

1 Introduction

1.1 Study Background

1.1.1 The development of Tung Chung New Town started in the 1990s under the original goal of establishing a supporting community for Hong Kong's new international airport. In 2007, The Revised Concept Plan for Lantau was completed, featuring a greater emphasis on tourism, economic infrastructure and nature conservation on Lantau. Under the Revised Concept Plan, Tung Chung would be developed into a new town with increased population. According to Census 2011, the existing population in Tung Chung is 78,400.

1.1.2 In order to increase land supply to satisfy the housing demand and other development needs of the territory, the Civil Engineering and Development Department (CEDD) and the Planning Department (PlanD) of the Government of HKSAR jointly commissioned Ove Arup & Partners Hong Kong Limited (the Consultant) under Agreement No. CE 32/2011 (CE) in January 2012 to carry out a planning and engineering study on Tung Chung New Town Extension (the Study). The Study aims to explore the feasibility of extending Tung Chung to the east and west to form an integrated new community with local employment opportunities and various community facilities to meet the demand of the local residents, and with a balance for development and conservation.

1.2 Study Area

1.2.1 Study Area covers the entire area of Tung Chung and its expansion (TCE and TCW) in the form of fallow land, foreshore and sea-bed, places and waters as shown in Figure 1.

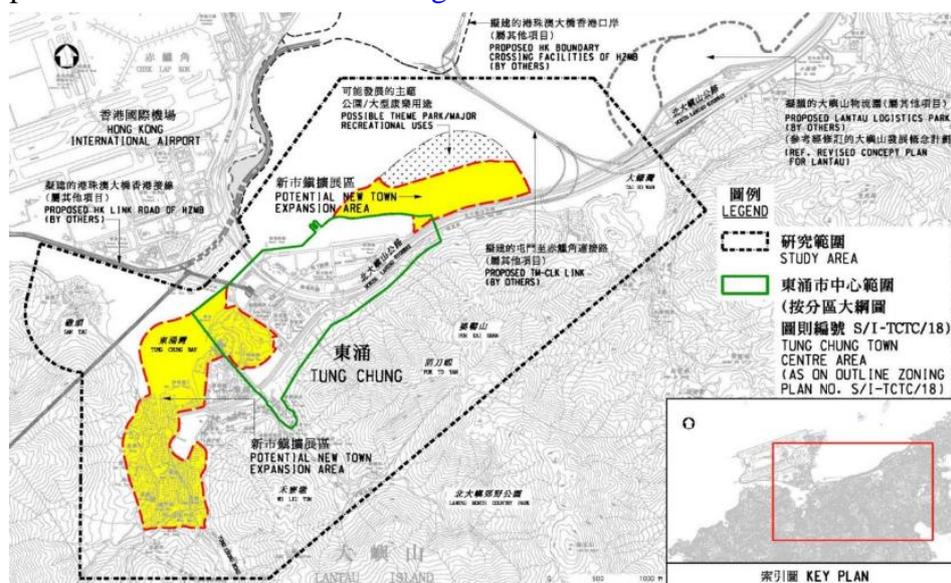


Figure 1 Study Area

1.3 Purpose of this Executive Summary

1.3.1 The purpose of this Executive Summary is to present a brief account on the works carried out under the Study and their key findings. More details on individual aspects are presented separately in respective reports.

2 Overview of Study Flow

2.1.1 The study flow is briefly summarized as follows:

- a) Baseline review, identification of opportunities and constraints and key issues;
- b) Stage 1 Public Engagement;
- c) Establish planning principles;
- d) Formulate initial land use options;
- e) Stage 2 Public Engagement;
- f) Formulate draft RODP, draft ROZP, draft MUDP, draft MLP, and PLP;
- g) Stage 3 Public Engagement;
- h) Formulate final RODP, final ROZP, final MUDP, final MLP and Revised PLP.

2.1.2 Technical assessments and statutory Environmental Impact Assessment was also carried out in parallel along the entire study process.

3 Public Engagement (PE)

3.1 Overview

3.1.1 Three stages of PE were carried out to solicit public views on the proposed Tung Chung extension throughout the Study.

3.1.2 Stage 1 PE was conducted from 12 June 2012 to 12 August 2012. The objective was to introduce to the Study background, the development opportunities and constraints, and to collect views on the development of Tung Chung. Roving exhibitions, briefing sessions and consultation meetings with various stakeholders, a public forum were held, and a survey was conducted to share the study background and to collect views on the proposed Tung Chung further development. The public had also submitted their views via fax, post and email. More than 2,300 suggestions and proposals were received during the Stage 1 PE.

3.1.3 PE2 was conducted from 21 May 2013 to 21 July 2013, with over 3,000 public comments received on the initial land use options. Two proposed initial land use options in TCE were introduced to the public, titled “Theme 1: Livable Town” and “Theme 2: Economic Vibrancy”, while the land use theme in TCW was “Development and Conservation – A Balance”. Various public engagement activities were held to introduce the planning and engineering considerations and the proposed initial land use options of the Study to the general public. These activities include roving exhibition, a Community Workshop, a Public Forum, Focus Group meetings with interested stakeholders and consultation meetings with statutory advisory bodies. Public views were collected via different channels including email, post, fax, by hand, by phone, Opinion Forms collected throughout the PE period, Comment Forms collected at the Public Forum, and views recorded during Community Workshop / Public Forum / Focus Group Meetings. 3,099 submissions were received, including 2,189 written submissions, 428 Opinion Forms/Questionnaires and 482 Comment Forms.

3.1.4 After careful consolidation and analysis of all the opinions on the initial land use options received in Stage 2 PE, a draft RODP was formulated and was consulted in the Stage 3 PE during the period between 15 August 2014 and 31 October 2014. In the draft RODP, attention was given to the commercial development and jobs introduced by other development projects on Lantau, such as the North Commercial District

(NCD) of the Hong Kong International Airport (HKIA) and development of the Hong Kong Boundary Crossing Facilities (HKBCF) of the Hong Kong-Zhuhai-Macao Bridge (HZMB). The proposed reclamation in TCW was deleted in response to public comments. Balance between nature and urban development was achieved through the development of a Town Park, preservation of rural characteristics and conservation of areas with high ecological value. A balance was also achieved in TCE through the planning of the high-density Metro Core Area, and provision of green walkways and waterfront promenade. Planning concepts including stepped height profile and Transport Oriented Development (TOD) were also included in the RODP.

3.1.5 During Stage 3 PE, the public submitted their views via different channels and at different events. Submission methods included email, post, fax, by hand and by phone. The public could also submit their views by filling in the Comment Form available at the Public Forum. Views expressed during the Focus Group meetings and Public Forum were also recorded. There were a total of 4,086 public submissions received, with 558 individual submissions, 3,515 standard submissions from groups such as Prajna Dhyana Temple, San Tau Village, villages of Tai Ho, etc., and 13 signature campaigns. Out of these 4,086 public submissions, 3,913 were written submissions received through email (1302), fax (6), post (315), by hand (2,270) and telephone (20), whereas 173 were received at the Public Forum on 11 October 2014 via Public Forum Comment Forms. 13 signature campaigns with a total of 7,536 signatures from various groups and villages were also received.

3.1.6 Key comments and suggestions received during the three stages of PE are broadly summarised below.

3.2 Stage 1 PE

General

3.2.1 There was broad consensus that Tung Chung needed further development. The benefits of more community and recreational facilities, local economic development and improvement of transport infrastructure were acknowledged. Transportation, community / recreational facilities and job/business opportunities were considered most important among others aspects consulted.

3.2.2 There was concern that the density of housing development would be too high. A balanced mix of public and private housing was generally demanded. There was suggestion that Tung Chung could be developed into a commercial, tourism and recreational hub with resorts, hotels, water sports centres, flea markets, marina, fisherman's wharf, and eco-tourist facilities (e.g. ecological parks, organic farms, eco-tourism and environmental educational centre, etc.).

Reclamation

3.2.3 Reclamation in TCW and land resumption for reselling to private developers was strongly opposed, while developing fallow agricultural land was supported. There was no major objection to reclamation in TCE.

Community Facilities

3.2.4 More community and recreational facilities, particularly hospitals, medical care facilities, sports grounds and wet markets were requested. These facilities should be more evenly distributed between TCE and TCW.

Transportation

3.2.5 Improvement on internal and external transportation connectivity, and an additional MTR station in TCW was clearly requested. More transport types and services were also suggested to help reduce transportation cost and to support population growth. Improvement and extension of the existing cycle tracks to Sunny Bay were also mentioned.

Environment

3.2.6 There were grave concerns about the adverse impacts of development on the ecology around Tung Chung Stream and Tung Chung Bay, and the disturbance to butterflies, birds, fish, horseshoe crabs and Chinese White Dolphins. There were also concerns about traffic noise caused by nearby roads and railway.

Cultural Heritage

3.2.7 Monuments, historical buildings and rural villages of preservation

values should be protected. Ma Wan Chung should be preserved and revitalised and the existing fishing village should be developed into a Fisherman's Wharf. Prajna Dhyana Temple at Shek Mun Kap should be preserved.

Economy

3.2.8 Increasing job and business opportunities for local residents were considered very important.

3.3 Stage 2 PE

General

3.3.1 In Stage 2 PE, there was broad consensus for further development in Tung Chung as soon as possible, and the existing problems in Tung Chung (e.g. poor connectivity, insufficient community facilities and job opportunities, etc.) should be addressed.

3.3.2 The public requested for sustainable development under a holistic approach to better integrate TCE and TCW. Other suggestions include balanced housing mix, better building design and avoidance of “wall-effect” residential development.

3.3.3 The public suggested that the development should not only focus on housing development but also on commercial and tourism growth. They agreed that tourism development could bring enormous economic benefits and create ample opportunities for both Tung Chung and Hong Kong, hence more facilities such as hotels, commercial premises and shopping malls were suggested. Leisure tours such as eco-tourism and concert tours were also suggested.

3.3.4 There were concerns that the additional population would overload the carrying capacity of the existing infrastructures.

TCE

3.3.5 On TCE, the proposed development was generally supported with higher development density near the core area and around the transportation hubs preferred. A hybrid development of Theme 1 “Livable Town” and Theme 2 “Economic Vibrancy” was generally supported. There was relatively less concern on the proposed 120ha

reclamation comparing to TCW. Major concerns include environmental impact, visual impact, impact on water flow and ecology near Tai Ho, cumulative impact on marine ecology and Chinese White Dolphins, narrowing of the navigation channel. There were suggestions to review the extent of reclamation in TCE. Views on the needs, scale and location of the marina was diverse, with some stakeholders believed that the marina would only benefit the affluent minority, while others considered that it could enhance the economy of Tung Chung and make Tung Chung a more interesting recreation and tourism destination.

TCW

3.3.6 There was strong opposition to the proposed reclamation due to the adverse impact on the ecology and water flow in Tung Chung Bay, thus deteriorating the current odour problem near Ma Wan Chung. There was also objection to the proposed private housing development near the Town Park. The proposed revitalisation of Ma Wan Chung village was however supported.

3.3.7 Comments on development scale and land uses in TCW were diverse.

- a) Some public supported more developments in TCW (e.g. commercial facilities on top of the railway station and higher plot ratio around) while some did not.
- b) There were many suggestions on the land uses. Some suggested developing all available fallow agricultural land. There were proposals to develop some specific sites (e.g. a hill slope at Nim Yuen Village, an area between Lam Che Village and YMCA of HK Christian College, etc.) for other uses (e.g. religious and tourism purposes with an organic farm and a memorial hall). There were also proposal to develop TCW into a recreational tourist spots under the theme with Buddhism characteristics, and zone the area around Prajna Dhyana Temple as G/IC and to retain the existing view from the temple. Other suggestions also included zoning some areas as Residential, Agriculture, G/IC and Recreation.
- c) At the same time, there were oppositions to the proposed zoning of particular sites near existing villages as Green Belt, Conservation Area and Agricultural because of the restraint on future development potential. There were also oppositions to the proposed development near Shek Mun Kap and the Prajna Dhyana Temple

and requested for lower plot ratio.

- d) On the other hand, Green Groups supported the proposed Conservation Area and Green Belt and preservation of the important ecological assets (e.g. Tung Chung Stream, Tung Chung Bay, Fung Shui Woodland, etc.). They urged the Government to proceed with the gazettal of the DPA plan as they were concerned that the areas with high ecological values will be adversely affected by the human activities arising from nearby developments.

Community Facilities

- 3.3.8** There was broad consensus that the facilities were not evenly distributed between TCE and TCW. The public requested for a balanced community facilities provisions for the youth, the elderly and the ethnic minorities, for more recreation, leisure, civic amenities and all levels of education land uses. Facilities that were frequently mentioned include wet market, G/IC complex, community / religious facilities, recreational facilities (e.g. cricket, rugby, water sports, etc.), local shops, cycling tracks to other parts of Lantau, G/IC facilities for the youth and the elderly, hospital, childcare centre, etc. There were suggestions that the proposed sport ground should be located between TCE and TCW.

Educational Facilities

- 3.3.9** Interested parties advised that conventional primary and secondary schools are currently more than sufficient in Tung Chung, and therefore there was no imminent need for more educational facilities in Tung Chung except tertiary education facilities or school for special needs students.

Transportation

- 3.3.10** There were strong requests for improvement of the transportation and connectivity within Tung Chung and to better connect with other parts of Hong Kong. The proposed railway stations in TCE and TCW were welcomed, but the public also expressed concerns that the existing rail and road capacity may not be sufficient to cope with the additional population. Proper cycling paths connecting all areas within Tung Chung were also requested. Other suggestions included electrification of the transportation system and green-road infrastructures, making use of the seven existing piers, developing monorail system, etc.

Environment

- 3.3.11** The public generally appreciated the proposed preservation of the natural environment and protection of the high ecological value areas in TCW in particular Tung Chung Stream and Tung Chung Bay. Green Groups expressed their concerns about the cumulative impact on the environment and marine ecology in particular the Chinese White Dolphins brought by the surrounding developments.

Cultural Heritage

- 3.3.12** The proposed preservation of the local cultural heritage such as Hau Wong Temple, Tung Chung Fort, Tung Chung Battery and the local villages, etc. was supported. There were suggestions to incorporate these assets as part of a cultural tourism programme or within a wider tourism plan.

Economy

- 3.3.13** The public called for more diverse job opportunities in Tung Chung that can match the local skillsets. More local business such as street shops, commercial facilities including retail premises should be provided so that more diverse job opportunities could be created. There were suggestions that the development of Tung Chung should capitalise the advantages of its strategic geographic bridgehead location to develop business centre or MICE which could well integrate with the HKZMB and HKIA.

3.4 Stage 3 PE

General

- 3.4.1** As in Stage 1 and Stage 2 PE, the public continued to urge for earliest implementation of the proposed development. The public urged for a balance development among economic, environmental and ecological protection considerations.
- 3.4.2** There were diverse views on population increase. Some parties worried about the impact due to increase in population, while there were also opinions that the population should meet the demand of more economic development and job requirements in future.

3.4.3 The public generally appreciated a balance provision of public and private housing in Tung Chung. Some suggested increasing the plot ratio for housing development in TCW to better utilise the land.

Reclamation

3.4.4 Deletion of the proposed reclamation in TCW was strongly supported. There was no major objection to the proposed reclamation in TCE and Road P1. Nevertheless, some concerned about the potential direct and indirect impacts on marine ecology and Chinese White Dolphins due to the proposed reclamation.

TCE

3.4.5 The concept of transport-oriented development was supported. There were other suggestions including more leisure spaces with local characteristics, a balance provision of land for educational use, and better utilization of underground space for development.

3.4.6 The public generally supported the proposed marina in TCE and believed it can enhance the vibrancy of the area. Some suggested that the marina should be open for public use, while some suggested providing a sheltered water area by the Government for local vessels to help meet the growing demand of sheltered and safe berthing spaces in Hong Kong. Other suggestions include limiting the capacity of the marina to 300 vessels, integrating the marina into the pedestrian walkway networks so that the promenade and scenic view of the water area and the Airport could be best utilised. Green Groups concerned about the potential impact on Chinese White Dolphins due to increase in marine traffic outside the Marina.

TCW

3.4.7 Considerable amount of public comments on the proposed zonings in TCW were received during Stage 3 PE. They include:

- a) Green Groups suggested zoning the Fung Shui woodland as CA or GB, designating the areas on the bank of Tung Chung Stream near Fong Yuen and Shek Mun Kap as CA and GB to protect the natural environment and the habitats for butterflies.
- b) There was objection to designating GB and CA zonings along the

bank of Tung Chung Stream, and at the village area around Lam Che and Nim Yuen. They suggested changing the land use of two sites around Lam Che and Nim Yuen from GB and R4 to Government, Institution or Communities (G/IC). They also expressed that the land in front of Hau Wong Temple should be used for traditional festival celebrations.

- c) Villagers opposed to any development near the village. They suggested that the proposed R3 site should be moved eastward, agricultural land in the village be preserved. They also commented that the village boundary shown in the RODP was incorrect and requested to extend their village boundary. There was requested for expansion of the Village Type Development (V) zone to meet their future small house demand. They also objected to the proposed R2 site near the town park due to hilly terrain and possible walled effect created by the buildings.
- d) The proposed land uses around Prajna Dhyana Temple in Shek Mun Kap was generally appreciated, while there was also suggestion to relocate the residential development near Prajna Dhyana Temple to the other side of Tung Chung Stream.
- e) There were comments that the proposed development intensities in TCW were too low and the plot ratio for the proposed R3 sites along Tung Chung Stream should be increased to 1.5 to 3.5.
- f) Villagers requested that suitable compensation should be provided if private land was zoned for conservation purpose.
- g) Some private land owners opposed zoning the areas around Nim Yuen Village as institution and community use instead of GB. Some also objected to the proposed zoning of their land holdings near Tung Chung Bay, and suggested designation of OU (Mixed use) zoning and a R3 site around the railway station which they considered in line with the TOD concept.
- h) Other suggestions include the better use of abandoned farmlands, designating the conservation area as a park to be managed by the government through land swap or resumption with compensation, designating the proposed R3 site at Shek Mun Kap as Natural Park,

relocating the proposed public housing development nearer to future railway station, retaining Area 23 for high density residential use, rezoning the proposed R4 sites near future railway station to R3, rezoning the area at the western side of the estuary of Tung Chung Stream for GIC or recreation uses, deleting all non-building areas in TCW, etc.

Existing Tung Chung Town Centre

3.4.8 Suggestions on land uses within the existing town centre area include: Areas 1, 2 and 3 should be used as transport interchange and parking areas for coaches; Area 52 to be used as public leisure space; the waterfront area could be used for commercial, recreational, cultural and educational purposes; extension of the covered walkway from the town centre to Tung Chung North and other new development areas and to improve public access to waterfront events; and to provide more diversified forms of open space.

Community Facilities

3.4.9 In general, the public considered that more community facilities should be provided specifically for different people in Tung Chung such as the youth, elderly and ethnic minorities. The facilities provided should be more balance between TCE and TCW. Facilities frequently mentioned include open spaces, reserved lands for Non-Government Organisations (NGOs), government municipal building; wet markets, cooked food markets, city hall, childcare and elderly centres, arts venue/theatre, clinics, government offices, facilities for ethnic minorities, sport facilities such as rugby pitch and stadium, hostel and community centre operated by a charitable foundation, etc. Some suggested that the shopping centres and markets shall be managed by more than one companies so as to allow competition among businesses.

3.4.10 There were concerns that the proposed R2 site in TCW would affect the Tung Chung Community Services Complex, and relocating of the existing services provided by the NGOs in the Services Complex should be provided to ensure minimum impact to the provision of services.

3.4.11 There were comments about the need of the proposed clinic/healthcare centre in TCW which would be located only 500 meters away from North Lantau Hospital.

Religious Facilities

- 3.4.12** A religious organization concerned that the proposed R2 site near Wong Nai Uk Village will affect the site of existing religious facilities. Another religious organization generally welcomed the draft RODP. Comment of the urgent need to have a Catholic church in Tung Chung to cater for the local Catholic community is also received. There was request to reserve some private lands at Nim Yuen, Lam Che and Shek Lau Po for “IC” uses, including religious uses to promote Tibetan Buddhism and other related activities such as Tibetan medicine and arts in Hong Kong.

Education Facilities

- 3.4.13** On education facilities, there are grave concerns on the provision of primary and secondary schools in both TCE and TCW and requested for a critical review of the provision taking into account the latest school plans allocation in Tung Chung. There were requests for specific tertiary education facilities including a university, aviation-training centre, vocation education and training centre. There were however diverse opinions on development of international schools.

Transportation

- 3.4.14** On transportation, as clearly voiced out in previous stages of PE, the public strongly requested that the internal and external transport and infrastructure network and connectivity should be improved, and frequency and modes of public transport services including bus and ferry services should be increased. They particularly concerned that the new population would overload the road and railway networks. Other suggestions include the use of environmentally-friendly transport systems such as electric buses, electric cars and bicycle sharing system.
- 3.4.15** On railway, the public supported the two proposed railway stations. Some suggested extending the Tung Chung Line to a new Siu Ho Wan Station and the Airport Island. There were also suggestions that a Public Transport Interchange (PTI) should be planned near the railway station in TCE and within the Metro Core area, in order to encourage the use of railway network and facilitate a seamless connection between railway and other modes of transport.
- 3.4.16** On road network, the proposed Tai Ho Interchange and Road P1 was

generally supported. There were suggestions to link up Cheung Tung Road with Tai Ho Interchange and the existing pedestrian and cycling underpass from Tai Ho access point to the shoreline. Other proposals include a new road at Chung Yat Street, widening of Cheung Tung Road into four lanes, widening and improving the coverage of local pedestrian paths, building cycling paths and promenades, minimising roads but to provide more greenery walkways, etc.

- 3.4.17** There were requests on improving the cycle track network in Tung Chung to cater for the needs of local residents, tourists and professional/sports cyclists in the area. The existing cycle track network should be linked up and connected to both TCE and TCW so as to promote the use of bicycles and enhanced connectivity. Some suggested that there should not be any restrictions for cyclists to use Cheung Tung Road and strict speed limits should be set for all users for safety reason. There were also suggestions to allow professional cyclists to have shared use of the roads with designated cycling lane. Ancillary facilities such as cycle parking spaces and rental kiosks, were also suggested.

Sewerage, Drainage and Flooding Measures

- 3.4.18** There were calls for improvements on the sewerage and drainage systems in TCW, as well as improvements on district-level storm water and sewage drainage. In particular, communal sewer connecting the villages was requested.
- 3.4.19** Some queried about the necessity and effectiveness of the proposed polders for flood prevention. Some concerned that the polder will affect the ecological connectivity across Tung Chung Stream, therefore the footprint should be kept to a minimum. Other flood prevention measures such as building bypass floodways, relocating residential uses away from the Stream and enforcement of laws to prevent illegal waste dumping were suggested.

Environment

- 3.4.20** On ecology and environment, the public supported that the biodiversity and natural environment of Tung Chung should be preserved and the natural scenery, environment and wildlife habitats in TCW should be maintained.
- 3.4.21** Green Groups concerned about the disturbance on Tung Chung Stream,

natural coastlines, riverbanks, Fung Shui woodland and other ecologically valuable sites due to development, and requested for protection of valuable natural habitats. In particular, they requested for a Development Permission Area (DPA) Plan in TCW to control human activities and possible environmental disturbance in the area. More stringent measures for protecting Tung Chung Stream, particularly around the Site of Special Scientific Interest along the Stream, Tung Chung Bay and Wong Lung Hang, were requested. Channelization of Tung Chung Stream, civil engineering works and human activities that would pollute the ecologically sensitive areas should be minimized. De-channelization and rehabilitation of the channelized section of Tung Chung Stream should also be considered.

3.4.22 There were concerns on the cumulative environment impact, in particular noise and air pollution due to increased traffic generated by the various developments in North Lantau. Some particularly concerned about the developments would further increase the already high level of ozone concentration in Tung Chung. Strategic Environment Assessment to ascertain such cumulative impact was requested.

Economic Development

3.4.23 On economic development, the commercial and economic elements introduced in the finalised RODP, taken into account nearby developments in Lantau, was generally appreciated by the public. As clearly voiced out in previous stages of PE, the public requested that local job opportunities should be provided which should match with the skills of the residents in Tung Chung. There were suggestions for technology development and business related to the environment in Tung Chung.

3.4.24 There were supports for the increase in commercial floor space and provision of waterfront retail and street shops selling variety of affordable goods to promote local economy and increase employment opportunities. There were suggestions that local economy could include public wet markets, flea markets, cooked food centres, underground shopping mall, local farming on rehabilitated land, retail uses on future footbridges between Metro Core Area and TCE railway station. There were also suggestions to develop business such as vessel maintenance, scientific research centres and other high value-added technology in Tung Chung.

Tourism

3.4.25 There were suggestions on measures to enhance tourist attraction, to preserve sites with historical and cultural values, improve the natural shorelines and linkage to the waterfront. There were also suggestions to promote eco-tourism by preserving the natural scenery and development of “ecology and heritage park”. The public was however concerned about the potential conflict between livelihood of local residents and tourist activities.

4 Finalized RODP

4.1 Overview

4.1.1 A finalized RODP for TCE and TCW as shown in [Figure 4.1](#) and [Figure 4.2](#) respectively have been formulated taking into considerations such as planning principles, urban design concepts, land use compatibility, access and connectivity, provision of and infrastructure capacities and preservation of surrounding ecological environment and landscape, findings of technical assessments, public comments received during the PE and Government departmental comments. Site number plan indicating the location of each of the development area in finalized RODP for TCE and TCW are shown in [Figure 4.3](#) and [Figure 4.4](#) for reference to the reporting in the coming sections.

4.1.2 Key development parameters are summarized in this section.

4.2 Summary of Key Development Parameters

4.2.1 Land Use Budget

4.2.1.1 The broad land use budget for the PNTEAs is summarized in Tables 4.1 to 4.4 below.

Table 4.1 Land Use Budget for Tung Chung PNTEAs (TCE+TCW)

Major Land Uses	Approx. Area (ha)	% in Total Area
Comprehensive Development Area (CDA)	7.65	3.05%
Residential	71.90	28.70%
G/IC and Utilities		
• GIC	12.46	4.97%
• Education	9.11	3.64%
• OU	2.03	0.81%
Commercial	8.76	3.50%
Open Space		
• Existing DO (DO and Town Park) in New Town (DO)	19.24	7.68%
• Waterfront Promenade (RO)	14.06	5.61%
• Cycling Park (RO)	1.37	0.55%
• District Open Space (DO)	14.44	5.76%
Village Type Development	14.00	5.59%
Agriculture	4.97	1.98%

Coastal Protection Area	4.94	1.97%
OU (Riverpark)	3.32	1.33%
OU (Polders)	1.68	0.67%
Conservation Area	10.42	4.16%
Green Belt	13.24	5.28%
Roads	36.97	14.76%
TOTAL	250.55	100.00%

Large site reduction factor (LSRF) of about 10% is assumed for residential sites during the preliminary estimation of flat production at the draft RODP stage. The provision of internal roads is assumed in LSRF. Details of each site including its development parameters will be refined through a layout plan approach during the finalization of RODP after PE3.

²Tai Ho Section of Road P1 is included

Table 4.2 Land Use Budget for TCE

Major Land Uses	Approx. Area (ha)	%
CDA (metro core)	7.65	6.25%
Residential	43.95	35.92%
G/IC and Utilities		
• GIC	7.44	6.08%
• Education	9.11	7.44%
• OU	1.92	1.57%
Open Space		
• Waterfront Promenade	10.74	8.78%
• District Open Space	10.74	8.77%
Commercial	7.64	6.24%
Roads	23.19	18.95%
TOTAL	122.37	100.00%

Table 4.3 Land Use Budget for Road P1

Major Land Uses	Approx. Area (ha)	%
Open Space		
• Waterfront Promenade	1.56	17.69%
• Cycling Park	1.37	15.51%
Roads	5.89	66.80%
TOTAL	8.82	100.00%

Table 4.4 Land Use Budget for TCW

Major Land Uses	Approx. Area (ha)	%
Residential	27.95	23.41%
G/IC and Utilities		
• GIC	5.02	4.21%

• OU	0.11	0.09%
Open Space		
• Waterfront Promenade	1.76	1.48%
• Existing DO (Town Park)	19.24	16.12%
• District Open Space	3.70	3.10%
OU (River Park)	3.32	2.78%
OU (Polders)	1.68	1.41%
Commercial	1.12	0.94%
Village Type Development	14.00	11.73%
Agriculture	4.97	4.17%
Coastal Protection Area	4.94	4.14%
Conservation Area	10.42	8.73%
Green Belt	13.24	11.09%
Roads	7.88	6.60%
TOTAL	119.37	100.00%

4.2.2 Flat Provision and Housing Mix

4.2.2.1 The land use proposal of the Finalized Layout Plan is to provide a total of about 49,400 flats, with an additional population of around 144,400 as summarized in Table 4.5. This is in line with the 2013 and 2014 Policy Addresses which both mentioned the potential to expand the Tung Chung New Town.

Table 4.5 Flat Provision and Anticipated Population

Existing and Planned		
	Population	Flat No.
Existing	75,394	28,804
Existing + Planned	124,000	44,250
Newly proposed for the RODP		
	Population	Flat No.
TCE	118,900	40,800
TCW	25,500	8,600
<i>Total</i>	144,400	49,400
Overall Population Upon Full Development (Existing + Planned + Newly Proposed)		
	Population	Flat No.
Total	268,400	93,650

4.2.2.2 In response to the recommendations of the Long Term Housing Strategy in 2014, and subsequently requested by Housing Department in Jan 2014, the public:private housing ratio for newly proposed

development in the PNTEAs will be at least 60:40. Therefore, the housing mix of the TCE and TCW PNTEA (based on flat no.) has responded accordingly and presented in the PE3 and has retained in the Finalized Layout Plan as summarised in Table 4.6.

Table 4.6 Public: Private Housing Ratio

Existing & Planned (already taken into account the latest Area 27 HOS development)			
	TCE	TCW	TCE + TCW
Public	11,200	16,850	28,050
Private	16,200	0	16,200
Total	27,400	16,850	44,250
% of Public Flat	41%	100%	63%
% of Private Flat	59%	0%	37%
Newly Proposed for RODP			
	TCE	TCW	TCE + TCW
Public	25,700	5,200	30,900
Private	15,100	3,400	18,500
Total	40,800	8,600	49,400
% of Public Flat	63%	60%	63%
% of Private Flat	37%	40%	37%
Overall Flat Upon Full Development (Existing + Planned + Newly Proposed)			
	TCE	TCW	TCE + TCW
Public	36,900	22,050	58,950
Private	31,300	3,400	34,700
Total	68,200	25,450	93,650
% of Public Flat	54%	87%	63%
% of Private Flat	46%	13%	37%

4.2.3 G/IC and Open Space Provision

4.2.3.1 In order to support the target population of about 144,400, a number of G/IC uses and Open Space provision are proposed in the Finalized Layout Plan and summarized in Table 4.7 below. This provision has been based on the requirements under the Hong Kong Planning Standard and Guidelines as well as liaison with different Government Departments.

Table 4.7 Schedule of GIC and Open Space

G/IC Facilities & Open Space Provision	HKPSG Requirement for RODP Population	Provision in the Layout Plan	Site Area Required (sqm)
Nursery Classes and Kindergartens (unit : classroom)	82.56	72	N/A
30-classroom Primary Schools (unit : school)	7.63	6	37,200
30-classroom Secondary Schools (unit : school)	4.13	2	13,900
Other School Use	N/A	1	15,000
Post-Secondary Institution	N/A	1	24,000
Clinics/Health Centres	1.97	2	10,000
District Police Stations	1.01	1	4,650
Married Police Quarter	N/A	1	4,650
Fire Stations	N/A	1	2,960
Integrated Family Service Centres (IFSC)	0.94	1	NOFA of 535 sqm GFA of 1,180 sqm
Social Security Field Unit (SSFU)	N/A	1	NOFA of 464 sqm GFA of 1,020 sqm
Family and Child Protective Services Unit (FCPSU) Sub-Office	N/A	1	NOFA of 84 sqm GFA of 190 sqm
Integrated Children and Youth Services Centres (ICYSC)	2.67	3	NOFA of 631sqm@ GFA of 1,390 sqm@
Residential Care Home for the Elderly (RCHE)	N/A	2	NOFA of 1575sqm@ GFA of 3470sqm@ (150 places each)
Day Care Unit for Elderly	N/A	1	NOFA of 70sqm GFA of 150sqm@
Neighbourhood Elderly Centre (NEC)	N/A	1	NOFA of 303sqm GFA of 670sqm@
Child Care Centre (for children age under 3)	N/A	2	NOFA of 488sqm@ GFA of 1,080sqm@
District Support Centre for Persons with Disabilities (DSC) Sub-base	N/A	1	NOFA of 170 sqm GFA of 380sqm@
Integrated Community Centre for Mental Wellness (ICCMW)	N/A	1	NOFA of 355 sqm GFA of 790sqm@
Sports Centre	3.34	2	12,000
Sports Ground	1 (also take into account of existing population)	1	30,000
Government Reserve	N/A	3	21,534
Regional Open Space (sqm)	N/A	154,000	-
District Open Space (sqm)	144,400	144,400	144,400
Local Open Space (sqm)	144,400	144,400	-

4.2.4 Commercial GFA and Job Opportunities

4.2.4.1 The proposed commercial GFA and anticipated job opportunities are summarized in Table 4.8 below.

Table 4.8 Commercial GFA and Anticipated Job Opportunities

	TCE		TCW	
	GFA (sqm)	No of jobs	GFA (sqm)	No of jobs
Retail (local)*	113,695	5,685	50,725	2,536
Retail (regional)*	163,346		-	-
• Along TCE MTR	121,427	6,071	-	-
• Along TCE waterfront#	41,919	2,096	-	-
Office(Major Office Node)	500,000	25,000	-	-
Hotel	48,573 (about 1000 rooms)	2,429	-	-
Total	825,613	41,281		2,536

Assumptions:

* Excluding GFA for kindergarten

Excluding the boatyard/maintenance area of the proposed marina/ yacht

- i) No of job: assumed on broad assumption of 1 job/ 20sqm (According to HKPSG Chp8 Table 2: Business Use: 20-25sqm/job)
- ii) Local retail GFA: calculated based on detailed design in the revised draft ODP
- iii) Regional retail GFA: adjustment of regional retail GFA due to the likeliness for the HKIA NCD to provide a substantial amount of regional GFA and hotel developments
- iv) Office GFA: Development of a “Major Node” (500,000sqm) with reference to the HK2030 Working Paper No. 46 and the SEKD Comprehensive Planning and Engineering Review
- v) Hotel Room: estimated by 50sqm per room, reference to Novotel City Gate Hotel (Tung Chung)

4.3 Broad Disposition of Land Uses

4.3.1 Comprehensive Development Area (“CDA”)

4.3.1.1 Two sites, i.e. Area 115a & 115b, with an area of 3.9ha and 3.7ha respectively are proposed in the TCE PNTEA for comprehensive residential-cum-commercial development. These two sites form a Metro Core Area of the TCE PNTEA. The Metro Core Area is intended to function as the key centre for the entire development.

4.3.1.2 The planning intention for the CDA sites are to facilitate the comprehensive development of the area to achieve the function as a Metro Core Area for the TCE PNTEA. The designation of the CDA

zoning will require future developers to submit a master layout plan for approval by the Town Planning Board to facilitate Authority's appropriate control over the development mix, scale, design and layout of the development at this prominent location at the TCE PNTEA. Given its connectivity with the proposed TCE MTR station and its emblematic centrality, higher development intensity will be appropriate for this Metro Core Area. However, the core urban design principles such as the stepped building profile will still be retained. As such, development within these sites is subject to a plot ratio (PR) of 8.5, including PR6 for domestic use and PR2.8 for non-domestic use. A maximum building height restriction is ranging from about 105mPD to 195mPD, while the building height should descend towards the north of these sites. The higher development intensity would allow the Metro Core Area to be distinguished from a distance from the surrounding buildings and its role as the development core of the TCE PNTEA will be emphasised. Moreover, some district-based facilities serving the entire TCE reclamation will be required within the OU zone, including 1 Public Transport Interchange (PTI), 1 public toilet and 2 6-classroom kindergartens. In order to enhance the connectivity of the OU site to the MTR Station as a gateway for the TCE reclamation, 24-hour pedestrian linkage should be maintained by future developer of the CDA sites to the MTR Station, the open plaza and connection to the linear park to the north. The design intention of the NBA labelled as Metro Public Plaza opposite the Railway Station is to provide a monumental entrance and activity node through which pedestrians enter Tung Chung East and find their way into the development and towards the waterfront.

4.3.1.3 Given its central location and proximity to the proposed TCE MTR Station, a major office area with a large retail component targeting regional demand is also proposed for the Metro Core Area. A non-domestic PR of 2.8 is therefore designated for the two "CDA" sites which from the Metro Core Area, which contribute to the development of a "Major Office Node" in Tung Chung which was proposed in complementary to the surrounding developments in the NCD and HKBCF etc. The scale and layout of non-domestic PR of the CDA sites have been carefully considered to serve as a barrier against nuisance brought by the NLH to the domestic portion further inland.

4.3.2 Commercial ("C")

4.3.2.1 A Retail and Office Belt along NLH, constituted of "Area 57a", Area 129" & "Area 130", is proposed as an extension to the east and west of

the proposed “CDA” zone at the metro-core area (“Area 115a” and “Area 115b”). This commercial belt, designated with a PR from 9 to 9.5 (total GFA of about 430,000sqm) is intended to form part of the “Major Office Node” proposed in the TCE PNTEA along the NLH with retail facilities on the lower floors. The scale of office development (in terms of BH and site coverage) of the Site has been carefully considered to effectively serve as a barrier against nuisance brought by the NLH to the domestic uses further inland. A refuse collection point (RCP) of 594sqm is also to be provided with an integrated design within the “Area 57a” Site.

4.3.2.2 A “C” Site designated with PR3, i.e. site “Area 142”, is proposed at the northern tip of the TCE PNTEA which is intended to support the proposed marina. This location is intended to develop together with the “OU(Boatyard and Maintenance Area”, into a marina clubhouse with retail and dining activities to create a vibrant waterfront, likely to be privately owned and operated, providing with a GFA of about 42,000sqm. It should be noted that the scale of the proposed marina will be maintained with 95 berths and further expansion is not desirable from urban design point of view. Thus, while the water inlet could potentially accommodate a marina of up to 150 berths, such a use would potentially occupy the entire aquatic space minimizing the intended expansive views across the inlet and the intimate relationship that it creates with the sea. The “C” site is also intended to synergize with the proposed waterfront park at its door-front to form a vibrant activity node in the TCE PNTEA. Maximum building height if this site is limited by the AHR and is set to +45mPD.

4.3.2.3 To the west of the Marina Clubhouse is another “C” Site designated with PR3, i.e. site “Area 145”, which is intended to capitalize the extensive view of the waterfront for hotel development up to a GFA of about 49,000sqm (about 1000 rooms). The edge facing the waterfront promenade will cater for alfresco dining and shop-fronts to create a vibrant waterfront promenade and form an activity cluster along the coastline.

4.3.2.4 In TCW PNTEA, three “C” Sites are designated with PR3, i.e. “Area 67”, “Area 66b” and “Area 66a” outside the proposed TCW MTR Station. These commercial sites are intended to serve as a central hub of retail activities serving the future TCW population, as well as population in Yat Tung Estate and future population in the Area 39 PRH. The scale of these “C” sites are limited in terms of its PR (PR3)

and BH (ranging from 20 to 35MPD) to keep with the character of the Tung Chung Estuary as well as to intended for design to match the scale of the proposed DO near the Hau Wong Temple and Tung Chung Estuary. A Public Transport Interchange (PTI) of not less than 3,000sqm is also required to be developed in an integrated manner with the “Area 66a” site next to the TCW MTR Station.

4.3.3 Residential

Special Residential (“RS”)

4.3.3.1 13 sites are proposed for “RS” zoning for high density subsidised residential development in the Tung Chung PNTEAs.

4.3.3.2 Within the TCE PNTEA, 11 sites are proposed for “RS” zoning. They include Areas 116, 119, 102, 103, 132a, 132b, 132c, 111, 110,122 and 127. These sites mostly within the 500m catchment around the proposed TCE MTR Station to allow convenient access to public transport. Development within these sites is subject to a maximum domestic PR ranging from 5 to 6.5 and a maximum building height restriction ranging from 95mPD to 140mPD constrained by the AHR and stepped building height considerations with surrounding planned developments.

4.3.3.3 To retain a stepped building height profile and taken into account the airport height restriction, building height in these sites generally descends towards the waterfront. Compatible non-domestic uses including commercial are proposed on the lowest two floors of the buildings above ground of at least PR0.4 as requested by Housing Department. Different G/IC facilities serving the population need, including a total of 36 kindergarten classrooms, 2 integrated children and youth services centres, 1 residential care home for the elderly with 1 Day Care Unit, 1 District Support Centre for Persons with Disabilities, 1 Integrated Community Centre for Mental Wellness, 1 Integrated Family Service Centre, 1 Security Field Unit office, 1 Child Care Centre (for children under age of 3), and 1 Family and Child Protective Services unit are to be provided within the 8 of the “RS” sites. Besides, 2 PTIs with a minimum size of 3000sqm are to be provided within “Area 132b” and “Area 102” respectively to serve the district transport need, subject to detail study and agreement with the relevant Government departments. 20m-wide Non-building Areas (NBAs) in a general East-to-West direction are proposed within 8 RS sites to facilitate air ventilation, while additional North-to-South NBAs are

proposed for view and routing purposes. Within these NBAs, landscaping and street furniture and underground structures will be permitted, fence or boundary walls that are designed to allow for high air porosity will also be allowed.

4.3.3.4 Within the TCW PNTEA, 2 sites are proposed for “RS” zoning. They include “Area 42” and “Area 46” along Tung Chung Road. “Area 42” is located to the southeast of planned public housing at Area 39. Development within this site is subject to a maximum domestic PR of 6 and a maximum building height restriction 130mPD. “Area 46” is located at the southern end of the TCV. Development within this site is subject to a maximum PR of 5 and a maximum building height of 140mPD. The development intensity of both sites reflects the high accessibility of their location along Tung Chung Road. Especially for site “Area 81”, proximity to the proposed TCW railway station and the planned PRH at Area 39 (also of PR6) permits a relatively higher PR, while the mountain backdrop to the east of both sites is respected by the residential towers as the top of both sets of structures remains below the ridgeline. Compatible non-domestic use including commercial uses are proposed at the non-domestic portion on both “RS” sites with a non-domestic PR of about 0.4. Different G/IC facilities to serve the district need is to be provided within the “Area 42” RS site, including 1 6-classroom kindergarten, 1 residential care home for the elderly, 1 neighbourhood elderly centre, 1 integrated children and youth services centre and , and 1 a child care centre (for children under age of 3).

Residential Zone 1 (“R1”)

4.3.3.5 2 sites are proposed for “R1” zoning intended for high-density private residential development in the PNTEAs. Both sites are within the TCE PNTEA, which are “Area 117” & “Area 118”. They are located to the immediate north of the Metro Core Area. District Open Space of at least 30m wide is proposed between the two sites, connecting with the DO and open plaza from the Metro Core Area. Development within these two sites is subject to a maximum domestic PR of 6.5 and a maximum building height restriction of 105mPD constrained by the AHR.

Residential Zone 2 (“R2”)

4.3.3.6 3 sites are proposed for “R2” zoning intended for medium to high density private residential development ranging from PR4 to 5 in the PNTEAs. In all these “R2” sites, compatible non-residential uses

including a number of commercial and G/IC uses are proposed on the lowest two floors of the buildings above ground to serve the local neighbourhood.

4.3.3.7 Within the TCE PNTEA, 2 sites are proposed for “R2” zoning. They include “Area 123” and “Area 124”. They are located to the north of the Central Green at the centre of the TCE PNTEA. Development within the “R2” sites are subject to a maximum domestic PR of 5 and a maximum building height restriction of 90mPD. Non-domestic PR of about 0.4 are proposed for local commercial uses for the two sites for synergizing with the Central Green.

4.3.3.8 Within the TCW PNTEA, “Area 23” site located to the west of the planned Town Park is proposed for “R2” zoning. It is proposed for a maximum domestic PR of 4 and a maximum building height restriction of 75mPD. The adjustment of PR from 5 (from the R(A) zone of the existing Tung Chung Town Centre OZP S/I-TCTC/19) to 4 is due to detailed layout design of the Site to a scale adhere to the height of the Town Park knoll (of 75mPD). Non-domestic PR of 0.1 is reserved at the site which serves local retail as well as 1 6-classroom kindergarten to serve the district need. On top of that, a GFA of about 2,411sqm¹ will be reserved at this site for re-provision of the existing Tung Chung Community Services Complex 2.

Residential Zone 3 (“R3”)

4.3.3.9 15 sites are proposed for “R3” zoning intended for low to medium intensity private residential development in the PNTEAs in respect to the site context such as near to the waterfront and the rural context of the TCV. Non-domestic component such as local commercial and G/IC uses are proposed on lower floors of selective sites with higher accessibility for residents.

4.3.3.10 Within the TCE PNTEA, 11 sites are proposed for “R3” zoning. They include “Area 112a”, “Area 112b”, “Area 112c”, “Area 113”, “Area 143”, “Area 144”, “Area 126”, “Area 141”, “Area 140a”, “Area 138” & “Area 140b”. All these sites are located along the waterfront. For sites in the north-western part of the Planning Scheme Area, i.e. “Area 112a”, “Area 112b” & “Area 112c”, development within these sites are

¹ It is advised by HAD on 22 Apr 2015 that 2410.68m² should be reserved for re-provisioning of the Tung Chung Community Service Complex

subject to a maximum domestic PR of 3.5 and a maximum BHR of 70mPD. For sites “Area 113” and “Area 143”, development are subject to a maximum domestic PR of 3.5 and a non-domestic PR of 0.3 to 0.4 and a maximum BHR of 70mPD. For sites in the north-eastern part of the Planning Scheme Area, i.e. “Area 144”, “Area 126”, “Area 141”, “Area 140b”, “Area 138” & “Area 140b”, development within these sites is subject to a maximum domestic PR of 2.5 to 3, and a maximum non-domestic PR of 0 to 0.4 and a maximum BHR ranging from 45mPD to 70mPD. The maximum BHR descends towards the northeast due to the AHR.

4.3.3.11 20m-wide NBAs are proposed within “Area 138”, in between “Area 140b” and “Area 140a”, in between “Area 112c” and “Area 112b” and in between “Area 112a” and “Area 112b” to serve different purposes including air ventilation, visual permeability and pedestrian connections. The tip of “Area 126” includes an NBA to cater for routing and view purposes. Within the NBAs, landscaping and street furniture and underground structures will be permitted, fence or boundary walls that are designed to allow for high visual/air porosity will also be allowed. In “Area 113”, “Area 143”, “Area 144”, “Area 138” & “Area 141” which are located along the linear open space and waterfront promenade, compatible non-residential uses including a number of commercial and G/IC uses are also proposed.

4.3.3.12 Within the TCW PNTEA, 4 sites are proposed for “R3” zoning. They include “Area 33”, “Area 48a”, “Area 99a” & “Area 99b”. “Area 33” is located on the west of the Yat Tung Estate. Development within this site is subject to a maximum domestic PR of 3.5 and a maximum building height of 70mPD. “Area 48a” is located between the planned town park and the Ma Wan Chung village, which is a residential site newly added to this Finalized RODP. Given its elongated site layout and close proximity to the low-rise Ma Wan Chung village, it is subject to a relatively low domestic PR of 2 and maximum building height of 55mPD. “Area 99a” & “Area 99b” are located in the southern (inner) part of the TCV. Development within these two sites is subject to a maximum domestic PR of 1.5 and a maximum building height restriction of 45mPD. A 30m-wide NBA in North-South orientation is proposed within “Area 99a” to enhance visual/perceptual permeability for community/religious considerations, starting at Shek Mun Kap, through the Fung Shui Wood and leading to Shek Lau Po, preserving a spatial reference towards the bay. Within the NBA, landscaping and street furniture and underground structures will be permitted, while

fence or boundary walls that are designed to allow for high visual porosity will also be allowed.

Residential Zone 4 (“R4”)

4.3.3.13 5 sites are proposed for “R4” zoning is intended for low-density private residential development in the TCV of the TCW PNTEA, which development intensity ought to pay due respect to compatibility with the naturalistic and rural context of the area. They include “Area 74”, “Area 91”, “Area 61c”, “Area 61a/b” and the newly added “Area 81” (in front of Ngau Au, at the mouth of the Tung Chung Estuary) . All of them are located at the heart of the TCV and along the environmentally-sensitive Tung Chung Stream. They are currently mainly covered by abandoned agricultural land and orchard. Based upon the updated Habitat Map, there are currently no ecological features (species or habitats) of special conservation importance found within these sites. However, taken into account the land use compatibility with the existing naturalistic and rural settlement character of the TCV and the potential disturbance to the adjacent woodland habitats and natural stream courses during operational phase, a lower development intensity is therefore proposed.

4.3.3.14 Hence, development within these sites is subject to a maximum domestic PR of 1 and a maximum building height restriction ranging from 20mPD to 55mPD. It is considered that given the rural and scenic topography of the Valley, the location of these sites between village-type developments and the proximity to ecologically sensitive resources, a relatively low PR is preferable to respect with the surroundings and prevent altering the character of the Valley. The maximum building height restriction general descends towards the northeast due to the difference in site level resulted from the topography of the TCV. A 20-m wide NBA of east-to-west direction is proposed to enhance air ventilation at “Area 74” Site. Within the NBA, landscaping and street furniture and underground structures will be permitted, while fence or boundary walls that are designed to allow for high air porosity will also be allowed.

Shop-Fronts

4.3.3.15 In TCE PNTEA, shop-fronts are a key feature that creates a nearly continuous frontage of shops mainly along the Linear Parks leading towards the waterfront, around the Central Green and waterfront

promenade. These are configured as two-storey establishments located in the lower stories of residential developments, intended for local commercial uses serving daily needs of residents. These nevertheless create generous openings for entry into the individual residential estates on the ground floor level, allowing the commercial floor to continue uninterrupted on the second floor. This is to encourage “street-life” and encourage small shops serving the locals and promotion of lively streetscapes and activities. This is in-line with the community aspirations received in the PE activities.

- 4.3.3.16** The encouragement of active shop-fronts will be supported by the designation of small street block design throughout the Finalized RODP. Reference could be made to the similar development restrictions to facilitate shop fronts stipulated in the Tseung Kwan O and Kai Tak OZP³ to add requirements on the ODP and its Explanatory Statements for retail and commercial activities to be developed along the edge fronting major pedestrian corridors.

Social Welfare Facilities

- 4.3.3.17** Majority of required Social Welfare Department (SWD) facilities are proposed to be located at the lower floors of residential developments. Nevertheless, to maintain flexibility in the future, the two proposed clinic sites in TCE and TCW PNTEAs can be explored to develop in joint-user arrangement for a G/IC complex to accommodate social welfare facilities, if necessary.

4.3.4 Village Type Development (“V”)

- 4.3.4.1** There are currently 8 recognized villages within the TCW PNTEA, i.e. Ma Wan Chung, Wong Nai Uk, Shek Lau Po, Shek Mun Kap, Mok Ka, Nim Yuen, Lam Che, and Ngau Au, and they will be designated as “V” zone in the PNTEAs. The planning intention of this zone is to reflect these existing recognized villages, and to provide land considered suitable for village expansion according to the outstanding small house demand and 10-year small house demand forecast provided by the

³ On the Residential (Group B) zone on the Kai Tak OZP (S/K22/4), it is specified on the Plan and in the Schedule of Use that “On land designated design ‘Shops and Services’ and ‘Eating Place’ uses only in the ‘Residential (Group B)1’ and ‘Residential (Group B)2’, building not exceeding 2 storeys to accommodate ‘Shops and Services’ and ‘Eating Place’ uses shall be provided”. Besides, in the Explanatory Statement of Residential (Group A)5 zone on the Tseung Kwan O OZP (S/TKO/20), it is specified that “Retail and commercial activities should be developed along the edge that fronts onto the town plaza and the waterfront park.” These examples may serve as references for similar requirements to be provided in the draft ODP for the PNTEAs in Tung Chung.

Lands Department (LandsD).

4.3.4.2 The “V” zones has been formulated taking account into to the information on the demand for small houses for villages provided by LandsD.

4.3.4.3 Majority of “V” zones will effectively accommodate the outstanding small house applications and the 10-year small house demand, with the exception of Wong Nai Uk and Mok Ka village. This is due to the expansion of “V” zones are constrained by physical features (e.g. slopes, roads, proposed polders), as well as ecological features (e.g. “CA” zone along the Tung Chung Stream as well as the nearby Fung Shui Woods.

4.3.5 Government, Education, Community and Institution Uses (“G”, “E”, “IC”)

Government (“G”)

4.3.5.1 Sports Ground – A “G” site (“Area 137”) is reserved for a Sports Ground with seating capacity for about 10,000 spectators. The Sports Ground will provide a 400m track (all weather) and a grass infield for athletics (field events) which can also be used as an 11-a-side football pitch and in a joint-user arrangement for rugby pitch.

4.3.5.2 Sports Centres – Two “G” sites are reserved for Sports Centres in the PNTEA in accordance with the HKPSG (i.e. “Area 109a” and “Area 139a”). Development within these two sites is subject to a maximum building height of 5 storeys. As confirmed with LCSD, LCSD will proceed with development of a Sports Centre in Area 39. Hence, no Sports Centre is required in the TCW PNTEA.

4.3.5.3 Fire Station – A “G” site is proposed for a Standard Divisional Fire Station at “Area 135”. Development within this site is subject to a maximum building height of 45mPD.

4.3.5.4 District Police Station – A “G” site for a District Police Station is proposed at “Area 131a”. The maximum building height of the District Police Station is subject to a maximum building height of 16 storeys as requested by the Police.

4.3.5.5 Married Police Quarters – A “G” site is reserved at “Area 133” for the

Married Police Quarters which can provide approximately 420 flats. Development within this site is subject to a maximum building height of 70mPD as requested by the Police.

- 4.3.5.6** Clinics– 1 “G” site is proposed for Clinic in the TCE PNTEA in accordance with the HKPSG, located at “Area 59a” (east of Area 56) and the other one is located at “Area 36a” in the southeast of the Hau Wong Temple in the TCW PNTEA. Development within the site in the TCE PNTEA is subject to a maximum building height of 5 storeys. The site reservation for the two sites (each of 0.5ha) are larger than the requirement stipulated in the HKPSG (i.e. 2,200sqm) to facilitate the joint-user arrangement of the clinics with other social welfare facilities and G/IC facilities in the future when need arises, subject to further agreement with FHB.
- 4.3.5.7** Salt Water Pumping Station – One “G” site is reserved for a salt water pumping station towards the western end of the proposed “RO” waterfront promenade at “Area 106”. This location in proximity to the seafront will provide a convenient access to clean sea water. This Salt Water Pumping Station will provide flushing salt water to support the future developments in the PNTEA.
- 4.3.5.8** Sewage Pumping Stations – Two sites on the TCE PNTEA, at “Area 59c” and “Area 131b”, are reserved for sewage pumping stations for collecting sewage flows from the PNTEA and pumping the sewage to the Siu Ho Wan Sewage Treatment Works. In the TCW PNTEA, 4 “G” sites are designated for sewage pumping Stations. Of the 4 “G” sites, 3 of them are new sewage pumping stations (at “Area 45c”, “Area 44” and “Area 92”) of about 400sqm each to serve the new developments; while 1 of them is an expansion of the existing Chung Yan Road Sewage Pumping Station (at “Area 24a”).
- 4.3.5.9** Government Reserves – A total of 3 new Government Reserve sites are proposed in the PNTEAs, 1 located in the TCE PNTEA (i.e. “Area 125”) and 2 located in the TCW PNTEA (i.e. “Area 24c” and “Area 24b”). These Government Reserve sites offer flexibility in the land use in case of need arise from future population growth.
- 4.3.5.10** Attenuation Ponds – A total area of about 1.8ha is designated for attenuation ponds, which are located within the TCW in the TCW PNTEA. The intention is to collect all the surface runoff for treatment and remove pollutants before discharge to the Tung Chung Stream.

Education (“E”)

- 4.3.5.11** Nursery Classes and Kindergartens – According to the requirements of the HKPSG, a total of 72 classrooms of nursery classes/kindergartens are proposed, taken into account of the existing surplus/deficit. With respect to the HKPSG, the size of kindergarten for most of the plots are with a minimum of 6 classrooms.
- 4.3.5.12** Primary and Secondary Schools – Taking into account of existing surplus/deficit, comments from school principals and instruction of EDB, the total number of primary schools and secondary schools to be provided in the PNTEAs are 6 and 2 respectively. This is less than that required by the HKPSG.
- 4.3.5.13** Post-Secondary Institution – In response to public comments and liaison with EDB, a site of about 25,000sqm has been reserved at “Area 136” for a post-secondary institution in TCE PNTEA. The intention for the institution is to offer technical/ job training, and in long-term to provide the adequate training to address the job mis-match problem currently occurred in Tung Chung.
- 4.3.5.14** Other School Use – In response to public comments and liaison with EDB, a site of about 15,000sqm has been reserved at “Area 134” for Other School Use in the TCE PNTEA, which has opportunity to be developed into international school in future.

Institution and Community (“IC”)

- 4.3.5.15** Two “IC” sites have been designated on the TCW PNTEAs, which comprises the existing Hau Wong Temple (about 2,100sqm) near the Tung Chung Estuary and the Prajna Dhyana Temple (about 1,000sqm) in the TCV. Both “IC” zones are designated accordingly to the existing land use and existing building height, as well as taken into consideration with their land holdings.

4.3.6 Other Specified Uses (“OU”)

Railway Station

- 4.3.6.1** “Area 114” is reserved for the TCE Station. It is a new station on the Tung Chung Line to mainly serve the planned population in the Area.

Electricity Sub-Station

4.3.6.2 An electricity sub-station (ESS) is reserved at “Area 59b” in the TCE. It is aimed to serve the future demand in the Area together with the existing ESS in Area 9 in the town centre.

A Petrol Filling Station

4.3.6.3 A PFS is reserved at “Area 51” in the TCE, at the other side of the Road P1 in accordance to the requirement of the HKPSG.

Boatyard and Maintenance Area

4.3.6.4 To support the proposed marina at the northern tip of the TCE, a Boatyard and Maintenance Area is reserved at “Area 146” Site.

Pier

4.3.6.5 The existing pier at “Area 29d” and the associated car parking facilities locates to the immediate north of the Ma Wan Chung village is to be designed as pier to reflect the existing use.

Telephone Exchange

4.3.6.6 A telephone exchange originally located in Area 40 affected by planned public housing development at Area 39. As requested by the Office of the Communications Authority (OFCA), a relocation site of similar size should be reserved within the TCW PNTEA. It is proposed to be relocated to the “Area 36b” in TCW PNTEA, with a site area of about 1,060sqm, similar to the original site in Area 40. Together with the existing provision in the town centre in Area 12, the site is reserved to facilitate possible competing operators of fixed telecommunication network services to roll out their networks in the New Town.

Polder

4.3.6.7 To mitigate flood risk of Tung Chung Stream during extreme rain events, a total area of about 1.7ha is reserved along the Tung Chung Stream for approximately 1.5m high earth embankments.

River Park

4.3.6.8 On the eastern tributary of the Tung Chung Stream, from the edge of the planned PRH at Area 39 to the Shek Mun Kap Road, will be developed into a “River Park” with a total area of about 3.1ha on both side of the river for public recreational use.

Other Public Utility Facilities

4.3.6.9 Certain public utility facilities required by the HKPSG which is of a smaller scale will also be provided, e.g. social welfare facilities, Refuse Collection Points, public toilets, railway ventilation and associated plants etc.

4.3.7 Open Space (“DO”, “RO”)

Regional Open Space

4.3.7.1 Waterfront promenade linking TCE and TCW will form a distinctive component of Tung Chung’s coastal identity and will also serve as pedestrian walkway to enhance connectivity of the entire TCNT. Waterfront parks at the edges of the TCE reclamation aims to provide a formal spatial experience and views towards Airport Island and the HKBCF, as well as synergized with the proposed marina clubhouse development immediately south of it. The existing TCNT and the TCW is connected by proposing a pedestrian walkway along the coastal area above high water mark.

4.3.7.2 Along the western edge of the Yat Tung Estate an area is required to be a railway reserve for the construction of the railway to TCW station. In order to make full use of the space of the area, the said railway reserve has been designated as part of the regional open space.

District Open Space

4.3.7.3 North-south Linear Parks with landscaped facilities in TCE will allow visual relief / corridors and enhance air ventilation and pedestrian mobility amongst residential neighbourhoods, waterfront promenade and mass-transit facilities in a comfortable manner. Special urban design features include a public plaza in the Metro Core Area that creates a monumental central entrance to TCE. The Plaza is connected to the Linear Park system as well as pocket parks with seating and sports activities. These can serve as focal nodes and transform public space into event venues for community and festive activities to foster community identity and attract visitors. The Linear Park system in particular is envisioned as a multifunctional series of activity corridors that enhance pedestrian connectivity by linking together residential neighbourhoods, distribute passive open space throughout the development and provide an identifiable open space network with activity nodes tailor-made for TCE. In the heart of the development, a

Central Green forms a shared meeting place for people from all neighbourhoods. The space is flanked by retail activities on ground level adding vibrancy to the area. Shop fronts are concentrated within the Central Park area of this pedestrian spine to create a unique activity node that would otherwise be diffused with additional commercial frontage along the entire length.

4.3.7.4 To enable smooth pedestrian access to the waterfront directly from the proposed TCE Railway Station, the district distributor bisecting the reclamation from east to west is sunken at the height of the Central Green to allow the creation of a pedestrian platform over its entire width. This platform, which will form part of the continuous open space network in TCE, will enable pedestrians to walk uninterrupted northwards utilizing the open space system as a safe and comfortable walking environment.

4.3.7.5 In TCW a series of district open space areas are dispersed close to the new developments and are intended to serve both the new and existing residents. Immediately to the east of Hau Wong Temple a proposed open space covers the corner of the area. The space is intended to complement the open views from Hau Wong Temple into the surroundings. It will form a new waterfront park area accompanied with a couple of sports-facilities, e.g. a 7-a-side football court, 2 basketball courts, seating areas and greenery. This will help to retain a view corridor towards the north and create a pedestrian passage parallel to the existing residential estate.

4.3.7.6 The area above the railway reserve in TCW is designated as District Open Space (DO). The DO will need to be temporarily allocated as a works area for the construction for the TCW station.

Local Open Space

4.3.7.7 Local Open Space are assumed be provided within individual residential sites according to HKPSG of 1sqm/person standard to provide activity space and enhance the living environment by fulfilling the requirement for local open space provision.

4.3.8 Green Belt (“GB”)

4.3.8.1 Several sites are designated as “GB” in the TCW PNTEA in the TCV, with a planning intention to define the limits of urban and rural area

and sub-urban development areas by natural features and to contain urban sprawl as well as to provide passive recreational outlets. Patches of Feng Shui woods are scattered throughout TCV. They are mostly situated close to the existing village-type development and have both environmental and culture importance. To prevent these areas from being developed in the future, they are zoned as GB and excluded from the formulation of “V” boundaries.

4.3.9 Agriculture (“AGR”)

4.3.9.1 The areas in between proposed “V” zones as well as in between low-rise residential developments in the TCV are designated as “AGR” zone. They are mainly the remaining areas of VE after the designation of the “V” zones. With the formulation of village zone boundaries the land between the boundary of village environs and village zone boundary has been zoned exclusively as AGR except for specific areas such as Feng Shui woodlands which have been zoned as “GB”. This is to allow continuation of existing farming practices, if applicable, as well as to serve as a buffer between these developments in the valley area.

4.3.10 Conservation Area (“CA”)

4.3.10.1 Two main areas are designated as “CA” in the TCW PNTEA. It generally consists of two parts: 1) belt shaped zones along the main branches of Tung Chung Stream (natural sections) together with the concourse, and 2) the surroundings of an area between the coastline of Tung Chung Bay and the northern of Ngau Au Village. The “CA” offers buffer zones for the protection of ecologically sensitive areas. The “CA” zoning allows a certain extent of eco-tourism, education and research opportunities which is in-line with the suggestions raised by Joint Green Groups.

4.3.11 Coastal Protection Area (“CPA”)

4.3.11.1 An elongated site along the Tung Chung Estuary has been designated as “CPA” in the TCW PNTEA. It is intended to conserve, protect and retain the natural coastlines and the sensitive coastal natural environment of high landscape, scenic or ecological value. The “CPA” zone outside Hau Wong Temple could act as a buffer zone for the mudflat habitat in Tung Chung Bay which is of high ecological value. One part of the “CPA” zone is narrower to the NW of Hau Wong

Temple since it is already occupied by an existing football pitch (Tung Chung Playground).

4.3.12 Connectivity

Roads

4.3.12.1 The road network in TCE PNTEA will consist of primary, district and local distributors. In general, the road configuration for primary and district distributors will be either dual 2-lane or single 4-lane carriageway, while local distributor will be single 2-lane road. The primary distributor will connect to North Lantau Highway through TCE Interchange and the proposed Tai Ho Interchange.

4.3.12.2 In TCE PNTEA, the primary distributor includes Tung Chung Waterfront Road, Ying Hei Road and a new road named Road P1 - Tai Ho Section which will serve as the primary east-west connection to and from North Lantau Highway. The Road P1 - Tai Ho Section is proposed to be mainly on at-grade road on reclamation. Grade separated interchange, namely Tai Ho Interchange, in the form of elevated bridge structures are proposed for connection to North Lantau Highway.

4.3.12.3 Connected to Road P1 in TCE PNTEA are the district distributors: D1, D2, D3 and D4. D1 together with D4 provide a link to the west of the TCE PNTEA, whereas D2 provides connection to the east. D3 is located in between D1 and D2 which provides a north-south link from Road P1 to the north of the development. The remaining roads (L1-L9) in the TCE development are local distributors that provide links to specific land parcels within the development. All local distributors are assumed to have one lane per direction.

4.3.12.4 The road network in TCW PNTEA will consist of district and local distributors. In general, the road configuration for district distributor Chung Mun Road will be single 4-lane carriageway, while local distributors will be single 2-lane road. The district distributor will connect to Yu Tung Road, which connect further to North Lantau Highway via TCE Interchange.

4.3.12.5 In terms of existing roads in the vicinity of the TCW PNTEA, Tung Chung Road will be maintained as a two-lane (one lane each direction) rural road, while Yu Tung Road (district distributor) and Chung Yan Road (local distributor) will be two lanes per direction. Shek Mun Kap

Road, which connects to Tung Chung Road, is proposed to be widened from a single lane access track to a single 2-lane carriageway.

4.3.12.6 TCW PNTEA is located immediately south-west of Tung Chung. Regarding the western portion of the development, it involves the extension of Chung Mun Road to the development that will serve as the district distributor in the development with two lanes per direction. Chung Mun Road will connect the northern part of the development to Yu Tung Road. There will be two local distributors (L30 and the improved Shek Mun Kap Road) connecting the middle and southern part of the development to Tung Chung Road respectively. A new local distributor (L29) connecting Chung Mun Road and the improved Shek Mun Kap Road will form a corridor to connect other local distributors (L24, L25, L26 and L28) to the external road network via Chung Mun Road, L30 and Shek Mun Kap Road. The local distributors are also extended to connect to existing villages like Ngau Au, Lam Che, Nim Yuen and Mok Ka.

4.3.12.7 Regarding the northern portion of the development, Tung Chung Road North, L21 and L31 will be local distributors while L31 will involve formation of a new left-in-left-out vehicular access on Yu Tung Road.

Railway

4.3.12.8 The existing Tung Chung Station is approximately 1.4 km away from the most southern portion of the proposed new development in TCE PNTEA. A new railway station close to the TCE PNTEA is proposed to improve the connectivity and accessibility for the entire Tung Chung development. The TCE station is proposed to be added to the existing TCL to the east of Caribbean Coast. The station is about 3 km west of the Siu Ho Wan depot abutting the Future Road P1. Supporting facilities including feeder services such as buses and minibuses connecting the residential areas north of the new station shall be provided to enlarge the catchment areas.

4.3.12.9 A new railway station is proposed within TCW PNTEA close to Area 39 adjacent to Yu Tung Road. It is about 1 km away from the existing Tung Chung Station. The new station will not only serve the TCW Development but also enhance the accessibility of Yat Tung Estate and the local villages. This can also respond to the strong request from local resident for a new railway station near Yat Tung Estate where approximately 40,000 populations are resided. The station is suggested to be underground due to the constraints of existing and planned

developments. The underground TCW Station will have exits on Yu Tung Road for access by residents of the Yat Tung Estate and the new development areas in TCW.

Public Transport Interchange (PTI)

4.3.12.10 In TCE, there are 3 PTIs proposed with one located next to the planned TCE railway station and the other two located next to Road L4 and Road L6.

4.3.12.11 In TCW, there are 2 PTIs proposed with one located next to the planned TCW railway station and the other an on-street bus terminus located along Shek Mun Kap Road. It is expected that majority of the residents would rely on the road-based public transport services, either as the ultimate mode of transport bringing them to their final destinations or just as feeder service.

Pedestrian and Cycle Track Connections

4.3.12.12 Pedestrian and cycling connectivity throughout the PNTEAs is one of the key urban design concepts driving the configuration of the spatial framework. Primarily the key pedestrian / cycling routes are located in parallel to the Linear Parks and within the Waterfront Promenade connecting directly to the mass-transport facilities in TCE. It is considered that the greening and activity within the Linear Parks will create a pleasant, shaded environment that will enhance the pedestrian experience and encourage the use of non-motorized transportation within the new development areas.

4.3.12.13 In TCW, pedestrian and cycling routes are strategically located either along the Waterfront Promenade or in parallel to the road system. The consideration is to create opportunities for residents living in TCV to access the proposed TCW railway station via walking and cycling. In addition, as the routes within the Valley also follow the TC River the allocation of pedestrian and cycling routes can be utilized for leisure purposes and enjoyment of the scenic character of TCW.

4.3.12.14 Two-way cycle track in the Tung Chung PNTEAs is recommended. Cycle track has been proposed at one side of the carriageway only in order to maintain a balance between cycle track connectivity and valuable land resources. Cycle track is also proposed along the promenade for leisure purpose. Cycling networks for TCE and TCW are shown in [Figure 4.5](#) and [Figure 4.6](#) respectively.

4.3.12.15 Integrated pedestrian network is proposed within the new development area which includes walkway system, pedestrian facilities, pedestrianized plazas, linkage to PTIs and railway stations. It aims to reduce the number of short motorised trips and the conflict between pedestrians and vehicles. The cross section of the footpath follows the recommendations in the HKPSG and TPDM. Pedestrian networks for TCE and TCW are shown in [Figure 4.5](#) and [Figure 4.6](#) respectively.

4.4 Commercial GFA and Employment Opportunities

4.4.1 Commercial

4.4.1.1 The commercial elements of the Finalized RODP are summarized below and shown in [Figure 4.7](#) and [Figure 4.8](#) for TCE and TCW respectively.

Major Office Node

4.4.1.2 The latest information suggests that that hotel and retail projects will be the mainstays of commercial development in the NCD in the HKIA, while HKBCF topside development will likely focus on retail and hotel facilities. It was therefore proposed to position Tung Chung as a “Major Office Node” with a commercial GFA of about 500,000sqm, with a scale comparable to the office floor space of two IFC1 and IFC2 in Central. 500,000sqm is the critical mass for major office node according to the Study on the Propensity for Office Decentralization and the Formation of an Office Land Development Strategy as well as the HK2030 Planning Vision and Strategy Working Paper No. 46 Planning Strategy for CBD Grade A Offices.

4.4.1.3 This “Major Office Node” will mainly be clustered in the commercial belt around the TCE Station along the NLH, to be located in “Area 57a”, “Area 129”, “Area 130” and the “Area 115a” and “Area 115b” CDA zones in the TCE PNTEA.

Regional Retail Cluster

4.4.1.4 The retail commercial component in the Tung Chung PNTEAs is to ensure complementary with the surrounding developments. About 163,300m² retail GFA is proposed under the Tung Chung PNTEAs. This number is considered appropriate given NCD will provide about 500,000m² GFA for retail & hotel, HKBCF topside development will provide about 350,000m² commercial GFA for retail, dining,

entertainment and hotel uses, while up to about 1 million sqm for shopping, dining, entertainment and hotel uses might be yielded in the HKBCF bridgehead zone as supplemented by AAHK.

4.4.1.5 The regional retail node will mainly be clustered around the proposed TCE Station, to be located in “Area 129”, “Area 130” and the “Area 115a” and “Area 115b” CDA Sites, with some retail activities at “Area 145” and “Area 142” Sites along the waterfront in the TCE PNTEA. For the proposed scale of retail GFA around the proposed TCE Station, it is comparable to 0.9 of the Metro City Plaza located on-top of Po Lam MTR Station in Tseung Kwan O. For the regional retail node around the TCE waterfront, it is about 1 Tung Chung City Gate.

1000-room Hotel

4.4.1.6 With the future connectivity to Pearl River Delta (PRD) and increased air passenger after the expansion of HKIA Third Runway, on top of the existing and planned hotel developments in Tung Chung, it is considered that an additional 1,000 hotel rooms is appropriate in the Tung Chung to support the hotel demand in the district and long-term demand for Hong Kong.

4.4.1.7 Hotel GFA of about 50,000sqm is proposed in the waterfront area of TCE PNTEA (at “Area 145”). This is equivalent to an approximate of 1000 rooms and the scale is comparable to about 2.2 Novotel Citygate Hotel in Tung Chung.

Local Retail

4.4.1.8 Local retails will be located mainly in parallel to the north-south Linear Parks within residential plots and are anticipated to provide jobs in addition to enhancing the vibrancy of the Parks. Additional areas for local retail establishments are also defined on the perimeter of the Central Park as well as along the Waterfront Promenade on the edge of the water inlet.

4.4.1.9 The proposed local retail GFA of about 114,000sqm in TCE are derived from the total floor area provided in the 2-storey local commercial belts. Not only the importance of the local retail to enhance the convenience for local residents, their function is also to add “street life” which is repeated demanded by local communities in the PE activities.

4.4.1.10 The proposed local retail GFA of about 51,000sqm refers to the total

floor area provided at the 3 commercial sites near to the proposed TCW station as well as commercial uses to be provided in the proposed subsidized housing sites at “Area 42” and “Area 46”. To capitalize on the synergy of the proposed TCW railway station, new commercial areas are located in close proximity to the station exits. These commercial lots form a continuous path along Yu Tung Road turning northwards towards the Hau Wong Temple to create a well-defined entrance to the public spaces adjacent to the Temple grounds.

Anticipated Job Opportunities

4.4.1.11 The anticipated job opportunities are derived based on a broad assumption of 1 job opportunity / 20sqm of commercial GFA. The estimated job opportunities should be interpreted with caution, as the number of jobs created per unit of commercial GFA in reality could be different from the assumed ratio of 1 job to 20 sqm. Also, given that the commercial GFA might crowd out certain similar activities in the rest of Hong Kong, the net employment created for Hong Kong as a whole could be lower than the estimated jobs for the commercial GFA in the PNTEAs.

4.5 Summary

4.5.1.1 This above section summarizes the land use budget, planning intention, development parameters, population intake, and employment opportunities for the finalised RODP of TCE and TCW PNTEAs. This set of RODP forms the basis for carrying out the Environmental Impact Assessment (EIA) in parallel.

4.5.1.2 The finalized RODP form the basis for preparing various plans including finalized ROZP, finalized MLP, finalized MUDP and finalized RLP (as shown in [Figure 4.9a to 4.9g](#) and [Figure 4.10a to 4.10e](#) for TCE and TCW respectively). Details of these plans are presently separately in the Final Report for the Whole Feasibility Study.

4.5.1.3 It should be noted that with further comments received from relevant government bureau and departments, further refinement in minor magnitude have been made during our subsequent preparation of the ROZP and the RLP. One example of change is: with the latest information provided by the FHB, the proposed clinic site at Area 36a of the TCW PNTEA will no longer be necessary, and the site will then be used for the re-provisioning of Tung Chung Social Security Field

Unit in detailed design stage. Another example is that as per latest discussion with FEHD, the proposed RCP, used to be developed an integrated manner within “Area 57a” C Site in the RODP, is to be developed in a standalone “G” site with a building height restriction of 2 storeys in the ROZP and RLP. In addition, more refinement is that the proposed “CDA” site at the Metro Core of TCE PNTEA will be renamed as “OU(Comprehensive Commercial and Residential Development with Public Transport Interchange)” in the ROZP and RLP, while the “C” site proposed at Area 142 will be renamed as “OU (Yacht Club, Boat Repairing and Commercial Facilities Associated with Marina Development)” together with the proposed boatyard site to ensure a more coherent development between the two sites.

5 Engineering Assessments

5.1 General

5.1.1 Technical assessments on various aspects including traffic and transport, geotechnical and natural terrain hazard, air ventilation, marine, drainage, sewerage, water supply and utilities have been conducted. The findings of these assessments have confirmed that the proposed developments under the finalised RODP are feasible without insurmountable planning and engineering problems. The key findings of the assessments are summarized below.

5.2 Drainage Impact Assessment

5.2.1 The development area in TCE interfaces with four outfalls of the existing urban trunk drainage (box culverts) meeting the 200 year flooding protection standard. These existing box culverts are required to be extended and routed within the new reclamation area in TCE eastwards and northwards to the sea. A new drainage system with drainage pipe networks as well as the extension of the existing box culverts is proposed to collect all surface runoff in the development area and discharge to the sea.

5.2.2 For the new development area around Yat Tung Estate in TCW, a new drainage system is proposed with discharge of surface runoff eastwards and northwards to the sea via Wong Lung Hang and outfall at Shun Tung Road respectively.

5.2.3 In TCV, a new drainage system is proposed to collect the surface runoff to regional attenuation ponds (stormwater treatment ponds) for treatment to remove pollutants before discharge to the Tung Chung Stream. Details of the attenuation ponds will be discussed in the following sections.

5.2.4 Overall layout of the existing, planned and proposed drainage networks are shown in the [Drawing No. 219844/DR/1000](#).

5.2.5 According to the broad drainage impact assessment, there will be a risk of localised flooding within the new development areas and existing village in TCV under extreme rainfall events.

5.2.6 To mitigate flooding of Tung Chung Stream, protect the sensitive ecology at Tung Chung Stream and Bay, and provide adequate flood protection for the proposed development at TCV, the following drainage mitigation measures are proposed.

- a) Provision of 30m Stream Buffer Zone along Both Banks of Tung Chung Stream: - A 30m-buffer-zone along both banks of Tung Chung Stream is proposed to preserve the high ecological value of Tung Chung Stream.
- b) Provision of Polder Scheme at Proposed Development: - Where development sites are planned for private development, a polder scheme is proposed in order to protect planned developments and local villages under the 200-year design event. Flood protection will be achieved by elevating proposed roadways and earth embankments to preliminarily 1m to 1.5m above existing ground with 1:2 sloping embankments. The required elevation of the proposed roadways shall be determined and confirmed by hydraulic modelling in detailed design stage.
- c) Platform Grading of Proposed Developments Scheduled for Subsidized Housing: - Platform grading is proposed in lieu of polder scheme to elevate both the land parcels above the 200-year flood level.
- d) Stormwater Attenuation Storage under Proposed Polder: - Additional volume of attenuation storage may be achieved by installing several 1m diameter pipes below the roadway and earthed embankments at the polder schemes. The pipes will serve as the main gravity drain for runoff generated by the roadway and development parcels during small rain events and will serve as additional flood storage volume for the Tung Chung Stream during large events.
- e) Provision of Regional Stormwater Attenuation and Treatment Ponds: - Each development parcel within the polder scheme will have an attenuation storage and water treatment pond to manage peak flows and remove pollutants. The ponds will be fixed with a pumping station to discharge runoff direct to the river or drainage channel outside the polder embankments under heavy rain events. Each pond will serve as a regional treatment device, treating runoff from new roadways, development parcels, and local villages.

- f) Upgrading of Existing Engineered Channel at East Stream of Tung Chung Stream and Diversion of Development Runoff to the Upgraded Engineered Channel: The existing drainage channel of 8~10m wide shall be widened to improve its conveyance capacity. Some reaches of the channel are estimated to have enough space to accommodate up to 23m in width.
- g) Sustainable Urban Drainage (SUDS) Measures: A comprehensive SUDS plan will be developed to reduce the risks of pollutants being transported from urban development into Tung Chung Stream. Source-control SUDS help minimize pollutants from entering the storm drainage network and may include street sweeping, vehicle washing stations, and educational signage. Treatment-control SUDS remove pollutants washed up by stormwater, which may include rain gardens, infiltration planters, and permeable pavements, may be considered to be installed within the public roadways and at the parcel developments.

5.3 Sewerage Impact Assessment

5.3.1 In TCW, the proposed sewerage system will serve both the proposed developments as well as the existing village areas (including Ma Wan Chung, Wong Nai Uk, Shek Mun Kap, Mok Ka, Nim Yuen, Lam Che, Ngau Au and Shek Lau Po). Three new sewage pumping stations supplemented by sewerage networks, are proposed in the new development area within TCV. One of the new pumping stations will pump sewage flow to a gravity sewer pipe in Shun Tung Road which discharges to the Tung Chung Sewage Pumping Station (TCSPS) and ultimately Siu Ho Wan Sewage Treatment Works (SHWSTW). In addition, the existing Chung Mun Road Sewage Pumping Station (CMRSPS), which will receive additional sewage flow from new development parcels in TCW, is identified with inadequate capacity. Therefore upgrading works with enhanced capacity is required at CMRSPS.

5.3.2 In the new reclamation area at TCE, two new sewage pumping stations and associated sewerage pipe networks are required to divert all the sewage flow from the new developments to SHWSTW. Sewage flow will be diverted directly to SHWSTW via proposed twin rising main along the new Road P1 on reclaimed land. To overcome early population intake in a portion of TCE, an interim connection of one new sewage pumping to the TCSPS is proposed until construction of Road

P1 (Tung Chung – Tai Ho Section) is completed. According to the sewage impact assessment, the existing capacity of the TCSPS collecting all sewage flow from new development in TCW, the interim connection from new development in TCE, as well as from the existing Tung Chung New Town will be exceeded. The pumping capacity of TCSPS can be increased to its designed maximum handling capacity by installing additional pump sets. Fitting out works of the TCSPS and construction of a new DN1200 rising main with rehabilitation of the existing DN1200 rising main will be carried out by DSD under Agreement No. CE 6/2012(DS) to ensure sufficient capacity of the TCSPS is available to serve all the new development in Tung Chung.

5.3.3 In addition, the peak sewage flow to SHWSTW from the new development areas and other areas within the sewage catchment would exceed the current capacity of the existing SHWSTW. The handling capacity of SHWSTW can be increased to its designed maximum handling capacity by installing additional treatment units. EPD has arranged with DSD to fit out the remainder of the treatment units at SHWSTW to its design maximum handling capacity to cope with the increased flow.

5.3.4 Overall layout of the existing, planned and proposed sewerage network are shown in [Drawing No. 219844/SW/1000](#).

5.4 Water Supply

5.4.1 The water supply impact assessment conducted suggested a number of water infrastructure including water treatment works, salt water pumping station, fresh/salt water service reservoirs and water mains should be provided or upgraded to cope with the need for the proposed developments.

5.4.2 Based on the latest RODP and known/committed adjacent development, the projected mean daily water demand will exceed the existing capacity of Siu Ho Wan Water Treatment Works (SHWWTW) of 150,000m³/day and an additional fresh water treatment capacity of at least 50,000m³/day is identified to be required. The implementation of extension of SHWWTW from existing 150,000m³/day to 300,000m³/day under WSD Planning Report No. 13/2001 shall be re-visited and considered.

5.4.3 Overall layout of the freshwater and flushing water networks are shown

in [Drawing Nos. 219844/WS/1000](#) and [219844/WS/4000](#) respectively.

5.4.4 The capacities of the existing Tung Chung No. 1 Fresh Water Service Reservoir (FWSR) (41,659m³) and the planned Tung Chung No. 2 FWSR with site formation in place (40,000m³, being planned by WSD) will not be adequate to meet the projected fresh water demand in the proposed development in Tung Chung. An additional FWSR with capacity in order of 55,000m³ will be required.

5.4.5 A completely new salt water supply network including sea water intake and trunk mains from proposed new salt water pumping station near the shoreline of the proposed reclamation in TCE to a proposed salt water service reservoir (SWSR) with a capacity of about 11,000m³ will be required for the distribution to the proposed new development area in TCE and TCW, as well as the existing Tung Chung New Town. Location and layout of the proposed service reservoirs are shown in [Drawing No. 219844/WS/5000](#).

5.4.6 Based on the WSIA conducted under the TCNTE Study, the Project is considered technically feasible from a water supply impact perspective.

5.5 Utilities Impact Assessment

5.5.1 To facilitate the proposed new development area in TCE, a new 132kV bulk infeed substation is required in TCE along the future Road P1. The power supply to TCW will be provided by the reserved capacity of the existing Tung Chung New Town 132kV substation. Existing, Planned and Proposed Power Supply Network is shown in [Drawing No. 219844/UT/1000](#).

5.5.2 It is anticipated the existing Tai Ho Gas Offtake and Pigging Station and Pigging Station can already support the remaining development in TCE and TCW with the installation of any necessary gas supply networks for new development. Existing, Planned and Proposed Power Supply Network is shown in [Drawing No. 219844/UT/2000](#).

5.5.3 According to the record plans received from the telecommunication service providers to date, the existing Tung Chung New Town is well covered by the telecommunication networks. A site area of about 1,000m² near Yu Tung Road is currently proposed to locate a future telephone exchange for the remaining development in TCE and TCW. The telecommunication service providers shall be further consulted in

detailed design stage to check whether the reserved land for telephone exchange could be reduced or released for other land uses. Existing and Planned Telecom Cable Networks are shown in [Drawing Nos. 219844/UT/3001 to 3005](#).

5.6 Site Formation and Reclamation

5.6.1 Approximate 120.5 hectares and 8.6 hectares of reclamation (above high water mark) is proposed for the new town extension at TCE and Road P1 – Tai Ho Section respectively. Layout of the proposed reclamation is shown in [Drawing No. 219844/GEO/RN003](#).

5.6.2 For the reclamation of TCE and Road P1, various types of seawall, reclamation and ground improvement measures have been studied. Non-dredged seawall with ground improvement works and non-dredged reclamation are proposed for the reclamation. Preliminary stability analyses for the proposed sloping and vertical seawall during the construction stage and operation stage have been carried out on selected critical sections to demonstrate the feasibility of the seawall scheme. Preliminary calculation of residual settlement is carried out on selected representative geology. It is proposed that vertical band drains shall be installed and surcharge of 6m to 8m height with a surcharge period of 6 months to 7 months are provided. Typical section of seawalls are shown in [Drawing Nos. 219844/GEO/RN021 to RN022](#).

5.6.3 Reclamation works for TCE is targeted to be commenced in late 2017 and will be handed over in phases for the housing development and necessary construction of supporting infrastructure. The entire reclamation works for TCE is targeted to be completed by 2023. The reclamation works for Road P1 is scheduled to commence in early 2018 and is envisaged to be completed in 3 years by around 2021.

5.6.4 The reclamation sequence is assumed to start with installation of silt curtain, ground treatment for seawall, seawall construction, sand blanket installation, geotextile installation, marine band drain installation, reclamation filling, surcharging and surcharge removal.

5.6.5 Site formation for subsidized government housing, private residential development in existing government land and infrastructure is required in TCW. Subsidized government housing developments include Area 42 and Area 46 located at existing sloping ground adjacent to Tung Chung Road in TCV. In order to provide a flat platform for the

development at these areas, a combination of cutting back of existing slope with slope stabilization works and raising of existing platform (approx. 1 to 2m) with provision of retaining wall / slope is required. The raised platform can also serve as part of the flooding protection measures for the development areas.

5.6.6 Major site formation works are also required for the proposed development Area 23 for private residential development located at the hillside near the Yat Tung Estate to provide a flat platform for the development. The site formation is anticipated to comprise some retaining walls and cut back with soil nail as slope stabilisation works. The proposed site formation level is around +10mPD to +12mPD while the proposed slope works may be up to +55mPD.

5.6.7 The proposed service reservoir is located next to the existing Freshwater Service Reservoir which is to the south of the Yat Tung Estate and Yu Tung Road. The site formation works for the proposed freshwater and saltwater service reservoirs is envisaged to include excavation and cutting back of existing slopes with possible slope stabilisation works. The proposed ground level of the saltwater service reservoir and freshwater service reservoir is approx. +60mPD and +80mPD respectively. The top of the proposed slopes reach up to about +120mPD.

5.6.8 Site formation layout for those development areas are shown in [Drawing Nos. 219844/GEO/SF011 to SF012](#) and site formation layout for the proposed service reservoirs are shown in [Drawing Nos. 219844/GEO/SF061 to SF062](#). Preliminary slope stability analyses on critical sections have been performed to demonstrate the feasibility of the proposed site formation scheme.

5.7 Air Ventilation Assessment

5.7.1 Site wind availability study has been conducted in the wind tunnel laboratory with 1:4000 scale model and a number of representative approaching wind conditions were identified for the Study Site to rationalize and characterize the effects of the various topographical and terrain features for the 16 measured wind directions and the incoming wind profile adopted in this study. For the annual wind condition, N, NNE, NE, ENE, E, ESE, SSW and SW are selected which give total wind frequency of 83.4% over a year; while ENE, E, ESE, SSE, S, SSW, SW and WSW are selected which gives total wind frequency of

77.4% in summer months to further conduct the quantitative and qualitative assessments.

5.7.2 The Expert Evaluation has then been conducted to assess the wind performance of development scheme options and provide recommendations to develop the draft RODP in early stage of the Study. With the draft RODP, the Initial Study using Computational Fluid Dynamics was conducted with the model domain built far beyond the Surrounding Area as required in the Technical Circular. The studied size of CFD model of the development is approximately 8,000m (L) x 8,000m (W) x 2,700m (H) which contains more than 14,000,000 cells. The computational domain covers the site of the Development and provides sufficient consideration on surrounding buildings and topography.

5.7.3 Further to the formulation of the finalized RODP, detailed Air Ventilation Assessment study demonstrated that the finalised RODP would not have major wind stagnant problem under both annual and summer wind conditions. The overall wind performance can be further enhanced in detailed design stage by imposing some wind enhancement features such as slight widening the wind corridor, minimizing the bending angle of wind corridors/ air paths, relocation of some low-rise podia, adjustment of the building layouts, etc.

5.8 Traffic and Transport Impact Assessment

5.8.1 External transport provisions in the form of road networks and railway service to serve the developments in the proposed new town extension areas have been proposed. The road networks include existing major strategic trunk road – North Lantau Highway connecting TCE and TCW to the main urban areas of Hong Kong. A section of the future Road P1 connecting TCE and North Lantau Highway at the future Tai Ho Interchange is proposed to serve as an additional transport link. Schematic road network in Tung Chung is shown in [Drawing No. 219844/HY/0001](#).

5.8.2 Internal transport provisions including local road networks, footpaths and cycle track networks are proposed as shown in [Drawing Nos. 219844/HY/3100](#), [219844/HY/3200](#), [219844/HY/0002](#) and [219844/HY/0003](#) respectively. Walking and cycling are encouraged in the development area.

5.8.3 Based on the traffic analysis, it is anticipated that all assessed internal and external road links will be operating at satisfactory level except Lantau Link which will operate slightly over the manageable degree of congestion with a V/C ratio of 1.25 when all the new developments on Airport Island and in North Lantau being planned are in place. The forecast is consistent with the findings from previous studies. Depending on the findings of other planning studies for developments in North Lantau, including proposed topside development at the Hong Kong Boundary Crossing Facilities Island of Hong Kong-Zhuhai-Macao Bridge, Siu Ho Wan development and Sunny Bay Development, the need for additional strategic road link catering for the traffic demand in the region in the long run should be reviewed separately in due course.

5.8.4 The Road P1 - Tai Ho Section and future Tai Ho Interchange are proposed as one of the key supporting infrastructure of new town extension in TCE and has the following key functions:

- a) To relieve the future traffic over-capacity of TCE Interchange;
- b) To alleviate the air and noise impacts of through diverging traffic;
- c) To serve as an alternative access to TCE in case of traffic accidents in TCE Interchange and Yi Tung Road.

5.8.5 Road P1 can be in the form of reclamation or marine viaduct from engineering feasibility point of view. The reclamation option is recommended for the following reasons:

- a) The reclamation option offers a continuous promenade and shoreline for public enjoyment;
- b) The visual impact of the reclamation option is also relatively low.

5.8.6 Layout of the proposed Road P1 – Tai Ho Section is shown in [Drawing No. 219844/HY/2000](#).

5.8.7 In order to allow sufficient feasibility for future potential Road P1 Siu Ho Wan Section, a grade separation and an elevated round-about are proposed. Under this scheme, about 8.6 hectares of reclamation will be required for the proposed roadworks, round-about and connecting viaduct. It is desirable to have Road P1 - Tai Ho Section in place in year 2026 to relieve the traffic pressure, when North Lantau Highway

and the adjacent road network is anticipated to start to saturate.

5.8.8 Two new railway stations at TCE and TCW are proposed to serve the developments in TCE and TCW respectively. According to preliminary assessment, the peak patronages of Tung Chung Line would reach 41,700 pphpd (Kowloon to Hong Kong) and 19,500 pphpd (Sunny Bay to Tsing Yi) by 2036. To meet the anticipated increase in railway transport demand, the maximum carrying capacity of Tung Chung Line can be enhanced by construction of an overrun tunnel (i.e. the new infrastructure) in future, and upgrading of signalling system of Tung Chung Line by 2026. Upon completion of these two modification works, the maximum carrying capacity along Kowloon to Hong Kong will be increased to 66,000 pphpd under 6 ppsm or 47,000 pphpd under 4 ppsm, while that of Sunny Bay to Tsing Yi will be increased to 44,000 pphpd under 6 ppsm or 31,300 pphpd under 4 ppsm. The patronage of Tung Chung Line will be under an acceptable level with the newly added population and new railway stations.

5.8.9 The proposed TCE railway station will be located near the proposed Metro Core Area to the north of the existing Tung Chung railway line. The existing Tung Chung Line is proposed to be extended westwards for the proposed TCW station and the proposed station will be located adjacent to Yat Tung Estate and the proposed housing site at Area 39. Road-based public transport will be provided to feed the residents to the new rail stations as well as to other parts of Hong Kong. Pedestrian linkage will be provided for connection to a Public Transport Interchange where shuttle services are proposed to carry passengers to different land lots within the proposed development in TCW. It provides another means of supporting transport facility for passenger movement out of the 500m catchment area of the proposed TCW Station.

5.8.10 Space provision for station structure arrangement and detailed construction arrangement for the proposed new railway stations in TCE and TCW will require further study by future railway operator.

5.9 Marine Impact Assessment

5.9.1 The presence of Tung Chung Navigation Channel to the north of the proposed development in TCE will impose constraints to the reclamation configuration and marine access for construction vessels during construction phase.

5.9.2 Based on the current development plan in TCE, the alignment of Tung Chung Navigation Channel will remain the same in the operation phase. After the construction of HZMB Hong Kong Boundary Crossing Facilities (HKBCF) and proposed development in TCE, the adjacent buoys including Weather Buoy may need to be relocated and some of the Tung Chung Buoys will need to be delineated by the new coastline respectively.

5.9.3 Marine impact study covering Tung Chung Channel, Airport Channel, and Urmston Road (from Ma Wan Channel to Urmston Road Anchorage) has been carried out and no insurmountable problem is identified. However, some water-related issues need to be highlighted including:

- a) The extent of Tung Chung Reclamation is in parallel with Tung Chung Channel. It is not anticipated that the Channel will be affected after the completion of the reclamation. Parts of the Tung Chung Channel will be allocated as works area during reclamation and marine traffic control measures such as temporary diversion of the navigation channel, implantation of traffic control by the contractor, etc. will be required.
- b) The proposed marine park in The Brothers is planned to be gazetted in 2015. Once the marine park is designated, vessels within the marine park are statutorily required to operate at a speed at 10 knots or under. Permission from AFCD will be needed if the speed of vessels is greater than permitted. All construction vessels for TCE reclamation would need to strictly comply with the statutory requirements.
- c) Tuen Mun - Chek Lap Kok Link (TM-CLKL) Southern Viaduct will be completed when the reclamation works at TCE are completed. As such, the vertical clearance of TM-CLKL Southern Viaduct (21.3m navigable clearance) has been considered in the planning of the reclamation.
- d) The construction period for the reclamation works of Three-runway System (3RS) and Tung Chung New Town Extension Study may be overlapped subject to the implementation programme of these two projects. Construction vessels of two projects will navigate Urmston Road and its vicinity, coordination between two projects during detailed design stage and construction stage will hence be

required to minimise their impacts on existing marine traffic and to uphold navigation safety.

- e) The proposed Tung Chung Marina is located adjacent to Tung Chung Navigation Channel. As the size and capacity of the marina are still under review, the marine impact to Tung Chung Channel and its vicinity will be required to be evaluated in next stage of study.

5.9.4 While no insurmountable problem is identified in the marine impact study, detailed marine impact assessment shall be carried out at the detailed design stage to determine the exact mitigation measures to be implemented, in order to minimize the impacts to the marine traffic due to the proposed reclamation works during and after reclamation construction.

5.10 Geotechnical and Natural Terrain Hazard Assessment

5.10.1 Reclamation of approximately 120.5 hectares adjoining the existing coastline is proposed for the development at TCE and approximately 8.6 hectares for the future Road P1 - Tai Ho Section to support the new town development. The preliminary geotechnical assessment indicates that a layer of up to approximately 15m thick soft marine deposits and considerable long term consolidation settlement after reclamation (about 8m to 10m reclamation filling) is anticipated. Ground treatment such as installation of vertical drain with surcharging will be required to accelerate the speed of consolidation and ensure the long term settlement of the newly reclaimed land is within the acceptable limit.

5.10.2 The new development area in TCE falls within the Designated Area of Northern Lantau, which is identified as having potential for complex geological conditions, including the presence of marble and depressions in rock head. The existing ground investigation information reveals that the rockhead level is in general within 60m below ground for the eastern and central part of the site, and tends to be deeper at the western part of the site with localized deep rockhead up to about 130m below ground as shown in a borehole further offshore. Detailed planning of ground investigation works is essential in collecting more information on the ground condition. The potential constraints associated with the design and construction of foundations for high rise buildings may render the need of local rearrangement of buildings within a building lot or proper

selection of the foundation type similar to the recorded cases in existing Tung Chung New Town. No insurmountable problem is expected with proper planning of ground investigation works and detailed design with due consideration of the ground condition.

5.10.3 For the new development area in TCW, overlain by a layer of superficial deposits and completely decomposed rock, the rockhead level at this area is in general in range of 10m to 30m below ground as revealed from limited existing ground investigation information. Low-rise buildings / light-weighted structures may be founded on shallow foundation while medium-rise by conventional deep foundations on rock and the selection will be subject to the local ground condition.

5.10.4 Both proposed development sites in TCE and TCW are located areas with natural terrain hillslopes adjacent. As a result of this, screening of natural terrain catchments in order to determine their requirement for further natural terrain hazard assessment has been undertaken as presented in [Drawing Nos. 219844/NH/1000](#) and [219844/NH/1001](#). A preliminary assessment of the potential for the impact of natural terrain hazards to the proposed development areas have been conducted based on the “In-principle Objection Criteria” and “Alert Criteria” stated in GEO Report No. 138.

5.10.5 For the new developments in TCE, there are no natural terrain catchments in the immediate vicinity of this study area, with the closest hillsides being located at distances greater than 50m from the site and with a number of intervening facilities in between them, including the North Lantau Expressway, Tung Chung Line and Airport Express Line. And hence it has a low susceptibility to natural terrain hazard.

5.10.6 For the new developments in TCW, 20 out of 37 catchments adjacent to the southern and north-eastern portion of the proposed development areas are identified as having sloping terrain greater than 15 degree within 50m of the proposed development and therefore will require further study in the detailed design stage in accordance with the Alert Criteria.

5.11 Green Initiatives

5.11.1 A comprehensive framework of green initiatives has been formulated with consideration of various aspects including urban design and planning, landscape design, transportation and logistics, green energy

application, building energy efficiency, water conservation and recycling, waste management and green construction materials.

5.11.2 Urban Design and Planning – Compact development approach is adopted to create a mixed-use area with a concentrated population and job opportunities within easy walking distance of major transportation terminals to promote sustainable and green planning, whereby walking and cycling are also promoted. Wind corridors aligning with the prevailing wind directions will also be reserved to facilitate air ventilation for the development and leeward areas.

5.11.3 Landscape Design – The proposal of a town park, conservation of TCV, provision of regional open space, district open space and waterfront promenade, as well as integration of green corridors with major roads in the Development increase the amount of open space and subsequently green coverage. Heritage, established wildlife habitats significant landscape features will also be protected.

5.11.4 Transportation and Logistics – Footpath and cycle track network will be provided to promote walking and cycling in the development area. Public transports including the planned railway Station and public bus services could reduce carbon emissions due to transport. Besides, low carbon vehicles such as electric vehicles will also be promoted.

5.11.5 Green Buildings – Photovoltaic system and solar hot water system are possible means to reduce the carbon footprint of the development. The former can be in form of Building Integrated Photovoltaic (BIPV) systems and/or hybrid street lamps on the road. The latter can be installed at buildings with significant hot water demand, such as hotels and/or sports complex. Besides, passive building design including high performance facade, daylighting, green roof, etc. can be considered to reduce energy demand.

5.12 Socio-economic Impact Assessment

5.12.1 The Finalized RODP is oriented to meet with the strong economic opportunities brought by the various infrastructures in vicinity with Tung Chung in connection with the larger Pearl River Delta area. Ample area has been reserved for commercial activities which will not only capture the “bridgehead economy” associated with nearby infrastructures for years to come and create substantial amount of employment opportunities that will bring benefits to the community.

Collectively they create a vibrant and sustainable local economic and social environment for the new town. In addition, the provision of community facilities such as post-secondary institution might provide opportunities in resolving the job matching problem and equip the local residents with necessary skills to cope with job opportunities offered in the new town.

5.12.2 From social perspective, it is expected that with the ample provision of community facilities, recreation areas, sport ground, social welfare facilities and connectivity enhancement in accordance to the relevant guidelines as well as request from the comments received from PE1, PE2 and PE3, the quality of life for both existing and future residents is expected to be improved.

5.12.3 Since TCE will mainly be reclaimed land, social impact to existing residents is considered minimal, mainly are indirect impact to residents living nearby the TCE boundary. For TCW, development has avoided encroachment to existing recognized villages, yet, indirect impact to the existing village is likely due to introducing a new residential clusters around these village clusters. This impact is likely to be offset by adoption of low-density nature of these new residential plots compatible with the rural context and designation of essential conservation zoning to the ecologically sensitive and areas to be reserved. Moreover, improvement to the living standard of the existing village is anticipated due to improvement to connecting roads and addition of car parking spaces, which the later will happen in the Ma Wan Chung village to facilitate its revitalization. Moreover, in the TCV area, our addition of drainage measures such as attenuation ponds and polders will help to mitigate flooding problem currently exists along the Tung Chung Stream.

5.12.4 Planning of the new town with carefully designed linear parks, promenade and open space network creates a communication and social networking channel to the residents, enhancing self-pride and social cohesion. A mixture of public and private housing adheres with the Long Term Housing Strategy provides a right balance of the social groups within Tung Chung. Collectively, they improve livability for local residents and form the basis for a sense of belonging.

5.12.5 The implications on land use planning and provision of various facilities and infrastructures for the existing community and the new communities in TCE and TCW, such as the mitigation measures in the

possibility of affecting existing agricultural land, graves, private landholdings for the proposed developments in TCW have been taken into account in the course of the Study.

5.13 Sustainability Assessment

5.13.1 Key sustainability issues have been identified and highlighted for the development.

5.13.2 On the positive side, the proposed development is expected to extend Tung Chung into a distinct community which can meet housing, social, economic, environmental and local needs. The development will improve cost-benefit, air pollution, fixed capital, local freshwater, travel speed and unemployment. The development will also enhance self-reliance and social cohesion, provide balanced allocation of leisure and cultural facilities, reduce housing waiting time and private rent without compromising the needs to address energy consumption, income differential, marine water quality, open space shortfall, ecology, health and heritage. Education expenditure is also increased to provide a higher quality of education through establishment of schools for different level of education.

5.13.3 On the negative side, there will be a very slight deterioration of condition with respect to construction waste, freshwater supplied and consumed, landfill capacity, municipal waste, river water quality and solid waste management due to the proposed development. There will be slight deterioration with respect to carbon dioxide emitted per year, excessive noise, freight costs, marine eco-value, significant landscape features (area), terrestrial eco-value and travel distance. These changes are considered to be extremely small as compared with the Hong Kong territory-wide values. Some of the negative impact would be occurred only in the construction stage which can be mitigated or minimized through best practices. The impact from the operational stage would be managed and minimized by proposed mitigation measures incorporated in different stages of the Project.

5.13.4 The overall assessment is mainly based on a qualitative approach. Based on the theory of the three pillars of sustainability: society, environment and economy, this project can be considered as positive overall in terms of sustainability given the potential negative environmental impacts can be offset by implementing proper mitigation measures.

5.14 Land Requirement

5.14.1 Further to the completion of the Stage 3 Public Engagement in October 2014, the RODP has been revised. The planned developments in the latest RODP represent the result of the effort of minimizing the use of private land.

5.14.2 Based upon the RODP presented in the Technical Paper (TP10A & 16A) on the Finalized RODP and ROZP, the land required for the proposed development in Tung Chung has been re-examined, covering both private lots and government land. Examination of the land required includes the status of the land involved, the current usage, the ownership, etc. Private lots to be zoned under CA, CPA, and GB, although not to be resumed, have also been studied. Other major issues that would affect the cost of land acquisition and clearance are also discussed and taken into account in formulating the optimal resumption scheme, e.g. VRT, removal of graves, etc.

5.14.3 Other key issues that would have potential impacts on the resumption have also been discussed, including rehousing commitment upon land clearance, timing, adverse zoning/downzoning, road closure, etc. Recommendations on implementation strategies of the resumption have been proposed for relevant parties' consideration.

6 Environmental Impact Assessment

6.1 Approach to Environmental Impact Assessment

6.1.1 An Environmental Impact Assessment (EIA) has been carried out to assess the environmental impact from the Tung Chung New Town Extension (TCNTE) Project, including the possible development areas (PDAs) at both Tung Chung East (TCE) and Tung Chung West (TCW). The EIA has been prepared in accordance with the requirements of the Environmental Impact Assessment Ordinance (EIAO) and the EIA Study Brief (ESB-285/2015).

6.1.2 The EIA process provides a means of identifying, 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 Project. Feedback and advice obtained from the various stakeholder engagement activities have been considered and incorporated into the EIA process where appropriate. Mitigation measures have been proposed to avoid some potential environmental impacts, or to minimise or mitigate the impacts to acceptable levels. The impact evaluation and proposed mitigation measures in different environmental aspects, if any, are summarised below.

6.2 Air Quality

Construction Phase

6.2.1 The key activities that could potentially result in dust emissions during construction phase of the project have been identified. These activities include reclamation, site clearance, soil excavation, backfilling, site formation and wind erosion of open sites. In addition, construction dust emissions from concurrent projects have also been identified and included in the cumulative air quality impact assessment where appropriate. The assessment has include representative Air Sensitive Receivers (ASRs) in the vicinity and considered the relevant air pollutants such as Total Suspended Particulates (TSP), Respirable Suspended Particulates (RSP) and Fine Suspended Particulates (FSP).

6.2.2 Assessment results indicate that, with the implementation of the

mitigation measures as stipulated in the Air Pollution Control (Construction Dust) Regulation and dust control measures (i.e. watering once per hour on exposed worksites and haul road, and good site practices), the predicted concentrations of TSP, RSP and FSP at representative ASRs would comply with the Air Quality Objectives (AQOs) and TM-EIAO.

Operational Phase

6.2.3 Key existing and planned / committed air pollution sources in the vicinity of the Project during operational phase include the vehicular emission from neighbouring roads, such as North Lantau Highway, Hong Kong Link Road, Hong Kong Boundary Crossing Facilities, and Tuen Mun - Chek Lap Kok Link, Hong Kong International Airport, and Organic Waste Treatment Facilities Phase I etc. The assessment has also considered other emission sources that would have certain influence on the background air quality level, including territory wide vehicular emission, power plants, marine traffic emission, as well as regional emission from the Pearl River Delta. Key representative air pollutants include Nitrogen Dioxide (NO₂), RSP and FSP.

6.2.4 During the course of formulating the RODP, air quality impact on the newly introduced population in the TCE development area is one of the key concerns given the close proximity to the North Lantau Highway (NLH). Appropriate buffer distance from NLH has been provided for the air sensitive receivers. Assessment results indicate that the cumulative air quality impact during operational phase for the assessment year would comply with the AQOs. Hence, the operation of the project will not result in adverse residual air quality impacts and mitigation measures are therefore not required.

6.3 Noise Impact

Construction Airborne Noise

6.3.1 Potential construction airborne noise impacts would be caused by various construction activities including reclamation for the PDA at TCE and Road P1 extension, site clearance and formation activities for TCE and TCW, construction of service reservoirs, revitalization works along the channelized section of Tung Chung Stream, internal roads, superstructure, etc.

6.3.2 Construction noise assessment has concluded that the unmitigated

construction noise impacts would exceed the noise criteria at some existing and planned Noise Sensitive Receivers (NSRs). A package of noise mitigation measures such as good site practices, movable noise barriers, full enclosure, quiet plants and working sequence have therefore been proposed to mitigate construction noise impacts. Assessment results indicate that, with the implementation of the above mitigation measures, noise levels at all NSRs including residential premises and schools during both normal and examination periods would comply with the stipulated noise criterion.

Construction Groundborne Noise

6.3.3 The extension of the existing Tung Chung Line to the proposed TCW Station is expected to be constructed by the use of Tunnel Boring Machine (TBM), which would generate groundborne noise. Assessment results suggest that, given the separation distance between the new railway extension and the planned NSRs, the vibration generation by typical TBM operation would cause groundborne noise impacts of 38 – 40dB(A) at planned residential uses, which would not exceed the respective noise criterion. Adverse construction groundborne noise impact is not anticipated.

Road Traffic Noise

6.3.4 The road traffic from both existing and planned roads would generate road traffic noise that would have impacts on the planned and existing NSRs. Existing roads that have been included in the assessment include North Lantau Highway, Ying Hei Road, Yu Tung Road, Tung Chung Road and planned roads under TCNTE including those internal roads inside TCE, TCW and Road P1.

Assessment results suggest that, for the scenario without mitigation measures, the predicted road noise levels at some of the planned noise sensitive receivers including residential uses and educational institutions inside TCE and TCW would exceed the respective noise criteria. The use of noise mitigation measures have therefore been explored, including 1) approximately 270m long noise barriers (height ranges from 5m to 5m with 3m cantilever arm at 45°) along some road sections or boundary walls within development sites; 2) application of approximately 530m long low noise road surfacing materials on some road sections; and 3) suitable treatment on end walls, arranging noise tolerant portions of buildings in internal layout design and architectural fins in some buildings. With all the proposed mitigation measures in

place, the façade noise levels at all the planned sensitive receivers would comply with the respective noise criteria.

Fixed Noise

6.3.5 A number of facilities have been recommended to support the operation of the proposed new town. Some of these facilities are fixed noise sources that would have potential noise impacts on NSRs. These noise sources include planned salt water pumping station / sewage pumping station / pumping station, fire station, Chung Mun Road sewage pumping station, electric substation, public transport interchange. Other than these planned noise sources, fixed noise sources from boatyard maintenance area, sports ground, ventilation shafts for the railway stations at TCE and TCW and planned Third Runway of Hong Kong International Airport would also contribute to noise environment.

6.3.6 In order to ensure that the noise impacts from these fixed noise sources would comply with the respective noise criteria, their maximum allowable sound power level have been derived. The detailed design of these plant rooms etc. shall ensure that sufficient sound attenuators are appropriately incorporated into the design such that the sound power level is within its maximum allowable level. Adverse fixed noise impact is therefore not anticipated.

Aircraft Noise

6.3.7 The approved EIA of Expansion of Hong Kong International Airport into a Three-Runway System (3RS) (AEIAR-185/2014) has predicted the NEF noise contours for different years. According to its findings, the NEF25 noise contour in Year 2021 will encroach onto the part of the reclamation boundary of TCE. However, the predicted NEF 25 contours would be shifted away from TCE boundary upon the full commissioning of the 3RS, currently planned for 2023 as stated in the 3RS EIA.

6.3.8 Since the population intake for the portion of TCE that are within the Year 2021 NEF 25 noise contour would be at Year 2023 the earliest, adverse aircraft noise impacts on the planned sensitive receivers are not anticipated and hence mitigation measures are not required. If the operational year of the 3RS would need to be shifted beyond the programme stated in the 3RS EIA or the Project is developed in advance of operation of the 3RS of HKIA, the Project Proponent of this Project shall conduct a review on the dates of population intake so as to ensure

that all the NSRs within TCE would not be adversely affected by aircraft noise. Moreover, without implementation of the 3RS project of the HKIA, it is noted that part of the proposed TCE reclamation on the seaward side would fall within the NEF 25 contour based on the current operation of HKIA. In that case, the planning of TCE which envisages a mix of residential and commercial development would need to be reviewed.

- 6.3.9** For TCW, the development boundary will be away from the predicted NEF 25 contours for all the operation modes for airport including the existing two runway system and the 3RS. Adverse aircraft noise impact is therefore not anticipated.

Rail Noise

- 6.3.10** The railway stations at TCE and TCW and the associated railway system are Designated Projects under Item A.2 of Schedule 2 of TM-EIAO. A separate study would therefore be conducted by the future rail operator to fulfil all the statutory requirements and procedures under the EIAO.

- 6.3.11** Nevertheless, the current assessment has considered the cumulative railway noise impacts for the planned NSRs within TCE during different phases of the implementation. According to current planning, the commercial buildings that are strategically located between the Phase 1 residential buildings and TCL & AEL would be in place prior to the Phases 1 & 2 population intake. Assessment results indicate that noise mitigation measures would be required, in the form of facade with no openable windows and architectural fin. With these mitigation measures in place, the predicted noise impacts at all the NSRs would be in the range of 40 – 60dB(A), which comply with respective statutory noise criteria.

- 6.3.12** Similarly, the commercial buildings that are strategically located between Phases 3 & 4 residential buildings and TCL & AEL would be in place prior to the Phases 3 & 4 population intake. Assessment results indicate that noise mitigation measures would be required for TCL, in the form of semi-noise enclosures covering part of the TCL track tentatively subject to further review under a separate study to be conducted by future rail operator. With these tentative mitigation measures in place, the predicted noise impacts at all the NSRs would be in the range of 29 – 58dB(A), which comply with respective statutory noise criteria and hence adverse rail noise impact is not anticipated.

6.3.13 For operational groundborne noise, based on the vibration source term established on site, the predicted groundborne noise impact would be in the range of 34 – 44 dB(A) which comply with respective statutory noise criteria and hence adverse impact is not anticipated.

Helicopter Noise

6.3.14 The helicopters being operated by both Government Flying Services and a commercial company would be using the airspace in the vicinity of TCE and TCW. An assessment has been conducted based on the noise source term for helicopters and flying route. According to the assessment results, the predicted helicopter noise level at planned NSRs will be within the statutory noise criterion.

Marine Traffic Noise

6.3.15 Potential marine traffic noise sources that would have impacts on the proposed development include the existing ferry plying between Tuen Mun, public Pier in Tung Chung, Sha Lo Wan and Tai O, and the proposed marina at TCE. The predicted marine traffic noise impact from those noise sources would be in the range of 39 – 48dB(A) during daytime and evening periods and 39 – 44dB(A) during night-time period and are below the respective background noise levels at various NSRs and hence adverse marine traffic noise impact is not anticipated.

6.4 Water Quality

Construction Phase

6.4.1 While reclamation in TCW has been removed to allay public concerns and avoid water quality impacts, reclamation works at TCE is still required. Potential key sources of water quality impact during the construction phase include land formation works in TCE and Road P1. It should be noted that potential construction phase water quality impacts associated with the proposed works have already been substantially reduced by the adoption of non-dredged reclamation methods for land formation and reclamation filling works within a leading seawall of about 200m. Other than reclamation works, the construction work in both TCE and TCW would involve construction site runoff and drainage; sewage effluent from construction workforce.

6.4.2 Assessment results show that with the application of about 200m leading edge of partially completed seawall prior to marine filling activities and the implementation of mitigation measures (in the form

of silt curtains and silt screens where applicable), there will be no exceedance of the suspended solid (SS) criteria at any WSR due to the construction activities.

6.4.3 Cumulative impacts taking into account the concurrent project have also been assessed. Exceedance in SS is predicted at few WSRs near the Brothers Islands. Nevertheless, the exceedance is basically not relating to Tung Chung project given the far distance apart. It is primarily due to the conservative assumptions for Contaminated Mud Pits (CMPs) project. Based on the information from the project proponent of CMPs, the actual dredging/disposal rates of East Shau Chau CMPs from the latest forecast are much lower than the assumed rates. Therefore, adverse residual water quality impacts due to the project are not anticipated. Moreover, according to the modelling results, it is observed that the predicted SS plume extent due to construction under the Tung Chung project is localised within Tung Chung waters and is complied with the SS criteria after implementing mitigation measures. For prudent sake, water quality monitoring will be carried out during the construction period.

6.4.4 Other construction activities include bridge works at Tung Chung Stream, construction work of sewage pumping stations, fresh water and salt water services reservoirs, water management facilities and polder scheme, proposed marina and groundwater and runoff for tunnel works. With the implementation of good site practices and the recommended mitigation measures to minimise potential water quality impacts, these construction activities, as well as general construction site drainage and sewage effluent from the construction workforce, are not anticipated to result in significant water quality impacts.

6.4.5 In view of the above assessment findings, it is concluded that no adverse residual water quality impacts are anticipated during the construction phase of the project.

Operational Phase

6.4.6 The potential key sources of water quality impact during the operational phase include changes in hydrodynamics as a result of the reclaimed land in TCE and Road P1 and the increase of sewage amount and increase of pollution load from surface runoff.

6.4.7 For the reclamation in TCE and Road P1, quantitative assessments for 'with project' and 'without project' scenarios were undertaken for the

assessment year of Year 2030 which represents the worst case for pollution loading, taking into account other planned and committed concurrent projects in the study area. The findings show that despite minor exceedance in total inorganic nitrogen (TIN) at some WSRs, these were attributed from the background concentration but not attributed to the Project. In order to protect the water quality of Tung Chung Stream, Tai Ho Wan and other neighbouring water body, all the sewage pumping stations serving the TCE and TCW will be designed with appropriate measures to avoid the need for emergency discharge. For the surface runoff from TCW, enhancement measures such as provision of stormwater attenuation and treatment ponds, dry weather flow interceptor at the existing villages have been recommended to protect the water quality in Tung Chung Stream.

6.5 Sewerage and Sewage Treatment Implications

6.5.1 The TCNTE project will generate a large amount of sewage flow which will be taken up by proposed sewers, sewage pumping stations (SPSs) within TCE and TCW developments. Sewage generated by TCNTE will be discharged to the Siu Ho Wan Sewage Treatment Works (SHWSTW) for treatment.

6.5.2 Two SPSs are proposed within the TCE, where the intake population will occur in two stages, namely “interim” from Year 2023 to 2026 and “ultimate” from Year 2027 to 2030. Interim stage will be taken up by one proposed SPS within TCE with twin rising mains delivering flow directly to the Tung Chung Sewage Pumping Station (TCSPS). During ultimate stage, all flow from TCE will be diverted away from TCSPS and toward the other SPSs within TCE with twin rising mains delivering flow directly to SHWSTW. All rising mains will be concrete encased to avoid risk of pipe bursting.

6.5.3 Three new SPSs are proposed within the TCW and the existing Chung Mun Road Sewage Pumping Station (CMRSPS) would be upgraded. Flow generated by a portion of TCW development will be diverted by sewers toward the upgraded CMRSPS, which will deliver flow by twin rising mains directly to one new SPS nearby the eastern tributary of Tung Chung Stream. Two other new SPSs are proposed nearby the West Tung Chung Stream which will also deliver flow by twin rising mains to the SPS nearby the East Tung Chung Stream. The SPS at East Tung Chung Stream will then deliver flow by twin rising mains directly to the TCSPS. All rising mains will be concrete encased to avoid risk

of pipe bursting.

6.5.4 Taking into account the ecological sensitivity of the Tung Chung Stream and Tung Chung Bay, a series of enhanced mitigation measures are proposed at these SPSs in TCE and TCW so as to minimize the risk of pump failure, rising main failure and power failure during emergency situations. Each SPS will be fitted with a) 100% standby pumping capacity within each SPS, with spare pump up to 50% pumping capacity stockpiled in each SPS for any emergency use; b) twin rising mains; c) dual-feed power supply; d) emergency storage facilities up to 6-hours ADWF capacity; and e) emergency communication mechanism amongst relevant government departments. These measures were considered to be appropriate for TCE and TCW. It is considered that emergency discharge is not expected, and thus no adverse impact on water quality or ecology due to emergency discharge is anticipated.

6.6 Waste Management Implications

Construction Phase

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

Operation Phase

6.6.2 The types of waste that would be generated during the operational phase have also been assessed. Recommendations have been made to ensure proper treatment, handling and disposal of these wastes.

6.7 Land Contamination

Potential Impact

- 6.7.1** Land contamination assessment was carried out to examine the potential contaminative land use within the PDAs and the works areas for the associated infrastructures. The assessment involved desktop review, site surveys and the proposed environmental site investigation (SI).
- 6.7.2** Since the potentially contaminated sites are located in private land lots, SI could not be carried out at this stage. Further site visit at these potentially contaminated sites are proposed once future development of these sites are confirmed and that site access is available in order to identify the need for SI for any additional hot spots as a result of the on-going land contaminating activities.
- 6.7.3** In addition, re-appraisal would be required for the other surveyed sites, other remaining areas of the potential development areas and the works areas for the associated infrastructures to address any change in land use that may give rise to potential land contamination issues.
- 6.7.4** Findings of the further site visit at the potentially contaminated sites and the re-appraisal will be presented in a supplementary CAP. Upon approval of the supplementary CAP and completion of the SI works, a Contamination Assessment Report (CAR) would be prepared to present findings of the SI works. If contamination has been identified, a Remediation Action Plan (RAP) would be prepared to recommend specific remediation measures. Upon completion of the remediation works, if any, a Remediation Report (RR) would also be prepared to demonstrate that the clean-up works are adequate. The CAR, RAP and RR would be submitted to EPD for approval prior to commencement of any construction /development works.

6.8 Ecology

- 6.8.1** The present Project will involve development in existing land and new reclamation. Both possible terrestrial and marine ecological impacts have been assessed. Ecological survey programmes covering from 2012 to 2015 was carried out to fulfil the EIA SB.
- 6.8.2** Approaches for avoiding and minimisation of impacts have been

considered. No development or channelization of Tung Chung Stream is proposed and buffer zones of maximum 30m are provided for protection. A lot of areas inside TCV have been preserved by non-development zoning on the RODP such as CA, CPA, GB, AGR, especially those with higher ecological values such as Fung Shui Woods, Fong Yuen area.

6.8.3

Most habitats to be affected, such as urbanised/disturbed and orchard, are of low ecological value. The potential impact of loss of woodland is considered as moderate. Small areas of fringe of Fung Shui woods (about 0.2ha) will be inevitable affected due to flood protection works for villages and road widening given the space constraints, but the final loss might be further minimised during the later detailed design stage of the layout plan refinements. Although the ecological value of orchard was ranked as low, the potential impact loss of this type of habitat was considered minor to moderate due to the size of the affected area. The potential impacts due to loss of the other types of habitats were all considered minor or insignificant. The service reservoirs will not encroach Wong Lung Hang EIS or Lantau North (Extension) Country Park. In order to minimize the potential impact due to habitat loss and site formation, a number of mitigation measures will be implemented. Compensation woodland planting of total area of 11ha will be provided and advance planting will be explored. Planting list will include tree species targeting to mitigate the loss of Fung Shui Wood and Orchard by ecological functions. Plant species of conservation importance will be retained or transplanted as far as possible in public works, and private residential/commercial developments inside TCV-1 before site formation commence. Capture-and-translocation exercise for amphibians of conservation importance including Romer's Tree Frog and Chinese Bullfrog will be conducted in the TCW PDA at areas with sightings, including public works near the eastern branch of Tung Chung Stream and private residential/commercial developments inside TCV-1 and TCV-5 before site formation commences.

6.8.4

Regarding the marine ecological impact, no reclamation or development of intertidal habitats is proposed in Tung Chung Bay, and thus there will be no direct impact on Tung Chung Bay or San Tau Beach SSSI. TCE-PDA is located to the north of Tung Chung New Town over coastal waters. Together with the Road P1, proposed reclamation will cause marine habitat loss, but the area is of low importance to Chinese White Dolphin. The construction and operation

of the Project would still cause certain marine habitat loss. Due to the inclined seawalls, the actual loss of coastal waters habitat (water column and subtidal soft-bottom seabed) will be larger than the sizes on RODP. About 145 ha of seabed will be lost due to the 129.1 ha of reclamation (measured at the High Water Mark level) from both TCE PDA and Road P1. The impact is considered Minor to Moderate. During the construction phase, there will be another 55 ha of temporary marine habitat loss due to the marine works area for an about 6 year duration.

6.8.5 Assessment of construction phase and operational phase indirect impacts related to water quality has adopted water quality modelling results which have taken into account concurrent projects. The magnitudes of the water quality related impacts range from Insignificant to Minor.

6.8.6 Approaches for avoiding and minimisation of impacts have also been considered for marine ecology. Non-development zoning on the RODP has been provided along a large section of Tung Chung Bay coastline such CPA as buffer zone and the low disturbance RO/DO. There will be no emergency discharge from any sewage pumping stations, design/measures will be implemented to enhance the sewerage network reliability and minimize the environmental impacts due to system failure or in case of emergency situations. Eco-shoreline will be provided on the future reclamation seawalls as mitigation for loss of general marine waters habitat, to provide better ecological functions when compared with the traditional artificial seawall. Measures to reduce the construction phase marine traffic, including using larger-sized barges, land transportation, and also reuse of C&D materials, have been recommended as mitigation. Works Vessel Travel Route Plan is also required for the present Project prior to commencement of construction, in which constraints, speed regulations, and good site practices will be taken into account, and will follow all requirements of existing legislation.

6.8.7 The potential disturbance on CWD due to the work-related vessel traffic flow during construction phase is considered Minor to Moderate, while the potential disturbance due to the marina traffic during operational phase is considered as Insignificant. The assessment has indicated that the potential temporary impacts on the proposed The Brothers Marine Park from the present Project during construction phase would not be severe and additional measures have been recommended to protect its

functions as Chinese White Dolphin habitats, while the potential impacts in operational phase would not be significant.

6.9 Fisheries

6.9.1 The proposed reclamations are located in areas of low fisheries production. And the number of fishing vessels utilized the reclaimed areas is not high and dominated by small-sized vessels. The reclaimed areas are also away from other sites of fisheries importance. The nearest mariculture site is Ma Wan FCZ, which is about 10 km from the Project Area.

6.9.2 The construction and operation of the Project would cause certain fishing ground loss. During the construction phase, a 200 ha of marine works area will be established, and the marine works area is not available for fishing operations for an about 6 year duration from 2017 to 2023. During the operation phase, there will be inevitable permanent losses of fishing grounds due to the reclamation footprint and the marine waters within the future marina. A total of 149.2 ha fishing ground will be permanently lost. The impact is considered Minor during both construction and operation phases given the loss area is a minor proportion compared with the available fishing ground in Hong Kong waters and the loss area is not of high fisheries production rate. Eco-shoreline design will be provided on the future reclamation seawalls as mitigation on marine ecology. It is expected that fisheries species in North Lantau will also be benefited by the enhanced ecological functions.

6.9.3 Fishing vessels originally operated in the loss area will need to shift their operation locations. As the number of fishing vessels utilized this area is not high and alternative operation locations/areas are available, the impact is considered Minor during both construction and operation phases.

6.9.4 Assessment of construction phase and operational phase indirect impacts related to water quality has adopted water quality modelling results which have taken into account concurrent projects. The magnitudes of the water quality related impacts range from Insignificant to Minor. Occasional exceedance are mostly caused by either contributions from concurrent projects or the high background level. Mitigation measures for construction phase water quality impacts have been proposed under water quality assessment and during the

operational phase no adverse water quality impact phase is anticipated.

6.9.5 For the protection of fisheries resources, there will be no emergency discharge from any sewage pumping stations in TCE PDA and TCW PDA, and measures will be implemented to enhance the sewerage network reliability and minimize the environmental impacts due to system failure or in case of emergency situations.

6.9.6 For potential cumulative disturbance impacts from works vessels, the overlap of marine traffic with concurrent projects would be small and with the mitigation measures proposed to reduce part of marine traffic volume, the potential cumulative disturbance impact on fishing activities during construction phase would be acceptable. It is not expected that other concurrent projects would propose marina in the areas close to the TCE PDA, and therefore it is unlikely there will be cumulative disturbance impact on fishing activities from the marina marine traffic during operation phase.

6.9.7 Permanent loss of about 149.2ha of fishing ground of low production rate would constitute residual impact. Due to low to moderate number of fishing vessels and the limited fisheries production affected, the residual impact is considered acceptable. The operational phase hydrodynamic modelling works has also taken into account concurrent projects, and the results indicated no adverse water quality impact during the operational phase is anticipated. Adverse residual fisheries impact and water quality impact are not anticipated from the present Project. Additionally, with the implementation of good site practices and the recommended mitigation measures to minimise potential water quality impacts, construction activities as well as general construction site drainage and sewage effluent from the construction workforce and other concurrent projects, are not anticipated to result in significant water quality impacts.

6.10 Landscape and Visual

Construction Phase

6.10.1 Based on the impact assessment findings, mitigation measures covering all relevant landscape and visual aspects are proposed to be implemented during construction. These include optimising construction works areas and providing temporary landscape on temporary construction; providing screen hoarding; minimising topographical changes; preserving Potentially Registrable OVTs, and

rare and protected vegetation; transplanting affected trees; adopting non-dredge method for reclamation, protecting natural rivers and streams; preserving natural coastlines; providing natural rock material/ planting for artificial seawall; landscaping on slope; landscape treatment on channelized watercourses; and light control.

6.10.2 After implementing the recommended mitigation measures, all Landscape Resources and Landscape Character Areas are either anticipated to experience residual impacts of moderate to slight significance, or they are anticipated to be unaffected by the proposed development. In addition, with the implementation of the mitigation measures, most Visually Sensitive Receivers are either anticipated to experience residual impacts of slight/moderate or slight significance, with some of the VSRs anticipated to experience insignificant impacts by the proposed development of TCE and TCW during construction phase.

6.10.3 *Operation Phase*

6.10.4 Based on the impact assessment findings, mitigation measures covering all relevant landscape and visual aspects are proposed to be implemented during the operation phase. These include compensatory tree planting, woodland restoration, screen planting, roadside planting, aesthetic design of built development; maximising greening on structures, noise barrier design; landscape treatment for polders & stormwater attenuation and treatment ponds, landscaping on slopes, landscape treatment on channelized watercourses, and light control.

6.10.5 The residual landscape impacts on LRs and LCAs after the implementation of mitigation measures during the operation phase were assessed. All LRs and LCAs are anticipated to either experience residual impacts of moderate to insubstantial significance, or be unaffected by the proposed development. The residual impacts on coastal waters in TCE would remain moderate throughout the operation phase due to the permanent loss of approx. 124 ha of coastal waters. Nevertheless, there remains a much larger area of coastal waters of North Lantau that will be unaffected by the development and that will be available in the operation phase as an on-going landscape resource. Apart from that, the residual impacts on miscellaneous rural fringe landscape in TCE would be substantial in the operation phase due to the permanent character change from naturalistic and rural to artificial, but could be reduced to moderate eventually with relevant mitigation

measures.

6.10.6 The overall visual character in Tung Chung area would be significantly changed by the proposed development after the construction, all the recommended mitigation measures would not be able to alleviate the fundamental change in character. While, in terms of effectiveness of mitigation measures, it is considered that for visual amenity purpose, improving the appearance of new urban infrastructures together with landscape planting or screening measures, and lighting control would help to alleviate the adverse visual impacts from the new urban development and enhance the compatibility with the existing Tung Chung Town Centre. With implementation of the recommended mitigation measures, most VSRs are either anticipated to experience residual impacts of slight/moderate or slight significance by the proposed development of TCE and TCW at Operation Day 1, except that visitors of Tung Chung North Waterfront Area in the existing reclamation land of TCE, and future recreational/occupational users of Topside Development at HKBCF island are anticipated to experience residual impacts of moderate significance. It is considered that the residual adverse visual impacts would be slight/moderate to insignificant by Year 10 of the operation phase when the mitigation measures have matured and taken effect.

6.10.7 It is considered that the overall residual landscape and visual impacts of the proposed development are acceptable with mitigation during the construction and operation phases.

6.11 Cultural Heritage

Terrestrial Archaeology

6.11.1 An Archaeological Impact Assessment (AIA) has been conducted for both the TCE and TCW developments. Since TCE is on reclaimed land, there are no potential for terrestrial archaeology. For TCW, the baseline conditions have been established by first reviewing literature information relating to the geological characteristics of Tung Chung Bay, historical aerial photos, Sites of Archaeological Interest etc. There are 4 Sites of Archaeological Interest within the boundary of TCW, including the Fu Tei Wan Kiln (relocated to Tung Chung), Ma Wan Chung, Sha Tsui Tau and Tung Chung Game Board Carving.

6.11.2 Terrestrial archaeological survey was conducted in 13 January to 24 May 2014. The survey results were then analysed together with the

literature information to form the baseline conditions. According to the latest design, Fu Tei Wan Kiln (relocated to Tung Chung) and Tung Chung Game Board Carving Sites of Archaeological Interest would be avoided. For the rest of the development areas within TCW, the archaeological potential has been evaluated based on the baseline conditions established, and hence the impacts and mitigation measures are assessed and recommended accordingly. Rescue excavations/survey-cum-rescue excavations/ further surveys/ watching briefs have been recommended as the mitigation measures for particular development clusters. The archaeologist to be appointed by the respective project proponent or respective developer shall apply for a licence to conduct the rescue excavations/ survey-cum-rescue excavations/ further surveys/ watching briefs under the Antiquities and Monuments Ordinance (Cap.53). An archaeological action plan detailing the scope and methodology of the archaeological work shall be submitted to the AMO for agreement prior to applying for a licence. The project proponent or respective developer shall implement the archaeological mitigation measures in prior agreement with the AMO before the commencement of any proposed works.

- 6.11.3** Pursuant to the Antiquities and Monuments Ordinance, the construction contractor should inform the AMO immediately in case of discovery of antiquities or supposed antiquities in the course of soil excavation works in construction stage.

Marine Archaeology

- 6.11.4** A Marine Archaeological Investigation (MAI) has been conducted for both the TCE and TCW developments. Since TCW is on existing land, there are no potential for marine archaeology. For TCE, the baseline conditions have been established by first reviewing historical information relating to Tung Chung. According to those survey results, there are no archaeological remains in the areas surveyed. Adverse impacts on marine archaeology are therefore not anticipated and mitigation measures are not required.

Built Heritage

- 6.11.5** The literature review conducted for the AIA had also collated relevant information on Declared Monuments and Graded Historical Buildings. A field survey was also conducted for built heritage to identify other built heritage resources. Results indicate that there is one Declared Monument within the boundary of TCW (i.e. the Tung Chung Battery).

Besides, there are 2 Graded Historic Buildings including Hau Wong Temple and Entrance Gate at Shek Mun Kap and number of other resources including shrines, village houses, ancestral halls, stone bridges, temples etc within the boundary of TCW.

6.11.6 According to the latest RODP, all these identified built heritage resources within TCW are located within land lot with proposed landuses of District Open Space (DO), Village Development Area (V), Institution and Community (IC), Coastal Protection Area (CPA), Conservation Area (CA), Agricultural (AGR) and Green Belt (GB) in which large scale development is not proposed. Adverse impacts on these built heritage is not anticipated and thus no further action or mitigation is required.

7 Implementation Strategy and Development Programme

7.1 Implementation Strategy

7.1.1 Different implementation mechanisms previously adopted in new town development in Hong Kong including Conventional New Town Approach (CNTA), Enhanced Conventional New Town Approach and Private Sector Participation (PSP) Approach have been reviewed for the decision of the preferred implementation mechanism for the development of the Tung Chung new town extension.

7.1.2 Having considered the difference in nature of the Tung Chung East and Tung Chung West development, the implementation mechanism is considered separately as summarized below.

Tung Chung East

7.1.3 The majority of the development in TCE are on newly reclaimed land. No resumption of private land is involved for the proposed works at TCE. Large scale reclamation works and the associated infrastructure works are required for the development. For comprehensive and well-coordinated implementation, it is proposed that Conventional New Town Approach to be adopted for TCE where the government will carry out reclamation works and provide infrastructure in TCE before allocating land for various purposes, including disposal of the land planned for private developments in the market.

Tung Chung West

7.1.4 The development in TCW is on existing land on the western side of the existing Tung Chung New Town and along the Tung Chung Valley. The proposed development involves both government land and private land. To minimize land resumption and allow possible early availability of land for development, it is proposed that the Private Sector Participation (PSP) Approach to be adopted.

7.1.5 For public housing, infrastructure and government / institute / community facilities in TCW, the government will be responsible for the construction and delivery with a view to achieving comprehensive

planning and timely provision of these facilities. The government will resume and clear the private land planned for public works projects, public housing, carry out site formation works and provide infrastructures before allocating land for various purposes.

7.1.6 For private residential and commercial development in TCW, market-driven type development is proposed where development is carried out by private sector further to the new zoning proposed in the future Outline Zoning Plan. The land will not be resumed by the government. Applications for modification of lease by land owners for land planned for private development meeting specified criteria can be proposed.

7.2 Implementation Agent of Development Proposal

7.2.1 Based on the implementation mechanism set out in Section 7.1, the agent for different types of works have been identified. Some of the works are entrusted to non-government agent and private sectors and are discussed in details in the following sub-sections. A summary of category of works to be taken up by various sectors is shown in Table 7.1 below.

Table 7.1 Summary of the Implementation Agents

Implementation Agent	Items
Government	<ul style="list-style-type: none"> All public housing, essential infrastructure and community facilities, and the associated site formation / reclamation works in TCE, TCW and Road P1, except Public transport interchange (PTI) within private lot
Non-government agent	<ul style="list-style-type: none"> Tung Chung Line Extension including the TCE and TCW Railway Stations and associated works, e.g. Footbridges, Ventilation Building and railway operator facilities Marina in TCE International School Private utilities works, e.g. electricity, town gas, telecommunication
Private Developers	<ul style="list-style-type: none"> Private residential / commercial development in TCE and TCW Site formation work for private residential / commercial development in existing land in TCW PTI within private lot

7.3 Development Programme

7.3.1.1 Tung Chung New Town Extension is planned to be commissioned in phases with first population intake in end 2023. The construction major work is targeted to commence in Year 2017 and completed by Year 2030 for full population intake.

7.3.1.2 In Tung Chung East, the overall phasing for population intake will be implemented in 4 phases to support the population intake from 2023. The sequencing of reclamation works, infrastructure such as road, freshwater and saltwater supply, drainage, sewerage, utilities works and housing development will follow the 4 phases of population intake respectively in general while particular government facilities such as fire station may be provided in early phase of the population intake to serve the need of the development area.

7.3.1.3 In Tung Chung West, the overall phasing will be implemented in 2 phases to support the population intake from 2023 to 2030. Phase 1 covers the areas around the “Area 42” and “Area 46” subsidized housing development and the areas around Ma Wan Chung which aims for a population intake by 2023/2024. Phase 2 covers the remaining sections of the development which aims for a population intake by 2030. The sequencing of site formation works, infrastructure such as road, freshwater and saltwater supply, drainage, sewerage, utilities works and housing development will follow the 2 phases of population intake respectively.

7.3.1.4 A summary of the schedule of the population intake for Tung Chung East and Tung Chung West is listed in the Table 7.2 below. It is the prediction based on the early availability of land and phase completion of the supporting infrastructure to support the population and will still be subjected to change according to the latest implementation programme and government policy. Locations of population intake phasing in TCE and TCW are illustrated in [Figure 7.1](#) and [Figure 7.2](#).

Table 7.2 Population Intake Summary

Phase	Year of Population Intake	Population Intake (Approximate)	Cumulative Population Intake (Approximate)
Tung Chung East			
Phase 1	2023	23,900	23,900
Phase 2	2025	13,700	37,600
Phase 3	2027	37,000	74,600
Phase 4	2029 - 2030	44,300	118,900

Phase	Year of Population Intake	Population Intake (Approximate)	Cumulative Population Intake (Approximate)
Tung Chung West			
Phase 1	2023	19,200	19,200
Phase 2	2026 to 2030	6,300	25,500