

## 1. INTRODUCTION

### 1.1 Background

- 1.1.1 Ramboll Hong Kong Ltd. (the Consultant) has been commissioned by the Applicant to conduct this Environmental Assessment (EA) in support of the S16 Planning Application for Proposed Residential Development, North of Kam Pok Road, Nam Sang Wai.
- 1.1.2 The Subject Site is also the subject of a previous planning application under the application no. A/YL-NSW/290 and an EA report (R7229\_v6.0) was previously submitted in support of that planning application (Previous EA). Since then, the layout plan of proposed development has been further reviewed taking into account the concerns of AFCD with respect to the layout of proposed wetland restoration area. Compared to the previous scheme in Previous EA, the application boundary in current application remains the same. Thus, this EA serves as an update to the above-mentioned previous submitted EA report based on the current revised development scheme as requested by AFCD.

### 1.2 The Project Location

- 1.2.1 The Subject Site comprises various lots in D.D. 104, north of Kam Pok Road East, Yuen Long, N.T. It is bounded by other residential developments such as Man Yuen Chuen, Merry Garden, Meister House, and existing abandoned ponds and open storage activities (**Figure 1.1** refers). The area of the Subject Site is about 5 ha.
- 1.2.2 The Subject Site currently consists of abandoned ponds, grassland and a few temporary house structures.

### 1.3 The Project Description

- 1.3.1 The original proposed development scheme comprises 114 units in 108 housing blocks of 3- to 5-storey high (i.e. 89 in the form of 2- to 4-storey on top of 1-level of communal basement carpark and 25 in 2-storey on top of 1-level of carport), two 2-storeys clubhouses, an underground sewage pumping station (SPS) and a proposed wetland restoration area (WRA). To respond to AFCD's comments, amendments to the original MLP are hence required. As a result, a net reduction in total no. of units have been reduced to 90 units in 84 housing blocks varying from 2-storeys to 4-storeys on top of 1-level of carport. The revised master layout plan of the proposed development is presented in **Figure 1.2**, and the schematic floor layouts of the residential houses are presented in **Appendix 1.1**. The locations and orientation of proposed houses in current MLP and their separation distance to nearby road edge, basically follow that in the original scheme.
- 1.3.2 The entire development is compatible with the existing or planned uses on the adjacent sites.
- 1.3.3 Possible environmental mitigation measures have been explored and recommended for the proposed development, where appropriate. For instance, various measures have been incorporated into the design of current scheme, such as adequate setback distance from site boundary line in accordance with HKPSG requirement; setback distance from proposed on-site sewage pumping station; various noise barriers, single aspect design, fixed glazing/ blank facade, and parapet walls to alleviate road traffic noise and/ or fixed noise impacts; proper site drainage system with screening facility to control surface runoff from proposed development; on-site sewage pumping station and proposed sewer to convey domestic sewage to existing Nam Sang Wai Sewage

Pumping Station during operation stage, etc. Please refer to respective chapters for more details of the proposed mitigation measures.

- 1.3.4 With the domestic nature and scale of development, small amount of general refuse will be generated during operation phase. With proper storage and daily collection of waste, no adverse environmental impact associated with waste management is anticipated. Standard approach that is widely adopted in other parts of Hong Kong will be adopted for the handling and disposal of any domestic waste generated from proposed development. Proper refuse collection points will be provided, and collection of waste will be arranged by a licensed contractor on regular basis. It is noted that part of the Subject Site may potentially fall within the area of high natural background level of Arsenic in soil. The current proposed development will be a designated project under the Environmental Impact Assessment (EIA) Ordinance under Item P.1 Part 1, Schedule 2 of the EIAO (i.e. a residential development or recreational development, other than New Territories exempted houses within Deep Bay Buffer Zone 2) (**Figure 1.1** refers) and a separate EIA study will also be conducted later on. An environmental permit under the EIAO is required before the construction and operation of the proposed development. The presence of high natural background level of Arsenic will be reviewed in later EIA stage.

## 1.4 Scope

- 1.4.1 The scope of this EA study includes the assessment of the key potential environmental impacts of the proposed development:
- Air quality impact;
  - Road traffic noise impact;
  - Industrial noise impact; and
  - Water quality impact.

NSR	No. of Storeys	Assessment Level, mPD (Ground level +1.2m)
E01	2	G/F 6.3 1/F 10.8
E02	2	G/F 6.3 1/F 10.8
E03	2	G/F 6.3 1/F 10.8
E04	2	G/F 6.3 1/F 10.8
E05	2	G/F 6.3 1/F 10.8
E06	2	G/F 6.3 1/F 10.8
E07	2	G/F 6.3 1/F 10.8
E08	2	G/F 6.3 1/F 10.8
E09	2	G/F 6.3 1/F 10.8
E10	2	G/F 6.3 1/F 10.8
E11	2	G/F 6.3 1/F 10.8
E12	2	G/F 6.3 1/F 10.8
E13	2	G/F 6.3 1/F 10.8
E14	2	G/F 6.3 1/F 10.8
E15	2	G/F 6.3 1/F 10.8
E16	2	G/F 6.3 1/F 10.8

Notes:

- [1] For Unit Type C residential blocks, there are three storeys, but the ground floor is a carport which is not of noise sensitive use. Thus, the ground floor of Unit Type C residential blocks is not considered as a NSR in this assessment.

### 3.4 Assessment Methodology

- 3.4.1 As discussed in **Section 3.1**, according to HKPSG, the maximum allowable road traffic noise level expressed in terms of  $L_{10}(1 \text{ hr})$  at the typical façades of the proposed development is recommended to be 70 dB(A). In this regard, the traffic noise impact assessment below involves the prediction of the maximum hourly  $L_{10}$  level at the noise sensitive receivers (NSRs) of the proposed development due to the projected traffic flow from the major roads within 300m from the proposed development (e.g. Kam Pok Road East, Kam Pok Road East, Castle Peak Road – Tam Mi and San Tin Highway).
- 3.4.2 The projected peak hour traffic flow data for Year 2040, which is considered to be the worst-case scenario within 15 years upon completion of the current proposed development **by 2025**, have been adopted for the noise assessment. The methodology for traffic forecast has been endorsed by Transport Department (TD) (See **Appendix 3.1**). The traffic flow data was provided by the Project traffic consultant which has strictly adopted the above-mentioned endorsed methodology for traffic forecast.
- 3.4.3 The UK Department of Transport's procedures - "Calculation of Road Traffic Noise" (CRTN) has been used in the prediction of the road traffic noise at the representative NSRs of the proposed development within the Subject Site. The existing topographic

details, such as the existing village houses near the Subject Site, have been considered in the assessment.

- 3.4.4 The noise prediction has been carried out using the *RoadNoise 2000* software, which is a computerised model developed on the basis of the U.K. Department of Transport's CRTN procedures, and is acceptable to the EPD.

### 3.5 Prediction and Evaluation of Noise Impacts

- 3.5.1 Details of information on peak hour traffic volume and percentage of heavy vehicle of the road network within the 300m assessment area provided by the Project traffic consultant is presented in **Appendix 3.1**, which represents the worst-case scenario of the projected traffic flows.
- 3.5.2 An assessment on the road traffic noise level at the NSRs based on the above traffic flow data has been conducted. Existing low noise road surfacing (LNRS) along San Tin Highway has been taken into account. Noise mitigation measures which have already been incorporated in the design of the layout, and considered in the unmitigated scenario include the followings:
- Setback of residential blocks from the site boundary, behind the non-noise-sensitive clubhouse, at the southeast of the Subject Site near the site entrance.
- 3.5.3 Information of existing roadside barriers along Kam Pok Road East has been obtained from Highways Department and included in the assessment as well.
- 3.5.4 As summarised in **Table 3.2**, under the unmitigated scenario, the predicted road traffic noise levels at some NSRs along the eastern side of the Subject Site would exceed the relevant noise criteria of 70 dB(A) by up to 2 dB(A). The detailed unmitigated results are presented in **Appendix 3.2**.

**Table 3.2 Summary of Predicted Unmitigated Road Traffic Noise Levels at Representative NSRs**

NSR	Predicted Road Traffic Noise Level, L <sub>10</sub> (1-hour), dB(A) <sup>[1]</sup> (Unmitigated)
A01	55 - 67
A02	54 - 57
A03	54 - 57
A04	54 - 57
A05	54 - 57
A06	55 - 58
B01	57 - 62
B02	44 - 62
B03	44 - 62
B04	45 - 63
B05	45 - 64
B06	47 - 65
B07	48 - 66
B08	45 - 66
B09	45 - 66
B10	45 - 66
B11	51 - 64
B12	49 - 64
B13	49 - 64
B14	50 - 64
B15	52 - 67

<b>NSR</b>	<b>Predicted Road Traffic Noise Level, L<sub>10</sub> (1-hour), dB(A) <sup>[1]</sup> (Unmitigated)</b>
B16	52 - 70
B17	52 - 70
B18	52 - 70
B19	52 - 69
B20	52 - 68
B21	52 - 68
B22	51 - 68
B23	51 - 68
B24	52 - 69
C01	57 - <u>71</u>
C02	55 - <u>72</u>
C03	48 - <u>72</u>
C04	48 - <u>72</u>
C05	48 - <u>71</u>
C06	48 - <u>71</u>
C07	48 - <u>71</u>
C08	48 - <u>71</u>
C09	48 - 70
C10	48 - 70
C11	48 - 69
C12	48 - 69
C13	60 - 64
C14	47 - 63
C15	47 - 63
C16	47 - 64
C17	47 - 64
C18	47 - 64
C19	47 - 65
C20	47 - 65
C21	47 - 65
C22	47 - 65
C23	48 - 65
C24	48 - 65
C25	48 - 65
D01	55 - 66
D02	54 - 66
E01	53 - 64
E02	53 - 64
E03	52 - 64
E04	52 - 64
E05	53 - 64
E06	52 - 63
E07	56 - 59
E08	48 - 58
E09	49 - 57
E10	51 - 60
E11	49 - 59
E12	49 - 58
E13	56 - 60
E14	48 - 58
E15	47 - 57
E16	58 - 66

Notes:

[1] Bolded and underlined values exceed the noise criteria of 70dB(A).

3.5.5 While there are noise exceedances identified at a few NSRs, provision of the following boundary wall/mitigation measures are already incorporated into the design due to other fixed noise sources. As such, these proposed noise mitigation measures are also incorporated and presented in below mitigated scenario for road traffic noise assessment in order to show compliance with the noise criteria. **Incorporation of these proposed noise mitigation measures including the proposed 7.5m to 10.1m high noise barriers in the design of the proposed scheme has been accepted by the Applicant, which is technically feasible as per advice from Project Engineer. Mitigation measures will be incorporated for implementation during the detailed design stage later on:**

- A noise barrier of 10.1m high (i.e. 15.2mPD) along a portion of the southwestern boundary of the Subject Site;
- A noise barrier of 9.4m high (i.e. 14.5mPD) along a portion of the southwestern boundary of the Subject Site;
- A noise barrier of 7.9m high (i.e. 13.0mPD) along the southwestern corner of the Subject Site;
- A noise barrier of 7.5m high (i.e. 12.6mPD) along the eastern boundary of the Subject Site;
- A noise barrier of 5.1m high (i.e. 10.2mPD) along a portion of the western boundary of the Subject Site;
- A noise barrier of 4.8m high (i.e. 9.9mPD) along a portion of the southwestern and southern boundary of the Subject Site; and
- Single aspect design has been incorporated, in terms of fixed windows, blank facades, and placing non-noise-sensitive uses along the facades, for the southern façades (directly facing Kam Pok Road East) of residential blocks at the southwest of the Subject Site, i.e. all the Unit Type C residential blocks.

3.5.6 The boundary wall/mitigation measures shield the line of sight from the NSRs to the noise sources. The location and extent of the proposed mitigation measures are indicated in **Figure 3.5**, which are adequate to mitigate road traffic noise. The layout plan showing the single aspect design of the Unit Type C residential blocks is present in **Appendix 1.1**.

3.5.7 Under the mitigated scenario, those NSRs with identified noise exceedances and those units with single aspect design incorporated, have been assessed to check noise compliance. As seen in the results table, there is no exceedance of the noise criteria at these NSRs. The summary of the road traffic noise impact assessment results is presented in **Table 3.3**, and the details are presented in **Appendix 3.3**.

**Table 3.3 Summary of Predicted Mitigated Road Traffic Noise Levels at Representative NSRs**

NSR	Predicted Road Traffic Noise Level, L <sub>10</sub> (1-hour), dB(A) (Mitigated)
C01	54 - 60
C02	50 - 58
C03	48 - 58

### 4.3 Identification of Potential Noise Impacts

#### Industrial Noise Sources

4.3.1 Within 300m radius from the boundary of the Subject Site, a few existing open storage activities, including logistic centers, warehouses, open storage sites, have been identified as potential sources of industrial noise. The locations of the potential industrial noise sources are indicated in **Figure 4.1**. Sheltered structures were observed from the basemap and aerial photos, and during site surveys at the noise sources as indicated in **Figure 4.1**. These enclosed structure at open storage sites would provide further noise shielding effect. The noise sources during site surveys and details are presented in **Appendix 4.1**. According to the site surveys conducted in July 2019, August 2019, September 2019, March 2020, June 2020, May 2021, July 2021, July 2022, and September 2023, Towngas Open Yard at the south, and Sime Darby Hong Kong Multi Franchise Motor Group at the west have been identified as non-noise sources. For the Towngas Open Yard, it was observed with no particular noisy operation. For Sime Darby Hong Kong Multi Franchise Motor Group, as confirmed with their staff, their operations are inside an enclosed structure without any opening facing the Subject Site, so no particular noise source is identified. As observed during the site visits, the noise sources were found to operate occasionally. There was no night-time operation at the identified fixed noise sources during site surveys (**Appendix 4.1** refers). There are other existing village houses as well as residential buildings at Man Yuen Chuen in close vicinity to noise sources S11 and S10 respectively (**Figure 4.1** refers). Operation of these noise sources will also need to comply with noise criteria at these existing sensitive uses. Although it is unlikely that all the identified industrial sites will be in operation simultaneously, to be conservative, it has been assumed that all the identified noise sources are in operation at the same time, which also represents a worst case scenario. Noise sources are assumed to operate continuously instead of occasional as observed on-site and all noise sources are regarded as point source. In assessing the noise level, the locations of identified noisy equipment are shown in **Figure 4.1**. For noise sources S10 and S11, which are in adjacent to the Subject Site, S10a to S10c and S11a to S11b are derived to represent corresponding notional source location with respective to their nearest representative NSRs, which are then adopted for noise assessment as shown in **Figure 4.1**. There are also noted clusters of existing village houses in close proximity to some of the identified fixed noise sources, which are worst affected.

### 4.4 Determination of Noise Sensitive Receivers and Assessment Points

4.4.1 The planned residential blocks within the Subject Site are noise sensitive receivers (NSRs) of potential industrial noise impact. The proposed residential blocks located closest to the identified industrial noise sources would be worst affected by the noise sources. Therefore, representative assessment points (APs) on the blocks at Subject Site which are located closest to the noise sources are selected for this industrial noise impact assessment as the worst-case scenario. The locations and details of the APs are provided in **Figures 4.2** to **4.5**, and **Table 4.2** below, respectively.

**Table 4.2 Assessment Points for Operational Industrial Noise Impact Assessment**

NSR	No. of Storeys	AP	Floor	Assessment Level (Ground level +1.2m)
A01	4	A01-01	G	6.3
		A01-11	1	9.8
		A01-21	2	13.3

## 4.6 Prediction and Evaluation of Noise Impacts

### Industrial Noise Assessment Results

4.6.1 Based on the assumptions mentioned above and information of noise sources in **Section 4.3**, noise level estimation for the selected APs at the Subject Site has been conducted. Noise mitigation measures and higher barriers are also proposed to alleviate potential industrial noise, which have already been incorporated in the design of the layout, and considered in the noise assessment:

- Single aspect design for the southern façades (directly facing potential industrial noise sources S4 and S5) of residential blocks at the southwest of the Subject Site, such that there would be direct line of sight from sensitive uses of those residential blocks to the potential noise sources;
- Setback of residential blocks from the site boundary, behind the non-noise-sensitive clubhouse, at the southeast of the Subject Site near the site entrance;
- A noise barrier of 10.1m high (i.e. 15.2mPD) along a portion of the southwestern boundary of the Subject Site;
- A noise barrier of 9.4m high (i.e. 14.5mPD) along a portion of the southwestern boundary of the Subject Site;
- A noise barrier of 7.9m high (i.e. 13.0mPD) along the southwestern corner of the Subject Site;
- A noise barrier of 7.5m high (i.e. 12.6mPD) along the eastern boundary of the Subject Site;
- A noise barrier of 5.1m high (i.e. 10.2mPD) along a portion of the western boundary of the Subject Site;
- A noise barrier of 4.8m high (i.e. 9.9mPD) along a portion of the southwestern and southern boundary of the Subject Site;
- Single aspect design has been incorporated, in terms of fixed windows, blank facades, and placing non-noise-sensitive uses along the facades, for the southern façades (directly facing Kam Pok Road East) of residential blocks at the southwest of the Subject Site, i.e. all the Unit Type C residential blocks;
- In addition to the above, additional noise mitigation measures such as 1.2m high solid parapet wall at terrace at 2/F and fixed glazing/ blank façade at 2/F at houses labelled D01, E42 to E50 near the eastern boundary, have also been proposed and incorporated (see **Figure 4.6**); and
- Incorporation of these proposed noise mitigation measures including the proposed 7.5m to 10.1m high noise barriers in the design of the proposed scheme has been accepted by the Applicant, which is technically feasible as per advice from Project Engineer. Mitigation measures will be incorporated for implementation during the detailed design stage later on.

4.6.2 The consolidated overall proposed noise mitigation measures for the proposed development including locations and extents of the noise barriers, single aspect design, fixed glazing/ blank facade, and parapet walls are indicated in **Figure 4.6**. With the proposed noise mitigation measures incorporated in the layout, the calculated industrial noise levels at all APs would comply with the noise criteria. With provision



## 5. WATER QUALITY IMPACT

### 5.1 Introduction

- 5.1.1 This assessment is to identify the potential water quality impact during the construction and operational phases of the proposed development at the Subject Site. The extent of water quality impact assessment was based on an area within 500m radius from the boundary of the Subject Site.

### 5.2 Assessment Criteria

#### Water Pollution Control Ordinance

- 5.2.1 The Water Pollution Control Ordinance (WPCO) provides the major statutory framework to protect and to control the water quality in Hong Kong. According to the Ordinance and its subsidiary legislation, Hong Kong waters are divided into ten Water Control Zones (WCZs). Corresponding statements of Water Quality Objectives (WQOs) are stipulated for different water regimes (marine waters, inland waters, bathing beaches subzones, secondary contact recreation subzones and fish culture subzones) in the WCZ based on their beneficial uses. The Project area is located within Deep Bay WCZ. Key WQOs for river monitoring stations in Deep Bay WCZ is presented in Table 5.1, while the WQOs for Deep Bay WCZ in the Schedule of Cap 358R is also presented in **Appendix 5.1**.

#### Technical Memorandum

- 5.2.2 Discharge of effluents are subject to control under the WPCO. The "Technical Memorandum on Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters" (TM-DSS) gives guidance on the permissible effluent discharges based on the type of receiving waters (foul sewers, stormwater drains, inland and coastal waters). The limits control the physical, chemical and microbial quality of effluents. Any sewage from the proposed construction and operation activities must comply with the standards for effluents discharged into the foul sewers, inland waters and coastal waters of Deep Bay WCZ, as given in the TM-DSS.

#### TPB PG No. 12C "Town Planning Board Guidelines for Application for Developments Within Deep Bay Area under Section 16 of Town Planning Ordinance"

- 5.2.3 As Deep Bay is an ecological sensitive area, a "zero discharge policy" for Deep Bay has been implemented in Deep Bay catchment. Effluents discharged into Deep Bay are required to be properly treated prior to final disposal so as not to cause net increase in pollution load to Deep Bay.

#### Practice Note

- 5.2.4 A Professional Persons Environmental Consultative Committee Practice Note (ProPECC PN) was issued by the EPD to provide guidelines for handling and disposal of construction site discharges. The ProPECC PN 2/23 "Construction Site Drainage" provides good practice guidelines for dealing with 10 types of discharge from construction sites. These include surface run-off, groundwater, boring and drilling water, bentonite slurry, water for testing and sterilisation of water retaining structures and water pipes, wastewater from building constructions, acid cleaning, etching and pickling wastewater, and wastewater from site facilities. Practices given in the ProPECC PN 2/23 should be followed as far as possible during construction to minimise the water quality impact due to construction site drainage.

- 5.2.5 The ProPECC PN 1/23 "Drainage Plans subject to Comments by Environmental Protection Department" provides guidelines and practices for handling, treatment and disposal of various effluent discharges to stormwater drains and foul sewers. The design of site drainage and disposal of various site effluents generated within the new development area should follow the relevant guidelines and practices as given in the ProPECC PN 1/23. Best Management Practices (BMPs) for storm water discharge are recommended for the Project to mitigate potential adverse water quality impacts.

ETWBTC (Works) No. 5/2005 "Protection of Natural Streams/Rivers from Adverse Impacts Arising from Construction Works".

- 5.2.6 The Technical Circular provides an administrative framework to better protect natural streams/rivers from impacts of construction works. Construction works in adjacent to natural streams/rivers should follow the guidelines and precautionary measures given in the Technical Circular as far as possible.

**Table 5.1 Key Water Quality Objectives for River Monitoring Stations in Deep Bay Water Control Zone**

Parameter	WQOs
pH range	6.0 - 9.0
Maximum 5-Day Biochemical Oxygen	5
Maximum Chemical Oxygen Demand, mg/L	30
Maximum Annual Median Suspended Solids,	20
Minimum Dissolved Oxygen, mg/L	4

Remark: The above refers to Key WQOs for river monitoring stations in the Northwestern New Territories, River Water Quality in Hong Kong published by EPD (Appendix C refers). Please also refer to **Appendix 5.1** for the list of WQOs for Deep Bay WCZ.

### 5.3 Water Sensitive Receivers

- 5.3.1 The Subject Site is currently mainly covered by ponds with no engineered drainage system. Currently, surface runoff within the area as well as water ponds are discharged by means of overland flow into drainage ditch to the west of the Site and without any treatment. The nullahs/drainage channels and ponds within the 500m assessment area are identified as the water sensitive receivers (WSRs) for the construction and operation phases of the Project. The Subject Site is partially inside the Wetland Buffer Area (WBA) but falls outside the Wetland Conservation Area (WCA) by about 184m. Ponds within the WBA maybe subject to direct water quality impact from the construction and operation of the Project, while the WCA is subject to indirect water quality impact from the Subject Site as they are separated by other existing uses. In accordance with Nam Sang Wai Outline Zoning Plan (OZP) S/YL-NSW/8 and Kam Tin North OZP S/YL-KTN/10, there are areas zoned as Conservation Area (CA) within the assessment area to the southeast and southwest of the Subject Site. These CA zones are indicated in **Figure 5.1**.
- 5.3.2 During construction of the current proposed WRA which is within Subject Site and during its establishment period, the WRA will form part of a construction site, which is not a WSR. Once the WRA has been fully functional later on, it will become a WSR. During operation, the proposed WRA will be a WSR. In case there will be any discharge from the ponds at WRA, the effluent shall comply with WPCO-TM.

## 5.4 Potential Water Quality Impact

- 5.4.1 The Subject Site is currently mainly covered by ponds with no engineered drainage system. Currently, surface runoffs within the area as well as water ponds are discharged by means of overland flow into drainage ditch to the west of the Site without any treatment. The potential water quality impacts during the construction phase of the Proposed Development include filling of existing ponds, general construction activities, construction site runoff, and accidental spillage.

### Construction Phase

#### General Construction Activities

- 5.4.2 Various types of construction activities would generate wastewater. They include general cleaning and polishing, wheel washing, dust suppression and utility installation, which would contain high concentrations of suspended solids. Without proper control, these could lead to increase in suspended solids level, as well as increase in turbidity and reduced dissolved oxygen in the nearby watercourses.
- 5.4.3 Wastewater would also be generated from the accumulation of solid waste such as plastic package and construction material, and sewage effluent from the construction workforce during the construction phase. If uncontrolled, they could lead to deterioration in water quality.
- 5.4.4 The Practice Note for Professional Persons (ProPECC Note PN2/23) on Construction Site Drainage provides guidelines on good practice for dealing with discharges from construction sites. It is applicable to this study for control of site runoff and wastewater generated during the construction phase.

#### Filling of Existing Ponds

- 5.4.5 The existing ponds within Subject Site used to be commercial fishponds. Based on existing condition, when drain-down of these existing ponds is required due to operational needs, water would be discharged into adjacent existing drainage ditches then to the existing Ngau Tam Mei Drainage Channel and without any treatment.
- 5.4.6 During the construction phase, construction activities will be conducted in phases. The proposed wetland restoration area (WRA) will be created first, before the construction of the residential buildings. The construction activities at the existing abandoned ponds will be scheduled to commence immediately after the dry season as far as possible when the water level is relatively low in the year. Since this project is still at early planning stage, details of construction works are subject to later detailed design stage. Key construction activities to be carried out at WRA area are tabulated below as illustration. Prior to the commencement of the construction, water from the ponds within the WRA extent will be drained to other ponds within the Subject Site for temporary storage. The construction works will be carried out in phases so to avoid discharge where possible. In case there is still water in the WRA extent, the remaining water will, with the consent of the owners of those ponds sought by the Applicant, be transferred to other ponds outside the Subject Site for temporary storage. The chance to drain pond water to the adjacent existing ditches would thus be minimized. With the proposed development, proper drainage system and screening facilities will be provided to treat surface runoff. It is expected that the water is of similar quality as when these ponds were commercial fishponds, so no adverse water quality issue is anticipated. Once the WRA has been created physically, the establishment period for the wetland and relevant planting will take a much longer time to complete in order for it to function. During which, it is still part of a construction site so it is not water

quality sensitive receiver. However, in case the WRA is fully functional later on while there are still construction works at residential development portion, further mitigation measure such as intercepting drains will be provided by the contractor to divert construction runoff away from the established wetland.

Task	Description of Construction Activities
1	Vegetation clearance
2	Draining of pond water to adjacent ponds for temporary storage *
3	Reprofiling at ponds and earth works *
4	Planting and establishment period *
5	Operation of WRA

Remark: The above are key construction activities at WRA areas. Works to be carried out in phases or in pairs. Details are subject to detailed design stage later on.

- 5.4.7 When the WRA reprofiling and planting are completed, water will be transferred back to the WRA from the temporary storage ponds. Then, the other ponds within the Subject Site will undergo construction/reprofiling. Before the construction / reprofiling, water from the other ponds will be drained to the reprofiled WRA for temporary storage. The reprofiled ponds will be re-filled after the construction has been completed. Any spare water after the re-filling will be absorbed by soakaway mechanism and the chance to drain pond water to drainage ditches would thus be minimized. In case there is still surplus pond water, the pond water will be used on-site for the construction activities such as dust suppression and wheel washing facilities to minimize the water consumption of Project. In case there will be any discharge from the ponds during construction, the effluent shall comply with WPCO-TM.

#### Construction Site Runoff

- 5.4.8 Site runoff may cause potential water quality impacts. During construction, soil surfaces would be exposed. Site runoff would wash away the soil particles on unpaved lands and areas with the topsoil exposed. This site runoff is characterised by high concentrations of suspended solids. Release of site runoff into the water body directly or via drainage channel could lead to increase in SS levels and turbidity in the nearby water environment. Site runoff may also wash away contaminated soil particles and therefore cause water pollution.
- 5.4.9 Best practice as stipulated in ProPECC Note PN 2/23 will be adopted by contractor. As a standard site practice, sufficient site drainage should be provided to collect site runoff for appropriate treatment before discharge. Perimeter drainage should be installed at site perimeter as well as near any watercourses passing through the construction site to avoid polluted construction site runoff from leaving the sites or entering any nearby watercourses or drainage system without appropriate treatment. Silt removal facilities with sufficient capacity, such as sedimentation tanks, should be provided on site to handle all site runoff before discharge.
- 5.4.10 Water pumped out from foundation piling or excavation works would also be discharged into the nearby drainage via silt removal facilities. The Contractor would be required to obtain a license from EPD for discharge to the inland waters. With the

provision of adequate construction site drainage and sediment removal facilities, no unacceptable water quality impacts would be expected.

#### Accidental Spillage

- 5.4.11 Site drainage would be well-maintained and good construction practices would be observed to ensure that litter, fuels and solvents are managed, stored and handled properly and do not enter the nearby water streams and coastal water. Therefore, it is expected that no water quality impacts caused by accidental spillage would be generated.

#### Sewage Effluent from Construction Workforce

- 5.4.12 Sewage effluents will arise from the sanitary facilities provided for the on-site construction workforce. Based on the "Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning" issued by EPD, the sewage production rate for construction workers is estimated at 0.15 m<sup>3</sup> per employee per day. Thus, for every 100 construction workers working simultaneously at the construction site, about 15 m<sup>3</sup> of sewage would be generated per day. Sewage would consist of high levels of BOD<sub>5</sub>, Ammonia and *E. coli* counts.
- 5.4.13 The sewage would be collected on-site using chemical toilets and be appropriately handled by licensed contractor. No direct discharge of sewage effluent would be allowed. No adverse water quality impact from sewage effluent from construction workforce is expected.

#### **Operation Phase**

##### Surface runoff

- 5.4.14 The Subject Site is currently mainly covered by ponds with no engineered drainage system. Currently, surface runoffs within the area as well as water ponds are discharged by means of overland flow into drainage ditch to the west of the Site without any treatment.
- 5.4.15 During operation, there will be discharge of surface runoff from the proposed development. A proper drainage system would be provided for the proposed development to collect surface runoff for discharge to the drainage ditch. The surface runoff will be collected and then discharged via screening facility. There will be no direct discharge without treatment. Mitigation measures have been proposed in **Section 5.6**.

##### Sewage effluent

- 5.4.16 Domestic sewage from the proposed development would be a major source of water quality impact from the operational phase. Without proper arrangement, sewage may enter the nearby stormwater system or nearby water bodies, resulting in an increase in levels of pollutants such as *E. coli*, suspended solids (SS), and ammonia nitrogen (NH<sub>3</sub>-N), etc.
- 5.4.17 The sewage generated from the proposed development will be collected by a properly planned sewage pumping station within Subject Site (with ADWF capacity of about 125 m<sup>3</sup>/day) to existing Nam Sang Wai Sewage Pumping Station (SPS) via proposed sewer, and will then be conveyed to the existing Yuen Long Sewage Treatment Works (YLSTW) via existing public sewerage network during operation stage as detailed in the separate Sewerage Impact Assessment (SIA) Report. According to the SIA, sewage generation from the Subject Site will take up about 0.30% of the design daily flow of the Nam Sang Wai SPS, and about 0.18% of YLSTW. There should be adequate capacity at the sewerage system to cater for the proposed development. Please also refer to **Figure**

**5.2** for the proposed sewerage system. This planned sewerage system will be in place before occupation of proposed development. With this proposed sewerage system in place, there will be no discharge of raw sewage from the proposed development. Thus, no adverse water quality impact is anticipated. Relevant design measures recommended on emergency situation of the proposed SPS have also been proposed in Section 5.6.

#### Operation and Maintenance of the Proposed WRA

- 5.4.18 Since there are already existing water ponds within the Subject Site and pond draining is required for such commercial fish ponds, it is expected that the nature of proposed WRA is of similar to existing water ponds during normal operation of WRA. Relevant measures have been proposed in **Section 5.6**.

#### Leakage of Oil and Grease from Vehicles

- 5.4.19 For the proposed roads and the underground parking areas inside the Subject Site, proper drainage system will be provided at the proposed development to follow the requirements of ProPECC PN 1/23 and runoff will be discharged via petrol interceptors (**Section 5.6.12** refers).

### **5.5 Mitigation Measures for Construction Phase**

#### Filling of Existing Ponds

- 5.5.1 As discussed in **Sections 5.4.1** to **5.4.7**, filling of existing ponds and the WRA reprofiling works will be conducted in phases immediately after the dry season as far as possible. Pond water will be drained to other ponds for temporary storage to avoid discharge where possible. With such arrangements, water will be retained in the WRA in the Subject Site. Water loss from the existing abandoned ponds due to the construction activities will be minimized as far as possible, and no discharge of water is anticipated from the construction phase of the proposed development. After the establishment period of WRA, it is fully functional. In case there are still construction works at residential development portion, further mitigation measure such as intercepting drains will be provided by the contractor to divert construction runoff away from the established wetland.

#### General Construction Activities

- 5.5.2 The site practices outlined in ProPECC PN 2/23 Construction Site Drainage should be adopted as far as practicable to minimise the potential water quality impacts from various construction activities and construction site runoff. Extra attention should be paid for works areas which are in close proximity to the water sensitive receivers. Reference should be made to relevant best practices and precautionary measures as outlined in the ETWBTC (Works) No. 5/2005 during the course of construction when working in adjacent to watercourse in order to minimize potential impact.

#### **Wheel Washing Facilities**

- 5.5.3 The wheels of all vehicles should be washed before they leave a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. A wheel washing bay should be provided at every site exit if practicable. Wash water should be recycled whenever possible to minimise the generation of wastewater and should have sand and silt removed before discharging into storm drains. The section of construction road between the wheel washing bay and the public road should be paved with backfall to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains.

- 5.5.4 There will be need for the Contractor to apply to the EPD for a discharge licence for discharge of effluent from the construction site under the WPCO. The discharge quality must meet the requirements specified in the discharge licence. All the runoff and wastewater generated from the works areas should be treated so that it satisfies all the standards listed in the TM-DSS. The beneficial uses of the treated effluent for other on-site activities such as dust suppression, wheel washing and general cleaning etc., can minimise water consumption and reduce the effluent discharge volume. If monitoring of the treated effluent quality from the works areas is required during the construction phase of the Project, the monitoring should be carried out in accordance with the WPCO license.

#### **Wastewater from Solid Waste**

- 5.5.5 Debris and refuse generated on-site should be collected, handled and disposed of properly to avoid entering to the nearby watercourses. Stockpiles of cement and other construction materials should be kept covered when not being used.
- 5.5.6 Rubbish and litter from construction sites should also be collected to prevent spreading of rubbish and litter from the site area. It is recommended to clean up the construction waste on a regular basis for good site practice.

#### **Construction Site Runoff**

- 5.5.7 In order to meet the requirements of the Technical Memorandum standard under the Water Pollution Control Ordinance, surface runoff from construction sites should be discharged into storm drains via adequately designed sand/silt removal facilities such as sand traps, and sedimentation basins.
- 5.5.8 Exposed slope/soil surfaces should be covered by a tarpaulin or similar material during rainstorms to prevent the washing away of construction materials into any drainage system, watercourses and inshore water. Other measures which are proposed to be implemented before, during, and after rainstorms, as appropriate, are summarized in ProPECC PN 2/23. The surface run-off from construction sites as detailed below shall also be incorporated into the construction site drainage where practicable as an integral part of good practice:
- Surface run-off from construction sites should be discharged into storm drains via adequately designed sand/ silt removal facilities such as sand traps, and sediment basins. Channels or earth bunds or sand bag barriers should be provided on site to properly direct stormwater to such silt removal facilities. Perimeter channels at site boundaries should be provided where necessary.
  - Silt removal facilities, channels and manholes should be maintained, and the deposited silt and grit should be removed regularly.
  - Construction work should be programmed to minimize soil excavation works in rainy seasons (April to September). If excavation in soil could not be avoided in these months, temporarily exposed slope surfaces should be covered, and temporary access roads should be protected by crushed stone or gravel, as excavation proceeds.
  - Earthworks final surfaces should be well compacted, and the subsequent permanent work or surface protection should be carried out immediately after the final surfaces are formed.

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### Sewage effluent

- 5.6.8 With provision of properly planned sewer system, a SPS is proposed within the Subject Site so that sewage would be collected and conveyed to existing Nam Sang Wai Sewage Pumping Station, which will then be conveyed to the existing Yuen long Sewage Treatment Works via existing public sewerage network and existing public Nam Sang Wai Sewage Pumping Station during operation stage. The proposed SPS has a design ADWF of about 125 m<sup>3</sup>/day. As there will be no direct discharge of sewage to nearby area, no adverse water quality impact is anticipated from sewage generated by the operation of the proposed development. Drainage in covered carparks, covered transport interchange, covered loading and unloading area should be connected to foul sewer via petrol interceptors in accordance with ProPECC PN 1/23. With the provision of the proposed sewerage system, no associated water quality impact is anticipated.
- 5.6.9 As discussed above, sewage from the Subject Site will be collected by proposed sewers and SPS for discharge into public sewerage system. Detailed design of the proposed SPS is only available during later detailed design stage. In case of emergency situation during operation of the proposed SPS, it is proposed that adequate spare parts for the plant will have to be made readily available as well as provision of duty & standby pumps to ensure the operation of the SPS. In addition, measures have also been proposed for emergency such as qualified personnel will be hired to inspect the plant condition and carry out maintenance on a regular basis; equalization tank to provide temporarily storage; and tank away will be provided in case of prolonged outage of SPS for disposal at designated DSD's sewage treatment works. Moreover, twin sewer is proposed in case of maintenance of one of the sewers. With these measures in place, it is considered that the proposed SPS will unlikely cause any adverse water quality impact.

### Operation and Maintenance of the Proposed WRA

- 5.6.10 Since there are already existing water ponds within the Subject Site and pond draining is required for such commercial fish ponds, it is expected that the nature of proposed WRA is of similar to existing water ponds. Under normal operation, there will be no discharge from the proposed WRA. Should draining of the WRA is inevitable (e.g. for maintenance purpose or excessive water), the water should be temporarily drained to adjacent ponds so as to avoid discharge. Water in the WRA can also be temporarily drained to adjacent ponds, with the consent of the owners of those ponds sought by the future management party of the Proposed Development, so that discharge of water can be minimized as far as possible. In case there will be any discharge from the ponds, proper pre-treatment should be carried out so that the effluent quality shall comply with WPCO-TM. The discharge should follow the conditions in the effluent discharge licence to be issued and be sited away from natural water stream as much as possible.
- 5.6.11 Currently, there is also discharge of surface runoff at the Subject Site as well as existing ponds, which is directly discharged and untreated. During operation stage, there will be proper drainage system at proposed development to collect and direct surface runoff towards the site drainage system as far as possible. Screening facilities such as standard gully grating and trash grille, with spacing which is capable of screening off large substances such as fallen leaves and rubbish should be provided at the inlet of drainage system/ discharge points. Thus, there will be no direct discharge of surface runoff without treatment, which may affect the WRA. Furthermore, there should be regular cleaning and sweeping of road surface/ open areas as well as prior to occurrence of rainstorm to minimize exposure of pollutants to stormwater.

### Leakage of Oil and Grease from Vehicles

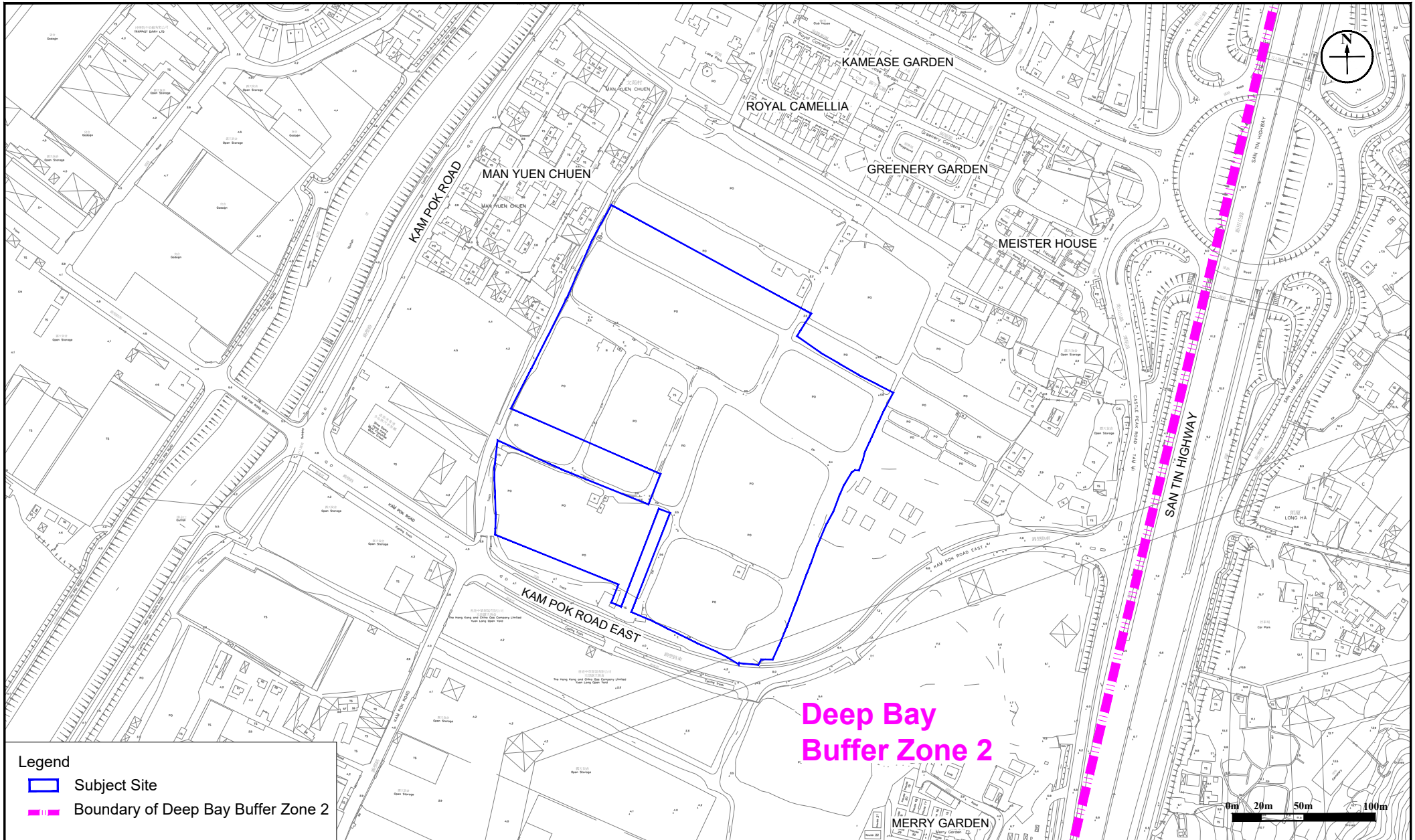


- 5.6.12 Drainages for the proposed roads and the underground parking areas should be connected to foul sewer via petrol interceptors while drainage serving open space should be connected to stormwater drain via screening facilities in accordance with EPD's Practice Note PN 1/23 in order to avoid oil and grease from entering the drainage system.

## **5.7 Conclusion**

- 5.7.1 Surface runoff of stormwater, sewage effluent from the proposed development, and oil leakage from vehicles would be the major sources of water quality impact during the operation of the proposed development. Proper stormwater drainage system with standard screening facilities will be provided to convey the collected drainage to the Ngau Tam Mei Drainage Channel. For the proposed WRA, there will be no discharge under the normal operation. Any maintenance works should be scheduled to be conducted during the dry season or immediately after the dry season as far as possible when the water level is the lowest in the year.
- 5.7.2 For the filling and reprofiling of the existing abandoned ponds, the construction activities should be conducted in phases to avoid water discharge.
- 5.7.3 The sewage generated from the proposed development will be collected by proposed sewers and SPS for discharge into public sewerage system to existing Nam Sang Wai Sewage Pumping Station, and will then conveyed to the existing Yuen long Sewage Treatment Works via existing public sewerage network and existing public Nam Sang Wai Sewage Pumping Station during operation stage. This planned sewerage system will be in place before occupation of proposed development. With this proposed sewerage system in place, there will be no discharge of raw sewage from the proposed development. Thus, no adverse water quality impact is anticipated. Relevant design measures recommended on emergency situation of the proposed SPS, have also been proposed.
- 5.7.4 Provided that mitigation measures such as BMP and provision of appropriately designed drainage and sewerage systems are implemented, adverse water quality impact from the operation of the proposed development is not anticipated.

## Figures



**Legend**

- Subject Site
- Boundary of Deep Bay Buffer Zone 2

**Figure:** 1.1

**Title:** Subject Site and Its Environs

**Project:** Planning Application for Proposed Comprehensive Development Scheme to include Wetland Restoration Proposal and Proposed Filling of Ponds/Land and Excavation of Land in "OU(CDWRA)" Zone at Various Lots in D.D. 104, North of Kam Pok Road East, Pok Wai, Yuen Long, New Territories

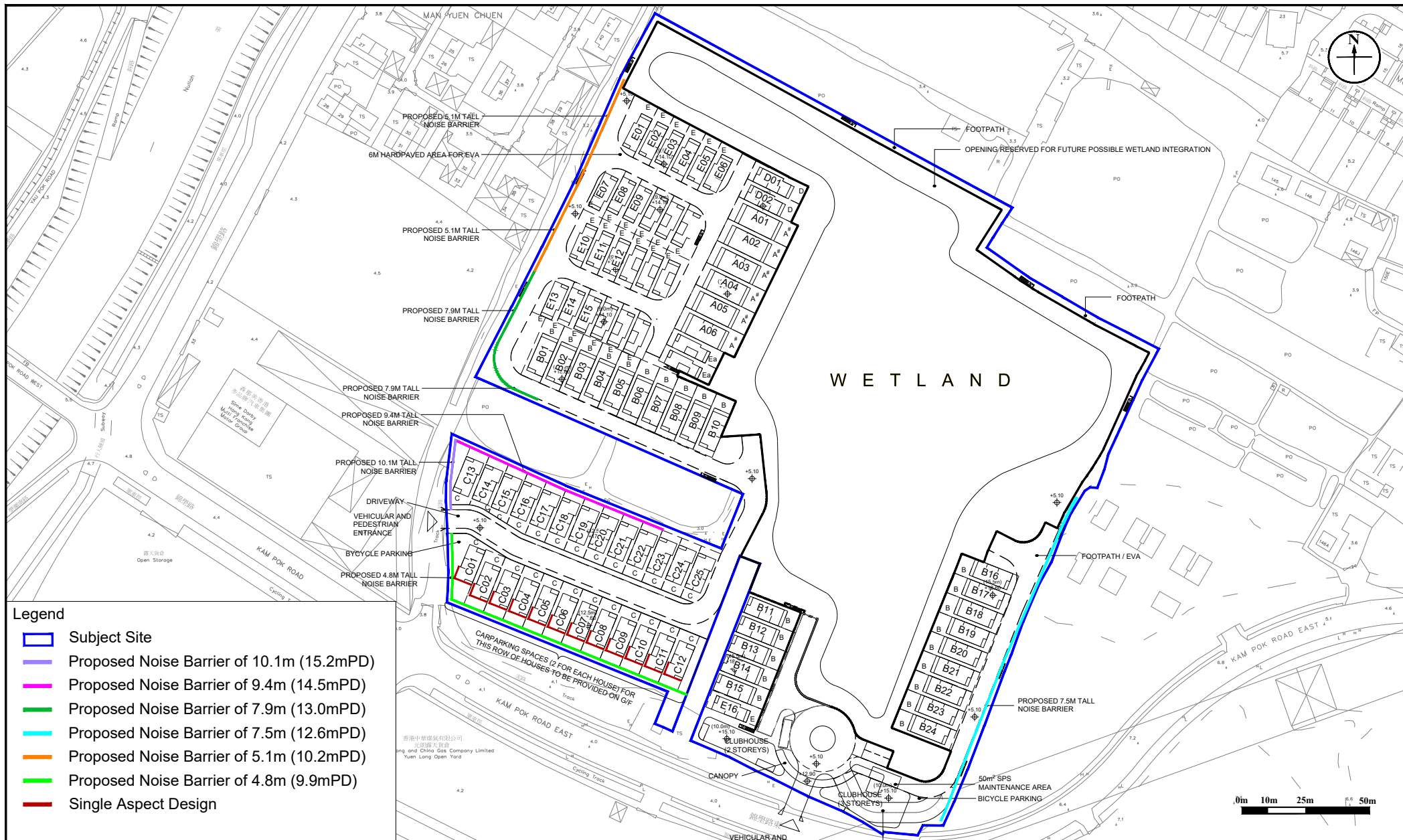
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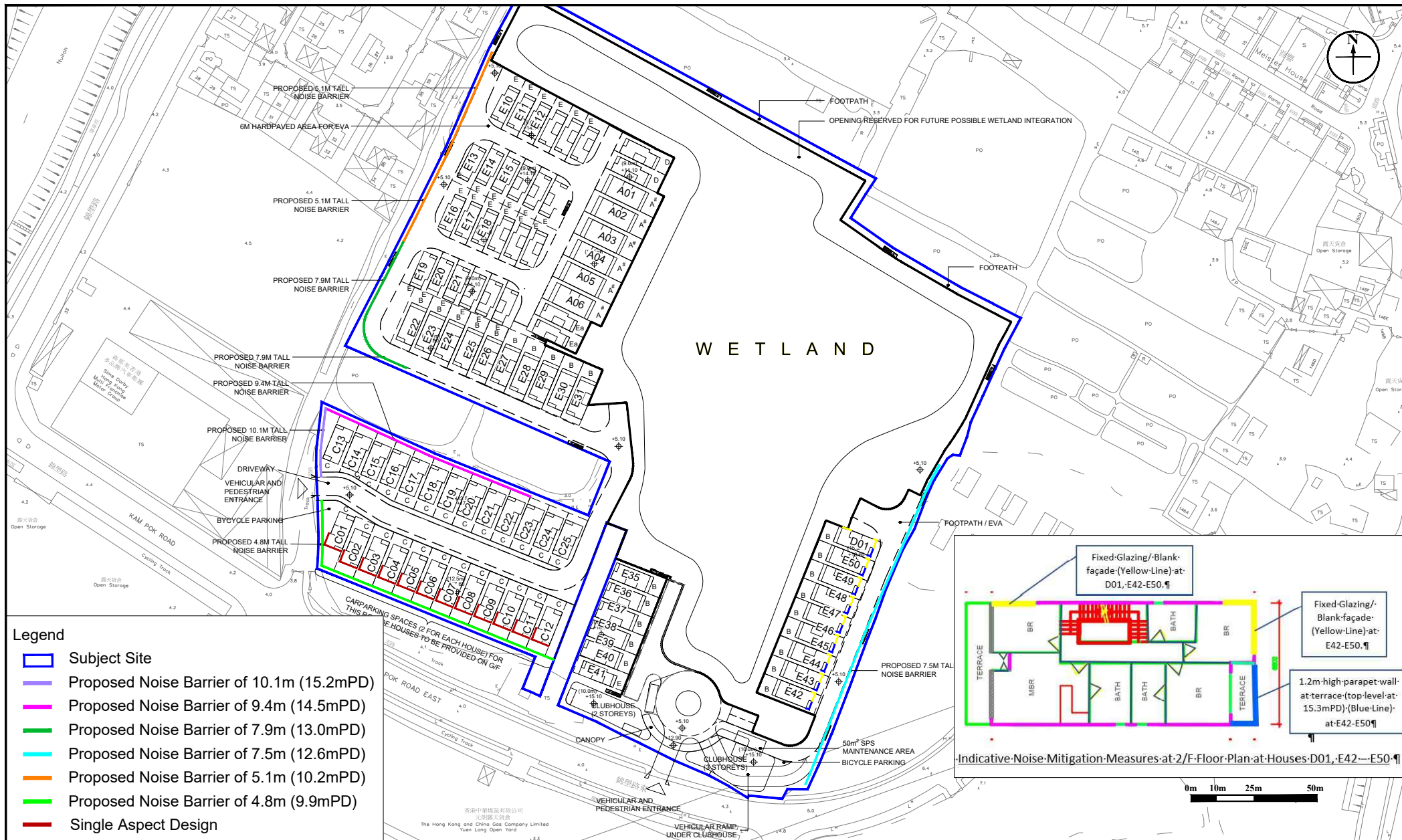


- Legend**
- Subject Site
  - Proposed Noise Barrier of 10.1m (15.2mPD)
  - Proposed Noise Barrier of 9.4m (14.5mPD)
  - Proposed Noise Barrier of 7.9m (13.0mPD)
  - Proposed Noise Barrier of 7.5m (12.6mPD)
  - Proposed Noise Barrier of 5.1m (10.2mPD)
  - Proposed Noise Barrier of 4.8m (9.9mPD)
  - Single Aspect Design

**Figure:** 3.5  
**Title:** Proposed Mitigation Measures for Traffic Noise Impact Assessment

**Project:** Planning Application for Proposed Comprehensive Development Scheme to include Wetland Restoration Proposal and Proposed Filling of Ponds/Land and Excavation of Land in "OU(CDWR)" Zone at Various Lots in D.D. 104, North of Kam Pok Road East, Pok Wai, Yuen Long, New Territories

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**Figure:** 4.6

**Title:** Proposed Noise Mitigation Measures for Proposed Development

**Project:** Planning Application for Proposed Comprehensive Development Scheme to include Wetland Restoration Proposal and Proposed Filling of Ponds/Land and Excavation of Land in "OU(CDWR)" Zone at Various Lots in D.D. 104, North of Kam Pok Road East, Pok Wai, Yuen Long, New Territories

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**Appendix 4.1**  
**Inventory of Potential Industrial Noise Sources**

Sources of Industrial Noise

ID	Description	Activity <sup>[1]</sup>	Coordinates		SWL, dB(A) <sup>[2]</sup>	mPD + 1m	Measured SPL, dB(A) <sup>[2][3]</sup>	Distance from Source, m <sup>[2]</sup>	Distance Correction, dB(A)
			x	y					
S1	Hung Kee Metal Recycling International Limited	Fork Lift	823601	836709	91.4	4.2	66.5	7.0	24.9
S2	Dorfield Limited	Fork Lift	823652	836655	94.9	4.7	66.9	10.0	28.0
S3-1	祥發五金貿易有限公司	Scraping Metal	823605	836630	96.8	4.9	71.4	7.4	25.4
S3-2	祥發五金貿易有限公司	Lorry Movement with Crane	823627	836649	99.0	4.9	73.0	7.9	26.0
S4	Wing Tat Logistics Group Limited	Fork Lift	823089	836544	94.4	4.6	69.5	7.0	24.9
S5	威盛物流	Loading Unloading of Goods	823153	836442	98.5	4.9	72.4	8.0	26.1
S6	Santa Fe	Fork Lift	823001	836707	98.0	5.6	71.9	8.0	26.1
S7	Bun Kee (International) Limited	Loading Unloading of Goods Carried Out By Lorry with Crane	822966	836729	95.7	5.1	66.9	11.0	28.8
S8	Hichain Logistics Group	Fork Lift	823027	836786	91.4	5.7	66.5	7.0	24.9
S9	Taiwan Express	Fork Lift	823059	836822	92.5	5.7	68.9	6.0	23.6
S10 <sup>[4]</sup>	Open storage site (east)	Lorry Movement with Crane	823216	836713	99.0	5.2	73.0	7.9	26.0
S10a <sup>[4]</sup>	Open storage site (east)	Lorry Movement with Crane	823217	836734	99.0	5.2	73.0	7.9	26.0
S10b <sup>[4]</sup>	Open storage site (east)	Lorry Movement with Crane	823219	836721	99.0	5.2	73.0	7.9	26.0
S10c <sup>[4]</sup>	Open storage site (east)	Lorry Movement with Crane	823210	836699	99.0	5.2	73.0	7.9	26.0
S11 <sup>[4]</sup>	Open storage site (west)	Lorry Movement with Crane	823449	836546	99.0	7.4	73.0	7.9	26.0
S11a <sup>[4]</sup>	Open storage site (west)	Lorry Movement with Crane	823464	836563	99.0	7.4	73.0	7.9	26.0
S11b <sup>[4]</sup>	Open storage site (west)	Lorry Movement with Crane	823447	836539	99.0	7.4	73.0	7.9	26.0

Notes:

Plant inventory at each noise source was based on site surveys in July 2019, August 2019, September 2019, March 2020, June 2020, May 2021, July 2021, July 2022, and September 2023. As observed during the site surveys, noisy plants were only found to operate occasionally. No night-time operation was observed during site surveys and the noise sources were found to be closed at night-time.

[1] Site visits were carried out and that the above noise sources had no night-time operation. Type of noise sources are based on site observation during site visit.

[2] Sound power levels (SWL) of the noise noise sources are determined based on the sound pressure levels (SPL) measurement conducted on-site and general acoustic principal.

[3] SPLs were measured at free-field.

[4] S10, S10a, S10b, and S10c represent the notional noise source location at noise source S10 & with respective to different NSR locations. Accordingly, S11, S11a, and S11b represent the notional noise source location at noise source S11 & with respective to different NSR locations.