

**Interim Sewage Treatment Plant and
Effluent Reuse Facility at Wo Shang Wai, Yuen Long**

Sewerage Impact Assessment

January 2016



CONTENTS

	Page
1. Introduction.....	1
1.1 Background.....	1
1.2 Objective of the Report.....	1
1.3 Structure of the Report.....	2
2. Sewerage Impact Assessment	2
2.1 Existing and Committed Sewerage System	2
2.2 Population Projection.....	3
2.3 Sewage Flow Projection	3
2.4 Sewerage Impact	4
3. Proposed Mitigation Measures.....	5
3.1 Proposed Interim On-Site Sewage Treatment Plant	5
3.2 Preventive Measures for Overflow of Raw Sewage /Treated Effluent	8
3.3 Compliance with WSD Standards of Effluent Reuse.....	8
3.4 Compliance with Town Planning Board Guidelines.....	10
3.5 Operation and Maintenance of Interim Sewage Treatment Plant.....	10
4. Conclusions.....	12

LIST OF FIGURES

Figure 1	Location Plan of Proposed Development
Figure 2	Sewerage Impact Assessment – Proposed Ngau Tam Mei Trunk Sewerage (Key Plan)
Figure 3	Sewerage Impact Assessment – Proposed Ngau Tam Mei Trunk Sewerage
Figure 4	Layout Plan of Preliminarily Designed Permanent Sewerage System
Figure 5	Layout Plan of Preliminarily Designed Interim Sewerage System
Figure 6	Process Flow Diagram of Interim On-site Sewage Treatment Plant
Figure 7	Layout Plan of Communal Landscape Area (with Effluent Reuse for Irrigation)

LIST OF ANNEXES

Annex A	RNTPC Paper No. A/YL-MP/229C
Annex B	Estimation of Sewage Flow from Pools
Annex C	Assessment of Ngau Tam Mei Trunk Sewerage Capacity

1. INTRODUCTION

1.1 Background

- 1.1.1.1 AECOM Asia Company Limited (AECOM) was commissioned by Profit Point Enterprises Limited to act as an engineering consultant for the proposed Comprehensive Residential Development at Wo Shang Wai, Yuen Long.
- 1.1.1.2 Presently, the planning application for this project under Section 16 of Town Planning Ordinance (Cap. 131) (application no. A/YL-MP/229) was approved with conditions by the Rural and New Town Planning Committee of the Town Planning Board on 27 February 2015. This Sewerage Impact Assessment (SIA) report serves as a supporting document for discharging approval conditions (o) from Planning Department.
- 1.1.1.3 The site area of Comprehensive Development in Wo Shang Wai (hereinafter referred to as the "WSW Development") is located by the side of Castle Peak Road and San Tin Highways as shown in **Figure 1**. To the immediate south and west of the WSW Development, there are the existing Wo Shang Wai Village, residential developments namely Royal Palms and Palm Springs. Besides, there are fish ponds to the north and village development to the east of the WSW Development.
- 1.1.1.4 The WSW Development comprises of houses and residential facilities including club house, landscaped open spaces, refuse collection point, car parks, and a wetland restoration area.
- 1.1.1.5 The Development will be occupied in phases, with the delineation as shown on Figure 1. According to the latest schedule, Phase 1 area (i.e. western portion of the Site) would be occupied by early 2017, while Phase 2 (i.e. eastern portion of the Site) is tentatively scheduled to be occupied by end 2017. This assessment covers the sewage flow to be generated by both phases of the development.
- 1.1.1.6 As stipulated in the Environmental Permit (EP) No. EP-311/2008/C Condition 5.13, "the residential units shall be occupied only after sewage can be discharged to government sewerage network". However, the implementation programme of the government sewerage network outside the WSW Development is uncertain at the current moment. The population in-take for the proposed development would likely be in advance to the commissioning of the public sewer, it is necessary to consider the provision of the on-site sewage treatment facility as an interim measure to handle the sewage generated from the WSW Development before the availability of public sewerage for connection despite connection to the public sewerage system at Castle Peak Road is still the permanent and long term measure.
- 1.1.1.7 The interim sewage treatment facility consists of an on-site sewage treatment plant (STP) and an effluent reuse facility. Except serving as an interim measure before the government sewerage network is available, the interim Sewage Treatment Plant will also involve sewage treatment for on-site effluent reuse for toilet flushing and irrigation of landscape areas including communal landscape area, vertical green and private gardens.
- 1.1.1.8 The application for the interim sewage treatment plant will follow the statutory process under the Environmental Impact Assessment Ordinance (EIAO) (Cap. 499).

1.2 Objective of the Report

- 1.2.1.1 The purpose of this SIA is to assess the impact of the sewage generated due to the proposed development and the revised occupation schedule. Mitigation measures would be recommended whenever necessary.

1.3 Structure of the Report

1.3.1.1 The remainder of this Report, in addition to Section 1, is structured as follows:-

- Section 2: Sewerage Impact Assessment
- Section 3: Proposed Mitigation Measures
- Section 4: Conclusions

2. SEWERAGE IMPACT ASSESSMENT

2.1 Existing and Committed Sewerage System

2.1.1.1 The existing land use for the WSW Development comprises bare ground and grassland. The site falls within the Yuen Long / Kam Tin sewerage catchment. According to the existing sewerage record, there is no sewerage system in the vicinity to the site area. The area where the WSW Development located is classified as unsewered area under the Yuen Long and Kam Tin Sewerage Master Plan (YLKT SMP).

2.1.1.2 In the Yuen Long/ Kam Tin sewerage catchment, only Yuen Long town centre, Hung Shui Kiu and Tin Shui Wai are currently served by the public sewerage network. The collected sewage in the public sewer is conveyed to the Yuen Long Sewage Treatment Works (YLSTW), which is located at north of Yuen Long town centre, for secondary treatment before discharging into the Deep Bay.

2.1.1.3 Sewerage provision to unsewered areas in Yuen Long and Kam Tin areas was proposed under the review of YLKT SMP. Further to the recommendation made in the previous studies, a DN900 twin rising mains and the Nam Sang Wai Sewage Pumping Station was constructed under PWP Item No. 4215DS. The pumping station is located adjacent to Kam Tin River and is connected to the rising mains which run along Kam Tin River and Shan Pui River to YLSTW. The alignment of the proposed rising mains and location of the pumping station are shown in **Figures 2 and 3**. This sewerage system is designed to transport the sewage from Kam Tin, San Tin and Ngau Tam Mei catchments to YLSTW for treatment. The construction works commenced in December 2005 and was completed in 2010.

2.1.1.4 Apart from the committed works mentioned above, there is another proposed trunk sewer, namely Ngau Tam Mei trunk sewer, which serves the Ngau Tam Mei and San Tin sewerage catchment under PWP Item No. 4235DS. The Ngau Tam Mei trunk sewer, size ranges from DN525 to DN825, runs along Castle Peak Road southward to the proposed Ngau Tam Mei Sewage Pumping Station, which will pump the sewage to the Nam Sang Wai Sewage Pumping Station constructed under 4215DS.

2.1.1.5 As advised by the Mainland North Division of Drainage Services Department (DSD/MND) in the Rural and New Town Planning Committee (RNTPC) Paper No. A/YL-MP/229C dated 27 February 2015, the Ngau Tam Mei Trunk Sewerage is tentatively scheduled to commence in the end of 2017 for completion in 2021 provided that local/public support can be obtained shortly and funding is available. The RNTPC paper is attached in **Annex A** for information. The proposed trunk sewerage might not be available in the near future, which means that the implementation programme is uncertain.

2.2 Population Projection

2.2.1.1 The WSW Development will be occupied in phases. According to the schedule, Phase 1 area (i.e. western portion of the Site) would be occupied by early 2017, while Phase 2 (i.e. eastern portion of the Site) is tentatively scheduled to be occupied by end 2017.

2.2.1.2 The population for the WSW Development is summarised in **Table 1**:-

Table 1 - Population Projection

Population Type	Head
Resident ⁽¹⁾	
Number of House ⁽³⁾	400
Number of Head per House	3
Total Residential Population	1200
Staff ⁽²⁾	
Total Staff	45
Total Population	1245

Remarks:-

- (1) It is assumed that each house is occupied by 1 household and each household contains 3 persons.
- (2) It is assumed that there will be a total of 45 staff which includes management office staff, club house staff and security staff.
- (3) Number of houses are the total of both Phase 1 and Phase 2 of the development.

2.3 Sewage Flow Projection

2.3.1.1 The sewage discharge from the proposed residential development comprises of flow contribution from residential population, the security staff, club house and the management staff. The accumulative average dry weather flows of proposed development are estimated based on the *Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning* published by EPD and shown in **Table 2**:-

Table 2 - Flow Projection for the WSW Development

	Units	Resident	Staff	Pool ⁽²⁾	Total
Design Population	head	1200	45	-	1245
Unit Flow Factor ⁽¹⁾	m ³ /head/d	0.37	0.28	-	-
Design Average Dry Weather Flow (ADWF)	m ³ /d	444	13	25	482

Note:

- (1) The unit flow factors for the resident and staff are extracted from *Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning*. The unit flow factor for commercial activities type J11, community, social & personal services is adopted for estimating the flow generated by the staff.
- (2) The sewage flow generated from the pools in clubhouse and individual houses is estimated to be 25m³/day. The estimation of the sewage flow from pools is attached in **Annex B** for reference.

- 2.3.1.2 For estimating the peak flows of the proposed sewerage system, design peaking factors, including stormwater allowance, as stipulated in Table T-5 of Guideline for Estimating Sewage Flows (GESF) is adopted. The estimated peak flow will be adopted for the design of the proposed sewers within the WSW Development. The design peak flow of the WSW Development is 32.0 l/s.

2.4 Sewerage Impact

- 2.4.1.1 In general, within the WSW Development area, manholes will be located at various points along the sewers either to accept a connection from individual building or at a change of horizontal or vertical alignment. The manholes will provide access for cleaning and maintenance purposes. The sewer will be designed in accordance with the Sewerage Manual published by Drainage Services Department (DSD) and the Building Ordinance.
- 2.4.1.2 The size of the proposed sewerage system is determined by Colebrook-white equation. The proposed size of sewer is ranged from 150mm to 375mm depending on the sewerage catchment area. The detailed design of the sewerage system within the WSW Development area will be submitted to relevant departments, including BD and DSD, for comments in detailed design stage.
- 2.4.1.3 As sewage will be discharged into the public foul sewer at Castle Peak Road which will be eventually conveyed to the YLSTW, effluents discharged into the public sewers will follow the standards laid down in Table 1 of the EPD's technical memorandum of "*Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters*" under Water Pollution Control Ordinance (WPCO), Cap. 358, S21.
- 2.4.1.4 Size of the planned Ngau Tam Mei trunk sewer ranges from DN525 to DN825 which are at the gradient of 1 in 450 to 1 in 750. The trunk sewer will be laid along Castle Peak Road and connect to Ngau Tam Mei Sewage Pumping Station next to Kam Pok Road.
- 2.4.1.5 An assessment has been carried out to check the capacity of Ngau Tam Mei trunk sewer, with details shown in **Annex C**. As revealed from the assessment result, the Ngau Tam Mei trunk sewer, which has a maximum capacity of 0.463m³/s, is sufficient to receive the sewage flow from the WSW Development as well as other developments within Ngau Tam Mei and San Tin sewerage catchment.
- 2.4.1.6 The Feasibility Study of Provision of Sewerage to Unsewered Areas/Villages in Northwest New Territories revealed that the total projected flow to be conveyed to YLSTW in Year 2030 is 44,790m³/d, whilst the design capacity of the planned YLSTW will be changed from 70,000m³/d to 46,000m³/d under the ongoing project of effluent polishing scheme. Even with the reduced design capacity, the YLSTW will still have sufficient capacity to handle the flow generated from the WSW Development of 482m³/d. As such, both the trunk sewer and the YLSTW have sufficient capacity to cater for the additional flow from the WSW Development. There will not be any adverse impact on the existing and planned sewerage system due to the WSW Development. In this regards, it is proposed to connect the sewerage system for the WSW Development to the public sewerage system at Castle Peak Road as permanent and long term measure. The schematic layout of sewerage network within the WSW Development is shown in **Figure 4** for reference.
- 2.4.1.7 Since the population in-take for the WSW Development would be in advance to the commissioning of the public sewer, it is necessary to consider the provision of the on-site sewage treatment facility as an interim measure to handle the sewage generated from the WSW Development before the availability of public sewerage for connection despite connection to the public sewerage system at Castle Peak Road is still the permanent and long term measure.

3. PROPOSED MITIGATION MEASURES

3.1 Proposed Interim On-Site Sewage Treatment Plant

- 3.1.1.1 The estimated average dry weather flow (ADWF) due to development is about 482m³/day. Previous experience revealed that the use of temporary sewage storage for tankering away this quantity of sewage to YLSTW is unlikely feasible, due to the associated odour problems and the high demand, if not impossible, of tanker.
- 3.1.1.2 It is considered that the provision of on-site sewage treatment plant (STP) as an interim measure is one of the feasible options to handle the sewage generated from the WSW Development. The on-site STP will be provided near the roundabout beside the future clubhouse, and commissioned prior to the occupation of Phase 1 development. The preliminary design of interim sewerage network within the WSW Development is shown in **Figure 5** for reference.
- 3.1.1.3 It is proposed to adopt Membrane Bioreactor (MBR) technology for sewage treatment in the STP. The process flow diagram showing the treatment process of the interim STP is illustrated in **Figure 6** for reference. The on-site sewage treatment facility will be designed generally in accordance with EPD's "Guidelines for the Design of Small Sewage Treatment Plant". Considering the high sensitivity of the development site, it is proposed to design the STP with capacity to handle a peak flow of 3 times of ADWF (i.e. 1,446m³/d) with the excess flow over 3 times of ADWF being equalized in an equalization tank of adequate volume to store up at least such flow for 4 hours (i.e. 241m³).
- 3.1.1.4 The on-site sewage treatment facility will be decommissioned when the trunk sewer becomes available for connection. The wastewater flow generated from the WSW Development of 482m³/d will ultimately be discharged to the Ngau Tam Mei trunk sewer.
- 3.1.1.5 Except serving as interim measure before the government sewerage network is available, the treated effluent by the interim STP will be fully reused for toilet flushing and irrigation of landscape areas.
- 3.1.1.6 According to unit flow factor as recommended in Appendix III(3) of EPD's "Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning", the estimated toilet flushing water demand for the Development is 78m³/d. The quantities of treated effluent from the STP (i.e. 482m³/d) will be sufficient for supplying toilet flushing water for the whole Development with surplus to be used for irrigation.
- 3.1.1.7 A minimum of 50,850m² landscape areas within the Development will be maintained, adopting the remaining reclaimed effluent for irrigation, including communal landscape area, vertical green and private gardens. The layout of different types of landscape areas with effluent reuse for irrigation is shown in **Figure 7**. An average irrigation rate of 10 l/m²/d is assumed with reference to the irrigation rate adopted in the approved Water Supply Impact Assessment of the project "CE35/2006 (CE) - Kai Tak Engineering Study cum Design and Construction of Advance Works – Investigation, Design and Construction". The assumed irrigation rate has made allowance for rainy days, which means a higher irrigation demand would be required during non-rainy days. Reference has also made to the approved EIA report of the project "Sludge Treatment Facilities" (EIA-155/2008), which estimated reclaimed water demand for the landscaping area based on a daily consumption rate of 12 l/m²/d. As such, the adopted average irrigation rate (i.e. 10 l/m²/d) is considered conservative for the purpose of estimation of irrigation water demand for the proposed Development. Additionally, the excessive reclaimed water, if any, will also be reused for irrigation of vertical green to be proposed under detailed landscape design.

3.1.1.8 The estimations of reclaimed water demand for toilet flushing and landscape irrigation are tabulated in **Table 3A and 3B** below:-

Table 3A – Estimation of Reclaimed Water Demand for Toilet Flushing⁽¹⁾

	Units	Toilet Flushing	
		Resident	Staff
Design Population	head	1200	45
Unit Flow Factor ⁽¹⁾	m ³ /head/d	0.063	0.05
Average Daily Demand	m ³ /d	78	

Note:

(1) Quantity of toilet flushing is estimated according to Appendix III of Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning.

Table 3B – Estimation of Reclaimed Water Demand for Landscape Irrigation⁽¹⁾

	Units	Landscape Irrigation				Total
		Communal Open Space's Landscape	Communal Landscape & Perimeter Landscape	Communal Streetside Landscape	Private Garden	
Area	m ²	11,681	7,500	2,000	29,669 ⁽²⁾	--
Irrigation Rate	l/m ² /d	10 ⁽³⁾				--
Average Daily Demand	m ³ /d	117	75	20	297	509

Note:

- (1) Figures in the table are approximate and subject to detailed design. The Deed of Mutual Covenant (DMC) will stipulate the minimum requirement of landscape area (50,850m²) adopting reclaimed water for irrigation in the development, which is one of the design parameters of the Planning Submission. The DMC Manager shall manage and maintain the common landscape area while he/she shall also manage the private gardens by house rules to ensure the minimum landscape areas are provided. Should there be any intention of modification or removal of landscape area or irrigation system inside the private garden by future private house owners, prior approval should be obtained from the DMC Manager. In addition, a pre-set semi-automatic control irrigation system with underground drip pipes would be installed in the private garden and managed by DMC manager to ensure that reclaimed water would be used up for irrigation. Should there be any intention of modification or removal of landscape area or irrigation system inside the private garden by future private house owners, prior approval should be obtained from the DMC Manager.
- (2) The overall landscape coverage in private garden (29,669m²) is about 50% of the total private garden area (59,337m²).
- (3) The irrigation rate is an average rate with allowance for rainy days, and an average water demand of 10 l/m²/d would be required under the detailed landscaping design.

- 3.1.1.9 As shown above, the treated effluent water could be fully utilized within the site (i.e. $78\text{m}^3/\text{d} + 509\text{m}^3/\text{d} = 587\text{m}^3/\text{d}$, which is larger than $482\text{m}^3/\text{d}$). In case of potential adverse weather condition (e.g. successive heavy rainy days) or maintenance period of landscape area, an effluent storage buffer tank, which does not form part of the storage volume for regular operation of the STP, would be provided on site to temporarily store any excessive reclaimed water. The reclaimed water would be progressively consumed in following period or used in case of shortage of irrigation water. Any further excessive reclaimed water will be tanked away to public Sewage Treatment Works to prevent overflow of treated effluent.
- 3.1.1.10 The buffer tank is sized with adequate volume to cater for most of the extreme weather condition so that the frequency for tanking away can be minimized. In order to size the buffer tank, the past rainfall records from 2004 to 2013 at a nearby weather station (Au Tau Automatic Weather Station) were reviewed. It is considered that no irrigation would be required when the soil is saturated at the landscaping area. It is thus assumed that irrigation would normally stop when daily rainfall depth reaches 15mm (assuming a runoff coefficient of 0.35), which is equivalent to the average daily irrigation rate (i.e. $10\text{ l/m}^2/\text{d}$). According to the rainfall records, successive rainfall events with daily rainfall depth over 15mm mostly occurred in the form of 2 or 3 successive days, accounting for over 90% of the total number of adverse weather events. Therefore, a $1,180\text{m}^3$ effluent storage buffer tank, which is 3 times of the net daily production rate of treated effluent (i.e. $482 - 78(\text{flushing}) - 13(\text{sludge})$), is proposed to temporarily store the excessive reclaimed water. With provision of the buffer tank capable to cater for most of the successive extreme rainfall events, the frequency for tanker service can be minimized.
- 3.1.1.11 The production of sludge is estimated to be $13\text{m}^3/\text{d}$ for solid content of 1% w/w. The sludge will be screened and dewatered (with a minimum solid content of 30%). Based on reference to other similar projects, the dewatered sludge will be collected by a licensed collector at regular intervals and disposed at the landfill. As an alternative to on-site dewatering of sludge, sludge could be transferred by tankers to Government's STW for off-site treatment due to its small quantity. Provided that the handling, storage and disposal of the wastes are properly managed and accidental release to the surrounding environment does not occur, adverse environmental impacts are not expected. In any case our sludge handling arrangement will be in compliance with requirements of the Water Pollution Control Ordinance (WPCO). Such approach for sludge disposal has also been adopted for some other projects, such as "Liantang / Heung Yuen Wai Boundary Control Point and Associated Works", "Redeveloped Lo Wu Correctional Institution" and "CLP Black Point Power Station".

3.2 Preventive Measures for Overflow of Raw Sewage /Treated Effluent

3.2.1.1 As “no net increase of pollution load requirement” as stipulated in the Town Planning Board Guideline (TPB PG-No. 12C), no overflow of either raw sewage or treated effluent should be allowed in the proposed STP. The following mitigation measures would be adopted in the design of STP to ensure no overflow of raw sewage / treated effluent at any times:-

Prevention of overflow of raw sewage: -

- Provision of equalization tank to store up 3 times of ADWF for a period of 4 hours;
- Dual or standby power supply;
- Standby unit for major equipment to allow for partial shut down for maintenance;
- Flow measurement and level sensors connected with alarm signaling system will be installed to keep monitoring on inflow rate to avoid sewage overflow; and
- Raw sewage will be tanked away to public Sewage Treatment Works in case the operation of STP could not be resumed after all the above mitigation measures utilized.

Prevention of overflow of treated effluent: -

- Provision of a 1,180m³ effluent storage tank to store excessive treated effluent in case of emergency (e.g. extreme adverse weather) or maintenance of landscape area;
- Effluent storage tank will be partitioned into several compartment to allow partial shut-down of the tank for maintenance;
- Level sensors connected with alarm signaling system will be installed to keep monitoring on storage volume of treated effluent to avoid overflow of treated effluent. The warning signal will be automatically generated and sent to Estate Manager when the flow in the tank reached as pre-set level so as to allow the Estate Manager sufficient time (e.g. 1 day) to arrange and mobilize tanker service to tank away the excessive treated effluent with 1-day effluent storage capacity reserved as contingency; and
- Any further excessive treated effluent will be tanked away to public Sewage Treatment Works when irrigation is stopped due to continuous adverse weather or prolonged suspension of irrigation or flushing water supply systems for maintenance / repairing.

3.3 Compliance with WSD Standards of Effluent Reuse

3.3.1.1 A review of reference standards or guidelines on reuse water quality from both individual HK projects and overseas has been carried out under the EIA study of “North East New Territories New Development Areas Planning and Engineering Study - Investigation” (EIA-213/2013), and a set of reuse water quality standards has been proposed. This set of reuse water quality standards has been recommended in the “Water Supplies Department (WSD) Inter-departmental Working Group on the Implementation of Reclaimed Water Supply in Sheung Shui and Fanling” for non-portable uses, which is also comparable to international guidelines such as the USEPA Guidelines for Water Reuse (2012). The WSD reuse water quality standards and USEPA water quality standards for unrestricted urban reuse are summarised in **Table 4** below. In this regards, it is proposed to make reference to and fully adopt the WSD reuse water quality standards for the effluent quality of the proposed STP.

Table 4 – Summary of WSD Reuse Water Quality Standard and USEPA Unrestricted Urban Reuse Water Quality Standards

Water Quality Parameters	Unit	WSD Criteria*	USEPA Criteria [#]	
		Irrigation & Non-Portable Uses	Toilet Flushing	Irrigation
pH	--	6-9	6-9	6-9
Turbidity	NTU	≤ 5	≤ 2	≤ 2
TSS	mg/L	≤ 5	N.S.	≤ 30
BOD ₅	mg/L	≤ 10	≤ 10	≤ 30
<i>E. coli</i>	cfu/100ml	Non-detectable	Non-detectable	≤ 200
Total Residual Chlorine (TRC)	mg/L	≥1/L (out of treatment system); ≥0.2 (at point-of-use)	≥ 1	≥ 1
Dissolved oxygen (DO)	mg/L	≥2	N.S.	N.S.
Color	Hazen Unit	≤20	N.S.	N.S.
Threshold Odour Number (TON)	TON	≤100	N.S.	N.S.
Ammonia nitrogen	mg/L	≤1	N.S.	N.S.
Synthetic detergents	mg/L	≤5	N.S.	N.S.
Note: Apart from total residual chlorine which has been specified, the water quality standards for all parameters shall be applied at the point-of-use of the system				

Remarks:-

N.S. – Not Specified;

* Standard of effluent reuse from WSD Inter-departmental Working Group on the Implementation of Reclaimed Water Supply to Sheung Shui and Fanling

[#] From Table 4-4 of USEPA (2012) Guidelines for Water Reuse

3.3.1.2 MBR is a combined system of biological treatment and microfiltration process. It is a proven technology, which is capable to generate high quality effluent in terms of low turbidity, BOD, TSS, nitrogen and bacteria. The treated effluent from MBR process will undergo ultraviolet (UV) disinfection, which will serve as second disinfection barrier to ensure the *E. coli* level in the effluent being reduced to non-detectable level. Followed by UV disinfection, appropriate levels of sodium hypochlorite solution (liquid chlorine) will be added to the UV-disinfected effluent so as to maintain the total residual chlorine (TRC) above 1 mg/L according to the WSD's recommended water quality standard prior to on-site effluent reuse for toilet flushing and irrigation.

3.3.1.3 MBR have been widely adopted in overseas for producing reclaimed water for non-portable uses, such as toilet flushing and landscape irrigation. In Hong Kong, there are also a number of local applications in using MBR for producing reclaimed water with water quality similar to the WSD's recommended water quality standard, such as Redeveloped Lo Wu Correctional Institution with effluent reuse for toilet flushing, Liantang/Heung Yuen Wai Boundary Control Point and Associated Works with effluent reuse for irrigation, and Stonecutters Island Sewage Treatment Works with effluent reuse for toilet flushing, make-up water, ground and facility washing. It has been confirmed by EPD that the proposed reuse of treated effluent by MBR is environmentally acceptable. In view of successful local applications of MBR, it is evident that the proposed treatment processes for the STP could meet the proposed reuse water quality standards.

3.4 Compliance with Town Planning Board Guidelines

- 3.4.1.1 For complying with the Zero Discharge Policy for the Deep Bay, it is necessary to demonstrate that the interim sewage disposal scheme would not pose a net increase in pollution loads to the Deep Bay WCZ, in accordance with the Town Planning Board (TPB) Guidelines, i.e. TPB PG-No.12C.
- 3.4.1.2 Since all sewage generated from this development will be fully reused on-site, the proposed development will not cause any net increase in pollution flow and load to the Deep Bay area. In this regards, compliance with Town Planning Board guideline will be fulfilled.

3.5 Operation and Maintenance of Interim Sewage Treatment Plant

- 3.5.1.1 Proper operation and maintenance of interim sewage treatment plant is essential to safeguard the quality of treated effluent for reuse, subject to the following aspects:
- a. A team of competent technicians will be assigned to operate the STP. They are to be fully conversant with the operating procedures as stipulated in the operation and maintenance manuals.
 - b. The STP is to be kept in a tidy state. This includes regular hosing down, scraping of the walkways, whitewashing the walls, cleaning and painting the metalwork and maintaining adequate lighting and ventilation.
 - c. Adequate spare parts for the plant will have to be made readily available by storage.
 - d. Qualified personnel will be hired to inspect and maintain the plant on a regular basis.
 - e. Where parts of the STP are sited beneath ground, forced ventilation will be provided.
 - f. An easily accessible sampling point will be provided for taking samples of the treated effluent.
 - g. Samples of treated effluent will be taken regularly and tested to ensure compliance with reuse criteria.
 - h. The production of sludge is estimated to be 13m³/d (also described in Section 3.1.1.10 above). All the sludge will be dewatered and disposed at landfill or alternatively transported from the Interim STP to Public STW for off-site treatment and disposal.

3.5.1.2 Preventive Measures for Cross Contamination and Mis-use of Reclaimed Water:

With reference to the recommendations in the approved EIA report of "North East New Territories New Development Areas Planning and Engineering Study - Investigation", the following preventive measures would be adopted for prevention of cross contamination between reclaimed water and freshwater supplied from WSD, and misuse of reclaimed water for portable use:-

Engineering Measures:

- Water to be supplied for portable use, toilet flushing and irrigation should be stored in three different tanks in different colors and clearly labeled;
- All pipes and fittings used for the reclaimed water supply and associated distribution system should be purple in color (exact color code to be reviewed) for distinguishing them from the pipes and fittings used for the fresh water supply and its distribution systems;
- Regular checking/inspections of the reclaimed water supply and associated distribution systems should be carried out to identify any possible cross connection to the fresh water supply and distribution system. Non-toxic dye may be adopted in the checking/inspections;
- Non-return valves should be installed on both the inlet pipes feed from effluent storage tank and WSD's supply mains, to the toilet flushing and irrigation waters storage tanks; and
- All precaution measures should be clearly stated in the O&M manual of the STP, toilet flushing and irrigation systems.

Management Measures:

- Warning plate with sign and letter "NOT FOR PORTABLE USE 不能飲用" would be shown on the toilet flushing and irrigation water storage tanks, and tagged on all accessible water taps supplying reclaimed water if any within the developments, notifying the staff, visitors and the public at large that treated effluent is being used and is not suitable for drinking;
- All water taps of reclaimed water at communal areas if any should be locked in order to avoid mis-use of reclaimed water for other non-planned use;
- Requirements of Fire Services Department (FSD) for bulk storage of sodium hypochlorite solution (liquid chlorine) or chlorine gas cylinders for STP operation shall be properly observed under the Dangerous Goods Ordinance (Cap. 295) to prevent potential hazard to life.
- Proper signage, promotion and training workshops will be provided periodically to all management and operation staffs of the Development, as well as future land owners on the proper use of reclaimed water and portable water; and
- All precaution measures should be clearly stated in the management manual of the Development.

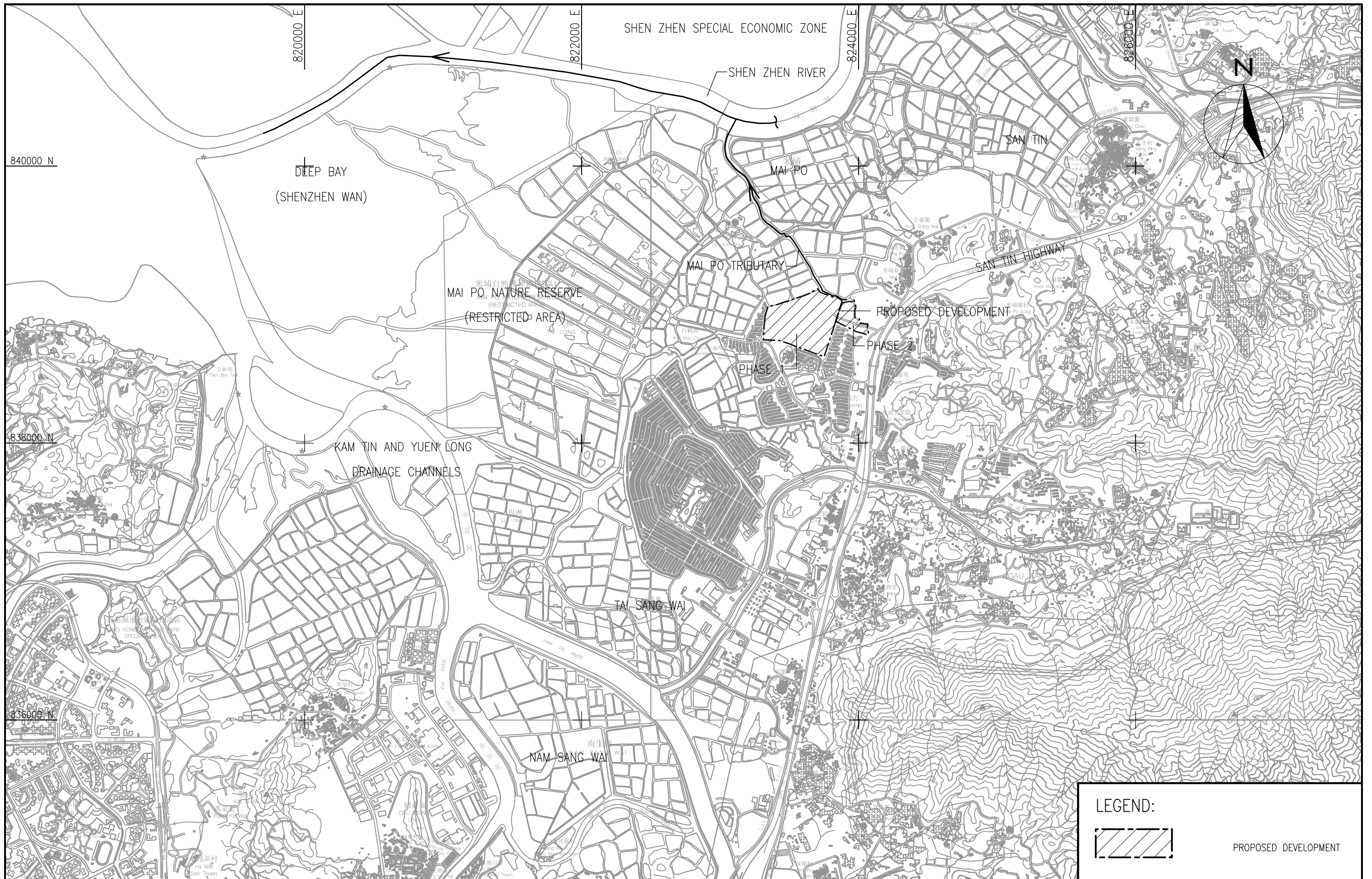
3.5.1.3 Preventive Measures for Excessive Irrigation:

A preset semi-automatic control irrigation system would be adopted with provision of underground drip pipes (about 200mm below soil level) to prevent irrigation water entering into surface drains. The irrigation system should only be operated by designated landscape maintenance team, following the procedures as stated in the O&M manual.

4. CONCLUSIONS

- 4.1.1.1 The proposed WSW development is located by the side of Castle Peak Road and San Tin Highways, with fish ponds to the north and village development to the east. There is no existing public sewerage system in the vicinity to the WSW Development.
- 4.1.1.2 As stipulated in the Environmental Permit (EP) No. EP-311/2008/C Condition 5.13, "the residential units shall be occupied only after sewage can be discharged to government sewerage network". The wastewater flow generated from the WSW Development (i.e. 482m³/d) is to be discharged to the Ngau Tam Mei trunk sewer which subsequently conveyed to YLSTW for treatment and disposal. The Ngau Tam Mei trunk sewer is currently planned under PWP Item No. 4235DS for Yuen Long and Kam Tin Sewerage and Sewage Disposal.
- 4.1.1.3 The sewerage system within the WSW Development area will be designed to facilitate the future connection to the government sewerage system at Castle Peak Road. The proposed sewerage system for the WSW Development will be connected to Ngau Tam Mei sewerage system as permanent measure. It has been proved that the public sewer and YLSTW have sufficient capacity to cater for the additional flow and load from the WSW Development.
- 4.1.1.4 However, the proposed Ngau Tam Mei trunk sewerage might not be available in near future, it is necessary to consider the provision of an on-site STP as an interim measure to handle the sewage. The treated effluent will be treated by the on-site sewage treatment plant and fully reused on site. The on-site sewage treatment plant will be commissioned prior to the occupation of Phase 1 development, and will be decommissioned when the trunk sewer becomes available for connection. The wastewater flow generated from the WSW Development of 482m³/d will be ultimately discharged to the Ngau Tam Mei trunk sewer when it is constructed.
- 4.1.1.5 The on-site sewage treatment facility with the enhanced tertiary treatment process of MBR with UV disinfection system will treat the 482m³/day sewage from the development to achieve effluent quality to meet the standard for on-site effluent reuse for toilet flushing and irrigation for landscape areas within the Development. Since all sewage generated from this development will be fully reused on-site, the proposed development will not cause any net increase in pollution flow and load to the Deep Bay area. In this regards, compliance with Town Planning Board guideline will be fulfilled.
- 4.1.1.6 Adverse short-term and long-term environmental impacts in respect of water quality, health and safety arising from both the long term and interim sewerage scheme are not anticipated. No adverse sewerage impact will be incurred as a result of occupation of the WSW Development.

FIGURES



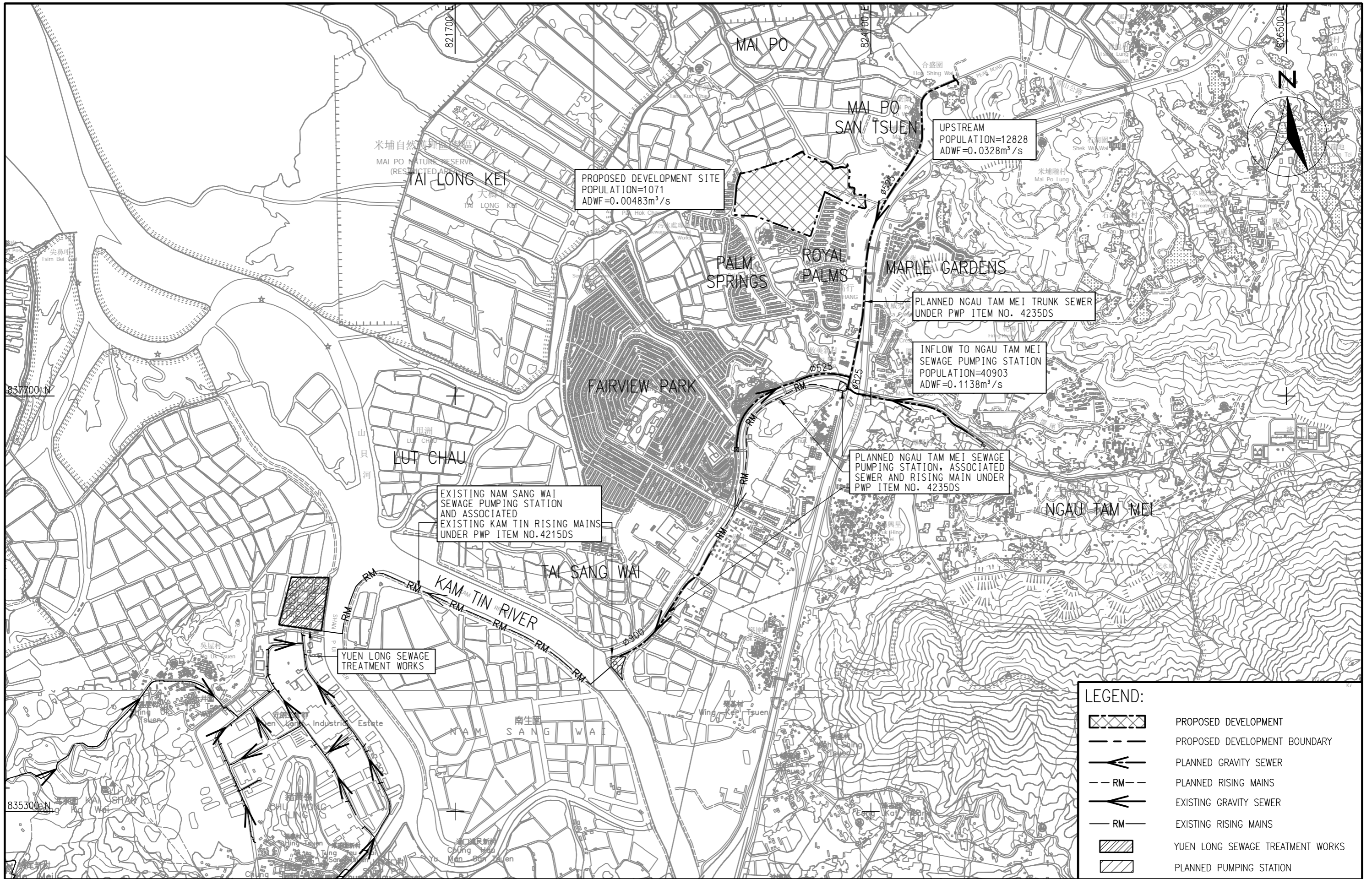
LEGEND:	
	PROPOSED DEVELOPMENT

PROPOSED COMPREHENSIVE DEVELOPMENT IN WO SHANG WAI

AECOM

LOCATION PLAN OF PROPOSED DEVELOPMENT

SCALE	A3 1 : 25000	DATE	NOV. 2012
CHECK	-	DRAWN	GHX
JOB No.	60097289	DRAWING No.	FIGURE 1
		REV	-



PROPOSED DEVELOPMENT SITE
POPULATION=1071
ADWF=0.00483m³/s

UPSTREAM
POPULATION=12828
ADWF=0.0328m³/s

PLANNED NGAU TAM MEI TRUNK SEWER
UNDER PWP ITEM NO. 4235DS

INFLOW TO NGAU TAM MEI
SEWAGE PUMPING STATION
POPULATION=40903
ADWF=0.1138m³/s

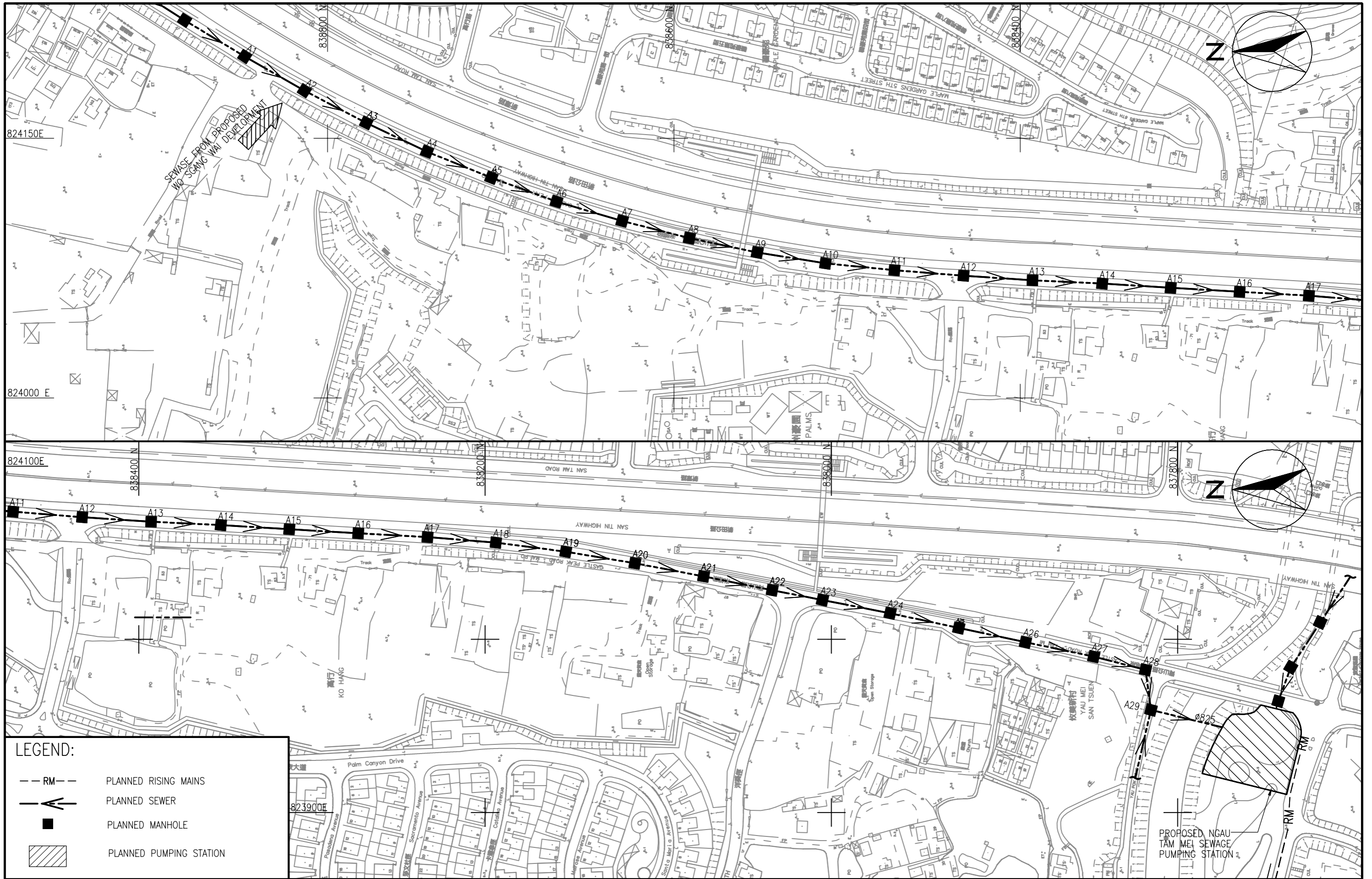
PLANNED NGAU TAM MEI SEWAGE
PUMPING STATION, ASSOCIATED
SEWER AND RISING MAIN UNDER
PWP ITEM NO. 4235DS

EXISTING NAM SANG WAI
SEWAGE PUMPING STATION
AND ASSOCIATED
EXISTING KAM TIN RISING MAINS
UNDER PWP ITEM NO. 4215DS

YUEN LONG SEWAGE
TREATMENT WORKS

LEGEND:	
	PROPOSED DEVELOPMENT
	PROPOSED DEVELOPMENT BOUNDARY
	PLANNED GRAVITY SEWER
	PLANNED RISING MAINS
	EXISTING GRAVITY SEWER
	EXISTING RISING MAINS
	YUEN LONG SEWAGE TREATMENT WORKS
	PLANNED PUMPING STATION

SCALE	A3 1 : 20000	DATE	NOV. 2012
CHECK	—	DRAWN	GHX
JOB No.	60097289	DRAWING No.	FIGURE 2
		REV	—



LEGEND:

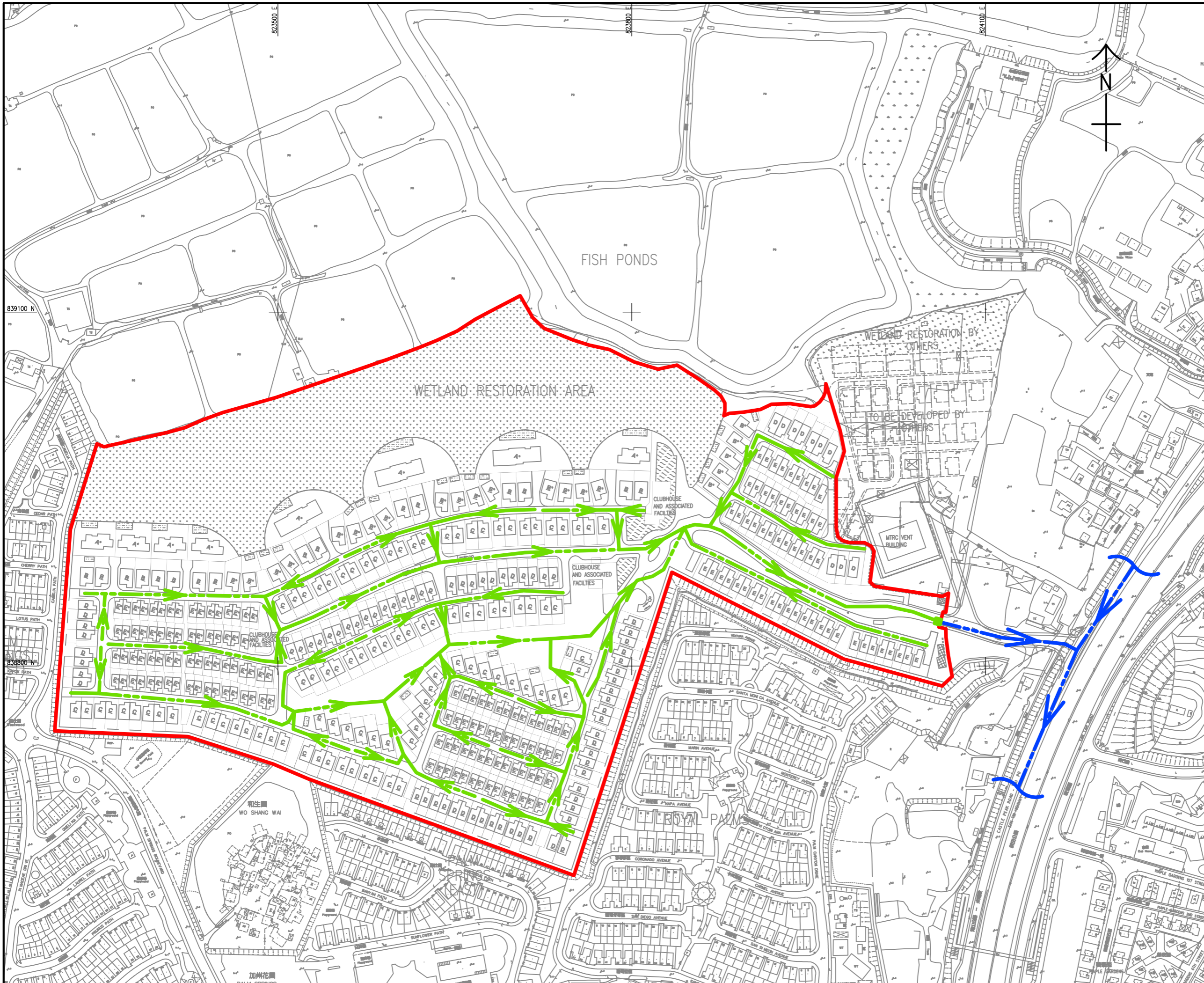
- RM --- PLANNED RISING MAINS
- PLANNED SEWER
- PLANNED MANHOLE
- ▨ PLANNED PUMPING STATION



PROPOSED COMPREHENSIVE DEVELOPMENT IN WO SHANG WAI

SEWERAGE IMPACT ASSESSMENT – PROPOSED NGAU TAM MEI TRUNK SEWERAGE

SCALE	A3 1 : 2000	DATE	NOV. 2012
CHECK	—	DRAWN	GHX
JOB No.	60097289	DRAWING No.	FIGURE 3
		REV	—



LEGEND:

- SITE BOUNDARY
- PUBLIC FOUL SEWERAGE SYSTEM
- PROPOSED FOUL SEWERAGE



REV. NO.	DESCRIPTION	DATE
—	BD SUBMISSION	YWF JYCH OCT.11

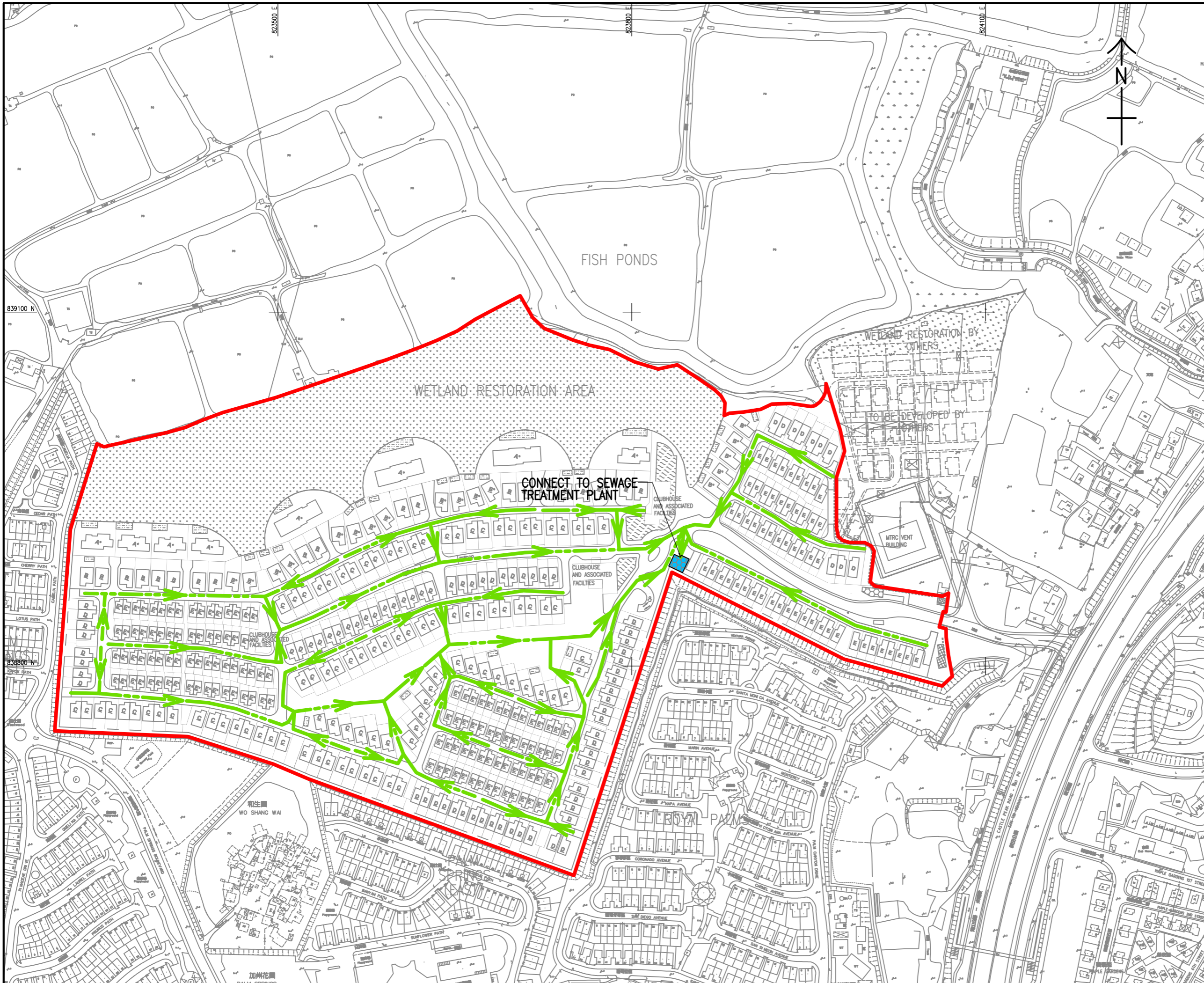
PROFIT POINT ENTERPRISE LIMITED
 PROPOSED COMPREHENSIVE DEVELOPMENT
 AT WO SHANG WAI, YUEN LONG

LAYOUT PLAN OF PRELIMINARILY
 DESIGNED PERMANENT
 SEWERAGE SYSTEM



DRG. NO. 圖紙編號
 FIGURE 4

DESIGNED BY 設計	CONTRACT NO. 合約編號	P. No. APPROVED 批准
DRAWN BY 繪圖 WDF	STATUS 階段	
SCALE 比例 A1 1 : 1500		
DIMENSIONS ARE IN 尺寸單位 METER	COPYRIGHT RESERVED 版權所有	



LEGEND:

- SITE BOUNDARY
- - - PROPOSED FOUL SEWERAGE
- INTERIM SEWAGE TREATMENT PLANT

REV.	DESCRIPTION	DATE
BD SUBMISSION		YWF JYCH OCT.11

PROFIT POINT ENTERPRISE LIMITED
 PROPOSED COMPREHENSIVE DEVELOPMENT
 AT WO SHANG WAI, YUEN LONG

**LAYOUT PLAN OF
 PRELIMINARILY DESIGNED INTERIM
 SEWERAGE SYSTEM**

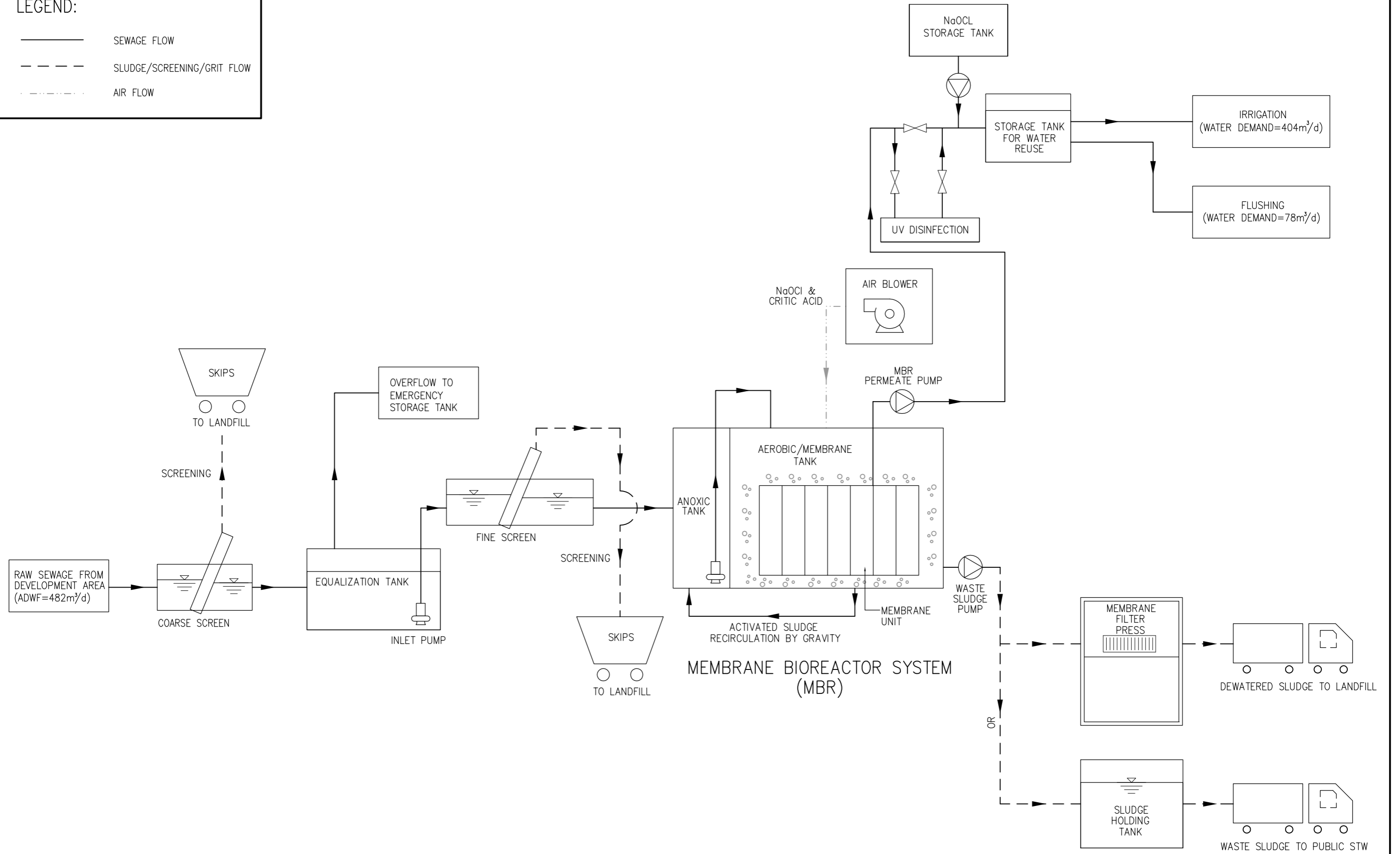


FIGURE 5

DESIGNED BY	CONTRACT NO.	P. No. APPROVED
WDF		
SCALE	DATE	
A1 1 : 1500		
UNIT	METER	
COPYRIGHT RESERVED		

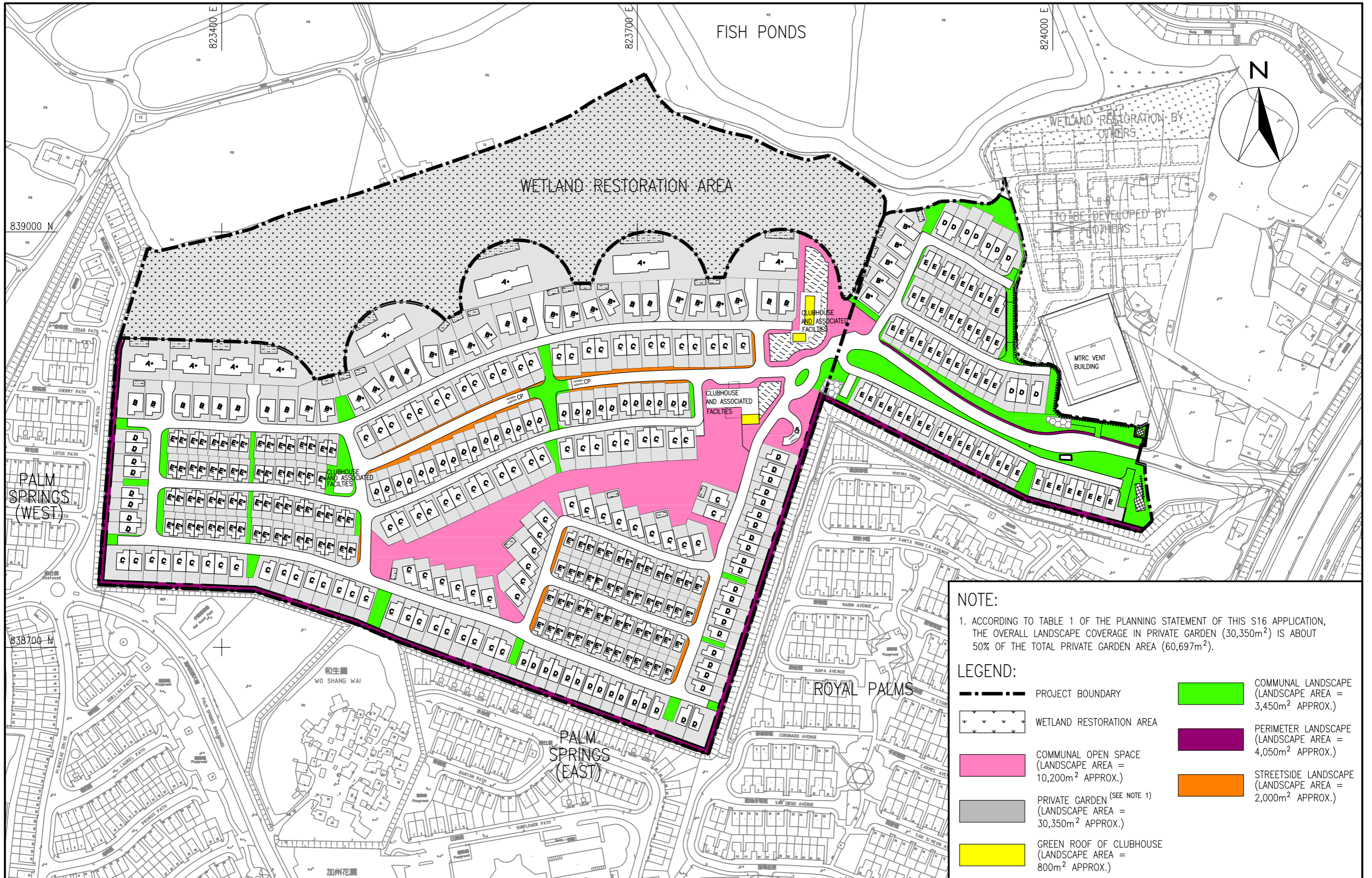
LEGEND:

- SEWAGE FLOW
- - - - - SLUDGE/SCREENING/GRIT FLOW
- · · · · AIR FLOW



PROPOSED COMPREHENSIVE DEVELOPMENT IN WO SHANG WAI
 PROPOSED PROCESS FLOW DIAGRAM OF INTERIM ON-SITE
 SEWAGE TREATMENT PLANT

SCALE	N.T.S.	DATE	OCT. 2014
CHECK	-	DRAWN	WDF
JOB No.	60097289	DRAWING No.	FIGURE 6
		REV	-



NOTE:

1. ACCORDING TO TABLE 1 OF THE PLANNING STATEMENT OF THIS S16 APPLICATION, THE OVERALL LANDSCAPE COVERAGE IN PRIVATE GARDEN (30,350m²) IS ABOUT 50% OF THE TOTAL PRIVATE GARDEN AREA (60,697m²).

LEGEND:

	PROJECT BOUNDARY		COMMUNAL LANDSCAPE (LANDSCAPE AREA = 3,450m ² APPROX.)
	WETLAND RESTORATION AREA		PERIMETER LANDSCAPE (LANDSCAPE AREA = 4,050m ² APPROX.)
	COMMUNAL OPEN SPACE (LANDSCAPE AREA = 10,200m ² APPROX.)		STREETSIDE LANDSCAPE (LANDSCAPE AREA = 2,000m ² APPROX.)
	PRIVATE GARDEN (SEE NOTE 1) (LANDSCAPE AREA = 30,350m ² APPROX.)		GREEN ROOF OF CLUBHOUSE (LANDSCAPE AREA = 800m ² APPROX.)



PROPOSED COMPREHENSIVE DEVELOPMENT IN WO SHANG WAI
 LAYOUT PLAN OF LANDSCAPE AREA (WITH EFFLUENT REUSE FOR IRRIGATION)

SCALE	A3 1 : 2500	DATE	JUNE, 2014
CHECK	-	DRAWN	WDF
JOB No.	60097289	DRAWING No.	FIGURE 7
		REV	-

ANNEX A

RNTPC Paper No. A/YL-MP/229C

**APPLICATION FOR PERMISSION
UNDER SECTION 16 OF THE TOWN PLANNING ORDINANCE**

APPLICATION NO. A/YL-MP/229

- Applicant** : Profit Point Enterprises Limited represented by Masterplan Limited
- Site** : Lots 43 S.A RP, 50 S.A and 50 RP in D.D. 101, Wo Shang Wai, Mai Po, Yuen Long
- Site Area** : 207,408m² (about)
- Lease** : Block Government Lease (demised for agricultural use)
- Plan** : Approved Mai Po and Fairview Park Outline Zoning Plan (OZP) No. S/YL-MP/6
- Zoning** : “Other Specified Uses” annotated “Comprehensive Development to include Wetland Restoration Area” (“OU(CDWRA)”)

[restricted to a maximum plot ratio of 0.4 and a maximum building height of 6 storeys including car park. Minor relaxation of the stated restrictions, based on the merits of individual development or redevelopment proposals, may be considered by the Town Planning Board on application under section 16 of the Town Planning Ordinance.]

- Application** : Proposed Comprehensive House and Wetland Habitat Development with Filling and Excavation of Land

1. Proposal

- 1.1 The applicant seeks planning permission for a proposed comprehensive house and wetland habitat development with a plot ratio of 0.4 and a building height of 2 to 3 storeys (i.e. 7.8m to 11.3m (15.6mPD to 19.1mPD)) over 1 common basement floor car park, and wetland habitat at the application site (the site) (Plans A-1 to A-3). The proposed development also involves filling and excavation of land for site formation.
- 1.2 The site falls within an area zoned “OU(CDWRA)” on the approved Mai Po and Fairview Park OZP. According to the Notes for “OU(CDWRA)” zone on the OZP, ‘House’, ‘Wetland Habitat’ and filling and excavation of land require planning

permission from the Town Planning Board (the Board).

- 1.3 The site is the subject of 2 previously approved Applications No. A/YL-MP/166 and 185 submitted by the current applicant for the same uses. Both applications were approved with conditions by the Rural and New Town Planning Committee (the Committee) of the Board on 19.9.2008 and 21.10.2011 respectively. Application No. A/YL-MP/185-1 for minor amendments to the approved scheme was approved by the Director of Planning under the delegation of the Board on 19.7.2012. The approved schemes under Applications No. A/YL-MP/185 and 185-1 are both valid until 21.10.2015. The construction works for the wetland habitat at the wetland restoration area (WRA) under the approved scheme of Application No. A/YL-MP/185 has been completed while site formation works for the residential portion is being carried out (site photos on **Plans A-4a** and **A-4b**).
- 1.4 A comparison of the major development parameters of the previously approved scheme under Application No. A/YL-MP/185 and the proposed scheme under current application are listed as follows (**Drawing A-1**):

Major Development Parameters	Previously Approved Application (No. A/YL-MP/185) (a)	Current Application Scheme (No. A/YL-MP/229) (b)	Difference (b) - (a)
Gross Site Area (m ²)	207,408 (about)	207,408 (about)	0
Residential Area (m ²)	160,008 (77.15%)	160,008 (77.15%)	0
WRA (m ²)	47,400 (22.85%)	47,400 (22.85%)	0
Plot Ratio (PR)			
Gross site	0.4	0.4	0
Net site (excluding WRA)	0.52	0.52	0
Maximum Domestic Gross Floor Area (GFA) (m ²)	82,963.2	82,963.2	0
Site Coverage (%)	25	25	0
Number of Houses/ Storeys and Building Height	344 -315 houses with 2-storey above ground (15.6mPD) -29 houses with 3-storey above ground (19.1mPD)	400 -248 house with 2-storey above ground (15.6mPD) -152 houses with 3-storey above ground (19.1mPD)	+56 (+16.3%)
Average House Size (m ²)	241.17	207.4	-33.77 (-14%)
Clubhouse Floor Area (m ²)	4,148 (5% of domestic GFA)	3,000 (3.6% of domestic GFA)	-1,148 (-27.7%)
Clubhouse Building Height	2 storeys without basement (13.1m high)	3 storeys (including basement)(17mPD)	+1
Communal Open Space Area (m ²)	11,616	13,066	+1,450 (+12.5%)
Communal and Streetside Landscape/Waterbody	9,022	10,956	+1,934 (+21.4%)
Private Garden (m ²)	57,694	60,697	+3,003 (+5.2%)
No. of Car Parking Spaces:			
Residents	736	835	+99
Visitor	731	829	+13.5%
5 (including 1 for the disabled)	5 (including 1 for the disabled)	6 (including 1 for the disabled)	
No. of Motorcycle Parking Spaces	37	42	+5 (+13.5%)
Loading/Unloading Bay	1	1	0

Major Development Parameters	Previously Approved Application (No. A/YL-MP/185) (a)	Current Application Scheme (No. A/YL-MP/229) (b)	Difference (b) - (a)
Mean Site Formation Level	6.3mPD	6.8mPD	+0.5m (+8%)
Sewage Treatment Plant	Nil	1	Newly proposed

- 1.5 In the previously approved scheme of Application No. A/YL-MP/185, sewage generated from the proposed development would be discharged to the planned Ngau Tam Mei Trunk Sewerage. In view of the uncertain development programme of the planned Ngau Tam Mei Trunk Sewerage, the applicant now proposes to provide a temporary on-site sewage treatment plant (STP) at the southeast part of the site (**Drawing A-3**) as an interim mitigation measure in order to meet the anticipated completion date of the development by 2017. The treated effluent from the STP will be reused for toilet flushing and landscape irrigation within the site (**Drawing A-4**) in order to meet the requirement of no net increase in pollution load to the Deep Bay. Furthermore, an effluent storage buffer tank will be provided on site to temporarily store any excessive treated effluent. Any further excessive treated effluent will be tanked away to the public sewage treatment works to prevent overflow of treated effluent.
- 1.6 According to the applicant, the Deed Mutual Covenant (DMC) will stipulate the minimum requirement of 50,850m² landscape area (including the communal landscape areas and private gardens) adopting treated effluent for irrigation (**Drawing A-4**). Any modification or removal of private garden by the future house owners should obtain prior approval from the DMC Manager. In addition, a pre-set semi-automatic irrigation system with underground pipes would be installed in the private gardens and will be managed by the DMC Manager to ensure that the treated effluent could be fully used up for irrigation. Upon the availability of the public sewerage system, the temporary STP will be decommissioned and a permanent sewerage pipe connection to the Ngau Tam Mei Trunk Sewerage will be provided.
- 1.7 Apart from the STP stated in paragraph 1.5 above, the current application has the following proposed amendments to the previously approved scheme:
- increase in number of houses from 344 to 400 and decrease in the average house size from 241.17m² to 207.4m²;
 - increase in the communal open space area from 11,616m² to 13,066m², communal landscape from 9,022m² to 10,956m², private garden from 57,694m² to 60,697m²;
 - increase in mean site formation level from 6.3mPD to 6.8mPD. The applicant explains that the design of the site formation has taken into account the flood prevention measure and the drainage provision;
 - increase in number of car parking spaces from 736 to 835 in accordance with the revised number of houses and the relevant requirements of the Hong Kong Planning Standards and Guidelines (HKPSG);

- (e) reduction in the GFA of the clubhouses from 4,148m² to 3,000m². Addition of the third clubhouse at the western part of the site (**Drawing A-1**);
 - (f) extension of the basement access road system and common basement car park from the central part of the development under the approved scheme to cover the southern part of the development (**Drawing A-7**);
 - (g) reduction in height on part of the noise barrier at the entrance from 6m to 5.5m (**Drawing A-5**); and
 - (h) replacement of a series of sporadic and broken open spaces to a central open space design (**Drawing A-2**).
- 1.8 To address the long-term maintenance and management of the WRA, the applicant has proposed to follow the previously agreed arrangements under Application No. A/YL-MP/185 for an upfront lump sum donation to the Environment and Conservation Fund (ECF), and confirmed that the land exchange and/or lease modification for the proposed development shall not be executed prior to the compliance with the approval condition in relation to submission and implementation of the funding arrangement with the ECF (**Appendix Ih**).
- 1.9 The application was first received on 14.11.2013. Upon the requests of the applicant, the Committee agreed to defer a decision on the application for three times on 9.5.2014, 22.8.2014 and 12.12.2014 respectively. On 11.12.2013, 6.1.2014, 14.1.2014, 13.2.2014, 17.3.2014, 20.3.2014, 10.4.2014, 4.7.2014 and 20.10.2014, 3.12.2014 and 12.1.2015, the applicant submitted further information to support the application.
- 1.10 In support of the application, the applicant has submitted the following documents:
- (a) Application Form received on 14.11.2013 (**Appendix I**)
 - (b) Supplementary Planning Statement including a Master Layout Plan (MLP), Diagrammatic schematic sections, Landscape Master Plan (LMP), Landscape and Visual Impact Assessment (LVIA), Environmental Assessment (EA), Sewerage Impact Assessment (SIA), Drainage Impact Assessment (DIA), Traffic Impact Assessment (TIA) (**Appendix Ia**)
 - (c) Letter dated 13.11.2013 providing supplementary information (**Appendix Ib**)
 - (d) Letter dated 21.11.2013 providing supplementary information ((a) to (d) published on 22.11.2013) (**Appendix Ic**)
 - (e) Letter dated 11.12.2013 providing responses to departmental comments and Ecological Impact Assessment (EcoIA) (published on 20.12.2013) (**Appendix Id**)
 - (f) Letter dated 2.1.2014 providing responses to departmental comments and revised DIA (**Appendix Ie**)
 - (g) Letter dated 14.1.2014 providing responses to departmental comments and revised EcoIA ((f) and (g) published on 24.1.2014) (**Appendix If**)

- (h) Letter dated 13.2.2014 providing a Wetland Restoration and Creation Scheme (WRCS) (*published on 21.2.2014*) (Appendix Ig)
- (i) Letters dated 17.3.2014 and 20.3.2014 providing a funding and long-term management proposal of the WRA, and responses to departmental comments (*published on 4.4.2014*) (Appendix Ih)
- (j) Letter dated 10.4.2014 providing responses to departmental comments (Appendix Ii)
- (k) Letter dated 4.7.2014 providing responses to departmental comments and revised SIA (*published on 18.7.2014*) (Appendix Ij)
- (l) Letter dated 20.10.2014 providing responses to departmental comments and revised SIA (*published on 7.11.2014*) (Appendix Ik)
- (m) Letter dated 3.12.2014 providing responses to departmental comments (Appendix Il)
- (n) Letter dated 12.1.2015 providing responses to departmental comments (Appendix Im)

2. Justifications from the Applicant

The justifications put forth by the applicant in support of the application are detailed in the Planning Statements at **Appendix Ia**, and further information at (**Appendices Id to Im**). They can be summarised as follows: -

- (a) The proposed residential development under the current scheme is roughly the same as the previously approved scheme under Application No. A/YL-MP/185, and is in line with the planning intention of the "OU(CDWRA)" zone. It will not have any adverse impact on the restored wetlands at the site or the adjoining fishponds. The increased housing production from the proposed residential development is consistent with the Chief Executive's Policy Address 2013 advocating for increased housing supply.
- (b) The site falls within the Wetland Buffer Area (WBA) under the Town Planning Board Guidelines for Application for Developments within Deep Bay Area under Section 16 of the Town Planning Ordinance (TPB PG-No. 12C). The proposed residential development at the site is in line with the TPB PG-No. 12C.
- (c) The provision of the public sewer by Government is uncertain. The proposed interim on-site STP is a practical solution and positive measure to ensure timely housing provision at the site, while complying with the requirement on "no net increase on pollution load" to the Deep Bay. Once the public sewer is available and connected to the development, the interim STP would be decommissioned.
- (d) The proposed residential development under previously approved Application No. A/YL-MP/185 is a designated project under the Environmental Impact Assessment Ordinance (EIAO). An EIA report was approved in July 2008, an Environmental Permit (EP) No. EP-311/2008 was issued in September 2009 and subsequent Variations to the EP were issued in March 2013. A condition of the EP requires that the residential units shall be occupied only after the sewage from the development can be discharged to the Government sewerage network. The applicant will apply to the Director of Environmental Protection (DEP) for

approval on variation to the approved EIA report under the EIAO.

- (e) The current scheme has provided a more efficient road system. The basement carpark is extended and vehicular movements above ground are reduced. The buildings and internal roads have been re-arranged to minimise the frontage addressing the secondary roads. The central open space and the clubhouse buildings will be served by the secondary roads envisaged for shared vehicular/pedestrian movements fostering traffic safety.
- (f) To improve the interface and privacy with the neighbouring developments, a further building setback for the 2-storey houses along the southern boundary of the site is proposed.
- (g) The proposed residential development will not have adverse traffic, visual and environmental impacts to the surrounding areas.

3. Compliance with the "Owner's Consent/Notification" Requirements

The applicant is the sole "current land owner". Detailed information would be deposited at the meeting for Members' reference.

4. Town Planning Board Guidelines

According to the Town Planning Board Guidelines for Application for Developments within Deep Bay Area under Section 16 of the Town Planning Ordinance (TPB PG-No. 12C), the site falls within the WBA. The relevant assessment criteria are summarized as follows:

- (a) the intention of the WBA is to protect the ecological integrity of the fish ponds and wetland within the WCA and prevent development that would have a negative off-site disturbance impact on the ecological value of fish ponds. A buffer area of about 500m along the landward boundary of the WCA is thus designated as a WBA;
- (b) within the WBA, for development or redevelopment which requires planning permission from the Board, an EcoIA would also need to be submitted. Development/redevelopment which may have negative impacts on the ecological value of the WCA would not be supported by the Board, unless the EcoIA can demonstrate that the negative impacts could be mitigated through positive measures. The assessment study should also demonstrate that the development will not cause net increase in pollution load to Deep Bay; and
- (c) proposals for residential/recreational developments on degraded sites to remove/replace existing open storage or container back-up uses and/or to restore lost wetlands may be given sympathetic consideration by the Board subject to satisfactory ecological and other impact assessments. Residential developments should be compatible with the surrounding land uses and the rural setting of the area. Consideration should also be given to the compatibility of recreational use with any adjoining fish pond area and to other planning and environmental implications of the development.

5. Background

The site is not the subject of any active planning enforcement action.

6. Previous Applications (Plan A-1)

- 6.1 The site is the subject of two previous applications (No. A/YL-MP/166 and 185) submitted by the current applicant for residential development with WRA. Both were approved with conditions by the Committee.
- 6.2 Application No. A/YL-MP/166 for the same use with a plot ratio of 0.4 and a maximum building height of 13.1m above ground was approved with conditions by the Committee on 19.9.2008. The planning permission lapsed on 19.9.2012.
- 6.3 Application No. A/YL-MP/185 for the same use with the same plot ratio of 0.4 and the same maximum building height of 13.1m above ground was approved with conditions by the Committee on 21.10.2011. The application was approved on the grounds that it mainly involved amendments to the previously approved scheme Application No. A/YL-MP/166 which included the reduction of the site area/ adjustment to the lot boundary, reduction of domestic GFA/ number of units; amendments to the design of the residential blocks/ general layout of the residential part of the proposed development. The WRA under the approved scheme Application No. A/YL-MP/166 had already been implemented to the satisfaction of the Director of Agriculture, Fisheries and Conservation (DAFC). The proposed development would not worsen the previous approved scheme. The proposed development was in line with the TPB PG-No. 12B regarding the requirements on Ecological Impact Assessment (EcoIA) submission, no net increase in pollution load to Deep Bay, and provision of ecological and visual buffer to the WCA. Besides, concerned departments had no adverse comments on the application. Application No. A/YL-MP/185-1 relating to minor change in disposition of houses, addition of an electrical and mechanical building, and addition of a basement floor to the two clubhouses, was approved with conditions by the Director of Planning under the delegated authority of the Board on 19.7.2012. For the compliance of approval conditions, the applicant has submitted a revised LMP which has been considered generally acceptable to concerned department. The approved schemes under Applications No. A/YL-MP/185 and 185-1 are both valid until 21.10.2015.

7. Similar Application

There is no similar application within the same "OU(CDWRA)" zone.

8. The Site and Its Surrounding Areas (Plans A-1 to A-4)

- 8.1 The site:
- (a) falls within the WBA of Deep Bay;
 - (b) is accessible via an access road off Castle Peak Road – Mai Po section leading to San Tin Highway; and

- (c) is under construction. Construction works for the WRA in the northern part of the site have been completed. Site formation works for the residential development in the remaining part of the site are in progress.

8.2 The surrounding areas have the following characteristics:

- (a) to the north and northwest are contiguous fish ponds extending all the way to the Mai Po Nature Reserve (MPNR) under "Conservation Area" ("CA") zone;
- (b) to the northeast is the remaining portion of the subject "OU(CDWRA)" zone. A ventilation building for the Guangzhou- Shenzhen-Hong Kong Express Rail Link (XRL) is being constructed; to the further northeast are the village settlements of Mai Po San Tsuen and Mai Po Lo Wai within "V" zone;
- (c) to the east are the Castle Peak Road - Mai Po section, San Tin Highway and the proposed cycle track under Project No. 7259RS 'Cycle Tracks Connecting North West New Territories with North East New Territories'; to the further east across San Tin Highway are a mix of uses including the residential development of Maple Gardens and unused land; and
- (d) to the immediate south are the residential developments of Palm Springs, Royal Palms and Wo Shang Wai within "Residential (Group C)" ("R(C)") zone.

9. **Planning Intention**

- 9.1 The "OU(CDWRA)" zone is intended to provide incentive for the restoration of degraded wetlands adjoining existing fish ponds through comprehensive residential and/or recreational development to include WRA. It is also intended to phase out existing sporadic open storage and port back-up uses on degraded wetlands. Any new building should be located farthest away from Deep Bay.
- 9.2 To ensure that development and/or redevelopment would be developed in a comprehensive manner, an applicant should submit to the Board a development and/or redevelopment proposal in the form of a comprehensive development scheme to include a layout plan with supporting documents, including an environmental impact study which should include, inter alia, an EcoIA and a VIA; and traffic, drainage and sewerage impacts assessments as well as information on programming, phasing and implementation schedule of the development. The applicant should also submit a wetland restoration and/or creation scheme, including its detailed design, wetland buffer proposals to mitigate the potential impact on the nearby existing wetland, a maintenance and management plan with implementation details, arrangement of funding and monitoring programme to ensure the long-term management of the restored wetland. The EcoIA should demonstrate that any negative ecological impacts on the area could be fully mitigated through positive measures. The submission should demonstrate that the development and/or redevelopment would not cause a net increase of pollution load into Deep Bay.

- 9.3 To be in line with the rural setting which is mainly low-rise residential developments and village houses, to minimise visual impact and to take into account the capacities of local road network and infrastructure in this area, development and/or redevelopment shall not result in a total development or redevelopment intensity in excess of a total plot ratio of 0.4 and a maximum building height of 6 storeys including car park. Minor relaxation of these restrictions may be considered to provide flexibility for innovative design adapted to the characteristics of particular sites.

10. Comments from Relevant Government Departments

10.1 The following Government departments have been consulted and their views on the application are summarised as follows:

Land Administration

10.1.1 Comments of the District Lands Officer/Yuen Long, LandsD (DLO/YL, LandsD):

- (a) He has no comment on the application which involves differences in site configuration, total number of residential units and total number of car parking spaces etc. as compared to the previous approved scheme.
- (b) With reference to the Figure A3 of the WRCS, the WRA boundary is modified. A proposed land exchange is being processed for the lots within the site based on the previous Application No. A/YL-MP/185. Should the Board approve the application which cause amendments to the proposed land exchange, the applicant is required to apply to LandsD for the proposed development in current scheme. However, there is no guarantee that such application (including the granting of any additional Government land (GL)) will be approved. Such application will be dealt with by his department acting in the capacity as the landlord at his discretion, and if it is approved under such discretion, the approval would be subject to terms and conditions including among others, the payment of premium and administrative fee as may be imposed by his department.
- (c) The proposed storm water drain will connect to outfall beyond the site boundary. Should such drains encroach upon private land and GL, the applicant should clearly indicate the whole alignment of such storm water drain connection, in particular the one connecting the existing outfall to Mai Po Tributary, and then obtain prior approval/consent from the relevant authorities before carrying out of the works.
- (d) According to the layout plan of the preliminary designed interim sewage system, there is no GL involved. However, the applicant should consult his department if there is any works to be carried out on GL, if unavoidable.
- (e) He has no comment on the funding arrangement and long-term management proposal on the WRA.

- (f) The details and the technical requirements of the proposed interim STP within the site should be subject to DEP and the Director of Drainage Services (D of DS)' comments.
- (g) In the proposed lease conditions of the land exchange of the WRA, there is a proposed Special Condition for 'Treatment and Disposal of Sewage', which provides that "(i) the Grantee shall throughout the term hereby agreed to be granted indemnify and keep indemnified the Government against all actions, claims and demands for any loss, damage, nuisance or pollution caused by or arising out of any discharge from the lot of sewage, foul or contaminated water; and (ii) the lot is in an area where no public sewage maintained by the Government is currently available for connection and there is no guarantee that sewage connection would be provided in the near future". This is not quite the same as the applicant's understanding as submitted on 12.1.2015.

10.1.2 Comments of Chief Estate Surveyor/Railway Development, Lands Department (CES/RD, LandsD):

- (a) He has no comment on the long-term use of the site from railway development point of view.
- (b) Part of Lot 43 s.A RP in D.D. 101 falls within the temporary occupation area (TOA) created under Railways Ordinance for XRL project with expiry date of the temporary occupation period on 31.12.2013, 31.7.2014, 31.10.2014 and 31.12.2015 respectively. The TOA area will be handed back to the owner of the affected lot after completion of XRL. He trusts Railway Development Office (RDO), HyD, will offer their comments from the construction point of view of the XRL project.
[See comment of RDO, HyD in paragraph 10.1.6 below.]

Conservation

10.1.3 Comments of the Director of Agriculture, Fisheries and Conservation (DAFC):

- (a) According to the revised EcoIA, it is concluded that with implementation of the mitigation measures identified, no additional ecological impact is predicted to be resulted from the current scheme as compared to the approved scheme under Application No. A/YL-MP/185. In this regard, he has no adverse comment on the application from ecological perspective.
- (b) It is understood that the applicant is committed to follow the Public-Private Partnership (PPP) scheme under the New Nature Conservation Policy for ensuring the long-term maintenance and management of the WRA.
- (c) Subject to DEP's policy view on the applicant's long-term arrangement proposal for the WRA, he considers that previous

approval conditions (f) to (i) should also be applied to the current application if it is approved by the Board. These conditions are related to the implementation of the mitigation measures identified in the revised EcolA, the submission and implementation of a maintenance and management plan, the submission and implementation of the funding arrangement proposal, and execution of land exchange and/or lease modification after the funding arrangement has been implemented to the satisfaction of DEP and DAFC.

- (d) The public concerns on ecological impact are mainly on potential disturbance and water pollution impacts on the WRA and nearby fishponds/wetlands in WCA. The issues have been addressed in the EcoIA.

Environment

10.1.4 Comments of the DEP:

- (a) The revised SIA report proposed to fully reuse the treated sewage effluent (482m³/day) from the on-site STP for toilet flushing (78m³/day) and irrigation (205m³/day in communal area and clubhouse, and 304m³/day in private garden). Thus, there will be no net increase in pollution load to Deep Bay. The remarks in Table 3B of the SIA report proposed the control and management of landscape area and irrigation system in the private garden by DMC Manager.
- (b) The proposed house development with the reuse of treated effluent, as proposed by the applicant, in the SIA is a designated project under the EIAO and an EP is required. Should the application be approved, a condition could be imposed requiring the applicant to implement the sewage disposal arrangement including the proposed interim on-site sewerage treatment plant, the reuse of treated effluent and the proposed irrigation system, as proposed by the applicant, to the satisfaction of the DEP or of the Board.
- (c) Subject to the textual amendments in the SIA report submitted on 3.12.2014, he would have no comment on the SIA.
- (d) This is a revised residential development scheme different from the layout shown in the EP No. EP-311/2008/D issued under the EIAO (Cap. 499), and the proposed on-site wastewater treatment does not conform to Condition 5.13 of the EP. The applicant should be reminded to go through the statutory EIAO process should the current development scheme goes ahead.
- (e) Regarding the funding arrangement and long-term management proposal for the WRA submitted by the applicant, he concurs with DAFC's views in respect of the applicant's commitment to follow the PPP scheme under the New Nature Conservation Policy for ensuring long-term maintenance and management of the WRA, as well as the need to impose the previous approval conditions in

relation to the submission and implementation of funding arrangement proposal for ensuring the long-term maintenance and management of the restored wetland area.

[see approval condition at paragraph 13.2(h)]

[see comments of DAFC at paragraph 10.1.3(c) above]

- (f) He has no comment on the noise impact assessment and air quality issue.

Traffic

10.1.5 Comments of the Commissioner for Transport (C for T):

- (a) He has no objection to the application from traffic engineering point of view and has no comment on the proposed number of parking spaces which complied with the requirements under the HKPSG and the TIA submitted.
- (b) The applicant should take account of the segregation of vehicles and pedestrian in the detailed design during submission of the general building plan stage. He has no objection to the proposed basement carpark but comment will be provided at the detailed design stage.

10.1.6 Comments of the Chief Engineer/Railway Development 2-2, Railway Development Office, Highways Department (CE/RD2-2, RDO, HyD):

- (a) He has no comment on the application from railway development point of view provided that MTR Corporation Limited's (MTRCL) requirements will be followed.
- (b) As the site, in particular the site portion within Lot 43 s.A RP in D.D. 101 (**Plan A-2**), falls within the railway protection boundary of the Hong Kong Section of the XRL, which is now under construction. The applicant should consult MTRCL on full details of the proposal and comply with their requirements with respect to the construction, operation, maintenance and safety of the XRL.

10.1.7 Comments of the Chief Highway Engineer/New Territories West, Highways Department (CHE/NTW, HyD):

- (a) He has no objection to the application from highways maintenance point of view.
- (b) Since the site falls within the gazetted railway scheme boundary of the XRL, RDO, HyD should be consulted.
[See comments of RDO, HyD at paragraph 10.1.6 above]
- (c) DEP should be consulted and he presumes there is no proposed noise barrier to be maintained by HyD.
[See comments of DEP at paragraph 10.1.4 above]

Fire Safety

10.1.8 Comments of the Director of Fire Services (D of FS):

- (a) He has no objection in principle to the application subject to the water supplies for firefighting and fire service installations being provided to his satisfaction.
- (b) Detailed fire safety requirements will be formulated upon receipt of formal submission of general building plans.

Building

10.1.9 Comments of the Chief Building Surveyor/New Territories West, Buildings Department (CBS/NTW, BD):

- (a) He has no in-principle objection to the application under the Buildings Ordinance (BO).
- (b) The access road linking the site and the Castle Peak Road shall be completed before Occupation Permit application.
- (c) In view of the size of the site, area of any internal streets/roads required under the BO s.16(1)(p) may have to be deducted from site area for plot ratio/site coverage calculations under the BO.
- (d) Recreational facilities and the proposed noise barriers, unless exempted, are accountable for GFA calculation under the BO.
- (e) Filtration plant rooms for swimming pool at private houses are accountable for GFA calculation under the BO.
- (f) Each phase of the proposed development should be self-sustainable under the BO.
- (g) The applicant's attention is drawn to the requirements on provision of emergency vehicle access (EVA) to all buildings to be erected on the site under Building (Planning) Regulation (B(P)R) 41D.
- (h) The proposed open space should not be less than the requirements as stipulated in the second schedule of B(P)R.
- (i) Due to the limited information provided, he is not able to comment on the design of the basement carpark at this stage. Application for exemption of car parking spaces from GFA calculation under the BO will be considered on the basis of the PNAP APP-2 during plan submission stage. The new quality and sustainable built environment (QBE) requirements are applicable to the site.
- (j) In accordance with the Government's committed policy to implement building design to foster a QBE, the sustainable building design requirements (including building separation, building setback and greenery coverage) should be included, where possible,

in the planning approval.

- (k) For building plans related to the STP and related facilities within the private lot, detailed checking will be carried out upon formal submission of building/drainage plans when comments from relevant departments will be sought through the centralized plan processing system.

Drainage

10.1.10 Comments of the Chief Engineer/Mainland North, Drainage Services Department (CE/MN, DSD):

- (a) He has no objection in principle to the proposed development from drainage point of view and has no comment on the further information submitted.
- (b) He has no comment on the DIA report submitted at this preliminary stage. Should the Board consider the application is acceptable from planning point of view, the following approval conditions should be stipulated in the approval letter:
 - (i) The submission of a revised and detailed DIA, including flood relief mitigation measures to the satisfaction of D of DS or of the Board.
 - (ii) The implementation of drainage proposal and other necessary flood relief mitigation measures identified in the revised and detailed DIA to the satisfaction of D of DS or of the Board.
- (c) He would reserve his comments until specific drainage proposal is submitted.
- (d) The applicant should be reminded that the SIA for the current application needs to meet the full satisfaction of DEP.
- (e) The construction of the planned Ngau Tam Mei Trunk Sewerage is tentatively scheduled for commencement in the end of 2017 for completion in 2021 subject to the conditions that local/public support can be obtained shortly and funding availability.

Landscape and Visual Aspects

10.1.11 Comments of the Chief Town Planner/Urban Design and Landscape, Planning Department (CTP/UD&L, PlanD):

Urban Design

- (a) Regarding the proposed change in house type and configuration at the northern portion of the development, the applicant has provided reasonable explanation in the submitted further information that the north-south visual permeability achieved along the visual corridors in the previously approved scheme under Application No.

A/YL-MP 185 will also be achieved. As such, he considers that his concern on the reduction of visual permeability has been addressed.

- (b) As to the change in layout at the south-eastern portion affecting the east-west permeability, the applicant explains that the east-west visual permeability has been enhanced by the enlarged central open space. He has no comment on this aspect.
- (c) He has no particular concern on the proposed highest site formation level of 7.8mPD as it is required as a flood prevention measure.
- (d) He noted the applicant's confirmation that the height of the temporary noise barriers (9m and 10m) is the absolute minimum. The applicant also advised that the temporary noise barrier along the site boundary was already established in 2010 in order to meet the requirements under the Environmental Permit.
- (e) Regarding communal open space calculation, the applicant should be advised that the ancillary pedestrian route should be "within" the open space to be counted as part of the open space as per the HKPSG.
- (f) It is noted that the statutory restrictions of the OZP in terms of maximum building height and plot ratio applicable to the site are 6 storeys and 0.4. Hence, the proposed development comprising 2-storey and 3-storey detached and/or detached houses is generally in line with the OZP restrictions. Nevertheless, 2-storey houses along the northern portion of the subject site seem to relate better to the fish ponds/wetlands to its north.
- (g) Presumably, the continuous belt of green planting along the southern/eastern boundary should be carefully arranged at the detailed design stage in order to maintain the porosity of the proposed east-west and north-south visual corridors.
- (h) In order to minimize any potential visual impact from the proposed noise barrier structures, should the application be approved, it is suggested that an approval condition in relation to the design and provision of mitigation measures to alleviate the visual impact of the noise barriers be imposed.

Landscape Planning

- (i) He has no objection to the application from landscape planning perspective.
- (j) The site was the subject of 2 previous applications (No. A/YL-MP/166 and 185) of the same use to which he had no objection from landscape planning perspective. According to the submitted information, the current application is an amendment to the approved Application No. A/YL-MP/185 and related to the layout of the residential development, the WRA would not be affected. According to the aerial photo of 14.1.2013, the wetland

restoration component is completed and site formation works are in progress in the residential area. Further adverse landscape impact is not anticipated.

- (k) The applicant should maximize the provision of greening, especially at-grade tree and shrub planting along roadside and clubhouses to improve the landscape and visual amenity of the development.
- (l) Should the Board approve the application, the following landscape condition should be included in the planning approval:

the submission and implementation of a revised Landscape Master Plan including tree preservation proposal to the satisfaction of the Director of Planning or of the Board.

Other

10.1.12 Comments of the Chief Engineer/Development (2), Water Supplies Department (CE/Dev(2), WSD):

- (a) He has no objection to the application.
- (b) For provision of water supply to the development, the applicant may need to extend his inside services to the nearest suitable Government water mains for connection. The applicant shall resolve any land matter (such as private lots) associated with the provision of water supply and shall be responsible for the construction, operation and maintenance of the inside services within the private lots to WSD's standards.
- (c) Fresh water from Government mains shall not be used for watering plant nurseries or landscape features purposes except with the written consent of the Water Authority. Consent to use fresh water from the mains for such purposes may be given on concessionary supply basis if an alternative supply is impracticable and evidence to that effect is offered to and accepted by the Water Authority. Such permission will be withdrawn if in the opinion of the Water Authority the supply situation requires it.

10.1.13 Comments of the Director of Electrical and Mechanical Services (DEMS):

Electricity Safety

- (a) The applicant shall approach the electricity supplier for the requisition of cable plans to find out whether there is any underground cable (and/or overhead line) within or in the vicinity of the application site.
- (b) For the site within the preferred working corridor of high voltage overhead lines at transmission voltage level 132kV and above as stipulated in the HKPSG published by the Planning Department, prior consultation and arrangement with the electricity supplier is necessary.

- (c) Prior to establishing any structure within the site, the applicant and/or his contractors shall liaise with the electricity supplier and, if necessary, ask the electricity supplier to divert the underground cable (and/or overhead line) away from the vicinity of the proposed structure.
- (d) The "Code of Practice on Working near Electricity Supply Lines" established under the Electricity Supply Lines (Protection) Regulation shall be observed by the applicant and his contractors when carrying out works in the vicinity of the electricity supply lines.

Town Gas Safety

- (e) There is a high pressure town gas pipeline running along San Tin Highway.
- (f) As regards the public comments concerning the site in close proximity to the existing high pressure gas pipeline, he considers that given the application is a low density residential development (i.e. plot ratio is 0.4) and the minimum proximity distance of the proposed houses to the concerned gas pipeline is about 150m, it should not be a mandatory requirement for the applicant to submit a risk assessment (Plan A-2). Nevertheless, given that there is a town gas pipeline near to the proposed development, the project proponent should maintain liaison/coordination with the Hong Kong and China Gas Company Limited in respect of the exact location of existing or planned gas pipe routes/gas installations in the vicinity of the proposed works area and the minimum set back distance away from the gas pipes/gas installations if any excavation work is required during the design and construction stages of the development. The project proponent shall also note the requirements of the Electrical and Mechanical Services Department's 'Code of Practice on Avoiding Danger from Gas Pipes'.

District Officer's Comments

10.1.14 Comments of the District Officer/Yuen Long, Home Affairs Department (DO/YL, HAD):

- (a) His office has no comment on the application and the local comments shall be submitted to the Board direct, if any.
- (b) He advises that DMC is a private covenant among the owners, the property manager and the developer of a building. Engaged parties are empowered to act under the power conferred by the administration of the building. They may also take appropriate actions and measures against any owner who does not comply with the DMC. He has no power to enforce against non-compliance of the DMC conditions.
- (c) Four objection letters, i.e. three from San Tin Rural Committee

(STRC) and one from a member of Yuen Long District Council (YLDC), were received by his Office. The objection letters were also received by the Board as public comments (**Appendices III-3 to III-5 and III-20**).

10.2 The following Government departments have no comment on the application:

- (a) Director of Leisure and Cultural Services (DLCS);
- (b) Chief Engineer/Sewerage Projects, Drainage Services Department (CE/SP, DSD);
- (c) Commissioner of Police (C of P);
- (d) Director of Food and Environmental Hygiene (DFEH);
- (e) Director of Health; and
- (f) Project Manger (New Territories West), Civil Engineering and Development Department (PM(NTW), CEDD).

11. Public Comments Received During the Statutory Publication Period

11.1 The application and subsequent further information (FI) submitted by the applicant were published 7 times on 22.11.2013, 20.12.2013, 24.1.2014, 21.2.2014, 4.4.2014, 18.7.2014 and 7.11.2014 respectively.

11.2 A total of 278 public comments (**Appendix II**) were received, including 175 supporting comments and 103 objecting comments on the application. A full set of public comments received on the application is deposited at the Board's Secretariat for Members' inspection and reference. Their major views are summarized as follows:

Objecting comments (samples at **Appendices III-1 to III-20**)

- (a) 103 objecting comments were received, including 2 members of YLDC, the STRC, Villager Representatives (VR) of Mai Po Tsuen and Wo Shang Wai Tsuen, Chairman of the Owners' Committee of Royal Palms, one of the owner of Palm Springs, 7 green groups (viz. Hong Kong Nature Protection Organisation, World Wild Fund Hong Kong, Kadoorie Farm & Botanic Garden Corporation, Green Power, Conservancy Association, Hong Kong Bird Watching Society, and Designing Hong Kong Limited), Hong Kong and China Gas Company Limited, villagers of Wing Ping Tsuen, Fan Tin Tsuen, San Lung Tsuen, Tsing Lung Tsuen, Tung Chan Wai, Chuk Yuen Tsuen and Lok Ma Chau Tsuen, and private individuals.
- (b) The major grounds of objection are summarized as follows:

Conservation of Wetland

- (i) there is no overall funding arrangement and long-term management plan to achieve active conservation and management of the WRA within the site;
- (ii) The proposed development is in conflict with the conservation policy. Approval of the application would set an undesirable precedent for similar development in Deep Bay area;

Ecology

- (iii) the site is located within the Deep Bay Ramsar site of high ecological value, which is identified as part of the 12 priority sites under the New Nature Conservation Policy. The proposed development is incompatible with the surrounding wetland area and would create irreversible changes to the ecology, biodiversity and habitats of wildlife;
- (iv) a vast number of birds use the area as an over-wintering site or a stopping-over point during their seasonal migration along the East Asian – Australasian Flyway. The fish ponds in the Mai Po area also provide suitable habitats for the Eurasian Otter. The proposed development would increase human disturbance and adversely affect the habitats of wild animals and birds in the wetland area;
- (v) the proposed development would affect the chance of reproduction of the insects in the wetland;
- (vi) the management for invasive species as proposed in the WRCS is insufficient. It is suggested that active management with action and limit levels for Red Imported Fire Ant and Apple Snail be added as part of the long-term management strategy in the WRCS;
- (vii) the annual tree and shrub pruning works to be undertaken at the end of each wet season is incorrect. It should be completed prior to the beginning of October to avoid autumn migration months;

Environment and Other Technical Issues

- (viii) it would create adverse impacts on glare, dust, noise, air quality, traffic, waste, hygiene, right of way, drainage and sewerage aspects during construction and operation stages. The proposed development will increase flooding risk in the area;
- (ix) the proposed increase in the number of 3-storey houses particularly facing the WRA will cause more ecological impact and further human disturbance, e.g. light, water and noise pollutions. The buffer planting to screen out human disturbance between the WRA and the proposed houses is insufficient;
- (x) the nearby infrastructure is insufficient and road network is already saturated. The proposed development would worsen the traffic at Castle Peak Road and the roundabout at Fairview Park. There is no EIA and TIA in the submission;
- (xi) there is no road to connect the site and Castle Peak Road. It is suggested that an approval condition be imposed requiring the applicant to provide a connection road between site and Castle Peak Road;
- (xii) the site is in close proximity to an existing high pressure gas pipeline;

Other Concerns

- (xiii) application for pond/land filling and excavation of land and Small

House development by villagers are rejected;

- (xiv) there is inadequate recreation facilities in the area. It is suggested using part of the site to provide recreation facilities for villagers;
- (xv) the proposed development will affect 'fung shui' of the village; and
- (xvi) there is a need to maintain the rural setting and living environment.

Supporting comments (samples at Appendices III-21 to III-25)

- (c) 175 private individuals express support to the application. The main supporting reasons are summarized as follows:
 - (i) the proposed development would restore the lost wetland of high ecological value and conserve the natural environment. It has struck a balance between wetland protection and the development;
 - (ii) the proposed low-rise low-density residential development is compatible with the surrounding environment and would not have significant adverse impact;
 - (iii) the development will create jobs, better utilize abandoned agricultural land, improve hygiene, increase residential unit supply, satisfy housing demand, efficiently use the land resource, and prevent the area to become a mosquito and insects breeding ground; and
 - (iv) it provides an opportunity to improve local environment for the benefits of the neighbouring residents e.g. improving the traffic and infrastructural facilities in the area.

12. Planning Considerations and Assessments

In-Line with the Planning Intention

12.1 The site falls within an area zoned "OU(CDWRA)". The proposed development involves restoration of about 4.7 ha of lost wetland at the northern part of the site, i.e. the WRA (22.85% of the site) and conversion of the remaining site of about 16 ha (77.15% of the site) into a residential development with a plot ratio of 0.4 and a building height of 2 to 3 storeys above ground and over 1 common basement car park. The proposed development is in line with the planning intention of the "OU(CDWRA)" zone and conforms to the plot ratio and building height restrictions as stipulated in the Notes of the OZP.

Comparison with the Previously Approved Scheme

12.2 The site is the subject of a previous Application No. A/YL-MP/185 for the same uses, which was approved with conditions by the Committee on 21.10.2011. Compared with the approved scheme, there is no change to the PR and site coverage. The current scheme involves an increase in the number of houses, reduction in average house size, rearrangement of the houses, clubhouse and internal road, an increase in open space, number of car parking spaces, a minor decrease in the height of the noise barrier as well as an addition of a temporary STP

at the south-eastern part of the site. The current scheme with revised layout could still maintain the east-west and north-south visual corridors of the previously approved scheme as indicated by the applicant (**Drawing A-2**). The amount of the proposed communal open space, communal landscape and private garden provision has been increased by 1,450m², 1,934m² and 3,003m² respectively. In this regard, CTP/UD&L of PlanD has no objection to the current application from urban design, visual and landscape planning perspective. The height of the proposed noise barriers along the eastern boundary of the site is generally the same as the previously approved scheme, except that the height of the noise barrier near the entrance has been reduced from 6m to 5.5m. CTP/UD&L of PlanD and DEP have no adverse comment on the proposed noise barriers. C for T has no adverse comment on the increase in car parking spaces from 736 to 835, which is provided in accordance with the HKPSG. DEP has no adverse comment on the proposed temporary STP.

TPB-PG No. 12C

- 12.3 The site falls within the WBA under the TPB PG-No. 12C requiring EcoIA submission, no net increase in pollution load to Deep Bay, and provision of ecological and visual buffer to the WCA. In this regard, DAFC has no adverse comment on the current application, the revised EcoIA and the WRCS submitted. The WRA has already been implemented to the satisfaction of DAFC. With regard to the long-term maintenance and management of the WRA, the applicant has proposed to follow the arrangements for an upfront lump sum donation to the ECF established under the ECF Ordinance. The applicant also confirms that the arrangement should be completed prior to execution of the lease modification for the proposed residential development. The funding arrangement and long-term management proposal of the WRA is the same as that of the previously approved scheme. DEP and DAFC have no adverse comment on the current application.

No Net Increase in Pollution Load to Deep Bay

- 12.4 Regarding the requirement on no net increase in pollution load to Deep Bay, the applicant proposed in the approved scheme under Application No. A/YL-MP/185 that the sewage from the proposed development would be discharged to the planned Ngau Tam Mei Trunk Sewerage. CE/MN of DSD comments that the planned Ngau Tam Mei Trunk Sewerage is tentatively scheduled to commence in the end of 2017 for completion in 2021 provided that local/public support can be obtained shortly and funding is available. According to the submission, in order to meet the anticipated completion date of the development by 2017, the applicant now proposes a temporary on-site STP to cater for the interim need until the public trunk sewer is available. By then, the temporary STP would be decommissioned.

- 12.5 To ensure that the proposed residential development would not cause net increase in pollution load to Deep Bay, the applicant proposes in the SIA to reuse the treated effluent from the STP for toilet flushing and landscape irrigation within the site and such arrangement will be stipulated in the DMC (**Drawings A-3 and A-4**). DEP advises that the proposed house development with the reuse of treated effluent in the SIA is a designated project under the EIAO and an EP is required. DEP proposed to impose a condition in the planning approval requiring the applicant to implement the sewage disposal arrangement including the proposed interim on-site sewerage treatment plant, the reuse of treated effluent and the proposed irrigation system, as proposed by the applicant, to his satisfaction or of the Board. In this

regard, the control over implementation of the reuse of treated effluent could be addressed by approval condition as recommended in paragraph 13.2 (q).

Other Departmental Comments

- 12.6 Other concerned Government departments including D of FS, DAFC, CBS/NTW of BD, DLO/YL of LandsD, CTP/UD&L of PlanD, C for T and CE/MN of DSD have no objection to or adverse comment on the application. Their technical concerns could be addressed by approval conditions as recommended in paragraphs 13.2 (c) to (p) below.

Public Views

- 12.7 There are 103 public comments objecting to the application mainly on the grounds that the proposed development would have adverse impacts on traffic, ecology, hygiene, environment, air, noise, dust and light pollutions, sewerage, drainage, flooding, conservation, visual aspects, natural habitat, feng shui, and the nearby gas pipeline as detailed in paragraph 11.2 above. In this regard, concerned government departments including DAFC, DLO/YL of LandsD, D of FS, CBS/NTW of BD, C for T, CE/MN of DSD, DEP and CTP/UD&L of PlanD have no objection to or no adverse comment on the application.

- 12.8 There are 175 public comments expressing support to the application.

13. Planning Department's Views

- 13.1 Based on the assessment made in paragraph 12 and having taken into account the public comments mentioned in paragraph 11 above, the Planning Department has no objection to the application.

- 13.2 Should the Committee decide to approve the application, it is suggested that the permission shall be valid until 27.2.2019, and after the said date, the permission shall cease to have effect unless before the said date, the development permitted is commenced or the permission is renewed. The following conditions of approval and advisory clauses are also suggested for Members' reference:

Approval Conditions

- (a) the submission and implementation of a revised Master Layout Plan to take into account conditions (b) to (q) below to the satisfaction of the Director of Planning or of the Town Planning Board;
- (b) the interface arrangement for Express Rail Link project in terms of permanent land take for Express Rail Link tunnels and structures and temporary land take for related construction to the satisfaction of the Director of Highways or of the Town Planning Board;
- (c) the submission and implementation of a revised Landscape Master Plan including tree preservation proposal to the satisfaction of the Director of Planning or of the Town Planning Board;
- (d) the submission of a revised Drainage Impact Assessment (DIA), including

flood relief mitigation measures to the satisfaction of the Director of Drainage Services or of the Town Planning Board;

- (e) in relation to (d) above, the implementation of drainage proposal and other necessary flood relief mitigation measures identified in the revised DIA to the satisfaction of the Director of Drainage Services or of the Town Planning Board;
- (f) the implementation of the mitigation measures identified therein in the revised Ecological Impact Assessment to the satisfaction of the Director of Agriculture, Fisheries and Conservation or of the Town Planning Board;
- (g) the submission and implementation of a maintenance and management plan which covers implementation details and the estimated annual recurrent costs with breakdown required for maintaining the restored wetland area to the satisfaction of the Director of Agriculture, Fisheries and Conservation or of the Town Planning Board;
- (h) the submission and implementation of a funding arrangement proposal for ensuring the long-term maintenance and management of the restored wetland area to the satisfaction of the Director of Environmental Protection and the Director of Agriculture, Fisheries and Conservation, or of the Town Planning Board;
- (i) as proposed by the applicant, land exchange and/or lease modification for the proposed development if considered and approved by the Director of Lands, should not be executed prior to the compliance with condition (h) to the satisfaction of the Director of Environmental Protection and the Director of Agriculture, Fisheries and Conservation, or of the Town Planning Board;
- (j) the design and provision of improvement measures at junction of Palm Springs Boulevard and Castle Peak Road – Mai Po section identified to the satisfaction of the Commissioner for Transport or of the Town Planning Board;
- (k) the design and provision of vehicle parking, motorcycle parking and loading/unloading facilities for the proposed development to the satisfaction of the Commissioner for Transport or of the Town Planning Board;
- (l) the design and provision of the access connection between the development and the public road to the satisfaction of the Commissioner for Transport or of the Town Planning Board;
- (m) the provision of emergency vehicular access, water supplies for fire-fighting and fire service installations to the satisfaction of the Director of Fire Services or of the Town Planning Board;
- (n) the design and provision of mitigation measures to alleviate the visual impact of the noise barriers to the satisfaction of the Director of Planning or of the Town Planning Board;

- (o) the submission of a revised Sewerage Impact Assessment (SIA) to the satisfaction of the Director of Environmental Protection or of the Town Planning Board;
- (p) the implementation of mitigation measures identified in the revised SIA to the satisfaction of the Director of Environmental Protection or of the Town Planning Board; and
- (q) the implementation of sewage disposal arrangement including the interim on-site sewerage treatment plant, the reuse of treated effluent and the irrigation system, as proposed by the applicant, to the satisfaction of the Director of Environmental Protection or of the Town Planning Board.

[Apart from the newly added conditions (o) to (q) above, the other conditions are similar to those under previously approved Application No. A/YL-MP/185]

Advisory Clauses

- (a) the approval of the application does not imply that the proposed building design elements could fulfil the requirements under the Sustainable Building Design Guidelines and the relevant requirements under the lease, and that the proposed gross floor area (GFA) concession for the proposed development will be approved/granted by the Building Authority. The applicant should approach the Buildings Department and the Lands Department direct to obtain the necessary approval. If the building design elements and the GFA concession are not approved/granted by the Building Authority and the Lands Authority and major changes to the current scheme are required, a fresh planning application to the Board may be required;
- (b) to note the comments of DLO/YL, LandsD that with reference to the Figure A3 of the WRCS, the WRA boundary is modified. A proposed land exchange is being processed for the lots within the site based on the previous Application No. A/YL-MP/185. Should the Board approve the application which cause amendments to the proposed land exchange, the applicant is required to apply to LandsD for the proposed development in current scheme. However, there is no guarantee that such application (including the granting of any additional Government land (GL)) will be approved. Such application will be dealt with by his department acting in the capacity as the landlord at his discretion, and if it is approved under such discretion, the approval would be subject to terms and conditions including among others, the payment of premium and administrative fee as may be imposed by his department. The proposed storm water drain will connect to outfall beyond the site boundary. Should such drains encroach upon private land and GL, the applicant should clearly indicate the whole alignment of such storm water drain connection, in particular the one connecting the existing outfall to Mai Po Tributary, and then obtain prior approval/consent from the relevant authorities before carrying out of the works. According to the layout plan of the preliminary designed interim sewage system, there is no GL involved. However, the applicant should consult his department if there is any works to be carried out on GL, if unavoidable;

- (c) to note the comments of the DEP that this is a revised residential development scheme different from the layout shown in the Environmental Permit No. EP-311/2008/D issued under the Environmental Impact Assessment Ordinance (Cap. 499). The proposed on-site wastewater treatment does not conform with Condition 5.13 of the Environmental Permit. The applicant should be reminded to go through the statutory EIAO process should the current development scheme goes ahead;
- (d) to note comments of C for T that the applicant should take account of the segregation of vehicles and pedestrian in the detailed design during submission of the general building plan stage. He has no objection to the proposed basement carpark but comment will be provided at the detailed design stage;
- (e) to note comments of CE/RD2-2, RDO, HyD that as the application site, in particular the site portion within Lot 43 s.A RP in D.D. 101, falls within the railway protection boundary of the Hong Kong Section of the XRL, which is now under construction. The applicant should consult MTRCL on full details of the proposal and comply with their requirements with respect to the construction, operation, maintenance and safety of the XRL;
- (f) to note the comments of the CBS/NTW, BD that the access road linking the site and the Castle Peak Road shall be completed before Occupation Permit application. In view of the size of the site, are of any internal streets/roads required under the BO s.16(1)(p) may have to be deducted from site area for plot ratio/site coverage calculations under the BO. Recreational facilities and the proposed noise barriers, unless exempted, are accountable for GFA calculation under the BO. Filtration plant rooms for swimming pool at private houses are accountable for GFA calculation under the BO. Each phase of the proposed development should be self-sustainable under the BO. The applicant's attention is drawn to the requirements on provision of emergency vehicle access (EVA) to all buildings to be erected on the site under Building (Planning) Regulations (B(P)R) 41D. The proposed open space should not be less than the requirements as stipulated in the second schedule of B(P)R. Application for exemption of carparking spaces from GFA calculation under the BO will be considered on the basis of the PNAP APP-2 during plan submission stage. The new quality and sustainable built environment (QBE) requirements are applicable to the site. In accordance with the Government's committed policy to implement building design to foster a QBE, the sustainable building design requirements (including building separation, building setback and greenery coverage) should be included, where possible, in the planning approval;
- (g) to note the comments of the CE/MN, DSD that he would reserve his comments until specific drainage proposal is submitted. The applicant should be reminded that the SIA for the current application needs to meet the full satisfaction of DEP;
- (h) to note the comments of the CTP/UD &L, PlanD that regarding communal open space calculation, the applicant should be advised that the ancillary pedestrian route should be "within" the open space to be counted as part of the open space as per the HKPSG. The applicant should maximize the provision of greening, especially at-grade tree and shrub planting along

roadside and clubhouses to improve the landscape and visual amenity of the development;

- (i) to note the comments of the CE/Dev(2), WSD that for provision of water supply to the development, the applicant may need to extend his inside services to the nearest suitable government water mains for connection. The applicant shall resolve any land matter (such as private lots) associated with the provision of water supply and shall be responsible for the construction, operation and maintenance of the inside services within the private lots to WSD's standards. Fresh water from Government mains shall not be used for watering plant nurseries or landscape features purposes except with the written consent of the Water Authority. Consent to use fresh water from the mains for such purposes may be given on concessionary supply basis if an alternative supply is impracticable and evidence to that effect is offered to and accepted by the Water Authority. Such permission will be withdrawn if in the opinion of the Water Authority the supply situation requires it; and
- (j) to note the comments of the DEMS that for electricity safety, the applicant shall approach the electricity supplier for the requisition of cable plans to find out whether there is any underground cable (and/or overhead line) within or in the vicinity of the application site. For the application site within the preferred working corridor of high voltage overhead lines at transmission voltage level 132kV and above as stipulated in the HKPSG published by the Planning Department, prior consultation and arrangement with the electricity supplier is necessary. Prior to establishing any structure within the application site, the applicant and/or his contractors shall liaise with the electricity supplier and, if necessary, ask the electricity supplier to divert the underground cable (and/or overhead line) away from the vicinity of the proposed structure. The "Code of Practice on Working near Electricity Supply Lines" established under the Electricity Supply Lines (Protection) Regulation shall be observed by the applicant and his contractors when carrying out works in the vicinity of the electricity supply lines. For town gas safety, there is a high pressure town gas pipeline running along San Tin Highway and the site is in close proximity to the existing high pressure gas pipeline. He considers that given the application is a low density residential development (i.e. plot ratio is 0.4) and the minimum proximity distance of the proposed houses to the concerned gas pipeline is about 150m, it should not be a mandatory requirement for the applicant to submit a risk assessment. Nevertheless, given that there is a town gas pipeline near to the proposed development, the project proponent should maintain liaison/coordination with the Hong Kong and China Gas Company Limited in respect of the exact location of existing or planned gas pipe routes/gas installations in the vicinity of the proposed works area and the minimum set back distance away from the gas pipes/gas installations if any excavation work is required during the design and construction stages of the development. The project proponent shall also note the requirements of the Electrical and Mechanical Services Department's 'Code of Practice on Avoiding Danger from Gas Pipes'.

13.3 Alternatively, should the Committee decide to reject the application, the following reasons for rejections are suggested for Members' consideration:

- (a) the proposed development is not in line with the Town Planning Board Guidelines for "Application for Developments within Deep Bay Area" (TPB PG-No. 12C) in that the applicant fails to demonstrate that the proposed development would not have adverse sewerage impact on the surrounding areas, and would not cause net increase in pollution load to the Deep Bay; and
- (b) the approval of the application would set an undesirable precedent for similar applications in the Deep Bay area, and the cumulative effect of which would result in a general degradation of the environment in the Deep Bay area.

14. Decision Sought

- 14.1 The Committee is invited to consider the application and decide whether to grant or refuse to grant permission.
- 14.2 Should the Committee decide to approve the application, Members are invited to consider the approval conditions and advisory clauses, if any, to be attached to the permission, and the date when the validity of the permission should expire.
- 14.3 Alternatively, should the Committee decide to reject the application, Members are invited to advise what reason(s) for rejection should be given to the applicant.

15. Attachments

Appendix I	Application Form received on 14.11.2013
Appendix Ia	Supplementary Planning Statement including a Master Layout Plan (MLP), Diagrammatic schematic sections, Landscape Master Plan (LMP), Landscape and Visual Impact Assessment (LVIA), Environmental Assessment (EA), Sewerage Impact Assessment (SIA), Drainage Impact Assessment (DIA) and Traffic Impact Assessment (TIA)
Appendix Ib	Letter dated 13.11.2013 providing supplementary information
Appendix Ic	Letter dated 21.11.2013 providing supplementary information
Appendix Id	Letter dated 11.12.2013 providing responses to departmental comments and Ecological Assessment (EcoIA)
Appendix Ie	Letter dated 2.1.2014 providing responses to departmental comments and revised DIA with a drainage model
Appendix If	Letter dated 14.1.2014 providing responses to departmental comments and revised EcoIA
Appendix Ig	Letter dated 13.2.2014 providing a Wetland Restoration and Creation Scheme (WRCS)
Appendix Ih	Letters dated 17.3.2014 and 20.3.2014 providing a funding and long-term management proposal of the WRA, and responses to departmental comments
Appendix Ii	Letter dated 10.4.2014 providing responses to departmental comments

Appendix Ij	Letter dated 4.7.2014 providing responses to departmental comments and revised SIA
Appendix Ik	Letter dated 20.10.2014 providing responses to departmental comments and revised SIA
Appendix Il	Letter dated 3.12.2014 providing responses to departmental comments
Appendix Im	Letter dated 12.1.2015 providing responses to departmental comments
Appendix II	Table of public comments received during statutory publication periods
Appendices III-1 to III-25	Samples of public comments received during the publication period
Drawing A-1	Master Layout Plan of Previously Approved Scheme (No. A/YL-MP/185) and the Current Scheme
Drawing A-2	Landscape Master Plan of Previously Approved Scheme (No. A/YL-MP/185) and the Current Scheme
Drawing A-3	Proposed Sewer Connection for Interim Stage
Drawing A-4	Layout Plan of Landscape Area (with effluent reuse for irrigation)
Drawing A-5	Proposed Noise Barriers in Operation Phase
Drawing A-6	Landscape Sections
Drawing A-7	Basement Floor Plan of Previously Approved Scheme (No. A/YL-MP/185) and the Current Scheme
Drawings A-8a to A-8g	Sectional Plans for House Unit
Plan A-1	Location Plan
Plan A-2	Site Plan
Plan A-3	Aerial Photo
Plans A-4a and A-4b	Site Photos

ANNEX B

Estimation of Sewage Flow from Pools



Consulting Engineers
Tower 2, Grand Central Plaza
138, Shatin Rural Committee Road
Shatin, New Territories, Hong Kong

Job Wo Shang Wai Residential Area Development Sewerage Impact Assessment			Reference
Drawing Ref	Calculations by ALTH	Check by YWF	Page L 1-1
Subject Design Calculation on the backwash volume of pools in WSW (Annex B)			Date Nov-2012

Pool (house)

Pool area = 32 m²
Pool depth = 1.3 m
Pool volume = 41.6 m³
Turn over rate = 6 hours
Flow rate = 41.6 m³ / 6 hours
= 1.93 l/s

Duration of backwash from sand filter = 3 min/day

Volume of backwash = 1.93 l/s x 3 min/day
= 0.35 m³/day

No. of houses with pool = 47 houses

Volume of backwash of all pools
in houses = 0.35 m³/day x 47 houses
= 16.45 m³/day

Pool (clubhouse - indoor)

Pool area = 124 m²
Pool depth = 1.1 m
Pool volume = 136.4 m³
Turn over rate = 4 hours
Flow rate = 136.4 m³ / 4 hours
= 9.47 l/s

Duration of backwash from sand filter = 3 min/day

Volume of backwash = 9.47 l/s x 3 min/day
= 1.70 m³/day

Pool (clubhouse - outdoor)

Pool area = 662 m²
Pool depth = 1.3 m
Pool volume = 860.6 m³
Turn over rate = 6 hours
Flow rate = 860.6 m³ / 6 hours
= 39.84 l/s

Duration of backwash from sand filter = 3 min/day

Volume of backwash = 39.84 l/s x 3 min/day
= 7.17 m³/day

Total Volume of backwash of all
pools in the development = 16.45 m³/day + 1.7 m³/day + 7.17 m³/day
= 25 m³/day

ANNEX C

Assessment of Ngau Tam Mei Trunk Sewerage Capacity



YUEN LONG AND KAM TIN SEWERAGE AND SEWAGE DISPOSAL
NGAU TAM MEI TRUNK SEWER
(with Additional Flow from the Proposed Wo Shang Wai Development)

MANHOLE No.	Total DWF		Accumulated Population head	Peaking factor P	Design Flow PxTotal DWF Q m ³ / s	PIPE			Full Bore		Invert Levels	
	Increment m ³ / s	Accumulated m ³ / s				Length m	Dia. mm	Grad. 1 IN	Capacity m ³ /s	Velocity m/s	m.P.D.	
											inlet m	outlet m
A1		0.03279	12828	4	0.1784	40	525	450	0.227	1.048	-1.049	-1.049
A2											-1.137	-1.137
(from Proposed Wo Shang Wai Development)	0.00483	0.03762	15407	4	0.1977	40	525	450	0.227	1.048		
A3		0.03762	15407	4	0.1977	39	525	450	0.227	1.048	-1.227	-1.227
A4		0.03762	15407	4	0.1977	40	525	450	0.227	1.048	-1.313	-1.313
A5		0.03762	15407	4	0.1977	40	525	450	0.227	1.048	-1.402	-1.502
A6											-1.591	-1.666
	0.00287	0.04049	16386	4	0.2092	40	600	550	0.291	1.030		
A7		0.04049	16386	4	0.2092	40	600	550	0.291	1.030	-1.738	-1.738
A8		0.04049	16386	4	0.2092	40	600	550	0.291	1.030	-1.811	-1.811
A9		0.04049	16386	4	0.2092	40	600	550	0.291	1.030	-1.884	-1.884
A10		0.04049	16386	4	0.2092	40	600	550	0.291	1.030	-1.956	-1.956
		0.04049	16386	4	0.2092	40	600	550	0.291	1.030		
A11		0.04049	16386	4	0.2092	40	600	550	0.291	1.030	-2.029	-2.029
A12											-2.102	-2.177
	0.02112	0.06161	23923	4	0.2937	40	675	650	0.365	1.019		
A13		0.06161	23923	4	0.2937	40	675	650	0.365	1.019	-2.238	-2.238
A14		0.06161	23923	4	0.2937	40	675	650	0.365	1.019	-2.300	-2.300
		0.06161	23923	4	0.2937	40	675	650	0.365	1.019		
A15		0.06161	23923	4	0.2937	40	675	650	0.365	1.019	-2.361	-2.361
A16		0.06161	23923	4	0.2937	40	675	650	0.365	1.019	-2.423	-2.423
		0.06161	23923	4	0.2937	40	675	650	0.365	1.019		
A17		0.06161	23923	4	0.2937	40	675	650	0.365	1.019	-2.484	-2.484
A18		0.06161	23923	4	0.2937	40	675	650	0.365	1.019	-2.546	-2.546
		0.06161	23923	4	0.2937	40	675	650	0.365	1.019		
A19											-2.608	-2.683
	0.00151	0.06312	24437	4	0.2997	40	750	750	0.447	1.012		
A20		0.06312	24437	4	0.2997	40	750	750	0.447	1.012	-2.737	-2.737
		0.06312	24437	4	0.2997	40	750	750	0.447	1.012		
A21		0.06312	24437	4	0.2997	40	750	750	0.447	1.012	-2.791	-2.791
		0.06312	24437	4	0.2997	30	750	750	0.447	1.012		
A22		0.06312	24437	4	0.2997	40	750	750	0.447	1.012	-2.844	-2.844
		0.06312	24437	4	0.2997	40	750	750	0.447	1.012		
A23		0.06312	24437	4	0.2997	40	750	750	0.447	1.012	-2.884	-2.884
		0.06312	24437	4	0.2997	40	750	750	0.447	1.012		
A24		0.06312	24437	4	0.2997	40	750	750	0.447	1.012	-2.937	-2.937
		0.06312	24437	4	0.2997	40	750	750	0.447	1.012		
A25		0.06312	24437	4	0.2997	40	750	750	0.447	1.012	-2.991	-2.991
		0.06312	24437	4	0.2997	40	750	750	0.447	1.012		
A26											-3.044	-3.044
	0.00192	0.06505	25377	4	0.3074	40	750	700	0.463	1.048		
A27		0.06505	25377	4	0.3074	31	750	700	0.463	1.048	-3.101	-3.101
		0.06505	25377	4	0.3074	23	750	700	0.463	1.048		
A28		0.06505	25377	4	0.3074	23	750	700	0.463	1.048	-3.145	-3.145
		0.06505	25377	4	0.3074	23	750	700	0.463	1.048		
A29											-3.179	-3.254
	0.04900	0.11405	42405	4	0.5034	43	825	650	0.618	1.155		
Pumping Station											-3.320	