

# TOWN PLANNING BOARD

TPB Paper No. 10374

for consideration by  
the Town Planning Board on 5.1.2018

THE DRAFT SIU HO WAN OUTLINE ZONING PLAN NO. S/I-SHW/B  
PRELIMINARY CONSIDERATION OF A NEW PLAN

**DRAFT SIU HO WAN OUTLINE ZONING PLAN NO. S/I-SHW/B**  
**PRELIMINARY CONSIDERATION OF A NEW PLAN**

**1 Purpose**

The purpose of this paper is to seek Members' agreement that:

- (a) the draft Siu Ho Wan Outline Zoning Plan (OZP) No. S/I-SHW/B (**Appendix I**) and its Notes (**Appendix II**) are suitable for consultation with the Islands District Council (IsDC) and Tsuen Wan District Council (TWDC); and
- (b) the Explanatory Statement (ES) (**Appendix III**) is an expression of the planning intention and objectives of the Town Planning Board (the Board) for the various land use zonings of the draft OZP and is suitable for consultation with IsDC and TWDC together with the draft OZP.

**2 Background**

- 2.1 On 7 December 2017, under the power delegated by the Chief Executive (CE), the Secretary for Development (SDEV) directed the Board, under section 3(1)(a) of the Town Planning Ordinance (the Ordinance), to prepare an OZP for Siu Ho Wan area (**Plan 1**).

**3 Strategic Planning Context**

- 3.1 The Siu Ho Wan area (the Area) covers about 186 ha of land located to the east of Tung Chung New Town Extension (TCNTE) area at the northern shore of Lantau Island. It stretches from Sham Shui Kok in the northeast to the proposed Tai Ho Interchange in the southwest enclosed by the Lantau North (Extension) Country Park in the east and south with foothills of Tai Che Tung, Lau Fa Tung and Lo Fu Tau within the Country Park (**Plans 2 and 3**).
- 3.2 The Area, situated in the northshore Lantau, has always been an integral part of Lantau development. Upon completion of the Port and Airport Development Strategy (PADS) in 1989, the Government decided to build a new international airport at Chek Lap Kok, i.e. the current Hong Kong International Airport (HKIA). The PADS also recommended to develop North Lantau New Town (NLNT) as a supporting community of HKIA. Subsequently, the North Lantau Development Study (1992) proposed development of a new town in the area to accommodate an ultimate population of about 260,000. Siu Ho Wan was considered in the Study to be a

suitable location for industrial activities related to the new airport and other major utilities such as water treatment works and sewage treatment works.

- 3.3 Pursuant to the 2004 Policy Address, the Lantau Development Task Force was set up in February 2004 to provide a high-level policy steer on the economic and infrastructure development on Lantau. The Revised Concept Plan for Lantau endorsed by the Task Force in 2007 recommended the water off Siu Ho Wan could be reclaimed to host the Lantau Logistic Park (LLP) and to serve as a transportation hub given its proximity to the Hong Kong-Zhuhai-Macao Bridge (HZMB). Together with the HKIA and other strategic transport links, the proposed LLP would strengthen Hong Kong's role as a regional transport and logistics centre.
- 3.4 On the other hand, the former Financial Secretary stated in his 2012 Budget that the Government should make optimal use of the development potential of railway-property projects and explore opportunities for development along railways. In 2013, the former CE stipulated in his Policy Address that the top priority of the Government was to tackle the housing problem and the Government would explore vigorously the residential development potential of land along existing and planned railways.
- 3.5 Taking into account comments of the Lantau Development Advisory Committee (LanDAC) formed in January 2014 to provide advice conducive to the sustainable development and conservation of Lantau, and public's view gathered during the public engagement exercise carried out between January and April 2016, the Sustainable Lantau Blueprint was published by the Government in June 2017 to provide a reference roadmap for guiding and implementing the development and conservation initiatives on Lantau. Siu Ho Wan Development is one of the key projects within the "North Lantau Corridor" which is proposed mainly for economic and housing development (**Plan 4**).
- 3.6 In order to facilitate the development of the Siu Ho Wan area according to the planning strategy of economic and housing development as highlighted in the Sustainable Lantau Blueprint and at the same time giving due consideration to the existence of developed strategic/regional infrastructure and utility installations as well as their planned expansion, an OZP has been prepared to provide statutory planning guidance and control on the future development of the Area. Details of the land use considerations are contained in the Planning Report on Siu Ho Wan at **Appendix IV**. Some major issues in relation to the proposed zonings are stated in the following paragraphs.

#### **4 Object of the Plan**

- 4.1 The object of the Plan is to indicate the broad land use zonings and major transport networks for the Siu Ho Wan area so that development and redevelopment within the Planning Scheme Area can be put under statutory planning control. It also provides the planning framework for preparing more detailed non-statutory plans which form the basis for public works planning and site reservation for various uses.

- 4.2 The Plan is to illustrate the broad principles of development and planning control within the Area. As it is a small-scale plan, the alignments of the roads and railways and boundaries between the land use zones may be subject to minor adjustments as detailed planning and development proceed.
- 4.3 Since the Plan is to show broad land use zonings, there would be situations in which small strips of land not intended for building development purposes and carry no development right under the lease, such as the areas restricted as non-building area or for garden, slope maintenance and access road purposes, are included in the zones. The general principle is that such areas should not be taken into account in plot ratio (PR) and site coverage calculation. Development within zones should be restricted to building lots carrying development right in order to maintain the character and amenity of the Siu Ho Wan area and not to overload the transport networks in this area.

## **5 The Planning Scheme Area (Plans 1 to 3)**

- 5.1 Siu Ho Wan was a bay surrounded by hillside with vegetation fronting an open sea in the 1980s. Part of the vegetation at the foothills of the natural terrain was removed due to slope formation and the bay was largely reclaimed for development purpose in the early 1990s, in association with the construction of North Lantau Highway (NLH) and the Airport Railway. The reclamation and the associated construction works were completed in 1997. As most of the land is formed by reclamation, the shoreline is circumvented by the existing man-made seawall without natural coastal features.
- 5.2 The Area is mainly occupied by various infrastructure and government uses to support Tung Chung New Town (TCNT), HKIA and Northeast Lantau developments. The land to the south/southeast of NLH contains primarily depots and utility installations, such as sewage treatment works, water treatment works, organic resources recovery centre, etc and slope areas adjoining the Lantau North (Extension) Country Park which is largely a continuous stretch of scrubland/shrubland with some existing trees scattered around. Land to the north of NLH houses mainly a railway depot which is the largest single development on the reclamation area in the west, a refuse transfer station and a site proposed for columbarium development in the east (**Plan 5**). The boundary of the Area is shown by a heavy broken line on the OZP (**Appendix I**).
- 5.3 There is no village settlement within the Area. The Area has no residential population as no development has been completed yet for population intake. To its southwest, Tai Ho Valley, Tai Ho Wan and Tai Ho Stream have been identified as one of the priority sites for enhanced conservation under the New Nature Conservation Policy with a view to better conserving this ecologically important area.

- 5.4 Vehicular access to the Area is via Cheung Tung Road, which is primarily a single two-way utility service road runs along the southern side of NLH, connecting the Area to Tung Chung, HKIA and the metro area as well as access to the Discovery Bay Tunnel Link. An underpass is built under NLH to connect the North Lantau Refuse Transfer Station and the site for the proposed columbarium to Cheung Tung Road. The existing NLH, a dual-three-lane highway, is the major strategic road link connecting HKIA and TCNT with other parts of the territory. Siu Ho Wan railway depot is also accessible through a slip road branching off NLH.
- 5.5 The proposed Tai Ho Interchange to the west of the Area will serve as the major access point for vehicles from NLH to the Area. A slip road linking Cheung Tung Road and the future Tai Ho Interchange is proposed under the TCNTE project to improve the connectivity between TCNTE area and Tai Ho area. The proposed Road P1 (Tung Chung to Tai Ho Section) providing another access to developments in Siu Ho Wan, Tai Ho and Tung Chung is subject to review in the detailed design stage of TCNTE.
- 5.6 The Airport Express (AE) and Tung Chung Line (TCL) run from east to west within the transport corridor on the northern shore of Lantau and pass through the Area. Two types of services are provided, the AE runs between AsiaWorld-Expo Station and Hong Kong Station, and TCL runs between Tung Chung Station and Hong Kong Station through the urban area providing commuter service to developments in North Lantau.

## **6 Land Use Planning Considerations**

### *Optimising the use of land along railway*

- 6.1 Being located in the proximity to TCNTE and connected with urban areas by strategic rail and road links, Siu Ho Wan, which is currently occupied by government and depot uses, has the potential to accommodate housing development with higher development intensities. The TCL and NLH, providing convenient connection between Tung Chung and the urban areas, could also serve to enhance the accessibility of the Siu Ho Wan area with a possible railway station at Siu Ho Wan and suitable road base transport network enhancement.
- 6.2 Topside development of Siu Ho Wan depot is also in line with the Government policy for rail-based development to facilitate fast and mass movement of people in an environmentally-friendly mode of transport. Opportunities exist to make better use of valuable land resources atop the railway depot. The depot site requires no private land resumption and hence could be implemented in a timely manner. Early implementation of residential development atop the depot could help address the acute demand for housing.

*Development Proposals in response to Policy Initiative*

- 6.3 In response to the policy initiative to make full use of the potential of land along railway for property development, Mass Transit Railway Corporation Limited (MTRCL) as the current occupier and operator of the Siu Ho Wan railway depot submitted a technical study report to the Government to explore the feasibility of the residential and commercial development atop the depot.
- 6.4 According to the indicative development scheme submitted in MTRCL's technical study report (**Annex of Appendix IV**), the depot site with a total site area of about 30ha, could be designated for a mix of residential and commercial development including 1,040,000m<sup>2</sup> GFA for domestic use and 30,000 m<sup>2</sup> GFA for commercial/retail use atop railway depot with supporting facilities. Indicative layout plans, section plans and artistic illustrations showing the proposed development are extracted at **Plans 6a to 6i**.
- 6.5 The maximum building height of the proposed development ranging from 86mPD to 106mPD (15 to 22 residential storeys) is subject to the gazetted Airport Height Restriction Plan (AHRP) and any potential amendments to the gazetted AHRP related to the Expansion of HKIA into a 3RS Project. The layout of the development would be planned and designed in a holistic manner to take into account the AHRP and the interfacing work with the railway depot and associated facilities.
- 6.6 Upon full development, the proposed development would provide a total of about 14,000 flats for a total population of about 37,800. Various Government, Institution or Community (GIC) and retail facilities would be provided at appropriate location to serve the new population and the community, including a public transport interchange, three 30-classroom schools, a total number of 24 kindergarten classrooms, a minimum of 75,600 m<sup>2</sup> of open space and a minimum of 4,000 m<sup>2</sup> GFA for social welfare facilities. The proposed commercial/ residential development atop will be implemented by phases to tie in with the migration work of the railway depot.
- 6.7 Preliminary technical assessment on various aspects including traffic and transport, air ventilation, environmental, sewerage, drainage, water supply and utilities, quantitative risk, geotechnical and structural feasibility, landscape and visual for the proposed residential and commercial development atop Siu Ho Wan Depot have been undertaken to review the feasibility of the development proposal and the required supporting infrastructure. A possible railway station at Siu Ho Wan has been explored by the MTRCL to provide train service for the residents of the proposed property development atop.
- 6.8 Relevant Environmental Impact Assessments (EIAs) for the proposal were submitted under the EIA Ordinance. On 29 November 2017, the EIA Reports for "Siu Ho Wan Station and Siu Ho Wan Depot Replanning Works" and "Proposed Comprehensive Residential and Commercial Development atop Siu Ho Wan Depot" were approved with conditions in accordance with

the provisions of the EIA Ordinance (Cap.499).

## **7 Planning Intention**

The general planning intention for the Area is to reserve land for Government, Institution or Community facilities and supporting infrastructure taking advantage of the geographical location and to facilitate sustainable residential/commercial development and maximise the development potential on suitable land. Due consideration should be given to preserve the existing natural landscape and maintain suitable buffer between the Country Park and the built-up area.

## **8 Urban Design Concept**

- 8.1 In general, the Area is mainly occupied by government land and the valley within the Area is predominantly occupied by low-rise GIC facilities, creating a visual relief space with an unobstructed view towards a natural mountain backdrop. Any development/redevelopment within this valley should respect the natural and rural characters of the surroundings, preserve the view towards the mountain backdrop and create a harmonious building height profile. Detailed building height restriction for the GIC facilities in the Area is specified in the adopted Siu Ho Wan Layout Plan No. L/I-SHW/1A (**Appendix V**).
- 8.2 Located amid Tai Ho Estuary and the low-rise GIC facilities in the Area, the Siu Ho Wan railway depot site, currently occupied by low-rise railway depot structures, provides an open view from NLH towards the sea and gives a transition from industrial/utilities uses to the natural and rural environment at Tai Ho. The relatively open area also facilitates penetration of prevailing winds within the Area. The proposed commercial/residential development atop the Siu Ho Wan depot would inevitably have an impact on the existing open view towards the sea and affect the transition between the Area and Tai Ho Estuary. To achieve a development that is compatible with the natural and rural character of the surroundings, preserve the visual character of the Area, any development/redevelopment on the depot site shall be planned and designed in a holistic manner to take into account, inter alia, preservation of view corridors and breezeways, integration with/transition to the waterfront and Tai Ho Estuary, the interface with the railway depot and adjacent GIC facilities, the gazetted AHRP and any potential amendments to the gazetted AHRP related to the Expansion of HKIA into a 3RS Project, etc. To this end, planning application in the form of layout plan for the development/redevelopment atop the depot site shall be required for approval by the Board to ensure an integrated and compatible layout for development.

## 9 **Land Use Zonings (Plan 7)**

### 9.1 “Government, Institution or Community” (“G/IC”): Total Area 15.54 ha

- 9.1.1 The planning intention of this zone is primarily for the provision of GIC facilities serving the needs of the local residents and/or a wider district, region or the territory. It is also intended to provide land for uses directly related to or in support of the work of the Government, organisations providing social services to meet community needs, and other institutional establishments.
- 9.1.2 Most of the “G/IC” sites are to reflect the existing GIC uses, such as the Siu Ho Wan Government Maintenance Depot, Siu Ho Wan Vehicle Pound/Vehicle Examination Centre and Weigh Station and Sham Shui Kok Chlorine Loading and Unloading Area. Sites are also reserved for other potential/proposed GIC uses including the service reservoirs to the east of the existing Siu Ho Wan Water Treatment Works (SHWWTW) which are intended to serve TCNTE and other planned developments in North Lantau. Other “G/IC” sites are now occupied by temporary uses including works areas and bus depots and long-term uses of these sites are yet to be designated.

### 9.2 “Other Specified Uses” (“OU”): Total Area 63.60 ha

This zoning denotes land allocated or reserved for the following specified uses:

#### “Railway Depot and Public Transport Interchange with Commercial/Residential Development”

- 9.2.1 This zone is intended primarily to provide land for railway depot with commercial and/or residential development above with the provision of public transport interchange, GIC facilities and other supporting facilities. This site is at present occupied by the MTR Siu Ho Wan Depot. The zoning is to facilitate appropriate planning control over the development mix, scale, design and layout of development, taking account of various environmental, traffic, infrastructure and other constraints as well as air ventilation and visual considerations.
- 9.2.2 To ensure that development or redevelopment would be developed and designed in an integrated manner, an applicant should submit a development or redevelopment proposal in the form of a layout plan with supporting documents, including environmental, drainage and sewerage, traffic and transport, air ventilation, visual and other relevant assessment reports, landscape and urban design proposal including connectivity proposals, as well as other materials as specified in the Notes of Plan for the approval of the Board. Adequate open space and GIC facilities shall be provided within the development to serve the future residents and the community.



- 9.2.3 Development and/or redevelopment in this “OU” site are subject to a maximum domestic GFA of 1,040,000 m<sup>2</sup> and a maximum non-domestic GFA of 30,000 m<sup>2</sup> for commercial use, which are demonstrated by an indicative scheme as part of the submission approved under the EIA Ordinance and justified by MTRCL’s supporting assessments. In addition, a public transport interchange, three 30-classroom schools, a total number of 24 kindergarten classrooms and a minimum of 4,000 m<sup>2</sup> GFA for social welfare facilities as required by the Government shall be provided within this “OU” site. A minimum of 75,600 m<sup>2</sup> open space will be provided to serve future residents. According to the indicative scheme submitted by MTRCL, the proposed development would provide a total of about 14,000 flats for a total population of about 37,800.
- 9.2.4 In determining the maximum GFA of the development and/or redevelopment in this “OU” site, the GFA for railway uses, public transport interchange, schools, GIC or social welfare facilities, as required by the Government, or covered walkway may be exempted from GFA calculation.
- 9.2.5 It is envisaged that the proposed development will comprise a podium accommodating the railway depot, public transport interchange, commercial/retail facilities and car parking facilities. Domestic towers will be provided above the landscape deck. The existing railway depot will be migrated by phases and a deck will be constructed on top of the depot to facilitate the commercial/residential development atop. The proposed commercial/ residential development atop will also be implemented by phases to tie in with the migration work of the railway depot. The phased development should be self-contained and sustaining in provision of GIC facilities.
- 9.2.6 Since the site is in elongated configuration sitting along the foothill facing the seafront, a number of urban design measures as demonstrated in the indicative scheme in support of the EIA should be made reference for the future development on the site. These include:
- (a) provision of at least four 30m-wide major air/visual corridors that generally align in the north-south and east-west directions and at least six 15m-wide supplementary air/visual corridors that generally align in the northwest-southeast direction amongst the residential towers to facilitate sea breeze penetration and improve visual permeability;
  - (b) building disposition to enhance visual permeability, e.g. adoption of curvilinear layout for buildings along the southern site boundary;

- (c) provision of stepped building height profile with building heights gradually reduced from northeast to the southwest nearer to Tai Ho Wan. According to an indicative development scheme prepared by MTRCL for the approved EIA, building height of the residential towers ranges from 86 mPD to 106 mPD;
- (d) submission of a connectivity proposal including but not limited to provision of all-weathered pedestrian walkway/linkage from different parts of the development within the site to proposed railway station and commercial facilities, vertical connections among podium and the waterfront, as well as the cycle track network and open space network to enhance connectivity and walkability within the site and also to the adjacent waterfront and nearby TCNTE; and
- (e) landscape planting on podium/deck and vertical greening on facades should be provided. Planting along the edges and terraced design with greening should be applied to the podium for further visual relief and interest. Local recess in some part of the depot along the waterfront at ground level could be provided for creation of green pockets/aesthetically pleasing landscape design and proposal for public enjoyment and amenity.

9.2.7 The project proponent should examine design concepts and give due considerations to further alleviate the landscape and visual impact of the residential buildings and podium with a view to harmonizing with the landscape character of the surrounding area. Landscape and urban design proposals for the proposed development including but not limited to the features as mentioned in paragraph 9.2.6 above should be submitted for approval by the Board upon application under section 16 of the Ordinance. Future developments within this zone should follow Sustainable Building Design Guidelines to achieve higher building permeability and improve wind environment.

9.2.8 The building height for the developments within this zone is subject to the gazetted AHRP and any potential amendments to the gazetted AHRP related to the Expansion of HKIA into a 3RS Project. No part of building or buildings or other structure or equipment erected or to be erected within the Area (or any addition or fitting to such building or buildings or structure or equipment) shall exceed the “restricted height” prescribed under the Hong Kong Airport (Control of Obstructions) Ordinance (Cap. 301), usually referred to as AHR, or any amendment thereto.

9.2.9 Aircraft noise due to overflight of approaching and departing aircraft from HKIA is anticipated for the proposed development. The developer(s) should explore and review the use of acoustic

insulation in form of well-gasketted window to enhance the indoor living environment.

- 9.2.10 With the future 3RS operations in HKIA, a review of the existing AHR for the current 2RS operations is being conducted. Subject to verification of the new AHR, possible AHR relaxation can take effect administratively. As such, there is scope to further maximise the development potential of the site. To provide flexibility for maximizing development potential of the site upon relaxation of AHR and for innovative design adapted to the characteristics of the site and planning circumstances, relaxation of the GFA restriction may be considered by the Board through the planning application system. Each proposal will be considered on its individual planning merits.

“Water Treatment Works”

- 9.2.11 This zone is intended primarily for the provision of water treatment works serving the needs of the community.
- 9.2.12 The site includes an existing water treatment works and a raw water booster pumping station to its northwest. The water treatment works treat water from Tai Lam Chung Reservoir and Shek Pik Reservoir before supplying to Tung Chung, Discovery Bay, HKIA, Siu Ho Wan, Penny’s Bay and other settlements in North Lantau.
- 9.2.13 The water treatment works are classified as PHI, any developments near the site shall comply with the recommendations contained in the CCPHI Report. Furthermore, any development proposal resulting in an increase in residential or working population within the Consultation Zone is subject to the approval of CCPHI.

“Sewage Treatment Works”

- 9.2.14 This zone is intended primarily for the provision of sewage treatment works serving the needs of the community. A site to the southeast of NLH has been developed into a sewage treatment works serving Tung Chung, HKIA, Siu Ho Wan and Penny’s Bay.
- 9.2.15 The sewage treatment works will need further fitting-out, expansion and upgrading in order to cope with the additional sewage arising from the medium-term and long-term developments in North Lantau, including the TCNTE, 3RS of HKIA, Siu Ho Wan Development, etc. The proposed expansion of the SHWSTW to its immediate west will be subject to further study.

“Organic Resources Recovery Centre”

- 9.2.16 This zone is intended primarily to designate land for Organic Resources Recovery Centre (Phase I) (ORRC1) developed by Environmental Protection Department. The ORRC1 is currently

under construction.

“Refuse Transfer Station”

- 9.2.17 This zone is intended primarily to designate land for refuse transfer station. This zone is occupied by a refuse transfer station. It receives solid waste collected from the HKIA, Tung Chung New Town, Kwai Chung, Tsuen Wan as well as additional solid waste from the HKIA wastewater treatment plant. The consolidated waste will eventually be transferred by barges to the West New Territories Landfill for disposal.

“Columbarium”

- 9.2.18 This zone is intended primarily to designate land for columbarium use and garden of remembrance. It is located at the western side of Sham Shui Kok Drive near NLH and the proposed Road P1.
- 9.2.19 The site can provide about 26,000 niches and a garden of remembrance. In view of its vicinity to the CZ of SHWWTW, the project proponent should prepare and submit a Hazard Assessment to the Coordinating Committee on Land-use Planning and Control relating to Potentially Hazardous Installations (CCPHI) to assess the potential risks associated with SHWWTW and obtain the approval from CCPHI.

“Pumping Station and Associated Facilities”

- 9.2.20 This zone is intended primarily to designate land for pumping station and associated facilities. This zone covers a Potable Water Booster Pumping Station near SHWWTW along Discovery Bay Tunnel Link, which serves Discovery Bay and is in operation.

9.3 “Green Belt” (“GB”): Total Area 68.04 ha

- 9.3.1 The planning intention of this zone is primarily for defining the limits of urban and sub-urban development areas by natural features and to contain urban sprawl as well as to provide passive recreational outlets. There is a general presumption against development within this zone.
- 9.3.2 The lowland slopes adjoining the Lantau North (Extension) Country Park is zoned “GB” in order to preserve the natural vegetation and to serve as buffer between the developed areas and country park. This area is largely undeveloped hill slopes except for a few informal footpaths. The hilly area consists of scrubland/shrubland with some existing trees scattered around. At higher level, the hillsides are characterised by grassland and scattered rock outcrops.

- 9.4 A summary of land use zonings for the draft Siu Ho Wan OZP No. S/I-SHW/B is shown in the table below:

Land Use Zoning	Area on Draft OZP	
	(ha)	(%)
“Government, Institution or Community”	15.54	8.35
“Other Specified Uses”	63.60	34.18
“Green Belt”	68.04	36.57
Major Road etc.	38.89	20.90
<b>Total Area</b>	<b>186.07</b>	<b>100</b>

## 10 Notes of the Plan

Attached to the Plan is a set of Notes which shows the types of uses or developments which are always permitted within the Area and in particular zones and which may be permitted by the Board, with or without conditions, on application. The draft Notes are formulated on the basis of the latest set of Master Schedule of Notes (MSN) to Statutory Plans endorsed by the Board. The provision for application for planning permission under section 16 of the Ordinance allows greater flexibility in land use planning and control of development to meet changing needs.

## 11 Consultation

- 11.1 The draft OZP together with its Notes and ES as well as the Planning Report have been circulated to relevant government bureaux and departments for comments. Comments received have been incorporated into the draft OZP, its Notes and ES and the Planning Report as appropriate.
- 11.2 Subject to the agreement of the Board, the draft OZP No. S/I-SHW/B will be submitted to IsDC and TWDC for consultation. Comments from IsDC and TWDC will be submitted to the Board for further consideration prior to the publication of the draft OZP under section 5 of the Ordinance.

## 12 Decision Sought

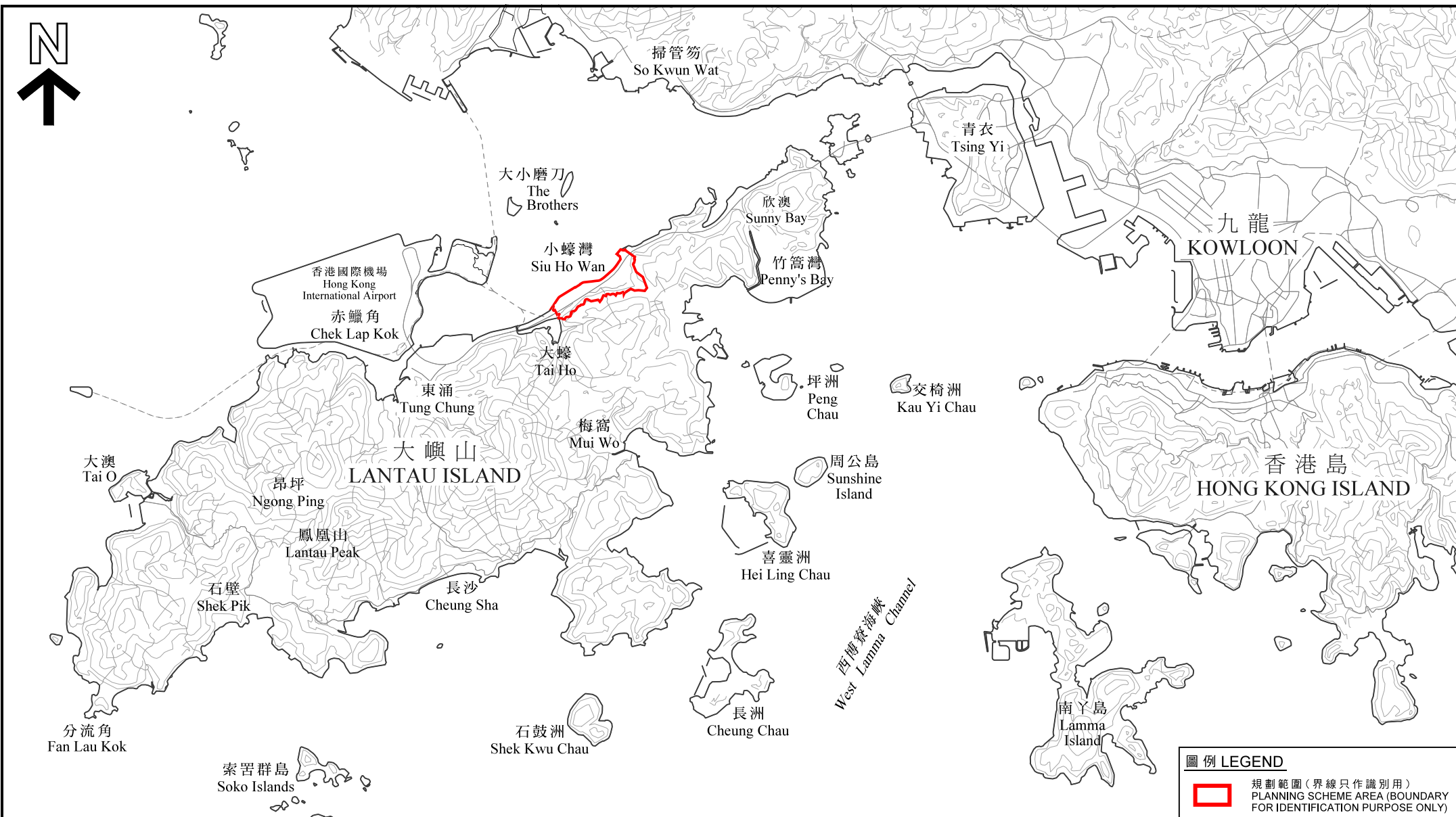
Members are invited to:

- (a) agree that the draft Siu Ho Wan Outline Zoning Plan (OZP) No. S/I-SHW/B (**Appendix I**) together with its Notes (**Appendix II**) is suitable for consultation with IsDC and TWDC;
- (b) agree that the ES (**Appendix III**) is suitable to serve as an expression of the planning intention and objectives of the Board for the various land use zonings of the draft OZP; and
- (c) agree that the ES (**Appendix III**) is suitable for consultation with IsDC and TWDC together with the draft OZP.

**13     Attachments**

<b>Plan 1</b>	Location Plan of the Planning Scheme Area
<b>Plan 2</b>	Boundary of the Planning Scheme Area
<b>Plan 3</b>	Aerial Photo
<b>Plan 4</b>	Spatial Planning and Land Use in Lantau
<b>Plan 5</b>	Existing Land Use
<b>Plans 6a to 6i</b>	Indicative Scheme submitted by MTRCL
<b>Plan 7</b>	Proposed Land Use Pattern
<b>Appendix I</b>	Draft Siu Ho Wan Outline Zoning Plan (OZP) No. S/I-SHW/B
<b>Appendix II</b>	Notes of the draft Siu Ho Wan OZP No. S/I-SHW/B
<b>Appendix III</b>	Explanatory Statement of the draft Siu Ho Wan OZP No. S/I-SHW/B
<b>Appendix IV</b>	Planning Report on Siu Ho Wan
<b>Appendix V</b>	Adopted Siu Ho Wan Layout Plan No. L/I-SHW/1A

**PLANNING DEPARTMENT  
JANUARY 2018**

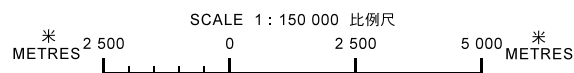


**圖例 LEGEND**

 規劃範圍 (界線只作識別用)  
 PLANNING SCHEME AREA (BOUNDARY FOR IDENTIFICATION PURPOSE ONLY)

**規劃範圍的位置圖**  
**LOCATION PLAN OF THE PLANNING SCHEME AREA**

**小蠔灣**  
**SIU HO WAN**



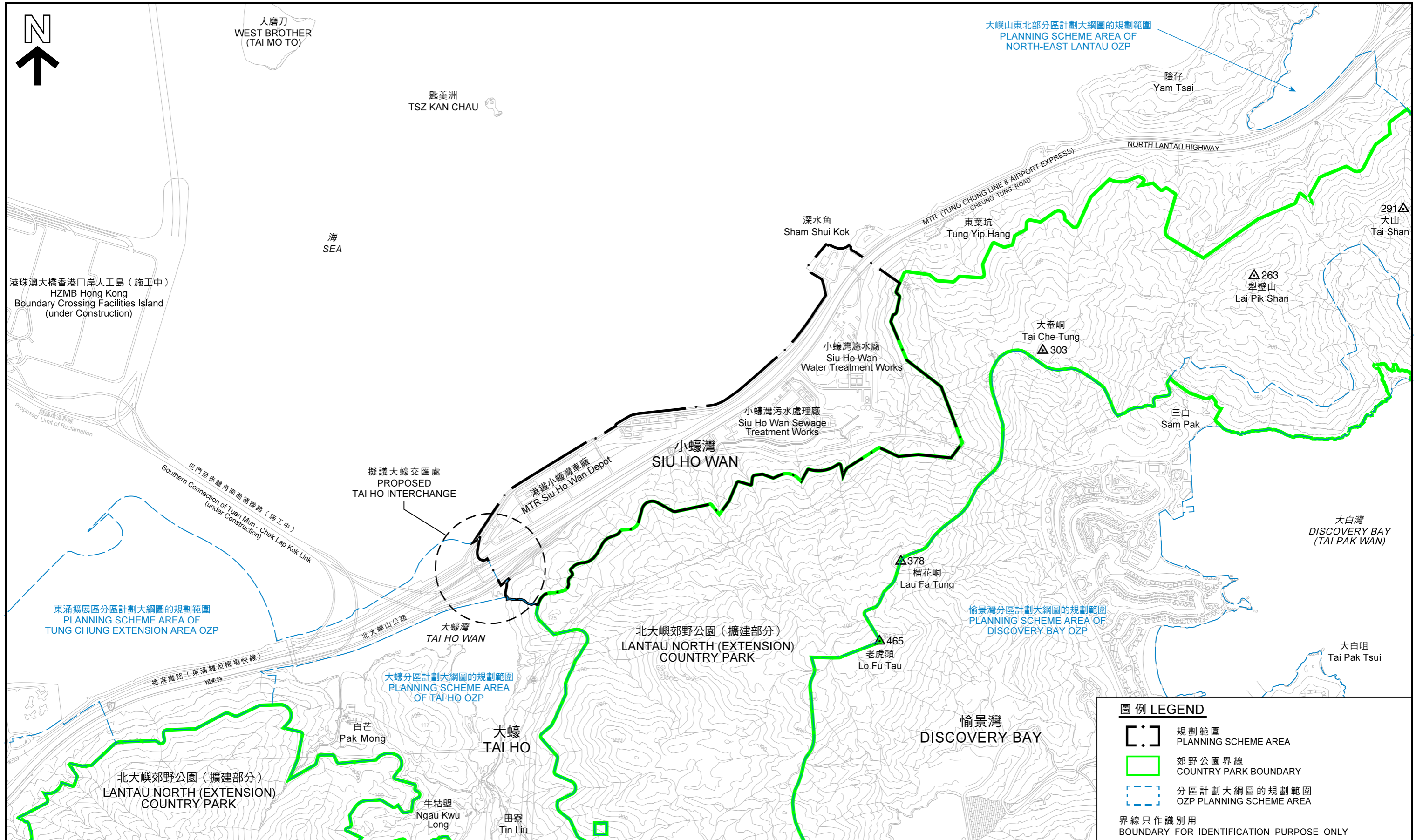
本摘要圖於2017年11月22日擬備，  
 所根據的資料為地形圖編號HM200CL  
 EXTRACT PLAN PREPARED ON 22.11.2017  
 BASED ON TOPOGRAPHICAL MAP HM200CL

**規劃署**  
**PLANNING DEPARTMENT**



參考編號  
 REFERENCE No.  
**M/LI/17/50**

**圖 PLAN**  
 1



**圖例 LEGEND**

- 規劃範圍 PLANNING SCHEME AREA
- 郊野公園界線 COUNTRY PARK BOUNDARY
- 分區計劃大綱圖的規劃範圍 OZP PLANNING SCHEME AREA

界線只作識別用  
BOUNDARY FOR IDENTIFICATION PURPOSE ONLY

本摘要圖於2017年11月22日擬備，  
所根據的資料為地形圖組別 iB20000 編號 T9 和 T10  
EXTRACT PLAN PREPARED ON 22.11.2017  
BASED ON TOPOGRAPHIC MAP SERIES iB20000 Nos. T9 & T10

**規劃範圍界線**  
**BOUNDARY OF THE PLANNING SCHEME AREA**

**小蠔灣**  
**SIU HO WAN**

SCALE 1 : 20 000 比例尺

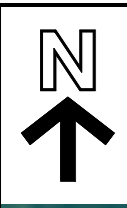
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**規劃署**  
**PLANNING DEPARTMENT**

參考編號  
REFERENCE No.  
**M/LI/17/50**

圖 PLAN  
**2**





圖例 LEGEND	
<span style="border: 2px solid red; display: inline-block; width: 15px; height: 10px;"></span>	規劃範圍(界線只作識別用) PLANNING SCHEME AREA (BOUNDARY FOR IDENTIFICATION PURPOSE ONLY)
<span style="border: 2px solid yellow; display: inline-block; width: 15px; height: 10px;"></span>	郊野公園界線 COUNTRY PARK BOUNDARY

本摘要圖於2017年11月22日擬備，  
所根據的資料為地政總署於2017年1月23日拍得的航攝照片  
EXTRACT PLAN PREPARED ON 22.11.2017  
BASED ON AERIAL PHOTOS TAKEN ON 23.1.2017  
BY LANDS DEPARTMENT

航攝照片 AERIAL PHOTO

小蠔灣  
SIU HO WAN

規劃署 PLANNING DEPARTMENT	
參考編號 REFERENCE No. <b>M/LI/17/50</b>	<b>圖 PLAN</b> <b>3</b>

# 整體空間布局 Overall Spatial Framework



北大嶼山走廊 — 經濟及房屋發展  
North Lantau Corridor —  
Economic and housing development

大嶼山大部分地區 —  
保育及可持續休閒康樂用途  
Predominant part of Lantau —  
Conservation with sustainable  
leisure and recreational uses

東北大嶼山匯點 —  
休閒、娛樂及旅遊發展  
Northeast Lantau Node —  
Leisure, entertainment and  
tourism development

東大嶼都會 —  
策略增長區  
East Lantau Metropolis —  
Strategic growth area

可能的策略性運輸走廊  
(有待進一步研究)  
Possible Strategic Transport Corridors  
(subject to further study)

備註：只作顯示之用  
Remarks: For illustration purpose only

**圖例 LEGEND**  
 規劃範圍(界線只作識別用)  
 PLANNING SCHEME AREA (BOUNDARY  
 FOR IDENTIFICATION PURPOSE ONLY)

## 大嶼山空間規劃及土地利用 SPATIAL PLANNING AND LAND USE IN LANTAU

小蠔灣  
SIU HO WAN

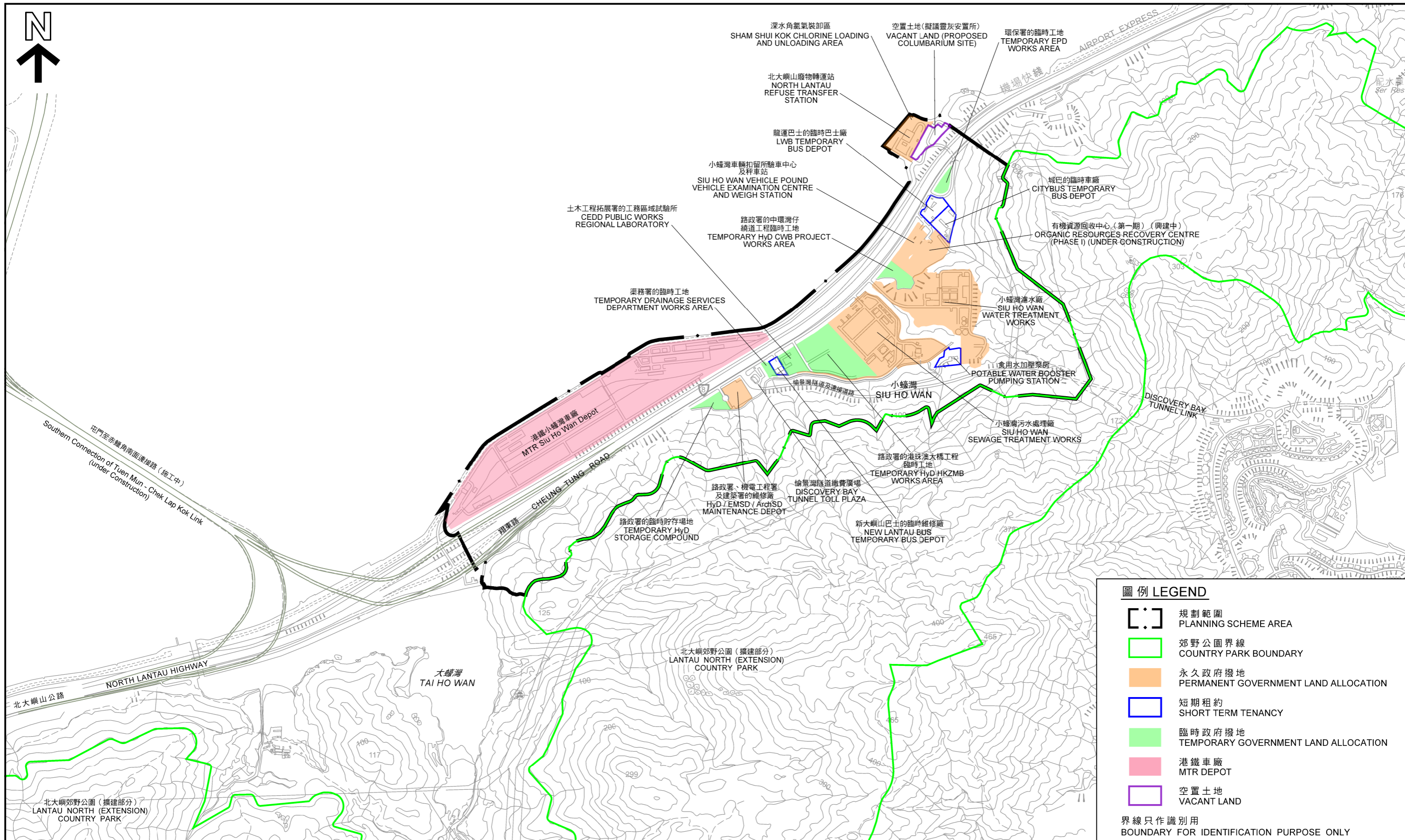
規劃署  
PLANNING  
DEPARTMENT 

本摘要圖於2017年11月22日擬備，  
所根據的資料為可持續大嶼山藍圖摘要  
EXTRACT PLAN PREPARED ON 22.11.2017  
BASED ON SUSTAINABLE LANTAU  
BLUEPRINT DIGEST

參考編號  
REFERENCE No.  
M/LI/17/50

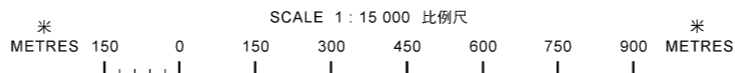
圖 PLAN  
4

資料來源: 香港地政總署, Three Runway System Layout from Airport Authority Hong Kong



**現時土地用途 EXISTING LAND USE**

**小蠔灣  
SIU HO WAN**



本摘要圖於2017年12月21日擬備，  
所根據的資料為地形圖組別iB20000編號T9和T10  
EXTRACT PLAN PREPARED ON 21.12.2017  
BASED ON TOPOGRAPHIC MAP SERIES iB20000 Nos. T9 & T10

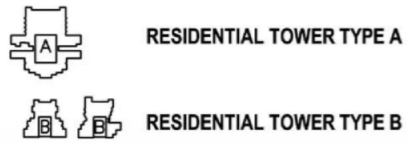
**規劃署  
PLANNING DEPARTMENT**



參考編號  
REFERENCE No.  
**M/LI/17/50**

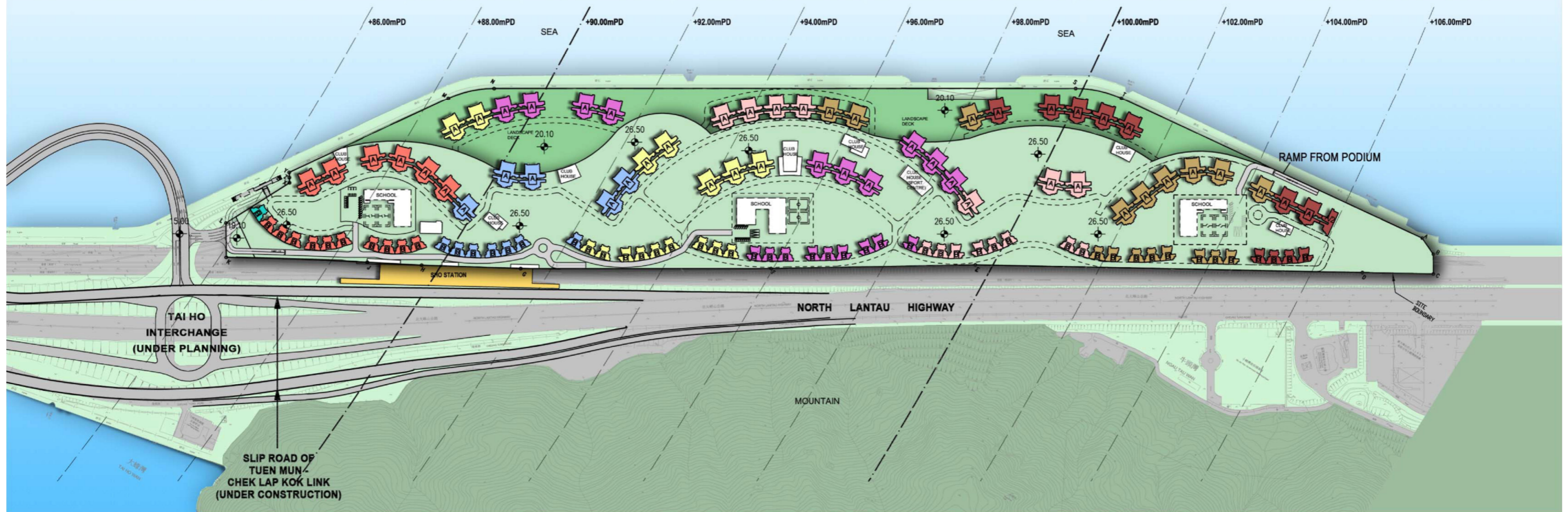
**圖 PLAN**  
**5**

**LEGEND:**



**LEGEND**

	No. of Residential Storeys		No. of Residential Storeys
	15		19
	16		20
	17		21
	18		22



Source of 90mPD & 100mPD Airport Height Restriction: Map Series AHRP Sheet 10-NW-C by Survey and Mapping Office Land Department



由香港鐵路有限公司提交的概略計劃  
INDICATIVE SCHEME SUBMITTED BY MTRCL

小蠔灣  
SIU HO WAN

規劃署  
PLANNING DEPARTMENT



本摘要圖於2017年11月22日擬備，  
EXTRACT PLAN PREPARED ON 22.11.2017

參考編號  
REFERENCE No.  
M/LI/17/50

圖 PLAN  
6a



由香港鐵路有限公司提交的概略計劃  
INDICATIVE SCHEME SUBMITTED BY MTRCL

小蠔灣  
SIU HO WAN

規劃署  
PLANNING DEPARTMENT



參考編號  
REFERENCE No.  
M/LI/17/50

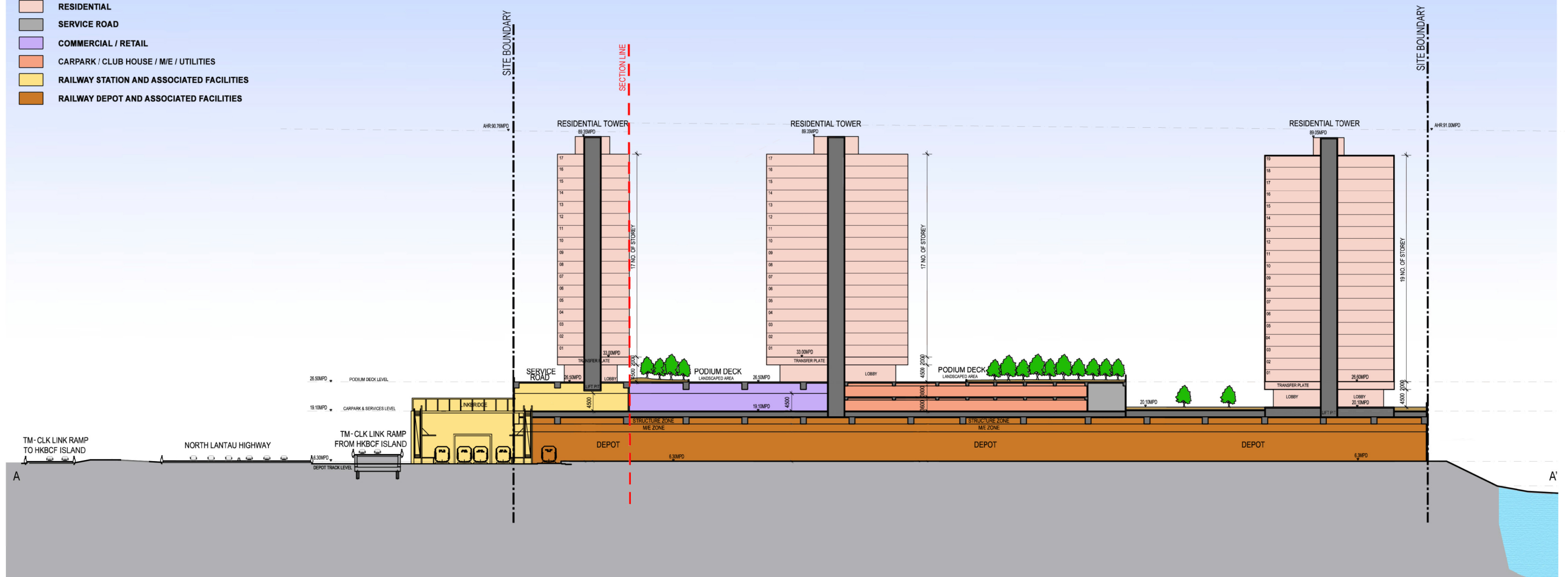
圖 PLAN  
6b

本摘要圖於2017年11月22日擬備，  
EXTRACT PLAN PREPARED ON 22.11.2017



**LEGEND**

- RESIDENTIAL
- SERVICE ROAD
- COMMERCIAL / RETAIL
- CARPARK / CLUB HOUSE / M/E / UTILITIES
- RAILWAY STATION AND ASSOCIATED FACILITIES
- RAILWAY DEPOT AND ASSOCIATED FACILITIES



由香港鐵路有限公司提交的概略計劃  
INDICATIVE SCHEME SUBMITTED BY MTRCL

小蠔灣  
SIU HO WAN

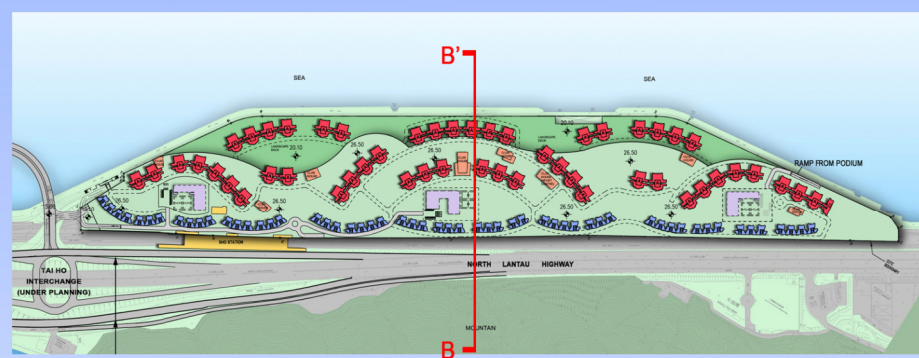
本摘要圖於2017年11月30日擬備，  
EXTRACT PLAN PREPARED ON 30.11.2017

規劃署  
PLANNING DEPARTMENT

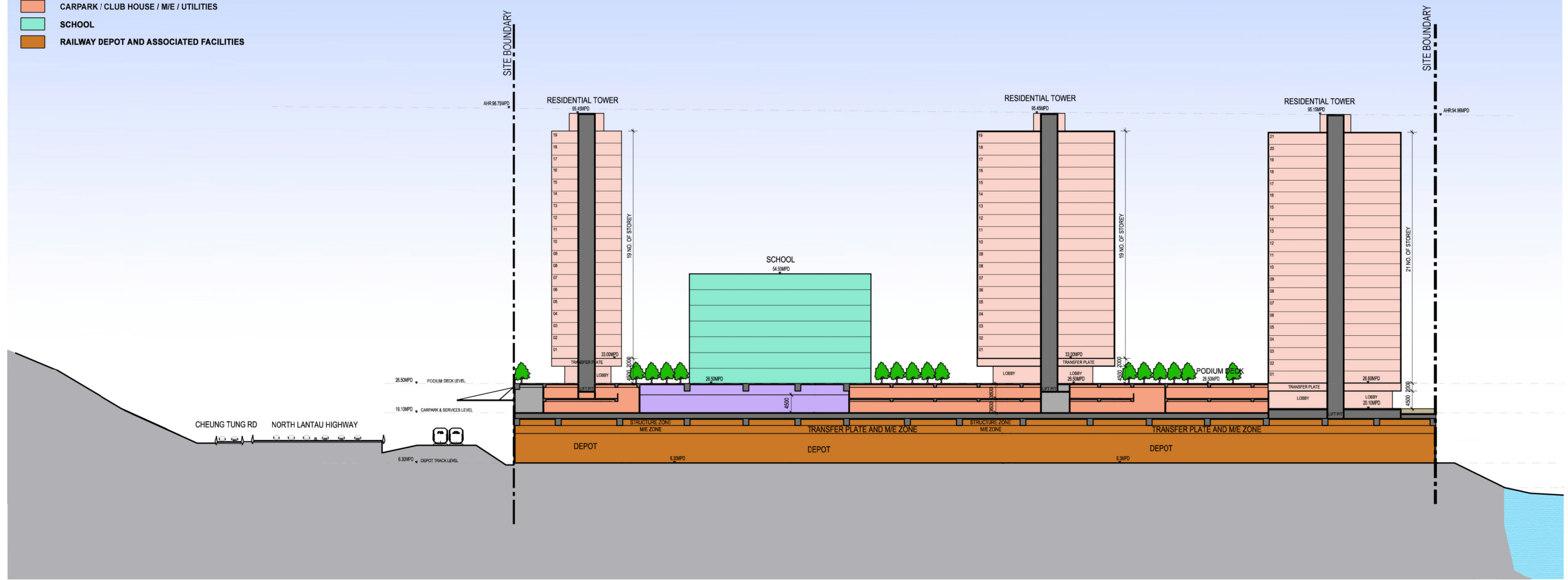


參考編號  
REFERENCE No.  
M/LI/17/50

圖 PLAN  
6c



- LEGEND**
- RESIDENTIAL
  - SERVICE ROAD
  - COMMERCIAL / RETAIL
  - CARPARK / CLUB HOUSE / M/E / UTILITIES
  - SCHOOL
  - RAILWAY DEPOT AND ASSOCIATED FACILITIES



由香港鐵路有限公司提交的概略計劃  
INDICATIVE SCHEME SUBMITTED BY MTRCL

小蠔灣  
SIU HO WAN

規劃署  
PLANNING DEPARTMENT



本摘要圖於2017年11月30日擬備，  
EXTRACT PLAN PREPARED ON 30.11.2017

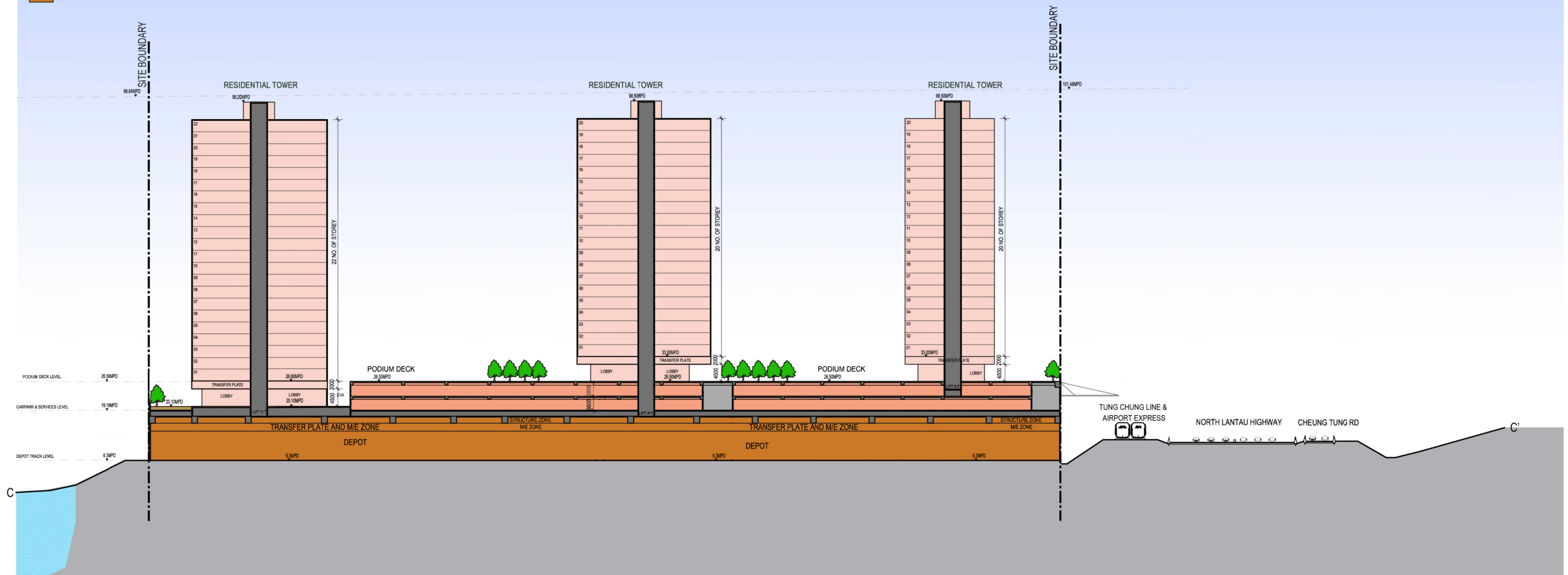
參考編號  
REFERENCE No.  
M/LI/17/50

圖 PLAN  
6d



**LEGEND**

- RESIDENTIAL
- SERVICE ROAD
- CARPARK / CLUB HOUSE / M/E / UTILITIES
- RAILWAY DEPOT AND ASSOCIATED FACILITIES



由香港鐵路有限公司提交的概略計劃  
INDICATIVE SCHEME SUBMITTED BY MTRCL

小蠔灣  
SIU HO WAN

本摘要圖於2017年11月30日擬備，  
EXTRACT PLAN PREPARED ON 30.11.2017

規劃署  
PLANNING DEPARTMENT



參考編號  
REFERENCE No.  
M/LI/17/50

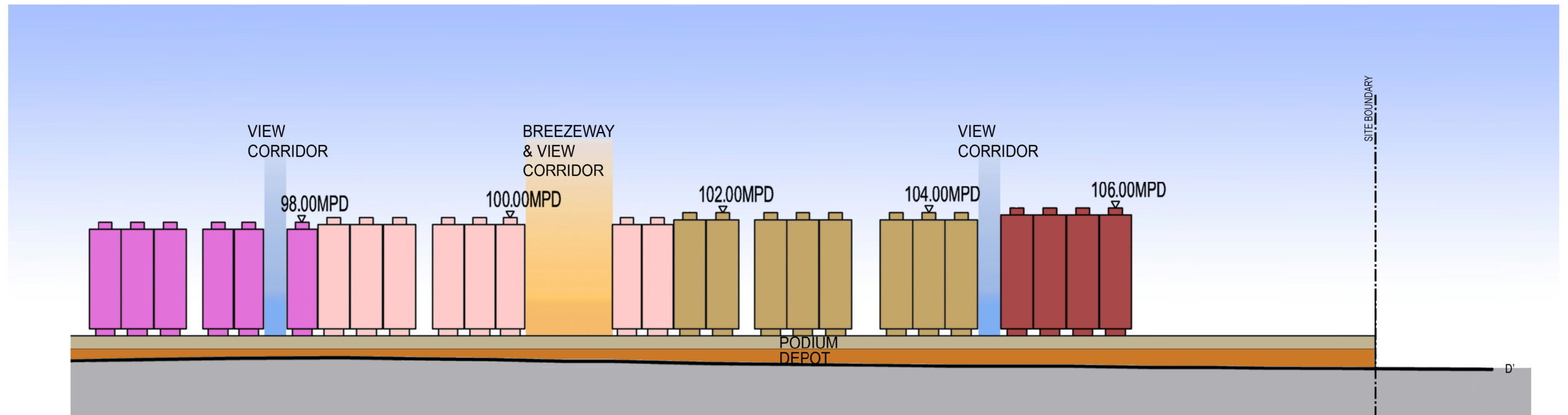
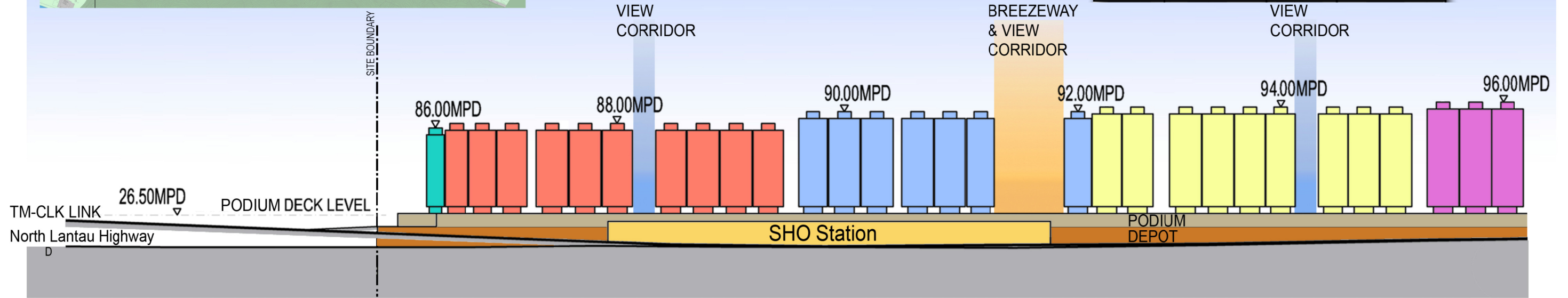
圖 PLAN  
6e





**LEGEND**

	No. of Residential Storeys		No. of Residential Storeys
	15		19
	16		20
	17		21
	18		22



由香港鐵路有限公司提交的概略計劃  
INDICATIVE SCHEME SUBMITTED BY MTRCL

小蠔灣  
SIU HO WAN







規劃署  
PLANNING DEPARTMENT

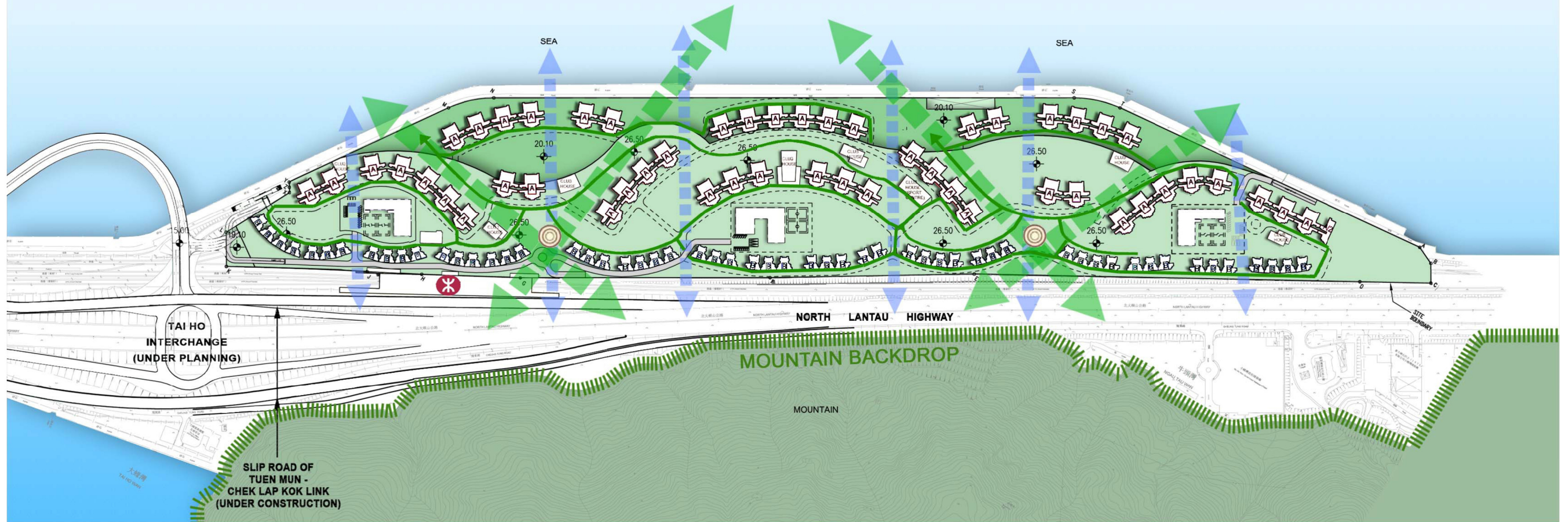


本摘要圖於2017年12月13日擬備，  
EXTRACT PLAN PREPARED ON 13.12.2017

參考編號  
REFERENCE No.  
M/LI/17/50

圖 PLAN  
6f

-  INDICATIVE LANDSCAPED PEDESTRIAN ROUTE
-  TERRACED PODIUM STEPPING TOWARDS WATERFRONT
-  30m WIDE VISUAL CORRIDORS & BREEZEWAY
-  MINIMUM 15m WIDE VIEW CORRIDORS
-  ACTIVITY NODE
-  RAILWAY STATION



由香港鐵路有限公司提交的概略計劃  
INDICATIVE SCHEME SUBMITTED BY MTRCL

小蠔灣  
SIU HO WAN

本摘要圖於2017年12月27日擬備，  
EXTRACT PLAN PREPARED ON 27.12.2017

規劃署  
PLANNING DEPARTMENT



參考編號  
REFERENCE No.  
M/LI/17/50

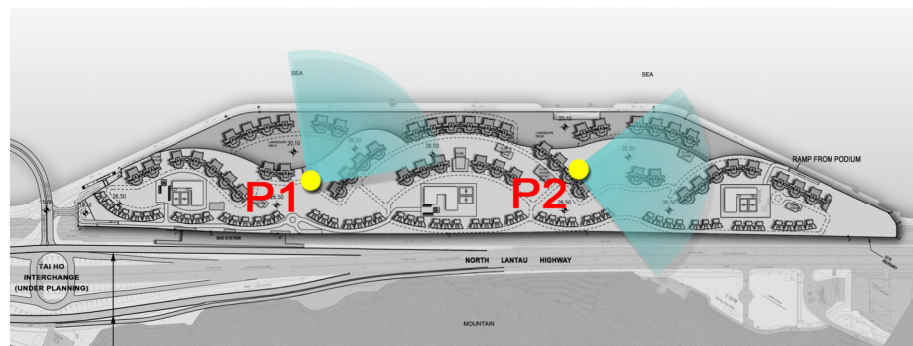
圖 PLAN  
6g

For illustrative purpose only and subject to refinements and changes at detailed design stage.



P1 - View at Civic Square to the sea through the 30m wide landscaped corridor.

P2 - View to landscaped terrace and 30m wide corridor offering vista to a mountain backdrop.



本摘要圖於2017年12月27日擬備，  
EXTRACT PLAN PREPARED ON 27.12.2017

由香港鐵路有限公司提交的概略計劃  
INDICATIVE SCHEME SUBMITTED BY MTRCL

小蠔灣  
SIU HO WAN

規劃署  
PLANNING DEPARTMENT



參考編號  
REFERENCE No.  
M/LI/17/50

圖 PLAN  
6h



由香港鐵路有限公司提交的概略計劃  
**INDICATIVE SCHEME SUBMITTED BY MTRCL**

小蠔灣  
SIU HO WAN

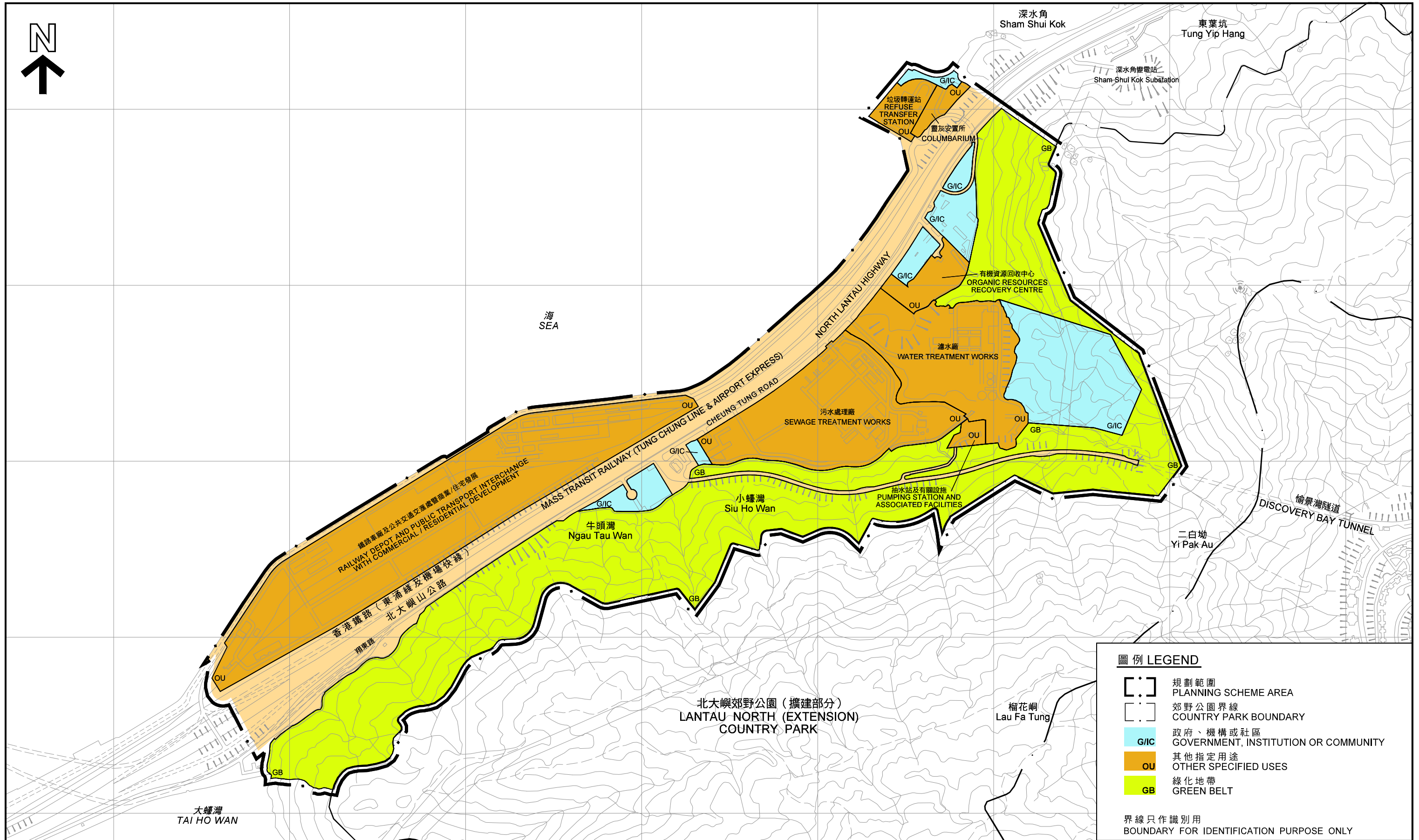
本摘要圖於2017年12月27日擬備，  
EXTRACT PLAN PREPARED ON 27.12.2017

規劃署  
PLANNING DEPARTMENT



參考編號  
REFERENCE No.  
M/LI/17/50

圖 PLAN  
6i



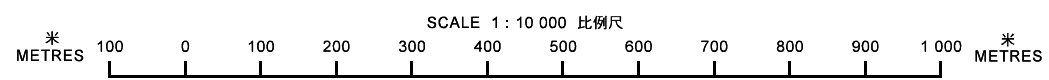
**圖例 LEGEND**

- 規劃範圍  
PLANNING SCHEME AREA
- 郊野公園界線  
COUNTRY PARK BOUNDARY
- G/IC 政府、機構或社區  
GOVERNMENT, INSTITUTION OR COMMUNITY
- OU 其他指定用途  
OTHER SPECIFIED USES
- GB 綠化地帶  
GREEN BELT

界線只作識別用  
BOUNDARY FOR IDENTIFICATION PURPOSE ONLY


**擬議的土地用途模式 PROPOSED LAND USE PATTERN**

**小蠔灣 SIU HO WAN**



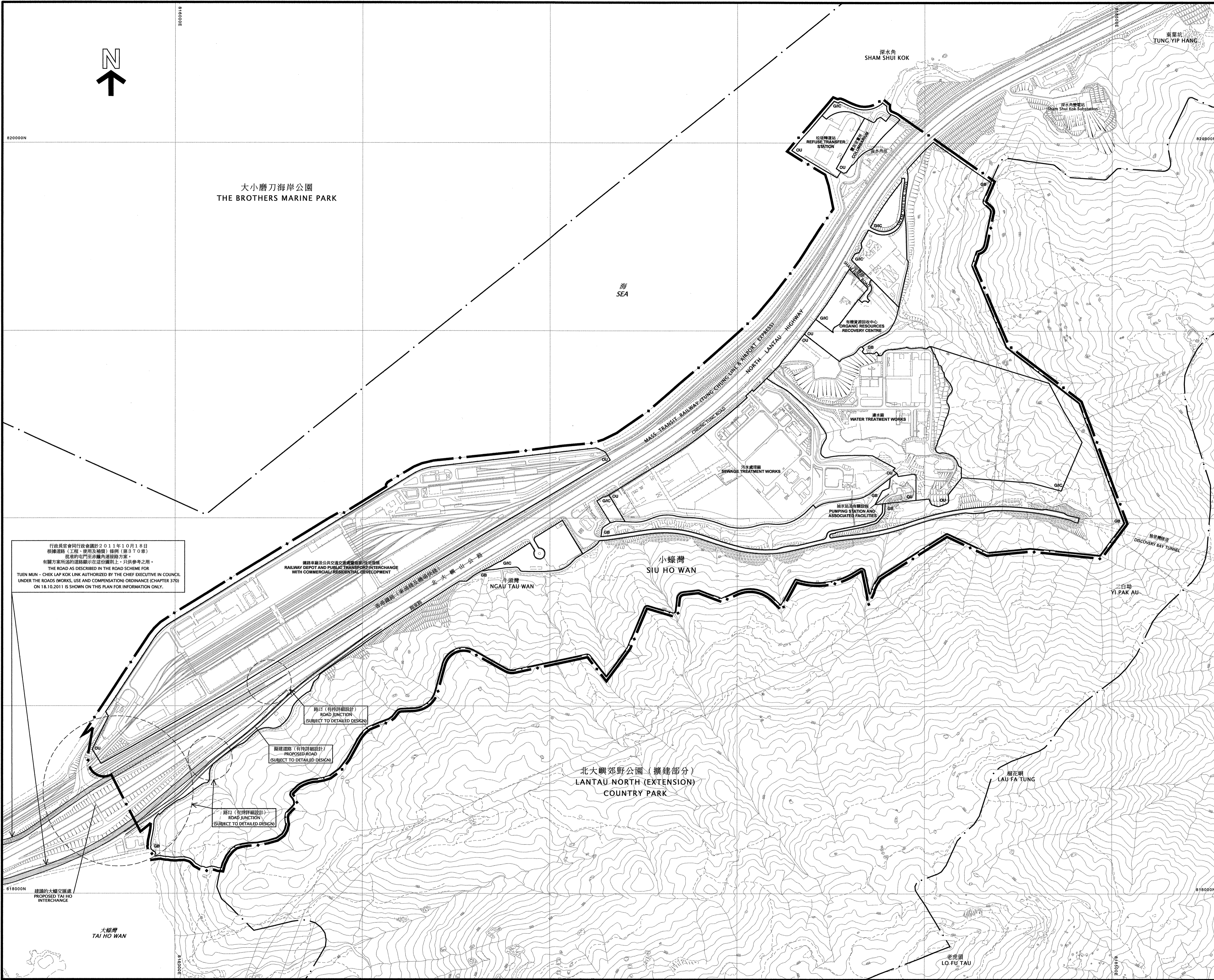
本摘要圖於2017年11月22日擬備  
EXTRACT PLAN PREPARED ON 22.11.2017

**規劃署 PLANNING DEPARTMENT**



參考編號 REFERENCE No. **M/LI/17/50**

圖 PLAN **7**



**圖例 NOTATION**

<b>ZONES</b>		<b>地帶</b>
GOVERNMENT, INSTITUTION OR COMMUNITY	G/C	政府、機構或社區
OTHER SPECIFIED USES	OU	其他指定用途
GREEN BELT	GB	綠化地帶
<b>COMMUNICATIONS</b>		<b>交通</b>
MAJOR ROAD AND JUNCTION	[Symbol]	主要道路及路口
ELEVATED ROAD	[Symbol]	高架道路
<b>MISCELLANEOUS</b>		<b>其他</b>
BOUNDARY OF PLANNING SCHEME	[Symbol]	規劃範圍界線
BOUNDARY OF COUNTRY PARK / MARINE PARK	[Symbol]	郊野公園 / 海岸公園界線

**土地用途及面積一覽表 SCHEDULE OF USES AND AREAS**

USES	大約面積及百分比 APPROXIMATE AREA & %		用途
	公頃 HECTARES	% 百分比	
GOVERNMENT, INSTITUTION OR COMMUNITY	15.54	8.35	政府、機構或社區
OTHER SPECIFIED USES	63.60	34.18	其他指定用途
GREEN BELT	68.04	36.57	綠化地帶
MAJOR ROAD ETC.	38.89	20.90	主要道路等
<b>TOTAL PLANNING SCHEME AREA</b>	<b>186.07</b>	<b>100.00</b>	<b>規劃範圍總面積</b>

行政局會同行政會議於2011年10月18日根據《工程、使用及補償條例》(第370章)批准有關方案所載的建議在土地圖上予以參考之用。THE ROAD AS DESCRIBED IN THE ROAD SCHEME FOR TUEN MUN - CHEK LAP KOK LINK, AUTHORIZED BY THE CHIEF EXECUTIVE IN COUNCIL UNDER THE ROADS (WORKS, USE AND COMPENSATION) ORDINANCE (CHAPTER 370) ON 18.10.2011 IS SHOWN ON THIS PLAN FOR INFORMATION ONLY.

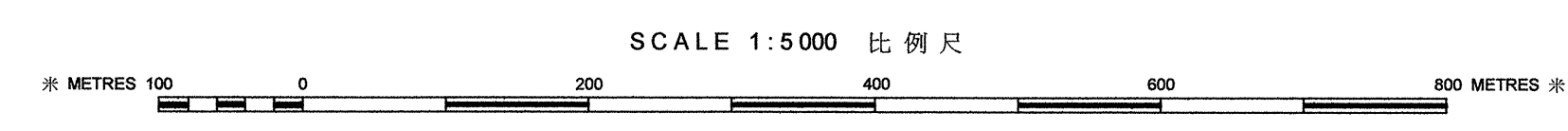
夾附的《註釋》屬這份圖則的一部分  
THE ATTACHED NOTES ALSO FORM PART OF THIS PLAN

按照城市規劃條例第5條展示的  
草圖  
DRAFT PLAN EXHIBITED UNDER SECTION 5 OF THE TOWN PLANNING ORDINANCE ON  
SECRETARY  
TOWN PLANNING BOARD  
城市規劃委員會秘書

香港城市規劃委員會依據城市規劃條例擬備的小蠔灣分區計劃大綱圖  
**TOWN PLANNING ORDINANCE, HONG KONG TOWN PLANNING BOARD**  
**SIU HO WAN - OUTLINE ZONING PLAN**

規劃署遵照城市規劃委員會指示擬備  
PREPARED BY THE PLANNING DEPARTMENT UNDER  
THE DIRECTION OF THE TOWN PLANNING BOARD

圖則編號  
PLAN No. **S/I-SHW/B**



**DRAFT SIU HO WAN OUTLINE ZONING PLAN NO. S/I-SHW/B**

(Being a Draft Plan for the Purposes of the Town Planning Ordinance)

**NOTES**

(N.B. These form part of the Plan)

- (1) These Notes show the uses or developments on land falling within the boundaries of the Plan which are always permitted and which may be permitted by the Town Planning Board, with or without conditions, on application. Where permission from the Town Planning Board for a use or development is required, the application for such permission should be made in a prescribed form. The application shall be addressed to the Secretary of the Town Planning Board, from whom the prescribed application form may be obtained.
- (2) Any use or development which is always permitted or may be permitted in accordance with these Notes must also conform to any other relevant legislation, the conditions of the Government lease concerned, and any other Government requirements, as may be applicable.
- (3)
  - (a) No action is required to make the existing use of any land or building conform to this Plan until there is a material change of use or the building is redeveloped.
  - (b) Any material change of use or any other development (except minor alteration and/or modification to the development of the land or building in respect of the existing use which is always permitted) or redevelopment must be always permitted in terms of the Plan or, if permission is required, in accordance with the permission granted by the Town Planning Board.
  - (c) For the purposes of subparagraph (a) above, “existing use of any land or building” means -
    - (i) before the publication in the Gazette of the notice of the first statutory plan covering the land or building (hereafter referred as ‘the first plan’),
      - a use in existence before the publication of the first plan which has continued since it came into existence; or
      - a use or a change of use approved under the Buildings Ordinance which relates to an existing building; and
    - (ii) after the publication of the first plan,
      - a use permitted under a plan which was effected during the effective period of that plan and has continued since it was effected; or
      - a use or a change of use approved under the Buildings Ordinance which relates to an existing building and permitted under a plan prevailing at the time when the use or change of use was approved.

- (4) Except as otherwise specified by the Town Planning Board, when a use or material change of use is effected or a development or redevelopment is undertaken, as always permitted in terms of the Plan or in accordance with a permission granted by the Town Planning Board, all permissions granted by the Town Planning Board in respect of the site of the use or material change of use or development or redevelopment shall lapse.
- (5) Road junctions, alignments of roads and railway tracks, and boundaries between zones may be subject to minor adjustments as detailed planning proceeds.
- (6) Temporary uses (expected to be 5 years or less) of any land or building are always permitted as long as they comply with any other relevant legislation, the conditions of the Government lease concerned, and any other Government requirements, and there is no need for these to conform to the zoned use or these Notes. For temporary uses expected to be over 5 years, the uses must conform to the zoned use or these Notes.
- (7) The following uses or developments are always permitted on land falling within the boundaries of the Plan except where the uses or developments are specified in Column 2 of the Notes of individual zones:
  - (a) provision, maintenance or repair of plant nursery, amenity planting, open space, rain shelter, refreshment kiosk, road, bus/public light bus stop or lay-by, cycle track, Mass Transit Railway station entrance, Mass Transit Railway structure below ground level, taxi rank, nullah, public utility pipeline, electricity mast, lamp pole, telephone booth, telecommunications radio base station, automatic teller machine and shrine;
  - (b) geotechnical works, local public works, road works, sewerage works, drainage works, environmental improvement works, marine related facilities, waterworks (excluding works on service reservoir) and such other public works co-ordinated or implemented by Government; and
  - (c) maintenance or repair of watercourse and grave.
- (8) In any area shown as 'Road', all uses or developments except those specified in paragraph (7) above and those specified below require permission from the Town Planning Board:

toll plaza, on-street vehicle park and railway track.
- (9) Unless otherwise specified, all building, engineering and other operations incidental to and all uses directly related and ancillary to the permitted uses and developments within the same zone are always permitted and no separate planning permission is required.
- (10) In these Notes, "existing building" means a building, including a structure, which is physically existing and is in compliance with any relevant legislation and the conditions of the Government lease concerned.



**DRAFT SIU HO WAN OUTLINE ZONING PLAN NO. S/I-SHW/B**

Schedule of Uses

	<u>Page</u>
GOVERNMENT, INSTITUTION OR COMMUNITY	1
OTHER SPECIFIED USES	2
GREEN BELT	7

GOVERNMENT, INSTITUTION OR COMMUNITY

Column 1 Uses always permitted	Column 2 Uses that may be permitted with or without conditions on application to the Town Planning Board
Ambulance Depot Animal Quarantine Centre (in Government building only) Broadcasting, Television and/or Film Studio Cable Car Route and Terminal Building Eating Place (Canteen, Cooked Food Centre only) Educational Institution Exhibition or Convention Hall Field Study/Education/Visitor Centre Government Refuse Collection Point Government Use (not elsewhere specified) Hospital Institutional Use (not elsewhere specified) Library Market Pier Place of Recreation, Sports or Culture Public Clinic Public Convenience Public Transport Terminus or Station Public Utility Installation Public Vehicle Park (excluding container vehicle) Recyclable Collection Centre Religious Institution Research, Design and Development Centre School Service Reservoir Social Welfare Facility Training Centre Wholesale Trade	Animal Boarding Establishment Animal Quarantine Centre (not elsewhere specified) Columbarium Correctional Institution Crematorium Driving School Eating Place (not elsewhere specified) Flat Funeral Facility Helicopter Landing Pad Helicopter Fuelling Station Holiday Camp Hotel House Marine Fuelling Station Mass Transit Railway Vent Shaft and/or Other Structure above Ground Level other than Entrances Off-course Betting Centre Office Petrol Filling Station Place of Entertainment Private Club Radar, Telecommunications Electronic Microwave Repeater, Television and/or Radio Transmitter Installation Refuse Disposal Installation (Refuse Transfer Station only) Residential Institution Sewage Treatment/Screening Plant Shop and Services Utility Installation for Private Project Zoo

Planning Intention

This zone is intended primarily for the provision of Government, institution or community facilities serving the needs of the local residents and/or a wider district, region or the territory. It is also intended to provide land for uses directly related to or in support of the work of the Government, organizations providing social services to meet community needs, and other institutional establishments.

OTHER SPECIFIED USES

Column 1 Uses always permitted	Column 2 Uses that may be permitted with or without conditions on application to the Town Planning Board
<u>For “Railway Depot and Public Transport Interchange with Commercial/Residential Development” only</u>	
Railway Depot Railway Station Railway Track	Ambulance Depot Commercial Bathhouse/Massage Establishment Eating Place Educational Institution Exhibition or Convention Hall Flat Government Refuse Collection Point Government Use (not elsewhere specified) Hotel House Information Technology and Telecommunications Industries Institutional Use (not elsewhere specified) Library Market Off-course Betting Centre Office Petrol Filling Station Pier Place of Entertainment Place of Recreation, Sports or Culture Private Club Public Clinic Public Convenience Public Transport Terminus or Station Public Utility Installation Public Vehicle Park (excluding container vehicle) Recyclable Collection Centre Religious Institution Research, Design and Development Centre Residential Institution School Shop and Services Social Welfare Facility Training Centre Utility Installation for Private Project

(Please see next page)

OTHER SPECIFIED USES (cont'd)For "Railway Depot and Public Transport Interchange  
with Commercial/Residential Development" only (cont'd)Planning Intention

This zone is intended primarily to provide land for railway depot with commercial and/or residential development above with the provision of public transport interchange, Government, institution or community facilities and other supporting facilities. The zoning is to facilitate appropriate planning control over the development mix, scale, design and layout of development, taking account of various environmental, traffic, infrastructure and other constraints as well as air ventilation and visual considerations.

Remarks

- (a) An applicant for permission for development on land designated "Other Specified Uses" annotated "Railway Depot and Public Transport Interchange with Commercial/Residential Development" shall prepare a layout plan for the approval of the Town Planning Board and include therein the following information:
- (i) the areas of the proposed land uses, the nature, position, dimensions, and heights of all buildings to be erected in the area;
  - (ii) the proposed total site area and gross floor area (GFA) for various uses, total number of flats and flat sizes, where applicable;
  - (iii) the details and extent of Government, institution or community (GIC) and recreational facilities, public transport and parking facilities including cycle parking spaces, and open space to be provided within the area;
  - (iv) the alignment, widths and levels of any access proposed to be constructed within the area;
  - (v) the landscape and urban design proposals, including connectivity proposals, within the area;
  - (vii) programmes of development in detail;
  - (viii) an environmental assessment report to examine any possible environmental problems that may be caused to or by the proposed development during and after construction and the proposed mitigation measures to tackle them;
  - (ix) a drainage and sewerage impact assessment report to examine any possible drainage and sewerage problems that may be caused by the proposed development and the proposed mitigation measures to tackle them;
  - (x) a traffic and transport impact assessment report to examine any possible traffic problems that may be caused by the proposed development and the proposed mitigation measures to tackle them;

(Please see next page)

OTHER SPECIFIED USES (cont'd)For "Railway Depot and Public Transport Interchange  
with Commercial/Residential Development" only (cont'd)Remarks (cont'd)

- (xi) an air ventilation assessment report to examine any possible air ventilation problems that may be caused by the proposed development and the proposed mitigation measures to tackle them;
  - (xii) a visual impact assessment report to examine any possible visual impacts that may be caused by the proposed development and the proposed mitigation measures to tackle them; and
  - (xiii) such other information as may be required by the Town Planning Board.
- (b) No new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of a maximum domestic GFA of 1,040,000 m<sup>2</sup> and a maximum non-domestic GFA of 30,000 m<sup>2</sup> for commercial use, or the GFA of the existing building, whichever is the greater.
- (c) In determining the relevant maximum GFA for the purposes of paragraph (b) above, any floor space that is constructed or intended for use solely as car park, loading/unloading bay, plant room and caretaker's office, or caretaker's quarters and recreational facilities for the use and benefit of all the owners or occupiers of the domestic building or domestic part of the building, provided such uses and facilities are ancillary and directly related to the development or redevelopment, may be disregarded. Any floor space that is constructed or intended for use solely as railway depot/station and associated facilities, public transport interchange, schools, GIC or social welfare facilities, as required by the Government, or covered walkway may also be disregarded.
- (d) Based on the individual merits of a development or redevelopment proposal, relaxation of the GFA restrictions stated in paragraph (b) above may be considered by the Town Planning Board on application under section 16 of the Town Planning Ordinance.

(Please see next page)

OTHER SPECIFIED USES (Cont'd)


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Column 1  
Uses always permitted

Column 2  
Uses that may be permitted with or  
without conditions on application  
to the Town Planning Board

---

For "Water Treatment Works" Only

Water Treatment Works  
Service Reservoir

Government Use (not elsewhere specified)  
Public Utility Installation

Planning Intention

This zone is intended primarily for the provision of water treatment works serving the needs of the community.

For "Sewage Treatment Works" Only

Sewage Treatment Works

Government Use (not elsewhere specified)  
Public Utility Installation

Planning Intention

This zone is intended primarily for the provision of sewage treatment works serving the needs of the community.

For "Organic Resources Recovery Centre" Only

Organic Resources Recovery Centre  
Recyclable Collection Centre

Government Use (not elsewhere specified)  
Public Utility Installation

Planning Intention

This zone is intended primarily to designate land for organic resources recovery centre.

(Please see next page)

OTHER SPECIFIED USES (Cont'd)


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Column 1  
Uses always permitted

Column 2  
Uses that may be permitted with or  
without conditions on application  
to the Town Planning Board

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For "Refuse Transfer Station" Only

Refuse Transfer Station

Government Use (not elsewhere specified)  
Public Utility Installation

Planning Intention

This zone is intended primarily to designate land for refuse transfer station.

For "Columbarium" Only

Columbarium  
Garden of Remembrance  
Government Use (not elsewhere specified)

Public Utility Installation  
Religious Institution  
Utility Installation for Private Project

Planning Intention

This zone is intended primarily to designate land for columbarium use and garden of remembrance.

For "Pumping Station and Associated Facilities" Only

Pumping Station and Associated Facilities

Government Use (not elsewhere specified)  
Public Utility Installation

Planning Intention

This zone is intended primarily to designate land for pumping station and associated facilities.

GREEN BELT

Column 1 Uses always permitted	Column 2 Uses that may be permitted with or without conditions on application to the Town Planning Board
Agricultural Use Barbecue Spot Government Use (Police Reporting Centre only) Nature Reserve Nature Trail On-Farm Domestic Structure Picnic Area Public Convenience Tent Camping Ground Wild Animals Protection Area	Animal Boarding Establishment Broadcasting, Television and/or Film Studio Burial Ground Cable Car Route and Terminal Building Columbarium (within a Religious Institution or extension of existing Columbarium only) Crematorium (within a Religious Institution or extension of existing Crematorium only) Field Study/Education/Visitor Centre Flat Government Refuse Collection Point Government Use (not elsewhere specified) Helicopter Landing Pad Holiday Camp House Mass Transit Railway Vent Shaft and/or Other Structure above Ground Level other than Entrances Petrol Filling Station Place of Recreation, Sports or Culture Public Transport Terminus or Station Public Utility Installation Public Vehicle Park (excluding container vehicle) Radar, Telecommunications Electronic Microwave Repeater, Television and/or Radio Transmitter Installation Religious Institution Residential Institution School Service Reservoir Social Welfare Facility Utility Installation for Private Project Zoo

Planning Intention

The planning intention of this zone is primarily for defining the limits of urban and sub-urban development areas by natural features and to contain urban sprawl as well as to provide passive recreational outlets. There is a general presumption against development within this zone.



**DRAFT SIU HO WAN OUTLINE ZONING PLAN NO. S/I-SHW/B**

**EXPLANATORY STATEMENT**

**DRAFT SIU HO WAN OUTLINE ZONING PLAN NO. S/I-SHW/B**

**EXPLANATORY STATEMENT**

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# **DRAFT SIU HO WAN OUTLINE ZONING PLAN NO. S/I-SHW/B**

(Being a Draft Plan for the Purposes of the Town Planning Ordinance)

## **EXPLANATORY STATEMENT**

Note: For the purposes of the Town Planning Ordinance, this Statement shall not be deemed to constitute a part of the Plan.

### **1. INTRODUCTION**

This Explanatory Statement is intended to assist an understanding of the draft Siu Ho Wan Outline Zoning Plan (OZP) No. S/I-SHW/B. It reflects the planning intention and objectives of the Town Planning Board (the Board) for various land use zonings on the Plan.

### **2. AUTHORITY FOR THE PLAN AND PROCEDURE**

- 2.1 On 7 December 2017, under the power delegated by the Chief Executive (CE), the Secretary for Development, directed the Board, under section 3(1)(a) of the Town Planning Ordinance (the Ordinance), to prepare an OZP for Siu Ho Wan area.
- 2.2 On XX XXXX 2018, the draft Siu Ho Wan OZP No. S/I-SHW/1 was exhibited for public inspection under section 5 of the Ordinance.

### **3. OBJECT OF THE PLAN**

- 3.1 The object of the Plan is to indicate the broad land use zonings and major transport networks for the Siu Ho Wan area so that development and redevelopment within the Planning Scheme Area (the Area) can be put under statutory planning control.
- 3.2 The Plan is to illustrate the broad principles of development and planning control within the Area. As it is a small-scale plan, the alignments of the roads and railways and boundaries between the land use zones may be subject to minor adjustments as detailed planning and development proceed.
- 3.3 Since the Plan is to show broad land use zonings, there would be situations in which small strips of land not intended for building development purposes and carry no development right under the lease, such as the areas restricted as non-building area or for garden, slope maintenance and access road purposes, are included in the zones. The general principle is that such areas should not be taken into account in plot ratio (PR) and site coverage calculation. Development within zones should be restricted to building lots carrying

development right in order to maintain the character and amenity of the Siu Ho Wan area and not to overload the transport networks in this area.

#### **4. NOTES OF THE PLAN**

- 4.1 Attached to the Plan is a set of Notes which shows the types of uses or developments which are always permitted within the Area and in particular zones and which may be permitted by the Board, with or without conditions, on application. The provision for application for planning permission under section 16 of the Ordinance allows greater flexibility in land use planning and control of development to meet changing needs.
- 4.2 For the guidance of the general public, a set of definitions that explains some of the terms used in the Notes may be obtained from the Technical Services Division of the Planning Department (PlanD) and can be downloaded from the Board's website at <http://www.info.gov.hk/tpb>.

#### **5. THE PLANNING SCHEME AREA**

- 5.1 The Area covers about 186 ha of land located to the east of Tung Chung New Town Extension (TCNTE) area at the northern shore of Lantau Island. It stretches from Sham Shui Kok in the northeast to the proposed Tai Ho Interchange in the southwest enclosed by the Lantau North (Extension) Country Park in the east and south with the foothills of Tai Che Tung, Lau Fa Tung and Lo Fu Tau within the country park.
- 5.2 Siu Ho Wan was a bay surrounded by hillside with vegetation fronting an open sea in the 1980s. Part of the vegetation at the foothills of the natural terrain was removed due to slope formation and the bay was largely reclaimed for development purpose in the early 1990s, in association with the construction of the North Lantau Highway (NLH) and the Airport Railway. The reclamation and the associated construction works were completed in 1997.
- 5.3 The Area is mainly occupied by various infrastructure and government uses to support Tung Chung New Town (TCNT), the Hong Kong International Airport (HKIA) and Northeast Lantau developments. The land to the south/southeast of NLH contains primarily depots and utility installations, such as sewage treatment works, water treatment works, organic resources recovery centre, etc. and slope areas adjoining the Lantau North (Extension) Country Park which is largely a continuous stretch of scrubland/shrubland with some existing trees scattered around. Land to the north of NLH houses mainly a railway depot which is the largest single development on the reclamation area in the west, a refuse transfer station and a site proposed for columbarium development in the east. As most of the land is formed by reclamation, the shoreline is circumvented by the existing man-made seawall without natural coastal features. There is no village settlement within the Area. To its southwest, Tai Ho Valley, Tai Ho Wan and Tai Ho Stream have been identified as one of the priority sites for enhanced conservation under the New Nature Conservation Policy with a

view to better conserving this ecologically important area.

- 5.5 The boundary of the Area is shown in a heavy broken line on the Plan. For planning and reference purposes, the Area has been divided into a number of smaller planning areas.

## **6. STRATEGIC PLANNING CONTEXT**

- 6.1 The Area, situated in the northshore Lantau, has always been an integral part of Lantau development. Upon completion of the Port and Airport Development Strategy (PADS) in 1989, the Government decided to build a new international airport at Chek Lap Kok, i.e. the current HKIA. PADS also recommended to develop North Lantau New Town (NLNT) as a supporting community of HKIA. Subsequently, the North Lantau Development Study (1992) proposed development of a new town in the area to accommodate an ultimate population of about 260,000. Siu Ho Wan was considered in the Study to be a suitable location for industrial activities related to the new airport and other major utilities such as water treatment works and sewage treatment works.
- 6.2 Pursuant to the 2004 Policy Address, the Lantau Development Task Force was set up in February 2004 to provide a high-level policy steer on the economic and infrastructure development on Lantau. The Revised Concept Plan for Lantau endorsed by the Task Force in 2007 recommended the water off Siu Ho Wan could be reclaimed to host the Lantau Logistic Park (LLP) and to serve as a transportation hub given its proximity to the Hong Kong-Zhuhai-Macao Bridge (HZMB). Together with HKIA and other strategic transport links, the proposed LLP would strengthen Hong Kong's role as a regional transport and logistics centre.
- 6.3 On the other hand, the former Financial Secretary stated in his 2012 Budget that the Government should make optimal use of the development potential of railway-property projects and explore opportunities for development along railways. In 2013, the former CE stipulated in his Policy Address that the top priority of the Government was to tackle the housing problem and the Government would explore vigorously the residential development potential of land along existing and planned railways.
- 6.4 Taking into account the comments of the Lantau Development Advisory Committee (LanDAC) formed in January 2014 to provide advice conducive to the sustainable development and conservation of Lantau, and public's view gathered during the public engagement exercise carried out between January and April 2016, the Sustainable Lantau Blueprint was published by the Government in June 2017 to provide a reference roadmap for guiding and implementing the development and conservation initiatives on Lantau. Siu Ho Wan Development is one of the key projects within the "North Lantau Corridor" which is proposed mainly for economic and housing development.
- 6.5 In response to the policy initiative to make full use of the potential of land along railway for property development, Mass Transit Railway Corporation Limited

(MTRCL) as the current occupier and operator of the Siu Ho Wan railway depot commissioned a technical study to explore the feasibility of residential and commercial development atop the depot. Preliminary technical assessment on various aspects including traffic and transport, air ventilation, environmental, sewerage, drainage, water supply and utilities, quantitative risk, geotechnical and structural feasibility, landscape and visual for the proposed residential and commercial development atop Siu Ho Wan Depot have been undertaken to review the feasibility of the development proposal and the required supporting infrastructure. A possible railway station at Siu Ho Wan has been explored by MTRCL to provide train service for the residents of the proposed property development atop. Relevant Environmental Impact Assessments (EIAs) for the proposal were submitted under the EIA Ordinance. On 29 November 2017, the EIA Reports for “Siu Ho Wan Station and Siu Ho Wan Depot Replanning Works” and “Proposed Comprehensive Residential and Commercial Development atop Siu Ho Wan Depot” were approved with conditions in accordance with the provisions of the EIA Ordinance (Cap.499).

## **7. POPULATION**

There is currently no population in the Area as no residential development has been completed for population intake. It is expected that the planned population of the Area would be about 37,800.

## **8. OPPORTUNITIES AND CONSTRAINTS**

### **8.1 *Opportunities***

#### Optimising the use of land along railway

8.1.1 Being located in the proximity to TCNTE and connected with urban areas by strategic rail and road links, Siu Ho Wan, which is currently occupied by government and depot uses, has the potential to accommodate housing development with higher development intensities. The Tung Chung Line (TCL) and NLH, providing convenient connection between Tung Chung and the urban areas, could also serve to enhance the accessibility of the Siu Ho Wan area with a possible railway station at Siu Ho Wan and suitable road base transport network enhancement.

8.1.2 Topside development of Siu Ho Wan depot is also in line with the government policy for rail-based development to facilitate fast and mass movement of people in an environmentally-friendly mode of transport. Opportunities exist to make better use of valuable land resources atop the railway depot. The depot site requires no land agglomeration and hence could be implemented in a timely manner. Early implementation of residential development atop the depot could help address the acute demand for housing.

## 8.2 *Constraints*

### Accessibility

8.2.1 Cheung Tung Road is the only existing external vehicular access to the Area except Siu Ho Wan railway depot which is connected by a particular slip road branching off NLH. The Tai Ho Interchange proposed under the TCNTE project serving as the major access point from NLH to Cheung Tung Road would improve the accessibility of the Area. However, with the anticipated increase in traffic to be generated by new developments, both the Lantau Link and NLH are expected to be subject to capacity constraints. New road (Road P1 and Route 11) would be necessary to meet the development needs of the Area. The possible traffic impact of new developments on NLH and Lantau Link will be carefully considered and assessed.

### Noise and Vehicle Emissions

8.2.2 Development within the Area is constrained by adverse traffic noise and emissions from NLH and railway. The latest infrastructure proposals around North Lantau including the Tuen Mun – Chek Lap Kok Link (TM-CLKL) and HZMB (including the associated Hong Kong Link Road and Hong Kong Boundary Crossing Facilities (HKBCF)) projects would likely increase the traffic flow on NLH which in turn may have further implication on the environment of the Area. The potential development atop Siu Ho Wan depot has been studied under the EIA process and noise mitigation measures have been proposed in accordance with the EIA Ordinance.

8.2.3 Aircraft approaching and departing from HKIA is identified as one of the key existing noise sources which affects the Area. Although the Area falls outside the coverage of Noise Exposure Forecast (NEF) 25 contour under the HKIA three-runway system (3RS), the Area is in proximity to HKIA, which is a very busy airport operating 24 hours and aircraft noise due to overflight of approaching and departing aircraft is anticipated. The developer(s) in the Area should explore and review the use of acoustic insulation in form of well-gasketed window to enhance the indoor living environment. In addition, the Area is in proximity to the helicopter holding area above Pak Mong and HKIA and helicopter flight paths, which might also contribute to noise environment.

### Civil Aviation

8.2.4 Given its proximity to HKIA, the Area is subject to Airport Height Restriction (AHR). No part of any building or buildings or other structure or equipment erected or to be erected within the Area, or any addition or fitting to such building or buildings or structure or equipment shall exceed the “restricted height” prescribed under the Hong Kong Airport (Control of Obstructions) Ordinance (Cap. 301), any regulation or order made thereunder and any amending legislation.

- 8.2.5 A study with regard to feasibility of relaxing the existing AHR for the current two-runway system (2RS) operations is being conducted. The study results will be subject to verification of the new AHR for the future 3RS operations. Any AHR relaxation, if feasible, can take effect administratively by temporary exemption by Civil Aviation Department (CAD) after verification of the new AHR under 3RS operations pending legislative amendment under the Hong Kong Airport (Control of Obstructions) Ordinance (Cap. 301).
- 8.2.6 Besides, the western tip of the Area is beneath a helicopter holding area "H5" over Pak Mong, which is an essential helicopter holding point for GFS flight operations and emergency response flights. In addition, the Area is also within the vicinity of the NLH route, which is a 500 feet high (above mean sea level) flight corridor along the coastline of North Lantau between Pak Mong and the Toll Plaza of the Tsing Ma Bridge. The route is essential for GFS to conduct emergency response flights during bad weather times. A Forward Base (FB) is being established to relocate part of the emergency helicopter services. Prior to a fully established and commissioned FB is available, GFS will continue to use the route.
- 8.2.7 In addition to the helicopter noise arising from the operation of GFS helicopters in and out of HKIA via designated Silvermine Pass and Pak Mong Helicopter Holding Area will present an adverse impact on the Area, any development within the Pak Mong Holding Area will adversely affect GFS flight operations, particularly for emergency flights during bad weather times. Any future development or redevelopment within the Area should take into account this constraint.

#### Risk Hazard

- 8.2.8 The eastern part of the Area falls within the 1km Consultation Zone (CZ) of the Siu Ho Wan Water Treatment Works (SHWWTW). The SHWWTW is classified as Potentially Hazardous Installation (PHI) on account of the storage of liquefied chlorine in one tonne drums. For any proposed development in CZ of SHWWTW that will result in an increase in the number of persons living or working, the project proponent should prepare and submit a Hazard Assessment (HA) to the Coordinating Committee on Land-use Planning and Control relating to Potentially Hazardous Installations (CCPHI) to assess the potential risks associated with SHWWTW and obtain the approval from CCPHI. In addition, the Sham Shui Kok Chlorine Loading and Unloading Area (SSK CLUA) is located within CZ of SHWWTW. Relevant departments should be consulted if there is any development in the vicinity of SSK CLUA.
- 8.2.9 The high pressure gas pipeline and offtake & pigging station located to the southwest outside the Area are classified as Notifiable Gas Installations (NGIs) under the Gas Safety Ordinance (Cap. 51), and its



construction and use are required to undergo an approval system. The southwestern part of the Area is within 200m of these NGIs. For any proposed development in the vicinity (i.e. within 200m) of these NGIs, the increase in population brought by the proposed development would be a concern and thus a risk/hazard assessment would be required from the project proponent to assess the potential risks associated with these NGIs.

#### Infrastructure

- 8.2.10 Fresh water supply to Siu Ho Wan area is provided by SHWWTW. The existing water supply system does not have the capacity to meet the demand of future developments on Lantau. The water supply system will need to be upgraded and extended, which may include expansion of SHWWTW, construction of new pumping stations and construction of new service reservoirs at the hillside, to keep pace with the new developments in North Lantau.
- 8.2.11 Any increase in population or number of visitors to the Area or further residential/commercial developments will require upgrade or new sewage collection and transfer system to be provided to keep pace with the increasing sewage arising from the new development areas. Moreover, the existing Siu Ho Wan Sewage Treatment Works (SHWSTW) does not have the capacity to meet the demand for sewage treatment from the new developments on Lantau in the medium and long terms. The sewage treatment works will need to be expanded and upgraded. The proposed expansion of SHWSTW to its immediate west will subject to further study.

#### Geotechnical

- 8.2.12 The southern and eastern portions of the Area are overlooked by steep natural terrain and meet the Alert Criteria for a Natural Terrain Hazard Study (NTHS). For future development in these areas, the developer(s) may be required to carry out a NTHS and provide suitable mitigation works, if found necessary, as part of the development. Some of the land is overlooked by registered man-made slopes and retaining walls. If these slope features would affect or be affected by any development and redevelopment, geotechnical investigations and studies including the details of any permanent geotechnical works should be submitted to the Geotechnical Engineering Office (GEO) of CEDD for checking in accordance with the principle laid down in the Environment, Transport and Works Bureau Technical Circular (Works) No. 29/2002.
- 8.2.13 The area within the Designated Area of North-Shore Lantau might be underlain by locally complex geological condition. Due attention should be paid to the potential problems associated with high rise buildings and other structures involving deep foundation. The requirements as stipulated in the Environment, Transport and Works Bureau Technical Circular (Works) No. 4/2004 should be followed for government

projects and the Practice Note for Authorized Persons, Registered Structural Engineers and Registered Geotechnical Engineers (APP-134) should be followed for private projects.

#### Ecological Consideration

8.2.14 The southern periphery of the Area is adjoining to the Lantau North (Extension) Country Park, which is an integral part of the natural landscape comprising scrubland/shrubland with some existing trees scattered around. This area with high degree of naturalness should be protected against any impact from development. The Area also fronts on The Brothers Marine Park which was designated in 2016, with the aim to help better conserve the Chinese White Dolphins, their habitats and enhance the marine and fisheries resources therein.

#### Landscape Consideration

8.2.15 Major landscape feature in the vicinity is the Lantau North (Extension) Country Park which is a natural landscape of valuable landscape resources. The lowland slopes are vegetated scrubland/shrubland with some existing trees scattered around the area adjoining to the Lantau North (Extension) Country Park. Tree species observed within this area are native woodland species such as *Macaranga tanarius* 血桐, *Sterculia lanceolate* 假蘋婆, *Mallotus paniculatus* 白楸, *Dicranopteris pedata* 芒萁 and *Schefflera heptaphylla* 鵝掌柴. It would serve as a landscape buffer between the country park and built-up area to be preserved and conserved.

### **9. GENERAL PLANNING INTENTION**

The general planning intention for the Area is to reserve land for Government, Institution or Community (GIC) facilities and supporting infrastructure taking advantage of the geographical location and to facilitate sustainable residential/commercial development and maximise the development potential on suitable land. Due consideration should be given to preserve the existing natural landscape and maintain suitable buffer between the country park and the built-up area.

### **10. Urban Design Concept**

10.1 In general, the Area is mainly occupied by government land and the valley within the Area is predominantly occupied by low-rise GIC facilities, creating a visual relief space with an unobstructed view towards a natural mountain backdrop. Any development/redevelopment within this valley should respect the natural and rural characters of the surroundings, preserve the view towards the mountain backdrop and create a harmonious building height profile. Detailed building height restriction for the GIC facilities in the Area is specified in the adopted Siu Ho Wan Layout Plan No. L/I-SHW/1A.

- 10.2 Located amid Tai Ho Estuary and the low-rise GIC facilities in the Area, the Siu Ho Wan railway depot site, currently occupied by low-rise railway depot structures, provides an open view from NLH towards the sea and gives a transition from industrial/utilities uses to the natural and rural environment at Tai Ho. The relatively open area also facilitates penetration of prevailing winds within the Area. The proposed commercial/residential development atop the Siu Ho Wan depot would inevitably have an impact on the existing open view towards the sea and affect the transition between the Area and Tai Ho Estuary. To achieve a development that is compatible with the natural and rural character of the surroundings, preserve the visual character of the Area, any development/redevelopment on the depot site shall be planned and designed in a holistic manner to take into account, inter alia, preservation of view corridors and breezeways, integration with/transition to the waterfront and Tai Ho Estuary, the interface with the railway depot and adjacent GIC facilities, the gazetted Airport Height Restriction Plan (AHRP) and any potential amendments to the gazetted AHRP related to the Expansion of HKIA into a 3RS Project, etc. To this end, planning application in the form of layout plan for the development/redevelopment atop the depot site shall be required for approval by the Board to ensure an integrated and compatible layout for development.

## 11. LAND USE ZONINGS

### 11.1 “Government, Institution or Community” (“G/IC”) : Total Area 15.54 ha

11.1.1 The planning intention of this zone is primarily for the provision of GIC facilities serving the needs of the local residents and/or a wider district, region or the territory. It is also intended to provide land for uses directly related to or in support of the work of the Government, organisations providing social services to meet community needs, and other institutional establishments.

11.1.2 Most of the “G/IC” sites are to reflect the existing GIC uses, such as Siu Ho Wan Government Maintenance Depot, Siu Ho Wan Vehicle Pound/Vehicle Examination Centre and Weigh Station and Sham Shui Kok Chlorine Loading and Unloading Area. Sites are also reserved for other potential/proposed GIC uses including the service reservoirs to the east of the existing SHWWTW which are intended to serve TCNTE and other planned developments in North Lantau. Sites are also reserved for unforeseen GIC uses.

### 11.2 “Other Specified Uses” (“OU”) : Total Area 63.60 ha

11.2.1 This zone denotes land allocated or reserved for specified uses including the following:

“Railway Depot and Public Transport Interchange with Commercial/Residential Development”

- 11.2.2 This zone is intended primarily to provide land for railway depot with commercial and/or residential development above with the provision of public transport interchange, GIC facilities and other supporting facilities. This site is occupied by the MTR Siu Ho Wan Depot. The zoning is to facilitate appropriate planning control over the development mix, scale, design and layout of development, taking account of various environmental, traffic, infrastructure and other constraints as well as air ventilation and visual considerations.
- 11.2.3 To ensure that development or redevelopment would be developed and designed in an integrated manner, an applicant should submit a development or redevelopment proposal in the form of a layout plan with supporting documents, including environmental, drainage and sewerage, traffic and transport, air ventilation, visual and other relevant assessment reports, landscape and urban design proposal including connectivity proposals, as well as other materials as specified in the Notes of Plan for the approval of the Board. Adequate open space and GIC facilities shall be provided within the development to serve the future residents and the community.
- 11.2.4 Development and/or redevelopment in this “OU” site are subject to a maximum domestic GFA of 1,040,000 m<sup>2</sup> and a maximum non-domestic GFA of 30,000 m<sup>2</sup> for commercial use, which are demonstrated by an indicative scheme as part of the submission approved under the EIA Ordinance and justified by MTRCL’s supporting assessments. In addition, a public transport interchange, three 30-classroom schools, a total number of 24 kindergarten classrooms and a minimum of 4,000 m<sup>2</sup> GFA for social welfare facilities as required by the Government shall be provided within this “OU” site. A minimum of 75,600 m<sup>2</sup> open space will be provided to serve future residents. According to the indicative scheme submitted by MTRCL, the proposed development would provide a total of about 14,000 flats for a total population of about 37,800.
- 11.2.5 In determining the maximum GFA of the development and/or redevelopment in this “OU” site, the GFA for railway uses, public transport interchange, schools, GIC or social welfare facilities, as required by the Government, or covered walkway may be exempted from GFA calculation.
- 11.2.6 It is envisaged that the proposed development will comprise a podium accommodating the railway depot, public transport interchange, commercial/retail facilities and car parking facilities. Domestic towers will be provided above the landscape deck. The existing railway depot will be migrated by phases and a deck will be constructed on top of the depot to facilitate the commercial/residential development atop. The proposed commercial/residential development atop will also be

implemented by phases to tie in with the migration work of the railway depot. The phased development should be self-contained and sustaining in provision of GIC facilities.

11.2.7 Since the site is in elongated configuration sitting along the foothill facing the seafront, a number of urban design measures as demonstrated in the indicative scheme in support of the EIA should be made reference for the future development on the site. These include:

- (a) provision of at least four 30m-wide major air/visual corridors that generally align in the north-south and east-west directions and at least six 15m-wide supplementary air/visual corridors that generally align in the northwest-southeast directions amongst the residential towers to facilitate sea breeze penetration and improve visual permeability;
- (b) building disposition to enhance visual permeability, e.g. adoption of curvilinear layout for buildings along the southern site boundary;
- (c) provision of stepped building height profile with building heights gradually reduced from northeast to the southwest nearer to Tai Ho Wan. According to an indicative development scheme prepared by MTRCL for the approved EIA, the building height of the residential towers ranges from 86mPD to 106mPD;
- (d) submission of a connectivity proposal including but not limited to provision of all-weathered pedestrian walkway/linkage from different parts of the development within the site to the proposed railway station and commercial facilities, vertical connections among podium deck, podium and the waterfront, as well as the cycle track network and open space network to enhance connectivity and walkability within the site and also to the adjacent waterfront and nearby TCNTE; and
- (e) landscape planting on podium/deck and vertical greening on facades should be provided. Planting along the edges and terraced design with greening should be applied to the podium for further visual relief and interest. Local recess in some parts/potential set back at the northern part of the depot along the waterfront at ground level could be provided for creation of green pockets/aesthetically pleasing landscape design and proposal for public enjoyment and amenity.

11.2.8 The project proponent should examine design concepts and give due considerations to further alleviate the landscape and visual impact of the residential buildings and podium with a view to harmonizing with the landscape character of the surrounding area. Landscape and urban design proposals for the proposed development including but not limited to the features as mentioned in paragraph 11.2.7 above should be

submitted for approval by the Board upon application under section 16 of the Ordinance. Future developments within this zone should follow Sustainable Building Design Guidelines to achieve higher building permeability and improve wind environment.

- 11.2.9 The building height for the developments within this zone is subject to the gazetted AHRP and any potential amendments to the gazetted AHRP related to the Expansion of HKIA into a 3RS Project. No part of building or buildings or other structure or equipment erected or to be erected within the Area (or any addition or fitting to such building or buildings or structure or equipment) shall exceed the “restricted height” prescribed under the Hong Kong Airport (Control of Obstructions) Ordinance (Cap. 301), usually referred to as AHR, or any amendment thereto.
- 11.2.10 Aircraft noise due to overflight of approaching and departing aircraft from HKIA is anticipated for the proposed development. The developer(s) should explore and review the use of acoustic insulation in form of well-gasketed window to enhance the indoor living environment.
- 11.2.11 With the future 3RS operations in HKIA, a review of the existing AHR for the current 2RS operations is being conducted. Subject to verification of the new AHR, possible AHR relaxation can take effect administratively. As such, there is scope to further maximise the development potential of the site. To provide flexibility for maximizing development potential of the site upon relaxation of AHR and for innovative design adapted to the characteristics of the site and planning circumstances, relaxation of the GFA restriction may be considered by the Board through the planning application system. Each proposal will be considered on its individual planning merits.

“Water Treatment Works”

- 11.2.12 This zone is intended primarily for the provision of water treatment works serving the needs of the community.
- 11.2.13 The site includes the existing SHWWTW and a raw water booster pumping station to its northwest. The water treatment works treat water from Tai Lam Chung Reservoir and Shek Pik Reservoir before supplying to Tung Chung, Discovery Bay, HKIA, Siu Ho Wan, Penny’s Bay and other settlements in North Lantau.
- 11.2.14 The water treatment works are classified as PHI, any developments near the site shall comply with the recommendations contained in the CCPHI Report. Furthermore, any development proposal resulting in an increase in residential or working population within the Consultation Zone is subject to the approval of CCPHI.

“Sewage Treatment Works”

- 11.2.15 This zone is intended primarily for the provision of sewage treatment works serving the needs of the community. A site to the southeast of NLH has been developed into the SHWSTW serving Tung Chung, HKIA, Siu Ho Wan and Penny’s Bay.
- 11.2.16 The sewage treatment works will need further fitting-out, expansion and upgrading in order to cope with the additional sewage arising from the medium-term and long-term developments in North Lantau, including TCNTE, 3RS of HKIA, Siu Ho Wan Development, etc. The proposed expansion of SHWSTW to its immediate west will be subject to further study.

“Organic Resources Recovery Centre”

- 11.2.17 This zone is intended primarily to designate land for Organic Resources Recovery Centre (Phase I) (ORRC1) developed by the Environmental Protection Department. ORRC1 is currently under construction.

“Refuse Transfer Station”

- 11.2.18 This zone is intended primarily to designate land for refuse transfer station. This zone is occupied by the North Lantau Refuse Transfer Station. It receives solid waste collected from HKIA, TCNT, Kwai Chung, Tsuen Wan as well as additional solid waste from the HKIA wastewater treatment plant. The consolidated waste will eventually be transferred by barges to the West New Territories Landfill for disposal.

“Columbarium”

- 11.2.19 This zone is intended primarily to designate land for columbarium use and garden of remembrance. It is located at the western side of Sham Shui Kok Drive near NLH and the proposed Road P1.
- 11.2.20 The site can provide about 26,000 niches and a garden of remembrance. In view of its vicinity to the CZ of SHWWTW, the project proponent should prepare and submit a HA to the CCPHI to assess the potential risks associated with SHWWTW and obtain the approval from CCPHI.

“Pumping Station and Associated Facilities”

- 11.2.21 This zone is intended primarily to designate land for pumping station and associated facilities. This zone covers a Potable Water Booster Pumping Station near SHWWTW along Discovery Bay Tunnel Link, which serves Discovery Bay and is in operation.

11.3 “Green Belt” (“GB”) : Total Area 68.04 ha

- 11.3.1 The planning intention of this zone is primarily for defining the limits of urban and sub-urban development areas by natural features and to contain urban sprawl as well as to provide passive recreational outlets. There is a general presumption against development within this zone.
- 11.3.2 The lowland slopes adjoining the Lantau North (Extension) Country Park is zoned “GB” in order to preserve the natural vegetation and to serve as buffer between the developed areas and country park. This area is largely undeveloped hill slopes except for a few informal footpaths. The hilly area consists of scrubland/shrubland with some existing trees scattered around. At higher level, the hillsides are characterised by grassland and scattered rock outcrops

12. COMMUNICATIONS

- 12.1 The existing NLH, a dual-three-lane highway, is the major strategic road link connecting HKIA and TCNT with other parts of the territory. Siu Ho Wan railway depot is accessible through a slip road branching off NLH. Cheung Tung Road, which is primarily a single two-way utility service road runs along the southern side of NLH and provides access and maintenance convenience for the government uses and utility installations along the highway corridor as well as access to the Discovery Bay Tunnel Link. An underpass is built under NLH to connect the North Lantau Refuse Transfer Station and a site proposed for columbarium development to Cheung Tung Road.
- 12.2 TM-CLKL is a strategic road link connecting HKBCF of HZMB with other parts of the territory. The Southern Connection of TM-CLKL will connect with the existing NLH at Tai Ho/Siu Ho Wan. The proposed Tai Ho Interchange to the west of the Area is a grade-separated interchange serving as the major access point for vehicles from NLH to the Area. A slip road linking Cheung Tung Road and the Tai Ho Interchange is proposed under the TCNTE project.
- 12.3 The proposed Road P1 (Tung Chung to Tai Ho Section) is a primary distributor with dual-two-lane carriageway parallel to NLH providing another access to developments in Siu Ho Wan, Tai Ho and Tung Chung. It also serves to re-route traffic in the event of accidents on NLH. The road alignment and implementation of Road P1 (Tung Chung to Tai Ho Section) are subject to review in the detailed design stage of TCNTE. Further extension of the proposed Road P1 between Siu Ho Wan and Sunny Bay is subject to further studies.
- 12.4 Discovery Bay Tunnel Link is restricted to public buses, private buses, private light buses, goods vehicles, Urban and Lantau taxi, other specific vehicles and emergency vehicles under the Discovery Bay Tunnel Link Ordinance (Chapter 520) [Notice under section 23] gazetted on 26 October 2014.



- 12.5 The Airport Express (AE) and TCL run from east to west within the transport corridor on the northern shore of Lantau and pass through the Area. Two types of services are provided, AE runs between AsiaWorld-Expo Station and Hong Kong Station, and TCL runs between Tung Chung Station and Hong Kong Station through the urban area providing commuter service to developments in North Lantau.
- 12.6 Currently, the available public transport to the Area is by Lantau taxis, urban taxis or by the franchised bus service No. 36, which provides several departures daily each way (with additional services on Sunday and public holidays) between Siu Ho Wan and TCNT.

### **13. UTILITY SERVICES**

#### **13.1 Water Supply**

Fresh water supply to Siu Ho Wan area is provided by SHWWTW, currently via the pumping water main leading to Tung Chung fresh water service reservoir. Temporary mains water (i.e. fresh water) is being provided for flushing. The existing water supply system at Siu Ho Wan does not have the capacity to meet the demand of future developments in the Area. The water supply system will need to be upgraded and extended, which may include expansion of SHWWTW, construction of new pumping stations and construction of new service reservoirs at the hillside, to cater for additional demand from TCNTE and other planned developments in North Lantau.

#### **13.2 Sewerage**

The sewage collection and transfer system in Siu Ho Wan are being implemented in phases to keep pace with the new development areas. In the first phase, sewage arising from HKIA, Tung Chung and Penny's Bay is conveyed to SHWSTW via rising mains in the utility reserve. New sewerage systems will need to be provided to collect and transfer sewage to SHWSTW from the new development areas, including, TCNTE and Siu Ho Wan depot redevelopment, etc. The sewage treatment works will need to be expanded and upgraded. The proposed expansion of SHWSTW to its immediate west will be subject to further study.

#### **13.3 Drainage**

A drainage system has been devised for the Area that conveys the runoff from the upland steep basins to the seaward outfall points. It also collects stormwater drained from the reclamation area. The major components of the drainage system include an open channel and receptor running along the edge of the existing coastline to gather water from the major streams. Box culverts across the Area are constructed to direct stormwater into the sea. Secondary pipe culverts will also be built along Road P1.

#### 13.4 Electricity

The entire North Lantau Development is served primarily by a 132kV electricity network. The network is afforded by three submarine cables with landfall at Sham Shui Kok. At Sham Shui Kok Electricity Station to the east of the Area, the transmission voltage is stepped down to 11kV distribution level. Both 132kV and 11kV cables are routed via Cheung Tung Road to other primary substations and individual developments respectively.

#### 13.5 Gas

Town gas is supplied via the submarine gas pipeline to Ta Pang Po. There are several existing underground town gas transmission pipes located within the Area (running along and across NLH). Should any excavation works be required, prior liaison/coordination with the Hong Kong and China Gas Company Limited in respect of the exact location of existing or planned gas pipes routes/gas installations in the vicinity of the proposed work area and the minimum set back distance away from the gas pipelines is required. Reference should also be made to the Electrical and Mechanical Services Department's "Code of Practice on Avoiding Danger from Gas Pipes".

#### 13.6 Telecommunications

There is a new fibre optic cable telephone system with a telephone exchange at Tung Chung which also serves the Area.

### 14. CULTURAL HERITAGE

There are no declared monuments, graded buildings or recorded site of archaeological interest within the Area.

### 15. IMPLEMENTATION

15.1 Although existing uses non-conforming to the statutory zonings are tolerated, any material change of use and any other development/redevelopment must be always permitted in terms of the Plan or, if permission is required, in accordance with the permission granted by the Board. The Board has published a set of guidelines for the interpretation of existing use in the urban and new town areas. Any person who intends to claim an "existing use right" should refer to the guidelines and will need to provide sufficient evidence to support his claim. The enforcement of the zonings mainly rests with the Buildings Department, the Lands Department (LandsD) and the various licensing authorities.

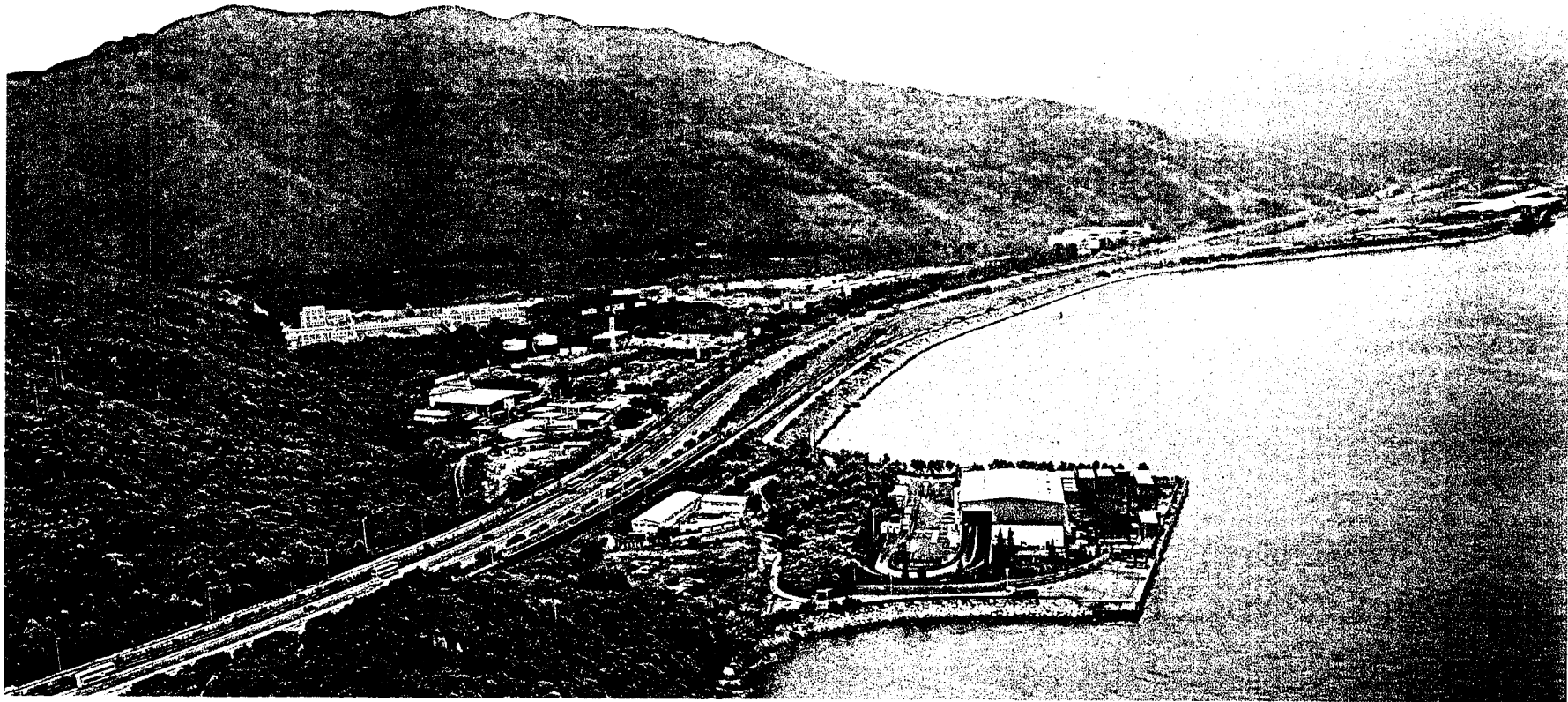
15.2 The overall programme for the provision of infrastructure within the Area will be subject to review in the detailed design stage. The implementation process will be gradual depending on the availability of resources. It will be undertaken through the participation of both public and private sectors. Disposal of sites is undertaken by LandsD. Land formation and the provision of infrastructure will

be co-ordinated by CEDD in conjunction with the client departments and the works departments, such as the Highways Department and the Architectural Services Department. Social welfare and other community facilities will be implemented by the appropriate government departments on the basis of the Capital Works Programme and other Public Works Programme. Public housing, if any, together with the supporting facilities will be built by the Housing Authority or other relevant agents.

- 15.3 Planning applications to the Board will be assessed on individual merits. In general, the Board, in considering planning applications, will take into account all relevant planning considerations which may include the departmental layout plans, and the guidelines published by the Board. The layout plans will be available for public inspection at PlanD. Guidelines published by the Board are available from the Board's website, the Secretariat of the Board and the Technical Services Division of PlanD. Application forms and guidance notes for planning applications can be downloaded from the Board's website and are available from the Secretariat of the Board and the Technical Services Division of PlanD. Applications should be supported by such materials as the Board thinks appropriate to enable it to consider the applications.

**TOWN PLANNING BOARD  
JANUARY 2018**

# PLANNING REPORT ON SIU HO WAN



# **PLANNING REPORT ON SIU HO WAN**

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## 1 INTRODUCTION

### 1.1 Purpose of the Planning Report

The purpose of this Planning Report is to give an account of the background and an appraisal of the existing conditions, characteristics and development opportunities/constraints of the Siu Ho Wan area (the Area). It also aims at providing a basis for the preparation of the Siu Ho Wan Outline Zoning Plan (OZP) and the formulation of a planning framework to guide future development of the Area.

### 1.2 Background

1.2.1 Siu Ho Wan (**Figure 1**) is located to the east of Tung Chung New Town Extension (TCNTE) area at the northern shore of Lantau Island (**Figure 2**). The Area is largely formed by reclamation. It houses various utility facilities including sewage treatment works, water treatment works, refuse transfer station and railway depot, etc in supporting the adjacent new town development, the Hong Kong International Airport (HKIA) and Northeast Lantau developments.

1.2.2 The former Financial Secretary stated in his 2012 Budget that the Government should make optimal use of the development potential of railway-property projects and invite the Mass Transit Railway Corporation Limited (MTRCL) to explore opportunities for development along railways. The former Chief Executive (CE) announced in his 2013 Policy Address that the Government would explore vigorously the residential development potential of land along existing and planned railways. The 2015 Policy Address reaffirmed the initiative to explore the development potential of stations and related sites along existing and future rail lines, specifically highlighting Siu Ho Wan railway depot on Lantau, as one of the short and medium-term measures to increase land supply to meet the public's housing needs.

1.2.3 According to the Sustainable Lantau Blueprint published by the Government in June 2017, Siu Ho Wan Development is one of the key projects within the "North Lantau Corridor" which is proposed mainly for economic and housing development.



1.2.4 MTRCL which is the current occupier and operator of the Siu Ho Wan railway depot, commissioned a technical study to explore the feasibility of residential and commercial development atop the depot. Preliminary technical assessments have been carried out to review the feasibility of the development proposal and the required supporting infrastructure. Relevant Environmental Impact Assessments (EIAs) for the proposal were also submitted under the EIA Ordinance. The findings and recommendations of the technical study including the statutory EIAs would also serve as a reference to formulate appropriate land use control on future development on the Siu Ho Wan depot site.

1.2.5 Given that all the land in Siu Ho Wan area except the railway depot is government land occupied by various utility facilities, the preparation of a Development Permission Area plan to enable statutory planning enforcement control on the area is considered not necessary.

1.2.6 It is considered that preparation of a draft OZP is more appropriate to take account of the overall

existing and planned land uses under the recent studies to provide a statutory planning framework to guide long-term development of the Area.

1.2.7 On 7 December 2017, under the power delegated by the CE, the Secretary for Development pursuant to section 3(1)(a) of the Ordinance, directed the Town Planning Board (the Board) to prepare an OZP for the Area. On 29 November 2017, the EIA Reports for “Siu Ho Wan Station and Siu Ho Wan Depot Replanning Works” and “Proposed Comprehensive Residential and Commercial Development atop Siu Ho Wan Depot” were approved with conditions in accordance with the provisions of the EIA Ordinance (Cap.499).

## 2 THE STUDY AREA

### 2.1 Location (Figures 2 &3)

2.1.1 The Area covers about 186 ha of land in the eastern extremity of the TCNTE. It stretches from Sham Shui Kok in the northeast to the proposed Tai Ho Interchange in the southwest enclosed by the Lantau North (Extension) Country Park in the east and south with foothills of Tai Che Tung, Lau Fa Tung and Lo Fu Tau within the Country Park.

2.1.2 Vehicular access to the Area is via Cheung Tung Road which runs in parallel to North Lantau Highway (NLH), connecting the Area to Tung Chung, HKIA and the metro area. Siu Ho Wan railway depot is also accessible through a slip road branching off NLH.

### 2.2 Physical Setting and Conditions

The Area is mainly occupied by various infrastructure and government uses to support Tung Chung New Town (TCNT), HKIA and Northeast Lantau developments. The land to the south/southeast of NLH contains primarily depots and utility installations, such as sewage treatment

works, water treatment works, organic resources recovery centre, etc and slope areas adjoining the Lantau North (Extension) Country Park which are largely a continuous stretch of scrubland/shrubland with some existing trees scattered around. Land to the north of the NLH houses mainly a railway depot in the west, a refuse transfer station and a site proposed for columbarium development in the east. As most of the land is formed by reclamation, the shoreline is circumvented by the existing man-made seawall without natural coastal features. There is no existing residential and commercial development nor village settlement within the Area. To its southwest are Tai Ho Valley, Tai Ho Wan and Tai Ho Stream which have been identified as one of the 12 priority sites for enhanced conservation under the New Nature Conservation Policy with a view to better conserving this ecologically important area.

### 2.3 Historical Development

Siu Ho Wan was a bay located at the north shore of Lantau Island. It was surrounded by hillside with vegetation fronting an open sea in the 1980s. Part of the vegetation at the foothills of the natural terrain was removed due to slope formation and the bay was largely reclaimed for

development purpose in the early 1990s, in association with the construction of NLH and the Airport Railway. The reclamation and the associated construction works were completed in 1997. Siu Ho Wan railway depot is the largest single development on the existing reclamation area.

#### 2.4 Population and Employment

The Area has no residential population. There are only a limited number of workers in the utility installations and depots. The existing water treatment works are classified as Potentially Hazardous Installation (PHI) due to the storage of liquefied chlorine in one tonne drums. In accordance with the relevant Coordinating Committee on Land-use Planning and Control relating to Potentially Hazardous Installations (CCPHI) Report, no more than 300 workers should be allowed in the area adjacent to the water treatment works.

#### 2.5 Existing and Committed Land Uses

The major existing land uses in the Area include the following (Figures 4 & 5a to 5c):

#### *Government, Institution or Community (GIC) Facilities*

2.5.1 Major existing/planned/proposed GIC facilities in the Area to meet the community needs include:

- (a) North Lantau Refuse Transfer Station;
- (b) proposed columbarium development;
- (c) Siu Ho Wan Vehicle Pound / Vehicle Examination Centre and Weigh Station;
- (d) Organic Resources Recovery Centre (Phase 1) (under construction);
- (e) Siu Ho Wan Water Treatment Works;
- (f) Siu Ho Wan Sewage Treatment Works; and
- (g) Siu Ho Wan Government Maintenance Depot

2.5.2 Other existing GIC facilities include Sham Shui Kok Chlorine loading and unloading area and Civil Engineering and Development Department (CEDD) Public Works Regional Laboratory.

#### *Industrial Uses*

2.5.3 There are three bus maintenance depot sites in the Area. The bus depots have been allocated to three franchised bus companies under short term tenancies.

2.5.4 A railway depot for the Airport Express (AE), Tung Chung Line (TCL) and Disneyland Resort Line (DRL) is located to the north of the NLH.

2.5.5 There are also several temporary works/storage areas allocated to Highways Department, Drainage Services Department and Environmental Protection Department for infrastructure projects.

*Others*

2.5.6 The Discovery Bay Tunnel Link connects Discovery Bay with Cheung Tung Road. The Discovery Bay Tunnel Link toll plaza is located at the end of Tunnel Link.

2.5.7 There is a Potable Water Booster Pumping Station near Siu Ho Wan Water Treatment Work along Discovery Bay Tunnel Link which is already in operation.

2.6 Transportation

2.6.1 The existing NLH, a dual-three-lane highway, is

the major strategic road link connecting HKIA and TCNT with other parts of the territory. Before the opening of the Northern Connection of Tuen Mun – Chek Lap Kok Link (TM-CLKL), NLH is the only access road for the public transport services to / from HKIA and TCNT. Siu Ho Wan railway depot is accessible through a slip road branching off NLH. Cheung Tung Road, which is primarily a single two-way utility service road runs along the southern side of NLH and provides access and maintenance convenience for the government uses and utility installations along the highway corridor as well as access to the Discovery Bay Tunnel Link. An underpass is built under NLH to connect the North Lantau Refuse Transfer Station and a site proposed for columbarium development to Cheung Tung Road.

2.6.2 TM-CLKL is a strategic road link connecting Hong Kong Boundary Crossing Facilities (HKBCF) of the Hong Kong-Zhuhai-Macao Bridge (HZMB) with other parts of the territory. The Southern Connection of TM-CLKL will connect with the existing NLH at Tai Ho/Siu Ho Wan.

- 2.6.3 The proposed Tai Ho Interchange to the west of the Area is a grade-separated interchange serving as the major access point for vehicles from NLH to the Area. A slip road linking Cheung Tung Road and the Tai Ho Interchange is proposed under the TCNTE project to improve the connectivity between TCNTE area and Tai Ho area.
- 2.6.4 The proposed Road P1 (Tung Chung to Tai Ho Section) is a primary distributor with dual-two-lane carriageway parallel to NLH providing another access to developments in Siu Ho Wan, Tai Ho and Tung Chung. It also serves to re-route traffic in the event of accidents on the NLH. The road alignment and implementation of Road P1 (Tung Chung to Tai Ho Section) are subject to review in the detailed design stage of TCNTE. Further extension of the proposed Road P1 between Siu Ho Wan and Sunny Bay is subject to further studies.
- 2.6.5 Under the Discovery Bay Tunnel Link Ordinance (Chapter 520) [Notice under section 23] gazetted on 26 October 2014, public buses, private buses, private light buses, goods vehicles, Urban and Lantau taxi, other specific vehicles and emergency

vehicles are allowed to use the tunnel link.

- 2.6.6 Currently, the available public transport to the Area is by Lantau taxis, urban taxis or by the franchised bus service No. 36, which provides several departures daily each way (with additional services on Sunday and public holidays) between Siu Ho Wan and TCNT.
- 2.6.7 The AE and TCL run from east to west within the transport corridor on the northern shore of Lantau and pass through the Area. Two types of services are provided, the AE runs between AsiaWorld-Expo Station and Hong Kong Station, and the TCL runs between Tung Chung Station and Hong Kong Station through the urban area providing commuter service to developments in North Lantau.

## 2.7 Land Ownership

Majority of the Area is government land occupied by public utility facilities and other short-term uses except MTR running line and Siu Ho Wan depot which has been granted to MTRCL by private treaty for use as a railway workshop and a maintenance depot from 1995 to 2050. A

small part of the Area at the uphill to the east of the Area falls within the area covered by a Deed of Restrictive Covenant.

## 2.8 Infrastructure and Utility Services

### *Water Supply*

2.8.1 Fresh water supply to Siu Ho Wan area is provided by Siu Ho Wan Water Treatment Works (SHWWTW), currently via the pumping water main leading to Tung Chung fresh water service reservoir. Temporary mains water (i.e. fresh water) is being provided for flushing. The existing water supply system at Siu Ho Wan does not have the capacity to meet the demand of future developments in the Area. The water supply system will need to be upgraded and extended, which may include expansion of Siu Ho Wan Water Treatment Works (SHWWTW), construction of new pumping stations and construction of new service reservoirs at the hillside, to cater for additional demand from TCNTE and other planned developments in North Lantau.

### *Sewerage*

2.8.2 The sewage collection and transfer system in Siu Ho Wan are being implemented in phases to keep pace with the new development areas. In the first phase, sewage arising from the HKIA, Tung Chung and Penny's Bay is conveyed to Siu Ho Wan Sewage Treatment Works via rising mains in the utility reserve. New sewerage systems will need to be provided to collect and transfer sewage to the SHWSTW from the new development areas, including, TCNTE and Siu Ho Wan depot development, etc. The sewage treatment works will need to be expanded and upgraded. The proposed expansion of the SHWSTW to its immediate west will subject to further study.

### *Drainage*

2.8.3 A drainage system has been devised for the Area that conveys the runoff from the upland steep basins to the seaward outfall points. It also collects stormwater drained from the reclamation area. The major components of the drainage system include an open channel and receptor running along the

edge of the existing coastline to gather water from the major streams. Box culverts across the Area are constructed to direct stormwater into the sea. Secondary pipe culverts will also be built along Road P1.

### *Electricity*

2.8.4 The entire North Lantau Development is served primarily by a 132kV electricity network. The network is afforded by three submarine cables with landfall at Sham Shui Kok. At Sham Shui Kok Electricity Station to the east of the Area, the transmission voltage is stepped down to 11kV distribution level. Both 132kV and 11kV cables are routed via Cheung Tung Road to other primary substations and individual developments respectively.

### *Gas*

2.8.5 Town gas is supplied via the submarine gas pipeline to Ta Pang Po. There are several existing underground town gas transmission pipes located within the Area (running along and across NLH).

Should any excavation works is required, prior liaison/coordination with the Hong Kong and China Gas Company Limited in respect of the exact location of existing or planned gas pipes routes/gas installations in the vicinity of the proposed work area and the minimum set back distance away from the gas pipelines is required. Reference should also be made to the Electrical and Mechanical Services Department's "Code of Practice on Avoiding Danger from Gas Pipes".

### *Telephone*

2.8.6 There is a new fibre optic cable telephone system with a telephone exchange at Tung Chung which also serves the Area.

### *Bus Depots*

2.8.7 The three bus depots in Siu Ho Wan area are essential facilities for provision of proper and efficient franchised bus services for HKIA, Tung Chung, HKBCF of HZMB and other planned developments on Lantau. The sites are being utilised for provisioning of bus repair, cleansing,

parking and refuelling services and are strategically located in North Lantau to the effect that the franchised bus operators can minimize dead mileage of buses to/from the depot and can deploy replacement buses and recovery vehicles in a swift manner in the event of bus breakdown in the area. Due to the expansion of bus fleets to cater for the new demand from TCNTE and other planned developments on Lantau, expansion of the bus depots is desirable. The Government is currently conducting a preliminary assessment and review on the long-term provision of depots for franchised buses in the territory.



### 3 PLANNING ANALYSIS

#### 3.1 Planning Contexts

3.1.1 The Area, situated in the northshore Lantau, has always been an integral part of Lantau development. Upon completion of the Port and Airport Development Strategy (PADS) in 1989, the Government decided to build a replacement international airport at Chek Lap Kok, i.e. the current HKIA. The PADS also recommended to develop North Lantau New Town (NLNT) as a supporting community of HKIA. Subsequently, the North Lantau Development Study (1992) proposed development of a new town in the area to accommodate an ultimate population of about 260,000. Siu Ho Wan was considered in the Study to be a suitable location for industrial activities related to the new airport and other major utilities such as water treatment works and sewage treatment works. With the subsequent change in planning circumstances of the surrounding area including the designation of Tai Ho Stream as Site of Special Scientific Interest (SSSI) in 1999, the introduction of the New Nature Conservation Policy in 2004 and the development of strategic

infrastructure projects in North Lantau such as HZMB and the associated boundary crossing facilities, as well as TM-CLKL, development of the area has evolved accordingly.

3.1.2 Pursuant to the 2004 Policy Address, the Lantau Development Task Force was set up in February 2004 to provide a high-level policy steer on economic and infrastructure development on Lantau. The Revised Concept Plan for Lantau endorsed by the Task Force in 2007 recommended the water off Siu Ho Wan could be reclaimed to host the Lantau Logistic Park (LLP) and to serve as a transportation hub given its proximity to HZMB. Together with HKIA and other strategic transport links, the proposed LLP would strengthen Hong Kong's role as a regional transport and logistics centre.

3.1.3 On the other hand, the former Financial Secretary stated in his 2012 Budget that the Government should make optimal use of the development potential of railway-property projects and invite MTRCL to explore opportunities for development along railways. In 2013, the former CE stipulated

in his Policy Address that the top priority of the Government was to tackle the housing problem and the Government would explore vigorously the residential development potential of land along existing and planned railways. The former CE reaffirmed in his 2015 Policy Address that the initiative to explore the development potential of stations and related sites along existing and future rail lines, specifically highlighting Siu Ho Wan on Lantau, as one of the short and medium-term measures to increase land supply to meet the public's housing and other needs.

3.1.4 Taking into account comments of the Lantau Development Advisory Committee (LanDAC) formed in January 2014 to provide advice conducive to the sustainable development and conservation of Lantau, and public's view gathered during the public engagement exercise carried out between January and April 2016, the Sustainable Lantau Blueprint was published by the Government in June 2017 to provide a reference roadmap for guiding and implementing the development and conservation initiatives on Lantau. Siu Ho Wan Development is one of the

key projects within the "North Lantau Corridor" which is proposed mainly for economic and housing development (**Figure 6**).

3.1.5 For strategic traffic and transport infrastructure, a possible railway station at Siu Ho Wan is being explored by MTRCL to provide train service for the residents of the proposed property development atop the existing Siu Ho Wan Depot.

### 3.2 Development Opportunities

#### *Optimising the use of land along railway*

3.2.1 Being located in the proximity to TCNTE and connected with urban areas by strategic rail and road links, Siu Ho Wan, which is currently occupied by government and depot uses, has the potential to accommodate housing development with higher development intensities. TCL and NLH, providing convenient connection between Tung Chung and the urban areas, could also serve to enhance the accessibility of Siu Ho Wan area with a possible railway station at Siu Ho Wan and suitable road base transport network enhancement.

3.2.2 Topside development of Siu Ho Wan depot is also in line with the Government policy for rail-based development to facilitate fast and mass movement of people in an environmentally-friendly mode of transport. Opportunities exist to make better use of valuable land resources atop the railway depot. The depot site requires no private land resumption and hence could be implemented in a timely manner. Early implementation of residential development atop the depot could help address the acute demand for housing.

### 3.3 Development Constraints (Figure 7)

#### *Accessibility*

3.3.1 Currently, Cheung Tung Road is the only proper external vehicular access to the Area except Siu Ho Wan railway depot which is connected by a particular slip road branching off NLH. The Tai Ho Interchange proposed under the TCNTE project serving as the major access point from NLH to Cheung Tung Road would improve the accessibility of the Area. However, with the

anticipated increase in traffic to be generated by new developments, both Lantau Link and NLH are expected to be subject to capacity constraints. New roads (Road P1 and Route 11) would be necessary to meet the development needs of the Area. The possible traffic impact of new developments on NLH and Lantau Link will be carefully considered and assessed.

#### *Noise and Vehicle Emissions*

3.3.2 Development within the Area is constrained by adverse traffic noise and emissions from NLH and railway. The latest infrastructure proposals around North Lantau including TM-CLKL and HZMB (including the associated Hong Kong Link Road and HKBCF) projects would likely increase the traffic flow on NLH which in turn may have further implication on the environment of the Area. The potential development atop Siu Ho Wan depot has been studied under the EIA process and noise mitigation measures have been proposed in accordance with the EIA Ordinance.

3.3.3 Aircraft approaching and departing from HKIA is identified as one of the key existing noise sources which affects the Area. Although the Area falls outside the coverage of Noise Exposure Forecast (NEF) 25 contour under the HKIA three-runway system (3RS), the Area is in proximity to HKIA, which is a very busy airport operating 24 hours and aircraft noise due to overflight of approaching and departing aircraft is anticipated. The developer(s) in the Area should explore and review the use of acoustic insulation in form of well-gasketed window to enhance the indoor living environment.

3.3.4 In addition, the Area is in proximity to the helicopter holding area above Pak Mong and HKIA and helicopter flight paths, which might also contribute to noise environment.

*Civil Aviation*

3.3.5 Given its proximity to HKIA, the Area is subject to Airport Height Restriction (AHR). No part of any building or buildings or other structure or equipment erected or to be erected within the Area, or any addition or fitting to such building or

buildings or structure or equipment shall exceed the “restricted height” prescribed under the Hong Kong Airport (Control of Obstructions) Ordinance (Cap. 301), any regulation or order made thereunder and any amending legislation.

3.3.6 A study with regard to feasibility of relaxing the existing AHR for the current two-runway system (2RS) operations is being conducted with the assistance of the Civil Aviation Department (CAD). The study results will be subject to verification of the new AHR for the future 3RS operations. Any AHR relaxation, if feasible, can take effect administratively by temporary exemption by CAD after verification of the new AHR under 3RS operations in 2018 tentatively pending legislative amendment under the Hong Kong Airport (Control of Obstructions) Ordinance (Cap. 301) tentatively in 2021.

3.3.7 Besides, the western tip of the Area is beneath a helicopter holding area “H5” over Pak Mong, which is an essential helicopter holding point for GFS flight operations and emergency response flights. In addition, the Area is also within the

vicinity of the NLH route, which is a 500 feet high (above mean sea level) flight corridor along the coastline of North Lantau between Pak Mong and the Toll Plaza of the Tsing Ma Bridge. The NLH route is essential for GFS to conduct emergency response flights during bad weather times. A Forward Base (FB) is being established by GFS and CEDD to relocate part of the emergency helicopter services. Prior to a fully established and commissioned FB is available, GFS will continue to use the NLH route.

- 3.3.8 In addition to the helicopter noise arising from the operation of GFS helicopters in and out of HKIA via designated Silvermine Pass and Pak Mong Helicopter Holding Area which will induce an adverse impact on the Area, any development within the Pak Mong Holding Area will adversely affect GFS flight operations, particularly for emergency flights during bad weather times. Any future development or redevelopment within the Area should take into account this constraint.

*Risk Hazard*

- 3.3.9 The eastern part of the Area falls within the 1km Consultation Zone (CZ) of the SHWWTW. The SHWWTW is classified as PHI on account of the storage of liquefied chlorine in one tonne drums. For any proposed development in the CZ of SHWWTW that will result in an increase in the number of persons living or working, the project proponent should prepare and submit a Hazard Assessment (HA) to the CCPHI to assess the potential risks associated with SHWWTW and obtain the approval from CCPHI. In addition, the Sham Shui Kok Chlorine Loading and Unloading Area (SSK CLUA) is located within CZ of SHWWTW. WSD and EPD should be consulted if there is any development in the vicinity of SSK CLUA.

- 3.3.10 The high pressure gas pipeline and offtake & pigging station located to the southwest outside the Area are classified as Notifiable Gas Installations (NGIs) under the Gas Safety Ordinance (Cap. 51), and its construction and use are required to undergo an approval system. The southwestern part of the Area is within 200m of these NGIs. For any proposed development in the vicinity (i.e.

within 200m) of these NGIs, the increase in population brought by the proposed development would be a concern and thus a risk/hazard assessment would be required from the project proponent to assess the potential risks associated with these NGIs.

*Limited Infrastructure*

3.3.11 Fresh water supply to Siu Ho Wan area is provided by SHWWTW. The existing water supply system does not have the capacity to meet the demand of future developments on Lantau. The water supply system will need to be upgraded and extended, which may include expansion of SHWWTW, construction of new pumping stations and construction of new service reservoirs at the hillside, to keep pace with the new developments in North Lantau.

3.3.12 Any increase in population or number of visitors to the Area or further residential/commercial developments will require upgrade or new sewage collection and transfer system to be provided to keep pace with the increasing sewage arising from

the new development areas. Moreover, the existing SHWSTW do not have the capacity to meet the demand for sewage treatment from the new developments on Lantau in the medium and long terms. The sewage treatment works will need to be expanded and upgraded. The proposed expansion of SHWSTW to its immediate west will be subject to further study.

*Geotechnical Constraints*

3.3.13 The southern and eastern portions of the Area are overlooked by steep natural terrain and meet the Alert Criteria for a Natural Terrain Hazard Study (NTHS). For future development in these areas, the developer(s) may be required to carry out a NTHS and provide suitable mitigation works, if found necessary, as part of the development. Some of the land is overlooked by registered man-made slopes and retaining walls. If these slope features would affect or be affected by any development and redevelopment, geotechnical investigations and studies including the details of any permanent geotechnical works should be submitted to the Geotechnical Engineering Office (GEO) of the

CEDD for checking in accordance with the principle laid down in the Environment, Transport and Works Bureau Technical Circular (Works) No. 29/2002.

- 3.3.14 The area within the Designated Area of North-Shore Lantau might be underlain by locally complex geological condition. Due attention should be paid to the potential problems associated with high rise buildings and other structures involving deep foundation. The requirements as stipulated in the Environment, Transport and Works Bureau Technical Circular (Works) No. 4/2004 should be followed for government projects and the Practice Note for Authorized Persons, Registered Structural Engineers and Registered Geotechnical Engineers (APP-134) should be followed for private projects.

#### *Ecological Consideration*

- 3.3.15 The southern periphery of the Area is adjoining to the Lantau North (Extension) Country Park, which is an integral part of the natural landscape comprising scrubland/shrubland with some existing

trees scattered around. This area with high degree of naturalness should be protected against any impact from development. The Area also fronts on The Brothers Marine Park which was designated in 2016, with the aim to help better conserve the Chinese White Dolphins, their habitats and enhance the marine and fisheries resources therein.

#### *Landscape Consideration*

- 3.3.16 Major landscape feature in the vicinity is Lantau North (Extension) Country Park which is a natural landscape of valuable landscape resources. The lowland slopes are vegetated scrubland/shrubland with some existing trees scattered around the area adjoining to the Lantau North (Extension) Country Park. Tree species observed within this area are native woodland species such as *Macaranga tanarius* 血桐, *Sterculia lanceolate* 假蘋婆, *Mallotus paniculatus* 白楸, *Dicranopteris pedata* 芒萁 and *Schefflera heptaphylla* 鵝掌柴. It would serve as a landscape buffer between the Country Park and built-up area to be preserved and conserved.

3.4 Development Pressure/Proposals

3.4.1 At present, there are no private developments proposed in the Area except the proposed development at Siu Ho Wan railway depot. It is anticipated that development in the Area would be only limited to government uses related to infrastructure and Government, Institution or Community (GIC) facilities. The hillsides at the east and south of the Area fall within the Strategic Cavern Areas delineated under the Cavern Master Plan, which are considered with potential for cavern development. The potential portal locations identified in the Strategic Cavern Areas fall within the Area. A consultancy study on the Siu Ho Wan reclamation and landside development is also being conducted to explore the technical feasibility as one of the five shortlisted sites being identified under the Enhancing Land Supply Strategy - Reclamation outside Victoria Harbour and Rock Cavern Development.

*Proposed Residential and Commercial Development atop Siu Ho Wan Depot*

3.4.2 In response to the policy initiative to make full use of the potential of land along railway for property development, MTRCL has commissioned a study to explore the potential for residential development at Siu Ho Wan depot since 2012.

3.4.3 On 12.5.2017, the MTRCL submitted two EIA reports covering Siu Ho Wan Station and Siu Ho Wan Depot Replanning Works as well as Proposed Residential and Commercial Development atop Siu Ho Wan Depot to EPD for consideration under the EIA Ordinance. The EIA Reports were published for public inspection in July 2017 in accordance with the provisions of the EIA Ordinance (Cap.499). The EIAs were approved with conditions on 29 November 2017.

3.4.4 In December 2017, MTRCL submitted the finalised study report of the proposed residential and commercial development atop Siu Ho Wan depot for Government's consideration (**Annex I**). The entire 30-ha depot site is proposed to be decked over with railway facilities provided within the deck and property development on top.



3.4.5 According to the proposal, a residential development with 14,000 flats, in 108 tower blocks of 15 to 22 residential storeys with commercial and other GIC facilities is proposed on top of the railway depot. Development will be implemented in 4 phases. The construction of the proposed topside development will be commenced in 2023-24 and the first population intake is anticipated in 2026-27. A possible railway station on TCL as well as a Public Transport Interchange are being explored by MTRCL to serve the topside development.

3.4.6 Preliminary technical assessment on various aspects including traffic and transport, air ventilation, environmental, sewerage, drainage, water supply and utilities, quantitative risk, geotechnical and structural feasibility, landscape and visual for the proposed residential and commercial development atop Siu Ho Wan depot have been undertaken. According to MTRCL's study, it is concluded that the proposed development can comply with relevant regulations and requirements and are broadly feasible without insurmountable planning and engineering problems subject to appropriate

improvement and mitigation measures.

## 4 PLANNING PROPOSALS

### 4.1 The Outline Zoning Plan

4.1.1 The draft Siu Ho Wan OZP (the Plan) prepared under section 3(1)(a) of the Ordinance is to provide a statutory framework for planning control over the Area. Uses and developments that are always permitted and those for which the Board's permission must be sought in various zones are set out in a schedule of Notes attached to the Plan. Also accompanying the Plan is an Explanatory Statement to assist an understanding of the Plan and to reflect the planning intentions and objectives of the Board for various land-use zonings.

### 4.2 Planning Objectives

4.2.1 In line with the planning strategy of economic and housing development in the Area but at the same time giving due consideration to development constraints such as the existence of PHI and other infrastructure provisions, the development of the Area should gear towards the following objectives:

- to reserve land for GIC facilities and supporting infrastructure;
- to facilitate sustainable residential and commercial development on suitable land; and
- to preserve the existing natural landscape including the landscape resources and landscape character areas such as trees/vegetation types/landform/topography and maintain suitable buffer between the Country Park and the built-up area.

### 4.3 Planning Principles

4.3.1 The main planning principles below are adopted for preparation of the planning and development proposals of the Area:

- (a) suitable land should be designated/reserved for existing/potential GIC facilities/expansion, taking advantage of the geographical location;
- (b) to maximise the development potential of the existing railway depot through residential and

commercial development in sustainable manner on top of the depot; and

- (c) to provide an buffer between the developed areas and the adjoining Lantau North (Extension) Country Park. This buffer area, which is largely a continuous stretch of scrubland/shrubland with some existing trees scattered around, should be preserved and protected in its natural state to safeguard the natural landscape.

#### 4.4 Urban Design Concept

4.4.1 In general, the Area is mainly occupied by government land and the valley within the Area is predominantly occupied by low-rise GIC facilities, creating a visual relief space with an unobstructed view towards a natural mountain backdrop. Any development/redevelopment within this valley should respect the natural and rural characters of the surroundings, preserve the view towards the mountain backdrop and create a harmonious building height profile. Detailed building height restriction for the GIC facilities in the Area is

specified in the adopted Siu Ho Wan Layout Plan No. L/I-SHW/1A.

4.4.2 Located amid Tai Ho Estuary and the low-rise GIC facilities in the Area, the Siu Ho Wan railway depot site, currently occupied by low-rise railway depot structures, provides an open view from NLH towards the sea and gives a transition from industrial/utilities uses to the natural and rural environment at Tai Ho. The relatively open area also facilitates penetration of prevailing winds within the Area. The proposed commercial/residential development atop the Siu Ho Wan depot would inevitably have an impact on the existing open view towards the sea and affect the transition between the Area and Tai Ho Estuary. To achieve a development that is compatible with the natural and rural character of the surroundings and to preserve the visual character of the Area, any development/redevelopment on the depot site shall be planned and designed in a holistic manner to take into account, inter alia, preservation of view corridors and breezeways, integration with/transition to the waterfront and Tai Ho Estuary, the interface with the railway depot and

adjacent GIC facilities, the gazetted Airport Height Restriction Plan (AHRP) and any potential amendments to the gazetted AHRP related to the Expansion of HKIA into a 3RS Project, etc. To this end, planning application in the form of layout plan for the development/redevelopment atop the depot site shall be required for approval by the Board to ensure an integrated and compatible layout for development.

#### 4.5 Land Use Proposals (Figure 8)

4.5.1 In the designation of various land use zones in the Area, consideration has been given to the natural environment, physical landform, existing land use pattern and availability of infrastructure. It also takes into account the relevant recommendations of the Policy Address, the Sustainable Lantau Blueprint and other relevant Government studies on land use development in North Lantau and infrastructure capacities affecting the Area. The following land use zones are proposed to be designated on the OZP.

#### 4.5.2 “Government, Institution or Community” (“G/IC”)

- (a) The planning intention of this zone is primarily for the provision of GIC facilities serving the needs of the local residents and/or a wider district, region or the territory. It is also intended to provide land for uses directly related to or in support of the work of the Government, organisations providing social services to meet community needs, and other institutional establishments.
- (b) Most of the “G/IC” sites are to reflect the existing GIC uses, such as the Siu Ho Wan Government Maintenance Depot, Siu Ho Wan Vehicle Pound/Vehicle Examination Centre and Weigh Station and Sham Shui Kok Chlorine Loading and Unloading Area.
- (c) Sites are also reserved for other potential/proposed GIC uses including the service reservoirs to the east of the existing SHWWTW which are intended to serve TCNTE and other planned developments in North Lantau. Other “G/IC” sites are now

occupied by temporary uses including works areas and bus depots. Long term uses of these sites are yet to be designated.

#### 4.5.3 “Other Specified Uses” (“OU”)

This zoning denotes land allocated or reserved for the following specified uses:

##### *Railway Depot and Public Transport Interchange with Commercial/Residential Development*

(a) This zone is intended primarily to provide land for railway depot with commercial and/or residential development above with the provision of public transport interchange, GIC facilities and other supporting facilities. This site is at present occupied by the MTR Siu Ho Wan Depot. The zoning is to facilitate appropriate planning control over the development mix, scale, design and layout of development, taking account of various environmental, traffic, infrastructure and other constraints as well as air ventilation and visual considerations.

(b) To ensure that development or redevelopment would be developed and designed in an integrated manner, an applicant should submit a development or redevelopment proposal in the form of a layout plan with supporting documents, including environmental, drainage and sewerage, traffic and transport, air ventilation, visual and other relevant assessment reports, landscape and urban design proposals including connectivity proposals, as well as other materials as specified in the Notes of Plan for the approval of the Board. Adequate open space and GIC facilities shall be provided within the development to serve the future residents and the community.

(c) Development and/or redevelopment in this “OU” site are subject to a maximum domestic GFA of 1,040,000 m<sup>2</sup> and a maximum non-domestic GFA of 30,000 m<sup>2</sup> for commercial use, which are demonstrated by an indicative scheme as part of the submission approved under the EIA Ordinance and justified by MTRCL’s supporting assessments. In addition, a public transport interchange, three 30-classroom

schools, a total number of 24 kindergarten classrooms and a minimum of 4,000 m<sup>2</sup> GFA for social welfare facilities as required by the Government shall be provided within this “OU” site. A minimum of 75,600 m<sup>2</sup> open space will be provided to serve future residents. According to the indicative scheme submitted by MTRCL, the proposed development would provide a total of about 14,000 flats for a total population of about 37,800.

- (d) In determining the maximum GFA of the development and/or redevelopment in this “OU” site, the GFA for railway uses, public transport interchange, schools, GIC or social welfare facilities as required by the Government, or covered walkway may be exempted from GFA calculation.
- (e) It is envisaged that the proposed development will comprise a podium accommodating the railway depot, public transport interchange, commercial/retail facilities and car parking facilities. Domestic towers will be provided above the landscape deck. The existing railway depot will be migrated by phases and a deck

will be constructed on top of the depot to facilitate the commercial/residential development atop. The proposed commercial/residential development atop will also be implemented by phases to tie in with the migration work of the railway depot. The phased development should be self-contained and sustaining in provision of GIC and their supporting facilities.

- (f) Since the site is in elongated configuration sitting along the foothill facing the seafront, a number of urban design measures should be made reference for the future development on the site as demonstrated in the indicative scheme and the EIAs approved under the EIA Ordinance. These include:
  - (i) provision of at least four 30m-wide major air/visual corridors that generally align in the north-south and east-west directions and at least six 15m-wide supplementary air/visual corridors that generally align in north-west-southeast direction amongst the residential towers to facilitate sea breeze

penetration and improve visual permeability;

- (ii) building disposition to enhance visual permeability, e.g. adoption of curvilinear layout for buildings along the southern site boundary;
- (iii) provision of stepped building height profile with building heights gradually reduced from northeast to the southwest nearer to Tai Ho Wan. According to the indicative development scheme prepared by MTRCL for the approved EIA, the building height of the residential towers ranges from 86mPD to 106mPD;
- (iv) submission of a connectivity proposal including but not limited to provision of all-weathered pedestrian walkway/linkage from different parts of the development within the site to the proposed railway station and commercial facilities, vertical connections among podium deck, podium and the waterfront, as well as the cycle

track network and open space network to enhance connectivity and walkability within the site and also to the adjacent waterfront and nearby TCNTE; and

- (v) landscape planting on podium/deck and vertical greening on facades should be provided. Planting along the edges and terraced design with greening should be applied to the podium for further visual relief and interest. Local recess in some parts/potential set back at the northern part of the depot along the waterfront at ground level could be provided for creation of green pockets/aesthetically pleasing landscape design and proposal for public enjoyment and amenity.
- (g) The project proponent should examine design concepts and give due considerations to further alleviate the landscape and visual impact of the residential buildings and podium with a view to harmonizing with the landscape character of the surrounding area. Landscape and urban design proposals for the proposed development

including but not limited to the features as mentioned in paragraph 4.5.3(f) above should be submitted for approval by the Board upon application under section 16 of the Ordinance. Future development within this zone should follow Sustainable Building Design Guidelines to achieve higher building permeability and improve wind environment.

- (h) The building height for the developments within this zone is subject to the gazetted AHRP and any potential amendments to the gazetted AHRP related to the Expansion of HKIA into a 3RS Project. No part of building or buildings or other structure or equipment erected or to be erected within the Area (or any addition or fitting to such building or buildings or structure or equipment) shall exceed the “restricted height” prescribed under the Hong Kong Airport (Control of Obstructions) Ordinance (Cap. 301), usually referred to as AHR, or any amendment thereto.
- (i) Aircraft noise due to overflight of approaching and departing aircraft from HKIA is anticipated

for the proposed development. The developer(s) should explore and review the use of acoustic insulation in form of well-gasketed window to enhance the indoor living environment.

- (j) With the future 3RS operations in HKIA, a review of the existing AHR for the current 2RS operations is being conducted. Subject to verification of the new AHR, possible AHR relaxation can take effect administratively. As such, there is scope to further maximise the development potential of the site. To provide flexibility for maximizing development potential of the site upon relaxation of AHR and for innovative design adapted to the characteristics of the site and planning circumstances, relaxation of the GFA restriction may be considered by the Board through the planning application system. Each proposal will be considered on its individual planning merits.



4.5.4 Water Treatment Works

- (a) This zone is intended primarily for the provision of water treatment works serving the needs of the community.
- (b) The site includes an existing water treatment works and a raw water booster pumping station to its northwest. The water treatment works treat water from Tai Lam Chung Reservoir and Shek Pik Reservoir before supplying to Tung Chung, Discovery Bay, HKIA, Siu Ho Wan, Penny's Bay and other settlements in North Lantau.
- (c) The water treatment works are classified as PHI, any developments near the site shall comply with the recommendations contained in the CCPHI Report. Furthermore, any development proposal resulting in an increase in residential or working population within the CZ is subject to the approval of CCPHI.

4.5.5 Sewage Treatment Works

- (a) This zone is intended primarily for the provision of sewage treatment works serving the needs of the community. A site to the southeast of NLH has been developed into a sewage treatment works serving Tung Chung, HKIA, Siu Ho Wan and Penny's Bay.
- (b) The sewage treatment works will need further fitting-out, expansion and upgrading in order to cope with the additional sewage arising from the medium-term and long-term developments in North Lantau, including the TCNTE, 3RS of HKIA, Siu Ho Wan Development, etc. The proposed expansion of SHWSTW to its immediate west will be subject to further study.

4.5.6 Organic Resources Recovery Centre

This zone is intended primarily to designate land for Organic Resources Recovery Centre (Phase I) (ORRC1) developed by Environmental Protection Department. The ORRC1 is currently under construction.

4.5.7 Refuse Transfer Station

This zone is intended primarily to designate land for refuse transfer station. This zone is primarily occupied by a refuse transfer station. It receives solid waste collected from HKIA, TCNT, Kwai Chung, Tsuen Wan as well as additional solid waste from the HKIA wastewater treatment plant. The consolidated waste will eventually be transferred by barges to the West New Territories Landfill for disposal.

4.5.8 Columbarium

- (a) This zone is intended primarily to designate land for columbarium use and garden of remembrance. It is located at the western side of Sham Shui Kok Drive near NLH and the proposed Road P1.
- (b) The site can provide about 26,000 niches and a garden of remembrance. In view of its vicinity to CZ of SHWWTW, the project proponent should prepare and submit a HA to CCPHI to assess the potential risks associated

with SHWWTW and obtain the approval from CCPHI.

4.5.9 Pumping Station and Associated Facilities

This zone is intended primarily to designate land for pumping station and associated facilities. This zone covers a Potable Water Booster Pumping Station near SHWWTW along Discovery Bay Tunnel Link, which serves Discovery Bay and is in operation.

4.5.10 “Green Belt” (“GB”)

- (a) The planning intention of this zone is primarily for defining the limits of urban and sub-urban development areas by natural features and to contain urban sprawl as well as to provide passive recreational outlets. There is a general presumption against development within this zone.
- (b) The lowland slopes adjoining the Lantau North (Extension) Country Park is zoned “GB” in order to preserve the natural vegetation and to

serve as buffer between the developed areas and country park. This area is largely undeveloped hill slopes except for a few informal footpaths. The hilly area consists of scrubland/shrubland with some existing trees scattered around. At higher level, the hillsides are characterised by grassland and scattered rock outcrops.

## 5 IMPLEMENTATION

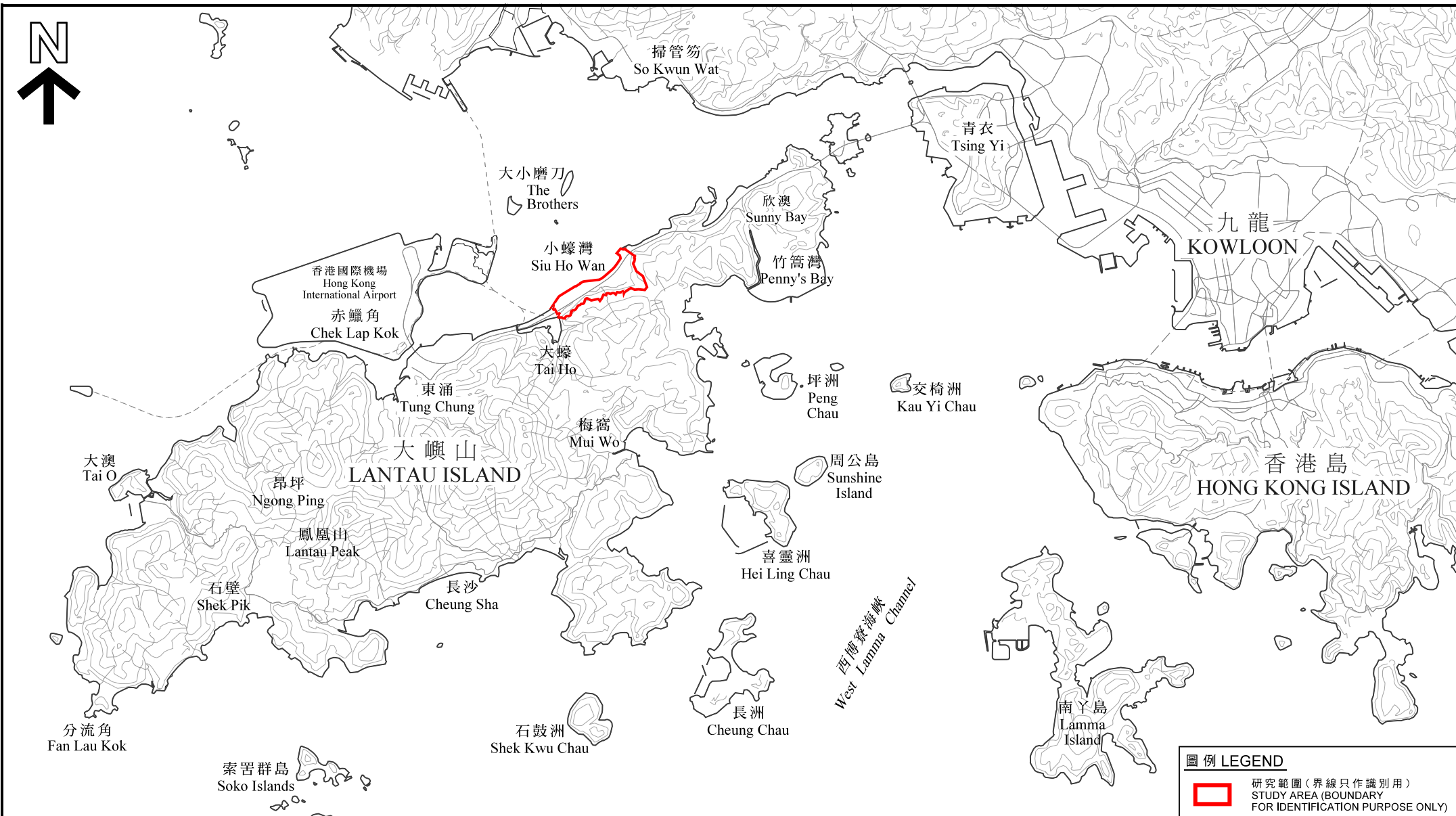
### 5.1 Infrastructural Provisions

- 5.1.1 For developments in the vicinity of PHI/NGI which require a risk/hazard assessment, the project proponent should maintain liaison/coordination with EMSD/EPD/WSD and the minimum set back distance away from the PHI/NGI if any works are required during the design and construction stages of the development.
- 5.1.2 The implementation of Tai Ho Interchange and the road alignment of Road P1 (Tung Chung and Tai Ho Section) is subject to the review in the detailed design stage of TCNTE.
- 5.1.3 Fresh water supply to the Area is provided by SHWWTW, currently via the pumping water main leading to Tung Chung fresh water service reservoir. Temporary main water (i.e. fresh water) is being provided for flushing. The existing water supply system in the Area will need to be upgraded and extended, which may include expansion of SHWWTW, construction of new

pumping stations and construction of new service reservoirs at the hillside to keep pace with the new developments in North Lantau/Lantau.

- 5.1.4 The sewage collection and transfer system in the Area requires expansion or new system provided in order to keep in pace with and as an integral part of the new developments in North Lantau. Upgrading of SHWSTW including reprovision of submarine outfall will be required in order to cope with the additional sewage arising from the medium-term and long-term developments in North Lantau. The proposed expansion of SHWSTW to its immediate west will subject to further study.
- 5.1.5 Prior to the implementation of any government building projects, the development proposal should be subject to Government Property Administrator's scrutiny and endorsement of site utilization level to be achieved.

**PLANNING DEPARTMENT**  
**DECEMBER 2017**



**圖例 LEGEND**

 研究範圍 (界線只作識別用)  
STUDY AREA (BOUNDARY FOR IDENTIFICATION PURPOSE ONLY)

本摘要圖於2017年11月7日擬備，  
所根據的資料為地形圖編號HM200CL  
EXTRACT PLAN PREPARED ON 7.11.2017  
BASED ON TOPOGRAPHICAL MAP HM200CL


**位置圖 LOCATION PLAN**

**小蠔灣  
SIU HO WAN**

SCALE 1 : 150 000 比例尺

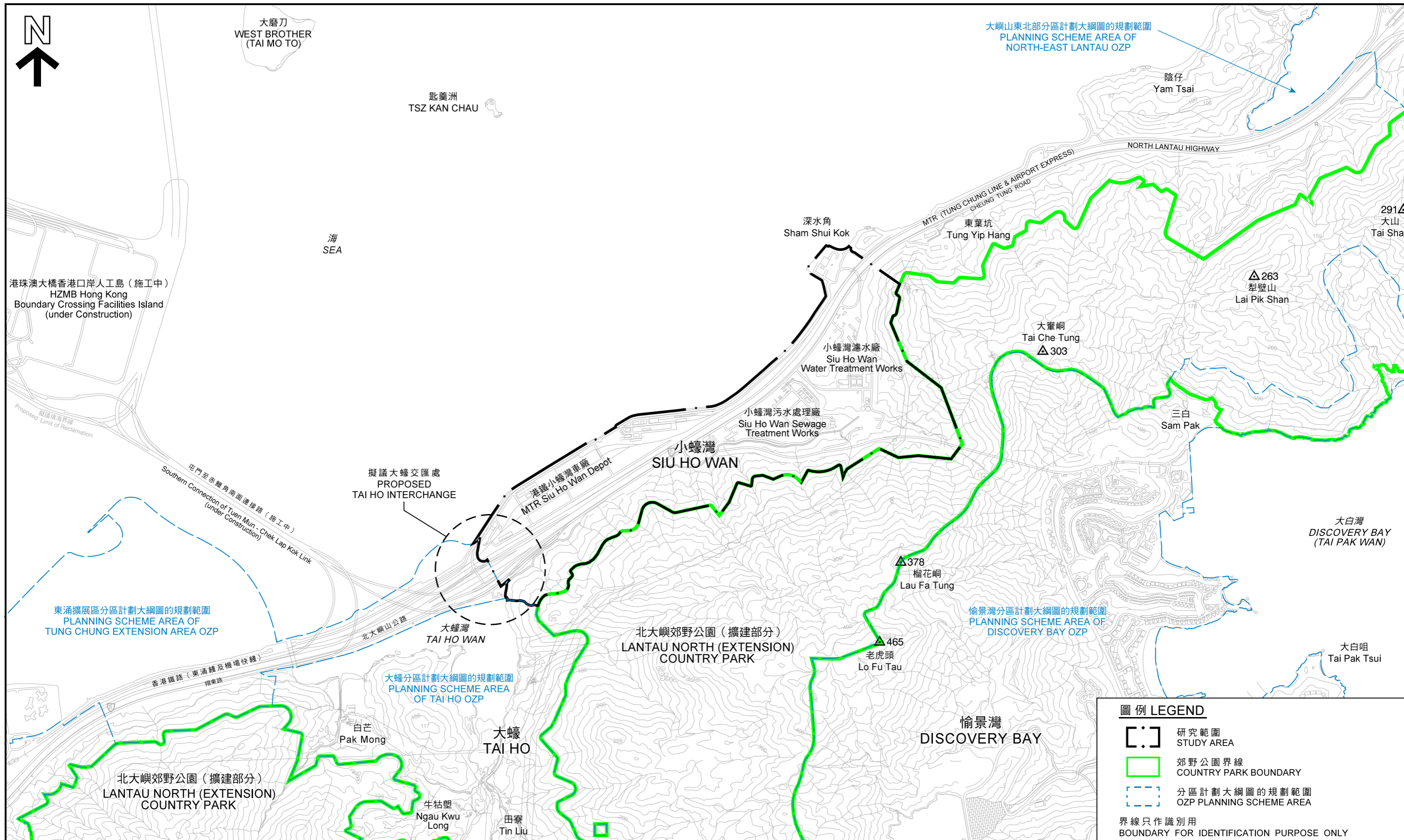

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**規劃署  
PLANNING  
DEPARTMENT**



參考編號  
REFERENCE No.  
**M/LI/17/50**

圖表  
**FIGURE**  
1



**圖例 LEGEND**

- [ ] 研究範圍 STUDY AREA
- ▭ 郊野公園界線 COUNTRY PARK BOUNDARY
- [ ] 分區計劃大綱圖的規劃範圍 OZP PLANNING SCHEME AREA

界線只作識別用  
BOUNDARY FOR IDENTIFICATION PURPOSE ONLY

本摘要圖於2017年11月22日擬備，  
所根據的資料為地形圖組別 iB20000 編號 T9 和 T10  
EXTRACT PLAN PREPARED ON 22.11.2017  
BASED ON TOPOGRAPHIC MAP SERIES iB20000 Nos. T9 & T10

**研究範圍 STUDY AREA**

**小蠔灣 SIU HO WAN**

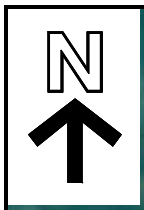
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METRES 200 0 200 400 600 800 1 000 1 200 1 400 1 600 1 800 2 000 METRES

**規劃署 PLANNING DEPARTMENT**

參考編號 REFERENCE No. **M/LI/17/50**

圖表 FIGURE **2**



**圖例 LEGEND**

- 研究範圍 (界線只作識別用)  
STUDY AREA (BOUNDARY FOR IDENTIFICATION PURPOSE ONLY)
- 郊野公園界線  
COUNTRY PARK BOUNDARY

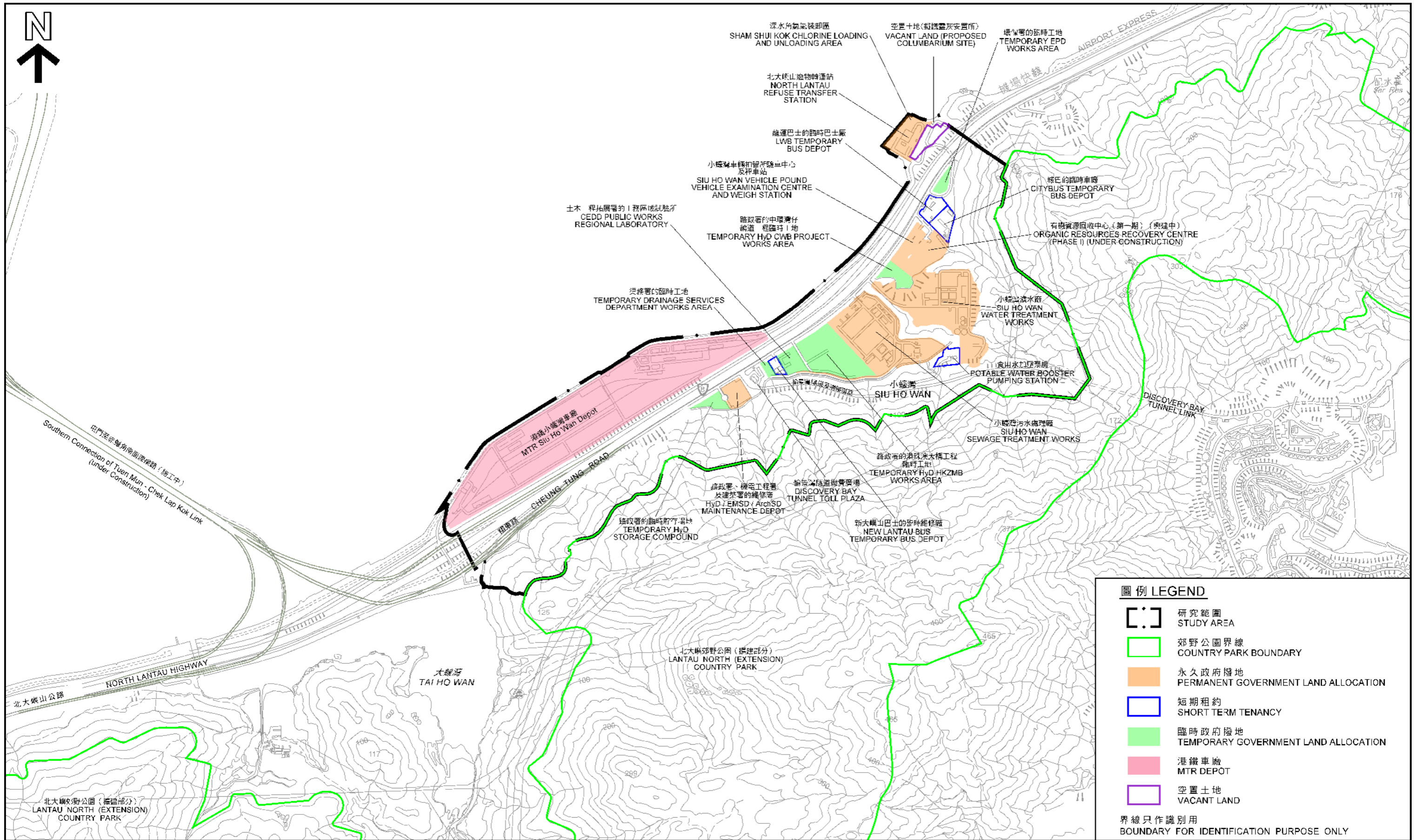
本摘要圖於2017年11月17日擬備，  
所根據的資料為地政總署於2017年1月23日拍得的航攝照片  
EXTRACT PLAN PREPARED ON 17.11.2017  
BASED ON AERIAL PHOTOS TAKEN ON 23.1.2017  
BY LANDS DEPARTMENT

航攝照片 AERIAL PHOTO

**小蠔灣  
SIU HO WAN**

**規劃署  
PLANNING DEPARTMENT**

參考編號 REFERENCE No. <b>M/LI/17/50</b>	圖表 FIGURE <b>3</b>
--	--------------------------



本摘要圖於2017年12月21日擬備，  
所根據的資料為地形圖組別IB20000編號T9和T10  
EXTRACT PLAN PREPARED ON 21.12.2017  
BASED ON TOPOGRAPHIC MAP SERIES IB20000 Nos. T9 & T10

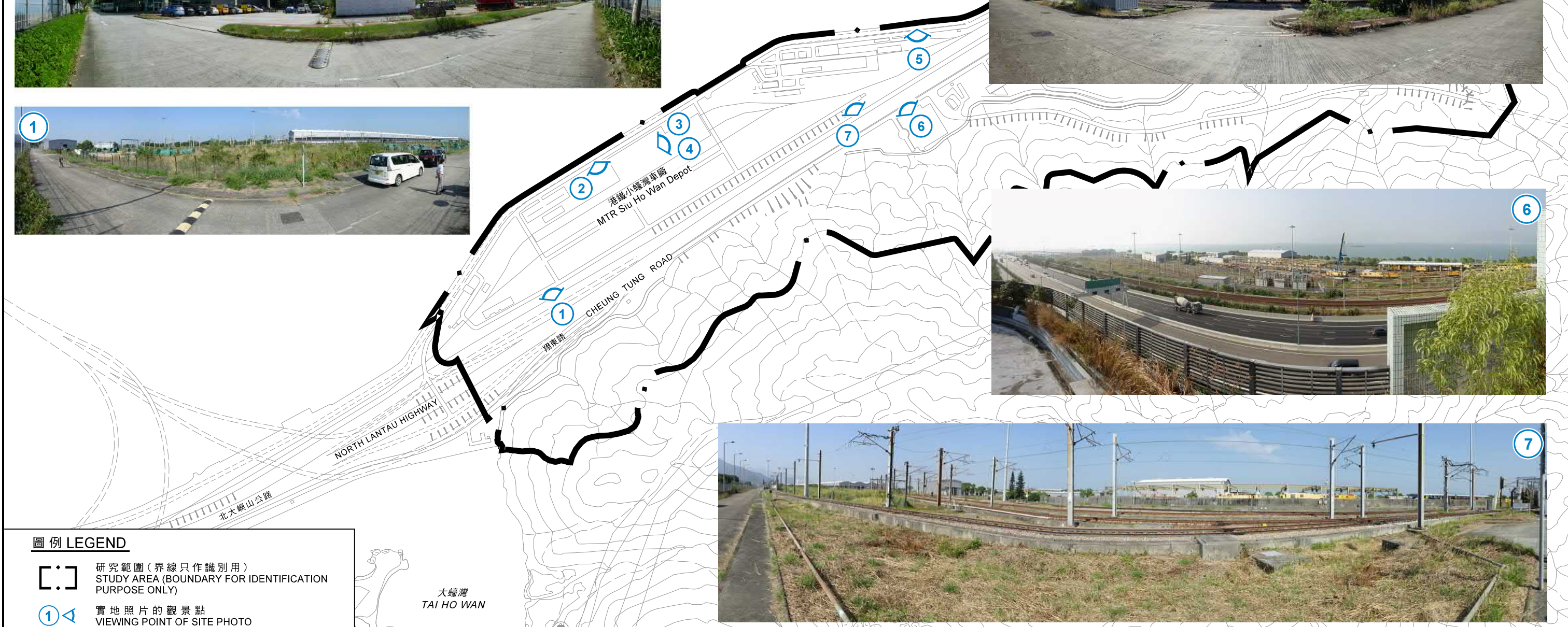
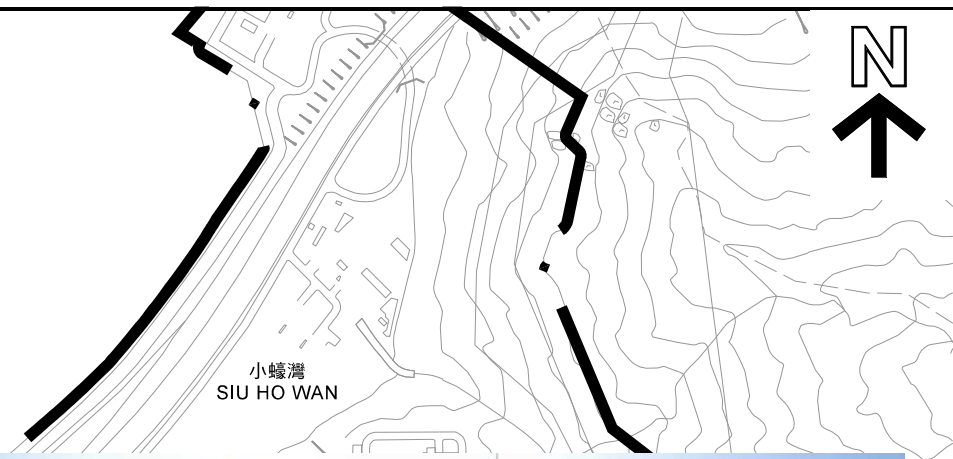
規劃署  
PLANNING DEPARTMENT





參考編號  
REFERENCE No.  
M/LI/17/50

圖表  
FIGURE  
4





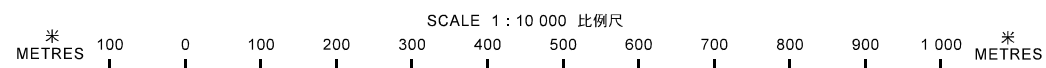
**圖例 LEGEND**

-  研究範圍 (界線只作識別用)  
STUDY AREA (BOUNDARY FOR IDENTIFICATION PURPOSE ONLY)
-  實地照片的觀景點  
VIEWING POINT OF SITE PHOTO



**實地照片 SITE PHOTOS**

**小蠔灣 SIU HO WAN**



本摘要圖於2017年12月6日擬備，  
所根據的資料為地形圖 iB20000 組別編號 T9 及 T10  
和攝於2017年12月4日的實地照片  
EXTRACT PLAN PREPARED ON 6.12.2017  
BASED ON TOPOGRAPHIC MAP iB20000 SERIES No. T9 & T10  
AND SITE PHOTOS TAKEN ON 4.12.2017

規劃署  
PLANNING DEPARTMENT



參考編號  
REFERENCE No.  
M/LI/17/50

圖表  
FIGURE  
5a



渠務署的臨時工地  
TEMPORARY DRAINAGE SERVICES DEPARTMENT WORKS AREA



新大嶼山巴士的臨時維修廠  
NEW LANTAU BUS TEMPORARY BUS DEPOT



土木工程拓展署的工務區域試驗所  
CEDD PUBLIC WORKS REGIONAL LABORATORY



愉景灣隧道繳費廣場  
DISCOVERY BAY TUNNEL TOLL PLAZA



路政署、機電工程署及建築署的維修廠  
HyD / EMSD / ArchSD MAINTENANCE DEPOT

小蠔灣污水處理廠  
SIU HO WAN SEWAGE TREATMENT WORKS

小蠔灣濾水廠  
SIU HO WAN WATER TREATMENT WORKS

小蠔灣  
SIU HO WAN



小蠔灣污水處理廠  
SIU HO WAN SEWAGE TREATMENT WORKS



小蠔灣濾水廠入口  
ENTRANCE OF SIU HO WAN WATER TREATMENT WORKS



抽水站及有關設施  
PUMPING STATION AND ASSOCIATED FACILITIES



路政署的港珠澳大橋工程臨時工地  
TEMPORARY HyD HKZMB WORKS AREA

### 圖例 LEGEND

[---] 研究範圍(界線只作識別用)  
STUDY AREA (BOUNDARY FOR IDENTIFICATION PURPOSE ONLY)

① 實地照片的觀景點  
VIEWING POINT OF SITE PHOTO

### 實地照片 SITE PHOTOS

### 小蠔灣 SIU HO WAN

SCALE 1 : 10 000 比例尺  
米 METRES 100 0 100 200 300 400 500 600 700 800 900 1 000 米 METRES

本摘要圖於2017年12月27日擬備，  
所根據的資料為地形圖 iB20000 組別編號 T10  
和攝於2017年11月16日的實地照片

EXTRACT PLAN PREPARED ON 27.12.2017  
BASED ON TOPOGRAPHIC MAP iB20000 SERIES No. T10  
AND SITE PHOTOS TAKEN ON 16.11.2017

規劃署  
PLANNING DEPARTMENT



參考編號  
REFERENCE No.  
M/LI/17/50

圖表  
FIGURE  
5b



深水角氯氣裝卸區  
SHAM SHUI KOK CHLORINE LOADING AND UNLOADING AREA



環保署的臨時工地  
TEMPORARY EPD WORKS AREA



龍運巴士的臨時巴士廠  
LWB TEMPORARY BUS DEPOT



北大嶼山廢物轉運站  
NORTH LANTAU REFUSE TRANSFER STATION

北大嶼山廢物轉運站  
NORTH LANTAU REFUSE TRANSFER STATION

龍運巴士的臨時巴士廠  
LWB TEMPORARY BUS DEPOT

深水角氯氣裝卸區  
SHAM SHUI KOK CHLORINE LOADING AND UNLOADING AREA



小蠔灣車輛扣留所驗車中心及秤車站  
SIU HO WAN VEHICLE POUND VEHICLE EXAMINATION CENTRE AND WEIGH STATION

小蠔灣車輛扣留所驗車中心及秤車站  
SIU HO WAN VEHICLE POUND VEHICLE EXAMINATION CENTRE AND WEIGH STATION



城巴的臨時車廠  
CITYBUS TEMPORARY BUS DEPOT



圖例 LEGEND  
[ ] 研究範圍 (界線只作識別用)  
STUDY AREA (BOUNDARY FOR IDENTIFICATION PURPOSE ONLY)  
① 實地照片的觀景點  
VIEWING POINT OF SITE PHOTO



有機資源回收中心 (第一期) (興建中)  
ORGANIC RESOURCES RECOVERY CENTRE (PHASE I) (UNDER CONSTRUCTION)

實地照片 SITE PHOTOS

小蠔灣  
SIU HO WAN

SCALE 1 : 5 000 比例尺  
米 METRES 100 0 100 200 300 400 米 METRES

規劃署  
PLANNING DEPARTMENT



參考編號  
REFERENCE No.  
M/LI/17/50

圖表  
FIGURE  
5c

本摘要圖於2017年11月30日製備，  
所根據的資料為地形圖 iB5000 組別編號 10 NW C  
和攝於2017年11月16日的實地照片  
EXTRACT PLAN PREPARED ON 30.11.2017  
BASED ON TOPOGRAPHIC MAP iB5000 SERIES No. 10-NW-C  
AND SITE PHOTOS TAKEN ON 16.11.2017

整體空間布局  
Overall Spatial Framework



大嶼山空間規劃及土地利用  
SPATIAL PLANNING AND LAND USE IN LANTAU

小蠔灣  
SIU HO WAN

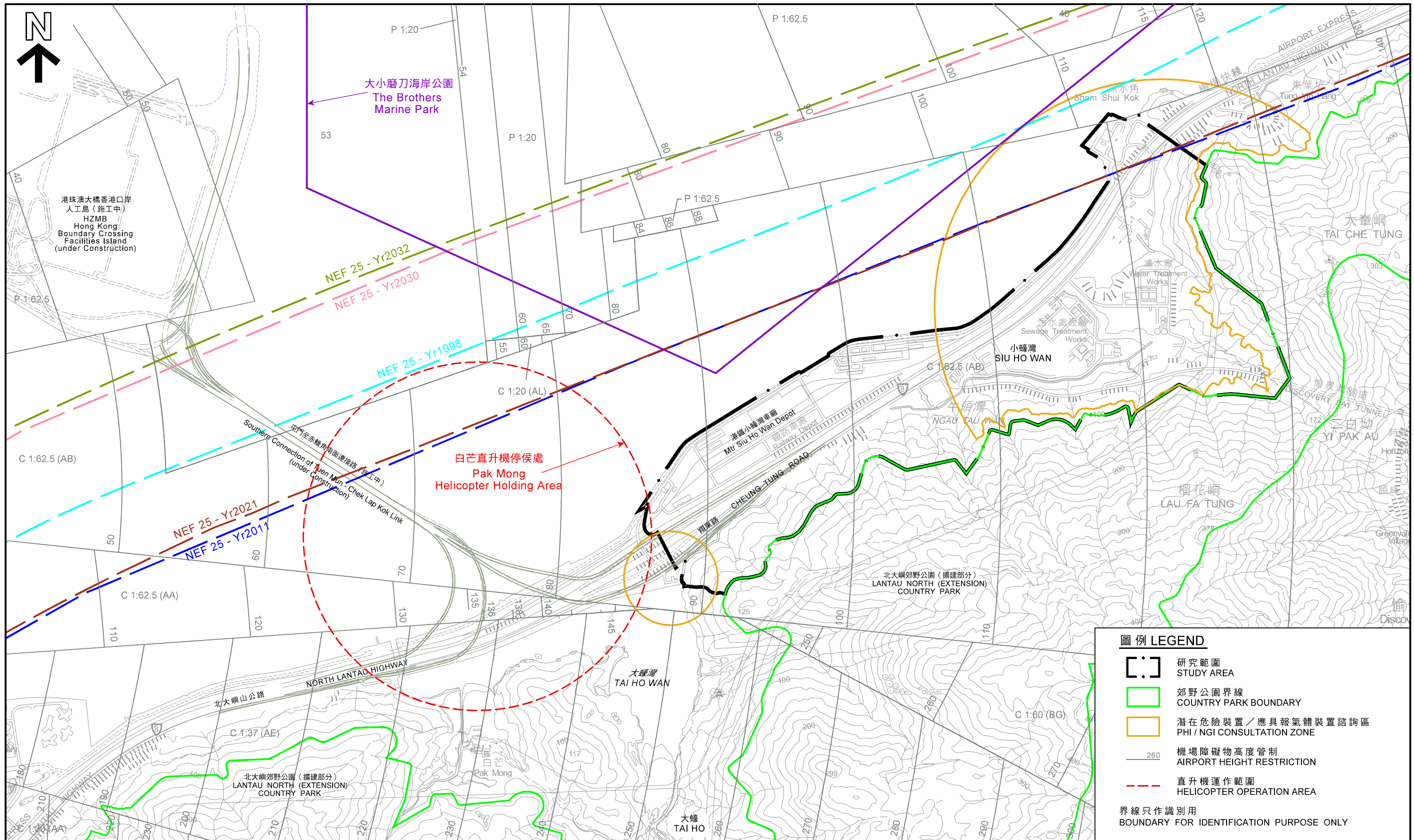
本摘要圖於2017年12月6日擬備，  
所根據的資料為可持續大嶼藍圖摘要  
EXTRACT PLAN PREPARED ON 6.12.2017  
BASED ON SUSTAINABLE LANTAU  
BLUEPRINT DIGEST

規劃署  
PLANNING  
DEPARTMENT



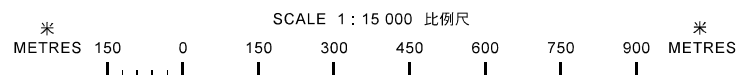
參考編號  
REFERENCE No.  
M/LI/17/50

圖表  
FIGURE  
6



發展限制 DEVELOPMENT CONSTRAINTS

小蠔灣  
SIU HO WAN



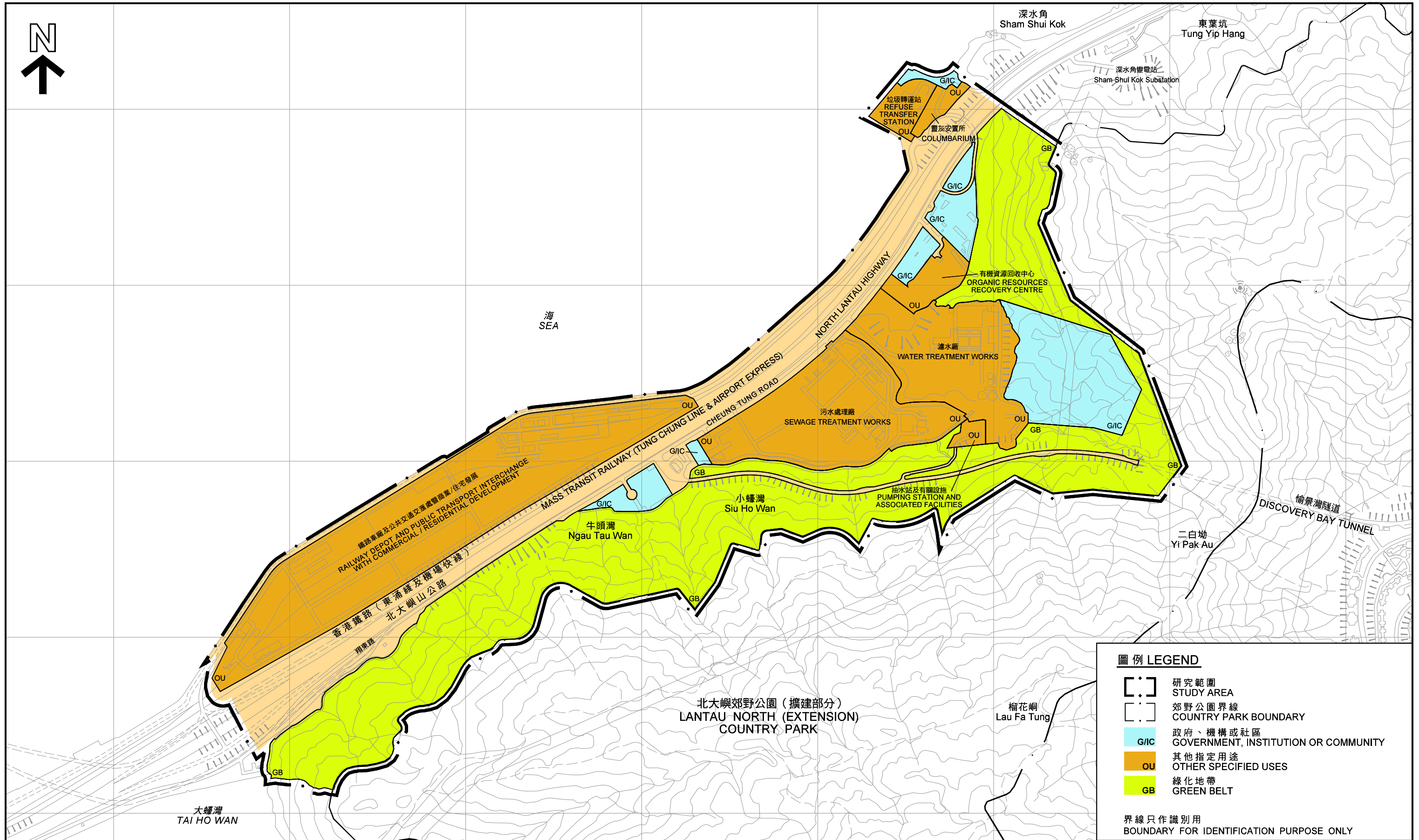
本摘要圖於2017年12月27日擬備，  
所根據的資料為地形圖 iB20000 組別編號 T9 及 T10  
EXTRACT PLAN PREPARED ON 27.12.2017  
BASED ON TOPOGRAPHIC MAP IB20000 SERIES No. T9 & T10

規劃署  
PLANNING DEPARTMENT



參考編號  
REFERENCE No.  
M/LI/17/50

圖表  
FIGURE  
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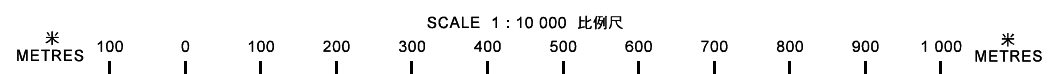
**圖例 LEGEND**

- [ . ] 研究範圍  
STUDY AREA
- [ . ] 郊野公園界線  
COUNTRY PARK BOUNDARY
- G/IC 政府、機構或社區  
GOVERNMENT, INSTITUTION OR COMMUNITY
- OU 其他指定用途  
OTHER SPECIFIED USES
- GB 綠化地帶  
GREEN BELT

界線只作識別用  
BOUNDARY FOR IDENTIFICATION PURPOSE ONLY

**擬議的概括土地用途模式 PROPOSED BROAD LAND USE PATTERN**

**小蠔灣  
SIU HO WAN**

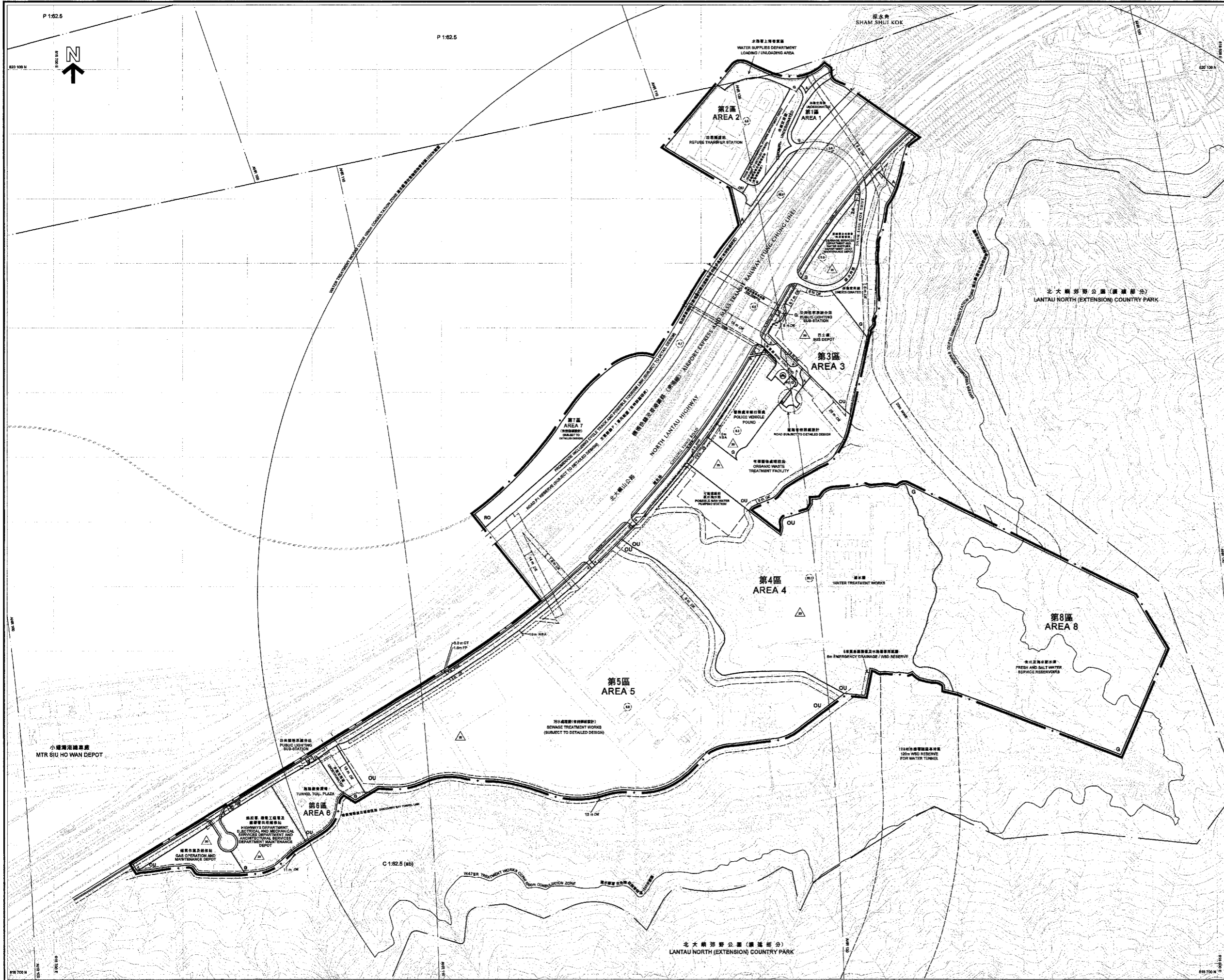


本摘要圖於2017年12月6日擬備  
EXTRACT PLAN PREPARED ON 6.12.2017

**規劃署  
PLANNING DEPARTMENT**

參考編號  
REFERENCE No.  
**M/LI/17/50**

**圖表  
FIGURE  
8**



**圖例 NOTATION**

☉	單車停泊區 CYCLE PARKING AREA	NBA	非建築用地 NON-BUILDING AREA
DR	排水蓄積區 DRAINAGE RESERVE	P2	抽水站 PUMPING STATION
WWR	水廠蓄積區 WATERWORKS RESERVE	P1	主要幹線 PRIMARY DISTRIBUTOR ROAD
FP	行人道 FOOTPATH	---	機場宵禁限制 AIRPORT RESTRICTION
CT	單車徑 CYCLE TRACK	---	國家公園界線 COUNTRY PARK BOUNDARY
---	發展區界線 PLANNING SCHEME BOUNDARY	△	最高建築高度 (在平均海面上若干米) MAXIMUM BUILDING HEIGHT (in m above mean sea level)
---	用地界線 ZONING BOUNDARY	---	建議的最低樓底高度 (在平均海面上若干米) PROPOSED LEVEL (in m above PD)

**土地用途及面積一覽表  
SCHEDULE OF USES AND AREAS**

地帶 ZONES	大約面積及百分比 APP. AREA & %	
	公頃 HECTARES	百分比 %
GO	13.85	52.20
RO	1.53	2.10
A	2.15	3.45
OU	53.68	65.05
ROAD, ETC	11.87	19.19
<b>發展區總面積 TOTAL PLANNING SCHEME AREA</b>	<b>62.98</b>	<b>100.00</b>

**註釋 NOTES**

- 本圖上所有標記均屬建議性質，並非保證。政府保留權利，在發展計劃進行期間，根據實際情況，對圖上的標記作出修改。此外，圖上的標記亦可能因政府土地用途及發展計劃的修改而有所改變。圖上的標記亦可能因政府土地用途及發展計劃的修改而有所改變。圖上的標記亦可能因政府土地用途及發展計劃的修改而有所改變。
- 本圖是根據由地政總署地籍科編製的 10-48-179, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 221, 222 及 224 號地圖編製的。本圖是根據由地政總署地籍科編製的 10-48-179, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 221, 222 及 224 號地圖編製的。
- 圖上的標記均屬建議性質，並非保證。政府保留權利，在發展計劃進行期間，根據實際情況，對圖上的標記作出修改。此外，圖上的標記亦可能因政府土地用途及發展計劃的修改而有所改變。圖上的標記亦可能因政府土地用途及發展計劃的修改而有所改變。圖上的標記亦可能因政府土地用途及發展計劃的修改而有所改變。

**近期修訂紀錄表  
TABLE OF RECENT AMENDMENT**

修訂 SUPPLEMENT LETTER	修訂 AMENDMENT	簽署 SIGNATURE	日期 DATE
A	"A" site in Area 5 rezoned to "OU" (encompassed "Organic Waste Treatment Facility" with revision to fire building height restriction from 25m to 28m above mean formation level.)	[Signature]	23.7.2014
	Amendment ratified by New Territories District Planning Conference on 3.8.2014	[Signature]	10.8.2014

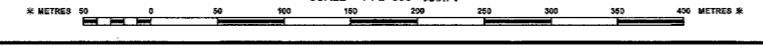
經批准土地發展計劃圖則於2011年12月11日獲准  
APPROVED BY COMMITTEE ON PLANNING AND LAND  
DEVELOPMENT ON 12.12.2011.

議決 採納  
ADOPTED

秘書長 譚國基  
SECRETARY FOR PLANNING AND LANDS  
日期 25.12.2010 DATE

**小蠔灣發展藍圖 - 大嶼山  
SIU HO WAN LAYOUT PLAN - LANTAU ISLAND**

SCALE 1:2 000 比例尺



程序 ACTION	簽署 SIGNATURE	日期 DATE	檔號 REFERENCE
批准發展 SUBMISSION AUTHORIZED	SD. P.Y. TAM 區議會主席 / 區議員 AD/MT	26.10.2011	檔案編號 FILE No. SK/LP/28
批准修訂 CIRCULATION AUTHORIZED	SD. C.K. LI 區議員 O/PD	15.12.1992	首次發出的日期 DATE OF FIRST CIRCULATION 21.12.1992
編製 PREPARED	SD. STANLEY AU 總區總辦 TP	15.12.1992	最後修訂日期 DATE OF LATEST CIRCULATION 17.8.2014

規劃署 西貢及離島規劃處  
SAI KUNG AND ISLANDS  
DISTRICT PLANNING OFFICE  
PLANNING DEPARTMENT

圖則編號  
PLAN No. L/I-SHW/1A



## **Proposed Comprehensive Residential And Commercial Development Atop Siu Ho Wan Depot, Lantau**

**December 2017**





**PROPOSED COMPREHENSIVE RESIDENTIAL  
AND COMMERCIAL DEVELOPMENT**

**ATOP**

**SIU HO WAN DEPOT, LANTAU**

**MTR CORPORATION LIMITED**

---

**PROJECT ARCHITECT**

**ENGINEERING CONSULTANTS**

**TRAFFIC CONSULTANT**

**AIR VENTILATION CONSULTANT**

**ENVIRONMENTAL CONSULTANT**

**LANDSCAPE & VISUAL CONSULTANTS**

**SIMON KWAN & ASSOCIATES LTD.**

**AECOM AND ARUP**

**AECOM**

**ARUP**

**ARUP**

**AECOM AND ARUP**

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## EXECUTIVE SUMMARY

### Introduction

The 30-hectare Siu Ho Wan Depot (SHD) has been highlighted in both 2015 and 2016 Policy Address as a potential railway site being explored by MTR Corporation in collaboration with the Government to provide housing supply (the Proposed Development). The Corporation supports this Government initiative to make better use of railway land by commissioning a multi-disciplinary consultant team to review the development potential of SHD, with the aim to optimise housing provision. The 2017 Policy Address has announced that Government would commence the statutory planning procedures for SHD, with the aim to provide not less than 14,000 residential units in the medium to long term.

### Key Opportunities and Challenges

Situated along the North Lantau transport corridor, SHD is served by existing road and railway network with good accessibility to the urban area, New Territories West and Hong Kong International Airport, as well as the Pearl River Delta via the future Hong Kong-Zhuhai-Macao Bridge. As private land resumption and reclamation is not required, and environmental acceptability of the project has been ascertained, no major public concern on the development proposal due to unacceptable impact is anticipated.

The Proposed Development involves complicated replanning and phased migration of an operating depot. The key challenge of the project is to ensure safe and uninterrupted railway operation during construction. In addition, the Subject Site is constrained by the Airport Height Restrictions, noise impact from North Lantau Highway and Lantau Airport Railway, underground utility reserves, and interface with nearby Government facilities and infrastructure, which have posed limitations on scheme design of the Proposed Development.

### The Proposed Development Scheme

With reference to the Sustainable Building Design Guidelines, the proposed Development Scheme comprises a total of about 108 medium-rise towers (max height +106mPD) situated on a terraced podium decking over the entire depot site to provide some 14,000 units with a domestic plot ratio of about 3.5, or 1.04 million m<sup>2</sup> of domestic gross floor area (GFA). Commercial/retail facilities of about 30,000m<sup>2</sup> GFA, along with recreational and supporting facilities, would be provided to serve the local community. Transport facilities have been proposed which include a public transport interchange and a new MTR Siu Ho Wan (SHO) Station with its concourse integrated with the podium for convenient accessibility.

As agreed with Education Bureau, three 30-classroom schools and four 6-classroom kindergartens have been reserved for provision in tandem with the population growth, subject to review at the detailed design stage. The provision of further Government, Institution or Community (G/IC) facilities would be reviewed in the detailed design in collaboration with relevant Government departments.

Breezeways and visual corridors have been introduced at strategic locations across the Proposed Development to enhance air ventilation and visual permeability. Conceptual Greening and Urban Design Frameworks have been formulated to provide about 9ha of greenery coverage. Curvilinear building alignment coupled with landscape design would be provided to soften the podium edge and building façade.

### Technical Feasibility

Technical assessments have been conducted to demonstrate feasibility of the proposed Development Scheme from traffic and transport, air ventilation, environmental and ecological, landscape and visual, and utilities perspectives. Specifically, Environmental Impact Assessment (EIA) of the Proposed Development, depot replanning works and the SHO Station has been approved under the EIA Ordinance in November 2017. Civil Engineering and Development Department has indicated that the Proposed Development would be taken into consideration in the planning and design of the Siu Ho Wan Reclamation and infrastructure to ensure compatibility.

Fresh water supply and sewage treatment capacities from the nearby Siu Ho Wan Water Treatment Works and Sewage Treatment Works have been identified by relevant Government departments to support the planned population of about 37,800. Upgrading of transport and utility infrastructure by Government may be required to accommodate various new development proposals in Lantau in the long run.

### Planning Justifications

The Proposed Development supports Government's housing supply initiative by optimising utilisation of valuable land resources conveniently served by the MTR network. In line with Government's *Sustainable Lantau Blueprint* published in June 2017, SHD has been earmarked as one of the key projects in the North Lantau Corridor to be developed as a new community of about 40,000 population in the medium to long term. With the significant number of job opportunities created by various new projects in Lantau, the Proposed Development would contribute housing accommodation to the workforce at a convenient location to promote smart urban growth with jobs closer to home.

### Development Programme

On the assumption that approval of the statutory planning process could be obtained by 2019, population intake of the Proposed Development is tentatively estimated to begin in Year 2026/27 with project completion by Year 2038, subject to further depot and development studies, Government approval processes, depot migration progress and market conditions.

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## 1 INTRODUCTION

### 1.1 Background

- 1.1.1 MTR Corporation (the Corporation) has conducted a number of studies to investigate possible topside development at the 30-hectare Siu Ho Wan Depot (SHD, the Subject Site) for predominantly residential use since the completion of the Lantau Airport Railway (LAR) project in 1998.
- 1.1.2 A feasibility study on retrofitting topside development was undertaken in response to Financial Secretary's suggestion in his 2012 Budget Speech to explore opportunities for development along railways. A report was submitted for Government's consideration in September 2012 which demonstrated technical feasibility of the topside development, subject to allocation of infrastructure capacities by the Government. A new Siu Ho Wan (SHO) Station along MTR Tung Chung Line (TCL) had been proposed to meet the transportation needs of the development and enable building of a sustainable community.
- 1.1.3 SHD has been highlighted in both 2015 and 2016 Policy Address as a potential railway site being explored by the Corporation in collaboration with the Government to provide housing supply (the Proposed Development). The Corporation supports Government's policy initiative to make better use of railway land by commissioning a consultancy study to optimise housing provision at the Subject Site. A technically feasible development scheme of 14,000 flats (the proposed Development Scheme) was presented in the Study Report submitted to Government in February 2016, with revised submissions made in December 2016 and November 2017 to address departmental comments.
- 1.1.4 The 2017 Policy Address has announced the initiative to commence the statutory planning procedures for the Proposed Development, with the aim to provide not less than 14,000 residential units in the medium to long term.
- 1.1.5 To take this potential development forward, the Corporation has commissioned preliminary design on depot replanning and SHO Station to study the depot migration programme and sequence and the station design, along with identifying the associated risks to ensure safe and uninterrupted railway operation.
- 1.1.6 Environmental Impact Assessment (EIA) has been conducted under the EIA Ordinance (Cap 499) for the Proposed Development, depot replanning works and SHO Station. Separate EIA Reports, namely "*Proposed Comprehensive Residential and Commercial Development atop Siu Ho Wan Depot (AEIAR-213/2017)*" and "*Siu Ho Wan Station and Siu Ho Wan Depot Replanning Works (AEIAR-214/2017)*", were exhibited for public inspection in July 2017, which have been approved by the Director of Environmental Protection in November 2017.

### 1.2 Purpose of this Submission

- 1.2.1 This submission presents the context of the Subject Site, planning and design considerations of the Proposed Development, along with planning and technical justifications with the aim to optimise its development potential in flat supply. The proposed Development Scheme has taken into account the findings of the aforesaid preliminary design of SHD Replanning and SHO Station, and the approved EIA Reports. Due consideration has been given to address comments received from Government bureaux/departments on the previous Study Report submissions.

## 2 SITE CONTEXT

### 2.1 The Subject Site

- 2.1.1 Lantau is the largest outlying island in Hong Kong with a land area of about 147km<sup>2</sup>. The Government has the vision to develop SHD into a smart and low-carbon community for living, as promulgated in the *Sustainable Lantau Blueprint* published in June 2017.
- 2.1.2 The Subject Site is situated on reclaimed land in Northshore Lantau at about 5km east of the Tung Chung New Town and Hong Kong International Airport (HKIA) (**Figure 2.1**). It is bounded by a seawall and a service road to its north, and the LAR and the North Lantau Highway (NLH) to its south. An aerial photo of the Subject Site and its surrounding context is presented in **Figure 2.2**.
- 2.1.3 With an area of 300,707m<sup>2</sup> under the lease plan, the Subject Site is a long trapezoidal linear piece of land of about 1,600m along the southern boundary and 240m wide. Site formation level is at about +6.3mPD.
- 2.1.4 SHD provides essential stabling, maintenance and supporting facilities for the entire fleet of TCL, Airport Express Line (AEL) and Disneyland Resort Line, including stabling tracks, workshops, and running/heavy maintenance facilities as well as infrastructure maintenance facilities.

### 2.2 The Surrounding Environment

- 2.2.1 Surrounding environment of the Subject Site is characterised by a combination of transport infrastructure, Government facilities and natural landscape. Major land uses in the vicinity are illustrated in **Figure 2.3**, which include the following:
- Siu Ho Wan Government Maintenance Depot, Discovery Bay Tunnel Administration Building, and New Lantau Bus Company Siu Ho Wan Depot at about 70-90m to the east/southeast;
  - Lantau North (Extension) Country Park at about 250m to the south, with the Lo Fu Tau Country Trail and the Hong Kong Olympic Trail at over 1.5km from SHD;
  - Siu Ho Wan Sewage Treatment Works (SHWSTW) at about 420m to the east;
  - Organic Waste Treatment Facilities (OWTF), under construction, at about 670m to the northeast;
  - Siu Ho Wan Vehicle Pound Vehicle Examination Centre and Weigh Station at about 680m to the northeast;
  - Siu Ho Wan Water Treatment Works (SHWWTW) at about 740m to the east;
  - Luk Hop Yuen Kung (六合玄宮), a Taoist temple, at about 780m to the south;
  - North Lantau Refuse Transfer Station (NLRTS) at about 1km to the northeast; and
  - Pak Mong (白芒), a recognised village, at about 1.2km to the southwest.

- 2.2.2 In the regional context, a number of committed major projects are located in North Lantau as illustrated in **Figure 2.1**, which include the following:

- Tung Chung New Town Extension (TCNTE);
- HKIA Three-Runway System (3RS) and the North Commercial District (NCD); and
- Hong Kong Boundary Crossing Facilities (HKBCF) Island of the Hong Kong-Zhuhai-Macao Bridge (HZMB) and its topside development.

- 2.2.3 The *TCNTE Study* has recommended to provide a total of 49,400 new residential units, of which about 63% would be subsidised housing. Total population of Tung Chung New Town after completion of its extension is expected to be about 277,600. Commercial facilities planned including a 500,000m<sup>2</sup> GFA regional office node at Tung Chung East, 163,000m<sup>2</sup> GFA regional retail and 164,000m<sup>2</sup> GFA local retail uses, and a hotel of about 1,000 rooms. The TCNTE is expected to create about 40,000 new job opportunities, with population intake targeted to commence in 2023.

- 2.2.4 Supported by the Executive Council in March 2015, the 3RS project involves reclamation of approximately 650ha of land north of the existing airport island, targeting to be operational in 2023-24. With the completion of the 3RS project, the direct employment will increase to some 123,000 jobs. In addition, HKIA has planned to convert its NCD at the north-eastern corner of the Airport Island for retail and entertainment uses, namely the SKY CITY. The first phase of the NCD development includes a hotel and a facility combining retail, dining and entertainment purposes, targeted for completion in 2021. According to the *Sustainable Lantau Blueprint*, the NCD development would provide up to 668,000m<sup>2</sup> floor space.

- 2.2.5 The *Topside Development at HKBCF Island of HZMB Study*, commissioned by Civil Engineering and Development Department (CEDD) and Planning Department (PlanD), is underway. According to the Stage 1 community engagement digest, its development potential could be more than 300,000m<sup>2</sup> GFA and could possibly be brought up to 500,000 m<sup>2</sup> GFA, subject to technical feasibility.

2.2.6 The *Enhancing Land Supply Strategy: Reclamation Outside Victoria Harbour and Rock Cavern Development Study* has earmarked Siu Ho Wan (SHW) as a potential location for near-shore reclamation. Land uses under consideration include residential, retail, entertainment and dining facilities, along with strategic economic activities such as educational uses, as indicated in CEDD's *Technical Study on Developments at Siu Ho Wan and the Associated Transport Infrastructures – Feasibility Study*. Whilst CEDD has advised that the implementation programme is currently not available, they have agreed to take into consideration the Proposed Development in the planning and design of the SHW Reclamation and infrastructure as far as practicable to ensure compatibility. Due consideration has also been given in the proposed Development Scheme to allow flexibility for pedestrian and road connections with the potential SHW Reclamation and infrastructure. Close liaison and coordination would be maintained with CEDD during the course of the study.

## 2.3 Planning Context

### Strategic Planning

2.3.1 The *Hong Kong 2030+: Towards a Planning Vision and Strategy Transcending 2030 (HK2030+)* public engagement document (October 2016) has proposed to underscore transit-oriented, compact development with railway as the backbone of the public transport system, as well as to optimise land uses by exploring more topside development.

2.3.2 The Proposed Development supports the strategic planning objective of building a sustainable community served by environmentally friendly rail transport. It also contributes housing accommodation to the workforce at a convenient location which aligns with the key strategic direction of “Reshaping Travel Pattern” to promote smart urban growth with jobs closer to home as promulgated by *HK2030+*.

### Local Planning

2.3.3 The Lantau Development Advisory Committee (LanDAC) has recommended “Strategic Economic and Housing Development” as the planning theme for the North Lantau Corridor, with the Proposed Development earmarked as one of the medium-term projects in their *First-term Work Report* published in January 2016. This has been affirmed in the *Sustainable Lantau Blueprint* which has identified SHD as home for about 40,000 people with a possible new railway station.

2.3.4 The Subject Site is not covered by any Outline Zoning Plan (OZP) hence no statutory planning requirements have been stipulated. Preparation of an OZP with appropriate development zoning would facilitate and guide the Proposed Development.

## 2.4 Land Status

2.4.1 The existing depot site (Lot No. 143 in D.D. 346) was granted to MTR Corporation on 15 September 1995 under Private Treaty Grant as shown on the lease plan (**Figure 2.4**). Under the lease conditions, railway workshop, maintenance depot and their ancillary uses are permitted. Lease modification would be required for the change in use of the lot to implement the Proposed Development.



### 3 THE PROPOSED DEVELOPMENT

#### 3.1 Objectives of Scheme Optimisation

3.1.1 A comprehensive study has been undertaken to formulate the proposed Development Scheme to optimise flat supply. With a reduction in average flat size as compared with the 2012 scheme to suit market conditions, higher design flexibility has been allowed on the development flat mix to address community demand.

#### 3.2 Development Constraints

3.2.1 The Proposed Development is subject to the following inherent constraints as illustrated in **Figure 3.1**, which have significant implications on the scheme design:

- **Airport Height Restriction (AHR):** Maximum building height has been limited to about +86mPD to +106mPD across the Subject Site.
- **Traffic and Railway Noise:** Significant noise impacts from LAR and NLH abutting the southern site boundary pose constraints on building design and disposition in order to comply with relevant criteria as stipulated in the *Noise Control Ordinance (NCO)* and the *Hong Kong Planning Standards and Guidelines (HKPSG)*. Building setback of some 200m from NLH is required to mitigate the traffic noise impact which is considered not practicable.
- **Utility Reserve:** The three box culvert protective zones of 10m to 25m-wide situated across the Subject Site pose constraints on structural arrangement.
- **Geotechnical Condition:** The Subject Site is located adjacent to the Designated Area of Northshore Lantau as outlined under *Geotechnical Engineering Office Technical Guidance Note 12*, localised areas with complex ground conditions may be anticipated.
- **SHWWTW Hazard:** About 8,600m<sup>2</sup> at eastern end of the Subject Site falls within the consultation zone of SHWWTW, a designated potentially hazardous installation for its chlorine storage, pose constraints on land use planning.
- **Depot Replanning:** Development atop an operating depot involves complicated replanning and costly migration to be carried out in phases to ensure safe and uninterrupted railway services, which poses constraint on structural arrangement and building disposition.
- **Existing Infrastructure:** The Tuen Mun – Chek Lap Kok (TM-CLK) Link slip road under construction and the existing NLH along the southern site boundary, the existing depot facilities, as well as the TCL and AEL alignments, pose constraints on design and location of the proposed SHO Station.

#### 3.3 Scheme Design Considerations

3.3.1 The following planning and design considerations have been incorporated in formulating the proposed Development Scheme.

##### Development Mix

3.3.2 The Proposed Development supports Government's policy initiative by optimising railway site for housing land supply. Alternative land use options such as offices or large-scale commercial/retail uses are considered not suitable, as the Subject Site is located relatively remote from the existing and planned/proposed central business districts, lacking the critical mass of business services to support office development. Further, significant commercial/retail and office facilities have already been planned at TCNTE, NCD and the topside development of HKBCF Island.

##### Sustainable Building Design

3.3.3 The scheme design has made reference to the Sustainable Building Design (SBD) Guidelines promulgated by Buildings Department in accordance with the *Practice Note for Authorised Persons, Registered Structural Engineers and Registered Geotechnical Engineers (PNAP) APP-152* to promote quality and sustainable built environment.

##### Urban Design and Development Permeability

3.3.4 Due consideration has been given to development bulk reduction, building orientation, disposition and building form to enhance visual interest and create a more spacious pedestrian environment. Double-storey design would be adopted for car park and plant rooms, as far as practicable, to reduce podium bulk in the detailed design. Breezeways and visual corridors have been introduced at strategic locations across the Subject Site to enhance wind penetration and visual permeability of the Proposed Development.

##### Development Height Profile

3.3.5 Terraced podium with enhanced greening opportunities has been incorporated above the depot deck to break down the physical bulk, promote wind circulation and enhance visual interest from the waterfront. With adherence to the AHR, medium-rise towers have been deployed with building height diminishing gradually towards the Tai Ho Estuary, while preserving the ridgeline of the mountain backdrop. Lower building height would have undesirable impact on flat supply hence is not recommended.

**Self-Protecting Building Design**

- 3.3.6 The HKPSG has stipulated that in situations where adequate separations between sensitive uses and noise emitters cannot be provided, other methods including self-protecting building design should find applications in the Hong Kong context. The approved EIA Report has recommended the adoption of self-protecting building design for towers along the southern site boundary, coupled with the provision of noise canopy and acoustic windows, for noise mitigation.
- 3.3.7 To enhance the living environment, prescribed windows of the towers along the southern site boundary have been designed to face the open spaces to the north. Fixed glazing would be provided at the southern façade of the habitable rooms facing NLH/LAR to provide lighting and views, while ventilation has been maintained. Possible options to promote cross-ventilation would be examined in the detailed design.
- 3.3.8 Curvilinear disposition of the towers would be adopted to optimise permeability; with the façade further broken up by limiting to maximum 4 towers per cluster with buffer planting for towers along the southern site boundary to enhance visual permeability and provide gaps for wind penetration. Further consideration would be given in the façade design, such as provision of greening, to add visual interest.

**Government, Institution or Community (G/IC) Facilities and Open Space**

- 3.3.9 Reference has been made to the HKPSG requirements in planning of G/IC facilities as summarised in **Table 3.1**. Three 30-classroom schools and four 6-classroom kindergartens have been reserved for provision in tandem with the population build-up, as agreed with the Education Bureau. The schools are located on Phases 2-4 of the podium deck while the kindergartens are located within the podium for each phase. Out of the three planned schools, one secondary school has been assumed for technical assessment purpose. Location and provision of the education facilities would be reviewed at the detailed design stage.
- 3.3.10 The provision of further G/IC facilities would be reviewed in collaboration with the Government, with space of about 2,000m<sup>2</sup> allowed within the podium (up to 4,000 m<sup>2</sup> GFA on a 2-storey arrangement), subject to detailed design.
- 3.3.11 Adequate private open space would be provided for future residents. Active and passive recreational facilities would be provided, coupled with landscaping features, to create a vibrant environment.

**Table 3.1 Proposed G/IC Facility Provisions**

Type of Facilities	HKPSG Requirements	Provision Reserved	Remarks
Secondary School	1 whole-day classroom for 40 persons aged 12-17	3 x 30-classroom	As agreed with Education Bureau.
Primary School	1 whole-day classroom for 25.5 persons aged 6-11		
Kindergarten / Nursery	26 classrooms for 1,000 children aged 3-6	4 x 6-classroom	
Police Post	No specified standard	---	Subject to Commissioner of Police's requirement at the detailed design stage.
Post Office	No specified standard	---	Subject to HK Post's requirement at the detailed design stage.

**3.4 Proposed Development Scheme**

- 3.4.1 The proposed Development Scheme comprises 108 residential towers of 15 to 22 residential storeys situated on a podium deck over the 30ha depot site. With a domestic GFA of about 1.04 million m<sup>2</sup> and a domestic plot ratio of about 3.5, some 14,000 flats would be provided with a design population of 37,800.
- 3.4.2 A grade-separated approach with general traffic largely contained within the podium has been adopted to provide a pleasant walking environment on the podium deck. A building podium has been incorporated for commercial/retail, kindergarten, public transport interchange (PTI), internal roads, car parking and loading/unloading facilities, SHO Station concourse, private recreational facilities (clubhouses), utility plant rooms and supporting facilities. The clubhouses, including a private sports centre subject to detailed design, would be provided in accordance with the *PNAP APP-104 Exclusion of Floor Areas for Recreational use*. The proposed Development Scheme and sections are presented in **Figures 3.2** and **3.3**, respectively.
- 3.4.3 Neighbourhood commercial/retail facilities of about 30,000m<sup>2</sup> GFA has been planned within the Phase 1 podium to serve the local community. Additional GFA has been reserved for other non-domestic uses including schools, kindergartens, PTI, depot and railway facilities, and covered walkways, subject to review at the detailed design stage. The proposed Development Schedule is presented in **Table 3.2**.

- 3.4.4 The Conceptual Greening Framework with minimum 30% site coverage of greenery (based on the entire site) as required by the SBD Guidelines is presented in **Figure 3.4**. The greening design concept aims to create a pleasant and attractive environment by means of landscaping, provide active and passive recreational facilities and open space to the residents and visitors, and to integrate in harmony with the architectural style and create identity. Environmentally-friendly design, such as skylights to promote natural light penetration to the podium and photo-voltaic panels, would be explored in the detailed design. Artist Impression of the Conceptual Greening Framework is presented in **Figure 3.5**.
- 3.4.5 Four 30m-wide diagonal corridors and six supplementary air paths of 15m-wide running perpendicular to NLH/LAR have been designated across the Subject Site to enhance wind penetration and visual permeability of the Proposed Development, with activity nodes (e.g. civic square and outdoor exercise area) at the intersections, as presented in the Urban Design Framework (**Figure 3.6**). The proposed building height profile and the AHR are illustrated in **Figure 3.7**. Artist Impression of the proposed Development Scheme is presented in **Figure 3.8**.
- 3.4.6 To create a pedestrian-friendly environment with convenient access to the SHO Station, all-weather pedestrian links would be provided at both the podium deck and within the podium. Within the podium (+19.1mPD), the elongated shopping mall connecting to the station concourse would provide an air-conditioned passageway, with all the residential towers generally located within 500m from this corridor to facilitate efficient and comfortable pedestrian movement. At the open air podium deck level (+20.1 and +26.5mPD), covered walkway would be provided with landscaping and street furniture to enhance pedestrian experience. An internal cycle track network would be provided to facilitate east-west movement within the Proposed Development particularly to access the proposed SHO Station. Other options to further enhancing pedestrian access to the SHO Station, such as travellator, would be explored in the detailed design. An indicative Pedestrian and Cycling Circulation Plan is presented in **Figure 3.9**.
- 3.4.7 A promenade would be provided along the northern boundary on the podium deck with pedestrian walkway and cycle track. To enhance the integration with the waterfront, possible connection with the potential SHW Reclamation has been discussed with CEDD, with a connection point reserved at the western corner, subject to detailed design. Vertical connection including staircases and accessible lifts would be provided along the northern podium boundary for access to the existing service road at the waterfront or the future SHW Reclamation.
- 3.4.8 Vertical greening opportunities along the northern depot façade/fence wall would be explored in the detailed design. Green pockets would be created by locally recessing the SHD by about 2m at ground level for enjoyment of future users and amenity. Artist impression illustrating possible integration of the Proposed Development and the waterfront is presented in **Figure 3.10**.

- 3.4.9 Two vehicular access points have been planned at both ends of the Proposed Development. The western one is the primary access connecting to Tai Ho Interchange with slip roads connecting both directions of NLH and the planned Road P1 (Tung Chung to Tai Ho Section). The eastern one at Phase 4 would be connected to the future Road P1 (SHW Section) or follow the existing connection to the Sham Shui Kok Drive (with local widening) before the connection is available. The provision of low-emission shuttle service within the Proposed Development would be explored in the detailed design to enhance accessibility to the SHO Station. An indicative Vehicular Circulation Plan is presented in **Figure 3.11**.
- 3.4.10 A PTI of about 9,000m<sup>2</sup> GFA has been planned next to the proposed SHO Station concourse within the Phase 1 podium. If necessary, feeder service would be provided to/from existing MTR station(s) to serve the initial phase of the Proposed Development before the opening of the SHO Station, which is subject to its construction programme and TCL operation.

### 3.5 Proposed Siu Ho Wan Station

- 3.5.1 Located at the western position of the Proposed Development, the proposed SHO Station comprises at-grade side platforms along the TCL tracks, with a station concourse of about 8,000m<sup>2</sup> GFA integrated with the Phase 1 podium located in between the PTI and the commercial/retail facilities.
- 3.5.2 The existing alignment of AEL/TCL shared track at the western location is level, with sufficient clearance between the southern depot boundary and the TM-CLK Link slip road along NLH hence is readily constructible. Alternative design options had been reviewed in the approved EIA Report, with due consideration on operational impact, risk, constructability and other technical aspects.

**Table 3.2 Proposed Development Schedule**

Development Site Area (based on Lease Plan)	300,707m <sup>2</sup>
Indicative Net Site Area (excluding internal road, school sites and emergency vehicular access)	About 245,000m <sup>2</sup>
Domestic GFA	1,040,000m <sup>2</sup>
Domestic Plot Ratio (based on Development Site Area)	3.5
No. of Flats	14,000
Average Flat Size (GFA)	74.3m <sup>2</sup>
No. of Blocks	108
No. of Residential Storeys (excluding lobby)	15 to 22
Design Population (PPOF 2.7) <sup>(i)</sup>	37,800
Residential Car Parking Space <sup>(ii)</sup>	3,953
Visitor Car Parking Space <sup>(ii)</sup>	459
Residential Motorcycle Parking Space <sup>(ii)</sup>	140
Residential Bicycle Parking Space <sup>(ii)</sup>	277
Residential Loading/Unloading Bay <sup>(ii)</sup>	108
Open Space	About 75,600m <sup>2</sup>
Commercial/Retail GFA	30,000m <sup>2</sup>
Commercial/Retail Plot Ratio (based on Development Site Area)	0.10
Commercial/Retail Car Parking Space <sup>(ii)</sup>	237
Commercial/Retail Motorcycle Parking Space <sup>(ii)</sup>	24
Commercial/Retail Loading/Unloading Bay <sup>(ii)</sup>	38
3 x 30-Classroom Schools (GFA) <sup>(iii)</sup>	38,370m <sup>2</sup>
4 x 6-Classroom Kindergartens (GFA) <sup>(iii)</sup>	2,000m <sup>2</sup>
Depot and Railway Facilities (GFA) <sup>(iii)</sup>	310,000m <sup>2</sup>
Public Transport Interchange (GFA) <sup>(iii)</sup>	9,000m <sup>2</sup>
Covered Walkway (GFA) <sup>(iii)</sup>	5,000m <sup>2</sup>
SHO Station Concourse (GFA) <sup>(iii)</sup>	8,000m <sup>2</sup>

Notes:

- (i) Person-Per-Occupied-Flat ratio as agreed with Planning Department.
- (ii) In accordance with the HKPSG, subject to review at the detailed design stage. Detailed calculations are presented in the T&TIA Report (**Appendix I**).
- (iii) Indicative floor area for reference purpose only, subject to review and adjustment at the detailed design stage.

Remarks: All key development parameters are approximate only and subject to change at the detailed design stage.

### 3.6 Tentative Development Programme

3.6.1 The Proposed Development will be implemented by phase based on depot migration progress and market conditions. Subject to Government approval processes, population intake is anticipated to begin in Year 2026/27 and the project is tentatively assumed to be completed by Year 2038 based on an outline development replanning strategy and development sequencing, subject to review at the detailed design stage. Tentative implementation programme of the Proposed Development is summarised in **Table 3.3**, with the indicative phasing plan presented in **Figure 3.12**, subject to review by further depot and development studies.

**Table 3.3 Tentative Implementation Programme**

Key Milestones	Commencement	Completion
SHD Replanning and Property Enabling Works	2019	2036
Key Milestones	Commencement	Population Intake
Proposed Development		
Phase 1	2023-24	2026-27
Phase 2	2026-27	2030
Phase 3	2030-31	2034
Phase 4	2031-35	2035-38

## 4 PLANNING JUSTIFICATIONS

### 4.1 Contribution to Housing Supply by Land Use Optimisation

4.1.1 The Proposed Development supports Government's housing policy initiative by optimising the utilisation of 30ha valuable land to provide 14,000 units served by the MTR network. The Subject Site is currently available for development and under 100% MTR ownership, therefore no private land resumption or reclamation is required for development to proceed, offering an attractive opportunity to deliver quality housing supply to meet community demand.

### 4.2 No Major Community Concern Envisaged

4.2.1 The Proposed Development is largely confined to already developed depot land with its environmental acceptability confirmed. Further improvement on the scheme design, in particular on urban design and environmentally friendly measures, would be made at the detailed design stage in response to comments/advice received from the public and other stakeholders. No major concern from the community due to unacceptable impact is envisaged.

### 4.3 Achievement of Strategic and Local Planning Objectives

4.3.1 SHD has been earmarked in the Government's *Sustainable Lantau Blueprint* as one of the key projects in the North Lantau Corridor for housing supply in the medium to long term. The Proposed Development supports the local planning objective by creating a self-contained community with supporting commercial/retail, recreational, and G/IC facilities. With the significant number of job opportunities created by various new projects on Lantau, the Proposed Development would contribute housing accommodation to the workforce at a convenient location.

4.3.2 The Government's strategic planning objective promulgates prudent use of land resources around railway stations to facilitate fast and mass movement of people in an environmentally friendly mode of transport. The Proposed Development supports the transport sustainability initiatives by adopting the transit-oriented development concept which is widely accepted as a sustainable form of urban development to minimise the reliance on road transport, thereby help reducing vehicular trip generation, rationalise traffic flows and minimise the level of traffic-induced pollution.

### 4.4 Quality Built Environment for a New Community

4.4.1 The local environ is suitable for residential development to take place at SHD. The proposed Development Scheme has been designed by making reference to the SBD Guidelines to promote quality and sustainable built environment. Terraced podium design has been adopted to reduce development bulk, with major corridors introduced at strategic positions across the development to enhance wind and visual permeability. Building height profile descends gradually towards Tai Ho Estuary to create visual harmony.

4.4.2 Contributing to micro-climate enhancement, the landscaped deck with about 9ha of greenery coverage offers ample opportunities for tree and amenity planting, outdoor furniture, recreational facilities and open space to create a pleasant living environment and encourage community activities. The opportunity to deck over the railway depot would add landscape and visual interests to the area.

### 4.5 Sustainable Technical Performance

4.5.1 Technical assessments conducted have demonstrated that the proposed Development Scheme is sustainable from traffic and transport, environment and ecology, air ventilation, landscape and visual, as well as utility service perspectives. Specifically, the road and railway network are able to support the Proposed Development with extra road capacity, i.e. Route 11 and Road P1 (Tai Ho to Sunny Bay Section) as illustrated in the *Sustainable Lantau Blueprint*, expected to be commissioned in time to support future developments in North Lantau. Relevant Government departments have indicated their objective of planning and design of Siu Ho Wan Reclamation and infrastructure to be compatible with the Proposed Development.

## 5 TECHNICAL JUSTIFICATIONS

### 5.1 Introduction

5.1.1 This section summarises key findings of the technical assessments to confirm that the proposed Development Scheme is sustainable from traffic and transport, TCL capacity, air ventilation, environment, landscape and visual, and utilities perspectives. Full reports of these assessments and the Executive Summary of the approved EIA Report for topside development are provided in **Appendices I to VII**. Mitigation/improvement measures recommended in the technical assessments have already been incorporated in the proposed Development Scheme, as appropriate.

5.1.2 In addition, information pertaining to SBD Guidelines and the preliminary Geotechnical and Structural Feasibility Assessment is also provided in this section.

### 5.2 Traffic and Transport Impact Assessment (T&TIA, Appendices I and II)

5.2.1 A T&TIA has been undertaken to assess the traffic impact and public transport facilities requirement based on existing and planned road and railway networks, with due consideration of various committed projects in Northshore Lantau.

5.2.2 The Subject Site is served by a comprehensive road network including NLH and the Lantau Link, as well as the TM-CLK Link under construction, providing convenient connection to the HKIA, the future HKBCF Island, New Territories West and the urban areas, as well as the Pearl River Delta via the future HZMB. The Tai Ho Interchange (THI) of NLH provides access to the SHD. A new dual 2-lane carriageway, namely Road P1, has been earmarked as a medium term project (Year 2023-2030) in Government's *Sustainable Lantau Blueprint* serving as a distributor road parallel to the NLH, with its Tung Chung to Tai Ho Section currently under detailed design.

5.2.3 Based on trip generation surveys conducted at Tung Chung private residential developments, along with other reference sources for commercial/retail and education facilities, it is estimated that the Proposed Development would generate and attract a total of 1,235 and 915 pcu/hr in AM and PM peak, respectively. The Proposed Development is also estimated to generate about 7,600 personal trips during peak hours, of which about 60% (i.e. 4,500 trips) would be using railway.

5.2.4 Traffic forecasts of the Assessment Year 2041 (3 years after project completion) have been prepared by extracting background traffic flows from the updated AECOM in-house traffic model which has taken into account the *Enhanced 2011-Based Territorial Population and Employment Data Matrix (TPEDM)*. Results have indicated that all road junctions in the vicinity and key junctions in Tung Chung New Town are predicted to be operating within design capacity.

5.2.5 With the timely implementation of the Route 11 between Sunny Bay and Yuen Long via Tsing Lung Tau and the Road P1, cumulative road traffic performance at all the key road links are predicted to be operating within manageable level.

5.2.6 In the long run, the proposed strategic road network linking Lantau and Hong Kong Island via the East Lantau Metropolis is expected to be in place to provide further capacities to support the developments under the planning frameworks proposed by the *Sustainable Lantau Blueprint* and the *HK2030+*. Notwithstanding, it is also expected that more personal trips would be contained within Lantau Island when the new job opportunities at various planned projects are progressively materialised in the future.

5.2.7 The *TCNTE Study* has recommended upgrading THI to a 3-lane interchange with connecting ramps/slip roads to Road P1, NLH and SHD. A new signal controlled junction would be provided outside the western access of the Proposed Development connecting to the slip road from Road P1 to/from the THI.

5.2.8 The eastern access of the Proposed Development would be connected to the future Road P1 (SHW Section). In the case that the connection is not available when the Phase 4 development is commissioned, the existing maintenance access road to Sham Shui Kok Drive would be upgraded to single 2-lane carriageway, as far as practicable, to cater for the traffic to/from the eastern access as a temporary measure if necessary.

5.2.9 A new SHO Station of TCL has been planned to serve the Proposed Development. Based on results of the TCL Capacity Assessment (**Appendix II**), the peak TCL loading with the Proposed Development is estimated to be within its maximum carrying capacity even under the more stringent density level scenario of 4 persons/m<sup>2</sup>.

5.2.10 The proposed residential car parking provision has taken into account the discount factor as stipulated in the HKPSG for developments which fall within the 500m-radius catchment area of the proposed SHO Station. Considering that there are no alternative car parking spaces in the vicinity, high end of the HKPSG requirement has been adopted for residential car parking provision due to expected strong demand in Lantau, as agreed with Transport Development. Higher car ownership incentive is expected for Lantau developments if the cross-boundary vehicle quota system for the HZMB is implemented. The residential car parking provision would be reviewed in the detailed design stage to ensure sufficient supply.

5.2.11 In conclusion, the T&TIA and the TCL Capacity Assessment have demonstrated that there would be sufficient road and rail capacities to support the Proposed Development.

### 5.3 Air Ventilation Assessment – Expert Evaluation (AVA-EE, Appendix III)

- 5.3.1 An AVA-EE has been conducted in accordance with the *Technical Circular No.1/06 – Air Ventilation Assessments* published by the Government to assess air ventilation impact of the proposed Development Scheme on areas in the vicinity.
- 5.3.2 Wind data available for the Subject Site from Planning Department, Site Wind Availability Study of the planned Tung Chung East, and Hong Kong Observatory Siu Ho Wan Weather Station has been analysed. Annual prevailing wind directions vary from NNE to SE, whereas summer prevailing wind directions vary from SE to WSW.
- 5.3.3 NLH is considered as the major wind corridor in the area. With four dedicated 30m-wide breezeways generally align in the north-south and east-west directions and six supplementary air paths of minimum 15m-wide generally align in the northwest-southeast direction, coupled with open space/low-rise structure at the intersections, incoming wind would ventilate across the Proposed Development and minimize the ventilation impact to its surrounding. Considering the existing Taoist temple and Pak Mong Village are located at some 780m and 1.2km away, respectively, with a small hill up to +117mPD in the windward side dominating the wind environment under annual prevailing wind condition, potential air ventilation impact on the temple and the villages would be insignificant. While under the summer prevailing wind conditions, the temple and the villages are located at the upwind side of the Proposed Development and therefore negligible impact would be encountered.
- 5.3.4 Breezeways and supplementary air paths have been incorporated in the proposed Development Scheme, along with the terraced podium, to facilitate wind penetration across the development. The AVA-EE has concluded that the Proposed Development would have negligible to minimal impact to the local wind environs. Quantitative AVA would be conducted to further enhance wind performance of the Proposed Development at the detailed design stage.

### 5.4 Environmental Impact Assessment (EIA, Appendix IV)

- 5.4.1 Statutory EIA has been conducted to identify and evaluate potential impacts arising from the construction and operation of the Proposed Development, SHD replanning works and SHO Station. The approved EIA Reports of *Proposed Comprehensive Residential and Commercial Development atop Siu Ho Wan Depot (Topside Development EIA, AEIAR-213/2017)* and *Siu Ho Wan Station and Siu Ho Wan Depot Replanning Works (Railway EIA, AEIAR-214/2017)* have covered the following designated project elements:
- Engineering feasibility study of an urban development project (Schedule 3, Item 1);
  - Sewage pumping station with an installed capacity of about 12,100m<sup>3</sup> per day (Schedule 2, Item F.3(b));
  - SHO Station and associated track works (Schedule 2, item A.2); and
  - The operation of SHD after replanning works (Schedule 2, Item A.4).
- 5.4.2 The principle of avoidance and minimisation of environmental impacts has been incorporated in the planning, design and operation of the Proposed Development, with key approaches adopted as below:
- the Proposed Development and its associated infrastructure are all land-based with no reclamation and marine works to be carried out, avoiding impact to the marine environment;
  - the residential blocks fronting NLH, TCL/AEL would adopt self-protecting building design such as using non-noise sensitive facades, coupled with the provision of noise canopy and acoustic windows, to minimise adverse noise impact;
  - the Proposed Development would not encroach onto recognised sites of conservation importance including Lantau North (Extension) Country Park, Tai Ho Stream Site of Special Scientific Interest, Conservation Area and Tai Ho Ecologically Important Stream and Coastal Protection Area; and
  - the Proposed Development has avoided encroachment onto Consultation Zone of SHWWTW to avoid any hazard implications.
- 5.4.3 The EIA has confirmed that the Proposed Development would be environmentally acceptable with the implementation of the recommended mitigation measures. By providing a landscaped deck over the entire depot site, the Proposed Development would bring environmental benefits to the community by containing the existing industrial operation, while acting as a focal point with new community facilities to allow flexibility for future land use planning of Siu Ho Wan Area. A summary of predicted environmental outcomes are summarised in **Table 5.1**. The approved EIA Reports are available at the EIA register and the EIA Ordinance website ([www.epd.gov.hk/eia](http://www.epd.gov.hk/eia)). Executive Summary of the *Topside Development EIA* is provided in **Appendix IV**.

5.4.4 Due consideration has been given to address the comments received by the public and the Advisory Council on the Environment (ACE) during the report inspection period, particularly on the proposed Development Scheme and environmentally friendly measures, which would be further explored in the detailed design.

5.4.5 The EIA findings, along with the mitigation measures, would be further reviewed and updated where necessary to ascertain the environmental acceptability of the changes arising from the detailed design and implementation of the Proposed Development.

**Environmentally-Friendly Measures**

5.4.6 To create a low carbon sustainable community, the Proposed Development is aimed to achieve at minimum the Hong Kong Building Environmental Assessment Method (BEAM) Plus Gold accreditation for its design and construction to reap the benefits of better indoor environment, minimise pollution to the external environment, provide energy-efficient buildings and reduce unsustainable consumption of scarce resources.

5.4.7 Further green measures, such as electric vehicle charging at residential and visitor car parking spaces, high performance building system and equipment, rainwater recycling for non-potable uses, municipal solid waste separation and recycling, and food waste decomposing facility, would be implemented subject to detailed design.

**Table 5.1: Summary of Environmental Outcomes**

Category	Predicted Environmental Outcomes with Implementation of Recommended Mitigation Measures
Air Quality	<ul style="list-style-type: none"> <li>All criteria pollutants are predicted to comply with the Hong Kong Air Quality Objectives and relevant standards during construction and operational phases.</li> <li>Negligible odour impact from the proposed underground sewage pumping station.</li> </ul>
Noise	<ul style="list-style-type: none"> <li>All predicted noise levels for construction noise, rail noise, road traffic noise, fixed noise, helicopter noise and marine traffic noise comply with relevant criteria.</li> <li>Situated at over 1km from the Noise Exposure Forecast 25 (NEF25) contour under full operation of the Three-Runway System of the HKIA.</li> </ul>
Water Quality	<ul style="list-style-type: none"> <li>No marine works.</li> <li>Control of surface runoff during construction by good site practices.</li> </ul>
Sewerage and Sewage Treatment	<ul style="list-style-type: none"> <li>Sewage generated would be conveyed to SHWSTW.</li> <li>Increase storage capacity at the sewage pumping station with standby pumping capacity and spare pump stockpiled to minimise the chance of emergency discharge.</li> </ul>
Waste Management Implications	<ul style="list-style-type: none"> <li>Reduce the generation of and reuse surplus inert Construction and Demolition materials in-situ as far as practicable.</li> <li>Implement precast construction method as far as practicable to minimise construction waste.</li> <li>Implement trip ticket system and GPS on dump trucks to minimise the chance of fly tipping.</li> <li>Explore food waste recycling at OWTF with Government.</li> </ul>
Land Contamination	<ul style="list-style-type: none"> <li>No potential contaminative activity identified.</li> <li>Follow up site investigation work to verify land contamination issues and identify any remedial actions needed after decommissioning of depot facilities.</li> </ul>
Ecology	<ul style="list-style-type: none"> <li>No percussive piling and marine works to minimise potential impact to Chinese White Dolphins and Brothers Marine Park.</li> <li>No species of conservation importance found within the Subject Site.</li> </ul>
Fisheries	<ul style="list-style-type: none"> <li>No loss in fishing ground or change in fishing operation location due to the Proposed Development.</li> <li>No adverse impact on fisheries resources and fishing ground.</li> </ul>
Landscape and Visual (see below section for detailed)	<ul style="list-style-type: none"> <li>Major visual corridor from Tai Ho to the sea not affected.</li> <li>Compensatory planting would be adopted to the affected trees of common species.</li> </ul>
Hazard to Life	<ul style="list-style-type: none"> <li>Proactively located residential population outside consultation zone of SHWWTW.</li> <li>Individual risk satisfies relevant risk criterion, while societal risk curve falls within “As Low As Reasonably Practicable (ALARP)” region.</li> </ul>



## 5.5 Landscape and Visual Impact Assessment (LVIA, Appendix V)

- 5.5.1 LVIA has been performed as part of the approved EIA, with predicted outcomes summarised as below.
- 5.5.1 The Subject Site is located within an area of low/moderate landscape value and sensitivity. Major landscape resources in the vicinity include the water body at Tai Ho Bay and woodland on slopes between NLH and Lantau North (Extension) Country Park would not be affected by the Proposed Development. Broad brush tree survey conducted has identified that some 520 trees of common species, mostly within the existing depot, would be affected. Compensatory tree planting would be provided in accordance with relevant Technical Circulars.
- 5.5.2 Key visually sensitive receivers (VSRs) within the visual envelope of the Proposed Development have been identified in the *Topside Development EIA*. These include users at Tung Chung East, NLH, Hong Kong Olympic Trail, Lo Fu Tau Country Trail, Tuen Mun South Coast, and Pak Mong village. Indicative photomontages have been prepared to illustrate the massing of the proposed Development Scheme with incorporation of recommended landscape and visual enhancement measures (**Appendix V**, extracted from the *Topside Development EIA*). Views from the VSRS are generally obstructed by existing vegetation, topography and infrastructure.
- 5.5.3 The terraced-design podium enhanced with minimum 30% site coverage of greenery would soften the podium edges and add visual interests at the pedestrian zone. Landscape and visual enhancement measures proposed in the *Topside Development EIA*, including aesthetic design of building façade and noise canopy, and buffer/compensatory planting etc., would be further studied at the detailed design stage. For VSRs travelling along NLH, the proposed diagonal and perpendicular corridors would maintain visual permeability and connection to the sea. VSRs from far distances e.g. Tuen Mun South Coast, would have limited visibility of the Proposed Development.
- 5.5.4 The EIA has concluded that the overall landscape and visual impact is considered acceptable with implementation of the proposed mitigation measures. Landscape and visual character of the Subject Site would be transformed from low-rise industrial to an urban development node with greening. Further visual enhancement measures including innovative façade treatment and aesthetic design of the noise canopy would be explored in the detailed design.

## 5.6 Preliminary Utilities Feasibility Study (Appendices VI and VII)

### Drainage

- 5.6.1 Stormwater drains ranged from 300mm to 1,200mm diameter are available within the Subject Site, connecting to the existing box culverts in the drainage reserve areas. As the catchment area and surface characteristics after the Proposed Development would be similar to the existing condition, the surface runoff pattern and quantity should remain generally the same and the existing box culverts should be adequate to collect the stormwater from the Proposed Development without causing adverse drainage impact.

### Sewerage

- 5.6.2 The existing SHWSTW is a chemically enhanced primary treatment works with a design capacity of 180,000m<sup>3</sup>/day. Sewage generated from the Proposed Development is estimated to be about 12,100m<sup>3</sup>/day (Average Dry Weather Flow, ADWF) based on EPD's *Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning (GESF)*. Additional sewage flow generated from SHD replanning works and the proposed SHO Station is estimated as about 483m<sup>3</sup>/day ADWF, as compared with the existing condition. The Government has identified sufficient capacity at the SHWSTW to accept the total sewage arising from the Proposed Development, SHO Station and the replanned SHD.
- 5.6.3 In addition to the new sewage pumping station to be installed within the Proposed Development, a new sewer (450mm diameter twin rising mains) with an indicative alignment of about 900m crossing the LAR/NLH via a new underground trench would be constructed to convey sewage to the SHWSTW for treatment. Sewerage and sewage treatment implications have been assessed part of the approved EIA.

### Water Supply

- 5.6.4 Total fresh and flushing water demand upon full completion of the Proposed Development is estimated to be about 15,400m<sup>3</sup>/day and 3,400m<sup>3</sup>/day, respectively, based on Water Supplies Department (WSD)'s *Departmental Instruction (DI) No.1309* and EPD's *GESF*. In addition, water demand for fire-fighting of a R2 residential development site would be 6,600m<sup>3</sup>/day for 8 hours in accordance with *DI No.1309*. Further, it is estimated that an additional demand of about 1,100m<sup>3</sup>/day would be required for the SHO Station and SHD. Application for water supply would be made to WSD in accordance with the Waterworks Ordinance and Regulations at the detailed design stage.

5.6.5 SHWWTW currently has a water treatment capacity of 150,000m<sup>3</sup>/day, which will be increased to 300,000m<sup>3</sup>/day by Year 2025 according to WSD's latest plan. CEDD has commissioned consultants to undertake detailed design of a new fresh water service reservoir and the associated water supply network for TCNTE. Upon completion of the proposed waterworks, WSD would connect them and improve the existing water supply network to provide gravity fresh water supply to the Proposed Development.

5.6.6 The new fresh water supply network would provide connection point(s) at the eastern or western end of the Proposed Development; while salt water would be supplied by the proposed Tung Chung Salt Water Pumping Station located at TCNTE with connection point near the western end of the Proposed Development.

#### **Other Utility Services**

5.6.7 Other utility services including electricity, gas and telecommunication are currently available at the Subject Site. No insurmountable problem has been identified with respect to extending the supplies to cater for the Proposed Development despite local upgrading or new facilities, e.g. electricity sub-station, gas kiosks, might be required, which would be reviewed at the detailed design stage.

### **5.7 Sustainable Building Design Guidelines Consideration**

5.7.1 The proposed Development Scheme design has made reference to the SBD Guidelines with respect to building separation, building setback and site coverage of greenery in accordance with *PNAP APP-152* as summarised below.

5.7.2 The Subject Site is bounded by sea and highway/railway infrastructure with limited pedestrian network connection. With the ground level occupied by an operating depot and railway facilities, construction of basement is considered not feasible. As indicated in **Figure 3.9**, the main open air pedestrian zone for residents and visitors is therefore on the podium deck at +20.1 and +26.5mPD, which is adopted as the "Level Zero" and the "Ultimate Place of Safety" for both the buildings above (i.e. residential towers, schools etc.) and the building podium below (i.e. PTI, carpark, commercial/retail facilities etc.). The design of buildings above "Level Zero" of the site would comply with the Design Requirements as stipulated in *PNAP APP-152*.

#### **Building Separation**

5.7.3 *Continuous Projected Façade Length (L<sub>p</sub>) of Buildings Abutting a Street*: As no proposed building is within 30m from the centerline of the abutting streets, the Design Requirement on the maximum permissible L<sub>p</sub> is not applicable.

5.7.4 *Separation Distance and Permeability of Buildings*: While one of the vertical projection plane is set in relation to the connecting road to the THI/the proposed upgraded Sham Shui Kwok Drive (these two roads are of similar orientation), and the other plane would be set in the perpendicular direction. Minimum Permeability of 20% and 33.3% would be allowed for these 2 chosen planes.

#### **Building Setback**

5.7.5 The width of the existing street abutting the Subject Site is more than 15m. As no part of the buildings is situated at less than 7.5m from the centerline of the abutting streets, the proposed Development Scheme has complied with the building setback requirements.

#### **Site Coverage of Greenery**

5.7.6 The minimum requirement on site coverage of greenery for the Proposed Development is 30% (based on the entire site), of which half (15%) should be located at the pedestrian (primary) zone. As indicated in the Conceptual Greening Framework (**Figure 3.4**), landscaped open space with tree planting would be located at the podium deck level which is the pedestrian zone of the proposed Development Scheme.

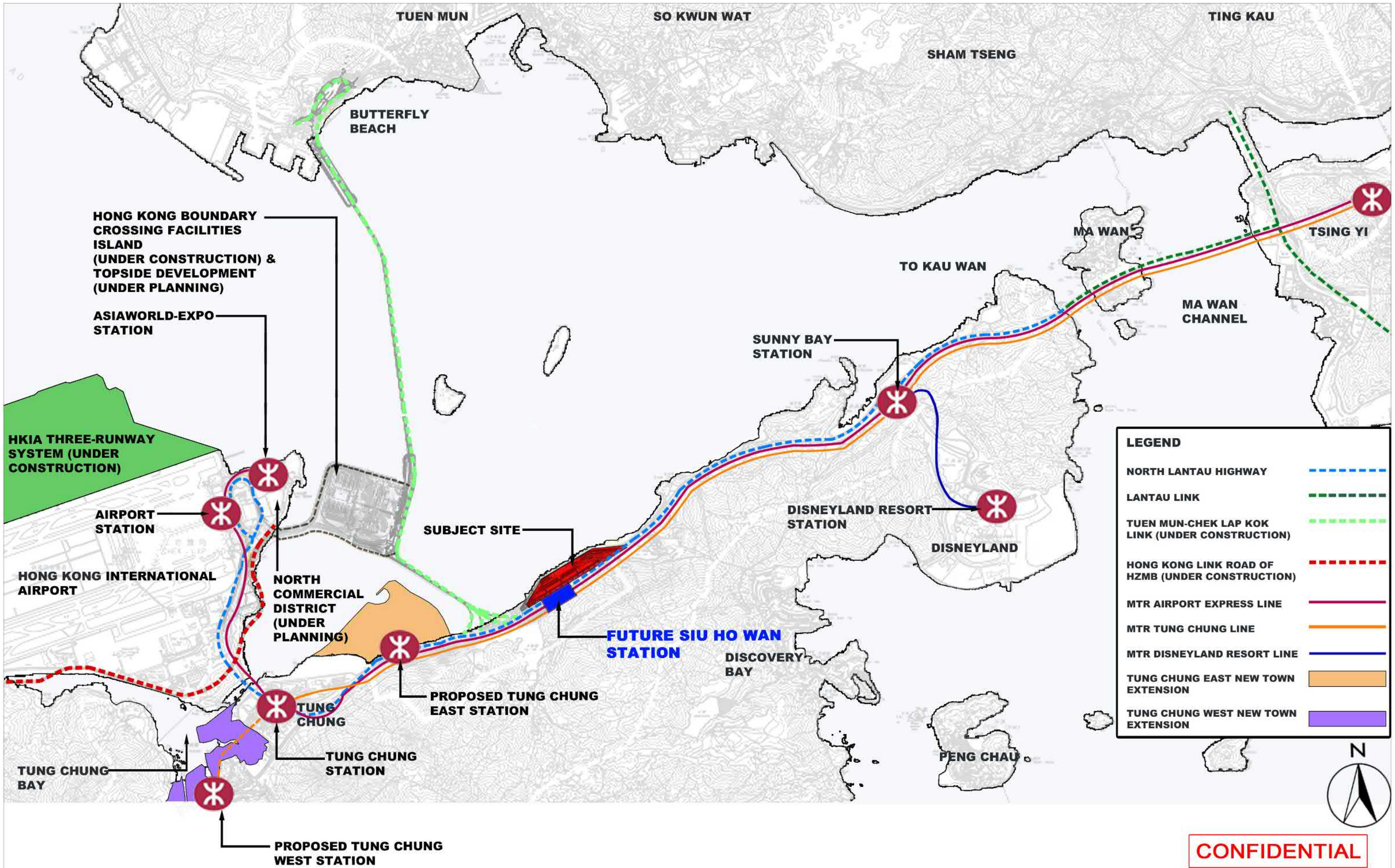
### **5.8 Preliminary Geotechnical and Structural Feasibility Study**

5.8.1 The Subject Site is located adjacent to the Designated Area of Northshore Lantau as outlined under *Geotechnical Engineering Office (GEO) Technical Guidance Note 12*. Based on available geotechnical information, the ground generally consists of 3m thick layer of general fill, 7 to 19m thick layer of marine sand fill, 5.5 to 14m thick layer of marine deposit, 1 to 15m thick layer of alluvial deposits, and 1 to 46m thick layer of in-situ decomposed rock. The granitic bedrock is located at about +5 to -60mPD. Reference would be made to *GEO Publication No. 1/2006* and *GEO Technical Guidance Note No.26* for technical guidance in foundation design in areas underlain by marble and marble-bearing rocks where appropriate.

5.8.2 Structural system of the Proposed Development would consist of shear wall structure for the tower on top of a concrete transfer plate, which would be supported by columns and beams framework of the podium and the depot. Negative skin friction would be considered for the foundation design. No insurmountable problem has been identified on geotechnical and structural feasibility matters.

## 6 CONCLUSION

- 6.1.1 As a positive response to the 2015 Policy Address, MTR Corporation has commissioned a multi-disciplinary consultant team to study the development potential of the Siu Ho Wan Depot to optimise housing supply. The objective is to utilise the existing depot of about 30 hectare to build an integrated residential and commercial development atop a landscaped podium decking over the entire depot and railway facilities.
- 6.1.2 The Subject Site is served by existing road and railway network with good accessibility to other parts of the territory, as well as the Pearl River Delta via the future Hong Kong-Zhuhai-Macao Bridge. The Proposed Development involves complicated replanning and phased migration of the operating depot. Other development constraints include the Airport Height Restrictions, noise impact from adjacent highway and railway, underground utility reserves, and interface with nearby Government facilities and infrastructure.
- 6.1.3 A proposed Development Scheme has been formulated to provide a self-sufficient community of about 14,000 residential units (domestic plot ratio about 3.5) to accommodate some 37,800 population with local commercial/retail facilities of about 30,000m<sup>2</sup> GFA, supported by private recreational facilities and open space, education facilities, public transport and other supporting facilities. A new Siu Ho Wan Station for MTR Tung Chung Line has been proposed to meet the transportation needs of the development and enable the building of a sustainable community.
- 6.1.4 Preliminary design of the depot replanning works and the SHO Station has been conducted to facilitate design and planning of the topside development, with migration of facilities to be carried out in phases to maintain safe and uninterrupted railway operations.
- 6.1.5 Technical assessments conducted have demonstrated that the Proposed Development is sustainable in traffic and transport, environmental and ecological, air ventilation, landscape and visual, and engineering terms. Specifically, the approved Environmental Impact Assessment has confirmed environmental acceptability of the Proposed Development with mitigation.
- 6.1.6 With the timely implementation of the new road links by Government, including Route 11 and Road P1, to support various development projects proposed under the *Sustainable Lantau Blueprint*, all the key road links are predicted to be operating within manageable level in Year 2041. Tung Chung Line would have sufficient capacity to cater for the Proposed Development even under the more stringent density level scenario of 4 persons/m<sup>2</sup>. In the long run, the proposed strategic road corridor linking Lantau and Hong Kong Island via the East Lantau Metropolis is expected to be in place to provide further capacities.
- 6.1.7 No private land resumption or reclamation is required for the Proposed Development. With the development taking place on existing railway depot land and the closest residents at Pak Mong Village located at some 1.2km away, no major concern from the public due to unacceptable impact is anticipated.
- 6.1.8 In summary, the proposed Development Scheme has achieved:
- (i) Optimal utilisation of railway land to provide housing supply;
  - (ii) Strategic planning objective of building a sustainable community served by environmentally friendly rail transport; and
  - (iii) Local planning objective of providing home for about 40,000 people along the North Lantau Corridor as promulgated by the *Sustainable Lantau Blueprint* to support the significant workforce from planned developments in Lantau.
- 6.1.9 The proposed comprehensive development atop Siu Ho Wan Depot is justified from land use suitability and technical sustainability perspectives. Government is requested to initiate the Outline Zoning Plan preparation to confirm the depot topside development and commit infrastructure support to secure the housing supply of 14,000 units to be completed by 2038 tentatively.

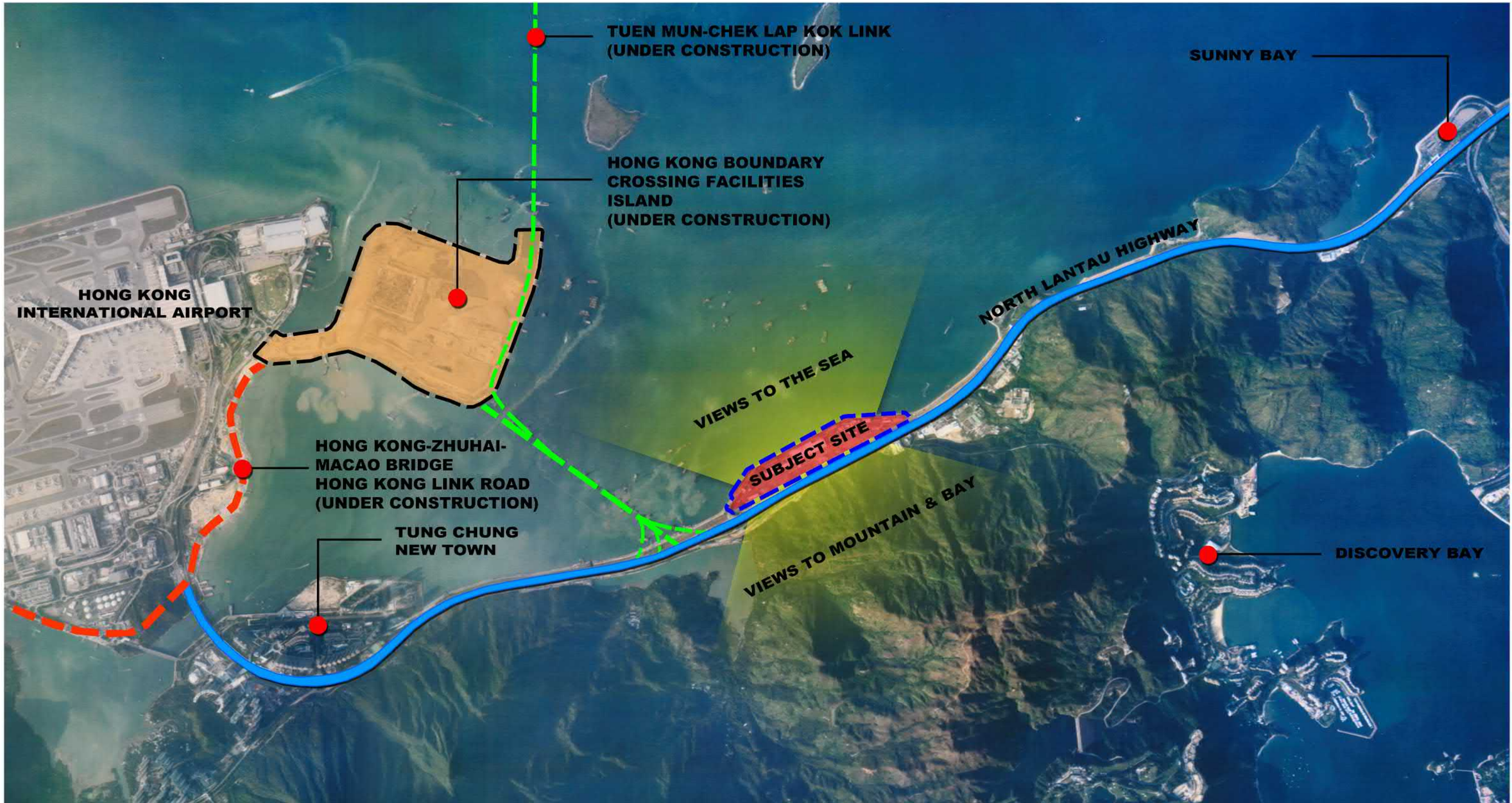


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Proposed Comprehensive Residential and Commercial Development atop Siu Ho Wan Depot  
 Site Location Plan



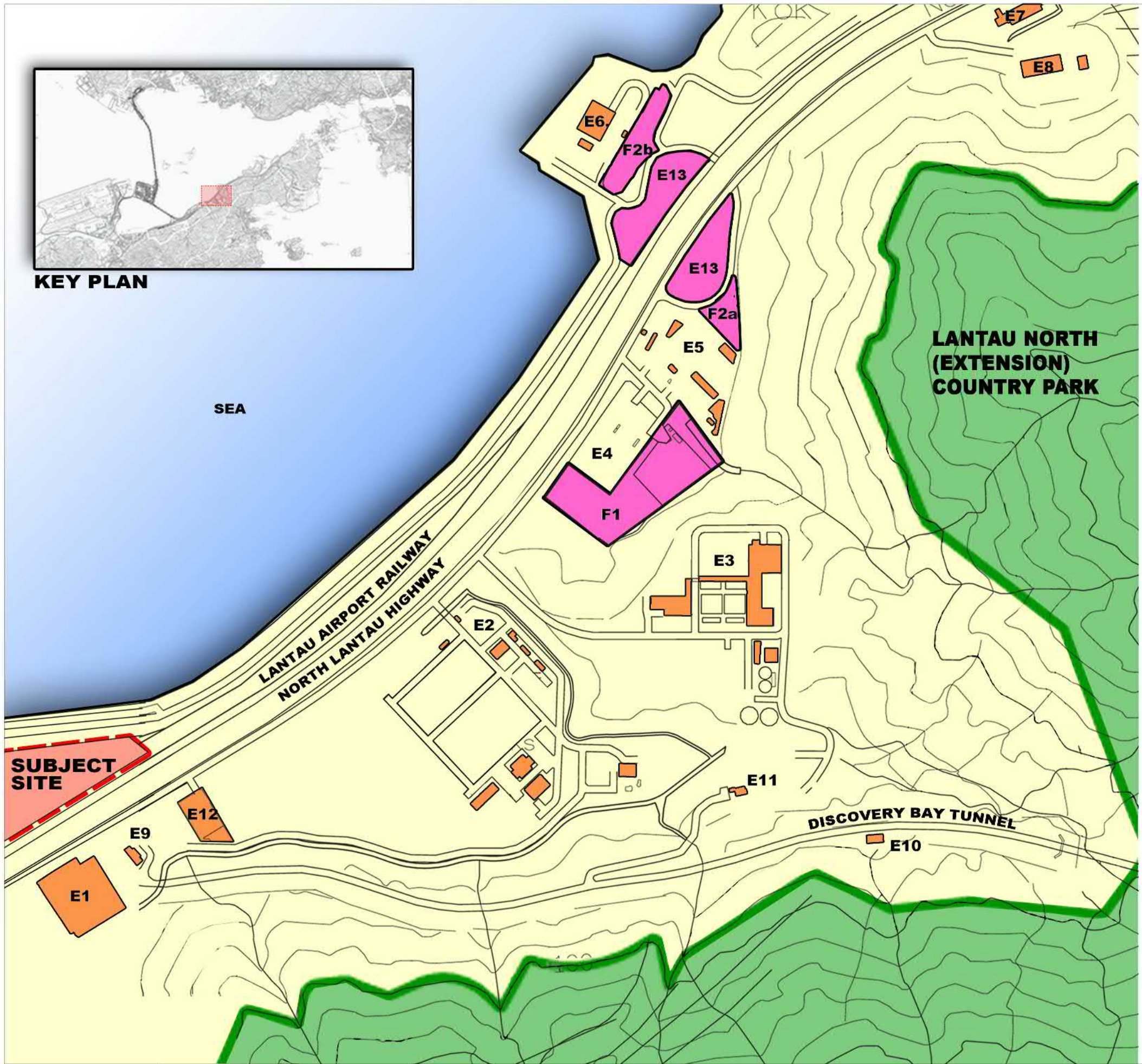
SCALE: 1:40000 (A3) FIGURE No. 2.1  
 DATE: DEC 2016



**CONFIDENTIAL**



**KEY PLAN**



**EXISTING FACILITIES**

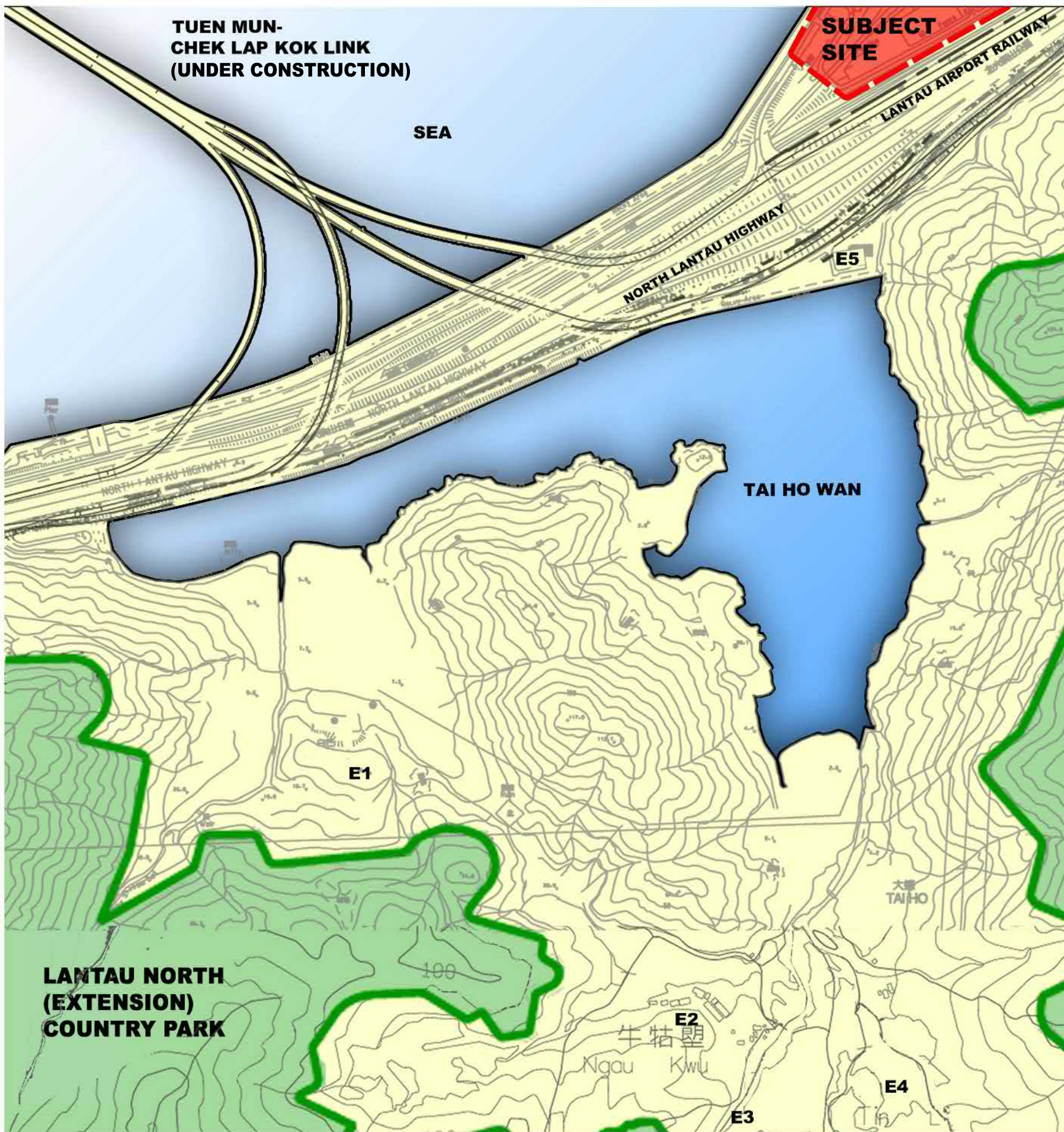
- E1. SIU HO WAN GOVERNMENT MAINTENANCE DEPOT**
- E2. SIU HO WAN SEWAGE TREATMENT WORKS**
- E3. SIU HO WAN WATER TREATMENT WORKS**
- E4. SIU HO WAN VEHICLE POUND VEHICLE EXAMINATION CENTRE AND WEIGH STATION**
- E5. BUS DEPOTS**
- E6. NORTH LANTAU REFUSE TRANSFER STATION**
- E7. SHAM SHUI KOK TRACTION SUB-STATION**
- E8. SHAM SHUI KOK SUB-STATION**
- E9. DISCOVERY BAY TUNNEL ADMINISTRATION BUILDING**
- E10. DISCOVERY BAY TUNNEL BUILDING SUBSTATION**
- E11. DISCOVERY BAY TUNNEL PWPT SUBSTATION**
- E12. BUS DEPOT**
- E13. TEMPORARY CONCRETE/ASPHALT PLANT**

**FACILITIES COMMITTED / UNDER STUDY**

- F1. ORGANIC WASTE TREATMENT FACILITIES**
- F2a & b. POTENTIAL SITES FOR POSSIBLE COLUMBARIUM (UNDER STUDY)**



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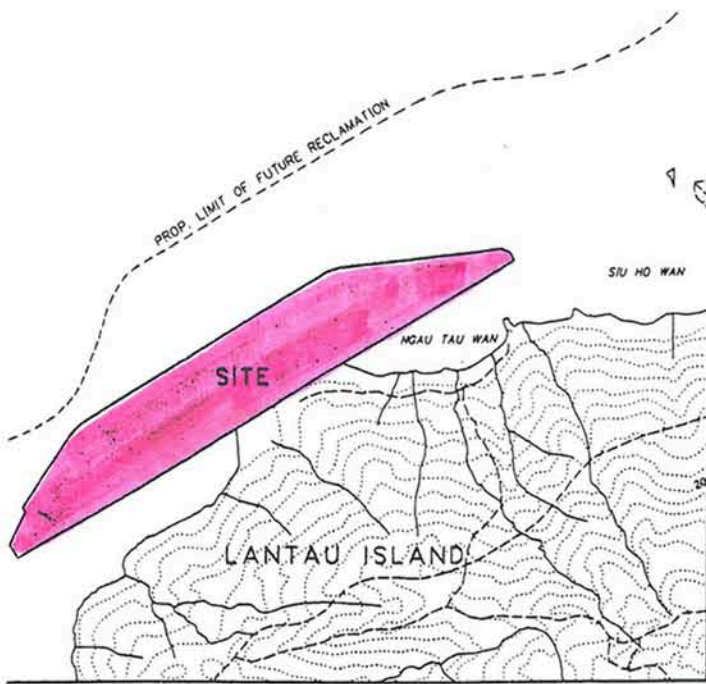
KEY PLAN

**EXISTING SETTLEMENTS / FACILITIES**

- E1. PAK MONG**
- E2. NGAU KWU LONG**
- E3. TAI HO SUN TSUEN**
- E4. TIN LIU**
- E5. TAI HO OFFTAKE AND PIGGING STATION**



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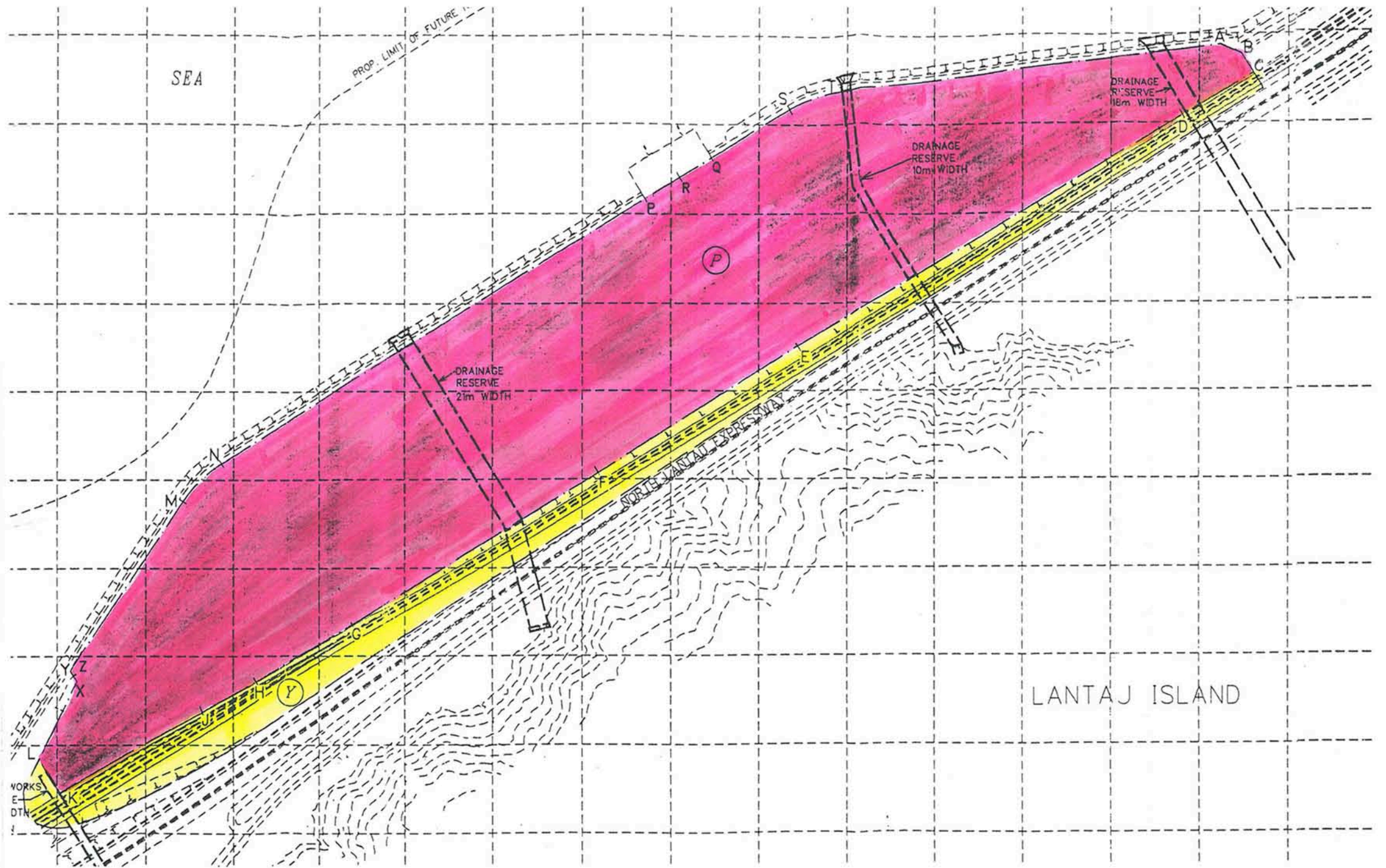
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B-C	25.82	148 15 20
C-D	92.93	239 32 00
D-E	506.79	239 33 00
E-F	267.93	237 23 00
F-G	327.68	238 24 20
G-H	129.64	240 22 30
H-J	71.14	241 27 00
J-K (Chord)	185.32	240 25 50
K-L	44.75	327 57 10
L-X	98.45	26 01 20
X-Y	13.66	326 36 50
Y-M	230.37	33 25 50
M-N (Chord)	61.41	45 55 00
N-S	761.46	58 24 30
S-T (Chord)	61.40	70 53 40
T-A	434.40	83 22 50

SIDE	ARC IN METRES	RADIUS	ANGLE
J-K	185.33	5205.02	2 02 20
M-N	61.90	141.98	24 58 40
S-T	61.89	142.00	24 58 20

Special conditions refer

- Yellow
- Points X, Y & Z
- P, Q & R
- Drainage reserve



COLOURED PINK AREA 300707 SQUARE METRES (ABOUT)

SCALE 1:5000



----- Proposed layout

**CONFIDENTIAL**

Approved by

*[Signature]*  
C.M. TO  
11/8/95

Senior Land Surveyor  
New Airport Survey Unit  
Lands Department

LOT No. 143 IN D.D. 346

File Ref. No. L/M(1) TO 13/PTG/92, LD NAS2/W 1  
Survey Sheet No. 10-NW-C, 10-SW-A  
Layout Plan No. L/I-SHW/C (Sht. 1 & 2)  
Engineering Dwg. No. 518/K/00/CIP/P0  
PLAN No. NA1142-DF2



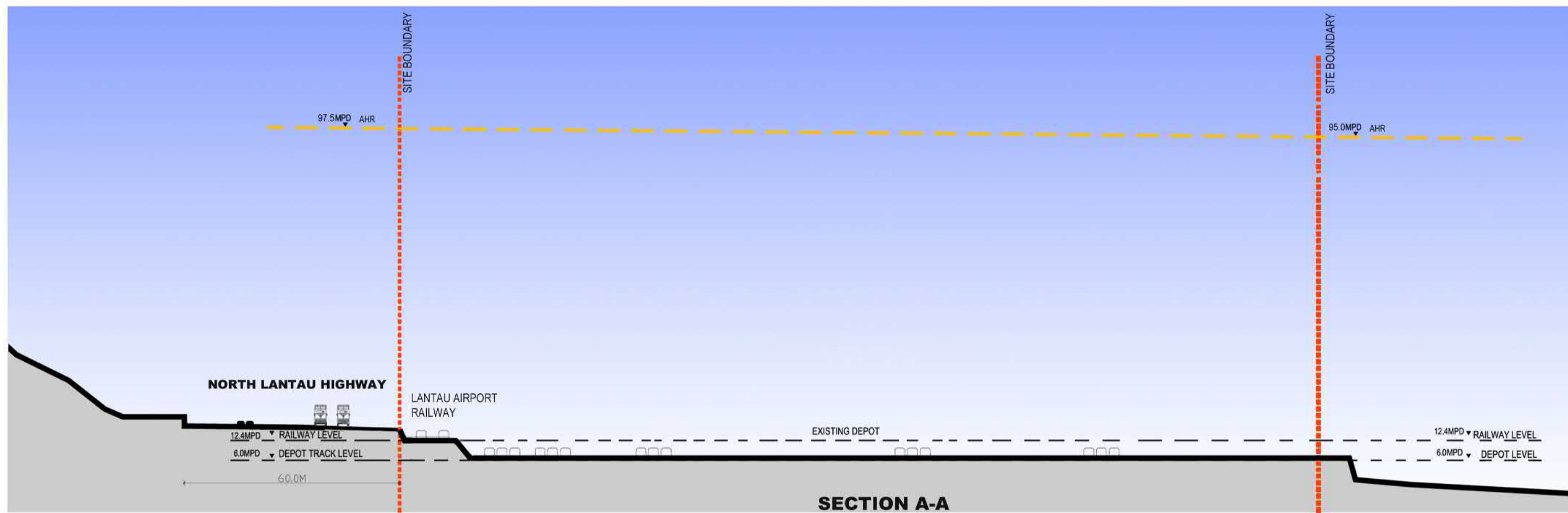
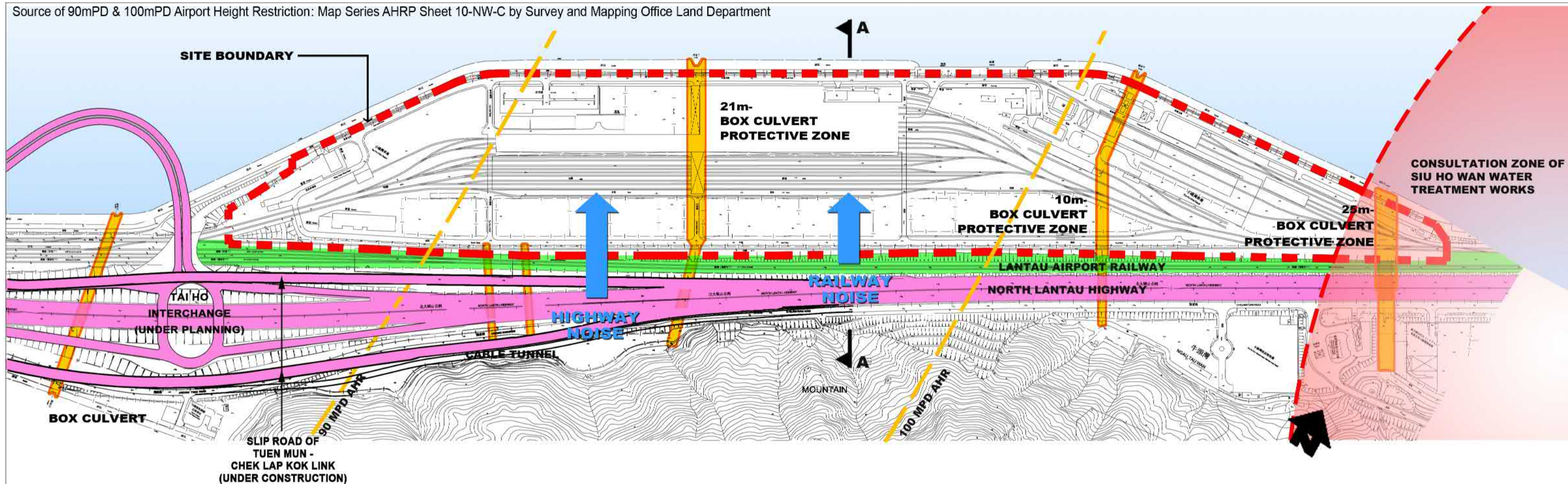
Proposed Comprehensive Residential and Commercial Development atop Siu Ho Wan Depot  
Lease Plan of Lot No.143 in D.D. 346





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DATE: AUG 2015

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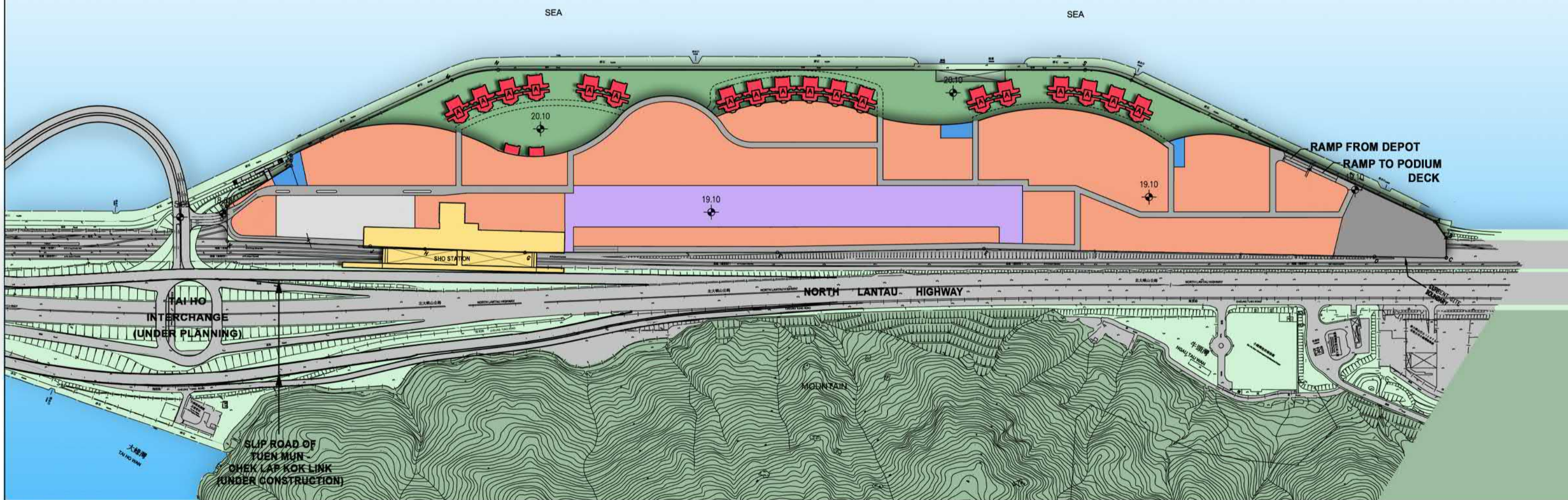
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-  RESIDENTIAL TOWER TYPE B



**LEGEND:**

-  RESIDENTIAL TOWER TYPE A
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-  KINDERGARTEN
-  RAILWAY STATION AND ASSOCIATED FACILITIES
-  PUBLIC TRANSPORT INTERCHANGE
-  M/E / UTILITIES



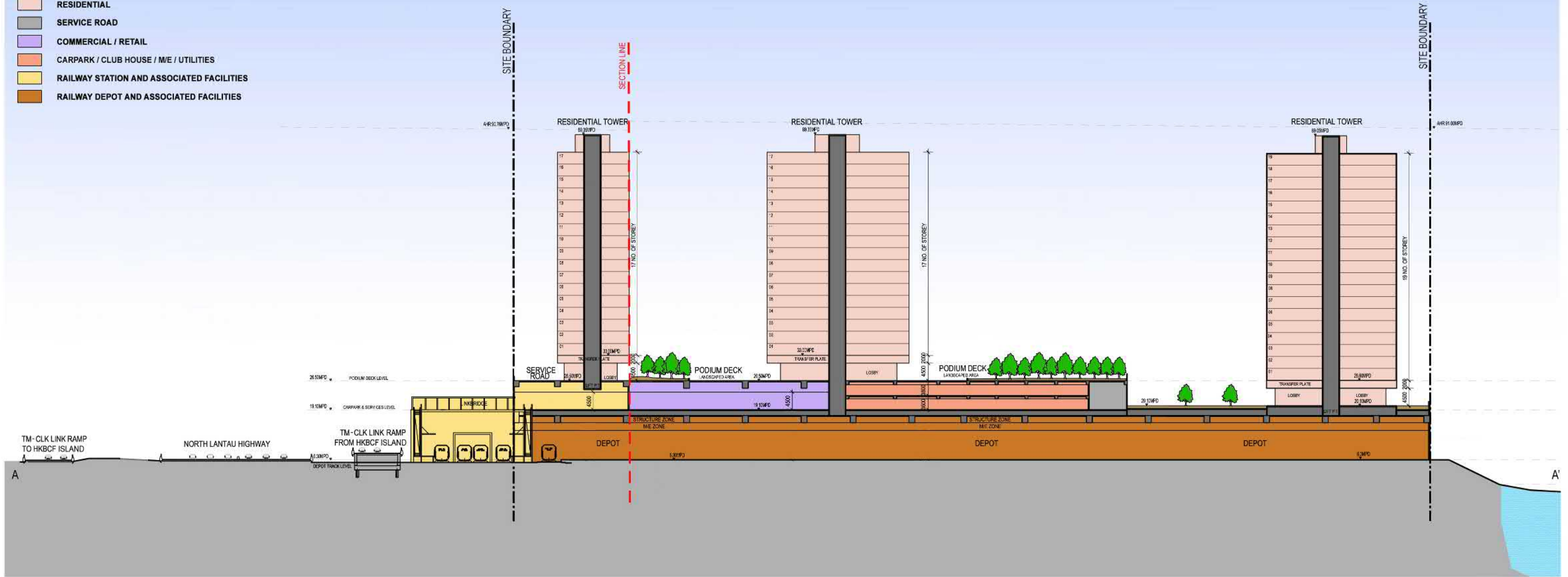


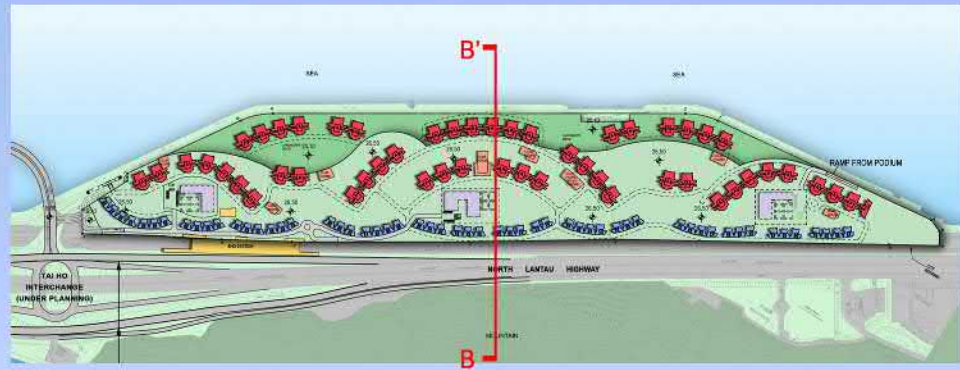
Proposed Comprehensive Residential and Commercial Development atop Siu Ho Wan Depot  
 Proposed Development Scheme - Ground Level



**LEGEND**

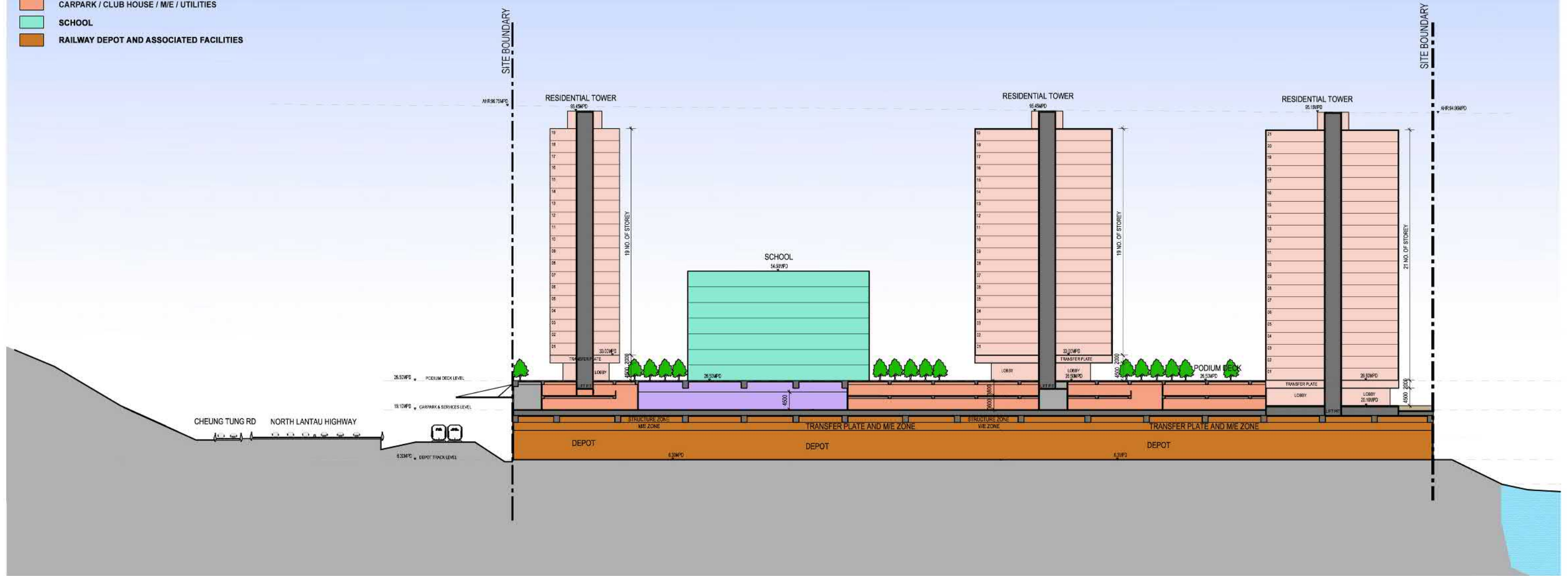
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- SERVICE ROAD
- COMMERCIAL / RETAIL
- CARPARK / CLUB HOUSE / M/E / UTILITIES
- RAILWAY STATION AND ASSOCIATED FACILITIES
- RAILWAY DEPOT AND ASSOCIATED FACILITIES





**LEGEND**

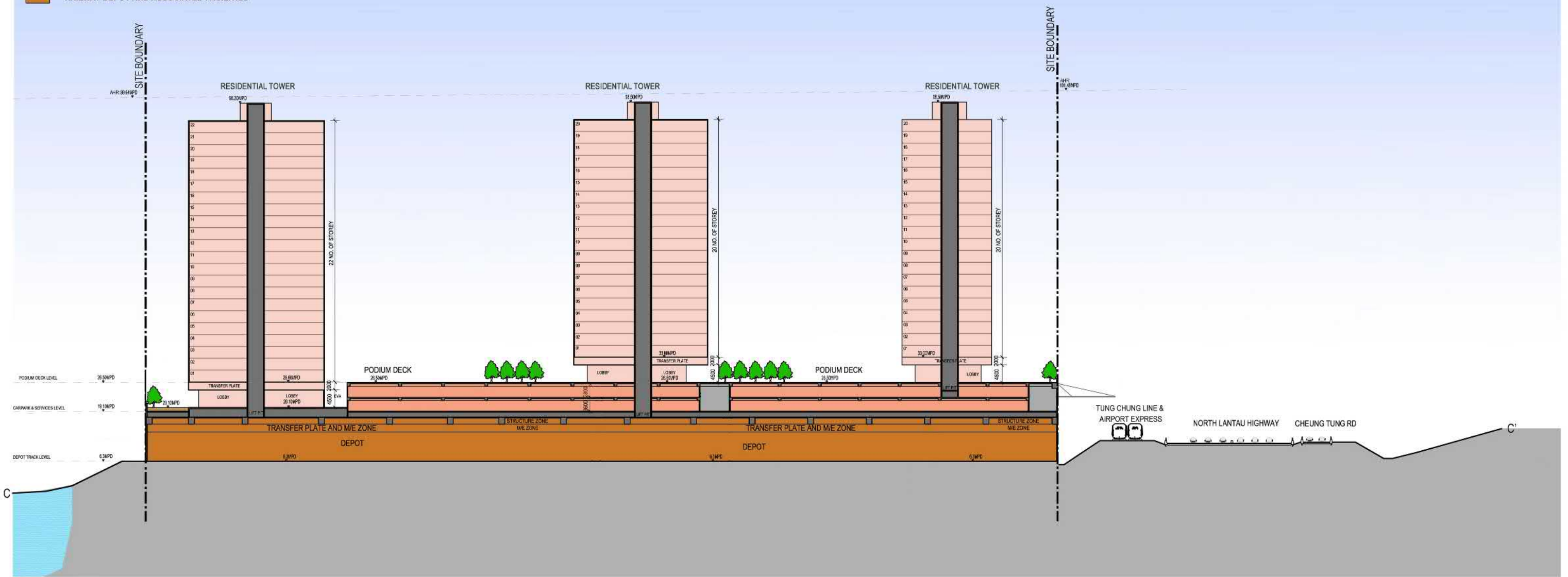
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- COMMERCIAL / RETAIL
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- SCHOOL
- RAILWAY DEPOT AND ASSOCIATED FACILITIES





**LEGEND**

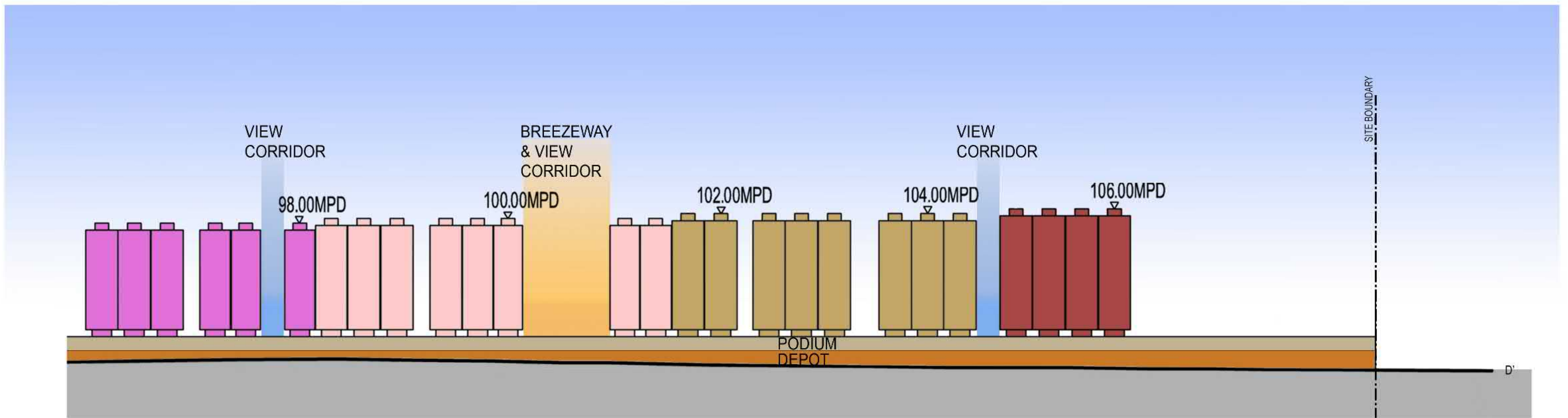
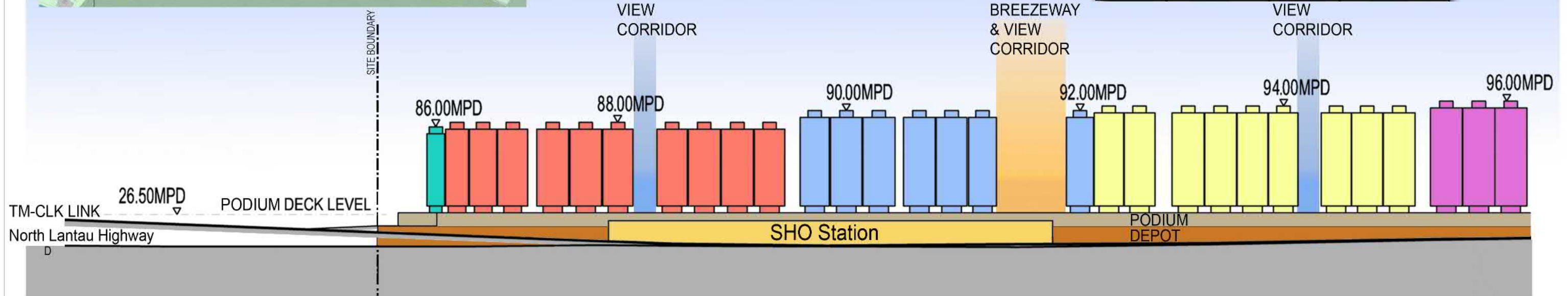
- RESIDENTIAL
- SERVICE ROAD
- CARPARK / CLUB HOUSE / M/E / UTILITIES
- RAILWAY DEPOT AND ASSOCIATED FACILITIES







**LEGEND**

	No. of Residential Storeys		No. of Residential Storeys
	15		19
	16		20
	17		21
	18		22





**LEGEND:**

-  RESIDENTIAL TOWER TYPE A
-  RESIDENTIAL TOWER TYPE B

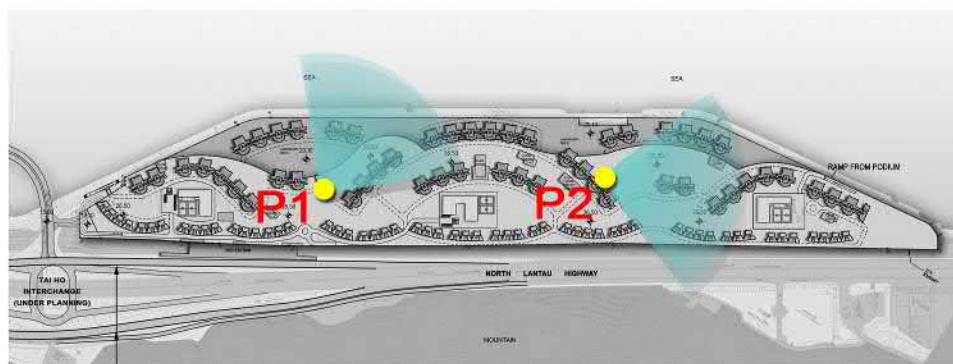








Proposed Comprehensive Residential and Commercial Development atop Siu Ho Wan Depot  
 Conceptual Greening Framework



P1 - View at Civic Square to the sea through the 30m wide landscaped corridor.

P2 - View to landscaped terrace and 30m wide corridor offering vista to a mountain backdrop.

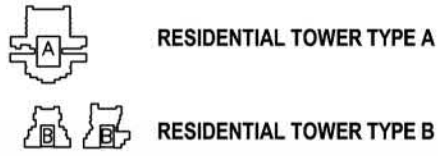


-  INDICATIVE LANDSCAPED PEDESTRIAN ROUTE
-  TERRACED PODIUM STEPPING TOWARDS WATERFRONT
-  30m WIDE VISUAL CORRIDORS & BREEZEWAY
-  MINIMUM 15m WIDE VIEW CORRIDORS
-  ACTIVITY NODE
-  RAILWAY STATION



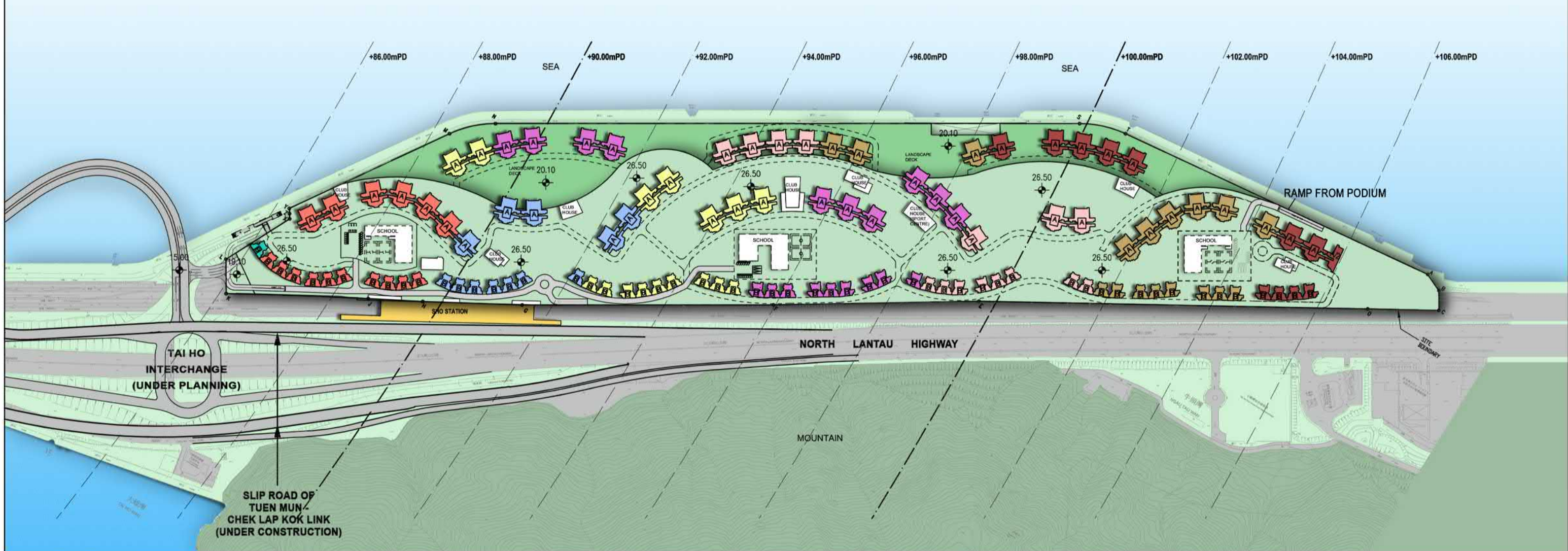
Proposed Comprehensive Residential and Commercial Development atop Siu Ho Wan Depot  
Urban Design Framework

**LEGEND:**



**LEGEND**

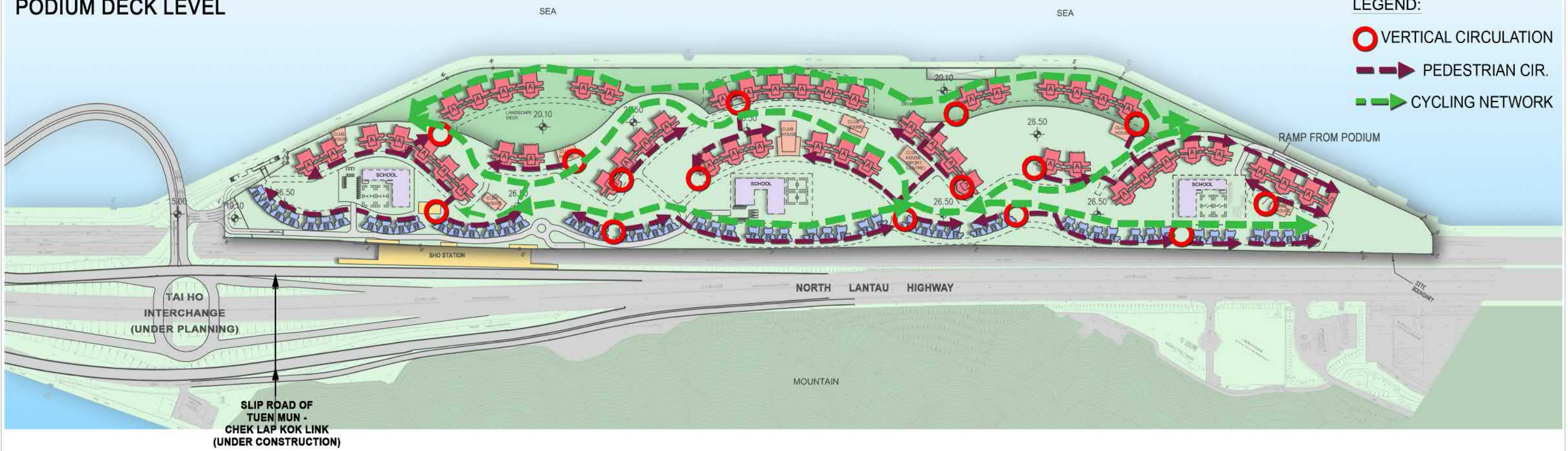
	No. of Residential Storeys		No. of Residential Storeys
	15		19
	16		20
	17		21
	18		22



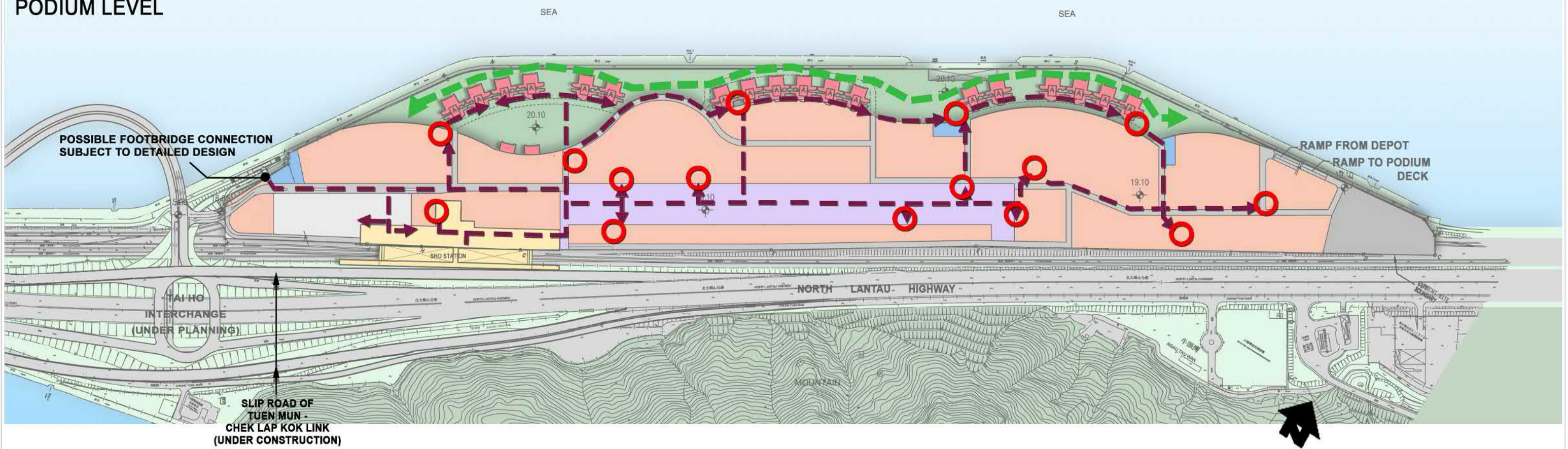


For illustrative purpose only and subject to refinements and changes at detailed design stage.

**PODIUM DECK LEVEL**

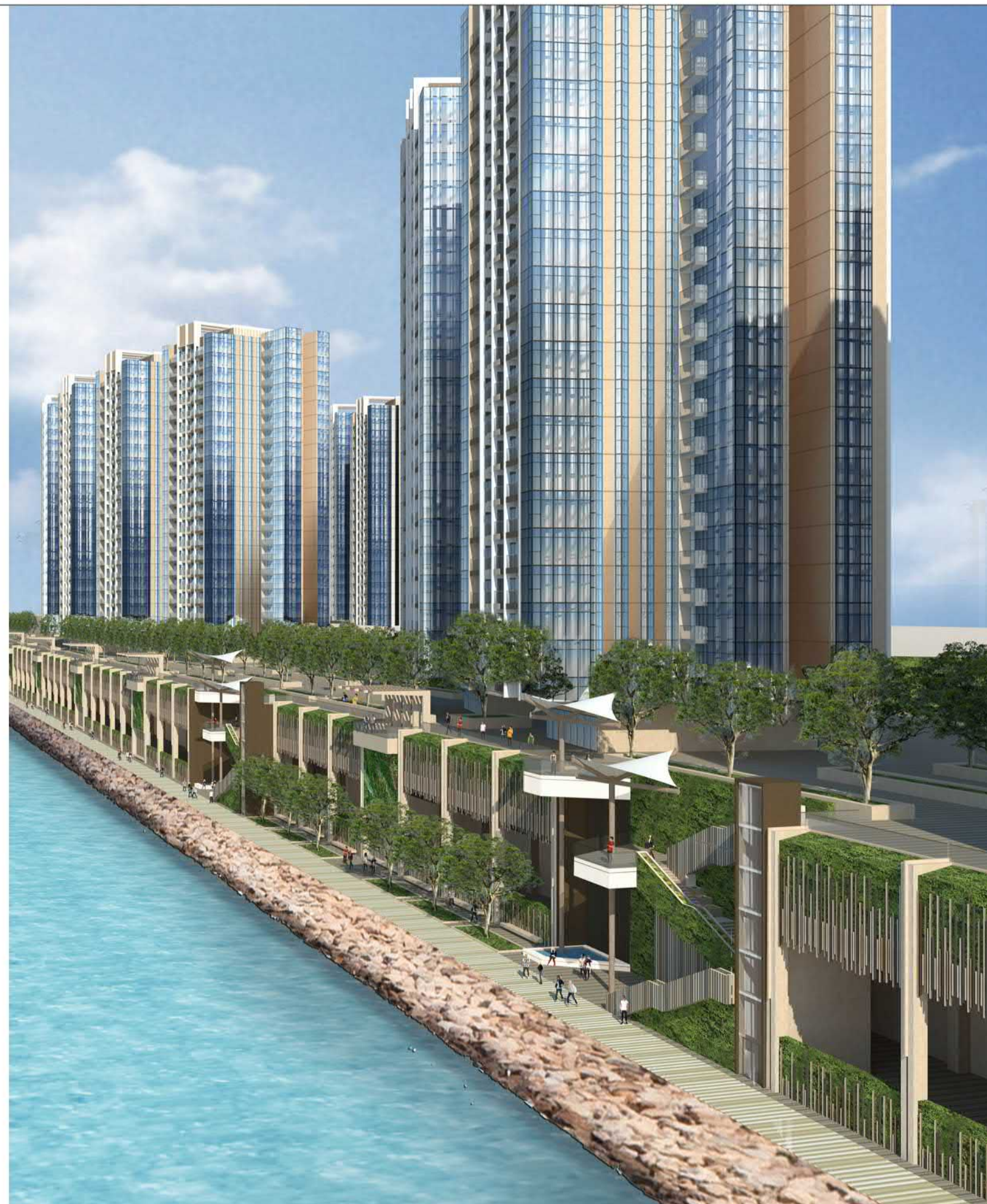


**PODIUM LEVEL**



Proposed Comprehensive Residential and Commercial Development atop Siu Ho Wan Depot  
Indicative Pedestrian and Cycling Circulations

For illustrative purpose only and subject to refinements and changes at detailed design stage.

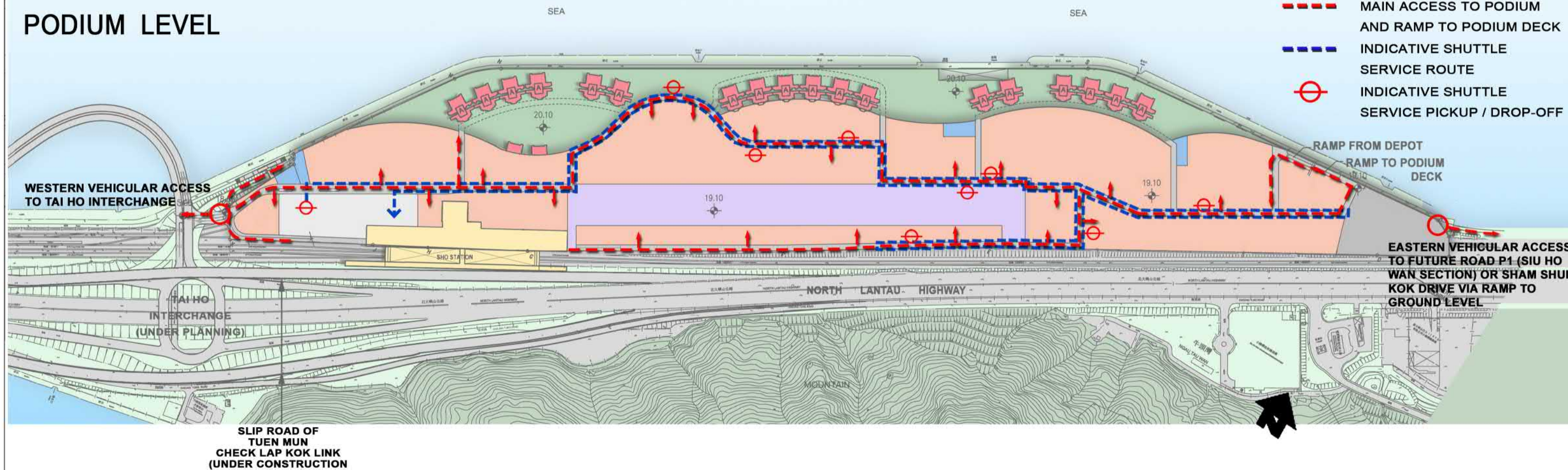


Proposed Comprehensive Residential and Commercial Development atop Siu Ho Wan Depot  
Artist Impression of the Integration with Waterfront

# PODIUM DECK LEVEL





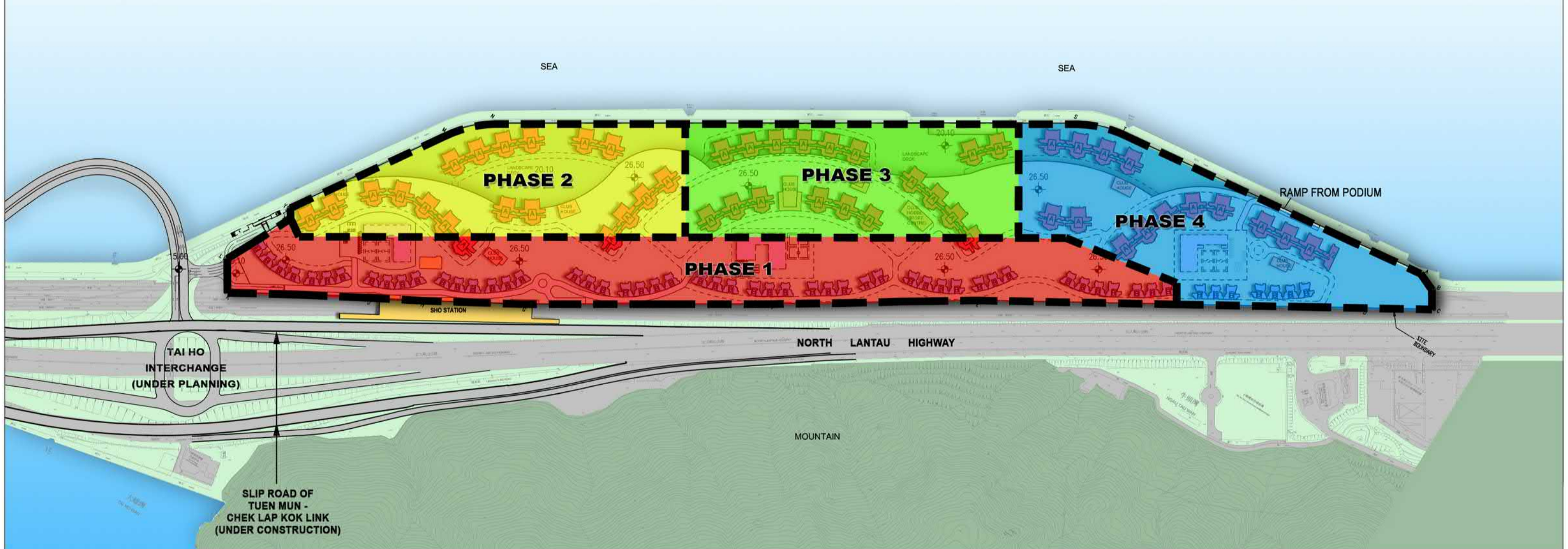
# PODIUM LEVEL





**LEGEND:**

-  RESIDENTIAL TOWER TYPE A
-  RESIDENTIAL TOWER TYPE B



Proposed Comprehensive Residential and Commercial Development atop Siu Ho Wan Depot  
Indicative Development Phasing Plan



SCALE:	1:5000	(A3)	FIGURE No.
DATE:	OCT 2017		3.12

# **APPENDIX I**

## **Traffic and Transport Impact Assessment**

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## **1 INTRODUCTION**

### **1.1 Background**

- 1.1.1 MTR Corporation has commissioned a multi-disciplinary consultancy team to undertake a feasibility study for the comprehensive residential and commercial development atop Siu Ho Wan Depot (SHD) (the Proposed Development). AECOM Asia Co. Ltd. (AECOM) has been commissioned to conduct a Traffic and Transport Impact Assessment (T&TIA) on the Proposed Development.
- 1.1.2 T&TIA Reports had been included in the Study Reports submitted to Government in February and December 2016 to demonstrate the feasibility of a conceptual topside development scheme of 14,000 residential units and 30,000m<sup>2</sup> GFA commercial/retail facilities from traffic/transport engineering and management perspectives. A new Siu Ho Wan (SHO) Station has been planned at the western position along the existing MTR Tung Chung Line (TCL) tracks to meet development transport need and enable building of a sustainable community.
- 1.1.3 SHD, with a site area of about 30ha (the Subject Site), provides essential maintenance and support facilities such as stabling, workshop and running/heavy maintenance for the entire fleet of TCL, Airport Express Line (AEL) and Disneyland Resort Line, along with other infrastructure maintenance such as track work maintenance and engineering trains to support the maintenance functions.

### **1.2 Objectives**

- 1.2.1 This T&TIA Report has been updated to incorporate the latest planning and highways network assumptions with the aim to identify and address potential traffic and transport implications due to the Proposed Development on the nearby road network, and recommend necessary traffic improvement measures and public transport provision/facilities, and car parking and servicing requirements.
- 1.2.2 The main objectives of this report are summarised below:
- to present development parameters of the Proposed Development;
  - to recommend car parking and servicing provision;
  - to present existing and future road network in the vicinity;
  - to recommend vehicular access arrangement by taking into account the future external road network;
  - to provide traffic forecast by taking into account the latest planning and road/railway network assumptions;
  - to assess traffic impact due to the Proposed Development on nearby road network;
  - to recommend practicable traffic improvement schemes to mitigate any impact as necessary; and
  - to recommend public transport facilities requirements.

1.2.3 A separate assessment has been undertaken to demonstrate that TCL will have sufficient capacity to cater for the Proposed Development and the committed projects on Lantau with incorporation of the proposed SHO Station.

**1.3 Structure of Report**

1.3.1 Following this introductory chapter, there are six further chapters.

1.3.2 **Chapter 2 – The Proposed Development**, which presents the development parameters and recommends appropriate car parking and servicing provisions.

1.3.3 **Chapter 3 – Existing and Future Road Network**, which describes the existing and future road network, and presents the proposed access arrangement to/from the future road network in the vicinity.

1.3.4 **Chapter 4 – Traffic Forecasts**, which summaries the methodology of traffic forecasting and presents the reference and design flows.

1.3.5 **Chapter 5 – Traffic Impact Assessment**, which presents the findings of the traffic assessment for the future design years, and recommends improvement measures as necessary.

1.3.6 **Chapter 6 – Public Transport Facilities Requirement**, which summarizes the recommendations on public transport facilities requirement.

1.3.7 **Chapter 7 – Summary and Conclusion**, which summarizes the study findings and presents the conclusions on traffic and transport issues associated with the Proposed Development.

**2 THE PROPOSED DEVELOPMENT**

**2.1 Site Location**

2.1.1 SHD is located north of the TCL/AEL and North Lantau Highway (NLH) at about 5km east of the Tung Chung New Town and Hong Kong International Airport. Tuen Mun – Chek Lap Kok Link (TM-CLK Link), currently under construction, will have an interchange with NLH at the west of the SHD. **Figure 2.1** shows the location of the Subject Site and its nearby road network.

**2.2 Proposed Development Parameters**

2.2.1 The Proposed Development comprises about 14,000 residential units (average flat size about 74m<sup>2</sup> GFA) with an estimated population of approximately 37,800 will be implemented by phase. Neighborhood commercial/retail facilities of about 30,000m<sup>2</sup> GFA will be provided to serve the community. As agreed with Education Bureau, three 30-classroom schools and four 6-classroom kindergartens will be reserved for provision in tandem with the population build-up. The first phase population intake is targeted in 2026/27 with full completion of the Proposed Development by 2038, subject to depot migration progress and market conditions. The proposed development parameters are summarized in **Table 2.1**.

**Table 2.1 Proposed Development Parameters**

Development Component	Parameter
Private Residential	14,000 flats 37,800 population <sup>(1)</sup>
Commercial (Mainly Retail)	About 30,000m <sup>2</sup> GFA
School	3 nos. (@30 classrooms) <sup>(2)</sup>
Kindergarten	4 nos. (@6 classrooms)

Note: (1) Person-Per-Occupied Flat ratio of 2.7 has been adopted, as agreed with Planning Department  
(2) One secondary school and two primary schools have been assumed for technical assessment purpose, subject to review at the detailed design stage.

2.2.2 Based on the proposed Development Scheme, an indicative flat mix has been formulated for estimation of car parking provision, as summarized in **Table 2.2**.

**Table 2.2 Indicative Flat Mix for Estimation of Car Parking Provision**

Average Flat Size (m <sup>2</sup> GFA)	No. of Flats
≤40	1,900
>40 to ≤70	6,009
>70 to ≤100	4,109
>130 to ≤160	1,982
Total	14,000

### 2.3 Proposed Car Parking and Servicing Provision

2.3.1 Reference has been made to the Hong Kong Planning Standards and Guidelines (HKPSG) for planning of the internal transport facilities including car parking space and Loading/Unloading (L/UL) bay. Detailed calculations are provided in **Tables 2.3 to 2.17**.

#### Private Car Parking Spaces for Residents

2.3.2 The proposed SHO Station for TCL will be located at western position of the SHD development due to space constraints by the TM-CLK Link/ NLH and the depot. In accordance with the HKPSG, a 25% discount should be applied (i.e. Accessibility Adjustment Ratio, R2=0.75) to the provision of residential car parking spaces where over 50% of the site area of the development fall within a 500m radius of rail stations. Based on the 500m-radius catchment area of a rail station drawn from the centre of the station, about half of the Subject Site is located within the proposed SHO Station catchment as indicated in **Figure 2.1**.

2.3.3 The Proposed Development will be implemented in 4 major phases in tandem with the depot replanning and migration (see indicative phasing plan in Figure 3.12 of the Rezoning Study Report). Each development phase will be further broken down into development packages. In response to Transport Department's (TD) comments, the 25% discount will be applied to development packages partially within the SHO Station catchment as a conservative approach, subject to review at the detailed design stage.

2.3.4 There are strong demands on residential car parking spaces in Lantau, with high occupancy rates for developments in Tung Chung New Town including Tung Chung Crescent, Caribbean Coast, Seaview Crescent and Coastal Skyline. Local District Councillors and residents have also voiced the car parking space shortage problem at various consultation forums for projects in Lantau. Further, MTR Corporation has received strong requests from the locals on providing of more car parking spaces at other above-depot property developments.

2.3.5 Taking into consideration that there are no alternative car parking spaces in the vicinity, it has been agreed in-principle with TD that upper range of the HKPSG should be adopted for residential car parking provision, i.e. 1 car space per 6 flats as the Global Parking Standard (GPS), to address the anticipated strong demand. Detailed calculations of residential car parking provision are summarised in **Tables 2.3 and 2.4**.

**Table 2.3 Proposed Residential Car Parking Space Provision (Within SHO Station Catchment)**

RESIDENTIAL CAR PARK – Within SHO Station Catchment				
Development Component		Parameter	HKPSG Standard (GPS: 1 car space/ 6 flats)	Proposed Parking Provision
	No. of Flats	Flat Size		
Private Housing	1,282	<40m <sup>2</sup>	0.4 space / 6 flats	85
	3,903	40–70m <sup>2</sup>	0.7 space / 6 flats	455
	2,621	70–100m <sup>2</sup>	2.1 space / 6 flats	917
	1,364	130–160m <sup>2</sup>	7.5 space / 6 flats	1,705
Total	9,170		(A) Total	3,162
(B) R2 – within 500m radius of rail station				0.75
(C) R3 - PR=2.0-5.0 use 1.0				1.00 <sup>(1)</sup>
Total Residential Parking Spaces Required = (A) x (B) x (C)				<b>2,372</b>

Note: (1) Proposed domestic plot ratio is approx. 3.5, hence the Development Intensity Adjustment Ratio R3 is 1.0.

**Table 2.4 Proposed Residential Car Parking Space Provision (Outside SHO Station Catchment)**

RESIDENTIAL CAR PARK – Outside SHO Station Catchment				
Development Component		Parameter	HKPSG Standard (GPS: 1 car space/ 6 flats)	Proposed Parking Provision
	No. of Flats	Flat Size		
Private Housing	618	<40m <sup>2</sup>	0.4 space / 6 flats	41
	2,106	40–70m <sup>2</sup>	0.7 space / 6 flats	246
	1,488	70–100m <sup>2</sup>	2.1 space / 6 flats	521
	618	130–160m <sup>2</sup>	7.5 space / 6 flats	773
Total	4,830		(A) Total	1,581
(B) R2 – outside 500m radius of rail station				1.00
(C) R3 - PR=2.0-5.0 use 1.0				1.00 <sup>(1)</sup>
Total Residential Parking Spaces Required = (A) x (B) x (C)				<b>1,581</b>

Note: (1) Proposed domestic plot ratio is approx. 3.5, hence the Development Intensity Adjustment Ratio R3 is 1.0.

2.3.6 According to **Tables 2.3** and **2.4**, total residential car parking space provision for the Proposed Development is 3,953 nos. based on the indicative flat mix and upper range of the HKPSG requirement.

Private Car Parking Spaces for Visitors

2.3.7 The proposed car parking provision for visitor of residential development in accordance with the HKPSG requirement is summarised in **Table 2.5**.

**Table 2.5 Proposed Visitor Car Parking Space Provision**

RESIDENTIAL - VISITOR CAR PARK			
Development Component	Parameter (Blocks)	Proposed Reference Standard	Proposed Parking Provision
Private Housing	81 <sup>(1)</sup>	5 (HKPSG – Upper value)	405
	27	2 <sup>(2)</sup>	54
Proposed Residential Visitor's Parking Spaces			<b>459</b>

Note: (1) 81 nos. of blocks with over 75 units per block.  
 (2) 27 nos. of blocks with about 60 to 72 units per block. No specification in HKPSG for blocks with less than 75 units.

2.3.8 As the Subject Site is remote with no public car parking space in its vicinity, the proposed provision as shown in **Table 2.5** is considered appropriate to ensure sufficient parking spaces available for visitors during weekends and public holidays.

Private Car Parking Spaces for Commercial (Retail)

2.3.9 The proposed car parking provision for commercial/retail facilities in accordance with the HKPSG requirement is summarised in **Table 2.6**. Notwithstanding the nature of local clientele of the commercial/retail facilities, the proposed provision of 237 nos. based on the upper value is considered appropriate to meet the car parking demand in view of the linear configuration of the Subject Site to serve the community living outside the railway catchment.

**Table 2.6 Proposed Car Parking Spaces for Commercial/Retail Facilities**

COMMERCIAL/RETAIL - CAR PARK				
Development Component	Parameter GFA (m <sup>2</sup> )	HKPSG (Lower value)	HKPSG (Upper value)	Parking Spaces Required
Commercial/ Retail	30,000	For first 2,000m <sup>2</sup> GFA, 1 space/50 m <sup>2</sup> GFA, above 2,000m <sup>2</sup> GFA, 1 space/200m <sup>2</sup> GFA <sup>(1)</sup>	For first 2,000m <sup>2</sup> GFA, 1 space/40 m <sup>2</sup> GFA, above 2,000m <sup>2</sup> GFA, 1 space/150m <sup>2</sup> GFA <sup>(1)</sup>	180-237
Proposed Commercial/Retail Parking Provision (upper value)				<b>237</b>

Note: (1) Assume the development is in Zones 2 and 3 Areas.

Private Car Parking Spaces for School and Kindergarten

2.3.10 The proposed car parking provision for school and kindergarten in accordance with the HKPSG requirements is summarised in **Table 2.7**.

**Table 2.7 Car Parking Spaces for Educational Uses**

SCHOOL and KINDERGARTEN CAR PARK				
Development Component	Parameter (No. of School x Classrooms)	HKPSG (Lower value)	HKPSG (Upper value)	Parking Spaces Required
Primary School	2 x 30	1 space per 6 classrooms	1 space per 4 classrooms	10-16
Secondary School	1 x 30	1 space per 4 classrooms	1 space per 3 classrooms	8-10
Proposed Parking Provision for 3 Schools (Assume 2 primary schools and 1 secondary school for technical assessment purpose)				<b>26</b>
Kindergarten	4 x 6	0 to 1 space per 6 classrooms	0 to 1 space per 4 classrooms	4-8
Proposed Parking Provision for Kindergartens				<b>8</b>

2.3.11 According to HKPSG, nil provision may be permitted for kindergarten within general purpose buildings. However, taking into account of the remoteness of the Subject Site, the upper value of HKPSG requirement is proposed for car parking spaces at the schools and kindergartens to ensure sufficient provision, subject to review in the detailed design stage.

Accessible Car Parking Space for Disabled

2.3.12 According to the Regulation 72 in *Chapter 123F of Building (Planning) Regulations*, the requirements of accessible parking spaces for disabled in residential development and commercial facilities are summarised in **Table 2.8**.

**Table 2.8 Accessible Parking Spaces for Disabled**

Accessible Parking Spaces			
Total number of parking spaces provided in the development		Minimum number of accessible parking spaces	
1 - 50		1	
51 - 150		2	
151 - 250		3	
251 - 350		4	
351 - 450		5	
Above 450		6	
Development Component	Total number of Parking Spaces	Range of parking spaces	Proposed Provision
Residential – for residents	3,953	Above 450	<b>6</b>
Residential – for visitors	459	Above 450	<b>6</b>
Commercial	237	151 - 250	<b>3</b>

Overall Car Parking Space

2.3.13 The proposed car parking provision for the Proposed Development is summarised in **Table 2.9**.

**Table 2.9 Summary of Recommended Car Parking Space Provision**

Development Component	Recommended Car Parking Spaces	Dimension of Car Parking Space
Residential	3,953 for residents (including 6 for disabled) 459 for visitors (including 6 for disabled)	2.5m (W) x 5m (L) and 3.5m (W) x 5m (L) for accessible parking space
Commercial	237 (including 3 for disabled)	
School	26	
Kindergarten	8	
Total	4,683	

Loading/unloading (L/UL) Facilities for Residential

2.3.14 The proposed provision of loading/unloading bays for the residential development around each block for service vehicles in accordance with the HKPSG requirement is summarised in **Table 2.10**.

**Table 2.10 Proposed Residential L/UL Bay Provision**

RESIDENTIAL GOODS VEHICLE L/UL BAYS			
Development Component	Parameter (blocks)	HKPSG Requirement	L/UL Bays Required
Residential	108	1 bay/block	108
Total Residential L/UL Bays Required			<b>108</b>

Goods Vehicle Loading/unloading (L/UL) Facilities for Commercial (Retail)

2.3.15 The proposed provision of loading/unloading bays for the commercial/retail facilities in accordance with the HKPSG requirement is summarised in **Table 2.11**.

**Table 2.11 Proposed Commercial/Retail L/UL Bay Provision**

COMMERCIAL/RETAIL GOODS VEHICLE L/UL BAYS				
Development Component	Parameter GFA (m <sup>2</sup> )	HKPSG (Lower value)	HKPSG (Upper value)	L/UL Bays Required
Commercial/Retail	30,000	1 bay /1,200m <sup>2</sup> GFA	1 bay /800m <sup>2</sup> GFA	25-38
Proposed L/UL Bays for Commercial/Retail (mean to upper value)				<b>30-38</b>

2.3.16 From past experience, the larger the retail malls, their L/UL demand would be closer to the lower end, as one goods vehicle may serve few shops in one delivery activity. Considering that the commercial/retail development at SHD is of medium scale, the provision of middle range, i.e. 1 bay per 1,000 m<sup>2</sup> = 30, should be adequate to cater for the demand. As requested by TD, however, flexibility would be allowed in the scheme design to accommodate additional 8 L/UL bays, in view of possible demand for overnight parking of the commercial vehicles. The provision, design and location will be subject to review in the detailed design stage.

2.3.17 According to the HKPSG, the L/UL provision is divided into 65% Light Goods Vehicles (LGV) and 35% Heavy Goods Vehicles (HGV). The recommended numbers of L/UL provision of LGV and HGV for the commercial/retail facilities are therefore 20 to 26 and 10 to 12 respectively.

General Loading/unloading (L/UL) Facilities for School and Kindergarten

2.3.18 The provision of general loading/unloading requirements for the schools and kindergarten in accordance with the HKPSG requirements is summarised in **Table 2.12**.

**Table 2.12 Proposed L/UL Bay Provision for Educational Uses**

SCHOOL and KINDERGARTEN – L/UL REQUIREMENT				
Development Component	Parameter (No. of School/ Kindergarten x Classrooms)	HKPSG (Lower value)	HKPSG (Upper value)	Required Provision
School	3 x 30	1 lay-by for taxi and private cars per 3 classroom in primary schools	1 lay-by for taxi and private cars per 2 classroom in primary schools	10 to 15 lay-bys per primary school
		1 lay-by for taxi and private cars per 5 classroom in secondary schools	1 lay-by for taxi and private cars per 3 classroom in secondary schools	6 to 10 lay-bys per secondary school
3 lay-bys for school buses				Total 9 lay-bys for school buses
Kindergarten	4 x 6	1 lay-by for taxi and private car per 8 classrooms	1 lay-by for taxi and private car per 5 classrooms	1 to 2 lay-bys per kindergarten
		2 lay-bys for school buses		Total 8 lay-bys for school buses

2.3.19 As the schools and kindergartens will serve mainly the local residents of the Proposed Development, mean/upper value of lay-by for private car/taxi in **Table 2.12** is recommended. The recommended lay-by provisions for private car/taxi for the three schools and four kindergartens are 34 (2x13+8, i.e. 13 per primary school and 8 per secondary school) and 8 (4x2, i.e. 2 per kindergarten) respectively. In addition, a total of 9 and 8 lay-bys for school buses are proposed for the three schools and four kindergartens respectively.



Overall Goods Vehicle and General Loading/unloading (L/UL) Facilities

2.3.20 The proposed L/UL provisions for the Proposed Development are summarised in **Table 2.13**.

**Table 2.13 Summary of Proposed L/UL Facilities**

Development Component	Proposed L/UL Facilities	Space Dimension
Residential	108 L/UL bays for HGV	3.5m (W) x 11m (L)
Commercial	20 to 26 L/UL bays for LGV	3.5m (W) x 7m (L)
	10 to 12 L/UL bays for HGV	3.5m (W) x 11m (L)
School (3 x 30 classrooms)	34 lay-bys for private car/taxi	2.5m (W) x 5m (L)
	9 lay-bys for school buses	3.5m (W) x 12m (L)
Kindergarten (4 x 6 classrooms)	8 lay-bys for private car/taxi	2.5m (W) x 5m (L)
	8 lay-bys for school buses	3.5m (W) x 12m (L)

Motorcycle Parking Spaces for Residential

2.3.21 The proposed provision of residential motorcycle parking spaces in accordance with the HKPSG requirement is summarised in **Table 2.14**.

**Table 2.14 Proposed Residential Motorcycle Parking Space Provision**

RESIDENTIAL MOTORCYCLE PARKING SPACE			
Development Component	Parameter (Flats)	HKPSG (Upper value)	Proposed Provision
Residential	14,000	1 space / 100 flats	140

2.3.22 Using the same rationale for car parking space for residential development as mentioned in Section 2.3.5 and taking into consideration that there are no alternative motorcycle parking spaces in the vicinity, the upper value of HKPSG requirement as shown in **Table 2.14** is recommended.

Motorcycle Parking Spaces for Commercial (Retail)

2.3.23 The proposed provision of motorcycle parking spaces for commercial/retail facilities in accordance with the HKPSG requirement is summarised in **Table 2.15**.

**Table 2.15 Proposed Commercial/Retail Motorcycle Parking Space Provision**

COMMERCIAL/RETAIL MOTORCYCLE PARKING SPACE			
Development Component	Parameter (Car Parking Space)	HKPSG Requirement	Parking Space Required
Commercial/Retail	237 <sup>(1)</sup>	5-10% of Car Parking Spaces	10-24
Proposed Motorcycle Parking Provision for Commercial/Retail (Upper value)			<b>24</b>

Note: Refer to Table 2.6.

2.3.24 Using the same rationale for car parking space for commercial development as mentioned in Section 2.3.9, the upper value in **Table 2.15** is recommended.

Overall Motorcycle Parking Spaces

2.3.25 The proposed numbers of motorcycle parking provision for the Proposed Development are summarised in **Table 2.16**.

**Table 2.16 Summary of Recommended Motorcycle Parking Provision**

Development Component	Recommended Motorcycle Parking Space	Dimension of Space
Residential	140	1m (W) x 2.4m (L)
Commercial	24	1m (W) x 2.4m (L)
Total	<b>164</b>	1m (W) x 2.4m (L)

Bicycle Parking Spaces for Residential

2.3.26 An internal cycle track network would be provided to facilitate east-west movement within the Proposed Development particularly to access the proposed SHO Station, with routing to be determined at the detailed design stage. In accordance with the HKPSG, bicycle parking spaces shall be provided in the residential developments where proper cycle tracks with direct connection to rail station are accessible. The requirements for bicycle parking spaces are summarized in **Table 2.17**.

**Table 2.17 Proposed Residential Bicycle Parking Spaces Provision**

RESIDENTIAL BICYCLE PARKING SPACES			
Development Component	Parameter (flats)	HKPSG Requirement	Proposed Provision
Residential	4,149	Within a 0.5-2km radius of a rail station, 1 space/15 flats with flat size smaller than 70m <sup>2</sup>	277
Total Residential Bicycle Parking Spaces Required			<b>277</b>

### 3 EXISTING AND FUTURE ROAD NETWORK

#### 3.1 Existing Road Network

- 3.1.1 The major road link serving the North Lantau area is the NLH which is an expressway with dual-3 lane carriageway. NLH and the Lantau Link (LL), together with the TM-CLK Link under construction, provide road base connection for Lantau Island, Hong Kong International Airport (HKIA) and the future HKBCF to/from urban and other areas in the territory. The existing Tai Ho Interchange (THI) of NLH provides access to the SHD as shown in **Figure 2.1**.
- 3.1.2 Sham Shui Kok Drive is a single track access road located at the north-eastern side of the Subject Site as shown in **Figure 2.1**. With its eastern end connecting to Cheung Tung Road, traffic can access to NLH via Cheung Tung Road, Sunny Bay Road, Penny's Bay Highway and Sunny Bay Interchange.
- 3.1.3 Cheung Tung Road is a single 2-lane service road along the southern side of NLH connecting Sunny Bay Interchange to its eastern end and Tung Chung to its western end.

#### 3.2 Future Road Network

- 3.2.1 The TM-CLK Link (under construction) will be commissioned before population intake of the Proposed Development. The Southern Connection of TM-CLK Link between HKBCF and NLH, anticipated for commissioning in 2019 at the earliest, will have an all-movement interchange with NLH at immediately west of the Subject Site.
- 3.2.2 The Northern Connection of TM-CLK Link between HKBCF and Tuen Mun, anticipated for commissioning in 2020 at the earliest, will provide a major road connection for HKBCF traffic going to/from North West New Territories (NWNT) and other area in New Territories. The entire TM-CLK Link will provide a new external road connection for Lantau.
- 3.2.3 A new dual 2-lane carriageway, namely Road P1 (Tai Ho Section), will be provided to connect the future Tung Chung East developments with external road network. It will serve as the primary east-west connection to NLH through Tung Chung Eastern Interchange to the west and the THI to the east. It is recommended in the Tung Chung New Town Extension (TCNTE) Study that Road P1 (Tai Ho section) should be in place by Year 2026 to relieve the traffic pressure on NLH. The Road P1 (Tai Ho Section) together with the THI upgrading is currently under detailed design by the Government. According to the TCNTE Study, the upgraded THI will be a 3-lane interchange with connecting ramps/slip roads to Road P1 (Tai Ho Section), NLH and SHD as shown in **Figure 3.1**.
- 3.2.4 The Road P1, including its extension to Sunny Bay, has been earmarked as a medium term project in the Government's *Sustainable Lantau Blueprint* (June 2017) anticipated to be available between Year 2023 and 2030. The Road P1 (Siu Ho Wan Section) is also presented in the *Technical Study on Developments at Siu Ho Wan and the Associated Transport Infrastructures- Feasibility Study (Agreement No. CE 12/2015CE)* Final Executive Summary (November 2017) by Civil Engineering and Development Department (CEDD).

- 3.2.5 In addition to the planned new roads, Route 11 and Road P1 (Tai Ho to Sunny Bay Section) have been earmarked as proposed major roads in Government's *Sustainable Lantau Blueprint* published in June 2017. The indicative alignment for Route 11 shows connection between Sunny Bay and Yuen Long via Tsing Lung Tau to serve as the third external road connection for Lantau. As advised by TD, this T&TIA has assumed that Route 11 will be completed by 2036.

#### 3.3 Vehicular Access Arrangement

- 3.3.1 Two access points (at the western and eastern ends) are proposed to serve the Proposed Development. The western access would serve as the main access of the Proposed Development and the only one for the initial 3 phases.
- 3.3.2 A new signal controlled junction will be provided outside the western access with connection between the car park and Public Transport Interchange (PTI) at podium level and the slip road from Road P1 to/from the THI. Most of the traffic accessing the Proposed Development is expected to use the THI due to its good connectivity with slip roads to/from both directions of NLH. The proposed connection arrangement to the upgraded THI is shown in **Figure 3.2**.
- 3.3.3 The 2 right turn movements from the Proposed Development to the slip road of Road P1 and from THI to the Proposed Development will be banned in order to simplify the method of control of this new signal controlled junction and avoid the risk of the queue tailing back to THI. It will provide free flow lanes for straight ahead movement of the northbound traffic. The affected traffic will be diverted to take U-turn at the THI and the roundabout connecting to Road P1 to ensure no adverse traffic impact.
- 3.3.4 As shown in **Figure 3.2**, traffic leaves the signal controlled junction near the THI and could choose to:
  - Turn left and use the down ramp to the depot service road; or
  - Keep straight ahead to the car park and the PTI at podium level; or
  - Turn right and use the up ramp to the podium deck level and the schools.
- 3.3.5 The proposed eastern access (a straight ramp connecting to the at grade level of Sham Shui Kok Drive from the carpark podium level) will serve as an alternative access to the Proposed Development connecting to the future Road P1 (SHW Section). In the case that the connection to Road P1 (SHW Section) is not available when the Phase 4 development is commissioned, the current connection to the Sham Shui Kok Drive will be maintained as an interim arrangement. To achieve this, the existing Sham Shui Kok Drive between the North Lantau Refuse Transfer Station to the east and the eastern access will be upgraded to a 7.3m single 2-lane carriageway as far as practicable without modification to the seawall and the existing railway tracks, as shown in **Figure 3.1**. Indicative extent of the Sham Shui Kok Drive upgrading is presented in **Figure 3.3**.

### 3.4 Ingress and Egress Routing

- 3.4.1 The proposed ingress and egress routings of the development traffic to/from the western access via the new signal controlled junction are presented in **Figure 3.2**. This T&TIA has assumed that all development traffic will use the western access, which is more attractive than eastern access in terms of connectivity to/from NLH, as a conservative approach.
- 3.4.2 As most of the development traffic is expected to use NLH, critical junctions that will be affected by the development traffic are the new signal controlled junction, THI and the Tung Chung Eastern Interchange. Performance of these critical junctions will be discussed in **Chapter 5**.

### 3.5 Pedestrian Connectivity

- 3.5.1 Pedestrian activities of the Proposed Development are mainly generated by and occur between the residential towers, schools and kindergartens, car park, commercial/retail facilities, and the proposed SHO Station.
- 3.5.2 At podium deck level, covered walkway will be provided with landscaping and street furniture to enhance pedestrian experience. Pedestrians could access the podium level using lifts, escalators or stairs where the integrated SHO Station concourse, PTI, car parks, commercial/retail facilities and the kindergartens are located.
- 3.5.3 Underneath the podium level, the depot and the SHO Station platforms are on at-grade level. Passengers accessing to the SHO Station platforms could use lifts, or escalators/stairs via the integrated concourse at the podium level.

### 3.6 Cycle Track Connectivity

- 3.6.1 Internal cycling track would be provided at the podium deck level, as presented in the Indicative Pedestrian and Cycling Circulation Plan (**Figure 3.9** of the Main Report). Bicycle parking spaces would be provided underneath the transfer plates of residential towers and other appropriate locations subject to detailed design.

## 4 TRAFFIC FORECAST

### 4.1 General Approach and Assumptions

- 4.1.1 The Proposed Development will be implemented by phase for targeted completion by Year 2038, subject to depot migration progress and market conditions, which has been adopted as the initial design year for this T&TIA. In addition, 3 year after the project completion, i.e. Year 2041, has also been adopted as another design year for this T&TIA.
- 4.1.2 In 2012, Highways Department gazetted the proposed amendment of the road works at the southern portion of the HKBCF Island, in which a park-and-ride car park for private cars with HK license would be provided on the HKBCF Island.
- 4.1.3 The Stage 1 Community Engagement Digest of CEDD's *Topside Development at HKBCF of the HZMB Feasibility Study (July 2015)* has indicated that it would be possible to provide a car park for inbound private cars at the Vehicle Checking Plaza (VCP) on the HKBCF Island.
- Park-n-Ride for Private Car with HK License would be provided on the HKBCF Island, and hence on longer need to have another one at the Proposed Development.
  - It would have an available land on HKBCF Island to reserve for Possible Long Term Park and Ride for Inbound Private Car, and hence on longer need to have another one at the Proposed Development.
- 4.1.4 The projected 2036 (for the initial design year 2038) and 2041 (for the design year 2041) (as they are the standard design years with available official planning data) background traffic flows are extracted from the updated AECOM in-house traffic model which has taken into account of the *Enhanced 2011-Based Territorial Population and Employment Data Matrix (TPEDM)* and the major committed developments in Lantau as listed below.
- Tung Chung Public Housing Developments;
  - Tung Chung New Town Extension;
  - HKBCF Topside Development;
  - HKIA North Commercial District;
  - HKIA Three Runway System; and
  - The proposed SHD topside development.
- 4.1.5 Detailed assumptions for major future developments in the adjacent area, and the strategic road/railway are listed out in **Appendix A**. Government studies in progress/under planning with no committed land use planning proposal and/or implementation programme, such as potential reclamation at Siu Ho Wan and Sunny Bay, and East Lantau Metropolis, have been excluded in this assessment.
- 4.1.6 Notwithstanding, a sensitivity test has been performed on the development scenario for the Siu Ho Wan Reclamation comprising mainly educational use (18,000 school places, 2,600 employment and 4,000 population) based on preliminary development information provided by CEDD.

- 4.1.7 The Sunny Bay Reclamation has been earmarked for regional tourism, entertainment and commercial uses hence potential contribution to the peak hour traffic is expected to be minimal. The approximately 4,000 employment at the Sunny Bay zone in the *Enhanced 2011-based TPEDM* has been included in the T&TIA.
- 4.1.8 Validation of the traffic forecast flows extracted from the updated AECOM in-house traffic model have been carried out with results summarised in **Appendix B**. According to the results, the AECOM in-house traffic model is considered well validated for use in forecasting the traffic demand.
- 4.1.9 The 2038 and 2041 background traffic flows are estimated based on the 2036 and 2041 traffic forecast flows respectively and then the additional traffic flows were assigned manually based on the following assumption:
- Air passengers growth from years 2036-38
  - Air cargo growth from year 2036-38
  - HZMB growth from year 2036-38
- 4.1.10 The projected Year 2038 and 2041 traffic flows without the Proposed Development are presented in **Figures 4.1** and **4.3**, respectively.

## 4.2 Trip Rates

### Trip Rates for Residential Development

- 4.2.1 In order to determine a set of appropriate trip rates for estimation of the residential development traffic, trip generation survey was conducted in May 2015 and verified on site in October 2016 at 3 private residential developments in Tung Chung, i.e. Seaview Crescent, Coastal Skyline and Caribbean Coast, which are considered to have similar traffic characteristics with the Proposed Development. The surveyed trip rates from these 3 residential developments are summarised in **Table 4.1**.

**Table 4.1 Surveyed Trip Rates for Residential Developments in Tung Chung**

Development	Average Flat Size (m <sup>2</sup> )	AM Peak (pcu/hr/flat)		PM Peak (pcu/hr/flat)	
		Generation	Attraction	Generation	Attraction
Seaview Crescent	71	<b>0.0288</b>	<b>0.0157</b>	<b>0.0222</b>	<b>0.0216</b>
Coastal Skyline	75	0.0237	0.0175	0.0163	0.0217
Caribbean Coast	76	0.0432	0.0321	0.0278	0.0317

Note: Similar surveyed results were verified on site in October 2016

- 4.2.2 As observed during the survey, the higher trip rates at Caribbean Coast were mainly attributed to the short distance taxi trips to/from Tung Chung Station. As the private car/taxi/shuttle trips to/from the proposed SHO Station will be confined within the podium of the Proposed Development, trip rates from Seaview Crescent and Coastal Skyline are considered more representative, of which the higher surveyed results from the **Seaview Crescent** have been chosen.

- 4.2.3 To further verify the above recommended trip rates, trip rate surveys conducted by TD at Seaview Crescent in May 2017 and 2006 are summarised in **Table 4.2**. As requested by TD, the highest trip rate for each category has been adopted to forecast traffic generated from the residential units of the Proposed Development as a conservative approach.

**Table 4.2 Comparison of Trip Rates at Seaview Crescent**

Seaview Crescent	AM Peak (pcu/hr/flat)		PM Peak (pcu/hr/flat)	
	Generation	Attraction	Generation	Attraction
AECOM's survey conducted in May 2015	0.0288	0.0157	0.0222	0.0216
TD's survey conducted in May 2017	0.0335	0.0232	0.0218	0.0244
TD's survey presented in Traffic Generation Survey (TGS) 2006	0.0304	0.0231	0.0123	0.0152
<b>Proposed Trip Rates for Residential Development</b>	<b>0.0335</b>	<b>0.0232</b>	<b>0.0222</b>	<b>0.0244</b>

### Trip Rates for Commercial (mainly for Retail)

- 4.2.4 Trip rates for commercial/retail facilities from various sources are summarised in **Table 4.3**.

**Table 4.3 Comparison of Trip Rates for Commercial/Retail Facilities**

Development	Note	AM Peak (pcu/hr/100m <sup>2</sup> GFA)		PM Peak (pcu/hr/100m <sup>2</sup> GFA)	
		Generation	Attraction	Generation	Attraction
Tung Chung New Town Extension Study	Commercial (office and retail)	0.0950	0.1282	0.1366	0.1425
District Retail Development in TGS 2006	Close to railway station in Sha Tin	0.0411	0.1020	0.1816	0.1144
Lower Limit <sup>(1)</sup> of Retail/ shopping complex in TPDM	N.A.	<b>0.1285</b>	<b>0.1525</b>	<b>0.2360</b>	<b>0.2622</b>

Note: (1) Lower Limit has been chosen as the commercial/retail facilities are located next to the proposed MTR Station.

- 4.2.5 According to the trip rates as shown in TPDM, the trip rates for Retail/Shopping Complex are generally higher than that for Office. Hence, the commercial (office and retail) from *TCNTE Study* as shown in **Table 4.3**, are considered not representative for the commercial/retail facilities of the Proposed Development without office.

4.2.6 In comparison with the trip rates in *Traffic Generation Survey (TGS) 2006*, the higher trip rates extracted from the lower limit of retail/shopping complex in TPDM have been adopted for the commercial/retail facilities of the Proposed Development as a conservative assumption.

Trip Rates for School

4.2.7 Trip rates for primary school have been adopted for the 3 schools as a conservative assumption. Trip rates from various sources are summarised in **Table 4.4**.

**Table 4.4 Comparison of Trip Rates for Primary School**

Development	Note	AM Peak (pcu/hr/class)		PM Peak (pcu/hr/class)	
		Generation	Attraction	Generation	Attraction
Primary School Development in TGS 2006	Less well served by high capacity PT systems <sup>(1)</sup>	<b>1.3462</b>	<b>1.3846</b>	<b>0.6154</b>	<b>0.6154</b>
In-house Surveyed Results from other studies <sup>(2)</sup>	With walking distance >500m from the nearest railway station	0.96	1.04	1.43	0.07

Note: (1) This category has been chosen as a conservative assumption.  
 (2) Surveys were conducted in Fanling and Sheung Shui.

4.2.8 As shown in **Table 4.4**, trip rates from TGS 2006 are the highest one, which have been adopted for the Proposed Development as a conservative assumption.

Trip Rates for Kindergarten

4.2.9 Trip rates for Kindergarten from various sources are summarised in **Table 4.5**.

**Table 4.5 Comparison of Trip Rates for Kindergarten**

Development	Source <sup>(1)</sup>	AM Peak (pcu/hr/class)		PM Peak (pcu/hr/class)	
		Generation	Attraction	Generation	Attraction
Kindergarten	In-house surveyed results from other study	3.75	4.04	1.5	1.07
	TGS – CE-3	<b>2.3056</b>	<b>2.3056</b>	<b>0.0286</b>	<b>0.0286</b>

Note: (1) In-house survey: Kindergarten at Tai Po Kau (>2km from MTR station)  
 (2) TGS-CE-3: St Catherine International Kindergarten, Kowloon Tong (<500m from MTR station)

4.2.10 As shown in **Table 4.5**, trip rates from TGS-CE-3 have been adopted for the Proposed Development as the kindergartens are within the podium served by the proposed SHO Station.

Overall

4.2.11 Trip rates adopted in the TIA for the Proposed Development are summarized in **Table 4.6**.

**Table 4.6 Summary of Trip Rates Adopted in the Traffic Impact Assessment**

Development Component	AM Peak		PM Peak	
	Generation	Attraction	Generation	Attraction
Residential (pcu/hr/flat)	0.0335	0.0232	0.0222	0.0244
Commercial/Retail (pcu/hr/100m <sup>2</sup> GFA)	0.1285	0.1525	0.2360	0.2622
School (pcu/hr/class)	1.3462	1.3846	0.6154	0.6154
Kindergarten (pcu/hr/class)	2.3056	2.3056	0.0286	0.0286

4.2.12 Based on the development schedule and the proposed trip rates (including the surveyed trip rates for Residential Development) as indicated in **Table 4.6**, peak hour traffic generation/attraction trips of the Proposed Development have been estimated as summarized in **Table 4.7**.

**Table 4.7 Traffic Generation/Attraction of the Proposed Development**

Development Component	AM Peak (pcu/hr)		PM Peak (pcu/hr)	
	Generation	Attraction	Generation	Attraction
Residential	469	325	311	342
Retail	39	46	71	79
School	121	125	55	55
Kindergarten	55	55	1	1
<b>Total</b>	<b>684</b>	<b>551</b>	<b>438</b>	<b>477</b>

**4.3 Traffic Forecast Results**

4.3.1 With the amount of development traffic (based on surveyed trip rates for Residential Development) as shown in **Table 4.7** and the distribution assumptions of the development traffic as listed above, the 2038 and 2041 AM and PM peak hour traffic flows have been predicted and presented in **Figures 4.2** and **4.4**, respectively.

## 5 TRAFFIC IMPACT ASSESSMENT

### 5.1 Junction Capacity Assessment

5.1.1 As mentioned in Section 3.4 and the proposed ingress/egress routing as shown in **Figure 3.2**, the major routings would be via NLH (to/from the urban area, HKIA), THI (to/from the Subject Site, Tung Chung East) and the Tung Chung Eastern Interchange (to/from Tung Chung New Town and Tung Chung West). Hence, the critical junctions which are likely to be affected by the Proposed Development will include:

- Tung Chung Eastern Interchange (J1)
- Tai Ho Interchange (J2)
- New signal controlled junction (J3)

5.1.2 In addition to the junctions in the vicinity, 4 junctions in Tung Chung Town Centre have been included for the capacity assessment:

- Tung Chung Waterfront Road/Chek Lap Kok South Road/Shun Tung Road (J4)
- Shun Tung Road/Tat Tung Road (West) (J5)
- Shun Tung Road/Tat Tung Road (East) (J6)
- Shun Tung Road/Yu Tung Road (J7)

5.1.3 The locations of these 7 assessed junctions are shown in **Figure 5.1**. Junction performance for the scenarios “with” and “without” the Proposed Development based on the surveyed trip rates for residential development for the initial design year 2038 and the design year 2041 is summarized in **Table 5.1**.

**Table 5.1 Performance of Assessed Junctions in 2038 and 2041**

No.	Junction Name	Junction Type/ Performance Type	Peak Hour	2038 Junction Performance		2041 Junction Performance	
				w/o SHD	with SHD	w/o SHD	with SHD
J1	Tung Chung Eastern Interchange	Roundabout/DFC*	AM	0.717	0.772	0.718	0.773
			PM	0.548	0.600	0.552	0.605
J2	Tai Ho Interchange	Roundabout/DFC*	AM	0.479	0.668	0.488	0.672
			PM	0.648	0.745	0.648	0.751
J3	New Signal Controlled junction	Signal/ RC^	AM	>100%	97%	>100%	96%
			PM	>100%	>100%	>100%	>100%
J4	Tung Chung Waterfront Road/Chek Lap Kok South Road/Shun Tung Road	Roundabout/DFC*	AM	0.726	0.728	0.733	0.733
			PM	0.652	0.652	0.652	0.652
J5	Shun Tung Road/Tat Tung Road (West)	Signal/ RC^	AM	39%	38%	39%	38%
			PM	22%	22%	22%	22%
J6	Shun Tung Road/Tat Tung Road (East)	Signal/ RC^	AM	16%	16%	16%	16%
			PM	43%	43%	43%	43%
J7	Shun Tung Road/Yu Tung Road	Signal/ RC^	AM	35%	34%	35%	33%
			PM	58%	55%	58%	55%

Note: \* Figures in decimal represent “Design Flow to Capacity” (DFC) ratio for priority junctions or roundabouts.

^ RC is reserved capacity in % for signal controlled junction.

5.1.4 As indicated in **Table 5.1**, all the assessed junctions are expected to operate within their capacities in the assessment years of 2038 and 2041 under both “with” and “without” the Proposed Development scenarios. Therefore, no junction capacity problem is anticipated. Notwithstanding, the performance of junction J2 at Tai Ho Interchange could be improved by adding an exclusive left turn lane for the slip road of Road P1 to NLH eastbound as shown in **Figure 3.2**, which would reduce the design flow capacity (DFC) by about 0.1 to 0.15 during AM and PM peak, respectively. Further discussion with relevant departments would be arranged to ascertain the proposed junction improvement measure for J2 in the detailed design of THI.

5.1.5 The queue length analysis indicated that the average queue length of slip road SB approaching to the new signal controlled junction at J3 is 38m(32m) during AM(PM) peak in 2041 respectively. The separation between this new signal controlled junction at J3 and the roundabout at Road P1 is over 420m. Hence, the queue will not tail back to the roundabout at Road P1.

**5.2 Road Link Capacity Assessment**

5.2.1 Capacity analysis was carried out for the key local road links which are likely to be affected by the Proposed Development. The assessed road links include:

- NLH – west of Tung Chung Eastern Interchange (L1)
- NLH – east of Tung Chung Eastern Interchange (L2)
- Yi Tung Road – north of Tung Chung Eastern Interchange (L3)
- NLH – west of Tai Ho Interchange (L4)
- NLH – east of Tai Ho Interchange (L5)
- Slip Road of Road P1 – north of Tai Ho Interchange (L6)
- Road P1 - between Tung Chung and Tai Ho (L8)
- Road P1 – between Tai Ho and Sunny Bay (L9)

5.2.2 The locations of these 8 key local road links are shown in **Figure 5.1**. In addition, the performance of the strategic road link of Tsing Ma Bridge (L7) has also been assessed.

5.2.3 Road Link performance for the scenarios “without” and “with” the Proposed Development for the design year of 2038 is summarized in **Tables 5.2** and **5.3**, respectively.

**Table 5.2 Performance of Assessed Road Links in 2038 without the Proposed Development**

Key Road Links	Road Type*	Design Capacity (pcu/hr)	2038 Peak Hour Flows (pcu/hr) (w/o SHD)		2038 Peak Hour V/C Ratio (w/o SHD)		
			AM	PM	AM	PM	
L1 NLH – west of Tung Chung Eastern Interchange	EB	6,100	EX	1,510	2,820	0.25	0.46
	WB			3,130	1,820	0.51	0.3
L2 NLH – east of Tung Chung Eastern Interchange	EB	6,100	EX	2,640	3,900	0.43	0.64
	WB			4,580	2,970	0.75	0.49
L3 Yi Tung Road – north of Tung Chung Eastern Interchange	NB	2,800	LD	790	740	0.28	0.26
	SB			530	470	0.19	0.17
L4 NLH – west of Tai Ho Interchange	EB	6,100	EX	2,260	3,520	0.37	0.58
	WB			4,070	2,460	0.67	0.40
L5 NLH – east of Tai Ho Interchange	EB	6,100	EX	4,520	6,980	0.74	1.14
	WB			6,930	4,970	1.14	0.81
L6 Slip Road of Road P1 – north of Tai Ho Interchange	NB	2,800	DD	520	710	0.19	0.25
	SB			1,190	560	0.43	0.20
L7 Tsing Ma Bridge	EB	6,100	EX	4,770	6,970	0.78	1.14
	WB			6,880	4,920	1.13	0.81
L8 Road P1 (between Tung Chung and Tai Ho)	EB	3,600	DD	1,540	900	0.43	0.58
	WB			880	920	0.24	0.26
L9 Road P1 (between Tai Ho and Sunny Bay)	EB	3,600	DD	350	340	0.10	0.09
	WB			360	210	0.10	0.06

Note: \* EX = Expressway, DD = District Distributor, LD = Local Distributor.

**Table 5.3 Performance of Assessed Road Links in 2038 with the Proposed Development**

Key Road Links	Road Type	Design Capacity (pcu/hr)	2038 Peak Hour Flows (pcu/hr) (with SHD)		2038 Peak Hour V/C Ratio (with SHD)		
			AM	PM	AM	PM	
L1 NLH – west of Tung Chung Eastern Interchange	EB	6,100	EX	1,550	2,960	0.25	0.49
	WB			3,320	1,880	0.54	0.31
L2 NLH – east of Tung Chung Eastern Interchange	EB	6,100	EX	2,780	4,130	0.46	0.68
	WB			4,880	3,140	0.80	0.51
L3 Yi Tung Road – north of Tung Chung Eastern Interchange	NB	2,800	LD	800	760	0.29	0.27
	SB			530	480	0.19	0.17
L4 NLH – west of Tai Ho Interchange	EB	6,100	EX	2,380	3,710	0.39	0.61
	WB			4,320	2,600	0.71	0.42
L5 NLH – east of Tai Ho Interchange	EB	6,100	EX	4,730	7,120	0.78	1.17
	WB			7,060	5,100	1.16	0.84
L6 Slip Road of Road P1 – north of Tai Ho Interchange	NB	2,800	DD	790	1,040	0.28	0.37
	SB			1,500	890	0.54	0.32
L7 Tsing Ma Bridge	EB	6,100	EX	4,960	7,100	0.81	1.16
	WB			7,010	5,050	1.15	0.83
L8 Road P1 (between Tung Chung and Tai Ho)	EB	3,600	DD	1,850	1,230	0.51	0.34
	WB			1,150	1,250	0.32	0.35
L9 Road P1 (between Tai Ho and Sunny Bay)	EB	3,600	DD	350	340	0.10	0.09
	WB			360	210	0.10	0.06

Note: \* EX = Expressway, DD = District Distributor, LD = Local Distributor.

5.2.4 Road Link performance for the scenarios “without” and “with” the Proposed Development for the design year of 2041 is summarized in **Tables 5.4** and **5.5**, respectively.

**Table 5.4 Performance of Assessed Road Links in 2041 without the Proposed Development**

Key Road Links	Road Type *	Design Capacity (pcu/hr)	2041 Peak Hour Flows (pcu/hr) (w/o SHD)		2041 Peak Hour V/C Ratio (w/o SHD)		
			AM	PM	AM	PM	
L1 NLH – west of Tung Chung Eastern Interchange	EB	6,100	EX	1,520	2,810	0.25	0.46
	WB			3,130	1,830	0.51	0.30
L2 NLH – east of Tung Chung Eastern Interchange	EB	6,100	EX	2,650	3,900	0.43	0.64
	WB			4,580	2,980	0.75	0.49
L3 Yi Tung Road – north of Tung Chung Eastern Interchange	NB	2,800	LD	790	740	0.28	0.26
	SB			540	480	0.19	0.17
L4 NLH – west of Tai Ho Interchange	EB	6,100	EX	2,270	3,510	0.37	0.58
	WB			4,080	2,460	0.67	0.40
L5 NLH – east of Tai Ho Interchange	EB	6,100	EX	4,660	7,140	0.76	1.17
	WB			7,110	5,130	1.17	0.84
L6 Slip Road of Road P1 – north of Tai Ho Interchange	NB	2,800	DD	520	710	0.19	0.25
	SB			1,210	560	0.43	0.20
L7 Tsing Ma Bridge	EB	6,100	EX	4,920	7,140	0.81	1.17
	WB			7,070	5,120	1.16	0.84
L8 Road P1 (between Tung Chung and Tai Ho)	EB	3,600	DD	1,590	930	0.44	0.26
	WB			920	960	0.26	0.27
L9 Road P1 (between Tai Ho and Sunny Bay)	EB	3,600	DD	380	370	0.11	0.10
	WB			400	250	0.11	0.07

Note: \* EX = Expressway, DD = District Distributor, LD = Local Distributor.



**Table 5.5 Performance of Assessed Road Links in 2041 with the Proposed Development**

Key Road Links	Road Type	Design Capacity (pcu/hr)	2041 Peak Hour Flows (pcu/hr) (with SHD)		2041 Peak Hour V/C Ratio (with SHD)		
			AM	PM	AM	PM	
L1 NLH – west of Tung Chung Eastern Interchange	EB	6,100	EX	1,550	2,950	0.25	0.48
	WB			3,320	1,880	0.54	0.31
L2 NLH – east of Tung Chung Eastern Interchange	EB	6,100	EX	2,790	4,130	0.46	0.68
	WB			4,890	3,150	0.80	0.52
L3 Yi Tung Road – north of Tung Chung Eastern Interchange	NB	2,800	LD	800	760	0.29	0.27
	SB			540	480	0.19	0.17
L4 NLH – west of Tai Ho Interchange	EB	6,100	EX	2,390	3,710	0.39	0.61
	WB			4,320	2,600	0.71	0.43
L5 NLH – east of Tai Ho Interchange	EB	6,100	EX	4,860	7,280	0.80	1.19
	WB			7,240	5,260	1.19	0.86
L6 Slip Road of Road P1 – north of Tai Ho Interchange	NB	2,800	DD	790	1,040	0.28	0.37
	SB			1,510	890	0.54	0.32
L7 Tsing Ma Bridge	EB	6,100	EX	5,110	7,270	0.84	1.19
	WB			7,200	5,240	1.18	0.86
L8 Road P1 (between Tung Chung and Tai Ho)	EB	3,600	DD	1,890	1,260	0.53	0.35
	WB			1,190	1,290	0.33	0.36
L9 Road P1 (between Tai Ho and Sunny Bay)	EB	3,600	DD	380	370	0.11	0.10
	WB			400	250	0.11	0.07

Note: \* EX = Expressway, DD = District Distributor, LD = Local Distributor.

- 5.2.5 Results of the road link performance have indicated that all the key road links assessed will be operating with sufficient capacities or within manageable level (V/C ratio  $\leq 1.2$ ) in the design years 2038 and 2041 with the Proposed Development as shown in **Tables 5.3** and **5.5**.
- 5.2.6 The new roads under planning, as presented in Government's *Sustainable Lantau Blueprint*, would help relieving traffic at the key road links. Specifically, the Road P1 extension from Tai Ho to Sunny Bay is found to be effective to provide an alternative road link to the NLH; while the Route 11 is found to be effective to relieve traffic at Tsing Ma Bridge.
- 5.2.7 Results of the sensitivity test have shown that peak hour traffic contribution from the potential SHW Reclamation is insignificant (V/C +0.01).
- 5.2.8 In the long run, the *HK2030+: Towards a Planning Vision and Strategy Transcending 2030 (HK2030+)* and the *Sustainable Lantau Blueprint* have proposed to connect the northern shore of Lantau, the East Lantau Metropolis, the urban areas of Hong Kong and the New Territories through strategic road network to form a curve-shaped road corridor linking NT West – Lantau – Metro Area.
- 5.2.9 In sum, it is considered that the Proposed Development is feasible from traffic engineering view point. Further review of the traffic situation should be undertaken when the planning of new road links is confirmed.

## 6 PUBLIC TRANSPORT FACILITIES REQUIREMENT

### 6.1 Estimation of Public Transport Demand

- 6.1.1 The public transport demand was estimated by referring to AECOM's in-house Strategic Transport Model (STM) which is compatible with the Enhanced CTS-3 Model. The strategic transport model has since been updated to reflect the strategic information of 2011 travel characteristics within Hong Kong based on the *Travel Characteristics Survey 2011*, *Goods Vehicle Travel Characteristics Survey 2011*, and *Cross Boundary Travel Survey* data at the road-based control points. The STM has been adopted in various government projects recently such as Hung Shui Kiu NDA and Kwu Tung North/Fanling North NDAs etc..
- 6.1.2 The Proposed Development will accommodate new population of about 37,800. By referring to the in-house STM, 20.1% of person (mechanised) trips (excluded walk-only) will be generated during peak hours in outbound direction, 25% of person trip will travel to adjacent areas (i.e. Tung Chung, Airport Island and HKBCF Island). The rest of the people will be heading to Hong Kong Island, Kowloon and New Territories. It is expected that more person trips will be travelling within Lantau Island when the new job opportunities at TCNTE, 3RS and NCD of HKIA, and HKBCF topside development are materialized in the future.
- 6.1.3 By referring to the in-house STM, the modal split for the anticipated personal trips generated from the Proposed Development and the trips taking different transport modes are summarized in **Table 6.1**.

**Table 6.1 Estimated Modal Split of the Proposed Development in Year 2041**

Means of Transport	Average Modal Split	Personal Trips during Peak hours
Railway	60%	4,500
Franchised bus	31.4%	2,400
Taxi	1.3%	100
Private Car	7.3%	600
Total	100%	7,600 <sup>(1)</sup>

Note: (1) Figures are rounded to nearest 100

#### Railway

- 6.1.4 Construction of the proposed SHO Station will involve works along the existing railway tracks during the limited window of non-traffic hours. Due consideration have to be made on its design and construction to ensure safe and uninterrupted railway operation. Hence the opening of the SHO Station will be subject to its construction program and overall TCL operation to be determined at the detailed design stage. If necessary, feeder service would be provided from the Subject Site to/from Tsing Yi or other MTR Station(s) to serve the initial phase of the Proposed Development before SHO Station opening.
- 6.1.5 Notwithstanding, it is considered necessary to have the SHO Station to serve the Proposed Development to minimize the use of road-based transport causing serious congestion at the NLH and Tsing Ma Bridge.

#### Franchised Bus

- 6.1.6 Adopting the capacity of a double deck franchised bus as 100 ppl/veh and the directional split referred to in-house STM, the estimated franchised bus demand with respect to different direction is tabulated in **Table 6.2**.

**Table 6.2 Estimated Franchised Bus Demand**

Direction	Directional Split	No. of Personal Trips during Peak Hour	No. of Bus Trips Required during Peak Hour*	No. of bus bay required
Hong Kong	23%	550	6	1
Kowloon	27%	650	7	2
New Territories	25%	600	6	1
Lantau – Tung Chung/ HKIA	25%	600	6	1
			Total:	5

Note: \* It is assumed that the passenger carrying capacity of bus is 100 ppl/bus and peak frequency is 10 min/bus or 6 bus/hr.

- 6.1.7 According to the estimated bus demand, 5 routes with 10-minute headway for each route would be able to serve the demand. The suggested destinations in **Table 6.2** are for reference only. The detailed bus routings should be further investigated and discussed with TD and bus operators in future (close to the intake year).

### 6.2 Public Transport Interchange

- 6.2.1 By considering the estimated public transport demand in Section 6.1, it is recommended to provide a PTI on-site with the facilities as shown in **Table 6.3**. According to a rough estimation, it is estimated that the size of the PTI would be around 9,000m<sup>2</sup> gross floor area. It is proposed that the PTI will be constructed by the future Project Proponent in accordance with technical specifications, and then hand over to Government for operation and maintenance.
- 6.2.2 As shown in the **Table 6.3**, this PTI would have sufficient space to serve 5 bus routes with terminus and stops, 1 circular route with the terminus in the other end destination and 3 passing bus routes. The indicative bus routes are presented in **Appendix A**.

**Table 6.3 Summary of Public Transport Facilities Requirements within PTI**

Public Transport Facilities within PTI	Provision
Franchised Bus Bay	4 Bays with single lane width and 1 Bay with double lane width (each with 1 for loading and 3 for stacking)
Bay for other buses	1 bay for other buses
Taxi Bay	1 for Urban Taxi 1 for NT & Lantau Taxi
General Loading/Unloading Lay-by for Private Car, Coach, Shuttle Service	2 lay-by with double lane width

## 7 SUMMARY AND CONCLUSION

### 7.1 Summary

- 7.1.1 Siu Ho Wan Depot with re-planning and migration of the depot facilities could provide an available land of about 30 hectares atop the depot for housing development.
- 7.1.2 The proposed comprehensive development atop SHD comprises 14,000 residential units, retail facilities of about 30,000m<sup>2</sup> GFA, three 30-classroom schools, four 6-classroom kindergartens, a public transport interchange, car parking and loading/unloading facilities, recreational facilities, utility plant rooms and supporting facilities. A new Siu Ho Wan (SHO) Station has been planned at western position of the site along the existing Tung Chung Line with station concourse integrated with the topside development podium to serve the community.
- 7.1.3 Recommendations on car parking and L/UL provision for different development types have been discussed in Chapter 2. Upper range of the HKPSG has been proposed as car and motorcycle parking provisions at the Proposed Development to cater for the anticipated high demand due to (i) high market and local demand in existing Lantau developments, (ii) local demand for high provision in other MTR depot topside developments, and (iii) no alternative parking space in the vicinity.
- 7.1.4 Since the proposed SHD development is tentatively estimated for completion by phase up to 2038, this T&TIA has focused on the initial design year of 2038 and the design year of 2041 to assess the initial and ultimate traffic impact respectively. The forecasted traffic flows in years 2038 and 2041 based on AECOM's in-house traffic model with particular adjustment to cater for the latest land use planning information in Lantau have been adopted for junction and road link capacity analysis.
- 7.1.5 Trip rates for residential component are based on surveys conducted at Seaview Crescent at Tung Chung with similar characteristics to the Proposed Development in May 2015 and verified in October 2016, as well as verification survey conducted by TD in May 2017.
- 7.1.6 The forecasted 2038 and 2041 traffic flows for this T&TIA are shown in **Figures 4.1** and **4.3** (without the Proposed Development), and **Figures 4.2** and **4.4** (with the Proposed Development) respectively.
- 7.1.7 Results of the assessment have indicated that all road junctions in the vicinity and key junctions in Tung Chung New Town are predicted to be operating within design capacity in 2041. No junction capacity problem is envisaged with the Proposed Development. An exclusive left turn lane has been proposed for the slip road of Road P1 to NLH eastbound to improve the performance of junction for J2 at Tai Ho Interchange as shown in **Figure 3.2**.
- 7.1.8 Major road links including Tsing Ma Bridge are predicted to be operating within manageable level in 2041 (V/C ratio  $\leq 1.2$ ) with the Route 11 and Road P1 (Tai Ho to Sunny Bay Section) under planning, as presented in Government's *Sustainable Lantau Blueprint*, which are expected to be available before the Assessment Year of 2038. Sensitivity test conducted has indicated that peak hour traffic contribution from the potential SHW Reclamation is insignificant. No insurmountable road capacity issue is envisaged with the Proposed Development.

7.1.9 The *HK2030+* and the *Sustainable Lantau Blueprint* have proposed to examine further strategic highway linking Lantau and Hong Kong Island West via the East Lantau Metropolis.

7.1.10 Based on the analysis for the public transport facilities requirement in Chapter 6, a PTI of approximate 9,000m<sup>2</sup> comprising 5 bus lay-bys for franchised buses, 1 bus lay-by for other buses, 2 taxi lay-bys and 2 lay-bys for general L/UL activities has been included in the conceptual development scheme, subject to review and discussion with TD and bus operators in the implementation stage.

### 7.2 Conclusion

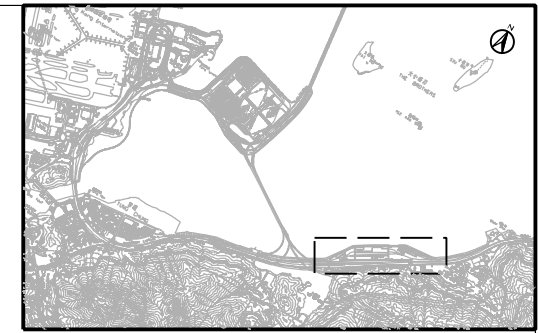
7.2.1 Traffic and transport impacts arising from the proposed comprehensive residential and commercial development atop Siu Ho Wan Depot is manageable. The Proposed Development is considered feasible from traffic and transport engineering and management perspectives.

7.2.2 This T&TIA has examined the worst-case scenario by assuming the upper-bound of various committed projects in North Lantau, including HKBCF topside development and NCD. Further review of the T&TIA would be carried out, if necessary, when the road network and land use planning at Lantau is confirmed at the detailed design stage.

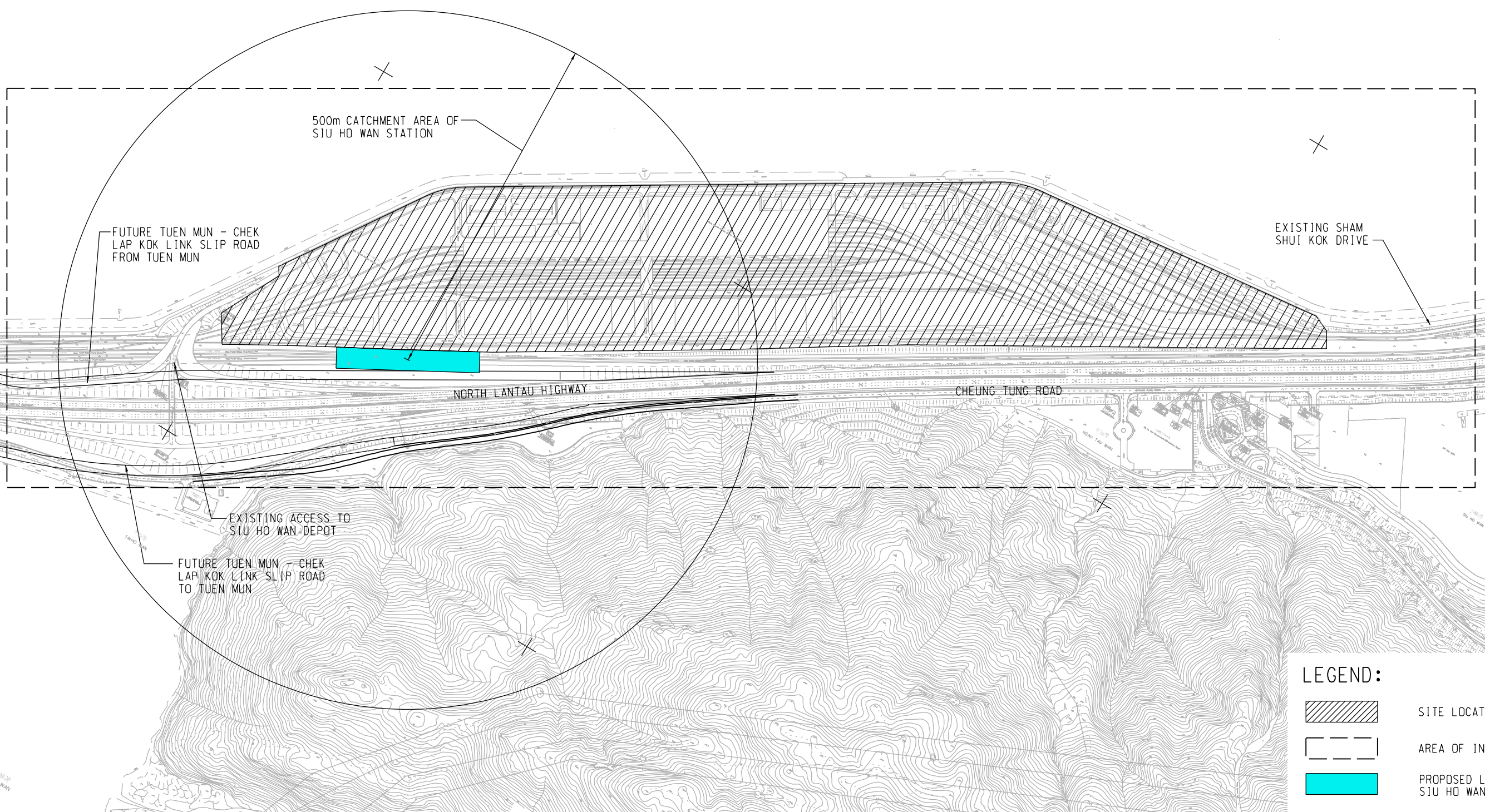
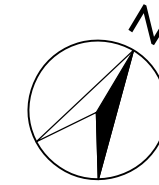
***Figures***

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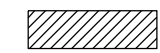
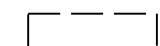

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LOCATION PLAN



LEGEND:

-  SITE LOCATION
-  AREA OF INFLUENCE
-  PROPOSED LOCATION OF SIU HO WAN STATION

Proposed Comprehensive Residential and Commercial Development atop Siu Ho Wan Depot

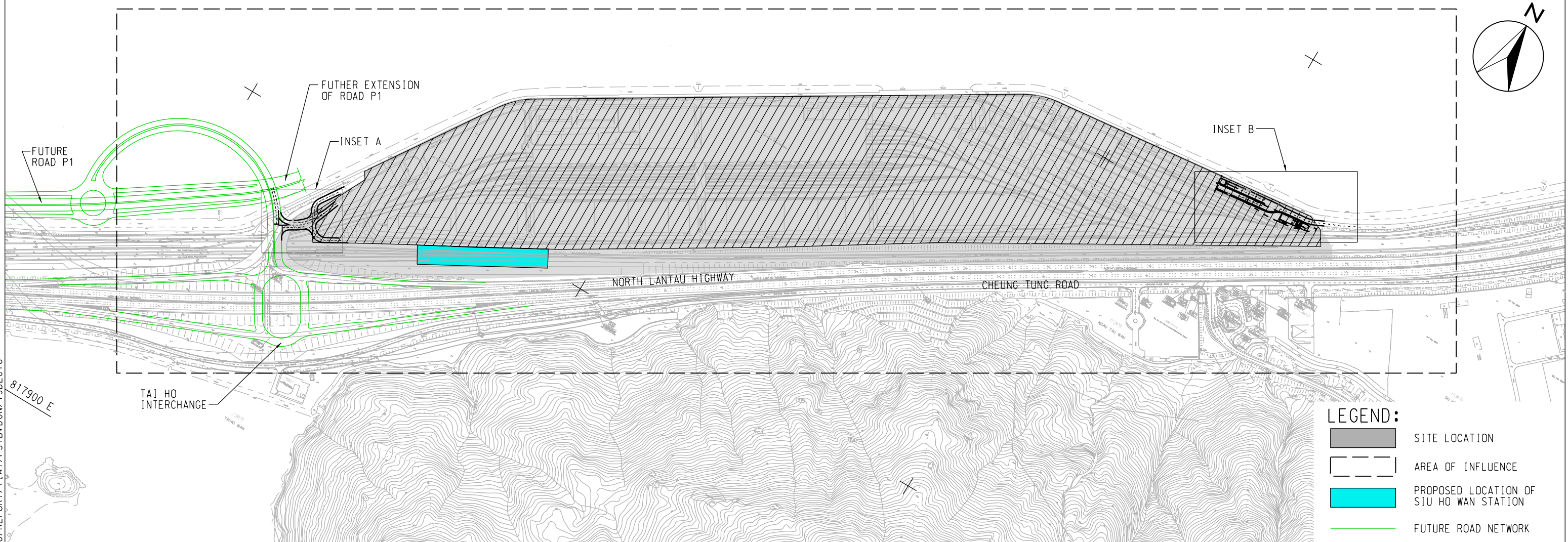
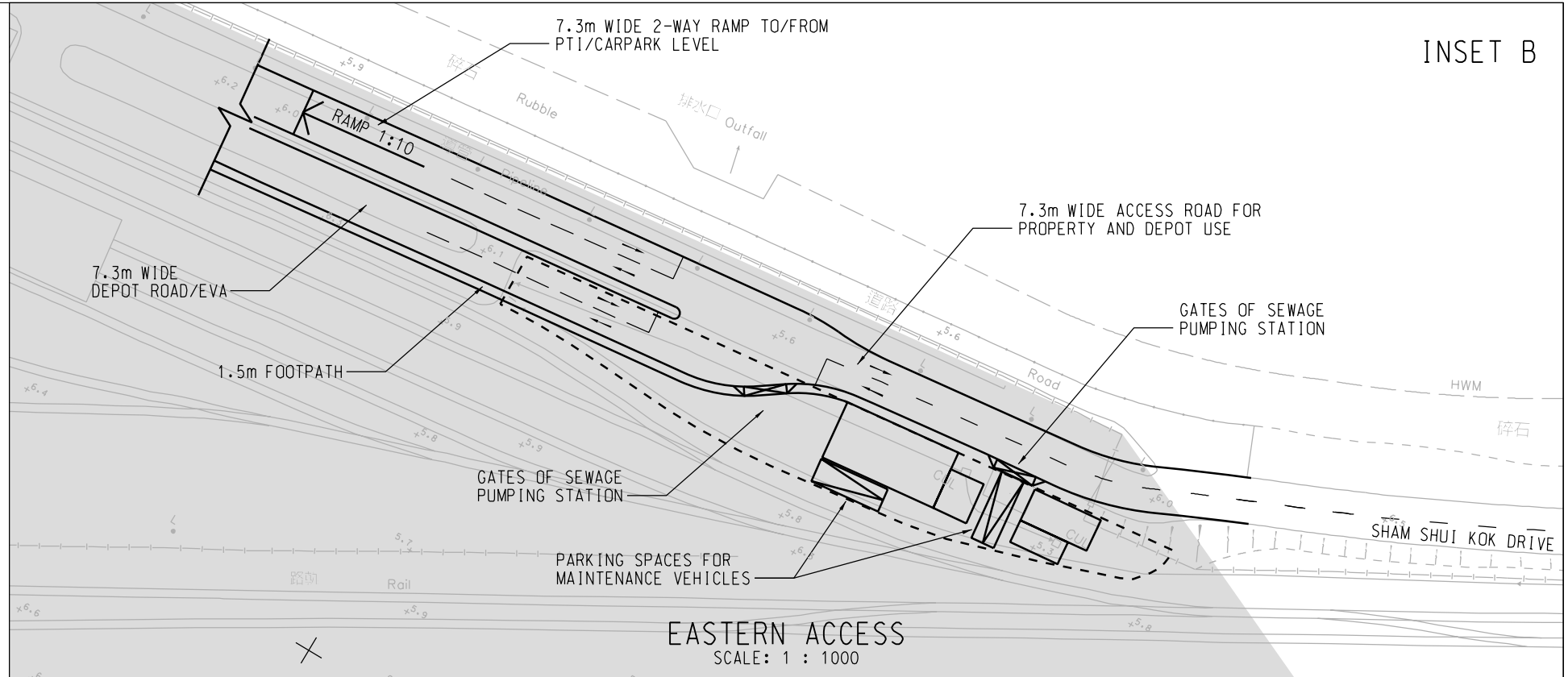
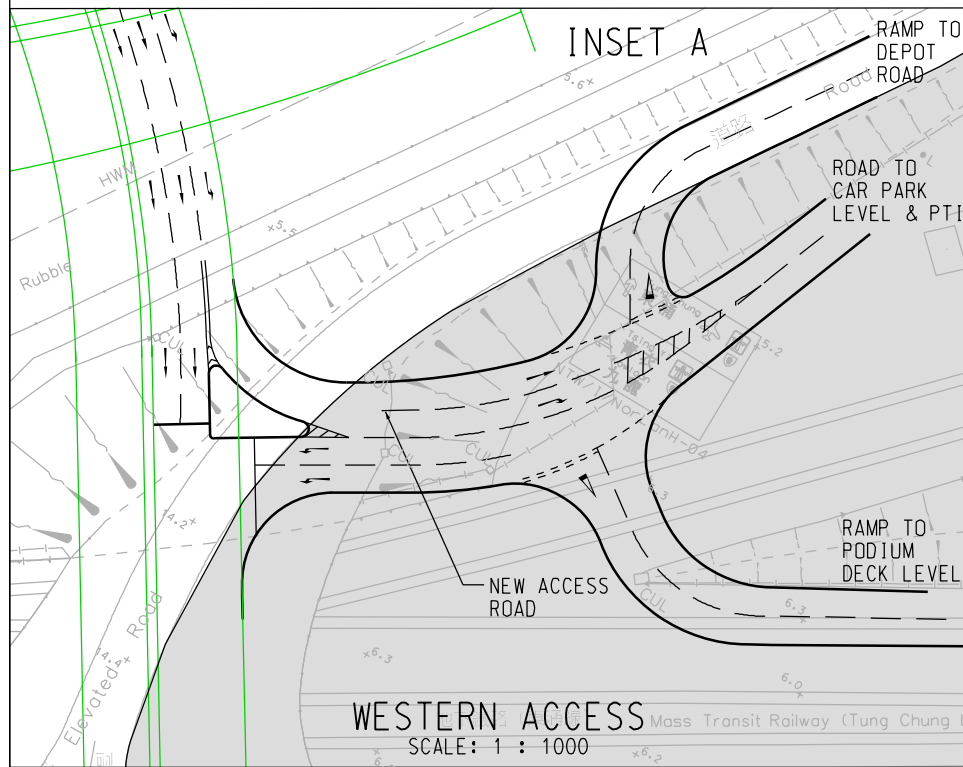
EXISTING ROAD NETWORK WITHIN AOI



SCALE:	1 : 6000	(A3)	FIGURE No.
DATE:	NOV. 2016		2.1A

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Proposed Comprehensive Residential and Commercial Development atop Siu Ho Wan Depot

FUTURE ROAD NETWORK

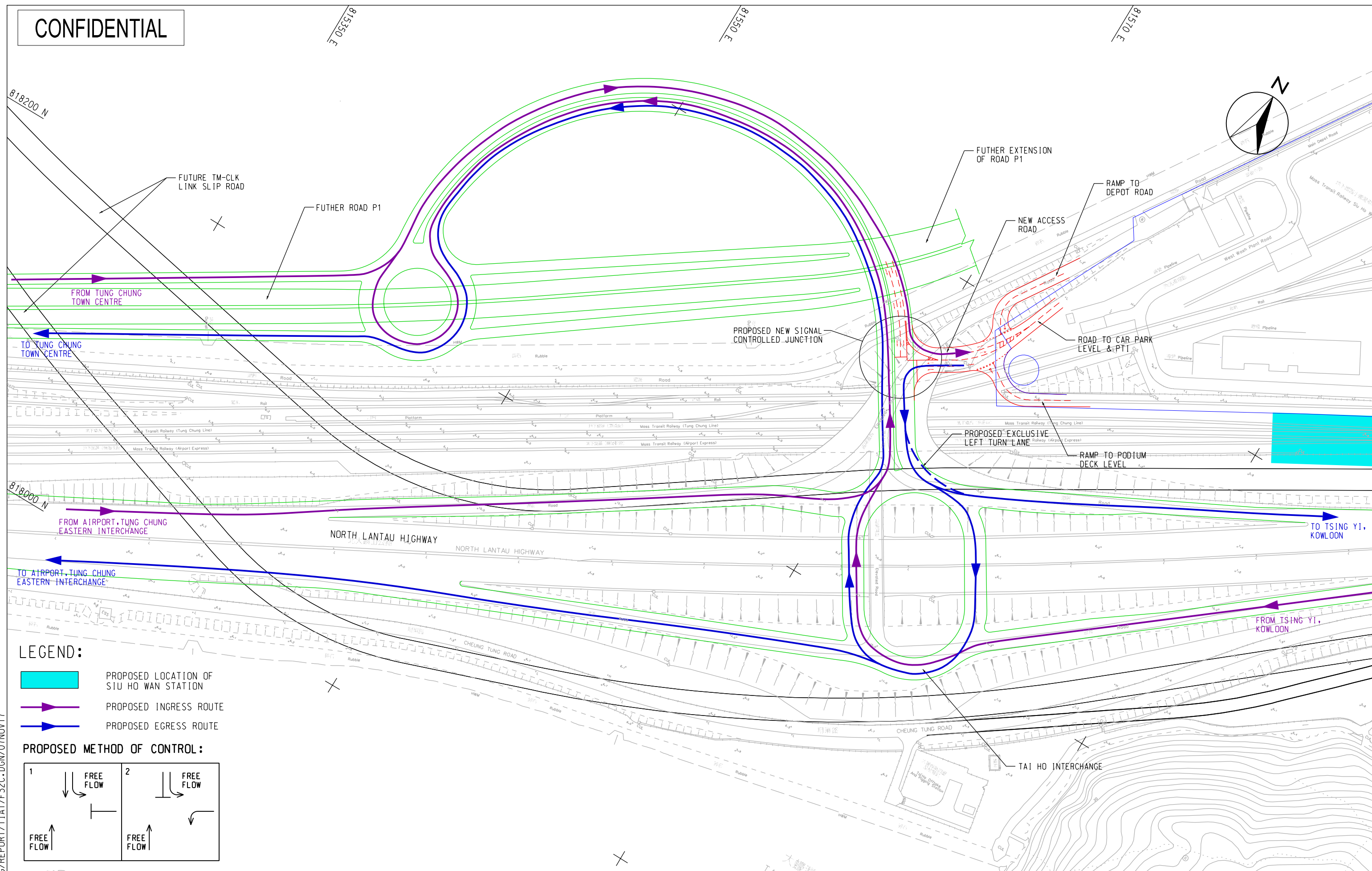


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DATE: DEC. 2016

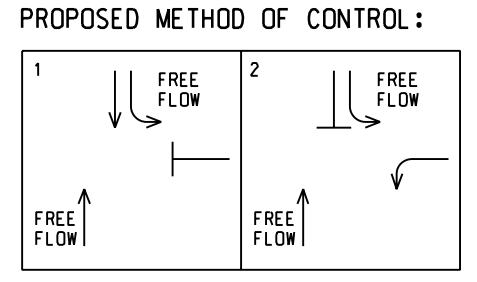
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**LEGEND:**

- PROPOSED LOCATION OF SIU HO WAN STATION
- PROPOSED INGRESS ROUTE
- PROPOSED EGRESS ROUTE



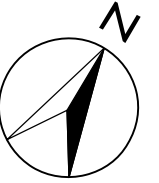
Proposed Comprehensive Residential and Commercial Development atop Siu Ho Wan Depot  
**PROPOSED SITE ACCESS ARRANGEMENT**



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DATE:	DEC. 2016		3.2C

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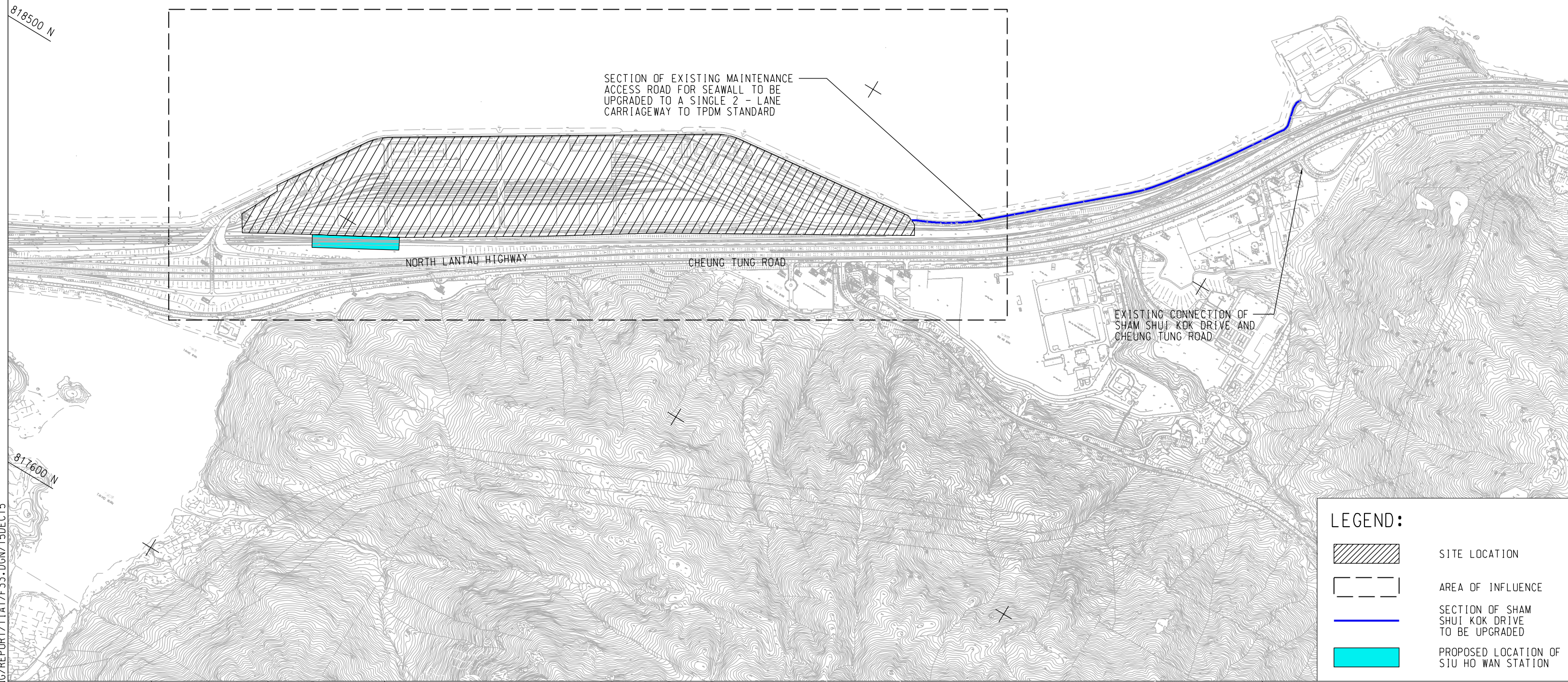
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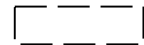


816900 E

817600 N

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**LEGEND:**

	SITE LOCATION
	AREA OF INFLUENCE
	SECTION OF SHAM SHUI KOK DRIVE TO BE UPGRADED
	PROPOSED LOCATION OF SIU HO WAN STATION



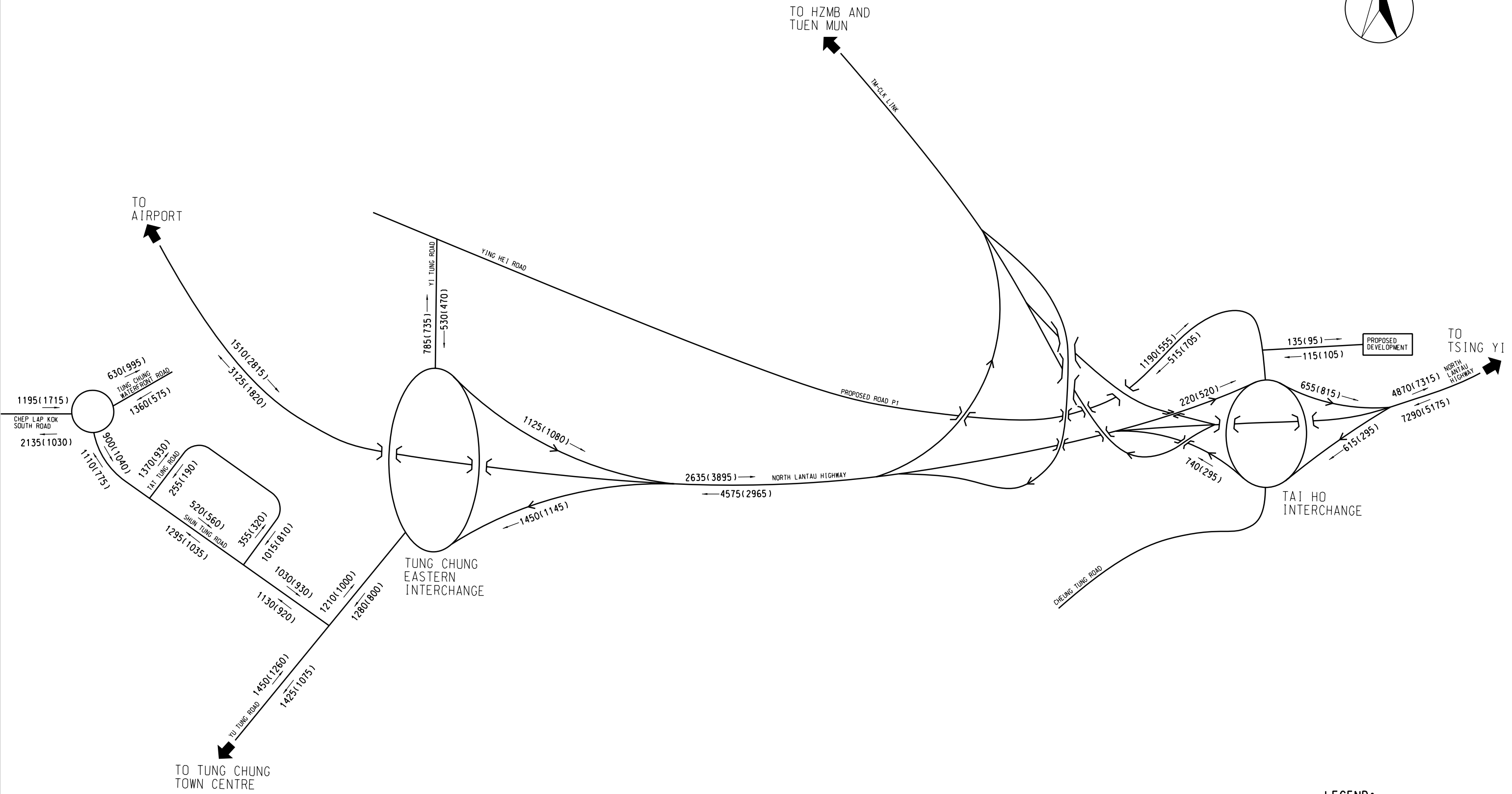
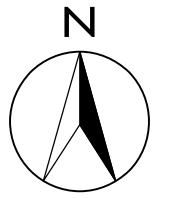
Proposed Comprehensive Residential and Commercial Development atop Siu Ho Wan Depot

**PROPOSED SHAM SHUI KOK DRIVE UPGRADING**



SCALE:	1 : 9000	(A3)	FIGURE No.
DATE:	DEC. 2015		3.3





**LEGEND:**  
 770(830) AM(PM) PEAK HOUR FLOWS (PCU/HR)  
 TO NEAREST 10 PCU/HR

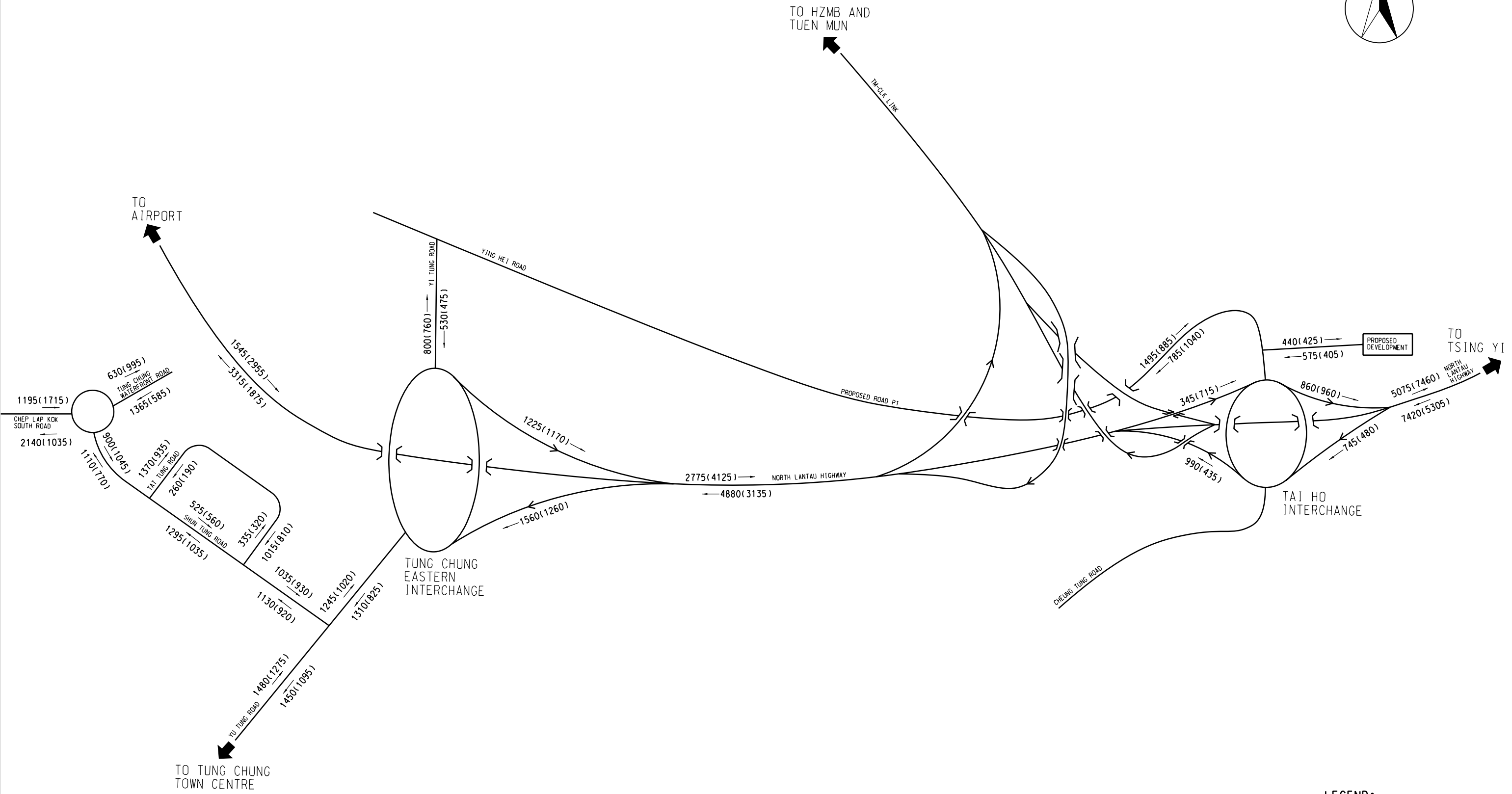
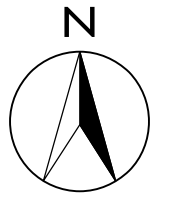


Proposed Comprehensive Residential and Commercial Development atop Siu Ho Wan Depot  
 2038 FORECAST FLOWS WITHOUT DEVELOPMENT



SCALE:	N. T. S.	(A3)	FIGURE No.
DATE:	SEP. 2017		4.1B

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**LEGEND:**  
 770(830) AM(PM) PEAK HOUR FLOWS (PCU/HR)  
 TO NEAREST 10 PCU/HR

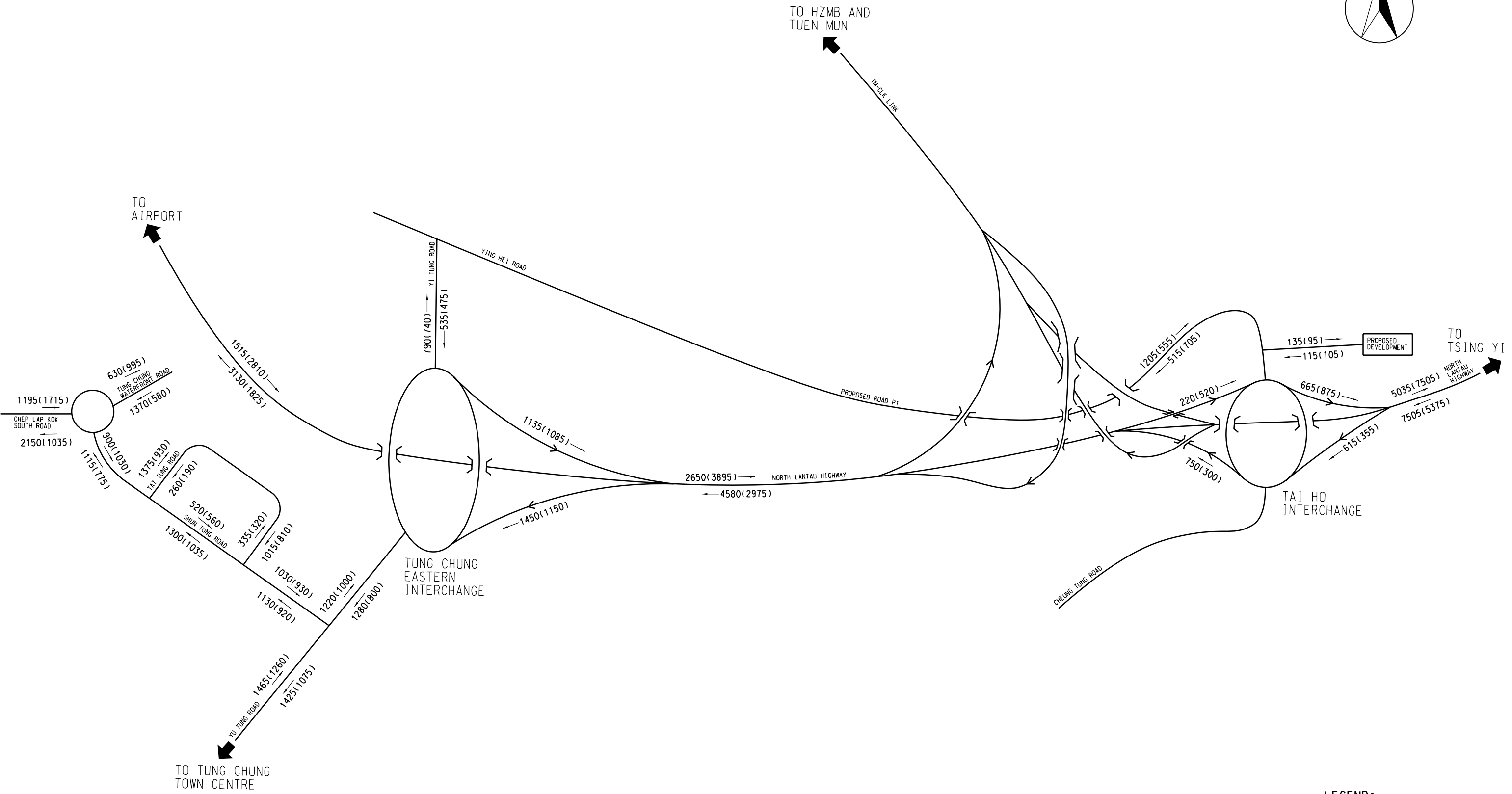
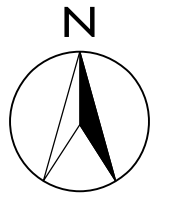


Proposed Comprehensive Residential and Commercial Development atop Siu Ho Wan Depot  
 2038 FORECAST FLOWS WITH DEVELOPMENT



SCALE:	N. T. S.	(A3)	FIGURE No.
DATE:	SEP. 2017		4.2B

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**LEGEND:**  
 770(830) AM(PM) PEAK HOUR FLOWS (PCU/HR)  
 TO NEAREST 10 PCU/HR

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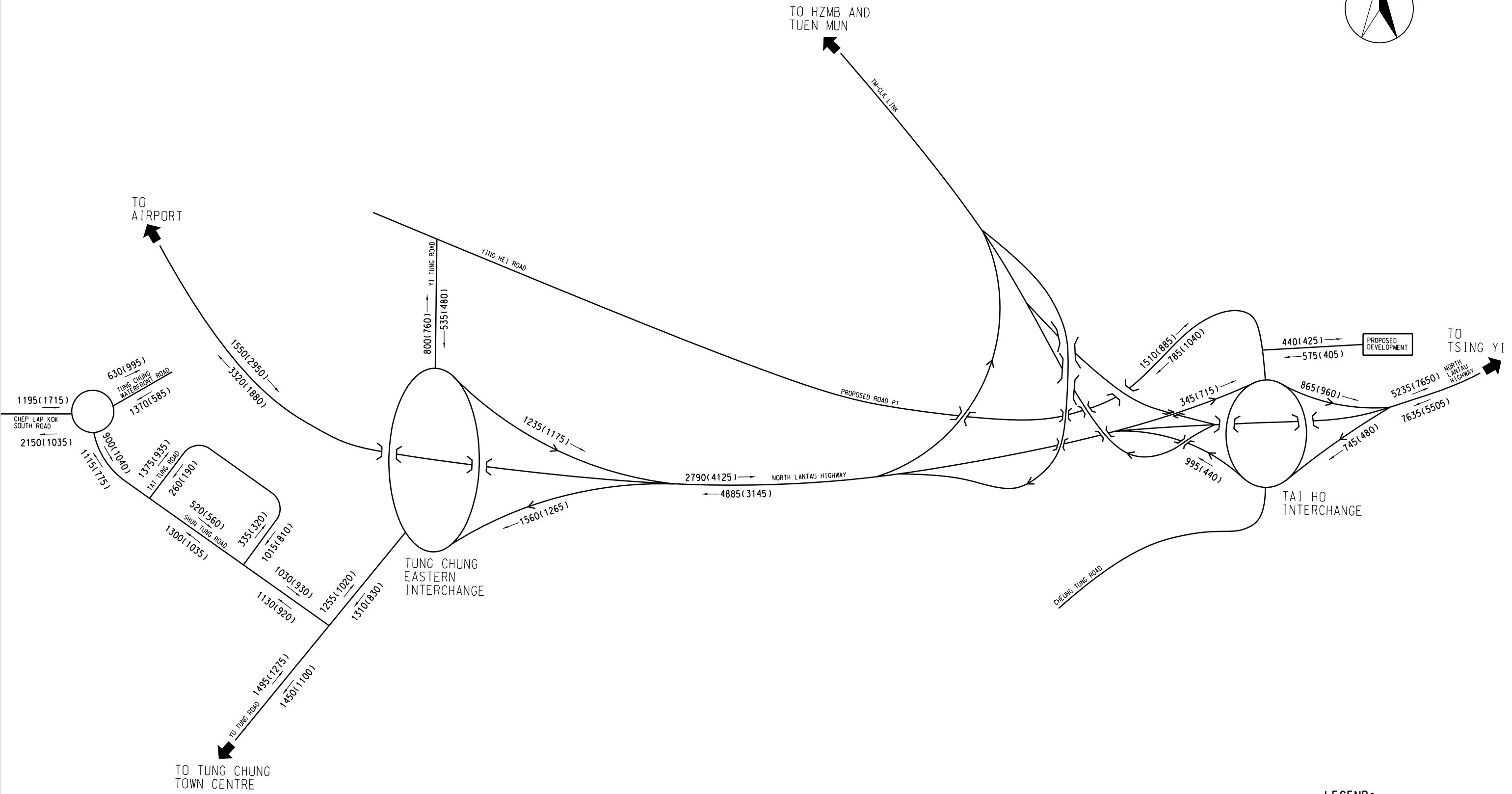
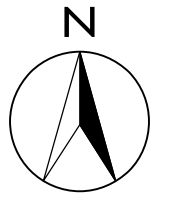


Proposed Comprehensive Residential and Commercial Development atop Siu Ho Wan Depot  
 2041 FORECAST FLOWS WITHOUT DEVELOPMENT



SCALE:	N. T. S.	(A3)	FIGURE No.
DATE:	SEP. 2017		4.3B

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LEGEND:  
 770(830) AM(PM) PEAK HOUR FLOWS (PCU/HR)  
 TO NEAREST 10 PCU/HR



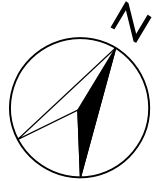
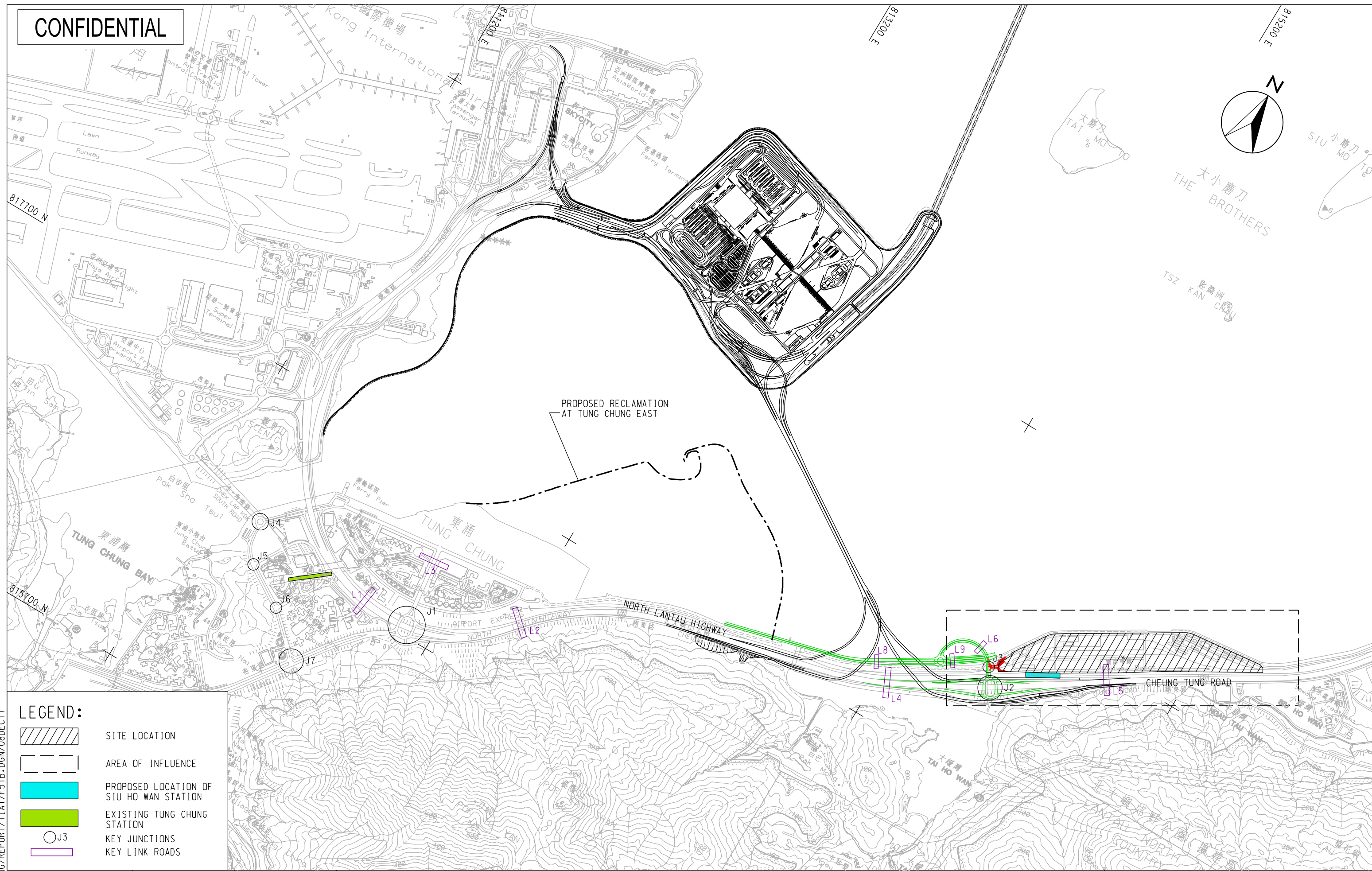
Proposed Comprehensive Residential and Commercial Development atop Siu Ho Wan Depot  
 2041 FORECAST FLOWS WITH DEVELOPMENT



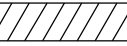
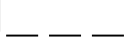




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DATE:	SEP. 2017		4.4B

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**LEGEND:**

-  SITE LOCATION
-  AREA OF INFLUENCE
-  PROPOSED LOCATION OF SIU HO WAN STATION
-  EXISTING TUNG CHUNG STATION
-  ○ J3
-  KEY LINK ROADS

Proposed Comprehensive Residential and Commercial Development atop Siu Ho Wan Depot  
**LOCATIONS OF KEY JUNCTIONS AND ROAD LINKS**

60342202/DRAWING/REPORT/TIAT1/F51B.DGN/08DEC17

**SKA** SIMON KWAN & ASSOCIATES LTD.  
**AECOM** **ARUP**

**MTR**

SCALE:	1 : 20000	(A3)	FIGURE No.
DATE:	DEC. 2017		5.1B



**Appendix A Traffic & Transport Impact Assessment (T&TIA) and Tung Chung Line (TCL)  
Capacity Assessment – Consolidated Assumptions**

**A1. Major Developments in North Lantau**

2026			
Major Development	Parameter	Population	Employment
SHD Topside Development	2,432 flats	6,600	60
Tung Chung Town Centre and New Town Extension	---	162,200	28,000
HKBCF Island Topside Development	125,000m <sup>2</sup> GFA	0	4,700
HKIA Three-Runway System	62.4M passenger trips/year (excluding transfer/transit) 6.17M tonnes cargo/year (excluding transshipment)	0	106,000
HKIA North Commercial District	Up to 500,000m <sup>2</sup> floor space of retail complexes, entertainment facilities, dining space, hotels & offices	0	18,000
SHW Reclamation and Landside Development*	0	0	0
Tung Chung Traction Substation Development*	0	0	0
Sunny Bay Reclamation	Not Included	0	Enhanced-2011 TPEDM (Approx. 4,000)
Lantau Logistic Park	Not Included	---	---
<b>TOTAL</b>		<b>168,800</b>	<b>160,760</b>
2031			
Major Development	Parameter	Population	Employment
SHD Topside Development	6,858 flats Commercial: 30,000m <sup>2</sup> GFA	18,500	1,700
Tung Chung Town Centre and New Town Extension	TCE and TCW: 49,400 flats and 877,000m <sup>2</sup> Commercial GFA	277,600	60,000
HKBCF Island Topside Development	350,000m <sup>2</sup> GFA	0	13,000
HKIA Three-Runway System	71.6M passenger trips/year (excluding transfer/transit) 7.51M tonnes cargo/year (excluding transshipment)	0	123,000
HKIA North Commercial District	Up to 668,000m <sup>2</sup> floor space of retail complexes, entertainment facilities, dining space, hotels & offices	0	24,000
SHW Reclamation and Landside Development*	18,000 School Places	4,000	2,600
Tung Chung Traction Substation Development*	1,345 flats	3,000	0
Sunny Bay Reclamation	Not Included	0	Enhanced-2011 TPEDM (Approx. 4,000)
Lantau Logistic Park	Not Included	---	---
<b>TOTAL</b>		<b>303,100</b>	<b>228,300</b>

2036			
Major Development	Parameter	Population	Employment
SHD Topside Development	10,910 flats Commercial: 30,000m <sup>2</sup> GFA	29,500	1,800
Tung Chung Town Centre and New Town Extension	TCE and TCW: 49,400 flats and 877,000m <sup>2</sup> Commercial GFA	277,600	60,000
HKBCF Island Topside Development	500,000m <sup>2</sup> GFA	0	18,700
HKIA Three-Runway System	77.4M passenger trips/year (excluding transfer/transit) 8.16M tonnes cargo/year (excluding transshipment)	0	123,000
HKIA North Commercial District	Up to 668,000m <sup>2</sup> floor space of retail complexes, entertainment facilities, dining space, hotels & offices	0	24,000
SHW Reclamation and Landside Development*	18,000 School Places	4,000	2,600
Tung Chung Traction Substation Development*	1,345 flats	3,000	0
Sunny Bay Reclamation	Not Included	0	Enhanced-2011 TPEDM (Approx. 4,000)
Lantau Logistic Park	Not Included	---	---
<b>TOTAL</b>		<b>314,100</b>	<b>234,100</b>
Project Completion (2038)			
Major Development	Parameter	Population	Employment
SHD Topside Development	14,000 flats Commercial: 30,000m <sup>2</sup> GFA	37,800	1,900
Tung Chung Town Centre and New Town Extension	TCE and TCW: 49,400 flats and 877,000m <sup>2</sup> Commercial GFA	277,600	60,000
HKBCF Island Topside Development	500,000 m <sup>2</sup> GFA	0	18,700
HKIA Three-Runway System	79.9M passenger trips/year (excluding transfer/transit) 8.43M tonnes cargo/year (excluding transshipment)	0	123,000
HKIA North Commercial District	Up to 668,000m <sup>2</sup> floor space of retail complexes, entertainment facilities, dining space, hotels & offices	0	24,000
SHW Reclamation and Landside Development*	18,000 School Places	4,000	2,600
Tung Chung Traction Substation Development*	1,345 units	3,000	0
Sunny Bay Reclamation	Not Included	0	Enhanced-2011 TPEDM (Approx. 4,000)
Lantau Logistic Park	Not Included	---	---
<b>TOTAL</b>		<b>322,400</b>	<b>234,200</b>

\* Uncommitted developments for sensitivity test purpose only.

## A2. Strategic Highway Network Assumptions

### Strategic Highway Network Assumptions for Various Design Years

2016 Road network assumptions (in addition to 2011 network)	Configuration
<b>New Territories</b>	
Widening of Tolo Highway/Fanling Highway between Island House Interchange and Fanling (Stage 1 – Section between Island House Interchange and Tai Hang)	D4
Reconstruction and Improvement to Tuen Mun Road	D3
Traffic Improvement to Tuen Mun Road (Town Centre Section)	D3
2021 Road network assumptions (in addition to 2016 network)	Configuration
<b>Hong Kong</b>	
Road P2 and realigned Hung Hing Road on Wan Chai Development Phase II	D2
Road P1, P2 and Distributor Roads on Central Reclamation Phase III	D2 <sup>(1)</sup>
Central – Wan Chai Bypass and Island Eastern Corridor Link	D3/D4 <sup>(1)</sup>
Island Eastern Corridor Improvement between Causeway Bay and North Point	D4/D5 <sup>(1)</sup>
<b>New Territories</b>	
Dualling of Hiram's Highway between Clear Water Bay Road and Marina Cove	D2
Widening of Tolo Highway/Fanling Highway between Island House Interchange and Fanling (Stage 2 – Section between Tai Hang and Wo Hop Shek Interchange)	D4
Route 6 (formerly Route 11) Tseung Kwan O – Lam Tin Tunnel	D2
Cross Bay Link at Tseung Kwan O	D2
Hong Kong – Zhuhai – Macao Bridge Hong Kong Link Road	D3
Tuen Mun – Chek Lap Kok Link Southern Connection	D2
Tuen Mun – Chek Lap Kok Link Northern Connection	D2
Widening of Castle Peak Road (Castle Peak Bay Section)	D2
Link Road to Liantang/Heung Yuen Wai Cross-Boundary Control Point	D2
<b>Cross Boundary</b>	
Hong Kong – Zhuhai – Macao Bridge	D3
2026 Road network assumptions (in addition to 2021 network)	Configuration
<b>Kowloon</b>	
Widening of Gascoigne Road Flyover	D2
Route 6 (formerly Route 11) – Central Kowloon Route	D3
Route 6 (formerly Route 11) – Trunk Road T2 (Kai Tak – Cha Kwo Ling Link)	D2
<b>New Territories</b>	
Dualling of Hiram's Highway between Marina Cove and Sai Kung Town	D2
Tsuen Wan Bypass, Widening of Tsuen Wan Road between Tsuen Tsing Interchange and Kwai Tsing Interchange and Associated Junction Improvement Works Widening	Add 2 lanes per direction
Widening of Fanling Highway between Pak Shek Au Interchange and Po Shek Wu Interchange	D4
Lantau Road P1 between Tung Chung and Tai Ho	D2
Widening of Tai Po Road (existing remaining D2 Shatin section)	D3
2031 Road network assumptions (in addition to 2026 network)	Configuration
Tuen Mun Western Bypass Southern Section (Tuen Mun – Chek Lap Kok Link to Tsing Tin Road)	D2
Tuen Mun Western Bypass Northern Section (Tsing Tin Road to San Sang San Tsuen)	D2

Note:

(1) The configuration of these proposed highways vary at different sections of the roads.

(2) Route 11 and Road P1 have been included in the T&TIA based on information available in the *HK2030+* and *Sustainable Lantau Blueprint*.

## A3. Railway Network Assumptions

By 2026 (in addition to existing network)
Kwun Tong Line Extension
West Island Line (from Sheung Wan to Kennedy Town)
South Island Line (East)
Shatin to Central Link (East-West Line)
Shatin to Central Link (North-South Line)
Guangzhou – Shenzhen – Hong Kong Express Rail Link (Hong Kong Section)
Hung Shui Kiu Station
Tung Chung West Extension and Tung Chung East Station
South Island Line (West)
Tuen Mun South Extension
Northern Link (Between Kam Sheung Road Station and Kwu Tung Station)
Lok Ma Chau Spur Line (Kwu Tung Station)
East Kowloon Line
North Island Line
<b>No additional railway network was assumed beyond 2026</b>

## A4. Vehicle Fleet Sizes

Year	Mid-year Fleet Size	
	Private Vehicle (Private Cars and Motor Cycles)	Goods Vehicle
2026	738,700	118,400
2031	811,600	121,400
2036	853,000	124,400

Note:

1. For the goods vehicle fleet, a constant growth rate of 0.5% is assumed for period up to 2036.

## A5. GDP Growth Assumptions

Year	Percentage Growth per Annum
2014-2015	2.8%
2015-2016	2.5%
2016-2022	3.5%
2022-2026	3.0%
Beyond 2026	2.5%



## A6. Highway Toll Assumptions (in 2016 Dollar)

Toll Facility	Car	Taxi	Private Light Bus	Good Van	Light Goods Vehicle	Medium Goods Vehicle (5)	Heavy Goods Vehicle (5)	Tractor Unit (5)
Shing Mun Tunnel	5	5	5	5	5	5	5	5
Lion Rock Tunnel (LRT)	8	8	8	8	8	8	8	8
Tate's Cairn Tunnel (TCT) <sup>(1)</sup>	20	20	24	24	24	33	76	100
Sha Tin Heights Tunnel and Eagle's Nest Tunnel (Route 8 between Cheung Sha Wan and Sha Tin)	8	8	8	8	8	8	8	8
Tseung Kwan O (TKO) Tunnel	3	3	3	3	3	3	3	3
Eastern Harbour Crossing (EHC)	25	25	38	38	38	56	125	150
Cross Harbour Tunnel (CHT)	20	10	10	15	15	22	50	60
Western Harbour Crossing <sup>(2)</sup>	60	55	70	70	70	102	185	215
Aberdeen Tunnel	5	5	5	5	5	5	5	5
Lantau Link <sup>(3)</sup>	15	15	20	20	20	25	40	40
Tai Lam Tunnel (R3-CPS) <sup>(4)</sup>	40	40	100	41	41	47	52	52
TKO – Lam Tin Tunnel <sup>(6)</sup>	3	3	3	3	3	3	3	3
Tuen Mun – Chek Lap Kok Link <sup>(7)</sup> (TMCLKL)	15	15	20	20	20	25	40	40
Tuen Mun Western Bypass <sup>(8)</sup> (TMWB)	20	20	50	21	21	24	26	26
Route 11 <sup>(9)</sup>	40	40	100	41	41	47	52	52

Notes:

- (1) Based on new tolls for Tate's Cairn Tunnel effective from January 2016.
- (2) Based on new tolls for Western Harbour Crossing effective from July 2015.
- (3) The toll shown represents one-way toll collected in each direction.
- (4) Based on new tolls for Tai Lam Tunnel effective from February 2015.
- (5) The weighted average number of additional axles would be adopted for some tunnels including Tate's Cairn Tunnel, Cross Harbour Tunnel, Western Harbour Crossing and Eastern Harbour Crossing. The factor of weighted average number of additional axles with 0.22 for Medium Goods Vehicle, 2 for Heavy Goods Vehicle and 3 for Tractor Unit are adopted.
- (6) The tolls for TKO-Lam Tin Tunnel assumed to be the same as current tolls at Tseung Kwan O Tunnel.
- (7) The tolls for TMCLKL assumed to be the same as current tolls at Lantau Link.
- (8) The tolls level of TMWB assumed to be half of Tai Lam tunnel (Route 3)
- (9) The tolls for Route 11 assumed to be the same as current tolls at Tai Lam tunnel (Route 3).

## A7. Port Related Assumptions

Container Throughput Assumptions for Hong Kong Port (in Million TEUs per year)

Year	2026	2031	2036
CT 1-9	23	25	25
New CT 10	-	-	-
<b>Total</b>	<b>23</b>	<b>25</b>	<b>25</b>

## A8. Airport Related Assumptions

Design Year Airport Usage Forecasts (Excluding Transfer/Transit Passengers and Transshipment Cargo)

Year	2026	2031	2036
Daily Air Passengers (Thousand)	181	196	212
Daily Air Cargo Throughput (Thousand Tonnes)	20	21	22

## A9. Value of Time (VOT) and Vehicle Operating Cost (VOC)

Values of Time for Person Trips by Future Years

Trip Purpose	VOT (\$/min/person in 2011 prices)			
	2026	2031	2036	2041
<b>Non-Car-Available</b>				
Home-based Work (HBW)	0.78	0.81	0.84	0.88
Home-based School (HBS)	0.65	0.68	0.71	0.74
Home-based Others (HBO) / Non-Home Based (NHB)	0.78	0.81	0.84	0.88
Employers' Business (EB)	3.26	3.38	3.53	3.71
<b>Car-Available</b>				
Home-based Work (HBW)	1.18	1.22	1.28	1.34
Home-based School (HBS)	0.82	0.85	0.89	0.94
Home-based Others (HBO) / Non-Home Based (NHB)	0.95	0.99	1.03	1.08
Employers' Business (EB)	4.94	5.13	5.36	5.62

**Values of Time for Goods Vehicle Trips by Future Years**

Goods Vehicle Type	VOT (\$/min/vehicle in 2011 prices)			
	2026	2031	2036	2041
Goods Van	2.09	2.17	2.27	2.38
Light Goods Vehicle	2.41	2.50	2.62	2.75
Medium Goods Vehicle	3.14	3.26	3.41	3.58
Heavy Goods Vehicle	3.67	3.81	3.98	4.18
Tractor Unit	3.47	3.61	3.77	3.96

**Vehicle Operating Costs by Future Years**

Vehicle Type	Distance-based VOC (\$/km in 2011 prices)			
	2026	2031	2036	2041
Private Car	1.51	1.51	1.51	1.51
Light Van (LV)	1.86	1.86	1.86	1.86
Light Goods Vehicle (LGV)	2.47	2.47	2.47	2.47
Medium Goods Vehicle (MGV)	3.07	3.07	3.07	3.07
Heavy Goods Vehicle (HGV)	4.75	4.75	4.75	4.75
Tractor Unit (TU)	3.02	3.02	3.02	3.02

**A10. Cross Boundary Assumptions**

The cross boundary information has been adopted based on the input from Planning Department received in June 2017.

**A11. Proposed Bus Services at Siu Ho Wan (SHO) Station**

Bus Route No.	Origin and Destination
New Service	SHO to/from Chek Lap Kok Ferry Terminal via Tung Chung
New Service	SHO to/from Kwun Tong
New Service	SHO to/from Sha Tin via Shing Mun Tunnel
New Service	SHO to/from Tin Shui Wai Town Centre via TMCLK Link
New Service	SHO to/from West Kowloon (Olympian City)
New Service	SHO to/from Discovery Bay



2011 Daily 2-way Screenline Validation Summary (PCU)

Screenline	Car			Taxi			GV			PT + SPB			Total		
	Obs	Mod	Mod/Obs	Obs	Mod	Mod/Obs	Obs	Mod	Mod/Obs	Obs	Mod	Mod/Obs	Obs	Mod	Mod/Obs
Screenline TYEC	1361	1403	1.03	569	512	0.90	1991	2172	1.09	818	779	0.95	4739	4866	1.03
Total													4739	4866	1.03

2011 Morning Peak 2-way Screenline Validation Summary (PCU/hr)

Screenline	Car			Taxi			GV			PT + SPB			Total		
	Obs	Mod	Mod/Obs	Obs	Mod	Mod/Obs	Obs	Mod	Mod/Obs	Obs	Mod	Mod/Obs	Obs	Mod	Mod/Obs
Screenline TYEC	103	113	1.10	37	37	0.99	137	128	0.93	59	63	1.07	336	341	1.01

2011 Evening Peak 2-way Screenline Validation Summary (PCU/hr)

Screenline	Car			Taxi			GV			PT + SPB			Total		
	Obs	Mod	Mod/Obs	Obs	Mod	Mod/Obs	Obs	Mod	Mod/Obs	Obs	Mod	Mod/Obs	Obs	Mod	Mod/Obs
Screenline TYEC	99	96	0.97	29	27	0.93	122	130	1.07	54	59	1.09	304	312	1.03

2011 Morning Peak 1-way Screenline Validation Summary (PCU/hr)

Screenline	Car			Taxi			GV			PT + SPB			Total		
	Obs	Mod	Mod/Obs	Obs	Mod	Mod/Obs	Obs	Mod	Mod/Obs	Obs	Mod	Mod/Obs	Obs	Mod	Mod/Obs
Screenline S-S EB	51	56	1.10	16	17	1.03	67	63	0.94	28	30	1.07	162	166	1.02
Screenline S-S WB	52	57	1.10	21	20	0.95	70	65	0.93	31	33	1.06	174	175	1.01

2011 Evening Peak 1-way Screenline Validation Summary (PCU/hr)

Screenline	Car			Taxi			GV			PT + SPB			Total		
	Obs	Mod	Mod/Obs	Obs	Mod	Mod/Obs	Obs	Mod	Mod/Obs	Obs	Mod	Mod/Obs	Obs	Mod	Mod/Obs
Screenline S-S EB	50	49	0.98	15	13	0.87	63	68	1.08	27	30	1.11	155	160	1.03
Screenline S-S WB	49	47	0.96	14	14	1.00	59	62	1.05	27	29	1.07	149	152	1.02

Note -

TYEC is Tsing Yi External Cordon which includes the following road links:

Tsing Yi North Bridge

Lantau Link-Lantau

Tsing Long Highway-Ting Kau Bridge

Cheung Tsing Tunnel & Rambler Bridge

Nam Wan Tunnel

Kwai Tsing Rd & Tsing Yi South Bridge

For Screenline S-S, please refer to Annual Traffic Census (ATC)

## **APPENDIX II**

### **Tung Chung Line Capacity Assessment**

# PROPOSED COMPREHENSIVE RESIDENTIAL AND COMMERCIAL DEVELOPMENT ATOP SIU HO WAN DEPOT TUNG CHUNG LINE CAPACITY ASSESSMENT (REVISION)- FINAL REPORT



## TUNG CHUNG LINE CAPACITY ASSESSMENT FOR PROPOSED COMPREHENSIVE RESIDENTIAL AND COMMERCIAL DEVELOPMENT ATOP SIU HO WAN DEPOT (REVISION)

IDENTIFICATION TABLE	
Client/Project owner	MTR Corporation Limited
Project	MTRCL Transport Planning Services
Study	Tung Chung Line Capacity Assessment for Proposed Comprehensive Residential and Commercial Development atop Siu Ho Wan Depot (Revision)
Type of document	Final Report
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**APPENDIX II FORECASTING INPUT ASSUMPTIONS**

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**APPENDIX IV TUNG CHUNG LINE V/C ANALYSIS**

**APPENDIX V MODELLED LINK FLOW DIAGRAMS FOR ALL SCENARIOS**

## 1. INTRODUCTION

- 1.1.1 MTR Corporation Limited (MTRCL) has commissioned a multi-disciplinary consultant team to conduct a preliminary feasibility study for the proposed comprehensive residential and commercial development atop Siu Ho Wan Depot, Lantau (the Siu Ho Wan Topside Development). MVA Hong Kong Limited (MVA) has been commissioned to assess the impact of the Siu Ho Wan Topside Development on the railway network usage to supplement the Traffic and Transport Impact Assessment.
- 1.1.2 The Siu Ho Wan Topside Development comprises some 14,000 residential units with an estimated population of 37,800, along with commercial/retail facilities of about 30,000 m<sup>2</sup> GFA, three 30-classroom schools and four 6-classroom kindergartens, and other supporting facilities. A new Siu Ho Wan Station (SHO) has been planned along the existing Tung Chung Line (TCL) to meet the future transport demand.
- 1.1.3 A Rezoning Study Report for the Siu Ho Wan Topside Development was prepared and submitted to the Government in February 2016. Following the submission of the Rezoning Study Report, a number of meetings were held between MTRCL and Railway Development Office (RDO) of Highways Department to discuss technical details of the TCL capacity assessment including the transport model inputs as well as the impact of the potential Siu Ho Wan Reclamation. After the meeting between Development Bureau (DEVB), Transport and Housing Bureau (THB), RDO and MTRCL on 9 August, 2016, the TCL Capacity Assessment Report for the Siu Ho Wan Topside Development was submitted to the Government in September 2016 which has been incorporated in the revised Rezoning Study Report (December 2016).
- 1.1.4 In response to the recent updates of forecasting assumptions, MTR initiated a new round of the TCL assessment study to investigate the potential passenger impacts on the TCL during the peak hours, following some revisits and coordination of planning parameters in conjunction with the traffic assessment this year.
- 1.1.5 A technical study is currently undertaken by the Civil Engineering and Development Department (CEDD) to investigate the feasibility of Siu Ho Wan Reclamation. CEDD advised that the planning parameters of Siu Ho Wan reclamation could only be ascertained in future planning and engineering studies. However, for assessment purposes, some assumed preliminary planning parameters as shown in **Table 1.1** were obtained from CEDD via MTRCL and provided to the consultant in May 2016.

**Table 1.1 Population and Employment Assumptions for the Siu Ho Wan Reclamation**

Description	Siu Ho Wan Reclamation		
	Population	Employment	School Place
Siu Ho Wan Reclamation	4,000	2,600	18,000

- 1.1.6 The purpose of this Report is to document the forecasting methodology and assumptions adopted in the assessment process and the impact of the Siu Ho Wan Topside Development

on the nearby railway network usage through the provision of railway patronage forecasts, with a sensitivity test conducted on the potential Siu Ho Wan Reclamation.

- 1.1.7 Following this brief introduction, the report is divided into 3 further chapters summarising the major findings:

- Chapter 2 Forecasting methodology and assumptions;
- Chapter 3 Patronage forecasts for with and without the Siu Ho Wan Development; and
- Chapter 4 Summary and conclusion.



## 2. FORECASTING METHODOLOGY AND ASSUMPTIONS

### 2.1 Forecasting Methodology

2.1.1 A two stage forecasting approach was applied using MVA's in-house HK SAR-wide strategic multi-modal transport model (MVTS) to provide the domestic travel demands by transport modes and to generate territorial total PT demands for a more detailed PT sub-mode split and rail assignment model (MVPT) to estimate the passenger flows using railways. Both the MVCTS and MVPT were fully validated to the 2013 travel conditions as shown in **Appendix I**.

#### The MVCTS Model

2.1.2 MVCTS has the architecture of a conventional four-stage transport model and has been specifically extended to meet the particular requirements of Hong Kong. The basic four stages are:

- Trip Generation this determines *how many trips are made*. In essence it ascertains the total travel demand generated and attracted to each zone based on land use and socio-economic characteristics, with population, employment and economic activity used as indicators of potential transport activity.
- Trip Distribution this determines *where trips are made*. Hence, having determined the total demand generated from or attracted to a zone, the next step is to determine where traffic/patronage is moving to or coming from. The distribution of trips between generation and attraction zones is generally related to the relative level of service provided in travelling between each competing zone (in terms of generalised travel cost covering time, distance and toll/fare) and the level of activity in each zone.
- Modal Choice this determines *which mode of transport is used* i.e. the choice of transport mode used to travel between a particular zone pair. The attractiveness of each transport mode normally depends on the relative level of service (i.e. travel time, walk/wait time, fare, comfort, reliability, etc.) provided by each mode.
- Assignment this determines *which route is taken* after having decided on a particular transport mode to be used to reach a destination i.e. the routings between zone pairs taken for each transport mode. For some modes the choice would be well defined, for example, rail travel, while for others this could involve numerous choices as in the case of private car travel on a road network.

2.1.3 The modelling approach has been used extensively in Hong Kong and once calibrated is capable of producing useful and accurate forecasts, depending of course on the accuracy of the input assumptions.

2.1.4 The trip end model is made of four separate sub-models that analyse household income, vehicle availability, and then calculate the generation and attraction trip ends. Trip ends are produced stratified by income group and vehicle availability class for each trip purpose.

2.1.5 The modal split model estimates the choice between public and private modes taking into account the transport costs using each mode as well as the characteristics of the zones at each end of the trip and their accessibility by public and private transport. The three modes are car, taxi, Special Purpose Bus (SPB) and total franchised public transport (rail, bus, ferry, etc.). The trips at this stage refer to person travel, i.e. the occupants of cars, and passengers of PT and taxi and SPB.

2.1.6 The distribution model links up the trip ends to form matrices. This is a conventional model operating on the generalised cost of travel for each mode with separate distribution functions for goods vehicles, car, taxi, SPB and public transport, distinct for each trip purpose.

2.1.7 The private matrices of person travel are then passed through the occupancy, empty taxi and peak period models to produce vehicle matrices for assignment to generate peak and off peak flows. At this stage, the trips from the port, port back-up, airport and cross boundary travel are included.

2.1.8 The matrix of public transport person trips is passed to the separate MVPT that applies a sub-modal split to estimate travel by mode and produces analysis of rail stations. This sub model is described in more detail in the following section.

2.1.9 The estimated highway and bus speeds are then iteratively updated to ensure a reasonable equilibrium is reached and the final assignment results are stable.

#### The MVPT Model

2.1.10 While modal split and assignment constitute part of the conventional four stage model, to improve the representation of travel by public transport in Hong Kong, these procedures have been promoted to separate sub models. A two-tiered hierarchical modelling approach is adopted that initially considers travel by public transport and then travel by rail in more detail. These two separate sub models are defined as:

2.1.11 Public Transport Sub Model - where a logit model is applied to the daily domestic PT demand estimated from MVCTS to determine rail and non-rail mode choice and then assignment; and

2.1.12 Rail Sub Model where rail demands forecast by the Public Transport Sub Model are assigned to a specifically designed rail model to improve the representation of multiple routing throughout the network. The rail sub model also estimates morning and evening peak hour travel demands and resultant link flows from the daily usage.

#### **Forecasting Input Assumptions**

2.1.13 The railway patronage forecasts have been prepared for planning horizon years 2026, 2031 and 2036. The forecasting input assumptions adopted in the MVCTS and MVP and are consistent with those proposed in the Traffic and Transport Impact Assessment taking into account the Enhanced 2011-Based Territorial Population and Employment Data Matrix (TPEDM) and the major committed developments in North Lantau.

- 2.1.14 A separate forecasting assumption is included as **Appendix II** of this Report.
- 2.1.15 In order to demonstrate both road and railway assessments were adopting the same set of model assumptions, the two-way daily passenger flows to and from Lantau and at the North Lantau Highway (East of Tai Ho Interchange) in the scenario with full intake of Siu Ho Wan Topside Development and Siu Ho Wan Reclamation from both assessments are compared in **Appendix III**. The passenger flows are just within 6% difference which indicates the consistency of the forecasting assumptions.

### 3. PATRONAGE FORECASTS FOR WITH AND WITHOUT THE SIU HO WAN DEVELOPMENT

#### 3.1 Introduction

- 3.1.1 This Chapter presents the patronage forecasts for “with” and “without” the Siu Ho Wan Development scenario; using the forecasting methodology and the input assumptions set out in Chapter 2.
- 3.1.2 The patronage forecasts are based on the railway network provided by the Railway Development Strategy 2014 (RDS-2014) network plus the Tung Chung East (TCE) station. The impacts of the Siu Ho Wan Topside Development and Siu Ho Wan Reclamation are assessed by investigating the morning peak hour TCL usage in 2026, 2031 and 2036 for the reference cases and various development scenarios as listed in **Table 3.1**.

**Table 3.1 List of Scenario tests**

Scenario	2026	2031	2036
Without Siu Ho Wan Development (Reference)	✓	✓	✓
With Siu Ho Wan Topside Development (Partial Intake) only	✓	✓	✓
With Siu Ho Wan Topside Development (Partial Intake) + Siu Ho Wan Reclamation		✓	
With Siu Ho Wan Topside Development (Partial Intake) + Siu Ho Wan Reclamation + Route 11			✓
With Siu Ho Wan Topside Development (Full Intake)+ Siu Ho Wan Reclamation			✓

- 3.1.3 The TCL line capacity adopted in the assessment is extracted from the LegCo paper CB(1)1132/14-15(01).

#### 3.2 Patronage Forecasts for 2036 With and Without the Siu Ho Wan Development Scenarios

- 3.2.1 The critical link flows on TCL for AM Peak are shown in **Table 3.2** for the cases with and without the Siu Ho Wan Topside Development. The one-way directional passenger link flows for the busiest sections together with the corresponding capacity derived based on 4 passengers per square meter (pps) are presented.
- 3.2.2 As shown in **Table 3.2**, the 2036 AM Peak TCL demand on the Tsing Ma Bridge section (from Sunny Bay Station (SBN) to Tsing Yi Station (TSY)) is forecast to increase from 26,000 (Reference case) to 28,000 (With Siu Ho Wan Topside Development only) whilst there is no significant change on the cross-harbour section (from Kowloon Station (KOW) to Hong Kong Station (HOK)). The forecast result supported to conclude no capacity issue on the TCL by 2036.

**Table 3.2 2036 AM Peak Critical Link Flows for Reference Scenario and With Siu Ho Wan Topside Development (Partial Intake) Only Scenario ('000s passengers)**

Rail Line	Critical Link	Capacity (4 ppsm)	AM Peak Link Flow	
		pphpd	Without Siu Ho Wan Development (Reference)	With Siu Ho Wan Topside Development (Partial Intake) * Only
Tung Chung Line (TCL)	SUN to TSY	31	26	28
	KOW to HOK	47	44	44

\* It is assumed that Siu Ho Wan Topside Development will reach its full intake in year 2038.

3.2.3 **Table 3.3** shows the 2036 morning peak TCL passenger forecasts for the case with Siu Ho Wan Reclamation together with the Siu Ho Wan Topside Development. It is noted that no capacity issue is concluded for the Siu Ho Wan Development (with the Siu Ho Wan Topside Development and Siu Ho Wan Reclamation) scenario.

**Table 3.3 2036 AM Peak Critical Link Flows with Siu Ho Wan Topside Development (Partial Intake) and Siu Ho Wan Reclamation Scenario ('000s passengers)**

Rail Line	Critical Link	Capacity (4 ppsm)	AM Peak Link Flow
		pphpd	Siu Ho Wan Topside + Siu Ho Wan Reclamation+ Route 11
Tung Chung Line (TCL)	SUN to TSY	31	28
	KOW to HOK	47	45

\* It is assumed that Siu Ho Wan Topside Development will reach its full intake in year 2038.

3.2.4 In order to assess the morning peak TCL demand with full intake of Siu Ho Wan Topside Development, a sensitivity test with Siu Ho Wan Reclamation together with full intake of the Siu Ho Wan Topside Development has been conducted. **Table 3.4** shows the 2036 morning peak TCL passenger forecasts for this test. No capacity issue is concluded for the Siu Ho Wan Development (with full intake of the Siu Ho Wan Topside Development and Siu Ho Wan Reclamation) scenario.

**Table 3.4 2036 AM Peak Critical Link Flows with Full Intake of Siu Ho Wan Topside Development and Siu Ho Wan Reclamation Scenario ('000s passengers)**

Rail Line	Critical Link	Capacity (4 ppsm)	AM Peak Link Flow
		pphpd	Full intake of Siu Ho Wan Topside + Siu Ho Wan Reclamation
Tung Chung Line (TCL)	SUN to TSY	31	29
	KOW to HOK	47	45

3.2.5 The relevant AM peak rail line flow diagrams are shown in **Appendix V**.

### 3.3 Patronage Forecasts for 2026, 2031 and Other Scenario Tests

3.3.1 The TCL passenger demand during the morning peak hour for the years 2026 and 2031 are generally less critical and lower than those in 2036, with all line sections operating under capacity at the Tsing Ma Bridge section. The inclusion of Tung Chung Traction Substation Development will only have minimal impact on the morning peak TCL usage.

3.3.2 The Tung Chung Line V/C Analysis for the cases with and without the Siu Ho Wan Developments are shown in **Appendix IV**. The AM peak rail line flow diagrams for all years and scenarios are shown in **Appendix V**.

#### 4. SUMMARY AND CONCLUSION

- 4.1.1 The morning peak TCL critical link flow forecasts (passenger flows per hour) for the above scenarios are summarized in **Table 4.1**. The Siu Ho Wan Topside Development with the SHO station will increase the 2036 AM peak critical link flows by 2,000 trips per hour for section between SUN and TSY whilst there is no significant change for section between KOW and HOK which is still within line capacity. The TCL link flows are less critical in 2026 and 2031.
- 4.1.2 The assessment concludes that the proposed comprehensive residential and commercial development atop Siu Ho Wan Depot, taking into consideration various committed developments in North Lantau including Tung Chung New Town Extension, Hong Kong International Airport Tree-Runway System and North Commercial District, and Hong Kong Boundary Crossing Facilities Island of the Hong Kong-Zhuhai-Macao Bridge and its topside development, can be accommodated on the TCL in 2036. The Siu Ho Wan Topside Development will increase the peak hours critical link flows but the TCL will still be operating within capacity.
- 4.1.3 Apart from the various committed developments in North Lantau, the TCL can further accommodate the future possible Tung Chung Traction Substation Development as well as the potential Siu Ho Wan Reclamation without any capacity issue.

**Table 4.1 Summary of AM Peak Critical Link Flows**

Scenario	Key Assumptions	Year 2026		Year 2031		Year 2036	
		SUN->TSY	KOW->HOK	SUN->TSY	KOW->HOK	SUN->TSY	KOW->HOK
Without Siu Ho Wan Development (Reference)	-SCL+7New Projects+TCE Station -TCNTE+NCD+3RS+BCF Dev	13,100	37,400	24,400	41,700	26,000	43,800
With Siu Ho Wan Topside Development only	-SCL+7New Projects+TCE & SHO Station -TCNTE+NCD+3RS+BCF Dev -SHD Population	13,200	37,500	25,700	42,100	28,100	44,400
With Siu Ho Wan Topside Development + Siu Ho Wan Reclamation #	-SCL+7New Projects+TCE & SHO Station -TCNTE+NCD+3RS+BCF Dev+TUT Dev* -SHD Population -Siu Ho Wan Reclamation	N/A	N/A	26,000	42,300	N/A	N/A
With Siu Ho Wan Topside Development + Siu Ho Wan Reclamation # + Route 11	-SCL+7New Projects+TCE & SHO Station -TCNTE+NCD+3RS+BCF Dev+TUT Dev*+Route11 -SHD Population -Siu Ho Wan Reclamation	N/A	N/A	N/A	N/A	28,400	44,500
With Siu Ho Wan Topside Development (Full Intake)+ Siu Ho Wan Reclamation #	-SCL+7New Projects+TCE & SHO Station -TCNTE+NCD+3RS+BCF Dev+TUT Dev* -SHD Population (Full Intake) -Siu Ho Wan Reclamation	N/A	N/A	N/A	N/A	28,900	44,600
	Line Capacity (4 ppsm)*	31,300	47,000	31,300	47,000	31,300	47,000

\* Reference: LegCo Paper No. CB(1)1132/14-15(01)

# Development parameters of Siu Ho Wan Reclamation are shown in Table 1.1

All the figures are rounded to nearest hundred

TUT Dev\* = Tung Chung Traction Substation

# Appendix I

## MODEL VALIDATION RESULTS FOR YEAR 2013

Daily Station Usage Validation				
Station Name	2013 Average Daily Station Entries/Exits (000's)			
	Obs	Syn	Syn-Obs	Syn/Obs
SHW	76	76	0	0%
CFN	136	149	13	9%
ADM	81	83	3	3%
WAC	112	117	5	4%
CAB	152	154	2	1%
TH	23	23	0	1%
FOH	37	41	4	10%
NOP	48	50	2	5%
QUB	53	62	9	18%
TAK	64	65	1	2%
SWH	29	29	0	-1%
SKW	39	43	4	10%
HFC	27	26	-1	-5%
CHW	52	54	2	4%
TST	145	149	5	3%
JDR	82	82	1	1%
YMT	80	77	-3	-4%
MCK	153	150	-3	-2%
PRE	80	77	-2	-3%
SSP	92	90	-2	-2%
CSW	55	52	-3	-5%
LCK	71	69	-2	-2%
MEF	56	53	-3	-5%
LAK	27	27	0	0%
KWF	83	85	3	3%
XWH	42	43	2	4%
TWH	19	21	2	8%
TSW	84	85	1	1%
SKM	34	34	0	1%
LOF	40	42	2	5%
WTS	81	80	-1	-1%
DH	51	49	-3	-5%
CHH	60	63	3	6%
KOB	102	102	0	0%
NTK	39	37	-3	-7%
KWT	110	112	1	1%
LAT	60	61	1	1%
HOK	61	60	-1	-1%
KOW	21	17	-4	-18%
DLY	37	35	-3	-7%
TSY	58	59	-1	-1%
SUN	4	4	0	-1%
TUC	45	43	-1	-2%
DIS	14	15	1	7%
YAT	53	49	-3	-6%
TK	59	55	-4	-7%
TKO	64	61	-2	-4%
HAH	63	60	-3	-5%
PDA	60	60	0	0%
LHP	14	17	3	17%
KOT	102	91	-10	-10%
HUH	128	129	1	1%
ANK	72	77	5	7%
TAW	85	88	3	4%
SHT	88	85	-3	-3%
FDT	45	46	1	2%
UNI	45	37	-8	-18%
TAP	70	78	8	11%
TWO	44	45	2	4%
FAN	81	73	-8	-10%
SHS	135	128	-8	-6%
LOW	108	110	2	2%
LMC	33	32	0	0%
CKT	10	9	-1	-11%
STW	21	25	3	18%
GD	29	29	0	-1%
SHM	14	15	1	4%
TSH	11	10	0	-1%
HEO	18	19	1	8%
MOS	24	23	-1	-4%
WKS	13	16	3	24%
NAC	23	26	3	11%
TUM	55	53	-2	-3%
SH	42	41	-1	-2%
TIS	87	91	4	5%
LOP	34	36	2	6%
YUL	47	48	1	3%
KSR	17	17	-1	-3%
TWW	38	37	-1	-2%
AUS	24	23	-1	-4%
ETS	47	50	3	6%
Total	4,713	4,733	20	0%

AM Station Usage Validation				
Station Name	2013 Average AM Station Entries/Exits ('000's)			
	Obs	Syn	Syn-Obs	Syn/Obs
SHW	9	9	0	0%
CEN	16	16	0	0%
ADM	11	11	0	1%
WAC	14	14	0	1%
CAB	11	11	0	1%
TIH	2	2	0	1%
FOH	5	5	0	1%
NOP	5	5	0	1%
QUB	10	10	0	1%
TAK	8	8	0	0%
SWH	4	4	0	1%
SKW	5	5	0	0%
HFC	3	3	0	0%
CHW	7	7	0	2%
TST	11	11	0	0%
JOR	5	5	0	1%
YMT	6	6	0	1%
MOK	9	9	0	0%
PRE	7	7	0	0%
SSP	7	7	0	0%
CSW	6	6	0	0%
LCK	10	10	0	0%
MEF	7	7	0	0%
LAK	4	4	0	0%
KWF	9	9	0	0%
KWH	6	6	0	0%
TWH	3	3	0	0%
TSW	10	10	0	0%
SKM	3	3	0	-1%
LOF	4	4	0	0%
WTS	9	9	0	0%
DIH	7	7	0	0%
CHH	6	6	0	0%
KOB	13	13	0	0%
NTK	7	7	0	0%
KWT	13	13	0	0%
LAT	6	7	0	0%
HOK	8	8	0	0%
KOW	2	2	0	0%
OLY	6	6	0	0%
TSY	8	8	0	0%
SUN	0	0	0	0%
TUC	5	5	0	0%
DIS	1	1	0	-1%
YAT	5	5	0	-1%
TIK	7	7	0	0%
TKO	8	8	0	0%
HAH	8	8	0	0%
POA	7	7	0	0%
LHP	2	2	0	0%
KOT	9	8	0	-3%
HUH	16	15	-1	-6%
MKK	6	6	0	1%
TAW	9	9	0	0%
SHT	6	6	0	0%
FOT	7	7	0	0%
UNI	5	5	0	0%
TAP	7	7	0	-1%
TWO	5	5	0	0%
FAN	9	9	0	0%
SHS	11	11	0	-1%
LOW	6	6	0	0%
LMC	2	2	0	0%
CKT	1	1	0	0%
STW	2	2	0	0%
CIO	4	4	0	0%
SHM	2	2	0	0%
TSH	1	1	0	0%
HEO	2	2	0	1%
MOS	2	2	0	0%
WKS	1	1	0	0%
NAC	3	3	0	0%
TJM	6	8	0	0%
SHH	5	5	0	0%
TIS	10	10	0	0%
LOP	4	4	0	-1%
YUL	5	5	0	0%
KSR	2	2	0	0%
TWW	5	5	0	1%
AUS	3	3	0	1%
ETS	8	8	0	-1%
Total	508	508	-1	0%

Validation of Rail Model (2013)							
MTR Link Loadings - Daily Total							
A	B	Obs 2013 ('000)		Mdl 2013 ('000)		Mdl / Obs ('000)	
		FlowA to B	FlowB to A	FlowA to B	FlowB to A	FlowA to B	FlowB to A
<b>Kowloon Tong Line</b>							
YMT	MOK	35	28	72	72	105%	160%
MOK	PRE	158	188	199	198	26%	5%
PRE	SKM	324	356	348	346	7%	-2%
SKM	KOT	320	351	337	336	5%	-4%
KOT	LOF	308	328	316	317	3%	-3%
LOF	WTS	294	316	303	304	3%	-4%
WTS	DIH	271	283	279	280	3%	-1%
DIH	CHH	263	275	269	270	2%	-2%
CHH	KOB	251	255	258	259	3%	1%
KOB	NTK	245	248	239	240	-3%	-3%
NTK	KWT	243	242	231	232	-5%	-4%
KWT	LAT	240	245	215	216	-11%	-12%
LAT	YAT	240	243	207	208	-14%	-14%
YAT	TIK	112	109	97	96	-14%	-11%
<b>Tsuen Wan Line</b>							
CEN	ADM	102	99	103	102	1%	3%
ADM	TST	305	300	319	318	5%	6%
TST	JOR	285	306	328	327	15%	7%
JOR	YMT	294	322	342	340	16%	6%
YMT	MOK	281	314	296	292	5%	-7%
MOK	PRE	182	198	220	218	21%	10%
PRE	SSP	320	338	352	352	10%	4%
SSP	CSW	277	298	310	310	12%	4%
CSW	LCK	252	272	285	285	13%	5%
LCK	MEF	224	243	254	255	14%	5%
MEF	LAK	182	177	209	205	15%	16%
LAK	KWF	186	186	194	194	4%	5%
KWF	KWH	125	129	136	137	9%	6%
KWH	TWH	99	97	103	104	4%	7%
TWH	TSW	84	78	85	85	1%	9%
<b>Island Line</b>							
SHW	CEN	81	69	77	75	-5%	8%
CEN	ADM	154	131	158	156	2%	19%
ADM	WAC	341	321	348	347	2%	8%
WAC	CAB	316	309	326	325	3%	7%
CAB	TIH	274	282	279	279	2%	-1%
TIH	FOH	267	278	279	279	4%	0%
FOH	NOP	260	271	274	273	5%	1%
NOP	QUB	135	141	145	144	7%	2%
QUB	TAK	165	167	175	174	6%	4%
TAK	SWH	119	123	132	132	11%	7%
SWH	SKW	97	102	110	109	14%	8%
SKW	HFC	72	75	75	74	4%	-1%
HFC	CHW	49	54	54	54	10%	0%
<b>Tseung Kwan O Line</b>							
NOP	QUB	135	139	139	139	3%	0%
QUB	YAT	205	213	193	192	-6%	-10%
YAT	TIK	82	96	82	82	0%	-15%
TIK	TKO	158	166	152	152	-4%	-9%
TKO	HAH	108	112	107	107	1%	-4%
HAH	POA	58	60	60	60	3%	-1%
POA	LHP	14	15	17	17	24%	12%
<b>Tung Chung Line</b>							
HOK	KOW	96	99	112	111	17%	13%
KOW	OLY	96	100	114	113	18%	13%
OLY	NAC	99	103	125	124	26%	20%
NAC	LAK	109	118	107	111	-2%	-6%
LAK	TSY	99	103	105	105	6%	2%
TSY	SUN	56	57	57	57	2%	0%
SUN	TUC	42	43	43	44	2%	1%
<b>Disneyland Resort Line</b>							
SUN	DIS	13	14	15	15	14%	9%
<b>East Rail</b>							
HUH	MKK	166	176	169	171	2%	-3%
MKK	KOT	220	229	222	225	1%	-2%
KOT	TAW	335	356	361	361	8%	1%
TAW	SHT	279	285	311	311	11%	9%
SHT	FOT	263	275	283	284	8%	3%
FOT	UNI	253	262	268	268	6%	3%
UNI	TAP	246	254	262	263	7%	3%
TAP	TWO	223	232	233	234	5%	1%
TWO	FAN	213	217	225	225	5%	4%
FAN	SHS	178	180	181	181	2%	1%
SHS	LMC	32	33	31	34	-1%	1%
LMC	LOW	110	104	110	110	0%	5%
<b>West Rail</b>							
TUM	SIH	56	53	54	53	-5%	0%
SIH	TIS	93	87	85	84	-8%	-3%
TIS	LOP	129	117	136	136	6%	16%
LOP	YUL	131	120	145	146	10%	22%
YUL	KSR	145	137	150	151	3%	10%
KSR	TWW	151	142	153	154	1%	9%
TWW	MEF	147	140	153	154	4%	10%
MEF	NAC	109	122	113	118	3%	-3%
NAC	AUS	115	120	99	99	-14%	-18%
AUS	ETS	108	111	102	102	-5%	-8%
ETS	HUH	122	127	105	105	-14%	-17%
<b>MOS Rail</b>							
TAW	CKT	79	88	97	97	23%	9%
CKT	STW	77	85	94	94	22%	11%
STW	CIO	69	75	80	79	15%	5%
CIO	SHM	54	58	60	60	12%	2%
SHM	TSH	45	49	49	49	9%	-1%
TSH	HEO	41	44	45	44	9%	0%
HEO	MOS	31	32	36	36	18%	13%
MOS	WKS	12	13	16	16	31%	19%

Validation of Rail Model (2013)							
MTR Link Loadings - AM Total							
A	B	Obs 2013 ('000)		Mdl 2013 ('000)		Mdl / Obs ('000)	
		FlowA to B	FlowB to A	FlowA to B	FlowB to A	FlowA to B	FlowB to A
<b>Kwun Tong Line</b>							
YMT	MOK	2	3	3	12	69%	306%
MOK	PRE	7	27	9	31	32%	18%
PRE	SKM	25	48	29	53	16%	11%
SKM	KOT	27	46	30	51	14%	11%
KOT	LOF	31	44	32	47	4%	7%
LOF	WTS	31	41	33	44	3%	7%
WTS	DIH	35	33	36	35	2%	6%
DIH	CHH	36	30	37	31	0%	5%
CHH	KOB	39	24	40	26	2%	8%
KOB	NTK	34	28	33	28	-3%	1%
NTK	KWT	39	30	28	30	-4%	0%
KWT	LAT	23	36	21	35	-11%	-3%
LAT	YAT	27	32	25	31	-9%	-4%
YAT	TIK	8	18	6	19	-18%	5%
<b>Tsuen Wan Line</b>							
CEN	ADM	4	18	4	19	-12%	2%
ADM	TST	16	52	15	54	-4%	3%
TST	JOR	11	49	13	53	16%	7%
JOR	YMT	11	51	13	54	14%	7%
YMT	MOK	11	49	12	43	6%	-11%
MOK	PRE	9	27	10	27	11%	1%
PRE	SSP	29	41	31	44	6%	8%
SSP	CSW	29	36	30	39	5%	8%
CSW	LCK	28	31	29	34	6%	9%
LCK	MEF	19	33	20	36	6%	7%
MEF	LAK	19	21	20	26	4%	26%
LAK	KWF	21	23	21	26	-1%	10%
KWF	KWH	12	19	12	22	2%	15%
KWH	TWH	6	15	6	18	2%	17%
TWH	TSW	5	12	5	14	2%	18%
<b>Island Line</b>							
SHW	CEN	5	14	5	14	-1%	0%
CEN	ADM	16	23	15	24	-11%	8%
ADM	WAC	40	41	39	41	-3%	2%
WAC	CAB	28	49	28	50	-1%	4%
CAB	TIH	23	53	22	54	-3%	3%
TIH	FOH	22	52	22	54	-1%	4%
FOH	NOP	21	52	21	54	1%	4%
NOP	QUB	15	23	14	23	-12%	-2%
QUB	TAK	16	28	16	30	-1%	6%
TAK	SWH	10	21	11	23	6%	11%
SWH	SKW	9	16	10	18	7%	13%
SKW	HFC	8	11	8	12	3%	12%
HFC	CHW	5	8	5	9	4%	15%
<b>Tseung Kwan O Line</b>							
NOP	QUB	6	30	9	33	33%	11%
QUB	YAT	14	45	14	46	-1%	3%
YAT	TIK	3	23	3	25	12%	5%
TIK	TKO	8	33	8	36	-8%	8%
TKO	HAH	5	20	5	22	-1%	10%
HAH	POA	3	10	3	11	1%	13%
POA	LHP	1	3	1	3	1%	14%
<b>Tung Chung Line</b>							
HOK	KOW	7	22	7	25	8%	11%
KOW	OLY	6	22	7	25	9%	14%
OLY	NAC	7	22	9	25	31%	15%
NAC	LAK	9	21	9	20	2%	-7%
LAK	TSY	6	16	6	18	7%	11%
TSY	SUN	4	6	5	7	5%	13%
SUN	TLIC	3	5	3	6	7%	22%
<b>Disneyland Resort Line</b>							
SUN	DIS	2	0	1	0	-47%	-61%
<b>East Rail</b>							
HUH	MKK	11	32	11	31	0%	-4%
MKK	KOT	14	39	14	37	-1%	-5%
KOT	TAW	21	59	21	59	2%	0%
TAW	SHT	20	40	22	41	9%	3%
SHT	FOT	20	37	21	38	5%	2%
FOT	UNI	15	38	16	38	3%	1%
UNI	TAP	13	38	13	40	1%	3%
TAP	TWO	12	31	12	32	0%	3%
TWO	FAN	13	26	13	28	3%	7%
FAN	SPS	11	17	11	17	-6%	0%
SPS	LAC	3	2	2	2	-10%	-6%
LAC	LOW	6	5	6	5	9%	-4%
<b>West Rail</b>							
TUM	SIH	7	5	7	5	6%	-4%
SIH	TIS	14	7	14	7	4%	-7%
TIS	LOP	26	5	28	6	8%	10%
LOP	YUL	28	5	30	6	9%	12%
YUL	KSR	33	6	34	6	5%	-5%
KSR	TWW	35	6	35	5	4%	-5%
TWW	MEF	33	7	34	6	3%	-3%
MEF	NAC	23	6	26	5	17%	-17%
NAC	AUS	23	7	23	5	-2%	-31%
AUS	ETS	20	8	21	7	5%	-9%
ETS	HUH	14	17	13	15	-9%	-8%
<b>MOS Rail</b>							
TAW	CCT	7	15	7	16	5%	2%
CCT	STW	7	14	7	15	4%	2%
STW	CIO	7	12	7	12	0%	-1%
CIO	SHM	5	10	5	9	-2%	-2%
SHM	TSH	2	9	2	9	-17%	-2%
TSH	HED	2	8	2	7	-10%	-1%
HED	MOS	2	5	2	5	6%	3%
MOS	WKS	1	2	1	2	-6%	0%

## Appendix II

### FORECASTING INPUT ASSUMPTIONS

**Traffic & Transport Impact Assessment (T&TIA) and Tung Chung Line (TCL) Capacity Assessment – Consolidated Assumptions**

**A1. Major Developments in North Lantau**

2026			
Major Development	Parameter	Population	Employment
SHD Topside Development	2,432 flats	6,600	60
Tung Chung Town Centre and New Town Extension	---	162,200	28,000
HKBCF Island Topside Development	125,000m <sup>2</sup> GFA	0	4,700
HKIA Three-Runway System	62.4M passenger trips/year (excluding transfer/transit) 6.17M tonnes cargo/year (excluding transshipment)	0	106,000
HKIA North Commercial District	Up to 500,000m <sup>2</sup> floor space of retail complexes, entertainment facilities, dining space, hotels & offices	0	18,000
SHW Reclamation and Landside Development*	0	0	0
Tung Chung Traction Substation Development*	0	0	0
Sunny Bay Reclamation	Not Included	0	Enhanced-2011 TPEDM (Approx. 4,000)
Lantau Logistic Park	Not Included	---	---
<b>TOTAL</b>		<b>168,800</b>	<b>160,760</b>
2031			
Major Development	Parameter	Population	Employment
SHD Topside Development	6,858 flats Commercial: 30,000m <sup>2</sup> GFA	18,500	1,700
Tung Chung Town Centre and New Town Extension	TCE and TCW: 49,400 flats and 877,000m <sup>2</sup> Commercial GFA	277,600	60,000
HKBCF Island Topside Development	350,000m <sup>2</sup> GFA	0	13,000
HKIA Three-Runway System	71.6M passenger trips/year (excluding transfer/transit) 7.51M tonnes cargo/year (excluding transshipment)	0	123,000
HKIA North Commercial District	Up to 668,000m <sup>2</sup> floor space of retail complexes, entertainment facilities, dining space, hotels & offices	0	24,000
SHW Reclamation and Landside Development*	18,000 School Places	4,000	2,600
Tung Chung Traction Substation Development*	1,345 flats	3,000	0
Sunny Bay Reclamation	Not Included	0	Enhanced-2011 TPEDM (Approx. 4,000)
Lantau Logistic Park	Not Included	---	---
<b>TOTAL</b>		<b>303,100</b>	<b>228,300</b>

2036			
Major Development	Parameter	Population	Employment
SHD Topside Development	10,910 flats Commercial: 30,000m <sup>2</sup> GFA	29,500	1,800
Tung Chung Town Centre and New Town Extension	TCE and TCW: 49,400 flats and 877,000m <sup>2</sup> Commercial GFA	277,600	60,000
HKBCF Island Topside Development	500,000m <sup>2</sup> GFA	0	18,700
HKIA Three-Runway System	77.4M passenger trips/year (excluding transfer/transit) 8.16M tonnes cargo/year (excluding transshipment)	0	123,000
HKIA North Commercial District	Up to 668,000m <sup>2</sup> floor space of retail complexes, entertainment facilities, dining space, hotels & offices	0	24,000
SHW Reclamation and Landside Development*	18,000 School Places	4,000	2,600
Tung Chung Traction Substation Development*	1,345 flats	3,000	0
Sunny Bay Reclamation	Not Included	0	Enhanced-2011 TPEDM (Approx. 4,000)
Lantau Logistic Park	Not Included	---	---
<b>TOTAL</b>		<b>314,100</b>	<b>234,100</b>
Project Completion (2038)			
Major Development	Parameter	Population	Employment
SHD Topside Development	14,000 flats Commercial: 30,000m <sup>2</sup> GFA	37,800	1,900
Tung Chung Town Centre and New Town Extension	TCE and TCW: 49,400 flats and 877,000m <sup>2</sup> Commercial GFA	277,600	60,000
HKBCF Island Topside Development	500,000 m <sup>2</sup> GFA	0	18,700
HKIA Three-Runway System	79.9M passenger trips/year (excluding transfer/transit) 8.43M tonnes cargo/year (excluding transshipment)	0	123,000
HKIA North Commercial District	Up to 668,000m <sup>2</sup> floor space of retail complexes, entertainment facilities, dining space, hotels & offices	0	24,000
SHW Reclamation and Landside Development*	18,000 School Places	4,000	2,600
Tung Chung Traction Substation Development*	1,345 units	3,000	0
Sunny Bay Reclamation	Not Included	0	Enhanced-2011 TPEDM (Approx. 4,000)
Lantau Logistic Park	Not Included	---	---
<b>TOTAL</b>		<b>322,400</b>	<b>234,200</b>

\* Uncommitted developments for sensitivity test purpose only.



## A2. Strategic Highway Network Assumptions

### Strategic Highway Network Assumptions for Various Design Years

2016 Road network assumptions (in addition to 2011 network)	Configuration
<b>New Territories</b>	
Widening of Tolo Highway/Fanling Highway between Island House Interchange and Fanling (Stage 1 – Section between Island House Interchange and Tai Hang)	D4
Reconstruction and Improvement to Tuen Mun Road	D3
Traffic Improvement to Tuen Mun Road (Town Centre Section)	D3
2021 Road network assumptions (in addition to 2016 network)	Configuration
<b>Hong Kong</b>	
Road P2 and realigned Hung Hing Road on Wan Chai Development Phase II	D2
Road P1, P2 and Distributor Roads on Central Reclamation Phase III	D2 <sup>(1)</sup>
Central – Wan Chai Bypass and Island Eastern Corridor Link	D3/D4 <sup>(1)</sup>
Island Eastern Corridor Improvement between Causeway Bay and North Point	D4/D5 <sup>(1)</sup>
<b>New Territories</b>	
Dualling of Hiram's Highway between Clear Water Bay Road and Marina Cove	D2
Widening of Tolo Highway/Fanling Highway between Island House Interchange and Fanling (Stage 2 – Section between Tai Hang and Wo Hop Shek Interchange)	D4
Route 6 (formerly Route 11) Tseung Kwan O – Lam Tin Tunnel	D2
Cross Bay Link at Tseung Kwan O	D2
Hong Kong – Zhuhai – Macao Bridge Hong Kong Link Road	D3
Tuen Mun – Chek Lap Kok Link Southern Connection	D2
Tuen Mun – Chek Lap Kok Link Northern Connection	D2
Widening of Castle Peak Road (Castle Peak Bay Section)	D2
Link Road to Liantang/Heung Yuen Wai Cross-Boundary Control Point	D2
<b>Cross Boundary</b>	
Hong Kong – Zhuhai – Macao Bridge	D3
2026 Road network assumptions (in addition to 2021 network)	Configuration
<b>Kowloon</b>	
Widening of Gascoigne Road Flyover	D2
Route 6 (formerly Route 11) – Central Kowloon Route	D3
Route 6 (formerly Route 11) – Trunk Road T2 (Kai Tak – Cha Kwo Ling Link)	D2
<b>New Territories</b>	
Dualling of Hiram's Highway between Marina Cove and Sai Kung Town	D2
Tsuen Wan Bypass, Widening of Tsuen Wan Road between Tsuen Tsing Interchange and Kwai Tsing Interchange and Associated Junction Improvement Works Widening	Add 2 lanes per direction
Widening of Fanling Highway between Pak Shek Au Interchange and Po Shek Wu Interchange	D4
Lantau Road P1 between Tung Chung and Tai Ho	D2
Widening of Tai Po Road (existing remaining D2 Shatin section)	D3
2031 Road network assumptions (in addition to 2026 network)	Configuration
Tuen Mun Western Bypass Southern Section (Tuen Mun – Chek Lap Kok Link to Tsing Tin Road)	D2
Tuen Mun Western Bypass Northern Section (Tsing Tin Road to San Sang San Tsuen)	D2

Note:

- (1) The configuration of these proposed highways vary at different sections of the roads.
- (2) Route 11 has been included based on information available in the *HK2030+* and *Sustainable Lantau Blueprint*. The Road P1 section between Tai Ho and Sunny Bay will have insignificant impact on TCL usage and will not increase the passenger flow on TCL.

## A3. Railway Network Assumptions

By 2026 (in addition to existing network)
Kwun Tong Line Extension
West Island Line (from Sheung Wan to Kennedy Town)
South Island Line (East)
Shatin to Central Link (East-West Line)
Shatin to Central Link (North-South Line)
Guangzhou – Shenzhen – Hong Kong Express Rail Link (Hong Kong Section)
Hung Shui Kiu Station
Tung Chung West Extension and Tung Chung East Station
South Island Line (West)
Tuen Mun South Extension
Northern Link (Between Kam Sheung Road Station and Kwu Tung Station)
Lok Ma Chau Spur Line (Kwu Tung Station)
East Kowloon Line
North Island Line
<b>No additional railway network was assumed beyond 2026</b>

## A4. Vehicle Fleet Sizes

Year	Mid-year Fleet Size	
	Private Vehicle (Private Cars and Motor Cycles)	Goods Vehicle
2026	738,700	118,400
2031	811,600	121,400
2036	853,000	124,400

Note:

1. For the goods vehicle fleet, a constant growth rate of 0.5% is assumed for period up to 2036.

## A5. GDP Growth Assumptions

Year	Percentage Growth per Annum
2014-2015	2.8%
2015-2016	2.5%
2016-2022	3.5%
2022-2026	3.0%
Beyond 2026	2.5%

## A6. Highway Toll Assumptions (in 2016 Dollar)

Toll Facility	Car	Taxi	Private Light Bus	Good Van	Light Goods Vehicle	Medium Goods Vehicle (5)	Heavy Goods Vehicle (5)	Tractor Unit (5)
Shing Mun Tunnel	5	5	5	5	5	5	5	5
Lion Rock Tunnel (LRT)	8	8	8	8	8	8	8	8
Tate's Cairn Tunnel (TCT) <sup>(1)</sup>	20	20	24	24	24	33	76	100
Sha Tin Heights Tunnel and Eagle's Nest Tunnel (Route 8 between Cheung Sha Wan and Sha Tin)	8	8	8	8	8	8	8	8
Tseung Kwan O (TKO) Tunnel	3	3	3	3	3	3	3	3
Eastern Harbour Crossing (EHC)	25	25	38	38	38	56	125	150
Cross Harbour Tunnel (CHT)	20	10	10	15	15	22	50	60
Western Harbour Crossing <sup>(2)</sup>	60	55	70	70	70	102	185	215
Aberdeen Tunnel	5	5	5	5	5	5	5	5
Lantau Link <sup>(3)</sup>	15	15	20	20	20	25	40	40
Tai Lam Tunnel (R3-CPS) <sup>(4)</sup>	40	40	100	41	41	47	52	52
TKO – Lam Tin Tunnel <sup>(6)</sup>	3	3	3	3	3	3	3	3
Tuen Mun – Chek Lap Kok Link <sup>(7)</sup> (TMCLKL)	15	15	20	20	20	25	40	40
Tuen Mun Western Bypass <sup>(8)</sup> (TMWB)	20	20	50	21	21	24	26	26
Route 11 <sup>(9)</sup>	40	40	100	41	41	47	52	52

Notes:

- (1) Based on new tolls for Tate's Cairn Tunnel effective from January 2016.
- (2) Based on new tolls for Western Harbour Crossing effective from July 2015.
- (3) The toll shown represents one-way toll collected in each direction.
- (4) Based on new tolls for Tai Lam Tunnel effective from February 2015.
- (5) The weighted average number of additional axles would be adopted for some tunnels including Tate's Cairn Tunnel, Cross Harbour Tunnel, Western Harbour Crossing and Eastern Harbour Crossing. The factor of weighted average number of additional axles with 0.22 for Medium Goods Vehicle, 2 for Heavy Goods Vehicle and 3 for Tractor Unit are adopted.
- (6) The tolls for TKO-Lam Tin Tunnel assumed to be the same as current tolls at Tseung Kwan O Tunnel.
- (7) The tolls for TMCLKL assumed to be the same as current tolls at Lantau Link.
- (8) The tolls level of TMWB assumed to be half of Tai Lam tunnel (Route 3)
- (9) The tolls for Route 11 assumed to be the same as current tolls at Tai Lam tunnel (Route 3).

## A7. Port Related Assumptions

Container Throughput Assumptions for Hong Kong Port (in Million TEUs per year)

Year	2026	2031	2036
CT 1-9	23	25	25
New CT 10	-	-	-
<b>Total</b>	<b>23</b>	<b>25</b>	<b>25</b>

## A8. Airport Related Assumptions

Design Year Airport Usage Forecasts (Excluding Transfer/Transit Passengers and Transshipment Cargo)

Year	2026	2031	2036
Daily Air Passengers (Thousand)	181	196	212
Daily Air Cargo Throughput (Thousand Tonnes)	20	21	22

## A9. Value of Time (VOT) and Vehicle Operating Cost (VOC)

Values of Time for Person Trips by Future Years

Trip Purpose	VOT (\$/min/person in 2011 prices)			
	2026	2031	2036	2041
<b>Non-Car-Available</b>				
Home-based Work (HBW)	0.78	0.81	0.84	0.88
Home-based School (HBS)	0.65	0.68	0.71	0.74
Home-based Others (HBO) / Non-Home Based (NHB)	0.78	0.81	0.84	0.88
Employers' Business (EB)	3.26	3.38	3.53	3.71
<b>Car-Available</b>				
Home-based Work (HBW)	1.18	1.22	1.28	1.34
Home-based School (HBS)	0.82	0.85	0.89	0.94
Home-based Others (HBO) / Non-Home Based (NHB)	0.95	0.99	1.03	1.08
Employers' Business (EB)	4.94	5.13	5.36	5.62

**Values of Time for Goods Vehicle Trips by Future Years**

Goods Vehicle Type	VOT (\$/min/vehicle in 2011 prices)			
	2026	2031	2036	2041
Goods Van	2.09	2.17	2.27	2.38
Light Goods Vehicle	2.41	2.50	2.62	2.75
Medium Goods Vehicle	3.14	3.26	3.41	3.58
Heavy Goods Vehicle	3.67	3.81	3.98	4.18
Tractor Unit	3.47	3.61	3.77	3.96

**Vehicle Operating Costs by Future Years**

Vehicle Type	Distance-based VOC (\$/km in 2011 prices)			
	2026	2031	2036	2041
Private Car	1.51	1.51	1.51	1.51
Light Van (LV)	1.86	1.86	1.86	1.86
Light Goods Vehicle (LGV)	2.47	2.47	2.47	2.47
Medium Goods Vehicle (MGV)	3.07	3.07	3.07	3.07
Heavy Goods Vehicle (HGV)	4.75	4.75	4.75	4.75
Tractor Unit (TU)	3.02	3.02	3.02	3.02

**A10. Cross Boundary Assumptions**

The cross boundary information has been adopted based on the input from Planning Department received in June 2017.

**A11. Proposed Bus Services at Siu Ho Wan (SHO) Station**

Bus Route No.	Origin and Destination
New Service	SHO to/from Chek Lap Kok Ferry Terminal via Tung Chung
New Service	SHO to/from Kwun Tong
New Service	SHO to/from Sha Tin via Shing Mun Tunnel
New Service	SHO to/from Tin Shui Wai Town Centre via TMCLK Link
New Service	SHO to/from West Kowloon (Olympian City)
New Service	SHO to/from Discovery Bay

**A12. Other Proposed Bus Services at North Lantau**

Bus Route No.	Origin and Destination
New Service	Tung Chung West New Town -Tung Chung West MTR Station
New Service	Tung Chung East New Town -Tung Chung East MTR Station
New Service	Tung Chung West/ Tung Chung East -Tuen Mun/ Yuen Long/ Tin Shui Wai
New Service	Tung Chung West/ Tung Chung East - Mong Kok/ Tsim Sha Tsui/ Hunghom
New Service	Tung Chung West/ Tung Chung East - East Kowloon/ Tseung Kwan O
New Service	Tung Chung West/ Tung Chung East - Sheung Wan/ Admiralty/ Causeway Bay
New Service	HKBCF - Airport
New Service	HKBCF - Tuen Mun Town Center/ Tuen Mun West Rail Station
New Service	HKBCF - Tung Chung MTR Station
New Service	HKBCF - Fanling
New Service	HKBCF - Yuen Long Railway Station
New Service	HKBCF - Wan Chai
New Service	HKBCF - Kai Tak
New Service	HKBCF - Mong Kok East Station
New Service	HKBCF - Shatin
New Service	HKBCF - Tsuen Wan West Station

## Appendix III

### COMPARISON OF PASSENGER FLOWS BETWEEN ROAD ASSESSMENT AND RAILWAY ASSESSMENT

#### Appendix III. Comparison of passenger flows between road assessment and railway assessment <sup>(1)</sup>

##### Two-way daily passenger flows to/from Lantau (000's)

	Road Assessment <sup>(2)</sup>	Railway Assessment <sup>(3)</sup>	Railway Assessment/ Road Assessment
PV <sup>(4)</sup>	493	465	0.94
PT	1,088	1,037	0.95
<b>Total</b>	<b>1,581</b>	<b>1,501</b>	<b>0.95</b>

##### Two-way daily passenger flows at the North Lantau Highway (East of Tai Ho Interchange) (000's)

	Road Assessment <sup>(2)</sup>	Railway Assessment <sup>(3)</sup>	Railway Assessment/ Road Assessment
PV <sup>(4)</sup>	367	356	0.97
PT	879	880	1.00
<b>Total</b>	<b>1,246</b>	<b>1,236</b>	<b>0.99</b>

Note:

<sup>(1)</sup> This comparison is under the scenario with both full intake of Siu Ho Wan Topside development and Siu Ho Wan Reclamation.

<sup>(2)</sup> 2038 forecast

<sup>(3)</sup> 2036 forecast

<sup>(4)</sup> Private car, Taxi, SPB

# Appendix IV

## TUNG CHUNG LINE V/C ANALYSIS

### Appendix IV Siu Ho Wan Topside Development - Tung Chung Line V/C Analysis

#### (A) Line Capacity

Section	Train/ Hour Line Capacity	2015	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
		10	16	16	16	16	16	16	16	16	16	16	16
SUN -> TSY	17,800	31,300	31,300	31,300	31,300	31,300	31,300	31,300	31,300	31,300	31,300	31,300	31,300
HOK -> KOW	15	24	24	24	24	24	24	24	24	24	24	24	24
Line Capacity	26,700	47,000	47,000	47,000	47,000	47,000	47,000	47,000	47,000	47,000	47,000	47,000	47,000

#### Railway Network Assumptions

- Committed Network + 7 Projects in RDS2014 + TCE + Siu Ho Wan Station

#### (B) Peak Line Load and V/C Ratio

Section	Peak Line Load	V/C Ratio	2015	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
			6,000	13,100	15,400	17,600	19,900	22,100	24,400	26,700	29,000	31,300	33,600	35,900
SUN -> TSY	6,000	33.7%	41.9%	49.2%	56.2%	63.6%	70.6%	78.0%	85.4%	92.8%	100.2%	107.6%	115.0%	122.4%
HOK -> KOW	22,600	37,400	38,300	39,100	40,000	40,800	41,700	42,500	43,400	44,200	45,100	45,900	46,800	47,600
V/C Ratio	84.6%	79.6%	81.5%	83.2%	85.1%	86.8%	88.7%	90.4%	92.3%	94.1%	95.9%	97.7%	99.5%	101.3%

Peak line load figures are round to nearest hundred.

#### Scenario 2 - With SHD Development

Section	Peak Line Load	V/C Ratio	2015	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
			6,000	13,200	16,700	18,900	21,200	23,400	25,700	28,000	30,300	32,600	34,900	37,200
SUN -> TSY	6,000	33.7%	42.2%	53.4%	60.8%	67.7%	74.8%	81.9%	89.0%	96.1%	103.2%	110.3%	117.4%	124.5%
HOK -> KOW	22,600	37,500	38,700	39,500	40,400	41,200	42,100	42,900	43,800	44,600	45,500	46,300	47,200	48,000
V/C Ratio	84.6%	79.8%	82.3%	84.0%	86.0%	87.7%	89.6%	91.3%	93.1%	94.9%	96.7%	98.5%	100.3%	102.1%

Peak line load figures are round to nearest hundred.

#### Sensitivity Test - With SHD Development (Full Intake in 2036) + TUT Dev + SHW Reclamation

Section	Peak Line Load	V/C Ratio	2015	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
			6,000	13,200	16,700	18,900	21,200	23,400	25,700	28,000	30,300	32,600	34,900	37,200
SUN -> TSY	6,000	33.7%	42.2%	55.4%	60.8%	67.7%	74.8%	81.9%	89.0%	96.1%	103.2%	110.3%	117.4%	124.5%
HOK -> KOW	22,600	37,500	38,700	39,500	40,400	41,200	42,100	42,900	43,800	44,600	45,500	46,300	47,200	48,000
V/C Ratio	84.6%	79.8%	82.3%	84.0%	86.0%	87.7%	89.6%	91.3%	93.1%	94.9%	96.7%	98.5%	100.3%	102.1%

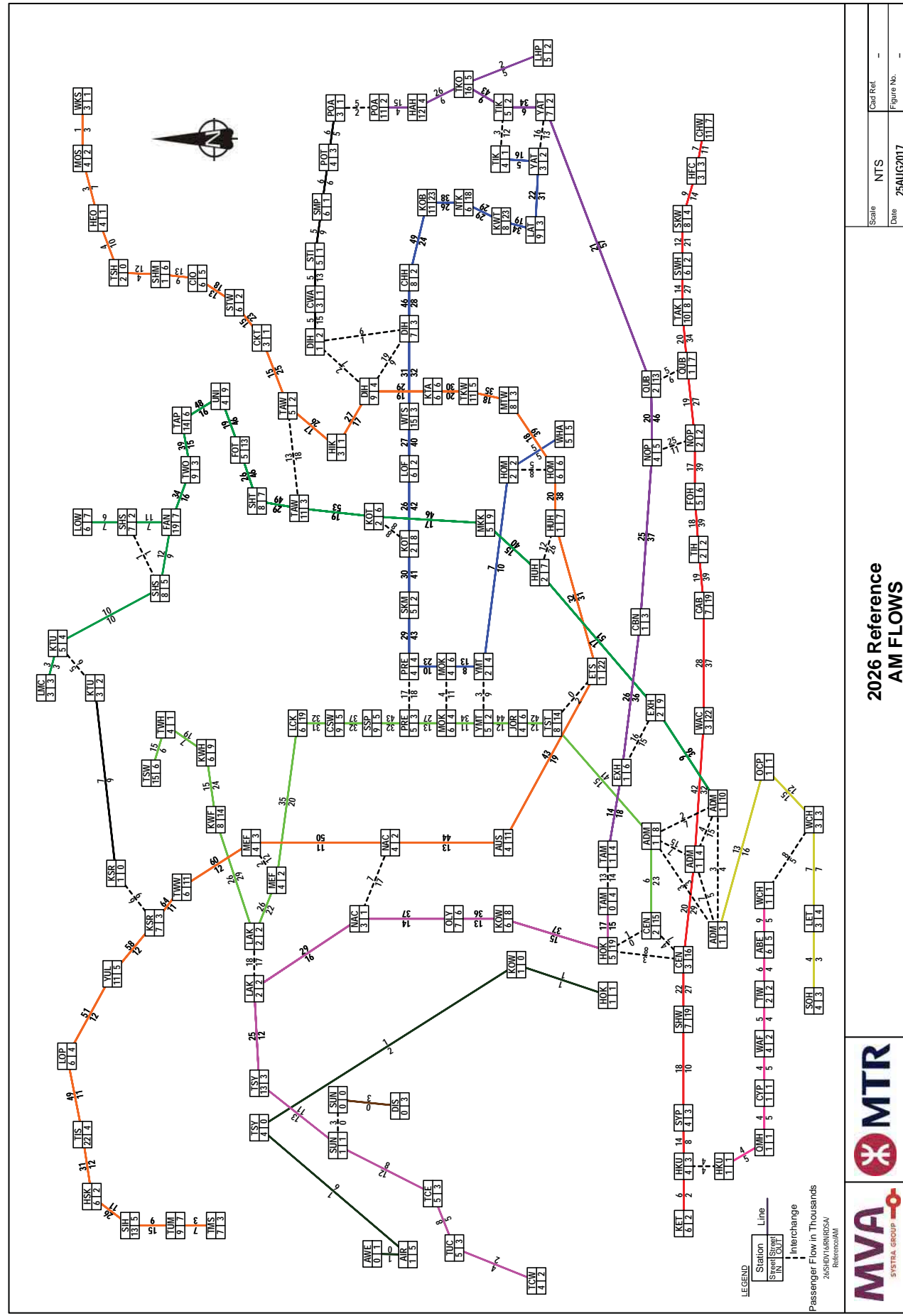
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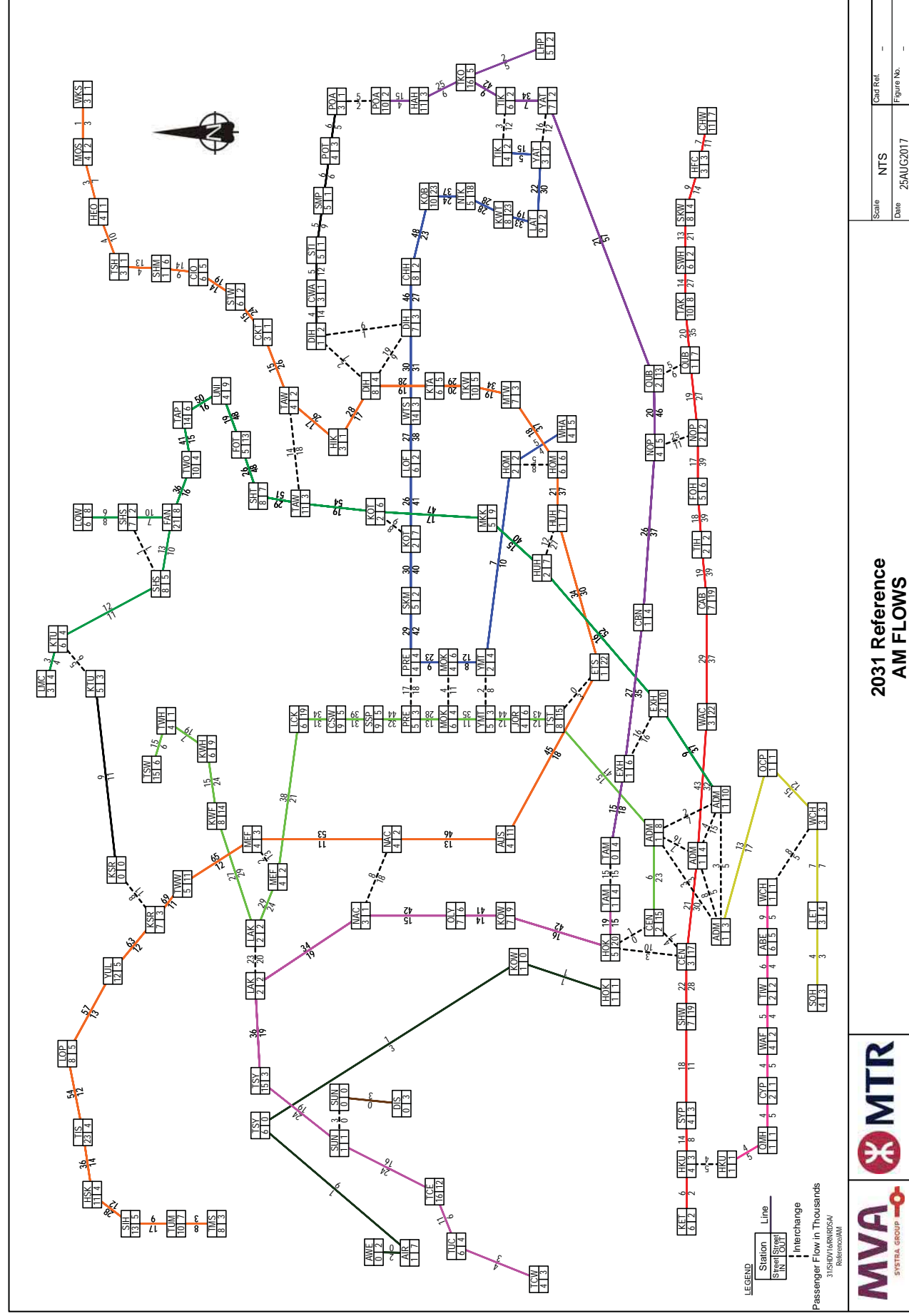
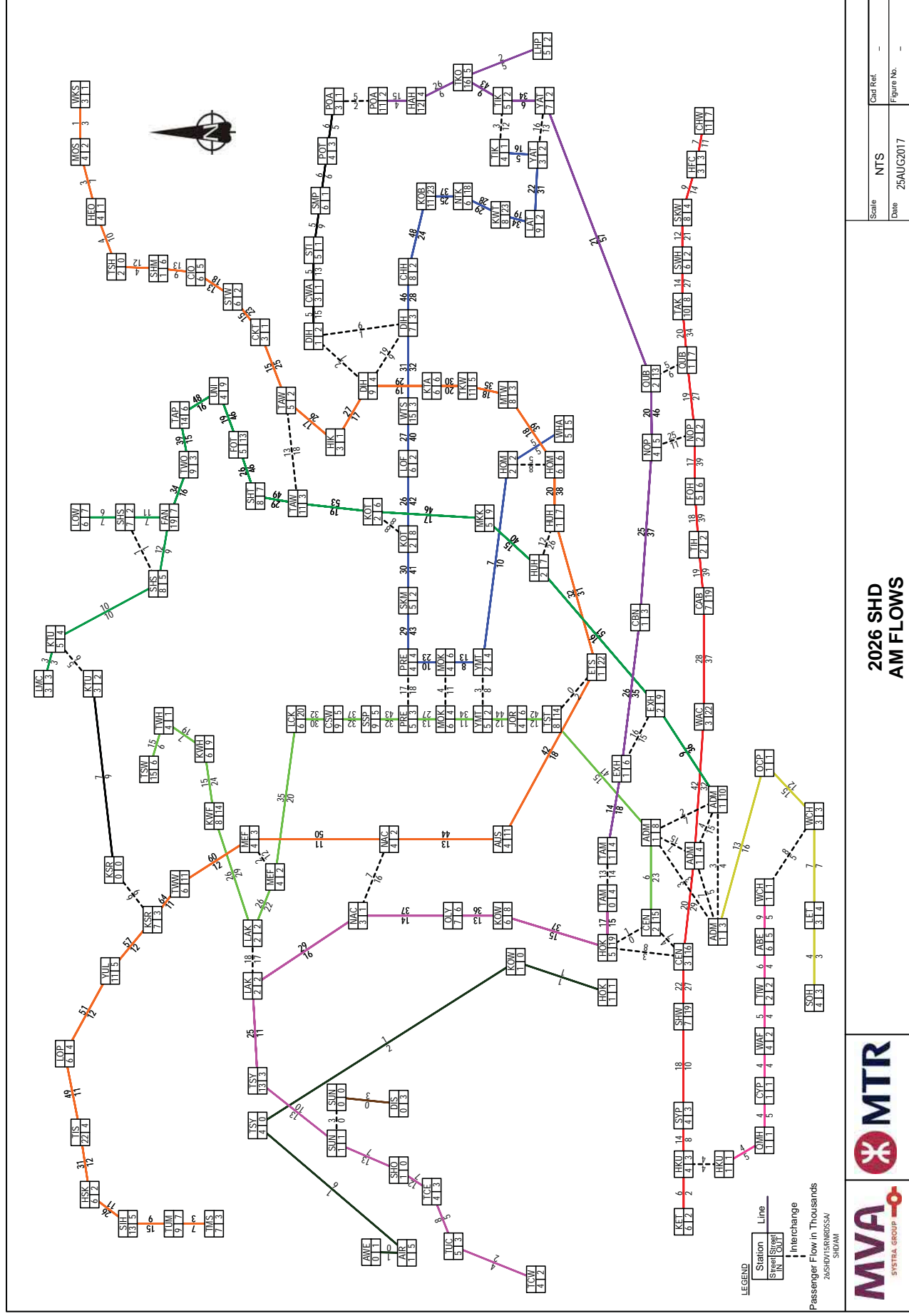
#### Key Planning Assumptions in North Lantau

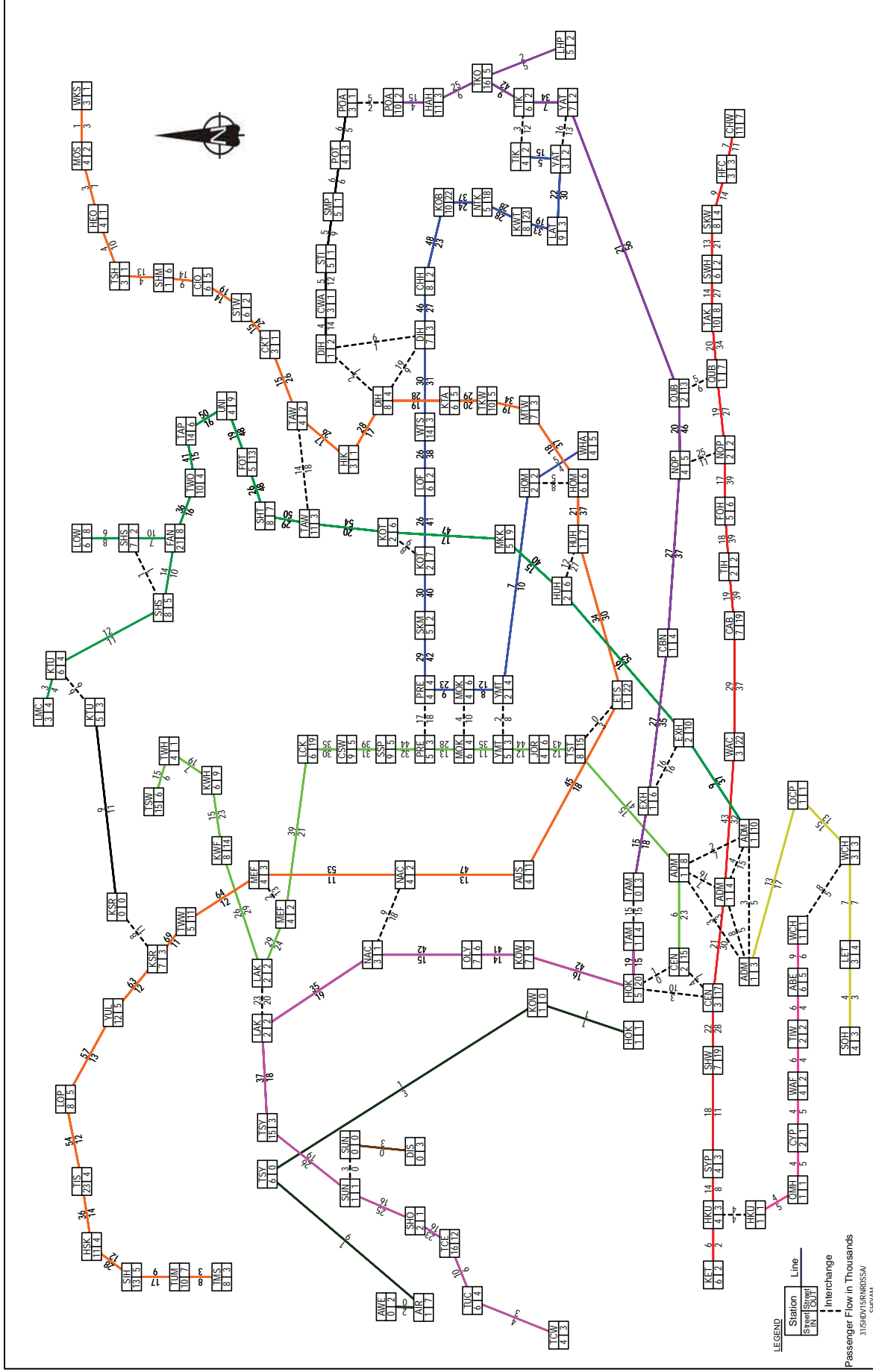
Section	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	Remark
SHD Topside Dev	6,600									29,500		MVA adopted a faster intake program and the peak line load become more conservative. Full intake of 37,800 population in Sensitivity Test.
Tung Chung Town Centre + ICNTE		185,280	208,360	231,440	254,520			277,600				The population between 2026 and 2031 by interpolation
SHW Reclamation (Option 2)							4,000					Sensitivity Test
Tung Chung Traction Substation Dev							3,000					Sensitivity Test
3RS + NCD + BCF			128,700					160,000			165,700	

# Appendix V

## MODELLED LINK FLOW DIAGRAMS FOR ALL SCENARIOS

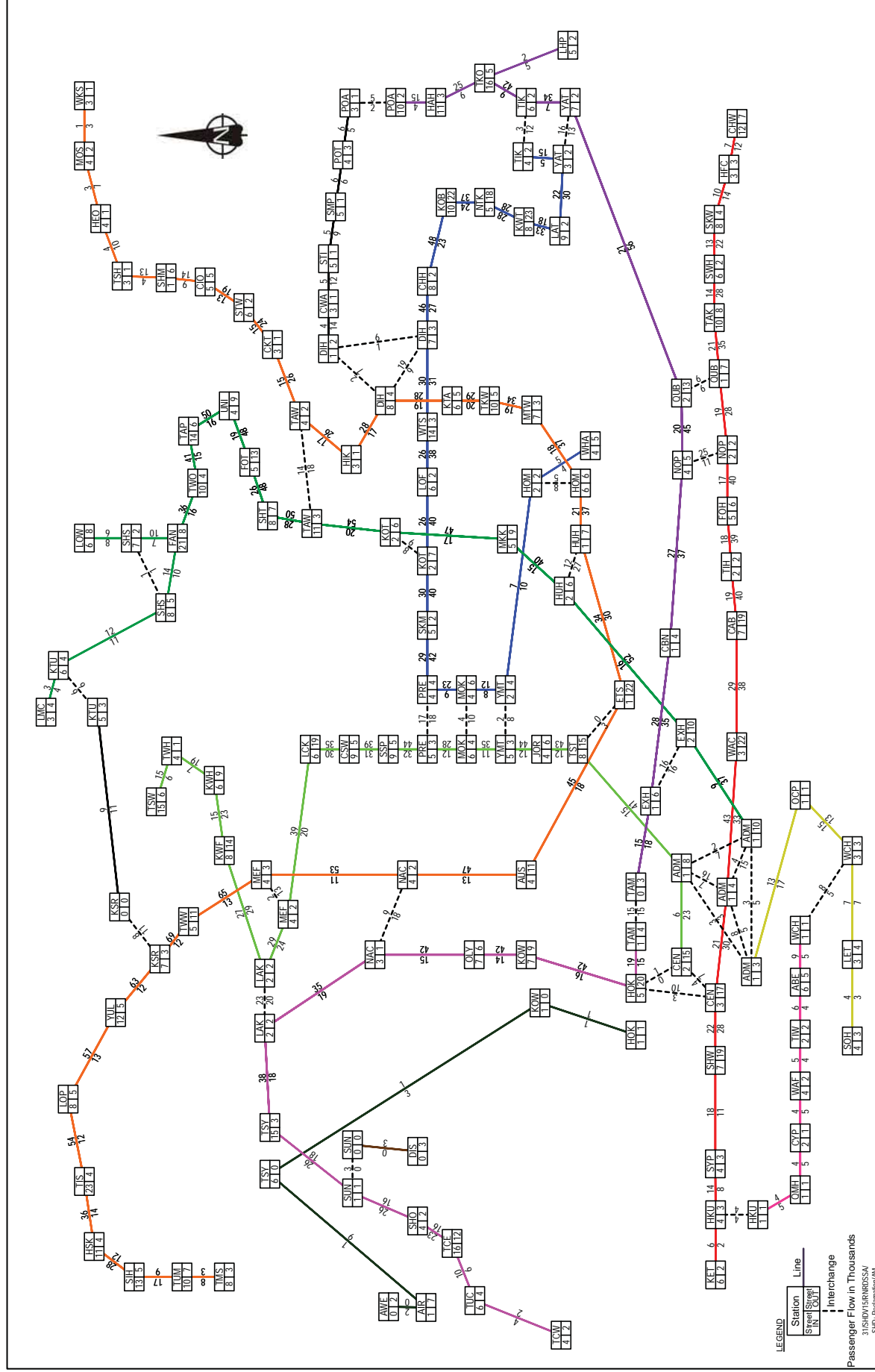






### 2031 SHD AM FLOWS

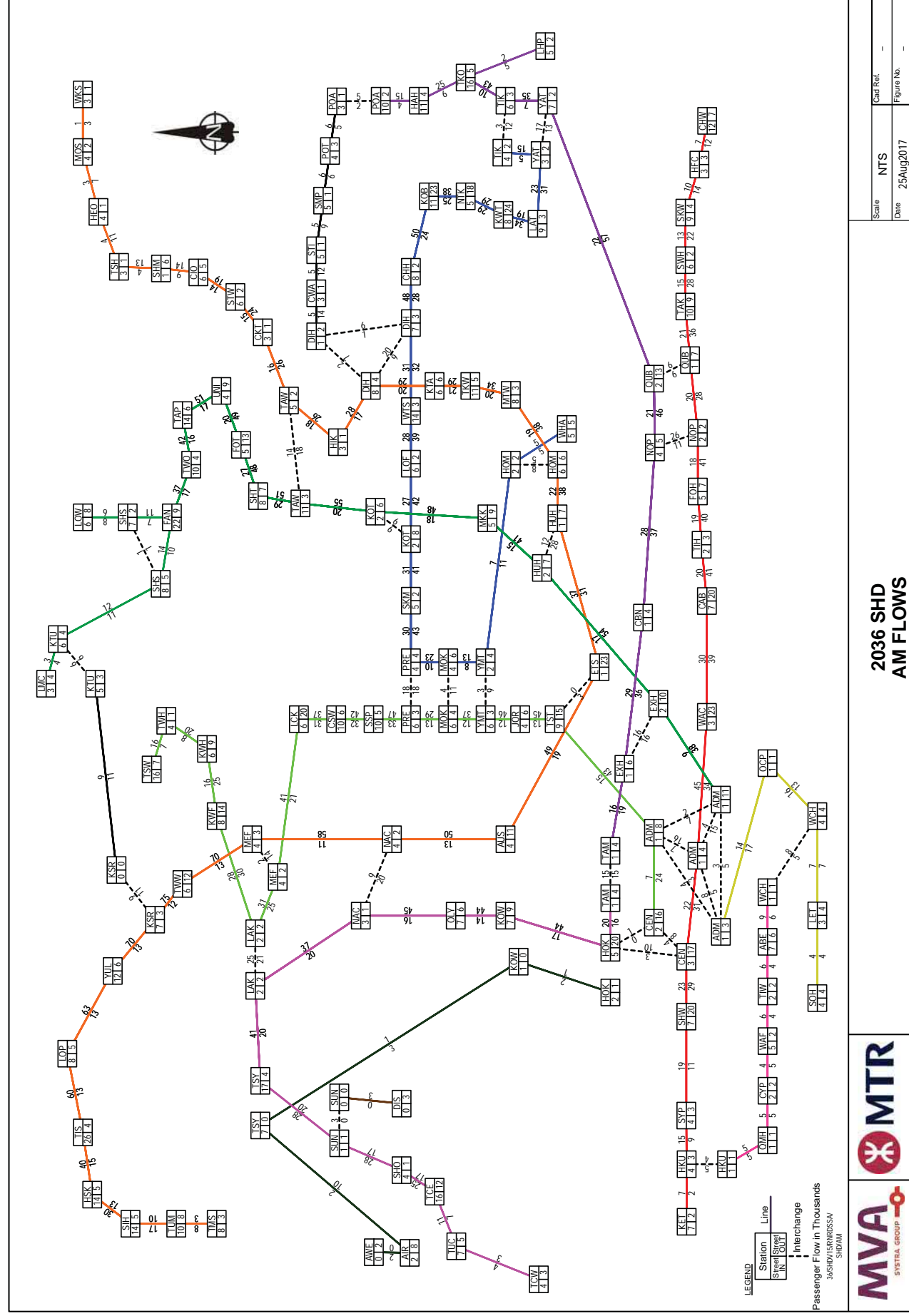
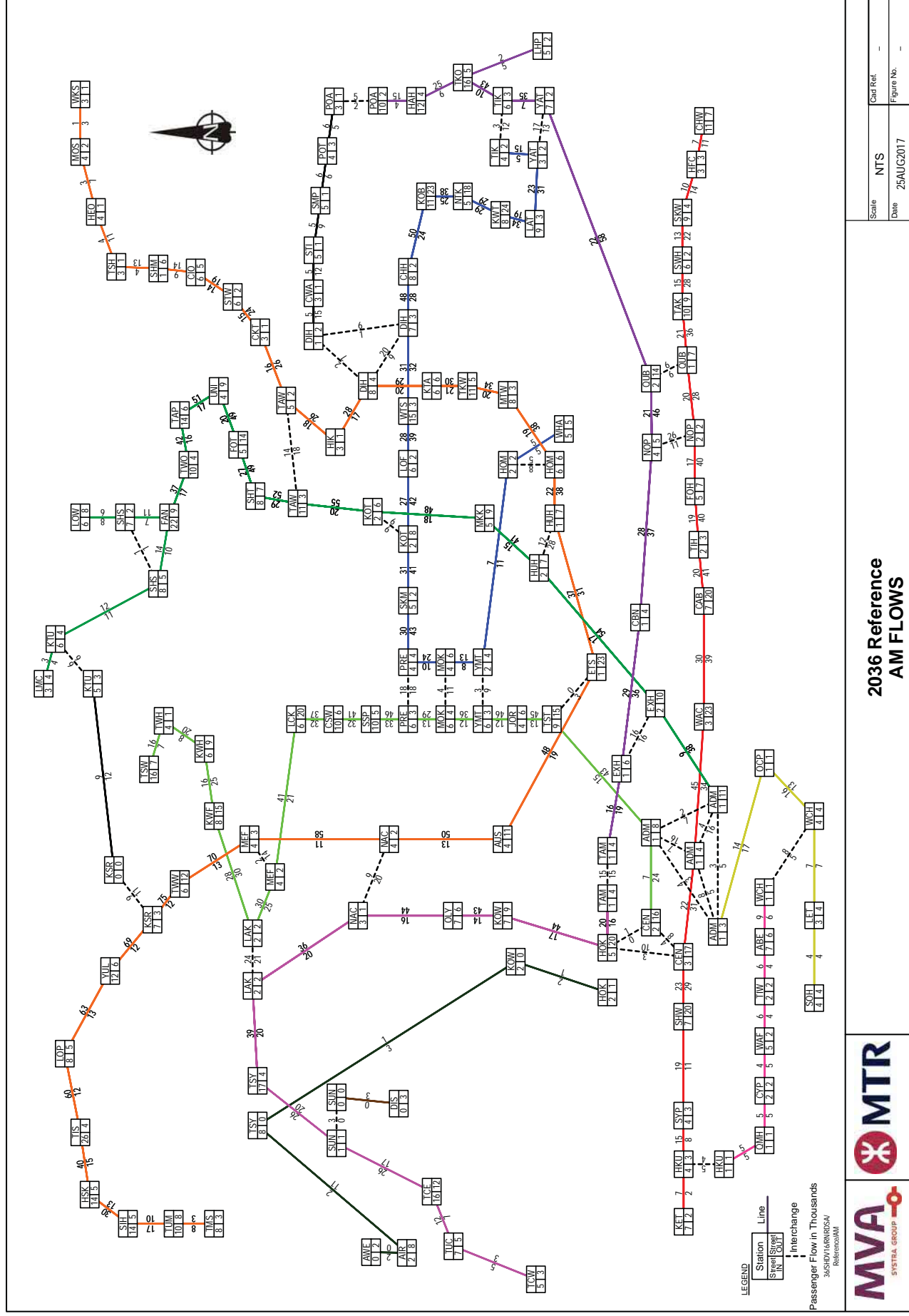
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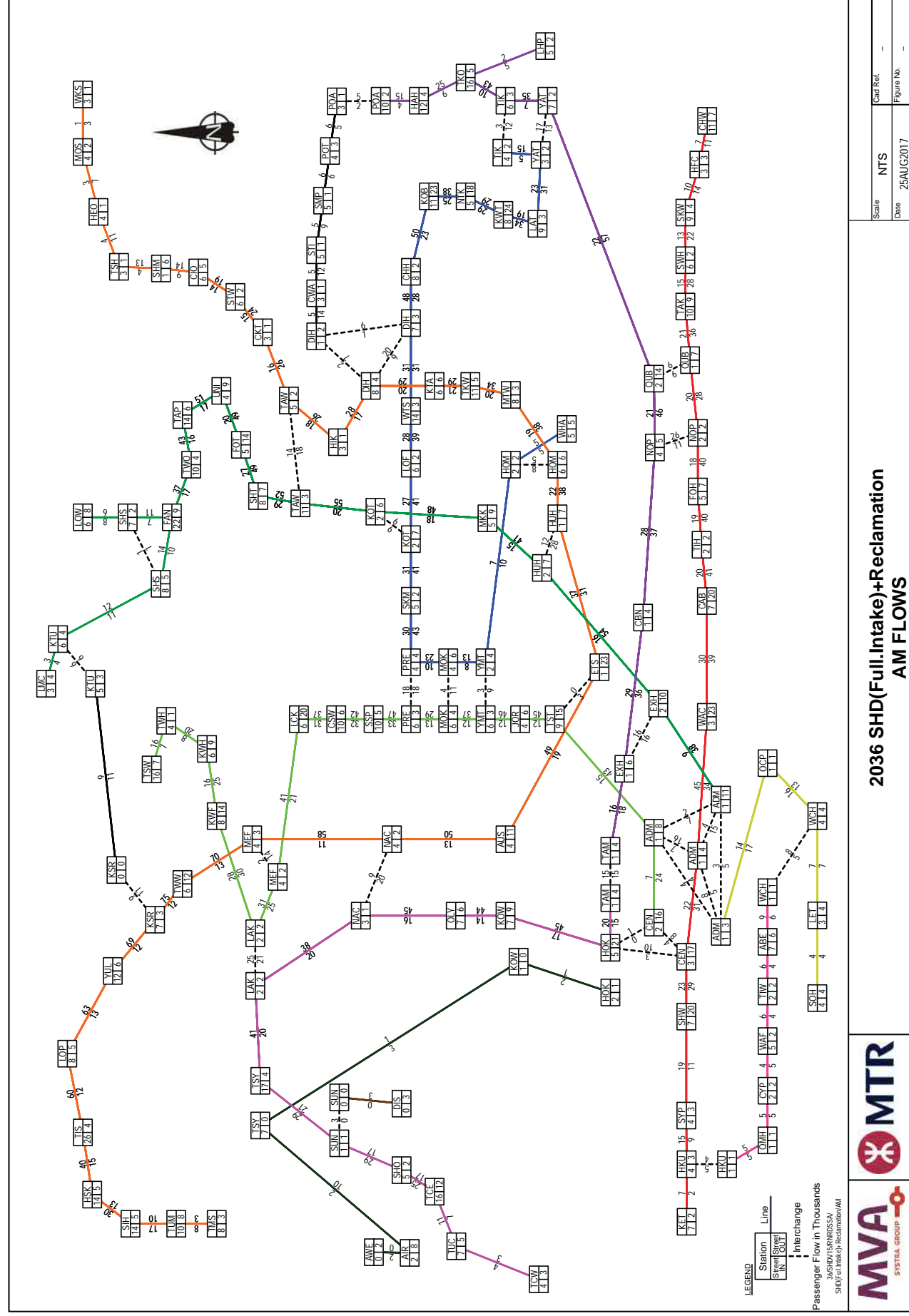
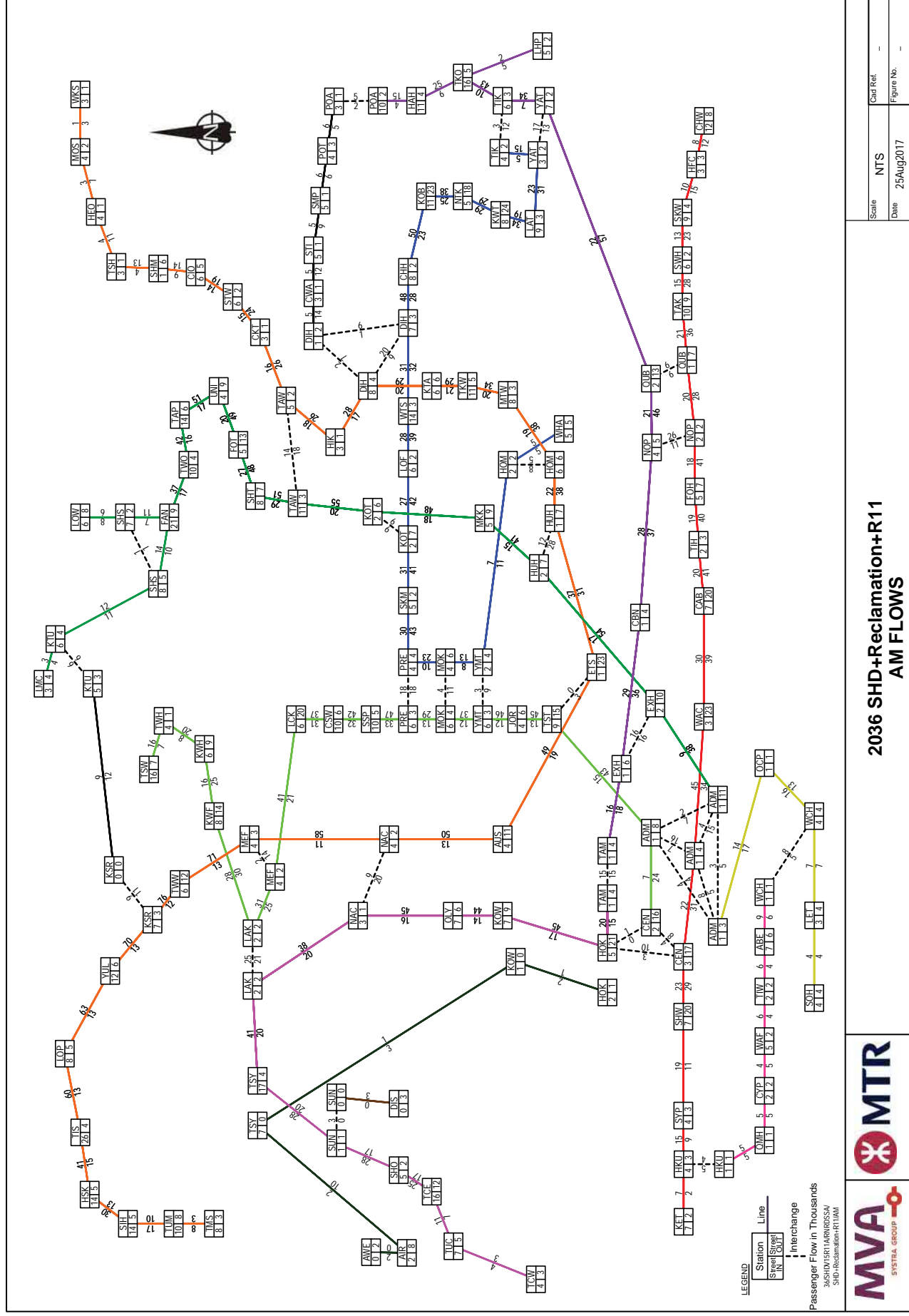


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**Abu Dhabi**

AS Business Centre, First Floor, Suites 201-213,  
Al Ain Road, Umm al Nar, P.O. Box 129865,  
Abu Dhabi, UAE  
T: +971 2 558 3809 F: +971 2 558 9961

**Birmingham**

Second Floor, 37a Waterloo Street  
Birmingham B2 5TJ United Kingdom  
T: +44 (0)121 233 7680 F: +44 (0)121 233 7681

**Dublin**

1st Floor, 12/13 Exchange Place,  
Custom House Docks, IFSC, Dublin 1 Ireland  
T: +353 (0)1 542 6000 F: +353 (0)1 542 6001

**Edinburgh**

Prospect House, 5 Thistle Street, Edinburgh EH2 1DF  
United Kingdom  
T: +44 (0)131 220 6966

**Glasgow**

Seventh Floor, 78 St Vincent Street  
Glasgow G2 5UB United Kingdom  
T: +44 (0)141 225 4400

**Lille**

86 Boulevard Carnot, 59000 Lille, France  
T: +33 (0)3 74 07 00 F: +33 (0)1 53 17 36 01

**London**

Seventh Floor, 15 Old Bailey  
London EC4M 7EF United Kingdom  
T: +44 (0)20 7529 6500 F: +44 (0)20 3427 6274

**Lyon**

11, rue de la République, 69001 Lyon, France  
T: +33 (0)4 72 10 29 29 F: +33 (0)4 72 10 29 28

**Manchester**

25th Floor, City Tower, Piccadilly Plaza  
Manchester M1 4BT United Kingdom  
T: +44 (0)161 236 0282 F: +44 (0)161 236 0095

**Marseille**

76, rue de la République, 13002 Marseille, France  
T: +33 (0)4 91 37 35 15 F: +33 (0)4 91 91 90 14

**Newcastle**

PO Box 438, Newcastle upon Tyne, NE3 9BT  
United Kingdom  
T: +44 (0)191 2136157

**Paris**

72 rue Henry Farman, 75015 Paris, France  
T: +33 (0)1 53 17 36 00 F: +33 (0)1 53 17 36 01

**Woking**

Dukes Court, Duke Street  
Woking, Surrey GU21 5BH United Kingdom  
T: +44 (0)1483 728051 F: +44 (0)1483 755207

**Hong Kong**

14th Floor West, Warwick House, TaiKoo Place,  
979 King's Road, Island East, Hong Kong  
T: +852 2529 7037 F: +852 2527 8490

**Shenzhen**

Room 905, Excellence Mansion, No.98, No.1 Fuhua Road,  
Futian Central Zone, Shenzhen, PRC, Post Code : 518048  
T : +86 755 3336 1898 F : +86 755 3336 2060

**Shenzhen - Beijing Branch Office**

Room 1503, Block C, He Qiao Mansion, No. 8 Guanghua Road,  
Chaoyang District, Beijing, PRC, Post Code : 100026  
T : +86 10 8557 0116 F : +86 10 8557 0126

**Beijing Joint Venture**

No. 60, Nan Li Shi Road, Xi Cheng District, Beijing, PRC,  
Post Code : 100045  
T : +86 10 8807 6320 F : +86 10 6804 3744

**Singapore**

25 Seah Street #04-01 Singapore 188381  
T : +65 6227 3252 F : +65 6423 0178

**Thailand**

37th Floor, Unit F, Payatai Plaza Building, 128/404-405 Payathai  
Road, Rajthwee, Bangkok 10400, Thailand  
T : +662 216 6652 F : +662 216 6651

**Vietnam**

5/F Perfect Building, Le Thi Hong Gam St, District 1,  
Ho Chi Minh City, Vietnam  
T : +84 8 3821 7183 F : +84 8 3821 6967



## **APPENDIX III**

### **Air Ventilation Assessment (Expert Evaluation)**

MTR Corporation Limited

**Proposed Comprehensive  
Residential and Commercial  
Development  
atop Siu Ho Wan Depot**

Air Ventilation Assessment – Expert  
Evaluation

248118-REP-027-00

Issue 6 | 21 December 2017

This report takes into account the particular  
instructions and requirements of our client

It is not intended for and should not be relied  
upon by any third party and no responsibility  
is undertaken to any third party

Job number 248118

**Ove Arup & Partners Hong Kong Ltd**

Level 5 Festival Walk  
80 Tat Chee Avenue  
Kowloon Tong  
Kowloon  
Hong Kong  
[www.arup.com](http://www.arup.com)

**ARUP**

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# 1 Introduction

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## 1.1 Project Background

MTR Corporation has commissioned a multi-disciplinary consultant team to undertake a feasibility study for the comprehensive residential and commercial development atop Siu Ho Wan Depot (SHD) (the Proposed Development).

An Air Ventilation Assessment (AVA) – Expert Evaluation (EE) had been included in the Study Report submitted to Government in February and December 2016 to demonstrate the feasibility of a conceptual development scheme of 14,000 residential units and 30,000m<sup>2</sup> GFA commercial/retail facilities from air ventilation perspective. A new Siu Ho Wan Station has been planned at the western position along the existing MTR Tung Chung Line tracks to meet the development transport need and enable building of a sustainable community.

Ove Arup and Partners Hong Kong Limited has been commissioned to carry out the AVA-EE on the proposed Development Scheme, with due consideration given to comments received from Government bureaux/departments on the previous submission.

## 1.2 Objective

The objective of this study is to evaluate the wind performance upon fully implementation of the Proposed Development using the methodology of Air Ventilation Assessment, based on the “*Housing Planning and Lands Bureau – Technical Circular No. 1/06, Environment, Transport and Works Bureau – Technical Circular No. 1/06*” issued on 19th July 2006 (the Technical Circular) and “*Technical Guide for Air Ventilation Assessment for Development in Hong Kong – Annex A*” (the Technical Guide).

## 1.3 Study Tasks

The major task of this Study is to carry out an expert evaluation on the characteristics of the wind data near the Proposed Development and assessment of the wind performance at pedestrian level under the proposed Development Scheme in a qualitative manner. The expert evaluation will cover the following tasks:

- Identify the wind condition;
- Identify problematic areas;
- Identify good design features; and
- Recommend further study in the detailed design stage if necessary.

## 2 Site Characteristics

The Proposed Development is located at Siu Ho Wan of Northshore Lantau as shown in **Figure 1** in which the closest developed major residential clusters include the Tung Chung Town Centre at about 5km to its southwest and Discovery Bay at about 3.6km to its east. The Hong Kong International Airport (HKIA) is located at about 5km to its northwest. The future Tung Chung East Extension and the Hong Kong Boundary Crossing Facilities (HKBCF) Island of the Hong Kong-Zhuhai-Macao Bridge are also located at west and northwest of the Proposed Development by 2.8km and 3.2km respectively.

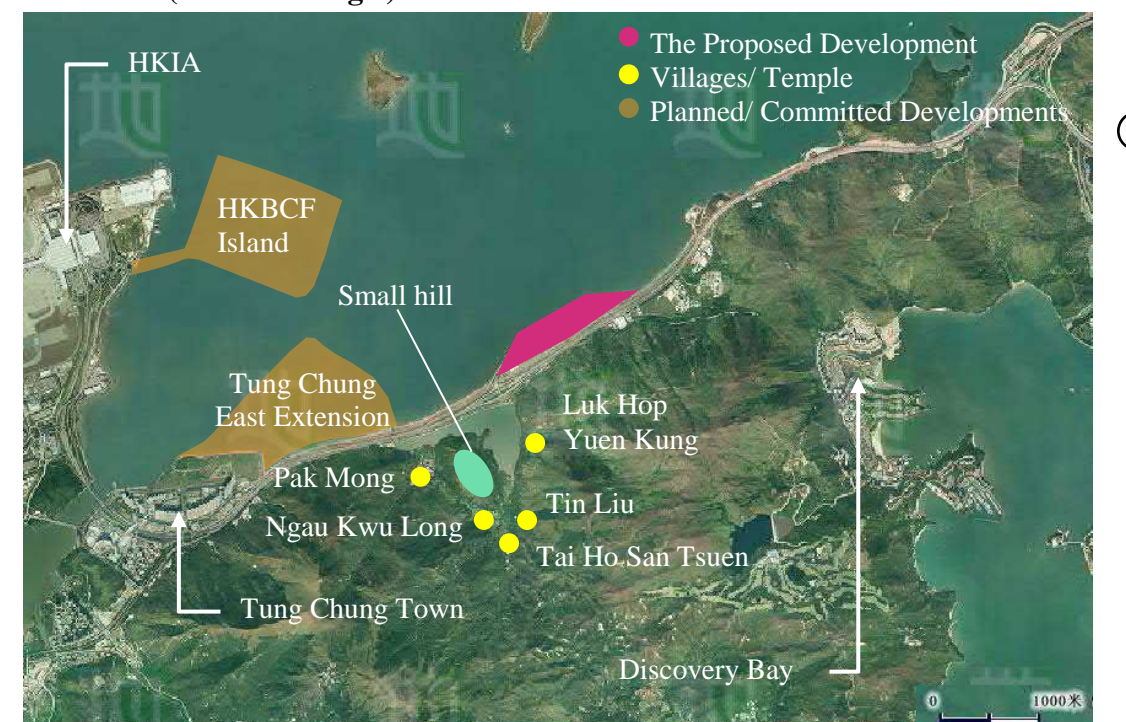
Within the vicinity of the Proposed Development, four village clusters are identified at Pak Mong (白芒), Ngau Kwu Long (牛牯壟), Tai Ho San Tsuen (大蠔新村), and Tin Liu (田寮) as indicated in **Figure 1**, in which the closest Pak Mong Village is located about 1.2km southwest of the Proposed Development boundary. A Taoist temple, Luk Hop Yuen Kung (六合玄宮), is also located at about 780m south of the Proposed Development boundary. A small hill (with an elevation of +117mPD) is located between the villages and the Proposed Development as indicated in **Figure 1**.

An extensive hilly range is located to the southeast to southwest quarter that would affect the wind availability of the Proposed Development which would be reflected in the wind roses. The heights of the major peaks of the hilly range, extracted from *Hong Kong Guide 2015*<sup>1</sup>, are shown in **Figure 2**.

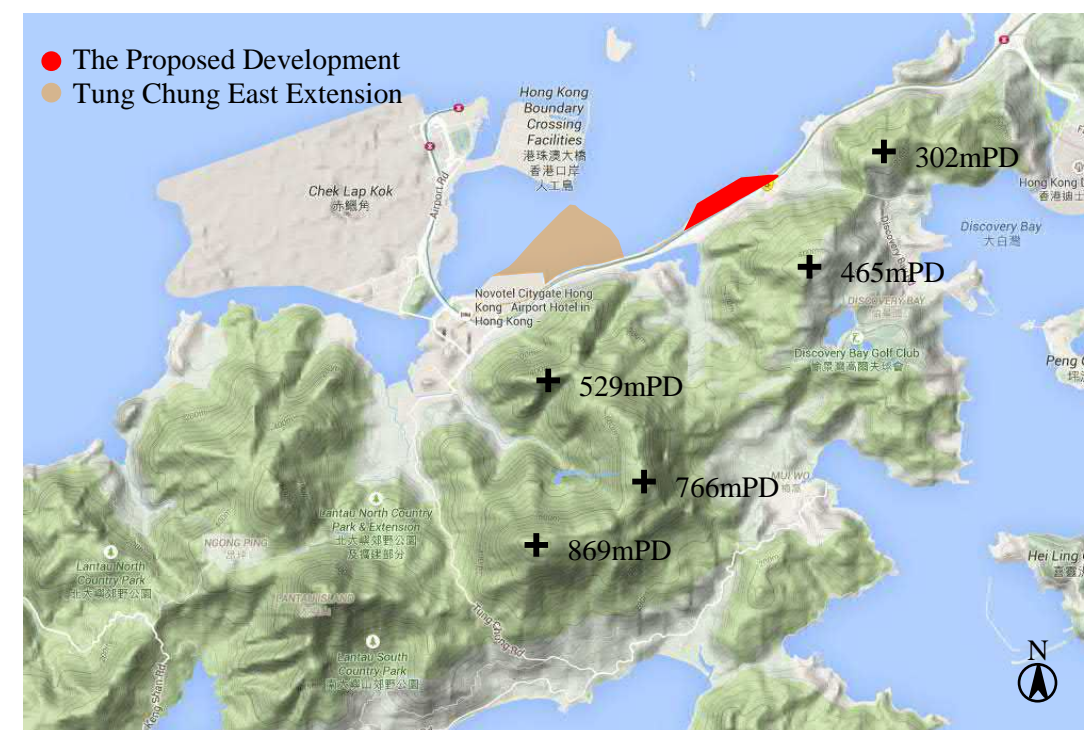
### 2.1 Site Constraints

The Proposed Development, with a site level of about +6.3mPD, is subject to Airport Height Restrictions (AHR) of about +86 to +106mPD (see **Figure 16**). With the 30-hectare depot site decked over to accommodate the Proposed Development, terraced podium platforms will be created above the depot deck with open-air pedestrian levels elevated at +20.1 and +26.5mPD.

**Figure 1 Location of the Proposed Development and its Surrounding Context (Source: Google)**



**Figure 2 Hilly Range near the Proposed Development (Source: Google)**



<sup>1</sup> Survey & Mapping Office of Lands Department, Hong Kong Guide – Gazetteer of Street and Place Names 2015



### 3 Wind Condition

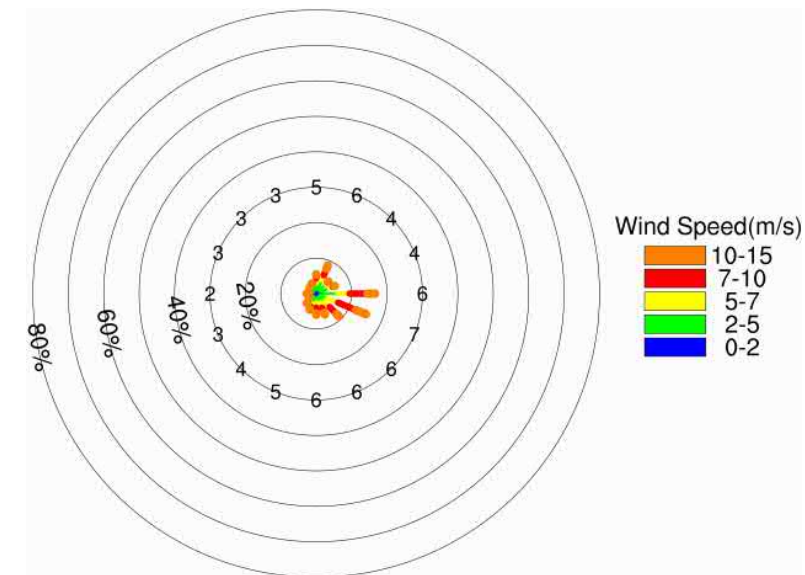
To investigate the wind performance of the Proposed Development, natural wind availability characteristics is essential to the wind environment study. Site wind availability data presented in the wind rose could be used to assess the wind characteristics in terms of the magnitude and frequency of approaching wind from different wind directions.

There are three sources of wind data available for the Proposed Development, including measured data from the Regional Atmospheric Modeling System (RAMS) wind data from Planning Department (PlanD), nearby Hong Kong Observatory (HKO) Station – Siu Ho Wan Weather Station and Site Wind Availability Study (SWAS) of Tung Chung East Extension from wind tunnel.

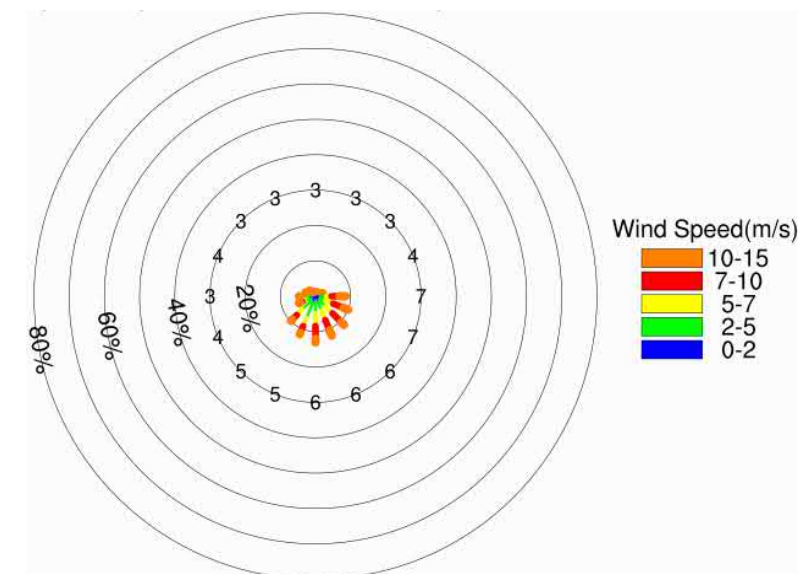
#### 3.1 RAMS Wind Data from PlanD

Various heights of wind data are available from the RAMS wind data published by PlanD. Amongst all, wind data at 200m is suitable for the Proposed Development, taking into consideration its surrounding hilly ranges. The RAMS wind data at 200m from PlanD's website<sup>2</sup> is shown in **Figure 3** and **Figure 4**. The annual and summer prevailing winds are NNE/ E/ ESE/ SE and SE/ SSE/ S/ SSW winds, respectively.

**Figure 3 Annual Wind Rose at Grid (x: 041, y: 040) at 200m (Source: PlanD)**



**Figure 4 Summer Wind Rose at Grid (x: 041, y: 040) at 200m (Source: PlanD)**

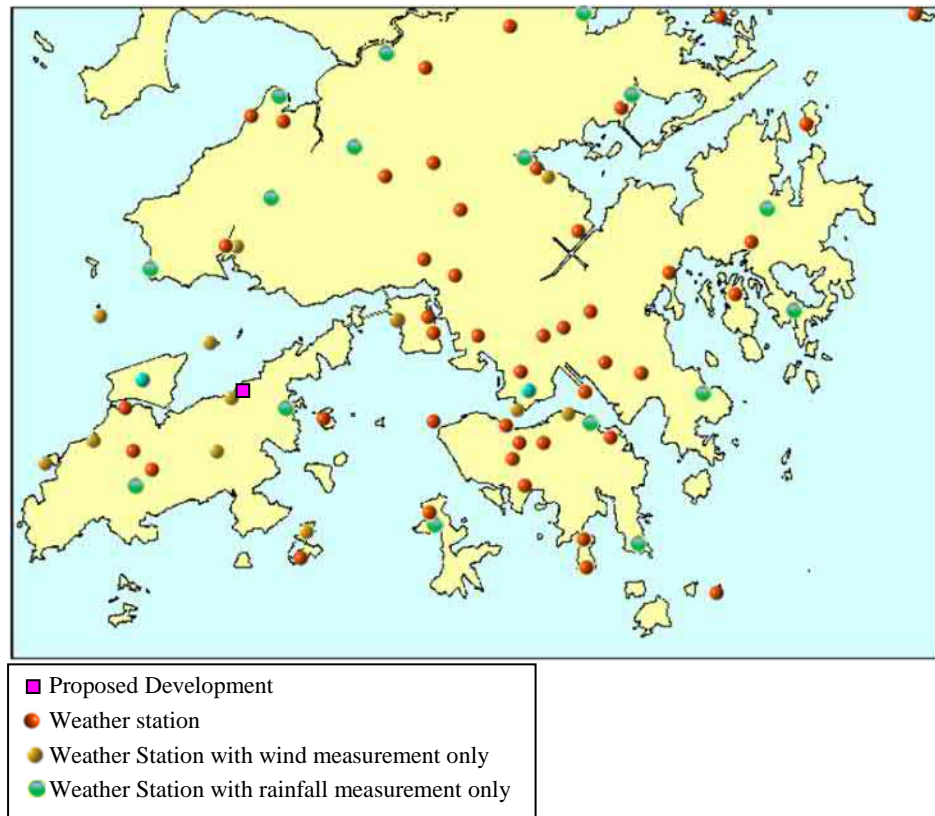


<sup>2</sup> [http://www.pland.gov.hk/pland\\_en/info\\_serv/site\\_wind/site\\_wind/index.html](http://www.pland.gov.hk/pland_en/info_serv/site_wind/site_wind/index.html)

### 3.2 Hong Kong Observatory (HKO)

The HKO weather station at Siu Ho Wan with an anemometer at +15mPD is situated at close proximity to the Proposed Development, as shown in **Figure 5**. Refer to the HKO report<sup>3</sup>, the annual wind rose measured at the Siu Ho Wan weather station (**Figure 6**) has shown that E and S winds are the prevailing wind directions. Prevailing wind directions recorded during the summer months of 2013 are from SSE/S directions, as summarised in **Table 1**. Summer wind rose is not available from the HKO report.

**Figure 5 Weather Stations in Hong Kong (Source: HKO)**



**Figure 6 Annual Wind Rose recorded in the HKO Siu Ho Wan Weather Station in 2013**



**Table 1 Prevailing Wind Recorded in the HKO Siu Ho Wan Weather Station during Summer 2013**

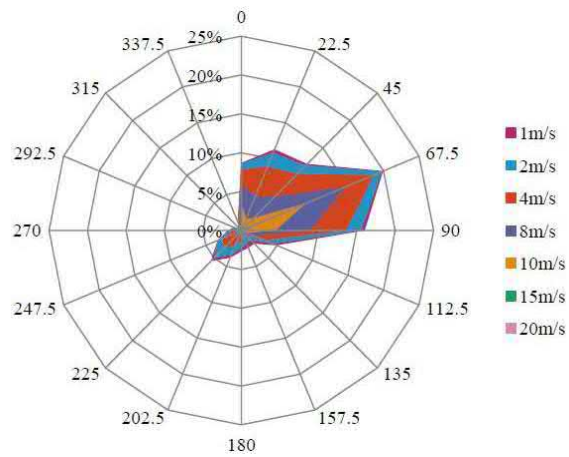
Month	Prevailing Wind Direction
May	170°
June	160°
July	100°
August	170°
September	110°

<sup>3</sup> Hong Kong Observatory, Summary of Meteorological and Tidal Observations in Hong Kong 2013, published in September 2014

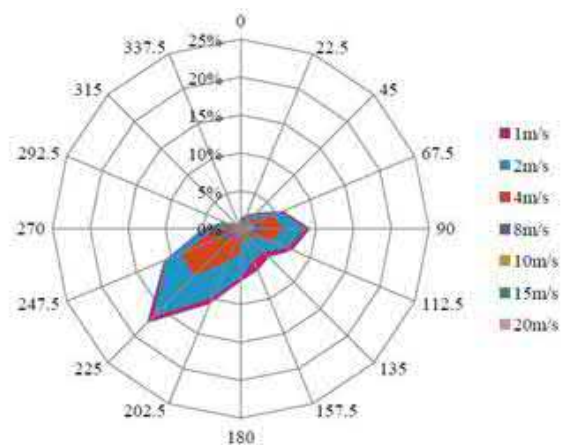
### 3.3 Site Wind Availability of Tung Chung East Extension from PlanD

The Tung Chung East Extension Study experimental site wind data (2012) provided by PlanD has also taken into consideration. The annual and summer wind roses at 200m are shown in **Figure 7** and **Figure 8** respectively. The annual prevailing winds are from NE (12.2%), ENE (20%) and E (16.2%) directions, while the summer prevailing winds are from SSW (11.0%), SW (17.9%) and WSW (11.0%) directions.

**Figure 7 Tung Chung East Extension - Wind Rose for Annual Probability Distribution, 200m Height**



**Figure 8 Tung Chung East Extension - Wind Rose for Summer Probability Distribution, 200m Height**



### 3.4 Summary of the Site Wind Data

These four sets of data are summarized in **Table 2**. All data basically reflects similar annual prevailing wind directions which are NNE/ NE/ ENE/ E/ ESE/ SE, whereas the summer prevailing wind directions varies from SE/ SSE/ S/ SSW/ SW/ WSW.

**Table 2 Prevailing Wind Directions for the Study Area**

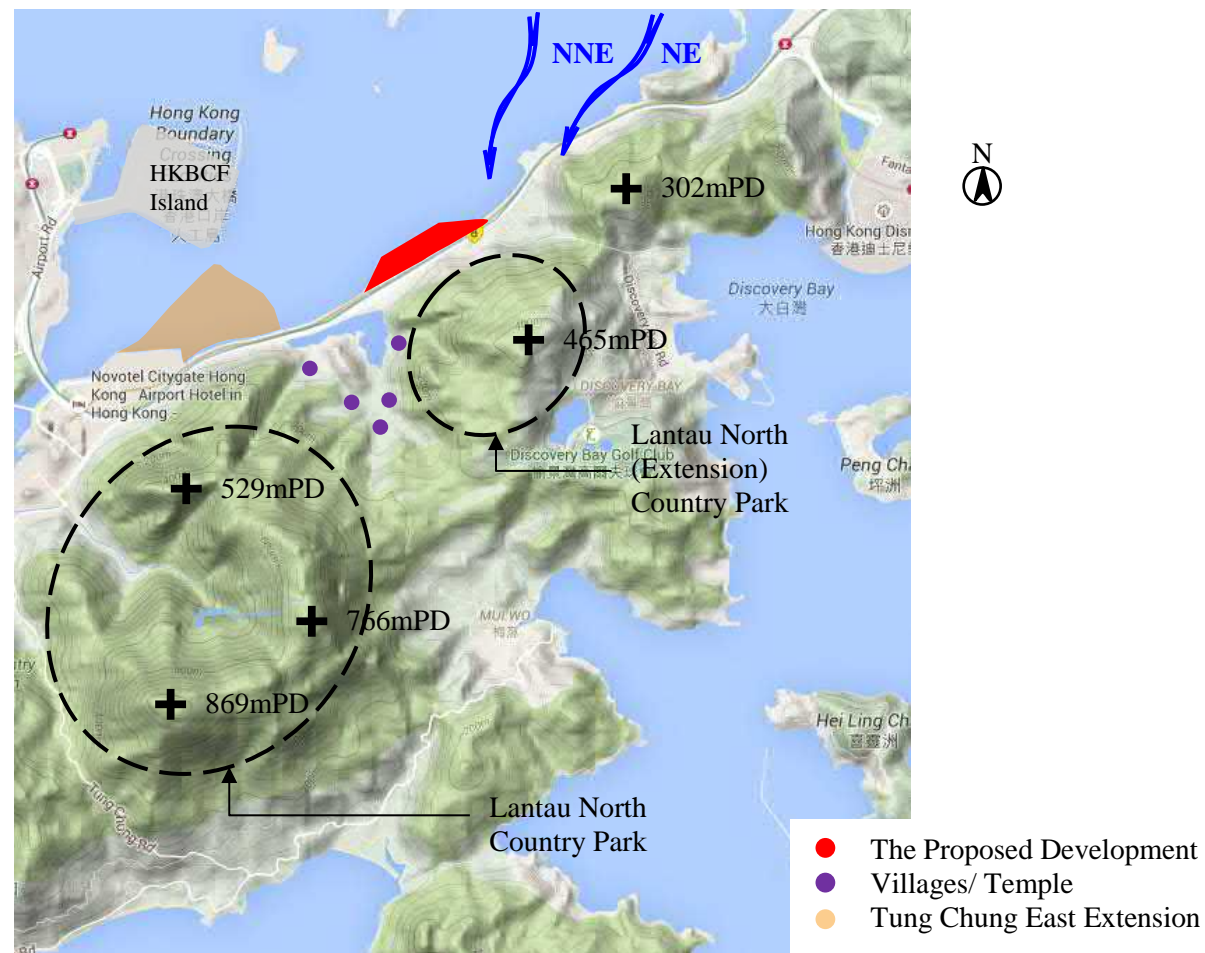
Wind Condition	RAMS (PlanD)	Measured Data (HKO Siu Ho Wan Weather Station)	Measured Data (SWAS of Tung Chung East)
Annual	NNE / E / ESE / SE	E / S	ENE / E / NE
Summer	SE / SSE / S / SSW	SSE / S	SW / SSW / WSW

## 4 Expert Evaluation on Existing Condition with Committed Developments

### 4.1 North-North-Easterly and North-Easterly Winds

North-North-Easterly (NNE) and North-Easterly (NE) winds, as indicated in **Figure 9**, are annual prevailing wind directions. Considering the Proposed Development is situated at Siu Ho Wan which is open to the sea to its northwest and hilly range (dominantly Lantau North (Extension) Country Park) to its southeast. These incoming winds would freely reach and serve the Proposed Development and would further distribute to the leeward areas (such as the existing village clusters).

**Figure 9 Existing Wind Environment under NNE/NE Prevailing Wind Conditions**  
(Source: Google)

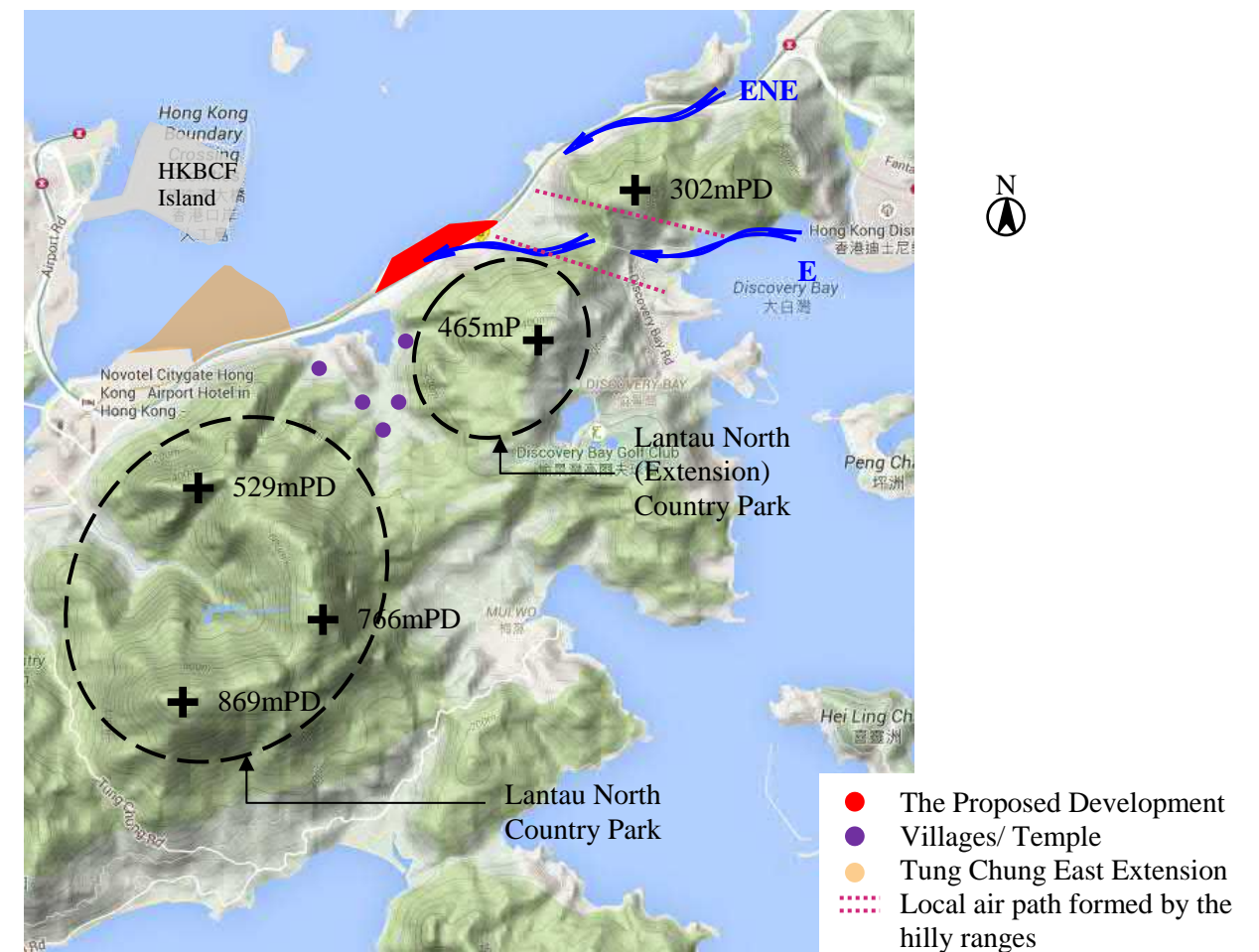


### 4.2 East-North-Easterly and Easterly Winds

The presence of the Lantau North (Extension) Country Park (to the southeast of the Proposed Development) would slightly alter the incoming easterly winds. The approaching wind may reach the Proposed Development via the trough as indicated in **Figure 10**. With such local air path, the easterly wind would likely travel through and therefore, no significant wind stagnant problem would be expected within the Proposed Development. The incoming wind would then travel towards the Tung Chung Area.

The wind environment of the villages and temple would be dominated by the surrounding topography in which the incoming wind will be shielded by the hilly range at their upwind side.

**Figure 10 Existing Wind Environment under ENE/E Prevailing Wind Conditions**  
(Source: Google)

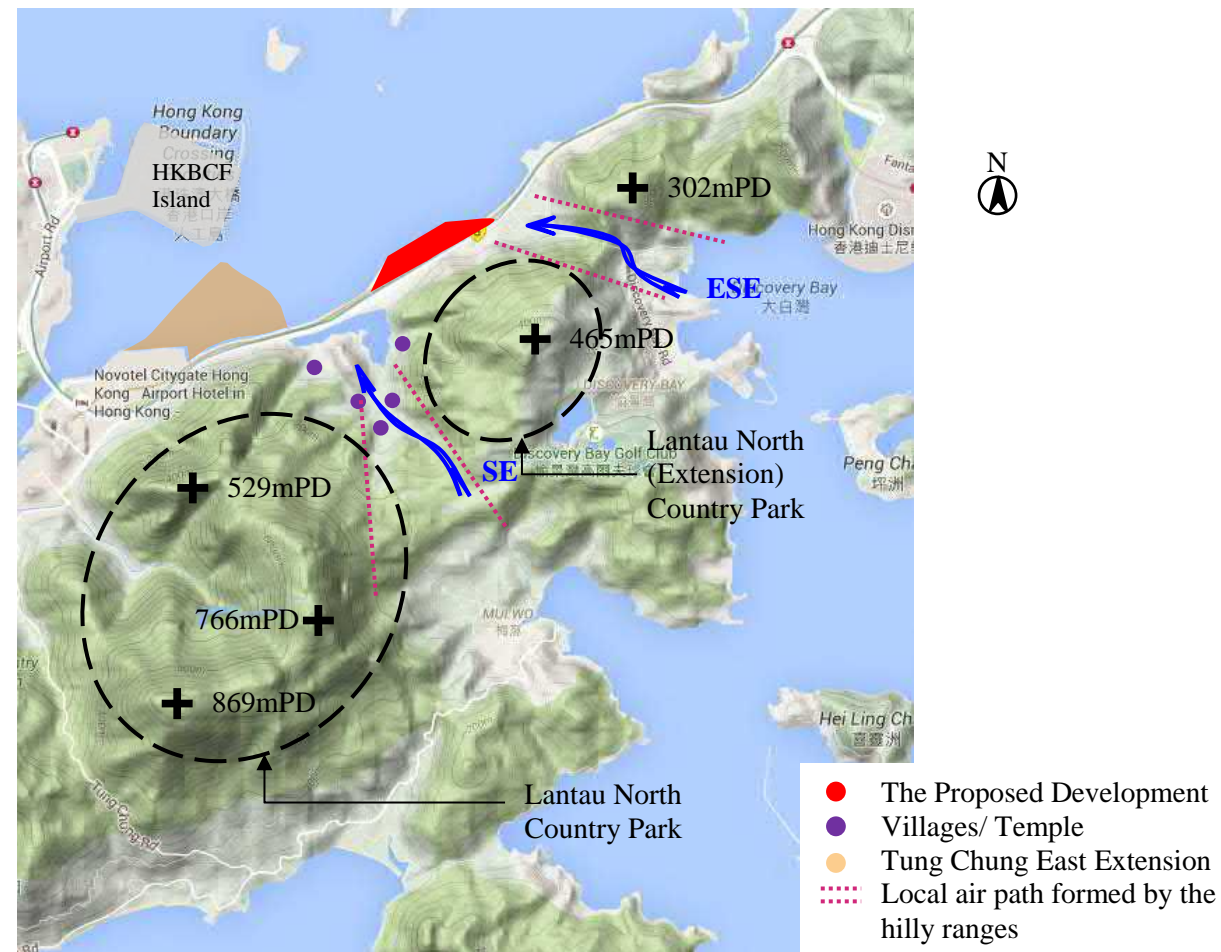


### 4.3 Easter-South-Easterly and South-Easterly Winds

As there is a hilly range with peak level at +465mPD, the incoming ESE/SE wind would be diverted towards the troughs of hilly ranges as indicated by the red dotted lines in **Figure 11**. With these naturally formed local air paths, the existing villages would enjoy the ESE/SE wind though they may be shielded locally by its adjacent topography.

Given the presence of the hilly range to the southeast of the Proposed Development, wind shadow would be expected to cast over part of the Proposed Development which limits the wind availability of these areas. The incoming wind would then travel towards HKBCF Island.

**Figure 11 Existing Wind Environment under ESE/ SE Prevailing Wind Conditions**  
(Source: Google)



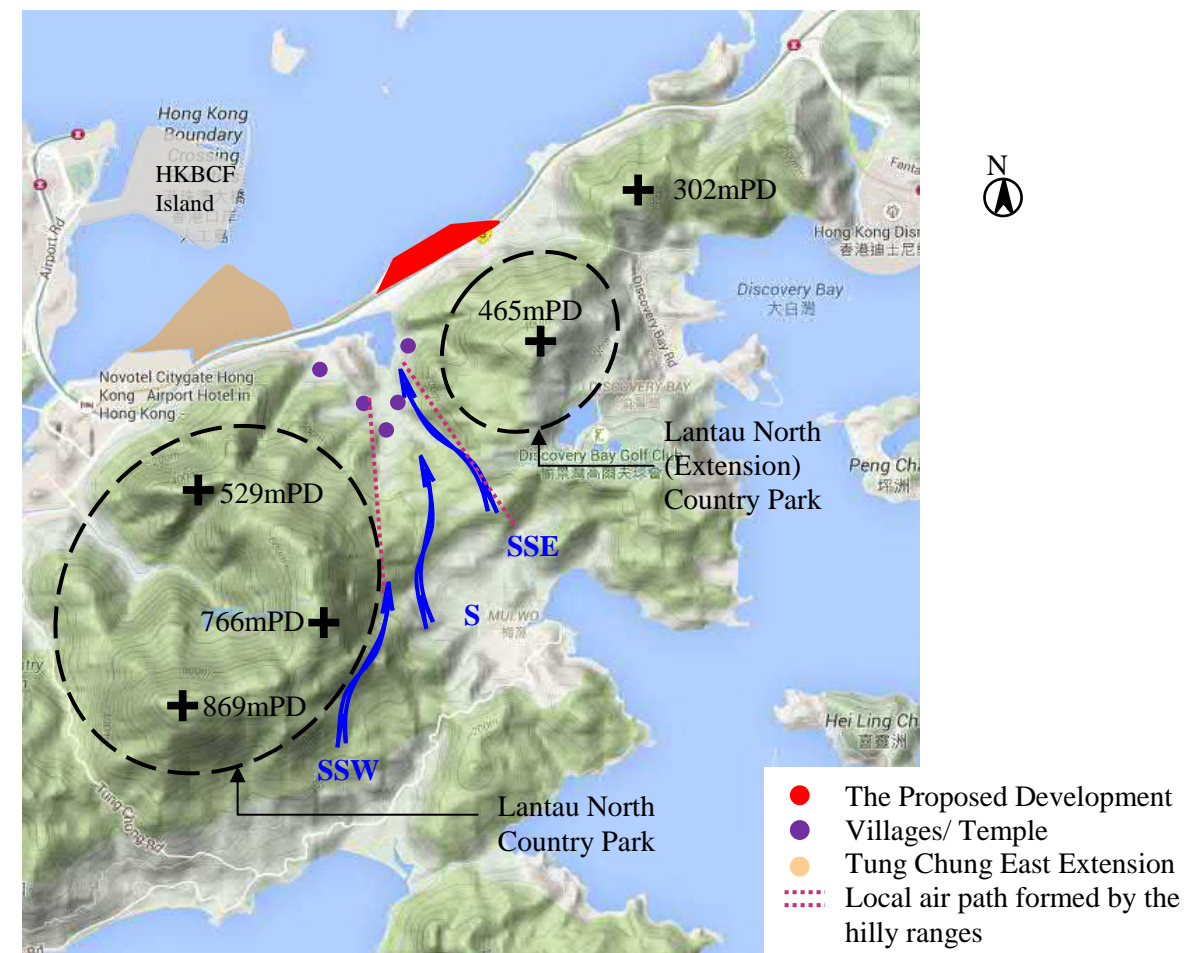
### 4.4 South-South-Easterly, Southerly and South-South-Westerly Winds

Given the presence of the hilly range to the southeast, south and southwest of the Proposed Development, the SSE/S/SSW winds would travel along the trough as indicated in **Figure 12**, to reach the Proposed Development. As the villages and temple are located at the upwind side of the Proposed Development, no significant adverse impact would be expected.

The eastern portion of the Proposed Development would likely be shielded by the hilly range to its southeast. With the existing depot, the incoming wind would freely penetrate across the project site toward the open water. Given the relatively flat and open area between Tung Chung East Extension and the Proposed Development, the HKBCF Island would freely enjoy the incoming wind traveling along the trough.

In the presence of Lantau North (Extension) Country Park, the wind availability to the Proposed Development would be affected.

**Figure 12 Existing Wind Environment under SSE/S/SSW Prevailing Wind Conditions**  
(Source: Google)

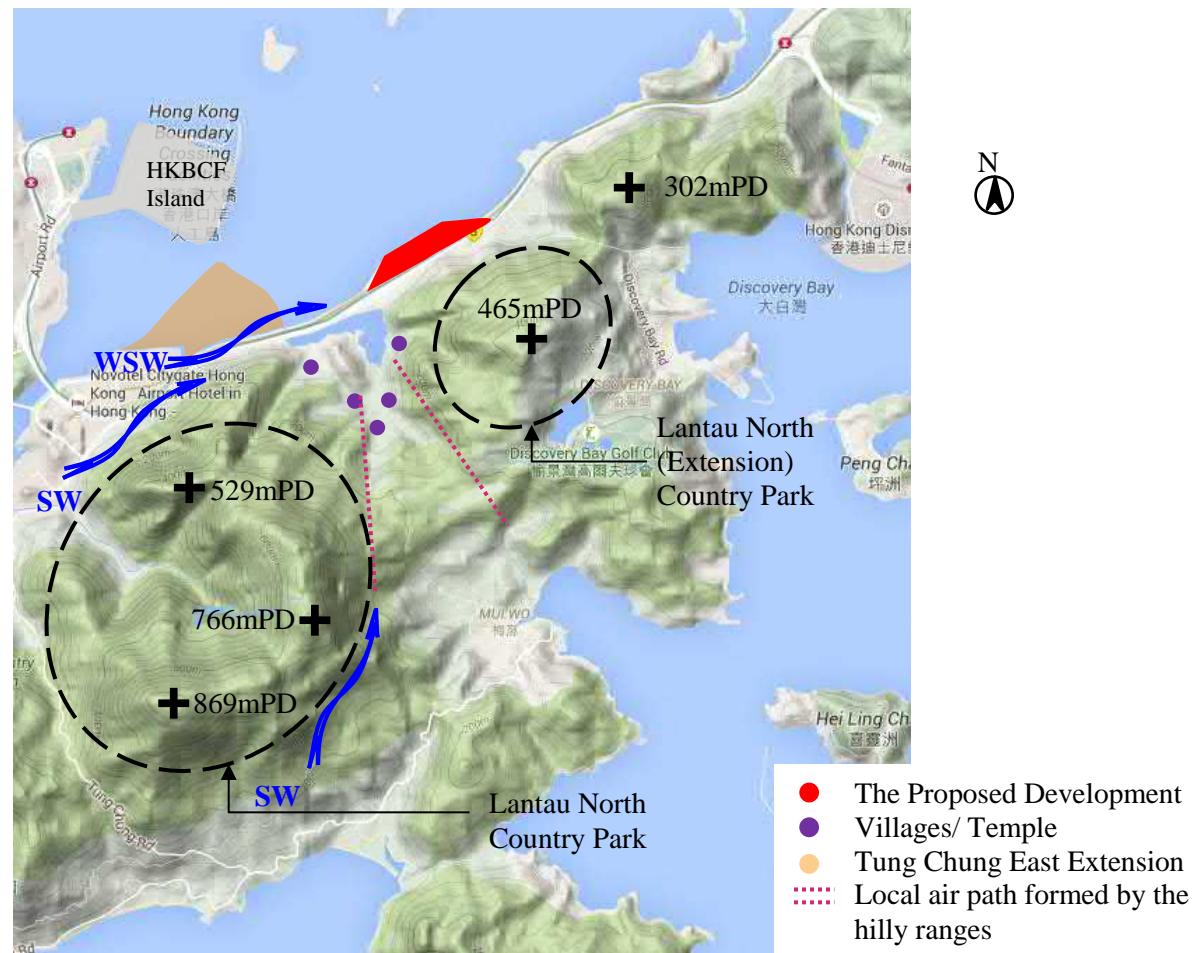


### 4.5 South-Westerly and West-South-Westerly Winds

Both SW and WSW winds would travel along the NLH towards the Proposed Development. In addition, the presence of hilly range to the southeast and southwest of the Proposed Development, i.e. Lantau North Country Park and Lantau North (Extension) Park respectively, would divert the incoming SW wind towards the Proposed Development. These air paths are indicated in **Figure 13**. Tung Chung East Extension would slightly affect the wind availability of WSW wind towards the Proposed Development.

Since the existing village clusters are on the windward side of the Proposed Development, these existing clusters would either freely enjoy the incoming winds under SW or be slightly shielded by its surrounding topography under WSW. The approach wind would then serve the Proposed Development as well as its leeward areas. The wind would then travel along the NLH towards the leeward areas.

**Figure 13 Existing Wind Environment under SW/WSW Prevailing Wind Conditions**  
(Source: Google)



## 5 The Proposed Development

The proposed Development Scheme consists of mid-rise towers which are disposition to enable the introduction of four 30m-wide breezeways running diagonally across the Proposed Development (shown by the red dotted lines in **Figure 14**) and six NW-SE running air paths perpendicular to North Lantau Highway (NLH)/ Lantau Airport Railway (LAR) with minimum width of 15m for the wind penetration to supplement the air flow for the building clusters as shown by the blue dotted lines. Among the four proposed breezeways shaded in green and purple, two of them function as the breezeways of the Proposed Development under NE/ENE/S winds (shaded in green) and two under E wind (shaded in purple). Nevertheless, these breezeways perform differently under different wind directions. For example, the one for E wind would be less effective for NE/ENE/S wind directions.

On the other hand, the arrangement of the self-protecting design buildings along the southern boundary is essential to mitigate noise impacts from NLH and LAR. Curvilinear disposition of the buildings has been adopted to optimise the permeability with building gaps to break down the clusters. Meanwhile, such curvilinear disposition creates a funnel-like arrangement facing open water to the northwest quadrant and NLH to the southeast quadrant of the site, which would favour more winds from NNE/ESE/SSE/SSW direction to enter the breezeway and subsequently enhance the wind performance at pedestrian level within the Proposed Development.

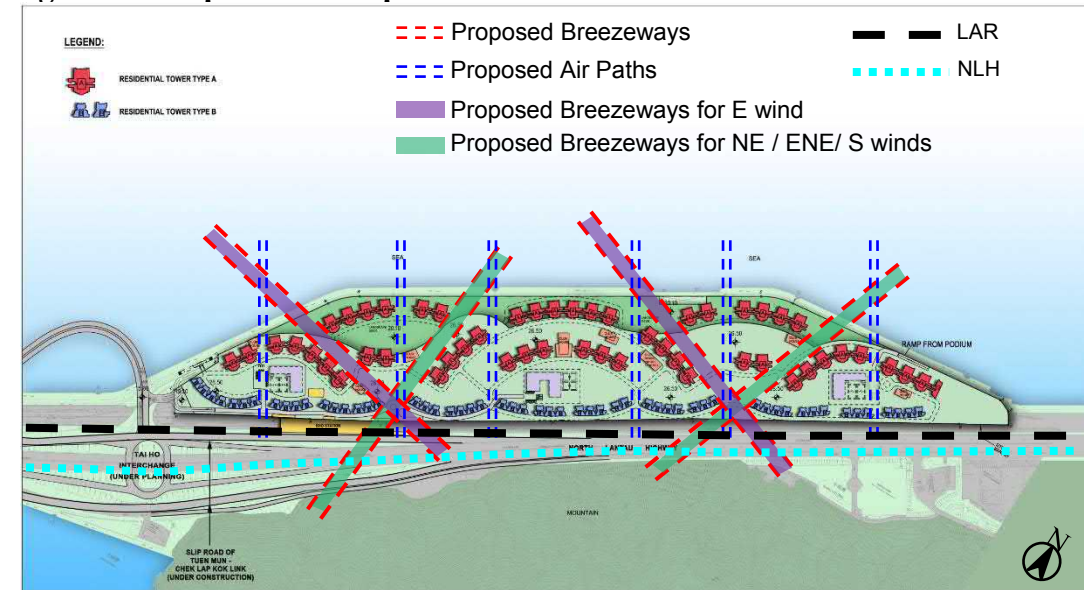
In addition, each residential tower was designed with no residential flats on podium, except for the necessary lift lobby, plant rooms and core structures, to minimize the building footprint at podium level (as shown in **Figure 16**) which would enhance the permeability and help to smooth the wind penetration through the Proposed Development.

Key development parameters of the Proposed Development are summarized in **Table 3** and the proposed Development Scheme is shown in **Figure 14**.

**Table 3 Key Development Parameters**

Site Area	About 30ha
Number of Residential Units	About 14,000
Commercial GFA	About 30,000m <sup>2</sup>
No. of Towers	About 108
No. of Schools	3

**Figure 14 Proposed Development Scheme**



In compliance with the AHR (refer to **Figure 15**), building height gradually descends from the eastern end (22 residential storeys, excluding lobby) towards the western end (15 residential storeys, excluding lobby) across the Proposed Development as shown in **Figure 15**. Such minor variation in building heights would slightly promote air movements and prevent air stagnation under SW wind.

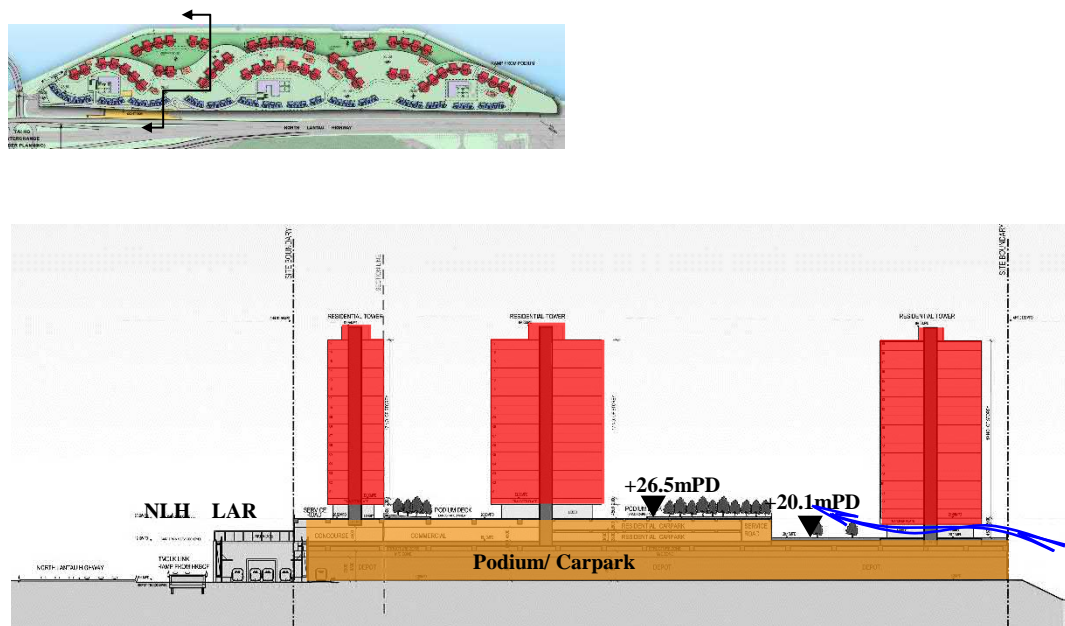
**Figure 15 Proposed Building Height Profile**



The terraced podium design has created two stepping levels at +20.1mPD and +26.5mPD over the depot deck as shown in **Figure 16**. Such terraced podium would help directing downward airflow to the pedestrian level as mentioned in HKPSG<sup>4</sup>, especially when the incoming wind is from the open water at NW quarter. The wind environment would be slightly enhanced by directing incoming winds to the pedestrian level of the podium deck accessible by residents of the Proposed Development.

With the objective to achieve better air ventilation and enhance the environmental quality of the living environment, the proposed Development Scheme is formulated with reference to the building setback, building separation, and site coverage of greenery requirements stipulated under the *Sustainable Building Design Guidelines* promulgated by Buildings Department. Specifically, total greenery area equivalent to 30% of the site coverage will be provided. Given the depot is located at grade and the pedestrian circulation is primarily elevated on the podium deck levels, the required greenery will be provided at the podium deck levels to enhance the pedestrian environment. In terms of the building separation, the proposed Development Scheme has allowed 20% and 33.3% of permeability on two projection planes.

**Figure 16 Terraced Podium Design**



<sup>4</sup> Planning Department (2015) Hong Kong Planning Standards and Guidelines, Ch. 11 – Urban Design Guidelines, Available at [http://www.pland.gov.hk/pland\\_en/tech\\_doc/hkpsg/full/ch11/ch11\\_text.htm](http://www.pland.gov.hk/pland_en/tech_doc/hkpsg/full/ch11/ch11_text.htm)



## 6 Expert Evaluation of the Proposed Development Scheme

### 6.1 North-North-East and North-Easterly Winds

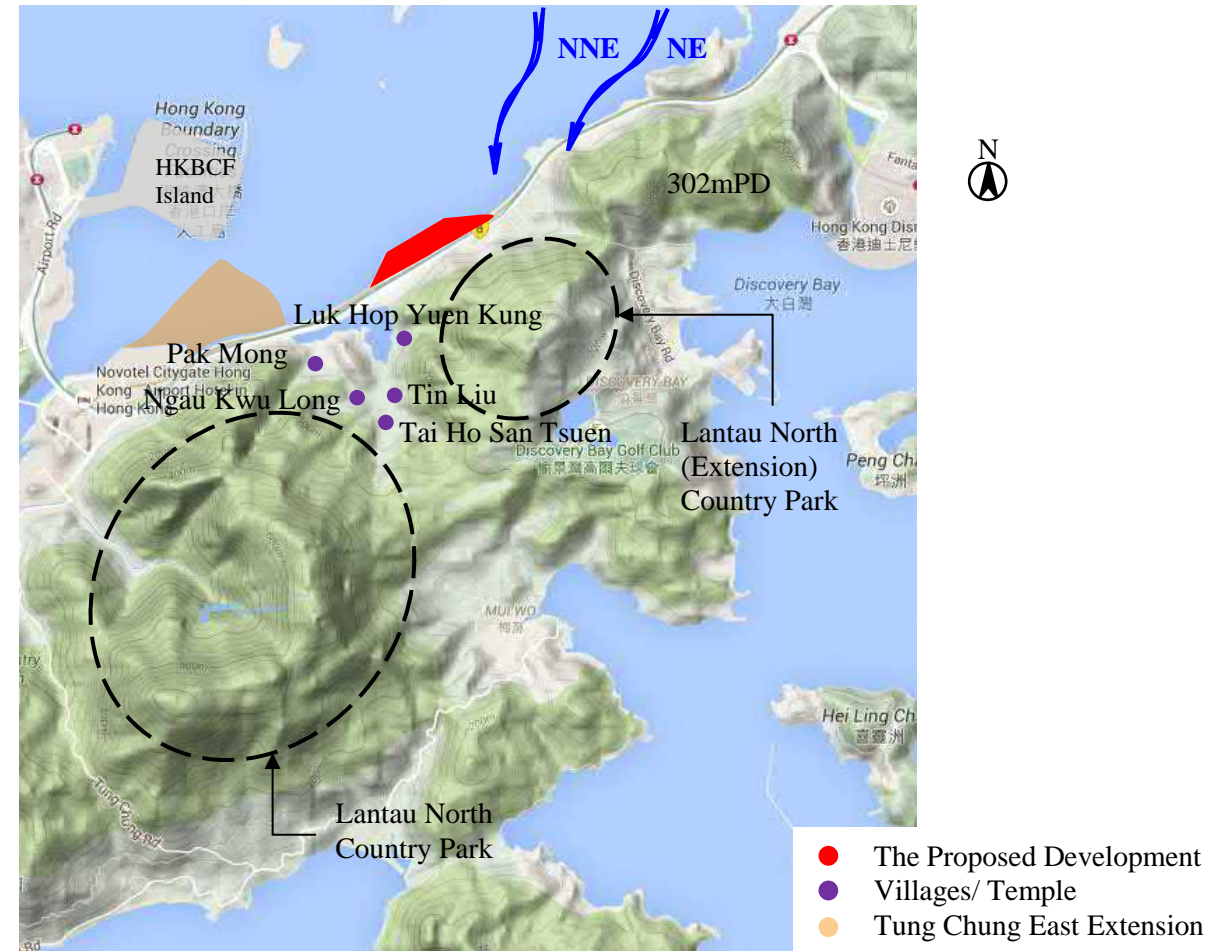
As the Proposed Development is currently located adjacent to the seashore and there is no significant man-made or natural infrastructure, the incoming wind would freely reach the Proposed Development as illustrated in **Figure 9**.

As the proposed breezeways highlighted in **Figure 14** are generally aligned with the incoming NNE/NE winds, the incoming wind would travel through, as well as the supplementary air paths, and ventilate its leeward area within the Proposed Development. In addition, the terraced podium design would divert the incoming NNE/NE winds towards the pedestrian level on the podium deck to enhance the wind environment on the podium deck. Although the podium deck would cast wind shadow over the NLH/LAR, its immediate leeward side is not pedestrian accessible and therefore negligible impact would be expected to the pedestrian.

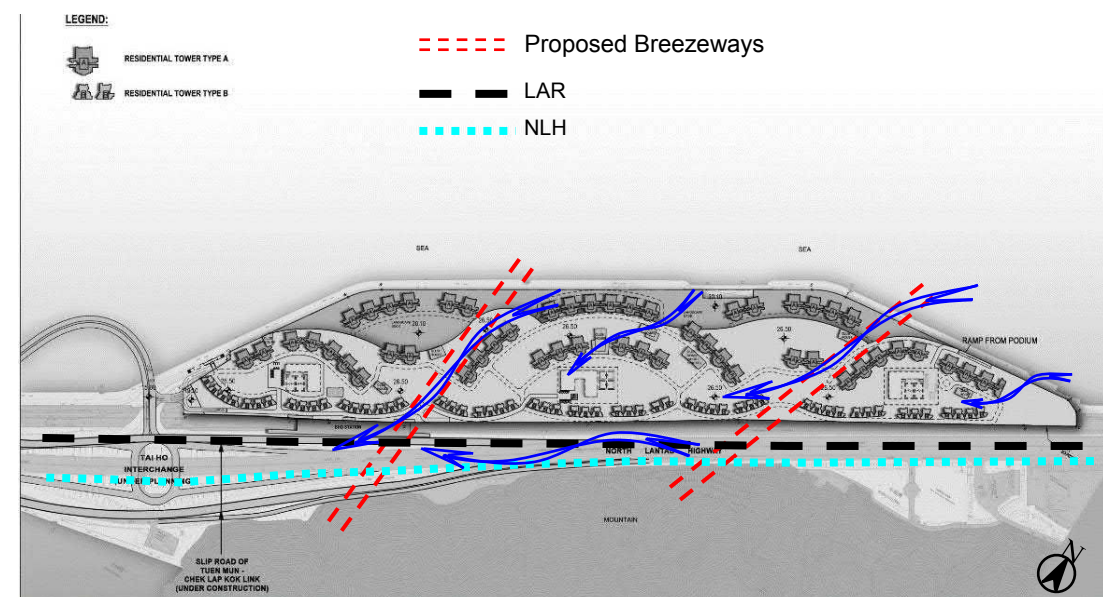
The NLH/LAR would serve as a major wind corridor to Siu Ho Wan and Tung Chung areas that will facilitate the incoming wind to further distribute to the leeward areas. The relatively open and flat area (where the existing village clusters in Pak Mong, Ngau Kwu Long, Tai Ho San Tsuen and Tin Liu and Luk Hop Yuen Kung locate) between Lantau North Country Park and Lantau North (Extension) Country Park would form a ventilation pocket, as shown in **Figure 17**. The curvilinear tower disposition would favour incoming wind to enter the proposed breezeways as indicated by the red dotted lines in **Figure 18**. The incoming wind would then travel along the proposed breezeways and merge at the NLH, as shown in **Figure 18**, which would further distribute towards the ventilation pocket and therefore, the existing village clusters would enjoy the incoming wind that travel along the proposed breezeways. Together with the distance between the Proposed Development and the existing villages/temple, the incoming low-level wind would skim over the podium deck and reattach to the pedestrian level of these existing building clusters. Therefore, the Proposed Development would impose insignificant air ventilation impact to the existing villages/temple cluster.

Considering the existing Tung Chung New Town and the planned Tung Chung East Extension are located far away (about 5km and 2.8km respectively) from the Proposed Development, insignificant air ventilation impact on the Tung Chung area would be expected.

**Figure 17 Wind Performance under NNE/NE Winds (Source: Google)**



**Figure 18 Wind Performance in Closer View of Proposed Development under NNE/NE Winds**



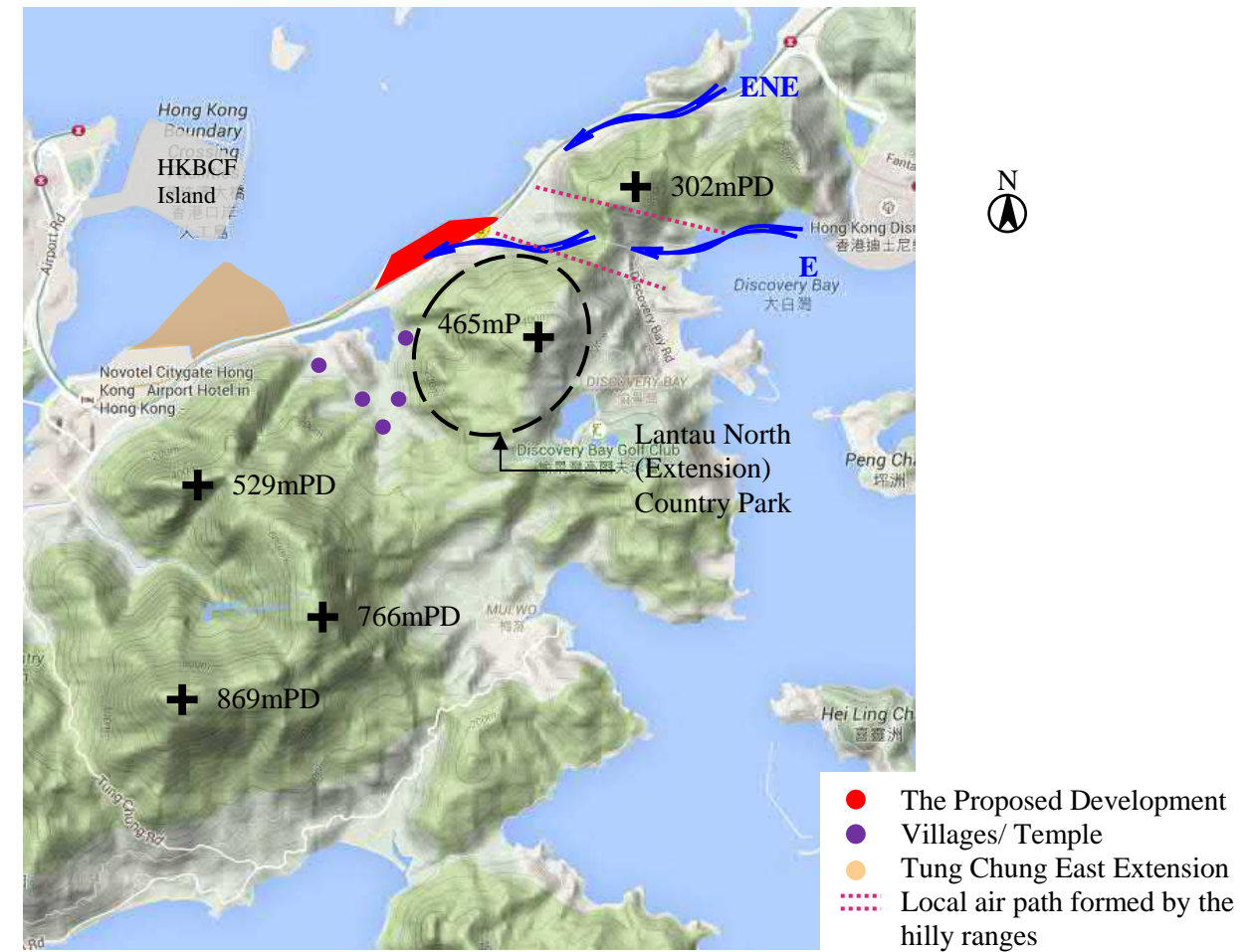
## 6.2 East-North-Easterly and Easterly Winds

As the hilly range (Lantau North (Extension) Country Park) is located to the southeast of the Proposed Development, the easterly wind would be diverted and travel along the trough between hilly ranges as indicated in **Figure 10**. Given the alteration of the approaching wind direction, the self-protecting design buildings along the southern site boundary would divert the approaching wind to travel along the NLH. The air paths and building gaps between the self-protecting design buildings would marginally allow the easterly wind to serve the Proposed Development. Two dedicated breezeways along E-W direction would facilitate wind penetration across the Proposed Development as indicated in **Figure 10**.

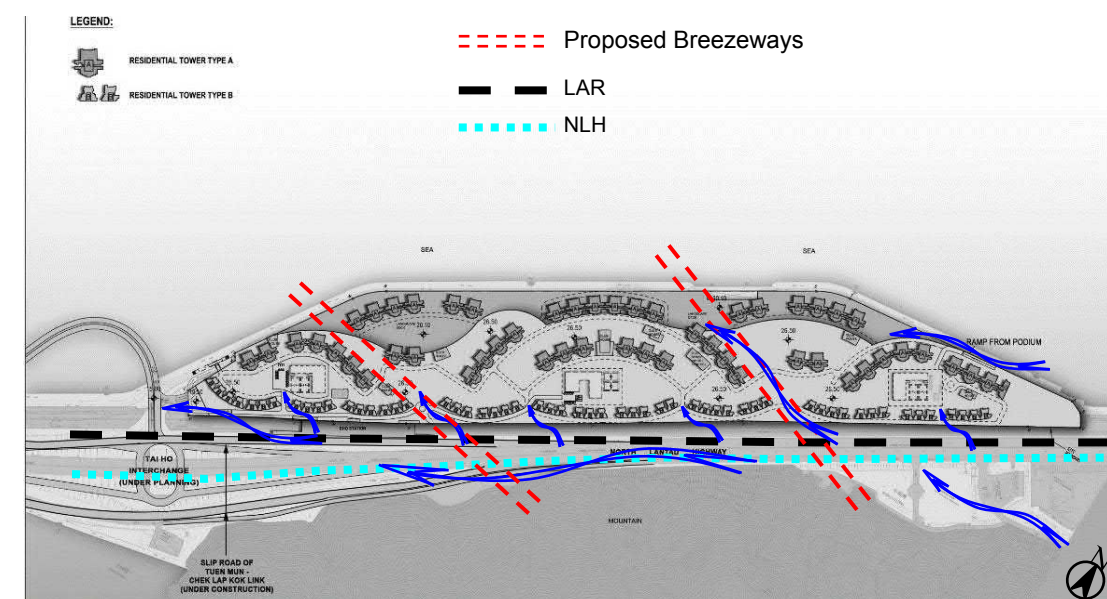
The Proposed Development would cast wind shadow over the open water. However, with the provision of the breezeways and the building gaps available in the Proposed Development, the wind shadow would be reduced.

As shown in **Figure 20**, the proposed breezeway running across the northeast part of the Proposed Development would be expected to have more wind penetration, as the majority of wind will flow along the district wind corridor of NLH and further penetrate through the proposed breezeway to the west, the proposed air paths and available building gaps among the self-protecting design buildings.

**Figure 19 Wind Performance under ENE/E Winds (Source: Google)**



**Figure 20 Wind Performance in Closer View of the Proposed Development under ENE/ E Winds**



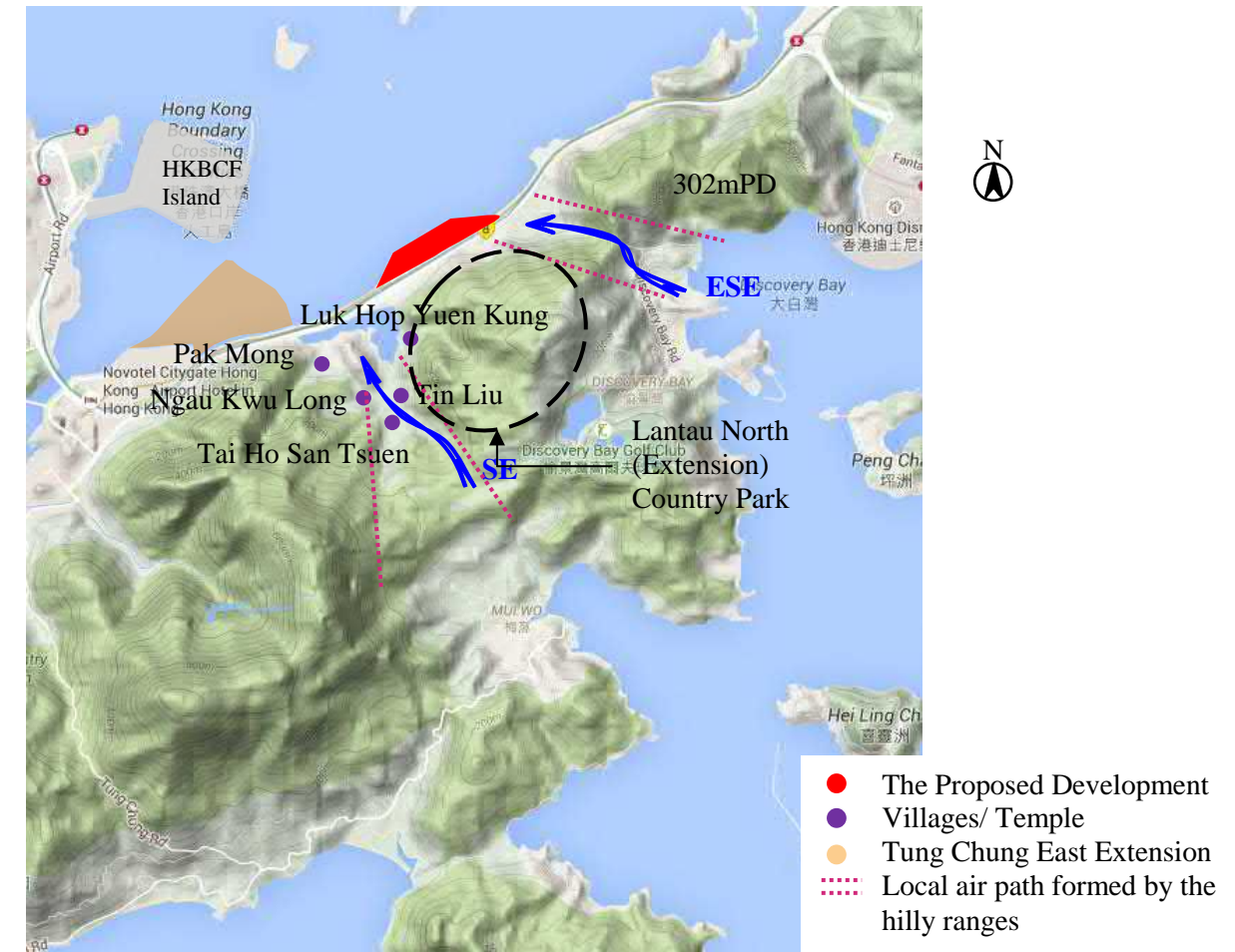
### 6.3 East-South-Easterly and South-Easterly Winds

The presence of hilly range (i.e. Lantau North (Extension) Country Park) to the southeast of the Proposed Development would shield some incoming ESE/SE winds at localized area. The trough to the southeast and southwest of the Proposed Development would become the major local air path under ESE/SE wind condition as indicated in **Figure 11**. The incoming ESE/SE winds would serve the Proposed Development via the gentle slope of the hilly range and further travel through the local air paths towards the sea shore as illustrated by the blue arrows in **Figure 21** and **Figure 22**.

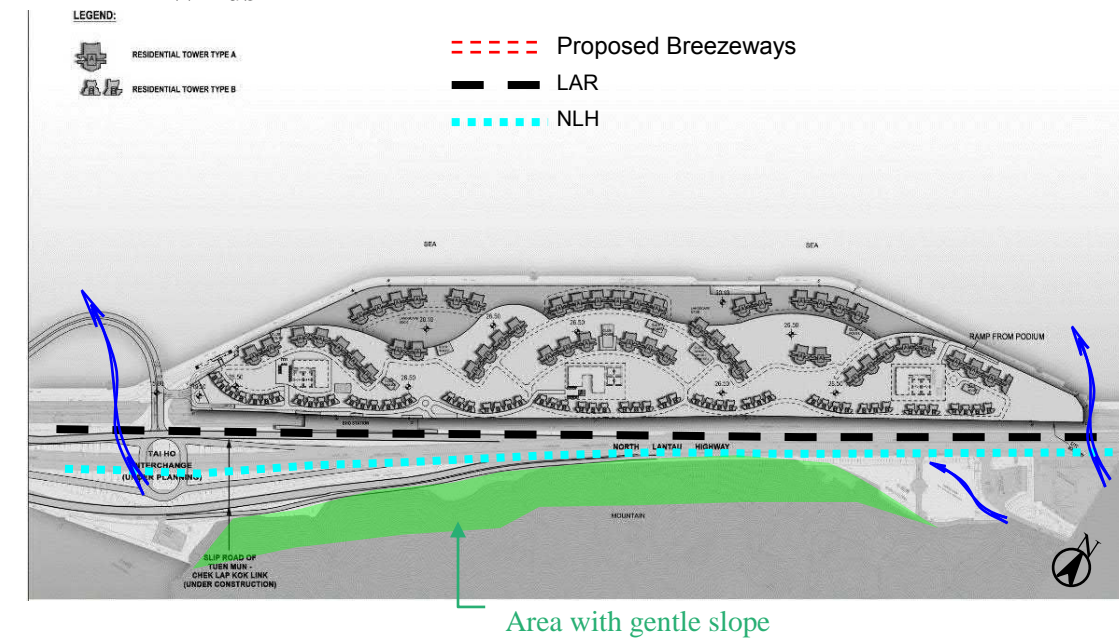
Considering the hilly range is situated at the upwind of the Proposed Development under ESE/SE winds, the Proposed Development would be fallen into the wind shadow of the hilly range. Therefore, the wind environment at the central part of the Proposed Development would be expected to be relatively calm under ESE/SE winds. Although small amount of incoming wind would reach the Proposed Development via the gentle slope of hilly range, the self-protecting design buildings along the southern site boundary would limit the wind penetration towards the Proposed Development. Therefore, the proposed breezeways and supplementary air paths would slightly enhance the wind permeability of the Proposed Development.

The existing village clusters in Pak Mong, Ngau Kwu Long, Tai Ho San Tsuen and Tin Liu and Luk Hop Yuen Kung, are located at the windward side of the Proposed Development, as shown in **Figure 21**, therefore the Proposed Development would have negligible impact to the wind performance of the villages/temple under ESE/SE wind conditions.

**Figure 21 Wind Performance under ESE/SE Winds (Source: Google)**



**Figure 22 Wind Performance in Closer View of the Proposed Development under ESE/ SE Winds**



### 6.4 South-South-Easterly, Southerly and South-South-Westerly Winds

The presence of hilly range to the southeast and southwest of the Proposed Development would dominantly shield the incoming SSE/S/SSW winds such that the trough to the southwest of the Proposed Development would become the major local air path under summer wind conditions as indicated in **Figure 23**. The incoming SSE/S/SSW winds would be affected to reach the Proposed Development.

The gentle slope near the hilly range would allow summer prevailing wind to travel along NLH/LAR. The openness of the NLH/LAR would favour wind penetration. The available building gaps between the self-protecting design building clusters as well as the six air paths running perpendicular to NLH/LAR would supplement the summer air flow to serve within Proposed Development. Two of the dedicated breezeways running in N-S direction would allow summer wind to penetrate across the Proposed Development as indicated in **Figure 24**. However, the proposed breezeway running across the southwest part of the Proposed Development would be expected to have more wind penetration, as the majority of wind will flow along the trough to the southwest of the Proposed Development and further penetrate through the proposed breezeway in the west, the proposed air paths and available building gaps among the self-protecting design buildings. On the other hand, the Lantau North (Extension) Country Park would affect the wind availability towards the proposed breezeway to the east. Therefore, the northeastern portion of the Proposed Development would be relatively calmer than its northwestern portion.

On the other hand, the SSE wind would be diverted to flow towards NLH/LAR where the wake zone of Lantau North (Extension) Country Park would be created. Therefore, the diverted wind would penetrate along the proposed breezeway to the west. The curvilinear tower arrangement would also facilitate the incoming wind to enter the proposed breezeways.

The existing villages/temple cluster is located at the windward side of the Proposed Development, therefore the Proposed Development would have negligible impact to the villages/temple under the SSE/S/SSW wind conditions.

Figure 23 Wind Performance under SSE/S/SSW Winds (Source: Google)

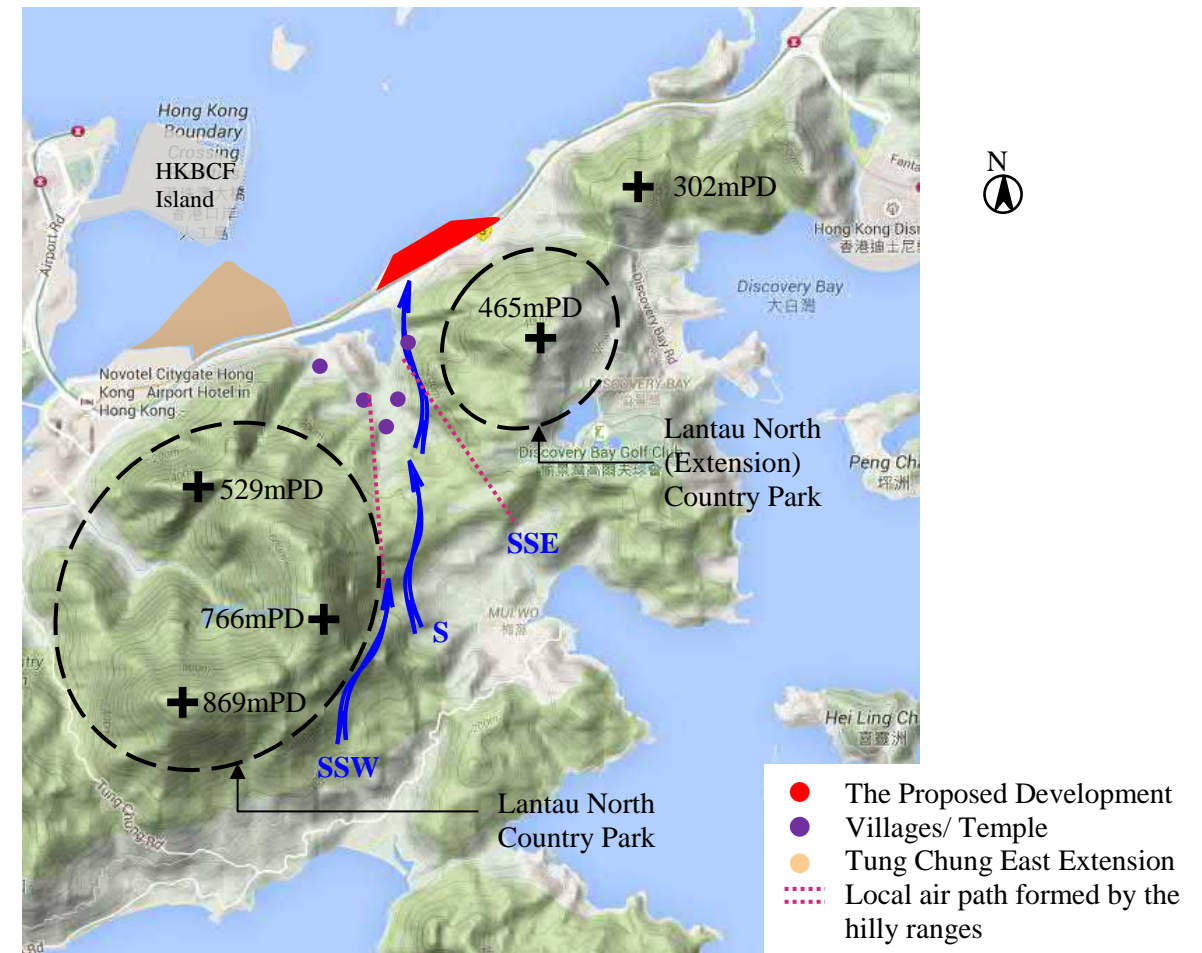
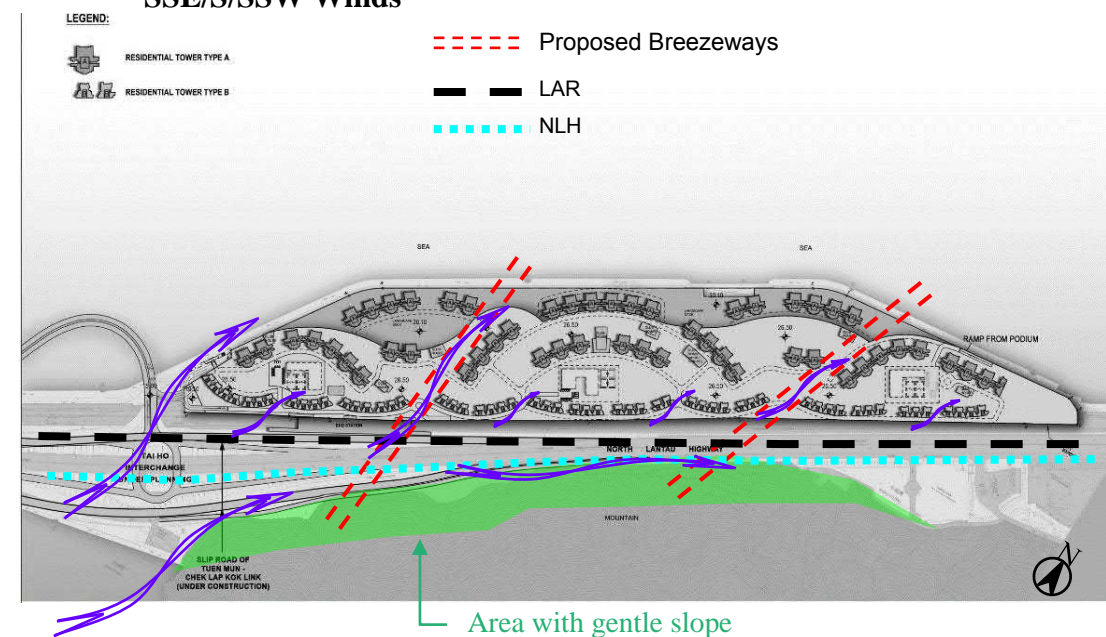


Figure 24 Wind Performance in Closer View of the Proposed Development under SSE/S/SSW Winds



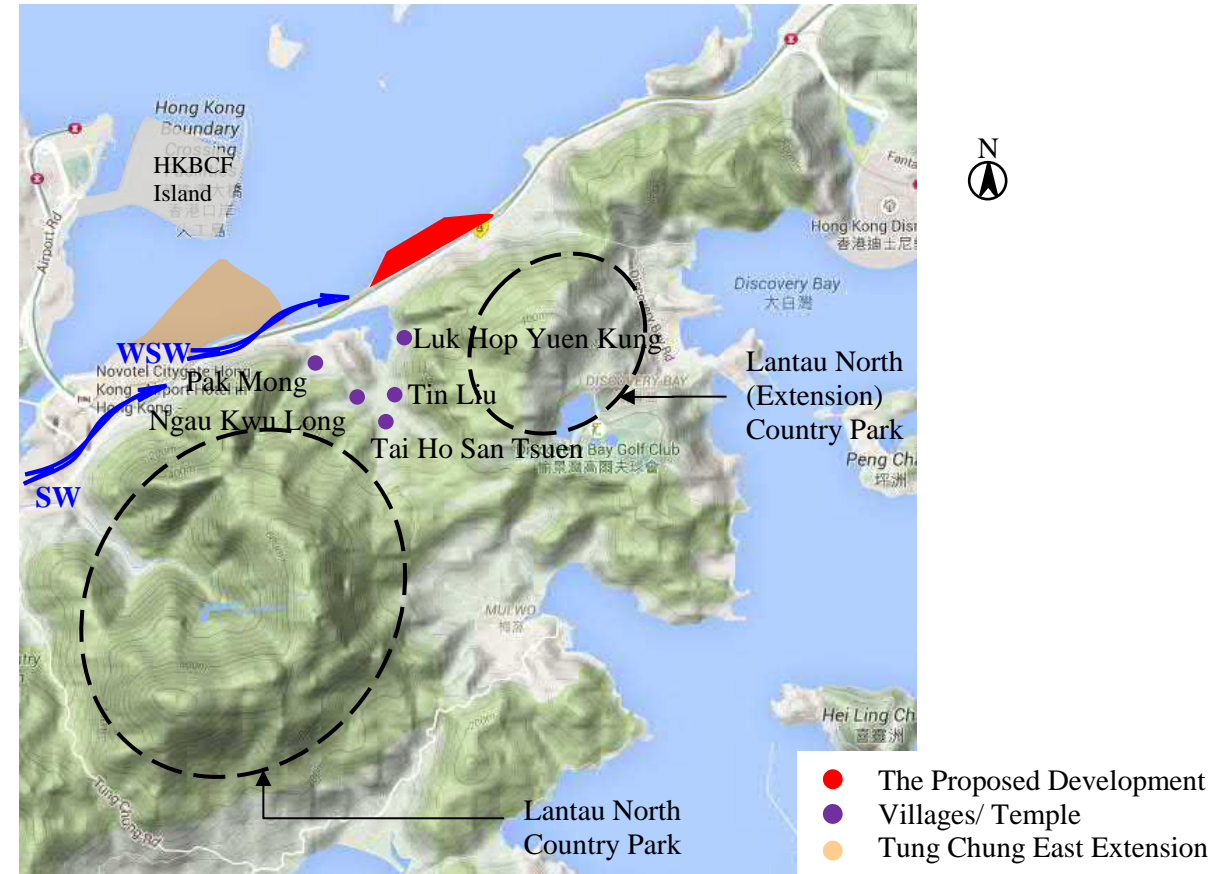
### 6.5 South-Westerly and West-South-Westerly Winds

Both SW and WSW winds would travel along the NLH/LAR towards the Proposed Development. In addition, the presence of hilly range to the southeast and southwest of the Proposed Development, i.e. Lantau North Country Park and Lantau North (Extension) Country Park respectively, would divert the incoming SW wind toward the Proposed Development as indicated in **Figure 13**.

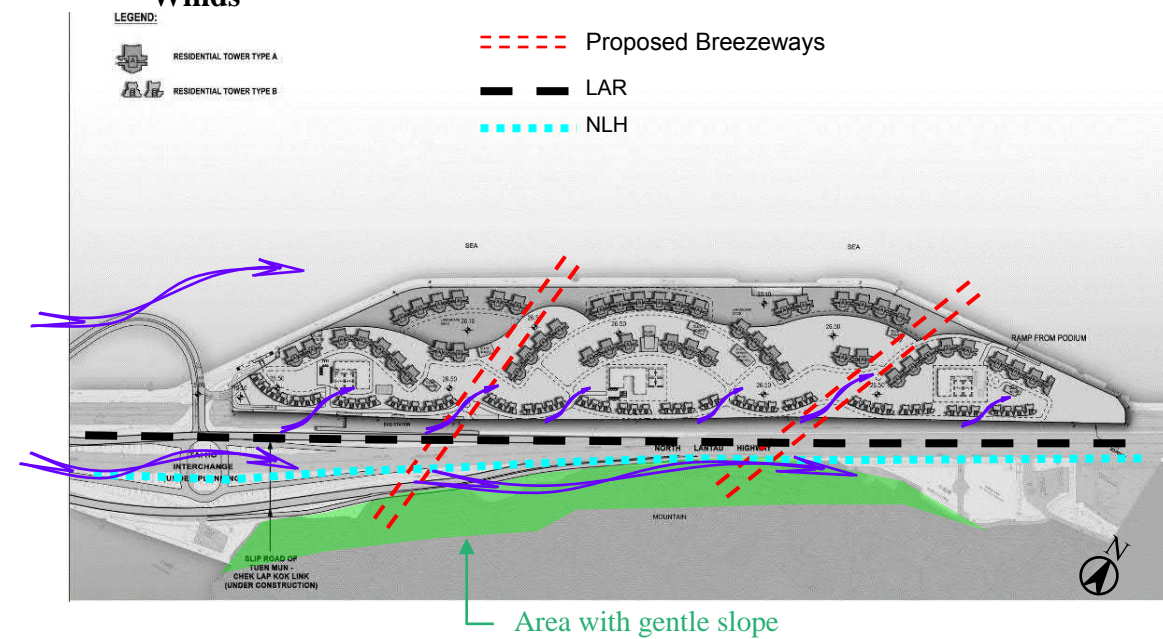
With the distance between Proposed Development and Tung Chung East Extension (about 2.8km), the incoming wind would reattach to the open sea and serve the Proposed Development. Merging with another portion of incoming wind running along NLH/LAR, the Proposed Development would be ventilated via the building gaps between leading towers along NLH/LAR (i.e. the southeast bound of local air paths and proposed breezeways), as shown in **Figure 25**. The wind would then ventilate the Proposed Development via the available building gaps as indicated in **Figure 26**. Whilst the proposed breezeways are better aligned to facilitate penetration of NE/ENE/S winds, minor wind penetration would be expected for SW and WSW winds.

The villages/temple cluster is located at the windward side of the Proposed Development, as shown in **Figure 25**, therefore the Proposed Development would have negligible impact to the existing villages/temple under SW/WSW wind conditions.

**Figure 25 Wind Performance under SW/WSW Winds (Source: Google)**



**Figure 26 Wind Performance in Closer View of the Proposed Development under SW/WSW Winds**



## 7 Conclusion

MTR Corporation has commissioned a multi-disciplinary consultancy study on the proposed comprehensive residential and commercial development at Siu Ho Wan Depot, with the aim to optimise housing land supply to support Government policy. An Air Ventilation Assessment (Expert Evaluation) has been undertaken to aid the formulation of a proposed Development Scheme, with reference to the Sustainable Building Design Guidelines, to provide some 14,000 residential units, a neighbourhood shopping mall, and recreational, transport and supporting facilities. A new MTR Station along Tung Chung Line has been proposed at the western position of the Proposed Development to serve the local community.

Among various sources of wind data, the annual prevailing wind is NNE/NE/ENE/E/ESE/SE directions and the summer prevailing wind is SE/SSE/S/SSW/SW/WSW directions.

Four 30m-wide major breezeways at diagonal positions are proposed to generally aligned with the annual and summer prevailing wind directions to enhance permeability within the Proposed Development and minimize the impact to the surrounding areas. In addition, six air paths with minimum 15m-wide are proposed along the NW-SE direction perpendicular to North Lantau Highway/Lantau Airport Railway to supplement the air flow penetration within the Proposed Development. The effectiveness of these proposed breezeways would vary under different wind directions.

Terraced podium design has been adopted to create two levels at +20.1 and +26.5mPD over the depot deck to marginally enhance air flow. As the Proposed Development is located near seashore and bounded by hilly ranges, it would generally enjoy the sea breeze (i.e. NNE/NE wind directions). Under the ENE/E/ESE/SE/SSE/S/SSW/SW wind directions, however, the troughs located within the hilly ranges would become the major wind corridor to the Proposed Development.

Curvilinear disposition of the buildings creates funnel-like arrangement facing open water to the northwest and NLH to the southeast of the site, which would favour more winds from NNE/ESE/SSE/SSW direction to enter the proposed breezeways and subsequently enhance the wind performance within the Proposed Development. Meanwhile, reducing the building footprint of each residential block at podium level would enhance the permeability and help to smooth the wind penetration through the Proposed Development.

The majority of incoming wind would travel along NLH/LAR. The dedicated breezeways would facilitate wind penetration within the Proposed Development. Together with the air paths and building gaps available amongst the self-protecting design buildings along the southern site boundary which supplement the air flow penetration, the E/SE/SSE/S/SSW/SW/WSW winds would slightly ventilate the Proposed Development.

The existing village clusters in Pak Mong, Ngau Kwu Long, Tai Ho San Tsuen and Tin Liu and Luk Hop Yuen Kung are located to the far southwest of the Proposed Development, the impact would only be expected under NNE/NE winds and negligible impact under ENE/E/SE/SSE/S/SSW/SW/WSW winds. However, considering the significant distance of at least 780m (more than 7H) in between, the wind impact to these villages and the temple would be minimal. In sum, the Proposed Development would unlikely impose significant adverse ventilation impact to the existing villages to its southwest.

Quantitative AVA is recommended to further enhance wind performance within the Proposed Development at the detailed design stage.

## **APPENDIX IV**

### **Executive Summary of Environmental Impact Assessment (EIA-252/2017)**

# PROPOSED COMPREHENSIVE RESIDENTIAL AND COMMERCIAL DEVELOPMENT ATOP SIU HO WAN DEPOT

Executive Summary



July 2017



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- Figure 1.1** Location of Project  
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## 1 INTRODUCTION

### 1.1 Background

**1.1.1.1** Siu Ho Wan Depot (SHD, the Subject Site) has been highlighted in both 2015 and 2016 Policy Address as a potential railway site being explored by MTR Corporation Limited (MTRCL) (the Project Proponent) in collaboration with the Government to provide housing supply (the Proposed Development). In the 2017 Policy Address, the Chief Executive announced the initiative to commence the statutory planning procedures this year, with the aim to provide not less than 14,000 residential units in the medium to long term.

**1.1.1.2** The Proposed Development is in line with the planning theme of “Strategic Economic and Housing Development” for the North Lantau Corridor recommended by the Lantau Development Advisory Committee (LanDAC), which has been earmarked as one of the medium-term projects in their *First-term Work Report* published in January 2016.

**1.1.1.3** In support of the Government’s policy initiative, the Project Proponent has commissioned a consultancy study (the Project) to formulate scheme options for comprehensive residential and commercial development (the Proposed Development Scheme) to optimise the development potential of SHD. The Proposed Development, with a new Siu Ho Wan Station (SHO) proposed along the Tung Chung Line (TCL) to meet the transportation needs of the development and enable building of a sustainable community, is based on an indicative scheme and indicative development/implementation programme formulated for providing the reference parameters for this Environmental Impact Assessment (EIA). The scheme details and implementation programme may be subject to change. The arrangements for implementation of the proposed development will be separately considered by the Government in due course.

### 1.2 Site Location and History

**1.2.1.1** The Subject Site, with an area of about 30 hectares, is located on reclaimed land in Northshore Lantau formed over 20 years ago at approximately 5 km east of Tung Chung New Town and Hong Kong International Airport (HKIA). It is bounded by an existing seawall

maintenance access road to its north, with the Lantau Airport Railway (LAR) and the North Lantau Highway (NLH) to its south (**Figure 1.1**).

**1.2.1.2** SHD currently serves the TCL, Airport Express Line (AEL) and Disney Resort Line (DRL). It provides maintenance service for the TCL, AEL and DRL trains, engineering train, railway infrastructure and stabling tracks.

**1.2.1.3** Surrounding environment of the Subject Site is characterised by a combination of transport infrastructure, Government facilities and natural landscape. Major land uses within 500m including Siu Ho Wan Government Maintenance Depot, Discovery Bay Tunnel Administration Building and New Lantao Bus Company Siu Ho Wan Depot, Lantau North (Extension) Country Park, and Siu Ho Wan Sewage Treatment Works (SHWSTW). The closest residents of Pak Mong Village are located at some 1.2km away.

**1.2.1.4** From ecological perspective, the Subject Site is highly disturbed with low percentage of vegetation coverage limited to planted trees of common species and exotic shrub. No species of conservation importance has been recorded within the Project Area. Major sites of conservation importance within 500m include Coastal Protection Area (CPA), Lantau North (Extension) Country Park and Tai Ho Priority Site located at south of NLH, and The Brothers Marine Park (BMP).

## 1.3 Scope of the Project

**1.3.1.1** The Proposed Development comprises residential towers situated on a podium deck over the entire SHD, along with commercial/retail facilities, schools and kindergartens, private recreational facilities and open space, car parking and loading/unloading facilities, public transport interchange (PTI), utility plant rooms and other supporting facilities.

**1.3.1.2** To facilitate construction of the Proposed Development, SHD will undergo replanning to re-provision the existing facilities within the site boundary by 4 major stages to make room for construction of the concrete slab deck and property enabling works (including piling). Depot operation will be maintained at all times during the replanning works and migration process.

**1.3.1.3** The proposed SHO will be located at the western position of the Proposed Development along the existing railway tracks outside the

SHD, with the station concourse integrated with the property development podium for convenient accessibility.

**1.3.1.4** Major works outside the site boundary to support the Proposed Development including western access (vehicular bridge) connection to Tai Ho Interchange, eastern access connection to the future Road P1 (Siu Ho Wan Section) or existing Sham Shui Kok Drive with local road improvement during interim period, and a new sewerage connection to the SHWSTW.

**1.3.1.5** The Project is classified as a Designated Project (DP) under Schedule 3 (Item 1) of the EIA Ordinance, Cap.499 (EIAO) for an engineering feasibility study of urban development covering more than 20 hectares. The following project components have been identified as DPs under Schedule 2 of the EIAO:

- An ultimate sewage pumping station (SPS) within the Subject Site to cater for sewage generated from the Proposed Development, that with an installed capacity more than 2,000m<sup>3</sup> per day and a boundary of which is less than 150m from an existing or planned residential area or educational institution (Item F.3(b));
- SHO and associated trackworks on AEL/TCL (Item A.2); and
- Operation of the SHD (Item A.4).

## 1.4 Scope of this EIA Report

**1.4.1.1** An EIA Study Brief No. ESB-294/2016 has been issued by Environmental Protection Department (EPD) for the Project under the EIAO (the Study Brief). Further design details on the SHO and SHD Replanning Works have been developed after the Study Brief is issued. To streamline the project implementation and for ease of reference by the public, a separate EIA Study has been undertaken concurrently for the railway related works, i.e. SHO and SHD Replanning Works including construction of the concrete slab deck and property enabling works, under the EIA Study Brief No. ESB-296/2016 (the Railway EIA). Both EIA Reports will be reviewed together for approval under the EIAO process.

**1.4.1.2** Accordingly this EIA has been focused on potential impacts associated with construction and operation of the topside development including the access roads, SPS and the sewerage connection to SHWSTW (the SHD Topside Development EIA). Potential environmental interface issues as well as cumulative impacts of railway related works and the

Proposed Development have been suitably addressed in this EIA in accordance with the Study Brief requirements.

## 1.5 Purpose of this Executive Summary

**1.5.1.1** This Executive Summary (ES) highlights the key information and findings of the SHD Topside Development EIA Study.

## 2 PROJECT DESCRIPTION

### 2.1 Purposes and Objectives of the Project

**2.1.1.1** The Project is aimed to achieve the following objectives:

- **Housing Supply by Land Use Optimisation:** The Project supports Government's housing initiative by optimising utilisation of 30ha valuable land resources for flat supply.
- **Strategic and Local Planning Frameworks:** Aligned with the planning theme of "Strategic Economic and Housing Development" recommended by LanDAC, the Project supports key strategic directions of underscoring transit-oriented, compact development, optimising land uses by exploring more topside development, and reshaping travel pattern by promoting smart urban growth with jobs closer to home, as promulgated in *Hong Kong 2030+: Towards a Planning Vision and Strategy Transcending 2030*.
- **Quality Built Environment for a New Community:** With reference to the Sustainable Building Design and Urban Design Guidelines, the Project creates a self-contained community with supporting commercial/retail, recreational, and Government, Institution and Community facilities of quality and sustainable built environment served by environmentally friendly rail transport.

#### **"With" and "Without" the Project**

**2.1.1.2** With the Project, the existing SHD operation will be covered by a landscaped deck after replanning works to contain potential environmental impact and allow flexibility for future planning of sensitive uses in the area. The Proposed Development will act as a focal point of Siu Ho Wan area by providing new commercial/retail, educational, and public transport facilities to serve the local community.

**2.1.1.3** Without the Project, Siu Ho Wan will remain as a low-rise industrial area with an open air depot on-site. The proposed new community and public transport facilities will not be materialised and the development potential of Siu Ho Wan area will be significantly deprived. The outcome will be wasting of valuable land resources proven to be technically feasible and suitable for housing development.

## 2.2 Consideration of Development Options

### 2.2.1 Development Scheme Design

**2.2.1.1** The Proposed Development Scheme has taken into account a number of planning and design considerations in the scheme design process as follows:

- ***SHD Replanning Works and Migration Sequence*** which pose restrictions on the development phasing, structural arrangement and building dispositions. Specifically, Stage 1 of the replanning works is located within the strip of land of about 70m-wide along the southern site boundary to maintain depot operation;
- ***Sustainable Building Design Guidelines*** with respect to building separation, building setback and site coverage of greenery;
- ***Urban Design Guidelines*** with respect to building height profile and disposition, podium design, and enhancement of air circulation and visual permeability. Specifically, breezeways and visual corridors have been introduced at strategic locations across the Proposed Development. Innovative and interesting façade design will be deployed to the towers along the southern site boundary by optimising the provision of fixed window/curtain wall in the detailed design;
- ***Chlorine Hazard Associated with Siu Ho Wan Water Treatment Works*** by planning amenity area and plant room within the consultation zone of about 8,600m<sup>2</sup> at eastern end of the Proposed Development;
- ***Provision of Schools*** in tandem with population build-up by reserving suitable spaces on the podium deck at Phases 2 to 4 of the Proposed Development; and
- ***Public Views*** collected during the EIA study in relation to design, environmental impacts and interfaces have been duly considered.

### 2.2.2 Environmental Design

**2.2.2.1** The Proposed Development is subject to significant traffic and rail noise impacts from NLH and LAR abutting its southern site boundary. The hierarchy of “Avoid, Minimise and Mitigate” principle has been adopted in the scheme design process to resolve environmental issues.

**2.2.2.2** The Study indicates that the options of at-source noise barrier/enclosure along the NLH and building setback are considered not practicable, due to the reasons: 1) unacceptable disturbance on strategic road network, 2) space limitation, and 3) unacceptable impacts and risk on depot and train services. Low noise road surface has already been provided at NLH and Tuen Mun - Chek Lap Kok (TM-CLK) Link.

**2.2.2.3** Practical and effective mitigation measures have been incorporated in the Proposed Development Scheme for noise control within acceptable levels as below:

- ***Noise Canopy*** of up to 15m-wide protruding from the southern podium façade will be installed at strategic locations to substantially shield the rail noise from the LAR.
- ***Self-protecting Building Design*** will be adopted by facing the prescribed windows of habitable rooms along the southern site boundary to the open spaces to the north. Building features such as balcony/utility platform will be deployed to further limit the angle-of-view to the noise sources where necessary. Curvilinear arrangement will be applied to the clusters of maximum 4 towers with innovative façade design to add visual interest and improve permeability.
- ***Acoustic Window and Balcony*** will be applied in the detailed design for habitable rooms subject to significant traffic noise impact to provide noise mitigation of up to 8 and 10 dB(A) respectively, based on precedent cases presented in EPD’s website and the approved *Hung Shui Kiu New Development Area EIA (AEIAR-203/2016)*.

## 2.3 Proposed Development Scheme

**2.3.1.1** The Proposed Development Scheme comprises about 108 residential towers and 3 schools situated on a podium deck (**Figure 1.2**). A building podium has been incorporated for neighbourhood shopping facilities, kindergartens, PTI, SHO concourse, internal transport facilities, private recreational facilities, utility plant room and supporting facilities etc.. The proposed development schedule summarising key development parameters is provided in **Table 1.1**.

**Table 1.1** Proposed Development Schedule

Parameter	Proposed Schedule
Development Site Area	About 30ha
Number of Flats	About 14,000
Number of Blocks	108
Building Height (approx.)	+86 to +106 mPD
Podium Height (approx.)	+20.1 and +26.5 mPD
Design Population	37,800
Open Space	About 75,600 m <sup>2</sup>
Commercial/Retail Facilities	30,000 m <sup>2</sup> Gross Floor Area
Educational Uses	3 x 30 Classroom Schools 4 x 6 Classroom Kindergartens
Transportation Facilities	Integrated SHO Concourse Public Transport Interchange

**2.3.1.2** An ultimate SPS with underground storage tanks, with a design capacity of about 12,100m<sup>3</sup>/day will be located at the eastern end of the Subject Site, which is identified as the only Schedule 2 DP within the Proposed Development. A new sewer comprises 450mm diameter twin rising mains of about 900m long will be constructed for connection to the SHWSTW under this Project to serve the Proposed Development.

**2.3.1.3** The Project will be implemented by phase based on SHD Replanning Works progress and market conditions. As an indicative reference for this EIA, SHO and SHD Replanning Works are tentatively scheduled to take place from 2019 to 2036. Construction works for the topside development is tentatively targeted to commence in 2023 for earliest population intake in 2026, with project completion in 2038.

**2.3.1.4** The Proposed Development Scheme, including but not limited to development schedule, building disposition, floor layout and implementation programme, is indicative to provide guiding principles on the design for future reference. In the project implementation stage, alternative measures/ approaches may be explored to achieve comparable environmental performance. Any changes to the project components that are not Schedule 2 DP after the approval of this EIA report, supplementary environmental assessments would be carried out as required by relevant authorities to satisfy the latest planning mechanism and other statutory requirements at that time, without the need for a new EIA.

## 3 SUMMARY OF ENVIRONMENTAL IMPACT ASSESSMENT

### 3.1 Approach to Environmental Impact Assessment

**3.1.1.1** The EIA process provides a means of scoping, assessing and reporting the environmental impacts and benefits of the Project. It is an iterative process that has been followed in parallel with the design process to identify the potential environmental effects of various design options, and develop alternatives as well as mitigation measures to be incorporated into the design, construction and operation of the Proposed Development. Public concerns have also been duly considered and incorporated into the scheme design and EIA process where appropriate. Mitigation measures have been proposed to avoid some potential environmental impacts, or to minimise or mitigate to acceptable levels.

### 3.2 Air Quality

**3.2.1.1** Potential air quality impacts associated with the Project have been assessed in accordance with Clause 3.4.4 and Appendix B of the Study Brief and Section 1 of Annex 4 and Annex 12 of the *Technical Memorandum on EIA Process (EIAO-TM)* to ensure compliance of the *Hong Kong Air Quality Objectives (HKAQOs)* and relevant criteria and guidelines.

#### 3.2.2 Construction Phase

**3.2.2.1** Fugitive dust generated from construction of the Project will be mainly attributed to the foundation and excavation works for the SPS, road improvement works at Sham Shui Kok Drive for the temporary eastern access connection, and wind erosion of open sites. Cumulative construction dust impacts with concurrent projects, in particular the railway related works, in form of Total Suspended Particulates (TSP), Respirable Suspended Particulates (RSP) and Fine Suspended Particulates (FSP) have been quantitatively assessed.

**3.2.2.2** Air sensitive receivers (ASRs) that may be affected by construction of the Proposed Development including the future residents, namely Internal (Planned) ASRs, and the offices/industrial undertakings in the vicinity, namely External (Existing) ASRs, have been considered.

**3.2.2.3** Results of the assessment have indicated that with the implementation of suitable dust mitigation measures as stipulated in the *Air Pollution Control (Construction Dust) Regulation* and good site practices, the predicted dust levels at representative ASRs would comply with

relevant HKAQOs and EIAO-TM criteria under conservative assumptions as presented in **Table 3.1**. Adverse air quality impact due to construction of the Project is therefore not anticipated.

**Table 3.1:** Summary of Predicted Cumulative Construction Dust Levels with Mitigation Measures (in  $\mu\text{g}/\text{m}^3$ )

	TSP		RSP		FSP		Compliance
	Highest 1-hr	10 <sup>th</sup> highest 24-hr	Annual	10 <sup>th</sup> highest 24-hr	Annual		
External (Existing) ASRs	220 454	78 96	34 36	58 62	24 25	Yes	
Internal (Planned) ASRs	219 268	78 80	34 35	58 60	23 24	Yes	
HKAQOs/ EIAO TM Criteria	500	100	50	75	35		

### 3.2.3 Operational Phase

**3.2.3.1** Major emission sources that may affect future occupants of the topside development including vehicular emission from the surrounding road network, HKIA emission under the 3-Runway System, industrial emission from the Organic Waste Treatment Facilities (OWTF), marine emission from North Lantau Refuse Transfer Station (NLRTS), as well as fugitive dust emission from construction of the Project have been considered.

**3.2.3.2** Background air quality has been extracted from EPD's regional scale model *Pollutant in the Atmosphere and the Transport over Hong Kong (PATH)* which has covered all major emission sources within Hong Kong and the Pearl River Delta Economic Zone. Nitrogen Dioxide (NO<sub>2</sub>), RSP and FSP have been chosen as representative criteria air pollutants for the assessment.

**3.2.3.3** Horizontal separation of minimum 20m has been allowed between NLH/TM-CLK Link and the residential dwellings of the Proposed Development in accordance with the *Hong Kong Planning Standards and Guidelines (HKPSG)*. Internal traffic has been largely confined within the podium to minimise potential impacts.

**3.2.3.4** Results of the assessment have indicated that the predicted concentrations of key representative pollutants at representative ASRs would comply with HKAQOs under conservative assumptions as presented in **Table 3.2**. Contour maps at worst-affected levels have been prepared to demonstrate full compliance of HKAQOs within the Subject Site.

**Table 3.2:** Summary of Predicted Concentrations of Representative Air Pollutants during Operational Phase (in  $\mu\text{g}/\text{m}^3$ )

	NO <sub>2</sub>		RSP		FSP		Compliance
	19 <sup>th</sup> highest 1-hr	Annual	10 <sup>th</sup> highest 24-hr	Annual	10 <sup>th</sup> highest 24-hr	Annual	
External (Existing) ASRs	128 185	24 37	77 94	33 35	58 61	24 25	Yes
Internal (Planned) ASRs	129 146	23 26	78 80	33 33	58 60	23 24	Yes
HKAQOs/ EIAO TM Criteria	200	40	100	50	75	35	

**3.2.3.5** Potential odour impact arising from the operation of SHWSTW, OWTF and NLRTS has been quantitatively assessed. As the SPS within the Project will be enclosed and equipped with odour control equipment, potential odour contribution to the ASRs is predicted to be negligible (less than 0.1 odour unit). Results of the assessment have indicated that the predicted odour concentrations at representative ASRs would comply with the odour criterion under conservative assumptions as presented in **Table 3.3**.

**Table 3.3:** Summary of Predicted Odour Concentrations (in odour units based on an averaging time of 5 seconds)

	Odour Concentration		Compliance
	With SPS	Without SPS	
External (Existing) ASRs	0.9 3.7	0.9 3.7	Yes
Internal (Planned) ASRs	0.5 1.7	0.5 1.7	Yes
EIAO TM Criterion	5	5	

### 3.3 Noise Impact

**3.3.1.1** Potential noise impacts associated with the Project have been assessed in accordance Clause 3.4.5 and Appendix C of the Study Brief and Annexes 5 and 13 of the EIAO-TM to ensure compliance of relevant standards and guidelines.

#### 3.3.2 Construction Noise

**3.3.2.1** Noise sensitive receivers (NSRs) at initial phases of the future residents that may be affected by construction of the Proposed Development have been considered. With the closest residents at Pak Mong Village located at some 1.2km away, no external (existing) NSR will be affected.

**3.3.2.2** Cumulative noise impact arising from construction of the Project, including railway related works, has been quantitatively assessed based on tentative implementation programme and Powered Mechanical Equipment inventories. Noise control measures including good site practices, barriers, quiet plants etc. would be adopted, while percussive piling would be avoided. Results of the assessment have indicated that with the recommended noise control measures in place, all NSRs within the Project would comply with relevant noise standards.

### 3.3.3 Road Traffic Noise

**3.3.3.1** Traffic noise impact on the Proposed Development has been quantitatively assessed based on peak-hour traffic forecasts of Year 2053 (i.e. 15 years upon project completion). Internal road traffic will be largely confined within the podium.

**3.3.3.2** Due consideration has been taken in the development scheme design to minimise and mitigate significant traffic noise impact from NLH. Self-protecting building design has been adopted in the Proposed Development Scheme. Acoustic window and balcony will be incorporated in the detailed scheme design, where appropriate, for traffic noise mitigation. With the noise sensitive uses at the 3 schools being effectively shielded and arrangement of noise tolerant use at some facades, compliance of relevant noise criteria as stipulated in the HKPSG can be achieved.

### 3.3.4 Fixed Noise

**3.3.4.1** The Railway EIA has recommended proper selection of plant and adoption of acoustic treatment to ameliorate the noise generated from depot operation during interim stages of replanning works to expedite housing supply at initial phases of the Project. As the entire SHD will be decked upon completion of the replanning works, noise impact to the future residents due to depot operation will be insignificant.

**3.3.4.2** Major utilities and fixed plant items, including SPS and PTI, will be suitably located with no direct line-of-sight from the future residents. Noise control measures including sound attenuators will be equipped at the ventilation louvers (including those along the SHD boundary) and fixed plant items where necessary to ensure compliance of relevant noise criteria.

### 3.3.5 Aircraft Noise

**3.3.5.1** The Subject Site is located at over 1km from the Noise Exposure Forecast 25 (NEF25) contour under full operation of the Three-Runway

System of the HKIA, which satisfies the criterion for planning of domestic premises and educational uses as stipulated in the HKPSG.

### 3.3.6 Rail Noise

**3.3.6.1** Rail noise impact on the Project has been quantitatively assessed, taking into account the TCL and AEL operation after track modification works for the proposed SHO and shunting noise entering/departing and within SHD.

**3.3.6.2** A temporary cantilever noise barrier and canopy will be installed at the podium edge to mitigate the rail noise during interim stages of the SHD replanning works. Sections of noise canopy of up to 15m-wide protruding from the southern podium will be installed at strategic locations to substantially shield the rail noise from TCL / AEL. Coupled with the self-protecting building design adopted in the Proposed Development Scheme, compliance of relevant noise criteria can be achieved.

**3.3.6.3** Cumulative fixed and rail noise assessment has been conducted. With the implementation of the recommended mitigation measures, cumulative fixed and rail noise impacts on NSRs would comply with the relevant noise criteria.

### 3.3.7 Helicopter Noise

**3.3.7.1** According to Government Flying Services, the emergency helicopter flight path along the Siu Ho Wan section is mainly used during adverse weather conditions. Civil Aviation Department has advised that no helicopter shall fly closer than 500 feet (about 150m) to any person or structure, etc.. Based on helicopter noise source data from the operators, the predicted maximum façade noise level at the Proposed Development will be within relevant noise criterion as stipulated in the HKPSG.

### 3.3.8 Marine Traffic Noise

**3.3.8.1** The Project does not involve any marine works and will not generate any marine traffic. As no existing or planned marine route is located within 300m, adverse marine traffic noise impact is not anticipated.

## 3.4 Water Quality

**3.4.1.1** Potential water quality impacts associated with the Project have been assessed in accordance with Clause 3.4.6 and Appendix D of the Study Brief and Annexes 6 and 14 of the EIAO-TM to ensure compliance of relevant standards and guidelines. No dredging or marine works is required under the Proposed Development.

**3.4.1.2** Major water sensitive receivers (WSRs) located in the vicinity including the BMP at about 200m to the north and Tai Ho Bay at about 270m across NLH have been considered.

### 3.4.2 Construction Phase

**3.4.2.1** With the implementation of good site practices and mitigation measures to control construction surface runoff, adverse water quality impact on the WSRs is not anticipated.

### 3.4.3 Operational Phase

**3.4.3.1** Sewage/effluent generated from the Project will be conveyed to SHWSTW for treatment. The proposed SPS will be designed (see below **Section 3.5**) to minimise the chance of emergency discharge. Appropriate measures such as silt traps will be incorporated in detailed design of the drainage system and road gullies. Residual water quality impact is not anticipated from operation of the Project.

## 3.5 Sewerage and Sewage Treatment Implications

**3.5.1.1** Potential sewerage and sewage treatment implications of the Project have been assessed in accordance with Clause 3.4.7 and Appendix E of the Study Brief and the criteria and guidelines stipulated in Section 6.5 in Annex 14 of the EIAO-TM.

**3.5.1.2** Sewage generated by the Proposed Development and the railway related operations (SHO and the reprovisioned SHD) is estimated to be about 12,100m<sup>3</sup>/day and 1,229m<sup>3</sup>/day Average Dry Weather Flow (ADWF), respectively. The Government has identified sufficient sewage treatment capacity at the SHWSTW to cater for the predicted flow.

**3.5.1.3** A new sewerage system will be provided to serve the Project (see **Section 2.3.1.2**). Due consideration has been given on its design to minimise the chance of discharging untreated sewage due to failure of rising main, pump and power by adopting the following measures. No adverse impacts on water quality or ecology is anticipated from the Proposed Development.

- Twin rising mains with concrete encasing;
- 100% standby pumping capacity with spare pump stockpiled up to 50% pumping capacity;
- Dual-feed power supply;
- Emergency storage tank of up to 3-hours ADWF capacity at the ultimate SPS;
- Real-time monitoring and control system;
- Term contractor to provide 24-hour emergency repair service in case of emergency situation; and
- Qualified personnel to carry out regular inspection and routine maintenance.

## 3.6 Waste Management Implications

**3.6.1.1** Waste management implications associated with the Project have been assessed in accordance with Clause 3.4.8 and Appendix F of the Study Brief and the criteria and guidelines stipulated in Annexes 7 and 15 respectively of the EIAO-TM.

### 3.6.2 Construction Phase

**3.6.2.1** Waste minimisation measures such as pre-cast construction method, on-site sorting and reuse of Construction and Demolition (C&D) materials will be adopted where practicable. About 100,860m<sup>3</sup> and 25,240m<sup>3</sup> of inert and non-inert C&D materials, respectively, 1,372 tonnes of general refuse, and a few hundred litres/month of chemical wastes will be generated from construction activities.

**3.6.2.2** Construction waste materials will be properly collected and stored prior to transportation, with good site practices to minimise environmental impacts. Trip-ticket system and dump trucks equipped with GPS or equivalent system will be adopted as appropriate to prevent illegal dumping. No adverse environmental implication is anticipated from construction waste generated from the Project.

### 3.6.3 Operational Phase

**3.6.3.1** About 81 tonnes/day of Municipal Solid Waste (MSW) will be generated from upon full completion of the Proposed Development, of which about 28 tonnes will be recycled through the provision of waste separation and recycling facilities. Proper measures will be deployed to minimise environmental impacts due to treatment, handling and disposal of MSW. Chemical wastes from the SPS and school operations will be collected by licensed waste collectors. No adverse environmental implication is anticipated from wastes generated from operation of the Proposed Development.



## 3.7 Land Contamination

**3.7.1.1** Potential land contamination impacts associated with the Project have been assessed in accordance with Clause 3.4.10 of the Study Brief and Appendix H and the guidelines as stipulated in Sections 3.1 and 3.2 of Annex 19 of the EIAO-TM.

**3.7.1.2** Potential land contamination impact within the SHO and SHD Replanning Works area has been assessed under the Railway EIA. All necessary site investigation, land contamination assessment and remediation works will be carried out under the SHO and SHD Replanning Works and will be completed prior the commencement of construction works at concerned area(s) of SHO and SHD Replanning Works.

**3.7.1.3** The existing and historical land uses within the proposed ultimate SPS located at eastern end of the SHD and works areas outside the site boundary (i.e. access roads and sewerage connection) have been reviewed, based on historical aerial photo, topographic map, relevant information from EPD and FSD, and site reconnaissance. No potential contaminative activities were identified and therefore potential land contamination is not anticipated.

## 3.8 Ecology

**3.8.1.1** Potential ecological impacts associated with the Project have been assessed in accordance with Clause 3.4.11 and Appendix I of the Study Brief, and Annexes 8 and 16 of the EIAO-TM.

### 3.8.2 Construction Phase

**3.8.2.1** The Project will not encroach into recognised sites of conservation importance in the area. Construction of the Proposed Development will only have direct impacts on urbanised/disturbed habitat of very low ecological value and plantation of low ecological value of very small extent. Percussive piling, marine works and marine traffic will be avoided to protect the BMP and Chinese White Dolphin habitat. Indirect impacts on the natural habitats due to construction activities are considered insignificant, and will be further minimised through adoption of good site practices. No adverse ecological impact is anticipated from construction of the Project.

### 3.8.3 Operational Phase

**3.8.3.1** Potential indirect ecological impacts due to operation of the Proposed Development are considered insignificant, given the large separation distance from the natural habitats.

**3.8.3.2** For marine ecological impact, given that the chances of emergency discharge of untreated sewage are minimised, no adverse impact is anticipated from operation of the Proposed Development.

## 3.9 Fisheries

**3.9.1.1** Potential fisheries impacts associated with the Project have been assessed in accordance with Clause 3.4.12 and Appendix J of the Study Brief and the criteria and guidelines stipulated in Annexes 9 and 17 of EIAO-TM.

**3.9.1.2** Results of the comprehensive study on capture fisheries, culture fisheries and sites of fisheries importance, including spawning and nursery grounds and artificial reefs, have revealed that fisheries production in the North Lantau Waters near SHD is ranked low, with the nearest spawning and nursery ground located at over 2 km away.

### 3.9.2 Construction Phase

**3.9.2.1** There will be no loss of fishing ground or change in fishing operation location due to the Project hence adverse fisheries impact is not anticipated. Construction site runoff will be properly controlled hence impact on marine waters is anticipated to be insignificant.

### 3.9.3 Operational Phase

**3.9.3.1** There will be no wastewater discharge during operation of the Project hence no adverse impact on the fisheries resources and fishing ground is anticipated. No fisheries-specific mitigation measure is therefore required.

## 3.10 Landscape and Visual

**3.10.1.1** Potential landscape and visual impacts from the Project have been assessed in accordance with Clause 3.4.13 and Appendix K of the Study Brief, EIAO Guidance Note No. 8/2010, and Annexes 10 and 18 of the EIAO-TM.

**3.10.1.2** The Subject Site is located within an area of low/moderate landscape value and sensitivity. Major landscape resources in the vicinity including the water body at Tai Ho Bay and woodland on slopes between NLH and Lantau North (Extension) Country Park will not be affected by the Proposed Development. Some 5 trees of common species will be affected by the road improvement works at Sham Shui Kok Drive. Potential impact on the existing tree plantations due to the proposed new sewer and access roads will be avoided as far as practicable.

- 3.10.1.3** Major visual corridor from Tai Ho to the sea channel between the Hong Kong Boundary Crossing Facilities Island and the BMP will not be affected by the Project. The proposed 30m-wide diagonal and 15m-wide perpendicular corridors, coupled with curvilinear building alignment, will maintain visual permeability across the Proposed Development; while the terraced-design podium enhanced with greening will marginally soften the podium edge.
- 3.10.1.4** Views of the Project from key visually sensitive receivers nearby are generally obstructed by existing vegetation, topography and road infrastructure. The residual impact at visually sensitive receivers, taking into account their respective sensitivities, are expect to experience insignificant to moderate visual impact during operation, with the implementation of proposed mitigation measures.
- 3.10.1.5** Overall, the residual landscape and visual impacts of the Project are considered acceptable with the implementation of the proposed mitigation measures and scheme design enhancement. Landscape and visual character of the Subject Site will be gradually transformed from low-rise industrial to an urban development node with greening.

### 3.11 Hazard to Life

- 3.11.1.1** A hazard-to-life assessment has been conducted in accordance with Clause 3.4.9 and Appendix G of the Study Brief and the criteria stipulated in Section 2 of Annex 4 of the EIAO-TM.
- 3.11.1.2** Siu Ho Wan Water Treatment Works (SHWWTW) is a potentially hazardous installation due to its chlorine storage, with a consultation zone (CZ) of about 1km-radius. About 8,600m<sup>2</sup> of the eastern end of the Subject Site is situated within the CZ where only amenity area and plant room will be located.
- 3.11.1.3** Potential risk associated with the chlorine transshipment dock at Sham Shui Kok considered insignificant as the temporary eastern access road connection is located outside the 10<sup>-6</sup>/yr individual risk contour.
- 3.11.1.4** Results of the quantitative assessment for SHWWTW have indicated that the Project is located outside the risk 10<sup>-5</sup>/yr individual risk contour which satisfies the relevant risk criterion. The societal risk curve falls within “As Low As Reasonably Practicable (ALARP)” region. No specific mitigation measure is required for the Project based on cost-benefit analysis. However, adequate emergency training and drills for construction workers within the consultation zone shall be provided as precautionary measures.

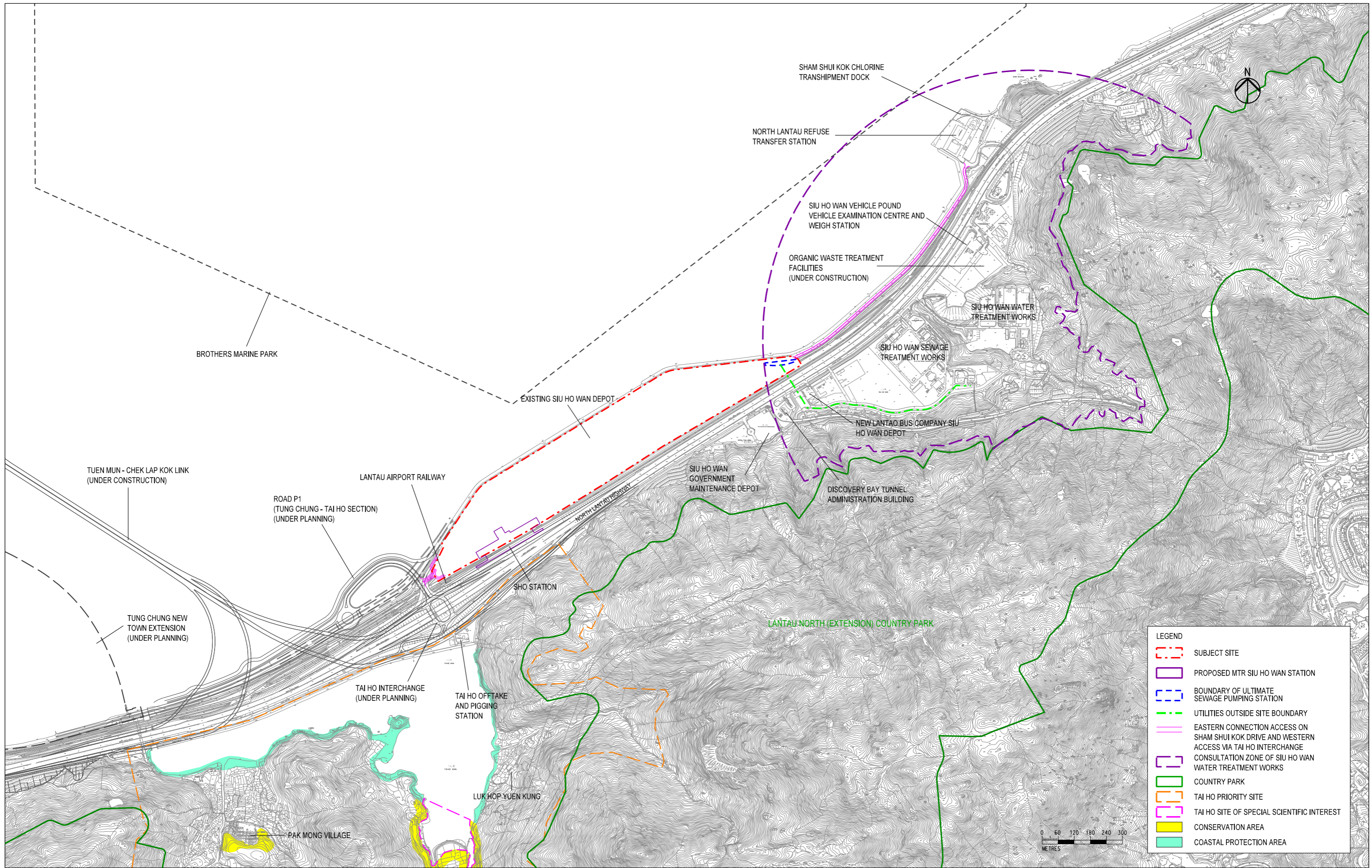
## 4 Environmental Monitoring and Audit

- 4.1.1.1** An Environmental Monitoring and Audit (EM&A) programme has been formulated for the ultimate SPS which is a DP listed under Schedule 2 of the EIAO, with details presented in the separate EM&A Manual.
- 4.1.1.2** The EM&A programme will provide management actions to check the effectiveness of the recommended mitigation measures and compliance with relevant statutory criteria, thereby ensuring the environmental acceptability of the construction and operation of the Project.

## 5 Conclusion

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- 5.1.1.1** This EIA Study has demonstrated overall environmental acceptability of the proposed comprehensive residential and commercial development atop Siu Ho Wan Depot, in accordance with the Study Brief (ESB-294/2016) and the EIAO-TM. The Project is expected to meet all relevant environmental standards with the implementation of suitable mitigation measures during both construction and operational stages.
- 5.1.1.2** The Project supports Government's policy initiatives by optimising the utilisation of existing railway land for housing supply. With reference to the Sustainable Building Design Guidelines, a technically feasible development scheme has been formulated for a self-contained community of about 14,000 residential units, supported by a new station along the Tung Chung Line for environmentally friendly transport.
- 5.1.1.3** By providing a landscaped deck over the entire depot site, the Project will bring environmental benefits to the community by containing the existing industrial operation, while acting as a focal point with new commercial/retail, educational and public transport facilities to allow flexibility for future land use planning of the Siu Ho Wan area which supports the Government's strategic planning direction for North Lantau.



Proposed Comprehensive Residential and Commercial Development atop Siu Ho Wan Depot  
 LOCATION OF PROJECT

ARUP



SCALE: AS SHOWN  
 DATE: MAY 2017

FIGURE No.  
 1.1

**LEGEND:**

-  RESIDENTIAL TOWER TYPE A
-  RESIDENTIAL TOWER TYPE B



## **APPENDIX V**

**Photomontages of Proposed Development (Extract from EIA Report (EIA-252/2017))**



VSR1 Tung Chung New Town Extension Tung Chung East Development (TCNTE TCE Development) - Existing View (Approx. 1470m)

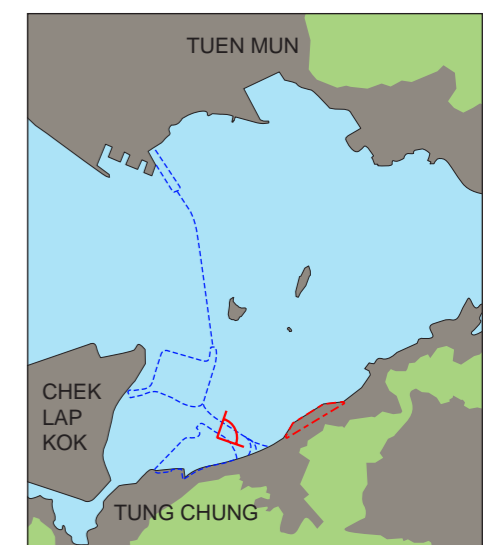


VSR1 Tung Chung New Town Extension Tung Chung East Development (TCNTE TCE Development) - Photomontage (Without mitigation at Day 1)

NOTES:

Sample photomontages have been generated to provide a preliminary idea on the scale, massing and extent of the proposed development, as well as the effect of the proposed mitigation measures. These images will be subject to change and are for illustrative purposes only. The architectural design, finishes or any other related detailed design components are subject to refinement and changes at the detailed design stage.

Mitigation Measures (Operational Phase)	
OM1	Re-instatement of Excavated Area
OM2	Aesthetic Design of Built Development
OM3	Appearance of the Proposed Structures
OM4	Compensatory Planting
OM5	Buffer Planting
OM6	Visual Design on Noise Mitigation Measures



Key Plan



VSR1 Tung Chung New Town Extension Tung Chung East Development (TCNTE TCE Development) - Photomontage (With mitigation at Day 1)

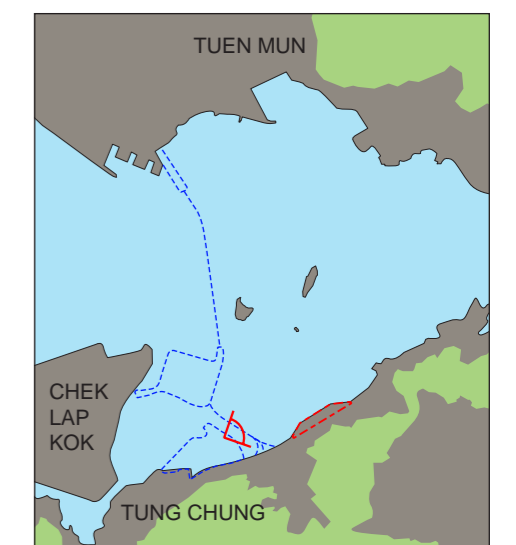


VSR1 Tung Chung New Town Extension Tung Chung East Development (TCNTE TCE Development) - Photomontage (With mitigation at Year 10)

NOTES:

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Mitigation Measures (Operational Phase)	
OM1	Re-instatement of Excavated Area
OM2	Aesthetic Design of Built Development
OM3	Appearance of the Proposed Structures
OM4	Compensatory Planting
OM5	Buffer Planting
OM6	Visual Design on Noise Mitigation Measures



Key Plan





VSR3 Pak Mong Village - Existing View (Approx. 1130m)

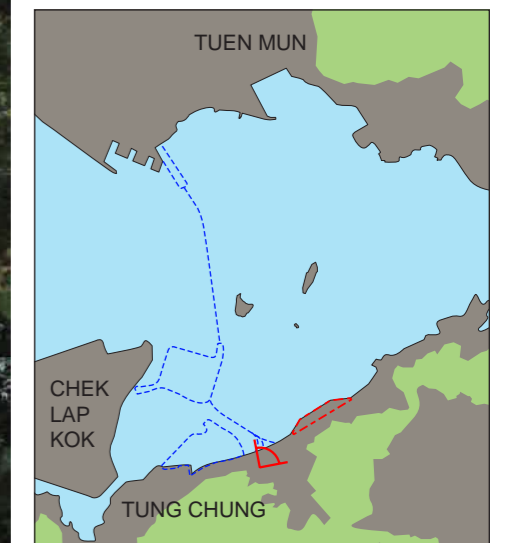
**NOTES:**

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Mitigation Measures (Operational Phase)	
OM1	Re-instatement of Excavated Area
OM2	Aesthetic Design of Built Development
OM3	Appearance of the Proposed Structures
OM4	Compensatory Planting
OM5	Buffer Planting
OM6	Visual Design on Noise Mitigation Measures



VSR3 Pak Mong Village - Photomontage (Without mitigation at Day 1)



Key Plan



VSR3 Pak Mong Village - Photomontage (With mitigation at Day 1)

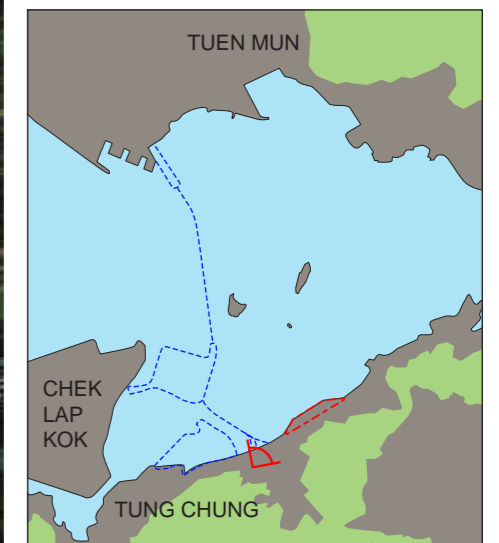


VSR3 Pak Mong Village - Photomontage (With mitigation at Year 10)

NOTES:

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Mitigation Measures (Operational Phase)	
OM1	Re-instatement of Excavated Area
OM2	Aesthetic Design of Built Development
OM3	Appearance of the Proposed Structures
OM4	Compensatory Planting
OM5	Buffer Planting
OM6	Visual Design on Noise Mitigation Measures



Key Plan



VSR4 Hong Kong Olympic Trail - Existing View (Approx. 1930m)

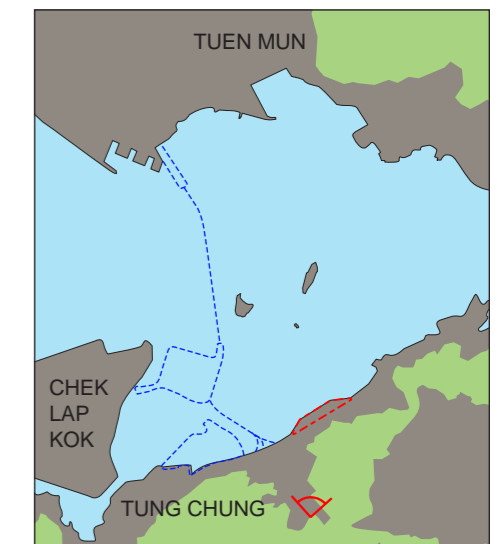


VSR4 Hong Kong Olympic Trail - Photomontage (Without mitigation at Day 1)

NOTES:

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Mitigation Measures (Operational Phase)	
OM1	Re-instatement of Excavated Area
OM2	Aesthetic Design of Built Development
OM3	Appearance of the Proposed Structures
OM4	Compensatory Planting
OM5	Buffer Planting
OM6	Visual Design on Noise Mitigation Measures



Key Plan



VSR4 Hong Kong Olympic Trail - Photomontage (With mitigation at Day 1)

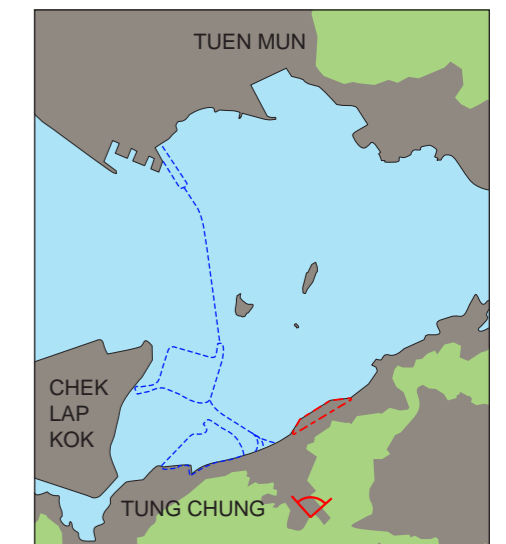


VSR4 Hong Kong Olympic Trail - Photomontage (With mitigation at Year 10)

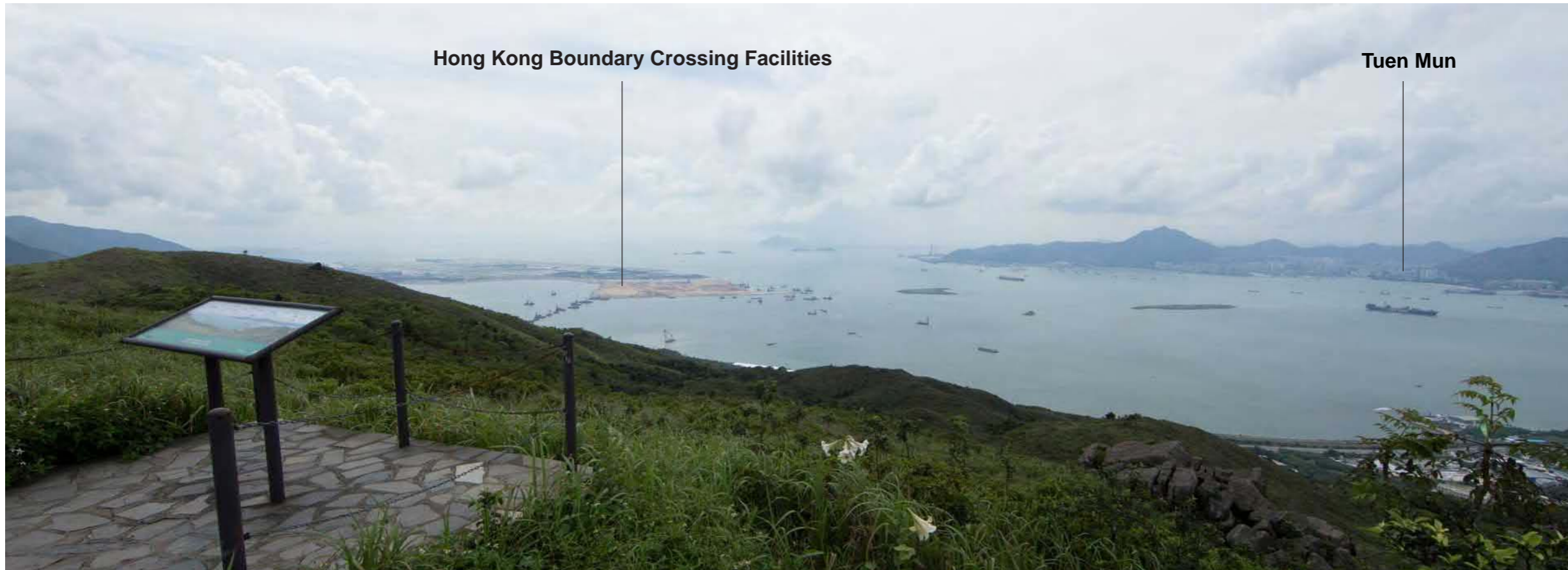
NOTES:

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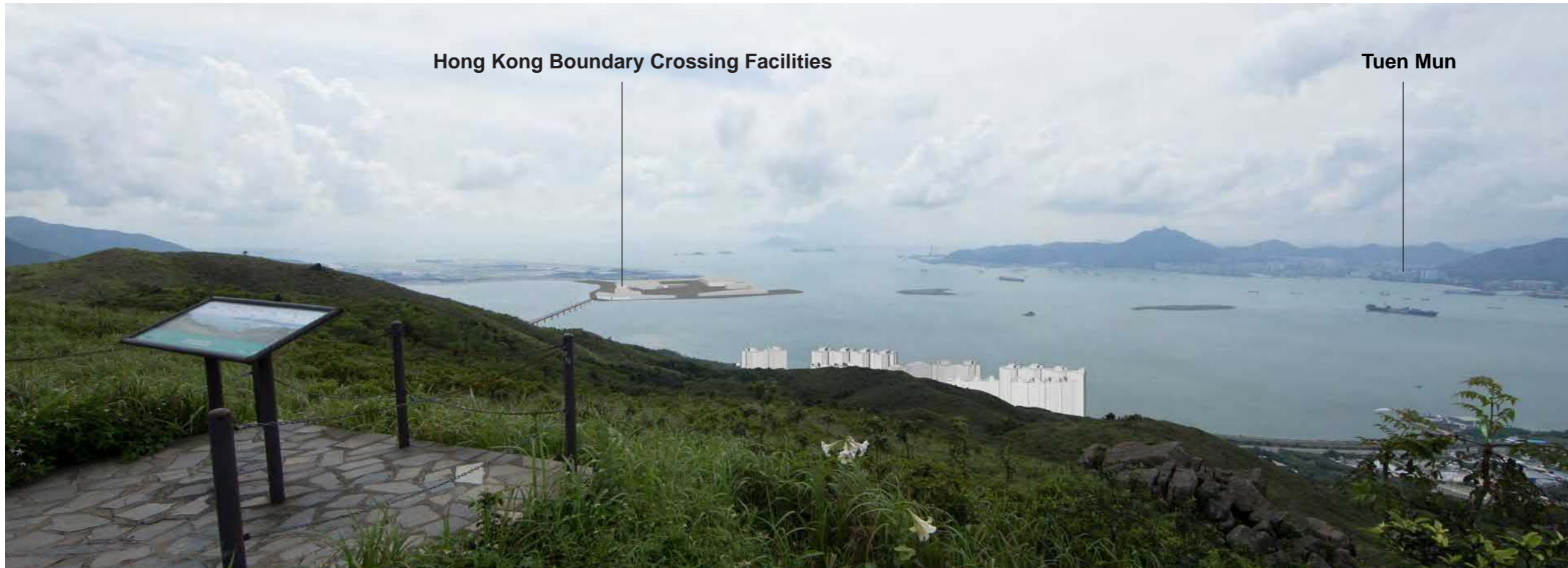
Mitigation Measures (Operational Phase)	
OM1	Re-instatement of Excavated Area
OM2	Aesthetic Design of Built Development
OM3	Appearance of the Proposed Structures
OM4	Compensatory Planting
OM5	Buffer Planting
OM6	Visual Design on Noise Mitigation Measures



Key Plan



VSR5 Lo Fu Tau Country Trail - Existing View (Approx. 1525m)

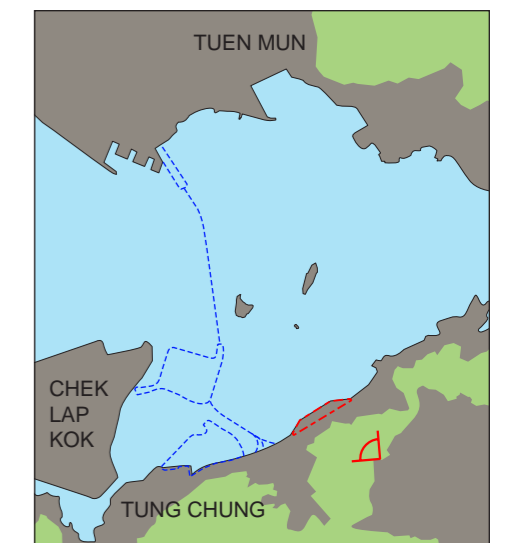


VSR5 Lo Fu Tau Country Trail - Photomontage (Without mitigation at Day 1)

NOTES:

Sample photomontages have been generated to provide a preliminary idea on the scale, massing and extent of the proposed development, as well as the effect of the proposed mitigation measures. These images will be subject to change and are for illustrative purposes only. The architectural design, finishes or any other related detailed design components are subject to refinement and changes at the detailed design stage.

Mitigation Measures (Operational Phase)	
OM1	Re-instatement of Excavated Area
OM2	Aesthetic Design of Built Development
OM3	Appearance of the Proposed Structures
OM4	Compensatory Planting
OM5	Buffer Planting
OM6	Visual Design on Noise Mitigation Measures



Key Plan



VSR5 Lo Fu Tau Country Trail - Photomontage (With mitigation at Day 1)

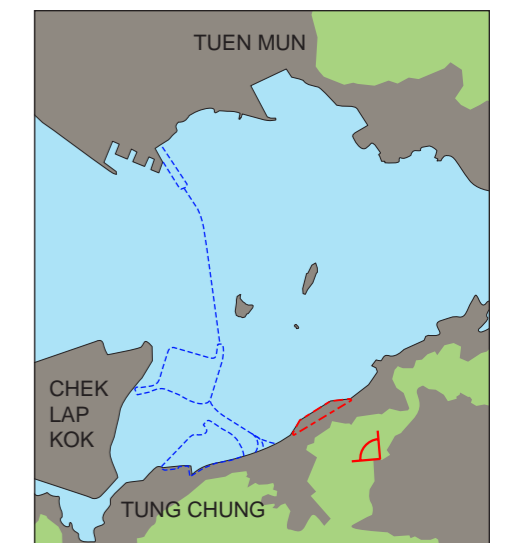


VSR5 Lo Fu Tau Country Trail - Photomontage (With mitigation at Year 10)

NOTES:

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Mitigation Measures (Operational Phase)	
OM1	Re-instatement of Excavated Area
OM2	Aesthetic Design of Built Development
OM3	Appearance of the Proposed Structures
OM4	Compensatory Planting
OM5	Buffer Planting
OM6	Visual Design on Noise Mitigation Measures



Key Plan

**NORTH LANTAU HIGHWAY**



VSR8 North Lantau Highway - Existing View (Approx. 275m)

**NORTH LANTAU HIGHWAY**

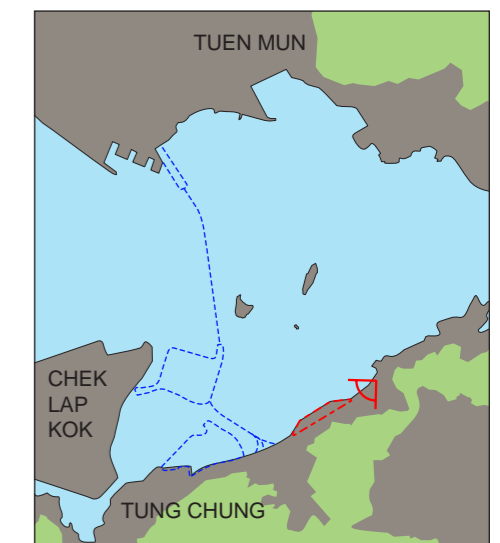


VSR8 North Lantau Highway - Photomontage (Without mitigation at Day 1)

**NOTES:**

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Mitigation Measures (Operational Phase)	
OM1	Re-instatement of Excavated Area
OM2	Aesthetic Design of Built Development
OM3	Appearance of the Proposed Structures
OM4	Compensatory Planting
OM5	Buffer Planting
OM6	Visual Design on Noise Mitigation Measures



Key Plan



VSR8 North Lantau Highway - Photomontage (With mitigation at Day 1)

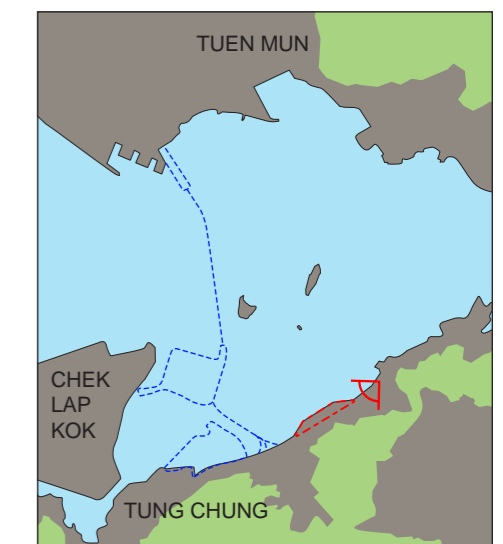


VSR8 North Lantau Highway - Photomontage (With mitigation at Year 10)

NOTES:

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Mitigation Measures (Operational Phase)	
OM1	Re-instatement of Excavated Area
OM2	Aesthetic Design of Built Development
OM3	Appearance of the Proposed Structures
OM4	Compensatory Planting
OM5	Buffer Planting
OM6	Visual Design on Noise Mitigation Measures



Key Plan





VSR12b Tuen Mun South Coast - Existing View (Approx. 6955m)

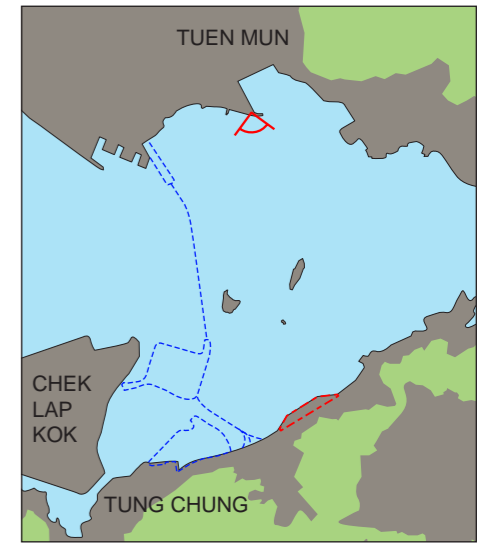


VSR12b Tuen Mun South Coast - Photomontage (Without mitigation at Day 1)

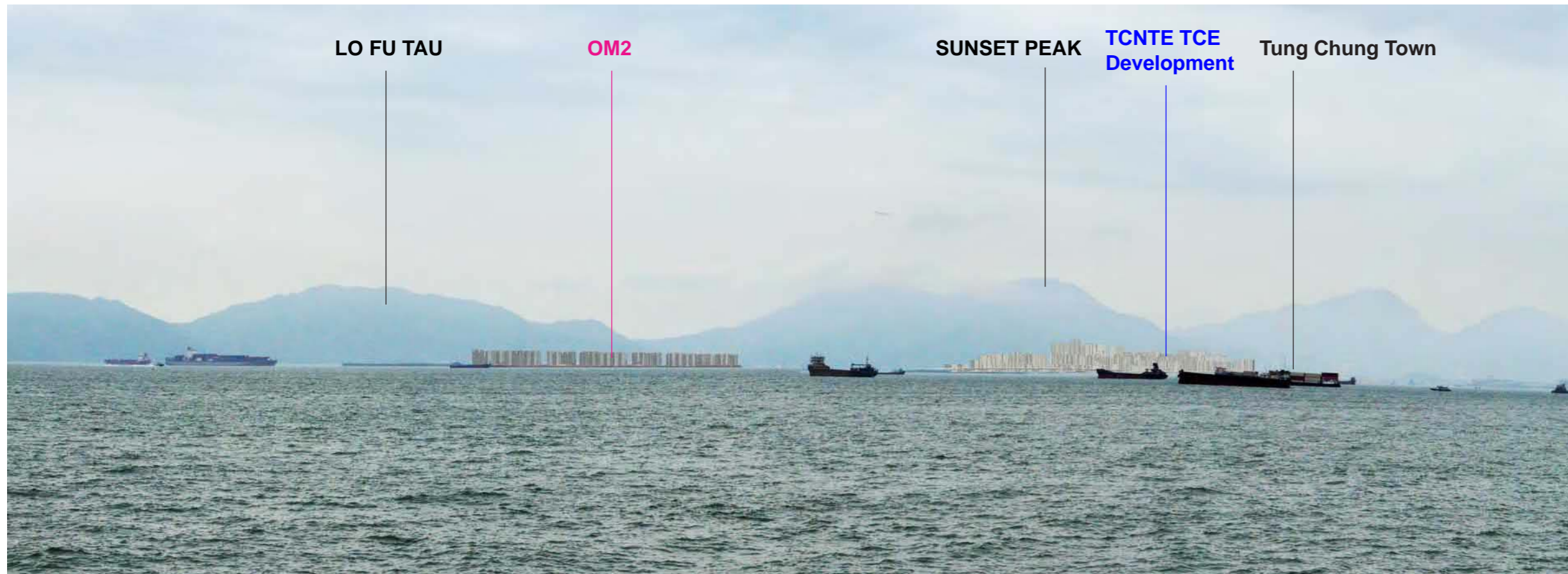
NOTES:

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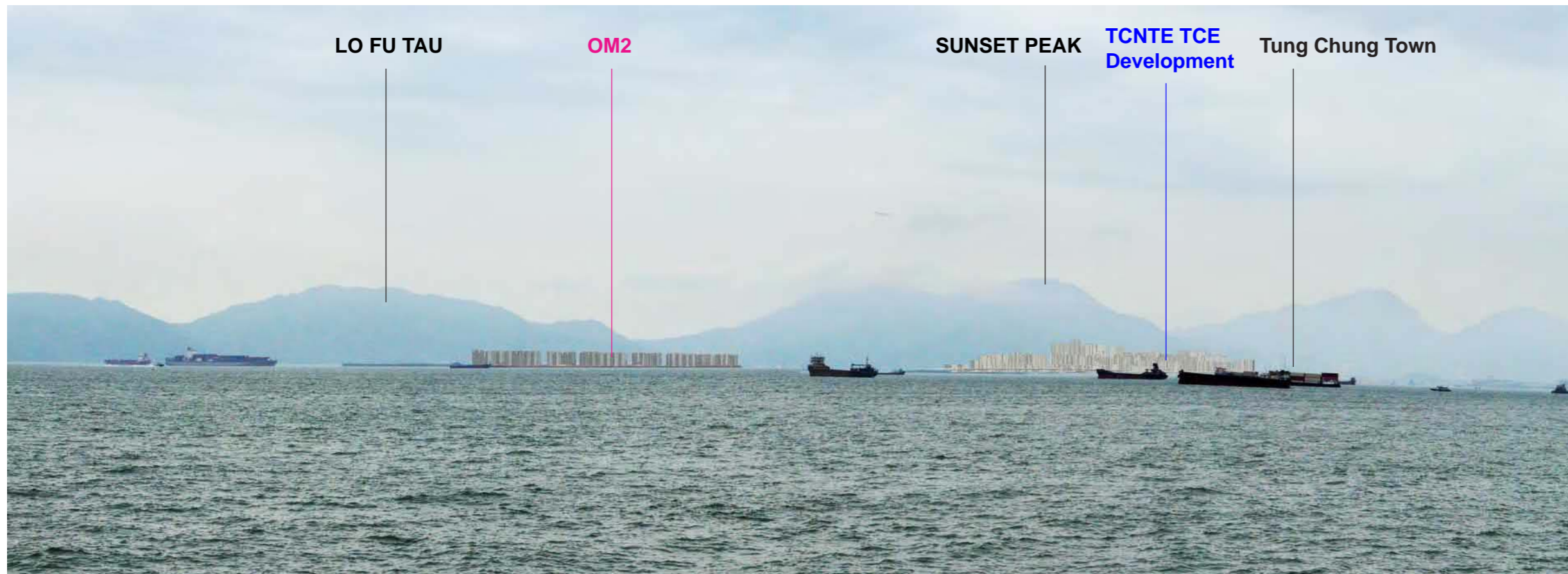
Mitigation Measures (Operational Phase)	
OM1	Re-instatement of Excavated Area
OM2	Aesthetic Design of Built Development
OM3	Appearance of the Proposed Structures
OM4	Compensatory Planting
OM5	Buffer Planting
OM6	Visual Design on Noise Mitigation Measures



Key Plan



VSR12b Tuen Mun South Coast - Photomontage (With mitigation at Day 1)

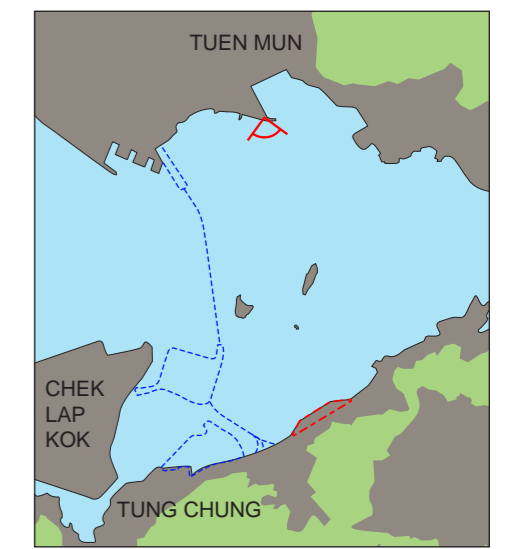


VSR12b Tuen Mun South Coast - Photomontage (With mitigation at Year 10)

NOTES:

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Mitigation Measures (Operational Phase)	
OM1	Re-instatement of Excavated Area
OM2	Aesthetic Design of Built Development
OM3	Appearance of the Proposed Structures
OM4	Compensatory Planting
OM5	Buffer Planting
OM6	Visual Design on Noise Mitigation Measures



Key Plan



VSR13 Cheung Tung Road - Existing View (Approx. 50m)

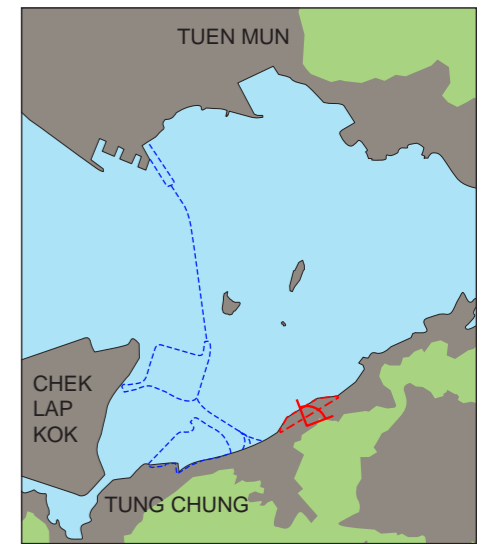


VSR13 Cheung Tung Road - Photomontage (Without mitigation at Day 1)

NOTES:

Sample photomontages have been generated to provide a preliminary idea on the scale, massing and extent of the proposed development, as well as the effect of the proposed mitigation measures. These images will be subject to change and are for illustrative purposes only. The architectural design, finishes or any other related detailed design components are subject to refinement and changes at the detailed design stage.

Mitigation Measures (Operational Phase)	
OM1	Re-instatement of Excavated Area
OM2	Aesthetic Design of Built Development
OM3	Appearance of the Proposed Structures
OM4	Compensatory Planting
OM5	Buffer Planting
OM6	Visual Design on Noise Mitigation Measures



Key Plan



VSR13 Cheung Tung Road - Photomontage (With mitigation at Day 1)

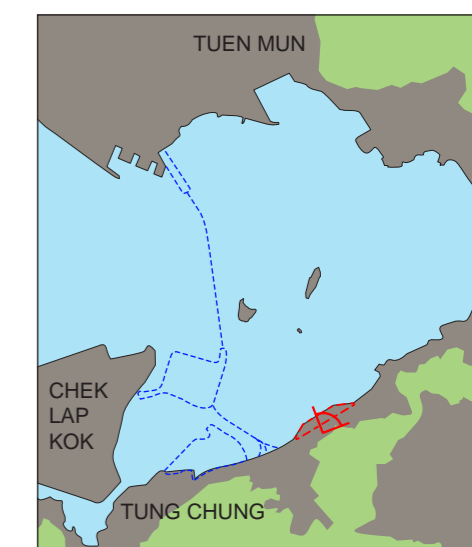


VSR13 Cheung Tung Road - Photomontage (With mitigation at Year 10)

NOTES:

Sample photomontages have been generated to provide a preliminary idea on the scale, massing and extent of the proposed development, as well as the effect of the proposed mitigation measures. These images will be subject to change and are for illustrative purposes only. The architectural design, finishes or any other related detailed design components are subject to refinement and changes at the detailed design stage.

Mitigation Measures (Operational Phase)	
OM1	Re-instatement of Excavated Area
OM2	Aesthetic Design of Built Development
OM3	Appearance of the Proposed Structures
OM4	Compensatory Planting
OM5	Buffer Planting
OM6	Visual Design on Noise Mitigation Measures



Key Plan

For illustrative purpose only and subject to refinements and changes at detailed design stage.



Proposed Comprehensive Residential and Commercial Development atop Siu Ho Wan Depot  
Potential Enhancement Measures at the Southern Facade

**SKA**  
SIMON KWAN & ASSOCIATES LTD.  
關善明建築師事務所有限公司

**AECOM**

**ARUP**

**MTR**

SCALE:	1:5000	(A3) FIGURE No.
DATE:	OCT 2017	

# **APPENDIX VI**

## **Sewerage and Drainage Appraisal**

MTR Corporation Limited  
**Proposed Comprehensive  
Residential and Commercial  
Development atop Siu Ho Wan  
Depot**  
Sewerage and Drainage Appraisal

248118-REP-029-01

Final | October 2017

This report takes into account the particular instructions and requirements of our client  
It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party

Job number 248118

**Ove Arup & Partners Hong Kong Ltd**  
Level 5 Festival Walk  
80 Tat Chee Avenue  
Kowloon Tong  
Kowloon  
Hong Kong  
[www.arup.com](http://www.arup.com)

**ARUP**

## Contents

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<b>1 Introduction</b>	<b>1</b>
<b>2 Sewerage</b>	<b>2</b>
<b>3 Drainage</b>	<b>4</b>

### Figures

Figure 1	Existing, Planned and Proposed Sewerage Network Overall Plan
Figure 2	Conceptual Design of the Sewerage System within the Development
Figure 3	Existing Drainage Network Plan



# 1 Introduction

---

- 1.1.1** MTR Corporation has commissioned Ove Arup and Partners Hong Kong Limited to undertake a Sewerage and Drainage Appraisal (D&SA) for the proposed comprehensive residential and commercial development atop Siu Ho Wan Depot (SHD) (the Proposed Development).
- 1.1.2** A D&SA was included in the Study Reports submitted to Government in February and December 2016 to demonstrate the feasibility of a conceptual development scheme comprising 14,000 residential units with private recreational and supporting facilities, neighbourhood shopping facilities of 30,000m<sup>2</sup> GFA, schools and kindergartens, and transport facilities including a new MTR station from drainage and sewerage perspective.
- 1.1.3** A Sewerage Impact Assessment (SIA) Report was prepared in May 2017 to formulate a sewerage scheme to convey sewage generated from the Proposed Development to Siu Ho Wan Sewage Treatment Works for treatment and disposal, which has been reviewed by Environmental Protection Department and Drainage Services Department. The sewerage scheme was subsequently included in the Sewerage and Sewage Treatment Implications section of the approved Environmental Impact Assessment (EIA) Report (EIA-252/2017).
- 1.1.4** This Sewerage Appraisal presents the sewerage scheme based on findings and recommendations of the SIA and the EIA.

## 2 Sewerage

**2.1.1** The Proposed Development falls within the North Lantau Sewerage Catchment, the sewage of which is mainly discharged to Siu Ho Wan Sewage Treatment Works (SHWSTW). SHWSTW provides chemically enhanced primary treatment (CEPT) and is situated approximately 420m east of the Development. According to the approved Environmental Impact Assessment (EIA) report for Tung Chung New Town Extension (AEIAR-196/2016), Drainage Services Department (DSD) would fit out the remainder of the treatment units at SHWSTW to its designed maximum handling capacity (180,000 m<sup>3</sup>/day) by 2024 in order to cope with the project sewage flows within its catchment.

**2.1.2** The sewage estimation has been carried out in accordance with the guidelines set out in Environmental Protection Department (EPD) Report No. EPD/TP1/05 Guidelines for Estimating Sewage Flows (GESF) for Sewerage Infrastructure Planning Version 1.0 and DSD's Sewerage Manual. The sewage flow generated from the Development is about 12,100m<sup>3</sup>/day Average Dry Weather Flow (ADWF). Detailed calculations are shown in **Table 2.1**:

**Table 2.1 Sewage Flow Estimation for the Proposed Development**

Development	Population / Employment No. (ppl) <sup>(iv)</sup>	Unit Flow Factor (m <sup>3</sup> /head/day)	Average Dry Weather Flow (m <sup>3</sup> /day)
Residential	37,800	0.27	10,206.0
Retail (i) (non-food & beverage)	1,050	0.28	294.0
Retail (i) (food & beverage)	450	1.58	711.0
Education (ii) (kindergarten)	780	0.04 / 0.08	33.6
Education (ii) (Primary / Secondary)	3,735	0.04 / 0.08	154.8
Clubhouse (iii) (non-food & beverage)	1485	0.28	415.8
Clubhouse (iii) (food & beverage)	165	1.58	260.7
<b>Total</b>			<b>12,076 (say 12,100)</b>

- (i) Assume 30% of the total commercial GFA for F&B purpose.
- (ii) Class size of 40 students for schools and 30 students for kindergartens. Assume 1.5 staff per class for schools and 2.5 staff per class for kindergartens. Unit Flow Factor per student and staff is 0.04 and 0.08 m<sup>3</sup>/head/day respectively.
- (iii) Clubhouse will be provided in accordance with *PNAP APP-104 Exclusion of Floor Areas for Recreational Use*. Assumptions on number of employee has been made for sewage flow estimation purpose.

**2.1.3** A new separate sewerage system will be provided to serve the Proposed Development situated atop the decked over Siu Ho Wan Depot site. The Government has identified available capacity of about 13,400m<sup>3</sup> /day for accepting the sewage arising from the Proposed Development and SHD for treatment at the SHWSTW. This available capacity is sufficient to cater sewage arising from the Proposed Development, the replanned SHD and SHO Station as the total sewage discharge is estimated to be 13,329m<sup>3</sup>/day. No adverse impact to SHWSTW is therefore anticipated.

**2.1.4** The inlet chamber of SHWSTW is located on the southeast side. It is noted that the inlet chamber of SHWSTW is located higher than the ground levels of adjacent Cheung Tung Road and the maintenance access road (ground level of approximately +5.6mPD to +7.7mPD). Due to such level difference, the provision of on-site sewage pumping station (SPS) is required to overcome the topographical constraint.

**2.1.5** A new sewerage system will be provided to serve the proposed development. It is currently proposed that the sewage generated from the proposed development to be collected from the sewerage system (including local pump sumps / sewage pumping stations and associated rising mains) and then discharged to the ultimate sewage pumping station via rising mains (see **Figure 1**).

**2.1.6** **Figure 2** shows the conceptual design of the sewerage system within the development. The ultimate sewage pumping station will be located at ground level of the eastern boundary of the proposed development and discharged to SHWSTW via twin rising mains with size of 450mm diameter. The rising mains will cross below the TCL and AEL and NLH, then along an existing drainage reserve and maintenance access road and finally discharge to SHWSTW. The crossing of twin rising mains below TCL and AEL and the NLH will be carried out by pipe jacking with jacking pit located adjacent to the ultimate sewage pumping station and receiving pit within existing drainage reserve area. The pipe jacking arrangement will be designed not to conflict with existing utilities. Precautionary and monitoring measures will be implemented.

**2.1.7** Due to the key concerns of the ecological sensitivity of The Brothers Marine Park within the vicinity to the site, additional provisions have been proposed for the ultimate SPS to enhance the sewerage network reliability and minimize environmental impacts due to system failure or in case of emergency situations:

- Provision of twin rising mains;
- Use of high density polyethylene (HDPE) pipe or ductile iron with concrete surround to prevent sewer bursting discharge to adjacent water body;
- 100% standby pumping capacity within SPS with 50% spare pumping capacity stockpiled for any emergency use;
- Dual-feed power supply;
- Emergency storage tank providing up to 3-hours ADWF capacity at the ultimate SPS;
- Monitoring and Control System (MACS) providing real-time notification of alert signal in emergency situation;
- Project Proponent's term contractor to provide 24-7 emergency repair service in the case of emergency situation; and
- Qualified personnel appointed by the Project Proponent carrying out regular inspection, routine maintenance and repairing of the facilities and equipment.

**2.1.8** With implementation of these provisions, emergency discharge is not expected and thus no adverse impact on water quality or ecology due to the proposed SPS is anticipated.

**2.1.9** Septicity of sewage may occur due to high organic content of domestic sewage, variation of sewage flow pattern and high temperature in hot summer period. Necessity of septicity control in the proposed sewerage network would be further reviewed in the detailed design stage.

**2.1.10** For the odour control, the proposed SPS would be enclosed in building with sufficient ventilation in order to maintain negative pressure preventing foul air escape from the building. Wet well can be air sealed, the ventilated foul air should be treated by a deodorisation system before discharge.

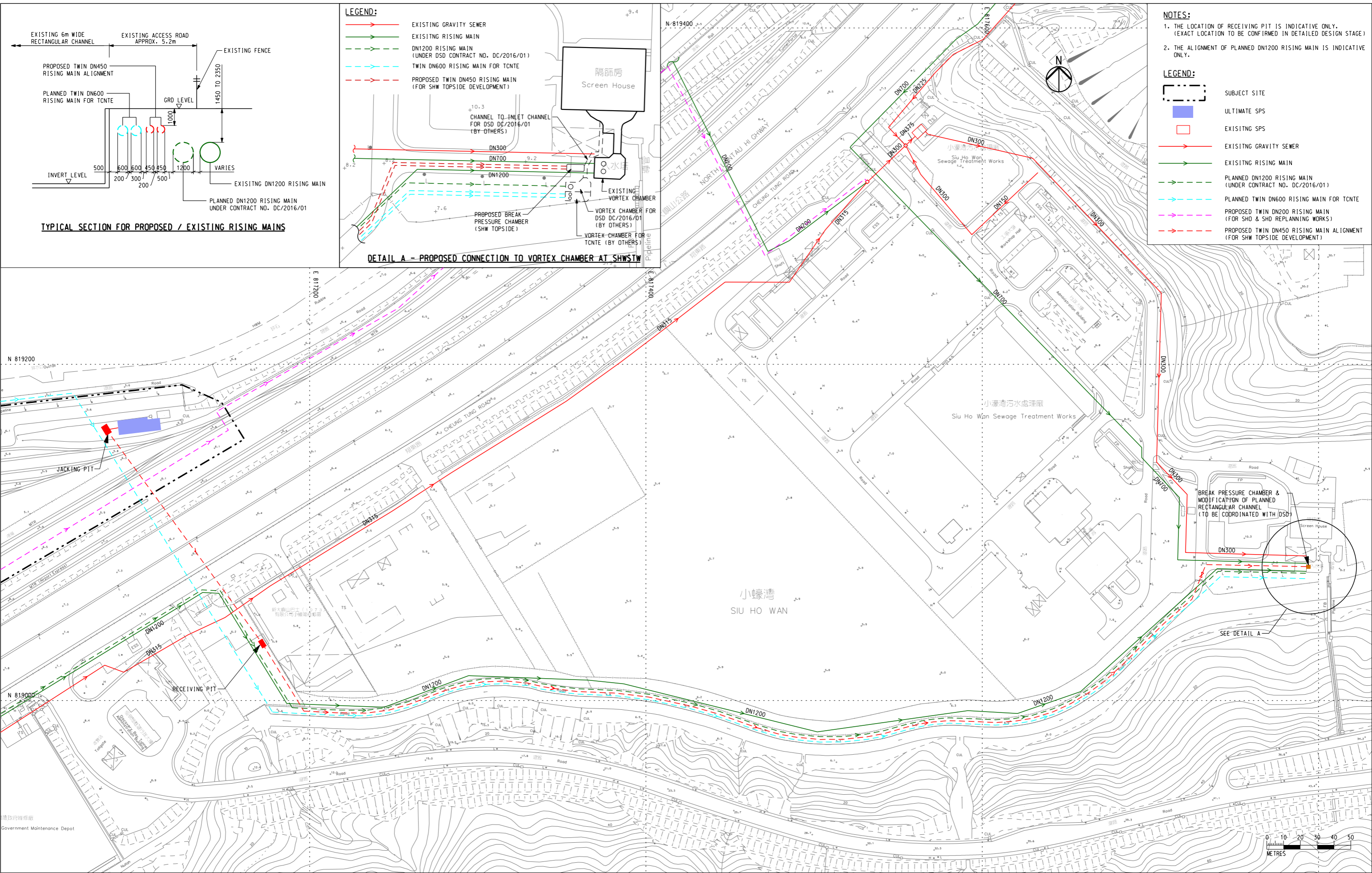
**2.1.11** To conclude, the Government has identified available capacity of about 13,400m<sup>3</sup> /day for accepting the sewage arising from the Proposed Development and SHD for treatment at the SHWSTW. No adverse impact to SHWSTW is therefore anticipated. With provision of appropriate measures for emergency situation and septicity control, no insurmountable impact on the existing/planned sewage networks and sewerage facilities due to the Proposed Development is anticipated.

## 3 Drainage

---

- 3.1.1** Three drainage reserve areas for existing box culverts are located within the Subject Site and their locations are shown in **Figure 3**. The drainage reserve area at the west is 21m wide for accommodating a twin cell 2,800 x 2,800 box culvert, the one at the middle is 10m wide for accommodating a single cell 2,800 x 2,800 box culvert and the one at east is 25m wide for accommodating a 3 cells 3,500 x 3,000 box culvert. Structures have avoided to be constructed within these drainage reserve areas and maintenance access to these drainage reserve areas has been allowed. Sufficient headroom within the drainage reserve areas will also be maintained for maintenance purpose.
- 3.1.2** There are existing stormwater drains ranging from 300mm to 1,200mm in diameter. These drainages will collect stormwater runoff from the Depot and discharge to the existing box culverts.
- 3.1.3** Since the catchment area and surface characteristics would remain similar to the existing condition after the depot replanning works and the proposed topside development, it is anticipated that the surface runoff pattern and quantity should also remain generally the same as the existing condition. Therefore, the existing box culverts should have adequate capacity to cater for the stormwater runoff from the Proposed Development without causing any adverse drainage impact.

## Figures



- LEGEND:**
- EXISTING GRAVITY SEWER
  - EXISTING RISING MAIN
  - - - DN1200 RISING MAIN (UNDER DSD CONTRACT NO. DC/2016/01)
  - - - TWIN DN600 RISING MAIN FOR TCNTE
  - - - PROPOSED TWIN DN450 RISING MAIN (FOR SHW TOPSIDE DEVELOPMENT)

- NOTES:**
1. THE LOCATION OF RECEIVING PIT IS INDICATIVE ONLY. (EXACT LOCATION TO BE CONFIRMED IN DETAILED DESIGN STAGE)
  2. THE ALIGNMENT OF PLANNED DN1200 RISING MAIN IS INDICATIVE ONLY.

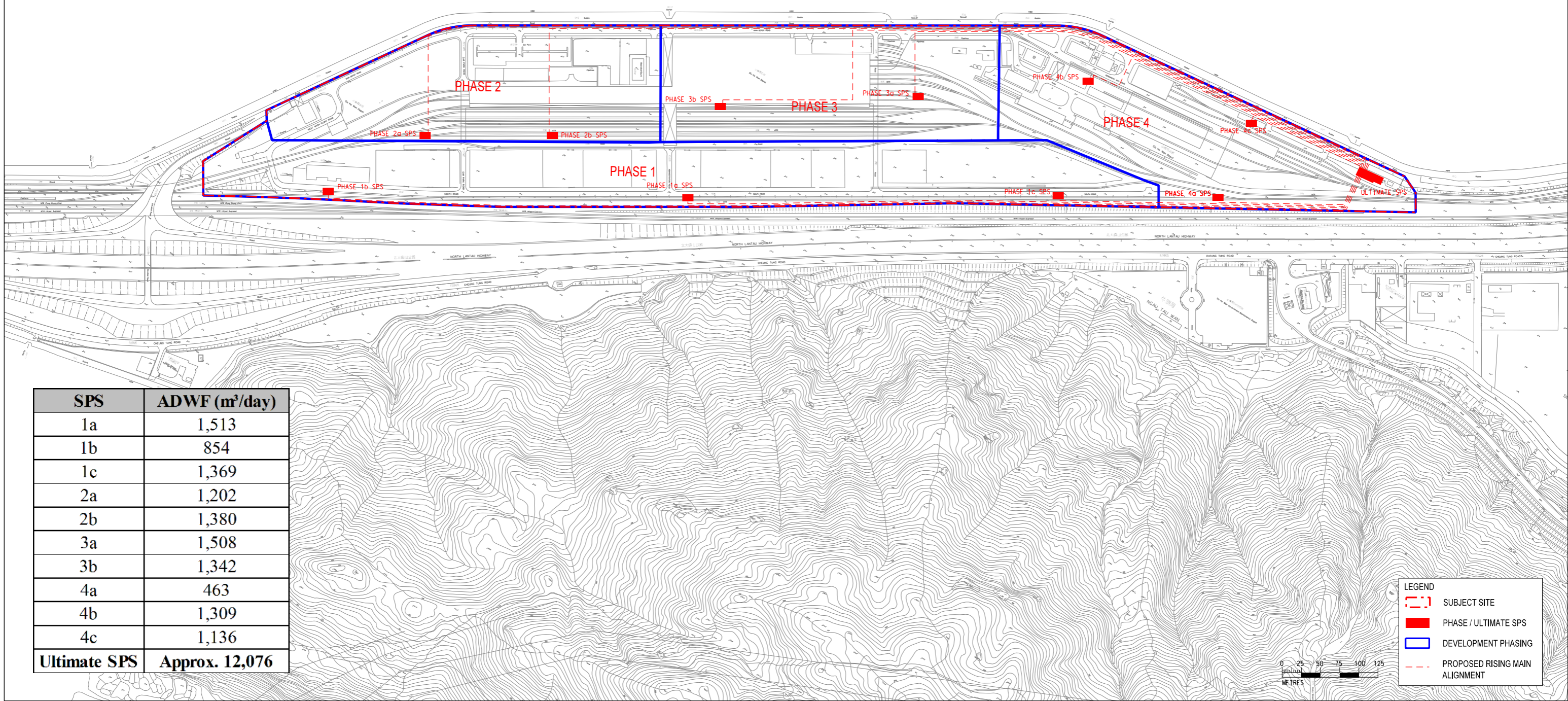
- LEGEND:**
- SUBJECT SITE
  - ULTIMATE SPS
  - EXISTING SPS
  - EXISTING GRAVITY SEWER
  - EXISTING RISING MAIN
  - - - PLANNED DN1200 RISING MAIN (UNDER CONTRACT NO. DC/2016/01)
  - - - PLANNED TWIN DN600 RISING MAIN FOR TCNTE
  - - - PROPOSED TWIN DN200 RISING MAIN (FOR SHO & SHD REPLANNING WORKS)
  - - - PROPOSED TWIN DN450 RISING MAIN ALIGNMENT (FOR SHW TOPSIDE DEVELOPMENT)

**TYPICAL SECTION FOR PROPOSED / EXISTING RISING MAINS**

**DETAIL A - PROPOSED CONNECTION TO VORTEX CHAMBER AT SHWSTW**

BREAK PRESSURE CHAMBER & MODIFICATION OF PLANNED RECTANGULAR CHANNEL (TO BE COORDINATED WITH DSD)

SEE DETAIL A







SPS	ADWF (m <sup>3</sup> /day)
1a	1,513
1b	854
1c	1,369
2a	1,202
2b	1,380
3a	1,508
3b	1,342
4a	463
4b	1,309
4c	1,136
<b>Ultimate SPS</b>	<b>Approx. 12,076</b>

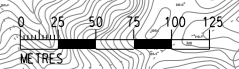
**LEGEND**

- SUBJECT SITE
- PHASE / ULTIMATE SPS
- DEVELOPMENT PHASING
- PROPOSED RISING MAIN ALIGNMENT

0 25 50 75 100 125  
METRES

**LEGEND:**

-  SUBJECT SITE
-  DRAINAGE RESERVE AREA
-  EXISTING BOX CULVERT
-  EXISTING DRAIN PIPE CONNECTED TO BOX CULVERT





## **APPENDIX VII**

### **Water Supply and Utilities Appraisal**

## 1. INTRODUCTION

### 1.1 Project Background

- 1.1.1 MTR Corporation has commissioned a multi-disciplinary consultant team to undertake a feasibility study for the comprehensive residential and commercial development atop Siu Ho Wan Depot (SHD) (the Proposed Development).
- 1.1.2 A Preliminary Utilities Feasibility Study, including water supply and utilities appraisal, was included in the Study Report submitted to Government in February and December 2016 to demonstrate the feasibility for a conceptual topside development scheme of 14,000 residential units and 30,000m<sup>2</sup> GFA commercial/retail facilities from a utility point of view. A new Siu Ho Wan (SHO) Station has been planned at the western position along the existing MTR Tung Chung Line (TCL) tracks to meet the development transport need and enable building of a sustainable community.
- 1.1.3 AECOM Asia Co. Ltd. (AECOM) has been commissioned Corporation to undertake the water supply and utilities appraisal on the proposed Development Scheme, with due consideration given to departmental comments received from the previous submission.

### 1.2 Purpose of this Report

- 1.2.1 This preliminary study aims to confirm that there are no insurmountable problems associated with supplies of fresh water, electricity and gas to support the Proposed Development.
- 1.2.2 Utility demands from the Proposed Development have been updated, along with the preliminary estimations on cumulative fresh water demands within the respective service catchments of the Siu Ho Wan Water Treatment Works (SHWWTW).

## 2. THE PROPOSED DEVELOPMENT

### 2.1 Development Schedule

- 2.1.1 With a development site area of about 30ha, the proposed Development Scheme provides about 14,000 residential units with an estimated population of 37,800. Neighbourhood commercial/retail facilities of about 30,000m<sup>2</sup> GFA would be provided to serve the local community, along with private recreational facilities (clubhouses), educational uses (three 30-classroom schools and four 6-classroom kindergartens as agreed with Education Bureau), a public transport interchange (9,000m<sup>2</sup> GFA subject to detailed design) and other supporting facilities. The proposed SHO station concourse (8,000m<sup>2</sup> GFA subject to detailed design) would be integrated with the property development podium.
- 2.1.2 For the purpose of this preliminary study, assumptions on operation of various facilities have been made as summarised in **Table 2.1**, which are subject to adjustment at the detailed design stage.

**Table 2.1 Development Assumptions Adopted in the Preliminary Utilities Feasibility Study**

Type of Use	No. of Occupants <sup>(v)</sup> /Area
Residential Clubhouse (Non-F&B) <sup>(i)</sup>	1,485 employees
Residential Clubhouse (F&B) <sup>(i)</sup>	165 employees
Commercial/Retail (Non-F&B) <sup>(ii)</sup>	1,050 employees
Commercial/Retail (F&B) <sup>(ii)</sup>	450 employees
Landscape Area <sup>(iii)</sup>	90,200m <sup>2</sup>
Educational Uses <sup>(iv)</sup>	4,515 students / staff

(i) Clubhouse will be provided in accordance with PNAP APP-104 Exclusion of Floor Areas for Recreational Use.

(ii) Assume 30% of the total commercial GFA for F&B purpose.

(iii) Based on 30% site coverage of greenery.

(iv) Class size of 40 students for schools and 30 students for kindergartens. Assume 1.5 staff per class for schools and 2.5 staff per class for kindergartens.

(v) Assumptions on the number of employee are for water requirement estimation purpose.

### 2.2 Information Collection

- 2.2.1 Information pertaining to the existing and planned utilities within and in the vicinity of SHD have been obtained from the following Government department and utility companies:
- Water Supplies Department (WSD);
  - The Hong Kong and China Gas Company Limited (HKCG);
  - CLP Power Hong Kong Limited (CLP);
  - Hutchison Global Communications (HCG);
  - Hong Kong Broadband Network (HKBN) and
  - Hong Kong Telecommunications Limited (HKT).

### 3. PRELIMINARY UTILITIES APPRAISAL

#### 3.1 Fresh Water Supply

3.1.1 Situated at about 740m to the east of SHD, the existing SHWWTW has a treatment capacity of 150,000m<sup>3</sup>/day, with allowance made in the design expansion to an ultimate capacity of 300,000m<sup>3</sup>/day. WSD has planned the integration of Siu Ho Wan and Silver Mine Bay Water Treatment Works to transfer fresh water at both directions to reduce risk of water supply interruption.

3.1.2 The *Tung Chung New Town Extension Study* has concluded that the projected cumulative mean daily water demand arising from the new town extension and known/committed adjacent developments would exceed the current SHWWTW capacity by at least 50,000m<sup>3</sup>/day. The Study has recommended that the Government should revisit and consider the implementation of its expansion to 300,000m<sup>3</sup>/day under *WSD Report No.13/2001*. It is expected that there should be adequate capacity to cater for the demand from the Proposed Development to be implemented by phases.

3.1.3 A 1,000mm diameter truck main is running along Cheung Tung Road to supply fresh water to the Tung Chung Fresh Water Service Reservoir (TCFWSR) from the SHWWTW. A 700mm diameter fresh water main is branched from the trunk main to supply fresh water to the depot, which is enclosed within the 10m-wide waterworks reserve area located at the western end of SHD. The existing fresh water supply network for SHD is shown in **Figure 3.1**. The proposed Development Scheme has avoided structures within the waterworks reserve area, while the depot has retained maintenance access for WSD.

3.1.4 Total fresh and flushing water demand upon full completion of the Proposed Development is estimated to be about 15,400m<sup>3</sup>/day and 3,400m<sup>3</sup>/day, respectively, based on WSD's *Departmental Instruction (DI) No.1309* and EPD's *GESF Appendix III (3) and (4)*. In addition, water demand for fire-fighting of a R2 residential development site shall be 6,600m<sup>3</sup>/day for 8 hours in accordance with *DI No.1309*. Further, it is estimated that an additional demand of about 1,100m<sup>3</sup>/day would be required for the proposed SHO Station and reprovisioned SHD. Breakdown of the estimated fresh water demand is summarised in **Table 3.1**. The fresh water and salt water demands are used for technical study only. Application for water supply would be made to WSD in accordance with the Waterworks Ordinance and Regulations at the detailed design stage.

3.1.5 SHWWTW currently has a water treatment capacity of 150,000m<sup>3</sup>/day, which will be increased to 300,000m<sup>3</sup>/day by Year 2025 according to WSD's latest plan. CEDD has commissioned consultants to undertake detailed design of a new fresh water service reservoir and the associated water supply network for TCNTE. Upon completion of the proposed waterworks, WSD would connect them and improve the existing water supply network to provide gravity fresh water supply to the Proposed Development. The new fresh water supply network would provide connection point(s) at the eastern or western end of the Proposed Development.

**Table 3.1 Estimation of Fresh and Flushing Water Demand from the Proposed Development**

Type of Usage	Population/ Employment/ Area	Unit Demand of Potable Water (m <sup>3</sup> /head/day)	Mean Daily Potable Water Demand (m <sup>3</sup> /day)
Residential Flat	37,800	0.34 (R2 + Service Trade)	12,852
Residential Clubhouse	1,650	0.23 (non-F&B) 1.53 (F&B)	594
Commercial/ Retail	1,500	0.23 (non-F&B) 1.53 (F&B)	930
Educational Uses	4,515	0.01	45
Landscape Area	90,200m <sup>2</sup>	0.01 m <sup>3</sup> /m <sup>2</sup> /day* (for irrigation)	902
<b>Total Fresh Water Demand (Potable), Say</b>			15,400
Type of Usage	Population/ Employment	Unit Demand of Flushing Water (m <sup>3</sup> /head/day)	Mean Daily Flushing Water Demand (m <sup>3</sup> /day)
Residential Flat	37,800	0.08	3,024
Residential Clubhouse	1,650	0.05	83
Commercial/ Retail	1,500	0.05	75
Educational Uses	4,515	0.03	135
<b>Total Flushing Water Demand, Say</b>			3,400

3.1.6 Government would also extend the proposed Tung Chung salt water supply system to supply salt water to the Proposed Development for flushing. The new WSD salt water supply network would provide a connection point near the western end of the Proposed Development for connection with the 300mm-diameter salt water main within the development. Indicative connection points of the fresh and flushing water supply system are shown in **Figure 3.1**, subject to review in the detailed design stage.

3.1.7 To conclude, no insurmountable problem has been identified for water supply to the Proposed Development for potable, flushing and firefighting purposes.

## 3.2 Electricity Supply

3.2.1 There is an existing 132kV substation in Shum Shui Kok at about 2km east of SHD to supply power to the Proposed Development. 132kV and 11kV cables were also found to be located near to the site. CLP would provide lead-in electricity cables and the cables would likely enter from the eastern end of the Proposed Development. The indicative location of connection to the lead-in electricity cables are shown in **Figure 3.2**. The system would be subject to review with CLP in the detailed design stage.

## 3.3 Gas Supply



3.3.1 The Tai Ho Gas Offtake and Pigging Station is located 300m away from the south-western boundary of the Proposed Development, a 300mm-diameter high pressure underground towngas transmission pipe line running along Cheung Tung Road and existing intermediate and low pressure gas mains within SHD as shown in **Figure 3.3**. Gas supply to the Proposed Development would be provided by the Tai Ho Gas Offtake and Pigging Station by further extension at the NLH crossing adjacent to the eastern site boundary. HKCG would be consulted with respect to gas supply arrangement in detailed design stage.

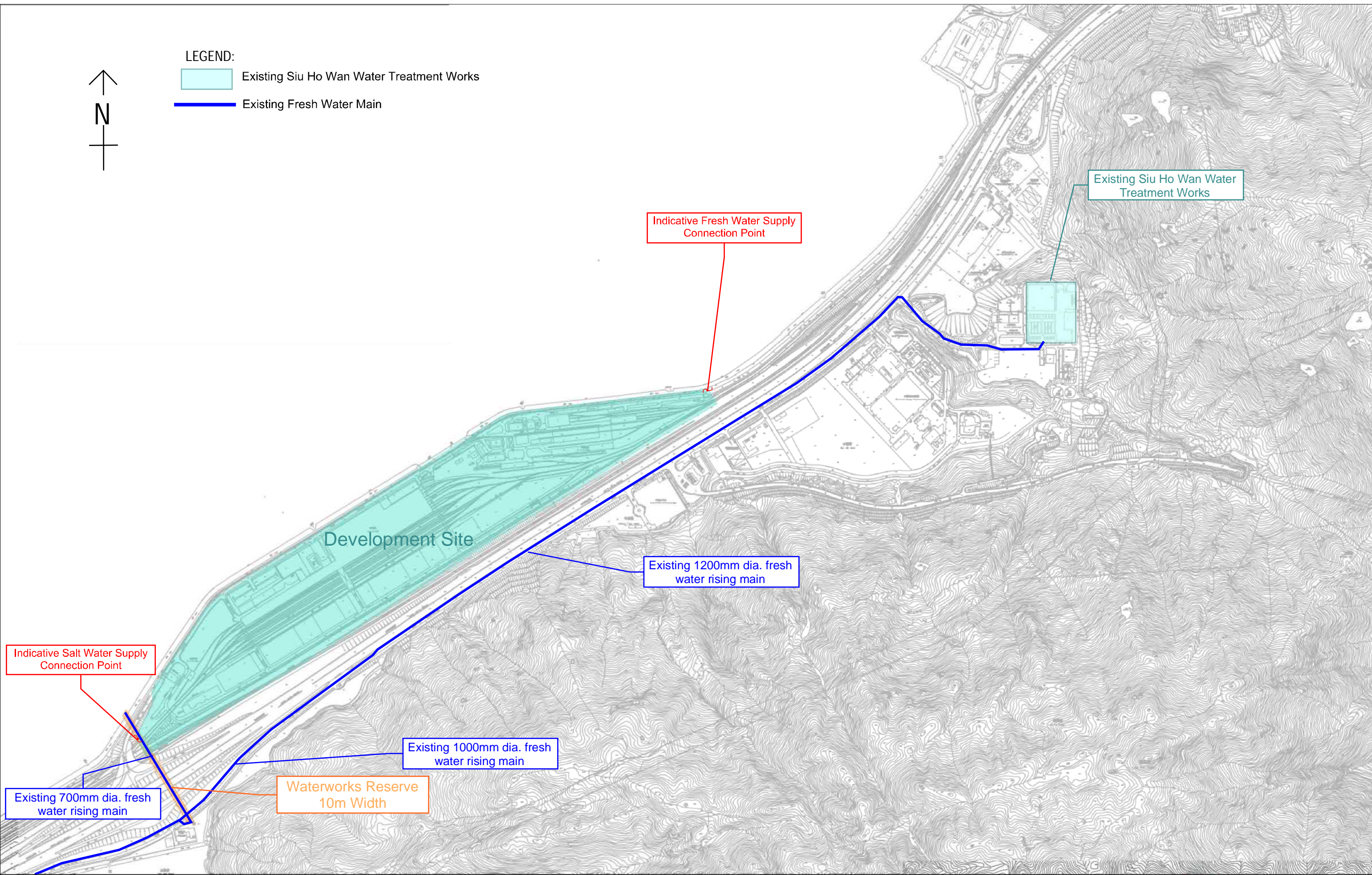
## 3.4 Telecommunication

3.4.1 Telephone lines could be provided by extending the existing telecommunication networks in the vicinity to support the Proposed Development (**Figure 3.4**). Telecommunication companies would be further consulted with respect to the arrangement in the detailed design stage.





LEGEND:

-  Existing Siu Ho Wan Water Treatment Works
-  Existing Fresh Water Main





**LEGEND:**

-  Existing Shum Shui Kok 132kV Substation
-  Existing 132kV and 11kV Cables

Existing 132kV and 11kV cables across North Lantau Highway and railway tracks along Shum Shui Kok Drive






Existing Shum Shui Kok 132kV Substation

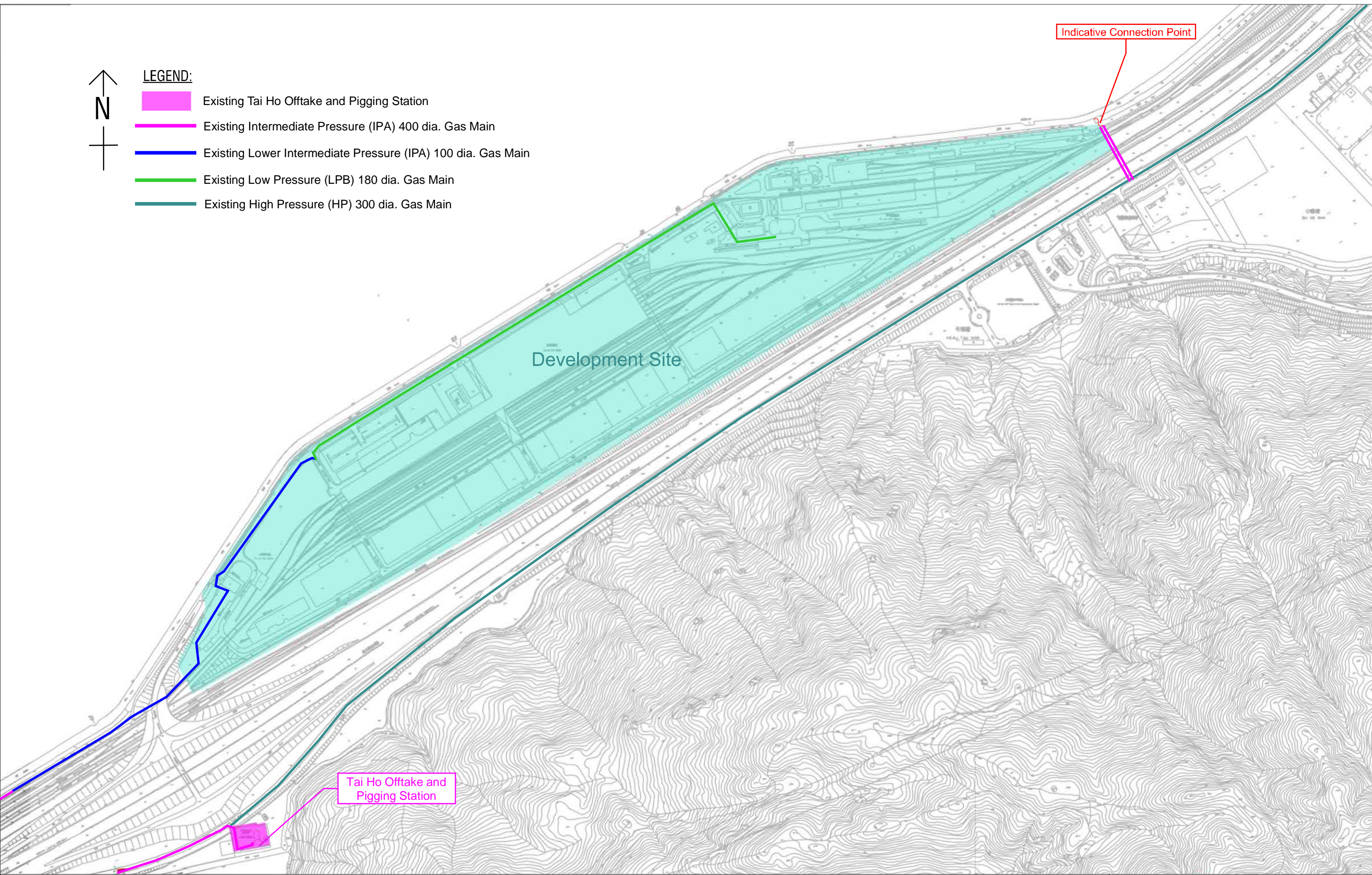
Indicative Connection Point

Development Site



**LEGEND:**

-  Existing Tai Ho Offtake and Pigging Station
-  Existing Intermediate Pressure (IPA) 400 dia. Gas Main
-  Existing Lower Intermediate Pressure (IPA) 100 dia. Gas Main
-  Existing Low Pressure (LPB) 180 dia. Gas Main
-  Existing High Pressure (HP) 300 dia. Gas Main



Proposed Comprehensive Residential and Commercial Development atop Siu Ho Wan Depot  
Gas Supply



SCALE: 1:5000	(A3)	FIGURE No.
DATE: AUG 2015		3.3



**LEGEND:**

 Existing Ducts of:  
Hutchision Global Communications Limited;  
Hong Kong Broadband Network &  
Hong Kong Telecommunications Limited

 Existing cross road ducts of  
Hutchision Global Communications Limited &  
Hong Kong Telecommunications Limited

