



Civil Engineering and
Development Department

Agreement No. CE 60/2017 (EP)

Environmental Team for Tung Chung New Town Extension (East) - Design and Construction

Updated Environmental Monitoring and Audit (EM&A) Manual

May 2018

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Environmental Resources Management

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Summary: This document presents the Updated EM&A Manual for the Environmental Permit No. EP-519/2016 Tung Chung New Town Extension.		Date: 15 May 2018			
		Approved by:  Craig A. Reid Partner			
1	Updated EM&A Manual	RC	JT	CAR	15/5/18
Revision	Description	By	Checked	Approved	Date
<p>This report has been prepared by Environmental Resources Management the trading name of 'ERM Hong-Kong, Limited', with all reasonable skill, care and diligence within the terms of the Contract with the client, incorporating our General Terms and Conditions of Business and taking account of the resources devoted to it by agreement with the client.</p> <p>We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.</p> <p>This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at their own risk.</p>		<p>Distribution</p> <p><input type="checkbox"/> Internal</p> <p><input checked="" type="checkbox"/> Public</p> <p><input type="checkbox"/> Confidential</p>			
		 			

Tung Chung New Town Extension

Environmental Certification Sheet for Environmental Permit No. EP-519/2016


Reference Document/Plan

Document/Plan to be Certified:	Updated Environmental Monitoring and Audit (EM&A) Manual for Tung Chung New Town Extension (East) (Revision 1)
Date of Report:	15 May 2018

Reference EP Condition

Environmental Permit Condition:	Condition 3.1
The Permit Holder shall, no later than 3 months before the commencement of construction of the Project, submit 10 hard copies and 1 electronic copy of an updated EM&A Manual to the Director for approval.	

ET Certification

I hereby certify that the above referenced document/plan complies with the above referenced condition of EP-519/2016	
Jovy Tam Environmental Team Leader	
Date:	15 May 2018



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DATE 15 May 2018

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For the attention of Mr. H.Y. Szeto / Mr. Stanley Yip

Dear Sirs,

Agreement No. CE 59/2017 (EP)
Independent Environmental Checker for Tung Chung New Town Extension - Investigation

Updated Environmental Monitoring and Audit (EM&A) Manual (EP condition 3.1)

We refer to the Updated EM&A Manual (Revision 1) dated 15 May 2018 and certified by the Environmental Team Leader on 15 May 2018. Please note we have no adverse comments on the captioned submission. The captioned submission is hereby verified in accordance with the requirement stipulated in Condition 3.1 of EP-519/2016.

Should you have any query, please feel free to contact the undersigned at 2608 7314 (chuawo@bv.com) or our Ivan Ting at 9222 9490 (iec.tcnte@gmail.com)

Yours faithfully,
for and on behalf of
BLACK & VEATCH HONG KONG LIMITED

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Independent Environmental Checker

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The study in North Lantau including Tung Chung area started since the Port and Airport Development Strategy in 1989 for the study on the construction of replacement international airport at Chek Lap Kok. Since then, various studies had been conducted including North Lantau Development Study in 1990, Territorial Development Strategic Review in 1996 and Remaining Development in Tung Chung and Tai Ho – Comprehensive Feasibility Study (CFS) in 1997. The CFS in 1997 showed that it was feasible for Tung Chung and Tai Ho areas to accommodate a population target of about 334,000 in anticipation of the projected territory-wide demand by 2011 estimated at that time. Phases 1, 2 and 3A of Tung Chung New Town were completed in 2003.

With the changes in planning circumstances and population target outlined in the above paragraph, the Tung Chung New Town Extension Study focuses on the remaining development of Tung Chung covering possible development areas (PDAs) at Tung Chung East (TCE) and Tung Chung West (TCW) to meet the territorial long-term housing, social, economic and environmental needs with existing and committed developments in existing Tung Chung New Town being taken as the given constraints in general. The study is also required to review and establish the feasibility of the remaining development of Tung Chung as well as to prepare documents to meet the relevant statutory requirements.

A previous Project Profile (No. PP-470/2012) for the Tung Chung New Town Development Extension was submitted on 16 July 2012 and an Environmental Impact Assessment (EIA) Study Brief (SB) (EIA SB No. ESB-251/2012) was subsequently issued on 28 August 2012 under the EIA Ordinance (EIAO). Since then, the Project Proponent has been proactively conducting a series of public engagement exercises (including forums and workshops) to collate views and opinions from stakeholders, green groups and local communities etc. In parallel to the public engagement process, the planning and engineering designs of the project have also been progressing and evolving to address various constraints and development needs as well as the comments collated in public engagement exercises.

These comments have been appropriately considered in formulating the Recommended Outline Development Plan (RODP). As such, the original PDA boundaries as presented in the previous EIA SB (EIA SB No.: ESB-251/2012) are refined and a number of associated infrastructures would also be required to support the development within the RODP. The key changes include the following:

- Withdrawal of 50ha reclamation at TCW as proposed in Stage 2 Public Engagement;
- Removal of possible theme park/ major recreational uses at TCE;

- Addition of marina; and
- Addition of associated infrastructures.

Because of the abovementioned changes in project elements, the Project Proponent had submitted another Project Profile (No. PP-519/2014) for application of a new EIA SB on 17 December 2014. The Director of Environmental Protection (DEP) then issued an EIA SB (EIA SB No.: ESB-283/2014) on 28 January 2015 under the EIAO.

During the public inspection period of the Project Profile (PP-519/2014), comments from the public were received and had been considered and incorporated as appropriate in the EIA SB (ESB-283/2014) issued on 28 January 2015. Nevertheless, the Project Proponent had also pro-actively reviewed those comments and had studied to make provisions for the possible elements which could further enhance the development plan from environmental perspective. As such, a revised Project Profile for this study (No. PP-523/2015) for application of a new EIA SB had been submitted on 18 March 2015. The DEP then issued an EIA SB (EIA SB No.: ESB-285/2015) on 17 April 2015 under the EIAO.

The EIA Report for Tung Chung New Town Extension (TCNTE) (Register No. AEIAR-196/2016) was approved on 8 April 2016 and the Environmental Permit (EP) EP-519/2016, covering the construction and operation of TCNTE was granted on 9 August 2016. The EIA Report and EP cover both TCE and TCW.

The location of the Project is shown in *Figure 1.1*. In addition, there are also associated infrastructure works (e.g. drainage connection, fresh water supply, flushing water supply) required to support the development and the respective pipe networks are illustrated in *Figure 1.2*.

Descriptions of the Project elements have been further elaborated and presented in *Section 2.1*.

1.2

THE UPDATED EM&A MANUAL

The *EM&A Manual* is an evolving document that should be updated to maintain its relevance as the Project progresses to ensure the impacts predicted and the recommended mitigation measures remain consistent and appropriate to the manner in which the works are to be carried out. This updated submission incorporates the update as required under Condition 3.1 of the EP, including:

- Updates on the project organization chart together with Event and Action Plans under the EM&A programme in accordance with Conditions 2.2 to 2.10 of the EP (see *Section 3* of this *EM&A Manual*);

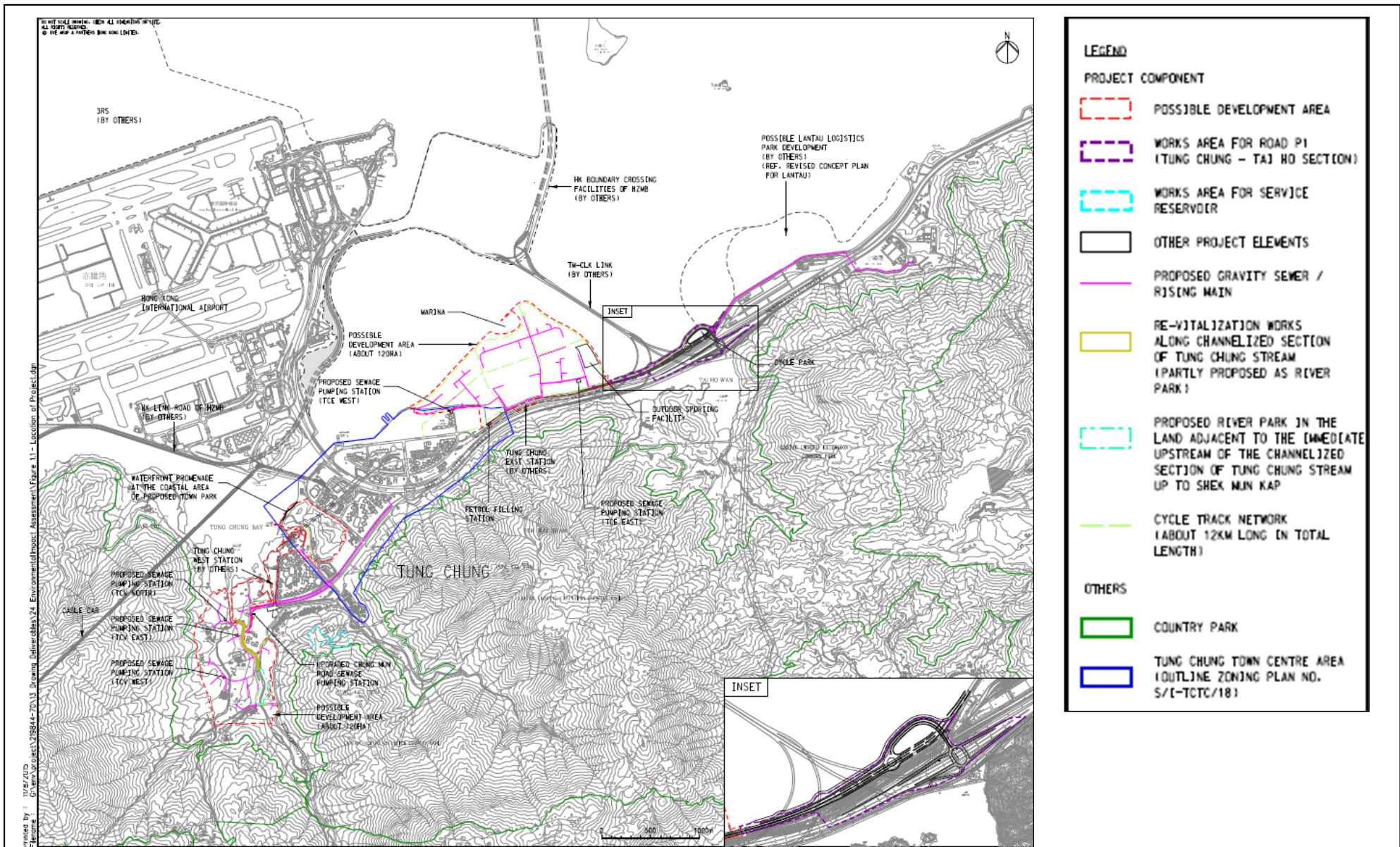


Figure 1.1

Location of the Project

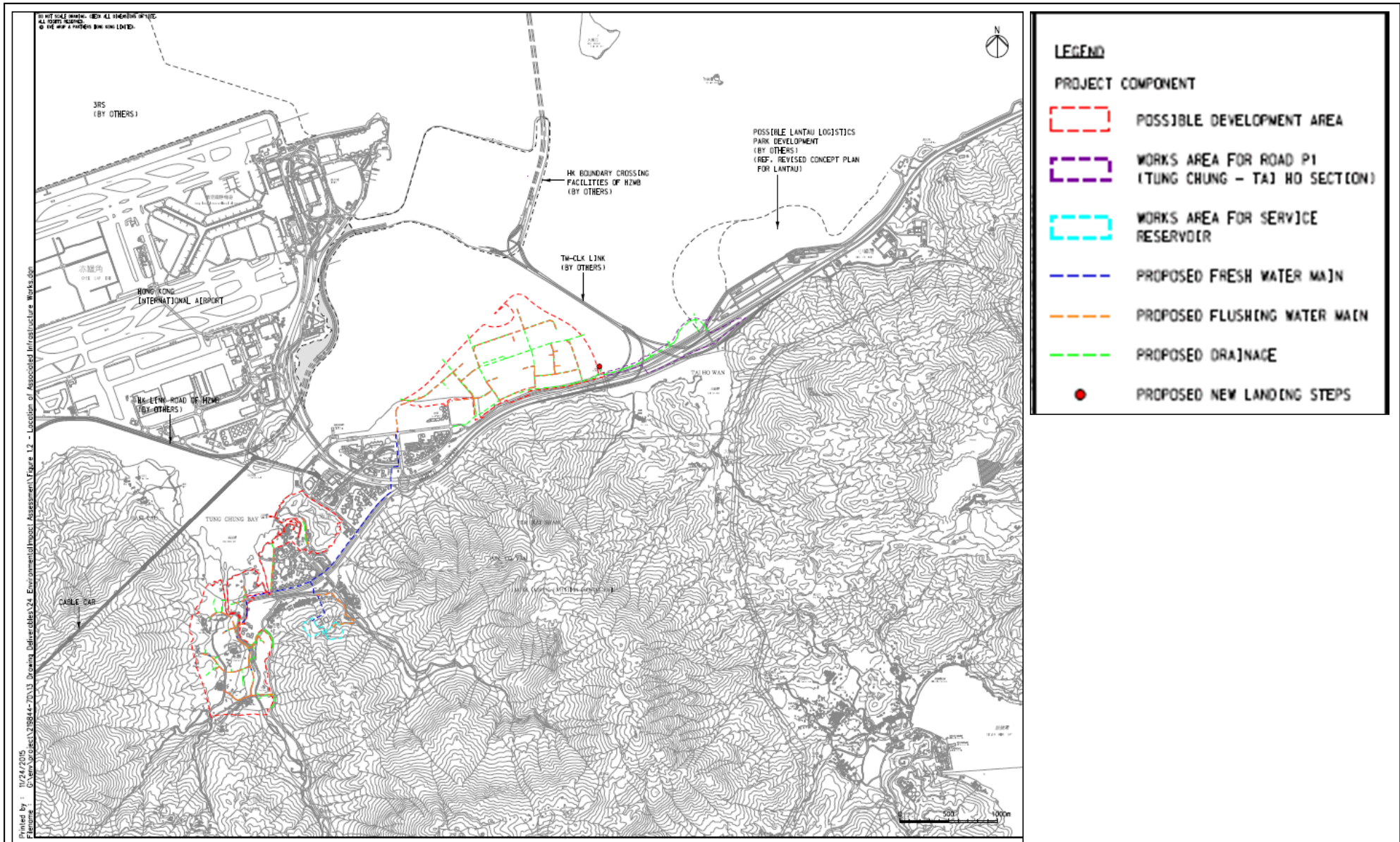


Figure 1.2

Location of the Associated Infrastructure Works

- Updates on the works vessel travel routes, deployment of silt curtain(s), post-planting monitoring and maintenance, use of new low noise road surfacing material(s) as well as follow-up actions to be taken by the Contractor and dump truck drivers in case of illegal dumping and landfilling of C&D materials in the Environmental Mitigation Implementation Schedule in accordance with Conditions 2.13, 2.16, 2.22, 2.23 and 2.24 of the EP respectively (see *Appendix 4.1* of this *EM&A Manual*);
- Reporting of actions taken under the Complaint Management Plan in accordance with Condition 2.1 of the EP (see *Section 15.4* of this *EM&A Manual*); and
- A format of the log-book as stated in Condition 2.3(v) of the EP (see *Section 15.5* of this *EM&A Manual*).

In addition, baseline monitoring for air quality (in *Section 5*) and construction noise (in *Section 6*) have been reviewed due to the absence of reclaimed land at TCE. The monitoring locations for water quality monitoring are also reviewed in *Section 7*. In addition, this *Updated EM&A Manual* describes the sampling design of soft shore ecological monitoring at Tung Chung Bay and Tai Ho Bay in *Section 11.4.7*.

1.3 *PURPOSE OF THE EM&A MANUAL*

The purposes of this *EM&A Manual* are to:

- Guide the set up of an EM&A programme to ensure compliance with the EIA recommendations;
- Specify the requirements for monitoring equipment;
- Propose environmental monitoring points, monitoring frequency etc;
- Propose Action and Limit Levels; and
- Propose Event and Action Plans.

This *EM&A Manual* outlines the monitoring and audit programme for the construction and operation of the proposed Project and provides systematic procedures for monitoring, auditing and minimizing environmental impacts.

This *EM&A Manual* has been prepared in accordance with the requirements stipulated in Annex 21 of the Technical Memorandum on the EIA Process (TM-EIAO).

This *EM&A Manual* contains the following information:

- Responsibilities of the Contractor, the Engineer or Engineer's Representative (ER), Environmental Team (ET), and the Independent

Environmental Checker (IEC) under the context of EM&A;

- Project organization for the EM&A works;
- The basis for, and description of the broad approach underlying the EM&A programme;
- Details of the methodologies to be adopted, including all laboratories and analytical procedures, and details on quality assurance and quality control programme;
- The rationale on which the environmental monitoring data will be evaluated and interpreted;
- Definition of Action and Limit Levels;
- Establishment of Event and Action Plans;
- Requirements for reviewing pollution sources and working procedures required in the event of non-compliance with the environmental criteria and complaints; and
- Requirements for presentation of environmental monitoring and audit data and appropriate reporting procedures.

For the purpose of this EM&A Manual, the ER shall refer to the Engineer as defined in the Construction Contract, in cases where the Engineer's powers have been delegated to the ER, in accordance with the Construction Contract. The ET leader, who shall be responsible for and in charge of the ET, shall refer to the person delegated the role of executing the environmental monitoring and audit requirements.

2.1**GENERAL DESCRIPTION OF THE PROJECT**

As described in the EP (EP-519/2016), the Project (including the elements for TCE and TCW) mainly comprises the following elements:

- 129.1 ha reclamation area (120.5 ha for TCE and 8.6 ha for the Road P1 (Tung Chung – Tai Ho Section));
- 124.5 ha existing land (4 ha for TCE, 0.5 ha for the Road P1 (Tung Chung – Tai Ho Section) and 120 ha for TCW));
- Construction of a Primary Distributor Road with total length of approximate 1.6km connecting Tung Chung to Tai Ho to support further development in Tung Chung;
- Construction of District Distributor Roads with total length of approximate 3.5km within PDAs at TCE and TCW;
- Construction of sewage pumping stations, some with individual capacity more than 2,000m³/day within PDAs at TCE and TCW;
- Upgrading the existing Chung Mun Road Sewage Pumping Station from existing capacity of 12,360m³/day to a proposed capacity of approximately 20,660m³/day;
- Land formation of a marina with about 95 berths at the PDA at TCE as part of the reclamation;
- Land formation of an outdoor sporting facility with a capacity of over 10,000 persons at the PDA at TCE as part of the reclamation;
- Land formation of a petrol filling station with an area of about 800m² at the PDA at TCE as part of the reclamation;
- Construction of two service reservoirs, including one for fresh water and the other for flushing water, with capacities of 55,000 m³ and 11,000 m³ respectively;
- Construction of about 4 km long of dual rising mains at TCE connecting a proposed sewage pumping station within the PDA at TCE to the existing Siu Ho Wan (SHW) Sewage Treatment Works (STW);
- Construction of waterfront promenade at the coastal area of proposed Town Park at the PDA at TCW;
- Revitalisation of the existing channelized section of Tung Chung Stream at the PDA at TCW and partly proposed as River Park;

- Proposed River Park in the land adjacent to the immediate upstream of the channelized section of Tung Chung Stream up to Shek Mun Kap at the PDA at TCW;
- A comprehensive network of cycle track (about 12km long in total length) along the proposed distributor roads, waterfront promenade, walkways and along future Road P1 (Tung Chung – Tai Ho Section);
- Land formation of a possible cycle park with an area of approximately 1.4ha surrounded by the slip roads connecting the future Tai Ho Interchange to integrate with the cycle tracks in TCE for forming a better cycle track network as part of the reclamation;
- Provision of Sustainable urban drainage system within TCW which comprises dual-purpose stormwater attenuation and treatment ponds;
- Provision of sewerage system for the existing unsewered villages and proposed residential developments within TCW; and
- Space provisions of facilities for possible green initiatives such as regional energy efficiency system and environmentally friendly transport systems (e.g. electric buses, electric cars and bicycle sharing system), etc. to promote environmental performance. (Note: The initiative of District Cooling System (DCS) in Tung Chung will be separately considered. Should the initiative is to be put forward in future, the DCS will be implemented under separate project subject to further study.)

In addition, there are also associated infrastructure works (e.g. drainage connection, fresh water supply, flushing water supply) required to support the development. The respective pipe networks are illustrated in *Figure 1.2*.

According to the latest arrangement, the construction of two possible railway stations, with one at TCE and the other one at TCW, will be carried out by the rail operator and hence will not be covered under this Project. Since the railway system including railway stations and railway lines is a Designated Project (DP) under the EIAO, the rail operator shall conduct a separate EIA under the EIAO.

2.2

DESIGNATED PROJECT

The Study is a Designated Project (DP) under Item 1 Schedule 3 of EIAO - Engineering feasibility study of urban development projects with a study area covering more than 20 ha or involving a total population of more than 100,000. For any future change(s) after the approval of this EIA report, the following steps will be taken:

- a) Should the change(s) involve(s) a designated project item under Schedule 2 of the EIAO, the requirements under the EIAO will be complied with; and
- b) Should the change(s) not involve any designated project items under Schedule 2 of the EIAO, prevailing planning mechanisms and standards will be followed and relevant EIA findings will be conformed to.”

According to the RODP, a number of work components would fall under various Schedule 2 DPs categories. A list of Schedule 2 DPs is summarised in *Table 2.1* below and are further described in the sequent sections. The locations of these DPs under the Project are shown in *Figure 2.1*.

Table 2.1 *Summary of Schedule 2 DPs*

Ref. Category No.	Designated Projects	Ref. in RODP	Environmental Permit (EP) Holder
Part I, A.1	Primary distributor roads and district distributor roads	Proposed road networks within PDA at TCE and TCW, Road P1 (Tung Chung to Tai Ho Section) and Chung Mun Road	CEDD ^[1]
Part I, A.8	A road more than 100m in length between abutments	The 400m long viaduct section of Road P1 (Tung Chung to Tai Ho Section) connecting to Tai Ho Interchange	CEDD ^[1]
Part I, C.1	Reclamation works (including associated dredging works) more than 5 ha in size	Reclamation area at TCE together with the necessary reclamation for Road P1 extension	CEDD
Part I, F.3(b)	Sewage pumping stations with installed capacity of more than 2000m ³ /d located at less than 150m from existing/ planned receivers	Proposed sewage pumping stations within PDA at TCE and TCW	CEDD ^[1]
Part I, I.1(b)	A drainage channel or river training and diversion works which discharges or discharge into an area which is less than 300m from the nearest boundary of a planned conservation area and coastal protection area	Revitalisation of the existing channelized section of Tung Chung Stream at the PDA at TCW and possible drainage outlets of the sustainable urban drainage system	CEDD ^[1]
Part I, Q.1	Any works partly or wholly in a proposed conservation area	Earthworks within a gazette zone	CA CEDD ^[1]

Note: [1] CEDD will liaise with the relevant departments for transfer of the operation responsibilities of these DPs through Further Environmental Permits.

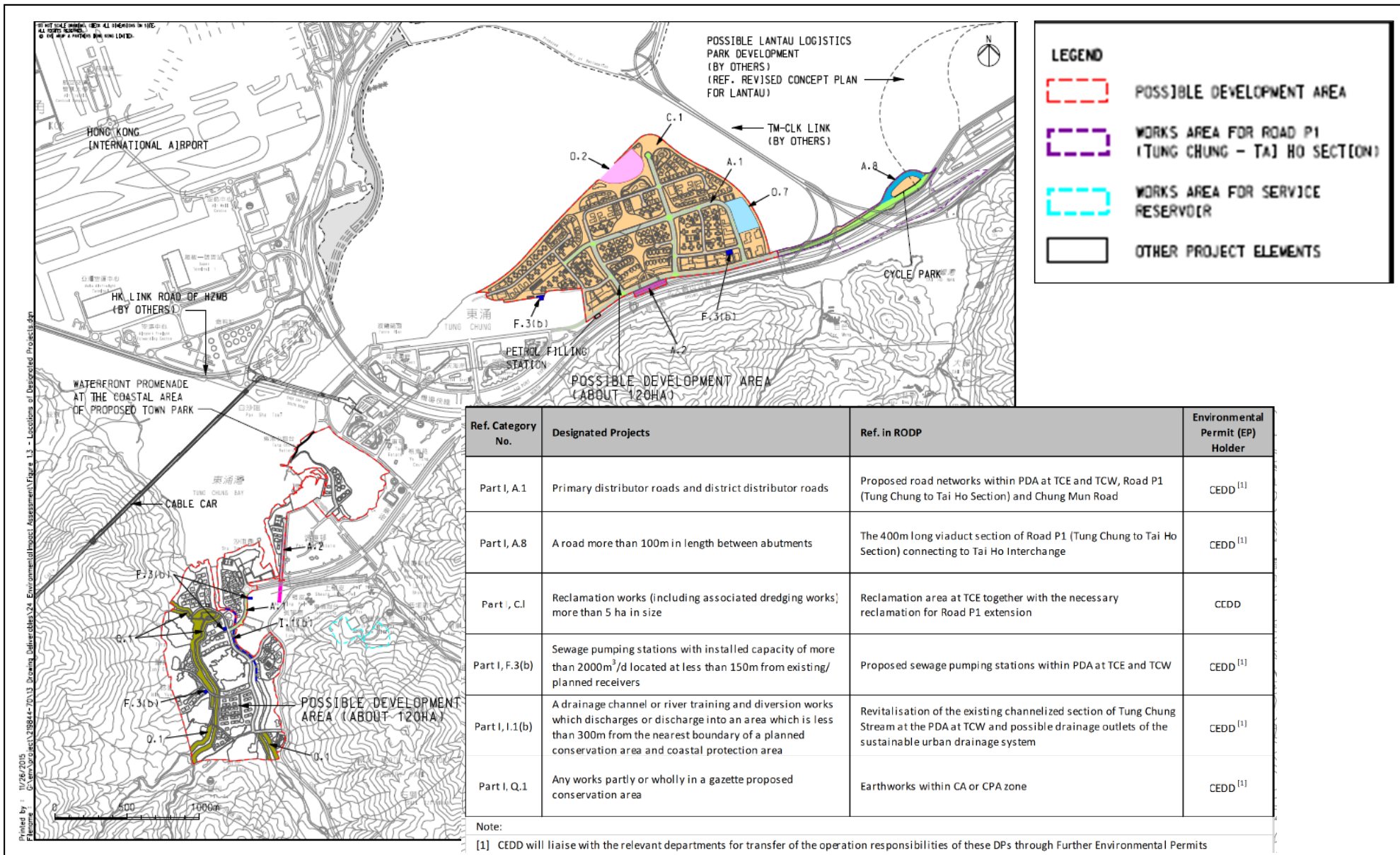


Figure 2.1

Locations of Designated Projects

2.2.1 *Part I, A.1 - Primary distributor roads and district distributor roads*

The internal roads in TCE consist of 4 district distributors with 2 lanes per direction and a number of local distributors with single lane per direction. Most of the internal roads are constructed at-grade, except a section of approximately 140m long in a form as a depressed road in order to encourage through pedestrian walking across the town centre and hence minimise the environmental impact. While in TCW, the internal roads consist of district and local distributors with typical at-grade road construction except the bridge structures across Tung Chung Stream. The existing Chung Mun Road will be extended to serve as a district distributor with two lanes per direction, while the local distributors will be single lane road. The remaining roads in the TCW development are local distributors that provide links to specific land parcels within the development. In terms of existing roads in the vicinity of the TCW development, Tung Chung Road will be maintained as a two-lane (both direction) rural road, while Yu Tung Road (district distributor) and Chung Yan Road (local distributor) will be two lanes per direction. In addition, the Road P1 (Tung Chung to Tai Ho Section) itself is a primary distributor road.

2.2.2 *Part I, A.8 - A road more than 100m in length between abutments*

Road P1 (Tung Chung to Tai Ho Section) aims to connect the existing Ying Hei Road to the proposed Tai Ho Interchange to serve the major external highway connection for TCE. The Road P1 comprises 3 elements: 1) 1km at-graded road, 2) one at-graded roundabout and 3) a viaduct section of approximately 400m connecting the Tai Ho Interchange.

2.2.3 *Part I, C.1 - Reclamation works (including associated dredging works) more than 5 ha in size*

As mentioned in Section 2.1, the Project involves a reclamation of 120.5 hectare of land for formation of TCE and 8.6 hectare of land for extension of Road P1 (Tung Chung to Tai Ho Section).

2.2.4 *Part I, F.3(b) - Sewage pumping stations with installed capacity of more than 2000m³/d located at less than 150m from existing/ planned receivers*

Land parcels with "Government" landuse have been reserved in the development to provide governmental facilities including sewage pumping station (SPS), sports grounds/ sports centre, clinic etc to support the development. According to the RODP, 2 SPSs and 4 SPSs will be proposed at TCE and TCW respectively, in which 5 of them, including TCE SPS (North), TCE SPS (West), TCV SPS (East), TCV SPS (West) and upgraded Chung Mun Road SPS as shown in *Figure 1.1*, have an individual capacity over 2,000m³/day.

2.2.5 *Part I, I.1(b) - A drainage channel or river training and diversion works which discharges or discharge into an area which is less than 300m from the nearest boundary of a planned conservation area and coastal protection area*

As highlighted in 2015 Policy Address, the government is promoting the concept of revitalising water bodies in large-scale drainage improvement works and planning drainage networks. In order to enhance the ecological connection between the upstream and downstream of Tung Chung Stream, it is proposed to revitalise the existing channelized section of Tung Chung Stream with a total length of approximately 625m long.

In addition, though the detailed design of the sustainable urban drainage system (SUDS) is yet to be confirmed and will be subject to further design, there is a possibility that the drainage outlet of the SUDS will be assigned within the Conservation Area (CA) or Coastal Protection Area (CPA) zone to discharge the treated runoff to the Tung Chung Stream.

2.2.6 *Part I, Q.1 - Any works partly or wholly in a gazette proposed conservation area*

While the amount of works within CA or CPA zone would be minimized, there is still a possibility that minor earthworks would be required partly or wholly within the CA or CPA zone.

2.2.7 *Possible Minor Works*

It should also be noted that minor maintenance works including minor works to connection roads, minor public utility works (e.g. installation of telecommunication wires), earthworks relating to agriculture, footpaths/ trails and facilities relating to sitting out areas, provision of water pipes etc would be anticipated within the proposed conservation areas and sites of cultural heritage. However, according to the Schedule 2 of the EIAO, these minor works are not classified as designated project items and thus EP application is not required.

The locations of these DPs under the Project are shown in *Figure 2.1*.

2.3 *CONCURRENT PROJECTS*

In order to assess the cumulative impacts, a review of best available information to identify a number of other projects that are undergoing planning, design, construction and/or operation within the construction and/or operation period for this Study has been conducted and a list of the tentative concurrent projects identified at this stage is summarised below and *Figure 2.2* shows the locations of these concurrent projects.

- Construction of additional sewage rising mains and rehabilitation of the existing sewage rising main between Tung Chung and Siu Ho Wan;
- Hong Kong - Zhuhai - Macao Bridge Hong Kong Boundary Crossing

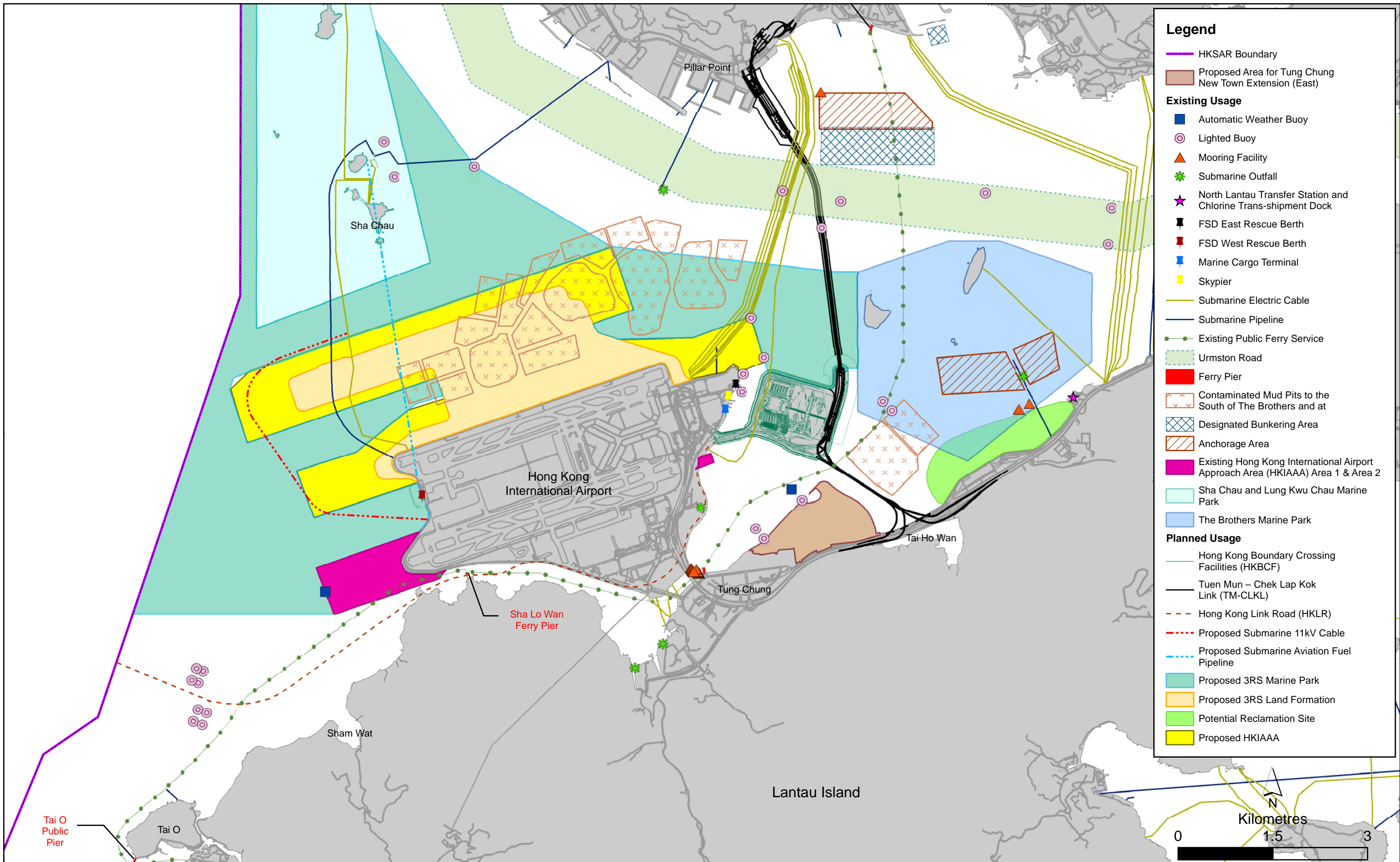


Figure 2.2

Existing and Planned Marine Usage

Facilities (HZMB HKBCF);

- Hong Kong - Zhuhai - Macao Bridge Hong Kong Link Road (HZMB HKLR);
- Tuen Mun - Chek Lap Kok Link (TM-CLKL);
- Proposed New Contaminated Mud Marine Disposal Facility at Airport East / East Sha Chau Area;
- Integration of Siu Ho Wan and Silver Mine Bay Water Treatment Works;
- Organic Waste Treatment Facilities Phase 1 (OWTF);
- Possible Lantau Logistics Park;
- Expansion of Hong Kong International Airport into a Three-Runway System (3RS);
- Further Landscape Enhancement to NLH;
- Planned developments in the existing Tung Chung New Town such as residential developments at Tung Chung Area 27, Area 39, Area 54, Area 55 and Area 56 and hotel development at Tung Chung Area 53a;
- Greening Master Plans for New Territories South West – Investigation, Design and Construction;
- North Commercial District (NCD) of Hong Kong International Airport (HKIA);
- Dredging, Management and Capping of Contaminated Sediment Disposal Facility to the South of The Brothers;
- The Brothers Marine Park (BMP);
- Topside Development at HZMB HKBCF;
- Cumulative Environmental Impact Assessment Study for the Three Potential Nearshore Reclamation Sites in the Western Waters of Hong Kong;
- Harbour Area Treatment Scheme (HATS) Stage 2A;
- Providing Sufficient Water Depth for Kwai Tsing Container Basin and its Approach Channel;
- Cross Boundary Hub in Siu Ho Wan;
- Leisure and Entertainment Node at Sunny Bay;
- Marina in TCE;

- Sports ground in TCE; and
- Proposed Railway Station at TCE and TCW.

2.4 CONSTRUCTION PROGRAMME

According to the current information, the Tung Chung New Town Extension will be commissioned in phases with first population intake in Year 2023. The construction work is targeted to commence in Year 2018 and completed by Year 2030 for full population intake. The implementation programme is shown in *Appendix 2.1*.

Summary of construction period of the key construction works is summarized in *Table 2.2* below.

Table 2.2 Summary of Key Construction Works

Stages	Key Construction Works	Construction Period
Reclamation Works		
Reclamation Works	<ul style="list-style-type: none"> • Tung Chung East Reclamation • Box Culvert Extension • Road P1 (Tung Chung - Tai Ho Section) Reclamation 	<ul style="list-style-type: none"> • Mid 2018 to Late 2023
Tung Chung East Infrastructure Works		
Tung Chung East Infrastructure Works	<ul style="list-style-type: none"> • Road Networks and Cycle Tracks in TCE • Road P1 (Tung Chung - Tai Ho Section) roadworks, Slip Roads and Tai Ho Interchange • Cycle Track at Road P1 (Tung Chung - Tai Ho Section) • Fresh Water Supply w/ pipelines in TCE • Salt Water Supply w/ pipelines in TCE • Saltwater In-take Pumping Station • Drainage w/ pipelines in TCE • Sewerage w/ pipelines in TCE • New Sewage Pumping Station - TCE West SPS • New Sewage Pumping Station - TCE East SPS • Freshwater and Saltwater Service Reservoirs 	<ul style="list-style-type: none"> • Early 2020 to Early 2030

Stages	Key Construction Works	Construction Period
Tung Chung West Infrastructures	<ul style="list-style-type: none"> • Road Networks and Cycle Track in TCW • Fresh Water Supply w/ pipelines in TCW • Salt Water Supply w/ pipelines in TCW • Drainage w/ pipelines in TCW • Sustainable urban drainage system and pumping stations for TCW • Polder Scheme for TCW • De-channalisation of channelised portion of Tung Chung Stream and River Park • Sewerage w/ pipelines in TCW • New Sewage Pumping Station • Upgrading Existing Sewage Pumping Station - TCW - CMRSPS • Site Formation in TCW 	<ul style="list-style-type: none"> • Early 2020 to Late 2026

Population intake for the proposed new development area in TCE and TCW will be implemented in phases together with the supporting infrastructures. Based on the implementation of the supporting infrastructures, the proposed new development will be available for the population intake as listed in the summary of the schedule of the population intake in *Table 2.3*. 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 subject to change according to the latest implementation programme and government policy. Locations of development phasing in TCE and TCW are illustrated in *Figures 2.3a* and *2.3b*.

Table 2.3 *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
Tung Chung West			
Phase 1	2023	19,200	19,200
Phase 2	2026 to 2030	6,300	25,500

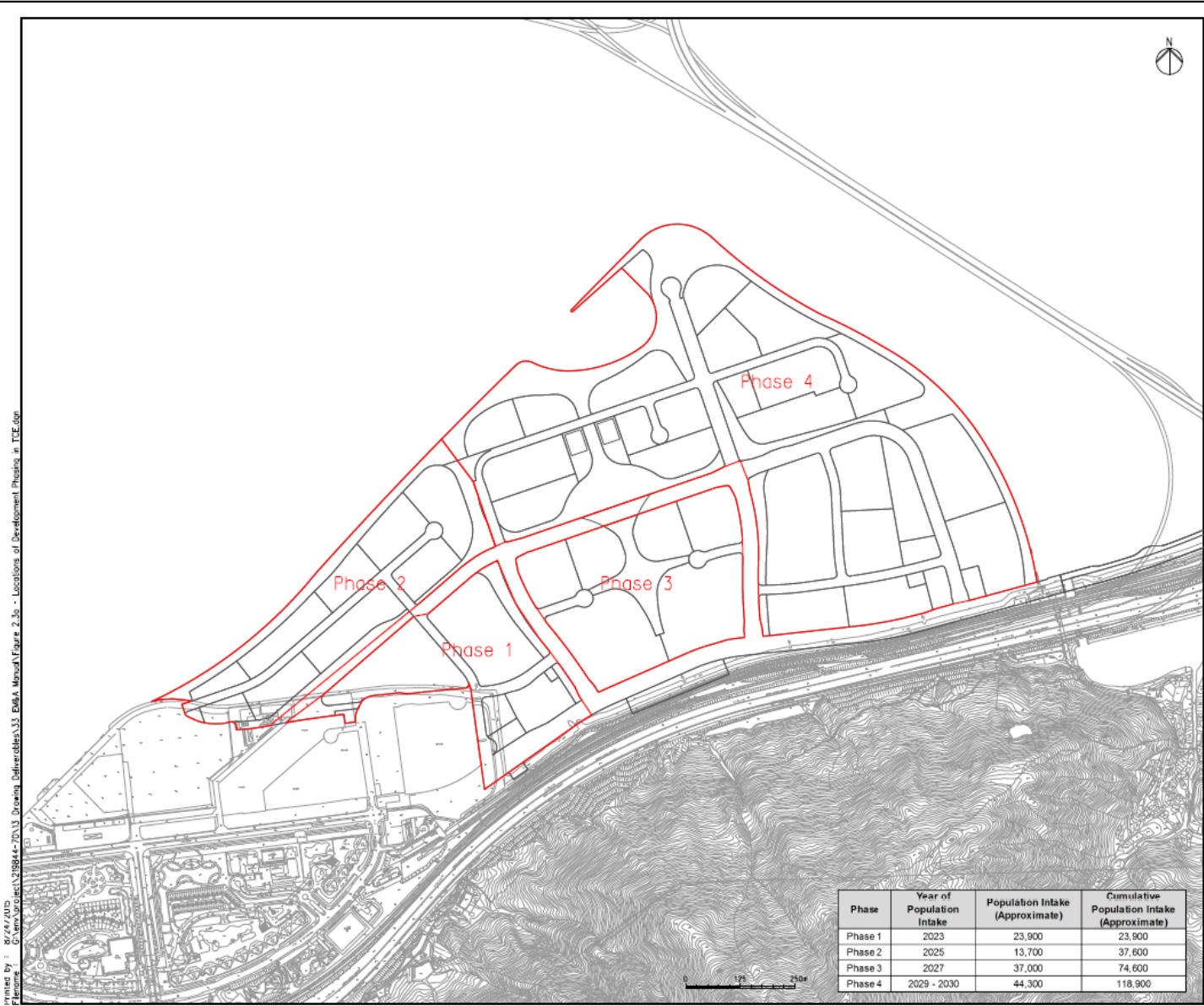


Figure 2.3a

Locations of Development Phasing in TCE

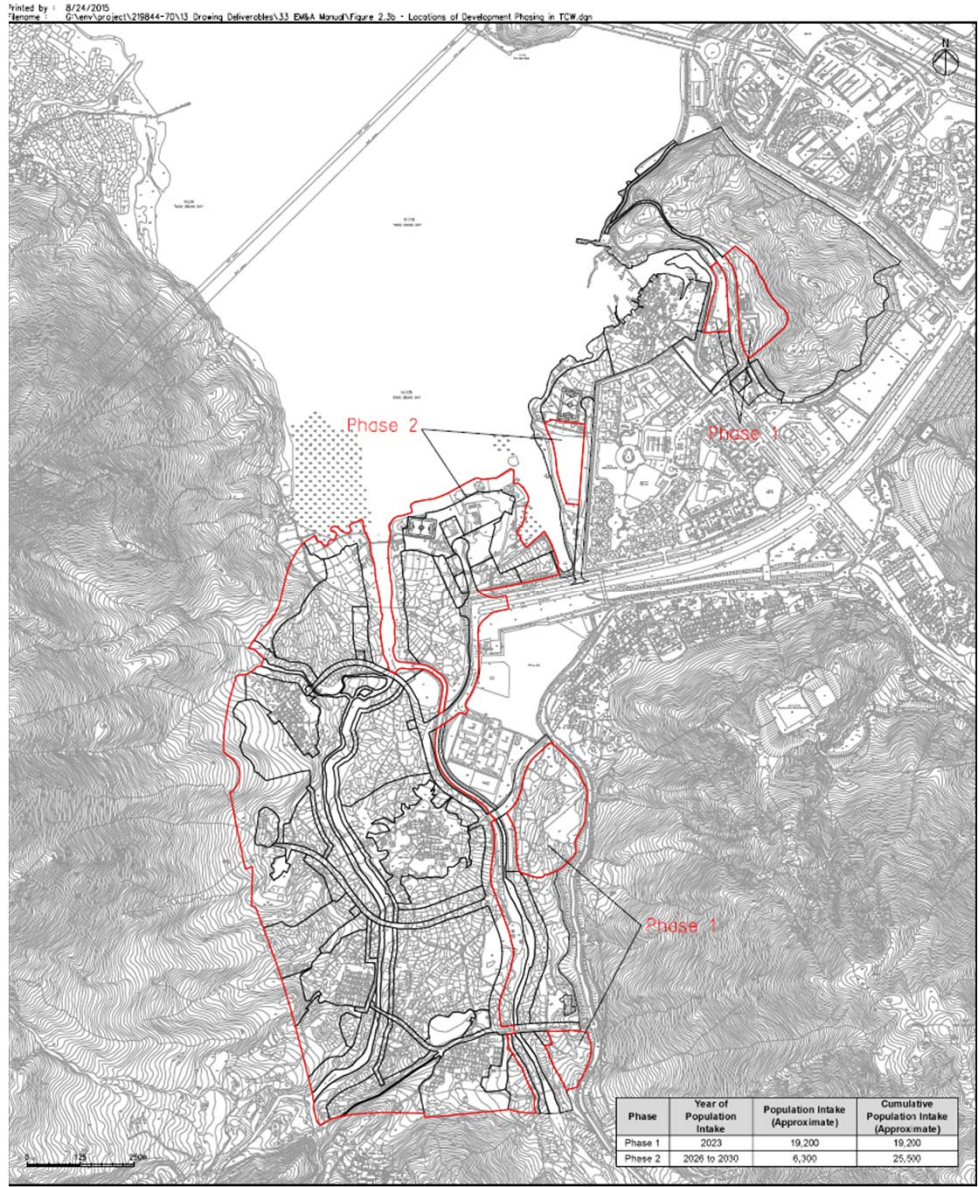


Figure 2.3b

Locations of Development Phasing in TCW

3 PROJECT ORGANISATION

3.1 PROJECT ORGANISATION

The proposed project organization and lines of communication with respect to environmental protection works are shown in *Appendix 3.1*.

A single full time on-site ET shall be employed by CEDD, shall be directly supervised by the ER and shall not be in any way an associated body of the Contractor or the IEC for the Project. The ET shall be headed by a full time on-site ET Leader. The ET Leader shall be a person who has at least 7 years of experience in environmental monitoring and auditing (EM&A) or environmental management.

A single full time on-site IEC with a supporting team shall be employed by CEDD. The IEC and his team shall not be in any way an associated body of the ER, the Contractor or the ET for the Project. The IEC shall be approved by EPD before appointment by the Permit Holder. The IEC shall be a person who has at least 7 years of experience in EM&A or environmental management.

Qualified Ecologist(s) shall be appointed by CEDD to form part of the ET to carry out work relating to ecological aspects including but not limited to dolphin monitoring, amphibian monitoring, and post-planting/transplanting monitoring and to prepare submissions for the Project as required under Conditions 2.13 to 2.22 of the EP respectively. Each Qualified Ecologist shall be a person who has at least 5 years of relevant experience. The qualification and experience of the Qualified Ecologist(s) shall be certified by the ET Leader and verified by the IEC.

Surveillance Team shall be employed by CEDD to form part of the ET to conduct regular site inspections to identify and report immediately to the IEC, the ER and the Director on suspected illegal dumping and landfilling of construction and demolition (C&D) materials within the Project site throughout the construction phase. Each member of the Surveillance Team shall be a person who has at least 3 years of experience in EM&A or environmental management. The qualification and experience of the members of the Surveillance Team shall be certified by the ET Leader and verified by the IEC.

The responsibilities of respective parties are:

The Contractor

- Implement the EIA recommendations and requirements;
- Employ an ET to undertake monitoring, laboratory analysis and reporting of environmental monitoring and audit;
- Provide assistance to ET in carrying out monitoring and auditing;

- Submit proposals on mitigation measures in case of exceedances of Action and Limit Levels in accordance with the Event and Action Plans;
- Implement measures to reduce impact where Action and Limit Levels are exceeded; and
- Adhere to the agreed procedures for carrying out compliant investigation.

Environmental Team

- Set up all the required environmental monitoring stations;
- Monitor various environmental parameters as required in the EM&A Manual;
- Analyse the environmental monitoring and audit data, review the success of EM&A programme, confirm the adequacy of mitigation measures implemented and the validity of the EIA predictions, and to identify any adverse environmental impacts arising;
- Carry out site inspection to investigate and audit the Contractors' site practice, equipment and work methodologies with respect to pollution control and environmental mitigation measures, and take proactive actions to pre-empt problems;
- Audit and prepare audit reports on the environmental monitoring data and site environmental conditions;
- Report on the environmental monitoring and audit results to the IEC, Contractor, the ER and EPD or its delegated representative;
- Recommend suitable mitigation measures to the Contractor in the case of exceedance of Action and Limit Levels in accordance with the Event and Action Plans;
- Undertake regular on-site audits / inspections and report to the Contractor and the ER of any potential non-compliance;
- Follow up and close out non-compliance actions; and
- Adhere to the procedures for carrying out environmental complaint investigation.

Engineer or Engineer's Representative

- Supervise the Contractor's activities and ensure that the requirements in the EM&A Manual are fully complied with;
- Inform the Contractor when action is required to reduce impacts in accordance with the Event and Action Plans;

- Assist the Project Proponent in employing an IEC to audit the results of the EM&A works carried out by the ET;
- Comply with the agreed Event Contingency Plan in the event of any exceedance;
- Adhere to the procedures for carrying out complaint investigations.

Independent Environmental Checker

- Review the EM&A works performed by the ET (at not less than monthly intervals);
- Audit the monitoring activities and results (at not less than monthly intervals);
- Validate and confirm the accuracy of monitoring results, monitoring equipment, monitoring locations, monitoring procedures and location of sensitive receivers;
- Report the audit results to the ER and EPD in parallel;
- Review the EM&A reports (monthly and quarterly summary reports) submitted by the ET;
- Review the proposal on mitigation measures submitted by the Contractor in accordance with the Event and Action Plans;
- Check the mitigation measures submitted by the Contractor in accordance with the Event and Action Plans;
- Check the mitigation measures that have been recommended in the EIA and this Manual, and ensure they are properly implemented in a timely manner, when necessary; and
- Report the findings of site inspections and other environmental performance reviews to ER and EPD.

Sufficient and suitably qualified professional and technical staff shall be employed by the respective parties to ensure full compliance with their duties and responsibilities, as required under the EM&A programme for the duration of the Project.

4 ENVIRONMENTAL SUBMISSION

4.1 INTRODUCTION

The Contractor shall prepare the Environmental Management Plan (EMP) (including a Waste Management Plan (WMP)), Construction Method Statement prior to the commencement of construction works and obtain approval from ER and IEC and other relevant authorities to encompass the recommended environmental protection / mitigation measures with respect to their latest construction methodology and programme.

4.2 ENVIRONMENTAL MANAGEMENT PLAN

A systematic EMP shall be set up by the Contractor to ensure effective implementation of the mitigation measures, monitoring and remedial requirements presented in EIA, EM&A and Environmental Mitigation Implementation Schedule (EMIS) (See *Appendix 4.1*). The ER and the IEC will audit the implementation status against the EMP and advise the necessary remedial actions required. These remedial actions shall be enforced by the ER through contractual means.

The EMP will require the Contractor (together with its sub-contractors) to define in details how to implement the recommended mitigation measures in order to achieve the environmental performance defined in the Hong Kong environmental legislation and the EIA documentation.

The review of on-site environmental performance shall be undertaken by ER and IEC through a systematic checklist and audit once the construction works commences. The environmental performance review programme comprises a regular assessment on the effectiveness of the EMP. Reference should be made to ETWB TC(W) No. 19 / 2005 “Environmental Management on Construction Sites” or its latest versions, and any other relevant Technical Circulars.

4.3 WASTE MANAGEMENT PLAN

As part of EMP, the Contractor shall include WMP for the construction of the project and prior to the commencement of construction works submit to the ER and IEC for approval. Where waste generation is unavoidable, the opportunities for recycling or reusing should be maximized. If wastes cannot be recycled, recommendations for appropriate disposal routes should be provided in the WMP. A method statement for stockpiling and transportation of the excavated materials and other construction wastes should also be included in the WMP and be approved before the commencement of construction works. All mitigation measures arising from the approved WMP shall be fully implemented.

For the purpose of enhancing the management of Construction and Demolition (C&D) materials including rock, and minimizing its generation at

source, construction works would be undertaken in accordance with the Section 4.1.3 of Chapter 4 in the Project Administration Handbook for Civil Engineering Works (PAH).

4.4 *CONSTRUCTION METHOD STATEMENT*

In case the Contractor would like to adopt alternative construction methods or implementation schedules, it is required to submit details of methodology and equipment to the ER for approval before the work commences. Any changes in construction method shall be reflected in a revised EMP or the Contractor will be required to demonstrate the manner in which the existing EMP should accommodate the proposed changes. The Contractor may need to apply for a Variation of Environmental Permit (VEP) from EPD before commencement of any construction activities.

5 AIR QUALITY IMPACT

5.1 INTRODUCTION

The EIA has considered the potential air quality impacts during both the construction and operational phases of the Project. Fugitive dust and vehicular emission would be the key impacts during the construction phase and operational phase respectively.

5.2 MITIGATION MEASURES

The EIA Report has recommended dust control measures including watering all works area once per hour during working hours. Mitigation measures are not required for the operational phase. All the proposed mitigation measures are summarized in the Environmental Mitigation Implementation Schedule (EMIS) in *Appendix 4.1*.

5.3 AIR QUALITY PARAMETERS

Monitoring and audit of the Total Suspended Particulate (TSP) levels shall be carried out by the ET to ensure that any deteriorating air quality could be readily detected and timely action taken to rectify the situation.

One-hour TSP levels shall be measured to indicate the impacts of construction dust on air quality. The 1-hour TSP levels could be measured by following the standard high volume sampling method as set out in the Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50), Appendix B. Upon approval of the IEC, 1-hour TSP levels can be measured by direct reading method which are capable of producing comparable results as that by the high volume sampling method, to indicate short event impacts.

All relevant data including weather conditions, and any other local atmospheric factors affecting or affected by site conditions, etc., shall be recorded down in detail. A sample data sheet is shown in *Appendix 5.1*.

5.4 MONITORING EQUIPMENT

The following specifications shall be complied should high volume samplers (HVSs) be used for carrying out the 1-hour TSP monitoring:

- 0.6 – 1.7 m³ per minute adjustable flow range;
- Equipped with a timing / control device with +/- 5 minutes accuracy for 24 hours operations;
- Installed with elapsed-time meter with +/- 2 minutes accuracy for 24 hours operation;

- Capable of providing a minimum exposed area of 406 cm²;
- Flow control accuracy: +/- 2.5% deviation over 24-hour sampling period;
- Equipped with a shelter to protect the filter and sampler;
- Incorporated with an electronic mass flow rate controller or other equivalent devices;
- Equipped with a flow recorder for continuous monitoring;
- Provided with a peaked roof inlet;
- Incorporated with a manometer;
- Able to hold and seal the filter paper to the sampler housing at horizontal position;
- Easily changeable filter; and
- Capable of operating continuously for a 24-hour period.

The ET is responsible for the provision, installation, operation, maintenance, dismantle of the monitoring equipment. They shall ensure that sufficient number of HVSs with an appropriate calibration kit is available for carrying out the baseline monitoring, regular impact monitoring and ad hoc monitoring. The HVSs shall be equipped with an electronic mass flow controller and be calibrated against a traceable standard at regular intervals. All the equipment, calibration kit, filter papers, etc., shall be clearly labelled.

Initial calibration of dust monitoring equipment shall be conducted upon installation and thereafter at fortnightly intervals. The transfer standard shall be traceable to the internationally recognized primary standard and be calibrated annually. The concern parties such as IEC shall properly document the calibration data for future reference. All the data should be converted into standard temperature and pressure condition.

If the ET proposes to use a direct reading dust meter to measure 1-hour TSP levels, they shall submit sufficient information to the IEC to prove that the instrument is capable of achieving a comparable results to the HVS. The instrument should also be calibrated regularly, and the 1-hour sampling shall be determined periodically by the HVS to check the validity and accuracy of the results measured by direct reading method.

Wind data monitoring equipment shall also be provided and set up for logging wind speed and wind direction near the dust monitoring locations. The equipment installation location shall be proposed by the ET and agreed with the IEC. For installation and operation of wind data monitoring equipment, the following points shall be observed:

- The wind sensors should be installed at 10 m above ground so that they

are clear of obstructions or turbulence caused by buildings;

- The wind data should be captured by a data logger, the data shall be downloaded for analysis at least once a month;
- The wind data monitoring equipment should be re-calibrated at least once every six months; and
- Wind direction should be divided into 16 sectors of 22.5 degrees each.

In exceptional situations, the ET may propose alternative methods to obtain representative wind data upon approval from the ER and agreement from the IEC.

5.5 ***PROPOSAL OF USE OF PORTABLE DIRECT READING DUST METER AND EXISTING WIND DATA FROM CHEK LAP KOK WIND STATION***

Further to the monitoring requirement as stated in *Section 5.4*, it is proposed to use portable direct reading dust meter to measure 1-hour TSP levels in undertaking the air quality monitoring for the Project. The proposal was submitted to the IEC and obtained agreement from the IEC. With the use of direct reading dust meter, it can also allow prompt and direct results for the EM&A reporting and the implementation of the event and action plan. The portable direct reading dust meter will be calibrated every year against HVS to check the validity and accuracy of the results measured by direct reading method.

It is also proposed and agreed by the IEC to adopt the wind data at Chek Lap Kok collected from the Hong Kong Observatory rather than setting up wind data monitoring equipment based on the following justification:

- The installation of wind sensors at 10 m above ground would involve construction of the underground foundation to support a 10 m metal pole. According to the ET's past experience, it may result in objection from the owners of the wind monitoring area, and thus it is considered not practicable.
- The area covering the Chek Lap Kok wind station and the Tung Chung New Town Extension East is relatively flat (primarily reclaimed land and ocean), with no prominent barrier (e.g. mountain) identified between the Chek Lap Kok wind station and the Tung Chung New Town Extension East. The wind field across this area is likely to be uniform. Therefore, the wind data recorded at the Chek Lap Kok station is considered representative of the wind conditions at the proposed dust monitoring stations.
- The wind data collected by the Hong Kong Observatory is widely adopted in many EM&A Projects, including the Expansion of Hong Kong International Airport into a Three-runway System. The dataset is

considered to be more robust and precise and it is readily available and accessible via the website of the Hong Kong Observatory.

5.6 *LABORATORY MEASUREMENT/ANALYSIS*

Should HVSSs be used for the 1-hr TSP monitoring, a clean laboratory with constant temperature and humidity control, and equipped with necessary measuring and conditioning instruments to handle the dust samples collected, shall be available for sample analysis, and equipment calibration and maintenance. The laboratory should be Hong Kong Laboratory Accreditation Scheme (HOKLAS) accredited.

If as site laboratory is set up or a non-HOKLAS accredited laboratory is hired for carrying out the laboratory analysis, the laboratory equipment shall be approved by the ER and the measurement procedures shall be demonstrated to the satisfaction of the ER and IEC. IEC shall regularly audit to the measurement performed by the laboratory to ensure the accuracy of measurement results. The ET Leader shall provide the ER with one copy of the Title 40 of Code of Federal Regulations, Chapter 1 (Part 50), Appendix B for his / her reference.

Filter paper of size 8" x 10" shall be labelled before sampling. It shall be a clean filter paper with no pinholes, and shall be conditioned in a humidity-controlled chamber for over 24-hours and be pre-weighed before use for the sampling.

After sampling, the filter paper loaded with dust shall be kept in a clean and tightly sealed plastic bag. The filter paper shall then be returned to the laboratory for reconditioning in the humidity-controlled chamber followed by accurate weighing by an electronic balance with readout down to 0.1 mg. The balance shall be regularly calibrated against a traceable standard.

5.7 *MONITORING LOCATIONS*

Figure 5.1, Figure 5.1a-b and Table 5.1 shows the locations of the proposed construction dust monitoring stations. The status and locations of dust sensitive receivers may change after issuing this manual. If such cases exist, the ET Leader shall propose updated monitoring locations and seek approval from ER and agreement from the IEC.

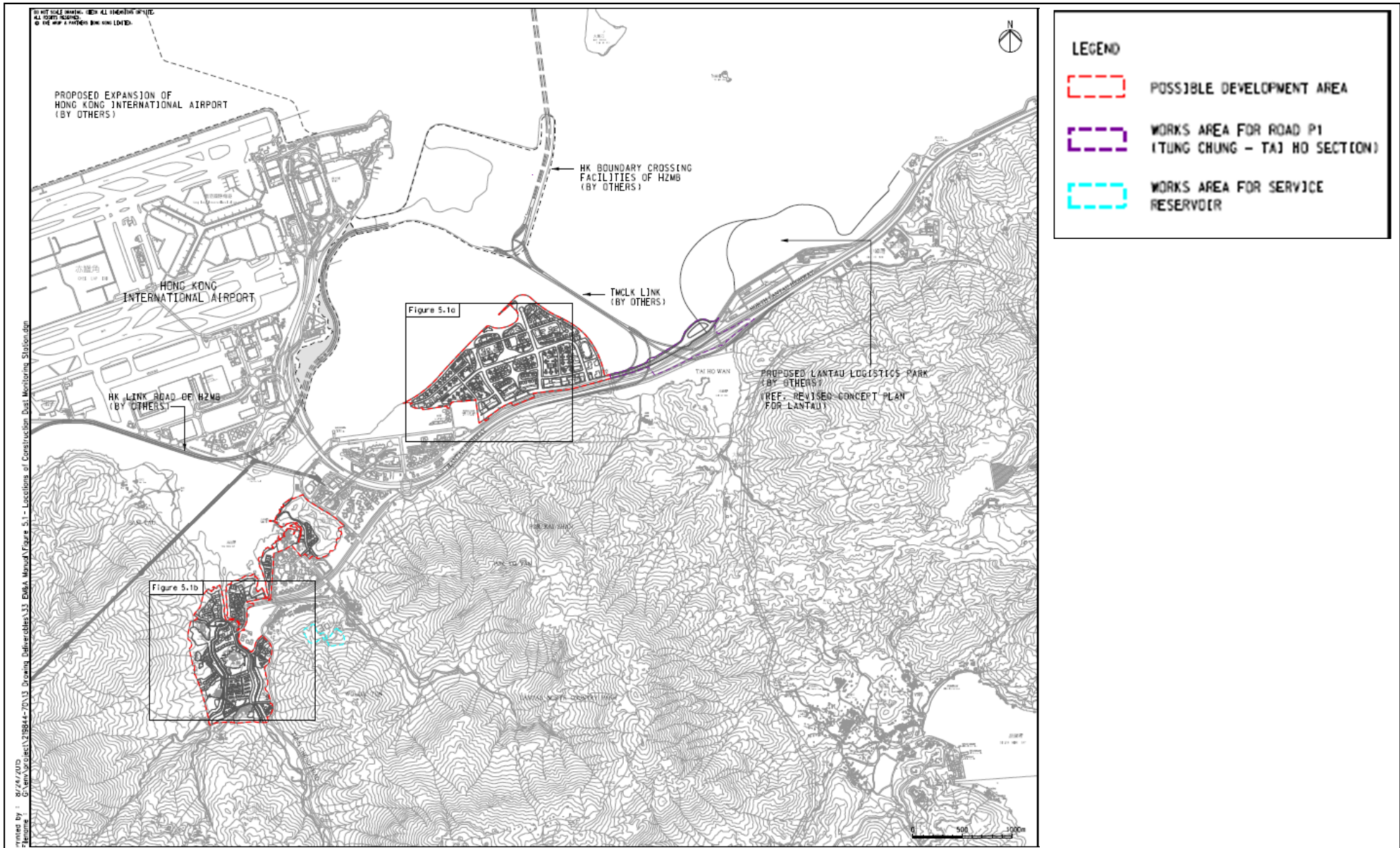


Figure 5.1

Locations of Construction Dust Monitoring Station (Sheet 1 of 3)

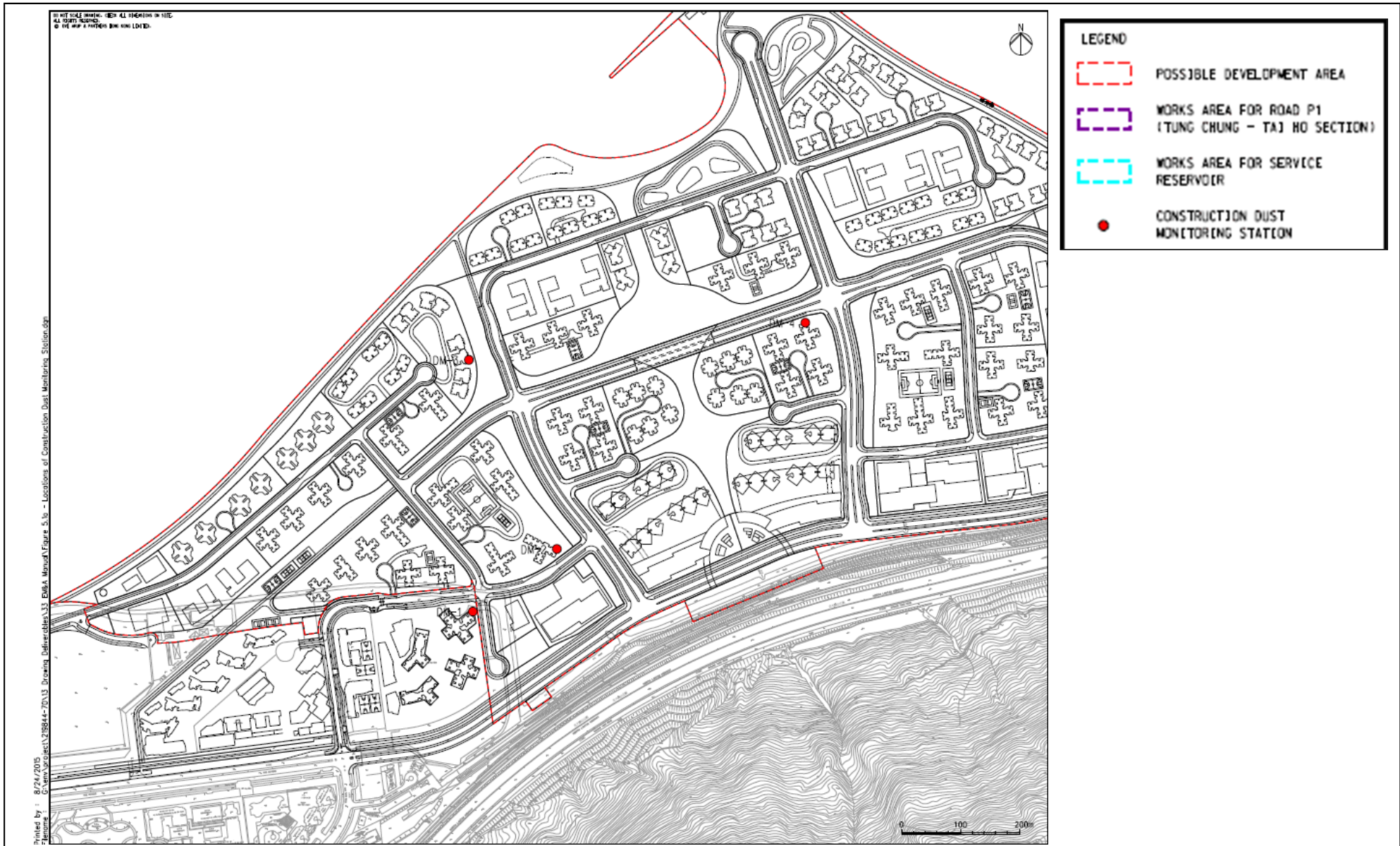


Figure 5.1a

Locations of Construction Dust Monitoring Station (Sheet 2 of 3)

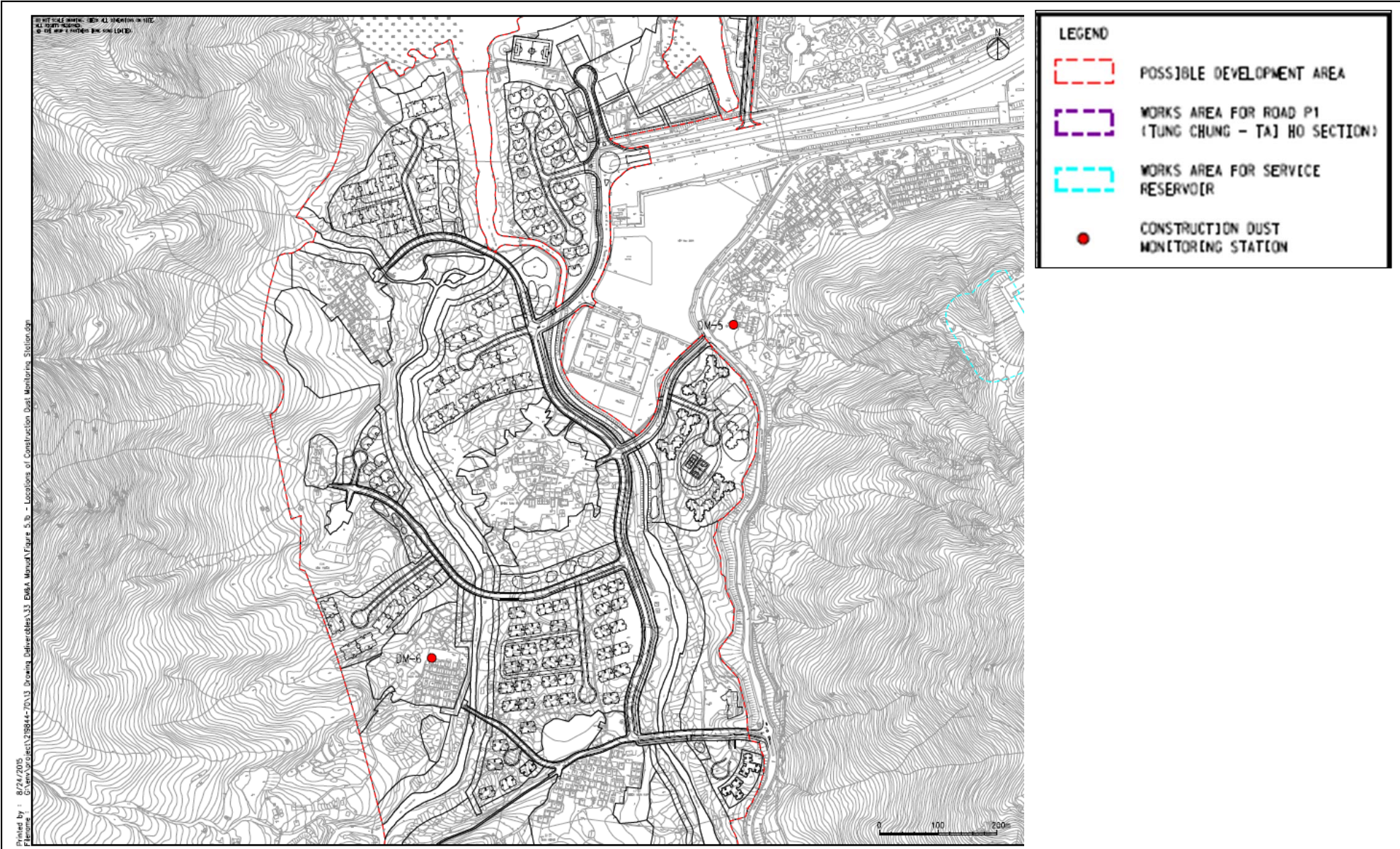


Figure 5.1b

Locations of Construction Dust Monitoring Station (Sheet 3 of 3)

Table 5.1 Construction Dust Monitoring Locations

ID	ASR ID	Location	Impact Monitoring Period
DM-1	P7	Tung Chung Area 56 - Planned Public Rental Housing Development	From commencement of construction period until flat intakes of TCE-7 and TCE-14
DM-2	TCE-7	Proposed Residential Development (B1-2)	From its flat intake until the end of construction period
DM-3	TCE-14	Proposed Residential Development (D2-2)	From its flat intake until the end of construction period
DM-4	TCE-24	Proposed Residential Development (A2-4)	From its flat intake until the end of construction period
DM-5	A33	Lung Tseung Tau	Entire construction period for Tung Chung West
DM-6	A39	Mo Ka	Entire construction period for Tung Chung West

When alternative monitoring locations are proposed, the proposed site should, as far as practicable:

- be at the site boundary or such locations close to the major dust emission source;
- be close to the sensitive receptors; and
- take into account the prevailing meteorological conditions.

The ET shall agree with the ER in consultation with the IEC on the position of the HVS for the installation of the monitoring equipment should HVSs be used for the 1-hour TSP monitoring. When positioning the samplers, the following points shall be noted:

- a horizontal platform with appropriate support to secure the samplers against gusty wind should be provided;
- no two samplers should be placed less than 2 meters apart;
- the distance between the sampler and an obstacle, such as buildings, must be at least twice the height that the obstacle protrudes above the sampler;
- a minimum of 2 meters of separation from walls, parapets and penthouses is required for rooftop samplers;
- a minimum of 2 meters separation from any supporting structure, measured horizontally is required;
- no furnace or incinerator flue is nearby;
- airflow around the sampler is unrestricted;
- the sampler is more than 20 meters from the dripline;

- any wire fence and gate, to protect the sampler, should not cause any obstruction during monitoring;
- permission must be obtained to set up the samplers and to obtain access to the monitoring stations; and
- a secured supply of electricity is needed to operate the samplers.

The ET may, depending on site conditions and monitoring results, decide whether additional monitoring locations shall be included or any monitoring locations could be removed / relocated during any stage of the construction phase.

5.8

BASELINE MONITORING

Baseline monitoring shall be carried out at all of the designated monitoring locations (see *Table 5.1*) for at least 14 consecutive days prior to the commissioning of major construction works at TCE and TCW, respectively to obtain 1-hour TSP samples. The selected baseline monitoring stations should reflect baseline conditions at the impact stations. One-hour sampling should also be done at least 3 times per day while the highest dust impact is expected.

During the baseline monitoring, there should not be any major construction or dust generation activities in the vicinity of the monitoring stations. Before commencing baseline monitoring, the ET shall inform the IEC of the baseline monitoring programme such that, if required, the ER can conduct on-site audit to ensure accuracy of the baseline monitoring results.

In case the baseline monitoring cannot be carried out at the designated monitoring locations, the ET Leader shall carry out the monitoring at alternative locations that can effectively represent the baseline conditions at the impact monitoring locations. The alternative baseline monitoring locations shall be approved by the ER and agreed with the IEC.

In exceptional cases, when insufficient baseline monitoring data or questionable results are obtained, the ET shall liaise with the IEC and EPD to agree on an appropriate set of data to be used as a baseline reference and submit to ER for approval.

Ambient conditions may vary seasonally and shall be reviewed once every three months. When the ambient conditions have changed and a repeat of the baseline monitoring is required to be carried out for obtaining the updated baseline levels, the monitoring should be at times when the Contractor's activities are not generating dust, at least in the proximity of the monitoring stations. Should change in ambient conditions be determined, the baseline levels and, in turn, the air quality criteria, should be revised. The revised baseline levels and air quality criteria should be agreed with the IEC and EPD.

5.8.1 *Proposal of Alternative Monitoring Stations for Tung Chung East Baseline Monitoring*

It should be noted that locations DM-2, DM-3 and DM-4 (*Table 5.1*) are located at the reclaimed land of TCE, which is currently not available for baseline monitoring. As such, three alternative locations DM-2A, DM-3A and DM-4A are proposed, approved by the ER and agreed by the IEC to be conducted for the baseline monitoring (see *Table 5.2 and Figure 5.2*). The alternative locations are proposed based on the criteria as stated in *Section 5.7*. In summary, the baseline monitoring for TCE will be carried out at four monitoring locations (DM-1, DM-2A, DM-3A and DM-4A) prior to the commissioning of major construction works at TCE.

Table 5.2 *Alternative Construction Dust Monitoring Locations*

ID	Location
DM-2A	School in Tung Chung East
DM-3A	Residential premise near Tung Chung East
DM-4A	Pak Mong Pier

5.9 *IMPACT MONITORING*

The ET shall carry out impact monitoring during the entire construction period unless specified in *Table 5.1*. For regular impact monitoring of 1-hour TSP, the sampling frequency of at least 3 times in every 6 days should be undertaken when the highest dust impact occurs. Before commencing impact monitoring, the ET shall inform the IEC of the impact monitoring programme such that the IEC can conduct on-site audit to ensure accuracy of the monitoring results.

In case of non-compliance with the air quality criteria, more frequent monitoring, as specified in the Event and Action Plan in the following section, shall be conducted within the specified timeframe after the result is obtained. This additional monitoring shall be continued until the excessive dust emission or the deterioration in air quality is rectified, and agreed with the ER and the IEC.

5.10 *ACTION AND LIMIT LEVELS*

The baseline monitoring results form the basis for determining the air quality criteria for the impact monitoring. The ET shall compare the impact monitoring results with air quality criteria set up for 1-hour TSP. *Table 5.3* shows the air quality criteria, namely Action and Limit Levels to be used.

Legend

- Proposed Area for Tung Chung New Town Extension (East)
- Tuen Mun – Chek Lap Kok Link (TM-CLKL)
- Construction Dust Monitoring Station

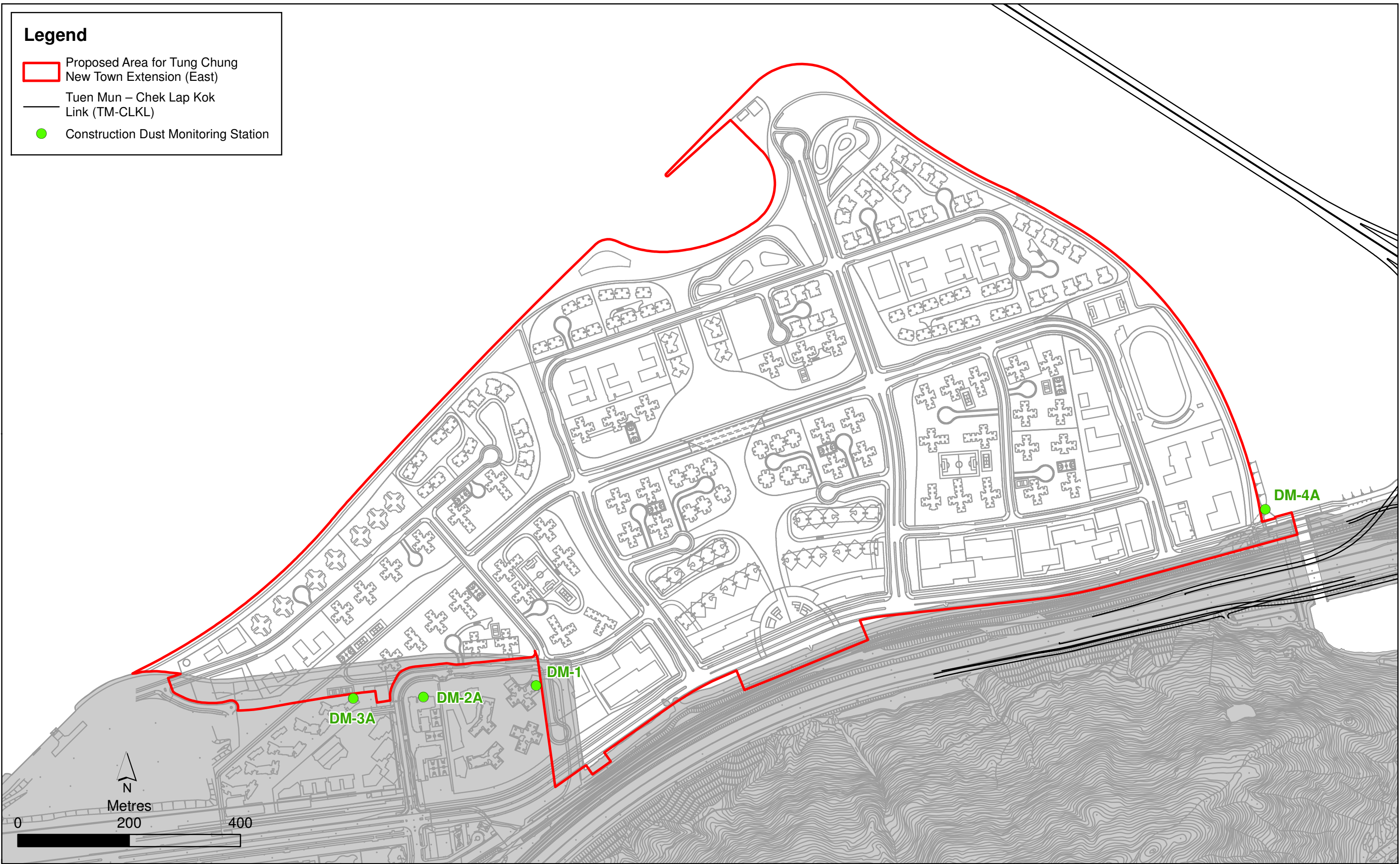


Figure 5.2

Construction Dust Monitoring Station Locations

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Date: 21/3/2018

Environmental
Resources
Management



Table 5.3 *Action and Limit Levels for Air Quality*

Parameters	Action	Limit
1-hour TSP Level in $\mu\text{g}/\text{m}^3$	For baseline level $\leq 384 \mu\text{g}/\text{m}^3$, Action level = (baseline level * 1.3 + Limit level)/2; For baseline level $> 384 \mu\text{g}/\text{m}^3$, Action level = Limit level	500 $\mu\text{g}/\text{m}^3$

5.11 *EVENT AND ACTION PLAN*

Should non-compliance of the air quality criteria occur, actions in accordance with the Action Plan in *Table 5.4* shall be carried out.

Table 5.4 *Event and Action Plan for Air Quality*

Event	Action			
	ET	IEC	ER	Contractor
Action level exceedance for one sample	<ol style="list-style-type: none"> 1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform IEC and ER; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method. 	<ol style="list-style-type: none"> 1. Notify Contractor. 	<ol style="list-style-type: none"> 1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
Action level exceedance for two or more consecutive samples	<ol style="list-style-type: none"> 1. Identify source; 2. Inform IEC and ER; 3. Advise the ER on the effectiveness of the proposed remedial measures; 4. Repeat measurements to confirm findings; 5. Increase monitoring frequency to daily; 6. Discuss with IEC and Contractor on remedial actions required; 7. If exceedance continues, arrange meeting with IEC and ER; 8. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ET on the effectiveness of the proposed remedial measures; 5. Supervise Implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented. 	<ol style="list-style-type: none"> 1. Submit proposals for remedial to ER within 3 working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.

Event	Action			
	ET	IEC	ER	Contractor
Limit level exceedance for one sample	<ol style="list-style-type: none"> 1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform ER, Contractor and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.
Limit level exceedance for two or more consecutive samples	<ol style="list-style-type: none"> 1. Notify IEC, ER, Contractor and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Arrange meeting with IEC and ER to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

6 NOISE IMPACT

6.1 INTRODUCTION

The EIA has considered the potential noise impacts during both the construction and operational phases of the Project. Noise monitoring is proposed to be conducted during construction and operational phase.

6.2 MITIGATION MEASURES

6.2.1 Construction Phase

The EIA Report has recommended construction noise mitigation measures including the use of quiet plant and temporary noise barriers, etc. All the proposed mitigation measures are summarized in the EMIS in *Appendix 4.1*.

6.2.2 Operational Phase

Road Traffic Noise

Due to the nature of the Project, population intake will be carried out in 4 phases (i.e. Year 2023 for Phase 1, Year 2025 for Phase 2, Year 2027 for Phase 3 and Year 2030 for Phase 4) and thus road traffic noise impact assessments at interim years and ultimate year have been conducted. Results indicate that mitigation measures at interim years Year 2025 and Year 2027, and ultimate Year 2045 will be required. A series of noise mitigation measures including 1) noise barriers along some road sections or boundary walls within development sites; 2) application of low noise road surfacing materials on some road sections; 3) suitable treatment on end walls, arranging noise tolerant portions of buildings in internal layout design and architectural fins in some buildings, would need to be implemented and the required mitigation measures under the above mentioned years are listed in *Table 6.1a* to *Table 6.1d* and are shown in *Figure 6.1*, *Figure 6.1a-b*, *Figure 6.2*, *Figures 6.2a-b*, *Figure 6.3*, *Figures 6.3a-d*, *Figure 6.4*, and *Figures 6.4a-e* respectively.

Table 6.1a *Extents and Locations of Proposed Mitigation Measures at 2023*

Zoning	Location	Type of Mitigation Measures ^{[1][2][3]}
TCE		
B1-1	Facade of residential block	Facade with no openable window
B1-1	Facade of residential block	1.5m long architectural fin
B1-2	Facade of residential block	Facade with no openable window
B1-2	Facade of residential block	1.5m long architectural fin
TCW		
TCV-6	Facade of residential block	Facade with no openable window
-	Possible School Development near Tung Chung Area 39	Approx. 50m long, 4m high school boundary wall
-	Corner at junction between Chung Mun Road and Road L24	Approx. 120m long, 5m high vertical barrier with 3m cantilevered arm at 45°
-	Along Chung Mun Road	Approx. 210m long LNRS
-	Along Road L24	Approx. 160m long LNRS

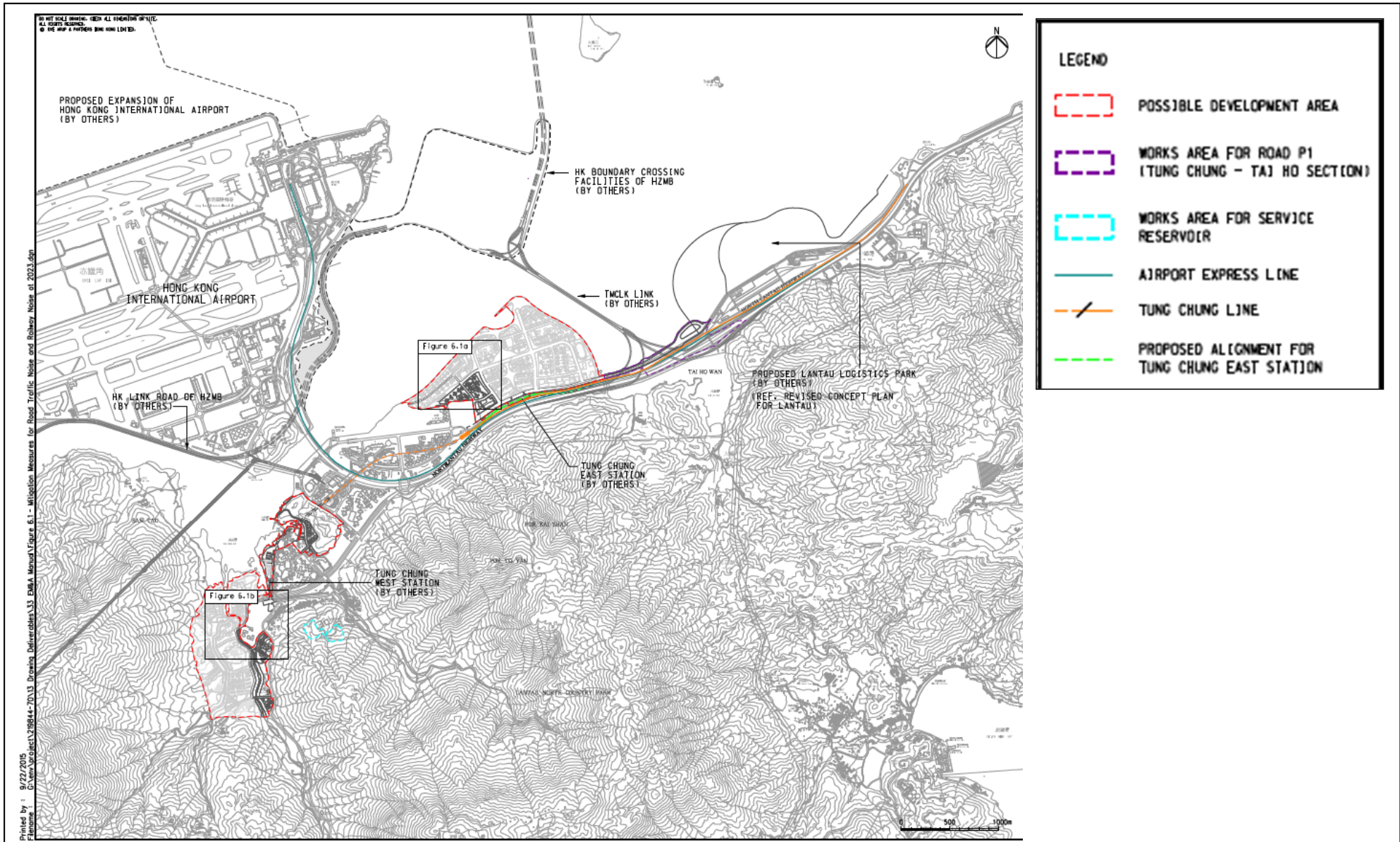


Figure 6.1

Mitigation Measures for Road Traffic Noise and Railway Noise at 2023 (Sheet 1 of 3)

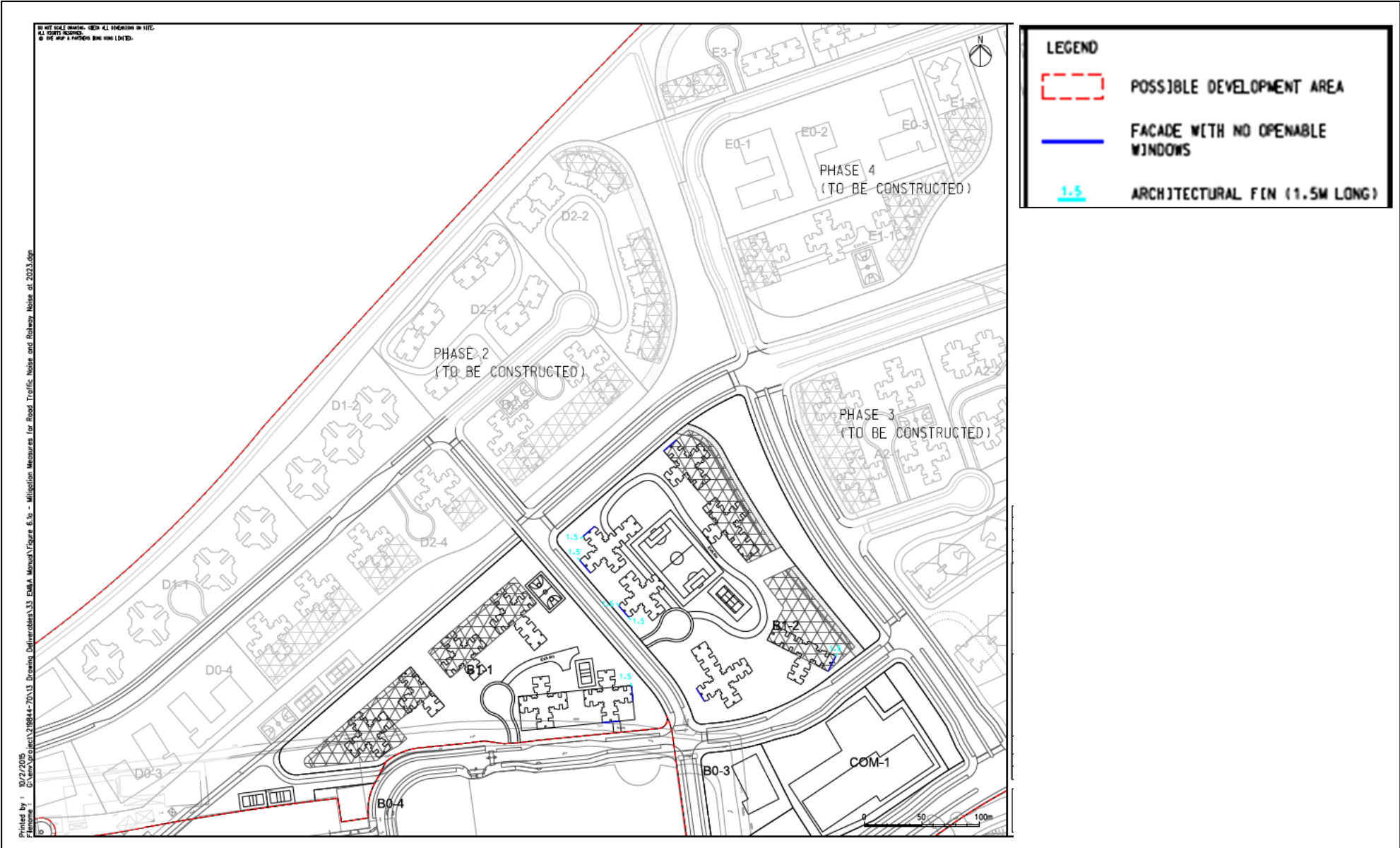
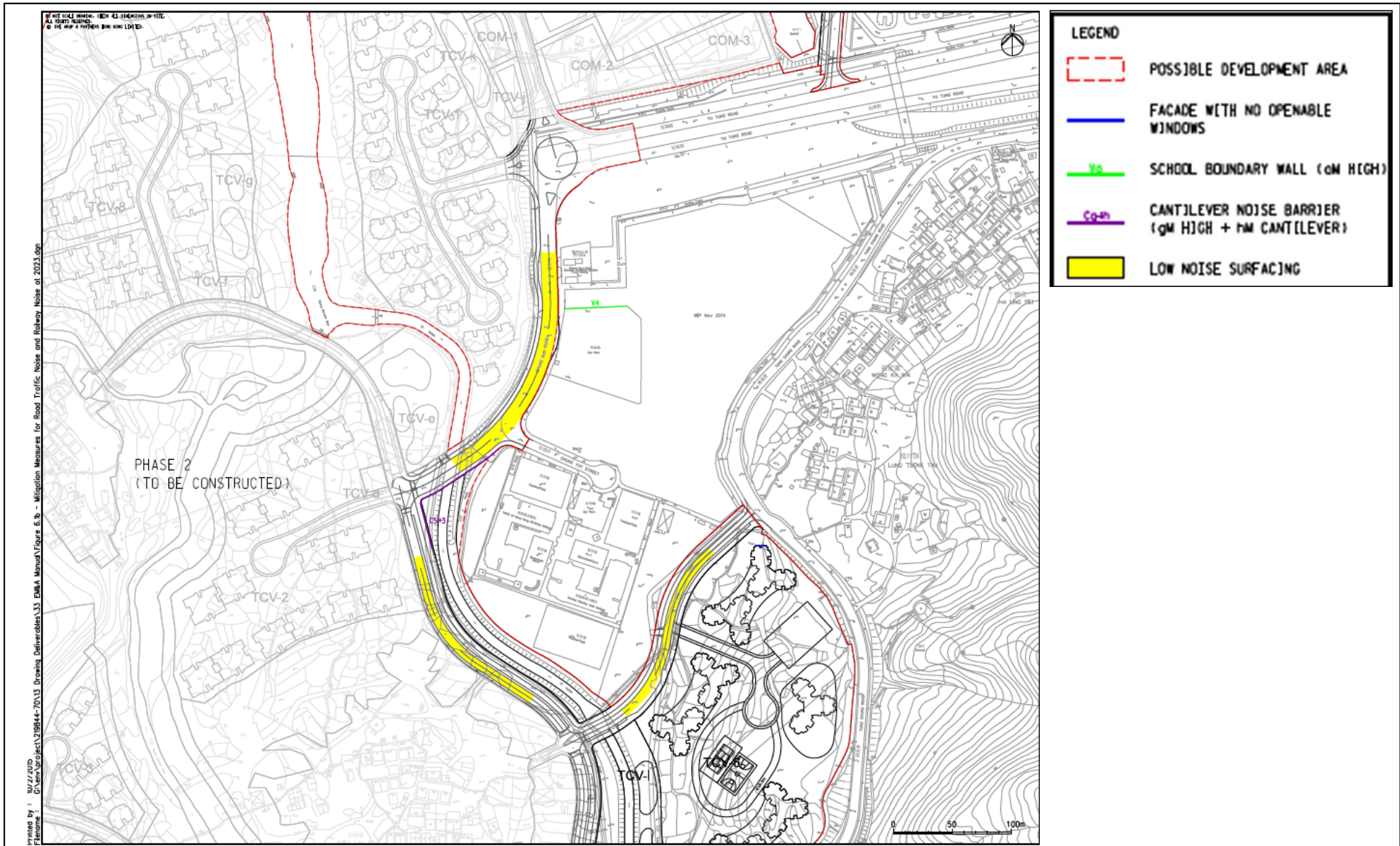


Figure 6.1a

Mitigation Measures for Road Traffic Noise and Railway Noise at 2023 (Sheet 2 of 3)








LEGEND	
	POSSIBLE DEVELOPMENT AREA
	FACADE WITH NO OPENABLE WINDOWS
	SCHOOL BOUNDARY WALL (1M HIGH)
	CANTILEVER NOISE BARRIER (1M HIGH + 1M CANTILEVER)
	LOW NOISE SURFACING

Figure 6.1b

Mitigation Measures for Road Traffic Noise and Railway Noise at 2023 (Sheet 3 of 3)

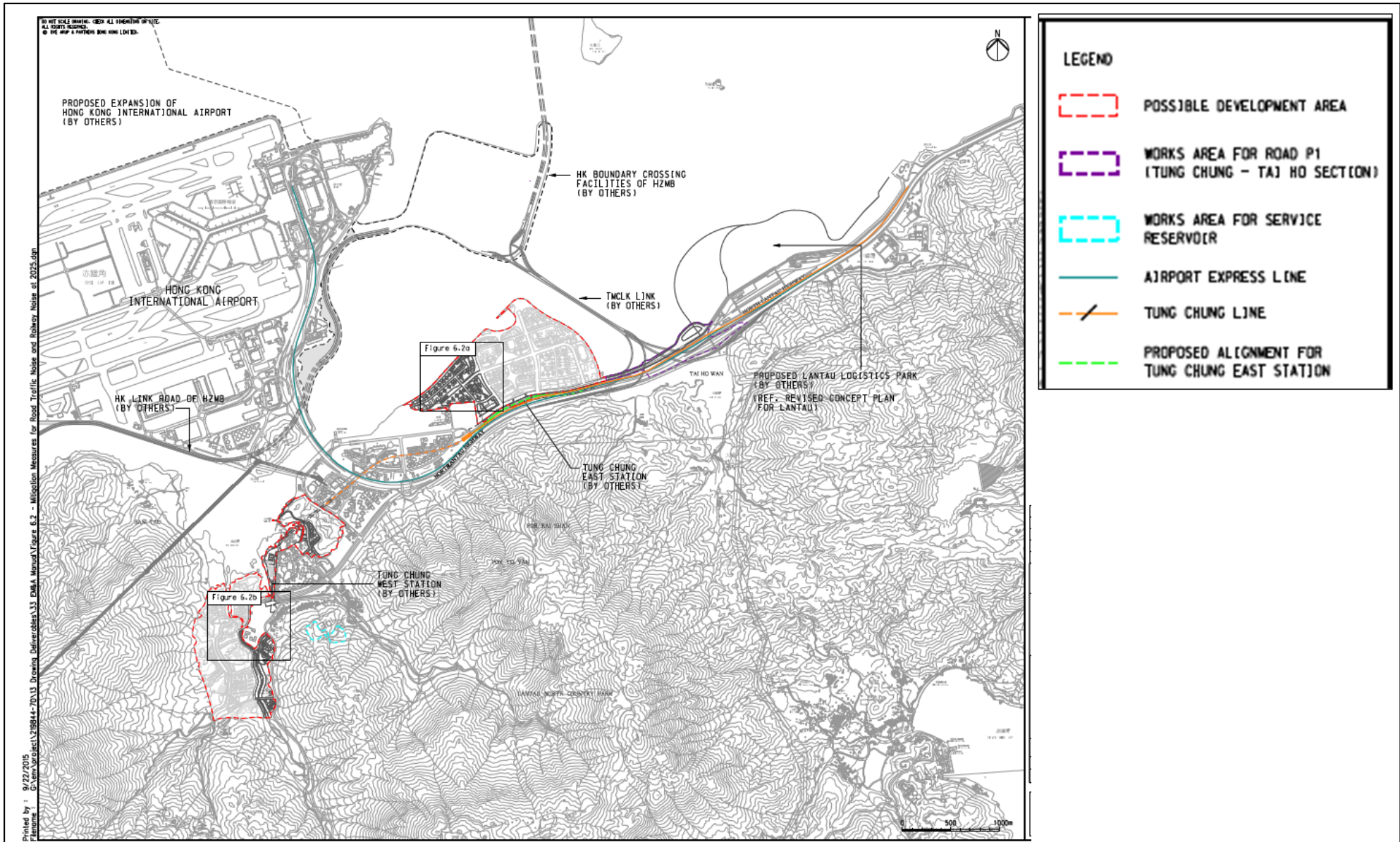


Figure 6.2

Mitigation Measures for Road Traffic Noise and Railway Noise at 2025 (Sheet 1 of 3)

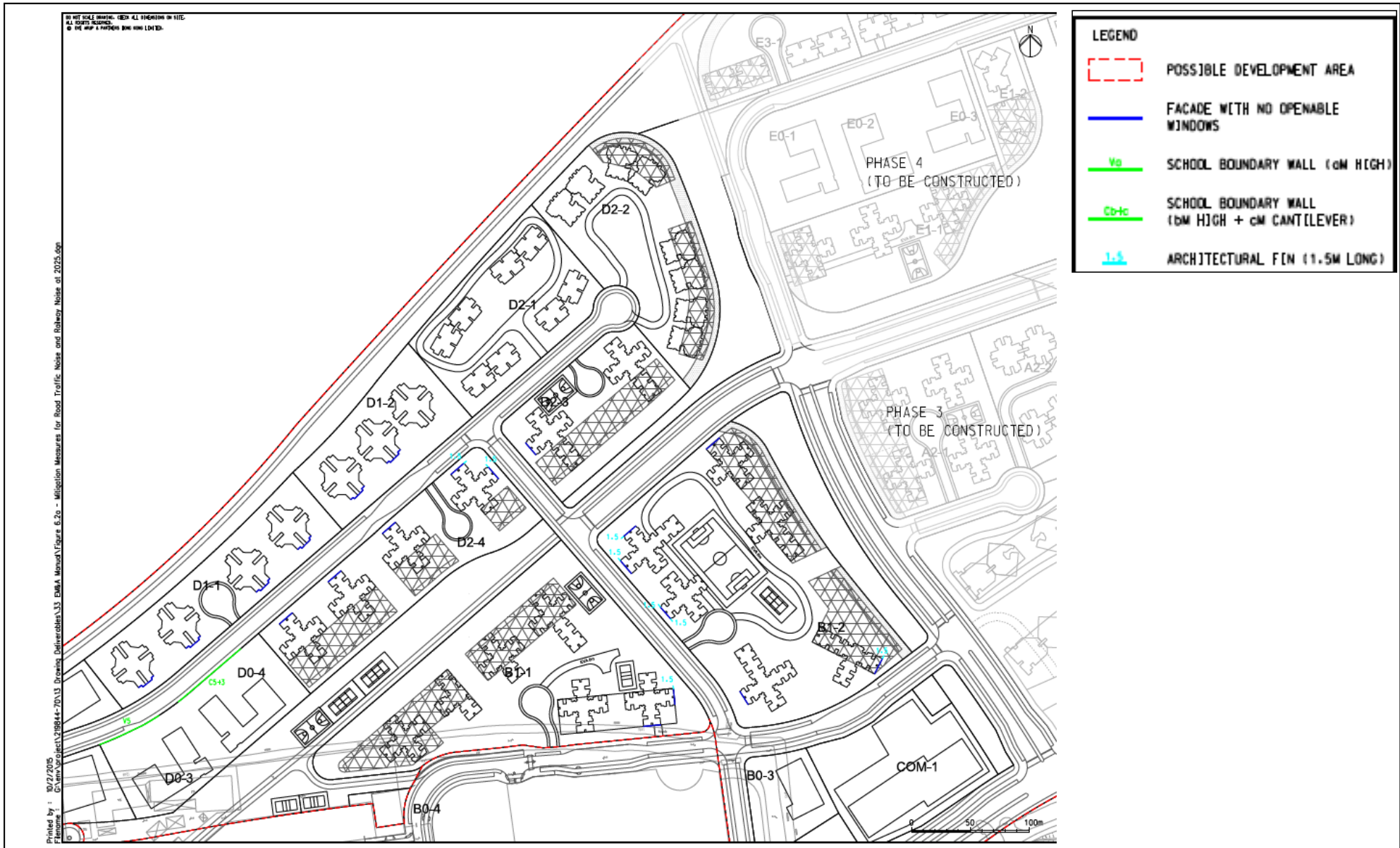


Figure 6.2a

Mitigation Measures for Road Traffic Noise and Railway Noise at 2025 (Sheet 2 of 3)

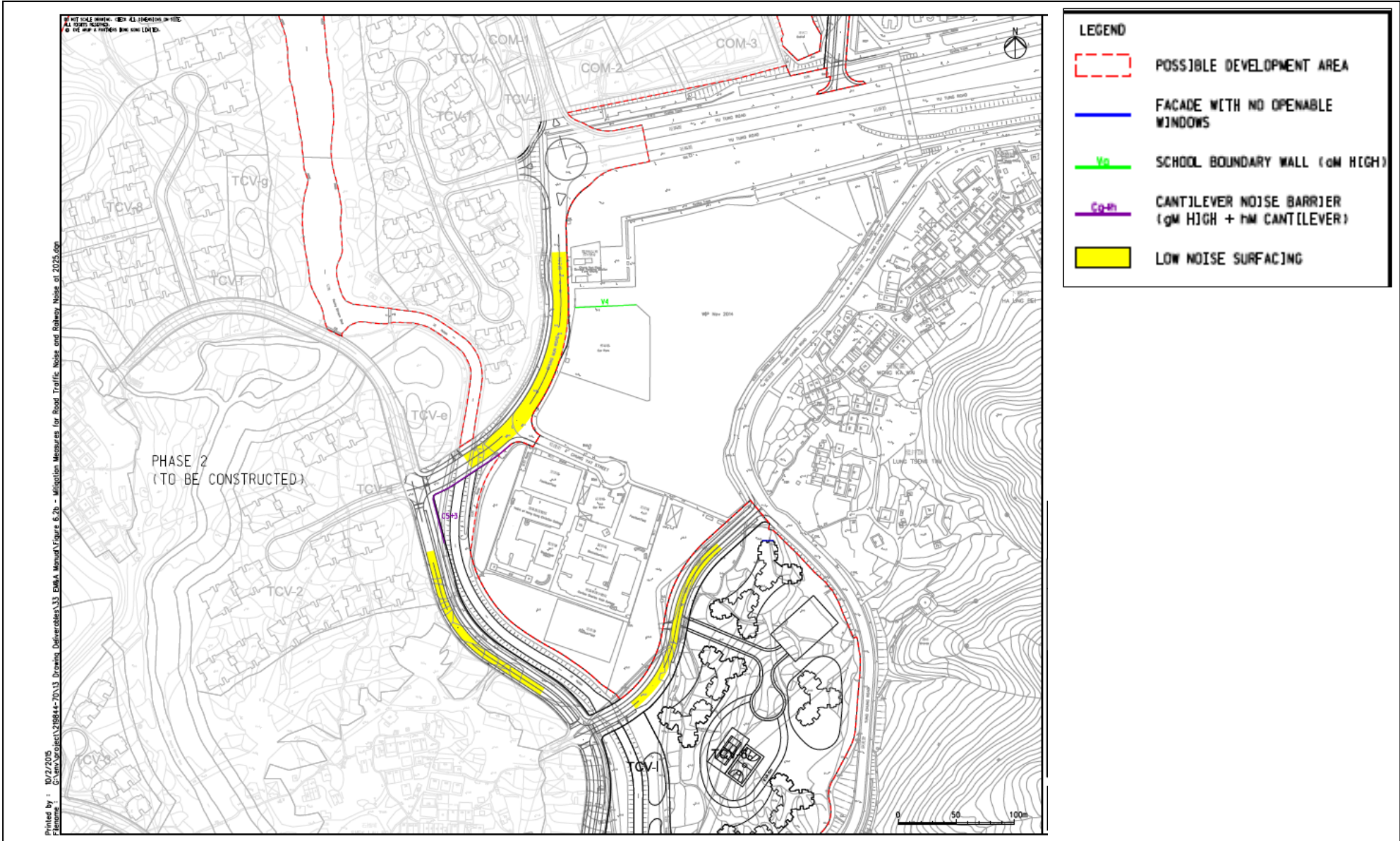


Figure 6.2b

Mitigation Measures for Road Traffic Noise and Railway Noise at 2025 (Sheet 3 of 3)

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PROPOSED EXPANSION OF HONG KONG INTERNATIONAL AIRPORT (BY OTHERS)

HONG KONG INTERNATIONAL AIRPORT

HK LINK ROAD OF HZMB (BY OTHERS)

HK BOUNDARY CROSSING FACILITIES OF HZMB (BY OTHERS)

TMCLK LINK (BY OTHERS)

PROPOSED LANTAU LOGISTICS PARK (BY OTHERS) (REF. REVISED CONCEPT PLAN FOR LANTAU)

TUNG CHUNG EAST STATION (BY OTHERS)

TUNG CHUNG WEST STATION (BY OTHERS)

Figure 6.3d

Figure 6.3c

Figure 6.3b

Figure 6.3a

TUNG CHUNG EAST STATION (BY OTHERS)

TUNG CHUNG WEST STATION (BY OTHERS)

HUI YAU SHUI

POK SU YAN

LANTAU NORTH CONCEPT SITE



LEGEND

- POSSIBLE DEVELOPMENT AREA
- WORKS AREA FOR ROAD P1 (TUNG CHUNG - TA) HO SECTION)
- WORKS AREA FOR SERVICE RESERVOIR
- AIRPORT EXPRESS LINE
- TUNG CHUNG LINE
- PROPOSED ALIGNMENT FOR TUNG CHUNG EAST STATION

Prepared by: 0122/2015
 Date: 2015/05/29
 Project: ERM Contract 218944-2013
 Drawing: Deliverable 3.3
 Figure 6.3 - Mitigation Measures for Road Traffic Noise and Railway Noise at 2027 (Sheet 1 of 5)

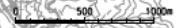


Figure 6.3

Mitigation Measures for Road Traffic Noise and Railway Noise at 2027 (Sheet 1 of 5)

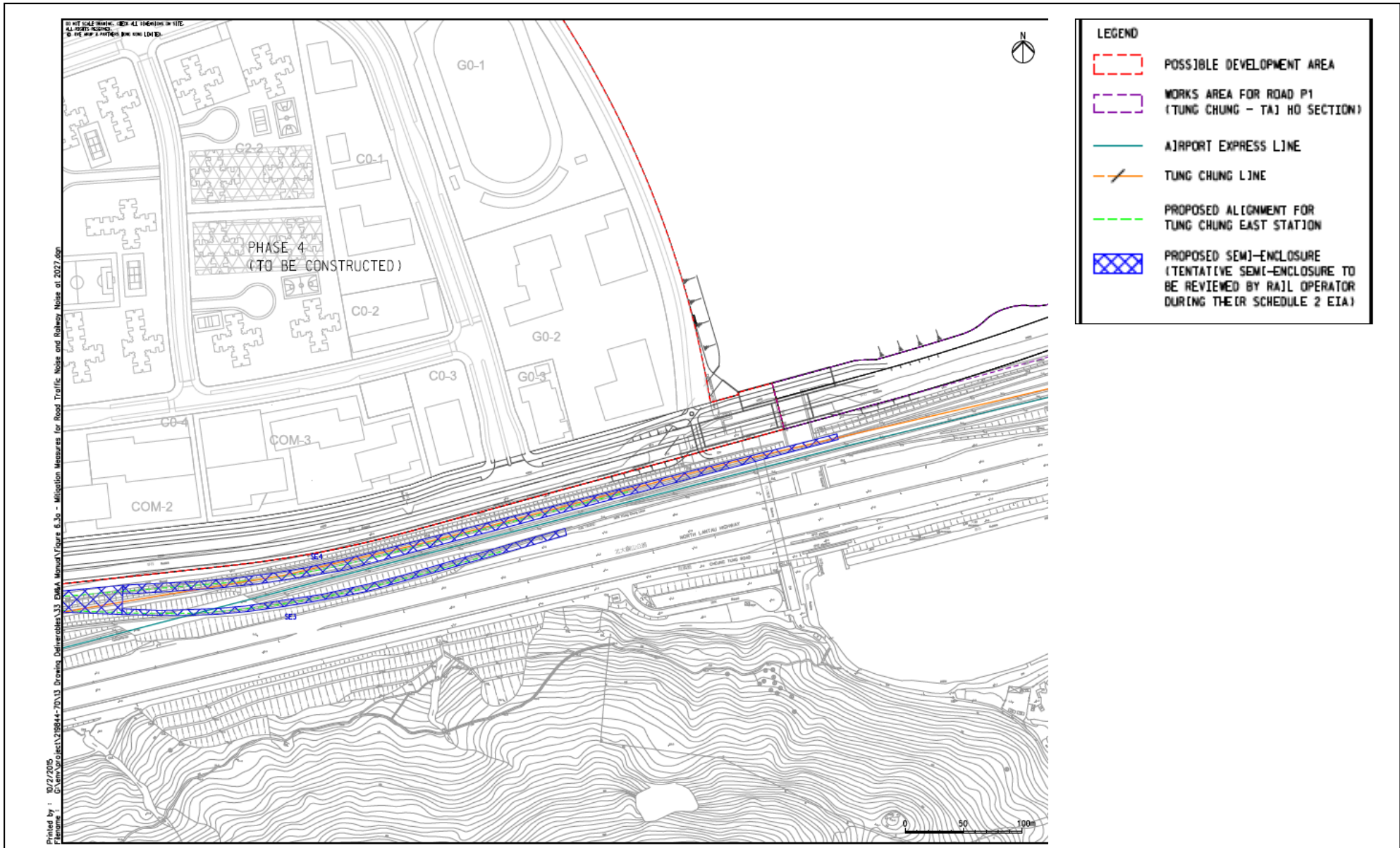


Figure 6.3a

Mitigation Measures for Road Traffic Noise and Railway Noise at 2027 (Sheet 2 of 5)

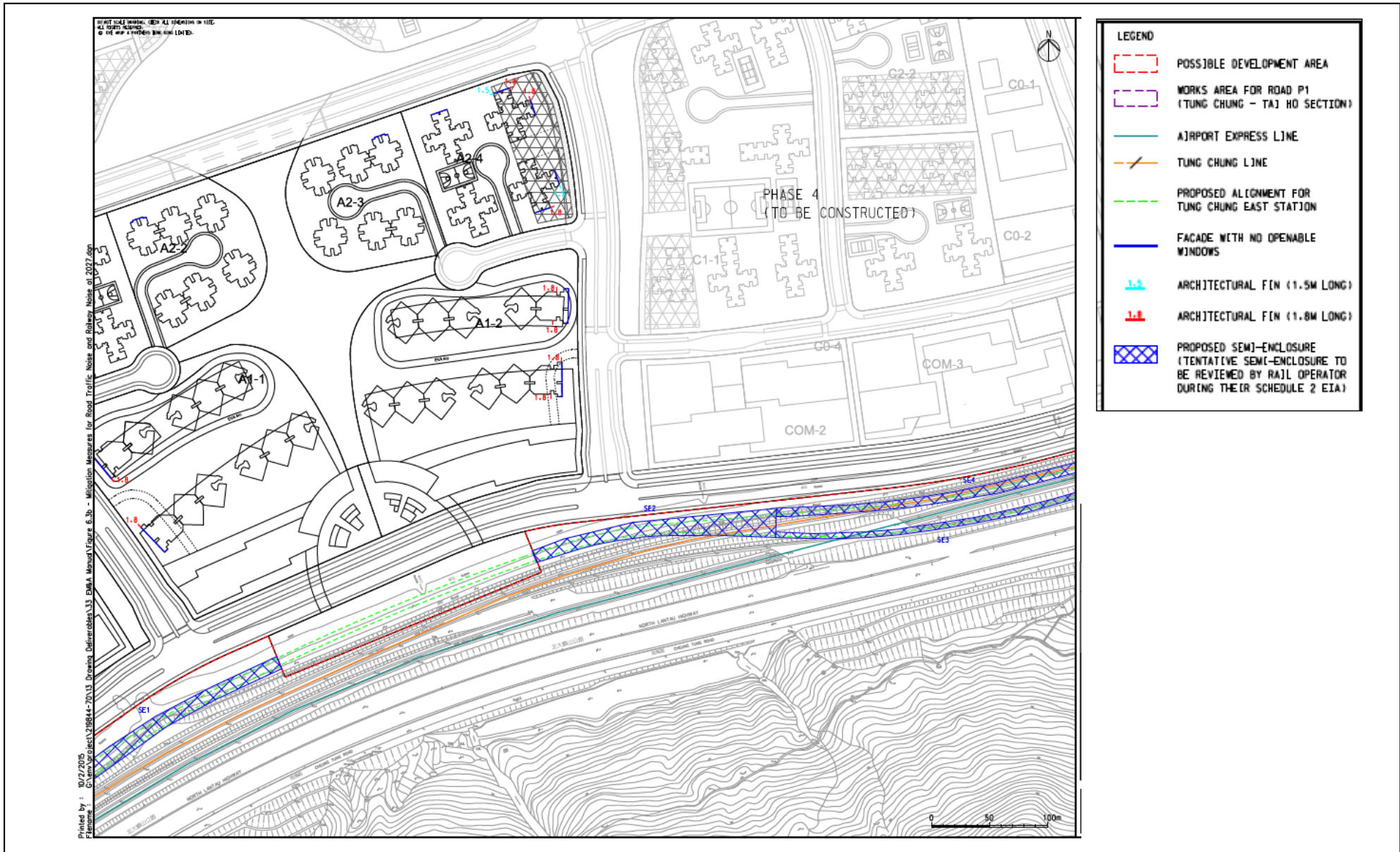


Figure 6.3b

Mitigation Measures for Road Traffic Noise and Railway Noise at 2027 (Sheet 3 of 5)

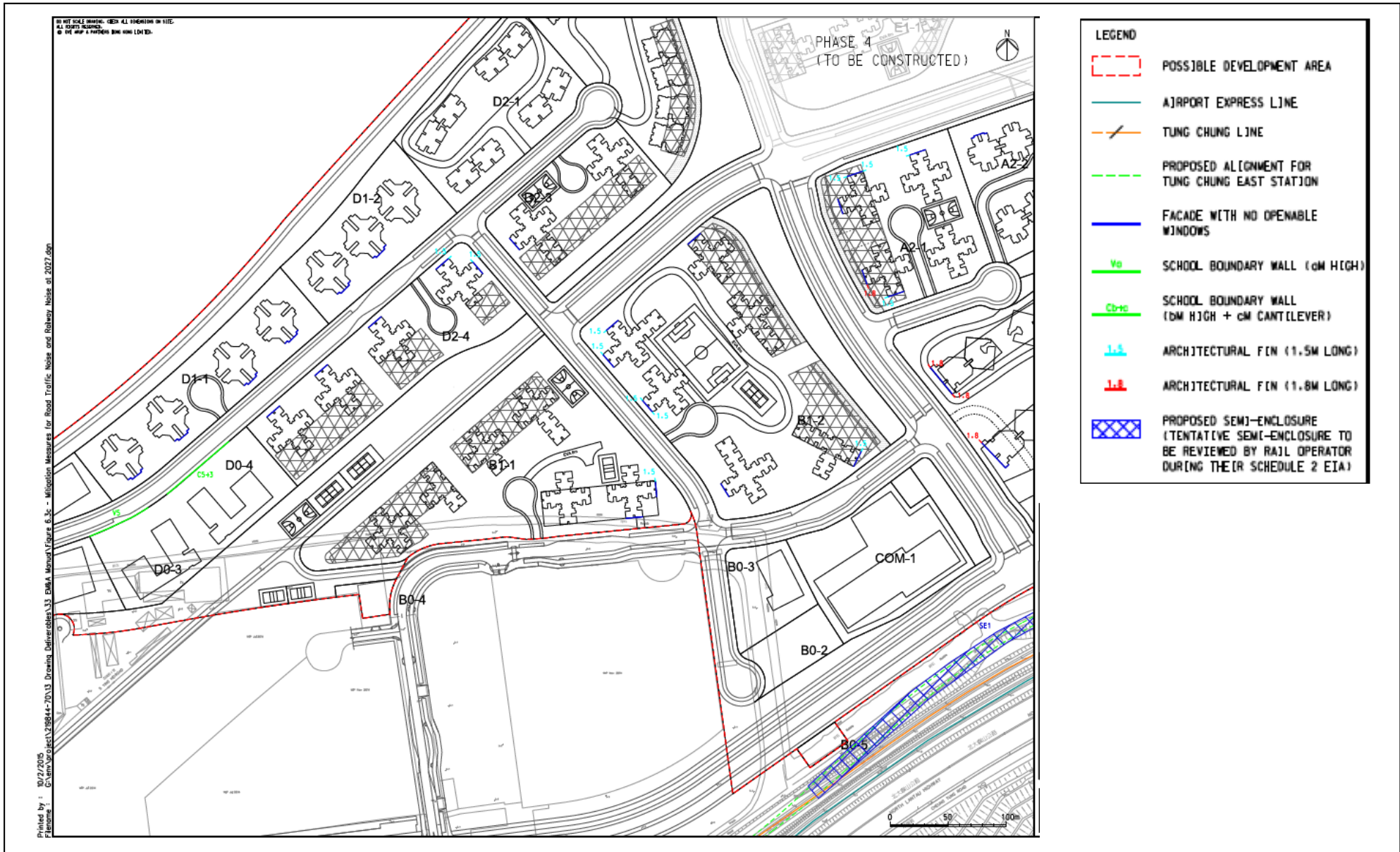
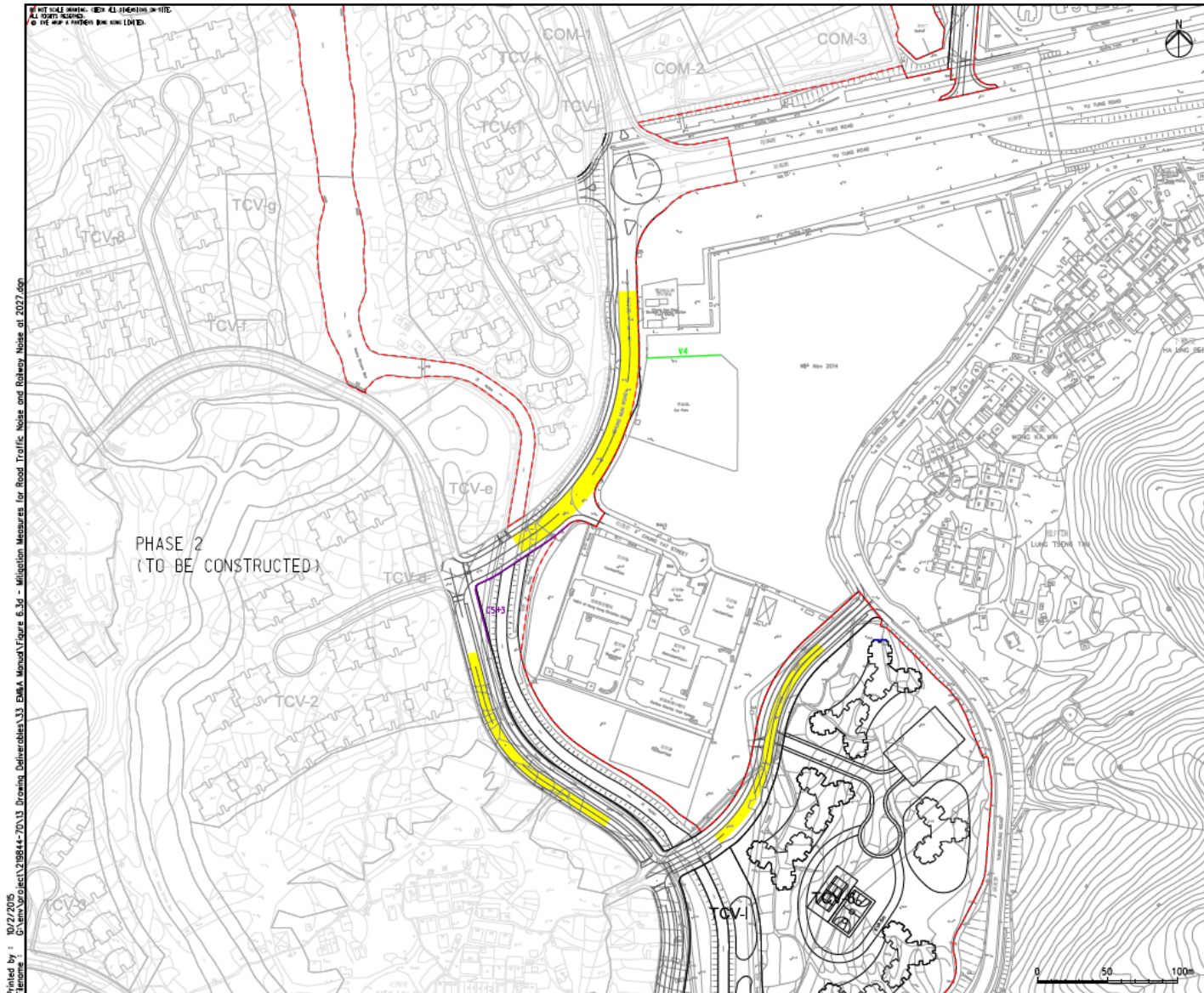







Figure 6.3c

Mitigation Measures for Road Traffic Noise and Railway Noise at 2027 (Sheet 4 of 5)



LEGEND	
	POSSIBLE DEVELOPMENT AREA
	FACADE WITH NO OPENABLE WINDOWS
	SCHOOL BOUNDARY WALL (0.6M HIGH)
	CANTILEVER NOISE BARRIER (1.0M HIGH + 1.5M CANTILEVER)
	LOW NOISE SURFACING

Printed by : 10/27/2015
 Filename : G:\env\proj\139844-70\13_Drawing_Deliverables\33_EMA_Manual\Figure 6.3d - Mitigation Measures for Road Traffic Noise and Railway Noise at 2027.dgn

Figure 6.3d

Mitigation Measures for Road Traffic Noise and Railway Noise at 2027 (Sheet 5 of 5)

Environmental
Resources
Management



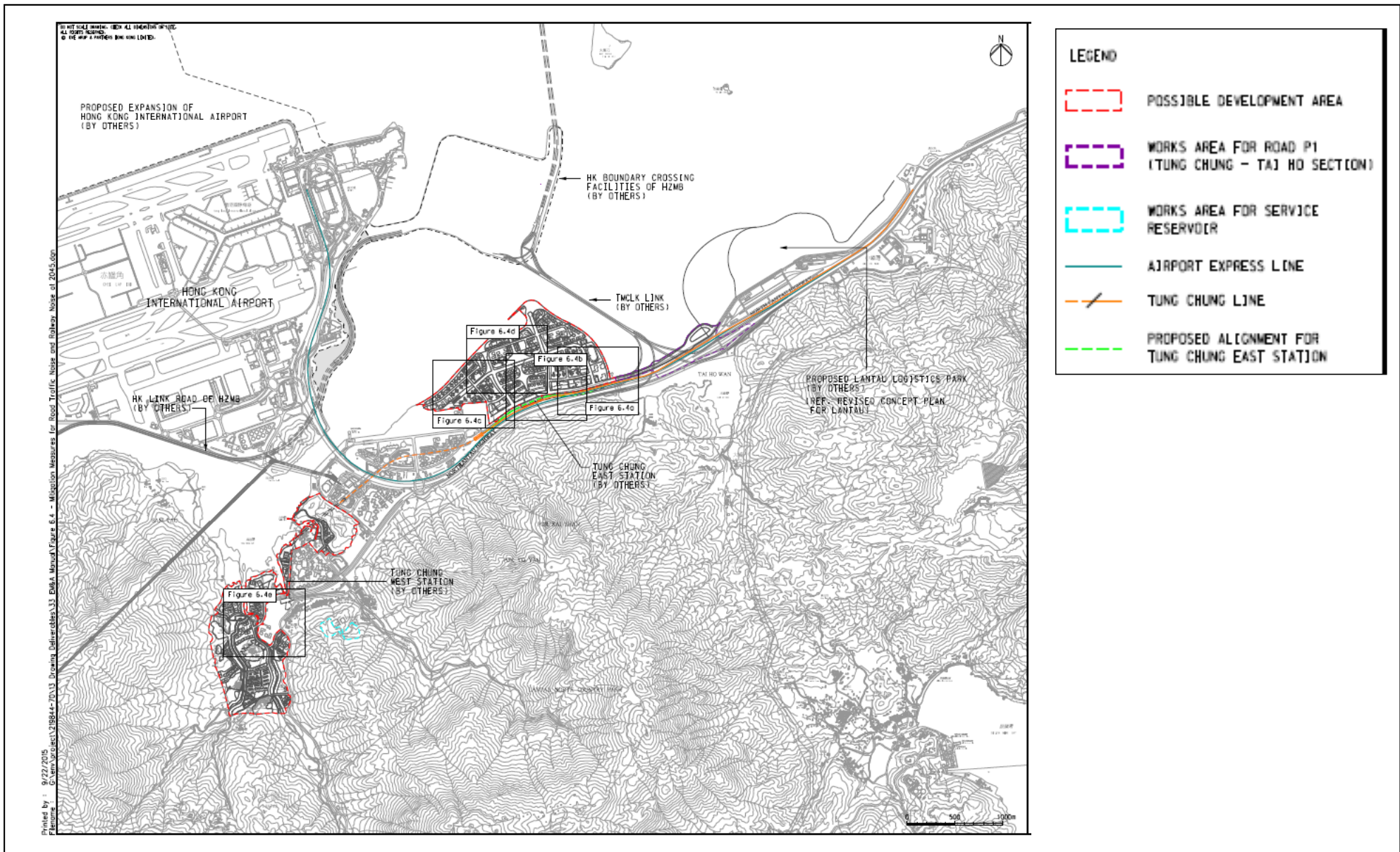


Figure 6.4

Mitigation Measures for Road Traffic Noise and Railway Noise at 2045 (Sheet 1 of 6)

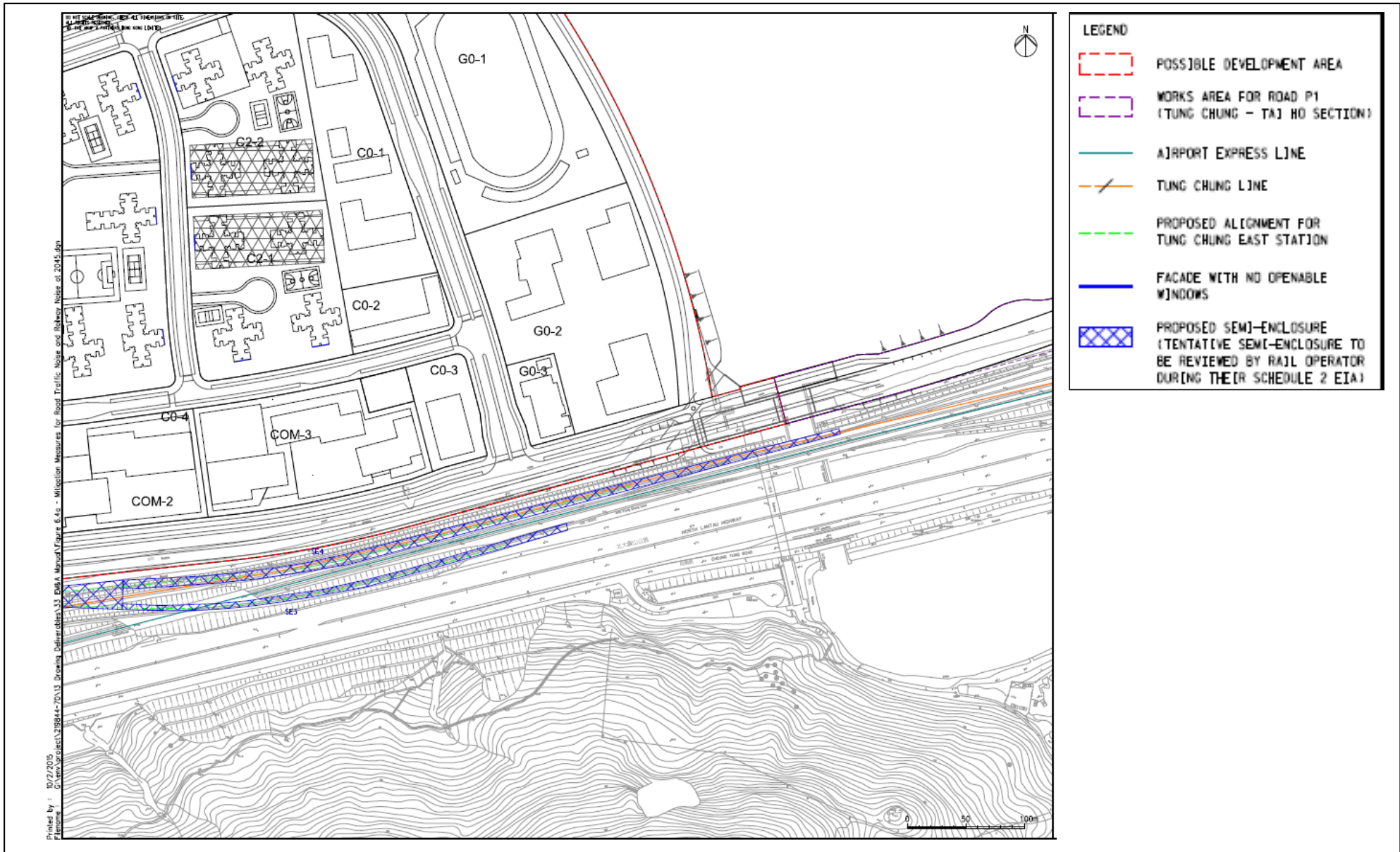


Figure 6.4a

Mitigation Measures for Road Traffic Noise and Railway Noise at 2045 (Sheet 2 of 6)

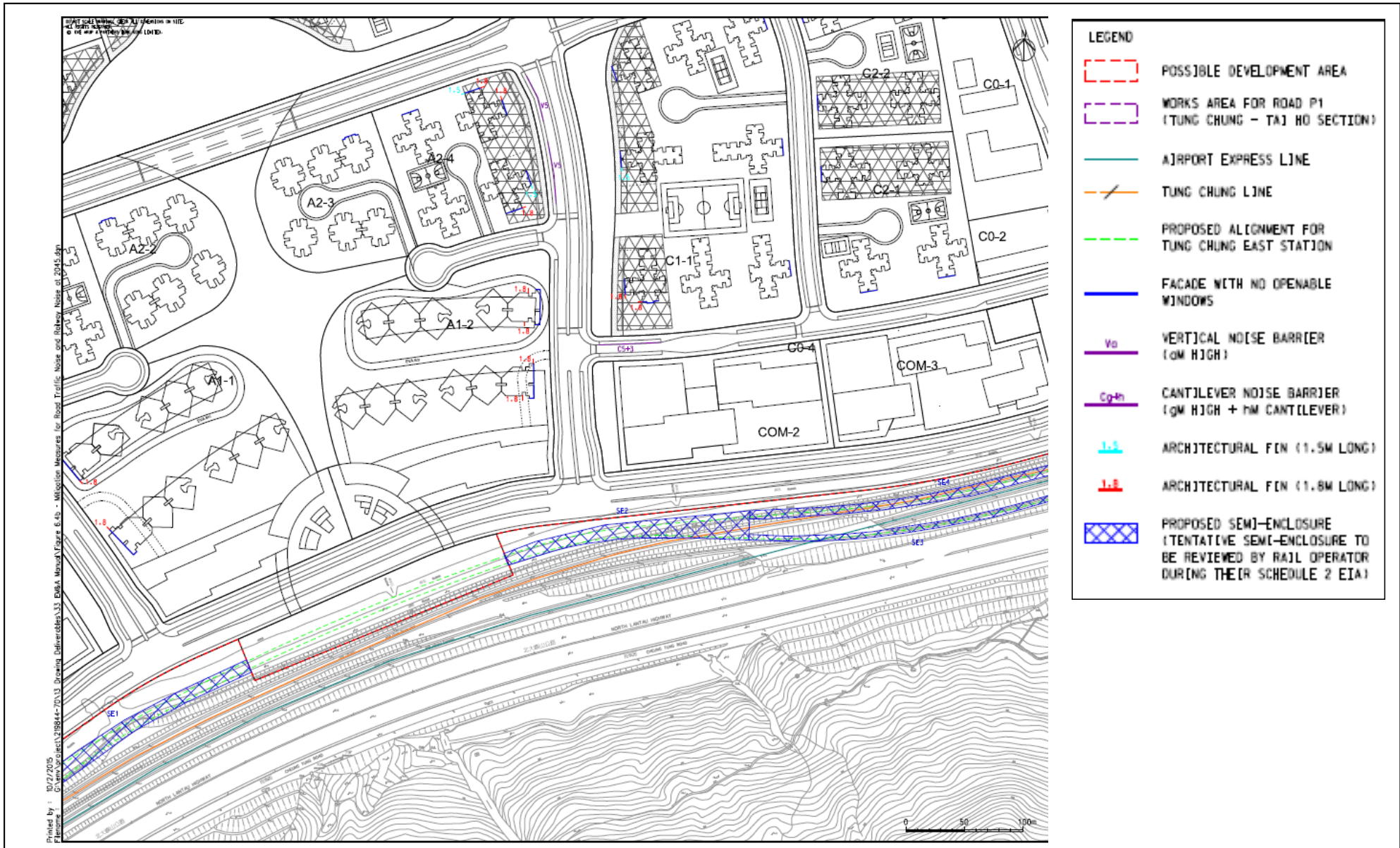


Figure 6.4b

Mitigation Measures for Road Traffic Noise and Railway Noise at 2045 (Sheet 3 of 6)

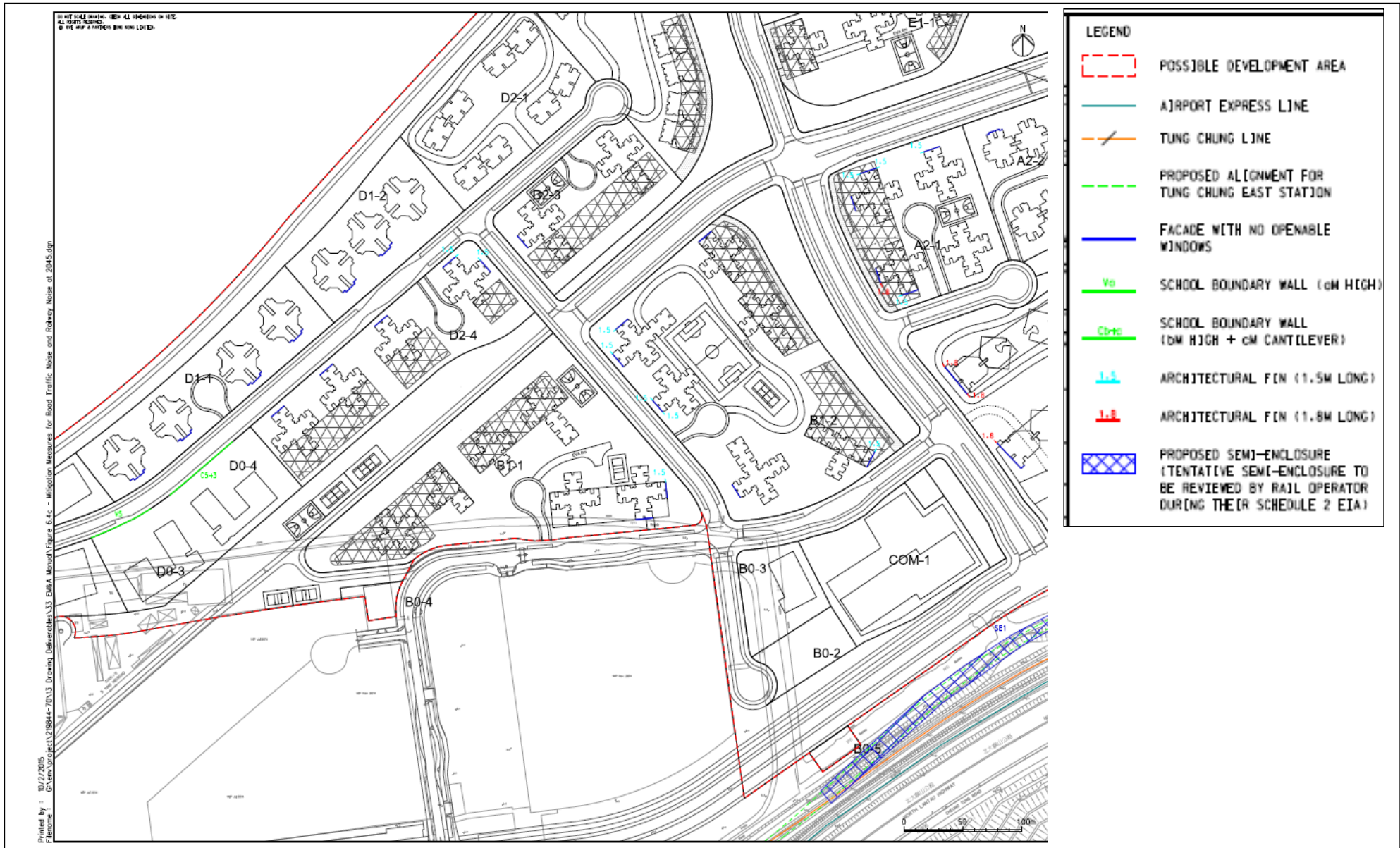
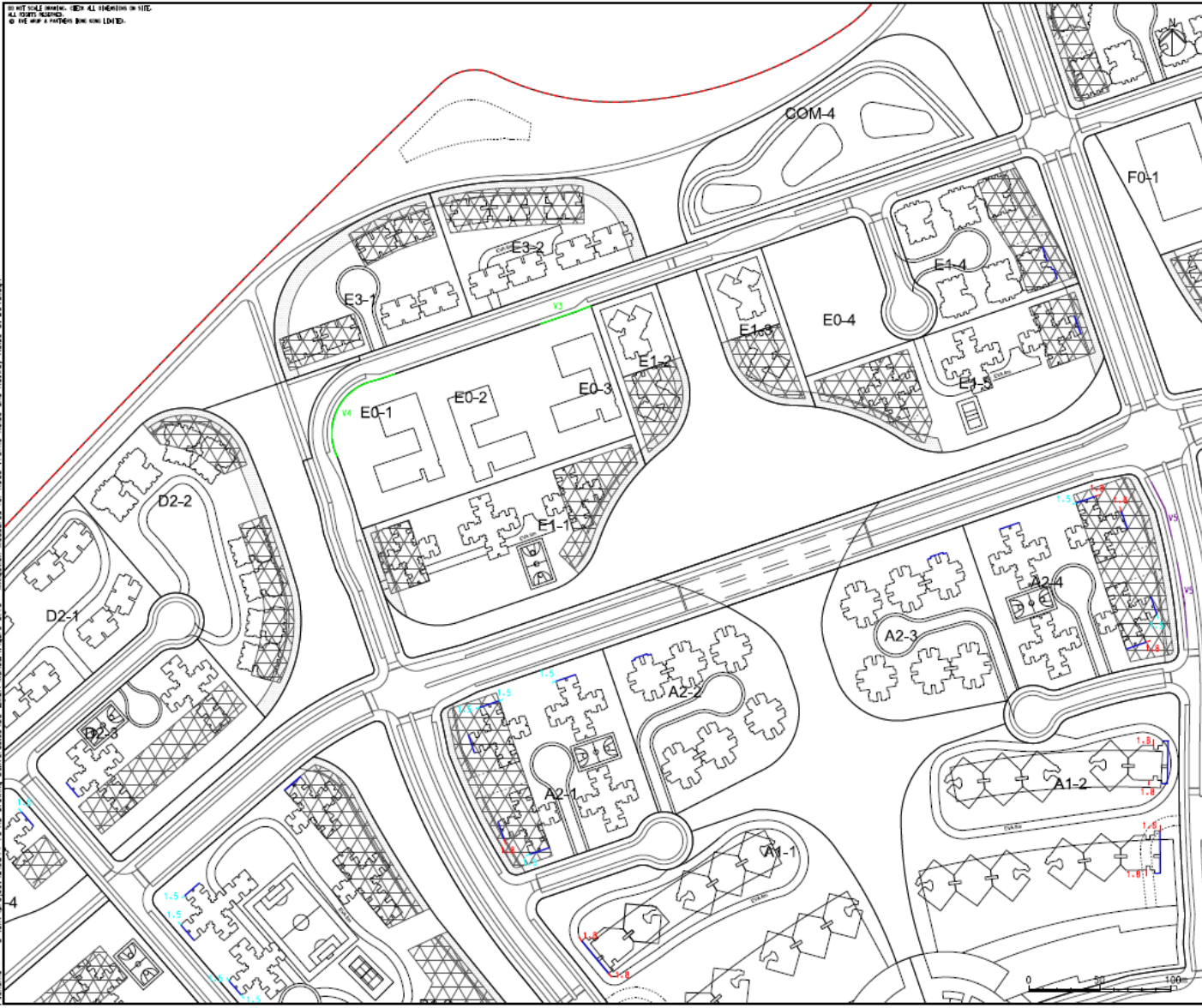


Figure 6.4c

Mitigation Measures for Road Traffic Noise and Railway Noise at 2045 (Sheet 4 of 6)

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Printed by : 10/27/2015
 File name : G:\env\project\20084-7013\Drawings\Deliverables\33_ERM_Mitigation\Figure 6.4.4 - Mitigation Measures for Road Traffic Noise and Railway Noise at 2045.dgn



LEGEND	
	POSSIBLE DEVELOPMENT AREA
	FACADE WITH NO OPENABLE WINDOWS
	SCHOOL BOUNDARY WALL (0M HIGH)
	VERTICAL NOISE BARRIER (0M HIGH)
	ARCHITECTURAL FIN (1.5M LONG)
	ARCHITECTURAL FIN (1.8M LONG)

Figure 6.4d

Mitigation Measures for Road Traffic Noise and Railway Noise at 2045 (Sheet 5 of 6)

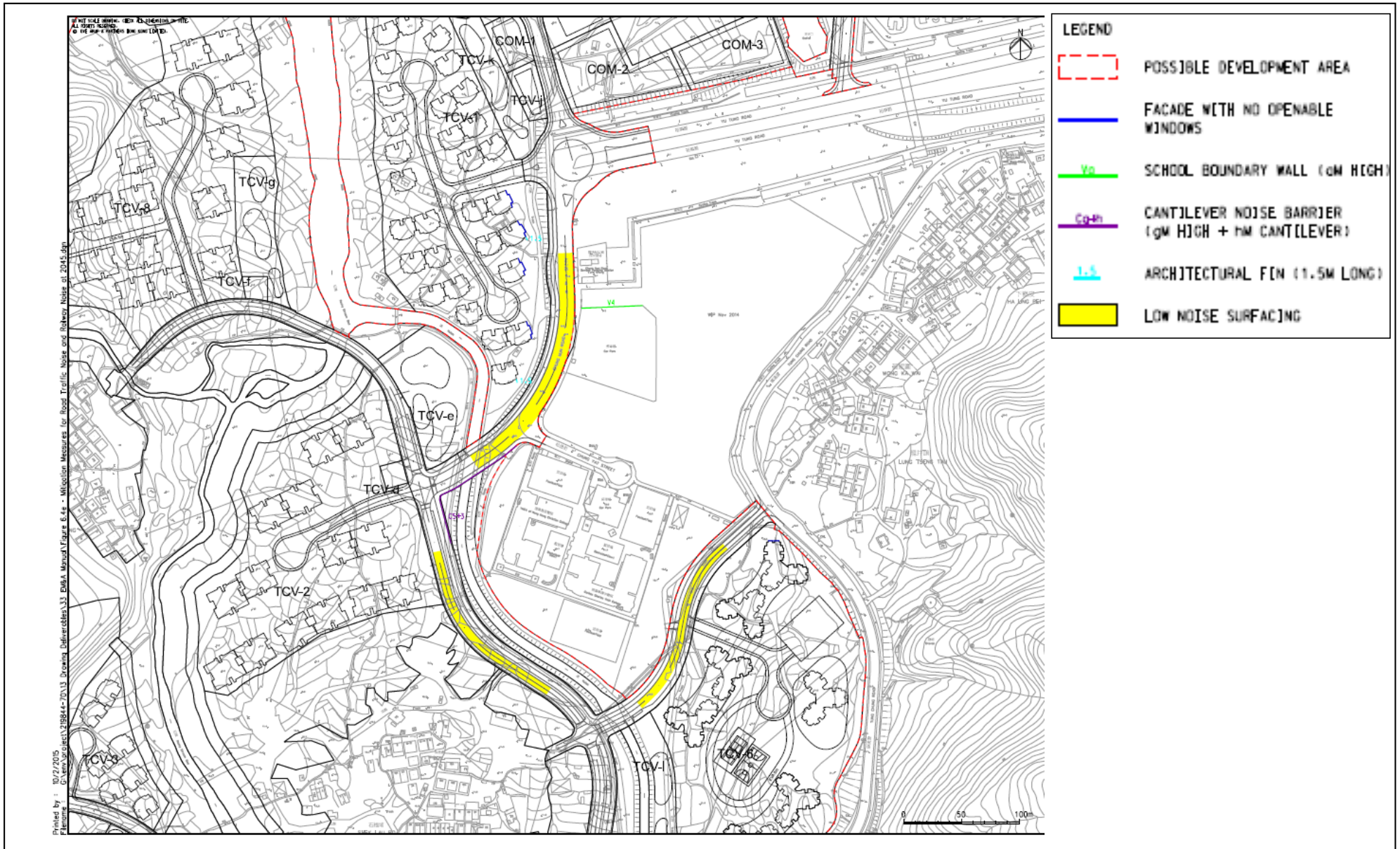


Figure 6.4e

Mitigation Measures for Road Traffic Noise and Railway Noise at 2045 (Sheet 6 of 6)

Zoning	Location	Type of Mitigation Measures ^[1] ^[2] ^[3]
-	Along Road L30	Approx. 160m long LNRS

Notes:

[1] Details are shown in *Figure 6.1*.

[2] LNRS – Low Noise Road Surfacing Materials.

[3] An environmental review may be conducted in due course to study how the use of new road surfacing material could help reduce traffic noise impacts and minimise the scale/extent of the proposed noise mitigation measures.

Table 6.1b *Extents and Locations of Proposed Mitigation Measures at 2025*

Zoning	Location	Type of Mitigation Measures ^[1] ^[2] ^[3]
TCE		
B1-1	Facade of residential block	Facade with no openable window
B1-1	Facade of residential block	1.5m long architectural fin
B1-2	Facade of residential block	Facade with no openable window
B1-2	Facade of residential block	1.5m long architectural fin
D0-3	Along Road L3	Approx. 60m long, 5m high school boundary wall
D0-4	Along Road L3	Approx. 70m long, 5m high school boundary wall with 3m cantilevered arm at 45°
D1-1	Facade of residential block	Facade with no openable window
D1-2	Facade of residential block	Facade with no openable window
D2-3	Facade of residential block	Facade with no openable window
D2-4	Facade of residential block	Facade with no openable window
D2-4	Facade of residential block	1.5m long architectural fin
TCW		
TCV-6	Facade of residential block	Facade with no openable window
-	Possible School Development near Tung Chung Area 39	Approx. 50m long, 4m high school boundary wall
-	Corner at junction between Chung Mun Road and Road L24	Approx. 120m long, 5m high vertical barrier with 3m cantilevered arm at 45°
-	Along Chung Mun Road	Approx. 210m long LNRS
-	Along Road L24	Approx. 160m long LNRS
-	Along Road L30	Approx. 160m long LNRS

Notes:

[1] Details are shown in *Figure 6.2*.

[2] LNRS – Low Noise Road Surface Materials.

[3] An environmental review may be conducted in due course to study how the use of new road surfacing material could help reduce traffic noise impacts and minimise the scale/extent of the proposed noise mitigation measures.

Table 6.1c *Extents and Locations of Proposed Mitigation Measures at 2027*

Zoning	Location	Type of Mitigation Measures ^[1] ^[2] ^[3]
TCE		
A1-1	Facade of residential block	Facade with no openable window
A1-1	Facade of residential block	1.8m long architectural fin
A1-2	Facade of residential block	Facade with no openable window
A1-2	Facade of residential block	1.8m long architectural fin
A2-1	Facade of residential block	Facade with no openable window
A2-1	Facade of residential block	1.5m long architectural fin
A2-1	Facade of residential block	1.8m long architectural fin
A2-2	Facade of residential block	Facade with no openable window
A2-3	Facade of residential block	Facade with no openable window
A2-4	Facade of residential block	Facade with no openable window

Zoning	Location	Type of Mitigation Measures ^[1] ^[2] ^[3]
A2-4	Facade of residential block	1.5m long architectural fin
A2-4	Facade of residential block	1.8m long architectural fin
B1-1	Facade of residential block	Facade with no openable window
B1-1	Facade of residential block	1.5m long architectural fin
B1-2	Facade of residential block	Facade with no openable window
B1-2	Facade of residential block	1.5m long architectural fin
D0-3	Along Road L3	Approx. 60m long, 5m high school boundary wall
D0-4	Along Road L3	Approx. 70m long, 5m high school boundary wall with 3m cantilevered arm at 45°
D1-1	Facade of residential block	Facade with no openable window
D1-2	Facade of residential block	Facade with no openable window
D2-3	Facade of residential block	Facade with no openable window
D2-4	Facade of residential block	Facade with no openable window
D2-4	Facade of residential block	1.5m long architectural fin
TCW		
TCV-6	Facade of residential block	Facade with no openable window
-	Possible School Development near Tung Chung Area 39	Approx. 50m long, 4m high school boundary wall
-	Corner at junction between Chung Mun Road and Road L24	Approx. 120m long, 5m high vertical barrier with 3m cantilevered arm at 45°
-	Along Chung Mun Road	Approx. 210m long LNRS
-	Along Road L24	Approx. 160m long LNRS
-	Along Road L30	Approx. 160m long LNRS

Notes:

[1] Details are shown in *Figure 6.3*.

[2] LNRS – Low Noise Road Surface Materials.

[3] An environmental review may be conducted in due course to study how the use of new road surfacing material could help reduce traffic noise impacts and minimise the scale/extent of the proposed noise mitigation measures.

Table 6.1d *Extents and Locations of Proposed Mitigation Measures at 2045*

Zoning	Location	Type of Mitigation Measures ^[1] ^[2] ^[3]
TCE		
A1-1	Facade of residential block	Facade with no openable window
A1-1	Facade of residential block	1.8m long architectural fin
A1-2	Facade of residential block	Facade with no openable window
A1-2	Facade of residential block	1.8m long architectural fin
A2-1	Facade of residential block	Facade with no openable window
A2-1	Facade of residential block	1.5m long architectural fin
A2-1	Facade of residential block	1.8m long architectural fin
A2-2	Facade of residential block	Facade with no openable window
A2-3	Facade of residential block	Facade with no openable window
A2-4	Facade of residential block	Facade with no openable window
A2-4	Facade of residential block	1.5m long architectural fin
A2-4	Facade of residential block	1.8m long architectural fin
A2-4	Along Road D3	Approx. 100m long, 5m high absorptive vertical barrier
B1-1	Facade of residential block	Facade with no openable window
B1-1	Facade of residential block	1.5m long architectural fin
B1-2	Facade of residential block	Facade with no openable window
B1-2	Facade of residential block	1.5m long architectural fin
C1-1	Facade of residential block	Facade with no openable window
C1-1	Facade of residential block	1.5m long architectural fin
C1-1	Facade of residential block	1.8m long architectural fin

Zoning	Location	Type of Mitigation Measures ^[1] ^[2] ^[3]
C1-1	Along Road L7	Approx. 50m long, 5m high absorptive vertical barrier with 3m cantilevered arm at 45°
C2-1	Facade of residential block	Facade with no openable window
C2-2	Facade of residential block	Facade with no openable window
D0-3	Along Road L3	Approx. 60m long, 5m high school boundary wall
D0-4	Along Road L3	Approx. 70m long, 5m high school boundary wall with 3m cantilevered arm at 45°
D1-1	Facade of residential block	Facade with no openable window
D1-2	Facade of residential block	Facade with no openable window
D2-3	Facade of residential block	Facade with no openable window
D2-4	Facade of residential block	Facade with no openable window
D2-4	Facade of residential block	1.5m long architectural fin
E0-1	Along Road L2	Approx. 80m long, 4m high school boundary wall
E0-3	Along Road L2	Approx. 40m long, 3m high school boundary wall
E1-4	Facade of residential block	Facade with no openable window
E1-5	Facade of residential block	Facade with no openable window
TCW		
TCV-1	Facade of residential block	Facade with no openable window
TCV-1	Facade of residential block	1.5m long architectural fin
TCV-6	Facade of residential block	Facade with no openable window
-	Possible School Development near Tung Chung Area 39	Approx. 50m long, 4m high school boundary wall
-	Corner at junction between Chung Mun Road and Road L24	Approx. 120m long, 5m high vertical barrier with 3m cantilevered arm at 45°
-	Along Chung Mun Road	Approx. 210m long LNRS
-	Along Road L24	Approx. 160m long LNRS
-	Along Road L30	Approx. 160m long LNRS

Notes:

[1] Details are shown in *Figure 6.4*.

[2] LNRS – Low Noise Road Surface Materials.

[3] An environmental review may be conducted in due course to study how the use of new road surfacing material could help reduce traffic noise impacts and minimise the scale/extent of the proposed noise mitigation measures.

Apart from the proposed noise mitigation measures, it should be noted the design and layout of the new town extension have also proactively located some commercial buildings between residential buildings and NLH to provide noise screening. This helps to avoid traffic noise impacts from NLH as much as practicable at the outlet.

Fixed Noise

For the proposed noise sources which are located near to existing and planned NSRs, the following tentative noise mitigation measures shall be considered:

- All the pumps should be enclosed inside building structures;
- Proper selection of quiet plant to reduce the tonality at NSRs;
- Installation of silencer / acoustic enclosure / acoustic louvers for the

exhaust of ventilation system.

- For underground train stations, sound attenuators with sufficient attenuations can be installed to the ventilation shafts.
- Openings of ventilation system should be located away from NSRs.

6.3 NOISE MONITORING PARAMETERS

6.3.1 Noise Monitoring Parameter for Construction Phase

Construction noise level shall be measured in terms of the A-weighted equivalent continuous sound pressure level (L_{eq}). $L_{eq(30min)}$ shall be used as the monitoring parameter for the time period between 0700 and 1900 hours on normal weekdays. For all other time periods, $L_{eq(5min)}$ shall be employed for comparison with the Noise Control Ordinance (NCO) criteria. A sample data sheet is shown in *Appendix 6.1*.

As supplementary information for data auditing, statistical results such as L_{10} and L_{90} shall also be obtained for reference.

6.3.2 Noise Monitoring Parameter for Operational Phase

The traffic noise level shall be measured twice within the first year of the road opening. Measurement shall be made in terms of A-weighted L_{10} over three half-hour periods during the peak traffic hour. Other metrics like L_{eq} may be added as seen fit.

As supplementary information for data auditing, statistical results such as L_{10} and L_{90} shall also be obtained for reference.

6.4 MONITORING EQUIPMENT

6.4.1 Monitoring Equipment for Construction and Operational Phase

As referred to in the Technical Memorandum (TM) issued under the NCO, sound level meters in compliance with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications shall be used for carrying out the noise monitoring. Immediately prior to and following each noise measurement, the accuracy of the sound level meter shall be checked using an acoustic calibrator generating a known sound pressure level at a known frequency. Measurements may be accepted as valid only if the calibration level from before and after the noise measurement agrees to within 1.0 dB.

Noise measurements should be made in accordance with standard acoustical principles and practices in relation to weather conditions.

The ET is responsible for the provision, installation, operation, maintenance, dismantle of the monitoring equipment. He shall ensure that sufficient noise

measuring equipment and associated instrumentation are available for carrying out the baseline monitoring, regular impact monitoring and ad hoc monitoring. All the equipment and associated instrumentation shall be clearly labelled.

6.5 MONITORING LOCATIONS

6.5.1 Monitoring Locations for Construction Phase

The most representative and affected NSRs were selected as monitoring stations and details could be referred to EIA Report. The locations of construction airborne noise monitoring stations are summarised in *Table 6.2* below and shown in *Figures 6.5, 6.5a – 6.5d*.

Table 6.2 Proposed Construction Noise Monitoring Locations

ID	NSR ID	Description
Tung Chung East		
NMS-CA-1	B1-2-04	Residential premise in Tung Chung East
NMS-CA-2	F0-3-01	School in Tung Chung East
NMS-CA-3	PSc-001	School in the reclamation area next to Tung Chung East
NMS-CA-4	A56-004	Residential premise in the reclamation area next to Tung Chung East
Tung Chung West		
NMS-CA-5	MWC-003	Village house in Ma Wan Chung
NMS-CA-6	SMK-003	Village house in Shek Mun Kap
NMS-CA-7	Esc-006	YMCA of Hong Kong Christian College
NMS-CA-8	Esc-003	Caritas Charles Vath College
NMS-CA-9	PSc-004	Possible school development near Tung Chung Area 39

The ET shall select the monitoring locations from the above table based on the locations of the construction activities and seek approval from ER and agreement from the IEC and EPD to the proposal. The monitoring locations should be chosen based on the following criteria:

- At locations close to the major site activities which are likely to have noise impacts;
- Close to the most affected existing noise sensitive receivers; and
- For monitoring locations located in the vicinity of the sensitive receivers, care should be taken to cause minimal disturbance to the occupants during monitoring.

The monitoring station shall normally be at a point 1 m from the exterior of the sensitive receiver building facade and be at a position 1.2 m above the ground. If there is problem with access to the normal monitoring position, an alternative position may be chosen, and a correction to the measurements shall be made. For reference, a correction of +3 dB(A) shall be made to the free field measurements. The ET shall agree with the IEC on the monitoring position and the corrections adopted. Once the positions for the monitoring

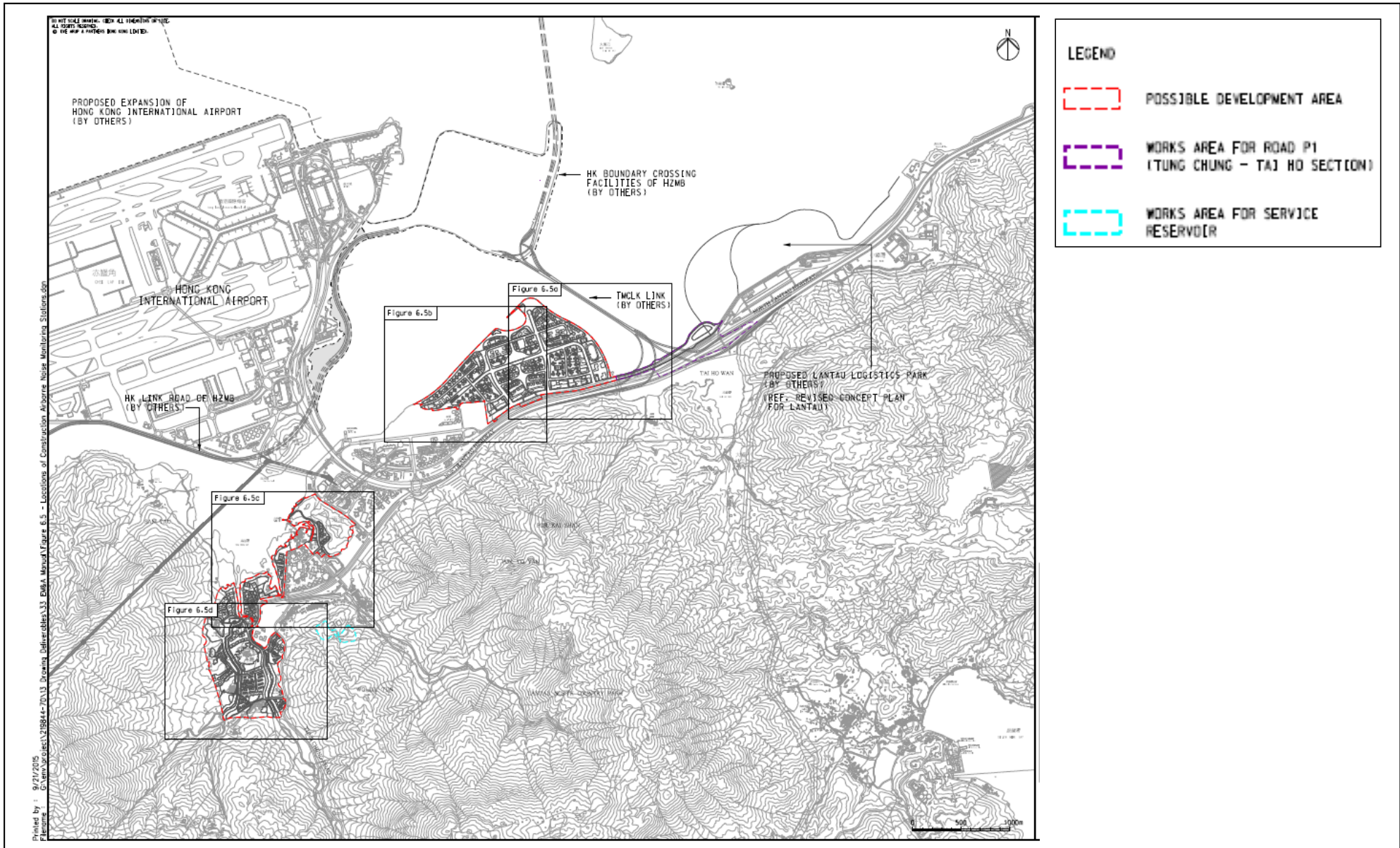


Figure 6.5

Locations of Construction Airborne Noise Monitoring Stations (Sheet 1 of 5)

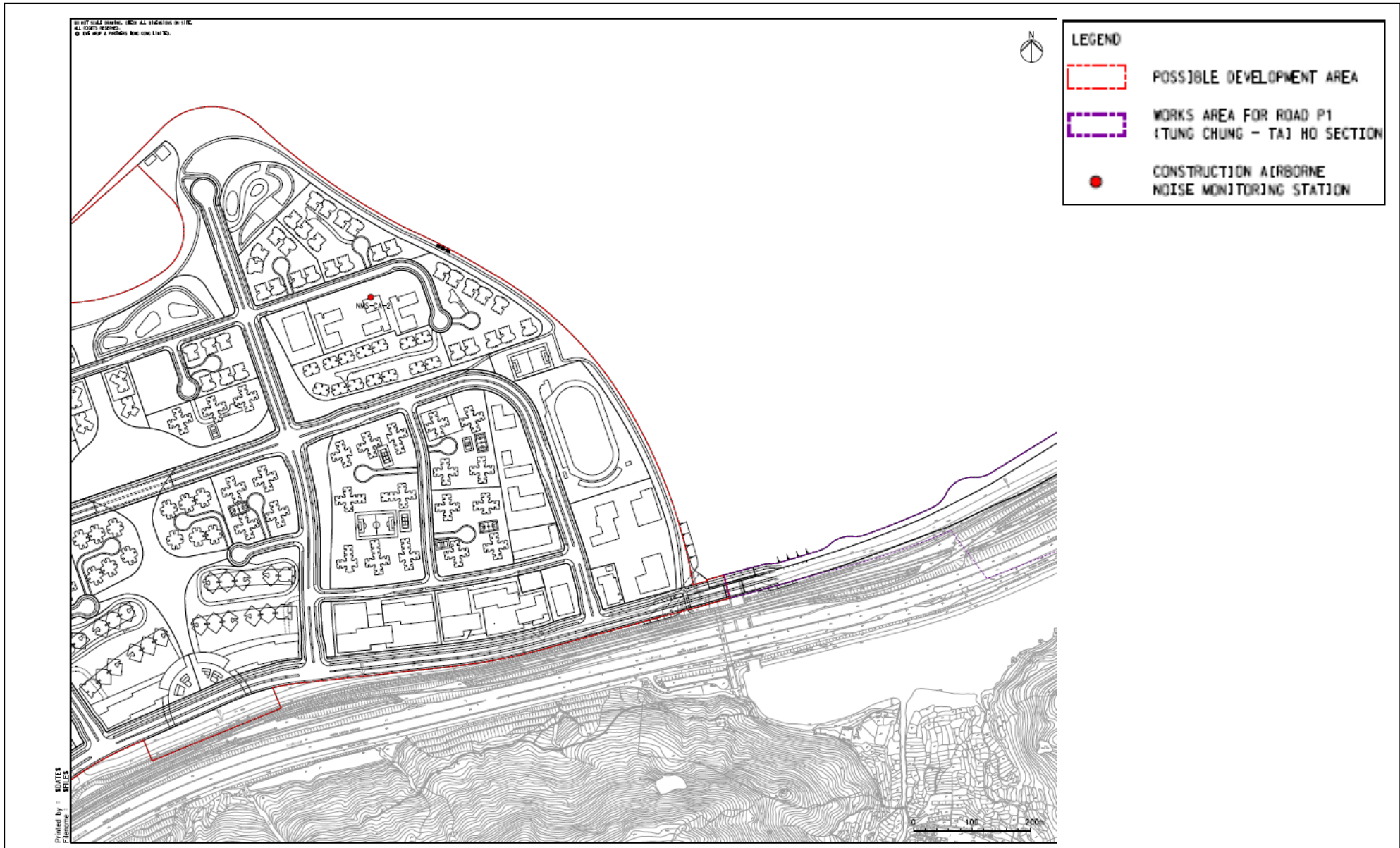


Figure 6.5a

Locations of Construction Airborne Noise Monitoring Stations (Sheet 2 of 5)

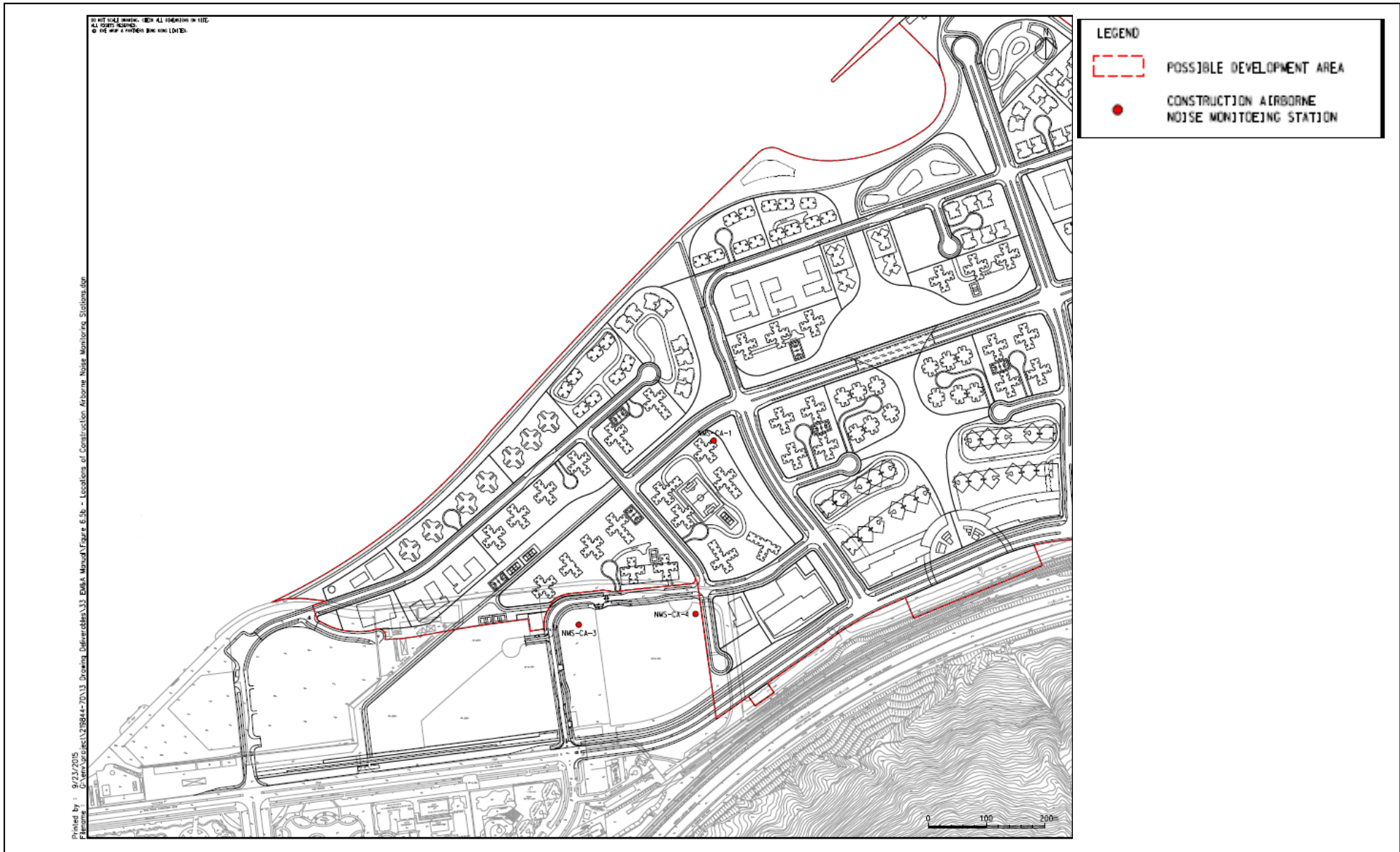
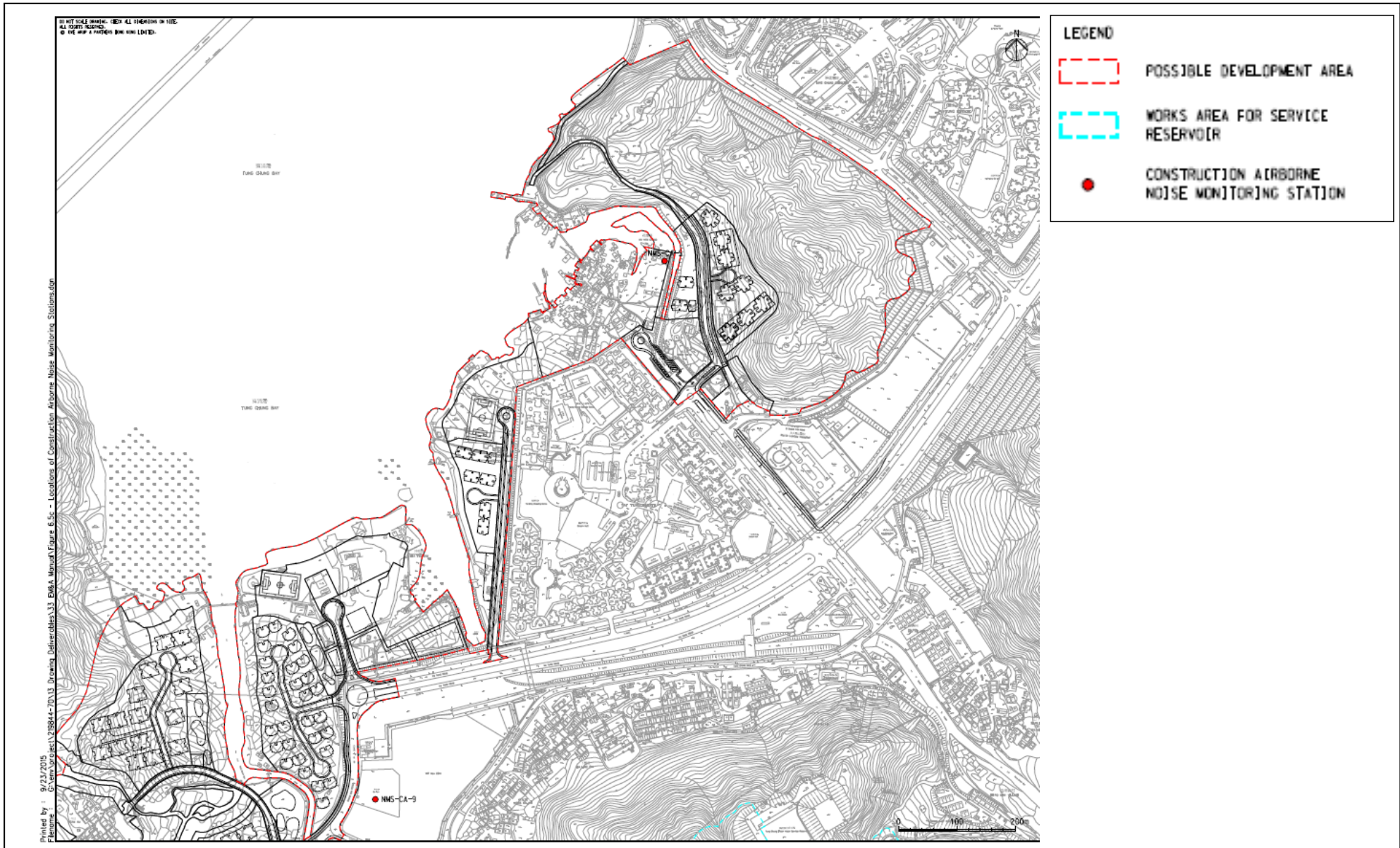


Figure 6.5b

Locations of Construction Airborne Noise Monitoring Stations (Sheet 3 of 5)



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Figure 6.5c

Locations of Construction Airborne Noise Monitoring Stations (Sheet 4 of 5)

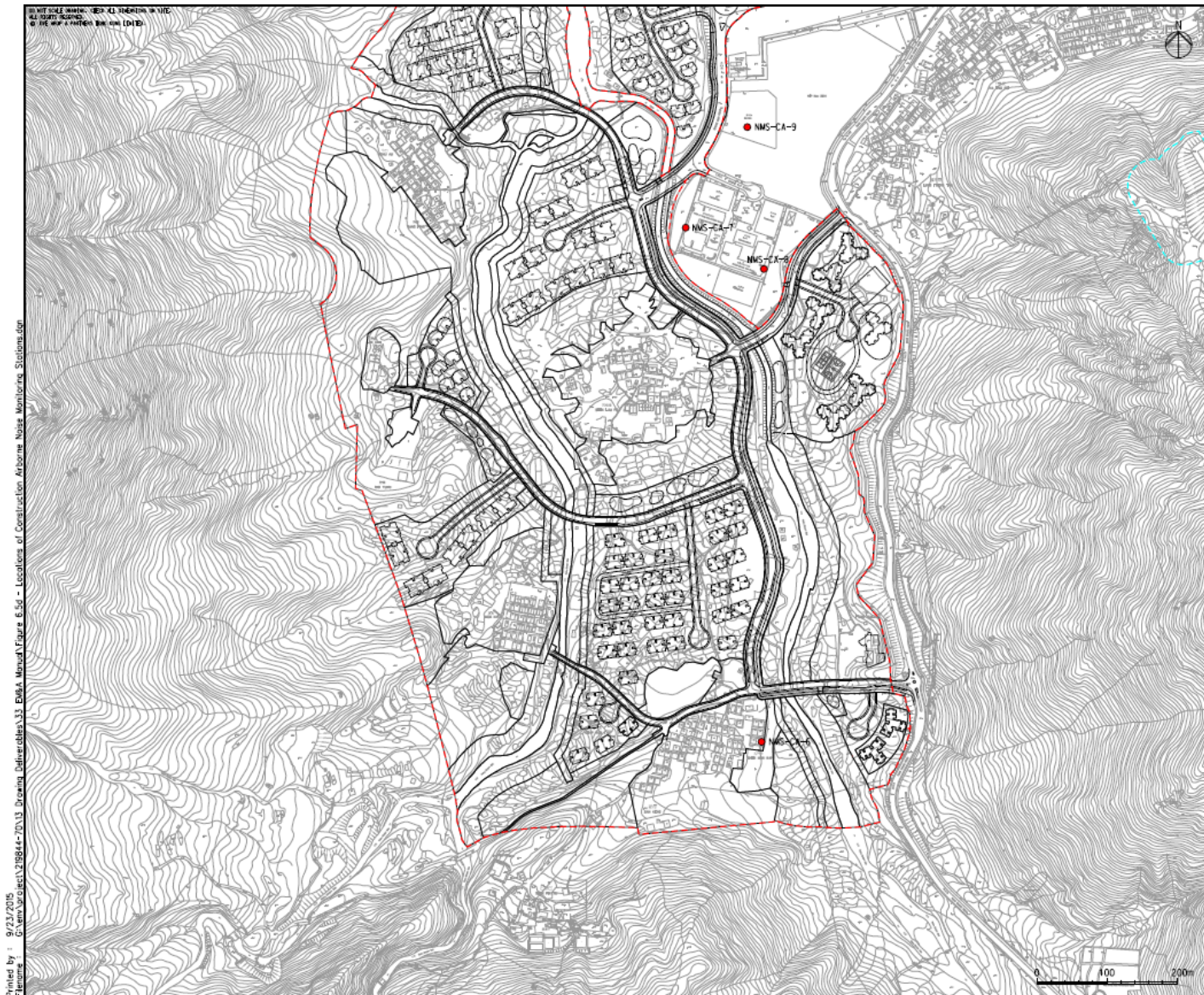


Figure 6.5d

Locations of Construction Airborne Noise Monitoring Stations (Sheet 5 of 5)

stations are chosen, the baseline monitoring and the impact monitoring shall be carried out at the same positions.

The ET may, depending on site conditions and monitoring results, decide whether additional monitoring locations shall be included or any monitoring locations could be removed / relocated during any stage of the construction phase.

6.5.2 *Monitoring Locations for Operational Phase*

The locations of road traffic noise monitoring stations after final population intake are summarised in *Table 6.3* below and shown in *Figures 6.6 and 6.6a*.

Table 6.3 *Proposed Road Traffic Noise Monitoring Locations*

ID	NSR ID	Description
Tung Chung East		
NMS-OA-1	A1-1-04a	Residential premise in Tung Chung East
NMS-OA-2	A1-2-04l	Residential premise in Tung Chung East
NMS-OA-3	D0-4-02	School in Tung Chung East
Tung Chung West		
NMS-OA-5	TCV-1-11a	Residential premise in Tung Chung West
NMS-OA-6	TCV-6-03	Residential premise in Tung Chung West
NMS-OA-7	ESc-003	Caritas Charles Vath College

The ET shall select the monitoring location and seek approval from ER and agreement from the IEC and EPD to the proposal. The ER/IEC/EPD may also request a closer locations based on on-site conditions and environmental complaint. The monitoring locations should be chosen based on the following criteria:

- At locations close to the noise mitigation measures such as noise barriers;
- Close to the most affected existing noise sensitive receivers; and
- For monitoring locations located in the vicinity of the sensitive receivers, care should be taken to cause minimal disturbance to the occupants during monitoring.

The monitoring station shall normally be at a point 1 m from the exterior of the sensitive receiver building facade and be at a position 1.2 m above the ground. If there is problem with access to the normal monitoring position, an alternative position may be chosen, and a correction to the measurements shall be made. For reference, a correction of +3 dB(A) shall be made to the free field measurements. The ET shall agree with the IEC on the monitoring position and the corrections adopted.

Legend

- Proposed Area for Tung Chung New Town Extension (East)
- Tuen Mun – Chek Lap Kok Link (TM-CLKL)
- Traffic Noise Monitoring Station

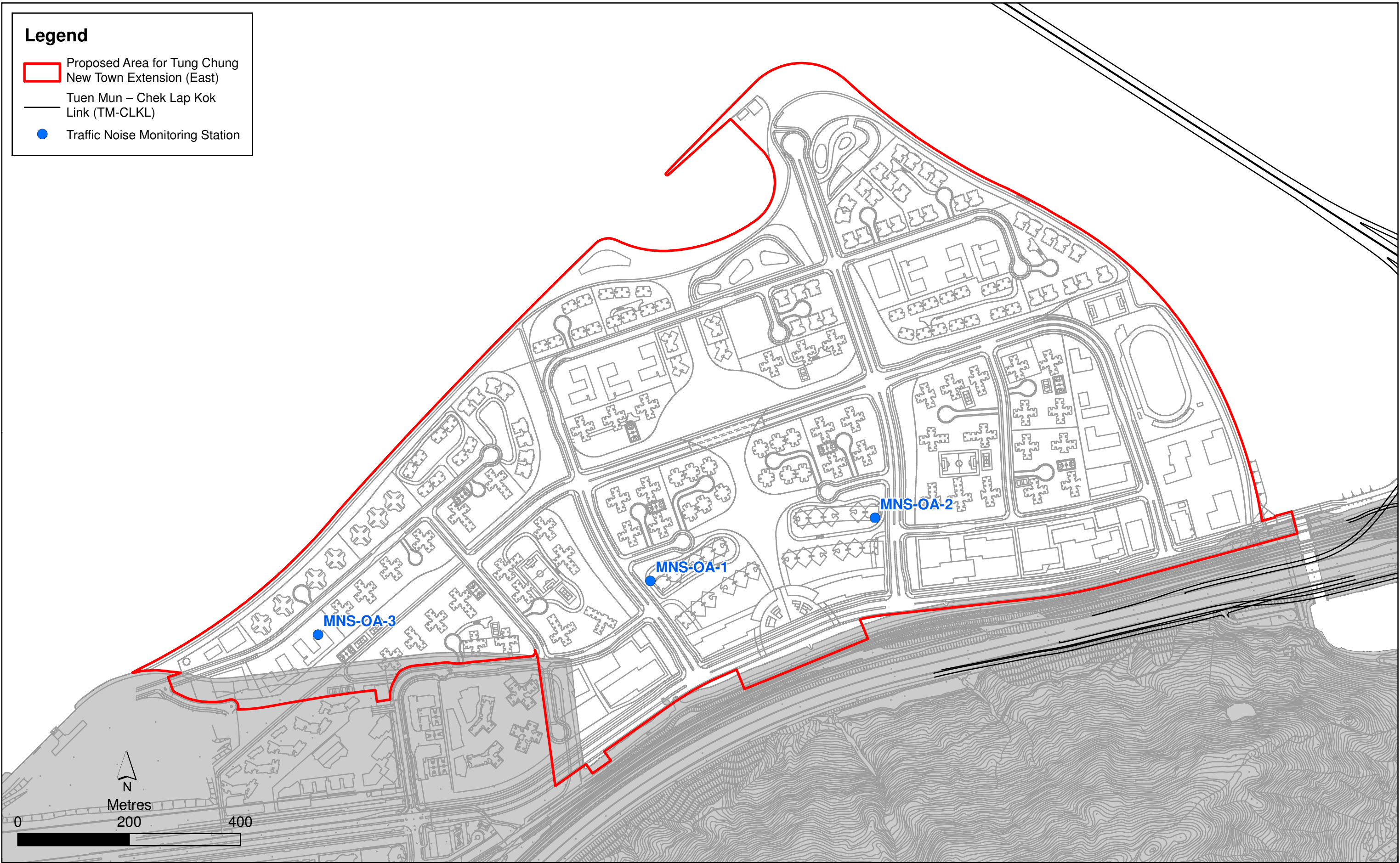


Figure 6.6

Traffic Noise Monitoring Station Locations

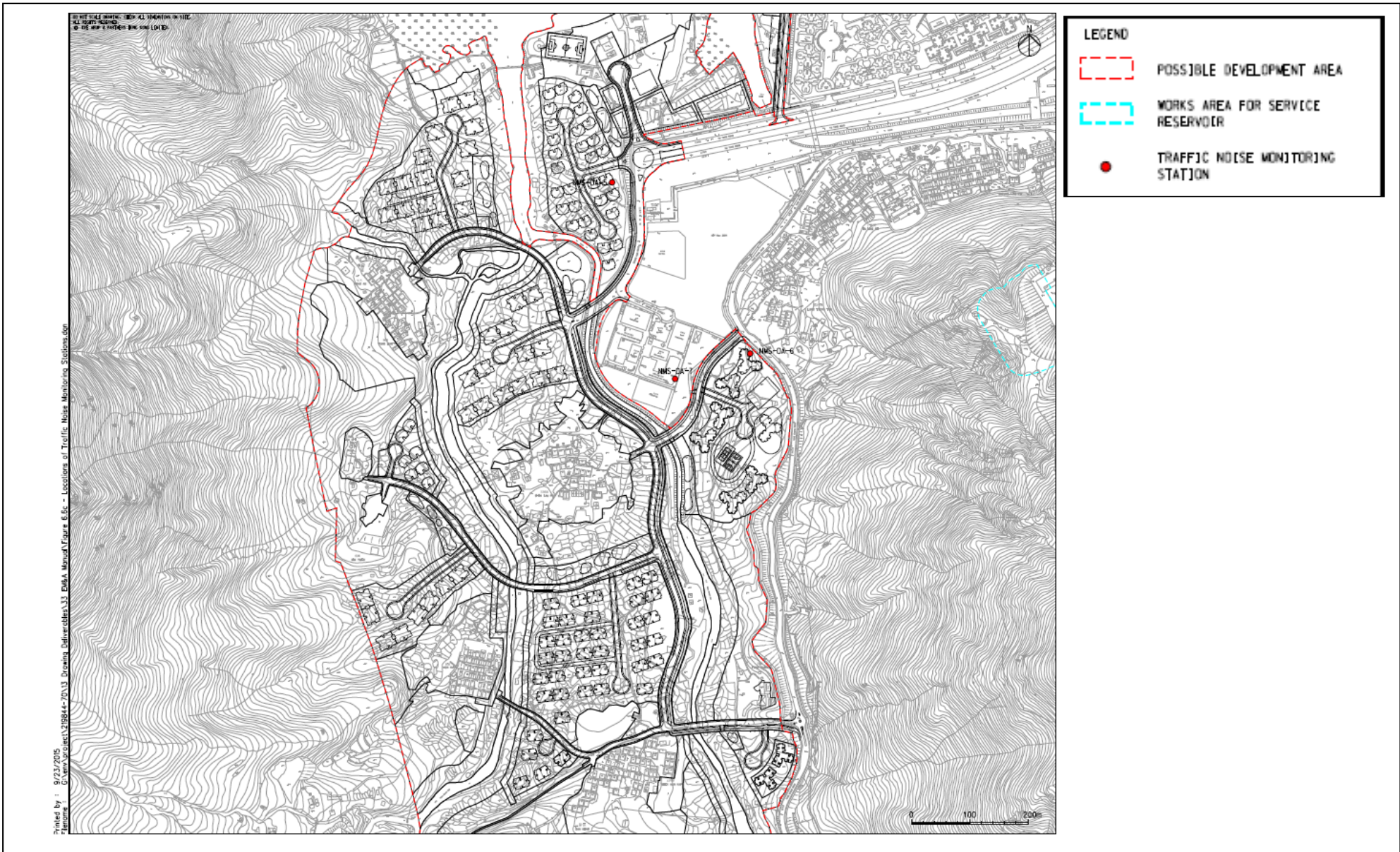


Figure 6.6a

Locations of Traffic Noise Monitoring Stations at Tung Chung West

6.6 **BASELINE MONITORING**

The ET shall carry out baseline noise monitoring prior to the commencement of the construction works at TCE and TCW, respectively, at the monitoring locations proposed in *Section 6.5*. There shall not be any construction activities in the vicinity of the stations during the baseline monitoring. Continuous baseline noise monitoring for the A-weighted levels L_{eq} , L_{10} and L_{90} shall be carried out daily for a period of at least two weeks in a sample period interval of 5 minutes or 30 minutes between 0700 and 1900, and 5 minutes between 1900 and 0700. A schedule on the baseline monitoring shall be submitted to the ER and IEC for approval before the monitoring starts.

In exceptional cases, when insufficient baseline monitoring data or questionable results are obtained, the ET shall liaise with the IEC and EPD to agree on an appropriate set of data to be used as a baseline reference and submit to the ER for approval.

6.6.1 **Proposal of Alternative Monitoring Stations for Tung Chung East Baseline Monitoring**

It should be noted that locations NMS-CA-1 and NMS-CA-2 (*Table 6.2*) are located at the reclaimed land of TCE, which is currently not available for baseline monitoring. As such, two alternative locations NMS-CA-1A and NMS-CA-2A are proposed, approved by the ER and agreed by the IEC to be conducted for the baseline monitoring (see *Table 6.4* and *Figure 6.7*). The alternative locations are proposed based on the criteria as stated in *Section 6.5.1*. In summary, the baseline monitoring for TCE will be carried out at four monitoring locations (NMS-CA-1A, NMS-CA-2A, NMS-CA-3 and NMS-CA-4) prior to the commencement of the construction works at TCE.

Table 6.4 *Alternative Construction Noise Monitoring Locations*

ID	Location
NMS-CA-1A	Residential premise near Tung Chung East
NMS-CA-2A	Pak Mong Pier




6.7 **IMPACT MONITORING**

6.7.1 **Impact Monitoring for Construction Phase**

During normal construction working hour (0700-1900 Monday to Saturday), monitoring of $L_{eq, (30min)}$ noise levels (as six consecutive $L_{eq, (5min)}$ readings) shall be carried out at the agreed monitoring locations once every week in accordance with the methodology in the TM. Noise measurement shall not be made in the presence of fog, rain, wind with a steady speed exceeding 5m/s or wind with gusts exceeding 10m/s.

In case of non-compliance with the construction noise criteria, more frequent monitoring, as specified in the Action Plan, shall be carried out. This

Legend

-  Proposed Area for Tung Chung New Town Extension (East)
-  Tuen Mun – Chek Lap Kok Link (TM-CLKL)
-  Construction Airborne Noise Monitoring Station

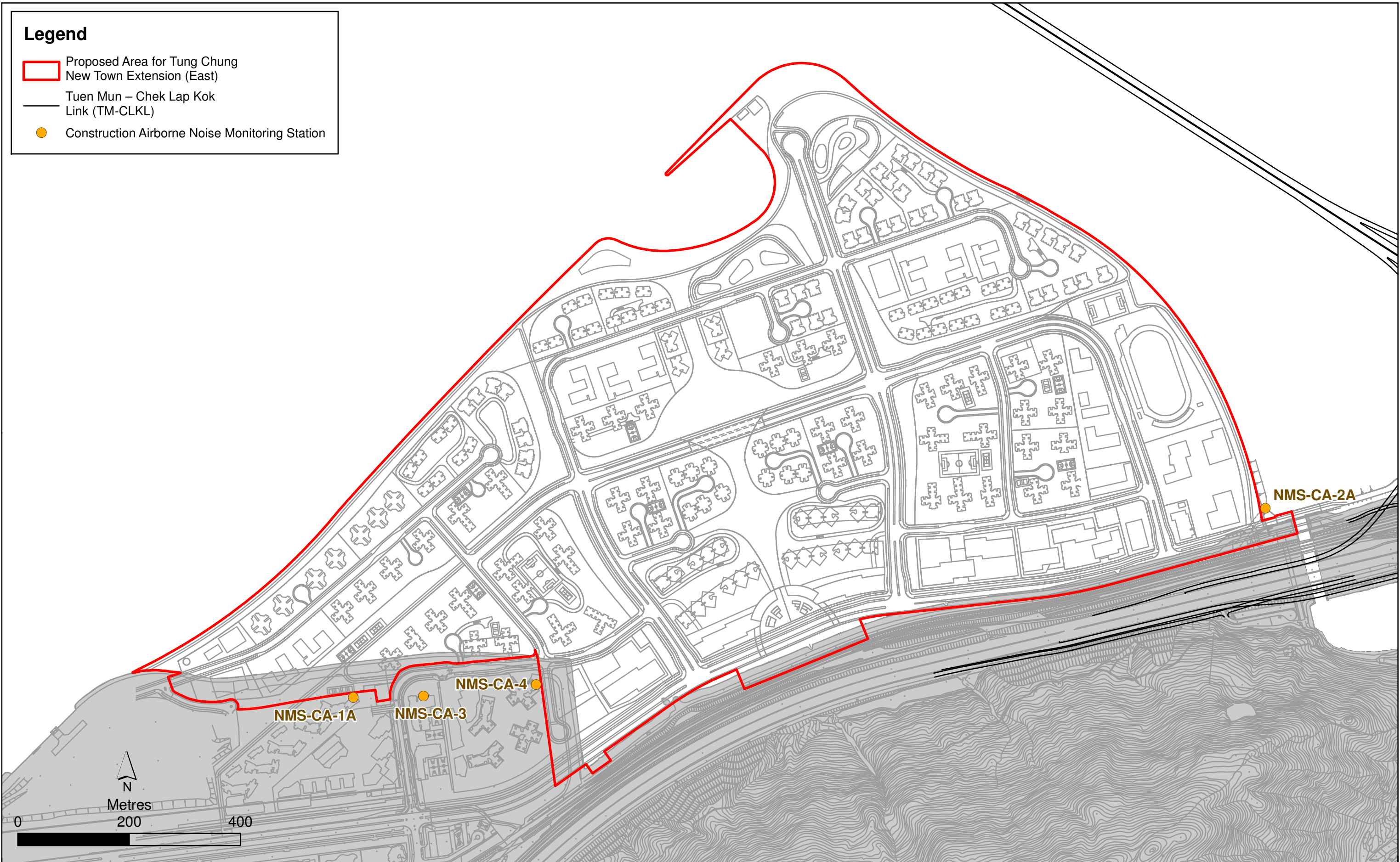


Figure 6.7

Construction Airborne Noise Monitoring Station Locations

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additional monitoring shall be continued until the recorded noise levels are rectified or proved to be irrelevant to the construction activities.

A schedule on the compliance monitoring shall be submitted to the ER and IEC for approval before the monitoring starts.

6.7.2 *Impact Monitoring for Road Traffic Noise during Operational Phase*

The ET should prepare and deposit to EPD, at least 6 months before the operation of the proposed roads under the Project, a monitoring plan for the purpose of assessing the accuracy of traffic noise predictions by comparing the noise impact predictions with the actual impacts. The monitoring plan should contain monitoring locations, monitoring schedules, methodology of noise monitoring including noise measurement procedures, traffic counts and speed checks, and methodology of comparison with the predicted levels. The ET should implement the monitoring plan in accordance with the deposited monitoring plan unless with prior justifications. Monitoring details and results including the comparison between the measured noise levels and the predicted levels should be recorded in a report to be deposited with EPD within one month of the completion of the monitoring. The report should be certified by the ET Leader before deposit with EPD.

Traffic noise monitoring shall be carried out at all the designated traffic noise monitoring stations. The following is an initial guide on the traffic noise monitoring requirements during the operational phase:

- two sets of measurements at the morning traffic peak hour on normal days;
- one set of measurement at the morning traffic peak hour on festival days;
- a concurrent census of traffic flow and percentage heavy vehicles shall be conducted for the Project Road and the existing road network in the vicinity of each measurement points;
- average vehicle speed estimated for Project Road and the existing road network in the vicinity of each measuring points; and
- the three sets of monitoring data shall be obtained within the first year of operation.

Measured noise levels shall be compared with the predicted noise levels by applying appropriate conversion corrections to allow for the traffic conditions at the time of measurement.

6.7.3 *Fixed Noise Commissioning Test*

The maximum allowable sound power levels of the identified fixed noise sources have been predicted in the EIA report. The Contractor should implement and refine the specified sound power levels as appropriate to

ensure compliances with the noise standards stipulated in the TM-EIAO and NCO for the fixed plant operations.

The Contractor should also carry out a noise commissioning test for all fixed noise sources before operation of the Project, in order to ensure compliance of the noise levels with the TM's stipulated noise standard.

6.8 ACTION AND LIMIT LEVELS

The ET shall compare the construction noise monitoring results with noise criteria. Table 6.5 shows the noise criteria, namely Action and Limit Levels to be used.

Table 6.5 *Action and Limit Levels for Construction Noise*

Time Period	Action Level	Limit Level
0700 - 1900 hours on normal weekdays	When one documented complaint is received	75 dB(A) *

Notes:

If works are to be carried out during restricted hours, the conditions stipulated in the construction noise permit issued by the Noise Control Authority have to be followed.

* Reduce to 70 dB(A) for schools and 65 dB(A) during school examination periods.

6.9 EVENT AND ACTION PLAN

Should non-compliance of the noise criteria occur, actions in accordance with the Action Plan in Table 6.6 shall be carried out.

For traffic noise, the measured / monitored noise levels shall be compared with the predicted results and the predicted traffic flow conditions (calculated noise levels based on concurrent traffic census obtained). In case discrepancies are observed, explanation shall be given to justify the discrepancies.

Table 6.6 *Event and Action Plan for Construction Noise*

Event	Action			
	ET	IEC	ER	Contractor
Action Level Exceedance	<ol style="list-style-type: none"> 1. Notify IEC, ER and Contractor; 2. Carry out investigation; 3. Report the results of investigation to the IEC, ER and Contractor; 4. Discuss with the Contractor and formulate remedial measures; 5. Increase monitoring frequency to check mitigation effectiveness. 	<ol style="list-style-type: none"> 1. Review the analysed results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; 3. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures are properly implemented 	<ol style="list-style-type: none"> 1. Submit noise mitigation proposals to IEC and ER; 2. Implement noise mitigation proposals.
Limit Level Exceedance	<ol style="list-style-type: none"> 1. Identify source; 2. Inform IEC, ER, EPD and Contractor; 3. Repeat measure-ments to confirm findings; 4. Increase monitoring frequency; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Inform IEC, ER and EPD the causes and actions taken for the exceedances; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractors remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

7 WATER QUALITY IMPACT

7.1 INTRODUCTION

The EIA Report has assessed the water quality impacts associated with the Project. According to the EIA Report, the water quality impact could be minimized with the implementation of mitigation measures. The water quality monitoring programme as discussed below could ensure the implementation of the recommended mitigation measures and provide continue improvements to the environmental conditions.

7.2 MITIGATION MEASURES

The EIA Report has recommended construction phase mitigation measures. All the proposed mitigation measures are summarized in the EMIS in *Appendix 4.1*.

7.3 WATER MONITORING PARAMETERS

The monitoring shall normally be established by measuring the dissolved oxygen (DO), dissolved oxygen saturation (DO%), temperature, turbidity, salinity, pH and suspended solids (SS) in water bodies at all designated locations as specified in *Section 7.6*.

The measurements shall be taken at all designated monitoring stations 3 days per week during construction phase. The interval between two sampling surveys shall not be less than 36 hours.

Two (2) replicate *in-situ* measurements and samples collected from each independent sampling event shall be collected to ensure a robust statistically interpretable database. DO, pH value, salinity, temperature and turbidity should be measured *in-situ* whereas other parameters should be determined by an accredited laboratory.

Other relevant data shall also be recorded, including monitoring location / position, time, water depth, tidal stages, weather conditions and any special phenomena or work underway at the construction site.

7.4 MONITORING EQUIPMENT

7.4.1 *Dissolved Oxygen, Dissolved Oxygen Saturation and Temperature Measuring Equipment*

The dissolved oxygen (DO) measuring instruments should be portable and weatherproof. The equipment should also complete with cable and sensor, and DC power source. It should be capable of measuring:

- A DO level in the range of 0 - 20 mg/L and 0 - 200% saturation; and

- A temperature of 0 – 45 degree Celsius.

The equipment should have a membrane electrode with automatic temperature compensation complete with a cable.

Should salinity compensation not be built-in to the DO equipment, in-situ salinity should be measured to calibrate the DO measuring instruments prior to each measurement.

7.4.2 *Turbidity Measuring Equipment*

The turbidity measuring instruments should be a portable and weatherproof with DC power source. It should have a photoelectric sensor capable of measuring turbidity level between 0 – 1000 NTU (for example, Hach model 2100P or an approved similar instrument).

7.4.3 *Salinity Measuring Equipment*

A portable salinometer capable of measuring salinity in the range of 0 – 40 parts per thousand (ppt) should be provided for measuring salinity of the water at each monitoring location.

7.4.4 *pH Measuring Equipment*

A portable pH meter capable of measuring a pH range between 0.0 and 14.0 shall be provided under the specified conditions (e.g., Orion Model 250A or an approved similar instrument).

7.4.5 *Positioning Equipment*

A hand-held or boat-fixed type digital Differential Global Positioning System (DGPS) with way point bearing indication and Radio Technical Commission for maritime (RTCM) Type 16 error message “screen pop-up” facilities (for real-time auto-display of error messages and DGPS corrections from the Hong Kong Hydrographic Office), or other equipment instrument of similar accuracy, should be provided and used during marine water monitoring to ensure the monitoring vessel is at the correct location before taking measurements.

7.4.6 *Water Depth Detector*

A portable, battery-operated echo sounder should be used for water depths determination at each designated monitoring station. The detector can either be hand held or affixed to the bottom of the work boat, if the same vessel is to be used throughout the monitoring programme.

7.4.7 *Water Sampling Equipment*

A water sampler is required for SS monitoring. It should comprise a transparent PVC cylinder, with a capacity of not less than 2 litres, which can be effectively sealed with latex cups at both ends. The sampler should have a

positive latching system to keep it open and prevent premature closure until released by a messenger when the sampler is at the selected water depth (for example, Kahlsico Water Sampler or an approved similar instrument).

7.4.8 *Sample Containers and Storage*

Water samples for SS should be stored in high density polythene bottles with no preservative added, packed in ice (cooled to 4°C without being frozen) and shipment to the testing laboratory. The samples shall be delivered to the laboratory within 24 hours of collection and be analysed as soon as possible after collection.

7.4.9 *Calibration of In-Situ Instruments*

The pH meter, DO meter and turbidimeter shall be checked and calibrated before use. DO meter and turbidimeter shall be certified by a laboratory accredited under HOKLAS or any other international accreditation scheme, and subsequently re-calibrated at quarterly basis throughout all stages of the water quality monitoring. Responses of sensors and electrodes should be checked with certified standard solutions before each use. Wet bulb calibration for a DO meter shall be carried out before measurement at each monitoring station.

7.4.10 *Back-up Equipment and Vessels*

Sufficient stocks of spare parts shall be maintained for replacements when necessary. Backup monitoring equipment shall also be made available so that monitoring can proceed uninterrupted even when some equipment is under maintenance, calibration, malfunction, etc.

The water quality monitoring will involve four monitoring stations and measurements should be conducted within the prescribed tidal conditions in order to ensure the measurement / samples are representative. A multi-probe monitoring equipment set integrated with water sampler(s) is highly recommended to improve the monitoring efficiency. Depending on the actual operation, more than one field survey vessels might be required simultaneously to ensure the monitoring are conducted within the acceptable monitoring period. The ET shall also consider the use of unattended automatic sampling / monitoring devices at fixed stations where monitoring are required throughout the construction period. The use of such unattended automatic devices, however, shall be subject to the approval of the ER, IEC and EPD.

7.5 *LABORATORY MEASUREMENT/ANALYSIS*

At least 2 replicate samples from each independent sampling event are required for the SS measurement which shall be carried in a HOKLAS or international accredited laboratory. Sufficient water samples shall be collected at the monitoring stations for carrying out the laboratory

measurement and analysis. The laboratory determination work shall start within 24 hours after collection of the water samples. The analysis for suspended solids is presented in *Table 7.1*.

Table 7.1 *Laboratory Analysis*

Parameters	Analytical Method	Reporting Limit
Suspended Solid (SS)	APHA 2540-D	0.5 mg/L

7.6 MONITORING LOCATIONS

Water quality monitoring will be carried out at 7 locations at TCE (TCE-WQM1 to TCE-WQM4, TCE-C1 to TCE-C2) and 5 locations of TCW (TCW-WQM1 to TCE-WQM5) of the inland water of the marine water nearby the project site.

The proposed water quality monitoring locations are shown in *Figure 7.1* and *Figure 7.1a* and listed in *Table 7.2*. The ET shall seek approval from IEC and EPD for any alternative monitoring locations.

Table 7.2 *Locations of Proposed Water Quality Monitoring Stations*

Monitoring Station ID	Description	Easting	Northing
Tung Chung East			
TCE-WQM1	Near Airport Channel	811838	817341
TCE-WQM2a	Marine Park 1	814439	819879
TCE-WQM2b	Marine Park 2	821905	821905
TCE-WQM3	Tai Ho Wan	814845	817676
TCE-WQM4	HKBCF	813344	818849
TCE-C1	Control Station - Outside Airport Channel	804247	815620
TCE-C2	Control Station - Sunny Bay	819460	821473
Tung Chung West			
TCW-WQM1	Downstream of Tung Chung Stream	810784	815710
TCW-WQM2	Middle of Tung Chung Stream	810701	815015
TCW-WQM3	Middle of Tung Chung Stream	811067	815036
TCW-WQM4	Upstream of Tung Chung Stream	810641	814405
TCW-WQM5	Upstream of Tung Chung Stream	811194	814368

7.6.1 Proposal of Alternative Monitoring Location for Tung Chung East

It is proposed and the IEC agreed to relocate monitoring station TCE-WQM3 to TCE-WQM3A (the outlet of Tai Ho Wan) (see *Table 7.3* and *Figure 7.2*) owing to the following reasons:

- Due to the presence of the North Lantau Highway and the vessel draft of the monitoring vessel, it is not practicable to enter station TCE-WQM3 during flood tide in consideration of the vessel operational safety.
- The use of alternative transportation (e.g. speed boat) has been considered, however, it is considered not practicable for both baseline

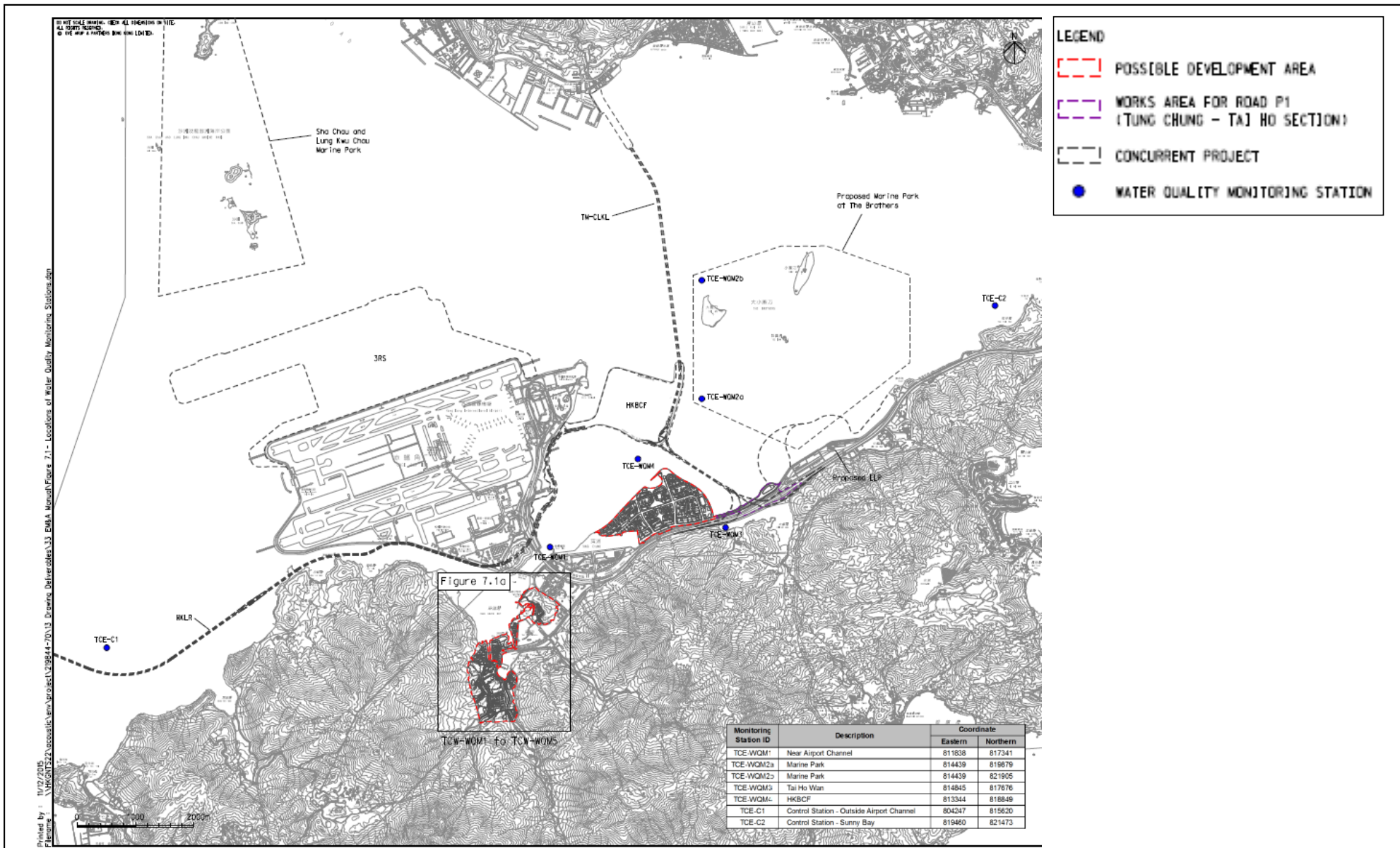
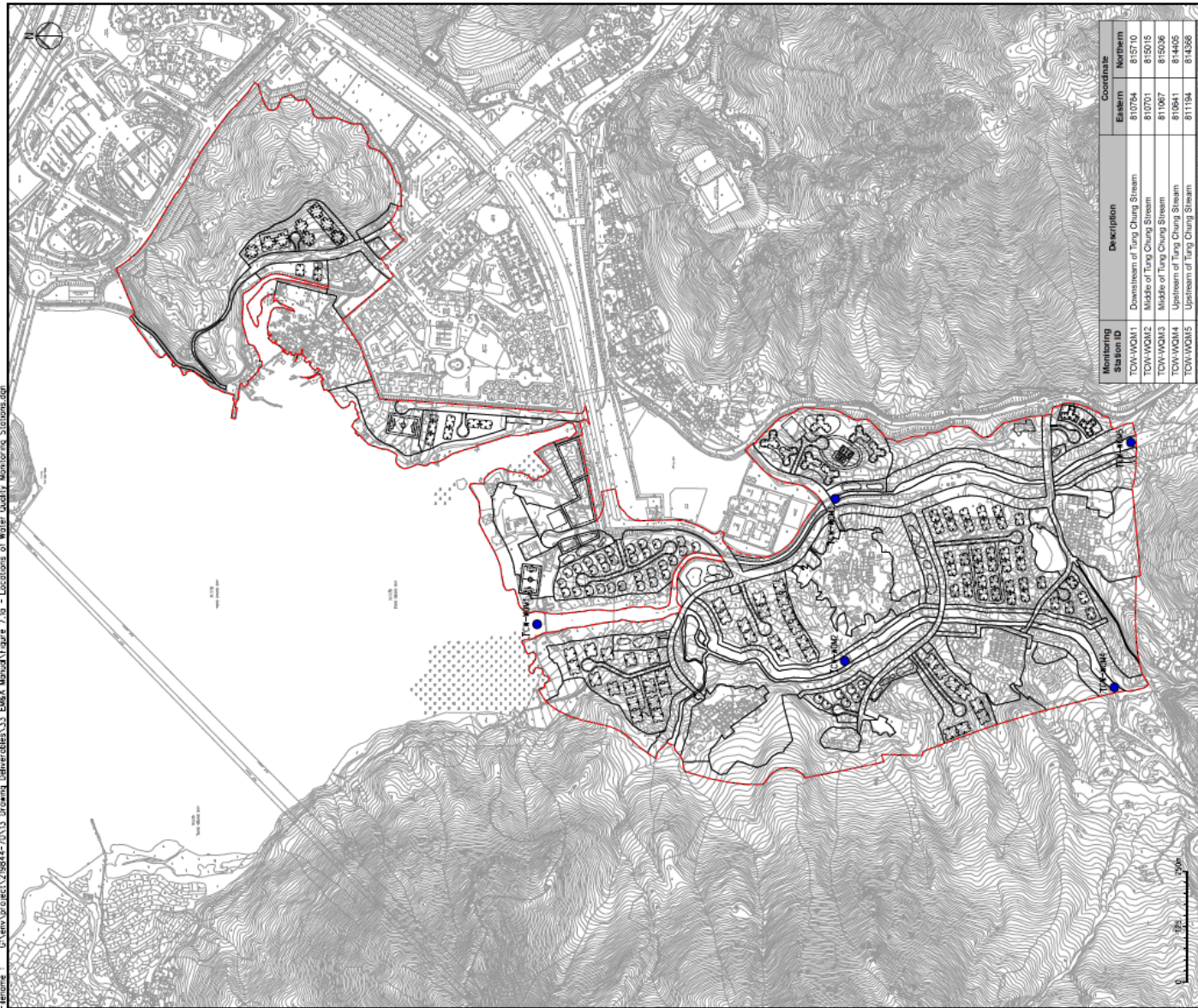


Figure 7.1

Locations of Water Quality Monitoring Stations (Sheet 1 of 2)

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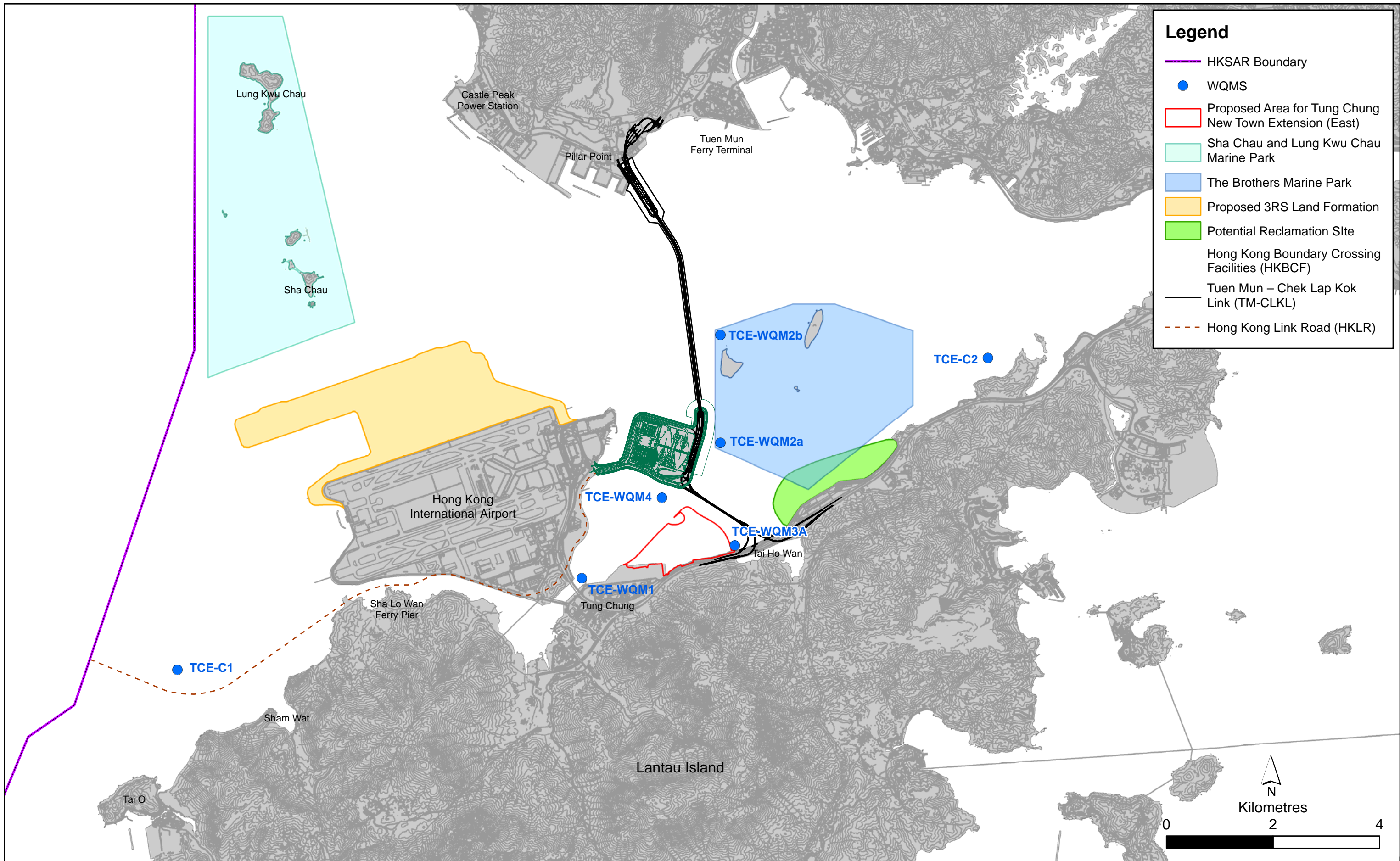
- POSSIBLE DEVELOPMENT AREA
- WATER QUALITY MONITORING STATION

Figure 7.1a

Locations of Water Quality Monitoring Stations (Sheet 2 of 2)

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and impact monitoring considering the health and safety of the monitoring works as a smaller boat / speed boat will have limited space for both labour and equipment. It will also have limited support during adverse weather (e.g. windy, rainy / stormy conditions).

- The relocated station is located at the outlet of Tai Ho Wan, which is closer to the Project and thus it is considered more representative in determining whether there is any potential water quality impact to Tai Ho Wan.

Table 7.3 *Locations of Proposed Alternative Water Quality Monitoring Station*

Monitoring Station ID	Description	Easting	Northing
Tung Chung East			
TCE-WQM3A	Outlet of Tai Ho Wan	814705	817859

Subject to the approval by the EPD on the proposed alternative water quality monitoring station, the water quality monitoring would be conducted at TCE-WQM3A instead of TCE-WQM3 during the baseline and impact monitoring.

7.7 *BASELINE MONITORING*

Baseline conditions for water quality shall be established and agreed with EPD prior to commencement of construction works at TCE and TCW, respectively. The purpose of the baseline monitoring is to establish ambient conditions prior to the commencement of the construction works and to demonstrate the suitability of the proposed impact and control monitoring stations.

The baseline monitoring shall be conducted for at least 4 weeks prior to the commencement of construction works at TCE and TCW. The proposed water quality monitoring schedule shall be submitted to EPD by the ET at least 2 weeks before the first day of the monitoring month. The interval between two sets of monitoring shall not be less than 36 hours. EPD shall also be notified immediately for any changes in schedule.

In general, where the difference in value between the first and second in-situ measurement of DO or turbidity parameters is more than 25% of the value of the first reading, the reading shall be discarded and further readings should be taken.

There should be no construction work in the vicinity of the stations during the baseline monitoring. The baseline data will be used to establish the Action and Limit Levels. The determination of Action and Limit Levels will be discussed in *Section 7.9*.

Table 7.4 below summarizes the proposed monitoring frequency and water quality parameters for baseline monitoring.

Table 7.4 Proposed Water Quality Baseline Monitoring Programme

Item	Baseline Monitoring
Monitoring Period	At least 4 weeks prior to the commencement of construction work
Monitoring Frequency	3 Days in a Week at both mid-ebb and mid-flood tides
Monitoring Locations	TCE: TCE-WQM1, TCE-WQM2a, TCE-WQM2b, TCE-WQM3A, TCE-WQM4, TCE-C1, TCE-C2 TCW: TCW-WQM1, TCW-WQM2, TCW-WQM3, TCW-WQM4, TCW-WQM5
Monitoring Parameters	Dissolved oxygen (DO), dissolved oxygen saturation (DO%), temperature, turbidity, salinity, pH and suspended solids (SS).
Intervals between 2 sets of monitoring	Not less than 36 hours

7.8 IMPACT MONITORING

The impact monitoring shall be conducted during construction period at TCE and TCW, respectively. The purpose of impact monitoring is to ensure the implementation of the recommended mitigation measures, provide effective control of any malpractices, and provide continuous improvements to the environmental conditions. The proposed water quality monitoring schedule shall be submitted to EPD by the ET at least 2 weeks before the first day of the monitoring month. The interval between two sets of monitoring shall not be less than 36 hours. EPD shall also be notified immediately for any changes in schedule.

In general, where the difference in value between the first and second in-situ measurement of DO or turbidity parameters is more than 25% of the value of the first reading, the reading shall be discarded and further readings should be taken.

In case of project-related exceedances of Action and/or Limit Levels, the impact monitoring frequency shall be increased according to the requirement of Event and Action Plan. The details of Event Action Plan will be discussed in Section 7.10.

Table 7.5 below summarises the proposed monitoring frequency and water quality parameters for and impact monitoring.

Table 7.5 Proposed Water Quality Impact Monitoring Programme

Item	Impact Monitoring
Monitoring Period	During entire construction period
Monitoring Frequency	3 Days in a Week at both mid-ebb and mid-flood tides
Monitoring Locations	TCE: TCE-WQM1, TCE-WQM2a, TCE-WQM2b, TCE-WQM3A, TCE-WQM4, TCE-C1, TCE-C2 TCW: TCW-WQM1, TCW-WQM2, TCW-WQM3, TCW-WQM4, TCW-WQM5
Monitoring Parameters	Dissolved oxygen (DO), dissolved oxygen saturation (DO%), temperature, turbidity, salinity, pH and suspended solids (SS).
Intervals between 2 sets of monitoring	Not less than 36 hours

7.9 ACTION AND LIMIT LEVELS

The Action and Limit Levels for water quality are defined in *Table 7.6* below.

Table 7.6 Action and Limit Levels for Water Quality

Parameters	Action Level	Limit Level
DO in mg/L (Surface, Middle & Bottom)	<u>Surface and Middle</u> 5 percentile of baseline data. ^[1]	<u>Surface and Middle</u> 4 mg/L or 1 percentile of baseline data. ^[1]
	<u>Bottom</u> 5 percentile of baseline data	<u>Bottom</u> 2 mg/L or 1 percentile of baseline data
SS in mg/L	95 percentile of baseline data or 120% of upstream control station at the same tide of the same day, whichever is higher. ^[2]	99 percentile of baseline data or 130% of upstream control station at the same tide of the same day, whichever is higher. ^[2]
Turbidity in NTU	95 percentile of baseline data or 120% of upstream control station at the same tide of the same day, whichever is higher. ^[2]	99 percentile of baseline data or 130% of upstream control station at the same tide of the same day, whichever is higher. ^[2]

Notes:

- (1) For DO, non-compliance occurs when monitoring results is lower than the limits.
- (2) For SS and turbidity, non-compliance occurs when monitoring results is larger than the limits

7.10 EVENT AND ACTION PLAN

Should non-compliance of the criteria occur, action in accordance with the Action Plan in the *Table 7.7* below shall be carried out.

Table 7.7 Event and Action Plan for Water Quality

Event	ET	IEC	Action ER	Contractor
Action level exceedance for one sampling day	<ol style="list-style-type: none"> 1. Inform IEC, Contractor and ER; 2. Check monitoring data, all plant, equipment and Contractor’s working methods; and 3. Discuss remedial measures with IEC and Contractor and ER. 	<ol style="list-style-type: none"> 1. Discuss with ET, ER and Contractor on the implemented mitigation measures; 2. Review proposals on remedial measures submitted by Contractor and advise the ER accordingly; and 3. Review and advise the ET and ER on the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> 1. Discuss with IEC, ET and Contractor on the implemented mitigation measures; 2. Make agreement on the remedial measures to be implemented; 3. Supervise the implementation of agreed remedial measures. 	<ol style="list-style-type: none"> 1. Identify source(s) of impact; 2. Inform the ER and confirm notification of the non-compliance in writing; 3. Rectify unacceptable practice; 4. Check all plant and equipment; 5. Consider changes of working methods; 6. Discuss with ER, ET and IEC and purpose remedial measures to IEC and ER; and 7. Implement the agreed mitigation measures.
Action level exceedance for more than one consecutive sampling days	<ol style="list-style-type: none"> 1. Repeat in-situ measurement on next day of exceedance to confirm findings; 2. Inform IEC, contractor and ER; 3. Check monitoring data, all plant, equipment and Contractor’s working methods; 4. Discuss remedial measures with IEC, contractor and ER 5. Ensure remedial measures are implemented 	<ol style="list-style-type: none"> 1. Discuss with ET, Contractor and ER on the implemented mitigation measures; 2. Review the proposed remedial measures submitted by Contractor and advise the ER accordingly; and 3. Review and advise the ET and ER on the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> 1. Discuss with ET, IEC and Contractor on the proposed mitigation measures; 2. Make agreement on the remedial measures to be implemented ; and 3. Discuss with ET, IEC and Contractor on the effectiveness of the implemented remedial measures. 	<ol style="list-style-type: none"> 1. Identify source(s) of impact; 2. Inform the ER and confirm notification of the non-compliance in writing; 3. Rectify unacceptable practice; 4. Check all plant and equipment and consider changes of working methods; 5. Discuss with ET, IEC and ER and submit proposal of remedial measures to ER and IEC within 3 working days of notification; and 6. Implement the agreed mitigation measures.

Event	ET	IEC	Action ER	Contractor
Limit level exceedance for one sampling day	<ol style="list-style-type: none"> 1. Repeat measurement on next day of exceedance to confirm findings; 2. Inform IEC, contractor and ER; 3. Rectify unacceptable practice; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Consider changes of working methods; 6. Discuss mitigation measures with IEC, ER and Contractor; and 7. Ensure the agreed remedial measures are implemented 	<ol style="list-style-type: none"> 1. Discuss with ET, Contractor and ER on the implemented mitigation measures; 2. Review the proposed remedial measures submitted by Contractor and advise the ER accordingly; and 3. Review and advise the ET and ER on the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> 1. Discuss with ET, IEC and Contractor on the implemented remedial measures; 2. Request Contractor to critically review the working methods; 3. Make agreement on the remedial measures to be implemented; and 4. Discuss with ET, IEC and Contractor on the effectiveness of the implemented remedial measures. 	<ol style="list-style-type: none"> 1. Identify source(s) of impact; 2. Inform the ER and confirm notification of the non-compliance in writing; 3. Rectify unacceptable practice; 4. Check all plant and equipment and consider changes of working methods; 5. Discuss with ET, IEC and ER and submit proposal of additional mitigation measures to ER and IEC within 3 working days of notification; and 6. Implement the agreed remedial measures.
Limit level exceedance for more than one consecutive sampling days	<ol style="list-style-type: none"> 1. Inform IEC, contractor and ER; 2. Check monitoring data, all plant, equipment and Contractor's working methods; 3. Discuss mitigation measures with IEC, ER and Contractor; and 4. Ensure mitigation measures are implemented; and 5. Increase the monitoring frequency to daily until no exceedance of Limit Level for two consecutive days 	<ol style="list-style-type: none"> 1. Discuss with ET, Contractor and ER on the implemented mitigation measures; 2. Review the proposed remedial measures submitted by Contractor and advise the ER accordingly; and 3. Review and advise the ET and ER on the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> 1. Discuss with ET, IEC and Contractor on the implemented remedial measures; 2. Request Contractor to critically review the working methods; 3. Make agreement on the remedial measures to be implemented; 4. Discuss with ET and IEC on the effectiveness of the implemented mitigation measures; and 5. Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the dredging activities until no exceedance of Limit level. 	<ol style="list-style-type: none"> 1. Identify source(s) of impact; 2. Inform the ER and confirm notification of the non-compliance in writing; 3. Rectify unacceptable practice; 4. Check all plant and equipment and consider changes of working methods; 5. Discuss with ET, IEC and ER and submit proposal of additional mitigation measures to ER and IEC within 3 working days of notification; and 6. Implement the agreed remedial measures. 7. As directed by the ER, to slow down or stop all or part of the dredging activities until no exceedance of Limit level.

8.1 INTRODUCTION

An assessment of potential impacts due to the sewage arising from the proposed Project has been assessed in Section 6 of the EIA Report.

8.2 MITIGATION MEASURES

8.2.1 Construction Phase

The sewage generated during the construction stage from the on-site workers will be collected in chemical toilets and disposed of off-site. Therefore, no sewerage impacts are expected from the site during the construction phase. As such, environmental monitoring and audit of the sewerage system is considered not required.

8.2.2 Operational Phase

Due to the key concerns of the ecological sensitivity of the Tung Chung Stream and Tung Chung Bay, the following provisions are proposed to enhance the sewerage network reliability and minimize environmental impacts due to system failure or in case of emergency situations.

Twin rising mains would be provided for proposed discharge from all proposed SPSs and the upgraded CMRSPS. It is proposed to use both mains as duty from an economical and operational point of view. Should one of the duty mains be taken out of operation, the remaining one would deliver more flow at a higher velocity (exceeding 3m/s) during a temporary period of repair. Twin gravity sewers would also be provided at the downstream of the inlet break chamber for all proposed SPSs and the upgraded CMRSPS.

It is proposed to adopt high density polyethylene (HDPE) pipe for proposed gravity sewers and rising mains. As gravity sewers will not be pressurized, they carry no risk of bursting. Further protection on proposed rising mains with concrete surround will be provided to mitigate the risk of bursting.

With the above measures, bursting discharge from gravity sewers and rising mains is not anticipated as discussed and agreed with DSD and EPD.

Additional Provisions for Tung Chung West Development

Taking into account the ecological sensitivity of the Tung Chung Stream, the occurrence of a possible emergency event at the SPSs in TCW (including TCV West SPS, TCV North SPS and Upgraded CMRSPS) has been considered due to the following risks: pump failure; rising main failure; and power failure.

To mitigate the risks of pump, rising main and/or power failure, several mitigation measures are proposed to cater for the emergency situations

including 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.

Considering the possible emergency situations and respective risks, as well as the practicality of construction, the above mitigation measures are considered the most appropriate and practical measures to deal with the emergency situations of the proposed SPSs in TCW development. Therefore, based on these provisions emergency discharge is not expected, and thus no adverse impact on water quality or ecology due to emergency discharge from the proposed SPSs in TCW development is anticipated.

Additional Provisions for Tung Chung East Development

The occurrence of any single emergency event at TCE East SPS and TCE West SPS has been considered due to the following risks: pump failure; rising main failure; and power failure.

To mitigate the risks of pump, rising main and/or power failure, several mitigation measures are proposed to cater for the emergency situations including 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.

Considering the possible emergency situations and respective risks, as well as the practicality of construction, the above mitigation measures are considered the most appropriate and practical measures to deal with the emergency situations of the proposed SPSs in TCE development. Therefore, based on these provisions emergency discharge from the proposed SPSs in TCE is not expected, and thus no adverse impact on water quality or ecology due to emergency discharge from the proposed SPSs in TCE development is anticipated.

In view of the above mitigation measures, environmental monitoring and audit of the sewage system is considered not required. The implementation schedule of the relevant mitigation measures is presented in *Appendix 4.1*.

9 WASTE MANAGEMENT IMPLICATIONS

9.1 INTRODUCTION

The quantity and timing for the generation of waste during the construction phase have been estimated. Measures including the opportunity for on-site sorting, reusing excavated materials etc, are devised in the construction methodology to minimise the surplus materials to be disposed off-site. Proper disposal of chemical waste should be via a licensed waste collector.

9.2 MITIGATION MEASURES

All the proposed mitigation measures are stipulated in the EIA Report and summarised in the EMIS in *Appendix 4.1*.

EM&A requirements are required for waste management during the construction phase only and the effective management of waste arising during the construction phase will be monitored through the site audit programme. The aims of the waste audit are:

- To ensure the waste arising from the works are handled, stored, collected, transferred and disposed of in an environmentally acceptable manner; and
- To encourage the reuse and recycling of material.

The types and quantities of waste that would be generated during the operational phase have been assessed. It is anticipated there would not be any insurmountable impacts during the operational phase. A trip-ticket system should be operated to monitor all movements of chemical wastes which will be collected by a licensed collector to a licensed facility for final treatment and disposal. Recommendations have been made to ensure proper treatment and proper disposal of these wastes in the EIA Report and summarised in the EMIS in *Appendix 4.1*.

According to Section 7.3 in the EIA report a Construction & Demolition Material Management Plan (C&DMMP) shall be submitted to the Public Fill Committee (PFC) for approval in the case of C&D materials disposal exceeding 50,000m³. The C&DMMP was submitted to the PFC in June 2015 after being approved by the CEDD Vetting Committee. The C&DMMP was approved by PFC on 18 September 2015.

According to Section 7.4 in the EIA report, the Contractor should prepare a Waste Management Plan (WMP) as part of the Environmental Management Plan (EMP) in accordance with the ETWB TC(W) No. 19/2005 for construction phase. The EMP should be submitted to the Engineer for approval. Mitigation measures proposed in the EIA Report and summarised in the EMIS should be adopted.

9.3

WASTE EM&A REQUIREMENTS

The Contractor shall be required to pay attention to the environmental standard and guidelines and carry out appropriate waste management and obtain the relevant licence / permits for waste disposal. The ET shall ensure that the Contractor has obtained from the appropriate authorities the necessary waste disposal permits or licences including:

- Chemical Waste Permits / licenses under the Waste Disposal Ordinance (Cap 354);
- Public Dumping Licence under the Land (Miscellaneous Provisions) Ordinance (Cap 28);
- Marine Dumping Permit under the Dumping at Sea Ordinance (Cap 466);
- Effluent Discharge Licence under the Water Pollution Control Ordinance; and
- Approval of Construction & Demolition Material Management Plan (C&DMMP).

The Contractor shall refer to the relevant booklets issued by the DEP when applying for the licence/permit and the ET shall refer to these booklets for auditing purposes.

9.4

SITE AUDIT REQUIREMENTS

Regular audits and site inspections should be carried out during construction phase by the ET to ensure that the recommended good site practices and other recommended mitigation measures are properly implemented by the Contractor. The audits should concern all aspects of on-site waste management practices including waste generation, storage, recycling, transport and disposal. Apart from site inspection, documents including licences, permits, disposal and recycling records should be reviewed and audited for compliance with the legislation and contract requirements.

The requirements of the environmental audit programme are set out in *Section 15* of this Manual. The audit programme will verify the implementation status and evaluate the effectiveness of the mitigation measures.

10 LAND CONTAMINATION IMPACT

10.1 INTRODUCTION

The EIA Report has assessed the land contamination associated with the Project.

10.2 PROPOSED SITE INVESTIGATION FOR POTENTIALLY CONTAMINATED AREAS

As outlined in Sections 8.3 and 8.4 of the EIA report, 4 surveyed sites, i.e. TC-1, TC-4, TC-9 and TC-10 were identified to have potentially contaminated land use and environmental site investigation (SI) was proposed. Within these areas, a total of 18 locations are proposed for soil and groundwater sampling and testing according to the EPD's Practice Guide for Investigation and Remediation of Contaminated Land.

As the 4 potentially contaminated sites are located in private land lot, SI is unlikely to be carried out at this stage. In addition, as the sites are still in operation, it is considered not worthy to carry out the SI at this stage as on-going activities would make the assessment result obsolete. It is recommended that further site visit be carried out by the PP's appointed consultant once the future development of this site is confirmed and site access is available (e.g. after land resumption), in order to identify the need for SI for any additional hot spots as a result of the on-going activities. The PP's appointed consultant would prepare and submit a supplementary Contamination Assessment Plan (CAP) to present findings of the further site visit for EPD review and approval prior to the commencement of the SI works.

10.3 SUBMISSION REQUIREMENTS OF CAR, RAP AND RR

Following the completion of environmental SI and lab testing works, the Project Proponent would prepare the Contamination Assessment Report (CAR). The CAR would present the findings of the SI and evaluate the level and extent of potential contamination.

If land contamination is identified during the proposed environmental SI and remediation is required, a Remediation Action Plan (RAP) would be prepared.

A Remediation Report (RR) would also be prepared to demonstrate that the clean-up works are adequate. No construction / development works would be carried out within the potentially contaminated areas in the Study Area prior to the agreement of the RR.

The implementation schedule are summarised in the EMIS in *Appendix 4.1*.

11 ECOLOGY

11.1 INTRODUCTION

The EIA has evaluated the ecological consequences of the Project and recommended ecological mitigation measures to avoid, minimize and compensate the impact arising from the Project.

11.2 MITIGATION MEASURES

11.2.1 Avoidance

Avoidance of Recognised Sites of Conservation Importance

All the recognised sites of conservation importance, including Country Parks, Sites of Special Scientific Interest (SSSIs), Ecologically Important Streams (EISs), and existing / proposed Marine Parks have been avoided and will not be encroached by any developments under the present Project.

Avoidance of Tung Chung Bay and Associated High Value Habitats

The majority of the habitat types with high or higher ecological values have been avoided. In the RODP, there will be no reclamation at TCW in order to protect the Tung Chung Bay. As there is no reclamation inside Tung Chung Bay, the Tung Chung Bay (including coastal waters and estuary of Tung Chung Stream) and associated habitats including the seagrass beds, mudflats, mangroves habitats, will be preserved.

Avoidance of Tung Chung Stream

For terrestrial habitats, encroachment of Tung Chung Stream has been avoided. All natural sections of Tung Chung Stream (including the two main branches and the joined outlet section) and one major tributary at Ngau Au have also been provided with buffer zones to cover the riparian zone, except where overlapped with the road crossings of local distributors. The widths of buffer zones are in general 30m (except locations without sufficient space) for the two main branches and the joined outlet section, and in general 20m for the major tributary at Ngau Au. In principle, the buffer zones should not be less than the recommended widths except with constraints such as without sufficient space or adjacent to existing developed areas such as villages. The recommended widths of buffer zones are based on the previous practices for EIS and other approved EIAs. For example, 30m buffer was provided for Sha Lo Tung Stream SSSI. Lin Ma Hang Stream has been designated as SSSI and is listed as one of the 33 EISs, and therefore the land corridor adjoining Lin Ma Hang Stream at the downstream area where there had already been settlements/community is also zoned "Green Belt" (~20m) to serve as a vegetated buffer to separate the village area from the river. Buffer zones of 5-20m were established in main streams on Kau Sai Chau for protection of habitats of aquatic fauna, including the endemic Atyid shrimp *Caridina*

trifasciata during the construction works of the public golf course extension (Black & Veatch 2005). *Caridina trifasciata* are still found in these main streams during the construction phase as well as operation phase monitoring for the public golf course. In the EIA study “North East New Territories New Development Areas Planning and Engineering Study – Investigation”, Ma Tso Lung Stream was ranked as high ecological value in the upper and midstream sections, and a buffer zone of 15-30 m is proposed and considered appropriate.

11.2.2

Minimisation

Selection of Proposed Development Areas in TCW PDA

Locations and extents of development parcels and other development areas in TCW PDA have been selected and adjusted to avoid as far as possible and minimise potential impacts to existing ecological resources. For example, developments in Fong Yuen area are limited to the Northern section of Fong Yuen area, which is more disturbed and fragmented, and thus of lower ecological value. The Middle Section and the Southern Section, which are of higher ecological value, were not proposed for developments and were zoned as Green Belt except a small area of existing urbanised/disturbed inside the Southern Section.

Preservation of Habitats with Ecological Values

Conservation or non-development land uses such as Conservation Area (CA) zoning, Coastal Protection Area (CPA) zoning, Green Belt (GB) zoning, and Agricultural (Agr) zoning, were proposed for various locations at TCW PDA. Developments within these zonings are basically prohibited. These areas will include Middle and Southern Sections of Fong Yuen area, Fung Shui Woods and part of the buffer zone of Tung Chung Stream.

Fung Shui Woods which fall within the RODP boundary will be covered by either CA or GB, except those in “V” land use zones which are following the current village area boundaries. Fung Shui Woods considered of higher ecological value (i.e. moderate to high) due to larger sizes and/or better conditions are covered by CA, while those of lower ecological value (i.e. moderate) due to smaller sizes or higher disturbance level are covered by “GB”.

The buffer zone for Tung Chung Stream will be zoned as “CA”, “CPA”, or “OU” except where overlapped with road crossings. For CA and CPA, only development needed to support the conservation of the existing landscape of scenic quality of the area or are essential infrastructure projects with overriding public interest may be permitted, such as the outlets of the Stormwater Attenuation and Treatment Ponds. For OU, this zoning is mainly proposed for polders and the future River Park. Though construction works will be required for the outlets, the polders and/or the future River Park, the scale of the construction works would not be large and mitigation to prevent site runoff affecting stream courses have been proposed under water

quality assessment. Furthermore, these future polders and River Park would be managed by Government after construction, and could thus better protect the stream, and the Stormwater Attenuation and Treatment Ponds will have wetlands incorporated and could provide additional habitats for fauna. As Enhancement Measures, native riparian tree and shrub species will also be planted on the earth-line polders and aquatic plants will be planted in biofiltration zone of Stormwater Attenuation and Treatment Ponds.

Non-development zoning on the RODP has been provided along a large section of Tung Chung Bay coastline such as CPA (as buffer zone) and RO/DO (with purpose-designed paths and landscape areas) to reduce potential disturbance impacts to the nearby natural habitats such as mangroves and mudflats in Tung Chung Bay, especially from the potential increase of visitors.

Limiting Works near Tung Chung Stream

Limited crossings for Tung Chung Stream would be required. It is understood the stream bed and stream banks would not be encroached, and the detail design would continue to explore suitable design so as to avoid the buffer zone as far as possible.

Refinement of Road Alignment/Design to Minimize Impact on Fung Shui Woods

Small areas (0.04 ha) of Fung Shui Wood loss (near the crossing of Tung Chung Stream eastern branch, and near TCV-5b) will be caused by the road upgrading along the existing Shek Mun Kap Road due to the space constraints. It is recommended that during the later detailed design stage or construction stage, efforts should be made to reduce or even avoid the impact on Fung Shui Woods as far as possible, subject to the later refinement of the alignment, the layout design, and the number and locations of trees to be proposed felling.

Noise Barrier & Bird Collision

In order to minimise the potential impact of bird collision, only solid noise barrier will be used during construction phase. Noise barrier will only be erected at a few locations in the TCE PDA during operation phase. Transparent noise barrier will be avoided as far as possible. If transparent panel will be used, stickers or other measures will be applied to increase the visibility of the panels to birds.

Reduction of the Reclamation Sizes

The total reclamation size under this Project has also been significantly reduced after the reclamation inside Tung Chung Bay was removed. On comparing to the original scheme with 50ha reclamation, the current scheme with the removal of TCW reclamation, has prevented loss or encroachment of ecological resources or deteriorations of water quality condition in Tung

Chung Bay. The potential direct impact from reclamation has been minimised.

Location of the Reclamations

The entire TCE PDA development as well as the Road P1 (Tung Chung - Tai Ho Section) are on new reclamations. The footprint of the proposed reclamations is at the location among the lowest use, if not none, by CWD inside North Lantau waters, and is not found to be important for other marine fauna of conservation importance.

Adopting Non-dredged Method

In order to minimize the potential impacts caused by the reclamation, a number of alternative construction methodologies has been critically examined. After considering all the options such as fully dredged, partially dredged and non-dredged methods for seawall construction and reclamation, non-dredged method for both the seawall construction and reclamation are recommended. By adopting non-dredged method, several potential impacts have been minimised. The disturbance of seabed sediments will be greatly reduced without the dredging process, and the water quality impacts caused by suspended solid or sediment plumes will be minimised. This construction method also minimizes the generation of dredged materials, and in turn reduces the marine vessel trips for transportation of dredged materials, and finally reduces the potential of off-site impacts such as the associated impacts on water quality and marine ecology near the disposal facilities.

Maintaining Tai Ho Wan Outlet

The design of the reclamation has taken into account the importance of the existing Tai Ho outlet for the ecology of Tai Ho Wan, and has minimized the extent of reclamation for Road P1, and maintaining the opening of the outlet in the new reclamation.

Avoiding the Overlapping of Construction Programmes with Concurrent Projects

During the EIA study, the known and anticipated construction programmes of other concurrent projects have been examined. Based on the available information, the currently proposed reclamation construction programme for the present Project only overlaps with two concurrent marine projects, i.e. 3RS and the CMP at East Sha Chau. This has minimized the implications on water quality impacts due to concurrent projects.

No emergency discharge in TCE and TCW

Sewage pumping stations will be present in TCE and TCE, but there will be back up measures and suitable designs to prevent emergency discharge accidents.

Reducing the Capacity of the Proposed Marina

The scale of the proposed marina in TCE PDA has been reduced from a capacity for 350 vessels to the currently proposed capacity for 95 vessels.

11.2.3

Mitigation

Compensation Woodland Planting

Compensation Woodland Planting is proposed to mitigate the woodland loss (total 5.72 ha, including 5.3ha from TCW PDA and 0.42 from the service reservoirs) and a small loss of Fung Shui Wood (0.20 ha). A search of area to mitigate the loss of woodland has been conducted. Priority has been given to the practicability of compensation of woodland within the boundary of RODP. Given the nature of the project is to provide development opportunities to satisfy the needs for the society in general and the aspirations of local communities (see Section 2 of the EIA report), compensation of woodland is only possible for the areas beyond the RODP. Efforts have been also been expedited to identify locations that would be suitable for woodland compensation. After considering a number of requirements such as the existing vegetation cover, the accessibility for planting and future maintenance, and the ecological linkage with other existing habitats after the compensation woodland is established, it is considered that the areas adjoining the woodlands near the existing service reservoirs, and hillsides to the east of Tung Chung Road, would be suitable locations. The advantage of these locations is that there are existing woodlands immediately downhill to the location and the Sheung Ling Pei Fung Shui Wood is further downhill behind Sheung Ling Pei Village, planting new woodland areas adjoining existing woodlands would form an ecological linkage and increase the overall habitat size and hence would help to enhance the biodiversity and ecological values in the long run. And it is noted that the compensation trees for landscape impacts will also be planted near the future service reservoirs. With woodland compensation on the hillsides to the east of Tung Chung Road, further ecological linkage could be formed. These 3 major areas, of a total area about 11 ha, which have been identified as suitable for compensation woodland planting are illustrated in Figure 9.11 of the EIA report. The selected locations are grassy/shrubby with little tree cover. The slope gradients ranged between 20° to 30°. Tree whips and shrub seedlings would be used for the planting mix. The feasibility of commencing woodland compensation planting as soon as practicable should be considered. The tree species to be planted should mostly be native species recorded at the Assessment Area (e.g. those reported in Appendix 9.2 of the EIA report) for woodland compensation, and the two areas uphill to Sheung Ling Pei should also make reference to the existing tree species reported in FSW habitat. A list of plant species recommended for compensatory woodland planting is provided in Appendix 9.21 of the EIA report. Early and timely arrangement with forest nursery for propagation of the seedlings should be made to ensure the availability of both the species and the quantity required.

With the 11 ha of compensation woodland, it is sufficient to mitigate the loss of about 6 ha of woodland and FSW from TCW PDA and service reservoirs. In addition to the native species, the planting list will also contain some fruit tree species which could provide habitats for wildlife including those reported in Orchard habitats. In order to protect the compensation woodland from potential disturbance by fires, fire resistant species (e.g., *Schima superba*) will be planted in the periphery. The compensation woodland will be maintained by the project proponent (i.e. CEDD) for 10 years before handing over to the government (i.e. Lands Department). The survival and conditions of the planted trees should be inspected during the maintenance period and replant where necessary.

Planting of Emergent Plant inside the future River Park

River Park is proposed at Tung Chung Stream, covering the full length of the channelized section together with the immediate upstream natural section alongside Fong Yuen area up to Shek Mun Kap Road. Though detailed design of the River Park has not been confirmed at this stage, it is anticipated that planting and features beneficial for ecology will be provided. It is suggested planting of emergent plant species including the larval food plant of the rare butterfly species Jhora Scrub Hopper, i.e. *Leersia hexandra*, should be provided in the future River Park, to provide habitats for this butterfly, and to compensate the loss of their habitats (wet abandoned agricultural land) in northern section of Fong Yuen. Currently the River Park covers an area size of about 3.98 ha, with about 3.3 ha land area (if excluding area of watercourses), and in which there is 1.25 ha of existing urbanised/disturbed area. It is suggested that at least 0.5 ha of emergent planting should be included in the future design of the River Park. A list of recommended plant species for the future River Park is shown in Appendix 9.22 of the EIA report. It is recommended that the future operator of the River Park should make reference to the recommended plant list when designing the landscape and make early arrangement for the availability and sufficient quantity of suitable plant species.

Capture and Translocation Exercise

Within the PDA of TCW, amphibian species of conservation importance were recorded in some areas to be directly disturbed during construction phase, and mitigation measures are recommended. Romer's Tree Frogs were mainly recorded near the eastern branch of Tung Chung Stream, inside or near orchard and woodland habitats. Chinese Bull Frog was found in orchard near Shek Mun Kap. Capture-and-translocation of amphibian species of conservation importance will be implemented in areas with sightings prior to site formation to minimize the impacts on these fauna species of conservation importance.

The exercise will cover areas for public works near the eastern branch of Tung Chung Stream, in particular 1) the River Park, 2) the Distributor Road along the eastern branch of Tung Chung Stream, 3) the road upgrade along the

existing Shek Mun Kap Road, and 4) the attenuation and treatment ponds in TCV-k, TCV-e, TCV-l, TCV-c, and TCV-n. Capture-and-translocation exercise for those public works will be provided before site formation commences by the government departments responsible for the construction of those public works or the site formation works for those sites.

Capture-and-translocation exercise of amphibian species of conservation importance will also be required in TCV-1 and TCV-5 which are zoned for residential/commercial developments by private developers and the lands within mostly belong to private lots. The future project proponents of those private lots shall be requested to conduct capture-and-translocation exercise prior to site formation via the established mechanism for land transaction application. The requirements of these measures will be stipulated in the explanatory statement of the OZP.

The above public works and development parcels for residential are near the eastern branch, and cover the sighting locations, and are thus suitable for capture-translocation survey. The survey should be undertaken by ecologists with relevant experience. Besides the primary target of Romer's Tree Frog and Chinese Bull Frog, other amphibian species of conservation importance should also be translocated if encountered during the capture survey. Captured individuals will be released to suitable habitats with no or low records of these species during the surveys (e.g., Chinese Bullfrog: agricultural land in San Tau; Romer's Tree Frog: woodland along the path to San Tau). Romer's Tree Frogs captured in Chek Lap Kok were translocated to seven recipient sites with suitable habitats but no record of this species (Chan *et al.* 2005).

There are proven track records of translocation of amphibians in Hong Kong. Capture-and-translocation exercise of Romer's Tree Frog had been conducted previously during the construction of the Hong Kong International Airport in Chek Lap Kok (Lau 1998). Post monitoring surveys showed that the populations were established in translocation. Capture-and-translocation exercise of Romer's Tree Frog were also conducted during the construction stage of drainage improvement project in Mui Wo (Ecosystems Ltd. 2009).

Habitats of Romer's Tree Frog will not be affected in the PDA at TCE, and hence capture-and-translocation exercise will not be necessary. Romer's Tree Frogs were also recorded in area not be affected by construction works such as those to be zoned as CPA, and ravine woodland at upper section of Wong Lung Hang Stream. No capture-and-translocation exercise is needed for these areas.

Two criteria stated in Lau (1998) will be used in the selection of translocation sites of Romer's Tree Frog. These included 1) a large area of forest or plantation; 2) suitable breeding habitats, i.e., shaded, slow-flowing or standing waters with plenty of leaf litter. For Chinese Bullfrog, locations with their preferred habitats (e.g., ponds, cultivated lands, streams, marshes) (Chan *et al.* 2005) will be selected as translocation sites.

Preservation and/or Transplantation of Plant Species of Conservation Importance

Preservation and/or Transplantation of plant species of conservation importance, including *Aquilaria sinensis*, *Pavetta hongkongensis*, and *Gmelina chinensis* will be conducted before site formation works. Though *Goodyera procera* and *Gymnosphaera hancockii* were not recorded in the present EIA study, if found before site formation works, these species will also be preserved and/or transplanted. Priority should be given to on-site preservation, especially for large sized individuals, and followed by transplantation, which is more feasible for small-sized individuals/seedlings.

Preservation and/or Transplantation of plant species of conservation importance will cover all areas for public works, provided before site formation commences by the government departments responsible for the construction of those public works or the site formation works for those sites. This measure will also be required in TCV-1 in where plant species of conservation importance were recorded, and which are zoned for residential/commercial developments by private developers and the lands within mostly belong to private lots. The future project proponents of those private lots shall be requested to conduct preservation and/or Transplantation of plant species of conservation importance prior to site formation via the established mechanism for land transaction application. The requirements of these measures will be stipulated in the explanatory statement of the OZP.

Defining and Maintaining Construction Site Boundaries

Site hoarding should be erected along the interface with natural terrestrial habitats of moderate to high / high ecological value (including secondary woodland, Fung Shui Wood, natural section of Tung Chung Stream), if any, to properly delineate the works site boundary and screen and minimise the potential disturbance due to construction activities to the nearby habitats and associated terrestrial fauna during construction phase. In addition, erecting of site hoarding along northern section of Fong Yuen (i.e. TCV-6) is also recommended since sighting records of the rare butterfly Jhora Scrub Hopper were aggregated in the northern end of the middle section of Fong Yuen.

Fences will be installed along the buffer zones of the Tung Chung Streams, mature woodland and Fung Shui Wood to minimise trespassing to these habitats and plants of conservation importance close to the site boundary.

Access Roads: The development areas will be mostly accessed by existing road network during both construction and operational phases. The temporary or permanent loss of habitats due to construction of temporary or permanent access is kept to minimum.

Protection of Tung Chung Stream

Construction Works near Tung Chung Stream: Though encroachment on natural sections of Tung Chung Stream has been avoided, there will be developments in Tung Chung Valley and the site runoff might potentially

disturb Tung Chung Stream. According to the RODP, an approximate 30m buffer zone for the natural sections of Tung Chung Stream and an approximate 20m buffer zone for the major tributary near Ngau Au will be zoned as "CA", "CPA", or "OU" (for polders and the future River Park), except the road crossing locations. Precast structures or other similar approaches will be used as far as possible to minimize the potential pollution from construction works. There will also be polders to be constructed for some sections of Tung Chung Stream. But the polders will be located at the landward side of the buffer zone and thus there will still be some distances to the stream channels. With the buffer zone, together with good site management which are stipulated in ProPECC PN1/94 and will be fully implemented so that the treated runoff will be discharged to public drainage system in compliance with the WPCO.

Road Crossings at Tung Chung Stream and Polder Construction: The local distributors will be extended to connect to existing villages like Ngau Au, Lam Che, Nim Yuen and Mok Ka. Although a few sections of these local distributors (in a form of bridge deck) will have to span over the Tung Chung Stream and its tributaries, only the footings of the bridge deck, which are considerably small in size, will be located within the area above high water mark near the stream banks. Considered that there is only relatively limited works for the footing construction and the area affected would likely be the area above high water mark with relatively less disturbance on ecological habitat. Precast structures or other similar approaches will be used as far as possible to minimize the potential pollution from construction works. Good site management as stipulated in ProPECC PN1/94 will be fully implemented so that the treated runoff will be discharged to public drainage system in compliance with the WPCO. Adverse impact on Tung Chung Stream is not anticipated.

It is recommended that the design of crossings (likely to be in the form of bridges) should be reviewed at the detailed design stage of the project to determine the optimum design to minimise construction and operational phase impacts on Tung Chung Stream and on fauna using the stream courses. Design and construction parameters should be reviewed to address the following requirements and objectives:

- Maximization of the span of bridge piers to span over the stream course
- Minimization of the sizes of any piers within the 30m buffer zone
- Avoidance and minimization of changes to the hydrological regime of the stream courses; including avoidance of changes to flow of streams
- Minimization of the duration of construction, by giving consideration to off-site pre-fabrication of bridges and bridge elements
- Construction of each crossing will be scheduled so as there is no overlap, in order to reduce disturbance impacts

Similar exercises should be conducted for the polders at the detailed design stage of the project, to address the following objectives:

- Minimization of the duration of construction,
- Construction of the polders or section of polders will be scheduled to minimize overlapping or limit the works fronts, in order to reduce disturbance impacts
- To schedule the construction within dry season as far as possible
- Avoidance and minimization of changes to the hydrological regime of the stream courses; including avoidance of changes to flow of streams

During the construction phase, a temporary drainage system would be implemented to ensure that the surface run-off with high concentration of suspended solid (SS) would not be discharged to Tung Chung Stream. Runoff would need to pass through sedimentation tanks to reduce the concentration of SS. DSD Technical Circular No. 2/2004 and ETWB TCW No. 5/2005 which set out for the protection of natural rivers and streams from adverse impacts arising from construction works should be followed during construction works near streams. In accordance with the Practice Note for Professional Persons on Construction Site Drainage, Environmental Protection Department, 1994 (ProPECC PN 1/94), best management practices should be implemented on site as far as practicable to control site runoff and drainage at all work sites during construction.

Other Site Practices

Standard Site Practices listed as follows would be implemented to minimise potential impacts, including dust, noise and site runoff, on the surrounding environment:

- Regular checking should be undertaken to ensure that the work site boundaries are not exceeded and that no damage occurs to surrounding areas;
- Implementation of mitigation measures specified in ProPECC PN 1/94 to control site runoff and drainage at all work sites during construction;
- Implementation of noise control measures at all construction sites to reduce impacts of construction noise to wildlife habitats adjacent works areas;
- Implementation of dust control measures at all construction sites to minimise dust nuisance to adjacent wildlife habitats during construction activities;
- Construction debris and spoil should be covered up and/or properly disposed of as soon as possible to avoid being washed into nearby

waterbodies by rain;

- Good site practice and site precautionary measures will also be implemented to avoid the potential impact due to site runoff. Construction effluent, site run-off and sewage should be properly collected and/or treated. Wastewater from a construction site should be managed with the following approach in descending order;
- Proper locations for discharge outlets of wastewater treatment facilities well away from the natural streams/rivers should be identified;
- Effluent monitoring should be incorporated to make sure that the discharged effluent from construction sites meets the effluent discharge guidelines; and
- Supervisory staff should be assigned to station on site to closely supervise and monitor the works.

With the implementation of good site practice, the potential impact due to dust, noise and site runoff during construction phase is anticipated to be acceptable.

Prevention of Emergency Discharge in Proposed and Upgraded Sewage Pumping Stations in TCE and TCW

There will be no emergency discharge from the proposed and upgraded sewage pumping stations in TCE and TCW, for the protection of ecological sensitive receivers of Tung Chug Stream and Tung Chung Bay. The following mitigation measures / additional provisions are proposed to enhance the sewerage network reliability and minimize the environmental impacts due to system failure or in case of emergency situations:

- 100% standby pumping capacity within each SPS, with spare pump up to 50% pumping capacity stockpiled in each SPS for any emergency use;
- Twin rising mains;
- Dual-feed power supply;
- Emergency storage facilities up to 6-hours ADWF capacity; and
- Emergency communication mechanism amongst relevant government departments.

With the implemented mitigation measures, emergency discharge of sewage from the proposed SPSs in TCE and TCW is not anticipated.

Furthermore, in order to prevent pipe bursting, it is proposed to adopt high density polyethylene (HDPE) pipe for proposed gravity sewers and rising mains. As gravity sewers will not be pressurized, they carry no risk of bursting. Further protection on proposed rising mains with concrete

surround will be provided to mitigate the risk of bursting. With the above proposed measures, bursting discharge is not expected and no adverse impact on ecology due to bursting discharge is anticipated.

Eco-shoreline

There would be inevitable permanent losses of marine waters (sub-tidal soft bottom seabed and water column), and direct impacts on existing artificial seawalls due to the reclamation. For the direct impact on artificial seawalls, as they are of low ecological value, the impact is considered insignificant and specific mitigation measure is not required, and there will be new seawalls of longer length on the future new reclamations. The permanent losses of marine waters, given the relatively larger sizes, are considered **Minor to Moderate**, and provision of mitigation measures is recommended.

The present proposed reclamation location has taken into account the constraints and avoided sensitive ecological resources such as Tung Chung Bay and Tai Ho Wan in the area and is located in the waters of very low dolphin use, therefore the impact would be the loss of common marine waters habitats. If the design of the future seawall could be improved to provide higher ecological functions than normal seawalls, it is expected that the enhanced functions from the future seawalls could mitigate the impact of the loss.

Adopting Eco-shoreline design

An 'eco-shoreline' is any shoreline which provides beneficial functions to the local ecosystem through a range of active or passive solutions, whilst providing coastal protection. As discussed above, the proposed reclamation in TCE PDA and that for Road P1 (Tung Chung - Tai Ho Section) Extension would be constructed along the existing artificial seawall. While the original artificial seawall has limited ecological values, due considerations have been given to consider the practicability of enhancing these new artificial seawall by providing eco-shoreline, which would help to provide better ecological functions as compared to the existing artificial seawall. It is however noted that the western artificial seawall of TCE PDA would be close to the marine navigation channel which would constrain the implementation of eco-shoreline. For the new artificial seawall along the Road P1 (Tung Chung - Tai Ho Section) Extension, the possibility of implementing eco-shoreline would be relatively more favourable. The extent of the future eco-shoreline covering the coastline of Road P1 (Tung Chung - Tai Ho Section) as well as the eastern coastline of TCE-PDA up to the opening of the marina is considered feasible and hence recommended.

While there are a number of variations on the approach of designing eco-shoreline, it is expected that the eco-shoreline (e.g. a sloping rip-rap form) could provide suitable habitats for colonization of intertidal and subtidal epifauna and juveniles of marine fauna and thereby effectively enhance the ecological function of the new seawalls. If feasible, a strip of platform with muddy substrates could be incorporated into the sloping seawalls, to further

facilitate the colonisation of estuarine plants and soft substrate fauna. It is therefore recommended that during the detailed design of the reclamation, a study should be conducted to investigate the proper form of eco-shoreline to be adopted for the artificial seawall along the reclamation for TCE PDA and Road P1 (Tung Chung - Tai Ho Section) Extension, and to devise the implementation scheme for incorporation into the reclamation construction programme. An Eco-shoreline study report covering the recommendations of the proper form of eco-shoreline to be adopted, the detailed design of the eco-shoreline and the implementation programme will be submitted for the approval of the authority before commencement of reclamation works.

Mitigation for Marine Water Quality

Based on the latest design, the use of non-dredged reclamation method is adopted. Should dredging be inevitable, suitable mitigation measures to the dredging activities should be implemented in accordance the recommendations proposed under Water Quality chapter of the EIA report.

Silt curtains have been proposed as mitigation for reclamation works. Other possible mitigation measures for inevitable dredging, if any, include using closed grab dredgers and control of dredge rate. Reduction in dredging rate (which in turn would prolong the dredging duration) will decrease the dispersion of suspended solids.

Besides, the number of concurrent dredging/filling work fronts should be limited, and the seawall should be constructed prior to the filling works. All reclamation filling works should be conducted within a leading seawall of 200m or enclosed by seawall.

The dredged marine sediment may contain organic materials and lead to a decreased in dissolved oxygen. Re-suspension of seabed sediment might potentially incur the release of contaminants, if any, into the seawater. If contaminants are present in the seawater, they may eventually be taken up into food chains. As non-dredged reclamation method was adopted, dredging activities would be limited. The above-mentioned mitigation measures for the dredging activities could further mitigate the DO depletion or the potential release of contaminants.

Good Site Practices for Water Quality in Marine Works

Good site practices shall be applied for the filling works, which are the largest potential sources for marine water quality impacts.

- Water quality monitoring (including monitoring at two stations within the The Brothers Marine Park) shall be implemented to ensure effective control of water pollution and recommend additional mitigation measures required;
- The decent speed of grabs shall be controlled to minimize the seabed impact and to reduce the volume of over-dredging according to the

assumed filling rate in water quality assessment;

- A perimeter silt curtain shall be installed during the entire reclamation periods, and the integrity and effectiveness of all silt curtains should be regularly inspected;
- Barges or hoppers shall not be filled to a level which will cause overflow of materials or pollution of water during loading or transportation;
- Excess materials shall be cleaned from the decks and exposed fittings of barges before the vessels are moved;
- Plants should not be operated with leaking pipes and any pipe leakages shall be repaired quickly;
- Adequate freeboard shall be maintained on barges to reduce the likelihood of decks being washed by wave action;
- All vessels should be sized so that adequate clearance is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash; and
- The works shall not cause foam, oil, grease, litter or other objectionable matter to be present in the water within and adjacent to the works site.

Besides the above good site practices for filling works, there are also good site practices for pollution generated from general construction works and sewage from workforce. Effluent monitoring should be incorporated to make sure that the discharged effluent from construction sites meets the effluent discharge guidelines.

Strict enforcement on no-dumping

Restrictions prohibiting dumping of rubbish, food, oil, or chemicals should be strictly enforced. This should also be covered in the contractor briefings.

Spill Response Plan

There will also be a spill response plan if vessels operating in the works areas will be transporting oil or other hazardous chemicals. The oil spill response plan will have specific provisions for protecting marine ecological resources. Given these measures, the marine ecosystem in the area would be protected.

Maintenance Dredging during the operation of the Proposed Marina

The volume of dredged material would be relatively small as compared with the construction phase impact. As the SS release would be within a semi-enclosed bay, the dispersion of SS would be constrained locally. The SS impact to the closest receiver WSR 43 future seawater intake for Tung Chung, which is located 1.2km far away from the mouth of marina, is not anticipated.

Silt curtain should be deployed to reduce the sediment dispersion from the dredging inside the marina.

Control and Minimisation of Marine Traffic

Disturbance impact to dolphin due to increase of working vessels is ranked as **Minor to Moderate**. It is recommended that approaches to reduce the marine traffic, including using larger-sized barges, land transportation of materials, and also reuse of excavation and C&D materials from the land-based works of the present Project, should be adopted as mitigation.

Larger-sized Barges

If barges of larger sized are used, more filling materials could be carried in each trip of the barges and it could reduce the marine traffic volume during construction. The feasibility of using larger barges for carrying filling materials has been investigated. The largest barge may be up to 5,000 tonnes in capacity and could be equivalent of 10-20 normal sized barges. But the number of this type of barges available in the region at the time of the present proposed reclamation would be subject to various factors, and therefore it could not confirm at this stage the amount or proportion of filling materials could be taken up by larger barges. But it is anticipated that if larger barge and land transportation (see below) are adopted for filling materials, it can help to reduce some (not more than 10%) of marine traffic. In the construction stage, the future contractors will be requested to submit a "Proposal on Reducing Marine Traffic" to authorities for approval before commencement of filling works, in which the contractors will need to detail measures adopted to reduce the marine vessel trip numbers and the traffic volume (except those for marine site investigation and survey works given the relatively minor number), including using more larger sized barges. The future contractors will have the responsibility to take into account the best available information at that time to verify the market availability at the time of construction and to arrange larger barges as many as possible for transporting the filling materials for the Project.

Land Transportation of Materials

Besides using larger barge, transportation of fill materials via land traffic is also possible to reduce the marine traffic. The present Project involves near shore reclamation and the site could be accessed by land transportation. The feasibility of using land transportation for carrying filling materials has also been investigated. The land traffic capacity of the Tung Chung area should be considered. And thus it is subject to approval by government departments on the quantity of fill materials could be taken up by land transportation. It is anticipated that if larger barge (see above) and land transportation are adopted for filling materials, it can help to reduce some (not more than 10%) of marine traffic. In the construction stage, the future contractors will be requested to submit a "Proposal on Reducing Marine Traffic" to authorities for approval before commencement of filling works, in which the contractors will need to detail measures adopted to reduce the

marine vessel trip numbers and the traffic volume (except those for marine site investigation and survey works given the relatively minor number), including using more land transportation. The future contractors will have the responsibility to arrange and/or apply land transportation for transporting the filling materials for the Project.

Reuse of C&D Materials

In accordance with the waste management assessment of the present EIA, based on the construction programme, all inert C&D materials would be reused on-site during the whole construction phase, including the reclamation works. All C&D materials arising from the construction would be sorted on-site to recover the inert C&D materials and promptly remove all sorted and processed material arising the construction activities. It is expected that, though the exact quantity could not be confirmed at this stage, by reusing the inert C&D materials, it could replace a portion of the fill materials and reduce the marine traffic for the fill transportation. In the construction stage, the future contractors will be requested to submit a "Proposal on Reducing Marine Traffic" to authorities for approval before commencement of filling works, in which the contractors will need to detail measures adopted to reduce the marine vessel trip numbers and the traffic volume (except those for marine site investigation and survey works given the relatively minor number), including reuse of C&D materials. The future contractors will have the responsibility to arrange and collect C&D materials for replacing part of the filling materials for the Project.

Speed Limits and Regular Routes of Works Vessels

The potential of marine traffic disturbance or collision risk due to the work-related vessel traffic flow during construction phase is also considered. The potential of an escalation in collision risk would be low as mainly large-sized and slower vessels. (It is considered that the high-speed outboard engine boats pose higher risk on collision.) But there still might be disturbance impact due to the marine traffic. Further to the above measures to reduce marine traffic volume, measures adopted by other EIAs for mitigating marine traffic disturbance on CWD, such as speed limits and regular routes, will also be applied to further mitigate the impact. In the construction stage, CEDD will prepare and submit a "Works Vessel Travel Route Plan" to authorities for approval before commencement of filling works. The submission will cover the routes, the speed limit, and other practices the vessels need to adopt, except those for marine site investigation and survey works given the relatively minor number. Works vessels should follow regular routes to limit the extent of marine areas with works vessels traffic, especially within BMP. It is recommended that the future travel routes of TCE PDA will avoid and/or restrict the extents within ecologically sensitive areas targeted for CWD conservation. Works vessels also need to follow all existing regulations, restrictions, and practices for works vessels (such as speed limits, and any other practices). For examples, as part of the good site practices, the fill materials on the barges should be properly loaded to avoid any overflow of

materials. The bottom openings of the hoppers should be properly maintained. The works vessels will be requested to adopt more stringent standards when inside BMP. For example, during normal circumstances, the works vessels should further reduce the speed from 10 knot (the statutory vessel speed within marine parks) to 8 knot. There should be no stopover or anchoring at the existing anchoring area within BMP, even these actions are not prohibiting by regulations. A Core Area around Siu Mo To has been demarcated to provide the highest level of protection to prey sources of CWD and fisheries resources. No works vessels will enter the core area of BMP. The magnitude of any marine traffic disturbance impact would thus be controlled.

Precautionary Measures - Dolphin Exclusion Zone

As a precautionary measure, dolphin exclusion zone of 250m radius is suggested to be implemented in the reclamation and dredging sites during the installation of the perimeter silt curtains and any re-deployment of the perimeter silt curtains. A dolphin watching plan will be implemented for the exclusion zone. Works should not be commenced until a 30 minute of no dolphin sighting is made within the exclusion zone and will be suspended when any CWD is found within the exclusion zone.

11.3 AUDIT REQUIREMENT

Site audits shall be undertaken during the construction phase of the Project to check the proper implementation and maintenance of recommended mitigation measures.

A project organisation consisting of the Engineer Representative (ER), Independent Environmental Checker (IEC), Environmental Team (ET), Project Proponent (CEDD) and Contractor should be established to take on the responsibilities for environmental protection for the Project.

Site inspections shall be undertaken by the ET at least once per week to checking the implementation of standard site practices and measures of protection of natural streams (DSD Technical Circular No. 2004).

Site hoardings and fences will be checked weekly by the ET. Damage sighted should be reported to the site manager and damaged site hoarding/ fence should be repaired by the Contractor as soon as possible.

Site inspection shall be undertaken by the ET at least once per week to check the implementation of standard site practices for marine works, strict enforcement on no-dumping and spill response plan.

Site inspection shall be undertaken by the ET at least once per week to check all silt curtains are located entirely within the boundary of the temporary works area and are still functioning.

Site inspection shall be undertaken by the ET at least once per week during the reclamation to check all reclamation filling works are within a leading seawall of 200m or enclosed by seawall.

A "Proposal on Reducing Marine Traffic" for size of barges, land transportation of materials, and reuse of C&D materials, will be submitted by future contractors. Site inspection shall be undertaken by the ET at least once per week to check the implementation of the proposed items in the "Proposal on Reducing Marine Traffic".

A "Works Vessel Travel Route Plan" will be submitted by CEDD. Site inspection shall be undertaken by the ET at least once per week to check if the works vessels follow the proposed routes and other requirements in the Plan.

Site inspection shall be undertaken by the ET at least once per week to check if the dolphin exclusion zone and dolphin watching plan are implemented in the reclamation and dredging sites during the installation of the perimeter silt curtains and any re-deployment of the perimeter silt curtains.

11.4 MONITORING REQUIREMENTS

11.4.1 *Monitoring for Compensation Woodland*

A total area about 11 ha of compensation woodland planting will be conducted to mitigate the loss of woodland, Fung Shui Wood, and orchard. Three proposed locations have been identified as suitable for compensation woodland planting: two uphill to the Sheung Ling Pei FSW, and one on the hillside to the east of Tung Chung Road. All these areas are outside all development areas, and thus in advance compensation planting is feasible and should be considered, especially the two areas uphill to Sheung Ling Pei FSW.

Survival and establishment of planted woodland at the three planting locations will be monitored quarterly for 3 years. The monitoring surveys shall be carried out by qualified botanist and ecologist. Survey in each woodland planting location will commence three months after completion of planting. Selected individuals of each planted species will be tagged and percentage survival computed. Supplementary planting will be recommended when necessary. Wildlife use of the planted woodland will also be monitored.

11.4.2 *Monitoring for Emergent Plant inside the future River Park*

Planting of emergent plant species including the larval food plant of the rare butterfly species Jhora Scrub Hopper, i.e. *Leersia hexandra*, will be provided in the future River Park.

Survival and establishment of planted emergent plants in the future River Park will be monitored quarterly for 2 years. The monitoring surveys shall be carried out by a qualified botanist and ecologist. Survey in the future River Park will commence three months after completion of planting. Selected individuals of each planted species will be checked and percentage

survival computed. Supplementary planting will be recommended when necessary. Wildlife use of the planted vegetation will also be monitored.

11.4.3 *Monitoring for Translocated Amphibians of Conservation Importance*

Amphibian species of conservation importance will be captured and translocated to suitable habitats prior to commencement of site formation. The capture-and-translocation exercise targets on species potentially impacted by construction activities, including Romer's Tree Frog and Chinese Bullfrog.

Establishment of the translocated Romer's Tree Frog and Chinese Bullfrog in the released location(s) will be studied. Post translocation monitoring shall be carried out by qualified ecologist.

The establishment of translocated populations of Romer's Tree Frog and Chinese Bullfrog in the release sites will be determined by observations of occurrence of reproduction during the breeding season following the capture-and-translocation exercise. Both Romer's Tree Frog and Chinese Bullfrog breed between March and September in Hong Kong (Chan *et al.* 2005). At least three surveys will be conducted in each release site during the breeding season, preferably monthly between April and June, Signs of breeding including calling males, eggs and tadpoles will be indications of breeding.

11.4.4 *Monitoring for Preserved/Transplanted Plant Species of Conservation Importance*

Monitoring surveys will be conducted to verify and evaluate the effectiveness of the preservation and transplantation programme.

For plant species of conservation importance, the survival and conditions of transplanted plant individuals as well as individuals to be preserved in-situ will be monitored. For transplanted individuals, the monitoring will be two years, and the frequency will be monthly for the first year, and then quarterly for the second year. For the *in-situ* preserved plant individuals, the monitoring will be conducted monthly throughout the construction period. The monitoring surveys shall be carried out by a qualified botanist approved by authorities. The condition of the tree-protection zone, if any, should be regularly checked.

11.4.5 *Monitoring for Tung Chung Stream EIS and Wong Lung Hang EIS*

For protection of Tung Chung Stream and verifying the effectiveness of mitigation measures, monitoring on Tung Chung Stream is recommended for public works in or near Tung Chung Stream, including construction of River Park (together with revitalization of channelized section of Tung Chung Stream), road crossings spanning over Tung Chung Stream, polders, and stormwater attenuation and treatment ponds. The monitoring should include pre-construction baseline survey, construction phase monitoring and post-construction monitoring. The monitoring items should cover the environment of the stream courses, the water quality, and the stream fauna.

During the works period of road crossings and the river park, monitoring shall be undertaken to identify and evaluate any impacts with appropriate actions taken as required to address and minimise any adverse impact found.

As the proposed River Park will have construction works inside Tung Chung Stream for revitalizing the channelized section, pre-construction (baseline) monitoring shall be carried out on a monthly basis for a 12-month duration. The duration of baseline monitoring for other public works (road crossings, polders, and stormwater attenuation and treatment ponds) shall not be less than 6 months and covering wet season. The construction phase monitoring shall cover the full construction programme on a monthly basis. The post-construction monitoring shall cover a 12 month duration after the completion on a monthly basis. (see *Table 11.1*).

Table 11.1 *Monitoring of Measures to Minimize Impacts to Tung Chung Stream*

Phase	Methodology
Pre-construction (Baseline) (12-month duration for River Park; at least 6-month and covering wet season for other public works)	Monthly quantitative replicate surveys of the environment of the stream courses, the water quality, and the stream fauna using standardized methodology at fixed points, the number of which should be determined prior to the first monitoring event.
Construction (cover the full construction programme)	Monthly quantitative replicate surveys of the environment of the stream courses, the water quality, and the stream fauna using standardized methodology at the fixed points determined in the pre-construction phase.
Post-construction (cover a 12 month duration after the completion)	Monthly quantitative replicate surveys of the environment of the stream courses, the water quality, and the stream fauna using standardized methodology at the fixed points determined in the pre-construction phase.

Action and limit levels, which should take into account the species and season, for construction phase will be established with reference to baseline survey data. The responses when triggering these limits are outlined in *Table 11.2* below.

Table 11.2 *Action and Limit Levels and Responses to Evidence of Declines in Aquatic Fauna*

Action Level	Response	Limit Level	Response
Construction Phase			
Non-compliance of Action Level to be established after baseline monitoring, (such as reduction in taxa diversity or abundance), such that response is triggered.	Investigate cause and if cause identified as related to Project instigate remedial action to remove or reduce source of disturbance	Non-compliance of Level to be established after baseline monitoring, (such as reduction in taxa diversity as well as abundance), Limit Level response is triggered.	Limit Investigate cause and if caused as related to Project instigate further remedial action.

Monitoring of stream fauna includes fish and aquatic invertebrate, methodology should follow standard methods of direct observation and active search. The frequency should be monthly.

In order to verify the effectiveness of mitigation measures of Wong Lung Hang during the construction of Service Reservoirs, monitoring on Wong Lung Hang is recommended. The monitoring approach should follow the methods adopted for other public works (road crossings, polders, and stormwater attenuation and treatment ponds) near Tung Chung Stream.

11.4.6 *Eco-shoreline Monitoring*

The colonisation and establishment of fauna and/or flora on the eco-shoreline at TCE PDA and Road P1 reclamation should be monitored. Marine ecosystems are expected to be enhanced by the eco-shoreline, and hence monitoring of the eco-shoreline shall include quantitative ecological survey methods and measurements of water quality parameters, and cover dry and wet seasons. As it is expected that this measure will also benefit fisheries species in the marine ecosystems, besides ecological components, the monitoring should also include monitoring on fisheries resources (in particular the recruitments of fisheries species). Monitoring shall be conducted for at least 3 years after the completion of reclamation works, twice in wet season and twice in dry season, in order to determine the effectiveness of the eco-shoreline. Reference sites shall be selected in nearby artificial seawalls, to be monitored following the same methods, to facilitate comparisons and evaluation of effectiveness. The need of extension of monitoring will be reviewed upon completion of the monitoring and subject to the findings of the monitoring surveys.

The details of the monitoring requirements, methodology and programme will be proposed in accordance with the design and targets of the eco-shoreline, with the submission of the Eco-Shoreline Design Study.

Marine ecosystems includes intertidal communities and subtidal hard substrate communities, which should be conducted both qualitatively and quantitatively. Species and abundance of biota should be recorded. Diversity index and evenness index should be provided for evaluation and comparison purposes.

Parameters for water quality monitoring include dissolved oxygen (DO), dissolved oxygen saturation (DO%), temperature, turbidity, salinity, pH and suspended solids (SS), and the measure methodology could make reference to Water Quality monitoring.

Regarding the monitoring of fisheries recruitment, it is recommended the monitoring survey should be monthly covering May to August (the spawning periods of marine fishes). The principal sampling method may involve the use of small seine net or plankton net. Other sampling methods such as fish cages, tidal nets and night-time survey could also be considered and recommended where appropriate. Reference sites shall be selected in nearby

locations, to be monitored following the same methods, to facilitate comparisons and evaluation of effectiveness.

11.4.7 *Tung Chung Bay and Tai Ho Wan Monitoring*

Though Tung Chung Bay is not being directly impacted by the Project, given the high ecological importance of Tung Chung Bay, ecological monitoring should be provided for the bay, including baseline monitoring before reclamation, construction phase monitoring during the reclamation process, and post-construction monitoring.

The monitoring will be conducted on the intertidal soft shore habitats, especially where horseshoe crab juveniles and seagrass beds have been sighted. The soft shore ecological monitoring details are described below.

Monitoring Methodology

The soft shore ecological monitoring will consist of qualitative walk-through surveys, quantitative transect surveys and sedimentation rate monitoring at the accessible survey locations of Tung Chung Bay and Tai Ho Wan as shown in *Figure 11.1*.

For qualitative walk-through surveys, the accessible shoreline of Tung Chung Bay and Tai Ho Wan at each of the three shore heights: 2 m, 1.5 m and 1 m above Chart Datum will be surveyed, and organisms encountered will be recorded and their relative abundance noted. In particular, active search of horseshoe crabs and seagrasses will be conducted to confirm whether these species are present along the sites.

For quantitative transect survey, one 50 – 100 m horizontal (belt) transects (actual length subject to the site conditions) will be surveyed at each of the three shore heights: 2 m, 1.5 m and 1 m above Chart Datum of each survey location. On each transect, five quadrats (50 cm x 50 cm) will be placed randomly in each transect to assess the abundance and distribution of flora and fauna. For each quadrat, surface layer to 5 cm depth will be sieved and microbenthic organisms (e.g. crustaceans) will be recorded and identified. Density of organisms will be expressed as individuals / m². Areas with seagrass will also be recorded and identified and other information, such as the percentage cover, will also be recorded. Sessile animals such as barnacles and oysters in each quadrat will not be counted but estimated as percentage cover on the rock surface. All species of algae (encrusting, foliose and filamentous) will also be identified and recorded by estimating the percentage cover on the rock surface. All organisms will be identified to the lowest possible taxonomic level (at least Genus level). Species encountered outside the quadrat but in the vicinity of survey transect will also be recorded.

For sedimentation rate monitoring, to avoid disturbance to the mudflat and nuisance to navigation, no fixed marker/monitoring rod was installed at the monitoring stations. A high precision Global Navigation Satellite System (GNSS) real time location fixing system (or equivalent technology) will be

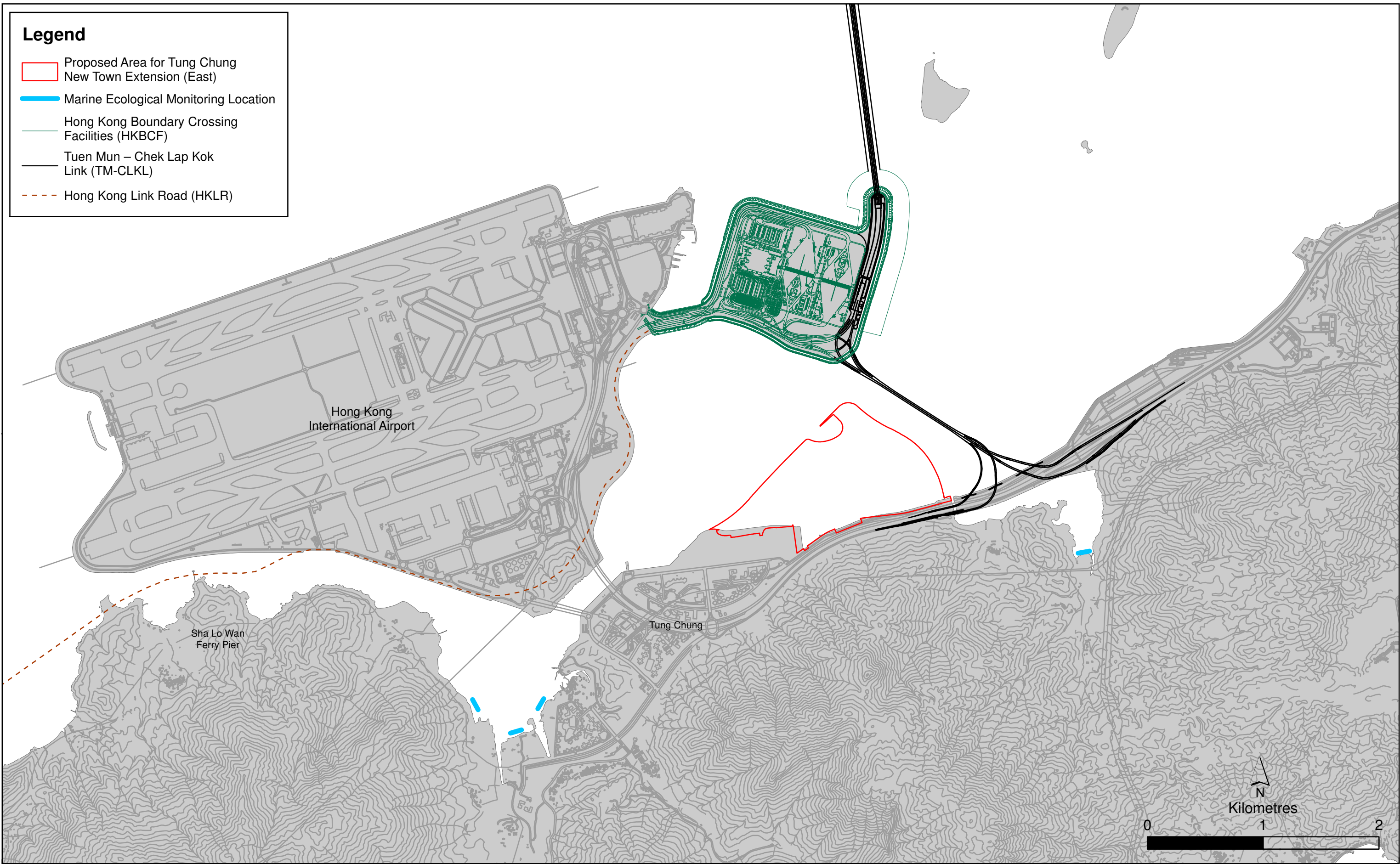


Figure 11.1

Marine Ecological Monitoring (Intertidal Soft-shore Habitats)

used to locate the station in the precision of 1 mm, which is reasonable under flat mudflat topography with uneven mudflat surface only at micro level.

Measurements will be taken directly on the mudflat surface. The Real Time Kinematic GNSS (RTK GNSS) surveying technology will be used to measure mudflat surface levels and 3D coordinates of a survey point. The RTK GNSS survey will be calibrated against a reference station in the field before and after each survey. The reference station is a survey control point established by the Lands Department of the HKSAR Government or traditional land surveying methods using professional surveying instruments such as total station, level and/or geodetic global navigation satellite system. The coordinates system is in HK1980 GRID system. The reference control station will be surveyed and established by traditional land surveying methods using professional surveying instruments such as total station, level and/or geodetic GNSS. The accuracy will be down to mm level and higher than the proposed RTK GNSS cm level so that the reference control station has relatively higher accuracy. As the reference control station has higher accuracy, it will be set as true evaluation relative to the RTK GNSS measurement. All position and height correction will be adjusted and corrected to the reference control station.

The precision of the measured mudflat surface level reading (vertical precision setting) will be within 10 mm (standard deviation) after averaging the valid survey records of the XYZ HK1980 GRID coordinates. Each survey record at each station will be computed by averaging at least three measurements that are within the above specified precision setting. Both digital data logging and written records will be collected in the field. Field data on station fixing and mudflat surface measurement will be recorded.

Monitoring Frequency

Prior to the commencement of construction works of the Project, baseline soft shore ecological monitoring will be conducted once at each survey location in April / May 2018.

During the marine construction of the Project, soft shore ecological monitoring will be conducted quarterly at each survey location covering wet and dry seasons.

Soft shore ecological monitoring will be conducted quarterly at each survey location covering wet and dry seasons in the post-construction phase at least for 2 year after completion of construction.

Event and Action Plan

If the impact monitoring results indicate that the density or the distribution pattern of intertidal fauna and seagrasses has changed, the ET should inform AFCD and investigate the possible causes of the change. Appropriate actions should be recommended and additional mitigation measures should be

implemented as necessary. The monitoring results should be made available within a reasonable short period to be agreed with the EPD, ER and IEC.

The Action and Limit levels and event-action plan for mudflat monitoring are not determined in this manual but will be proposed by Ecologist or respective specialists of the Environmental Team based upon the baseline monitoring data, agreed by AFCD and EPD.

12 FISHERIES

12.1 INTRODUCTION

The construction and operation of the Project would cause certain fishing ground loss. Permanent loss of about 149.2 ha of fishing ground of low production rate would constitute the residual impact. Due to the small number of fishing vessels and the limited fisheries production affected, the residual impact is considered acceptable. The present Project would only be a smaller contributor among all concurrent projects on the cumulative fishing ground loss. The loss of 149.2 ha fishing ground from the present Project would be about 8.2 % of the anticipated 1,800 ha cumulative fishing ground loss.

The EIA has considered avoidance and minimization for the impacts arising from the Project, including the following:

12.1.1 *Considerations for Impact Avoidance*

The Assessment Area is located in waters off North Lantau and there is no fishpond or mariculture site within the Project footprint. The locations of the proposed PDA at TCE reclamation is not located in waters of high fisheries production or fish fry collection, and also away from the identified sites of fisheries importance such as the spawning and nursery grounds for fisheries species in North Lantau waters.

12.1.2 *Considerations for Impact Minimisation*

Revealed from reviewed literatures, the marine waters within the Project Area are not identified as important fish spawning or nursery grounds, or support high fish production. The nearest mariculture site is Ma Wan FCZ, which is about 10 km from the Project Area.

The EIA concluded that the impact of direct loss and indirect disturbance of fishing grounds due to the Project was relatively minor.

12.2 MITIGATION MEASURES

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. During the operation phase, while part of marine works area will be released, 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 loss. 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 will be provided on the future

reclamation seawalls as mitigation on marine ecology. But it is expected that fisheries species in North Lantau will also be benefited by the enhanced ecological functions.

The present Project would only be a smaller contributor among all concurrent projects on the cumulative fishing ground loss. The loss of 149.2 ha fishing ground from the present Project would be about 8.2 % of the anticipated 1,800 ha cumulative fishing ground loss.

Permanent loss of about 149.2ha of fishing ground of low production rate would constitute the 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 significant water quality impact during the operational phase is anticipated. Adverse residual fisheries impact is not anticipated from the present Project.

Recommended mitigation measures for water quality for the construction phase that would minimise and mitigate the potential impacts on fishing grounds and mariculture sites in North Lantau waters have been proposed in the water quality assessment of the present EIA report. Besides the recommended mitigation measures for water quality stated in the water quality assessment, no further mitigation measures were necessary.

12.3 *MONITORING REQUIREMENTS*

There will be a water quality monitoring programme for the construction of the project to safeguard the marine water quality in the area. There will also be a monitoring programme for the eco-shoreline which is an ecological mitigation in Chapter 9 of this EIA Report. The colonisation and establishment of fauna and/or flora on the eco-shoreline at TCE PDA reclamation will be monitored after the eco-shoreline is completed. As it is expected that this measure will also benefit fisheries species in the marine ecosystems, the monitoring programme will also include, besides ecological surveys, water quality monitoring and fisheries resource monitoring (in particular the recruitments of fisheries species). Other than these, no other specific fisheries EM&A programme would be required.

12.4 *AUDIT REQUIREMENTS*

Audit requirements would follow those for water quality and general site practices.

13 LANDSCAPE AND VISUAL IMPACT

13.1 INTRODUCTION

The EIA has recommended EM&A for landscape and visual mitigation measures to be undertaken during the design, construction and operational stages of the project. The design, implementation and maintenance of landscape mitigation measures is a key aspect of this and should be checked to ensure that they are fully realised and that potential conflicts between the proposed landscape measures and any other project works and operational requirements are resolved at the earliest possible date and without compromise to the intention of the mitigation measures. In addition, implementation of the mitigation measures recommended by the EIA will be monitored through the site audit programme.

13.2 MITIGATION MEASURES

The Landscape and Visual Assessment of the EIA proposes a number of mitigation measures to ameliorate the landscape and visual impacts of the Project. These measures are listed in *Table 13.1* below and implementation is summarised in the EMIS in *Appendix 4.1*.

Table 13.1 Mitigation Measures for Landscape and Visual Impacts

Code	Summary Description	Mitigate Landscape Impacts	Mitigate Visual Impacts
Construction Phase			
MM1	Optimization of Construction Areas & Providing Temporary Landscape on Temporary Construction	√	√
MM2	Minimize Topographical Changes	√	√
MM3	Preservation of Potentially Registerable OVTs, Rare and Protective Vegetation	√	
MM4	Transplanting of Existing Trees	√	
MM5	Screen Hoarding		√
MM6	Adopting Non-dredge Method for the Reclamation	√	
MM7	Protection of Natural Rivers and Streams	√	
MM8	Preservation of Natural Coastline	√	
MM9	Providing Natural Rock Material/ Planting for Artificial Seawall	√	√
Operational Phase			
MM10	Compensatory Planting	√	
MM11	Woodland Restoration	√	
MM12	Screen Planting	√	√
MM13	Roadside Planting	√	√
MM14	Aesthetic Design of Built Development		√
MM15	Maximise Greening on Structures	√	√
MM16	Noise Barrier Design		√
MM17	Landscape Treatment for Polders & Stormwater Attenuation and Treatment Ponds	√	√

Code	Summary Description	Mitigate Landscape Impacts	Mitigate Visual Impacts
Construction & Operation Phase			
MM18	Landscaping on Slopes	√	√
MM19	Landscape Treatment on Channelized Watercourses	√	√
MM20	Lighting Control		√

The landscape and visual mitigation measures proposed should be incorporated in the detailed landscape and engineering design. Mitigation measures to be implemented during construction should be adopted from the start of construction and be in place throughout the entire construction period. Mitigation measures to be implemented during operation should be integrated into the detailed design and built as part of the construction works so that they are in place on commissioning of the Project. Tree transplantation, preservation of Potentially Registerable Old and Valuable Trees (OVTs), Rare and Protective Vegetation, and compensatory planting should be carried out as early as possible in the Project with transplantation carried out prior to construction starting in any particular area.

13.3 *BASELINE MONITORING*

The landscape and visual baseline will be determined with reference to the habitat maps included in the EIA Report and detailed tree survey to be completed before the works can commence as well as preliminary site conditions verification surveys.

13.4 *ENVIRONMENTAL MONITORING AND AUDIT REQUIREMENT*

The design stage EM&A requirements for landscape and visual resources comprise the audit of the detailed landscaping and visual specifications to be prepared during the detailed design together with ensuring that the design is sensitive to landscape and visual impacts. The landscape and visual auditor shall review the designs as and when they are prepared and liaise with the landscape architect and design engineer to ensure all measures have been incorporated in the design in a format that can be specified to the Contractor for implementation.

Site audits should be undertaken during the construction phase of the Project to check that the proposed landscape and visual mitigation measures are properly implemented and maintained as per their intended objectives. Site inspections should be undertaken by the ET at least once every two weeks during the construction period, preferably by a Registered Landscape Architect (RLA) employed by the Contractor. Particularly audits should be carried out during site clearance when proposed tree retain, tree felling, and transplantation may occur. For all soft landscaping work, including measures involving trees such as tree transplantation, compensatory planting

and woodland restoration, there should be at least a 24 month establishment period and maintenance which will commence once soft landscaping in an area has been planted. The broad scope of the audit is detailed below.

- The extent of the agreed works areas should be regularly checked during the construction phase. Any trespass by the contractor outside the limit of the works, including any damage to existing trees and woodland shall be noted.
- The progress of the engineering works should be regularly reviewed on site to identify the earliest practical opportunities for the landscape works to be undertaken.
- The tree and shrub transplanting and planting operations.
- Topsoil protection and storage operations.
- All existing trees and vegetation within the study area which are not directly affected by the works are retained and protected.
- The methods of protecting existing vegetation proposed by the Contractor are acceptable and enforced.
- All landscaping works are carried out in accordance with the specifications, with particular attention to approved use of herbicides or pesticides.
- The species and mix of new plant species to be planted are suitable.
- The newly planted trees, shrubs and grassed areas are maintained throughout the establishment period, particularly in respect of the following:
 - regular watering, weeding and fertilising of all planting and grass reinstatement;
 - regular grass cutting for reinstated areas;
 - firming up of plants after periods of strong winds or heavy rain;
 - regular checks for and eradication of pests, fungal infection etc.;
 - pruning of dead or broken branches; and
 - prompt replacement of dead plants and re-grassing of failed areas.

The audits during the operational phase will be restricted to the 24 months establishment works of the landscape proposals, with the appropriate agents taking over the maintenance and monitoring after this period as identified in the EIA report.

Table 13.2 *Monitoring Programme for Landscape and Visual*

Stage	Monitoring Task	Monitoring Report	Form of Approval	Frequency
Design	Monitoring of design works against the recommendations of the landscape and visual impact assessments within the EIA should be undertaken by the Engineer and Landscape Architect, to ensure that they fulfil the intentions of the mitigation measures. Any changes to the design, including design changes on site should also be checked.	Report by Engineer confirming that the design conforms to requirements of EP.	Approval by Project Proponent	At completion of design stage
Construction	Monitoring of the contractor's operations during the construction period.	Report on Contractor's compliance by ET	Counter-signature of report by IEC	Monthly
Establishment Works	Monitoring of the planting works during the 24-months Establishment Period after completion of the construction works.	Report on Contractor's compliance by ET	Counter-signature of report by IEC	Bi-monthly

13.5 *EVENT AND ACTION PLAN*

In the event of non-compliance, the responsibilities of the relevant parties are detailed in the Event/ Action plan provided in *Table 13.3*.

Table 13.3 *Event and Action Plan for Landscape and Visual*

Event	ET	IEC	Action ER	Contractor
Design Check	1. Check final design conforms to the requirements of EP and prepare report.	1. Check report. 2. Recommend remedial design if necessary.	1. Undertake remedial design if necessary.	
Non-conformity on one occasion	1. Inform the IEC, ER and the Contractor 2. Discuss remedial actions with IEC, ER and Contractor 3. Monitor remedial actions until rectification has been completed	1. Check report. 2. Check Contractor's working method 3. Discuss with ET, ER and Contractor on possible remedial measures. 4. Advise ER on effective of proposed remedial measures. 5. Check implementation of remedial measures	1. Confirm receipt of notification of non-conformity in writing 2. Review and agree on the remedial measures proposed by the Contractor 3. Ensure remedial measures are properly implemented	1. Identify source and investigate the non-conformity 2. Amend working methods agreed with ER as appropriate 3. Rectify damage and undertake any necessary replacement
Repeated Non-conformity	1. Identify sources 2. Inform the Contractor, IEC and ER 3. Discuss inspection frequency 4. Discuss remedial actions with IEC, ER and Contractor 5. Monitor remedial actions until rectification has been completed 6. If non-conformity stops, cease additional monitoring	1. Check inspection report 2. Check Contractor's working method 3. Discuss with ET, ER and Contractor on possible remedial measures 4. Advise ER on effectiveness of proposed remedial measures	1. Notify the Contractor 2. In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be implemented 3. Supervise implementation of remedial measures	1. Identify source and investigate the non-conformity 2. Amend working methods agreed with ER as appropriate 3. Rectify damage and undertake any necessary replacement. Stop relevant portion of works as determined by ER until the non-conformity is abated.

14 IMPACT ON CULTURAL HERITAGE

14.1 TERRESTRIAL ARCHAEOLOGY

14.1.1 Introduction

The assessment has considered both the construction and operational phases of the project.

14.1.2 Mitigation Measures

Construction Phase

According to the archaeological potential identified in Section 12.5 of EIA report, the recommendations for corresponding development clusters are summarised in *Table 14.1* below.

Table 14.1 *Summary of Recommendations for Development Clusters in TCW*

Cluster	Area surveyed	Archaeological Potential	Recommendations	Future Owner
TCV-1	Partly	High.	A rescue excavation after land resumption and prior to construction works is recommended for all areas within Sha Tsui Tau Site of Archaeological Interest affected by developing works in residential cluster TCV-1, facilities TCV-i, TCV-j and TCV-k as well as commercial lots COM-1 and COM-2. This recommendation also includes the respective access road to TCV-1 (NBA). For the western part of TCV-1 and Sha Tsui Tau Site of Archaeological Interest a Survey-cum-rescue excavation after land resumption and prior to construction works is recommended. For the DO to the north of TCV-1, the archaeological potential is also considered as high. However, most of this DO would be maintained as its current use and only minimal works would be conducted there. Hence, it is recommended that a Watching Brief with an archaeologist supervising any small scale excavation for utilities works etc. would be required.	Private residual developer
TCV-i	Exempted *	High.		Government
TCV-j				Government
TCV-k				Government
COM-1				Private developer

Cluster	Area surveyed	Archaeological Potential	Recommendations	Future Owner
COM-2	Partly	High due to proximity to Sha Tsui Tau Site of Archaeological Interest and previous results.		Private developer
COM-3	Yes	High due to proximity to Sha Tsui Tau Site of Archaeological Interest and previous results.	A Survey-cum-rescue excavation is recommended after land resumption and prior to construction works for commercial building cluster COM-3.	Private developer
TCV-2	Yes	High in south-western portion due to finds in TP14 and results of previous investigations. The remaining parts are considered low.	Further survey focusing around TP-14 and the low ridge in the south-western part of TCV-2 is recommended after land resumption and prior to any construction works. In all other areas of TCV-2, no further action is required.	Private residual developer
TCV-d	Yes	Low.	No further action is required.	Government
TCV-e	Yes	Medium due to finds in TP-13 and proximity to TCV-1.	Watching brief during excavation of TCV-e is recommended.	Government
TCV-3	No	Low.	No further action is required.	Private residual developer
TCV-a	No			Government
TCV-4	Yes	Low due to heavy re-modelling of slopes.	No further action is required.	Private residual developer
TCV-b	Yes			Government
TCV-5a	Yes	Low due to considerable disturbances.	No further action is required.	Private residual developer
TCV-c	Yes			Government
TCV-5b	Yes	Medium.	A watching brief during the construction phase is recommended for TCV-5b and access road between TCV-5a and 5b.	Private residual developer
Access road	Yes			Government
TCV-6	Yes	Low due to dumping and to slope works east of TCV-6.	No further action is required.	Private residual developer
TCV-1	No	Destroyed.		Government

Cluster	Area surveyed	Archaeological Potential	Recommendations	Future Owner
TCV-7	No	Low.	No further action is required.	Private residual developer
TCV-n	No	Destroyed.	No further action is required.	Government
TCV-8	Yes	High due to finds in TP 04 and site location comparable in terms of natural landscape and topology to Cheung Shue Tan near Chinese University. The south-western part was noted to be sterile and hence of low potential.	Further survey is recommended on lower terrace around TP 04 after land resumption and prior to any construction works. This also affects the access road leading into TCV-8. No further action is required for the south-western part of TCV-8.	Private residual developer
Access road into TCV-8	Yes			Government
TCV-f	Yes	Low.	Since facility TCV-f is planned with a small nullah, no further action is required.	Government
TCV-g	Yes	High due potentially favourable settlement conditions along former coastal area.	Further survey is recommended on the plan in and around TCV-g after land resumption and prior to any construction works.	Government
Access road along south side	Yes	Low.	No further action is required.	Government
TCW-1	Yes	Low due to considerable disturbances.	No further action is required.	Private residual developer
TCW-2	No	Medium due to the possible finds near the youth camp and also unsolved whereabouts of a second Tung Chung battery site.	Further survey in form of one or two test pits could be excavated in lot of youth camp after land resumption and prior to construction works.	Private residual developer

Cluster	Area surveyed	Archaeological Potential	Recommendations	Future Owner
Access road into TCW-2	No			Government
TCW-a	Exempted *	Low.	No further action required.	Government
TCW-3	No	Destroyed.	No further action required.	Private residual developer
TCW-b				Government
TCW-c				Government

Note:

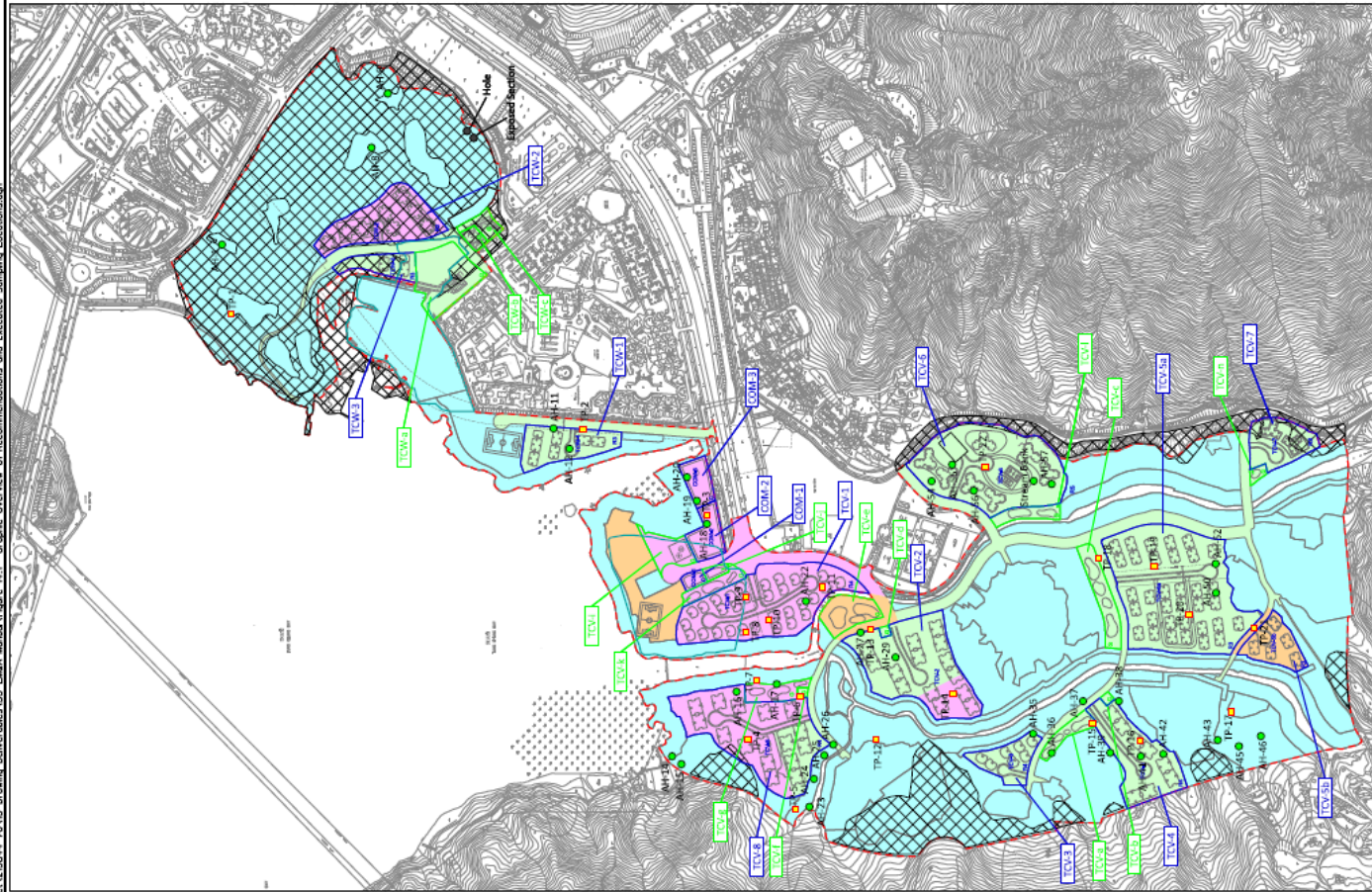
* The whole development cluster is proposed within the Site of Archaeological Interest which has been studied in previous studies and hence the area is not included in this survey. As there is only relatively smaller scale of works anticipated to be carried out at the other development areas including CA, CPA, GB, V, AGR, RO/DO, IC and OU, terrestrial archaeological impact is not anticipated and thus recommendation is not required.

The above mentioned recommendations are graphically summarised in *Figure 14.1*. Red shaded areas are areas where further archaeological investigations after land resumption and prior to any construction works are needed. Yellow shaded areas are areas where further action in form of watching briefs during construction works are recommended. Green shaded areas are areas where no further action is required. Blue shaded areas are other development areas (CA, CPA, GB, V, AGR, RO/DO, IC and OU zonings with minor works) where no further action is required.

The recommendations on archaeological investigation can be classified in three categories:

1. Rescue excavations where previous findings could be confirmed with this survey and where data is sufficient to exactly locate and define the extent of necessary works. Affected areas are Sha Tsui Tau Site of Archaeological Interest including eastern parts of cluster TCV-1, facilities TCV-i to TCV-k as well as commercial clusters COM-1 and 2;
2. Survey-cum-rescue excavations are subdivided procedures. An initial advanced survey as integral part of the works helps to complete data and to better locate and design the follow-up rescue excavations. Survey-cum-rescue excavations are recommended for western parts of cluster TCV-1 and for commercial cluster COM-3; and
3. Further surveys, where additional (enlarged) test pits are recommended without the imminent need of a follow-up rescue excavations are recommended for parts of clusters TCV-2 and TCV-8 as well as clusters TCW-2 and TCV-g. Further surveys will be conducted prior to the commencement of any construction works; and mitigation measures will be formulated based on the findings of further surveys in prior consultation with AMO before the construction phase of the Project.

DO NOT SCALE DRAWING. CHECK ALL DIMENSIONS ON SITE.
 ALL COORDINATES SHOWN
 ON THIS MAP ARE APPROXIMATE.

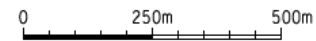


LEGEND

- POSSIBLE DEVELOPMENT AREA
- SITE OF ARCHAEOLOGICAL INTEREST
- HILL SLOPE + ROADS
- AUGER HOLE
- TEST PIT
- DEVELOPMENT CLUSTER

RECOMMENDATIONS

- RESCUE EXCAVATION / SURVEY-CUM-RESCUE EXCAVATION / FURTHER SURVEY
- WATCHING BRIEF
- NO FURTHER ACTION
- NO FURTHER ACTION FOR OTHER DEVELOPMENT AREA (CA, CPA, GB, V, AGR, RO/DO, JC AND OU ZONINGS WITH MINOR WORKS)



Printed by : 11/13/2015
 File name : G:\Data\Project\28844-20\13 Drawing Deliverables\13 ERM Map\Figure 14.1 - Graphic Overview of Recommendations and Executed Sampling Locations.dwg

Figure 14.1

Graphic Overview of Recommendations and Executed Sampling Locations

Environmental
 Resources
 Management



The project proponent should be aware of the protection of items of archaeological or historic significance according to the Antiquities and Monuments Ordinance. Should finds be discovered: 1) during the additional archaeological investigation after land resumption and prior to construction works; 2) during the watching brief during the construction phase of the project; or 3) where construction works can commence without further action being necessary, the AMO has to be contacted immediately for further agreement on practical and feasible handling procedures.

Operation Phase

As mentioned in Section 12.6 of EIA report, no adverse impact is anticipated for marine archaeology and thus no further action or mitigation is required.

14.2 MARINE ARCHAEOLOGY

14.2.1 Introduction

The assessment has considered both the construction and operational phases of the project.

14.2.2 Mitigation Measures

Construction Phase

As marine archaeological resource was not identified during the diver survey, no further action or mitigation is thus required.

Operation Phase

As mentioned in Section 12.6 of EIA report, no adverse impact is anticipated for marine archaeology and thus no further action or mitigation is required.

14.3 BUILT HERITAGE

14.3.1 Introduction

The assessment has considered both the construction and operational phases of the project.

14.3.2 Mitigation Measures

Construction Phase

As mentioned in Section 12.4 of EIA report, all the identified built heritage items within the vicinity of TCW are located in land use zonings of the RODP in which large scale development is not proposed, impacts on these items is not anticipated and thus no further action or mitigation is required.

Operation Phase

As mentioned in Section 12.6 of EIA report, no development will be proposed on all existing built heritage items and they will be retained as they are, no adverse impact is anticipated and thus no further action or mitigation is required.

15.1

SITE INSPECTION

Site inspection provides a direct means to initiate and enforce specified environmental protection and pollution control measures. These shall be undertaken routinely to inspect construction activities in order to ensure that appropriate environmental protection and pollution control mitigation measures are properly implemented. Site inspection is one of the most effective tools to enforce the environmental protection requirements at the works area.

The ET shall be responsible for formulating the environmental site inspection programme as well as the deficiency and action reporting system, and for carrying out the site inspections. The proposal for rectification, if any, should be prepared and submitted to the ET Leader and IEC by the Contractor.

Regular site inspections shall be carried out and led by the ER and attended by the Contractor and ET at least once per week during the construction phase. The areas of inspection shall not be limited to the environmental situation, pollution control and mitigation measures within the site. It should also review the environmental situations outside the works area which is likely to be affected, directly or indirectly, by the construction site activities of the Project. The ET shall make reference to the following information in conducting the inspection. During the inspection, the following information should be referred to:

- (i) EIA Report recommendations on environmental protection and pollution control mitigation measures;
- (ii) works progress and programme;
- (iii) individual works methodology proposals (which shall include the proposal on associated pollution control measures);
- (iv) contract specifications on environmental protection;
- (v) relevant environmental protection and pollution control legislations; and
- (vi) previous site inspection results.

The Contractor shall keep the ER and ET Leader updated with all relevant environmental related information on the construction contract necessary for him to carry out the site inspections. Site inspection results and associated recommendations for improvements to the environmental protection and pollution control efforts should be recorded and followed up by the Contractor in an agreed time-frame. The Contractor shall follow the procedures and time-frame as stipulated in the environmental site inspection, and the deficiency and action reporting system formulated by the ET, to report on any remedial measures subsequent to the site inspections.

The ER, ET and the Contractor should also carry out ad-hoc site inspections if significant environmental problems are identified. Inspections may also be required subsequent to receipt of a valid environmental complaint, or as part of the investigation work, as specified in the Action Plan for the EM&A programme.

15.2 ENVIRONMENTAL COMPLIANCE

There are statutory requirements on environmental protection and pollution control requirements with which construction activities must comply.

In order to ensure the works comply with corresponding requirements, all method statements of works should be submitted by the Contractor to the ER for approval and to the ET Leader to ensure sufficient environmental protection and pollution control measures have been included. The Environmental Mitigation Implementation schedule (EMIS) is summarised in *Appendix 4.1*. Any proposed changes to the mitigation measures shall be certified by the ET Leader and verified by the IEC as conforming to the relevant information and recommendations contained in the EIA Report.

The ER and ET shall also review the progress and programme of the works to check that relevant environmental legislations have not been violated, and that any foreseeable potential for violating laws can be prevented.

The Contractor should provide the update of the relevant documents to the ET Leader so that checking can be carried out. The document shall at least include the updated Works Progress Reports, updated Works Programme, method statements, any application letters for different licences / permits under the environmental protection laws, and copies of all valid licences / permits. The site diary and environmental records shall also be available for inspection by the relevant parties.

After reviewing the document, the ET shall advise the IEC and Contractor of any non-compliance with legislative requirements on environmental protection and pollution control so that they can timely take follow-up actions as appropriate. If the follow-up actions may still result in potential violation of environmental protection and pollution control requirements, the ER and ET should provide further advice to the Contractor to take remedial action to resolve the problem.

Upon receipt of the advice, the Contractor shall undertake immediate actions to correct the situation. The ER and ET shall follow up to ensure that appropriate action has been taken in order to satisfy legal requirements.

15.3 CHOICE OF CONSTRUCTION METHOD

At times during the construction phase the Contractor may submit method statements for various aspects of construction. This state of affairs would only apply to those construction methods that the EIA has not imposed

conditions while for construction methods that have been assessed in the EIA, the Contractor is bound to follow the requirements and recommendations in the EIA study. The Contractor's options for alternative construction methods may introduce adverse environmental impacts into the Project. It is the responsibility of the Contractor and ET, in accordance with established standards, guidelines and EIA study recommendations and requirements, to review and determine the adequacy of the environmental protection and pollution control measures in the Contractor's proposal in order to ensure no unacceptable impacts would result. To achieve this end, the ET shall provide a copy of the Proactive Environmental Protection Proforma as shown in *Appendix 15.1* to the IEC for approval. The IEC should audit the review of the construction method and endorse the proposal on the basis of no adverse environmental impacts.

15.4 ENVIRONMENTAL COMPLAINTS

A Complaint Management Plan has been submitted to EPD no later than one month before the commencement of construction of the Project to include a dedicated complaint hotline and an email channel for timely response to complaints. The Contractor has established the dedicated complaint hotline and email channel for receiving any comments from the public and the details are specified in *Table 15.1* below.

Table 15.1 Environmental Complaint Communication

Complaint Channel	Details
Dedicated Hotline Number	9617 2624
Dedicated Email Address	info.NL201703@gmail.com
Fax Number	2656 6598
Mailing Address	Units 601-605A, 6/F, Tower B, Manulife Financial Centre, 223 Wai Yip Street, Kwun Tong, Kowloon Attn: Environmental Officer

The following procedures should be undertaken upon receipt of any environmental complaint:

- The Contractor to log complaint and date of receipt onto the complaint database and inform the ER, ET and IEC immediately;
- The Contractor to investigate, with the ER and ET, the complaint to determine its validity, and assess whether the source of the problem is due to construction works of the Project with the support of additional monitoring frequency and stations, if necessary;
- The Contractor to identify remedial measures in consultation with the IEC, ET and ER if a complaint is valid and due to the construction works of the Project;
- The Contractor to implement the remedial measures as required by the ER and to agree with the ET and IEC any additional monitoring

frequency and stations, where necessary, for checking the effectiveness of the remedial measures;

- The ER, ET and IEC to review the effectiveness of the Contractor's remedial measures and the updated situation;
- The ET to undertake additional monitoring and audit to verify the situation if necessary, and oversee that circumstances leading to the complaint do not recur;
- If the complaint is referred by the EPD, the Contractor to prepare interim report on the status of the complaint investigation and follow-up actions stipulated above, including the details of the remedial measures and additional monitoring identified or already taken, for submission to EPD within the time frame assigned by the EPD; and
- The ET to record the details of the complaint, results of the investigation, subsequent actions taken to address the complaint and updated situation including the effectiveness of the remedial measures, supported by regular and additional monitoring results in the monthly EM&A reports.

If mitigation measures are identified as required during in the investigation by the ET, the Contractor should promptly carry out the mitigation works. ER should ensure that the measures have been carried out by the Contractor. The environmental complaint handling flow chart is presented in *Figure 15.1*.

15.5

LOG-BOOK

As stated in Condition 2.3(v) of the EP, the ET will keep a contemporaneous log-book of any such instance or circumstance or change of circumstances. The log-book will be kept readily available for inspection by all persons assisting in supervision of the implementation of the recommendations of the approved EIA Report (Register No. AEIAR-196/2016) and the EP or by EPD or his authorized officers. An log-book sample is shown in *Appendix 15.2*.

2018/2/22

Complaint Management Plan

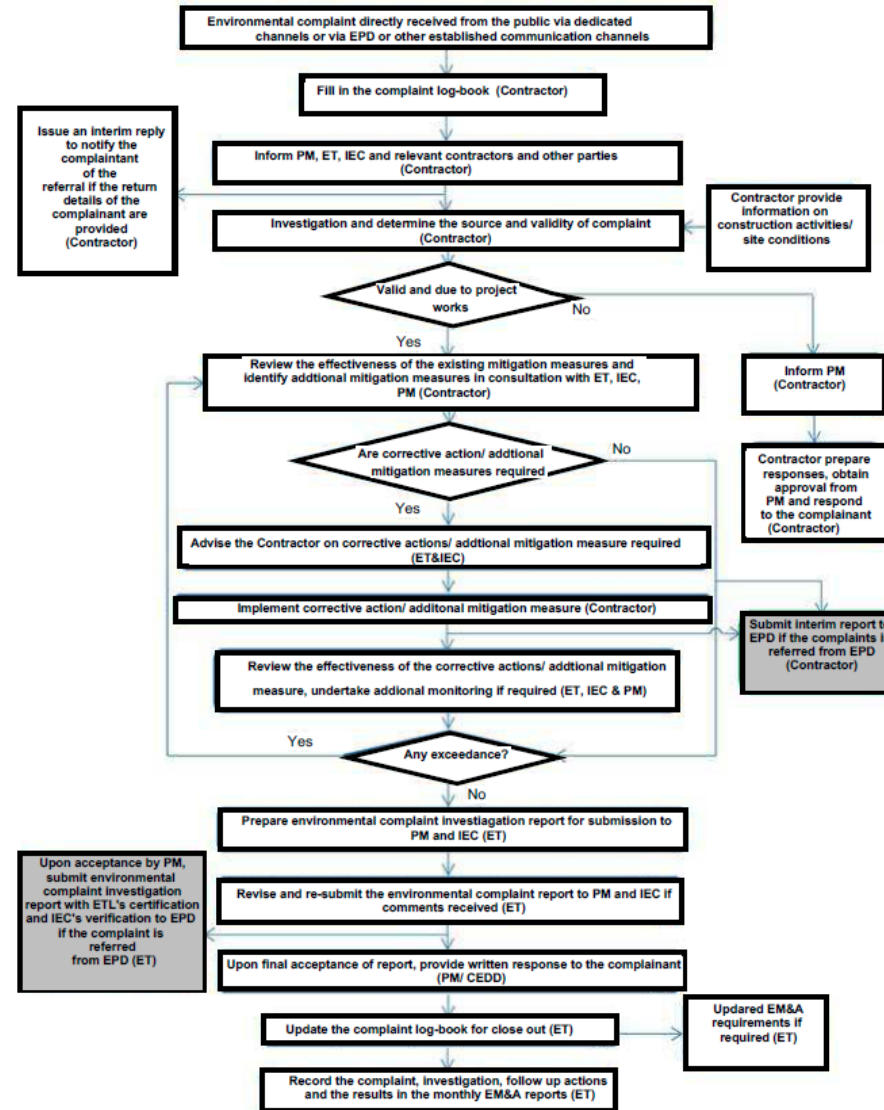


Figure 15.1

Environmental Complaint Handling Flow Chart

16.1**GENERAL**

Reports can be provided in an electronic medium upon agreeing the format with the ER and EPD. This would enable a transition from a paper / historic and reactive approach to an electronic / real time proactive approach. All the monitoring data (baseline and impact) shall also be submitted on diskettes or other approved media. The formats for air quality, noise and water quality monitoring data to be submitted shall be separately agreed.

The ET is responsible for establishing and maintaining a dedicated website throughout the entire construction period for publishing all the relevant environmental monitoring data (including but not limited to the baseline and impact monitoring). The ET shall propose the format and functionality of the website for agreement with the ER and IEC prior to publishing of data. Once the monitoring data are available (e.g. noise, dust, water quality etc) and vetted by the IEC, the ET is responsible to upload the relevant data to the dedicated website.

Types of reports that the ET shall prepare and submit include baseline monitoring report, monthly EM&A report and final EM&A review report. In accordance with Annex 21 of the TM-EIAO, a copy of the monthly and final review EM&A reports shall be made available to the Director of Environmental Protection.

16.2**BASELINE MONITORING REPORT**

The baseline monitoring report shall include at least the following:

- (i) up to half a page executive summary;
- (ii) brief project background information;
- (iii) drawings showing locations of the baseline monitoring stations;
- (iv) monitoring results (in both hard and diskette copies) together with the following information:
 - monitoring methodology;
 - name of laboratory and types of equipment used and calibration details;
 - parameters monitored;
 - monitoring locations;
 - monitoring date, time, frequency and duration; and

- quality assurance (QA) / quality control (QC) results and detection limits;
- (v) details of influencing factors, including:
- major activities, if any, being carried out on the site during the period;
 - weather conditions during the period; and
 - other factors which might affect monitoring results;
- (vi) determination of the Action and Limit Levels for each monitoring parameter and statistical analysis of the baseline data;
- (vii) revisions for inclusion in the EM&A Manual; and
- (viii) comments, recommendations and conclusions.

16.3 *MONTHLY MONITORING REPORTS*

The results and findings of all EM&A work required in the Manual shall be recorded in the monthly EM&A reports prepared by the ET and endorsed by the IEC. The EM&A report shall be prepared and submitted to EPD within 10 working days of the end of each reporting month, with the first report due the month after construction commences. Copies of each monthly EM&A report shall be submitted to the following parties: the IEC, the ER and EPD. Before submission of the first EM&A report, the ET shall liaise with the parties on the required number of copies and format of the monthly reports in both hard copy and electronic medium.

The ET should prepare and submit a Baseline Environmental Monitoring Report at least one month before commencement of construction of the Project. Copies of the Baseline Environmental Monitoring Report should be submitted to the IEC, ER and EPD. The ET should liaise with the relevant parties on the exact number of copies require.

The ET shall review the number and location of monitoring stations and parameters every six months, or on as needed basis, in order to cater for any changes in the surrounding environment and the nature of works in progress.

16.3.1 *First Monthly EM&A Report*

The first monthly EM&A report shall include at least the following:

- (i) Executive summary (1-2 pages):
- breaches of Action and Limit levels;
 - compliant log

- notifications of any summons and successful prosecutions;
 - reporting changes; and
 - future key issues.
- (ii) Basic project information:
- project organization including key personnel contact names and telephone numbers;
 - programme;
 - management structure; and
 - works undertaken during the month.
- (iii) Environmental status:
- advice on the status of statutory environmental compliance such as the status of compliance with the environmental permit (EP) conditions under the EIAO, submission status under the EP and implementation status of mitigation measures;
 - works undertaken during the month with illustrations (such as location of works, daily excavation rate, etc.); and
 - drawings showing the project are, any environmental sensitive receivers and the locations of the monitoring and control stations (with co-ordinates of the monitoring locations).
- (iv) A brief summary of EM&A requirements including:
- all monitoring parameters;
 - environmental quality performance limits (Action and Limit levels);
 - Event-Action Plans;
 - environmental mitigation measures, as recommended in the project EIA study final report; and
 - environmental requirements in contract documents.
- (v) Implementation status
- advice on the implementation status of environmental protection and pollution control / mitigation measures, as recommended in the project EIA Report.
- (vi) Monitoring results (in both hard and diskette copies) together with the following information:

- monitoring methodology;
- name of laboratory and types of equipment used and calibration details;
- monitoring parameters;
- monitoring locations;
- monitoring date, time, frequency, and duration;
- weather conditions during the period;
- any other factors which might affect the monitoring results; and
- QA / QC results and detection limits.

(vii) Report on non-compliance, complaints, and notifications of summons and successful prosecutions:

- record of all non-compliance (exceedances) of the environmental quality performance limits (Action and Limit levels);
- record of all complaints received (written or verbal) for each media, including locations and nature of complaints investigation, liaison and consultation undertaken, actions and follow-up procedures taken, results and summary;
- record of all notification of summons and successful prosecutions for breaches of current environmental protection / pollution control legislation, including locations and nature of the breaches, investigation, follow-up actions taken, results and summary;
- review of the reasons for and the implications of non-compliances, complaints, summons and prosecutions including review of pollution sources and working procedures; and
- description of the actions taken in the event of non-compliance and deficiency reporting and any follow-up procedures related to earlier non-compliance.

(viii) Others

- an account of the future key issues as reviewed from the works programme and work method statements;
- advice on the solid and liquid waste management status;
- record of any project changes from the originally proposed as described in the EIA (e.g. construction methods, mitigation proposals, design changes, etc.); and

- comments (for examples, effectiveness and efficiency of the mitigation measures), recommendations (for examples, any improvement in the EM&A programme) and conclusions.

16.3.2 *Subsequent Monthly EM&A Reports*

Subsequent monthly EM&A reports shall include at least the following:

- (i) Executive summary (1-2 pages):
 - breaches of Action and Limit levels;
 - compliant log
 - notifications of any summons and successful prosecutions;
 - reporting changes; and
 - future key issues.
- (ii) Basic project information:
 - project organization including key personnel contact names and telephone numbers;
 - programme;
 - management structure; and
 - works undertaken during the month; and
 - any updates as needed to the scope of works and construction methodologies.
- (iii) Environmental status:
 - advice on the status of statutory environmental compliance such as the status of compliance with the environmental permit (EP) conditions under the EIAO, submission status under the EP and implementation status of mitigation measures;
 - works undertaken during the month with illustrations (such as location of works, daily excavation rate, etc.); and
 - drawings showing the project area, any environmental sensitive receivers and the locations of the monitoring and control stations.
- (iv) Implementation status
 - advice on the implementation status of environmental protection and pollution control / mitigation measures, as recommended in the project EIA Report.

- (v) Monitoring results (in both hard and diskette copies) together with the following information:
- monitoring methodology;
 - name of laboratory and types of equipment used and calibration details;
 - monitoring parameters;
 - monitoring locations;
 - monitoring date, time, frequency, and duration;
 - weather conditions during the period;
 - any other factors which might affect the monitoring results; and
 - QA / QC results and detection limits.
- (vi) Report on non-compliance, complaints, and notifications of summons and successful prosecutions:
- record of all non-compliance (exceedances) of the environmental quality performance limits (Action and Limit levels);
 - record of all complaints received (written or verbal) for each media, including locations and nature of complaints investigation, liaison and consultation undertaken, actions and follow-up procedures taken, results and summary;
 - record of all notification of summons and successful prosecutions for breaches of current environmental protection / pollution control legislation, including locations and nature of the breaches, investigation, follow-up actions taken, results and summary;
 - review of the reasons for and the implications of non-compliances, complaints, summons and prosecutions including review of pollution sources and working procedures; and
 - description of the actions taken in the event of non-compliance and deficiency reporting and any follow-up procedures related to earlier non-compliance.
- (vii) Others
- an account of the future key issues as reviewed from the works programme and work method statements;
 - advice on the solid and liquid waste management status;
 - record of any project changes from the originally proposed as

described in the EIA (e.g. construction methods, mitigation proposals, design changes, etc.); and

- comments (for examples, effectiveness and efficiency of the mitigation measures), recommendations (for examples, any improvement in the EM&A programme) and conclusions.

(viii) Appendices

- Action and Limit levels;
- graphical plots of trends of the monitoring parameters at key stations over the past four reporting periods for representative monitoring stations annotated against the following:
 - ◆ major activities being carried out on site during the period;
 - ◆ weather conditions during the period; and
 - ◆ any other factors that might affect the monitoring results.
- monitoring schedule for the present and next reporting period;
- cumulative statistics on complaints, notifications of summons and successful prosecutions; and
- outstanding issues and deficiencies.

16.4 *FINAL EM&A REVIEW REPORTS*

16.4.1 *General*

The EM&A programme for construction stage should be terminated upon the completion of the construction activities, while the EM&A programme for operation stage should be terminated upon the completion of operation monitoring.

The proposed termination should only be implemented after the proposal has been endorsed by the IEC, the Engineer and the Project Proponent followed by approval from the Director of Environmental Protection.

16.4.2 *Final EM&A Review Report for Construction Stage*

The final EM&A review report for construction stage (to be submitted after completion of construction activities) should contain at least the following information:

- (i) Executive summary (1-2 pages):
- (ii) Drawings showing the project area, any environmental sensitive receivers and the locations of the monitoring and control stations;

- (iii) Basic project information including a synopsis of the project organization, contacts of key management, and a synopsis of work undertaken during the course of the project or past twelve months;
- (iv) A brief summary of EM&A requirements including:
 - environmental mitigation measures for construction stage, as recommended in the project EIA Report;
 - environmental impact hypotheses tested;
 - environmental quality performance limits (Action and Limit levels);
 - all monitoring parameters;
 - Event and Action Plans;
- (v) A summary of the implementation status of environmental protection and pollution control / mitigation measures for construction stage, as recommended in the project EIA Report and summarized in the updated implementation schedule;
- (vi) Graphical plots and the statistical analysis of the trends of monitoring parameters over the course of the project, including:
 - the major activities being carried out on site during the period;
 - weather conditions during the period; and
 - any other factors which might affect the monitoring results;
- (vii) A summary of non-compliance (exceedances) of the environmental quality performance limits (Action and Limit levels);
- (viii) A review of the reasons for and the implications of non-compliance including review of pollution sources and working procedures as appropriate;
- (ix) A description of the actions taken in the event of non-compliance;
- (x) A summary record of all complaints received (written or verbal) for each media, liaison and consultation undertaken, actions and follow-up actions taken and results;
- (xi) A review of the validity of EIA predictions for construction stage and identification of shortcomings in EIA recommendations;
- (xii) Comments (for example, a review of the effectiveness and efficiency of the mitigation measures and of the performance of the environmental management system, that is, of the overall EM&A programme for construction stage); and

- (xiii) Recommendations and conclusions (for example, a review of success of the overall EM&A programme for construction stage to cost-effectively identify deterioration and to initiate prompt effective mitigatory action when necessary).

16.4.3

Final EM&A Review Report for Operation Stage

The final EM&A review report for operation stage (to be submitted after completion of operation monitoring) should contain at least the following information:

- (i) Executive summary (1-2 pages):
- (ii) Drawings showing the project area, any environmental sensitive receivers and the locations of the monitoring and control stations;
- (iii) Basic project information including a synopsis of the project organization, contacts of key management, and a synopsis of work undertaken during the course of the project or past twelve months;
- (iv) A brief summary of EM&A requirements including:
 - environmental mitigation measures for operation stage, as recommended in the project EIA Report;
 - environmental impact hypotheses tested;
 - environmental quality performance limits (Action and Limit levels);
 - all monitoring parameters;
 - Event and Action Plans;
- (v) A summary of the implementation status of environmental protection and pollution control / mitigation measures for operation stage, as recommended in the project EIA Report and summarized in the updated implementation schedule;
- (vi) Graphical plots and the statistical analysis of the trends of monitoring parameters over the course of the project, including:
 - the major activities being carried out on site during the period;
 - weather conditions during the period; and
 - any other factors which might affect the monitoring results;
- (vii) A summary of non-compliance (exceedances) of the environmental quality performance limits (Action and Limit levels);
- (viii) A review of the reasons for and the implications of non-compliance including review of pollution sources and working procedures as

appropriate;

- (ix) A description of the actions taken in the event of non-compliance;
- (x) A summary record of all complaints received (written or verbal) for each media, liaison and consultation undertaken, actions and follow-up actions taken and results;
- (xi) A review of the validity of EIA predictions for operation stage and identification of shortcomings in EIA recommendations;
- (xii) Comments (for example, a review of the effectiveness and efficiency of the mitigation measures and of the performance of the environmental management system, that is, of the overall EM&A programme for operation stage); and
- (xiii) Recommendations and conclusions (for example, a review of success of the overall EM&A programme for operational stage to cost-effectively identify deterioration and to initiate prompt effective mitigatory action when necessary).

16.5 DATA KEEPING

No site-based documents (such as monitoring field records, laboratory analysis records, site inspection forms, etc.) are required to be included in the monthly EM&A reports. However, any such document shall be well kept by the ET and be ready for inspection upon request. All relevant information shall be clearly and systematically recorded in the document. Monitoring data shall also be recorded in magnetic media form, and the software copy must be available upon request. Data format shall be agreed with EPD. All documents and data shall be kept for at least one year following completion of the construction contract and one year following completion of the operational phase monitoring for construction phase EM&A and operational EM&A respectively.

16.6 INTERIM NOTIFICATIONS OF ENVIRONMENTAL QUALITY LIMIT EXCEEDANCES

With reference to the Event and Action Plans, when the environmental quality performance limits are exceeded and if they are proven to be valid, the ET should immediately notify the IEC and EPD, as appropriate. The notification should be followed up with advice to the IEC and EPD on the results of the investigation, proposed actions and success of the actions taken, with any necessary follow-up proposals. A sample template for the interim notification is presented in *Appendix 16.1*.

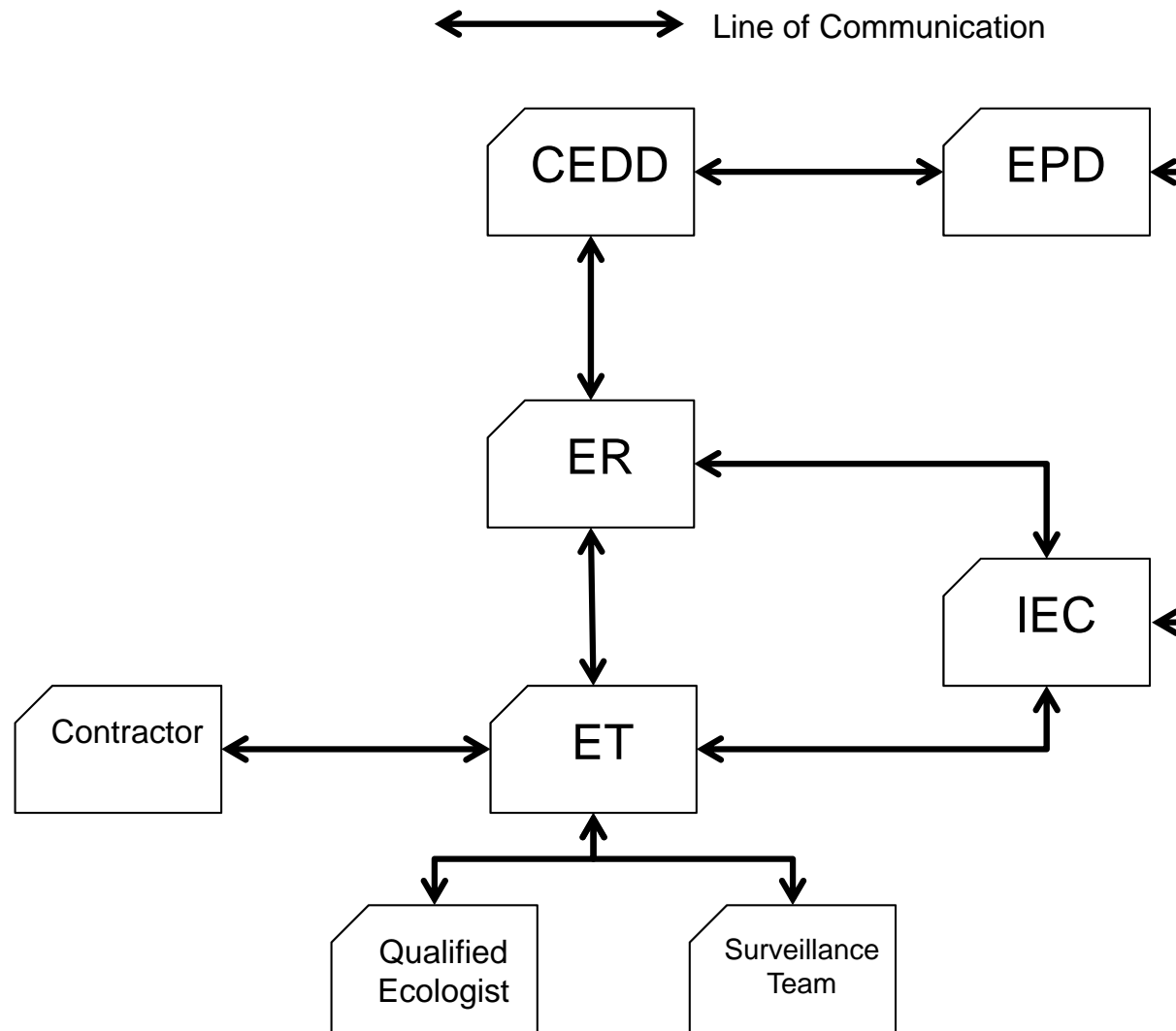
Appendix

Appendix 2.1

Tung Chung New Town
Extension - Construction
Programme

Appendix 3.1

Project Organization for Environmental Works



Appendix 4.1

Environmental Mitigation
Implementation Schedule –
Tung Chung New Town
Extension

Environmental Mitigation Implementation Schedule – Tung Chung New Town Extension

Note: Chapters 1 to 2 of the EIA report present the background information of the Project, identified concurrent projects, objectives and scope for various environmental aspects, and description on alternative options and construction description. Chapters 3 to 12 of the EIA report present the EIA findings and mitigation measures are described below with cross-reference to the EIA report. Chapters 13 to 15 describe the environmental monitoring requirements, summary of environmental outcomes and conclusion.

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
<i>Common Mitigation Measures (Applicable to ALL Project Components, including DPs and Non-DPs)</i>							
<i>Construction Dust Impact</i>							
S3.4.6	D1	Water spraying every hour on exposed worksites and haul road.	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • APCO • To control the dust impact to meet HKAQO and TM-EIAO criteria
S3.4.6	D2	The contractor shall follow the procedures and requirements given in the Air Pollution Control (Construction Dust) Regulation	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • APCO • To control the dust impact to meet HKAQO and TM-EIAO criteria
S3.4.6	D3	<p>The following dust suppression measures should be incorporated to control the dust nuisance throughout the construction phase:</p> <ul style="list-style-type: none"> • Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading; • Any dusty materials remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads; 	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • APCO • To control the dust impact to meet HKAQO and TM-EIAO criteria

Environmental Mitigation Implementation Schedule – Tung Chung New Town Extension

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
		<ul style="list-style-type: none"> • A stockpile of dusty material should not be extended beyond the pedestrian barriers, fencing or traffic cones; • The load of dusty materials on a vehicle leaving a construction site should be covered entirely by impervious sheeting to ensure that the dusty materials do not leak from the vehicle; • Where practicable, vehicle washing facilities with high pressure water jet should be provided at every discernible or designated vehicle exit point. The area where vehicle washing takes place and the road section between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores; • When there are open excavation and reinstatement works, hoarding of not less than 2.4m high should be provided as far as practicable along the site boundary with provision for public crossing. Good site practice shall also be adopted by the Contractor to ensure the conditions of the hoardings are properly maintained throughout the construction period; • The portion of any road leading only to construction site that is within 30m of a vehicle entrance or exit should be kept clear of dusty materials; • Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation takes place should be sprayed with water or a dust suppression chemical continuously; • Any area that involves demolition activities should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet; • Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, 					

Environmental Mitigation Implementation Schedule – Tung Chung New Town Extension

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
		<p>sheeting or netting should be provided to enclose the scaffolding from the ground floor level of the building, or a canopy should be provided from the first floor level up to the highest level of the scaffolding;</p> <ul style="list-style-type: none"> • Any skip hoist for material transport should be totally enclosed by impervious sheeting; • Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides; • Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed; • Loading, unloading, transfer, handling or storage of bulk cement or dry PFA should be carried out in a totally enclosed system or facility, and any vent or exhaust should be fitted with an effective fabric filter or equivalent air pollution control system; and • Exposed earth should be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shortcrete or other suitable surface stabiliser within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies. 					
S3.4.6	D4	Implement regular dust monitoring under EM&A programme during the construction stage.	Monitoring of dust impact	Contractor	Selected dust monitoring stations	Construction stage	<ul style="list-style-type: none"> • TM-EIAO

Environmental Mitigation Implementation Schedule – Tung Chung New Town Extension

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
Construction Noise							
S4.3.4	N1	<p>Implement the following good site management practices:</p> <ul style="list-style-type: none"> • only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme; • machines and plant (such as trucks, cranes) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • plant known to emit noise strongly in one direction, where possible, be orientated so that the noise is directed away from nearby NSRs; • silencers or mufflers on construction equipment should be properly fitted and maintained during the construction works; • mobile plant should be sited as far away from NSRs as possible and practicable; • material stockpiles, site office and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities. 	Control construction airborne noise	Contractor	All construction sites where practicable	Construction stage	• Annex 5, TM-EIAO
S4.3.4	N2	Use of quiet plant which should be made reference to the Powered Mechanical Equipment (PME) listed in the Technical Memorandum or the Quality Powered Mechanical Equipment (QPME) / other commonly used PME listed in Environmental Protection Department (EPD) web pages as far as possible which includes the Sound Power Level (SWLs) for specific quiet PME.	Reduce the noise levels of plant items	Contractor	All construction sites where practicable	Construction stage	• Annex 5, TM-EIAO
S4.3.4	N3	Install movable temporary noise barriers (typical design is wooden framed barrier with a small-cantilevered upper portion of superficial density no less than 7kg/m ² on a skid	Screen the noisy plant items to be used at all	Contractor	All construction sites where	Construction stage	• Annex 5, TM-EIAO

Environmental Mitigation Implementation Schedule – Tung Chung New Town Extension

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
		footing with 25mm thick internal sound absorptive lining), and full enclosure, screen the noisy plants including air compressors, generators etc.	construction sites		practicable		
S4.3.4	N4	Implement a noise monitoring under EM&A programme.	Monitor the construction noise levels at the selected representative locations	Contractor	Selected noise monitoring stations	Construction stage	• TM-EIAO
<i>Operational Noise (Road Traffic Noise)</i>							
S4.5.4	N5	<p>Provide a series of noise mitigation measures including low noise surfacing material, noise barriers, facades with no openable window, school boundary walls and architectural fins before occupation of the protected NSRs. Locations of noise mitigation measures are stated as following:</p> <p>Year 2023:</p> <ul style="list-style-type: none"> • Facade with no openable window at B1-1 and B1-2 for TCE; TCV-6 for TCW • 1.5m long architectural fin at B1-1 and B1-2 for TCE • Approx. 50m long, 4m high school boundary wall at possible school development near Tung Chung Area 39 • Approx. 120m long, 5m high vertical barrier with 3m cantilevered arm at 45° at the corner at junction between Chung Mun Road and Road L24 • Approx. 210m long LNRS along Chung Mun Road • Approx. 160m long LNRS along Road L24 • Approx. 160m long LNRS along Road L30 <p>Year 2025:</p> <ul style="list-style-type: none"> • Facade with no openable window at B1-1, B1-2, D1-1, 	Reduce operation noise from road traffic	Relevant government departments / Private developers	Refer to Figure 6.1, Figure 6.1a-b, Figure 6.2, Figures 6.2a-b, Figure 6.3, Figures 6.3a-d, Figure 6.4, and Figures 6.4a-e	Prior to operation of the Project for existing NSRs. While for mitigation measures to protect planned NSRs, it should be constructed before population intake of planned NSRs.	• TM-EIAO

Environmental Mitigation Implementation Schedule – Tung Chung New Town Extension

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
		<p>D1-2, D2-3 and D2-4 for TCE; TCV-6 for TCW</p> <ul style="list-style-type: none"> • 1.5m long architectural fin at B1-1, B1-2 and D2-4 for TCE; TCV-1 for TCW • Approx. 60m long, 5m high school boundary wall along Road L3 • Approx. 70m long, 5m high school boundary wall with 3m cantilevered arm at 45° along Road L3 • Approx. 50m long, 4m high school boundary wall at possible school development near Tung Chung Area 39 • Approx. 120m long, 5m high vertical barrier with 3m cantilevered arm at 45° at the corner at junction between Chung Mun Road and Road L24 • Approx. 210m long LNRS along Chung Mun Road • Approx. 160m long LNRS along Road L24 • Approx. 160m long LNRS along Road L30 <p>Year 2027:</p> <ul style="list-style-type: none"> • Facade with no openable window at A1-1, A1-2, A2-1, A2-2, A2-3, A2-4, B1-1, B1-2, D1-1, D1-2, D2-3 and D2-4 for TCE; TCV-6 for TCW • 1.5m long architectural fin at A2-1, A2-4, B1-1, B1-2 and D2-4 for TCE; • 1.8m long architectural fin at A1-1, A1-2, A2-1 and A2-4 • Approx. 60m long, 5m high school boundary wall along Road L3 • Approx. 70m long, 5m high school boundary wall with 3m cantilevered arm at 45° along Road L3 • Approx. 50m long, 4m high school boundary wall at 					

Environmental Mitigation Implementation Schedule – Tung Chung New Town Extension

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
		<p>possible school development near Tung Chung Area 39</p> <ul style="list-style-type: none"> • Approx. 120m long, 5m high vertical barrier with 3m cantilevered arm at 45° at the corner at junction between Chung Mun Road and Road L24 • Approx. 210m long LNRS along Chung Mun Road • Approx. 160m long LNRS along Road L24 • Approx. 160m long LNRS along Road L30 <p>Year 2045:</p> <ul style="list-style-type: none"> • Facade with no openable window at A1-1, A1-2, A2-1, A2-2, A2-3, A2-4, B1-1, B1-2, C1-1, C2-1, C2-2, D1-1, D1-2, D2-3, D2-4, E1-4 and E1-5 for TCE; TCV-1 and TCV-6 for TCW • 1.5m long architectural fin at A2-1, A2-4, B1-1, B1-2, C1-1 and D2-4 for TCE; TCV-1 for TCW • 1.8m long architectural fin at A1-1, A1-2, A2-1, A2-4 and C1-1 • Approx. 100m long, 5m high absorptive vertical barrier along Road D3 • Approx. 50m long, 5m high absorptive vertical barrier with 3m cantilevered arm at 45° along Road L7 • Approx. 60m long, 5m high school boundary wall along Road L3 • Approx. 70m long, 5m high school boundary wall with 3m cantilevered arm at 45° along Road L3 • Approx. 80m long, 4m high school boundary wall along Road L2 • Approx. 40m long, 3m high school boundary wall along Road L2 					

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		<ul style="list-style-type: none"> • Approx. 50m long, 4m high school boundary wall at possible school development near Tung Chung Area 39 • Approx. 120m long, 5m high vertical barrier with 3m cantilevered arm at 45° at the corner at junction between Chung Mun Road and Road L24 • Approx. 210m long LNRS along Chung Mun Road • Approx. 160m long LNRS along Road L24 • Approx. 160m long LNRS along Road L30 					
Operational Noise (Fixed Noise)							
S4.6.4	N6	<p>For existing and planned NSRs which are located near to the proposed noise sources, the following tentative noise mitigation measures are considered:</p> <ul style="list-style-type: none"> • All the pumps should be enclosed inside building structures; • Proper selection of quiet plant to reduce the tonality at NSRs; • Installation of silencer / acoustic enclosure / acoustic louvers for the exhaust of ventilation system. • For underground train stations, sound attenuators with sufficient attenuations can be installed to the ventilation shafts. • Openings of ventilation system should be located away from NSRs. 	Reduce operation fixed noise	Relevant government departments / Future Operator	All plant rooms where practicable	Prior to operation of the Project	<ul style="list-style-type: none"> • Noise Control Ordinance and its TM, TM-EIAO
Operational Noise (Rail Noise)							

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S4.8.4	N7	<p>Before Phase 1 is occupied:</p> <ul style="list-style-type: none"> • Facade with no openable windows for residential block at B1-2 • 1.5m long architectural fin at B1-2 <p>Before Phase 3 is occupied:</p> <p>It should be noted that Railway Stations at TCE and TCW and its associated railway system is a Designated Project under Item A.2 of Schedule 2 of TM-EIAO. Hence, the proposed mitigation measures are tentative for cumulative assessment purpose in this EIA and all the mitigation measures will be revised by the railway operator during their Schedule 2 EIA.</p> <ul style="list-style-type: none"> • Approx. 325m long, semi enclosure along the tracks of Tung Chung Line facing B0-2 and COM-1 • Approx. 210m long, semi enclosure along the tracks of Tung Chung Line facing A1-2 and C1-1 • Approx. 390m long, semi enclosure along the track of Tung Chung Line to Tung Chung direction facing C1-1 to C2-1 • Approx. 630m long, semi enclosure along the track of Tung Chung Line to Hong Kong direction facing C1-1 and C2-1 	Reduce operation rail noise	Relevant government departments / Future Operator	Refer to Figure 6.1, Figure 6.1a-b, Figure 6.2, Figures 6.2a-b, Figure 6.3, Figures 6.3a-d, Figure 6.4, and Figures 6.4a-e	Prior to final population intake	<ul style="list-style-type: none"> • Noise Control Ordinance and its TM, TM-EIAO

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<i>Water Quality (Construction Phase)</i>							
S5.4.3	W1	<p><u>General Construction Activities</u></p> <p>In accordance with the Practice Note for Professional Persons on Construction Site Drainage, Environmental Protection Department, 1994 (ProPECC PN1/94), best management practices should be implemented on site as far as practicable. The best practices are detailed below:</p> <ul style="list-style-type: none"> • At the start of site establishment, perimeter cut-off drains to direct off-site water around the site should be constructed with internal drainage works. Channels, earth bunds or sand bag barriers should be provided on site to direct stormwater to silt removal facilities.; • Diversion of natural stormwater should be provided as far as possible. The design of temporary on-site drainage should prevent runoff going through site surface, construction machinery and equipment in order to avoid or minimize polluted runoff. Sedimentation tanks with sufficient capacity, constructed from pre-formed individual cells of approximately 6 to 8 m3 capacities, are recommended as a general mitigation measure which can be used for settling surface runoff prior to disposal. The system capacity shall be flexible and able to handle multiple inputs from a variety of sources and suited to applications where the influent is pumped; • The dikes or embankments for flood protection should be implemented around the boundaries of earthwork areas. Temporary ditches should be provided to facilitate the runoff discharge into an appropriate watercourse, through a silt/sediment trap. The silt/sediment traps should be incorporated in the permanent drainage channels to enhance deposition rates; • The design of efficient silt removal facilities should be 	To minimize water quality impact from construction site runoff and general construction activities	Contractor	All construction sites where applicable	Construction stage	<ul style="list-style-type: none"> • Water Pollution Control Ordinance • ProPECC PN1/94 • TM-EIAO • TM-DSS

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		<p>based on the guidelines in Appendix A1 of ProPECC PN 1/94. The detailed design of the sand/silt traps should be undertaken by the contractor prior to the commencement of construction;</p> <ul style="list-style-type: none"> • Construction works should be programmed to minimize surface excavation works during the rainy seasons (April to September). All exposed earth areas should be completed and vegetated as soon as possible after earthworks have been completed. If excavation of soil cannot be avoided during the rainy season, or at any time of year when rainstorms are likely, exposed slope surfaces should be covered by tarpaulin or other means; • All drainage facilities and erosion and sediment control structures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly following rainstorms. Deposited silt and grit should be removed regularly and disposed of by spreading evenly over stable, vegetated areas; • If the excavation of trenches in wet periods is necessary, it should be dug and backfilled in short sections wherever practicable. Water pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities; • All open stockpiles of construction materials (for example, aggregates, sand and fill material) should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system; • Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and storm runoff being 					

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		<p>directed into foul sewers;</p> <ul style="list-style-type: none"> • Precautions to be taken at any time of year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecasted, and actions to be taken during or after rainstorms are summarized in Appendix A2 of ProPECC PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events; • All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and sited wheel washing facilities should be provided at every construction site exit where practicable. Wash-water should have sand and silt settled out and removed at least on a weekly basis to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains; • Oil interceptors should be provided in the drainage system downstream of any oil/fuel pollution sources. The oil interceptors should be emptied and cleaned regularly to prevent the release of oil and grease into the storm water drainage system after accidental spillage. A bypass should be provided for the oil interceptors to prevent flushing during heavy rain; • Construction solid waste, debris and rubbish on site should be collected, handled and disposed of properly to avoid water quality impacts; • All fuel tanks and storage areas should be provided with locks and sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank to prevent spilled fuel oils from reaching water sensitive 					

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		<p>receivers nearby;and</p> <ul style="list-style-type: none"> Regular environmental audit on the construction site should be carried out in order to prevent any malpractices. Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the water bodies, mangroves and open sea. 					
S5.4.3	W2	<p><u>Sewage from workforce</u></p> <ul style="list-style-type: none"> Portable chemical toilets and sewage holding tanks are recommended for handling the construction sewage generated by the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance; Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment during the construction phase of the Project; Regular environmental audit on the construction site should be conducted in order to provide an effective control of any malpractices and achieve continual improvement of environmental performance on site. 	To minimize water quality from sewage effluent in construction phase	Contractor	All construction sites where practicable	Construction stage	<ul style="list-style-type: none"> Water Pollution Control Ordinance TM-DSS
S5.4.3	W3	<p><u>Construction Works and Bridge Works near Tung Chung Stream</u></p> <ul style="list-style-type: none"> Use precast structures or other similar approaches 	To prevent any construction works in river and avoid any direct water quality impact to Tung Chung Stream	Contractor	All construction sites where practicable	Construction stage	<ul style="list-style-type: none"> ProPECC PN1/94
S5.4.3	W4	<p><u>Construction Works of Sewage Pumping Stations</u></p> <ul style="list-style-type: none"> A buffer zone of about 20m or about 30m will be zoned to 	To avoid any direct water quality impact to Tung Chung Stream	Contractor	All construction sites where	Construction stage	<ul style="list-style-type: none"> ProPECC PN1/94

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		prevent any construction works near river.			practicable		
S5.4.3	W5	<p><u>Construction Work of Fresh Water and Salt Water Reservoirs</u></p> <ul style="list-style-type: none"> • Good site management as stipulated in ProPECC PN1/94 will be fully implemented to avoid polluted liquid or solid wastes from falling into the river waters or drainage. 	To avoid water quality impact	Contractor	All construction sites where practicable	Construction stage	• ProPECC PN1/94
S5.4.3	W6	<p><u>Construction of Storm Water Management Facilities and Polder Scheme</u></p> <ul style="list-style-type: none"> • Good site management as stipulated in ProPECC PN1/94 will be fully implemented to avoid polluted liquid or solid wastes from falling into the river waters or drainage. 	To avoid any direct water quality impact to Tung Chung Stream	Contractor	All construction sites where practicable	Construction stage	• ProPECC PN1/94
S5.4.3	W7	<p><u>Groundwater and Runoff for Tunnel Works</u></p> <ul style="list-style-type: none"> • Cut-and-Cover method for the underpass at Road D1 in Tung Chung East to minimise the intrusion of groundwater. Good site management as stipulated in ProPECC PN1/94 will be fully implemented to avoid polluted liquid or solid wastes from falling into the river waters or drainage. 	To avoid water quality impact	Contractor	All construction sites where practicable	Construction stage	• ProPECC PN1/94
S5.5.8	W8	<p><u>Good Management Practice in Construction Phase</u></p> <p>The following good site management practices shall be adopted for the filling works:</p> <ul style="list-style-type: none"> • Water quality monitoring shall be implemented to ensure effective control of water pollution and recommend additional mitigation measures required; • The decent speed of grabs shall be controlled to minimize the seabed impact and to reduce the volume of over-dredging; • A perimeter silt curtain shall be installed during the entire 	To avoid water quality impact	Contractor	All construction sites where practicable	Construction stage	• ProPECC PN1/94

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		reclamation periods; <ul style="list-style-type: none"> • Barges or hoppers shall not be filled to a level which will cause overflow of materials or pollution of water during loading or transportation; • Excess materials shall be cleaned from the decks and exposed fittings of barges before the vessels are moved; • Plants should not be operated with leaking pipes and any pipe leakages shall be repaired quickly; • Adequate freeboard shall be maintained on barges to reduce the likelihood of decks being washed by wave action; • All vessels should be sized so that adequate clearance is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash; and • The works shall not cause foam, oil, grease, litter or other objectionable matter to be present in the water within and adjacent to the works site. 					
S5.5.8	W9	<ul style="list-style-type: none"> • The recovered C&D materials for filling would be ensured no floating or non-inert material by visual inspection, quality assurance, etc. 	To avoid water quality impact	Contractor	All construction sites where practicable	Construction stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance

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<i>Water Quality (Operational Phase)</i>							
S5.6.10	W10	<p>The following mitigation measures will be implemented to TCV East, North and West SPS, upgraded CMRSPS, proposed TCE West SPS and TCE East SPS</p> <ul style="list-style-type: none"> • 100% standby pump capacity with spare pump of 50% pump capacity • Dual-feed power supply • Wet well storage providing up to 6-hours ADWF capacity (equivalent to about 4 hours of response time during peak flow condition); and • Emergency communication mechanism amongst relevant government departments. 	To prevent the impact due to the emergency discharge at TCW and TCE	DSD	Proposed Sewage Pumping Station at TCW and TCE	Operational Stage	• DSD's Sewerage Manual
S5.6.10	W11	<p>The following mitigation measures will be implemented to gravity sewers and rising mains</p> <ul style="list-style-type: none"> • Adopt high density polyethylene (HDPE) pipe for proposed gravity sewers and rising mains. • Further protection on proposed rising mains with concrete surround will be provided to mitigate the risk of bursting. 	To minimize the risk of bursting and hence bursting discharge from gravity sewers and rising mains	DSD	Proposed rising mains within TCE and TCW	Operational Stage	-
S5.6.10	W12	<p><u>Maintenance Dredging for the Proposed Marina</u></p> <p>Silt curtain should be deployed to reduce the sediment dispersion from the dredging inside the marina.</p>	To reduce the sediment dispersion	Future operator	Proposed marina at TCE	Operational Stage	-

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<i>Sewage and Sewerage Treatment Implications</i>							
S6.5.4	SS1	<p><u>Emergency Discharge of Proposed TCV West SPS, TCV East SPS, TCV North SPS and Upgraded CMRSPS</u></p> <p>The following mitigation measures will be implemented to TCV East, North and West SPS, and upgraded CMRSPS:</p> <ul style="list-style-type: none"> • 100% standby pumping capacity within each SPS, with spare pump up to 50% pumping capacity stockpiled in each SPS for any emergency use • Twin rising mains • Dual-feed power supply • Emergency storage facilities up to 6-hours ADWF capacity; and • Emergency communication mechanism amongst relevant government departments. 	To prevent the impact due to the emergency discharge at TCW	DSD	Proposed Sewage Pumping Station at TCW	Operational stage	N/A
S6.5.4	SS2	<p><u>Emergency Discharge of Proposed TCE West SPS and TCE East SPS</u></p> <p>In order to minimize the impact due to the emergency discharge, the following precautionary measures shall be included in the design of sewage pumping station:</p> <ul style="list-style-type: none"> • 100% standby pumping capacity within each SPS, with spare pump up to 50% pumping capacity stockpiled in each SPS for any emergency use • Twin rising mains • Dual-feed power supply • Emergency storage facilities up to 6-hours ADWF capacity; and • Emergency communication mechanism amongst relevant 	To minimize the impact due to the emergency discharge at TCE	DSD	Proposed Sewage Pumping Station at TCE	Operational stage	N/A

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		government departments.					
S6.5.4	SS3	<p>The following mitigation measures will be implemented to prevent pipe bursting on Rising Mains within TCE and TCW:</p> <ul style="list-style-type: none"> • Strong pipe – use HDPE pipe with welded joints • Concrete encasement – concrete surround all rising mains 	To minimize the risk of bursting and hence bursting discharge from gravity sewers and rising mains	DSD	Proposed rising mains within TCE and TCW	Operational stage	N/A

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Waste Management (Construction Waste)							
S7.4.1	WM1	<p><u>Good Site Practices</u></p> <p>The following good site practices are recommended throughout the construction activities:</p> <ul style="list-style-type: none"> • nomination of an approved personnel, such as a site manager, to be responsible for the implementation of good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site; • training of site personnel in site cleanliness, appropriate waste management procedures and concepts of waste reduction, reuse and recycling; • provision of sufficient waste disposal points and regular collection for disposal; • imposition of penalty system on Contractors' improper behaviours when illegal dumping and landfilling outside their respective construction sites, i.e. on nearby farmlands and riverbanks, are reported; • appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers; • regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; and • the contractor should prepare a Waste Management Plan (WMP) as part of the Environmental Management Plan (EMP) in accordance with the ETWB TC(W) No. 19/2005 for construction phase. The EMP should be submitted to the Engineer for approval. Mitigation measures proposed in the EIA Report and the EM&A Manual should be adopted. 	Minimize waste generation during construction	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance

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S7.4.1	WM2	<p><u>Waste Reduction Measures</u></p> <p>Waste reduction is best achieved at the planning and design phase, as well as by ensuring the implementation of good site practices. The following recommendations are proposed to achieve reduction:</p> <ul style="list-style-type: none"> • segregate and store different types of waste in different containers, skip or stockpiles to enhance reuse or recycling of materials and their proper disposal; • proper storage and site practices to minimize the potential for damage and contamination of construction materials; • plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste; • sort out demolition debris and excavated materials from demolition works to recover reusable/recyclable portions (i.e. soil, broken concrete, metal etc.); • provide training to workers on the importance of appropriate waste management procedures, including waste reduction, reuse and recycling. 	Reduce waste generation	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance
S7.4.1	WM3	<p><u>Storage of Waste</u></p> <p>The following recommendation should be implemented to minimize the impacts:</p> <ul style="list-style-type: none"> • waste such as soil should be handled and stored well to ensure secure containment; and • Depends on actual site activities, certain locations within the site area would be used for storage of waste to enhance reuse. However, there would not be any designated location for storage of waste, and the storage locations would need to be adjusted to suite actual site conditions; 	Good site practice to minimize the waste generation and recycle the C&D materials as far as practicable so as to reduce the amount for final disposal	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Land (Miscellaneous Provisions) Ordinance • Waste Disposal Ordinance • ETWB TCW No. 19/2005

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S7.4.1	WM4	<p><u>Collection and Transportation of Waste</u></p> <p>The following recommendation should be implemented to minimize the impacts:</p> <ul style="list-style-type: none"> • remove waste in timely manner; • employ the trucks with cover or enclosed containers for waste transportation; • obtain relevant waste disposal permits from the appropriate authorities; and • disposal of waste should be done at licensed waste disposal facilities. 	Minimize waste impacts from storage	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance
S7.4.1	WM5	<p><u>Excavated and C&D Materials</u></p> <p>Wherever practicable, C&D materials should be segregated from other wastes to avoid contamination and ensure acceptability at public fill reception facilities or reclamation sites. The following mitigation measures should be implemented in handling the excavated and C&D materials:</p> <ul style="list-style-type: none"> • maintain temporary stockpiles and reuse excavated fill material for backfilling; • carry out on-site sorting; • make provisions in the Contract documents to allow and promote the use of recycled aggregates where appropriate; and • implement a trip-ticket system for each works contract to ensure that the disposal of C&D materials are properly documented and verified, so as to avoid the illegal dumping and landfilling of C&D materials on farmlands/ riverbanks at TCW; <p>The recommended C&D materials handling should include:</p>	Minimize waste impacts from excavated and C&D materials	Contractor	All construction sites	Construction Stage	<ul style="list-style-type: none"> • Land (Miscellaneous Provisions) Ordinance • Waste Disposal Ordinance • ETWB TCW No. 19/2005 • Project Administrative Handbook for Civil Engineering Works, 2012 Edition

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		<ul style="list-style-type: none"> On-site sorting of C&D materials Reuse of C&D materials Use of Standard Formwork and Planning of Construction Materials purchasing 					
S7.4.1	WM6	<p><u>Provision of Wheel Wash Facilities</u></p> <p>Wheel wash facilities have to be provided at the site entrance before the trucks leaving the works area. Dust disturbance due to the trucks transportation to the public road network could be minimized by such arrangement.</p>	Minimize waste impacts from trucks transportation	Contractor	All construction sites	Construction Stage	N/A
S7.4.1	WM7	<p><u>Excavated Contaminated Soil</u></p> <p>As a precaution, it is recommended that standard good site practice should be implemented during the construction phase to minimize any potential exposure to contaminated soils or groundwater.</p>	Remediate contaminated soil	Contractor	All construction sites where applicable	Construction stage	<ul style="list-style-type: none"> Practice Guide for Investigation and Remediation of Contaminated Land
S7.4.1	WM8	<p><u>Excavated Marine Sediments</u></p> <p>Reference has been made to the sediment testing results. Possible mitigation measures to handle the contaminated/uncontaminated sediment are summarized as follows.</p> <ul style="list-style-type: none"> All construction plant and equipment shall be designed and maintained to minimise the risk of silt, sediments, contaminants or other pollutants being released into the water column or deposited in the locations other than designated location. All vessels shall be sized such that adequate draft is maintained between vessels and the sea bed at all states of the tide to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash. Adequate freeboard shall be maintained on barges to 	Handle excavated sediment	Contractor	All construction sites where applicable	Construction stage	<ul style="list-style-type: none"> ETWB-TCW 34/2002

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		ensure that decks are not washed by wave action.					
S7.4.1	WM9	<p><u>Dumping of excavated sediment</u></p> <ul style="list-style-type: none"> Keep and produce logs and other records to demonstrate compliance and ensure journeys are consistent with designated locations Comply with the conditions in the dumping permit. All bottom dumping vessels (hopper barges) shall be fitted with tight fittings seals to their bottom openings to prevent leakage of material. The excavated sediment shall be placed into the disposal pit by bottom dumping. Contaminated marine mud shall be transported by split barge of not less than 750m³ capacity and capable of rapid opening and discharge at the disposal site. Discharge shall be undertaken rapidly and the hoppers shall be closed immediately. Sediment adhering to the sides of the hopper shall not be washed out of the hopper and the hopper shall remain closed until the barge returns to the disposal site. For Type 3 special disposal treatment, sealing of contaminant with geosynthetic containment before dropping into designated mud pit. A geosynthetic containment method is a method whereby the sediments are sealed in geosynthetic containers and, the containers would be dropped into the designated contaminated mud pit where they would be covered by further mud disposal and later by the mud pit capping at the disposal site, thereby fulfilling the requirements for fully confined mud disposal. 	Handle excavated sediment	Contractor	All construction sites where applicable	Construction stage	<ul style="list-style-type: none"> ETWB-TCW 34/2002
S7.4.1	WM10	<u>Chemical Waste</u>	Control the chemical waste and ensure proper	Contractor	All construction	Construction stage	<ul style="list-style-type: none"> Waste Disposal

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		If chemical wastes are produced at the construction site, the Contractors should register with EPD as chemical waste producer. Chemical wastes should be stored in appropriate containers and collected by a licensed chemical waste collector. Chemical wastes (e.g. spent lubricant oil) should be recycled at an appropriate facility as far as possible, while the chemical waste that cannot be recycled should be disposed of at either the Chemical Waste Treatment Centre, or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.	storage, handling and disposal.		sites		(Chemical Waste) General) Regulation <ul style="list-style-type: none"> • Code of Practice on the Packaging, Labelling and Storage of Chemical Waste
S7.4.1	WM11	<u>General Refuse</u> <ul style="list-style-type: none"> • General refuse should be stored in enclosed bins separately from construction and chemical wastes. Recycling bins should also be placed to encourage recycling. • Preferably enclosed and covered areas should be provided for general refuse collection and routine cleaning for these areas should also be implemented to keep areas clean. • A reputable waste collector should be employed to remove general refuse on a daily basis. 	Minimize production of the general refuse and avoid odour, pest and litter impacts	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance
S7.4.1	WM12	<u>Floating Refuse accumulated along the seawall</u> The floating refuse along seawall should be collected to avoid accumulation. In addition, proper seawall design should be employed, and regular checking and cleaning of floating refuse should be implemented.	Control floating refuse and ensure proper disposal	Contractor	Construction sites along seawall	Construction stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance
Waste Management (Operational Waste)							
S7.4.2	WM13	<u>Illegal dumping and landfilling</u>	Prevent waste from	Relevant	All	Operational stage	

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		As a Development Permission Area (DPA) plan will be issued by the Town Planning Board as a temporary measure before the formal Outline Zoning Plan (OZP) for Tung Chung New Town Extension is adopted, statutory right to guide and control the development and use of land would be authorised. Should there be illegal dumping and landfilling observed/ reported on nearby farmlands and riverbanks, the government authority should take all necessary actions including but not limited to prosecution to remediate the circumstances.	illegal dumping and landfilling	government departments	construction sites		
S7.4.2	WM14	<p><u>Municipal Solid Waste</u></p> <ul style="list-style-type: none"> • A reputable waste collector should be employed to remove general refuse on a daily basis. • A 4-bin recycling system for paper, metals, plastics and glass should be adopted together with a general refuse bin. They should be placed in prominent places to promote waste separation at source. All recyclable materials should be collected by recyclers. 	Remove general refuse generated from the proposed development	FEHD/ Relevant Operators	All construction sites	Operational stage	• Waste Disposal Ordinance
S7.4.2	WM15	<p><u>Chemical Waste</u></p> <ul style="list-style-type: none"> • Localized chemical waste storage areas should be located close to the source of waste generation for temporary storage. Drum-type containers with proper labelling should be used to collect chemical wastes for storage at the designated areas. • A licensed collector should be employed for the chemical waste collection and the chemical wastes should be disposed at an appropriate facility, such as Chemical Waste Treatment Centre (CWTC) in Tsing Yi. • Collection receipts issued by the licensed collector showing the quantities and types of chemical waste taken off-site and details of the treatment facility should be kept for record. 	Reduce chemical waste due to waste handling	Contractors/ Relevant Operators	All construction sites	Operational stage	

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S7.4.2	WM16	<u>Floating Refuse accumulated along seawall</u> <ul style="list-style-type: none"> The floating refuse along seawall should be collected to avoid accumulation. 	Control floating refuse and ensure proper disposal	MD	Along seawall	Operational stage	<ul style="list-style-type: none"> Waste Disposal Ordinance
S7.4.2	WM17	<u>Floating Refuse inside Marina</u> <ul style="list-style-type: none"> Floating refuse at the marina will be collected and disposed by the licensed waste collector and as required. 	Reduce floating refuse washing up onto marina by currents and wind	Future operator	Marina	Operational stage	<ul style="list-style-type: none"> Waste Disposal Ordinance

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<i>Land Contamination</i>							
S8.4.1	LC1	Undertaking environmental Site Inspection (SI) for all potentially contaminated sites as listed in the Contamination Assessment Plan (CAP).	Verify the land contamination potential before the commencement of construction	Project Proponent / Detailed Design Consultant / Private developer	All potentially contaminated sites as listed in the CAP	Prior to the construction stage	<ul style="list-style-type: none"> • Annex 19 of the TM-EIAO, Guidelines for Assessment of Impact On Sites of Cultural Heritage and Other Impacts (Section 3 : Potential Contaminated Land Issues); • Guidance Manual for Use of Risk-Based Remediation Goals (RBRGs) for Contaminated Land Management; • Guidance Notes for Contaminated Land Assessment and Remediation; and • Practice Guide for Investigation and Remediation of Contaminated Land

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							<ul style="list-style-type: none"> Recommendations in Health Risk Assessment
S8.4.2	LC2	<p>Re-appraisal would be required for the surveyed sites, other remaining areas of the PDAs and the works areas for the associated infrastructures because the development of these sites/ areas would only commence a number of years later, which may allow changes in the land usage of these sites and may give rise to potential land contamination issues.</p> <p>The Project Proponent’s appointed consultant would prepare a supplementary CAP presenting the findings of the re-appraisal and strategy of the recommended SI, if required, and submit to EPD for review and approval.</p>	To assess the latest site situation and identify any potential additional hot spots and contaminated sites.	Project Proponent / Detailed Design Consultant / Private developer	All the surveyed sites as listed in the CAP, other remaining areas of the PDAs and works areas for the associated infrastructures	Prior to the construction stage	Ditto
S8.5	LC3	After approval of the supplementary CAP and upon completion of the SI works, the PP should prepare and submit a Contamination Assessment Report (CAR) for all potentially contaminated sites listed in the CAP to EPD for agreement.	Present the findings of SI and evaluate the level and extent of potential contamination	Project Proponent / Detailed Design Consultant / Private developer	All the surveyed sites as listed in the CAP, other remaining areas of the PDAs and works areas for the associated infrastructures	Prior to the construction stage	Ditto
S.8.5	LC4	Preparation and submission of Remediation Action Plan (RAP) to EPD for agreement if land contamination is confirmed.	Recommend appropriate mitigation measures for the contaminated soil and groundwater identified in the	Project Proponent / Detailed Design Consultant / Private developer	All the surveyed sites as listed in the CAP, other remaining	Prior to the construction stage	Ditto

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			assessment if remediation is required		areas of the PDAs and works areas for the associated infrastructures		
S.8.5	LC5	Preparation and submission of Remediation Report (RR) to EPD for agreement.	Demonstrate that the decontamination work is adequate and is carried out in accordance with the endorsed CAR and RAP	Project Proponent / Detailed Design Consultant / Private developer	All the surveyed sites as listed in the CAP, other remaining areas of the PDAs and works areas for the associated infrastructures	Prior to the construction stage	Ditto

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<i>Ecology (Design Phase)</i>							
S9.8.1	EC1	Development under the Project have avoided all the recognised sites of conservation importance, including Country Parks,	To protect the recognised sites of conservation importance and habitats inside	PlanD	TCW	RODP	• Not available
S9.8.1	EC2	About 30m buffer zone at the two main branches and the joined outlet section of Tung Chung Stream; and about 20m buffer for the major tributary at Ngau Au of Tung Chung Stream	To protect the Tung Chung Stream	PlanD	Tung Chung Stream	RODP	• Not available
S9.8.2	EC3	Detailed designs should avoid the encroachment of important habitats (e.g. Fung Shui Wood) within the Project Site	To protect the important habitats within Project Site	PlanD	TCW	Design Phase	• Not available
S9.8.2	EC4	Detailed designs of noise barriers to prevent bird collision	To prevent bird collision	HyD	Noise barriers	Design Phase	• Guidelines on Design of Noise Barriers
S9.8.2	EC5	Measures and suitable designs of sewage pumping stations to prevent emergency discharge accidents in TCE and TCW <ul style="list-style-type: none"> • 100% standby pumping capacity within each SPS, with spare pump up to 50% pumping capacity stockpiled in each SPS for any emergency use • Twin rising mains • Dual-feed power supply • Emergency storage facilities up to 6-hours ADWF capacity; and • Emergency communication mechanism amongst relevant government departments. 	To protect the water bodies from impacts due to emergency discharge in TCE and TCW	DSD	Proposed and Upgraded Sewage pumping stations at TCE and TCW	Design Phase	• DSD standards

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<i>Ecology (Construction Phase)</i>							
S9.8.2	EC6	Adoption of non-dredged reclamation method	To maintain the marine water quality	Contractor	Reclamation area of TCE and Road P1	Construction phase	<ul style="list-style-type: none"> • EIA • Contractual requirements
S9.8.3	EC7	Compensation woodland planting	To compensate loss of woodland, fung shui wood and orchard	Contractor	Uphill of Sheung Lei Pai FSW and Tung Chung Road	Construction phase	<ul style="list-style-type: none"> • EIA • Contractual requirements
S9.8.3	EC8	Planting of emergent plant	To provide habitats for this Jhora Scrub Hopper, and to compensate the loss of their habitats (wet abandoned agricultural land) in northern section of Fong Yuen	DSD / Contractor	Inside the future River Park	Construction phase	<ul style="list-style-type: none"> • EIA • Contractual requirements
S9.8.3	EC9	Capture-and-translocation exercise	Minimize the potential impact to amphibian species of conservation importance including Romer’s Tree Frog and Chinese Bullfrog due to site formation	For public works, provided by the government departments responsible for the construction of those public works or the site formation works . For TCV-1 and	Public works near the eastern branch of Tung Chung Stream, in particular 1) the River Park, 2) the Distributor Road along	Capture-and-translocation exercise before commencement of site formation	<ul style="list-style-type: none"> • EIA • Contractual requirements • Explanatory statement of the OZP (for private lots)

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				TCV-5, where the lands within mostly belong to private lots, the future project proponents of those private lots, via the established mechanism for land transaction application.	the eastern branch of Tung Chung Stream, 3) the road upgrade along the existing Shek Mun Kap Road, and 4) the attenuation and treatment ponds in TCV-k, TCV-e, TCV-l, TCV-c, and TCV-n. Also be required in private lands in TCV-1 and TCV-5		
S9.8.3	EC10	Preservation and/or Transplantation of plant species of conservation importance and the following monitoring of preserved/transplanted plant individuals	Protection of plant species of conservation importance	For public works, provided by the government departments responsible for the construction of those public works or the site formation works.	Within construction sites All areas for public works Also be required in private lands	For preservation and/or transplantation, before commencement of site formation.	<ul style="list-style-type: none"> • EIA • Contractual requirements • Explanatory statement of the OZP (for private lots)

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				For TCV-1, where the lands within mostly belong to private lots, the future project proponents of those private lots, via the established mechanism for land transaction application.	in TCV-1.		
S9.8.3	EC11	Defining and maintaining construction site boundaries (including erection of site hoarding, fences etc.)	Screen construction disturbance to the nearby habitats	Contractor	Along the boundary of construction sites and buffer zones of Tung Chung Streams, along the boundary of mature woodland and Fung Shui Wood, and along the boundary between TCV-6 and the middle section of Fong Yuen	Before commencement of site formation	<ul style="list-style-type: none"> • EIA • Contractual requirements
S9.8.3	EC12	Protection of Tung Chung Stream	Minimize the potential water pollution due to	Contractor	Within construction	Construction	<ul style="list-style-type: none"> • EIA

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			construction of road crossings or other works near Tung Chung Stream		sites	phase	<ul style="list-style-type: none"> • Contractual requirements
S9.8.3	EC13	Implementation of standard site practices	Minimize the potential impact due to dust, noise and runoff during construction phase	Contractor	Within construction sites	Construction phase	<ul style="list-style-type: none"> • EIA • Contractual requirements
S9.8.4	EC14	Adopting Eco-shoreline design	To mitigate the impact of the marine loss	CEDD	Along future seawall	Construction stage	<ul style="list-style-type: none"> • EIA • Contractual requirements
S9.8.4	EC15	Strict enforcement on no-dumping	Minimise the potential impact to marine habitats	Contractor	In reclamation area as well as all works area and travel route of works vessels	Before and during construction phase	<ul style="list-style-type: none"> • EIA • Contractual requirements
S9.8.4	EC16	Spill response plan	Minimise the potential impact to marine habitats	Contractor	In reclamation area as well as all works area and travel route of works vessels	Before and during construction phase	<ul style="list-style-type: none"> • EIA • Contractual requirements
S.9.8.4	EC17	Control and minimization of marine traffic by including using larger-sized barges, land transportation of materials, reuse of excavation and C&D materials and speed limits &	Reduce marine traffic	Contractor	In reclamation area as well	Construction phase	<ul style="list-style-type: none"> • EIA • Contractual

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		regular routes of works vessels			as all works area and travel route of works vessels		requirements
S9.8.4	EC18	Dolphin exclusion zone and dolphin watching plan	Protection of CWD	Contractor	In reclamation area as well as all works area	Construction phase	<ul style="list-style-type: none"> • EIA • Contractual requirements
S9.8.4	EC19	Speed limits and regular routes of works vessels; Prepare and submit a “Works Vessel Travel Route Plan”	Protection of CWD	Contractor	In reclamation area as well as all works area	Construction phase	<ul style="list-style-type: none"> • EIA • Contractual requirements
S9.11.1	EC20	Monitoring of compensatory planting woodland	Monitor the survival of trees and establishment of the woodland	CEDD/ Contractor	Areas of compensatory woodland planting	Quarterly for 3 years after completion of planting works	<ul style="list-style-type: none"> • EIA • Contractual requirements
S9.11.1	EC21	Monitoring of translocated amphibians	Monitor the effectiveness of the translocation programme	Public works: Responsible government departments / Contractor Private lots: Private developers	Release sites for translocated amphibians	After translocation exercise. At least three surveys in each release site during the breeding season, preferably monthly between April and June,	<ul style="list-style-type: none"> • EIA • Contractual requirements • Explanatory statement of the OZP (for private lots)
S9.11.1	EC22	Monitoring of preserved / transplanted plant species	Monitor and evaluate	Public works:	Construction	After	<ul style="list-style-type: none"> • EIA

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			the effectiveness of the preservation and transplantation programme.	Responsible government departments / Contractor Private lots: Private developers	sites for preserved plants; recipient sites for transplanted plants	transplantation or preservation. For transplanted individuals, for two years, monthly for the first year, and then quarterly for the second year. For the preserved individuals, monthly throughout the construction.	<ul style="list-style-type: none"> Contractual requirements Explanatory statement of the OZP (for private lots)
S9.11.1	EC23	Monitoring of Tung Chung Stream and Wong Lung Hang Stream EISs	Protect the EISs	Contractor	Tung Chung Stream and Wong Lung Hang Stream	Construction phase and post-construction phase	<ul style="list-style-type: none"> EIA Contractual requirements
9.11.2	EC24	Monitoring of Tung Chung Bay and Tai Ho Wan	Protect Tung Chung Bay and Tai Ho Wan	Contractor	Tung Chung Bay and Tai Ho Wan	Construction phase and post-construction phase	<ul style="list-style-type: none"> EIA Contractual requirements
Ecology (Operational Phase)							
S9.11.1	EC25	Monitoring of emergent plant inside River Park	Monitor the survival of emergent plant	DSD/ Contractor	Three months after completion of planting in future River Park	Quarterly for 2 years after completion of planting works	<ul style="list-style-type: none"> EIA Contractual requirements

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9.11.2	EC26	Eco-shoreline monitoring	Monitor the colonisation and establishment of fauna and/or flora, water quality, and recruitments of fisheries species	CEDD/ Contractor	Eco-shoreline at TCE PDA reclamation	Post-construction phase, twice in wet and dry seasons respectively, at least 3 years, subject to review	<ul style="list-style-type: none"> • EIA • Contractual requirements

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<i>Fisheries</i>							
S10.8	F1	Good Site Practices	To protect the fisheries resources	Contractor	In reclamation area	Construction phase	<ul style="list-style-type: none"> • EIA • Contractual requirements
S10.8	F2	No dumping	To protect the fisheries resources	Contractor	In reclamation area	Construction phase	<ul style="list-style-type: none"> • EIA • Contractual requirements
S10.8	F3	Spill response plan	To protect the fisheries resources	Contractor	In reclamation area	Construction phase	<ul style="list-style-type: none"> • EIA • Contractual requirements
S10.9	F4	Follow the mitigation measures proposed in the water quality assessment for the construction and operation phases of the project.	To protect the fisheries resources	Contractor	Waters in Northern Lantau	Construction phase and operation phase	<ul style="list-style-type: none"> • EIA • Contractual requirements
S10.9	F5	Follow the mitigation measure of eco-shoreline in ecology chapter for the construction and operation phases of the project.	To enhance the fisheries resources	Contractor	Eco-shorelines	Construction phase and operation phase	<ul style="list-style-type: none"> • EIA • Contractual requirements

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<i>Landscapes and Visual (Construction Phase)</i>							
S11.7 MM1	LV1	<p>Optimisation of Construction Areas & Providing Temporary Landscape on Temporary Construction – Construction areas’ control shall be enforced, where possible, to ensure that the landscape and visual impacts arising from the construction activities are minimised.</p> <p>It includes reduction of the extent of working areas and temporary works areas, management on storing and using the construction equipment and materials, and consideration of detailed schedules to shorten the construction period. Temporary landscape treatments are considered to be adopted such as applying hydro-seeding on temporary stockpiles and reclamation areas to alleviate the potential impacts.</p>	Minimise the landscape and visual impacts arising from the construction activities	Relevant Government Departments / Private Sector	Through-out Tung Chung West (TCW) area and Tung Chung East (TCE) area	Construction Phase	
S11.7 MM2	LV2	<p>Minimize Topographical Change – The footprint of construction elements and temporary works areas should be optimised to reduce topographical/ landform changes, as well as reduce land take and interference with natural terrain. Where there is a need to significantly cut into the existing landform, retaining walls and cut slopes should be considered as appropriate.</p> <p>To minimize landform changes and land resumption, earthworks and engineered slopes should be designed to be a visually interesting, compatible with the surrounding landscape and to mimic the natural contouring and terrain as appropriate.</p>	Reduce topographical changes and minimize land resumption	Relevant Government Departments / Private Sector	Through-out TCW area	Prior to Construction & Construction Phase	<ul style="list-style-type: none"> • GEO Publication No/1/2011, Technical Guidelines on Landscape Treatment for Slopes
S11.7 MM3	LV3	Preservation of Potentially Registerable OVTs, Rare and Protective Vegetation – Existing trees to be retained within the Project Site should be carefully protected during construction. In particular Potentially Registerable OVTs are considered to be preserved according to ETWB	Protect and Preserve Trees	Relevant Government Departments / Private Sector	Onsite, particularly for TCW area	Prior to Construction & Construction Phase	<ul style="list-style-type: none"> • ETWB TC(W) No.29/2004 and DEVB TC(W)

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		<p>Technical Circular (Works) No. 29/2004. Rare and Protective Vegetation shall be protected following Forestry Regulations (Cap.96) and Protection of Endangered Species of Animals and Plants Ordinance (Cap.586). Detailed Tree Protection Specification shall be provided in the Contract Specification according to DEVB TCW No. 10/2013 Tree Preservation. Following DEVB (GLTM) Guidelines for Tree Preservation during Development, the Contractor shall be required to submit, for approval, a detailed working method statement for the protection of trees prior to undertaking any works adjacent to all retained trees, including trees in contractor's works areas.</p> <p>A detailed tree survey will be carried out for the Tree Removal Application (TRA) process which will be carried out at the later detailed design stage of the Project. The detailed tree survey will propose which trees should be retained, transplanted or felled and will include details of tree protection measures for those trees to be retained.</p>					<p>No.10/2013.</p> <ul style="list-style-type: none"> • Greening, Landscape and Tree Management Section (GLTM) of the Development Bureau, Guidelines on Tree Preservation during Development (April, 2015)
S11.7 MM4	LV4	<p>Transplanting of Existing Trees – Trees unavoidably affected by the Project works should be transplanted where practical. Trees should be transplanted straight to their final receptor locations within the site and not held in a temporary nursery as far as possible.</p> <p>A detailed Tree Transplanting Specification shall be provided in the Contract Specification, where applicable. Sufficient time for necessary tree root and crown preparation periods shall be allowed in the project programme. A detailed transplanting proposal will be submitted to relevant government departments for approval in accordance with DEVB TCW 10/2013 and LAO PN 7/2007 and final locations of transplanted trees should be agreed prior to commencement of the work.</p> <p>For trees associated with highways e.g. roadside planting</p>	Transplant Trees where suitable for transplantation	Relevant Government Departments / Private Sector	Onsite where possible, otherwise consider offsite locations	Prior to Construction & Construction Phase	<ul style="list-style-type: none"> • DEVB TC(W) No.10/2013 and LAO PN7/2007 • HyD HQ/GN/13 Interim Guidelines for Tree Transplanting Works under Highways Department's Vegetation Maintenance

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		along highways, that are unavoidably affected and should be transplanted. HyD HQ/GN/13 'Interim Guidelines for Tree Transplanting Works under Highways Department's Vegetation Maintenance Ambit' should be referred to.					<ul style="list-style-type: none"> Ambit GLTM of the Development Bureau, Guidelines on Tree Preservation during Development (April, 2015)
S11.7 MM5	LV5	<p>Screen hoarding – To reduce negative visual impact, construction site hoarding should be erected around the site to screen pedestrian level views into the construction area from visual sensitive receivers.</p> <p>Hoarding design should consider greening measures such as colour and form should be adopted to improve its visual appearance.</p>	To screen undesirable views of the work site.	Relevant Government Departments / Private Sector	Through-out TCW and TCE areas	Construction Phase	
S11.7 MM6	LV6	Adopting Non-dredge Method for the Reclamation – In order to minimize the potential adverse impacts caused by the reclamation, a number of alternative construction methodologies has been critically examined. After considering all the options such as fully dredged, partially dredged and non-dredged methods for seawall construction and reclamation, non-dredged method for both the seawall construction and reclamation are recommended so as to minimize the generation of dredged sediment.	Minimize the potential adverse impacts caused by the reclamation	Relevant Government Departments / Private Sector	Through-out TCE area	Construction Phase	<ul style="list-style-type: none"> Foreshore and Sea-bed (Reclamations) Ordinance (Cap.127)
S11.7 MM7	LV7	Protection of Natural Rivers and Streams – For all the natural rivers and streams inside the development area, in accordance with ETWB TCW 5/2005, consideration of protection measures should be made to minimize any impacts from the construction works, especially those	<p>Protection of Natural Rivers and Streams</p> <p>Minimize the impacts from the construction works</p>	Relevant Government Departments / Private Sector	Through-out TCW area	Prior to Construction & Construction Phase	<ul style="list-style-type: none"> EPD ProPECC PN1/94 Construction Site Drainage. DSD Technical

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		<p>development near Tung Chung Stream.</p> <p>According to the latest RODP, a 30m buffer zone will be zoned as “CA”. Precast structures or other similar approaches will be used to prevent / minimise any construction works in river and thus to avoid any direct water quality impact. Good site management as stipulated in ProPECC PN1/94 will be fully implemented to avoid polluted liquid or solid wastes from falling into the river waters.</p>					<p>Circular No. 2/2004.</p> <ul style="list-style-type: none"> ETWB TC(W) No.5/2005 Protection of natural streams/ rivers from adverse impacts arising from construction works
S11.7 MM8	LV8	<p>Preservation of Natural Coastline – The natural coastline along the proposed “RO” of the RODP in TCW should be preserved. The remaining natural shorelines in Tung Chung Bay including sandy shores close to the Tung Chung old pier will be conserved as a Waterfront Park according to the latest RODP.</p>	Preservation of Natural Coastline	Relevant Government Departments	Onsite where possible	Prior to Construction & Construction Phase	
S11.7 MM9	LV9	<p>Providing Natural Rock Material/ Planting for Artificial Seawall – There would be inevitable permanent losses of marine waters (seabed and water column), and direct impacts on existing artificial seawalls due to the reclamation. To minimize the impacts, the design of the future seawall like ‘eco-shoreline’ could be improved to provide high ecological functions and mitigate the impact of the loss.</p> <p>An ‘eco-shoreline’ is any shoreline which provides beneficial functions to the local ecosystem through a range of active or passive solutions, whilst providing coastal protection. By means of using natural rock materials for artificial seawall and considering to introduce a native vegetation buffer directly behind the top of seawalls as appropriate to create habitat, shelter and a source of food</p>	Mitigate the impacts on existing artificial seawalls	Relevant Government Departments	Onsite where possible	Prior to Construction & Construction Phase	

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		for benefiting both terrestrial and aquatic species along the foreshore, these measures can help to enhance the ecological functions and ‘natural-look’ of the shoreline, and the potential impacts will be mitigated.					
<i>Landscape and Visual (Operational Phase)</i>							
S11.7 MM10	LV10	<p>Compensatory Planting – Compensatory planting for felled trees shall be provided to the satisfaction of relevant Government departments. Required numbers and locations of compensatory trees shall be determined and agreed separately with Government during the Tree Removal Application process under DEVB TCW No. 10/2013 and LAO PN 7/2007.</p> <p>The location of compensatory planting is proposed at the potential open areas such as open spaces, amenity areas, open areas of the streetscapes including roadside planting, as well as the open areas within development lots.</p> <p>The species to be planted should be all native species, taken “Characteristics of Major Local Tree Species Propagated by AFCD” as a reference. A search of species to be planted will be conducted in a further detailed stage.</p>	Compensate for trees and shrubs lost due to the Project	Relevant Government Departments / Private Sector	Onsite where possible, particular-ly for TCW area	Prior to Construction, Construction Phase & Maintenance in Operation Phase	<ul style="list-style-type: none"> • DEVB TC(W) No.10/2013 and LAO PN 7/2007. • GLTM of the Development Bureau, Guidelines on Tree Preservation during Development (April, 2015)
S11.7 MM11	LV11	Woodland Restoration – A search of area to mitigate the loss of woodland has been conducted. Priority has been given to the practicability of compensation of woodland within the boundary of RODP. Given the nature of the project is to provide development opportunities to satisfy the needs for the society in general and the aspirations of local communities, compensation of woodland is only possible for the areas beyond the RODP. It is considered that the areas adjoining the woodlands near the existing services reservoirs, and hillsides to the east of Tung Chung Road, would be suitable locations. The advantage of these locations is that there are existing woodlands immediately	Reprovide areas of woodland to compensate for those areas of quality woodland lost	CEDD /AFCD	In areas identified and as agreed with AFCD	Prior to Construction, Construction Phase & Maintenance in Operation Phase	<ul style="list-style-type: none"> • DEVB Technical Circular Works 10/2013- Tree Preservation • GLTM of the Development Bureau, Guidelines on Tree Preservation

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		<p>downhill to the location and the Sheung Ling Pei Fung Shui Wood is further downhill behind Sheung Ling Pei Village, planting new woodland areas adjoining existing woodlands would form an ecological linkage and increase the overall habitat size, and hence would help to enhance the ecological and landscape values in the long run.</p> <p>It is noted that the compensation trees for landscape impacts will also be planted near the future service reservoirs. The tree species to be planted should be all native species for woodland compensation, and the two areas uphill to Sheung Ling Pei should also make reference to the existing tree species reported in Fung Shui Woods habitat.</p>					during Development (April, 2015)
S11.7 MM12	LV12	Screen Planting – Tall screen/buffer trees and shrubs should be planted to screen proposed structures such as roads and buildings. This measure will form part of the compensatory planting and will improve compatibility with the surrounding environment and create a pleasant pedestrian environment.	<p>To screen proposed structures</p> <p>Improve compatibility with the surrounding environment</p>	Relevant Government Departments	Through-out the working sites of the TCW and TCE areas	Prior to Construction, Construction Phase & Maintenance in Operation Phase	<ul style="list-style-type: none"> • HyD HQ/GN/15– Guidelines for Greening Works along Highways.
S11.7 MM13	LV13	Roadside Planting – Roadside greening is proposed alongside all roads within the possible developments. It will enhance local identity, if theme planting is used, and reduce visual impact through screening. At-grade road planting should be considered along central dividers and on road islands e.g. in the middle of roundabouts.	<p>Soften the hard, straight edges and provide greening along the roads;</p> <p>Improve the visual amenity</p>	Relevant Government Departments	Along new roads, and On appropriate viaducts	Prior to Construction, Construction Phase & Maintenance in Operation Phase	<ul style="list-style-type: none"> • HyD HQ/GN/15– Guidelines for Greening Works along Highways. • Development Bureau Technical Circular Works No.2/2012 – Allocation of Space for Quality

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							Greening on Roads

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S11.7 MM14	LV14	Aesthetic Design of Built Development – The planning of the revised RODP has considered reducing potential visual impacts, enhancing visual amenity and keeping visual corridors. The proposed development will ensure the building massing is compatible with its surroundings. To improve visual amenity, natural building materials could be used on building facades. For example, stone and timber should be considered for architectural features; light earthy tone colours such as shades of green, shades of grey, shades of brown and off-white should be considered for the façade treatment to reduce the visibility of the development components. The form, textures, finishes and colours of the proposed development components should aim to be compatible with the existing surroundings. It would only be implemented for public developments/projects.	Improve visual amenity of the new buildings, keep visual corridors and integrate as possible into the surrounding landscape	Relevant Government Departments	Through-out the TCW and TCE areas	Prior to Construction, Maintenance in Operation Phase	<ul style="list-style-type: none"> • Hong Kong Planning Standards and Guidelines (HKPSG) issued by the Planning Department (As at Aug 2011); • PNAP APP-152, Sustainable Building Design Guidelines
S11.7 MM15	LV15	Maximise Greening on Structures – The Government has been actively promoting greening in buildings and structures such as bridges to improve the environment. This includes actively implementing rooftop greening or vertical greening, as where practicable to enhance the cityscape and mitigate the heat island effect in urban areas. For the new built forms in TCW and TCE, it is considered the implementation of the following greening measures could alleviate the landscape and visual impacts of new development and help the development blend in with its surrounding landscape: <ul style="list-style-type: none"> • Sky Garden: Refuge floors or voids in building mass formed by partial removal of floor plates on certain building storeys or provision of freed up areas on certain building storeys provide opportunities for sky gardens for the proposed built development. It can allow views through the development to the background formed by the natural hillsides and 	<p>Maximise Greening coverage</p> <p>Enhance visual amenity, create visual corridors and integrate as possible into the surrounding landscape</p>	Relevant Government Departments	On appropriate buildings and structures	Prior to Construction, Construction Phase & Maintenance in Operation Phase	<ul style="list-style-type: none"> • Development Bureau Technical Circular (Works) No. 3/2012 Site Coverage of Greenery for Government Building Projects • PNAP APP-152, Sustainable Building Design Guidelines

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		<p>enhance the visual amenity effectively. For public developments, relevant technical document Technical Circular (Works) No. 3/2012 Site Coverage of Greenery for Government Building Projects by Development Bureau in 2011 shall be referred to. For private developments, it is only applicable to sites with inadequate greening coverage and should be implemented in accordance with Sustainable Building Design Guidelines PNAP APP-152.</p> <ul style="list-style-type: none"> • Green Roof: The Architectural Services Department completed the Study on Green Roof Application in Hong Kong in 2007 which reviewed the latest concepts and design technology of green roof and recommended technical guidelines suitable for application in Hong Kong. The study will be taken into account to the new buildings to be built in TCW and TCE. Landscape and visual impact can be alleviated and the landscape and visual value can be enhanced. For private development, it is only applicable to sites with inadequate greening coverage and should be implemented in accordance with Sustainable Building Design Guidelines PNAP APP-152. Relevant technical document Technical Circular (Works) No. 3/2012 Site Coverage of Greenery for Government Building Projects by Development Bureau in 2011 shall be reference. For public developments, relevant technical document Technical Circular (Works) No. 3/2012 Site Coverage of Greenery for Government Building Projects by Development Bureau in 2011 shall be referred to. For private developments, it is only applicable to sites with inadequate greening coverage and should be implemented in accordance with Sustainable Building Design Guidelines PNAP APP-152. • Vertical Green: Planting of climbers to grow up 					

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		<p>vertical surfaces where appropriate (e.g. building edges), to soften hard structures and facilities. Relevant technical document Technical Circular (Works) No. 3/2012 Site Coverage of Greenery for Government Building Projects by Development Bureau in 2011 shall be observed. For public developments, relevant technical document Technical Circular (Works) No. 3/2012 Site Coverage of Greenery for Government Building Projects by Development Bureau in 2011 shall be reference. For private development, it is only applicable to sites with inadequate greening coverage and should be implemented in accordance with Sustainable Building Design Guidelines PNAP APP-152.</p> <ul style="list-style-type: none"> Greening on infrastructure: Planting could be provided on infrastructure such as bridges where appropriate to enhance greenery to soften its built edges. Screen planting could be provided near infrastructure to reduce any undesirable visual impacts. 					
S11.7 MM16	LV16	<p>Noise barrier design – The visual impact of noise mitigation measures will be mitigated by appropriate detailed design, including suitable combination of transparent and sound absorbent materials, appropriate colour selection of panels and supporting structures, or provision of at-grade planting of trees, shrubs and/or climbers camouflage to the barriers, as well as design of supporting structures to incorporate a high level of quality and aesthetics. A combination of transparent panels at top and solid panels at bottom would lighten the visual impact, and at the same time maintain the attractiveness by using colourful panels. The noise barriers would be implemented for District Distributor Roads and Local Distributor Roads at both TCE and TCW area.</p>	Minimize the visual impact from the structures of noise barriers	HyD	Noise barriers within the TCW and TCE areas	Prior to Construction, Construction Phase & Maintenance in Operation Phase	<ul style="list-style-type: none"> GLTM of the Development Bureau’s Guidelines on Greening of Noise Barriers (April 2012). Guidelines on Design of Noise Barriers by HyD and EPD in 2003

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S11.7 MM17	LV17	<p>Landscape Treatment for Polders & Attenuation Ponds – There would be polders and attenuation ponds in TCW. While they are primarily used for receiving and treating surface runoff and alleviating the flood risk during heavy rainfall, the design of those has provided an opportunity to have a synergy to enhance both the ecological and landscape values together.</p> <p>Depending on detailed design, part of these attenuation ponds (mainly the biofiltration zone) could be refined in an appropriate manner, without compromising its primary functions of treating surface runoff and flood protection, to incorporate ecological and landscape design such as planting of aquatic plants and butterfly foodplant for providing the landscape and ecological enhancement.</p>	Enhance the landscape and visual value	DSD	Polders & Attenuation Ponds where possible	Prior to Construction, Construction Phase & Maintenance in Operation Phase	
<i>Landscape and Visual (Construction & Operational Phase)</i>							
S11.7 MM18	LV18	<p>Landscaping on Slopes – Hydro seeding of modified slopes should be done as soon as grading works are completed to prevent erosion and subsequent loss of landscape resources and character. Woodland tree seedlings and/ or shrubs should be planted where gradient and site conditions allow.</p> <p>In addition, landscape planting should be provided for the retaining structures associated with modified slopes where condition allow.</p>	Enhance landscape value, plant diversity and their visual appearance	CEDD	Onsite, particularly in TCW area	Prior to Construction, Construction Phase & Maintenance in Operation Phase	<ul style="list-style-type: none"> • GEO Publication No.1/2011 Technical Guidelines on Landscape Treatment for Slopes by CEDD in 2011
S11.7 MM19	LV19	Landscape Treatment on Channelized Watercourses – For the channelized watercourses in Tung Chung Stream that will be dechannelized, the Drainage Services Department Practice Note No.1/2005 – Guidelines on Environmental Considerations for River Channel Design, should be considered and appropriate measures included ensuring the new watercourses match the existing as far as possible.	<p>Avoid direct impacts on the watercourse</p> <p>Improve the visual amenity</p>	CEDD	The channelized watercourses throughout the TCW area	Prior to Construction, Construction Phase & Maintenance in Operation Phase	<ul style="list-style-type: none"> • Drainage Services Department Practice Note No.1/2005 – Guidelines on Environmental

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		Measures can include enhancement planting to upgrade the channels as appropriate, including consideration of wetland planting along embankments where appropriate; as well as consideration of the best materials for the channel lining (e.g. gabion).					Considerations for River Channel Design
S11.7 MM20	LV20	Light Control – Construction day and night time lighting should be controlled to minimize glare impact to adjacent VSRs during the construction stage. Street and night time lighting shall also be controlled to minimize glare impact to adjacent VSRs during the operation phase.	Minimize negative glare impact to adjacent VSRs	Relevant Government Departments / Private Sector	Through-out the TCW and TCE areas	Construction Phase & Operation Phase	

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<i>Cultural Heritage Impact (Construction and Operational Phase)</i>							
S.12.5	CH1	<u>Terrestrial Archaeology</u> <ul style="list-style-type: none"> Implement rescue excavations/ survey-cum-rescue excavations/ further surveys after land resumption and prior to any construction works (see Figure 14.1 for the locations of rescue excavations/survey-cum-rescue excavations/further survey) 	1) Rescue excavations to salvage archaeological data and cultural materials 2) Survey-cum-rescue excavations to better locate and design the follow up rescue excavations 3) Further surveys to obtain sufficient data for formulation of appropriate mitigation measures	Contractor / Future Private Developer	After land resumption and prior to any construction works	After land resumption and prior to any construction works	<ul style="list-style-type: none"> Guidelines for Cultural Heritage Impact Assessment TM-EIAO Annex 10 and Annex 19 Antiquities and Monuments Ordinance
S.12.5	CH2	<u>Terrestrial Archaeology</u> <ul style="list-style-type: none"> Implement watching brief during construction phase (see Figure 14.1 for the locations of watching brief) 	To identify and record any archaeological material or features revealed during construction phase	Contractor / Future Private Developer	During construction phase	During construction phase	

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<i>EM&A Project</i>							
S13.2	EM1	An Independent Environmental Checker needs to be employed as per the EM&A Manual.	Control EM&A Performance	Project Proponent	All construction sites	Construction stage	<ul style="list-style-type: none"> • EIAO Guidance Note No.4/2010 • TM-EIAO
S13.2 – 13.4	EM2	1) An Environmental Team needs to be employed as per the EM&A Manual. 2) Prepare a systematic Environmental Management Plan to ensure effective implementation of the mitigation measures. 3) An environmental impact monitoring needs to be implementing by the Environmental Team to ensure all the requirements given in the EM&A Manual are fully complied with.	Perform environmental monitoring & auditing	Project Proponent	All construction sites	Construction stage	<ul style="list-style-type: none"> • EIAO Guidance Note No.4/2010 • TM-EIAO

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<i>Works Vessel Travel Routes (Extracted from Works Vessel Travel Route Plan submitted under Condition 2.13 of the EP)</i>							
S3.2	WVTR1	All works vessels shall be equipped with Global Positional System (GPS) or equivalent automatic identification system (AIS) for real time tracking and monitoring of their travel routing, speed and anchorage points. The system shall be capable to record and analyse the travel routing, speed and anchorage points.	Control EM&A Performance	Contractor	All marine constructi on sites	Construction stage	<ul style="list-style-type: none"> • EIA • Contractual requirements
S3.3.1	WVTR2	<p>1) Once approaching or leaving the entrance of the silt curtain, all vessels will travel at a speed no greater than 8 knots between the site and boundary of The Brothers Marine Park. The vessels can then navigate at normal speed (8-12 knots) after that distance unless other restrictions are imposed.</p> <p>2) If any dolphins are sighted within 250m of a vessel then the vessel will slow down to a speed no greater than 5 knots for at least 3 minutes after the last sighting.</p>	Protection of CWD	Contractor	All marine constructi on sites	Construction stage	<ul style="list-style-type: none"> • EIA • Contractual requirements
S3.3.2	WVTR3	All captains and the supervising staff should undergo training to learn about local dolphins and porpoises. They should be trained to be aware of the protocol for dolphin friendly“ vessel operation (refer to the Code of Conduct for Dolphin Watching Activities from AFCD).	Protection of CWD	Contractor	All marine constructi on sites	Construction stage	<ul style="list-style-type: none"> • EIA • Contractual requirements
S3.3.2	WVTR4	Training on the requirements of the WVTRP would be provided for construction vessels’ personnel to follow, which should include the details of the normal operational routings of the construction works vessels and reporting of deviations from the normal operational routings of the construction works vessels. The training course will be given to the licensed vessel captains by the trainers before commencement of work and refreshment course will be provided every quarter.	Protection of CWD	Contractor	All marine constructi on sites	Construction stage	<ul style="list-style-type: none"> • EIA • Contractual requirements

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<i>Deployment of Silt Curtain(s) (Extracted from Silt Curtain Deployment Plan submitted under Condition 2.16 of the EP)</i>							
S4	SCD1	Before the start of the installation work, Qualified Ecologists with dolphin monitoring experience shall scan the exclusion zone for at least 30 minutes. If dolphins are observed in the exclusion zone, the installation work shall be delayed until the dolphins left the area.	Protection of CWD	Contractor	All marine constructi on sites	Construction stage	<ul style="list-style-type: none"> • EIA • Contractual requirements
S4	SCD2	If dolphins are observed within the exclusion zone during the installation work, the relevant part of the work shall cease until the dolphins left the area.	Protection of CWD	Contractor	All marine constructi on sites	Construction stage	<ul style="list-style-type: none"> • EIA • Contractual requirements
S5	SCD3	On-board supervisors will be assigned to check the condition of the silt curtain before commencement of works every day. An inspection checklist will be kept on site for record purpose.	Silt Curtain Integrity	Contractor	All marine constructi on sites	Construction stage	<ul style="list-style-type: none"> • EIA • Contractual requirements
S5	SCD4	For the tentative arrangement of silt curtain under adverse weather, the silt curtain will not be temporary removed during adverse weather. However, related works will be suspended immediately if silt curtain is found any damaged.	Silt Curtain Integrity	Contractor	All marine constructi on sites	Construction stage	<ul style="list-style-type: none"> • EIA • Contractual requirements
S5	SCD5	Diver inspection shall be carried out if necessary to inspect the installation and decommission of silt curtain to ensure proper installation and functioning of the silt curtain according to the design drawings. Nearby marine works will resume after repairing of the damaged silt curtains.	Silt Curtain Integrity	Contractor	All marine constructi on sites	Construction stage	<ul style="list-style-type: none"> • EIA • Contractual requirements
S5	SCD6	Refuse around the silt curtain will be collected at regular intervals on a daily basis so that water behind the silt curtains will be kept free from floating debris.	Waste Management	Contractor	All marine constructi on sites	Construction stage	<ul style="list-style-type: none"> • EIA • Contractual requirements

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<p><i>Post-planting Monitoring and Maintenance (Details to be provided after the submission of Detailed Compensatory Woodland Planting Plan as required under EP Condition 2.22)</i></p>							

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<p><i>Use of New Low Noise Road Surfacing Material(s) (Details to be provided after the submission of Plan for Review of Use of New Low Noise Road Surfacing Material(s) as required under EP Condition 2.23)</i></p>							

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<i>Follow-up actions to be taken by the Contractor and Dump Truck Drivers in case of Illegal Dumping and Landfilling of C&D Materials (Extracted from Waste Management Plan submitted under Condition 2.24 of the EP)</i>							
S5.4	WM1	Investigation report will be prepared by the Contractor and submit to ER within 2 working days.	Control Performance EM&A	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • EP • Contractual requirements
S5.4	WM2	The Contractor will discuss with ER for the follow up actions (e.g. warning letter, cease operation, etc.) if required.	Control Performance EM&A	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • EP • Contractual requirements

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Note: Chapters 1 to 2 of the EIA report present the background information of the Project, identified concurrent projects, objectives and scope for various environmental aspects, and description on alternative options and construction description. Chapters 3 to 12 of the EIA report present the EIA findings and mitigation measures are described below with cross-reference to the EIA report. Chapters 13 to 15 describe the environmental monitoring requirements, summary of environmental outcomes and conclusion.

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<i>Common Mitigation Measures (Applicable to DP Item A.1-Primary distributor roads and district distributor roads)</i>							
<i>Construction Dust Impact</i>							
S3.4.6	D1	Water spraying every hour on exposed worksites and haul road.	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • APCO • To control the dust impact to meet HKAQO and TM-EIAO criteria
S3.4.6	D2	The contractor shall follow the procedures and requirements given in the Air Pollution Control (Construction Dust) Regulation	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • APCO • To control the dust impact to meet HKAQO and TM-EIAO criteria
S3.4.6	D3	<p>The following dust suppression measures should be incorporated to control the dust nuisance throughout the construction phase:</p> <ul style="list-style-type: none"> • Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading; • Any dusty materials remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads; 	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • APCO • To control the dust impact to meet HKAQO and TM-EIAO criteria

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		<ul style="list-style-type: none"> • A stockpile of dusty material should not be extended beyond the pedestrian barriers, fencing or traffic cones; • The load of dusty materials on a vehicle leaving a construction site should be covered entirely by impervious sheeting to ensure that the dusty materials do not leak from the vehicle; • Where practicable, vehicle washing facilities with high pressure water jet should be provided at every discernible or designated vehicle exit point. The area where vehicle washing takes place and the road section between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores; • When there are open excavation and reinstatement works, hoarding of not less than 2.4m high should be provided as far as practicable along the site boundary with provision for public crossing. Good site practice shall also be adopted by the Contractor to ensure the conditions of the hoardings are properly maintained throughout the construction period; • The portion of any road leading only to construction site that is within 30m of a vehicle entrance or exit should be kept clear of dusty materials; • Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation takes place should be sprayed with water or a dust suppression chemical continuously; • Any area that involves demolition activities should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet; • Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, 					

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		<p>sheeting or netting should be provided to enclose the scaffolding from the ground floor level of the building, or a canopy should be provided from the first floor level up to the highest level of the scaffolding;</p> <ul style="list-style-type: none"> • Any skip hoist for material transport should be totally enclosed by impervious sheeting; • Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides; • Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed; • Loading, unloading, transfer, handling or storage of bulk cement or dry PFA should be carried out in a totally enclosed system or facility, and any vent or exhaust should be fitted with an effective fabric filter or equivalent air pollution control system; and • Exposed earth should be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shortcrete or other suitable surface stabiliser within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies. 					
S3.4.6	D4	Implement regular dust monitoring under EM&A programme during the construction stage.	Monitoring of dust impact	Contractor	Selected dust monitoring stations	Construction stage	<ul style="list-style-type: none"> • TM-EIAO

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Construction Noise							
S4.3.4	N1	Implement the following good site management practices: <ul style="list-style-type: none"> • only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme; • machines and plant (such as trucks, cranes) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • plant known to emit noise strongly in one direction, where possible, be orientated so that the noise is directed away from nearby NSRs; • silencers or mufflers on construction equipment should be properly fitted and maintained during the construction works; • mobile plant should be sited as far away from NSRs as possible and practicable; • material stockpiles, site office and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities. 	Control construction airborne noise	Contractor	All construction sites where practicable	Construction stage	• Annex 5, TM-EIAO
S4.3.4	N2	Use of quiet plant which should be made reference to the Powered Mechanical Equipment (PME) listed in the Technical Memorandum or the Quality Powered Mechanical Equipment (QPME) / other commonly used PME listed in Environmental Protection Department (EPD) web pages as far as possible which includes the Sound Power Level (SWLs) for specific quiet PME.	Reduce the noise levels of plant items	Contractor	All construction sites where practicable	Construction stage	• Annex 5, TM-EIAO
S4.3.4	N3	Install movable temporary noise barriers (typical design is wooden framed barrier with a small-cantilevered upper portion of superficial density no less than 7kg/m ² on a skid	Screen the noisy plant items to be used at all	Contractor	All construction sites where	Construction stage	• Annex 5, TM-EIAO

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		footing with 25mm thick internal sound absorptive lining), and full enclosure, screen the noisy plants including air compressors, generators etc.	construction sites		practicable		
S4.3.4	N4	Implement a noise monitoring under EM&A programme.	Monitor the construction noise levels at the selected representative locations	Contractor	Selected noise monitoring stations	Construction stage	• TM-EIAO
Operational Noise (Road Traffic Noise)							
S4.5.4	N5	<p>Provide a series of noise mitigation measures including low noise surfacing material, noise barriers, facades with no openable window, school boundary walls and architectural fins before occupation of the protected NSRs. Locations of noise mitigation measures are stated as following:</p> <p>Year 2023:</p> <ul style="list-style-type: none"> • Facade with no openable window at B1-1 and B1-2 for TCE; TCV-6 for TCW • 1.5m long architectural fin at B1-1 and B1-2 for TCE • Approx. 50m long, 4m high school boundary wall at possible school development near Tung Chung Area 39 • Approx. 120m long, 5m high vertical barrier with 3m cantilevered arm at 45° at the corner at junction between Chung Mun Road and Road L24 • Approx. 210m long LNRS along Chung Mun Road • Approx. 160m long LNRS along Road L24 • Approx. 160m long LNRS along Road L30 <p>Year 2025:</p> <ul style="list-style-type: none"> • Facade with no openable window at B1-1, B1-2, D1-1, 	Reduce operation noise from road traffic	Relevant government departments / Private developers	Refer to Figure 6.1, Figure 6.1a-b, Figure 6.2, Figures 6.2a-b, Figure 6.3, Figures 6.3a-d, Figure 6.4, and Figures 6.4a-e	Prior to operation of the Project for existing NSRs. While for mitigation measures to protect planned NSRs, it should be constructed before population intake of planned NSRs.	• TM-EIAO

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EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
		<p>D1-2, D2-3 and D2-4 for TCE; TCV-6 for TCW</p> <ul style="list-style-type: none"> • 1.5m long architectural fin at B1-1, B1-2 and D2-4 for TCE; TCV-1 for TCW • Approx. 60m long, 5m high school boundary wall along Road L3 • Approx. 70m long, 5m high school boundary wall with 3m cantilevered arm at 45° along Road L3 • Approx. 50m long, 4m high school boundary wall at possible school development near Tung Chung Area 39 • Approx. 120m long, 5m high vertical barrier with 3m cantilevered arm at 45° at the corner at junction between Chung Mun Road and Road L24 • Approx. 210m long LNRS along Chung Mun Road • Approx. 160m long LNRS along Road L24 • Approx. 160m long LNRS along Road L30 <p>Year 2027:</p> <ul style="list-style-type: none"> • Facade with no openable window at A1-1, A1-2, A2-1, A2-2, A2-3, A2-4, B1-1, B1-2, D1-1, D1-2, D2-3 and D2-4 for TCE; TCV-6 for TCW • 1.5m long architectural fin at A2-1, A2-4, B1-1, B1-2 and D2-4 for TCE; • 1.8m long architectural fin at A1-1, A1-2, A2-1 and A2-4 • Approx. 60m long, 5m high school boundary wall along Road L3 • Approx. 70m long, 5m high school boundary wall with 3m cantilevered arm at 45° along Road L3 • Approx. 50m long, 4m high school boundary wall at 					

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EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
		<p>possible school development near Tung Chung Area 39</p> <ul style="list-style-type: none"> • Approx. 120m long, 5m high vertical barrier with 3m cantilevered arm at 45° at the corner at junction between Chung Mun Road and Road L24 • Approx. 210m long LNRS along Chung Mun Road • Approx. 160m long LNRS along Road L24 • Approx. 160m long LNRS along Road L30 <p>Year 2045:</p> <ul style="list-style-type: none"> • Facade with no openable window at A1-1, A1-2, A2-1, A2-2, A2-3, A2-4, B1-1, B1-2, C1-1, C2-1, C2-2, D1-1, D1-2, D2-3, D2-4, E1-4 and E1-5 for TCE; TCV-1 and TCV-6 for TCW • 1.5m long architectural fin at A2-1, A2-4, B1-1, B1-2, C1-1 and D2-4 for TCE; TCV-1 for TCW • 1.8m long architectural fin at A1-1, A1-2, A2-1, A2-4 and C1-1 • Approx. 100m long, 5m high absorptive vertical barrier along Road D3 • Approx. 50m long, 5m high absorptive vertical barrier with 3m cantilevered arm at 45° along Road L7 • Approx. 60m long, 5m high school boundary wall along Road L3 • Approx. 70m long, 5m high school boundary wall with 3m cantilevered arm at 45° along Road L3 • Approx. 80m long, 4m high school boundary wall along Road L2 • Approx. 40m long, 3m high school boundary wall along Road L2 					

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EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
		<ul style="list-style-type: none"> • Approx. 50m long, 4m high school boundary wall at possible school development near Tung Chung Area 39 • Approx. 120m long, 5m high vertical barrier with 3m cantilevered arm at 45° at the corner at junction between Chung Mun Road and Road L24 • Approx. 210m long LNRS along Chung Mun Road • Approx. 160m long LNRS along Road L24 • Approx. 160m long LNRS along Road L30 					

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EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
<i>Water Quality (Construction Phase)</i>							
S5.4.3	W1	<p><u>General Construction Activities</u></p> <p>In accordance with the Practice Note for Professional Persons on Construction Site Drainage, Environmental Protection Department, 1994 (ProPECC PN1/94), best management practices should be implemented on site as far as practicable. The best practices are detailed below:</p> <ul style="list-style-type: none"> • At the start of site establishment, perimeter cut-off drains to direct off-site water around the site should be constructed with internal drainage works. Channels, earth bunds or sand bag barriers should be provided on site to direct stormwater to silt removal facilities.; • Diversion of natural stormwater should be provided as far as possible. The design of temporary on-site drainage should prevent runoff going through site surface, construction machinery and equipment in order to avoid or minimize polluted runoff. Sedimentation tanks with sufficient capacity, constructed from pre-formed individual cells of approximately 6 to 8 m3 capacities, are recommended as a general mitigation measure which can be used for settling surface runoff prior to disposal. The system capacity shall be flexible and able to handle multiple inputs from a variety of sources and suited to applications where the influent is pumped; • The dikes or embankments for flood protection should be implemented around the boundaries of earthwork areas. Temporary ditches should be provided to facilitate the runoff discharge into an appropriate watercourse, through a silt/sediment trap. The silt/sediment traps should be incorporated in the permanent drainage channels to enhance deposition rates; • The design of efficient silt removal facilities should be 	To minimize water quality impact from construction site runoff and general construction activities	Contractor	All construction sites where applicable	Construction stage	<ul style="list-style-type: none"> • Water Pollution Control Ordinance • ProPECC PN1/94 • TM-EIAO • TM-DSS

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EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
		<p>based on the guidelines in Appendix A1 of ProPECC PN 1/94. The detailed design of the sand/silt traps should be undertaken by the contractor prior to the commencement of construction;</p> <ul style="list-style-type: none"> • Construction works should be programmed to minimize surface excavation works during the rainy seasons (April to September). All exposed earth areas should be completed and vegetated as soon as possible after earthworks have been completed. If excavation of soil cannot be avoided during the rainy season, or at any time of year when rainstorms are likely, exposed slope surfaces should be covered by tarpaulin or other means; • All drainage facilities and erosion and sediment control structures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly following rainstorms. Deposited silt and grit should be removed regularly and disposed of by spreading evenly over stable, vegetated areas; • If the excavation of trenches in wet periods is necessary, it should be dug and backfilled in short sections wherever practicable. Water pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities; • All open stockpiles of construction materials (for example, aggregates, sand and fill material) should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system; • Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and storm runoff being 					

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EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
		<p>directed into foul sewers;</p> <ul style="list-style-type: none"> • Precautions to be taken at any time of year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecasted, and actions to be taken during or after rainstorms are summarized in Appendix A2 of ProPECC PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events; • All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and sited wheel washing facilities should be provided at every construction site exit where practicable. Wash-water should have sand and silt settled out and removed at least on a weekly basis to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains; • Oil interceptors should be provided in the drainage system downstream of any oil/fuel pollution sources. The oil interceptors should be emptied and cleaned regularly to prevent the release of oil and grease into the storm water drainage system after accidental spillage. A bypass should be provided for the oil interceptors to prevent flushing during heavy rain; • Construction solid waste, debris and rubbish on site should be collected, handled and disposed of properly to avoid water quality impacts; • All fuel tanks and storage areas should be provided with locks and sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank to prevent spilled fuel oils from reaching water sensitive 					

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		<p>receivers nearby;and</p> <ul style="list-style-type: none"> Regular environmental audit on the construction site should be carried out in order to prevent any malpractices. Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the water bodies, mangroves and open sea. 					
S5.4.3	W2	<p><u>Sewage from workforce</u></p> <ul style="list-style-type: none"> Portable chemical toilets and sewage holding tanks are recommended for handling the construction sewage generated by the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance; Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment during the construction phase of the Project; Regular environmental audit on the construction site should be conducted in order to provide an effective control of any malpractices and achieve continual improvement of environmental performance on site. 	To minimize water quality from sewage effluent in construction phase	Contractor	All construction sites where practicable	Construction stage	<ul style="list-style-type: none"> Water Pollution Control Ordinance TM-DSS
S5.4.3	W7	<p><u>Groundwater and Runoff for Tunnel Works</u></p> <ul style="list-style-type: none"> Cut-and-Cover method for the underpass at Road D1 in Tung Chung East to minimise the intrusion of groundwater. Good site management as stipulated in ProPECC PN1/94 will be fully implemented to avoid polluted liquid or solid wastes from falling into the river waters or drainage. 	To avoid water quality impact	Contractor	All construction sites where practicable	Construction stage	<ul style="list-style-type: none"> ProPECC PN1/94
S5.5.8	W8	<p><u>Good Management Practice in Construction Phase</u></p>	To avoid water quality	Contractor	All	Construction stage	<ul style="list-style-type: none"> ProPECC

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EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
		<p>The following good site management practices shall be adopted for the filling works:</p> <ul style="list-style-type: none"> • Water quality monitoring shall be implemented to ensure effective control of water pollution and recommend additional mitigation measures required; • The decent speed of grabs shall be controlled to minimize the seabed impact and to reduce the volume of over-dredging; • A perimeter silt curtain shall be installed during the entire reclamation periods; • Barges or hoppers shall not be filled to a level which will cause overflow of materials or pollution of water during loading or transportation; • Excess materials shall be cleaned from the decks and exposed fittings of barges before the vessels are moved; • Plants should not be operated with leaking pipes and any pipe leakages shall be repaired quickly; • Adequate freeboard shall be maintained on barges to reduce the likelihood of decks being washed by wave action; • All vessels should be sized so that adequate clearance is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash; and • The works shall not cause foam, oil, grease, litter or other objectionable matter to be present in the water within and adjacent to the works site. 	impact		construction sites where practicable		PN1/94

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EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
Waste Management (Construction Waste)							
S7.4.1	WM1	<p><u>Good Site Practices</u></p> <p>The following good site practices are recommended throughout the construction activities:</p> <ul style="list-style-type: none"> • nomination of an approved personnel, such as a site manager, to be responsible for the implementation of good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site; • training of site personnel in site cleanliness, appropriate waste management procedures and concepts of waste reduction, reuse and recycling; • provision of sufficient waste disposal points and regular collection for disposal; • imposition of penalty system on Contractors' improper behaviours when illegal dumping and landfilling outside their respective construction sites, i.e. on nearby farmlands and riverbanks, are reported; • appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers; • regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; and • the contractor should prepare a Waste Management Plan (WMP) as part of the Environmental Management Plan (EMP) in accordance with the ETWB TC(W) No. 19/2005 for construction phase. The EMP should be submitted to the Engineer for approval. Mitigation measures proposed in the EIA Report and the EM&A Manual should be adopted. 	Minimize waste generation during construction	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance

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EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
S7.4.1	WM2	<p><u>Waste Reduction Measures</u></p> <p>Waste reduction is best achieved at the planning and design phase, as well as by ensuring the implementation of good site practices. The following recommendations are proposed to achieve reduction:</p> <ul style="list-style-type: none"> • segregate and store different types of waste in different containers, skip or stockpiles to enhance reuse or recycling of materials and their proper disposal; • proper storage and site practices to minimize the potential for damage and contamination of construction materials; • plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste; • sort out demolition debris and excavated materials from demolition works to recover reusable/recyclable portions (i.e. soil, broken concrete, metal etc.); • provide training to workers on the importance of appropriate waste management procedures, including waste reduction, reuse and recycling. 	Reduce waste generation	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance
S7.4.1	WM3	<p><u>Storage of Waste</u></p> <p>The following recommendation should be implemented to minimize the impacts:</p> <ul style="list-style-type: none"> • waste such as soil should be handled and stored well to ensure secure containment; and • Depends on actual site activities, certain locations within the site area would be used for storage of waste to enhance reuse. However, there would not be any designated location for storage of waste, and the storage locations would need to be adjusted to suite actual site conditions; 	Good site practice to minimize the waste generation and recycle the C&D materials as far as practicable so as to reduce the amount for final disposal	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Land (Miscellaneous Provisions) Ordinance • Waste Disposal Ordinance • ETWB TCW No. 19/2005

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EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
S7.4.1	WM4	<p><u>Collection and Transportation of Waste</u></p> <p>The following recommendation should be implemented to minimize the impacts:</p> <ul style="list-style-type: none"> • remove waste in timely manner; • employ the trucks with cover or enclosed containers for waste transportation; • obtain relevant waste disposal permits from the appropriate authorities; and • disposal of waste should be done at licensed waste disposal facilities. 	Minimize waste impacts from storage	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance
S7.4.1	WM5	<p><u>Excavated and C&D Materials</u></p> <p>Wherever practicable, C&D materials should be segregated from other wastes to avoid contamination and ensure acceptability at public fill reception facilities or reclamation sites. The following mitigation measures should be implemented in handling the excavated and C&D materials:</p> <ul style="list-style-type: none"> • maintain temporary stockpiles and reuse excavated fill material for backfilling; • carry out on-site sorting; • make provisions in the Contract documents to allow and promote the use of recycled aggregates where appropriate; and • implement a trip-ticket system for each works contract to ensure that the disposal of C&D materials are properly documented and verified, so as to avoid the illegal dumping and landfilling of C&D materials on farmlands/ riverbanks at TCW; <p>The recommended C&D materials handling should include:</p>	Minimize waste impacts from excavated and C&D materials	Contractor	All construction sites	Construction Stage	<ul style="list-style-type: none"> • Land (Miscellaneous Provisions) Ordinance • Waste Disposal Ordinance • ETWB TCW No. 19/2005 • Project Administrative Handbook for Civil Engineering Works, 2012 Edition

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EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
		<ul style="list-style-type: none"> On-site sorting of C&D materials Reuse of C&D materials Use of Standard Formwork and Planning of Construction Materials purchasing 					
S7.4.1	WM6	<p><u>Provision of Wheel Wash Facilities</u></p> <p>Wheel wash facilities have to be provided at the site entrance before the trucks leaving the works area. Dust disturbance due to the trucks transportation to the public road network could be minimized by such arrangement.</p>	Minimize waste impacts from trucks transportation	Contractor	All construction sites	Construction Stage	N/A
S7.4.1	WM10	<p><u>Chemical Waste</u></p> <p>If chemical wastes are produced at the construction site, the Contractors should register with EPD as chemical waste producer. Chemical wastes should be stored in appropriate containers and collected by a licensed chemical waste collector. Chemical wastes (e.g. spent lubricant oil) should be recycled at an appropriate facility as far as possible, while the chemical waste that cannot be recycled should be disposed of at either the Chemical Waste Treatment Centre, or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.</p>	Control the chemical waste and ensure proper storage, handling and disposal.	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> Waste Disposal (Chemical Waste) General) Regulation Code of Practice on the Packaging, Labelling and Storage of Chemical Waste
S7.4.1	WM11	<p><u>General Refuse</u></p> <ul style="list-style-type: none"> General refuse should be stored in enclosed bins separately from construction and chemical wastes. Recycling bins should also be placed to encourage recycling. Preferably enclosed and covered areas should be provided for general refuse collection and routine cleaning for these areas should also be implemented to 	Minimize production of the general refuse and avoid odour, pest and litter impacts	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> Waste Disposal Ordinance

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EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
		keep areas clean. <ul style="list-style-type: none"> A reputable waste collector should be employed to remove general refuse on a daily basis. 					
EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
<i>Ecology (Design Phase)</i>							
S9.8.2	EC4	Detailed designs of noise barriers to prevent bird collision	To prevent bird collision	HyD	Noise barriers	Design Phase	<ul style="list-style-type: none"> Guidelines on Design of Noise Barriers
<i>Ecology (Construction Phase)</i>							
S9.8.3	EC13	Implementation of standard site practices	Minimize the potential impact due to dust, noise and runoff during construction phase	Contractor	Within construction sites	Construction phase	<ul style="list-style-type: none"> EIA Contractual requirements

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EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementati on Agent	Location	Implementation Stage	Requirements and / or standards to be achieved
<i>Landscape and Visual (Construction Phase)</i>							
S11.7 MM1	LV1	<p>Optimisation of Construction Areas & Providing Temporary Landscape on Temporary Construction – Construction areas’ control shall be enforced, where possible, to ensure that the landscape and visual impacts arising from the construction activities are minimised.</p> <p>It includes reduction of the extent of working areas and temporary works areas, management on storing and using the construction equipment and materials, and consideration of detailed schedules to shorten the construction period. Temporary landscape treatments are considered to be adopted such as applying hydro-seeding on temporary stockpiles and reclamation areas to alleviate the potential impacts.</p>	Minimise the landscape and visual impacts arising from the construction activities	Relevant Government Departments / Private Sector	Through-out Tung Chung West (TCW) area and Tung Chung East (TCE) area	Construction Phase	
<i>Landscape and Visual (Operational Phase)</i>							
S11.7 MM12	LV12	Screen Planting – Tall screen/buffer trees and shrubs should be planted to screen proposed structures such as roads and buildings. This measure will form part of the compensatory planting and will improve compatibility with the surrounding environment and create a pleasant pedestrian environment.	<p>To screen proposed structures</p> <p>Improve compatibility with the surrounding environment</p>	Relevant Government Departments	Through-out the working sites of the TCW and TCE areas	Prior to Construction, Construction Phase & Maintenance in Operation Phase	<ul style="list-style-type: none"> • HyD HQ/GN/15– Guidelines for Greening Works along Highways.
S11.7 MM13	LV13	Roadside Planting – Roadside greening is proposed alongside all roads within the possible developments. It will enhance local identity, if theme planting is used, and reduce visual impact through screening. At-grade road planting should be considered along central dividers and on road islands e.g. in the middle of roundabouts.	<p>Soften the hard, straight edges and provide greening along the roads;</p> <p>Improve the visual amenity</p>	Relevant Government Departments	Along new roads, and On appropriate viaducts	Prior to Construction, Construction Phase & Maintenance in Operation Phase	<ul style="list-style-type: none"> • HyD HQ/GN/15– Guidelines for Greening Works along Highways. • Development Bureau Technical Circular Works

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EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location	Implementation Stage	Requirements and / or standards to be achieved
							No.2/2012 – Allocation of Space for Quality Greening on Roads

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<i>EM&A Project</i>							
S13.2	EM1	An Independent Environmental Checker needs to be employed as per the EM&A Manual.	Control EM&A Performance	Project Proponent	All construction sites	Construction stage	<ul style="list-style-type: none"> • EIAO Guidance Note No.4/2010 • TM-EIAO
S13.2 – 13.4	EM2	1) An Environmental Team needs to be employed as per the EM&A Manual. 2) Prepare a systematic Environmental Management Plan to ensure effective implementation of the mitigation measures. 3) An environmental impact monitoring needs to be implementing by the Environmental Team to ensure all the requirements given in the EM&A Manual are fully complied with.	Perform environmental monitoring & auditing	Project Proponent	All construction sites	Construction stage	<ul style="list-style-type: none"> • EIAO Guidance Note No.4/2010 • TM-EIAO

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Note: Chapters 1 to 2 of the EIA report present the background information of the Project, identified concurrent projects, objectives and scope for various environmental aspects, and description on alternative options and construction description. Chapters 3 to 12 of the EIA report present the EIA findings and mitigation measures are described below with cross-reference to the EIA report. Chapters 13 to 15 describe the environmental monitoring requirements, summary of environmental outcomes and conclusion.

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
<i>Common Mitigation Measures (Applicable to DP Item A.2-A railway and its associated stations)</i>							
<i>Construction Dust Impact</i>							
S3.4.6	D1	Water spraying every hour on exposed worksites and haul road.	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • APCO • To control the dust impact to meet HKAQO and TM-EIAO criteria
S3.4.6	D2	The contractor shall follow the procedures and requirements given in the Air Pollution Control (Construction Dust) Regulation	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • APCO • To control the dust impact to meet HKAQO and TM-EIAO criteria
S3.4.6	D3	<p>The following dust suppression measures should be incorporated to control the dust nuisance throughout the construction phase:</p> <ul style="list-style-type: none"> • Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading; • Any dusty materials remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads; 	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • APCO • To control the dust impact to meet HKAQO and TM-EIAO criteria

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		<ul style="list-style-type: none"> • A stockpile of dusty material should not be extended beyond the pedestrian barriers, fencing or traffic cones; • The load of dusty materials on a vehicle leaving a construction site should be covered entirely by impervious sheeting to ensure that the dusty materials do not leak from the vehicle; • Where practicable, vehicle washing facilities with high pressure water jet should be provided at every discernible or designated vehicle exit point. The area where vehicle washing takes place and the road section between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores; • When there are open excavation and reinstatement works, hoarding of not less than 2.4m high should be provided as far as practicable along the site boundary with provision for public crossing. Good site practice shall also be adopted by the Contractor to ensure the conditions of the hoardings are properly maintained throughout the construction period; • The portion of any road leading only to construction site that is within 30m of a vehicle entrance or exit should be kept clear of dusty materials; • Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation takes place should be sprayed with water or a dust suppression chemical continuously; • Any area that involves demolition activities should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet; • Where a scaffolding is erected around the perimeter of a 					

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		<p>building under construction, effective dust screens, sheeting or netting should be provided to enclose the scaffolding from the ground floor level of the building, or a canopy should be provided from the first floor level up to the highest level of the scaffolding;</p> <ul style="list-style-type: none"> • Any skip hoist for material transport should be totally enclosed by impervious sheeting; • Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides; • Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed; • Loading, unloading, transfer, handling or storage of bulk cement or dry PFA should be carried out in a totally enclosed system or facility, and any vent or exhaust should be fitted with an effective fabric filter or equivalent air pollution control system; and • Exposed earth should be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shortcrete or other suitable surface stabiliser within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies. 					
S3.4.6	D4	Implement regular dust monitoring under EM&A programme during the construction stage.	Monitoring of dust impact	Contractor	Selected dust monitoring stations	Construction stage	<ul style="list-style-type: none"> • TM-EIAO

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Construction Noise							
S4.3.4	N1	Implement the following good site management practices: <ul style="list-style-type: none"> • only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme; • machines and plant (such as trucks, cranes) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • plant known to emit noise strongly in one direction, where possible, be orientated so that the noise is directed away from nearby NSRs; • silencers or mufflers on construction equipment should be properly fitted and maintained during the construction works; • mobile plant should be sited as far away from NSRs as possible and practicable; • material stockpiles, site office and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities. 	Control construction airborne noise	Contractor	All construction sites where practicable	Construction stage	• Annex 5, TM-EIAO
S4.3.4	N2	Use of quiet plant which should be made reference to the Powered Mechanical Equipment (PME) listed in the Technical Memorandum or the Quality Powered Mechanical Equipment (QPME) / other commonly used PME listed in Environmental Protection Department (EPD) web pages as far as possible which includes the Sound Power Level (SWLs) for specific quiet PME.	Reduce the noise levels of plant items	Contractor	All construction sites where practicable	Construction stage	• Annex 5, TM-EIAO
S4.3.4	N3	Install movable temporary noise barriers (typical design is wooden framed barrier with a small-cantilevered upper	Screen the noisy plant items to be used at all	Contractor	All construction	Construction stage	• Annex 5, TM-EIAO

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		portion of superficial density no less than 7kg/m ² on a skid footing with 25mm thick internal sound absorptive lining), and full enclosure, screen the noisy plants including air compressors, generators etc.	construction sites		sites where practicable		
S4.3.4	N4	Implement a noise monitoring under EM&A programme.	Monitor the construction noise levels at the selected representative locations	Contractor	Selected noise monitoring stations	Construction stage	• TM-EIAO
<i>Operational Noise (Fixed Noise)</i>							
S4.6.4	N6	For existing and planned NSRs which are located near to the proposed noise sources, the following tentative noise mitigation measures are considered: <ul style="list-style-type: none"> • All the pumps should be enclosed inside building structures; • Proper selection of quiet plant to reduce the tonality at NSRs; • Installation of silencer / acoustic enclosure / acoustic louvers for the exhaust of ventilation system. • For underground train stations, sound attenuators with sufficient attenuations can be installed to the ventilation shafts. • Openings of ventilation system should be located away from NSRs. 	Reduce operation fixed noise	Relevant government departments / Future Operator	All plant rooms where practicable	Prior to operation of the Project	• Noise Control Ordinance and its TM, TM-EIAO
<i>Operational Noise (Rail Noise)</i>							

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S4.8.4	N7	<p>Before Phase 1 is occupied:</p> <ul style="list-style-type: none"> • Facade with no openable windows for residential block at B1-2 • 1.5m long architectural fin at B1-2 <p>Before Phase 3 is occupied:</p> <p>It should be noted that Railway Stations at TCE and TCW and its associated railway system is a Designated Project under Item A.2 of Schedule 2 of TM-EIAO. Hence, the proposed mitigation measures are tentative for cumulative assessment purpose in this EIA and all the mitigation measures will be revised by the railway operator during their Schedule 2 EIA.</p> <ul style="list-style-type: none"> • Approx. 325m long, semi enclosure along the tracks of Tung Chung Line facing B0-2 and COM-1 • Approx. 210m long, semi enclosure along the tracks of Tung Chung Line facing A1-2 and C1-1 • Approx. 390m long, semi enclosure along the track of Tung Chung Line to Tung Chung direction facing C1-1 to C2-1 • Approx. 630m long, semi enclosure along the track of Tung Chung Line to Hong Kong direction facing C1-1 and C2-1 	Reduce operation rail noise	Relevant government departments / Future Operator	Refer to Figure 6.1, Figure 6.1a-b, Figure 6.2, Figures 6.2a-b, Figure 6.3, Figures 6.3a-d, Figure 6.4, and Figures 6.4a-e	Prior to final population intake	<ul style="list-style-type: none"> • Noise Control Ordinance and its TM, TM-EIAO

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<i>Water Quality (Construction Phase)</i>							
S5.4.3	W1	<p><u>General Construction Activities</u></p> <p>In accordance with the Practice Note for Professional Persons on Construction Site Drainage, Environmental Protection Department, 1994 (ProPECC PN1/94), best management practices should be implemented on site as far as practicable. The best practices are detailed below:</p> <ul style="list-style-type: none"> • At the start of site establishment, perimeter cut-off drains to direct off-site water around the site should be constructed with internal drainage works. Channels, earth bunds or sand bag barriers should be provided on site to direct stormwater to silt removal facilities.; • Diversion of natural stormwater should be provided as far as possible. The design of temporary on-site drainage should prevent runoff going through site surface, construction machinery and equipment in order to avoid or minimize polluted runoff. Sedimentation tanks with sufficient capacity, constructed from pre-formed individual cells of approximately 6 to 8 m3 capacities, are recommended as a general mitigation measure which can be used for settling surface runoff prior to disposal. The system capacity shall be flexible and able to handle multiple inputs from a variety of sources and suited to applications where the influent is pumped; • The dikes or embankments for flood protection should be implemented around the boundaries of earthwork areas. Temporary ditches should be provided to facilitate the runoff discharge into an appropriate watercourse, through a silt/sediment trap. The silt/sediment traps should be incorporated in the permanent drainage channels to enhance deposition rates; 	To minimize water quality impact from construction site runoff and general construction activities	Contractor	All construction sites where applicable	Construction stage	<ul style="list-style-type: none"> • Water Pollution Control Ordinance • ProPECC PN1/94 • TM-EIAO • TM-DSS

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		<ul style="list-style-type: none"> • The design of efficient silt removal facilities should be based on the guidelines in Appendix A1 of ProPECC PN 1/94. The detailed design of the sand/silt traps should be undertaken by the contractor prior to the commencement of construction; • Construction works should be programmed to minimize surface excavation works during the rainy seasons (April to September). All exposed earth areas should be completed and vegetated as soon as possible after earthworks have been completed. If excavation of soil cannot be avoided during the rainy season, or at any time of year when rainstorms are likely, exposed slope surfaces should be covered by tarpaulin or other means; • All drainage facilities and erosion and sediment control structures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly following rainstorms. Deposited silt and grit should be removed regularly and disposed of by spreading evenly over stable, vegetated areas; • If the excavation of trenches in wet periods is necessary, it should be dug and backfilled in short sections wherever practicable. Water pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities; • All open stockpiles of construction materials (for example, aggregates, sand and fill material) should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system; • Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so 					

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		<p>as to prevent silt, construction materials or debris being washed into the drainage system and storm runoff being directed into foul sewers;</p> <ul style="list-style-type: none"> • Precautions to be taken at any time of year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecasted, and actions to be taken during or after rainstorms are summarized in Appendix A2 of ProPECC PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events; • All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and sited wheel washing facilities should be provided at every construction site exit where practicable. Wash-water should have sand and silt settled out and removed at least on a weekly basis to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains; • Oil interceptors should be provided in the drainage system downstream of any oil/fuel pollution sources. The oil interceptors should be emptied and cleaned regularly to prevent the release of oil and grease into the storm water drainage system after accidental spillage. A bypass should be provided for the oil interceptors to prevent flushing during heavy rain; • Construction solid waste, debris and rubbish on site should be collected, handled and disposed of properly to avoid water quality impacts; • All fuel tanks and storage areas should be provided with 					

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		<p>locks and sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank to prevent spilled fuel oils from reaching water sensitive receivers nearby;and</p> <ul style="list-style-type: none"> Regular environmental audit on the construction site should be carried out in order to prevent any malpractices. Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the water bodies, mangroves and open sea. 					
S5.4.3	W2	<p><u>Sewage from workforce</u></p> <ul style="list-style-type: none"> Portable chemical toilets and sewage holding tanks are recommended for handling the construction sewage generated by the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance; Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment during the construction phase of the Project; Regular environmental audit on the construction site should be conducted in order to provide an effective control of any malpractices and achieve continual improvement of environmental performance on site. 	To minimize water quality from sewage effluent in construction phase	Contractor	All construction sites where practicable	Construction stage	<ul style="list-style-type: none"> Water Pollution Control Ordinance TM-DSS
S5.5.8	W8	<p><u>Good Management Practice in Construction Phase</u></p> <p>The following good site management practices shall be adopted for the filling works:</p> <ul style="list-style-type: none"> Water quality monitoring shall be implemented to ensure effective control of water pollution and recommend 	To avoid water quality impact	Contractor	All construction sites where practicable	Construction stage	<ul style="list-style-type: none"> ProPECC PN1/94

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		<p>additional mitigation measures required;</p> <ul style="list-style-type: none"> • The decent speed of grabs shall be controlled to minimize the seabed impact and to reduce the volume of over-dredging; • A perimeter silt curtain shall be installed during the entire reclamation periods; • Barges or hoppers shall not be filled to a level which will cause overflow of materials or pollution of water during loading or transportation; • Excess materials shall be cleaned from the decks and exposed fittings of barges before the vessels are moved; • Plants should not be operated with leaking pipes and any pipe leakages shall be repaired quickly; • Adequate freeboard shall be maintained on barges to reduce the likelihood of decks being washed by wave action; • All vessels should be sized so that adequate clearance is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash; and • The works shall not cause foam, oil, grease, litter or other objectionable matter to be present in the water within and adjacent to the works site. 					

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Waste Management (Construction Waste)							
S7.4.1	WM1	<p><u>Good Site Practices</u></p> <p>The following good site practices are recommended throughout the construction activities:</p> <ul style="list-style-type: none"> • nomination of an approved personnel, such as a site manager, to be responsible for the implementation of good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site; • training of site personnel in site cleanliness, appropriate waste management procedures and concepts of waste reduction, reuse and recycling; • provision of sufficient waste disposal points and regular collection for disposal; • imposition of penalty system on Contractors' improper behaviours when illegal dumping and landfilling outside their respective construction sites, i.e. on nearby farmlands and riverbanks, are reported; • appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers; • regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; and • the contractor should prepare a Waste Management Plan (WMP) as part of the Environmental Management Plan (EMP) in accordance with the ETWB TC(W) No. 19/2005 for construction phase. The EMP should be submitted to the Engineer for approval. Mitigation measures proposed in the EIA Report and the EM&A Manual should be adopted. 	Minimize waste generation during construction	Contractor	All construction sites	Construction stage	• Waste Disposal Ordinance

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S7.4.1	WM2	<p><u>Waste Reduction Measures</u></p> <p>Waste reduction is best achieved at the planning and design phase, as well as by ensuring the implementation of good site practices. The following recommendations are proposed to achieve reduction:</p> <ul style="list-style-type: none"> • segregate and store different types of waste in different containers, skip or stockpiles to enhance reuse or recycling of materials and their proper disposal; • proper storage and site practices to minimize the potential for damage and contamination of construction materials; • plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste; • sort out demolition debris and excavated materials from demolition works to recover reusable/recyclable portions (i.e. soil, broken concrete, metal etc.); • provide training to workers on the importance of appropriate waste management procedures, including waste reduction, reuse and recycling. 	Reduce waste generation	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance
S7.4.1	WM3	<p><u>Storage of Waste</u></p> <p>The following recommendation should be implemented to minimize the impacts:</p> <ul style="list-style-type: none"> • waste such as soil should be handled and stored well to ensure secure containment; and • Depends on actual site activities, certain locations within the site area would be used for storage of waste to enhance reuse. However, there would not be any designated location for storage of waste, and the storage locations would need to be adjusted to suite actual site conditions; 	Good site practice to minimize the waste generation and recycle the C&D materials as far as practicable so as to reduce the amount for final disposal	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Land (Miscellaneous Provisions) Ordinance • Waste Disposal Ordinance • ETWB TCW No. 19/2005

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S7.4.1	WM4	<p><u>Collection and Transportation of Waste</u></p> <p>The following recommendation should be implemented to minimize the impacts:</p> <ul style="list-style-type: none"> • remove waste in timely manner; • employ the trucks with cover or enclosed containers for waste transportation; • obtain relevant waste disposal permits from the appropriate authorities; and • disposal of waste should be done at licensed waste disposal facilities. 	Minimize waste impacts from storage	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance
S7.4.1	WM5	<p><u>Excavated and C&D Materials</u></p> <p>Wherever practicable, C&D materials should be segregated from other wastes to avoid contamination and ensure acceptability at public fill reception facilities or reclamation sites. The following mitigation measures should be implemented in handling the excavated and C&D materials:</p> <ul style="list-style-type: none"> • maintain temporary stockpiles and reuse excavated fill material for backfilling; • carry out on-site sorting; • make provisions in the Contract documents to allow and promote the use of recycled aggregates where appropriate; and • implement a trip-ticket system for each works contract to ensure that the disposal of C&D materials are properly documented and verified, so as to avoid the illegal dumping and landfilling of C&D materials on farmlands/ riverbanks at TCW; <p>The recommended C&D materials handling should include:</p>	Minimize waste impacts from excavated and C&D materials	Contractor	All construction sites	Construction Stage	<ul style="list-style-type: none"> • Land (Miscellaneous Provisions) Ordinance • Waste Disposal Ordinance • ETWB TCW No. 19/2005 • Project Administrative Handbook for Civil Engineering Works, 2012 Edition

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		<ul style="list-style-type: none"> On-site sorting of C&D materials Reuse of C&D materials Use of Standard Formwork and Planning of Construction Materials purchasing 					
S7.4.1	WM6	<p><u>Provision of Wheel Wash Facilities</u></p> <p>Wheel wash facilities have to be provided at the site entrance before the trucks leaving the works area. Dust disturbance due to the trucks transportation to the public road network could be minimized by such arrangement.</p>	Minimize waste impacts from trucks transportation	Contractor	All construction sites	Construction Stage	N/A
S7.4.1	WM10	<p><u>Chemical Waste</u></p> <p>If chemical wastes are produced at the construction site, the Contractors should register with EPD as chemical waste producer. Chemical wastes should be stored in appropriate containers and collected by a licensed chemical waste collector. Chemical wastes (e.g. spent lubricant oil) should be recycled at an appropriate facility as far as possible, while the chemical waste that cannot be recycled should be disposed of at either the Chemical Waste Treatment Centre, or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.</p>	Control the chemical waste and ensure proper storage, handling and disposal.	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> Waste Disposal (Chemical Waste) (General) Regulation Code of Practice on the Packaging, Labelling and Storage of Chemical Waste
S7.4.1	WM11	<p><u>General Refuse</u></p> <ul style="list-style-type: none"> General refuse should be stored in enclosed bins separately from construction and chemical wastes. Recycling bins should also be placed to encourage recycling. Preferably enclosed and covered areas should be provided for general refuse collection and routine cleaning for these areas should also be implemented to 	Minimize production of the general refuse and avoid odour, pest and litter impacts	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> Waste Disposal Ordinance

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		keep areas clean. • A reputable waste collector should be employed to remove general refuse on a daily basis.					
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<i>Ecology (Construction Phase)</i>							
S9.8.3	EC13	Implementation of standard site practices	Minimize the potential impact due to dust, noise and runoff during construction phase	Contractor	Within construction sites	Construction phase	<ul style="list-style-type: none"> • EIA • Contractual requirements

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<i>EM&A Project</i>							
S13.2	EM1	An Independent Environmental Checker needs to be employed as per the EM&A Manual.	Control EM&A Performance	Project Proponent	All construction sites	Construction stage	<ul style="list-style-type: none"> • EIAO Guidance Note No.4/2010 • TM-EIAO
S13.2 – 13.4	EM2	1) An Environmental Team needs to be employed as per the EM&A Manual. 2) Prepare a systematic Environmental Management Plan to ensure effective implementation of the mitigation measures. 3) An environmental impact monitoring needs to be implementing by the Environmental Team to ensure all the requirements given in the EM&A Manual are fully complied with.	Perform environmental monitoring & auditing	Project Proponent	All construction sites	Construction stage	<ul style="list-style-type: none"> • EIAO Guidance Note No.4/2010 • TM-EIAO

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Note: Chapters 1 to 2 of the EIA report present the background information of the Project, identified concurrent projects, objectives and scope for various environmental aspects, and description on alternative options and construction description. Chapters 3 to 12 of the EIA report present the EIA findings and mitigation measures are described below with cross-reference to the EIA report. Chapters 13 to 15 describe the environmental monitoring requirements, summary of environmental outcomes and conclusion.

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<i>Common Mitigation Measures (Applicable to DP Item A.8-A road more than 100m in length between abutments)</i>							
<i>Construction Dust Impact</i>							
S3.4.6	D1	Water spraying every hour on exposed worksites and haul road.	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • APCO • To control the dust impact to meet HKAQO and TM-EIAO criteria
S3.4.6	D2	The contractor shall follow the procedures and requirements given in the Air Pollution Control (Construction Dust) Regulation	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • APCO • To control the dust impact to meet HKAQO and TM-EIAO criteria
S3.4.6	D3	<p>The following dust suppression measures should be incorporated to control the dust nuisance throughout the construction phase:</p> <ul style="list-style-type: none"> • Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading; • Any dusty materials remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads; 	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • APCO • To control the dust impact to meet HKAQO and TM-EIAO criteria

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		<ul style="list-style-type: none"> • A stockpile of dusty material should not be extended beyond the pedestrian barriers, fencing or traffic cones; • The load of dusty materials on a vehicle leaving a construction site should be covered entirely by impervious sheeting to ensure that the dusty materials do not leak from the vehicle; • Where practicable, vehicle washing facilities with high pressure water jet should be provided at every discernible or designated vehicle exit point. The area where vehicle washing takes place and the road section between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores; • When there are open excavation and reinstatement works, hoarding of not less than 2.4m high should be provided as far as practicable along the site boundary with provision for public crossing. Good site practice shall also be adopted by the Contractor to ensure the conditions of the hoardings are properly maintained throughout the construction period; • The portion of any road leading only to construction site that is within 30m of a vehicle entrance or exit should be kept clear of dusty materials; • Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation takes place should be sprayed with water or a dust suppression chemical continuously; • Any area that involves demolition activities should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet; • Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, 					

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EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
		<p>sheeting or netting should be provided to enclose the scaffolding from the ground floor level of the building, or a canopy should be provided from the first floor level up to the highest level of the scaffolding;</p> <ul style="list-style-type: none"> • Any skip hoist for material transport should be totally enclosed by impervious sheeting; • Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides; • Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed; • Loading, unloading, transfer, handling or storage of bulk cement or dry PFA should be carried out in a totally enclosed system or facility, and any vent or exhaust should be fitted with an effective fabric filter or equivalent air pollution control system; and • Exposed earth should be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shortcrete or other suitable surface stabiliser within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies. 					
S3.4.6	D4	Implement regular dust monitoring under EM&A programme during the construction stage.	Monitoring of dust impact	Contractor	Selected dust monitoring stations	Construction stage	<ul style="list-style-type: none"> • TM-EIAO

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EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
Construction Noise							
S4.3.4	N1	Implement the following good site management practices: <ul style="list-style-type: none"> • only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme; • machines and plant (such as trucks, cranes) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • plant known to emit noise strongly in one direction, where possible, be orientated so that the noise is directed away from nearby NSRs; • silencers or mufflers on construction equipment should be properly fitted and maintained during the construction works; • mobile plant should be sited as far away from NSRs as possible and practicable; • material stockpiles, site office and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities. 	Control construction airborne noise	Contractor	All construction sites where practicable	Construction stage	• Annex 5, TM-EIAO
S4.3.4	N2	Use of quiet plant which should be made reference to the Powered Mechanical Equipment (PME) listed in the Technical Memorandum or the Quality Powered Mechanical Equipment (QPME) / other commonly used PME listed in Environmental Protection Department (EPD) web pages as far as possible which includes the Sound Power Level (SWLs) for specific quiet PME.	Reduce the noise levels of plant items	Contractor	All construction sites where practicable	Construction stage	• Annex 5, TM-EIAO
S4.3.4	N3	Install movable temporary noise barriers (typical design is wooden framed barrier with a small-cantilevered upper portion of superficial density no less than 7kg/m ² on a skid	Screen the noisy plant items to be used at all	Contractor	All construction sites where	Construction stage	• Annex 5, TM-EIAO

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EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
		footing with 25mm thick internal sound absorptive lining), and full enclosure, screen the noisy plants including air compressors, generators etc.	construction sites		practicable		
S4.3.4	N4	Implement a noise monitoring under EM&A programme.	Monitor the construction noise levels at the selected representative locations	Contractor	Selected noise monitoring stations	Construction stage	• TM-EIAO

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EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
<i>Water Quality (Construction Phase)</i>							
S5.4.3	W1	<p><u>General Construction Activities</u></p> <p>In accordance with the Practice Note for Professional Persons on Construction Site Drainage, Environmental Protection Department, 1994 (ProPECC PN1/94), best management practices should be implemented on site as far as practicable. The best practices are detailed below:</p> <ul style="list-style-type: none"> • At the start of site establishment, perimeter cut-off drains to direct off-site water around the site should be constructed with internal drainage works. Channels, earth bunds or sand bag barriers should be provided on site to direct stormwater to silt removal facilities.; • Diversion of natural stormwater should be provided as far as possible. The design of temporary on-site drainage should prevent runoff going through site surface, construction machinery and equipment in order to avoid or minimize polluted runoff. Sedimentation tanks with sufficient capacity, constructed from pre-formed individual cells of approximately 6 to 8 m3 capacities, are recommended as a general mitigation measure which can be used for settling surface runoff prior to disposal. The system capacity shall be flexible and able to handle multiple inputs from a variety of sources and suited to applications where the influent is pumped; • The dikes or embankments for flood protection should be implemented around the boundaries of earthwork areas. Temporary ditches should be provided to facilitate the runoff discharge into an appropriate watercourse, through a silt/sediment trap. The silt/sediment traps should be incorporated in the permanent drainage channels to enhance deposition rates; • The design of efficient silt removal facilities should be 	To minimize water quality impact from construction site runoff and general construction activities	Contractor	All construction sites where applicable	Construction stage	<ul style="list-style-type: none"> • Water Pollution Control Ordinance • ProPECC PN1/94 • TM-EIAO • TM-DSS

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EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
		<p>based on the guidelines in Appendix A1 of ProPECC PN 1/94. The detailed design of the sand/silt traps should be undertaken by the contractor prior to the commencement of construction;</p> <ul style="list-style-type: none"> • Construction works should be programmed to minimize surface excavation works during the rainy seasons (April to September). All exposed earth areas should be completed and vegetated as soon as possible after earthworks have been completed. If excavation of soil cannot be avoided during the rainy season, or at any time of year when rainstorms are likely, exposed slope surfaces should be covered by tarpaulin or other means; • All drainage facilities and erosion and sediment control structures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly following rainstorms. Deposited silt and grit should be removed regularly and disposed of by spreading evenly over stable, vegetated areas; • If the excavation of trenches in wet periods is necessary, it should be dug and backfilled in short sections wherever practicable. Water pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities; • All open stockpiles of construction materials (for example, aggregates, sand and fill material) should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system; • Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and storm runoff being 					

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		<p>directed into foul sewers;</p> <ul style="list-style-type: none"> • Precautions to be taken at any time of year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecasted, and actions to be taken during or after rainstorms are summarized in Appendix A2 of ProPECC PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events; • All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and sited wheel washing facilities should be provided at every construction site exit where practicable. Wash-water should have sand and silt settled out and removed at least on a weekly basis to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains; • Oil interceptors should be provided in the drainage system downstream of any oil/fuel pollution sources. The oil interceptors should be emptied and cleaned regularly to prevent the release of oil and grease into the storm water drainage system after accidental spillage. A bypass should be provided for the oil interceptors to prevent flushing during heavy rain; • Construction solid waste, debris and rubbish on site should be collected, handled and disposed of properly to avoid water quality impacts; • All fuel tanks and storage areas should be provided with locks and sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank to prevent spilled fuel oils from reaching water sensitive 					

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		<p>receivers nearby;and</p> <ul style="list-style-type: none"> Regular environmental audit on the construction site should be carried out in order to prevent any malpractices. Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the water bodies, mangroves and open sea. 					
S5.4.3	W2	<p><u>Sewage from workforce</u></p> <ul style="list-style-type: none"> Portable chemical toilets and sewage holding tanks are recommended for handling the construction sewage generated by the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance; Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment during the construction phase of the Project; Regular environmental audit on the construction site should be conducted in order to provide an effective control of any malpractices and achieve continual improvement of environmental performance on site. 	To minimize water quality from sewage effluent in construction phase	Contractor	All construction sites where practicable	Construction stage	<ul style="list-style-type: none"> Water Pollution Control Ordinance TM-DSS
S5.5.8	W8	<p><u>Good Management Practice in Construction Phase</u></p> <p>The following good site management practices shall be adopted for the filling works:</p> <ul style="list-style-type: none"> Water quality monitoring shall be implemented to ensure effective control of water pollution and recommend additional mitigation measures required; The decent speed of grabs shall be controlled to minimize the seabed impact and to reduce the volume of over- 	To avoid water quality impact	Contractor	All construction sites where practicable	Construction stage	<ul style="list-style-type: none"> ProPECC PN1/94

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		<p>dredging;</p> <ul style="list-style-type: none"> • A perimeter silt curtain shall be installed during the entire reclamation periods; • Barges or hoppers shall not be filled to a level which will cause overflow of materials or pollution of water during loading or transportation; • Excess materials shall be cleaned from the decks and exposed fittings of barges before the vessels are moved; • Plants should not be operated with leaking pipes and any pipe leakages shall be repaired quickly; • Adequate freeboard shall be maintained on barges to reduce the likelihood of decks being washed by wave action; • All vessels should be sized so that adequate clearance is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash; and • The works shall not cause foam, oil, grease, litter or other objectionable matter to be present in the water within and adjacent to the works site. 					

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EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
Waste Management (Construction Waste)							
S7.4.1	WM1	<p><u>Good Site Practices</u></p> <p>The following good site practices are recommended throughout the construction activities:</p> <ul style="list-style-type: none"> • nomination of an approved personnel, such as a site manager, to be responsible for the implementation of good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site; • training of site personnel in site cleanliness, appropriate waste management procedures and concepts of waste reduction, reuse and recycling; • provision of sufficient waste disposal points and regular collection for disposal; • imposition of penalty system on Contractors' improper behaviours when illegal dumping and landfilling outside their respective construction sites, i.e. on nearby farmlands and riverbanks, are reported; • appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers; • regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; and • the contractor should prepare a Waste Management Plan (WMP) as part of the Environmental Management Plan (EMP) in accordance with the ETWB TC(W) No. 19/2005 for construction phase. The EMP should be submitted to the Engineer for approval. Mitigation measures proposed in the EIA Report and the EM&A Manual should be adopted. 	Minimize waste generation during construction	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance

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S7.4.1	WM2	<p><u>Waste Reduction Measures</u></p> <p>Waste reduction is best achieved at the planning and design phase, as well as by ensuring the implementation of good site practices. The following recommendations are proposed to achieve reduction:</p> <ul style="list-style-type: none"> • segregate and store different types of waste in different containers, skip or stockpiles to enhance reuse or recycling of materials and their proper disposal; • proper storage and site practices to minimize the potential for damage and contamination of construction materials; • plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste; • sort out demolition debris and excavated materials from demolition works to recover reusable/recyclable portions (i.e. soil, broken concrete, metal etc.); • provide training to workers on the importance of appropriate waste management procedures, including waste reduction, reuse and recycling. 	Reduce waste generation	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance
S7.4.1	WM3	<p><u>Storage of Waste</u></p> <p>The following recommendation should be implemented to minimize the impacts:</p> <ul style="list-style-type: none"> • waste such as soil should be handled and stored well to ensure secure containment; and • Depends on actual site activities, certain locations within the site area would be used for storage of waste to enhance reuse. However, there would not be any designated location for storage of waste, and the storage locations would need to be adjusted to suite actual site conditions; 	Good site practice to minimize the waste generation and recycle the C&D materials as far as practicable so as to reduce the amount for final disposal	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Land (Miscellaneous Provisions) Ordinance • Waste Disposal Ordinance • ETWB TCW No. 19/2005

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S7.4.1	WM4	<p><u>Collection and Transportation of Waste</u></p> <p>The following recommendation should be implemented to minimize the impacts:</p> <ul style="list-style-type: none"> • remove waste in timely manner; • employ the trucks with cover or enclosed containers for waste transportation; • obtain relevant waste disposal permits from the appropriate authorities; and • disposal of waste should be done at licensed waste disposal facilities. 	Minimize waste impacts from storage	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance
S7.4.1	WM5	<p><u>Excavated and C&D Materials</u></p> <p>Wherever practicable, C&D materials should be segregated from other wastes to avoid contamination and ensure acceptability at public fill reception facilities or reclamation sites. The following mitigation measures should be implemented in handling the excavated and C&D materials:</p> <ul style="list-style-type: none"> • maintain temporary stockpiles and reuse excavated fill material for backfilling; • carry out on-site sorting; • make provisions in the Contract documents to allow and promote the use of recycled aggregates where appropriate; and • implement a trip-ticket system for each works contract to ensure that the disposal of C&D materials are properly documented and verified, so as to avoid the illegal dumping and landfilling of C&D materials on farmlands/ riverbanks at TCW; <p>The recommended C&D materials handling should include:</p>	Minimize waste impacts from excavated and C&D materials	Contractor	All construction sites	Construction Stage	<ul style="list-style-type: none"> • Land (Miscellaneous Provisions) Ordinance • Waste Disposal Ordinance • ETWB TCW No. 19/2005 • Project Administrative Handbook for Civil Engineering Works, 2012 Edition

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EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
		<ul style="list-style-type: none"> On-site sorting of C&D materials Reuse of C&D materials Use of Standard Formwork and Planning of Construction Materials purchasing 					
S7.4.1	WM6	<p><u>Provision of Wheel Wash Facilities</u></p> <p>Wheel wash facilities have to be provided at the site entrance before the trucks leaving the works area. Dust disturbance due to the trucks transportation to the public road network could be minimized by such arrangement.</p>	Minimize waste impacts from trucks transportation	Contractor	All construction sites	Construction Stage	N/A
S7.4.1	WM10	<p><u>Chemical Waste</u></p> <p>If chemical wastes are produced at the construction site, the Contractors should register with EPD as chemical waste producer. Chemical wastes should be stored in appropriate containers and collected by a licensed chemical waste collector. Chemical wastes (e.g. spent lubricant oil) should be recycled at an appropriate facility as far as possible, while the chemical waste that cannot be recycled should be disposed of at either the Chemical Waste Treatment Centre, or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.</p>	Control the chemical waste and ensure proper storage, handling and disposal.	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> Waste Disposal (Chemical Waste) (General) Regulation Code of Practice on the Packaging, Labelling and Storage of Chemical Waste
S7.4.1	WM11	<p><u>General Refuse</u></p> <ul style="list-style-type: none"> General refuse should be stored in enclosed bins separately from construction and chemical wastes. Recycling bins should also be placed to encourage recycling. Preferably enclosed and covered areas should be provided for general refuse collection and routine cleaning for these areas should also be implemented to 	Minimize production of the general refuse and avoid odour, pest and litter impacts	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> Waste Disposal Ordinance

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		keep areas clean. <ul style="list-style-type: none"> • A reputable waste collector should be employed to remove general refuse on a daily basis. 					

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<i>Ecology (Construction Phase)</i>							
S9.8.3	EC13	Implementation of standard site practices	Minimize the potential impact due to dust, noise and runoff during construction phase	Contractor	Within construction sites	Construction phase	<ul style="list-style-type: none"> • EIA • Contractual requirements

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EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementati on Agent	Location	Implementation Stage	Requirements and / or standards to be achieved
<i>Landscape and Visual (Construction Phase)</i>							
S11.7 MM1	LV1	<p>Optimisation of Construction Areas & Providing Temporary Landscape on Temporary Construction – Construction areas’ control shall be enforced, where possible, to ensure that the landscape and visual impacts arising from the construction activities are minimised.</p> <p>It includes reduction of the extent of working areas and temporary works areas, management on storing and using the construction equipment and materials, and consideration of detailed schedules to shorten the construction period. Temporary landscape treatments are considered to be adopted such as applying hydro-seeding on temporary stockpiles and reclamation areas to alleviate the potential impacts.</p>	Minimise the landscape and visual impacts arising from the construction activities	Relevant Government Departments / Private Sector	Through-out Tung Chung West (TCW) area and Tung Chung East (TCE) area	Construction Phase	
<i>Landscape and Visual (Operational Phase)</i>							
S11.7 MM12	LV12	Screen Planting – Tall screen/buffer trees and shrubs should be planted to screen proposed structures such as roads and buildings. This measure will form part of the compensatory planting and will improve compatibility with the surrounding environment and create a pleasant pedestrian environment.	<p>To screen proposed structures</p> <p>Improve compatibility with the surrounding environment</p>	Relevant Government Departments	Through-out the working sites of the TCW and TCE areas	Prior to Construction, Construction Phase & Maintenance in Operation Phase	<ul style="list-style-type: none"> • HyD HQ/GN/15– Guidelines for Greening Works along Highways.
S11.7 MM13	LV13	Roadside Planting – Roadside greening is proposed alongside all roads within the possible developments. It will enhance local identity, if theme planting is used, and reduce visual impact through screening. At-grade road planting should be considered along central dividers and on road islands e.g. in the middle of roundabouts.	<p>Soften the hard, straight edges and provide greening along the roads;</p> <p>Improve the visual amenity</p>	Relevant Government Departments	Along new roads, and On appropriate viaducts	Prior to Construction, Construction Phase & Maintenance in Operation Phase	<ul style="list-style-type: none"> • HyD HQ/GN/15– Guidelines for Greening Works along Highways. • Development Bureau Technical Circular Works

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							No.2/2012 – Allocation of Space for Quality Greening on Roads

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<i>EM&A Project</i>							
S13.2	EM1	An Independent Environmental Checker needs to be employed as per the EM&A Manual.	Control EM&A Performance	Project Proponent	All construction sites	Construction stage	<ul style="list-style-type: none"> • EIAO Guidance Note No.4/2010 • TM-EIAO
S13.2 – 13.4	EM2	1) An Environmental Team needs to be employed as per the EM&A Manual. 2) Prepare a systematic Environmental Management Plan to ensure effective implementation of the mitigation measures. 3) An environmental impact monitoring needs to be implementing by the Environmental Team to ensure all the requirements given in the EM&A Manual are fully complied with.	Perform environmental monitoring & auditing	Project Proponent	All construction sites	Construction stage	<ul style="list-style-type: none"> • EIAO Guidance Note No.4/2010 • TM-EIAO

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Note: Chapters 1 to 2 of the EIA report present the background information of the Project, identified concurrent projects, objectives and scope for various environmental aspects, and description on alternative options and construction description. Chapters 3 to 12 of the EIA report present the EIA findings and mitigation measures are described below with cross-reference to the EIA report. Chapters 13 to 15 describe the environmental monitoring requirements, summary of environmental outcomes and conclusion.

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
<i>Common Mitigation Measures (Applicable to DP Item C.1-Reclamation works (including associated dredging works) more than 5ha in size)</i>							
Construction Dust Impact							
S3.4.6	D1	Water spraying every hour on exposed worksites and haul road.	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • APCO • To control the dust impact to meet HKAQO and TM-EIAO criteria
S3.4.6	D2	The contractor shall follow the procedures and requirements given in the Air Pollution Control (Construction Dust) Regulation	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • APCO • To control the dust impact to meet HKAQO and TM-EIAO criteria
S3.4.6	D3	<p>The following dust suppression measures should be incorporated to control the dust nuisance throughout the construction phase:</p> <ul style="list-style-type: none"> • Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading; • Any dusty materials remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads; 	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • APCO • To control the dust impact to meet HKAQO and TM-EIAO criteria

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		<ul style="list-style-type: none"> • A stockpile of dusty material should not be extended beyond the pedestrian barriers, fencing or traffic cones; • The load of dusty materials on a vehicle leaving a construction site should be covered entirely by impervious sheeting to ensure that the dusty materials do not leak from the vehicle; • Where practicable, vehicle washing facilities with high pressure water jet should be provided at every discernible or designated vehicle exit point. The area where vehicle washing takes place and the road section between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores; • When there are open excavation and reinstatement works, hoarding of not less than 2.4m high should be provided as far as practicable along the site boundary with provision for public crossing. Good site practice shall also be adopted by the Contractor to ensure the conditions of the hoardings are properly maintained throughout the construction period; • The portion of any road leading only to construction site that is within 30m of a vehicle entrance or exit should be kept clear of dusty materials; • Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation takes place should be sprayed with water or a dust suppression chemical continuously; • Any area that involves demolition activities should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet; • Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, 					

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		<p>sheeting or netting should be provided to enclose the scaffolding from the ground floor level of the building, or a canopy should be provided from the first floor level up to the highest level of the scaffolding;</p> <ul style="list-style-type: none"> • Any skip hoist for material transport should be totally enclosed by impervious sheeting; • Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides; • Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed; • Loading, unloading, transfer, handling or storage of bulk cement or dry PFA should be carried out in a totally enclosed system or facility, and any vent or exhaust should be fitted with an effective fabric filter or equivalent air pollution control system; and • Exposed earth should be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shortcrete or other suitable surface stabiliser within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies. 					
S3.4.6	D4	Implement regular dust monitoring under EM&A programme during the construction stage.	Monitoring of dust impact	Contractor	Selected dust monitoring stations	Construction stage	<ul style="list-style-type: none"> • TM-EIAO

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EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
Construction Noise							
S4.3.4	N1	Implement the following good site management practices: <ul style="list-style-type: none"> • only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme; • machines and plant (such as trucks, cranes) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • plant known to emit noise strongly in one direction, where possible, be orientated so that the noise is directed away from nearby NSRs; • silencers or mufflers on construction equipment should be properly fitted and maintained during the construction works; • mobile plant should be sited as far away from NSRs as possible and practicable; • material stockpiles, site office and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities. 	Control construction airborne noise	Contractor	All construction sites where practicable	Construction stage	• Annex 5, TM-EIAO
S4.3.4	N2	Use of quiet plant which should be made reference to the Powered Mechanical Equipment (PME) listed in the Technical Memorandum or the Quality Powered Mechanical Equipment (QPME) / other commonly used PME listed in Environmental Protection Department (EPD) web pages as far as possible which includes the Sound Power Level (SWLs) for specific quiet PME.	Reduce the noise levels of plant items	Contractor	All construction sites where practicable	Construction stage	• Annex 5, TM-EIAO
S4.3.4	N3	Install movable temporary noise barriers (typical design is wooden framed barrier with a small-cantilevered upper portion of superficial density no less than 7kg/m ² on a skid	Screen the noisy plant items to be used at all	Contractor	All construction sites where	Construction stage	• Annex 5, TM-EIAO

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EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
		footing with 25mm thick internal sound absorptive lining), and full enclosure, screen the noisy plants including air compressors, generators etc.	construction sites		practicable		
S4.3.4	N4	Implement a noise monitoring under EM&A programme.	Monitor the construction noise levels at the selected representative locations	Contractor	Selected noise monitoring stations	Construction stage	<ul style="list-style-type: none"> • TM-EIAO

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EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
<i>Water Quality (Construction Phase)</i>							
S5.4.3	W1	<p><u>General Construction Activities</u></p> <p>In accordance with the Practice Note for Professional Persons on Construction Site Drainage, Environmental Protection Department, 1994 (ProPECC PN1/94), best management practices should be implemented on site as far as practicable. The best practices are detailed below:</p> <ul style="list-style-type: none"> • At the start of site establishment, perimeter cut-off drains to direct off-site water around the site should be constructed with internal drainage works. Channels, earth bunds or sand bag barriers should be provided on site to direct stormwater to silt removal facilities.; • Diversion of natural stormwater should be provided as far as possible. The design of temporary on-site drainage should prevent runoff going through site surface, construction machinery and equipment in order to avoid or minimize polluted runoff. Sedimentation tanks with sufficient capacity, constructed from pre-formed individual cells of approximately 6 to 8 m3 capacities, are recommended as a general mitigation measure which can be used for settling surface runoff prior to disposal. The system capacity shall be flexible and able to handle multiple inputs from a variety of sources and suited to applications where the influent is pumped; • The dikes or embankments for flood protection should be implemented around the boundaries of earthwork areas. Temporary ditches should be provided to facilitate the runoff discharge into an appropriate watercourse, through a silt/sediment trap. The silt/sediment traps should be incorporated in the permanent drainage channels to enhance deposition rates; 	To minimize water quality impact from construction site runoff and general construction activities	Contractor	All construction sites where applicable	Construction stage	<ul style="list-style-type: none"> • Water Pollution Control Ordinance • ProPECC PN1/94 • TM-EIAO • TM-DSS

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EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
		<ul style="list-style-type: none"> • The design of efficient silt removal facilities should be based on the guidelines in Appendix A1 of ProPECC PN 1/94. The detailed design of the sand/silt traps should be undertaken by the contractor prior to the commencement of construction; • Construction works should be programmed to minimize surface excavation works during the rainy seasons (April to September). All exposed earth areas should be completed and vegetated as soon as possible after earthworks have been completed. If excavation of soil cannot be avoided during the rainy season, or at any time of year when rainstorms are likely, exposed slope surfaces should be covered by tarpaulin or other means; • All drainage facilities and erosion and sediment control structures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly following rainstorms. Deposited silt and grit should be removed regularly and disposed of by spreading evenly over stable, vegetated areas; • If the excavation of trenches in wet periods is necessary, it should be dug and backfilled in short sections wherever practicable. Water pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities; • All open stockpiles of construction materials (for example, aggregates, sand and fill material) should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system; • Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being 					

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		<p>washed into the drainage system and storm runoff being directed into foul sewers;</p> <ul style="list-style-type: none"> • Precautions to be taken at any time of year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecasted, and actions to be taken during or after rainstorms are summarized in Appendix A2 of ProPECC PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events; • All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and sited wheel washing facilities should be provided at every construction site exit where practicable. Wash-water should have sand and silt settled out and removed at least on a weekly basis to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains; • Oil interceptors should be provided in the drainage system downstream of any oil/fuel pollution sources. The oil interceptors should be emptied and cleaned regularly to prevent the release of oil and grease into the storm water drainage system after accidental spillage. A bypass should be provided for the oil interceptors to prevent flushing during heavy rain; • Construction solid waste, debris and rubbish on site should be collected, handled and disposed of properly to avoid water quality impacts; • All fuel tanks and storage areas should be provided with locks and sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank 					

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EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
		<p>to prevent spilled fuel oils from reaching water sensitive receivers nearby;and</p> <ul style="list-style-type: none"> Regular environmental audit on the construction site should be carried out in order to prevent any malpractices. Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the water bodies, mangroves and open sea. 					
S5.4.3	W2	<p><u>Sewage from workforce</u></p> <ul style="list-style-type: none"> Portable chemical toilets and sewage holding tanks are recommended for handling the construction sewage generated by the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance; Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment during the construction phase of the Project; Regular environmental audit on the construction site should be conducted in order to provide an effective control of any malpractices and achieve continual improvement of environmental performance on site. 	To minimize water quality from sewage effluent in construction phase	Contractor	All construction sites where practicable	Construction stage	<ul style="list-style-type: none"> Water Pollution Control Ordinance TM-DSS
S5.5.8	W8	<p><u>Good Management Practice in Construction Phase</u></p> <p>The following good site management practices shall be adopted for the filling works:</p> <ul style="list-style-type: none"> Water quality monitoring shall be implemented to ensure effective control of water pollution and recommend additional mitigation measures required; The decent speed of grabs shall be controlled to minimize 	To avoid water quality impact	Contractor	All construction sites where practicable	Construction stage	<ul style="list-style-type: none"> ProPECC PN1/94

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EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
		<p>the seabed impact and to reduce the volume of over-dredging;</p> <ul style="list-style-type: none"> • A perimeter silt curtain shall be installed during the entire reclamation periods; • Barges or hoppers shall not be filled to a level which will cause overflow of materials or pollution of water during loading or transportation; • Excess materials shall be cleaned from the decks and exposed fittings of barges before the vessels are moved; • Plants should not be operated with leaking pipes and any pipe leakages shall be repaired quickly; • Adequate freeboard shall be maintained on barges to reduce the likelihood of decks being washed by wave action; • All vessels should be sized so that adequate clearance is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash; and • The works shall not cause foam, oil, grease, litter or other objectionable matter to be present in the water within and adjacent to the works site. 					
S5.5.8	W9	<ul style="list-style-type: none"> • The recovered C&D materials for filling would be ensured no floating or non-inert material by visual inspection, quality assurance, etc. 	To avoid water quality impact	Contractor	All construction sites where practicable	Construction stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance

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EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
Waste Management (Construction Waste)							
S7.4.1	WM1	<p><u>Good Site Practices</u></p> <p>The following good site practices are recommended throughout the construction activities:</p> <ul style="list-style-type: none"> • nomination of an approved personnel, such as a site manager, to be responsible for the implementation of good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site; • training of site personnel in site cleanliness, appropriate waste management procedures and concepts of waste reduction, reuse and recycling; • provision of sufficient waste disposal points and regular collection for disposal; • imposition of penalty system on Contractors' improper behaviours when illegal dumping and landfilling outside their respective construction sites, i.e. on nearby farmlands and riverbanks, are reported; • appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers; • regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; and • the contractor should prepare a Waste Management Plan (WMP) as part of the Environmental Management Plan (EMP) in accordance with the ETWB TC(W) No. 19/2005 for construction phase. The EMP should be submitted to the Engineer for approval. Mitigation measures proposed in the EIA Report and the EM&A Manual should be adopted. 	Minimize waste generation during construction	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance

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S7.4.1	WM2	<p><u>Waste Reduction Measures</u></p> <p>Waste reduction is best achieved at the planning and design phase, as well as by ensuring the implementation of good site practices. The following recommendations are proposed to achieve reduction:</p> <ul style="list-style-type: none"> • segregate and store different types of waste in different containers, skip or stockpiles to enhance reuse or recycling of materials and their proper disposal; • proper storage and site practices to minimize the potential for damage and contamination of construction materials; • plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste; • sort out demolition debris and excavated materials from demolition works to recover reusable/recyclable portions (i.e. soil, broken concrete, metal etc.); • provide training to workers on the importance of appropriate waste management procedures, including waste reduction, reuse and recycling. 	Reduce waste generation	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance
S7.4.1	WM3	<p><u>Storage of Waste</u></p> <p>The following recommendation should be implemented to minimize the impacts:</p> <ul style="list-style-type: none"> • waste such as soil should be handled and stored well to ensure secure containment; and • Depends on actual site activities, certain locations within the site area would be used for storage of waste to enhance reuse. However, there would not be any designated location for storage of waste, and the storage locations would need to be adjusted to suite actual site conditions; 	Good site practice to minimize the waste generation and recycle the C&D materials as far as practicable so as to reduce the amount for final disposal	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Land (Miscellaneous Provisions) Ordinance • Waste Disposal Ordinance • ETWB TCW No. 19/2005

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S7.4.1	WM4	<p><u>Collection and Transportation of Waste</u></p> <p>The following recommendation should be implemented to minimize the impacts:</p> <ul style="list-style-type: none"> • remove waste in timely manner; • employ the trucks with cover or enclosed containers for waste transportation; • obtain relevant waste disposal permits from the appropriate authorities; and • disposal of waste should be done at licensed waste disposal facilities. 	Minimize waste impacts from storage	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance
S7.4.1	WM5	<p><u>Excavated and C&D Materials</u></p> <p>Wherever practicable, C&D materials should be segregated from other wastes to avoid contamination and ensure acceptability at public fill reception facilities or reclamation sites. The following mitigation measures should be implemented in handling the excavated and C&D materials:</p> <ul style="list-style-type: none"> • maintain temporary stockpiles and reuse excavated fill material for backfilling; • carry out on-site sorting; • make provisions in the Contract documents to allow and promote the use of recycled aggregates where appropriate; and • implement a trip-ticket system for each works contract to ensure that the disposal of C&D materials are properly documented and verified, so as to avoid the illegal dumping and landfilling of C&D materials on farmlands/ riverbanks at TCW; <p>The recommended C&D materials handling should include:</p>	Minimize waste impacts from excavated and C&D materials	Contractor	All construction sites	Construction Stage	<ul style="list-style-type: none"> • Land (Miscellaneous Provisions) Ordinance • Waste Disposal Ordinance • ETWB TCW No. 19/2005 • Project Administrative Handbook for Civil Engineering Works, 2012 Edition

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		<ul style="list-style-type: none"> On-site sorting of C&D materials Reuse of C&D materials Use of Standard Formwork and Planning of Construction Materials purchasing 					
S7.4.1	WM6	<p><u>Provision of Wheel Wash Facilities</u></p> <p>Wheel wash facilities have to be provided at the site entrance before the trucks leaving the works area. Dust disturbance due to the trucks transportation to the public road network could be minimized by such arrangement.</p>	Minimize waste impacts from trucks transportation	Contractor	All construction sites	Construction Stage	N/A
S7.4.1	WM10	<p><u>Chemical Waste</u></p> <p>If chemical wastes are produced at the construction site, the Contractors should register with EPD as chemical waste producer. Chemical wastes should be stored in appropriate containers and collected by a licensed chemical waste collector. Chemical wastes (e.g. spent lubricant oil) should be recycled at an appropriate facility as far as possible, while the chemical waste that cannot be recycled should be disposed of at either the Chemical Waste Treatment Centre, or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.</p>	Control the chemical waste and ensure proper storage, handling and disposal.	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> Waste Disposal (Chemical Waste) (General) Regulation Code of Practice on the Packaging, Labelling and Storage of Chemical Waste
S7.4.1	WM11	<p><u>General Refuse</u></p> <ul style="list-style-type: none"> General refuse should be stored in enclosed bins separately from construction and chemical wastes. Recycling bins should also be placed to encourage recycling. Preferably enclosed and covered areas should be provided for general refuse collection and routine cleaning for these areas should also be implemented to 	Minimize production of the general refuse and avoid odour, pest and litter impacts	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> Waste Disposal Ordinance

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		keep areas clean. <ul style="list-style-type: none"> • A reputable waste collector should be employed to remove general refuse on a daily basis. 					
S7.4.1	WM12	<u>Floating Refuse accumulated along the seawall</u> The floating refuse along seawall should be collected to avoid accumulation. In addition, proper seawall design should be employed, and regular checking and cleaning of floating refuse should be implemented.	Control floating refuse and ensure proper disposal	Contractor	Construction sites along seawall	Construction stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance
<i>Waste Management (Operational Waste)</i>							
S7.4.2	WM16	<u>Floating Refuse accumulated along seawall</u> <ul style="list-style-type: none"> • The floating refuse along seawall should be collected to avoid accumulation. 	Control floating refuse and ensure proper disposal	MD	Along seawall	Operational stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance

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<i>Ecology (Construction Phase)</i>							
S9.8.2	EC6	Adoption of non-dredged reclamation method	To maintain the marine water quality	Contractor	Reclamation area of TCE and Road P1	Construction phase	<ul style="list-style-type: none"> • EIA • Contractual requirements
S9.8.3	EC13	Implementation of standard site practices	Minimize the potential impact due to dust, noise and runoff during construction phase	Contractor	Within construction sites	Construction phase	<ul style="list-style-type: none"> • EIA • Contractual requirements
S9.8.4	EC14	Adopting Eco-shoreline design	To mitigate the impact of the marine loss	CEDD	Along future seawall	Construction stage	<ul style="list-style-type: none"> • EIA • Contractual requirements
S9.8.4	EC15	Strict enforcement on no-dumping	Minimise the potential impact to marine habitats	Contractor	In reclamation area as well as all works area and travel route of works vessels	Before and during construction phase	<ul style="list-style-type: none"> • EIA • Contractual requirements
S9.8.4	EC16	Spill response plan	Minimise the potential impact to marine habitats	Contractor	In reclamation area as well as all works area and travel route of works vessels	Before and during construction phase	<ul style="list-style-type: none"> • EIA • Contractual requirements

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S.9.8.4	EC17	Control and minimization of marine traffic by including using larger-sized barges, land transportation of materials, reuse of excavation and C&D materials and speed limits & regular routes of works vessels	Reduce marine traffic	Contractor	In reclamation area as well as all works area and travel route of works vessels	Construction phase	<ul style="list-style-type: none"> • EIA • Contractual requirements
S9.8.4	EC18	Dolphin exclusion zone and dolphin watching plan	Protection of CWD	Contractor	In reclamation area as well as all works area	Construction phase	<ul style="list-style-type: none"> • EIA • Contractual requirements
S9.8.4	EC19	Speed limits and regular routes of works vessels; Prepare and submit a “Works Vessel Travel Route Plan”	Protection of CWD	Contractor	In reclamation area as well as all works area	Construction phase	<ul style="list-style-type: none"> • EIA • Contractual requirements
9.11.2	EC24	Monitoring of Tung Chung Bay and Tai Ho Wan	Protect Tung Chung Bay and Tai Ho Wan	Contractor	Tung Chung Bay and Tai Ho Wan	Construction phase and post-construction phase	<ul style="list-style-type: none"> • EIA • Contractual requirements
Ecology (Operational Phase)							
9.11.2	EC26	Eco-shoreline monitoring	Monitor the colonisation and establishment of fauna and/or flora, water quality, and recruitments of fisheries	CEDD/ Contractor	Eco-shoreline at TCE PDA reclamation	Post-construction phase, twice in wet and dry seasons respectively, at least 3 years,	<ul style="list-style-type: none"> • EIA • Contractual requirements

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			species			subject to review	

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<i>Fisheries</i>							
S10.8	F1	Good Site Practices	To protect the fisheries resources	Contractor	In reclamation area	Construction phase	<ul style="list-style-type: none"> • EIA • Contractual requirements
S10.8	F2	No dumping	To protect the fisheries resources	Contractor	In reclamation area	Construction phase	<ul style="list-style-type: none"> • EIA • Contractual requirements
S10.8	F3	Spill response plan	To protect the fisheries resources	Contractor	In reclamation area	Construction phase	<ul style="list-style-type: none"> • EIA • Contractual requirements
S10.9	F4	Follow the mitigation measures proposed in the water quality assessment for the construction and operation phases of the project.	To protect the fisheries resources	Contractor	Waters in Northern Lantau	Construction phase and operation phase	<ul style="list-style-type: none"> • EIA • Contractual requirements
S10.9	F5	Follow the mitigation measure of eco-shoreline in ecology chapter for the construction and operation phases of the project.	To enhance the fisheries resources	Contractor	Eco-shorelines	Construction phase and operation phase	<ul style="list-style-type: none"> • EIA • Contractual requirements

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<i>Landscapes and Visual (Construction Phase)</i>							
S11.7 MM1	LV1	<p>Optimisation of Construction Areas & Providing Temporary Landscape on Temporary Construction – Construction areas’ control shall be enforced, where possible, to ensure that the landscape and visual impacts arising from the construction activities are minimised.</p> <p>It includes reduction of the extent of working areas and temporary works areas, management on storing and using the construction equipment and materials, and consideration of detailed schedules to shorten the construction period. Temporary landscape treatments are considered to be adopted such as applying hydro-seeding on temporary stockpiles and reclamation areas to alleviate the potential impacts.</p>	Minimise the landscape and visual impacts arising from the construction activities	Relevant Government Departments / Private Sector	Through-out Tung Chung West (TCW) area and Tung Chung East (TCE) area	Construction Phase	
S11.7 MM6	LV6	Adopting Non-dredge Method for the Reclamation – In order to minimize the potential adverse impacts caused by the reclamation, a number of alternative construction methodologies has been critically examined. After considering all the options such as fully dredged, partially dredged and non-dredged methods for seawall construction and reclamation, non-dredged method for both the seawall construction and reclamation are recommended so as to minimize the generation of dredged sediment.	Minimize the potential adverse impacts caused by the reclamation	Relevant Government Departments / Private Sector	Through-out TCE area	Construction Phase	• Foreshore and Sea-bed (Reclamations) Ordinance (Cap.127)
S11.7 MM9	LV9	Providing Natural Rock Material/ Planting for Artificial Seawall – There would be inevitable permanent losses of marine waters (seabed and water column), and direct impacts on existing artificial seawalls due to the reclamation. To minimize the impacts, the design of the future seawall like ‘eco-shoreline’ could be improved to provide high ecological functions and mitigate the impact of the loss.	Mitigate the impacts on existing artificial seawalls	Relevant Government Departments	Onsite where possible	Prior to Construction & Construction Phase	

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		<p>An 'eco-shoreline' is any shoreline which provides beneficial functions to the local ecosystem through a range of active or passive solutions, whilst providing coastal protection. By means of using natural rock materials for artificial seawall and considering to introduce a native vegetation buffer directly behind the top of seawalls as appropriate to create habitat, shelter and a source of food for benefiting both terrestrial and aquatic species along the foreshore, these measures can help to enhance the ecological functions and 'natural-look' of the shoreline, and the potential impacts will be mitigated.</p>					

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<i>EM&A Project</i>							
S13.2	EM1	An Independent Environmental Checker needs to be employed as per the EM&A Manual.	Control EM&A Performance	Project Proponent	All construction sites	Construction stage	<ul style="list-style-type: none"> • EIAO Guidance Note No.4/2010 • TM-EIAO
S13.2 – 13.4	EM2	1) An Environmental Team needs to be employed as per the EM&A Manual. 2) Prepare a systematic Environmental Management Plan to ensure effective implementation of the mitigation measures. 3) An environmental impact monitoring needs to be implementing by the Environmental Team to ensure all the requirements given in the EM&A Manual are fully complied with.	Perform environmental monitoring & auditing	Project Proponent	All construction sites	Construction stage	<ul style="list-style-type: none"> • EIAO Guidance Note No.4/2010 • TM-EIAO

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Note: Chapters 1 to 2 of the EIA report present the background information of the Project, identified concurrent projects, objectives and scope for various environmental aspects, and description on alternative options and construction description. Chapters 3 to 12 of the EIA report present the EIA findings and mitigation measures are described below with cross-reference to the EIA report. Chapters 13 to 15 describe the environmental monitoring requirements, summary of environmental outcomes and conclusion.

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
<i>Common Mitigation Measures (Applicable to DP Item F.3(b) Sewage pumping stations with an installed capacity of more than 2000m³/d located at less than 150m from existing/planned receivers)</i>							
Construction Dust Impact							
S3.4.6	D1	Water spraying every hour on exposed worksites and haul road.	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • APCO • To control the dust impact to meet HKAQO and TM-EIAO criteria
S3.4.6	D2	The contractor shall follow the procedures and requirements given in the Air Pollution Control (Construction Dust) Regulation	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • APCO • To control the dust impact to meet HKAQO and TM-EIAO criteria
S3.4.6	D3	<p>The following dust suppression measures should be incorporated to control the dust nuisance throughout the construction phase:</p> <ul style="list-style-type: none"> • Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading; • Any dusty materials remaining after a stockpile is removed should be wetted with water and cleared from the surface 	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • APCO • To control the dust impact to meet HKAQO and TM-EIAO criteria

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EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
		<p>of roads;</p> <ul style="list-style-type: none"> • A stockpile of dusty material should not be extended beyond the pedestrian barriers, fencing or traffic cones; • The load of dusty materials on a vehicle leaving a construction site should be covered entirely by impervious sheeting to ensure that the dusty materials do not leak from the vehicle; • Where practicable, vehicle washing facilities with high pressure water jet should be provided at every discernible or designated vehicle exit point. The area where vehicle washing takes place and the road section between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores; • When there are open excavation and reinstatement works, hoarding of not less than 2.4m high should be provided as far as practicable along the site boundary with provision for public crossing. Good site practice shall also be adopted by the Contractor to ensure the conditions of the hoardings are properly maintained throughout the construction period; • The portion of any road leading only to construction site that is within 30m of a vehicle entrance or exit should be kept clear of dusty materials; • Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation takes place should be sprayed with water or a dust suppression chemical continuously; • Any area that involves demolition activities should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet; 					

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		<ul style="list-style-type: none"> • Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, sheeting or netting should be provided to enclose the scaffolding from the ground floor level of the building, or a canopy should be provided from the first floor level up to the highest level of the scaffolding; • Any skip hoist for material transport should be totally enclosed by impervious sheeting; • Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides; • Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed; • Loading, unloading, transfer, handling or storage of bulk cement or dry PFA should be carried out in a totally enclosed system or facility, and any vent or exhaust should be fitted with an effective fabric filter or equivalent air pollution control system; and • Exposed earth should be properly treated by compaction, turving, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shortcrete or other suitable surface stabiliser within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies. 					
S3.4.6	D4	Implement regular dust monitoring under EM&A programme during the construction stage.	Monitoring of dust impact	Contractor	Selected dust monitoring stations	Construction stage	<ul style="list-style-type: none"> • TM-EIAO

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EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
Construction Noise							
S4.3.4	N1	Implement the following good site management practices: <ul style="list-style-type: none"> • only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme; • machines and plant (such as trucks, cranes) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • plant known to emit noise strongly in one direction, where possible, be orientated so that the noise is directed away from nearby NSRs; • silencers or mufflers on construction equipment should be properly fitted and maintained during the construction works; • mobile plant should be sited as far away from NSRs as possible and practicable; • material stockpiles, site office and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities. 	Control construction airborne noise	Contractor	All construction sites where practicable	Construction stage	• Annex 5, TM-EIAO
S4.3.4	N2	Use of quiet plant which should be made reference to the Powered Mechanical Equipment (PME) listed in the Technical Memorandum or the Quality Powered Mechanical Equipment (QPME) / other commonly used PME listed in Environmental Protection Department (EPD) web pages as far as possible which includes the Sound Power Level (SWLs) for specific quiet PME.	Reduce the noise levels of plant items	Contractor	All construction sites where practicable	Construction stage	• Annex 5, TM-EIAO
S4.3.4	N3	Install movable temporary noise barriers (typical design is wooden framed barrier with a small-cantilevered upper	Screen the noisy plant items to be used at all	Contractor	All construction	Construction stage	• Annex 5, TM-EIAO

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		portion of superficial density no less than 7kg/m ² on a skid footing with 25mm thick internal sound absorptive lining), and full enclosure, screen the noisy plants including air compressors, generators etc.	construction sites		sites where practicable		
S4.3.4	N4	Implement a noise monitoring under EM&A programme.	Monitor the construction noise levels at the selected representative locations	Contractor	Selected noise monitoring stations	Construction stage	• TM-EIAO
<i>Operational Noise (Fixed Noise)</i>							
S4.6.4	N6	For existing and planned NSRs which are located near to the proposed noise sources, the following tentative noise mitigation measures are considered: <ul style="list-style-type: none"> • All the pumps should be enclosed inside building structures; • Proper selection of quiet plant to reduce the tonality at NSRs; • Installation of silencer / acoustic enclosure / acoustic louvers for the exhaust of ventilation system. • For underground train stations, sound attenuators with sufficient attenuations can be installed to the ventilation shafts. • Openings of ventilation system should be located away from NSRs. 	Reduce operation fixed noise	Relevant government departments / Future Operator	All plant rooms where practicable	Prior to operation of the Project	• Noise Control Ordinance and its TM, TM-EIAO

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<i>Water Quality (Construction Phase)</i>							
S5.4.3	W1	<p><u>General Construction Activities</u></p> <p>In accordance with the Practice Note for Professional Persons on Construction Site Drainage, Environmental Protection Department, 1994 (ProPECC PN1/94), best management practices should be implemented on site as far as practicable. The best practices are detailed below:</p> <ul style="list-style-type: none"> • At the start of site establishment, perimeter cut-off drains to direct off-site water around the site should be constructed with internal drainage works. Channels, earth bunds or sand bag barriers should be provided on site to direct stormwater to silt removal facilities.; • Diversion of natural stormwater should be provided as far as possible. The design of temporary on-site drainage should prevent runoff going through site surface, construction machinery and equipment in order to avoid or minimize polluted runoff. Sedimentation tanks with sufficient capacity, constructed from pre-formed individual cells of approximately 6 to 8 m3 capacities, are recommended as a general mitigation measure which can be used for settling surface runoff prior to disposal. The system capacity shall be flexible and able to handle multiple inputs from a variety of sources and suited to applications where the influent is pumped; • The dikes or embankments for flood protection should be implemented around the boundaries of earthwork areas. Temporary ditches should be provided to facilitate the runoff discharge into an appropriate watercourse, through a silt/sediment trap. The silt/sediment traps should be incorporated in the permanent drainage channels to enhance deposition rates; 	To minimize water quality impact from construction site runoff and general construction activities	Contractor	All construction sites where applicable	Construction stage	<ul style="list-style-type: none"> • Water Pollution Control Ordinance • ProPECC PN1/94 • TM-EIAO • TM-DSS

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		<ul style="list-style-type: none"> • The design of efficient silt removal facilities should be based on the guidelines in Appendix A1 of ProPECC PN 1/94. The detailed design of the sand/silt traps should be undertaken by the contractor prior to the commencement of construction; • Construction works should be programmed to minimize surface excavation works during the rainy seasons (April to September). All exposed earth areas should be completed and vegetated as soon as possible after earthworks have been completed. If excavation of soil cannot be avoided during the rainy season, or at any time of year when rainstorms are likely, exposed slope surfaces should be covered by tarpaulin or other means; • All drainage facilities and erosion and sediment control structures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly following rainstorms. Deposited silt and grit should be removed regularly and disposed of by spreading evenly over stable, vegetated areas; • If the excavation of trenches in wet periods is necessary, it should be dug and backfilled in short sections wherever practicable. Water pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities; • All open stockpiles of construction materials (for example, aggregates, sand and fill material) should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system; • Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so 					

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		<p>as to prevent silt, construction materials or debris being washed into the drainage system and storm runoff being directed into foul sewers;</p> <ul style="list-style-type: none"> • Precautions to be taken at any time of year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecasted, and actions to be taken during or after rainstorms are summarized in Appendix A2 of ProPECC PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events; • All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and sited wheel washing facilities should be provided at every construction site exit where practicable. Wash-water should have sand and silt settled out and removed at least on a weekly basis to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains; • Oil interceptors should be provided in the drainage system downstream of any oil/fuel pollution sources. The oil interceptors should be emptied and cleaned regularly to prevent the release of oil and grease into the storm water drainage system after accidental spillage. A bypass should be provided for the oil interceptors to prevent flushing during heavy rain; • Construction solid waste, debris and rubbish on site should be collected, handled and disposed of properly to avoid water quality impacts; • All fuel tanks and storage areas should be provided with 					

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		<p>locks and sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank to prevent spilled fuel oils from reaching water sensitive receivers nearby;and</p> <ul style="list-style-type: none"> Regular environmental audit on the construction site should be carried out in order to prevent any malpractices. Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the water bodies, mangroves and open sea. 					
S5.4.3	W2	<p><u>Sewage from workforce</u></p> <ul style="list-style-type: none"> Portable chemical toilets and sewage holding tanks are recommended for handling the construction sewage generated by the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance; Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment during the construction phase of the Project; Regular environmental audit on the construction site should be conducted in order to provide an effective control of any malpractices and achieve continual improvement of environmental performance on site. 	To minimize water quality from sewage effluent in construction phase	Contractor	All construction sites where practicable	Construction stage	<ul style="list-style-type: none"> Water Pollution Control Ordinance TM-DSS
S5.4.3	W4	<p><u>Construction Works of Sewage Pumping Stations</u></p> <ul style="list-style-type: none"> A buffer zone of about 20m or about 30m will be zoned to prevent any construction works near river. 	To avoid any direct water quality impact to Tung Chung Stream	Contractor	All construction sites where practicable	Construction stage	<ul style="list-style-type: none"> ProPECC PN1/94

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S5.5.8	W8	<p><u>Good Management Practice in Construction Phase</u></p> <p>The following good site management practices shall be adopted for the filling works:</p> <ul style="list-style-type: none"> • Water quality monitoring shall be implemented to ensure effective control of water pollution and recommend additional mitigation measures required; • The decent speed of grabs shall be controlled to minimize the seabed impact and to reduce the volume of over-dredging; • A perimeter silt curtain shall be installed during the entire reclamation periods; • Barges or hoppers shall not be filled to a level which will cause overflow of materials or pollution of water during loading or transportation; • Excess materials shall be cleaned from the decks and exposed fittings of barges before the vessels are moved; • Plants should not be operated with leaking pipes and any pipe leakages shall be repaired quickly; • Adequate freeboard shall be maintained on barges to reduce the likelihood of decks being washed by wave action; • All vessels should be sized so that adequate clearance is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash; and • The works shall not cause foam, oil, grease, litter or other objectionable matter to be present in the water within and adjacent to the works site. 	To avoid water quality impact	Contractor	All construction sites where practicable	Construction stage	<ul style="list-style-type: none"> • ProPECC PN1/94

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<i>Water Quality (Operational Phase)</i>							
S5.6.10	W10	<p>The following mitigation measures will be implemented to TCV East, North and West SPS, upgraded CMRSPS, proposed TCE West SPS and TCE East SPS</p> <ul style="list-style-type: none"> • 100% standby pumping capacity within each SPS, with spare pump up to 50% pumping capacity stockpiled in each SPS for any emergency use • Twin rising mains • Dual-feed power supply • Emergency storage facilities up to 6-hours ADWF capacity; and • Emergency communication mechanism amongst relevant government departments. 	To prevent the impact due to the emergency discharge at TCW and TCE	DSD	Proposed Sewage Pumping Station at TCW and TCE	Operational Stage	<ul style="list-style-type: none"> • DSD's Sewerage Manual

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<i>Sewage and Sewerage Treatment Implications</i>							
S6.5.4	SS1	<p><u>Emergency Discharge of Proposed TCV West SPS, TCV East SPS, TCV North SPS and Upgraded CMRSPS</u></p> <p>The following mitigation measures will be implemented to TCV East, North and West SPS, and upgraded CMRSPS:</p> <ul style="list-style-type: none"> • 100% standby pumping capacity within each SPS, with spare pump up to 50% pumping capacity stockpiled in each SPS for any emergency use • Twin rising mains • Dual-feed power supply • Emergency storage facilities up to 6-hours ADWF capacity; and • Emergency communication mechanism amongst relevant government departments. 	To prevent the impact due to the emergency discharge at TCW	DSD	Proposed Sewage Pumping Station at TCW	Operational stage	N/A
S6.5.4	SS2	<p><u>Emergency Discharge of Proposed TCE West SPS and TCE East SPS</u></p> <p>In order to minimize the impact due to the emergency discharge, the following precautionary measures shall be included in the design of sewage pumping station:</p> <ul style="list-style-type: none"> • 100% standby pumping capacity within each SPS, with spare pump up to 50% pumping capacity stockpiled in each SPS for any emergency use • Twin rising mains • Dual-feed power supply • Emergency storage facilities up to 6-hours ADWF capacity; and 	To minimize the impact due to the emergency discharge at TCE	DSD	Proposed Sewage Pumping Station at TCE	Operational stage	N/A

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		<ul style="list-style-type: none"> Emergency communication mechanism amongst relevant government departments. 					

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Waste Management (Construction Waste)							
S7.4.1	WM1	<p><u>Good Site Practices</u></p> <p>The following good site practices are recommended throughout the construction activities:</p> <ul style="list-style-type: none"> • nomination of an approved personnel, such as a site manager, to be responsible for the implementation of good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site; • training of site personnel in site cleanliness, appropriate waste management procedures and concepts of waste reduction, reuse and recycling; • provision of sufficient waste disposal points and regular collection for disposal; • imposition of penalty system on Contractors' improper behaviours when illegal dumping and landfilling outside their respective construction sites, i.e. on nearby farmlands and riverbanks, are reported; • appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers; • regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; and • the contractor should prepare a Waste Management Plan (WMP) as part of the Environmental Management Plan (EMP) in accordance with the ETWB TC(W) No. 19/2005 for construction phase. The EMP should be submitted to the Engineer for approval. Mitigation measures proposed in the EIA Report and the EM&A Manual should be adopted. 	Minimize waste generation during construction	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance

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S7.4.1	WM2	<p><u>Waste Reduction Measures</u></p> <p>Waste reduction is best achieved at the planning and design phase, as well as by ensuring the implementation of good site practices. The following recommendations are proposed to achieve reduction:</p> <ul style="list-style-type: none"> • segregate and store different types of waste in different containers, skip or stockpiles to enhance reuse or recycling of materials and their proper disposal; • proper storage and site practices to minimize the potential for damage and contamination of construction materials; • plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste; • sort out demolition debris and excavated materials from demolition works to recover reusable/recyclable portions (i.e. soil, broken concrete, metal etc.); • provide training to workers on the importance of appropriate waste management procedures, including waste reduction, reuse and recycling. 	Reduce waste generation	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance
S7.4.1	WM3	<p><u>Storage of Waste</u></p> <p>The following recommendation should be implemented to minimize the impacts:</p> <ul style="list-style-type: none"> • waste such as soil should be handled and stored well to ensure secure containment; and • Depends on actual site activities, certain locations within the site area would be used for storage of waste to enhance reuse. However, there would not be any designated location for storage of waste, and the storage locations would need to be adjusted to suite actual site conditions; 	Good site practice to minimize the waste generation and recycle the C&D materials as far as practicable so as to reduce the amount for final disposal	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Land (Miscellaneous Provisions) Ordinance • Waste Disposal Ordinance • ETWB TCW No. 19/2005

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S7.4.1	WM4	<p><u>Collection and Transportation of Waste</u></p> <p>The following recommendation should be implemented to minimize the impacts:</p> <ul style="list-style-type: none"> • remove waste in timely manner; • employ the trucks with cover or enclosed containers for waste transportation; • obtain relevant waste disposal permits from the appropriate authorities; and • disposal of waste should be done at licensed waste disposal facilities. 	Minimize waste impacts from storage	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance
S7.4.1	WM5	<p><u>Excavated and C&D Materials</u></p> <p>Wherever practicable, C&D materials should be segregated from other wastes to avoid contamination and ensure acceptability at public fill reception facilities or reclamation sites. The following mitigation measures should be implemented in handling the excavated and C&D materials:</p> <ul style="list-style-type: none"> • maintain temporary stockpiles and reuse excavated fill material for backfilling; • carry out on-site sorting; • make provisions in the Contract documents to allow and promote the use of recycled aggregates where appropriate; and • implement a trip-ticket system for each works contract to ensure that the disposal of C&D materials are properly documented and verified, so as to avoid the illegal dumping and landfilling of C&D materials on farmlands/ riverbanks at TCW; <p>The recommended C&D materials handling should include:</p>	Minimize waste impacts from excavated and C&D materials	Contractor	All construction sites	Construction Stage	<ul style="list-style-type: none"> • Land (Miscellaneous Provisions) Ordinance • Waste Disposal Ordinance • ETWB TCW No. 19/2005 • Project Administrative Handbook for Civil Engineering Works, 2012 Edition

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		<ul style="list-style-type: none"> On-site sorting of C&D materials Reuse of C&D materials Use of Standard Formwork and Planning of Construction Materials purchasing 					
S7.4.1	WM6	<p><u>Provision of Wheel Wash Facilities</u></p> <p>Wheel wash facilities have to be provided at the site entrance before the trucks leaving the works area. Dust disturbance due to the trucks transportation to the public road network could be minimized by such arrangement.</p>	Minimize waste impacts from trucks transportation	Contractor	All construction sites	Construction Stage	N/A
S7.4.1	WM10	<p><u>Chemical Waste</u></p> <p>If chemical wastes are produced at the construction site, the Contractors should register with EPD as chemical waste producer. Chemical wastes should be stored in appropriate containers and collected by a licensed chemical waste collector. Chemical wastes (e.g. spent lubricant oil) should be recycled at an appropriate facility as far as possible, while the chemical waste that cannot be recycled should be disposed of at either the Chemical Waste Treatment Centre, or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.</p>	Control the chemical waste and ensure proper storage, handling and disposal.	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> Waste Disposal (Chemical Waste) (General) Regulation Code of Practice on the Packaging, Labelling and Storage of Chemical Waste
S7.4.1	WM11	<p><u>General Refuse</u></p> <ul style="list-style-type: none"> General refuse should be stored in enclosed bins separately from construction and chemical wastes. Recycling bins should also be placed to encourage recycling. Preferably enclosed and covered areas should be provided for general refuse collection and routine cleaning for these areas should also be implemented to 	Minimize production of the general refuse and avoid odour, pest and litter impacts	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> Waste Disposal Ordinance

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		<p>keep areas clean.</p> <ul style="list-style-type: none"> • A reputable waste collector should be employed to remove general refuse on a daily basis. 					
Waste Management (Operational Waste)							
S7.4.2	WM13	<p><u>Illegal dumping and landfilling</u></p> <p>As a Development Permission Area (DPA) plan will be issued by the Town Planning Board as a temporary measure before the formal Outline Zoning Plan (OZP) for Tung Chung New Town Extension is adopted, statutory right to guide and control the development and use of land would be authorised. Should there be illegal dumping and landfilling observed/ reported on nearby farmlands and riverbanks, the government authority should take all necessary actions including but not limited to prosecution to remediate the circumstances.</p>	Prevent waste from illegal dumping and landfilling	Relevant government departments	All construction sites	Operational stage	
S7.4.2	WM14	<p><u>Municipal Solid Waste</u></p> <ul style="list-style-type: none"> • A reputable waste collector should be employed to remove general refuse on a daily basis. • A 4-bin recycling system for paper, metals, plastics and glass should be adopted together with a general refuse bin. They should be placed in prominent places to promote waste separation at source. All recyclable materials should be collected by recyclers. 	Remove general refuse generated from the proposed development	FEHD/ Relevant Operators	All construction sites	Operational stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance
S7.4.2	WM15	<p><u>Chemical Waste</u></p> <ul style="list-style-type: none"> • Localized chemical waste storage areas should be located close to the source of waste generation for temporary storage. Drum-type containers with proper labelling should be used to collect chemical wastes for storage at the designated areas. 	Reduce chemical waste due to waste handling	Contractors/ Relevant Operators	All construction sites	Operational stage	

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		<ul style="list-style-type: none"> • A licensed collector should be employed for the chemical waste collection and the chemical wastes should be disposed at an appropriate facility, such as Chemical Waste Treatment Centre (CWTC) in Tsing Yi. • Collection receipts issued by the licensed collector showing the quantities and types of chemical waste taken off-site and details of the treatment facility should be kept for record. 					

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<i>Ecology (Design Phase)</i>							
S9.8.2	EC5	Measures and suitable designs of sewage pumping stations to prevent emergency discharge accidents in TCE and TCW <ul style="list-style-type: none"> • 100% standby pumping capacity within each SPS, with spare pump up to 50% pumping capacity stockpiled in each SPS for any emergency use • Twin rising mains • Dual-feed power supply • Emergency storage facilities up to 6-hours ADWF capacity; and • Emergency communication mechanism amongst relevant government departments. 	To protect the water bodies from impacts due to emergency discharge in TCE and TCW	DSD	Proposed and Upgraded Sewage pumping stations at TCE and TCW	Design Phase	<ul style="list-style-type: none"> • DSD standards
<i>Ecology (Construction Phase)</i>							
S9.8.3	EC13	Implementation of standard site practices	Minimize the potential impact due to dust, noise and runoff during construction phase	Contractor	Within construction sites	Construction phase	<ul style="list-style-type: none"> • EIA • Contractual requirements

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<i>EM&A Project</i>							
S13.2	EM1	An Independent Environmental Checker needs to be employed as per the EM&A Manual.	Control EM&A Performance	Project Proponent	All construction sites	Construction stage	<ul style="list-style-type: none"> • EIAO Guidance Note No.4/2010 • TM-EIAO
S13.2 – 13.4	EM2	1) An Environmental Team needs to be employed as per the EM&A Manual. 2) Prepare a systematic Environmental Management Plan to ensure effective implementation of the mitigation measures. 3) An environmental impact monitoring needs to be implementing by the Environmental Team to ensure all the requirements given in the EM&A Manual are fully complied with.	Perform environmental monitoring & auditing	Project Proponent	All construction sites	Construction stage	<ul style="list-style-type: none"> • EIAO Guidance Note No.4/2010 • TM-EIAO

Environmental Mitigation Implementation Schedule – Tung Chung New Town Extension

Note: Chapters 1 to 2 of the EIA report present the background information of the Project, identified concurrent projects, objectives and scope for various environmental aspects, and description on alternative options and construction description. Chapters 3 to 12 of the EIA report present the EIA findings and mitigation measures are described below with cross-reference to the EIA report. Chapters 13 to 15 describe the environmental monitoring requirements, summary of environmental outcomes and conclusion.

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
<i>Common Mitigation Measures (Applicable to DP Item I.1(b) Drainage channels or rivers training and diversion works which discharge into an area which is less than 300m from existing/planned receivers)</i>							
Construction Dust Impact							
S3.4.6	D1	Water spraying every hour on exposed worksites and haul road.	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • APCO • To control the dust impact to meet HKAQO and TM-EIAO criteria
S3.4.6	D2	The contractor shall follow the procedures and requirements given in the Air Pollution Control (Construction Dust) Regulation	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • APCO • To control the dust impact to meet HKAQO and TM-EIAO criteria
S3.4.6	D3	<p>The following dust suppression measures should be incorporated to control the dust nuisance throughout the construction phase:</p> <ul style="list-style-type: none"> • Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading; • Any dusty materials remaining after a stockpile is removed should be wetted with water and cleared from the surface 	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • APCO • To control the dust impact to meet HKAQO and TM-EIAO criteria

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EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
		<p>of roads;</p> <ul style="list-style-type: none"> • A stockpile of dusty material should not be extended beyond the pedestrian barriers, fencing or traffic cones; • The load of dusty materials on a vehicle leaving a construction site should be covered entirely by impervious sheeting to ensure that the dusty materials do not leak from the vehicle; • Where practicable, vehicle washing facilities with high pressure water jet should be provided at every discernible or designated vehicle exit point. The area where vehicle washing takes place and the road section between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores; • When there are open excavation and reinstatement works, hoarding of not less than 2.4m high should be provided as far as practicable along the site boundary with provision for public crossing. Good site practice shall also be adopted by the Contractor to ensure the conditions of the hoardings are properly maintained throughout the construction period; • The portion of any road leading only to construction site that is within 30m of a vehicle entrance or exit should be kept clear of dusty materials; • Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation takes place should be sprayed with water or a dust suppression chemical continuously; • Any area that involves demolition activities should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet; • Where a scaffolding is erected around the perimeter of a 					

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		<p>building under construction, effective dust screens, sheeting or netting should be provided to enclose the scaffolding from the ground floor level of the building, or a canopy should be provided from the first floor level up to the highest level of the scaffolding;</p> <ul style="list-style-type: none"> • Any skip hoist for material transport should be totally enclosed by impervious sheeting; • Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides; • Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed; • Loading, unloading, transfer, handling or storage of bulk cement or dry PFA should be carried out in a totally enclosed system or facility, and any vent or exhaust should be fitted with an effective fabric filter or equivalent air pollution control system; and • Exposed earth should be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shortcrete or other suitable surface stabiliser within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies. 					
S3.4.6	D4	Implement regular dust monitoring under EM&A programme during the construction stage.	Monitoring of dust impact	Contractor	Selected dust monitoring stations	Construction stage	<ul style="list-style-type: none"> • TM-EIAO

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EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
Construction Noise							
S4.3.4	N1	Implement the following good site management practices: <ul style="list-style-type: none"> • only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme; • machines and plant (such as trucks, cranes) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • plant known to emit noise strongly in one direction, where possible, be orientated so that the noise is directed away from nearby NSRs; • silencers or mufflers on construction equipment should be properly fitted and maintained during the construction works; • mobile plant should be sited as far away from NSRs as possible and practicable; • material stockpiles, site office and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities. 	Control construction airborne noise	Contractor	All construction sites where practicable	Construction stage	• Annex 5, TM-EIAO
S4.3.4	N2	Use of quiet plant which should be made reference to the Powered Mechanical Equipment (PME) listed in the Technical Memorandum or the Quality Powered Mechanical Equipment (QPME) / other commonly used PME listed in Environmental Protection Department (EPD) web pages as far as possible which includes the Sound Power Level (SWLs) for specific quiet PME.	Reduce the noise levels of plant items	Contractor	All construction sites where practicable	Construction stage	• Annex 5, TM-EIAO
S4.3.4	N3	Install movable temporary noise barriers (typical design is wooden framed barrier with a small-cantilevered upper portion of superficial density no less than 7kg/m ² on a skid	Screen the noisy plant items to be used at all	Contractor	All construction sites where	Construction stage	• Annex 5, TM-EIAO

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		footing with 25mm thick internal sound absorptive lining), and full enclosure, screen the noisy plants including air compressors, generators etc.	construction sites		practicable		
S4.3.4	N4	Implement a noise monitoring under EM&A programme.	Monitor the construction noise levels at the selected representative locations	Contractor	Selected noise monitoring stations	Construction stage	• TM-EIAO

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<i>Water Quality (Construction Phase)</i>							
S5.4.3	W1	<p><u>General Construction Activities</u></p> <p>In accordance with the Practice Note for Professional Persons on Construction Site Drainage, Environmental Protection Department, 1994 (ProPECC PN1/94), best management practices should be implemented on site as far as practicable. The best practices are detailed below:</p> <ul style="list-style-type: none"> • At the start of site establishment, perimeter cut-off drains to direct off-site water around the site should be constructed with internal drainage works. Channels, earth bunds or sand bag barriers should be provided on site to direct stormwater to silt removal facilities.; • Diversion of natural stormwater should be provided as far as possible. The design of temporary on-site drainage should prevent runoff going through site surface, construction machinery and equipment in order to avoid or minimize polluted runoff. Sedimentation tanks with sufficient capacity, constructed from pre-formed individual cells of approximately 6 to 8 m3 capacities, are recommended as a general mitigation measure which can be used for settling surface runoff prior to disposal. The system capacity shall be flexible and able to handle multiple inputs from a variety of sources and suited to applications where the influent is pumped; • The dikes or embankments for flood protection should be implemented around the boundaries of earthwork areas. Temporary ditches should be provided to facilitate the runoff discharge into an appropriate watercourse, through a silt/sediment trap. The silt/sediment traps should be incorporated in the permanent drainage channels to enhance deposition rates; • The design of efficient silt removal facilities should be 	To minimize water quality impact from construction site runoff and general construction activities	Contractor	All construction sites where applicable	Construction stage	<ul style="list-style-type: none"> • Water Pollution Control Ordinance • ProPECC PN1/94 • TM-EIAO • TM-DSS

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		<p>based on the guidelines in Appendix A1 of ProPECC PN 1/94. The detailed design of the sand/silt traps should be undertaken by the contractor prior to the commencement of construction;</p> <ul style="list-style-type: none"> • Construction works should be programmed to minimize surface excavation works during the rainy seasons (April to September). All exposed earth areas should be completed and vegetated as soon as possible after earthworks have been completed. If excavation of soil cannot be avoided during the rainy season, or at any time of year when rainstorms are likely, exposed slope surfaces should be covered by tarpaulin or other means; • All drainage facilities and erosion and sediment control structures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly following rainstorms. Deposited silt and grit should be removed regularly and disposed of by spreading evenly over stable, vegetated areas; • If the excavation of trenches in wet periods is necessary, it should be dug and backfilled in short sections wherever practicable. Water pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities; • All open stockpiles of construction materials (for example, aggregates, sand and fill material) should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system; • Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and storm runoff being 					

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		<p>directed into foul sewers;</p> <ul style="list-style-type: none"> • Precautions to be taken at any time of year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecasted, and actions to be taken during or after rainstorms are summarized in Appendix A2 of ProPECC PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events; • All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and sited wheel washing facilities should be provided at every construction site exit where practicable. Wash-water should have sand and silt settled out and removed at least on a weekly basis to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains; • Oil interceptors should be provided in the drainage system downstream of any oil/fuel pollution sources. The oil interceptors should be emptied and cleaned regularly to prevent the release of oil and grease into the storm water drainage system after accidental spillage. A bypass should be provided for the oil interceptors to prevent flushing during heavy rain; • Construction solid waste, debris and rubbish on site should be collected, handled and disposed of properly to avoid water quality impacts; • All fuel tanks and storage areas should be provided with locks and sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank to prevent spilled fuel oils from reaching water sensitive 					

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		<p>receivers nearby;and</p> <ul style="list-style-type: none"> Regular environmental audit on the construction site should be carried out in order to prevent any malpractices. Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the water bodies, mangroves and open sea. 					
S5.4.3	W2	<p><u>Sewage from workforce</u></p> <ul style="list-style-type: none"> Portable chemical toilets and sewage holding tanks are recommended for handling the construction sewage generated by the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance; Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment during the construction phase of the Project; Regular environmental audit on the construction site should be conducted in order to provide an effective control of any malpractices and achieve continual improvement of environmental performance on site. 	To minimize water quality from sewage effluent in construction phase	Contractor	All construction sites where practicable	Construction stage	<ul style="list-style-type: none"> Water Pollution Control Ordinance TM-DSS
S5.5.8	W8	<p><u>Good Management Practice in Construction Phase</u></p> <p>The following good site management practices shall be adopted for the filling works:</p> <ul style="list-style-type: none"> Water quality monitoring shall be implemented to ensure effective control of water pollution and recommend additional mitigation measures required; The decent speed of grabs shall be controlled to minimize the seabed impact and to reduce the volume of over- 	To avoid water quality impact	Contractor	All construction sites where practicable	Construction stage	<ul style="list-style-type: none"> ProPECC PN1/94

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		<p>dredging;</p> <ul style="list-style-type: none"> • A perimeter silt curtain shall be installed during the entire reclamation periods; • Barges or hoppers shall not be filled to a level which will cause overflow of materials or pollution of water during loading or transportation; • Excess materials shall be cleaned from the decks and exposed fittings of barges before the vessels are moved; • Plants should not be operated with leaking pipes and any pipe leakages shall be repaired quickly; • Adequate freeboard shall be maintained on barges to reduce the likelihood of decks being washed by wave action; • All vessels should be sized so that adequate clearance is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash; and • The works shall not cause foam, oil, grease, litter or other objectionable matter to be present in the water within and adjacent to the works site. 					

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Waste Management (Construction Waste)							
S7.4.1	WM1	<p><u>Good Site Practices</u></p> <p>The following good site practices are recommended throughout the construction activities:</p> <ul style="list-style-type: none"> • nomination of an approved personnel, such as a site manager, to be responsible for the implementation of good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site; • training of site personnel in site cleanliness, appropriate waste management procedures and concepts of waste reduction, reuse and recycling; • provision of sufficient waste disposal points and regular collection for disposal; • imposition of penalty system on Contractors' improper behaviours when illegal dumping and landfilling outside their respective construction sites, i.e. on nearby farmlands and riverbanks, are reported; • appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers; • regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; and • the contractor should prepare a Waste Management Plan (WMP) as part of the Environmental Management Plan (EMP) in accordance with the ETWB TC(W) No. 19/2005 for construction phase. The EMP should be submitted to the Engineer for approval. Mitigation measures proposed in the EIA Report and the EM&A Manual should be adopted. 	Minimize waste generation during construction	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance

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S7.4.1	WM2	<p><u>Waste Reduction Measures</u></p> <p>Waste reduction is best achieved at the planning and design phase, as well as by ensuring the implementation of good site practices. The following recommendations are proposed to achieve reduction:</p> <ul style="list-style-type: none"> • segregate and store different types of waste in different containers, skip or stockpiles to enhance reuse or recycling of materials and their proper disposal; • proper storage and site practices to minimize the potential for damage and contamination of construction materials; • plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste; • sort out demolition debris and excavated materials from demolition works to recover reusable/recyclable portions (i.e. soil, broken concrete, metal etc.); • provide training to workers on the importance of appropriate waste management procedures, including waste reduction, reuse and recycling. 	Reduce waste generation	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance
S7.4.1	WM3	<p><u>Storage of Waste</u></p> <p>The following recommendation should be implemented to minimize the impacts:</p> <ul style="list-style-type: none"> • waste such as soil should be handled and stored well to ensure secure containment; and • Depends on actual site activities, certain locations within the site area would be used for storage of waste to enhance reuse. However, there would not be any designated location for storage of waste, and the storage locations would need to be adjusted to suite actual site conditions; 	Good site practice to minimize the waste generation and recycle the C&D materials as far as practicable so as to reduce the amount for final disposal	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Land (Miscellaneous Provisions) Ordinance • Waste Disposal Ordinance • ETWB TCW No. 19/2005

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S7.4.1	WM4	<p><u>Collection and Transportation of Waste</u></p> <p>The following recommendation should be implemented to minimize the impacts:</p> <ul style="list-style-type: none"> • remove waste in timely manner; • employ the trucks with cover or enclosed containers for waste transportation; • obtain relevant waste disposal permits from the appropriate authorities; and • disposal of waste should be done at licensed waste disposal facilities. 	Minimize waste impacts from storage	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance
S7.4.1	WM5	<p><u>Excavated and C&D Materials</u></p> <p>Wherever practicable, C&D materials should be segregated from other wastes to avoid contamination and ensure acceptability at public fill reception facilities or reclamation sites. The following mitigation measures should be implemented in handling the excavated and C&D materials:</p> <ul style="list-style-type: none"> • maintain temporary stockpiles and reuse excavated fill material for backfilling; • carry out on-site sorting; • make provisions in the Contract documents to allow and promote the use of recycled aggregates where appropriate; and • implement a trip-ticket system for each works contract to ensure that the disposal of C&D materials are properly documented and verified, so as to avoid the illegal dumping and landfilling of C&D materials on farmlands/ riverbanks at TCW; <p>The recommended C&D materials handling should include:</p>	Minimize waste impacts from excavated and C&D materials	Contractor	All construction sites	Construction Stage	<ul style="list-style-type: none"> • Land (Miscellaneous Provisions) Ordinance • Waste Disposal Ordinance • ETWB TCW No. 19/2005 • Project Administrative Handbook for Civil Engineering Works, 2012 Edition

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		<ul style="list-style-type: none"> On-site sorting of C&D materials Reuse of C&D materials Use of Standard Formwork and Planning of Construction Materials purchasing 					
S7.4.1	WM6	<p><u>Provision of Wheel Wash Facilities</u></p> <p>Wheel wash facilities have to be provided at the site entrance before the trucks leaving the works area. Dust disturbance due to the trucks transportation to the public road network could be minimized by such arrangement.</p>	Minimize waste impacts from trucks transportation	Contractor	All construction sites	Construction Stage	N/A
S7.4.1	WM10	<p><u>Chemical Waste</u></p> <p>If chemical wastes are produced at the construction site, the Contractors should register with EPD as chemical waste producer. Chemical wastes should be stored in appropriate containers and collected by a licensed chemical waste collector. Chemical wastes (e.g. spent lubricant oil) should be recycled at an appropriate facility as far as possible, while the chemical waste that cannot be recycled should be disposed of at either the Chemical Waste Treatment Centre, or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.</p>	Control the chemical waste and ensure proper storage, handling and disposal.	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> Waste Disposal (Chemical Waste) (General) Regulation Code of Practice on the Packaging, Labelling and Storage of Chemical Waste
S7.4.1	WM11	<p><u>General Refuse</u></p> <ul style="list-style-type: none"> General refuse should be stored in enclosed bins separately from construction and chemical wastes. Recycling bins should also be placed to encourage recycling. Preferably enclosed and covered areas should be provided for general refuse collection and routine cleaning for these areas should also be implemented to 	Minimize production of the general refuse and avoid odour, pest and litter impacts	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> Waste Disposal Ordinance

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		keep areas clean. <ul style="list-style-type: none"> • A reputable waste collector should be employed to remove general refuse on a daily basis. 					

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<i>Ecology (Construction Phase)</i>							
S9.8.3	EC13	Implementation of standard site practices	Minimize the potential impact due to dust, noise and runoff during construction phase	Contractor	Within construction sites	Construction phase	<ul style="list-style-type: none"> • EIA • Contractual requirements

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<i>EM&A Project</i>							
S13.2	EM1	An Independent Environmental Checker needs to be employed as per the EM&A Manual.	Control EM&A Performance	Project Proponent	All construction sites	Construction stage	<ul style="list-style-type: none"> • EIAO Guidance Note No.4/2010 • TM-EIAO
S13.2 – 13.4	EM2	1) An Environmental Team needs to be employed as per the EM&A Manual. 2) Prepare a systematic Environmental Management Plan to ensure effective implementation of the mitigation measures. 3) An environmental impact monitoring needs to be implementing by the Environmental Team to ensure all the requirements given in the EM&A Manual are fully complied with.	Perform environmental monitoring & auditing	Project Proponent	All construction sites	Construction stage	<ul style="list-style-type: none"> • EIAO Guidance Note No.4/2010 • TM-EIAO

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<i>Common Mitigation Measures (Applicable to DP Item O.2-A marina designed to provide moorings or dry storage for not less than 30 vessels used preliminarily for pleasure or recreation)</i>							
Construction Dust Impact							
S3.4.6	D1	Water spraying every hour on exposed worksites and haul road.	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • APCO • To control the dust impact to meet HKAQO and TM-EIAO criteria
S3.4.6	D2	The contractor shall follow the procedures and requirements given in the Air Pollution Control (Construction Dust) Regulation	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • APCO • To control the dust impact to meet HKAQO and TM-EIAO criteria
S3.4.6	D3	<p>The following dust suppression measures should be incorporated to control the dust nuisance throughout the construction phase:</p> <ul style="list-style-type: none"> • Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading; • Any dusty materials remaining after a stockpile is removed should be wetted with water and cleared from the surface 	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • APCO • To control the dust impact to meet HKAQO and TM-EIAO criteria

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		<p>of roads;</p> <ul style="list-style-type: none"> • A stockpile of dusty material should not be extended beyond the pedestrian barriers, fencing or traffic cones; • The load of dusty materials on a vehicle leaving a construction site should be covered entirely by impervious sheeting to ensure that the dusty materials do not leak from the vehicle; • Where practicable, vehicle washing facilities with high pressure water jet should be provided at every discernible or designated vehicle exit point. The area where vehicle washing takes place and the road section between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores; • When there are open excavation and reinstatement works, hoarding of not less than 2.4m high should be provided as far as practicable along the site boundary with provision for public crossing. Good site practice shall also be adopted by the Contractor to ensure the conditions of the hoardings are properly maintained throughout the construction period; • The portion of any road leading only to construction site that is within 30m of a vehicle entrance or exit should be kept clear of dusty materials; • Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation takes place should be sprayed with water or a dust suppression chemical continuously; • Any area that involves demolition activities should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet; • Where a scaffolding is erected around the perimeter of a 					

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		<p>building under construction, effective dust screens, sheeting or netting should be provided to enclose the scaffolding from the ground floor level of the building, or a canopy should be provided from the first floor level up to the highest level of the scaffolding;</p> <ul style="list-style-type: none"> • Any skip hoist for material transport should be totally enclosed by impervious sheeting; • Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides; • Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed; • Loading, unloading, transfer, handling or storage of bulk cement or dry PFA should be carried out in a totally enclosed system or facility, and any vent or exhaust should be fitted with an effective fabric filter or equivalent air pollution control system; and • Exposed earth should be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shortcrete or other suitable surface stabiliser within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies. 					
S3.4.6	D4	Implement regular dust monitoring under EM&A programme during the construction stage.	Monitoring of dust impact	Contractor	Selected dust monitoring stations	Construction stage	<ul style="list-style-type: none"> • TM-EIAO

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Construction Noise							
S4.3.4	N1	Implement the following good site management practices: <ul style="list-style-type: none"> • only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme; • machines and plant (such as trucks, cranes) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • plant known to emit noise strongly in one direction, where possible, be orientated so that the noise is directed away from nearby NSRs; • silencers or mufflers on construction equipment should be properly fitted and maintained during the construction works; • mobile plant should be sited as far away from NSRs as possible and practicable; • material stockpiles, site office and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities. 	Control construction airborne noise	Contractor	All construction sites where practicable	Construction stage	• Annex 5, TM-EIAO
S4.3.4	N2	Use of quiet plant which should be made reference to the Powered Mechanical Equipment (PME) listed in the Technical Memorandum or the Quality Powered Mechanical Equipment (QPME) / other commonly used PME listed in Environmental Protection Department (EPD) web pages as far as possible which includes the Sound Power Level (SWLs) for specific quiet PME.	Reduce the noise levels of plant items	Contractor	All construction sites where practicable	Construction stage	• Annex 5, TM-EIAO
S4.3.4	N3	Install movable temporary noise barriers (typical design is wooden framed barrier with a small-cantilevered upper portion of superficial density no less than 7kg/m ² on a skid	Screen the noisy plant items to be used at all	Contractor	All construction sites where	Construction stage	• Annex 5, TM-EIAO

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		footing with 25mm thick internal sound absorptive lining), and full enclosure, screen the noisy plants including air compressors, generators etc.	construction sites		practicable		
S4.3.4	N4	Implement a noise monitoring under EM&A programme.	Monitor the construction noise levels at the selected representative locations	Contractor	Selected noise monitoring stations	Construction stage	• TM-EIAO
<i>Operational Noise (Fixed Noise)</i>							
S4.6.4	N6	For existing and planned NSRs which are located near to the proposed noise sources, the following tentative noise mitigation measures are considered: <ul style="list-style-type: none"> • All the pumps should be enclosed inside building structures; • Proper selection of quiet plant to reduce the tonality at NSRs; • Installation of silencer / acoustic enclosure / acoustic louvers for the exhaust of ventilation system. • For underground train stations, sound attenuators with sufficient attenuations can be installed to the ventilation shafts. • Openings of ventilation system should be located away from NSRs. 	Reduce operation fixed noise	Relevant government departments / Future Operator	All plant rooms where practicable	Prior to operation of the Project	• Noise Control Ordinance and its TM, TM-EIAO

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<i>Water Quality (Construction Phase)</i>							
S5.4.3	W1	<p><u>General Construction Activities</u></p> <p>In accordance with the Practice Note for Professional Persons on Construction Site Drainage, Environmental Protection Department, 1994 (ProPECC PN1/94), best management practices should be implemented on site as far as practicable. The best practices are detailed below:</p> <ul style="list-style-type: none"> • At the start of site establishment, perimeter cut-off drains to direct off-site water around the site should be constructed with internal drainage works. Channels, earth bunds or sand bag barriers should be provided on site to direct stormwater to silt removal facilities.; • Diversion of natural stormwater should be provided as far as possible. The design of temporary on-site drainage should prevent runoff going through site surface, construction machinery and equipment in order to avoid or minimize polluted runoff. Sedimentation tanks with sufficient capacity, constructed from pre-formed individual cells of approximately 6 to 8 m3 capacities, are recommended as a general mitigation measure which can be used for settling surface runoff prior to disposal. The system capacity shall be flexible and able to handle multiple inputs from a variety of sources and suited to applications where the influent is pumped; • The dikes or embankments for flood protection should be implemented around the boundaries of earthwork areas. Temporary ditches should be provided to facilitate the runoff discharge into an appropriate watercourse, through a silt/sediment trap. The silt/sediment traps should be incorporated in the permanent drainage channels to enhance deposition rates; • The design of efficient silt removal facilities should be 	To minimize water quality impact from construction site runoff and general construction activities	Contractor	All construction sites where applicable	Construction stage	<ul style="list-style-type: none"> • Water Pollution Control Ordinance • ProPECC PN1/94 • TM-EIAO • TM-DSS

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		<p>based on the guidelines in Appendix A1 of ProPECC PN 1/94. The detailed design of the sand/silt traps should be undertaken by the contractor prior to the commencement of construction;</p> <ul style="list-style-type: none"> • Construction works should be programmed to minimize surface excavation works during the rainy seasons (April to September). All exposed earth areas should be completed and vegetated as soon as possible after earthworks have been completed. If excavation of soil cannot be avoided during the rainy season, or at any time of year when rainstorms are likely, exposed slope surfaces should be covered by tarpaulin or other means; • All drainage facilities and erosion and sediment control structures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly following rainstorms. Deposited silt and grit should be removed regularly and disposed of by spreading evenly over stable, vegetated areas; • If the excavation of trenches in wet periods is necessary, it should be dug and backfilled in short sections wherever practicable. Water pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities; • All open stockpiles of construction materials (for example, aggregates, sand and fill material) should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system; • Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and storm runoff being 					

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		<p>directed into foul sewers;</p> <ul style="list-style-type: none"> • Precautions to be taken at any time of year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecasted, and actions to be taken during or after rainstorms are summarized in Appendix A2 of ProPECC PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events; • All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and sited wheel washing facilities should be provided at every construction site exit where practicable. Wash-water should have sand and silt settled out and removed at least on a weekly basis to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains; • Oil interceptors should be provided in the drainage system downstream of any oil/fuel pollution sources. The oil interceptors should be emptied and cleaned regularly to prevent the release of oil and grease into the storm water drainage system after accidental spillage. A bypass should be provided for the oil interceptors to prevent flushing during heavy rain; • Construction solid waste, debris and rubbish on site should be collected, handled and disposed of properly to avoid water quality impacts; • All fuel tanks and storage areas should be provided with locks and sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank to prevent spilled fuel oils from reaching water sensitive 					

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		<p>receivers nearby;and</p> <ul style="list-style-type: none"> Regular environmental audit on the construction site should be carried out in order to prevent any malpractices. Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the water bodies, mangroves and open sea. 					
S5.4.3	W2	<p><u>Sewage from workforce</u></p> <ul style="list-style-type: none"> Portable chemical toilets and sewage holding tanks are recommended for handling the construction sewage generated by the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance; Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment during the construction phase of the Project; Regular environmental audit on the construction site should be conducted in order to provide an effective control of any malpractices and achieve continual improvement of environmental performance on site. 	To minimize water quality from sewage effluent in construction phase	Contractor	All construction sites where practicable	Construction stage	<ul style="list-style-type: none"> Water Pollution Control Ordinance TM-DSS
S5.5.8	W8	<p><u>Good Management Practice in Construction Phase</u></p> <p>The following good site management practices shall be adopted for the filling works:</p> <ul style="list-style-type: none"> Water quality monitoring shall be implemented to ensure effective control of water pollution and recommend additional mitigation measures required; The decent speed of grabs shall be controlled to minimize the seabed impact and to reduce the volume of over- 	To avoid water quality impact	Contractor	All construction sites where practicable	Construction stage	<ul style="list-style-type: none"> ProPECC PN1/94

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		<p>dredging;</p> <ul style="list-style-type: none"> • A perimeter silt curtain shall be installed during the entire reclamation periods; • Barges or hoppers shall not be filled to a level which will cause overflow of materials or pollution of water during loading or transportation; • Excess materials shall be cleaned from the decks and exposed fittings of barges before the vessels are moved; • Plants should not be operated with leaking pipes and any pipe leakages shall be repaired quickly; • Adequate freeboard shall be maintained on barges to reduce the likelihood of decks being washed by wave action; • All vessels should be sized so that adequate clearance is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash; and • The works shall not cause foam, oil, grease, litter or other objectionable matter to be present in the water within and adjacent to the works site. 					
<i>Water Quality (Operational Phase)</i>							
S5.6.10	W12	<p><u>Maintenance Dredging for the Proposed Marina</u></p> <p>Silt curtain should be deployed to reduce the sediment dispersion from the dredging inside the marina.</p>	To reduce the sediment dispersion	Future operator	Proposed marina at TCE	Operational Stage	-

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Waste Management (Construction Waste)							
S7.4.1	WM1	<p><u>Good Site Practices</u></p> <p>The following good site practices are recommended throughout the construction activities:</p> <ul style="list-style-type: none"> • nomination of an approved personnel, such as a site manager, to be responsible for the implementation of good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site; • training of site personnel in site cleanliness, appropriate waste management procedures and concepts of waste reduction, reuse and recycling; • provision of sufficient waste disposal points and regular collection for disposal; • imposition of penalty system on Contractors' improper behaviours when illegal dumping and landfilling outside their respective construction sites, i.e. on nearby farmlands and riverbanks, are reported; • appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers; • regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; and • the contractor should prepare a Waste Management Plan (WMP) as part of the Environmental Management Plan (EMP) in accordance with the ETWB TC(W) No. 19/2005 for construction phase. The EMP should be submitted to the Engineer for approval. Mitigation measures proposed in the EIA Report and the EM&A Manual should be adopted. 	Minimize waste generation during construction	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance

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S7.4.1	WM2	<p><u>Waste Reduction Measures</u></p> <p>Waste reduction is best achieved at the planning and design phase, as well as by ensuring the implementation of good site practices. The following recommendations are proposed to achieve reduction:</p> <ul style="list-style-type: none"> • segregate and store different types of waste in different containers, skip or stockpiles to enhance reuse or recycling of materials and their proper disposal; • proper storage and site practices to minimize the potential for damage and contamination of construction materials; • plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste; • sort out demolition debris and excavated materials from demolition works to recover reusable/recyclable portions (i.e. soil, broken concrete, metal etc.); • provide training to workers on the importance of appropriate waste management procedures, including waste reduction, reuse and recycling. 	Reduce waste generation	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance
S7.4.1	WM3	<p><u>Storage of Waste</u></p> <p>The following recommendation should be implemented to minimize the impacts:</p> <ul style="list-style-type: none"> • waste such as soil should be handled and stored well to ensure secure containment; and • Depends on actual site activities, certain locations within the site area would be used for storage of waste to enhance reuse. However, there would not be any designated location for storage of waste, and the storage locations would need to be adjusted to suite actual site conditions; 	Good site practice to minimize the waste generation and recycle the C&D materials as far as practicable so as to reduce the amount for final disposal	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Land (Miscellaneous Provisions) Ordinance • Waste Disposal Ordinance • ETWB TCW No. 19/2005

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S7.4.1	WM4	<p><u>Collection and Transportation of Waste</u></p> <p>The following recommendation should be implemented to minimize the impacts:</p> <ul style="list-style-type: none"> • remove waste in timely manner; • employ the trucks with cover or enclosed containers for waste transportation; • obtain relevant waste disposal permits from the appropriate authorities; and • disposal of waste should be done at licensed waste disposal facilities. 	Minimize waste impacts from storage	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance
S7.4.1	WM5	<p><u>Excavated and C&D Materials</u></p> <p>Wherever practicable, C&D materials should be segregated from other wastes to avoid contamination and ensure acceptability at public fill reception facilities or reclamation sites. The following mitigation measures should be implemented in handling the excavated and C&D materials:</p> <ul style="list-style-type: none"> • maintain temporary stockpiles and reuse excavated fill material for backfilling; • carry out on-site sorting; • make provisions in the Contract documents to allow and promote the use of recycled aggregates where appropriate; and • implement a trip-ticket system for each works contract to ensure that the disposal of C&D materials are properly documented and verified, so as to avoid the illegal dumping and landfilling of C&D materials on farmlands/ riverbanks at TCW; <p>The recommended C&D materials handling should include:</p>	Minimize waste impacts from excavated and C&D materials	Contractor	All construction sites	Construction Stage	<ul style="list-style-type: none"> • Land (Miscellaneous Provisions) Ordinance • Waste Disposal Ordinance • ETWB TCW No. 19/2005 • Project Administrative Handbook for Civil Engineering Works, 2012 Edition

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		<ul style="list-style-type: none"> On-site sorting of C&D materials Reuse of C&D materials Use of Standard Formwork and Planning of Construction Materials purchasing 					
S7.4.1	WM6	<p><u>Provision of Wheel Wash Facilities</u></p> <p>Wheel wash facilities have to be provided at the site entrance before the trucks leaving the works area. Dust disturbance due to the trucks transportation to the public road network could be minimized by such arrangement.</p>	Minimize waste impacts from trucks transportation	Contractor	All construction sites	Construction Stage	N/A
S7.4.1	WM10	<p><u>Chemical Waste</u></p> <p>If chemical wastes are produced at the construction site, the Contractors should register with EPD as chemical waste producer. Chemical wastes should be stored in appropriate containers and collected by a licensed chemical waste collector. Chemical wastes (e.g. spent lubricant oil) should be recycled at an appropriate facility as far as possible, while the chemical waste that cannot be recycled should be disposed of at either the Chemical Waste Treatment Centre, or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.</p>	Control the chemical waste and ensure proper storage, handling and disposal.	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> Waste Disposal (Chemical Waste) (General) Regulation Code of Practice on the Packaging, Labelling and Storage of Chemical Waste
S7.4.1	WM11	<p><u>General Refuse</u></p> <ul style="list-style-type: none"> General refuse should be stored in enclosed bins separately from construction and chemical wastes. Recycling bins should also be placed to encourage recycling. Preferably enclosed and covered areas should be provided for general refuse collection and routine cleaning for these areas should also be implemented to 	Minimize production of the general refuse and avoid odour, pest and litter impacts	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> Waste Disposal Ordinance

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		<p>keep areas clean.</p> <ul style="list-style-type: none"> • A reputable waste collector should be employed to remove general refuse on a daily basis. 					
S7.4.1	WM12	<p><u>Floating Refuse accumulated along the seawall</u></p> <p>The floating refuse along seawall should be collected to avoid accumulation. In addition, proper seawall design should be employed, and regular checking and cleaning of floating refuse should be implemented.</p>	Control floating refuse and ensure proper disposal	Contractor	Construction sites along seawall	Construction stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance
Waste Management (Operational Waste)							
S7.4.2	WM14	<p><u>Municipal Solid Waste</u></p> <ul style="list-style-type: none"> • A reputable waste collector should be employed to remove general refuse on a daily basis. • A 4-bin recycling system for paper, metals, plastics and glass should be adopted together with a general refuse bin. They should be placed in prominent places to promote waste separation at source. All recyclable materials should be collected by recyclers. 	Remove general refuse generated from the proposed development	FEHD/ Relevant Operators	All construction sites	Operational stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance
S7.4.2	WM15	<p><u>Chemical Waste</u></p> <ul style="list-style-type: none"> • Localized chemical waste storage areas should be located close to the source of waste generation for temporary storage. Drum-type containers with proper labelling should be used to collect chemical wastes for storage at the designated areas. • A licensed collector should be employed for the chemical waste collection and the chemical wastes should be disposed at an appropriate facility, such as Chemical Waste Treatment Centre (CWTC) in Tsing Yi. • Collection receipts issued by the licensed collector showing the quantities and types of chemical waste taken 	Reduce chemical waste due to waste handling	Contractors/ Relevant Operators	All construction sites	Operational stage	

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		off-site and details of the treatment facility should be kept for record.					
S7.4.2	WM16	<u>Floating Refuse accumulated along seawall</u> <ul style="list-style-type: none"> The floating refuse along seawall should be collected to avoid accumulation. 	Control floating refuse and ensure proper disposal	MD	Along seawall	Operational stage	<ul style="list-style-type: none"> Waste Disposal Ordinance
S7.4.2	WM17	<u>Floating Refuse inside Marina</u> <ul style="list-style-type: none"> Floating refuse at the marina will be collected and disposed by the licensed waste collector and as required. 	Reduce floating refuse washing up onto marina by currents and wind	Future operator	Marina	Operational stage	<ul style="list-style-type: none"> Waste Disposal Ordinance

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<i>Ecology (Construction Phase)</i>							
S9.8.2	EC6	Adoption of non-dredged reclamation method	To maintain the marine water quality	Contractor	Reclamation area of TCE and Road P1	Construction phase	<ul style="list-style-type: none"> • EIA • Contractual requirements
S9.8.3	EC13	Implementation of standard site practices	Minimize the potential impact due to dust, noise and runoff during construction phase	Contractor	Within construction sites	Construction phase	<ul style="list-style-type: none"> • EIA • Contractual requirements
S9.8.4	EC15	Strict enforcement on no-dumping	Minimise the potential impact to marine habitats	Contractor	In reclamation area as well as all works area and travel route of works vessels	Before and during construction phase	<ul style="list-style-type: none"> • EIA • Contractual requirements
S9.8.4	EC16	Spill response plan	Minimise the potential impact to marine habitats	Contractor	In reclamation area as well as all works area and travel route of works vessels	Before and during construction phase	<ul style="list-style-type: none"> • EIA • Contractual requirements
S.9.8.4	EC17	Control and minimization of marine traffic by including using larger-sized barges, land transportation of materials, reuse of excavation and C&D materials and speed limits & regular routes of works vessels	Reduce marine traffic	Contractor	In reclamation area as well as all works area and	Construction phase	<ul style="list-style-type: none"> • EIA • Contractual requirements

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					travel route of works vessels		
S9.8.4	EC18	Dolphin exclusion zone and dolphin watching plan	Protection of CWD	Contractor	In reclamation area as well as all works area	Construction phase	<ul style="list-style-type: none"> • EIA • Contractual requirements
S9.8.4	EC19	Speed limits and regular routes of works vessels; Prepare and submit a “Works Vessel Travel Route Plan”	Protection of CWD	Contractor	In reclamation area as well as all works area	Construction phase	<ul style="list-style-type: none"> • EIA • Contractual requirements
9.11.2	EC24	Monitoring of Tung Chung Bay and Tai Ho Wan	Protect Tung Chung Bay and Tai Ho Wan	Contractor	Tung Chung Bay and Tai Ho Wan	Construction phase and post-construction phase	<ul style="list-style-type: none"> • EIA • Contractual requirements
Ecology (Operational Phase)							
9.11.2	EC26	Eco-shoreline monitoring	Monitor the colonisation and establishment of fauna and/or flora, water quality, and recruitments of fisheries species	CEDD/ Contractor	Eco-shoreline at TCE PDA reclamation	Post-construction phase, twice in wet and dry seasons respectively, at least 3 years, subject to review	<ul style="list-style-type: none"> • EIA • Contractual requirements

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<i>Fisheries</i>							
S10.8	F1	Good Site Practices	To protect the fisheries resources	Contractor	In reclamation area	Construction phase	<ul style="list-style-type: none"> • EIA • Contractual requirements
S10.8	F2	No dumping	To protect the fisheries resources	Contractor	In reclamation area	Construction phase	<ul style="list-style-type: none"> • EIA • Contractual requirements
S10.8	F3	Spill response plan	To protect the fisheries resources	Contractor	In reclamation area	Construction phase	<ul style="list-style-type: none"> • EIA • Contractual requirements
S10.9	F4	Follow the mitigation measures proposed in the water quality assessment for the construction and operation phases of the project.	To protect the fisheries resources	Contractor	Waters in Northern Lantau	Construction phase and operation phase	<ul style="list-style-type: none"> • EIA • Contractual requirements
S10.9	F5	Follow the mitigation measure of eco-shoreline in ecology chapter for the construction and operation phases of the project.	To enhance the fisheries resources	Contractor	Eco-shorelines	Construction phase and operation phase	<ul style="list-style-type: none"> • EIA • Contractual requirements

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<i>Landscapes and Visual (Construction Phase)</i>							
S11.7 MM1	LV1	<p>Optimisation of Construction Areas & Providing Temporary Landscapes on Temporary Construction – Construction areas’ control shall be enforced, where possible, to ensure that the landscape and visual impacts arising from the construction activities are minimised.</p> <p>It includes reduction of the extent of working areas and temporary works areas, management on storing and using the construction equipment and materials, and consideration of detailed schedules to shorten the construction period. Temporary landscape treatments are considered to be adopted such as applying hydro-seeding on temporary stockpiles and reclamation areas to alleviate the potential impacts.</p>	Minimise the landscape and visual impacts arising from the construction activities	Relevant Government Departments / Private Sector	Through-out Tung Chung West (TCW) area and Tung Chung East (TCE) area	Construction Phase	
S11.7 MM9	LV9	<p>Providing Natural Rock Material/ Planting for Artificial Seawall – There would be inevitable permanent losses of marine waters (seabed and water column), and direct impacts on existing artificial seawalls due to the reclamation. To minimize the impacts, the design of the future seawall like ‘eco-shoreline’ could be improved to provide high ecological functions and mitigate the impact of the loss.</p> <p>An ‘eco-shoreline’ is any shoreline which provides beneficial functions to the local ecosystem through a range of active or passive solutions, whilst providing coastal protection. By means of using natural rock materials for artificial seawall and considering to introduce a native vegetation buffer directly behind the top of seawalls as appropriate to create habitat, shelter and a source of food for benefiting both terrestrial and aquatic species along the foreshore, these measures can help to enhance the ecological functions and ‘natural-look’ of the shoreline,</p>	Mitigate the impacts on existing artificial seawalls	Relevant Government Departments	Onsite where possible	Prior to Construction & Construction Phase	

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		and the potential impacts will be mitigated.					
<i>Landscape and Visual (Operational Phase)</i>							
S11.7 MM14	LV14	Aesthetic Design of Built Development – The planning of the revised RODP has considered reducing potential visual impacts, enhancing visual amenity and keeping visual corridors. The proposed development will ensure the building massing is compatible with its surroundings. To improve visual amenity, natural building materials could be used on building facades. For example, stone and timber should be considered for architectural features; light earthy tone colours such as shades of green, shades of grey, shades of brown and off-white should be considered for the façade treatment to reduce the visibility of the development components. The form, textures, finishes and colours of the proposed development components should aim to be compatible with the existing surroundings. It would only be implemented for public developments/projects.	Improve visual amenity of the new buildings, keep visual corridors and integrate as possible into the surrounding landscape	Relevant Government Departments	Through-out the TCW and TCE areas	Prior to Construction, Maintenance in Operation Phase	<ul style="list-style-type: none"> • Hong Kong Planning Standards and Guidelines (HKPSG) issued by the Planning Department (As at Aug 2011); • PNAP APP-152, Sustainable Building Design Guidelines
S11.7 MM20	LV20	Light Control – Construction day and night time lighting should be controlled to minimize glare impact to adjacent VSRs during the construction stage. Street and night time lighting shall also be controlled to minimize glare impact to adjacent VSRs during the operation phase.	Minimize negative glare impact to adjacent VSRs	Relevant Government Departments / Private Sector	Through-out the TCW and TCE areas	Construction Phase & Operation Phase	

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<i>EM&A Project</i>							
S13.2	EM1	An Independent Environmental Checker needs to be employed as per the EM&A Manual.	Control EM&A Performance	Project Proponent	All construction sites	Construction stage	<ul style="list-style-type: none"> • EIAO Guidance Note No.4/2010 • TM-EIAO
S13.2 – 13.4	EM2	1) An Environmental Team needs to be employed as per the EM&A Manual. 2) Prepare a systematic Environmental Management Plan to ensure effective implementation of the mitigation measures. 3) An environmental impact monitoring needs to be implementing by the Environmental Team to ensure all the requirements given in the EM&A Manual are fully complied with.	Perform environmental monitoring & auditing	Project Proponent	All construction sites	Construction stage	<ul style="list-style-type: none"> • EIAO Guidance Note No.4/2010 • TM-EIAO

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Note: Chapters 1 to 2 of the EIA report present the background information of the Project, identified concurrent projects, objectives and scope for various environmental aspects, and description on alternative options and construction description. Chapters 3 to 12 of the EIA report present the EIA findings and mitigation measures are described below with cross-reference to the EIA report. Chapters 13 to 15 describe the environmental monitoring requirements, summary of environmental outcomes and conclusion.

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
<i>Common Mitigation Measures (Applicable to DP Item O.7-An outdoor sporting facility with a capacity to accommodate more than 10,000 persons)</i>							
<i>Construction Dust Impact</i>							
S3.4.6	D1	Water spraying every hour on exposed worksites and haul road.	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • APCO • To control the dust impact to meet HKAQO and TM-EIAO criteria
S3.4.6	D2	The contractor shall follow the procedures and requirements given in the Air Pollution Control (Construction Dust) Regulation	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • APCO • To control the dust impact to meet HKAQO and TM-EIAO criteria
S3.4.6	D3	<p>The following dust suppression measures should be incorporated to control the dust nuisance throughout the construction phase:</p> <ul style="list-style-type: none"> • Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading; • Any dusty materials remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads; 	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • APCO • To control the dust impact to meet HKAQO and TM-EIAO criteria

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		<ul style="list-style-type: none"> • A stockpile of dusty material should not be extended beyond the pedestrian barriers, fencing or traffic cones; • The load of dusty materials on a vehicle leaving a construction site should be covered entirely by impervious sheeting to ensure that the dusty materials do not leak from the vehicle; • Where practicable, vehicle washing facilities with high pressure water jet should be provided at every discernible or designated vehicle exit point. The area where vehicle washing takes place and the road section between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores; • When there are open excavation and reinstatement works, hoarding of not less than 2.4m high should be provided as far as practicable along the site boundary with provision for public crossing. Good site practice shall also be adopted by the Contractor to ensure the conditions of the hoardings are properly maintained throughout the construction period; • The portion of any road leading only to construction site that is within 30m of a vehicle entrance or exit should be kept clear of dusty materials; • Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation takes place should be sprayed with water or a dust suppression chemical continuously; • Any area that involves demolition activities should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet; • Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, 					

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		<p>sheeting or netting should be provided to enclose the scaffolding from the ground floor level of the building, or a canopy should be provided from the first floor level up to the highest level of the scaffolding;</p> <ul style="list-style-type: none"> • Any skip hoist for material transport should be totally enclosed by impervious sheeting; • Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides; • Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed; • Loading, unloading, transfer, handling or storage of bulk cement or dry PFA should be carried out in a totally enclosed system or facility, and any vent or exhaust should be fitted with an effective fabric filter or equivalent air pollution control system; and • Exposed earth should be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shortcrete or other suitable surface stabiliser within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies. 					
S3.4.6	D4	Implement regular dust monitoring under EM&A programme during the construction stage.	Monitoring of dust impact	Contractor	Selected dust monitoring stations	Construction stage	<ul style="list-style-type: none"> • TM-EIAO

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EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
Construction Noise							
S4.3.4	N1	Implement the following good site management practices: <ul style="list-style-type: none"> • only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme; • machines and plant (such as trucks, cranes) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • plant known to emit noise strongly in one direction, where possible, be orientated so that the noise is directed away from nearby NSRs; • silencers or mufflers on construction equipment should be properly fitted and maintained during the construction works; • mobile plant should be sited as far away from NSRs as possible and practicable; • material stockpiles, site office and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities. 	Control construction airborne noise	Contractor	All construction sites where practicable	Construction stage	• Annex 5, TM-EIAO
S4.3.4	N2	Use of quiet plant which should be made reference to the Powered Mechanical Equipment (PME) listed in the Technical Memorandum or the Quality Powered Mechanical Equipment (QPME) / other commonly used PME listed in Environmental Protection Department (EPD) web pages as far as possible which includes the Sound Power Level (SWLs) for specific quiet PME.	Reduce the noise levels of plant items	Contractor	All construction sites where practicable	Construction stage	• Annex 5, TM-EIAO
S4.3.4	N3	Install movable temporary noise barriers (typical design is wooden framed barrier with a small-cantilevered upper portion of superficial density no less than 7kg/m ² on a skid	Screen the noisy plant items to be used at all	Contractor	All construction sites where	Construction stage	• Annex 5, TM-EIAO

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		footing with 25mm thick internal sound absorptive lining), and full enclosure, screen the noisy plants including air compressors, generators etc.	construction sites		practicable		
S4.3.4	N4	Implement a noise monitoring under EM&A programme.	Monitor the construction noise levels at the selected representative locations	Contractor	Selected noise monitoring stations	Construction stage	• TM-EIAO
<i>Operational Noise (Fixed Noise)</i>							
S4.6.4	N6	For existing and planned NSRs which are located near to the proposed noise sources, the following tentative noise mitigation measures are considered: <ul style="list-style-type: none"> • All the pumps should be enclosed inside building structures; • Proper selection of quiet plant to reduce the tonality at NSRs; • Installation of silencer / acoustic enclosure / acoustic louvers for the exhaust of ventilation system. • For underground train stations, sound attenuators with sufficient attenuations can be installed to the ventilation shafts. • Openings of ventilation system should be located away from NSRs. 	Reduce operation fixed noise	Relevant government departments / Future Operator	All plant rooms where practicable	Prior to operation of the Project	• Noise Control Ordinance and its TM, TM-EIAO

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<i>Water Quality (Construction Phase)</i>							
S5.4.3	W1	<p><u>General Construction Activities</u></p> <p>In accordance with the Practice Note for Professional Persons on Construction Site Drainage, Environmental Protection Department, 1994 (ProPECC PN1/94), best management practices should be implemented on site as far as practicable. The best practices are detailed below:</p> <ul style="list-style-type: none"> • At the start of site establishment, perimeter cut-off drains to direct off-site water around the site should be constructed with internal drainage works. Channels, earth bunds or sand bag barriers should be provided on site to direct stormwater to silt removal facilities.; • Diversion of natural stormwater should be provided as far as possible. The design of temporary on-site drainage should prevent runoff going through site surface, construction machinery and equipment in order to avoid or minimize polluted runoff. Sedimentation tanks with sufficient capacity, constructed from pre-formed individual cells of approximately 6 to 8 m3 capacities, are recommended as a general mitigation measure which can be used for settling surface runoff prior to disposal. The system capacity shall be flexible and able to handle multiple inputs from a variety of sources and suited to applications where the influent is pumped; • The dikes or embankments for flood protection should be implemented around the boundaries of earthwork areas. Temporary ditches should be provided to facilitate the runoff discharge into an appropriate watercourse, through a silt/sediment trap. The silt/sediment traps should be incorporated in the permanent drainage channels to enhance deposition rates; • The design of efficient silt removal facilities should be 	To minimize water quality impact from construction site runoff and general construction activities	Contractor	All construction sites where applicable	Construction stage	<ul style="list-style-type: none"> • Water Pollution Control Ordinance • ProPECC PN1/94 • TM-EIAO • TM-DSS

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		<p>based on the guidelines in Appendix A1 of ProPECC PN 1/94. The detailed design of the sand/silt traps should be undertaken by the contractor prior to the commencement of construction;</p> <ul style="list-style-type: none"> • Construction works should be programmed to minimize surface excavation works during the rainy seasons (April to September). All exposed earth areas should be completed and vegetated as soon as possible after earthworks have been completed. If excavation of soil cannot be avoided during the rainy season, or at any time of year when rainstorms are likely, exposed slope surfaces should be covered by tarpaulin or other means; • All drainage facilities and erosion and sediment control structures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly following rainstorms. Deposited silt and grit should be removed regularly and disposed of by spreading evenly over stable, vegetated areas; • If the excavation of trenches in wet periods is necessary, it should be dug and backfilled in short sections wherever practicable. Water pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities; • All open stockpiles of construction materials (for example, aggregates, sand and fill material) should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system; • Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and storm runoff being 					

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		<p>directed into foul sewers;</p> <ul style="list-style-type: none"> • Precautions to be taken at any time of year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecasted, and actions to be taken during or after rainstorms are summarized in Appendix A2 of ProPECC PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events; • All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and sited wheel washing facilities should be provided at every construction site exit where practicable. Wash-water should have sand and silt settled out and removed at least on a weekly basis to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains; • Oil interceptors should be provided in the drainage system downstream of any oil/fuel pollution sources. The oil interceptors should be emptied and cleaned regularly to prevent the release of oil and grease into the storm water drainage system after accidental spillage. A bypass should be provided for the oil interceptors to prevent flushing during heavy rain; • Construction solid waste, debris and rubbish on site should be collected, handled and disposed of properly to avoid water quality impacts; • All fuel tanks and storage areas should be provided with locks and sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank to prevent spilled fuel oils from reaching water sensitive 					

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		<p>receivers nearby;and</p> <ul style="list-style-type: none"> Regular environmental audit on the construction site should be carried out in order to prevent any malpractices. Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the water bodies, mangroves and open sea. 					
S5.4.3	W2	<p><u>Sewage from workforce</u></p> <ul style="list-style-type: none"> Portable chemical toilets and sewage holding tanks are recommended for handling the construction sewage generated by the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance; Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment during the construction phase of the Project; Regular environmental audit on the construction site should be conducted in order to provide an effective control of any malpractices and achieve continual improvement of environmental performance on site. 	To minimize water quality from sewage effluent in construction phase	Contractor	All construction sites where practicable	Construction stage	<ul style="list-style-type: none"> Water Pollution Control Ordinance TM-DSS
S5.5.8	W8	<p><u>Good Management Practice in Construction Phase</u></p> <p>The following good site management practices shall be adopted for the filling works:</p> <ul style="list-style-type: none"> Water quality monitoring shall be implemented to ensure effective control of water pollution and recommend additional mitigation measures required; The decent speed of grabs shall be controlled to minimize the seabed impact and to reduce the volume of over- 	To avoid water quality impact	Contractor	All construction sites where practicable	Construction stage	<ul style="list-style-type: none"> ProPECC PN1/94

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		<p>dredging;</p> <ul style="list-style-type: none"> • A perimeter silt curtain shall be installed during the entire reclamation periods; • Barges or hoppers shall not be filled to a level which will cause overflow of materials or pollution of water during loading or transportation; • Excess materials shall be cleaned from the decks and exposed fittings of barges before the vessels are moved; • Plants should not be operated with leaking pipes and any pipe leakages shall be repaired quickly; • Adequate freeboard shall be maintained on barges to reduce the likelihood of decks being washed by wave action; • All vessels should be sized so that adequate clearance is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash; and • The works shall not cause foam, oil, grease, litter or other objectionable matter to be present in the water within and adjacent to the works site. 					

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Waste Management (Construction Waste)							
S7.4.1	WM1	<p><u>Good Site Practices</u></p> <p>The following good site practices are recommended throughout the construction activities:</p> <ul style="list-style-type: none"> • nomination of an approved personnel, such as a site manager, to be responsible for the implementation of good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site; • training of site personnel in site cleanliness, appropriate waste management procedures and concepts of waste reduction, reuse and recycling; • provision of sufficient waste disposal points and regular collection for disposal; • imposition of penalty system on Contractors' improper behaviours when illegal dumping and landfilling outside their respective construction sites, i.e. on nearby farmlands and riverbanks, are reported; • appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers; • regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; and • the contractor should prepare a Waste Management Plan (WMP) as part of the Environmental Management Plan (EMP) in accordance with the ETWB TC(W) No. 19/2005 for construction phase. The EMP should be submitted to the Engineer for approval. Mitigation measures proposed in the EIA Report and the EM&A Manual should be adopted. 	Minimize waste generation during construction	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance

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S7.4.1	WM2	<p><u>Waste Reduction Measures</u></p> <p>Waste reduction is best achieved at the planning and design phase, as well as by ensuring the implementation of good site practices. The following recommendations are proposed to achieve reduction:</p> <ul style="list-style-type: none"> • segregate and store different types of waste in different containers, skip or stockpiles to enhance reuse or recycling of materials and their proper disposal; • proper storage and site practices to minimize the potential for damage and contamination of construction materials; • plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste; • sort out demolition debris and excavated materials from demolition works to recover reusable/recyclable portions (i.e. soil, broken concrete, metal etc.); • provide training to workers on the importance of appropriate waste management procedures, including waste reduction, reuse and recycling. 	Reduce waste generation	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance
S7.4.1	WM3	<p><u>Storage of Waste</u></p> <p>The following recommendation should be implemented to minimize the impacts:</p> <ul style="list-style-type: none"> • waste such as soil should be handled and stored well to ensure secure containment; and • Depends on actual site activities, certain locations within the site area would be used for storage of waste to enhance reuse. However, there would not be any designated location for storage of waste, and the storage locations would need to be adjusted to suite actual site conditions; 	Good site practice to minimize the waste generation and recycle the C&D materials as far as practicable so as to reduce the amount for final disposal	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Land (Miscellaneous Provisions) Ordinance • Waste Disposal Ordinance • ETWB TCW No. 19/2005

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S7.4.1	WM4	<p><u>Collection and Transportation of Waste</u></p> <p>The following recommendation should be implemented to minimize the impacts:</p> <ul style="list-style-type: none"> • remove waste in timely manner; • employ the trucks with cover or enclosed containers for waste transportation; • obtain relevant waste disposal permits from the appropriate authorities; and • disposal of waste should be done at licensed waste disposal facilities. 	Minimize waste impacts from storage	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance
S7.4.1	WM5	<p><u>Excavated and C&D Materials</u></p> <p>Wherever practicable, C&D materials should be segregated from other wastes to avoid contamination and ensure acceptability at public fill reception facilities or reclamation sites. The following mitigation measures should be implemented in handling the excavated and C&D materials:</p> <ul style="list-style-type: none"> • maintain temporary stockpiles and reuse excavated fill material for backfilling; • carry out on-site sorting; • make provisions in the Contract documents to allow and promote the use of recycled aggregates where appropriate; and • implement a trip-ticket system for each works contract to ensure that the disposal of C&D materials are properly documented and verified, so as to avoid the illegal dumping and landfilling of C&D materials on farmlands/ riverbanks at TCW; <p>The recommended C&D materials handling should include:</p>	Minimize waste impacts from excavated and C&D materials	Contractor	All construction sites	Construction Stage	<ul style="list-style-type: none"> • Land (Miscellaneous Provisions) Ordinance • Waste Disposal Ordinance • ETWB TCW No. 19/2005 • Project Administrative Handbook for Civil Engineering Works, 2012 Edition

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		<ul style="list-style-type: none"> On-site sorting of C&D materials Reuse of C&D materials Use of Standard Formwork and Planning of Construction Materials purchasing 					
S7.4.1	WM6	<p><u>Provision of Wheel Wash Facilities</u></p> <p>Wheel wash facilities have to be provided at the site entrance before the trucks leaving the works area. Dust disturbance due to the trucks transportation to the public road network could be minimized by such arrangement.</p>	Minimize waste impacts from trucks transportation	Contractor	All construction sites	Construction Stage	N/A
S7.4.1	WM10	<p><u>Chemical Waste</u></p> <p>If chemical wastes are produced at the construction site, the Contractors should register with EPD as chemical waste producer. Chemical wastes should be stored in appropriate containers and collected by a licensed chemical waste collector. Chemical wastes (e.g. spent lubricant oil) should be recycled at an appropriate facility as far as possible, while the chemical waste that cannot be recycled should be disposed of at either the Chemical Waste Treatment Centre, or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.</p>	Control the chemical waste and ensure proper storage, handling and disposal.	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> Waste Disposal (Chemical Waste) General Regulation Code of Practice on the Packaging, Labelling and Storage of Chemical Waste
S7.4.1	WM11	<p><u>General Refuse</u></p> <ul style="list-style-type: none"> General refuse should be stored in enclosed bins separately from construction and chemical wastes. Recycling bins should also be placed to encourage recycling. Preferably enclosed and covered areas should be provided for general refuse collection and routine cleaning for these areas should also be implemented to 	Minimize production of the general refuse and avoid odour, pest and litter impacts	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> Waste Disposal Ordinance

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		keep areas clean. <ul style="list-style-type: none"> A reputable waste collector should be employed to remove general refuse on a daily basis. 					
Waste Management (Operational Waste)							
S7.4.2	WM14	<u>Municipal Solid Waste</u> <ul style="list-style-type: none"> A reputable waste collector should be employed to remove general refuse on a daily basis. A 4-bin recycling system for paper, metals, plastics and glass should be adopted together with a general refuse bin. They should be placed in prominent places to promote waste separation at source. All recyclable materials should be collected by recyclers. 	Remove general refuse generated from the proposed development	FEHD/ Relevant Operators	All construction sites	Operational stage	<ul style="list-style-type: none"> Waste Disposal Ordinance
S7.4.2	WM15	<u>Chemical Waste</u> <ul style="list-style-type: none"> Localized chemical waste storage areas should be located close to the source of waste generation for temporary storage. Drum-type containers with proper labelling should be used to collect chemical wastes for storage at the designated areas. A licensed collector should be employed for the chemical waste collection and the chemical wastes should be disposed at an appropriate facility, such as Chemical Waste Treatment Centre (CWTC) in Tsing Yi. Collection receipts issued by the licensed collector showing the quantities and types of chemical waste taken off-site and details of the treatment facility should be kept for record. 	Reduce chemical waste due to waste handling	Contractors/ Relevant Operators	All construction sites	Operational stage	

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<i>Ecology (Construction Phase)</i>							
S9.8.3	EC13	Implementation of standard site practices	Minimize the potential impact due to dust, noise and runoff during construction phase	Contractor	Within construction sites	Construction phase	<ul style="list-style-type: none"> • EIA • Contractual requirements

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<i>Landscapes and Visual (Construction Phase)</i>							
S11.7 MM1	LV1	<p>Optimisation of Construction Areas & Providing Temporary Landscape on Temporary Construction – Construction areas’ control shall be enforced, where possible, to ensure that the landscape and visual impacts arising from the construction activities are minimised.</p> <p>It includes reduction of the extent of working areas and temporary works areas, management on storing and using the construction equipment and materials, and consideration of detailed schedules to shorten the construction period. Temporary landscape treatments are considered to be adopted such as applying hydro-seeding on temporary stockpiles and reclamation areas to alleviate the potential impacts.</p>	Minimise the landscape and visual impacts arising from the construction activities	Relevant Government Departments / Private Sector	Through-out Tung Chung West (TCW) area and Tung Chung East (TCE) area	Construction Phase	
S11.7 MM14	LV14	Aesthetic Design of Built Development – The planning of the revised RODP has considered reducing potential visual impacts, enhancing visual amenity and keeping visual corridors. The proposed development will ensure the building massing is compatible with its surroundings. To improve visual amenity, natural building materials could be used on building facades. For example, stone and timber should be considered for architectural features; light earthy tone colours such as shades of green, shades of grey, shades of brown and off-white should be considered for the façade treatment to reduce the visibility of the development components. The form, textures, finishes and colours of the proposed development components should aim to be compatible with the existing surroundings. It would only be implemented for public developments/projects.	Improve visual amenity of the new buildings, keep visual corridors and integrate as possible into the surrounding landscape	Relevant Government Departments	Through-out the TCW and TCE areas	Prior to Construction, Maintenance in Operation Phase	<ul style="list-style-type: none"> • Hong Kong Planning Standards and Guidelines (HKPSG) issued by the Planning Department (As at Aug 2011); • PNAP APP-152, Sustainable Building Design Guidelines
S11.7	LV15	Maximise Greening on Structures – The Government has been actively promoting greening in buildings and	Maximise Greening	Relevant Government	On appropriate	Prior to Construction,	<ul style="list-style-type: none"> • Development

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MM15		<p>structures such as bridges to improve the environment. This includes actively implementing rooftop greening or vertical greening, as where practicable to enhance the cityscape and mitigate the heat island effect in urban areas. For the new built forms in TCW and TCE, it is considered the implementation of the following greening measures could alleviate the landscape and visual impacts of new development and help the development blend in with its surrounding landscape:</p> <ul style="list-style-type: none"> • Sky Garden: Refuge floors or voids in building mass formed by partial removal of floor plates on certain building storeys or provision of freed up areas on certain building storeys provide opportunities for sky gardens for the proposed built development. It can allow views through the development to the background formed by the natural hillsides and enhance the visual amenity effectively. For public developments, relevant technical document Technical Circular (Works) No. 3/2012 Site Coverage of Greenery for Government Building Projects by Development Bureau in 2011 shall be referred to. For private developments, it is only applicable to sites with inadequate greening coverage and should be implemented in accordance with Sustainable Building Design Guidelines PNAP APP-152. • Green Roof: The Architectural Services Department completed the Study on Green Roof Application in Hong Kong in 2007 which reviewed the latest concepts and design technology of green roof and recommended technical guidelines suitable for application in Hong Kong. The study will be taken into account to the new buildings to be built in TCW and TCE. Landscape and visual impact can be alleviated and the landscape and visual value can be enhanced. For private development, it is only 	<p>coverage</p> <p>Enhance visual amenity, create visual corridors and integrate as possible into the surrounding landscape</p>	Departments	buildings and structures	Construction Phase & Maintenance in Operation Phase	<p>Bureau Technical Circular (Works) No. 3/2012 Site Coverage of Greenery for Government Building Projects</p> <ul style="list-style-type: none"> • PNAP APP-152, Sustainable Building Design Guidelines

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		<p>applicable to sites with inadequate greening coverage and should be implemented in accordance with Sustainable Building Design Guidelines PNAP APP-152. Relevant technical document Technical Circular (Works) No. 3/2012 Site Coverage of Greenery for Government Building Projects by Development Bureau in 2011 shall be reference. For public developments, relevant technical document Technical Circular (Works) No. 3/2012 Site Coverage of Greenery for Government Building Projects by Development Bureau in 2011 shall be referred to. For private developments, it is only applicable to sites with inadequate greening coverage and should be implemented in accordance with Sustainable Building Design Guidelines PNAP APP-152.</p> <ul style="list-style-type: none"> • Vertical Green: Planting of climbers to grow up vertical surfaces where appropriate (e.g. building edges), to soften hard structures and facilities. Relevant technical document Technical Circular (Works) No. 3/2012 Site Coverage of Greenery for Government Building Projects by Development Bureau in 2011 shall be observed. For public developments, relevant technical document Technical Circular (Works) No. 3/2012 Site Coverage of Greenery for Government Building Projects by Development Bureau in 2011 shall be reference. For private development, it is only applicable to sites with inadequate greening coverage and should be implemented in accordance with Sustainable Building Design Guidelines PNAP APP-152. • Greening on infrastructure: Planting could be provided on infrastructure such as bridges where appropriate to enhance greenery to soften its built edges. Screen planting could be provided near infrastructure to reduce any undesirable visual 					

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		impacts.					
<i>Landscape and Visual (Construction & Operational Phase)</i>							
S11.7 MM20	LV20	Light Control – Construction day and night time lighting should be controlled to minimize glare impact to adjacent VSRs during the construction stage. Street and night time lighting shall also be controlled to minimize glare impact to adjacent VSRs during the operation phase.	Minimize negative glare impact to adjacent VSRs	Relevant Government Departments / Private Sector	Through-out the TCW and TCE areas	Construction Phase & Operation Phase	

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<i>EM&A Project</i>							
S13.2	EM1	An Independent Environmental Checker needs to be employed as per the EM&A Manual.	Control EM&A Performance	Project Proponent	All construction sites	Construction stage	<ul style="list-style-type: none"> • EIAO Guidance Note No.4/2010 • TM-EIAO
S13.2 – 13.4	EM2	<p>1) An Environmental Team needs to be employed as per the EM&A Manual.</p> <p>2) Prepare a systematic Environmental Management Plan to ensure effective implementation of the mitigation measures.</p> <p>3) An environmental impact monitoring needs to be implementing by the Environmental Team to ensure all the requirements given in the EM&A Manual are fully complied with.</p>	Perform environmental monitoring & auditing	Project Proponent	All construction sites	Construction stage	<ul style="list-style-type: none"> • EIAO Guidance Note No.4/2010 • TM-EIAO

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Note: Chapters 1 to 2 of the EIA report present the background information of the Project, identified concurrent projects, objectives and scope for various environmental aspects, and description on alternative options and construction description. Chapters 3 to 12 of the EIA report present the EIA findings and mitigation measures are described below with cross-reference to the EIA report. Chapters 13 to 15 describe the environmental monitoring requirements, summary of environmental outcomes and conclusion.

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
<i>Common Mitigation Measures (Applicable to DP Item Q.1- Any works partly or wholly in a gazette proposed conservation area)</i>							
Construction Dust Impact							
S3.4.6	D1	Water spraying every hour on exposed worksites and haul road.	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • APCO • To control the dust impact to meet HKAQO and TM-EIAO criteria
S3.4.6	D2	The contractor shall follow the procedures and requirements given in the Air Pollution Control (Construction Dust) Regulation	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • APCO • To control the dust impact to meet HKAQO and TM-EIAO criteria
S3.4.6	D3	<p>The following dust suppression measures should be incorporated to control the dust nuisance throughout the construction phase:</p> <ul style="list-style-type: none"> • Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading; • Any dusty materials remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads; 	Minimize dust impact at the nearby sensitive receivers	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • APCO • To control the dust impact to meet HKAQO and TM-EIAO criteria

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		<ul style="list-style-type: none"> • A stockpile of dusty material should not be extended beyond the pedestrian barriers, fencing or traffic cones; • The load of dusty materials on a vehicle leaving a construction site should be covered entirely by impervious sheeting to ensure that the dusty materials do not leak from the vehicle; • Where practicable, vehicle washing facilities with high pressure water jet should be provided at every discernible or designated vehicle exit point. The area where vehicle washing takes place and the road section between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores; • When there are open excavation and reinstatement works, hoarding of not less than 2.4m high should be provided as far as practicable along the site boundary with provision for public crossing. Good site practice shall also be adopted by the Contractor to ensure the conditions of the hoardings are properly maintained throughout the construction period; • The portion of any road leading only to construction site that is within 30m of a vehicle entrance or exit should be kept clear of dusty materials; • Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation takes place should be sprayed with water or a dust suppression chemical continuously; • Any area that involves demolition activities should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet; • Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, 					

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		<p>sheeting or netting should be provided to enclose the scaffolding from the ground floor level of the building, or a canopy should be provided from the first floor level up to the highest level of the scaffolding;</p> <ul style="list-style-type: none"> • Any skip hoist for material transport should be totally enclosed by impervious sheeting; • Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides; • Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed; • Loading, unloading, transfer, handling or storage of bulk cement or dry PFA should be carried out in a totally enclosed system or facility, and any vent or exhaust should be fitted with an effective fabric filter or equivalent air pollution control system; and • Exposed earth should be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shortcrete or other suitable surface stabiliser within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies. 					
S3.4.6	D4	Implement regular dust monitoring under EM&A programme during the construction stage.	Monitoring of dust impact	Contractor	Selected dust monitoring stations	Construction stage	<ul style="list-style-type: none"> • TM-EIAO

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EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
Construction Noise							
S4.3.4	N1	Implement the following good site management practices: <ul style="list-style-type: none"> • only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme; • machines and plant (such as trucks, cranes) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • plant known to emit noise strongly in one direction, where possible, be orientated so that the noise is directed away from nearby NSRs; • silencers or mufflers on construction equipment should be properly fitted and maintained during the construction works; • mobile plant should be sited as far away from NSRs as possible and practicable; • material stockpiles, site office and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities. 	Control construction airborne noise	Contractor	All construction sites where practicable	Construction stage	• Annex 5, TM-EIAO
S4.3.4	N2	Use of quiet plant which should be made reference to the Powered Mechanical Equipment (PME) listed in the Technical Memorandum or the Quality Powered Mechanical Equipment (QPME) / other commonly used PME listed in Environmental Protection Department (EPD) web pages as far as possible which includes the Sound Power Level (SWLs) for specific quiet PME.	Reduce the noise levels of plant items	Contractor	All construction sites where practicable	Construction stage	• Annex 5, TM-EIAO
S4.3.4	N3	Install movable temporary noise barriers (typical design is wooden framed barrier with a small-cantilevered upper portion of superficial density no less than 7kg/m ² on a skid	Screen the noisy plant items to be used at all	Contractor	All construction sites where	Construction stage	• Annex 5, TM-EIAO

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		footing with 25mm thick internal sound absorptive lining), and full enclosure, screen the noisy plants including air compressors, generators etc.	construction sites		practicable		
S4.3.4	N4	Implement a noise monitoring under EM&A programme.	Monitor the construction noise levels at the selected representative locations	Contractor	Selected noise monitoring stations	Construction stage	<ul style="list-style-type: none"> • TM-EIAO

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EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
<i>Water Quality (Construction Phase)</i>							
S5.4.3	W1	<p><u>General Construction Activities</u></p> <p>In accordance with the Practice Note for Professional Persons on Construction Site Drainage, Environmental Protection Department, 1994 (ProPECC PN1/94), best management practices should be implemented on site as far as practicable. The best practices are detailed below:</p> <ul style="list-style-type: none"> • At the start of site establishment, perimeter cut-off drains to direct off-site water around the site should be constructed with internal drainage works. Channels, earth bunds or sand bag barriers should be provided on site to direct stormwater to silt removal facilities.; • Diversion of natural stormwater should be provided as far as possible. The design of temporary on-site drainage should prevent runoff going through site surface, construction machinery and equipment in order to avoid or minimize polluted runoff. Sedimentation tanks with sufficient capacity, constructed from pre-formed individual cells of approximately 6 to 8 m3 capacities, are recommended as a general mitigation measure which can be used for settling surface runoff prior to disposal. The system capacity shall be flexible and able to handle multiple inputs from a variety of sources and suited to applications where the influent is pumped; • The dikes or embankments for flood protection should be implemented around the boundaries of earthwork areas. Temporary ditches should be provided to facilitate the runoff discharge into an appropriate watercourse, through a silt/sediment trap. The silt/sediment traps should be incorporated in the permanent drainage channels to enhance deposition rates; • The design of efficient silt removal facilities should be 	To minimize water quality impact from construction site runoff and general construction activities	Contractor	All construction sites where applicable	Construction stage	<ul style="list-style-type: none"> • Water Pollution Control Ordinance • ProPECC PN1/94 • TM-EIAO • TM-DSS

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		<p>based on the guidelines in Appendix A1 of ProPECC PN 1/94. The detailed design of the sand/silt traps should be undertaken by the contractor prior to the commencement of construction;</p> <ul style="list-style-type: none"> • Construction works should be programmed to minimize surface excavation works during the rainy seasons (April to September). All exposed earth areas should be completed and vegetated as soon as possible after earthworks have been completed. If excavation of soil cannot be avoided during the rainy season, or at any time of year when rainstorms are likely, exposed slope surfaces should be covered by tarpaulin or other means; • All drainage facilities and erosion and sediment control structures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly following rainstorms. Deposited silt and grit should be removed regularly and disposed of by spreading evenly over stable, vegetated areas; • If the excavation of trenches in wet periods is necessary, it should be dug and backfilled in short sections wherever practicable. Water pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities; • All open stockpiles of construction materials (for example, aggregates, sand and fill material) should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system; • Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and storm runoff being 					

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		<p>directed into foul sewers;</p> <ul style="list-style-type: none"> • Precautions to be taken at any time of year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecasted, and actions to be taken during or after rainstorms are summarized in Appendix A2 of ProPECC PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events; • All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and sited wheel washing facilities should be provided at every construction site exit where practicable. Wash-water should have sand and silt settled out and removed at least on a weekly basis to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains; • Oil interceptors should be provided in the drainage system downstream of any oil/fuel pollution sources. The oil interceptors should be emptied and cleaned regularly to prevent the release of oil and grease into the storm water drainage system after accidental spillage. A bypass should be provided for the oil interceptors to prevent flushing during heavy rain; • Construction solid waste, debris and rubbish on site should be collected, handled and disposed of properly to avoid water quality impacts; • All fuel tanks and storage areas should be provided with locks and sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank to prevent spilled fuel oils from reaching water sensitive 					

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		<p>receivers nearby;and</p> <ul style="list-style-type: none"> Regular environmental audit on the construction site should be carried out in order to prevent any malpractices. Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the water bodies, mangroves and open sea. 					
S5.4.3	W2	<p><u>Sewage from workforce</u></p> <ul style="list-style-type: none"> Portable chemical toilets and sewage holding tanks are recommended for handling the construction sewage generated by the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance; Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment during the construction phase of the Project; Regular environmental audit on the construction site should be conducted in order to provide an effective control of any malpractices and achieve continual improvement of environmental performance on site. 	To minimize water quality from sewage effluent in construction phase	Contractor	All construction sites where practicable	Construction stage	<ul style="list-style-type: none"> Water Pollution Control Ordinance TM-DSS
S5.5.8	W8	<p><u>Good Management Practice in Construction Phase</u></p> <p>The following good site management practices shall be adopted for the filling works:</p> <ul style="list-style-type: none"> Water quality monitoring shall be implemented to ensure effective control of water pollution and recommend additional mitigation measures required; The decent speed of grabs shall be controlled to minimize the seabed impact and to reduce the volume of over- 	To avoid water quality impact	Contractor	All construction sites where practicable	Construction stage	<ul style="list-style-type: none"> ProPECC PN1/94

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		<p>dredging;</p> <ul style="list-style-type: none"> • A perimeter silt curtain shall be installed during the entire reclamation periods; • Barges or hoppers shall not be filled to a level which will cause overflow of materials or pollution of water during loading or transportation; • Excess materials shall be cleaned from the decks and exposed fittings of barges before the vessels are moved; • Plants should not be operated with leaking pipes and any pipe leakages shall be repaired quickly; • Adequate freeboard shall be maintained on barges to reduce the likelihood of decks being washed by wave action; • All vessels should be sized so that adequate clearance is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash; and • The works shall not cause foam, oil, grease, litter or other objectionable matter to be present in the water within and adjacent to the works site. 					

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Waste Management (Construction Waste)							
S7.4.1	WM1	<p><u>Good Site Practices</u></p> <p>The following good site practices are recommended throughout the construction activities:</p> <ul style="list-style-type: none"> • nomination of an approved personnel, such as a site manager, to be responsible for the implementation of good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site; • training of site personnel in site cleanliness, appropriate waste management procedures and concepts of waste reduction, reuse and recycling; • provision of sufficient waste disposal points and regular collection for disposal; • imposition of penalty system on Contractors' improper behaviours when illegal dumping and landfilling outside their respective construction sites, i.e. on nearby farmlands and riverbanks, are reported; • appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers; • regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; and • the contractor should prepare a Waste Management Plan (WMP) as part of the Environmental Management Plan (EMP) in accordance with the ETWB TC(W) No. 19/2005 for construction phase. The EMP should be submitted to the Engineer for approval. Mitigation measures proposed in the EIA Report and the EM&A Manual should be adopted. 	Minimize waste generation during construction	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance

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S7.4.1	WM2	<p><u>Waste Reduction Measures</u></p> <p>Waste reduction is best achieved at the planning and design phase, as well as by ensuring the implementation of good site practices. The following recommendations are proposed to achieve reduction:</p> <ul style="list-style-type: none"> • segregate and store different types of waste in different containers, skip or stockpiles to enhance reuse or recycling of materials and their proper disposal; • proper storage and site practices to minimize the potential for damage and contamination of construction materials; • plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste; • sort out demolition debris and excavated materials from demolition works to recover reusable/recyclable portions (i.e. soil, broken concrete, metal etc.); • provide training to workers on the importance of appropriate waste management procedures, including waste reduction, reuse and recycling. 	Reduce waste generation	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance
S7.4.1	WM3	<p><u>Storage of Waste</u></p> <p>The following recommendation should be implemented to minimize the impacts:</p> <ul style="list-style-type: none"> • waste such as soil should be handled and stored well to ensure secure containment; and • Depends on actual site activities, certain locations within the site area would be used for storage of waste to enhance reuse. However, there would not be any designated location for storage of waste, and the storage locations would need to be adjusted to suite actual site conditions; 	Good site practice to minimize the waste generation and recycle the C&D materials as far as practicable so as to reduce the amount for final disposal	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Land (Miscellaneous Provisions) Ordinance • Waste Disposal Ordinance • ETWB TCW No. 19/2005

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S7.4.1	WM4	<p><u>Collection and Transportation of Waste</u></p> <p>The following recommendation should be implemented to minimize the impacts:</p> <ul style="list-style-type: none"> • remove waste in timely manner; • employ the trucks with cover or enclosed containers for waste transportation; • obtain relevant waste disposal permits from the appropriate authorities; and • disposal of waste should be done at licensed waste disposal facilities. 	Minimize waste impacts from storage	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> • Waste Disposal Ordinance
S7.4.1	WM5	<p><u>Excavated and C&D Materials</u></p> <p>Wherever practicable, C&D materials should be segregated from other wastes to avoid contamination and ensure acceptability at public fill reception facilities or reclamation sites. The following mitigation measures should be implemented in handling the excavated and C&D materials:</p> <ul style="list-style-type: none"> • maintain temporary stockpiles and reuse excavated fill material for backfilling; • carry out on-site sorting; • make provisions in the Contract documents to allow and promote the use of recycled aggregates where appropriate; and • implement a trip-ticket system for each works contract to ensure that the disposal of C&D materials are properly documented and verified, so as to avoid the illegal dumping and landfilling of C&D materials on farmlands/ riverbanks at TCW; <p>The recommended C&D materials handling should include:</p>	Minimize waste impacts from excavated and C&D materials	Contractor	All construction sites	Construction Stage	<ul style="list-style-type: none"> • Land (Miscellaneous Provisions) Ordinance • Waste Disposal Ordinance • ETWB TCW No. 19/2005 • Project Administrative Handbook for Civil Engineering Works, 2012 Edition

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		<ul style="list-style-type: none"> On-site sorting of C&D materials Reuse of C&D materials Use of Standard Formwork and Planning of Construction Materials purchasing 					
S7.4.1	WM6	<p><u>Provision of Wheel Wash Facilities</u></p> <p>Wheel wash facilities have to be provided at the site entrance before the trucks leaving the works area. Dust disturbance due to the trucks transportation to the public road network could be minimized by such arrangement.</p>	Minimize waste impacts from trucks transportation	Contractor	All construction sites	Construction Stage	N/A
S7.4.1	WM10	<p><u>Chemical Waste</u></p> <p>If chemical wastes are produced at the construction site, the Contractors should register with EPD as chemical waste producer. Chemical wastes should be stored in appropriate containers and collected by a licensed chemical waste collector. Chemical wastes (e.g. spent lubricant oil) should be recycled at an appropriate facility as far as possible, while the chemical waste that cannot be recycled should be disposed of at either the Chemical Waste Treatment Centre, or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.</p>	Control the chemical waste and ensure proper storage, handling and disposal.	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> Waste Disposal (Chemical Waste) (General) Regulation Code of Practice on the Packaging, Labelling and Storage of Chemical Waste
S7.4.1	WM11	<p><u>General Refuse</u></p> <ul style="list-style-type: none"> General refuse should be stored in enclosed bins separately from construction and chemical wastes. Recycling bins should also be placed to encourage recycling. Preferably enclosed and covered areas should be provided for general refuse collection and routine cleaning for these areas should also be implemented to 	Minimize production of the general refuse and avoid odour, pest and litter impacts	Contractor	All construction sites	Construction stage	<ul style="list-style-type: none"> Waste Disposal Ordinance

Environmental Mitigation Implementation Schedule – Tung Chung New Town Extension

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
		keep areas clean. <ul style="list-style-type: none"> • A reputable waste collector should be employed to remove general refuse on a daily basis. 					

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
<i>Ecology (Construction Phase)</i>							
S9.8.3	EC12	Protection of Tung Chung Stream	Minimize the potential water pollution due to construction of road crossings or other works near Tung Chung Stream	Contractor	Within construction sites	Construction phase	<ul style="list-style-type: none"> • EIA • Contractual requirements
S9.8.3	EC13	Implementation of standard site practices	Minimize the potential impact due to dust, noise and runoff during construction phase	Contractor	Within construction sites	Construction phase	<ul style="list-style-type: none"> • EIA • Contractual requirements

Environmental Mitigation Implementation Schedule – Tung Chung New Town Extension

EIA Ref.	EM&A Log Ref	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to address	Implementation Agent	Location / Timing	Implementation Stage	Requirements and / or standards to be achieved
<i>EM&A Project</i>							
S13.2	EM1	An Independent Environmental Checker needs to be employed as per the EM&A Manual.	Control EM&A Performance	Project Proponent	All construction sites	Construction stage	<ul style="list-style-type: none"> • EIAO Guidance Note No.4/2010 • TM-EIAO
S13.2 – 13.4	EM2	1) An Environmental Team needs to be employed as per the EM&A Manual. 2) Prepare a systematic Environmental Management Plan to ensure effective implementation of the mitigation measures. 3) An environmental impact monitoring needs to be implementing by the Environmental Team to ensure all the requirements given in the EM&A Manual are fully complied with.	Perform environmental monitoring & auditing	Project Proponent	All construction sites	Construction stage	<ul style="list-style-type: none"> • EIAO Guidance Note No.4/2010 • TM-EIAO

Appendix 5.1

Data Sheet for TSP Monitoring

Appendix 5.1

1-hr TSP Monitoring Record Sheet

Monitoring Location			
Details of Location			
Sampler Identification			
Zero Calibration			
Date of Sampling			
Weather Conditions			
Time of Sampling	1	2	3
Start-time			
End-time			
Total Sampling Time (min)			
Measured TSP Level ($\mu\text{g}/\text{m}^3$)			
Site Conditions			
Observations / Remarks			

Name & Designation

Signature

Date

Field Operator:

Checked By:

Appendix 6.1

Noise Monitoring Field Record Sheet

Appendix 6.1

Noise Monitoring Field Record Sheet

Monitoring Location		
Description of Location		
Date of Monitoring		
Measurement Start Time (hh:mm)		
Measurement Time Length(min.)		
Noise Meter Model/Identification		
Calibrator Model/Identification		
Measurement Results	L ₉₀ (dB(A))	
	L ₁₀ (dB(A))	
	Leq (dB(A))	
Major Construction Noise Source(s) During Monitoring		
Other Noise Source(s) During Monitoring		
Remarks		

Name & Designation

Signature

Date

Recorded By :

Checked By :

Appendix 15.1

Proactive Environmental Protection Proforma

Appendix 15.2

Log-book Sample

Appendix 16.1

Sample Template for
Interim Notifications of
Environmental Quality
Limits Exceedances

Appendix 16.1

Sample Template for Interim Notifications of Environmental Quality Limits Exceedances

Incident Report on Action Level or Limit Level Non-compliance

Project	
Date	
Time	
Monitoring Location	
Parameter	
Action & Limit Levels	
Measured Level	
Possible reason for Action or Limit Level Non-compliance	
Actions taken / to be taken	
Remarks	

Location Plan

Prepared by :

Designation :

Signature :

Date :