.e., DEVB TC(W) No. 6/2010) shall be implemented for the disposal of C&D materials and/or C&D waste to any designated public filling facility and/or landfill respectively. To prohibit illegal dumping and landfilling of C&D materials, the dump trucks engaged on-site should be equipped with GPS or equivalent automatic system for real time tracking and monitoring of their travel routings and parking locations.

Non-inert C&D materials / C&D wastes should be reused and recycled on-site as far as possible before disposal at the designated landfill site. Suitable areas should be designated within the site for temporary stockpiling of C&D material and to facilitate the sorting process. Within stockpile areas, the following measures should be taken to control potential environmental impacts or nuisance:

- Covering material during heavy rainfall;
- Locating stockpiles to minimise potential air quality, water quality and visual impacts; and
- Minimising land intake of stockpile areas as far as possible.

4.5.1.5 Excavated Sediment

The sediment should be excavated, handled, transported, reused and/or disposed in a manner that would minimize adverse environmental impacts. All excavated sediment is proposed to be reused on-site, such as profiling and backfilling materials.

Requirements of the Air Pollution Ordinance (Construction Dust) Regulation, where relevant, shall be adhered to during excavation, transportation, reused and/or disposed of the excavated sediment.

In order to minimize the exposure to contaminated materials, workers shall, if necessary, wear appropriate personal protective equipment (PPE) when handling contaminated sediment. Adequate washing and cleaning facilities shall also be provided on-site.

Should offsite disposal or off-site re-use of surplus excavated sediment be required, the project proponent shall carry out the sampling and testing at the excavation area in accordance with the *Administrative Guidance* to determine the sediment quality. The project proponent shall prepare the Sediment Sampling and Testing Plan (SSTP) and submit to EPD for agreement. The testing results shall also be submitted to EPD for agreement prior to the commencement of construction. The sediment would be categorized by the testing results in accordance with the *Administrative Guidance*. For sediment to be disposed in marine disposal facilities, the disposal methods for the surplus excavated sediment will be decided by the classification for the excavated sediment based on their testing results in accordance with the *Administrative Guidance*. The Contractor, on the other hand, should be responsible for the application of the marine dumping permit under DASO from EPD for the sediment disposal.

Stockpiling of contaminated sediment should be avoided as far as possible. If temporary stockpiling of contaminated sediment is necessary, the concerned material should be covered by tarpaulin sheet and the area should be placed within earth bunds or sand bags to prevent leachate from entering the ground, nearby drains and surrounding water bodies. The stockpiles should be completely paved or covered by linings in order to avoid contamination to underlying soil or groundwater. Separate and clearly defined areas should be provided for stockpiling of contaminated and uncontaminated materials. Leachate, if any, should be collected and discharged according to the Water Pollution Control Ordinance (WPCO).

In order to minimize the potential odour / dust emissions during excavation and transportation of the excavated sediment, the concerned material shall be wetted during excavation / material handling and shall be properly covered by tarpaulin sheet.

4.5.1.6 Chemical Waste

The Waste Disposal Ordinance (Cap. 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes.

In addition, the following measures shall be observed:

- 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; and
- 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.

4.5.2 Operational Phase

The following measures should be implemented for the development within the Project site to minimise the amount of waste to be disposed of at landfill and to maximise the recovery of material from the waste stream.

4.5.2.1 General Refuse

Recycling bins shall be placed in prominent locations to maximise the capture of recyclables from general refuse.

General refuse from residential buildings should be collected with lidded bins and delivered to a central collection point and stored in enclosed containers to prevent windblown, vermin, water pollution and visual impact. At least daily collection should be arranged by the waste collector.

4.5.2.2 Chemical Waste

Paints, lubricants and used batteries may be generated during maintenance activities on the road networks within the Project site. To prevent health hazards to operators, all such chemical wastes should be collected and handled carefully.

To minimise potential environmental hazard due to waste handling, localized chemical waste storage areas should be located close to the source of waste generation for temporary storage. Drum-type containers with proper labelling should be used to collect chemical wastes for storage at the designated areas.

The producers should register with EPD as chemical waste producers. Chemical wastes should be stored in appropriate containers and collected by a licensed chemical waste collector. All chemical wastes generated should be dealt with according to the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes under the provisions of the Waste Disposal (Chemical Waste) (General) Regulation. Collection and disposal of chemical waste shall comply with the Waste Disposal Ordinance.

It is recommended that the chemical wastes are disposed at licensed chemical waste treatment facilities, such as the CWTC in Tsing Yi. A licensed collector should be employed for the chemical waste collection.

4.6 Evaluation of Residual Impact

With the implementation of recommended mitigation measures for the handling, transportation and disposal of the identified waste, adverse residual waste management implications are not anticipated for both the construction and operation phases.

4.7 Environmental Monitoring and Audit

4.7.1 Construction Phase

It would be the Contractor's responsibility to ensure that any wastes produced during the construction and demolition works are handled, stored and disposed of in accordance with good waste management practices and relevant regulations and other legislative requirements. The recommended mitigation measures should form the basis of the site WMP to be developed by the Contractor in the construction stage.

It is recommended that site inspections should be undertaken each week to determine if wastes are being managed in accordance with approved procedures. The audits should look at all aspects of on-site waste management practices including waste generation, storage, recycling, transport and disposal. Any irregularities observed during the site inspections will be raised

promptly to the contractor for rectification. Apart from site inspections, documents including licenses, permits, disposal and recycling records should be reviewed and audited for compliance with the legislation of the recommended good site practice and other waste management mitigation measures.

A WMP, as a part of the EMP, should be prepared in accordance with ETWB TCW No.19/2005 and submitted to the Architect/ Engineer for approval. The recommended mitigation measures should form the basis of the WMP. The monitoring and auditing requirement stated in ETWB TCW No.19/2005 should be followed with regard to the management of C&D materials.

4.7.2 Operational Phase

No EM&A requirement is considered necessary during the operation phase.

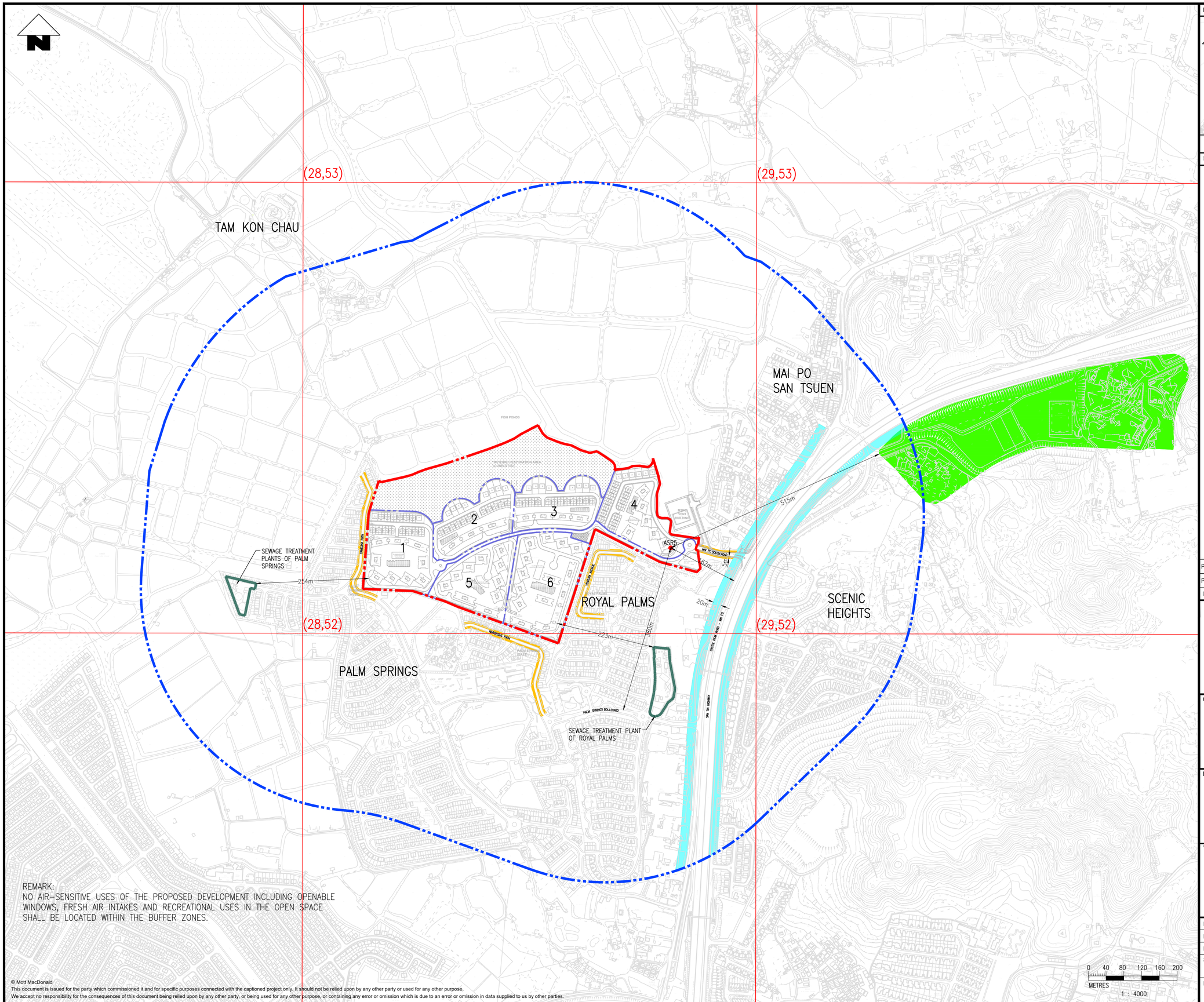
4.8 Conclusion

Potential waste management implications from the generation of waste during the construction phase have been evaluated. Measures, including the opportunity for on-site sorting, reusing C&D materials etc, have been explored to minimise the surplus materials to be disposed. Recommendations have been made for implementation by the Contractor during the construction period to minimise waste generation and off-site disposal.

The types of waste that would be generated during the operation phase have been identified. Recommendations have been made to ensure proper treatment and disposal of these waste.

With the implementation of recommended mitigation measures, the storage, handling, transportation and disposal of waste during construction and operation of the Project is not anticipated to cause adverse environmental impact.

Figures



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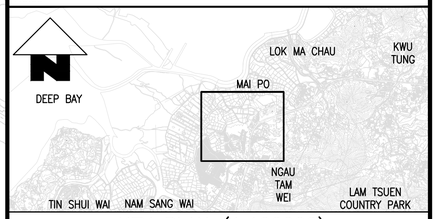

KEY PLAN (1:100000)

Key to symbols

LEGEND:

- SITE BOUNDARY
- ASSESSMENT AREA (500m)
- (28,52) REPRESENTATIVE PATH GRIDS
- PHASE BOUNDARY
- 1 CONSTRUCTION PHASE NO.
- REPRESENTATIVE AIR SENSITIVE RECEIVERS
- BUFFER ZONES(20m)
- BUFFER ZONES(5m)
- SAN TIN /LOK MA CHAU (STLMC) EFFLUENT POLISHING PLANT AND FOOD WASTE PRE-TREATMENT FACILITIES

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Title

LOCATION OF REPRESENTATIVE AIR SENSITIVE RECEIVERS

Designed	NS		Eng check	JC	
Drawn	TW		Coordination	LC	
Dwg check	AC		Approved	EC	

Scale at A1: 1:4000 | Status: PRE | Rev: P2

Drawing Number: FIGURE 1.1

F:\601370161-001-Hong Kong\01-BIM and Drawings\02_WIP\01_CV\Drawing\2024_S12A EA Report\FIGURE 1.1.dwg Jan 17, 2025 - 4:53pm
WON102115

E 823000
E 824000
E 825000
N 839500
N 838500

TAM KON CHAU

MAI PO
SAN TSUEN

ROYAL PALMS

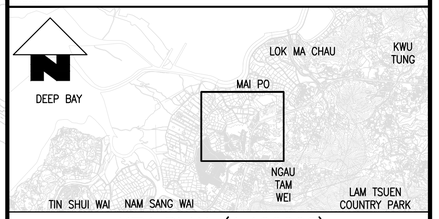
SCENIC
HEIGHTS

PALM SPRINGS

0 40 80 120 160 200
METRES
1 : 4000

F:\601370161-001-Hong Kong\01-BIM and Drawings\02_WIP\01_CV\Drawing\2024_S12A EA Report\FIGURE 2.1.dwg Jan 22, 2025 - 9:29am
WON102115

Notes



KEY PLAN (1:100000)

Key to symbols

LEGEND:

SITE BOUNDARY

ASSESSMENT AREA (300m)

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Title

NOISE ASSESSMENT AREA

Designed	NS		Eng check	JC	
Drawn	TW		Coordination	LC	
Dwg check	AC		Approved	EC	
Scale at A1	1:4000	Status	PRE	Rev	P1

Drawing Number

FIGURE 2.1

E 823000
E 824000
E 825000
N 839500
N 838500

TAM KON CHAU

MAI PO
SAN TSUEN

PALM SPRINGS

ROYAL PALMS

SCENIC
HEIGHTS

NSR1
NSR2
NSR3
NSR4
NSR5
NSR6
NSR7
NSR8
NSR9
NSR10
NSR11
NSR12
NSR13

1
2
3
4
5
6

0 40 80 120 160 200
METRES
1 : 4000

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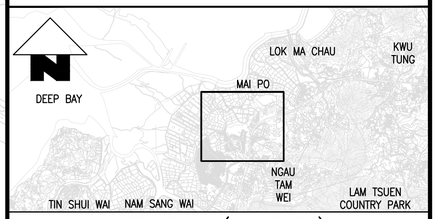

KEY PLAN (1:100000)

Key to symbols

LEGEND:

- SITE BOUNDARY
- ASSESSMENT AREA (300m)
- PHASE BOUNDARY
- 1 CONSTRUCTION PHASE NO.
- REPRESENTATIVE NOISE SENSITIVE RECEIVERS

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Title

LOCATION OF REPRESENTATIVE NOISE SENSITIVE RECEIVERS (NSRS) IN CONSTRUCTION PHASE

Designed	NS		Eng check	JC	
Drawn	TW		Coordination	LC	
Dwg check	AC		Approved	EC	
Scale at A1	1:4000	Status	PRE	Rev	P1

Drawing Number

FIGURE 2.2

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E 823000
E 824000
E 825000
N 839500
N 838500

TAM KON CHAU

MAI PO
SAN TSUEN

SCENIC
HEIGHTS

PALM SPRINGS

ROYAL PALMS

FISH PONDS

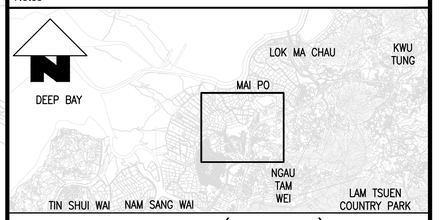
WETLAND RESTORATION AREA
(UNDER DEVELOPMENT)

TN1
TN2
TN3
TN4
TN5
TN6
TN7
TN8
TN9
TN10
TN11
TN12
TN13
TN14
TN15
TN16
TN17
TN18
TN19
TN20
TN21
TN22
TN23
TN24
TN25

E&M BUILDING
E&M BUILDING

0 40 80 120 160 200
METRES
1 : 4000

Notes



KEY PLAN (1:100000)

Key to symbols

LEGEND:

SITE BOUNDARY

ASSESSMENT AREA (300m)

REPRESENTATIVE NOISE SENSITIVE RECEIVERS

Rev	Date	Drawn	Description	Ch'k'd	App'd
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Title

LOCATION OF REPRESENTATIVE NOISE SENSITIVE RECEIVERS (NSRS) IN OPERATION PHASE (TRAFFIC NOISE)

Designed	GK		Eng check	JC	
Drawn	TW		Coordination	LC	
Dwg check	SC		Approved	EC	
Scale at A1	1:4000	Status	PRE	Rev	P2

Drawing Number

FIGURE 2.3a

TAM KON CHAU

MAI PO FLOODWATER PUMPING STATION

MAI PO
SAN TSUEN

MAI PO SUBSTATION

FISH PONDS

WETLAND RESTORATION AREA
(WRA)

FN7
FN6
FN5
FN4
MAI PO VENTILATION BUILDING
OF XRL PROJECT
N1
N2
N3
E1
W1
W2
S1
S2
FN3
FN2
FN1

E&M BUILDING

E&M BUILDING

SEE PART PLAN

SEWAGE TREATMENT
PLANTS OF PALM
SPRINGS

ROYAL PALMS

SCENIC
HEIGHTS

PALM SPRINGS

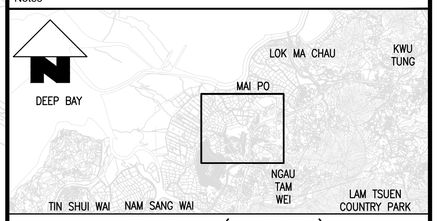
SEWAGE TREATMENT PLANT
OF ROYAL PALMS

0 40 80 120 160 200
METRES
1 : 4000

PART PLAN (1:2000)

E&M BU

Notes



KEY PLAN (1:100000)

Key to symbols

LEGEND:

- SITE BOUNDARY
- ASSESSMENT AREA (300m)
- REPRESENTATIVE NOISE SENSITIVE RECEIVERS
- LOUVER LOCATION

Rev	Date	Drawn	Description	Ch'k'd	App'd
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Title

LOCATION OF REPRESENTATIVE NOISE SENSITIVE RECEIVERS (NSRS) IN OPERATION PHASE (FIXED NOISE)

Designed	GK		Eng check	JC	
Drawn	TW		Coordination	LC	
Dwg check	SC		Approved	EC	
Scale at A1	1:4000/ 1:2000	Status	PRE	Rev	P2

Drawing Number

FIGURE 2.3b

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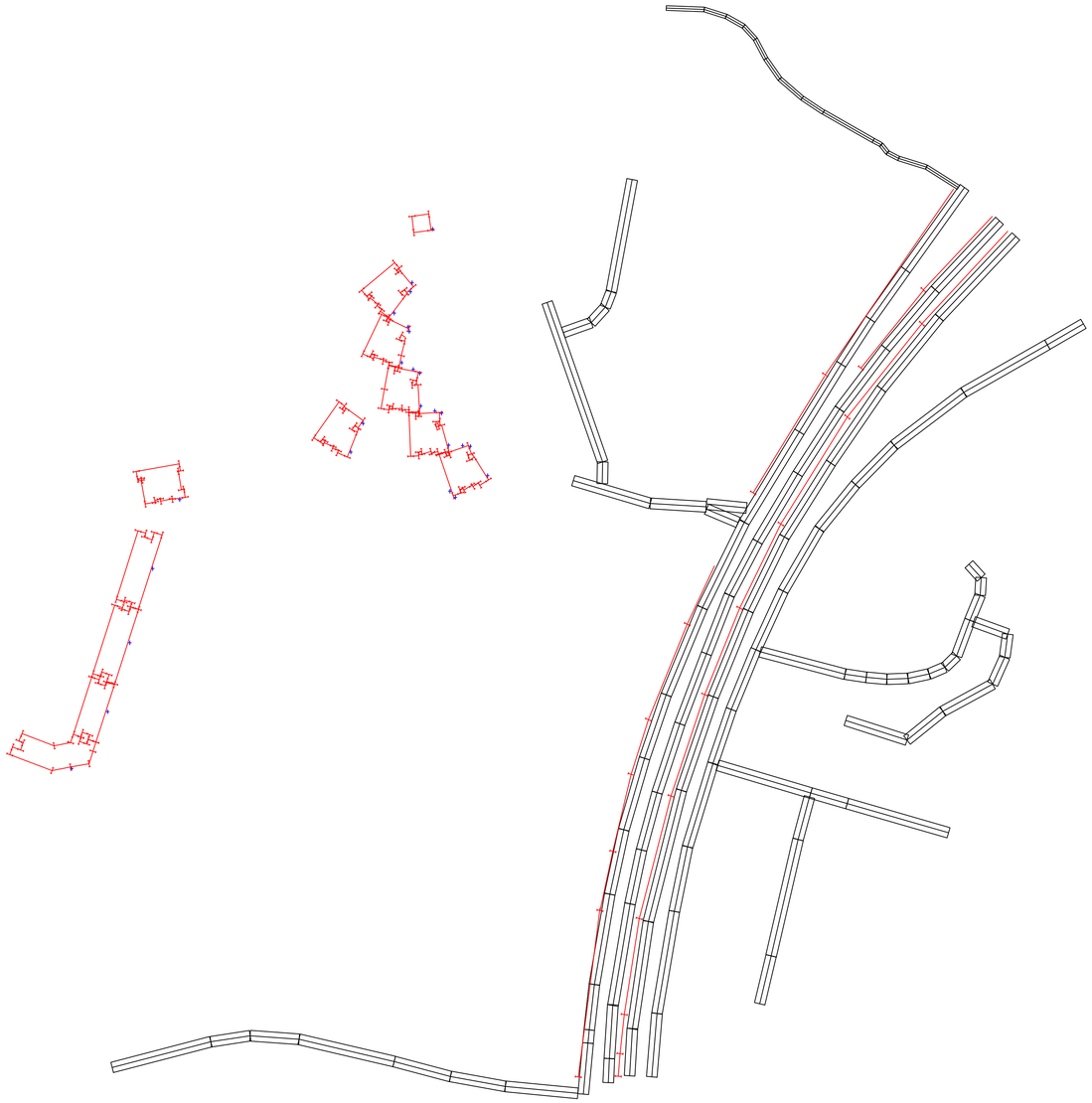
WON102115



0 20 40 60 80 100
METRES
1 : 2000

Notes

Key to symbols

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Title

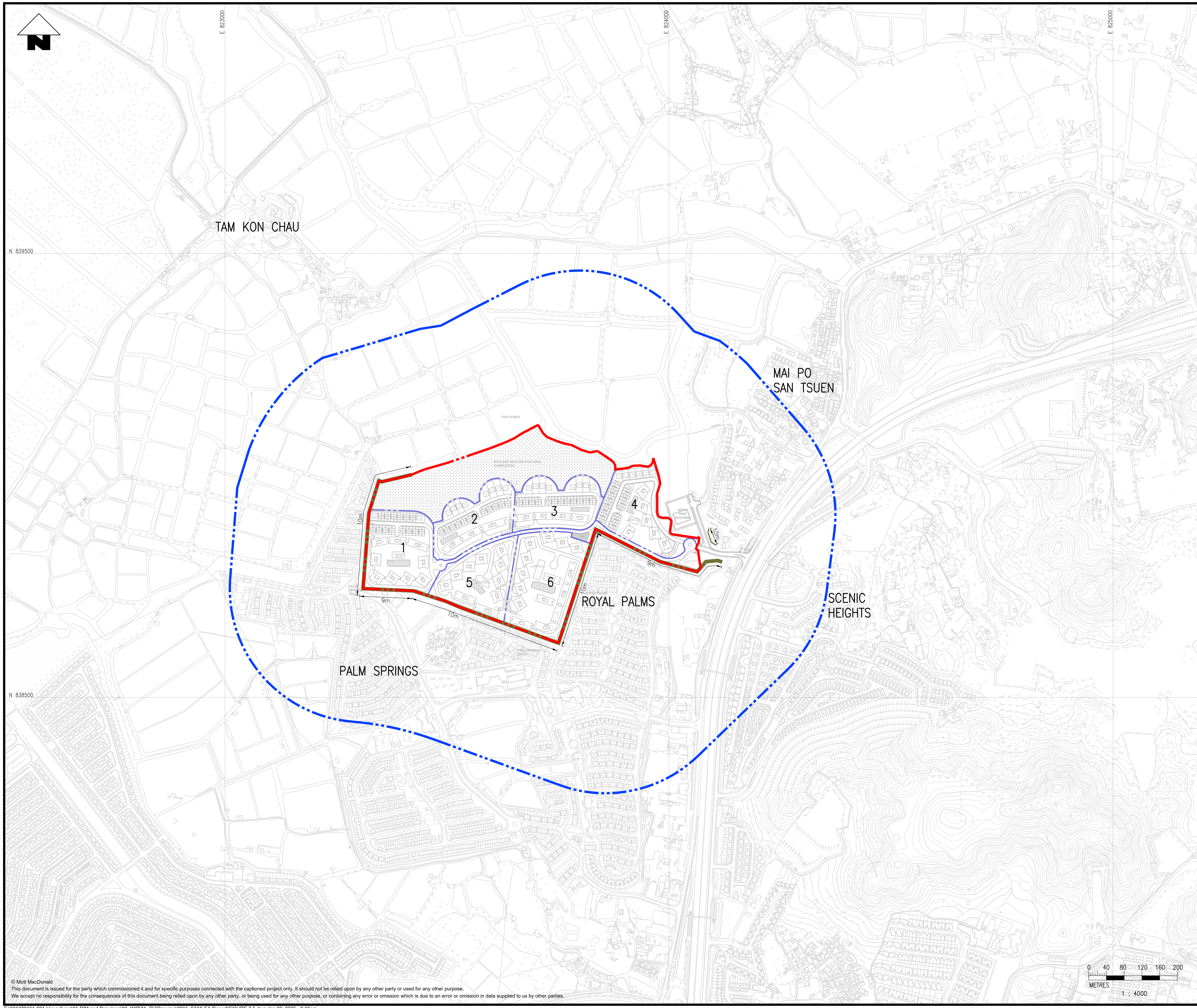
COMPUTER PLOT OF NOISE MODEL

Designed	GK		Eng check	JC	
Drawn	TW		Coordination	LC	
Dwg check	SC		Approved	EC	

Scale at A1	Status	Rev
1:2000	PRE	P2

Drawing Number

FIGURE 2.4



Notes

KEY PLAN (1:100000)

Key to symbols

LEGEND:

SITE BOUNDARY

ASSESSMENT AREA (300m)

PHASE BOUNDARY

1 CONSTRUCTION PHASE NO.

EXTENT OF TEMPORARY NOISE BARRIERS FOR CONSTRUCTION PHASE

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Title

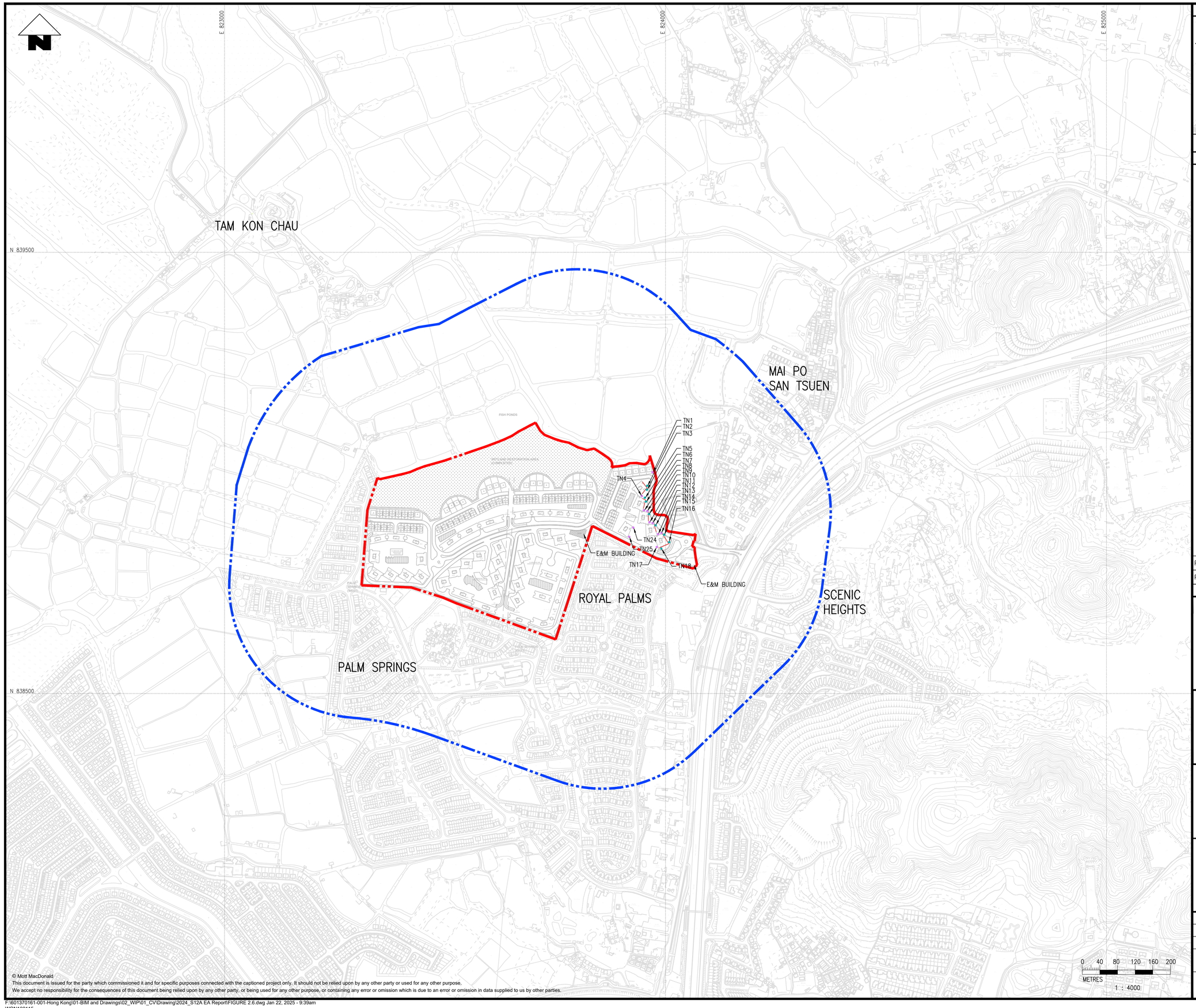
PROPOSED NOISE BARRIERS LOCATIONS FOR CONSTRUCTION PHASE

Designed	NS		Eng check	JC
Drawn	TW		Coordination	LC
Dwg check	AC		Approved	EC

Scale at A1	Status	Rev
1:4000	PRE	P1

Drawing Number

FIGURE 2.5



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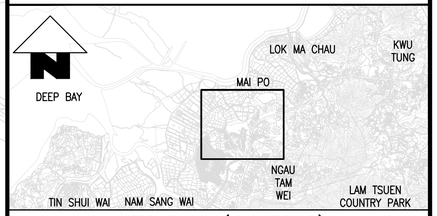

KEY PLAN (1:100000)

Key to symbols

LEGEND:

- SITE BOUNDARY
- ASSESSMENT AREA (300m)
- NSR (WITHOUT EXCEEDANCE / WITH EXCEEDANCE)
- FACADE WITH THE ADOPTION OF ACOUSTIC WINDOW

Rev	Date	Drawn	Description	Ch'k'd	App'd
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Title

LOCATION OF MITIGATION MEASURES FOR TRAFFIC NOISE

Designed	GK		Eng check	JC	
Drawn	TW		Coordination	LC	
Dwg check	SC		Approved	EC	
Scale at A1	1:4000	Status	PRE	Rev	P2

Drawing Number

FIGURE 2.6

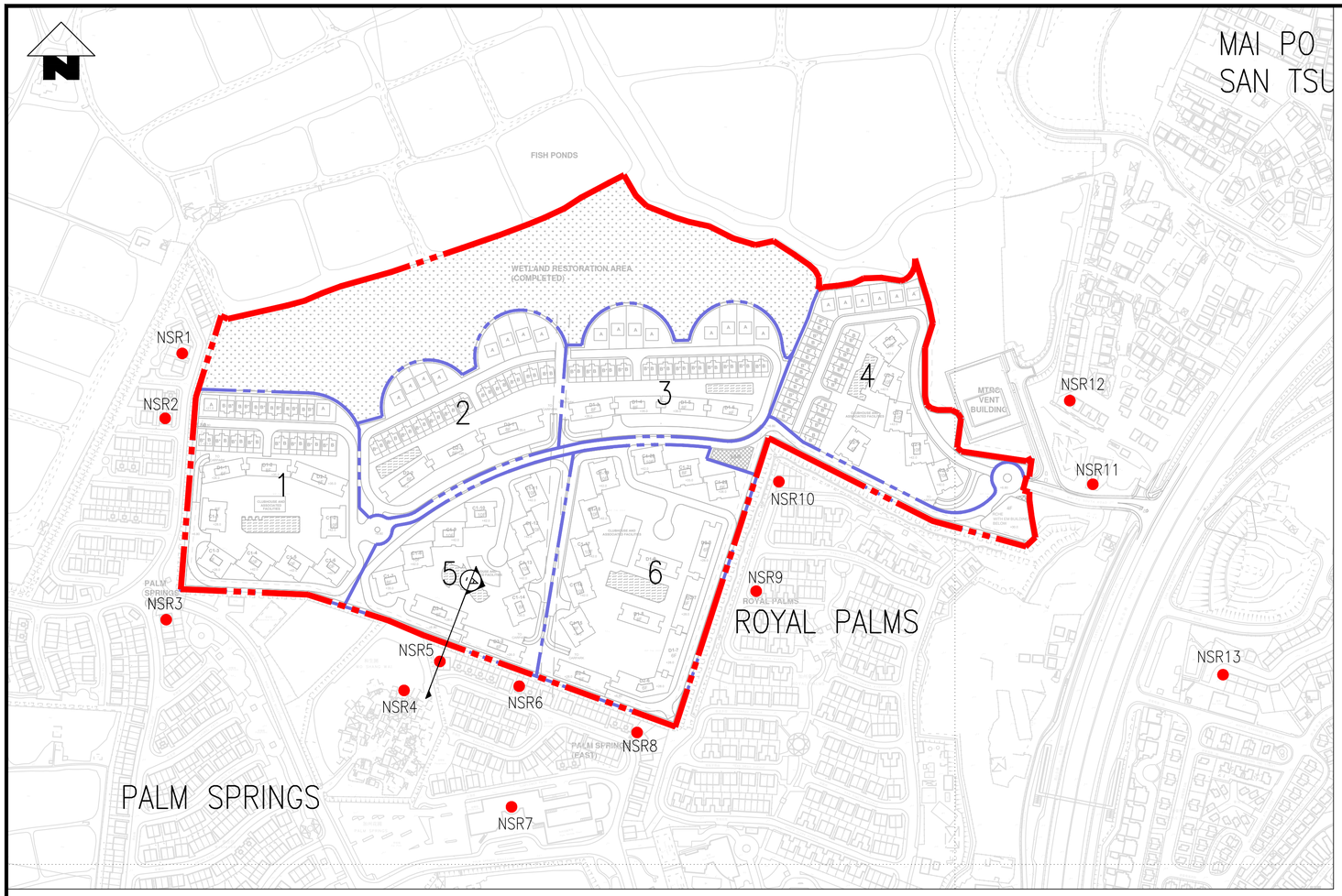
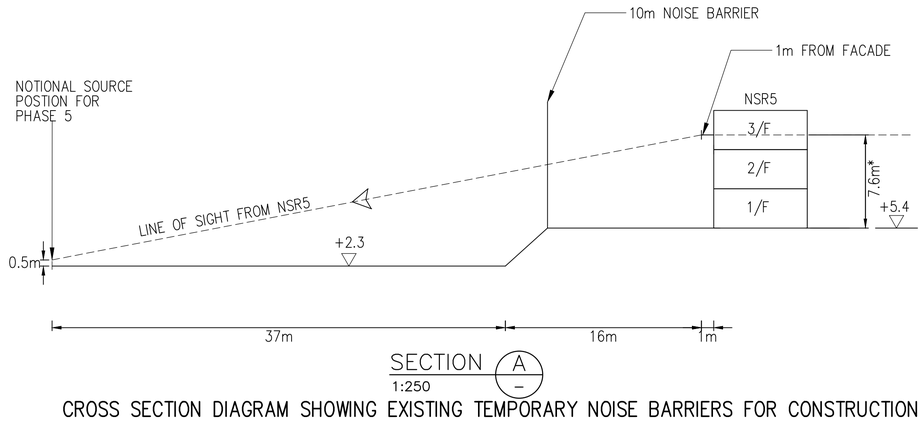


FIGURE 2.2
1:2500

0 25 50 75 100 125
METRES
1 : 2500



SECTION A
1:250

CROSS SECTION DIAGRAM SHOWING EXISTING TEMPORARY NOISE BARRIERS FOR CONSTRUCTION PHASE

* BUILDING HEIGHT INFORMATION IS OBTAINED FROM https://eiaced-noise.epd.gov.hk/noiseapplication/. LAST ACCESSED ON 17 DEC 24

0 2.5 5 7.5 10 12.5
METRES
1 : 250

LEGEND:

- SITE BOUNDARY
- PHASE BOUNDARY
- 1 CONSTRUCTION PHASE NO.
- REPRESENTATIVE NOISE SENSITIVE RECEIVERS

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Title
CROSS SECTION DIAGRAM SHOWING EXISTING TEMPORARY NOISE BARRIERS FOR CONSTRUCTION PHASE (SHEET 1 OF 2)

Designed	NS		Eng check	JC	
Drawn	TW		Coordination	LC	
Dwg check	AC		Approved	EC	

Scale at A1: AS SHOWN
Status: PRE
Rev: P1

Drawing Number
FIGURE 2.7

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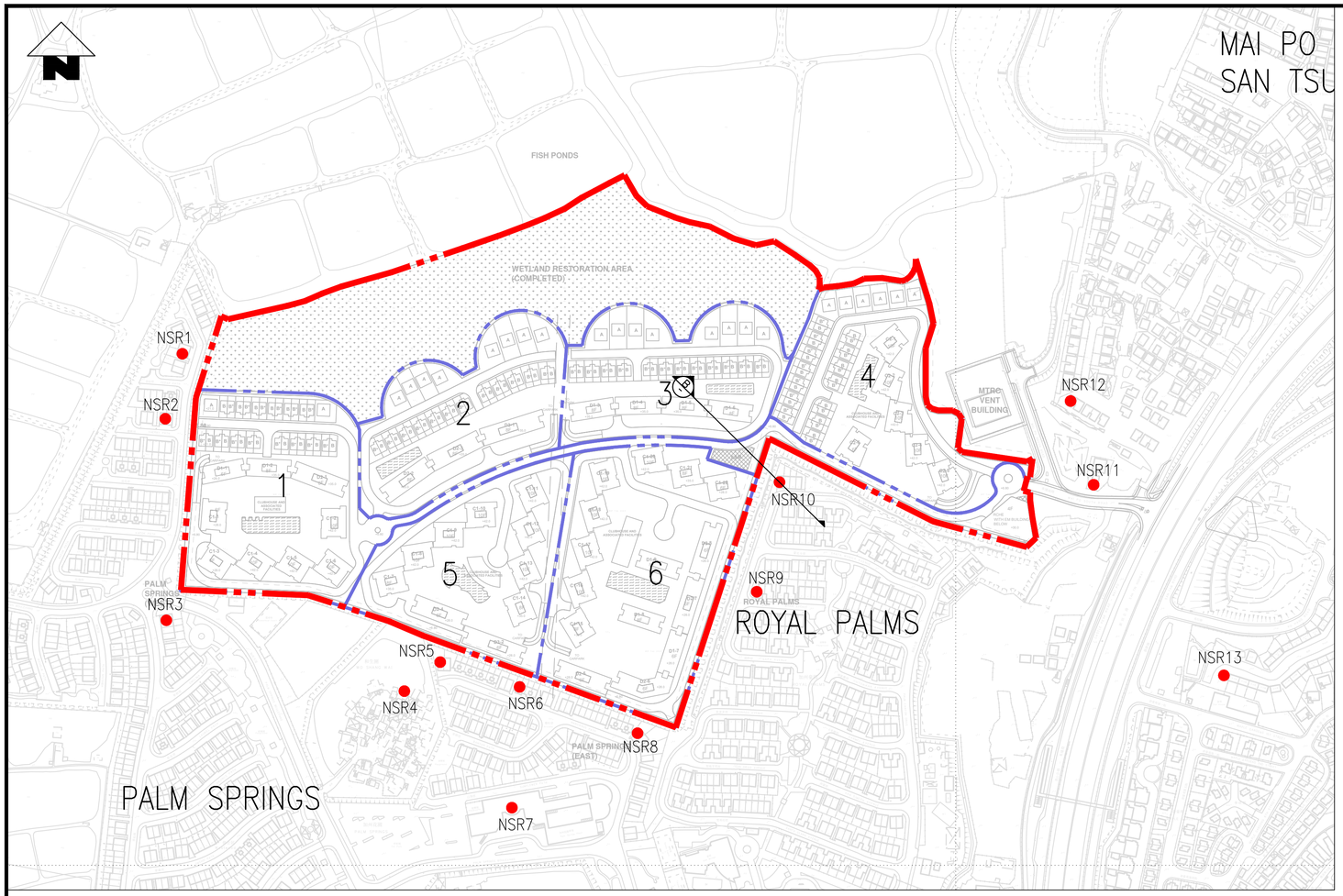
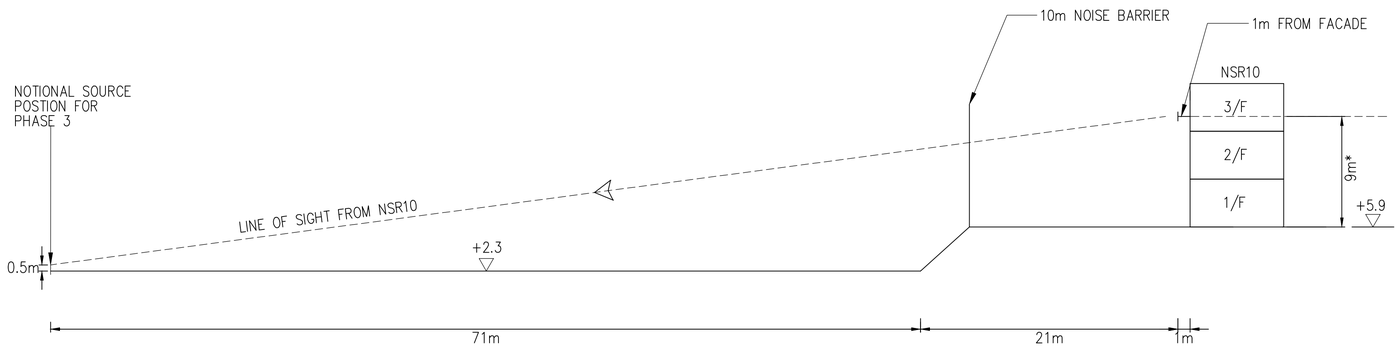


FIGURE 2.2
1:2500

0 25 50 75 100 125
METRES
1 : 2500



SECTION B
1:250

CROSS SECTION DIAGRAM SHOWING EXISTING TEMPORARY NOISE BARRIERS FOR CONSTRUCTION PHASE

* BUILDING HEIGHT INFORMATION IS OBTAINED FROM https://eiaced-noise.epd.gov.hk/noiseapplication/. LAST ACCESSED ON 17 DEC 24

0 2.5 5 7.5 10 12.5
METRES
1 : 250

LEGEND:

- SITE BOUNDARY
- PHASE BOUNDARY
- 1 CONSTRUCTION PHASE NO.
- REPRESENTATIVE NOISE SENSITIVE RECEIVERS

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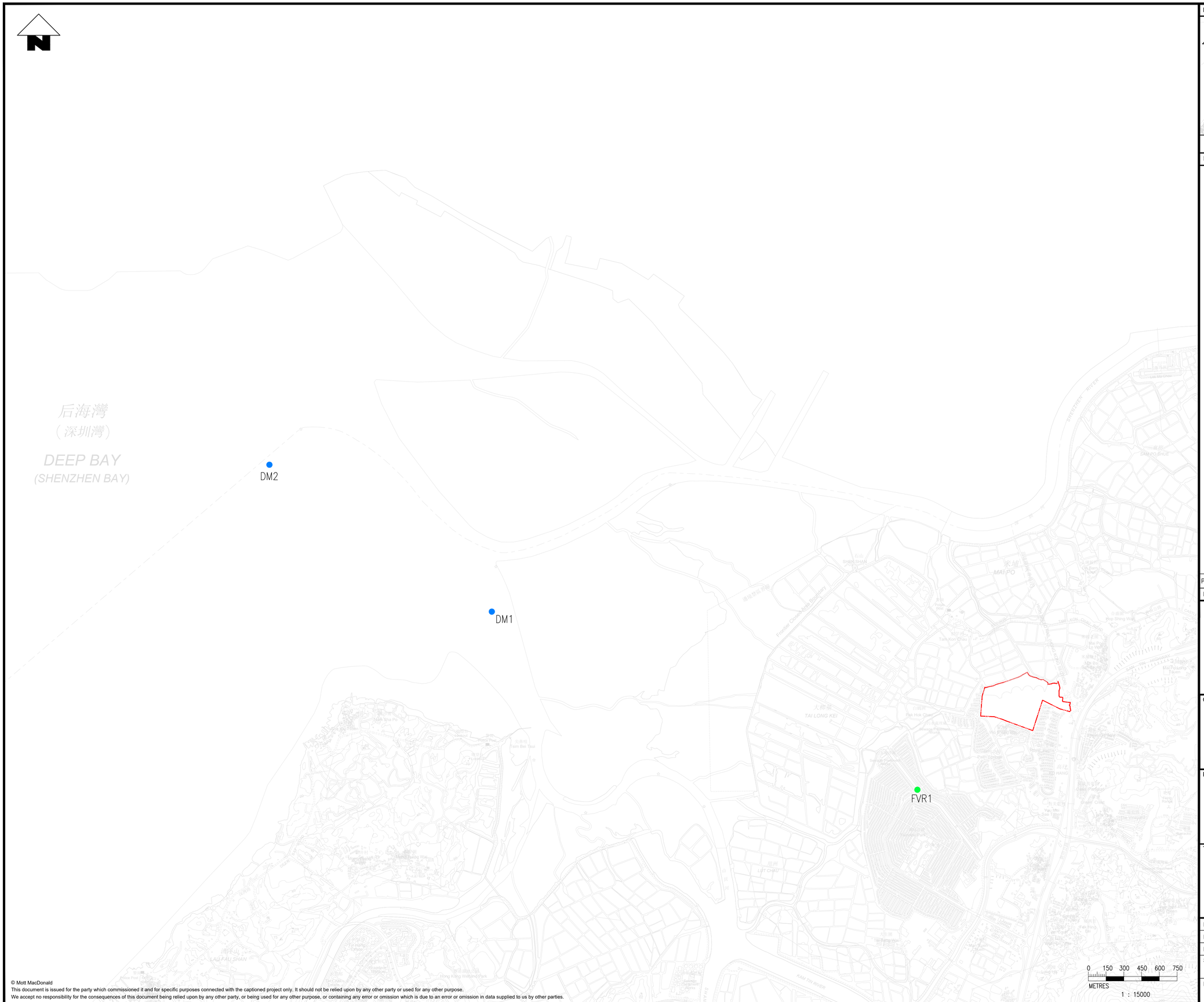
Title
CROSS SECTION DIAGRAM SHOWING EXISTING TEMPORARY NOISE BARRIERS FOR CONSTRUCTION PHASE (SHEET 2 OF 2)

Designed	NS		Eng check	JC	
Drawn	TW		Coordination	LC	
Dwg check	AC		Approved	EC	

Scale at A1: AS SHOWN
Status: PRE
Rev: P1

Drawing Number
FIGURE 2.8



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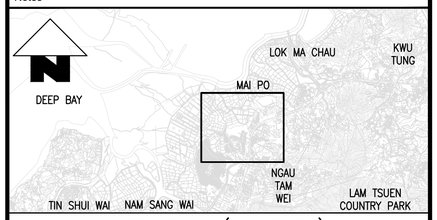

KEY PLAN (1:100000)

Key to symbols

LEGEND:

SITE BOUNDARY

MARINE WATER QUALITY MONITORING STATION

RIVER WATER QUALITY MONITORING STATION

Rev	Date	Drawn	Description	Ch'k'd	App'd
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Title

LOCATION OF REPRESENTATIVE WATER QUALITY MONITORING STATIONS

Designed	NS		Eng check	JC	
Drawn	TW		Coordination	LC	
Dwg check	DC		Approved	EC	
Scale at A1	1:15000	Status	PRE	Rev	P1

Drawing Number

FIGURE 3.1

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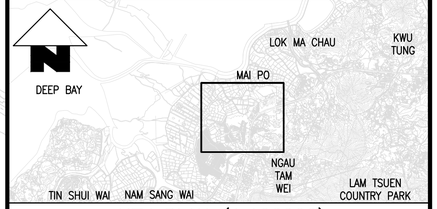
E 825000
N 839500
N 838500

TAM KON CHAU
MAI PO SAN TSUEN
ROYAL PALMS
SCENIC HEIGHTS
PALM SPRINGS

WSR1
WSR2
WSR3
WSR4
WSR5
WSR6
WSR7
WSR8
WSR9
WSR10
WSR11
WSR12
WSR13
WSR14

0 40 80 120 160 200
METRES
1 : 4000

Notes



KEY PLAN (1:100000)

Key to symbols

LEGEND:

- SITE BOUNDARY
- ASSESSMENT AREA (500m)
- WATER DITCH
- FISH POND
- POND
- CHANNEL

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	JUL 24	TW	EA FIRST DRAFT	JC	EC

MOTT MACDONALD

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T +852 2828 5757
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W mottmac.com

Client

PROFIT POINT ENTERPRISES LIMITED

Project

TO AMEND THE NOTES OF THE "COMPREHENSIVE DEVELOPMENT TO INCLUDE WETLAND RESTORATION AREA" ZONE FOR A PROPOSED COMPREHENSIVE DEVELOPMENT AT WO SHANG WAI ,YUEN LONG, LOTS 77 AND 50 S.A IN DD101

Title

LOCATION OF REPRESENTATIVE WATER QUALITY SENSITIVE RECEIVERS

Designed	NS		Eng check	JC	
Drawn	TW		Coordination	LC	
Dwg check	DC		Approved	EC	
Scale at A1	1:4000	Status	PRE	Rev	P1

Drawing Number

FIGURE 3.2

F:\601370161-001-Hong Kong\01-BIM and Drawings\02_WIP\01_CV\Drawing\2024_S12A EA Report\FIGURE 3.2.dwg Jan 17, 2025 - 5:50pm
WON102115

E 823000
E 824000
E 825000
N 839500
N 838500

TAM KON CHAU

MAI PO
SAN TSUEN

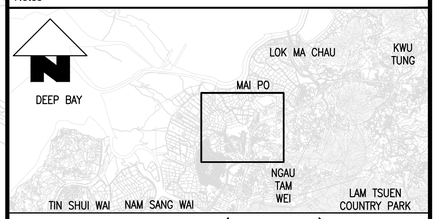
ROYAL PALMS

SCENIC
HEIGHTS

PALM SPRINGS

0 40 80 120 160 200
METRES
1 : 4000

Notes



KEY PLAN (1:100000)

Key to symbols

LEGEND:

- SITE BOUNDARY
- ASSESSMENT AREA (500m)
- PROPOSED DRAINAGE SYSTEM
- PROPOSED BOX CULVERT
- PROPOSED MANHOLE

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	JUL 24	TW	EA FIRST DRAFT	JC	EC

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Client

PROFIT POINT ENTERPRISES LIMITED

Project

TO AMEND THE NOTES OF THE "COMPREHENSIVE DEVELOPMENT TO INCLUDE WETLAND RESTORATION AREA" ZONE FOR A PROPOSED COMPREHENSIVE DEVELOPMENT AT WO SHANG WAI ,YUEN LONG, LOTS 77 AND 50 S.A IN DD101

Title

PROPOSED DRAINAGE SYSTEM AND BOX CULVERT

Designed	NS		Eng check	JC	
Drawn	TW		Coordination	LC	
Dwg check	DC		Approved	EC	

Scale at A1: 1:4000
Status: PRE
Rev: P1

Drawing Number

FIGURE 3.3

F:\601370161-001-Hong Kong\01-BIM and Drawings\02_WIP\01_CV\Drawing\2024_S12A EA Report\FIGURE 3.3.dwg Jan 23, 2025 - 10:58am
WON102115

Appendices

Appendix 1.1: Email Correspondence between the Project's Traffic Consultant and the Transport Department

Nick Sin

From: Florence Tak Yee KWAN <florencekwan@td.gov.hk>
Sent: Thursday, December 21, 2023 2:33 PM
To: CHAN Kelvin
Cc: Chi Kong LEUNG; Ming Yip TSE
Subject: RE: Planning Application No. A/YL-MP/344 - Road Type Classification of Nearby Road of the Subject Site

Dear Kelvin,

Please be advised that I have no comment on your proposed classification of Mai Po South Road as "Feeder Road" from traffic engineering point of view.

Thank you very much.

Regards,

Florence KWAN
E/B2, Traffic Engineering (NTW) Division
Transport Department
Tel. No.: 2399 2727

From: CHAN Kelvin <kchan2@systra.com>
To: Florence Tak Yee KWAN <florencekwan@td.gov.hk>
Cc: Ming Yip TSE <mingyiptse@td.gov.hk>, Chi Kong LEUNG <chikongleung@td.gov.hk>
Date: 21/12/2023 12:29 PM
Subject: RE: Planning Application No. A/YL-MP/344 - Road Type Classification of Nearby Road of the Subject Site

---

Dear Florence,

Thanks for your prompt reply.

Therefore, it is proposed that Mai Po South Road should be classified as **"Feeder Road"** under the road classification in rural areas.

We would be most grateful if you could reply to us at your earliest convenience. Should you have any enquiries or require further information, please do not hesitate to contact the undersigned at 2864 6462.

Regards,

Kelvin Chan
Principal Traffic Engineer
Tel: +852 2864 6462 (Direct Line) • Gen: +852 2529 7037 • Fax: +852 2527 8490

SYSTRA MVA

22nd Floor • Genesis • 33-35 Wong Chuk Hang Road • Hong Kong

Appendix 2.1 Site Survey Records for Fixed Noise Sources

Location:	Sewage Treatment Plant at Royal Palms
Description:	No noticeable noise was heard at the side facing Castle Peak Road - Mai Po or the side facing Palm Canyon Drive.
Record Photo:	View 1: Facing Castle Peak Rod - Mai Po  View 2: Facing Palm Canyon Drive 
Remark:	

Appendix 2.1 Site Survey Records for Fixed Noise Sources

Location:	Mai Po Ventilation Building (MPVB)
Description:	No noticeable noise from Mai Po Ventilation Building was heard from the side facing Mai Po South Road.
Record Photo:	View 1: Facing Mai Po South Road  
Remark:	Mai Po Ventilation Building was inaccessible to public. Site photos of other angles could not be taken. 

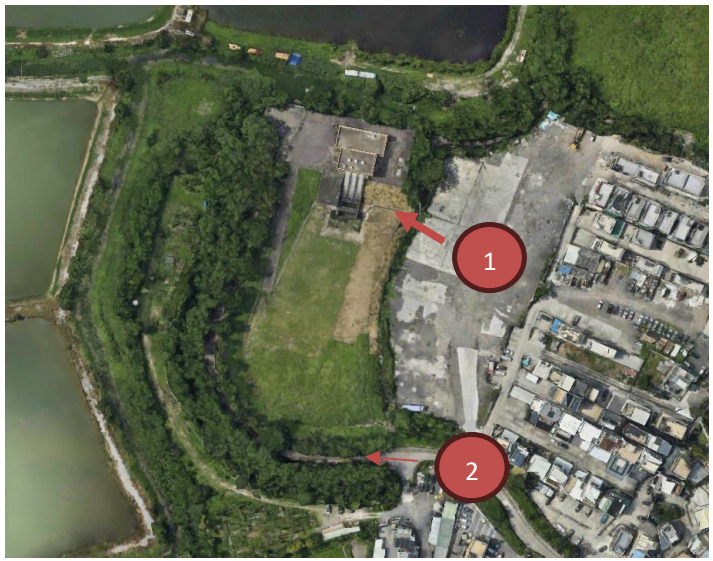
Appendix 2.1 Site Survey Records for Fixed Noise Sources

Location:	Mai Po Substation
Description:	No noticeable noise from Mai Po Substation was heard from the side facing San Tam Road. The equipment that generates noise appears to be enclosed in a building structure.
Record Photo:	View 1: Facing San Tam Road 
Remark:	Mai Po Substation was inaccessible to public. Site photos of other angles could not be taken. 

Appendix 2.1 Site Survey Records for Fixed Noise Sources

Location:	Sewage Treatment Plant at Palm Springs
Description:	No noticeable noise was heard from the side facing Springs Boulevard Road.
Record Photo:	View 1: Facing Palm Springs Boulevard Road 
Remark:	The sewage treatment plant at Palm Springs was inaccessible to public. Site photos of other angles could not be taken. 

Appendix 2.1 Site Survey Records for Fixed Noise Sources

Location:	Mai Po Floodwater Pumping Station
Description:	No noticeable noise from Mai Po Stormwater Pumping Station was heard from the side facing Mai Po Road or at the entrance of the Station. The equipment that generates noise appears to be enclosed in a building structure.
Record Photo:	View 1: Facing the brownfield land adjacent to Mai Po Road  View 2: Facing the entrance of the Floodwater Pumping Station 
Reference:	Mai Po Floodwater Pumping Station was inaccessible to public. Site photos of other angles could not be taken. 

Typical Plant Inventory (per phase)						
QPME / Quiet Consturction Method (QCM) ?	**PME**	**TM or Other Reference [1][2][3][4][5]**	**SWL, dB(A)**	**No. of PME**	**% on time**	**Total SWL, dB(A)**
Group A - Site Clearance						
Group A1 - Pavement Breaking / Excavation						
✓	Hydraulic Crusher for Concrete Breaking / Demolition Works	QME IN4	94	1	100%	94
✓	Excavator, wheeled/tracked (QPME)	QPME EPD 12299	92	1	80%	91
	Generator, silenced, 75 dB(A) at 7 m	CNP 102	100	1	100%	100
	Water pump (electric)	CNP 281	88	1	100%	88
						102
Group A2 - Compacting						
	Dump truck , 5.5 tonne < gross vehicle weight ≦ 38 tonne	OCUPME A38	105	2	50%	105
✓	Bulldozer, tracked (QPME)	EPD- 12694	108	1	50%	105
	Roller, vibratory	CNP 186	108	1	60%	106
						110
Group B - Substructure Works						
Group B1 - Piling Works (Option A)						
✓	Crane, mobile (QPME)	EPD- 12240	101	2	80%	103
✓	Excavator, wheeled/tracked (QPME)	EPD- 12299	92	1	80%	91
	Dump truck , 5.5 tonne < gross vehicle weight ≦ 38 tonne	OCUPME A38	105	3	60%	108
	Water pump (electric)	CNP 281	88	2	100%	91
	Generator, silenced, 75 dB(A) at 7 m	CNP 102	100	2	100%	103
	Concrete lorry mixer	CNP 044	109	1	70%	107
	Air compressor, air flow <= 10m3/min	CNP 001	100	4	70%	104
	Concrete pump, stationary mounted	CNP 047	109	1	60%	107
	Poker, vibratory, hand-held (electric)	OCUPME A19	102	4	50%	105
	Power pack for hand-held items of PME	CNP 168	100	4	50%	103
	Piling, large diameter bored, reverse circulation drill	CNP 166	100	2	60%	101
						115
Group B1 - Raft Foundation (Option B)						
	Crane, mobile (QPME)	EPD- 12240	101	2	80%	103
	Excavator, wheeled/tracked (QPME)	EPD- 12299	92	2	80%	94
	Dump truck , 5.5 tonne < gross vehicle weight ≦ 38 tonne	OCUPME A38	105	4	60%	109
	Water pump (electric)	CNP 281	88	2	100%	91
	Generator (QPME)	QPME EPD 14730	95	2	100%	98
	Concrete lorry mixer	CNP 044	109	1	70%	107
	Air compressor, air flow <= 10m3/min	CNP 001	100	4	70%	104
	Concrete pump, stationary mounted	CNP 047	109	1	60%	107
	Poker, vibratory, hand-held (electric)	OCUPME A19	102	4	50%	105
	Power pack for hand-held items of PME	CNP 168	100	4	50%	103
	Saw, circular, wood	CNP 201	108	2	50%	108
	Bar bender and cutter (electric)	CNP 021	90	4	50%	93
						115
Group C - Superstructure Works						
Group C1 - General Superstructure						
✓	Crane, mobile (QPME)	EPD- 12240	101	2	80%	103
	Poker, vibratory, hand-held (electric)	OCUPME A19	102	3	60%	105
	Power pack for hand-held items of PME	CNP 168	100	4	50%	103
	Compactor, vibratory	OCUPME 050	105	1	60%	103
	Bar bender and cutter (electric)	CNP 021	90	3	70%	93
	Concrete lorry mixer	CNP 044	109	2	70%	110
	Generator (QPME)	QPME EPD 14730	95	1	100%	95
	Drill/grinder, hand-held (electric)	CNP 065	98	5	60%	103
	Bar bender and cutter (electric)	CNP 021	90	3	60%	93
	Water pump (electric)	CNP 281	88	6	100%	96
	Dump truck , 5.5 tonne < gross vehicle weight ≦ 38 tonne	OCUPME A38	105	4	60%	109
	Air compressor, air flow <= 10m3/min	CNP 001	100	4	100%	106
						115

Hong Kong Section of Guangzhou-Shenzhen-Hong Kong Express Rail Link (XRL)

Commissioning Test Report for the Fixed Plant Noise at Mai Po (MPV), Ngau Tam Mei (NTV) and Shing Mun (SMV) Ventilation Buildings; ERS Plant Building – North (SPN) and ERS Plant Building – South (SPS)

MTR Corporation

July 2018

Location	NSR	Description
SMV	SM1	Sau Shan House, Cheung Shan Estate
	SM4	Shui Hong Nursing House
SPN	SS7	Leung Uk Tsuen Village House
	SS10	DD110 LOT 452, Wang Toi Shan
	SS15[(a)]	Abandoned village house in Shek Kong
SPS	SS11a[(a)]	Leung Uk Tsuen Squats
	SS20[(a)]	Village house in Shek Kong

Note:

(a) Certain direction of the ventilation shaft is totally or partially screened by the proposed noise barriers at Shek Kong Stabling Sidings (SSS).

3.2.4 Measurement Schedule

The noise measurements were carried out at the monitoring location for MPV, NTV, SMV, SPN and SPS, where the fixed plant items were operated steadily and continuously at their noisiest operating mode under normal scenario. The noise measurement schedule is shown in **Table 3.5**. Sample measurement photos of MPV, NTV, SMV, SPN and SPS are shown in **Appendix A3**.

Table 3.5 Measurement Schedule

Location	Date
MPV	25 – 26 Apr 2018
NTV	17 – 18 May 2018
SMV	8 – 9 Jun 2018
SPN	24 – 25 May 2018
SPS	24 – 25 May 2018

4 Measurement Results

4.1 The Noise Levels of Fixed Plant Noise Sources

The noise levels measured under the worst case scenario are determined and presented in **Table 4.1**. Details of the measurement results are shown in **Appendix A3**.

Table 4.1 Summary of Sound Power Levels for Fixed Plants

Works Area	Direction Facing/ Elevation	Calculated SWL L_{Aeq}, dB(A)
MPV	North N1 [(a)]	67
	North N2	69
	North N3	72
	East E1	74
	South S1	74
	South S2	75
	West W1	70
	West W2 [(a)]	69
NTV	North N1	72

Works Area	Direction Facing/ Elevation	Calculated SWL L_{Aeq}, dB(A)
	North N2	69
	North N3	61
	North N4 [(a)]	73
	East E1	77
	East E2	72
	South S1	78
	South S2	78
	South S3 [(a)]	71
	South S4 [(a)]	71
	South S5 [(a)]	76
	South S6 [(a)]	88
	West W1 [(a)]	82
SMV	North N1	80
	North N2	63
	North N3	77
	North N4	61
	North N5 [(a)]	74
	East E1 [(a)]	89
	East E2	81
	East E3	62
	East E4 [(a)]	74
	East E5 [(a)]	67
	South S1	89
	South S2	84
	South S3	86
	South S4	86
	South S5 [(a)]	68
	West W1	76
	West W2	76
	West W3 [(a)]	97
	West W4	78
SPN	North N1	84
	North N2	84
	North N3	66
	East E1	85
	East E2	64
	East E3	68
	South S1	90
	South S2	89
	West W1	87
	West W2	72
SPS	North N1	88
	North N2	90
	North N3	71

Works Area	Direction Facing/ Elevation	Calculated SWL L_{Aeq}, dB(A)
	East E1	84
	East E2	90
	East E3	89
	East E4	78
	East E5	76
	South S1	82
	South S2	84
	South S3	82
	West W1	84
	West W2	76
	West W3	80
	West W4	74

Note:

(a) The plant would be operated during day and evening time only under normal scenario.

A compliance check against the fixed plant noise criteria at NSR was conducted. The cumulative noise levels from noise sources were assessed to ensure the compliance with the noise criterion. **Table 4.2** shows the results, details of the calculation are also given in **Appendix A3**.

Table 4.2 Cumulative Fixed Plant Noise at NSR

NSR	Source Location	Cumulative SPL, dB(A)		Noise Criteria, dB(A)		Compliance (Y/N)	
		Day and Evening Time	Night-time	Day and Evening Time	Night-time	Day and Evening Time	Night-time
MP1	Ventilation Shaft and Building Service	29	28	60	50	Y	Y
MP5	Ventilation Shaft and Building Service	34	33	51	45	Y	Y
MP6	Ventilation Shaft and Building Service	35	35	60	50	Y	Y
NT1	Ventilation Shaft for N/B [(a)] and Building Service	42	36	55	44	Y	Y
	Ventilation Shaft for S/B [(a)] and Building Service	43	40	55	44	Y	Y
NT1a	Ventilation Shaft for N/B [(a)] and Building Service	43	40	55	44	Y	Y
	Ventilation Shaft	44	42	55	44	Y	Y

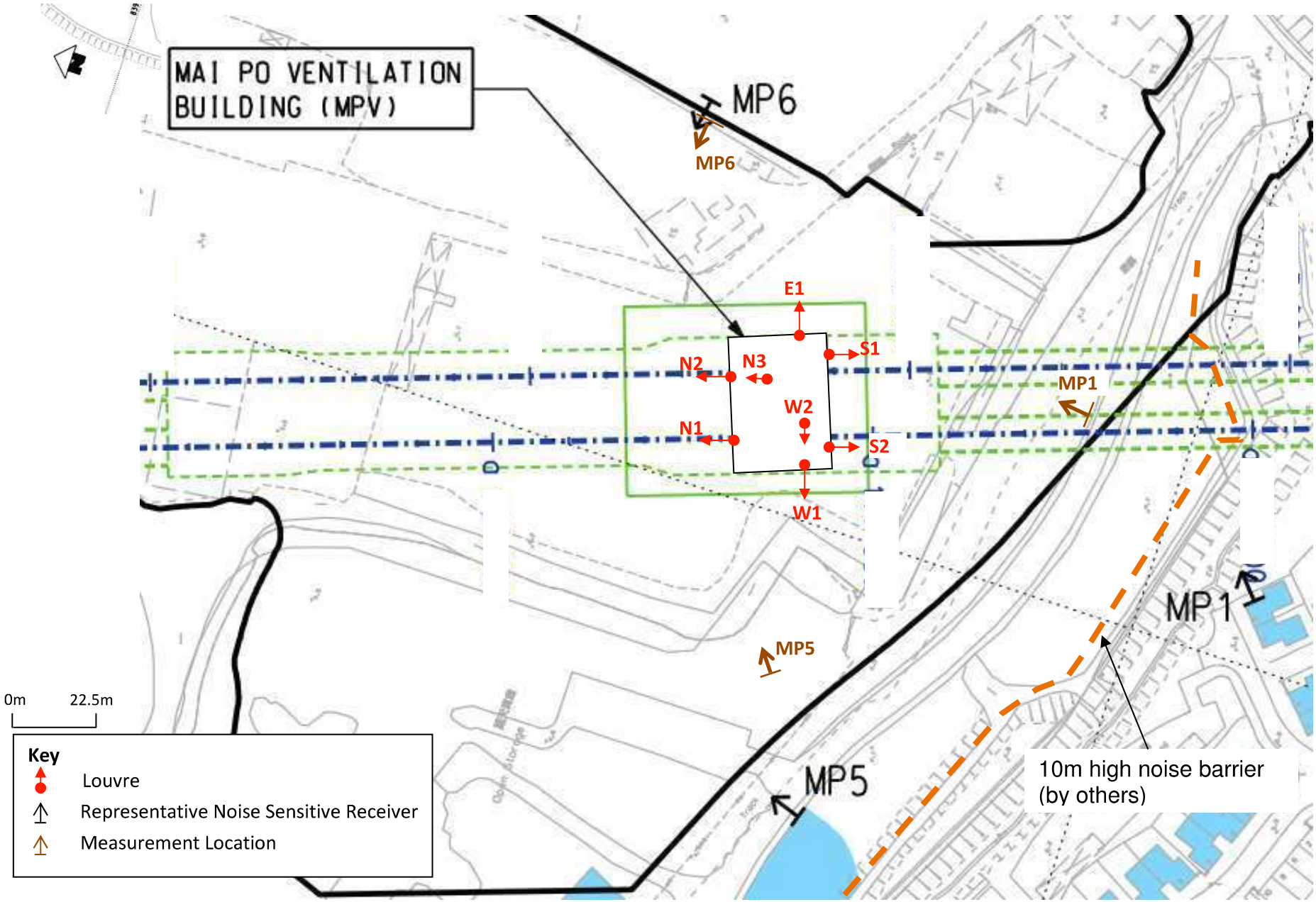


Figure 2.1 – Representative Noise Sensitive Receiver (NSR), Noise Measurement Location and Fixed Plant Sources at MPV

Appendix 2.3 - Construction Noise Assessment

NSR: NSR13

	(1) Max. SWL	Distance (m)	Distance Correction	Barrier Effect	Façade Correction	SPL	
Phase 1	115	721	-65	-10	3	43	
Phase 2	115	669	-65	-10	3	43	
Phase 3	115	513	-62	-10	3	46	
Phase 4	115	311	-58	-10	3	50	
Phase 5	115	637	-64	-10	3	44	
Phase 6	115	491	-62	-10	3	46	
					WSW (max spl)	**54**	dB(A)

Note: (1) Reference to the maximum mitigated sound power level among all works activities

(2) Barrier correction provided by temporary noise barrier installed around the site

Appendix 2.4 Construction Noise Assessment

NSR: NSR1

	[1] Max. SWL	[3] Distance (m)	Distance Correction	Barrier Effect	Façade Correction	SPL	
Phase 1	115	84	-46	-10	3	62	
Phase 2	115	220	-55	-10	3	53	
Phase 3	115	389	-60	-10	3	48	
Phase 4	115	577	-63	-10	3	45	
Phase 5	115	287	-57	-10	3	51	
Phase 6	115	414	-60	-10	3	48	
					WSW (max spl)	**63**	dB(A)

Note: (1) Reference to the maximum mitigated sound power level among all works activities

(2) Barrier correction provided by temporary noise barrier installed around the site

Appendix 2.4 Construction Noise Assessment

NSR: NSR2

	(1) Max. SWL	Distance (m)	Distance Correction	Barrier Effect	Façade Correction	SPL	
Phase 1	115	73	-45	-10	3	63	
Phase 2	115	223	-55	-10	3	53	
Phase 3	115	402	-60	-10	3	48	
Phase 4	115	591	-63	-10	3	45	
Phase 5	115	262	-56	-10	3	52	
Phase 6	115	404	-60	-10	3	48	
					WSW (max spl)	**64**	dB(A)

Note: (1) Reference to the maximum mitigated sound power level among all works activities

(2) Barrier correction provided by temporary noise barrier installed around the site

Appendix 2.4 Construction Noise Assessment

NSR: NSR3

	(1) Max. SWL	Distance (m)	Distance Correction	Barrier Effect	Façade Correction	SPL	
Phase 1	115	85	-47	-10	3	61	
Phase 2	115	259	-56	-10	3	52	
Phase 3	115	439	-61	-10	3	47	
Phase 4	115	626	-64	-10	3	44	
Phase 5	115	218	-55	-10	3	53	
Phase 6	115	386	-60	-10	3	48	
					WSW (max spl)	**63**	dB(A)

Note: (1) Reference to the maximum mitigated sound power level among all works activities

(2) Barrier correction provided by temporary noise barrier installed around the site

Appendix 2.4 Construction Noise Assessment

NSR: NSR4

	(1) Max. SWL	Distance (m)	Distance Correction	Barrier Effect	Façade Correction	SPL	
Phase 1	115	154	-52	-10	3	56	
Phase 2	115	211	-54	-10	3	54	
Phase 3	115	329	-58	-10	3	50	
Phase 4	115	456	-61	-10	3	47	
Phase 5	115	89	-47	-10	3	61	
Phase 6	115	190	-54	-10	3	54	
					WSW (max spl)	**64**	dB(A)

Note: (1) Reference to the maximum mitigated sound power level among all works activities

(2) Barrier correction provided by temporary noise barrier installed around the site

Appendix 2.4 Construction Noise Assessment

NSR: NSR5

	(1) Max. SWL	Distance (m)	Distance Correction	Barrier Effect	Façade Correction	SPL	
Phase 1	115	133	-50	-10	3	58	
Phase 2	115	187	-53	-10	3	55	
Phase 3	115	289	-57	-10	3	51	
Phase 4	115	418	-60	-10	3	48	
Phase 5	115	54	-43	-10	3	65	
Phase 6	115	150	-52	-10	3	56	
					WSW (max spl)	**67**	dB(A)

Note: (1) Reference to the maximum mitigated sound power level among all works activities

(2) Barrier correction provided by temporary noise barrier installed around the site

Appendix 2.4 Construction Noise Assessment

NSR: NSR6

	(1) Max. SWL	Distance (m)	Distance Correction	Barrier Effect	Façade Correction	SPL	
Phase 1	115	184	-53	-10	3	55	
Phase 2	115	217	-55	-10	3	53	
Phase 3	115	278	-57	-10	3	51	
Phase 4	115	375	-59	-10	3	49	
Phase 5	115	65	-44	-10	3	64	
Phase 6	115	67	-45	-10	3	63	
					WSW (max spl)	**67**	dB(A)

Note: (1) Reference to the maximum mitigated sound power level among all works activities

(2) Barrier correction provided by temporary noise barrier installed around the site

Appendix 2.4 Construction Noise Assessment

NSR: NSR7

	(1) Max. SWL	Distance (m)	Distance Correction	Barrier Effect	Façade Correction	SPL	
Phase 1	115	278	-57	-10	3	51	
Phase 2	115	321	-58	-10	3	50	
Phase 3	115	381	-60	-10	3	48	
Phase 4	115	457	-61	-10	3	47	
Phase 5	115	173	-53	-10	3	55	
Phase 6	115	167	-52	-10	3	56	
					WSW (max spl)	**60**	dB(A)

Note: (1) Reference to the maximum mitigated sound power level among all works activities

(2) Barrier correction provided by temporary noise barrier installed around the site

Appendix 2.4 Construction Noise Assessment

NSR: NSR8

	(1) Max. SWL	Distance (m)	Distance Correction	Barrier Effect	Façade Correction	SPL	
Phase 1	115	282	-57	-10	3	51	
Phase 2	115	294	-57	-10	3	51	
Phase 3	115	292	-57	-10	3	51	
Phase 4	115	335	-59	-10	3	49	
Phase 5	115	162	-52	-10	3	56	
Phase 6	115	66	-44	-10	3	64	
					WSW (max spl)	**65**	dB(A)

Note: (1) Reference to the maximum mitigated sound power level among all works activities

(2) Barrier correction provided by temporary noise barrier installed around the site

Appendix 2.4 Construction Noise Assessment

NSR: NSR9

	(1) Max. SWL	Distance (m)	Distance Correction	Barrier Effect	Façade Correction	SPL	
Phase 1	115	301	-58	-10	3	50	
Phase 2	115	269	-57	-10	3	51	
Phase 3	115	175	-53	-10	3	55	
Phase 4	115	173	-53	-10	3	55	
Phase 5	115	216	-55	-10	3	53	
Phase 6	115	69	-45	-10	3	63	
					WSW (max spl)	**65**	dB(A)

Note: (1) Reference to the maximum mitigated sound power level among all works activities

(2) Barrier correction provided by temporary noise barrier installed around the site

Appendix 2.4 Construction Noise Assessment

NSR: NSR10

	(1) Max. SWL	Distance (m)	Distance Correction	Barrier Effect	Façade Correction	SPL	
Phase 1	115	294	-57	-10	3	51	
Phase 2	115	243	-56	-10	3	52	
Phase 3	115	93	-47	-10	3	61	
Phase 4	115	82	-46	-10	3	62	
Phase 5	115	239	-56	-10	3	52	
Phase 6	115	82	-46	-10	3	62	
					WSW (max spl)	**67**	dB(A)

Note: (1) Reference to the maximum mitigated sound power level among all works activities

(2) Barrier correction provided by temporary noise barrier installed around the site

Appendix 2.4 Construction Noise Assessment

NSR: NSR11

	(1) Max. SWL	Distance (m)	Distance Correction	Barrier Effect	Façade Correction	SPL	
Phase 1	115	577	-63	-10	3	45	
Phase 2	115	519	-62	-10	3	46	
Phase 3	115	340	-59	-10	3	49	
Phase 4	115	167	-52	-10	3	56	
Phase 5	115	518	-62	-10	3	46	
Phase 6	115	368	-59	-10	3	49	
					WSW (max spl)	**58**	dB(A)

Note: (1) Reference to the maximum mitigated sound power level among all works activities

(2) Barrier correction provided by temporary noise barrier installed around the site

Appendix 2.4 Construction Noise Assessment

NSR: NSR12

	(1) Max. SWL	Distance (m)	Distance Correction	Barrier Effect	Façade Correction	SPL	
Phase 1	115	548	-63		3	55	
Phase 2	115	498	-62		3	56	
Phase 3	115	304	-58		3	60	
Phase 4	115	148	-51		3	67	
Phase 5	115	510	-62		3	56	
Phase 6	115	366	-59		3	59	
					WSW (max spl)	**69**	dB(A)

Note: (1) Reference to the maximum mitigated sound power level among all works activities

(2) Barrier correction provided by temporary noise barrier installed around the site

Appendix 2.3 - Construction Noise Assessment

NSR: NSR13

	(1) Max. SWL	Distance (m)	Distance Correction	Barrier Effect	Façade Correction	SPL	
Phase 1	115	721	-65	-10	3	43	
Phase 2	115	669	-65	-10	3	43	
Phase 3	115	513	-62	-10	3	46	
Phase 4	115	311	-58	-10	3	50	
Phase 5	115	637	-64	-10	3	44	
Phase 6	115	491	-62	-10	3	46	
					WSW (max spl)	**54**	dB(A)

Note: (1) Reference to the maximum mitigated sound power level among all works activities

(2) Barrier correction provided by temporary noise barrier installed around the site

Appendix 2.5 - Fixed Plant Noise Assessment

Daytime Fixed Plant Noise Assessment (Mai Po Ventilation Building)												
NSR ID	**Fixed Noise Source**	**Louvres - Direction Facing**	**SWL, dB(A)[1]**	**Horizontal Distance (m)**	**Distance Attenuation dB(A)**	**Tonality Correction dB(A)**	**Screening Correction dB(A)[2]**	**Facade Correction dB(A)**	**Barrier Correction dB(A)[3]**	**SPL, $L_{eq(30min)}$, dB(A)**	**Resultant SPL, $L_{eq(30min)}$, dB(A)**	**Daytime Noise Criteria, dB(A)**
FN1	Mai Po Ventilation Building	MPVB North N1 (N1)	67	81	-46	0	0	3	0	24	39	65
		MPVB North N2 (N2)	69	88	-47	0	0	3	0	25		
		MPVB North N3 (N3)	72	81	-46	0	0	3	0	29		
		MPVB East E1 (E1)	74	81	-46	0	0	3	0	31		
		MPVB South S1 (S1)	74	72	-45	0	0	3	0	32		
		MPVB South S2 (S2)	75	57	-43	0	0	3	0	35		
		MPVB West W1 (W1)	70	62	-44	0	0	3	0	29		
		MPVB West W2 (W2)	69	66	-44	0	0	3	0	28		
FN2	Mai Po Ventilation Building	MPVB North N1 (N1)	67	62	-44	0	0	3	0	26	41	65
		MPVB North N2 (N2)	69	73	-45	0	0	3	0	27		
		MPVB North N3 (N3)	72	66	-44	0	0	3	0	31		
		MPVB East E1 (E1)	74	70	-45	0	0	3	0	32		
		MPVB South S1 (S1)	74	62	-44	0	0	3	0	33		
		MPVB South S2 (S2)	75	42	-40	0	0	3	0	38		
		MPVB West W1 (W1)	70	44	-41	0	0	3	0	32		
		MPVB West W2 (W2)	69	51	-42	0	0	3	0	30		
FN3	Mai Po Ventilation Building	MPVB North N1 (N1)	67	54	-43	0	0	3	0	27	41	65
		MPVB North N2 (N2)	69	69	-45	0	0	3	0	27		
		MPVB North N3 (N3)	72	66	-44	0	0	3	0	31		
		MPVB East E1 (E1)	74	75	-45	0	0	3	0	32		
		MPVB South S1 (S1)	74	69	-45	0	0	3	0	32		
		MPVB South S2 (S2)	75	44	-41	0	0	3	0	37		
		MPVB West W1 (W1)	70	42	-40	0	0	3	0	33		
		MPVB West W2 (W2)	69	52	-42	0	0	3	0	30		
FN4	Mai Po Ventilation Building	MPVB North N1 (N1)	67	51	-42	0	0	3	0	28	40	65
		MPVB North N2 (N2)	69	68	-45	0	0	3	0	27		
		MPVB North N3 (N3)	72	68	-45	0	0	3	0	30		
		MPVB East E1 (E1)	74	81	-46	0	0	3	0	31		
		MPVB South S1 (S1)	74	78	-46	0	0	3	0	31		
		MPVB South S2 (S2)	75	55	-43	0	0	3	0	35		
		MPVB West W1 (W1)	70	49	-42	0	0	3	0	31		
		MPVB West W2 (W2)	69	59	-43	0	0	3	0	29		
FN5	Mai Po Ventilation Building	MPVB North N1 (N1)	67	56	-43	0	0	3	0	27	39	65
		MPVB North N2 (N2)	69	71	-45	0	0	3	0	27		
		MPVB North N3 (N3)	72	75	-45	0	0	3	0	30		
		MPVB East E1 (E1)	74	89	-47	0	0	3	0	30		
		MPVB South S1 (S1)	74	89	-47	0	0	3	0	30		
		MPVB South S2 (S2)	75	71	-45	0	0	3	0	33		
		MPVB West W1 (W1)	70	64	-44	0	0	3	0	29		
		MPVB West W2 (W2)	69	71	-45	0	0	3	0	27		
FN6	Mai Po Ventilation Building	MPVB North N1 (N1)	67	68	-45	0	0	3	0	25	37	65
		MPVB North N2 (N2)	69	78	-46	0	0	3	0	26		
		MPVB North N3 (N3)	72	85	-47	0	0	3	0	28		
		MPVB East E1 (E1)	74	99	-48	0	0	3	0	29		
		MPVB South S1 (S1)	74	101	-48	0	0	3	0	29		
		MPVB South S2 (S2)	75	89	-47	0	0	3	0	31		
		MPVB West W1 (W1)	70	81	-46	0	0	3	0	27		
		MPVB West W2 (W2)	69	86	-47	0	0	3	0	25		
FN7	Mai Po Ventilation Building	MPVB North N1 (N1)	67	97	-48	0	0	3	0	22	35	65
		MPVB North N2 (N2)	69	102	-48	0	0	3	0	24		
		MPVB North N3 (N3)	72	110	-49	0	0	3	0	26		
		MPVB East E1 (E1)	74	122	-50	0	0	3	0	27		
		MPVB South S1 (S1)	74	126	-50	0	0	3	0	27		
		MPVB South S2 (S2)	75	121	-50	0	0	3	0	28		
		MPVB West W1 (W1)	70	114	-49	0	0	3	0	24		
		MPVB West W2 (W2)	69	116	-49	0	0	3	0	23		

Notes: (1) The SWLs referenced the Commissioning Test Report submitted under EP-349/2009/N for the Hong Kong Section of the Guangzhou-Shenzhen-Hong Kong Express Rail Link (Appendix 2.4). The plants (N1 and W2) would be operated during day and evening time only under normal scenario.

Appendix 2.5 - Fixed Plant Noise Assessment

Night time Fixed Plant Noise Assessment (Mai Po Ventilation Building)												
NSR ID	**Fixed Noise Source**	**Louvres - Direction Facing**	**SWL, dB(A)[1]**	**Horizontal Distance (m)**	**Distance Attenuation dB(A)**	**Tonality Correction dB(A)**	**Screening Correction dB(A)[2]**	**Facade Correction dB(A)**	**Barrier Correction dB(A)[3]**	**SPL, $L_{eq(30min)}$, dB(A)**	**Resultant SPL, $L_{eq(30min)}$, dB(A)**	**Nighttime Noise Criteria, dB(A)**
FN1	Mai Po Ventilation Building	MPVB North N1 (N1)	0	81	-46	0	0	3	0	0	39	55
		MPVB North N2 (N2)	69	88	-47	0	0	3	0	25		
		MPVB North N3 (N3)	72	81	-46	0	0	3	0	29		
		MPVB East E1 (E1)	74	81	-46	0	0	3	0	31		
		MPVB South S1 (S1)	74	72	-45	0	0	3	0	32		
		MPVB South S2 (S2)	75	57	-43	0	0	3	0	35		
		MPVB West W1 (W1)	70	62	-44	0	0	3	0	29		
		MPVB West W2 (W2)	0	66	-44	0	0	3	0	0		
FN2	Mai Po Ventilation Building	MPVB North N1 (N1)	0	62	-44	0	0	3	0	0	41	55
		MPVB North N2 (N2)	69	73	-45	0	0	3	0	27		
		MPVB North N3 (N3)	72	66	-44	0	0	3	0	31		
		MPVB East E1 (E1)	74	70	-45	0	0	3	0	32		
		MPVB South S1 (S1)	74	62	-44	0	0	3	0	33		
		MPVB South S2 (S2)	75	42	-40	0	0	3	0	38		
		MPVB West W1 (W1)	70	44	-41	0	0	3	0	32		
		MPVB West W2 (W2)	0	51	-42	0	0	3	0	0		
FN3	Mai Po Ventilation Building	MPVB North N1 (N1)	0	54	-43	0	0	3	0	0	41	55
		MPVB North N2 (N2)	69	69	-45	0	0	3	0	27		
		MPVB North N3 (N3)	72	66	-44	0	0	3	0	31		
		MPVB East E1 (E1)	74	75	-45	0	0	3	0	32		
		MPVB South S1 (S1)	74	69	-45	0	0	3	0	32		
		MPVB South S2 (S2)	75	44	-41	0	0	3	0	37		
		MPVB West W1 (W1)	70	42	-40	0	0	3	0	33		
		MPVB West W2 (W2)	0	52	-42	0	0	3	0	0		
FN4	Mai Po Ventilation Building	MPVB North N1 (N1)	0	51	-42	0	0	3	0	0	39	55
		MPVB North N2 (N2)	69	68	-45	0	0	3	0	27		
		MPVB North N3 (N3)	72	68	-45	0	0	3	0	30		
		MPVB East E1 (E1)	74	81	-46	0	0	3	0	31		
		MPVB South S1 (S1)	74	78	-46	0	0	3	0	31		
		MPVB South S2 (S2)	75	55	-43	0	0	3	0	35		
		MPVB West W1 (W1)	70	49	-42	0	0	3	0	31		
		MPVB West W2 (W2)	0	59	-43	0	0	3	0	0		
FN5	Mai Po Ventilation Building	MPVB North N1 (N1)	0	56	-43	0	0	3	0	0	38	55
		MPVB North N2 (N2)	69	71	-45	0	0	3	0	27		
		MPVB North N3 (N3)	72	75	-45	0	0	3	0	30		
		MPVB East E1 (E1)	74	89	-47	0	0	3	0	30		
		MPVB South S1 (S1)	74	89	-47	0	0	3	0	30		
		MPVB South S2 (S2)	75	71	-45	0	0	3	0	33		
		MPVB West W1 (W1)	70	64	-44	0	0	3	0	29		
		MPVB West W2 (W2)	0	71	-45	0	0	3	0	0		
FN6	Mai Po Ventilation Building	MPVB North N1 (N1)	0	68	-45	0	0	3	0	0	36	55
		MPVB North N2 (N2)	69	78	-46	0	0	3	0	26		
		MPVB North N3 (N3)	72	85	-47	0	0	3	0	28		
		MPVB East E1 (E1)	74	99	-48	0	0	3	0	29		
		MPVB South S1 (S1)	74	101	-48	0	0	3	0	29		
		MPVB South S2 (S2)	75	89	-47	0	0	3	0	31		
		MPVB West W1 (W1)	70	81	-46	0	0	3	0	27		
		MPVB West W2 (W2)	0	86	-47	0	0	3	0	0		
FN7	Mai Po Ventilation Building	MPVB North N1 (N1)	0	97	-48	0	0	3	0	0	34	55
		MPVB North N2 (N2)	69	102	-48	0	0	3	0	24		
		MPVB North N3 (N3)	72	110	-49	0	0	3	0	26		
		MPVB East E1 (E1)	74	122	-50	0	0	3	0	27		
		MPVB South S1 (S1)	74	126	-50	0	0	3	0	27		
		MPVB South S2 (S2)	75	121	-50	0	0	3	0	28		
		MPVB West W1 (W1)	70	114	-49	0	0	3	0	24		
		MPVB West W2 (W2)	0	116	-49	0	0	3	0	0		

Notes: (1) The SWLs referenced the Commissioning Test Report submitted under EP-349/2009/N for the Hong Kong Section of the Guangzhou-Shenzhen-Hong Kong Express Rail Link (Appendix 2.4). The plants (N1 and W2) would be operated during day and evening time only under normal scenario.