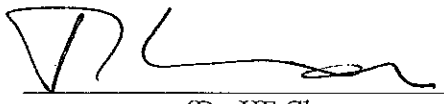
Civil Engineering and Development Department

Agreement No. CE 59/2015 (EP)
Environmental Team for
Tseung Kwan O – Lam Tin Tunnel
Design and Construction

Monthly Environmental Monitoring and Audit Report for December 2019

(version 1.0)

Approved By 

(Dr. HF Chan,
Environmental Team Leader)

REMARKS:

The information supplied and contained within this report is, to the best of our knowledge, correct at the time of printing.

CINOTECH accepts no responsibility for changes made to this report by third parties.

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ANEWR

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Your reference:

Our reference: HKCEDD08/50/106260

Date: 14 January 2020

Attention: Mr Lo Sai Pak, Sunny

BY FAX & POST
(Fax no.: 2739 0076)

Dear Sirs

Agreement No.: NTE 06/2016
Independent Environmental Checker for Tseung Kwan O – Lam Tin Tunnel
Monthly Environmental Monitoring and Audit Report for December 2019 (version 1.0)

We refer to emails of 8 and 10 December 2019 from Cinotech Consultants Limited attaching the Monthly Environmental Monitoring and Audit Report for December 2019 (version 1.0).

We have no further comment and hereby verify the captioned report in accordance with Clause 4.4 of the Environmental Permit no. EP-458/2013/C.

Should you have any queries, please do not hesitate to contact the undersigned or our Mr Ricky Lau on 2618 2831.

Yours faithfully
ANEWR CONSULTING LIMITED

Adi Lee
Independent Environmental Checker

LYMA/LCCR/csym

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EXECUTIVE SUMMARY

Introduction

1. This is the 38th Environmental Monitoring and Audit (EM&A) Report prepared by Cinotech Consultants Limited for the "Agreement No. CE 59/2015 (EP) Environmental Team for Tseung Kwan O – Lam Tin Tunnel – Design and Construction" (hereinafter called "the Project"). This report documents the findings of EM&A Works conducted in December 2019.

2. During the reporting month, the following works contracts were undertaken:
   - Contract No. NE/2015/01 – Tseung Kwan O – Lam Tin Tunnel – Main Tunnel and Associated Works;
   - Contract No. NE/2015/02 – Tseung Kwan O – Lam Tin Tunnel – Road P2 and Associated Works;
   - Contract No. NE/2015/03 – Tseung Kwan O – Lam Tin Tunnel – Northern Footbridge;
   - Contract No. NE/2017/01 – Tseung Kwan O – Lam Tin Tunnel –Tseung Kwan O Interchange and Associated Works
   - Contract No. NE/2017/02 – Tseung Kwan O – Lam Tin Tunnel – Road P2/D4 and Associated Works.
   - Contract No. NE/2017/06 – Tseung Kwan O – Lam Tin Tunnel – Traffic Control and Surveillance System(TCSS) and Associated Works
   - Contract No. NE/2017/07 – Cross Bay Link, Tseung Kwan O – Main Bridge and Associated Works.

Environmental Monitoring Works

3. Environmental monitoring for the Project was performed in accordance with the EM&A Manual and the monitoring results were checked and reviewed. Site Inspections/Audits were conducted once per week. The implementation of the environmental mitigation measures, Event Action Plans and environmental complaint handling procedures were also checked. The construction works under the Contract No. NE/2015/03, Northern Footbridge, had been completed in December 2019. Therefore, all site audits for NE/2015/03 shall be terminated from January 2020 onwards.

4. Summary of the non-compliance (exceedance) in the reporting month for the Project is tabulated in **Table I**.

Table I Non-compliance (exceedance) Record for the Project in the Reporting Month

Environmental Monitoring	No. of Non-compliance (Exceedance)		No. of Non-compliance (Exceedance) due to Construction Activities of this Project		Action Taken
	Action Level	Limit Level	Action Level	Limit Level	
Air Quality	0	0	0	0	N/A
Noise	5	3	3	0	Refer to Appendix K & O
Groundwater Quality	--	--	--	--	Not measured since Oct 19
Marine Water Quality	65	225	0	0	Refer to Appendix K
Groundwater Level Monitoring (Piezometer Monitoring)	0	N/A[1]	0	N/A[1]	N/A
Ecological	N/A	N/A	N/A	N/A	N/A
Cultural Heritage	0	0	0	0	N/A
Landfill Gas	0	0	0	0	N/A

Note:(1) No Limit Level for Groundwater Level Monitoring (Piezometer Monitoring).

Air Quality Monitoring

5. No Action/Limit Level exceedance for 1-hour TSP monitoring was recorded.

6. No Action/Limit Level exceedance for 24-hour TSP monitoring was recorded.

Construction Noise Monitoring

7. Five (5) Action Level exceedances were recorded due to the documented complaints received in this reporting month. The Summary of Documented Complaints in Reporting Month is tabulated in Table III.

8. No Limit Level exceedance for day time and three (3) limit level night time construction noise monitoring were recorded in the reporting month.

Water Quality Monitoring

9. Groundwater quality monitoring had been suspended since October 2019 upon the agreement by EPD. Further details should be founded at **Section 5.1**.

10. All marine water quality monitoring was conducted as scheduled in the reporting month. There were sixty-five (65) Action Level and two-hundred and twenty-five (225) Limit Level exceedances in marine water quality monitoring. During this reporting month, no sand plume was observed during the water quality monitoring and site audits, therefore there is no direct evidence that the recent exceedances were due to the ongoing reclamation activities of the Project. Details of this investigation are presented in **Section 5**. Daily silt curtain inspection and weekly diving inspection have been carried out by contractor, the record, as reviewed by the site auditors, indicated that silt curtains were found in good conditions. No major deficiency of the silt curtains were also observed during site auditing.

11. Construction phase daily piezometer monitoring by the Contractor commenced in June 2018. It has switched to monthly basis since 3 October 2018 as the construction activity was 120m away from the piezometer gate. The daily piezometer monitoring has resumed on 19 November 2018, as the construction activity was within 50m. No Action Level exceedance was recorded in the reporting month.

Ecological Monitoring

12. Post-translation coral monitoring survey shall be conducted once every 3 months for a period of 12 months after completion of coral translocation. The post-translocation coral monitoring surveys were completed in November 2017.

Monitoring on Cultural Heritage

13. Monitoring of impacts on Cultural Heritage at Cha Kwo Ling Tin Hau Temple commenced in May 2017. No Alert Alarm and Action (AAA) Level exceedance was recorded in the reporting month.

Landscape and Visual Monitoring and Audit

14. The implementation of landscape and visual mitigation measures was checked during the environmental site inspections. Recommended follow-up actions have been discharged by the Contractor. Details of the audit findings and implementation status are presented in Section 10.

Landfill Gas Monitoring

15. Monitoring of landfill gases commenced in December 2016 and were carried out by the Contractor at excavation location, Portion III. No Limit Level exceedance was recorded.

Environmental Site Inspection

16. Joint weekly site inspections were conducted by representatives of the Contractor, Engineer and Environmental Team. The representative of the IEC joined the site inspection for NE/2015/01, NE/2015/02, NE/2015/03, NE/2017/01 and NE/2017/02 on 24, 12, 19, 19 and 19 December 2019 respectively. Details of the audit findings and implementation status are presented in **Section 10**.

Waste Management

17. Wastes generated from this Project include inert construction and demolition (C&D) materials, non-inert C&D materials and marine sediment. Details of waste management data is presented in **Section 11** and **Appendix P**.

Key Information in the Reporting Month

18. Summary of key information in the reporting month is tabulated in **Table II**

Table II Key Information in the Reporting Month

Monthly Complaints	Event Details		Action Taken	Status
	Number	Nature		
December 2019	5	Noise	Details refer to App O	Draft CIRs submitted / On-going
November 2019	6	Air / Noise / Working Hours[2]	Details refer to App O	Draft CIRs submitted / On-going
October 2019	5	Noise / Working Hours[3]	Details refer to App O	Draft CIRs submitted / Closed
September 2019	4	Air / Noise / Water	Details refer to App O	Closed
August 2019	5	Noise / Water / Working Hours[2]	Details refer to App O	Closed
July 2019	8[1]	Noise	Details refer to App O	Closed
Notifications of any summons & prosecutions received	0	---	N/A	N/A

1. Two new complaints was received after the submission of the EMA Report (July 2019)
2. Operation Hour
3. The validity of conducting works during Restricted Hours

19. Summary of complaints received in the reporting month is tabulated in **Table III.**

Table III Summary of Complaints Details in Reporting Month

Complaint Type	Investigation Findings	Follow-up Action / Mitigation Measure
Tseung Kwan O Side		
Noise nuisance from marine works area (December 2019)	The major construction work was driven by pin piles. The noise emitted due to the construction activities is considered to be reduced to an acceptable level as no NSR falls under the ambit of 300m study area of the work site. The details shall be refer to CIR-N90.	The Contractor is reminded to apply noise barrier to noisy plants (e.g. generator and barge). And the Contractor has scheduled the noisy works to less sensitive hours.
Loud Noise Emission from Portion IX (December 2019)	No breaking activity was conducted by the C3. The complaint was still under investigation. Details refer to CIR-C32.	N.A.
Lam Tin Side		
Piling Noise Nuisance near Lam Tin Interchange	Project-related with valid CNP. Details refer to CIR-N91.	Contractor is reminded to reduce noise emission and prevent breaking and noisy activities during restricted hours.

Complaint Type	Investigation Findings	Follow-up Action / Mitigation Measure
Noise Nuisance from Portion IVC	Non project-related due to maintenance works of East Cross-harbor Tunnel. Details refer to CIR-N91.	N.A.
Groundborne Noise	Project-related with valid CNP. Details refer to CIR-N91.	Contractor is reminded to reduce noise emission and prevent breaking and noisy activities during restricted hours.

Key Construction Work in the reporting month & the next reporting month

20. Summary of key construction work in the reporting month is tabulated in **Table IV**.

Table IV Summary Table for Key Construction Work in the Reporting Month

Contract No.	Project Title	Site Activities (December 2019)	
NE/2015/01	Tseung Kwan O – Lam Tin Tunnel – Main Tunnel and Associated Works	Lam Tin Interchange	1) EHC2 U-Trough 2) Site Formation – Area 1G1, Area 1G2, Area 2, Area 3, Area 4 & Area 5 3) Administration Building
		Main Tunnel	4) Main Tunnel Excavation 5) Main Tunnel Lining Works
		TKO Interchange	6) Haul Road Construction and Site Formation & Slope Works 7) Cavern Excavation 8) Bridge Construction
NE/2015/02	Tseung Kwan O – Lam Tin Tunnel – Road P2 and Associated Works	1) Site formation works and drainage for Road P2 CH500-CH650 and SR1 2) Site formation and drainage works for SR2 CH250 – CH350 3) Structure works for U-trough CH318 – CH363.50 4) Construction of utility trough and pre-cast concrete barrier at P2 U-trough CH411 – CH500 and SR2 CH170 – CH250 5) Site establishment for construction of underpass at CH105 – CH318 6) 1st layer excavation for underpass CH105 – CH318 7) Installation of strut/ wailing at 1st layer of ELS for CH105 – CH318 underpass 8) Installation of de-watering system at CH105 – CH318 ELS 9) Surcharging of surcharge areas 2b1, 3, 5, 6 10) Transporting treated marine sediment from Area A to Portion IX for reclamation 11) Removal of surcharge area 4 & 6 12) Installation of socketed H-pile at S200 CH821 – P2 CH105	

Contract No.	Project Title	Site Activities (December 2019)
		13) Advance works and pre-drilling works at Zone 1: CT01 CH213 – CH366 14) Pre-boring for sheetpile at S200 CH821 – P2 CH105
NE/2015/03	Tseung Kwan O – Lam Tin Tunnel – Northern Footbridge	The construction works under the contract had been completed in December 2019
NE/2017/01	Tseung Kwan O – Lam Tin Tunnel – Tseung Kwan O Interchange and Associated Works	1) Construction of Temporary Platform 2) Construction of Pile Cap 3) Construction of Pier 4) Construction of Pier Head Works 5) Pre-drilling Works
NE/2017/02	Tseung Kwan O – Lam Tin Tunnel – Road P2/D4 and Associated Works	1) Trial pit 2) Underground utilities detection 3) Temporary traffic arrangement Setup 4) Pile Cap construction 5) Construction of drainage and watermain Predrilling 6) Bored Piles Works
NE/2017/06	Tseung Kwan O – Lam Tin Tunnel – Traffic Control and Surveillance System(TCSS) and Associated Works	Nil

Future Key Issues

21. The future key environmental issues in the coming month include:

Table V Summary Table for Site Activities in the next Reporting Period

Contract No. and Project Title	Site Activities (January 2020)		Key Environmental Issues *
NE/2015/01 - Tseung Kwan O – Lam Tin Tunnel – Main Tunnel and Associated Works	Lam Tin Interchange	1) EHC2 U-Trough 2) Site Formation – Area 1G1, Area 1G2, Area 2, Area 3, Area 4 & Area 5 3) Administration Building	(A) / (B) / (C) / (D) / (E) / (G)
	Main Tunnel	4) Main Tunnel Excavation 5) Main Tunnel Lining Works	(B)
	TKO Interchange	6) Haul Road Construction and Site Formation & Slope Works 7) Cavern Excavation 8) Bridge Construction	(A) / (C) / (D) / (E) / (F) / (I)
NE/2015/02 - Tseung Kwan O – Lam Tin Tunnel – Road P2 and Associated Works	1) Construction of pillar box and ducting system at Portion IV adjacent to Ocean Shores EVA 2) Construction of utility trough and road barriers at road P2 (land section) 3) Site formation at Road P2 CH500-CH650 and SR1 4) Structure works for U-trough CH318-CH363 5) Drainage works at Road P2 CH500-CH650 and slip road SR1 6) Drainage works at slip road SR2 (CH250 – CH350) 7) Surcharging at surcharge areas 3, 5 8) Installation of 1st layer strut/ wailing at underpass CH105 – CH318 9) Installation of dewatering system (P2 105 – 318) 10) 2nd layer excavation for underpass CH105 – CH318 11) Advance excavation works for underpass section 12) Laying of ducting and drau pit at P2 road CH500 – CH650 & slip road SR1 13) Pre-boring and sheetpile installation at S200 CH821 – P2 CH105 14) Installation of socketed H-pile at S200 CH821 – P2 CH105 15) Removal of surcharge at area 3, 5, 6 16) Drilling for de-watering system at S200 CH821 – P2 CH105 17) Installation of bored piles of abutments 18) Site establishment for construction of underpass at CH105 – CH318 19) Excavation and ELS works at CH105 – CH318 underpass		(A) / (B) / (C) / (D) / (E) / (G) / (I)

Contract No. and Project Title	Site Activities (January 2020)	Key Environmental Issues *
	20) Construction of 900 pipe from SMH9101 – SMH9103 21) Installation of socketed H-pile at CT01 CH213 – CH366	
NE/2015/03 - Tseung Kwan O – Lam Tin Tunnel – Northern Footbridge	The construction works under the contract had been completed in December 2019	N/A
NE/2017/01 – Tseung Kwan O Interchange and Associated Works	1) Construction of Temporary Working Platform 2) Pre-drilling Works 3) Bored Piling Works 4) Dismantling Works for Temporary Working Platform 5) Installation of Precast Pile Cap Shell 6) Construction of Pile Cap 7) Construction of Pier 8) Construction of Pier Head 9) Segment erection works	(A) / (B) / (E) / (F) / (G)
NE/2017/02 – Tseung Kwan O - Lam Tin Tunnel - Road P2/D4 and Associated Works	1) Trial pit 2) Underground utilities detection 3) Temporary traffic arrangement Setup 4) Pile Cap construction 5) Construction of drainage and watermain Predrilling 6) Bored Piles Works	(A) / (B) / (E) / (F) / (G)
NE/2017/06 – Tseung Kwan O – Lam Tin Tunnel – Traffic Control and Surveillance System(TCSS) and Associated Works	Nil	N/A

Note:

(A) Watering for dust generation from haul road, stockpiles of dusty materials, exposed site area, excavation works and rock breaking activities;
(B) Noisy construction activity such as rock-breaking activities and piling works;
(C) Runoff from exposed slope or site area;
(D) Wastewater and runoff discharge from site;
(E) Accumulation of silt, mud and sand along U-channels and sedimentation tanks;
(F) Set up and implementation of temporary drainage system for the surface runoff;
(G) Storage of chemicals/fuel and chemical waste/waste oil on site;
(H) Accumulation and storage of general and construction waste on site; and
(I) Marine water quality impact and indirect impact to coral communities due to marine construction for TKO-LTT reclamation

1. INTRODUCTION

1.1 Cinotech Consultants Limited (Cinotech) was commissioned by Civil Engineering and Development Department (CEDD) as the Environmental Team (ET) to undertake environmental monitoring and auditing services for the Works Contracts involved in the implementation of Tseung Kwan O – Lam Tin Tunnel (TKO-LTT) project to ensure that the environmental performance of the Works Contracts comply with the requirements specified in the Environmental Permit (EP), Environmental Monitoring & Audit (EM&A) Manual, Environmental Impact Assessment (EIA) Report of the TKO-LTT project and other relevant statutory requirements. This is the 38th Monthly EM&A report summarizing the EM&A works for the Project in November 2020.

Purpose of the Report

1.2 This is the 38th Monthly EM&A Report which summarises the impact monitoring results and audit findings for the EM&A programme during the reporting period in December 2020.

Structure of the Report

1.3 The structure of the report is as follows:

Section 1: **Introduction** – purpose and structure of the report.

Section 2: **Contract Information** – summarises background and scope of the Contract, site description, project organization and contact details, construction programme, the construction works undertaken and the status of Environmental Permits/Licenses during the reporting month.

Section 3: **Air Quality Monitoring** – summarises the monitoring parameters, monitoring programmes, monitoring methodologies, monitoring frequency, monitoring locations, Action and Limit Levels, monitoring results and Event / Action Plans.

Section 4: **Noise Monitoring** – summarises the monitoring parameters, monitoring programmes, monitoring methodologies, monitoring frequency, monitoring locations, Action and Limit Levels, monitoring results and Event / Action Plans.

Section 5: **Water Quality Monitoring** – summarises the monitoring parameters, monitoring programmes, monitoring methodologies, monitoring frequency, monitoring locations, Action and Limit Levels, monitoring results and Event / Action Plans.

Section 6: **Ecological Monitoring** – summarises the monitoring parameters, monitoring programmes, monitoring methodologies, monitoring frequency, monitoring locations and Action and Limit Levels, monitoring results and Event / Action Plans.

Section 7: **Cultural Heritage** –summarises the monitoring parameters, monitoring programmes, monitoring methodologies, monitoring frequency, monitoring locations and monitoring results.

Section 8: **Landscape and Visual Monitoring Requirements** – summarises the requirements of landscape and visual monitoring

Section 9: **Landfill Gas Monitoring** – summarises the monitoring parameters, monitoring programmes, monitoring methodologies, monitoring frequency, monitoring locations, monitoring results and Limit Levels and Action Plan

Section 10: **Environmental Site Inspection** – summarises the audit findings of the weekly site inspections undertaken within the reporting month.

Section 11: **Waste Management** – summarises the waste management data in the reporting month.

Section 12: **Environmental Non-conformance** – summarises any monitoring exceedance, environmental complaints, environmental summons and successful prosecutions within the reporting month.

Section 13: **Future Key Issues** – summarises the impact forecast and monitoring schedule for the next three months.

Section 14: **Conclusions and Recommendation**

2. PROJECT INFORMATION

Background

2.1 In 2002, Civil Engineering and Development Department (CEDD) commissioned an integrated planning and engineering study under Agreement No. CE 87/2001 (CE) "Further Development of Tseung Kwan O – Feasibility Study" (the "TKO Study") to formulate a comprehensive plan for further development of TKO New Town. It recommended to further develop TKO to house a total population of 450,000 besides the district's continuous commercial and industrial developments.

2.2 At present, the Tseung Kwan O Tunnel is the main connection between Tseung Kwan O (TKO) and other areas in the territory. To cope with the anticipated transport need, the TKO Study recommended the provision of Tseung Kwan O – Lam Tin Tunnel (TKO-LTT) (hereinafter referred to as "the Project") and Cross Bay Link (CBL) to meet the long-term traffic demand between TKO and the external areas. The site layout plan for the Project is shown in **Figure 1**. CBL was also entrusted with part of the marine viaducts near Tseung Kwan O Interchange since the commencement of the CBL project the December 2018.

2.3 The Environmental Impact Assessment (EIA) Report for the TKO-LTT project was approved under the Environmental Impact Assessment Ordinance (EIAO) in July 2013. The corresponding Environmental Permit (EP) was issued in August 2013 (EP no.: EP-458/2013). Variations to the EP was applied and the latest EP (EP no.: EP-458/2013/C) was issued by the Director of Environmental Protection (DEP) in January 2017.

2.4 The commencement dates of construction of this Project are:

- Contract No. NE/2015/01 and Contract No. NE/2015/02: 7 November 2016.
- Contract No. NE/2015/03: 29 May 2017.
- Contract No. NE/2017/02: 15 March 2018.
- Contract No. NE/2017/01: 23 May 2018.
- Contract No. NE/2017/06: 09 November 2018.

Project Organizations

2.5 Different parties with different levels of involvement in the project organization include:

- Project Proponent – Civil Engineering and Development Department (CEDD)
- The Engineer and the Engineer's Representative (ER) – AECOM
- Environmental Team (ET) – Cinotech Consultants Limited (Cinotech)
- Independent Environmental Checker (IEC) – AnewR Consulting Limited (AnewR)

2.6 The key contacts of the Project are shown in **Table 2.1**.

Table 2.1 Key Project Contacts

Party	Role	Contact Person	Phone No.	Fax No.
CEDD	Project Proponent	Mr. LO Sai Pak, Sunny	2301 1384	2739 0076
AECOM	Engineer's Representative	Mr. KY Chan	3922 9000	2759 1698
Cinotech	Environmental Team	Dr. HF Chan	2151 2088	3107 1388
		Mr. KS Lee	2151 2091	
AnewR	Independent Environmental Checker	Mr. Adi Lee	2618 2836	3007 8648

Construction Activities undertaken during the Reporting Month

2.7 The major site activities undertaken in the reporting month included:

Table 2.2 Summary Table for Major Site Activities in the Reporting Month

Contract No.	Project Title	Site Activities (December 2019)	
NE/2015/01	Tseung Kwan O – Lam Tin Tunnel – Main Tunnel and Associated Works	Lam Tin Interchange	1) EHC2 U-Trough 2) Site Formation – Area 1G1, Area 1G2, Area 2, Area 3, Area 4 & Area 5 3) Administration Building
		Main Tunnel	4) Main Tunnel Excavation 5) Main Tunnel Lining Works
		TKO Interchange	6) Haul Road Construction and Site Formation & Slope Works 7) Cavern Excavation 8) Bridge Construction
NE/2015/02	Tseung Kwan O – Lam Tin Tunnel – Road P2 and Associated Works	1) Site formation works and drainage for Road P2 CH500-CH650 and SR1 2) Site formation and drainage works for SR2 CH250 – CH350 3) Structure works for U-trough CH318 – CH363.50 4) Construction of utility trough and pre-cast concrete barrier at P2 U-trough CH411 – CH500 and SR2 CH170 – CH250 5) Site establishment for construction of underpass at CH105 – CH318 6) 1st layer excavation for underpass CH105 – CH318 7) Installation of strut/ wailing at 1st layer of ELS for CH105 – CH318 underpass 8) Installation of de-watering system at CH105 – CH318 ELS 9) Surcharging of surcharge areas 2b1, 3, 5, 6 10) Transporting treated marine sediment from Area A to Portion IX for reclamation	

Contract No.	Project Title	Site Activities (December 2019)
		11) Removal of surcharge area 4 & 6 12) Installation of socketed H-pile at S200 CH821 – P2 CH105 13) Advance works and pre-drilling works at Zone 1: CT01 CH213 – CH366 14) Pre-boring for sheetpile at S200 CH821 – P2 CH105
NE/2015/03	Tseung Kwan O – Lam Tin Tunnel – Northern Footbridge	The construction works under the contract had been completed in December 2019
NE/2017/01	Tseung Kwan O – Lam Tin Tunnel – Tseung Kwan O Interchange and Associated Works	1) Construction of Temporary Platform 2) Construction of Pile Cap 3) Construction of Pier 4) Construction of Pier Head Works 5) Pre-drilling Works
NE/2017/02	Tseung Kwan O – Lam Tin Tunnel – Road P2/D4 and Associated Works	1) Trial pit 2) Underground utilities detection 3) Temporary traffic arrangement Setup 4) Pile Cap construction 5) Construction of drainage and watermain Predrilling 6) Bored Piles Works
NE/2017/06	Tseung Kwan O – Lam Tin Tunnel – Traffic Control and Surveillance System(TCSS) and Associated Works	Nil

2.8 The construction programme showing the inter-relationship with environmental protection/mitigation measures are presented in **Table 2.3**.

Table 2.3 Construction Programme Showing the Inter-Relationship with Environmental Protection/Mitigation Measures

Construction Works	Major Environmental Impact	Control Measures
As mentioned in **Table 2.2**	Noise, dust impact, water quality and waste generation	• Sufficient watering of the works site with active dust emitting activities • Properly cover the stockpiles • On-site waste sorting and implementation of trip ticket system • Appropriate desilting/sedimentation devices provided on site for treatment before discharge • Use of quiet plant and well-maintained construction plant • Provide movable noise barrier

Status of Environmental Licences, Notification and Permits

2.9 A summary of the relevant permits, licences, and/or notifications on environmental protection for this Project is presented in **Table 2.4**.

Table 2.4 Summary of the Status of Environmental Licences, Notification and Permits

Contract No.	Permit / License No.	Valid Period		Status
		From	To	
Environmental Permit (EP)				
N/A	EP-458/2013/C	20/1/2017	N/A	Valid
Notification pursuant to Air Pollution Control (Construction Dust) Regulation				
NE/2015/01	EPD Ref no.: 405305	21/07/2016	N/A	Valid
	EPD Ref no.: 405582	28/07/2016	N/A	Valid
NE/2015/02	EPD Ref no.: 406100	12/08/2016	N/A	Valid
NE/2015/03	EPD Ref no.: 416072	26/04/2017	N/A	Valid
NE/2017/02	EPD Ref no.: 429867	19/01/2018	N/A	Valid
NE/2017/01	EPD Ref no.: 430070	25/01/2018	N/A	Valid
Billing Account for Construction Waste Disposal				
NE/2015/01	Account No. 7025431	11/07/2016	30/09/2020	Valid
NE/2015/02	Account No. 7025654	16/08/2016	N/A	Valid
NE/2015/03	Account No. 7026805	30/12/2016	N/A	Valid
NE/2017/02	Account No. 7029651	22/12/2017	N/A	Valid
NE/2017/01	Account No. 7029994	01/02/2018	N/A	Valid
NE/2017/06	Account No. 7032520	22/11/2018	N/A	Valid
Registration of Chemical Waste Producer				
NE/2015/01	Waste Producer No. 5218-290-L2881-02	22/08/2016	N/A	Valid
	Waste Producer No. 5213-833-L2532-03	22/08/2016	N/A	Valid
NE/2015/02	Waste Producer No. 5213-838-C4094-01	23/08/2016	N/A	Valid
NE/2015/03	Waste Producer No. 5213-265-W3435-04	19/07/2017	N/A	Valid
NE/2017/02	Waste Producer No. 5213-833-Z4004-04	01/02/2018	N/A	Valid
NE/2017/01	Waste Producer No. 5213-833-C4262-01	12/02/2018	N/A	Valid
Effluent Discharge License under Water Pollution Control Ordinance				
NE/2015/01	WT00025806-2016	18/07/2018	30/11/2021	Valid
	WT00026212-2016	16/05/2017	30/11/2021	Valid
	WT00027354-2017	22/03/2017	31/03/2022	Valid
	WT00027405-2017	22/03/2017	31/03/2022	Valid
	WT00028495-2017	11/08/2017	31/08/2022	Valid
NE/2015/02	WT00026386-2016	15/12/2016	31/12/2021	Valid
	WT00027226-2017	23/02/2017	28/02/2022	Valid
	WT00030654-2018	16/04/2018	30/04/2023	Valid

Contract No.	Permit / License No.	Valid Period		Status
		From	To	
NE/2015/03	WT00027295-2017	20/03/2017	31/03/2022	Valid
NE/2017/01	WT00030711-2018	11/04/2018	30/04/2023	Valid
	WT00030716-2018	23/05/2018	31/05/2023	Valid
NE/2017/02	WT00030654-2018	16/04/2018	30/04/2023	Valid
Construction Noise Permit (CNP)				
NE/2015/01	GW-RE0425-19	23/06/2019	22/12/2019	Expired on 22 Dec 2019
	GW-RE0732-19	13/09/2019	05/12/2019	Expired on 05 Dec 2019
	GW-RE0790-19	08/10/2019	03/12/2019	Expired on 03 Dec 2019
	GW-RE0872-19	07/11/2019	08/01/2020	Valid
	GW-RE0894-19	05/11/2019	02/01/2020	Valid
	GW-RE0937-19	23/11/2019	22/01/2020	Valid
	GW-RE0955-19	04/12/2019	03/03/2020	Valid
	GW-RE0959-19	08/12/2019	07/03/2020	Valid
	GW-RE0962-19	05/12/2019	05/03/2020	Valid
	GW-RE1000-19	23/12/2019	22/06/2020	Valid
	GW-RE1030-19	27/12/209	16/02/2020	Valid
NE/2015/02	GW-RE0355-19	02/06/2019	01/12/2019	Expired on 01 Dec 2019
	GW-RE0733-19	16/09/2019	15/12/2019	Expired on 15 Dec 2019
	GW-RE0791-19	11/10/2019	10/04/2020	Valid
	GW-RE0867-19	05/11/2019	04/01/2020	Valid
	GW-RE0987-19	06/12/2019	01/06/2020	Valid
	GW-RE0995-19	15/12/2019	14/06/2020	Valid
NE/2017/01	GW-RE0907-19	05/11/2019	04/05/2020	Valid
	GW-RE0909-19	13/11/2019	05/05/2020	Valid
Marine Dumping Permit				
NE/2017/01	EP/MD/20-034	06/08/2019	31/12/2019	Valid
Specified Process (SP) License				
NE/2015/01	L-11-053	09/03/2018	08/03/2021	Valid

Summary of EM&A Requirements

2.10 The EM&A programme requires construction noise monitoring, air quality monitoring, water quality monitoring, environmental site audit, etc. The EM&A requirements for each parameter are described in the following sections, including:

- All monitoring parameters;
- Action and Limit levels for all environmental parameters;
- Event Action Plans;

- Environmental mitigation measures, as recommended in the Project EIA Report.

2.11 The advice on the implementation status of environmental protection and pollution control/mitigation measures is summarized in **Section 10** of this report.

2.12 This report presents the monitoring results, observations, locations, equipment, period, methodology and QA/QC procedures of the monitoring parameters of the required environmental monitoring works and audit works for the Project in December 2019.

3. AIR QUALITY

Monitoring Requirements

3.1 According to EM&A Manual of the Project, 1-hour and 24-hour TSP monitoring are required to monitor the air quality. For regular impact monitoring, a sampling frequency of at least once in every six days shall be undertaken at all of the monitoring stations for 24-hour TSP monitoring. For 1-hour TSP monitoring, the sampling frequency of at least three times in every six days shall be undertaken when the highest dust impact occurs. **Appendix A** shows the established Action/Limit Levels for the environmental monitoring works.

Monitoring Locations

3.2 Six designated monitoring stations were selected for air quality monitoring programme. **Table 3.1** describes the air quality monitoring locations, which are also depicted in **Figure 2**.

Table 3.1 Locations for Air Quality Monitoring

Monitoring Stations	Location	Location of Measurement
AM1	Tin Hau Temple	Ground Level
AM2	Sai Tso Wan Recreation Ground	Ground Level
AM3	Yau Lai Estate Bik Lai House	Rooftop (41/F)
AM4(1)	Sitting-out Area at Cha Kwo Ling Village	Ground Level
AM4(A)(2) (*)	Cha Kwo Ling Public Cargo Working Area Administrative Office	Rooftop (3/F)
AM5(A)(*)	Tseung Kwan O DSD Desilting Compound	Ground Level
AM6(A) (*)	Park Central, L1/F Open Space Area	1/F

Remarks: (1) For 1-hour TSP monitoring; (2) For 24-hour TSP monitoring

(*) Air quality monitoring at designated station AM4(24-hr TSP), AM5 and AM6 was rejected by the premise owners. Therefore, baseline and impact air quality monitoring works were carried out at alternative air quality monitoring stations AM4(A) (24-hr TSP only), AM5(A) and AM6(A) respectively.

Monitoring Equipment

3.3 High Volume Samplers (HVS) were used to carry out 24-hour TSP monitoring. Direct reading dust meter were also used to measure 1-hour average TSP levels. The 1-hour sampling was determined periodically by HVS to check the validity and accuracy of the results measured by direct reading method.

3.4 Wind data monitoring equipment was set at rooftop (about 41/F) of Yau Lai Estate Bik Lai House for logging wind speed and wind direction such that the wind sensors are clear of obstructions or turbulence caused by building. The wind data monitoring equipment is re-calibrated at least once every six months and the wind directions are divided into 16 sectors of 22.5 degrees each. The location is shown in **Figure 2**.

3.5 **Table 3.2** summarizes the equipment to be used in the air quality monitoring. Copies of calibration certificates are attached in **Appendix B**.

Table 3.2 Air Quality Monitoring Equipment

Equipment	Model and Make	Quantity
Calibrator	TISCH Model: TE-5025A	1
1-hour TSP Dust Meter	Sibata Model No.: LD-3B / LD-5R	6
	Met One Instruments Model No.: AEROCET-831	0
	Handheld Particle Counter Hal-HPC300 / Hal-HPC301	0
HVS Sampler	TISCH Model: TE-5170	1
	GMW Model: GS2310	5
Wind Anemometer	Davis Weather Monitor II, Model no. 7440	1
	Davis Weather Stations, Vantage Pro 2, Model No. 6152CUK	0

Monitoring Parameters and Frequency

3.6 **Table 3.3** summarizes the monitoring parameters, monitoring period and frequencies of air quality monitoring.

Table 3.3 Frequency and Parameters of Air Quality Monitoring

Monitoring Stations	Parameter	Frequency
AM1, AM2, AM3, AM4, AM5(A) and AM6(A)	1-hour TSP	3 times per 6 days
AM1, AM2, AM3, AM4(A), AM5(A) and AM6(A)	24-hour TSP	Once per 6 days

Monitoring Methodology

1-hour TSP Monitoring

Measuring Procedures

3.7 The measuring procedures of the 1-hour dust meter are in accordance with the Manufacturer's Instruction Manual as follows:

(Model LD3 / LD3B / LD5R)

- The 1-hour dust meter is placed at least 1.3 meters above ground.
- Set POWER to "ON" and make sure that the battery level was not flash or in low level.
- Allow the instrument to stand for about 3 minutes and then the cap of the air sampling inlet has been released.
- Push the knob at MEASURE position.
- Set time/mode setting to [BG] by pushing the time setting switch. Then, start the background measurement by pushing the start/stop switch once. It will take 6 sec. to complete the background measurement.
- Push the time setting switch to change the time setting display to [MANUAL] at the bottom left of the liquid crystal display. Finally, push the start/stop switch to stop the measuring after 1 hour sampling.
- Information such as sampling date, time, count value and site condition were recorded during the monitoring period.

(AEROCET-531)

- The 1-hour dust meter is placed at least 1.3 meters above ground.
- Remove the red rubber cap from the AEROCET-531 inlet nozzle.
- Turn on the power switch that is located on the right side of the AEROCET-531.
- On power up the product intro screen is displayed for 3 seconds. The intro screen displays the product name and firmware version.
- Then the main counter screen will be displayed.
- Press the START button. Internal vacuum pump start running. After 1 minute the pump will stop and the 0.5µm and 5µm channels will show the cumulative counts of particles larger than 0.5µm and 5µm per cubic foot.
- The AEROCET-531 is now checked out and ready for use.
- To switch off the AEROCET-531 power to stop the measuring after 1 hour sampling.
- Information such as sampling date, time, and display value and site condition were recorded during the monitoring period.

(Equipment: Hal Technology; Model no. Hal-HPC300 / Hal-HPC301)

- The 1-hour dust meter is placed at least 1.3 meters above ground.
- Set POWER to "ON" and make sure that the battery level was not flash or in low level.
- Allow the instrument to stand for about 3 minutes and then the cap of the air sampling inlet has been released.
- Push the knob at MEASURE position.
- Set time/mode setting to [BG] by pushing the time setting switch. Then, start the background measurement by pushing the start/stop switch once. It will take 6 sec. to complete the background measurement.
- Push the time setting switch to change the time setting display to [MANUAL] at the bottom left of the liquid crystal display. Finally, push the start/stop switch to stop the measuring after 1 hour sampling.
- Information such as sampling date, time, count value and site condition were recorded during the monitoring period.

Maintenance/Calibration

3.8 The following maintenance/calibration is required for the direct dust meters:

- Check and calibrate the meter by HVS to check the validity and accuracy of the results measured by direct reading method at 2-month intervals throughout all stages of the air quality monitoring.

24-hour TSP Monitoring

Instrumentation

3.9 High volume samplers (HVS) (TISCH Model: TE-5170 and GMW Model: GS2310) completed with appropriate sampling inlets were employed for 24-hour TSP monitoring. The sampler is composed of a motor, a filter holder, a flow controller and a sampling inlet and its performance specification complied with that required by USEPA Standard Title 40, Code of Federation Regulations Chapter 1 (Part 50).

3.10 The positioning of the HVS samplers are as follows:

- a horizontal platform with appropriate support to secure the samplers against gusty wind shall be provided;
- no two samplers shall be placed less than 2 meter 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 metres of separation from walls, parapets and penthouses is required for rooftop samplers;
- a minimum of 2 metres of 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 metres from the dripline;
- any wire fence and gate, to protect the sampler, shall 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.

Operating/analytical procedures for the operation of HVS

3.11 Prior to the commencement of the dust sampling, the flow rate of the high volume sampler was properly set (between 1.1 m^3/min. and 1.4 m^3/min.) in accordance with the manufacturer's instruction to within the range recommended in USEPA Standard Title 40, CFR Part 50.

3.12 For TSP sampling, fiberglass filters with a collection efficiency of > 99% for particles of 0.3μm diameter were used.

3.13 The power supply was checked to ensure the sampler worked properly. On sampling, the sampler was operated for 5 minutes to establish thermal equilibrium before placing any filter media at the designated air monitoring station.

3.14 The filter holding frame was then removed by loosening the four nuts and a weighted and conditioned filter was carefully centred with the stamped number upwards, on a supporting screen.

3.15 The filter was aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter. Then the filter holding frame was tightened to the filter holder with swing bolts. The applied pressure should be sufficient to avoid air leakage at the edges.

3.16 The shelter lid was closed and secured with the aluminium strip.

3.17 The timer was then programmed. Information was recorded on the record sheet, which included the starting time, the weather condition and the filter number (the initial weight of the filter paper can be found out by using the filter number).

3.18 After sampling, the filter was removed and sent to the HOKLAS laboratory (Wellab Ltd.) for weighing. The elapsed time will be also recorded.

3.19 Before weighing, all filters was equilibrated in a conditioning environment for 24 hours. The conditioning environment temperature should be between 25°C and 30°C and not vary by more than ±3°C; the relative humidity (RH) should be < 50% and not vary by more than ±5%. A convenient working RH is 40%.

Maintenance/Calibration

3.20 The following maintenance/calibration is required for the HVS:

- The high volume motors and their accessories will be properly maintained. Appropriate maintenance such as routine motor brushes replacement and electrical wiring checking will be made to ensure that the equipment and necessary power supply are in good working condition.
- High volume samplers will be calibrated at bi-monthly intervals using TE-5025A Calibration Kit throughout all stages of the air quality monitoring.

Results and Observations

3.21 No Action/Limit Level exceedance was recorded for both 1-hour TSP and 24-hour TSP monitoring respectively.

3.22 The air temperature, precipitation and the relative humidity data was obtained from Hong Kong Observatory where the wind speed and wind direction were recorded by the installed Wind Anemometer at rooftop of Yau Lai Estate Bik Lai House (41/F). The location is shown in **Figure 2**. This weather information for the reporting month is summarized in **Appendix C**.

3.23 The monitoring data and graphical presentations of 1-hour and 24-hour TSP monitoring results are shown in **Appendix E** and **Appendix F** respectively.

3.24 According to our field observations, the major dust source identified at the designated air quality monitoring stations are as follows:

Table 3.4 Major Dust Source during Air Quality Monitoring

Station	Major Dust Source
AM1 – Tin Hau Temple	Road Traffic at Cha Kwo Ling Road
AM2 – Sai Tso Wan Recreation Ground	N/A
AM3 – Yau Lai Estate Bik Lai House	Road Traffic near Eastern Cross Harbour Tunnel Toll Plaza
AM4 - Sitting-out Area at Cha Kwo Ling Village	Road Traffic at Cha Kwo Ling Road
AM4(A) - Cha Kwo Ling Public Cargo Working Area Administrative Office	Road Traffic at Cha Kwo Ling Road
AM5(A) - Tseung Kwan O DSD Desilting Compound	Vehicle Movement within the Desilting Compound
AM6(A) - Park Central, L1/F Open Space Area	Road Traffic at Po Yap Road

4. NOISE

Monitoring Requirements

4.1 According to EM&A Manual of the Project, construction noise monitoring was conducted to monitor the construction noise arising from the construction activities. The regular monitoring frequency for each monitoring station shall be on a weekly basis and conduct one set of measurements between 0700 and 1900 hours on normal weekdays. **Appendix A** shows the established Action and Limit Levels for the environmental monitoring works.

Monitoring Locations

4.2 Noise monitoring was conducted at 8 designated monitoring stations (CM1, CM2, CM3, CM4, CM5, CM6(A), CM7(A), CM8(A)) in the reporting period. **Table 4.1** and **Figure 3** show the locations of these stations.

Table 4.1 Noise Monitoring Stations

Monitoring Stations	Locations	Location of Measurement
CM1	Nga Lai House, Yau Lai Estate Phase 1, Yau Tong	Rooftop (41/F)
CM2	Bik Lai House, Yau Lai Estate Phase 1, Yau Tong	Rooftop (41/F)
CM3	Block S, Yau Lai Estate Phase 5, Yau Tong	Rooftop (40/F)
CM4	Tin Hau Temple, Cha Kwo Ling	Ground Level
CM5	CCC Kei Faat Primary School, Yau Tong	Rooftop (6/F)
CM6(A)*	Site Boundary of Contract No. NE/2015/02 near Tower 1, Ocean Shores	Ground Level
CM7(A)*	Site Boundary of Contract No. NE/2015/02 near Tower 7, Ocean Shores	Ground Level
CM8(A)*	Park Central, L1/F Open Space Area	1/F
CM9(A)[1]	Rooftop of Capri Tower 10	Rooftop (12/F)

Remarks:

* Noise monitoring at designated station CM6, CM7 & CM8 was rejected by the premise owners. Therefore, baseline and impact noise monitoring works were carried out at alternative noise monitoring stations CM6(A), CM7(A) and CM8(A) respectively.

[1] Ad-hoc noise monitoring at station CM9(A) was commenced in September 2019.

4.3 Since the population intake of Capri had commenced during the construction of the TKOLTT, the noise monitoring work in daytime period was conducted at CM9(A) – Rooftop of Capri Tower 10 on normal weekdays. The background Noise Level was recorded during the Lunch Hour of Construction Site (i.e. 12:00-13:00) and to be used as the referencing value for compliance checking for Noise Action and Limit Level.

Monitoring Equipment

4.4 Integrating Sound Level Meter was used for impact noise monitoring. The meters are Type 1 sound level meter capable of giving a continuous readout of the noise level readings including equivalent continuous sound pressure level (L_{eq}) and percentile sound pressure level (L_x) that also complied with International Electrotechnical

Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1) specifications. **Table 4.2** summarizes the noise monitoring equipment being used. Copies of calibration certificates are attached in **Appendix B**.

Table 4.2 Noise Monitoring Equipment

Equipment	Model and Make	Quantity
Integrating Sound Level Meter	SVAN 957/ 959 / 979	1
	BSWA308 SLM	2
Calibrator	SV30A	0
	Brüel & Kjær 4231	0
	ST-120	2

4.5 **Table 4.3** summarizes the monitoring parameters, frequency and total duration of monitoring. The noise monitoring schedule is shown in **Appendix D**. Additional weekly impact monitoring are carried out for evening time (1900 – 2300 hours) for monitoring stations CM1, CM2, CM3 & CM6(A) and night-time (2300 – 0700 hours) for monitoring stations CM1, CM2 & CM3.

Table 4.3 Frequency and Parameters of Noise Monitoring

Monitoring Stations	Parameter	Period	Frequency	Measurement
CM1	L_{10}(30 min) dB(A) L_{90}(30 min) dB(A) L_{eq}(30 min) dB(A)	0700-1900 hrs on normal weekdays	Once per week	Façade
CM2				Façade
CM3				Façade
CM4				Façade
CM5				Façade
CM6(A)				Free Field
CM7(A)				Free Field
CM8(A)				Façade
CM9(A)				Façade
CM1	L_{10}(5 min) dB(A) L_{90}(5 min) dB(A) L_{eq}(5 min) dB(A)	1900 – 0700 hrs on normal weekdays		Façade
CM2				Façade
CM3				Façade
CM6(A)		1900 – 2300 hrs on normal weekdays		Free Field

Monitoring Methodology and QA/QC Procedure

4.6 The monitoring procedures are as follows:

- The monitoring station was normally be at a point 1m from the exterior of the sensitive receivers building façade and be at a position 1.2m above the ground.
- For free field measurement, the meter was positioned away from any nearby reflective surfaces. All records for free field noise levels was adjusted with a correction of +3 dB(A).
- The battery condition was checked to ensure the correct functioning of the meter.

- Parameters such as frequency weighting, the time weighting and the measurement time was set as follows:
  - frequency weighting: A
  - time weighting : Fast
  - measurement time : 30 minutes
- Prior to and after each noise measurement, the meter was calibrated using a Calibrator for 94.0 dB at 1000 Hz. If the difference in the calibration level before and after measurement will be more than 1.0 dB, the measurement would be considered invalid and repeat of noise measurement would be required after re-calibration or repair of the equipment.
- At the end of the monitoring period, the L_{eq}, L_{90} and L_{10} was recorded. In addition, noise sources was recorded on a standard record sheet.
- Noise monitoring will be cancelled in the presence of fog, rain, and wind with a steady speed exceeding 5 m/s, or wind with gusts exceeding 10 m/s. Supplementary monitoring was provided to ensure sufficient data would be obtained.

Maintenance and Calibration

4.7 The microphone head of the sound level meter and calibrator was cleaned with a soft cloth at quarterly intervals.

4.8 The sound level meter and calibrator was checked and calibrated at yearly intervals.

4.9 Immediately prior to and following each noise measurement the accuracy of the sound level meter was 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 levels from before and after the noise measurement agree to within 1.0 dB.

Results and Observations

4.10 Five (5) Action Level exceedances were recorded due to the documented complaints received in this reporting month. No exceedance for day-time and night-time construction noise monitoring was recorded and no Limit Level exceedance for day time was recorded in the reporting month.

4.11 Noise monitoring results and graphical presentations are shown in **Appendix G**.

4.12 The major noise source identified at the noise monitoring stations are shown in **Table 4.4**.

Table 4.4 Major Noise Source during Noise Monitoring

Monitoring Stations	Locations	Major Noise Source
CM1	Nga Lai House, Yau Lai Estate Phase 1, Yau Tong	Road Traffic near Eastern Cross Harbour Tunnel Toll Plaza
CM2	Bik Lai House, Yau Lai Estate Phase 1, Yau Tong	Road Traffic near Eastern Cross Harbour Tunnel Toll Plaza
CM3	Block S, Yau Lai Estate Phase 5, Yau Tong	Road Traffic near Eastern Cross Harbour Tunnel Toll Plaza

CM4	Tin Hau Temple, Cha Kwo Ling	Road Traffic at Cha Kwo Ling Road
CM5	CCC Kei Faat Primary School, Yau Tong	Road Traffic at Yau Tong Road
CM6(A)	Site Boundary of Contract No. NE/2015/02 near Tower 1, Ocean Shores	Road Traffic at O King Road near Ocean Shores
CM7(A)	Site Boundary of Contract No. NE/2015/02 near Tower 7, Ocean Shores	Road Traffic at Tong Yin Street
CM8(A)	Park Central, L1/F Open Space Area	Road Traffic at Po Yap Road
CM9(A)	Rooftop of Capri Tower 10	Construction Noise from Portion V/Area A of NE/2015/02 site area

4.13 All the Construction Noise Levels (CNLs) reported in this report were adjusted with the corresponding baseline level (i.e. Measured L_{eq} – Baseline L_{eq} = CNL), in order to facilitate the interpretation of the noise exceedance. The baseline noise level and the Noise Limit Level at each designated noise monitoring station are presented in **Table 4.5, 4.6 and 4.7**.

Table 4.5 Baseline Noise Level and Noise Limit Level for Monitoring Stations

Station	Baseline Noise Level, dB (A) (at 0700 – 1900 hrs on normal weekdays)	Noise Limit Level, dB (A) (at 0700 – 1900 hrs on normal weekdays)
CM1	65.5	75
CM2	63.6	
CM3	65.6	
CM4	62.0	
CM5	68.2	70*
CM6(A)	61.9	75
CM7(A)	58.3	
CM8(A)	69.1	
CM9(A)	N/A(1)	

(*) Noise Limit Level is 65 dB(A) during school examination periods.
(1)) The background Noise Level was recorded during the Lunch Hour of Construction Site (i.e. 12:00-13:00) and to be used as the referencing value for compliance checking for Noise Action and Limit Level.

Table 4.6 Baseline Noise Level and Noise Limit Level for Monitoring Stations (Evening-time & Daytime (Holiday))

Station	Baseline Noise Level, dB (A) (Evening time on all days (1900-2300 hrs) and Holidays (including Sundays) during daytime (0700-1900 hrs))	Noise Limit Level, dB (A) (Evening time on all days (1900-2300 hrs) and Holidays (including Sundays) during daytime (0700-1900 hrs))
CM1	64.4	70
CM2	62.2	
CM3	64.7	
CM6(A)	60.2	65[1]

1. ASR B was adopted according to the EIA as traffic in the surrounding area has not been changed.

Table 4.7 Baseline Noise Level and Noise Limit Level for Monitoring Stations (Night-time)

Station	Baseline Noise Level, dB (A) (Night-time (2300 – 0700 hrs)	Noise Limit Level, dB (A) (Night-time (2300 – 0700 hrs)
CM1	14-day baseline monitoring results for the time period of impact measurement at each station would be adopted	55
CM2		
CM3		

Current Tunnel Blasting Arrangement

4.14 The drill and blast method was evaluated as the most appropriate method and the general practice of this method was introduced during the EIA report assessment. The paragraphs 2.9.9 and 2.9.33 of the EIA Report mention that there might be one blast or multiple blasts and the maximum number of blast location per day would be determined by the Contractor to suite his method of working.

4.15 Notwithstanding the information provided by the Engineer at paragraphs 4.6.4 and 6.6.12 of the EIA Report, to minimize blast nuisance to the public and to respond to the community concerns, the tunnel blast should be arranged, where possible, avoiding the blast to be carried out during night time and shortening the blast duration by arranging various work fronts to be blasted at different time slots. Hence, it has become more desirable to split one tunnel blasting operation, which may consist of several blasting work fronts along the tunnels, into a total of two to three tunnel blasts per day. The tunnel blasts, which locate outside the MTR Protection Zone (RPZ) possessing insignificant risk to the MTR's structures would be carried out during day time and before 22:00. For the tunnel blasts within and in close vicinity to RPZ, Contractor's blasting assessment report revealed that those blasts have to be carried out after train service and, generally, at around 01:40.

4.16 Since part of the tunnelling works conducted in this reporting month has encroached on the vicinity of the RPZ, some blasting works were carried out during the mid-night.

5. WATER QUALITY

Monitoring Requirements

Groundwater Quality

5.1 The existing groundwater quality monitoring programme has been suspended as the monitoring results had been deemed non-representative of the impact from the project justified by two major factors: (1) influence on the monitoring results from non-project related factors, such as anthropogenic activities and natural phenomenon; and (2) large separation between the monitoring stations and works area. In addition, as no alternative locations for the groundwater quality monitoring were available, the groundwater quality monitoring has been suspended since October 2019 upon the agreement by EPD.

Marine Water Quality

5.2 Marine water quality monitoring was conducted three times per week at the designated monitoring stations. Monitoring took place two times per monitoring day during mid ebb and mid flood tides at three depths (1 meter from surface, mid depth and 1 meter from the bottom). For Tseung Kwan O Salt Water Intake (i.e. Station M6), water sampling and in-situ measurements was taken at the vertical level where the water abstraction point of the intake is located (i.e. approximately mid-depth level). If the water depth is less than 6m, the mid-depth measurement may be omitted. If the depth is less than 3m, only the mid-depth measurements need to be taken.

5.3 Duplicate in-situ measurements (Dissolved oxygen (DO) concentration, DO saturation, turbidity, pH, temperature and salinity) and water samples (suspended solids (SS)) at each depth were monitored in accordance with the requirements in the EM&A Manual. For selection of tides for in-situ measurement and water sampling, tidal range of individual flood and ebb tides were not less than 0.5m.

5.4 According to the Environmental Review Report (ERR) for Variations of Environmental Permit (Ref: C45-03), water quality monitoring and audit programme was implemented for monitoring of oxygen depletion (e.g. Dissolved Oxygen (DO) level) in this embayed waters during the period when the fully enclosed barrier is installed. A “Proposal for Water Quality Monitoring in Temporary Marine Embayment” has been submitted to EPD in July 2017 to propose the monitoring frequency, parameter, location, etc. EPD has no further comment on the Proposal.

Groundwater Level Monitoring (Piezometer Monitoring)

5.5 Daily piezometer monitoring at any time of the day shall be carried throughout the whole period when any tunnel construction activities are carried out within +/- 50m of the piezometer gate in plan. The monitoring commenced in June 2018. It has switched to monthly basis since 3 October 2018 as the construction activity was 120m away from the piezometer gate. The daily piezometer monitoring has resumed on 19 November 2018, as the construction activity was within 50m. No Action Level exceedance was recorded in the reporting month.

Monitoring Locations

Groundwater Quality

5.6 Stream 1 – Stream 3 is designated for the groundwater quality monitoring according to EM&A Manual. The locations are summarized in **Table 5.1** and shown on **Figure 4**.

Table 5.1 Groundwater Quality Monitoring Stations

Monitoring Streams	Descriptions	Sampling Location
Stream 1	Stream running between the Kwong Tin Estate and Lei Yue Mun Road	1 sampling location for each stream
Stream 2	Stream on western coast of Chiu Keng Wan	
Stream 3	Stream on western coast of Chiu Keng Wan	

Marine Water Quality

5.7 A total of twelve monitoring stations are designated for the water quality monitoring program according to EM&A Manual. One additional monitoring station (W1) is designated for monitoring of oxygen depletion in the embayed waters during the period when the fully enclosed barrier is installed. The locations are also summarized in **Table 5.2** and shown on **Figure 5** and **Figure 9**.

Table 5.2 Marine Quality Monitoring Stations

Monitoring Stations	Descriptions	Coordinates	
		Easting	Northing
M1	Junk Bay Coral Site – Junk Bay near Chiu Keng Wan	844255	817565
M2	Junk Bay Coral Site – Junk Bay	844076	817087
M3	Junk Bay Coral Site – Junk Island	844491	817890
M4	Junk Bay Coral Site –Chiu Keng Wan	843209	816416
M5	Junk Bay Coral Site – Fat Tong Chau	845463	815769
M6	Tseung Kwan O Salt Water Intake	845512	817442
C1	Control Station – Southeast	844696	814773
C2	Control Station – Northwest	842873	816014
G1	Gradient Station	844418	817560
G2	Gradient Station	844290	817384
G3	Gradient Station	844488	817735
G4	Gradient Station	844967	817551
W1	Ocean Shores (for WQM in temporary marine embayment)	844324	817791

Monitoring Equipment

5.8 For in-situ monitoring, a multi-parameter meter (Aquaread AP-2000-D) was used to measure Dissolved oxygen (DO) concentration, DO saturation (DO %), pH, temperature and turbidity. A sampler was used to collect water samples for laboratory analysis of SS, BOD_5, TOC, Total Nitrogen, Ammonia-N and Total Phosphate.

Dissolved Oxygen (DO) and Temperature Measuring Equipment

5.9 The instrument for measuring dissolved oxygen and temperature was portable and weatherproof complete with cable, sensor, comprehensive operation manuals and use DC power source. It was capable of measuring:

- a dissolved oxygen level in the range of 0-20 mg/L and 0-200% saturation; and
- a temperature of 0-45 degree Celsius.

5.10 It has a membrane electrode with automatic temperature compensation complete with a cable.

5.11 Sufficient stocks of spare electrodes and cables were available for replacement where necessary.

5.12 Salinity compensation was built-in in the DO equipment.

Turbidity

5.13 Turbidity was measured in-situ by the nephelometric method. The instrument was portable and weatherproof using a DC power source complete with cable, sensor and comprehensive operation manuals. The equipment was capable of measuring turbidity between 0-1000 NTU. The probe cable was not be less than 25m in length.

pH

5.14 The instrument was consisting of a potentiometer, a glass electrode, a reference electrode and a temperature-compensating device. It was readable to 0.1pH in a range of 0 to 14. Standard buffer solutions of at least pH 7 and pH 10 were used for calibration of the instrument before and after use.

Water Depth Detector

5.15 A portable, battery-operated echo sounder was used for the determination of water depth at each designated monitoring station.

Water Sampler

5.16 Water samples collected for laboratory analysis were stored in high density polythene bottles sample containers, with appropriate preservatives added. All sampling bottles were labelled (waterproof) with the sampling date and time, sample lot number and sampling location reference number to avoid mishandling.

Sample Container and Storage

5.17 Following collection, water samples for laboratory analysis were stored in high density polythene bottles, with preservative appropriately added where necessary. They will be packed in ice (cooled to 4°C without being frozen), delivered to the laboratory and analysed as soon as possible.

Calibration of In-Situ Instruments

5.18 All in-situ monitoring instruments were checked, calibrated and certified by a laboratory accredited under HOKLAS or other international accreditation scheme before use, and subsequently re-calibrated at 3 monthly intervals throughout all stages of the water quality monitoring.

5.19 For the on-site calibration of field equipment, the BS 1427:1993, "Guide to Field and on-site test methods for the analysis of waters" was observed.

5.20 Before each round of monitoring, a zero check in distilled water was performed with the turbidity probe of Aquaread AP-2000-D. The probe was then be calibrated with a solution of known NTU.

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

5.22 **Table 5.3** summarizes the equipment used in the water quality monitoring program. Copies of the calibration certificates of the equipment are shown in **Appendix B**.

Table 5.3 Water Quality Monitoring Equipment

Equipment	Model and Make	Qty.
Water Sampler	Kahlsico Water-Bottle Model 135DW 150	1
Multi-parameter Water Quality System	YSI 6820-C-M	0
	Aquaread AP-2000-D	0
	YSI EXO1 Multiparameter Sondes	1
Monitoring Position Equipment	"Magellan" Handheld GPS Model GPS-320	1
Water Depth Detector	Fishfinder 140	1

Monitoring Parameters and Frequency

5.23 **Table 5.4** summarizes the monitoring parameters, monitoring period and frequencies of the water quality monitoring in the reporting period.

Table 5.4 Water Quality Monitoring Parameters and Frequency

Monitoring Stations	Parameters, unit	Depth	Frequency
Marine Water Quality			
M1 M2 M3 M4 M5 M6 C1 C2 G1 G2 G3 G4	*In-situ*: Dissolved oxygen (DO) concentration, DO saturation, turbidity, pH, temperature and salinity Laboratory Testing: Suspended Solids (SS)	M1-M5, C1-C2, G1-G4 • 3 water depths: 1m below water surface, mid-depth and 1m above sea bed. • If the water depth is less than 3m, mid-depth sampling only. • If the water depth is less than 6m, omit mid-depth sampling. M6 • at the vertical level where the water abstraction point of the intake is located(i.e. approximately mid-depth level)	3 days per week / 2 per monitoring day (1 for mid-ebb and 1 for mid-flood)

Monitoring Stations	Parameters, unit	Depth	Frequency
Water Quality Monitoring in Temporary Marine Embayment			
W1	• DO, mg/L • DO Saturation, % • pH • Water Temperature (°C) • Salinity, ppt	• 3 water depths: 1m below water surface, mid-depth and 1m above sea bed. • If the water depth is less than 3m, mid-depth monitoring only. • If the water depth is less than 6m, omit mid-depth monitoring	Weekly during the period when the fully enclosed barrier is installed

Monitoring Methodology

Marine Water Quality

5.24 The monitoring stations were accessed using survey boat by the guide of a hand-held Global Positioning System (GPS). The depth of the monitoring location was measured using depth meter in order to determine the sampling depths. Afterwards, the probes of the in-situ measurement equipment was lowered to the predetermined depths (1 m below water surface, mid-depth and 1 m above seabed) and the measurements was carried out accordingly. The in-situ measurements at predetermined depths was carried out in duplicate. In case the difference in the duplicate in-situ measurement results was larger than 25%, the third set of in-situ measurement would be carried out for result confirmation purpose.

5.25 Water sampler was lowered into the water to the required depths of sampling. Upon reaching the pre-determined depth, a messenger to activate the sampler was then released to travel down the wire. The water sample was sealed within the sampler before retrieving. At each station, water samples for SS at three depths (1 m below water surface, mid-depth and 1 m above seabed) were collected accordingly. Water samples were stored in a cool box and kept at less than 4°C but without frozen and sent to the laboratory as soon as possible.

Laboratory Analytical Methods

5.26 The testing of all parameters were conducted by Wellab Ltd. (HOKLAS Registration No.083) and comprehensive quality assurance and control procedures in place in order to ensure quality and consistency in results. The testing method and limit of reporting are provided in **Table 5.5**.

Table 5.5 Methods for Laboratory Analysis for Water Samples

Parameters (Unit)	Proposed Method	Reporting Limit	Detection Limit
SS (mg/L)	APHA 2540 D	0.5 mg/L (1)	0.5 mg/L
BOD_5 (mg O_2/L)	APHA 19ed 5210B	2 mg O_2/L	--

TOC (mg-TOC/L)	In-house method SOP020 (Wet Oxidation)	1 mg-TOC/L	--
Total Nitrogen (mg/L)	In-house method SOP063 (FIA)	0.6 mg/L	--
Ammonia-N (mg NH_3-N/L)	In-house method SOP057 (FIA)	0.05 mg NH_3-N/L	--
Total Phosphorus (mg-P/L)(2)	In-house method SOP055 (FIA)	0.05 mg-P/L	--

Note:
1) Limit of Reporting is reported as Detection Limit for non-HOKLAS report.
2) Parameter Total Phosphorus represents the laboratory testing for total phosphate content in water which is the sum of all three forms of phosphates in water.

QA/QC Requirements

Decontamination Procedures

5.27 Water sampling equipment used during the course of the monitoring programme was decontaminated by manual washing and rinsed clean seawater/distilled water after each sampling event. All disposal equipment was discarded after sampling.

Sampling Management and Supervision

5.28 Water samples were dispatched to the testing laboratory for analysis as soon as possible after the sampling. All samples were stored in a cool box and kept at less than 4°C but without frozen. All water samples were handled under chain of custody protocols and relinquished to the laboratory representatives at locations specified by the laboratory.

5.29 QA/QC procedures as attached in **Appendix J** are available for the parameters analysed in the HOKLAS-accredited laboratory, WELLAB Ltd.

Results and Observations

Groundwater Quality Monitoring

5.30 Monitoring of groundwater quality had been suspended since October 2019. (Details refer to Section 5.1)

Marine Water Quality Monitoring

5.31 Marine water monitoring results and graphical presentations are shown in **Appendix I**. Other relevant data was also recorded, such as monitoring location / position, time, sampling depth, weather conditions and any special phenomena or work underway nearby.

5.32 Calculated Action and Limit Levels for Marine Water Quality is presented in **Appendix I**. Sixty-five (65) Action Level and two-hundred and twenty-five (225) exceedance were recorded in marine water quality monitoring.

5.33 Exceedances of turbidity and suspended solid were recorded on from various monitoring stations non-specifically among all stations including the control stations. Investigations over December 2019 showed that the range of SS levels recorded in December 2019 remained consistent with the records in recent months. Despite wet season had ended, the Contractor should keep checking the condition of silt curtains daily through visual inspections and weekly diver inspections. Precaution measures

were also adopted by the Contractor to further enhance the mitigation measures for water quality; the deployment of local double-layered silt curtains to surround the works with potential release of muddy water, and spare silt curtains were placed near the works area to replace any damaged silt curtains. Further details of the exceedance investigation reports can be found in **Appendix K**.

5.34 Silt curtain inspections are carried out before the commencement of the construction works every day and diving surveys are also conducted once a week to inspect the silt curtain below the water level. The inspection report are verified by both the RE and the diving specialist and the records are reviewed weekly during the site audits.

Groundwater Level Monitoring (Piezometer Monitoring)

5.35 Daily piezometer monitoring at any time of the day shall be carried throughout the whole period when any tunnel construction activities are carried out within +/- 50m of the piezometer gate in plan.

5.36 Tunnel construction activities are within +/- 50m of the piezometer gate in plan. Construction phase daily piezometer monitoring by the Contractor commenced in June 2018. It has switched to monthly basis since 3 October 2018 as the construction activity was 120m away from the piezometer gate. The daily piezometer monitoring has resumed on 19 November 2018, as the construction activity was within 50m. No Action Level exceedance was recorded in the reporting month. Details of the result are presented in **Appendix U**.

Mitigation Measures Adopted by Contractors for Surface runoff Prevention

5.37 During dry season, the Contractors have maintained the mitigation measures adopted on Site, in order to prevent surface run-off and muddy water from discharging to the public areas. The mitigation measures adopted by each Contract are summarised below:

NE2015/01

5.38 At Lam Tin Side, the Site drainage systems are divided into two parts, namely the site formation and tunnel site drainage which includes:

1. Site formation drainage system collects surface run-off from open excavation areas including slope works and flows naturally to the lowest point in the Site, where they are pumped to the wetseps and sedimentation tank for treatment near LTI site entrance before they are discharged to designated discharge point.
2. Tunnel drainage system collects surface run-off from the tunnel which are then pumped to the sedimentation tanks near tunnel adit, where three sets of wetseps and sedimentation tanks were set up. The treated water will be discharged to designated discharge point near the Eastern Harbour Crossing (EHC) area.

5.39 At Eastern Harbour Crossing (EHC), two sets of wetseps and sedimentation tanks are set up on site. The wastewater will flow to the lowest catchpit by gravity, which are then pumped to wetseps for wastewater treatment. The sandbags/bunds are also set up at the vehicle entrance to surface run-off from the Site.

5.40 At Tseung Kwan O (TKO), the surface run-off from the slope are directed to the lowest point at cavern via the permanent drainage, which are then pumped to the sedimentation tanks for wastewater treatment via temporary pipes. The treated water will be discharged at designated discharge points. The wetseps and sedimentation tanks are provided under the BMCPC bridge and at the two sides of marine working platform. Water from natural stream will also be diverted to existing drainage to avoid overloading the capacity of the wastewater treatment system. The reservoir on the right side of marine working platform will be enlarged to cater for higher water storage demands. During heavy rainfall, the water stored at the exit of the tunnel shall be pumped into the sedimentation tanks on the right.

NE2015/02

1. The exposed sloped area at Portion 9 has been covered with geotextile or tarpaulin to avoid surface run-off. Temporary peripheral open U-channel are also provided along the surcharge area within the rock mount to collect stormwater and surface run-off.

2. The bund wall near Area A has been extended to 300mm in depth along the drainage system at Area A, extra bund wall shall be provided at the gaps between the concrete block walls in Area A when necessary.
3. Soak away pit with a 600mm in diameter were bored into the ground, down to -14mPD, near the piling works area to cater for the surface runoff at portion 9. The stormwater and the water generated from the piling works are stored temporary at

the pit around the soak away pit, which shall be pumped automatically into the soak away pit where they are soaked into the soil naturally.

4. The stormwater received in Portion 9 shall be directed and pumped via the flex tube and sump towards the water treatment system in Area A and Z. The peripheral open U-channel are also provided along the site boundary, which shall be directed to the storage tank and WetSep for treatment in Area A.
5. Regular cleaning depending on site conditions are provided for the WetSep at Area A and Z; and the storage tanks and sedimentation tanks at Area A. The water treated by the sedimentation tank and the wetsep shall be discharged towards the designated discharge point. Quality of the effluent are also monitored regularly.

NE2017/02

1. Existing manholes are covered with sandbags and geotextiles to avoid surface run-off from entering the channels.
2. Stockpiles are covered with tarpaulin to avoid surface run-off.
3. Concrete blocks and sandbags are placed along the periphery of the site boundary to avoid surface run-off.
4. Stormwater within the site enters the excavated area and flow naturally into the sump due height difference. The stormwater collected in the sump shall be pumped into the sedimentation tank where the run-off are treated before discharging into the designated discharge point.

NE2015/03

1. The existing manhole cover are covered with geotextile to prevent muddy water from entering the existing U-channels along the side of Po Shun Road. Manhole inspection are carried out by taking silt measurement regularly in case if silt enters the channel, and silt shall be removed from the manhole if silt were found.
2. Sandbags were placed at the periphery of the site along the hoarding to prevent surface runoff from escaping the site.
3. Exposed slopes are covered with tarpaulin to prevent surface run-off.
4. The surface run-off shall be pumped into the sedimentation tank where they are treated before entering the designated discharge points

NE2017/01

1. Temporary peripheral open U-channels and sumps are provided for collecting the stormwater, which are pumped and directed towards the sedimentation tank for treatment. The treated water shall be directed to the designated discharge point.

6. ECOLOGY

Post-Translocation Coral Monitoring

6.1 Post-translocation monitoring survey is recommended in the EM&A Manual to audit the success of coral translocation. Information gathered during each post-translocation monitoring survey should include observations on the presence, survival, health condition and growth of the translocated coral colonies. These parameters should then be compared with the baseline results collected from the pre-translocation survey.

6.2 Under Contract No. NE/2015/01 and NE/2015/02, a total of 14 and 29 coral colonies were tagged and translocated respectively from the Donor Site to the Recipient Site in November 2016. Ten (10) corals at the Recipient Site were also tagged by each Contract as reference for post-translocation monitoring.

6.3 The post-translocation coral monitoring shall be conducted once every 3 months after completion for a period of 12 months. Location of post-translocation coral monitoring is shown in **Figure 7**. The fourth post-translocation coral monitoring was carried out on 07 November 2017. No further monitoring is required.

7. CULTURAL HERITAGE

Monitoring Requirement

7.1 According to the EP Conditions and EM&A Manual, monitoring of vibration impacts was conducted when the construction works are less than 100m from the Built Heritage in close proximity of the worksite, namely the Cha Kwo Ling Tin Hau temple. Tilting and settlement monitoring should be applied on the Cha Kwo Ling Tin Hau Temple. Construction works less than 100m from the Cha Kwo Ling Tin Hau temple commenced on 8 May 2017.

7.2 As stated in the "*Built Heritage Mitigation Plan*" for this Project, during the period of the construction works conducted within 100m from the Cha Kwo Ling Tin Hau Temple, monitoring on settlement and tilting will be conducted once a day for the Cha Kwo Ling. Monitoring of vibration will be conducted during blasting at Cha Kwo Ling area once a day. When there is no blasting to be conducted at the area, vibration monitoring at the Cha Kwo Ling Tin Hau Temple will be conducted once per day when there are piling works or rock breaking works within the 100m from the Cha Kwo Ling Tin Hau Temple.

Monitoring Locations

7.3 One vibration monitoring point and three building settlement monitoring points were proposed for monitoring of the cultural heritage. The building settlement markers were placed on the wall on three sides of the Temple, except the front, of the Cha Kwo Ling Tin Hau Temple and the vibration monitoring point is located within the Cha Kwo Ling Tin Hau Temple. Monitoring Location is shown in **Figure 8**.

Monitoring Equipment

7.4 Building settlement is measured via a settlement marker attached to the wall of Cha Kwo Ling Tin Hau Temple by adhesive tape.

7.5 Vibration monitoring was conducted by using vibrographs: Minimate Plus manufactured by Instantel. These vibrographs will be calibrated annually and its performance follows the requirements given in the "*Guidance Note on Vibration Monitoring*" (GN-VM) issued by the Civil Engineering and Development Department, which is based on the Performance Specification for Blasting Seismographs by International Society of Explosive Engineers (ISEE (2000)).

7.6 **Table 7.1** summarizes the equipment employed by the Contractor for cultural heritage monitoring. Copies of calibration certificates are attached in **Appendix B**.

Table 7.1 Cultural Heritage Monitoring Equipment

Equipment	Manufacturer and Model	Quantity
Digital Level for tilting	Leica LS15 Serial No.: 701141	1
Digital Caliper for tilting	Mitutoyo CD-6" ASX Serial No.: A17047921	1
iCivil-1011 Inclinometer for building settlement	iCivil-1011 Inclinometer Serial No.: HK110118 / HK110120	2
Vibrographs for vibration monitoring	MiniMate Plus / MicroMate manufactured by Instantel Model No.: 716A0403 / 721A2501	33

Monitoring Methodology

7.7 Vibrograph (velocity seismograph) was deployed at each monitoring station to measure and record the PPV and amplitude of ground motion in three mutually perpendicular directions. Vibration monitoring equipment fulfils the requirements stated in the Government guidelines and is calibrated to HOKLAS standards. Each monitoring would not be more than 10 minutes. Settlement monitoring should be conducted by surveyors manually.

Alert, Alarm and Action Levels

7.8 The Alert, Alarm and Action (AAA) Levels are given in **Table 7.2**.

Table 7.2 AAA Levels for Monitoring for Cultural Heritage

Parameter	Alert Level	Alarm Level	Action Level
Vibration	ppv: 4.5 mm/s	ppv: 4.8 mm/s	ppv: 5mm/s Maximum Allowable Vibration Amplitude: 0.1mm
Building Settlement Markers	6mm	8mm	10mm
Building Tilting(1)	1:2000	1:1500	1:1000

Remarks:
(1) Building tilting measurement was replaced by building settlement point measurement. The tilting can be calculated by the ratio of the maximum settlement difference between 2 points and the distance between the 2 points.

Results

7.9 In the reporting month, cultural heritage monitoring was carried out by the Contractor at the aforesaid location on 26 occasions. No AAA Level exceedance was recorded in the reporting month. The monitoring results are presented in **Appendix T**.

Mitigation Measures for Cultural Heritage

7.10 According to Condition 3.6 of the EP (EP No.: EP-458/2013/C), to prevent damage to Cha Kwo Ling Tin Hau Temple and its Fung Shui rocks (Child-given rocks) during the construction phase, a temporarily fenced-off buffer zone (Rocks buffer zone is 5 m from the edge of Rocks and 15m from the edge of Rocks alter) with allowance for public access (minimum 1 m) around the temple and the Fung Shui rocks shall be provided. The open yard in front of the temple should be kept as usual for annual Tin Hau festival.

7.11 As there is a large buffer distance from the current works to Cha Kwo Ling Tin Hau Temple and the Fung Shui rocks (Child-given rocks), the temporarily fenced-off rocks buffer zone and from the edge of Rocks alter is not required. The fenced-off rocks buffer zone would be implemented when there is construction activities in vicinity of the cultural heritage.

8. LANDSCAPE AND VISUAL IMPACT REQUIREMENTS

8.1 Landscape and visual mitigation measures during the construction phase shall be checked to ensure that they are fully realized and implemented on site.

8.2 Site audits were carried out on a weekly basis to monitor and audit the timely implementation of landscape and visual mitigation measures listed in "Implementation Schedule and Recommended Mitigation Measures" (shown in **Appendix N)**. The summaries of observations and recommendations related to landscape and visual impacts, if any, are shown in **Appendix L**.

8.3 No non-compliance of the landscape and visual impact was recorded in the reporting month.

9. LANDFILL GAS MONITORING

Monitoring Requirement

9.1 In accordance with the EM&A Manual, monitoring of landfill gas is required for construction works within the Sai Tso Wan Landfill Consultation Zone during the construction phase. This section presents the results of landfill gas measurements performed by the Contractor. **Appendix A** shows the Limit Levels for the monitoring works.

9.2 The "Landfill Gas Monitoring Proposal", including the monitoring programme and detailed actions, is submitted to the EPD for approval. Details of monitoring in this Proposal is in line with the monitoring requirements stipulated in the EM&A Manual.

Monitoring Parameters and Frequency

9.3 Monitoring parameters for Landfill gas monitoring include Methane, Carbon dioxide and Oxygen.

9.4 According to the implementation schedule and recommended mitigation measures of the EM&A Manual, measurements of the following frequencies should be carried out:

Excavations deeper than 1m
- at the ground surface before excavation commences;
- immediately before any worker enters the excavation;
- at the beginning of each working day for the entire period the excavation remains open; and
- periodically throughout the working day whilst workers are in the excavation.

Excavations between 300mm and 1m deep
- directly after the excavation has been completed; and
- periodically whilst the excavation remains open.

For excavations less than 300mm deep
- monitoring may be omitted, at the discretion of the Safety Officer or other appropriately qualified person

Monitoring Locations

9.5 Monitoring of oxygen, methane and carbon dioxide was performed for excavations at 1m depth or more within the Consultation Zone. In this reporting month, the area required to be monitored for landfill gas are shown below and **Figure 6** shows the landfill gas monitoring locations.
- Excavation Locations : Portion III
- Manholes and Chambers : N/A
- Relocation of monitoring wells : N/A
- Any other Confined Spaces : N/A

Monitoring Equipment noise mitigation

9.6 **Table 9.1** summarizes the equipment employed by the Contractor for the landfill gas monitoring.

Table 9.1 Landfill Gas Monitoring Equipment

Equipment	Model and Make	Quantity
Portable gas detector	ALTAIR 5X Multigas Detector (Serial No. 137333)	1

Results and Observations

9.7 In the reporting month, landfill gas monitoring was carried out by the Contractor at the aforesaid locations on 130 occasions. No Limit Level exceedance for landfill gas monitoring was recorded in the reporting month. The monitoring results are provided in **Appendix R**. Copies of calibration certificates are attached in **Appendix B.**

10. ENVIRONMENTAL AUDIT

Site Audits

10.1 Site audits were carried out on a weekly basis to monitor the timely implementation of proper environmental management practices and mitigation measures in the Project site. The summaries of site audits are attached in **Appendix L**.

10.2 Joint weekly site audits by the representatives of the Engineer, Contractor and the ET were conducted in the reporting month as shown in below:

- Contract No. NE/2015/01: 4, 11, 18, 24, 31 December 2019
- Contract No. NE/2015/02: 5, 12, 19, 23 December 2019
- Contract No. NE/2015/03: 5, 12, 19, 23 December 2019
- Contract No. NE/2017/01: 5, 12, 19, 23 December 2019
- Contract No. NE/2017/02: 5, 12, 19, 23 December 2019

10.3 Monthly joint site inspection with the representative of IEC was conducted for NE/2015/01, NE/2015/02, NE/2015/03, NE/2017/01 and NE/2017/02 on 24, 12, 19, 19 and 19 December 2019 respectively.

Implementation Status of Environmental Mitigation Measures

10.4 According to the EIA Study Report, Environmental Permit and the EM&A Manual of the Project, the mitigation measures detailed in the documents are recommended to be implemented during the construction phase. An updated summary of the Implementation Schedule and Recommended Mitigation Measures is provided in **Appendix N**.

10.5 During site inspections in the reporting month, no non-compliance was recorded on reporting month. The observations and recommendations made during the audit sessions are summarized in **Appendix L**.

11. WASTE MANAGEMENT

11.1 Waste generated from this Project includes inert construction and demolition (C&D) materials, non-inert C&D materials and marine sediments. Inert C&D waste includes soil, broken rock, broken concrete and building debris, while non-inert C&D materials are made up of C&D waste which cannot be reused or recycled and has to be disposed of at the designated landfill sites. Marine sediment shall be expected from excavation and dredging works of this Project.

11.2 With reference to relevant handling records of this Project, the quantities of different types of waste generated in the reporting month are summarised and presented in **Appendix P**.

11.3 The Contractors are advised to minimize the wastes generated through the recycling or reusing. All mitigation measures stipulated in the approved EM&A Manual and waste management plans shall be fully implemented. The status of implementation of waste management and reduction measures are summited in **Appendix N**.

12. ENVIRONMENTAL NON-CONFORMANCE

Summary of Exceedances

12.1 Five (5) Action Level exceedances were recorded due to the documented complaints received in the reporting month. Zero (0) and three (3) Limit Level exceedances of construction noise monitoring were recorded for day-time and night-time respectively in the reporting month. The night time Limit Level exceedances were considered due to road traffic near the Eastern Cross Harbour Tunnel Toll Plaza, therefore non-Project related.

12.2 Sixty-five (65) Action Level and two-hundred and twenty-five (225) exceedances were recorded in marine water quality monitoring.

12.3 Actions carried out in accordance with the Event and Action Plans in **Appendix M** are presented in **Appendix K** – Summary of Exceedance.

Summary of Environmental Non-Compliance

12.4 No non-compliance was recorded on this reporting month.

Summary of Environmental Complaint

12.5 Five (5) environmental complaints were received in the reporting month. The Cumulative Complaint Log is presented in **Appendix O**. The investigation status and result is also reported in **Appendix O**.

Summary of Environmental Summon and Successful Prosecution

12.6 No notification of summon or successful environmental prosecution was received in this reporting period. The Cumulative Log for environmental summon and successful prosecution since the commencement of the Project is presented in **Appendix O**.

13. FUTURE KEY ISSUES

13.1 Tentative construction programmes for the next three months are provided in **Appendix Q**.

13.2 Major site activities to be undertaken for the next reporting period are summarized in **Table 13.1**.

Table 13.1 Summary Table for Site Activities in the next Reporting Period

Contract No. and Project Title	Site Activities (January 2020)		Key Environmental Issues *
NE/2015/01 - Tseung Kwan O – Lam Tin Tunnel – Main Tunnel and Associated Works	Lam Tin Interchange	1) EHC2 U-Trough 2) Site Formation – Area 1G1, Area 1G2, Area 2, Area 3, Area 4 & Area 5 3) Administration Building	(A) / (B) / (C) / (D) / (E) / (G)
	Main Tunnel	4) Main Tunnel Excavation 5) Main Tunnel Lining Works	(B)
	TKO Interchange	6) Haul Road Construction and Site Formation & Slope Works 7) Cavern Excavation 8) Bridge Construction	(A) / (C) / (D) / (E) / (F) / (I)
NE/2015/02 - Tseung Kwan O – Lam Tin Tunnel – Road P2 and Associated Works	1) Construction of pillar box and ducting system at Portion IV adjacent to Ocean Shores EVA 2) Construction of utility trough and road barriers at road P2 (land section) 3) Site formation at Road P2 CH500-CH650 and SR1 4) Structure works for U-trough CH318-CH363 5) Drainage works at Road P2 CH500-CH650 and slip road SR1 6) Drainage works at slip road SR2 (CH250 – CH350) 7) Surcharging at surcharge areas 3, 5 8) Installation of 1st layer strut/ wailing at underpass CH105 – CH318 9) Installation of dewatering system (P2 105 – 318) 10) 2nd layer excavation for underpass CH105 – CH318 11) Advance excavation works for underpass section 12) Laying of ducting and drau pit at P2 road CH500 – CH650 & slip road SR1 13) Pre-boring and sheetpile installation at S200 CH821 – P2 CH105 14) Installation of socketed H-pile at S200 CH821 – P2 CH105 15) Removal of surcharge at area 3, 5, 6 16) Drilling for de-watering system at S200 CH821 – P2 CH105 17) Installation of bored piles of abutments		(A) / (B) / (C) / (D) / (E) / (G) / (I)

Contract No. and Project Title	Site Activities (January 2020)	Key Environmental Issues *
	18) Site establishment for construction of underpass at CH105 – CH318 19) Excavation and ELS works at CH105 – CH318 underpass 20) Construction of 900 pipe from SMH9101 – SMH9103 21) Installation of socketed H-pile at CT01 CH213 – CH366	
NE/2015/03 - Tseung Kwan O – Lam Tin Tunnel – Northern Footbridge	The construction works under the contract had been completed in December 2019.	N/A
NE/2017/01 – Tseung Kwan O Interchange and Associated Works	1) Construction of Temporary Working Platform 2) Pre-drilling Works 3) Bored Pilling Works 4) Dismantling Works for Temporary Working Platform 5) Installation of Precast Pile Cap Shell 6) Construction of Pile Cap 7) Construction of Pier 8) Construction of Pier Head Works 9) Segment erection works	(A) / (B) / (E) / (F) / (G)
NE/2017/02 – Tseung Kwan O - Lam Tin Tunnel - Road P2/D4 and Associated Works	1) Trial pit 2) Underground utilities detection 3) Temporary traffic arrangement Setup 4) Pile Cap construction 5) Construction of drainage and watermain Predrilling 6) Bored Piles Works	(A) / (B) / (E) / (F) / (G)
NE/2017/06 – Tseung Kwan O – Lam Tin Tunnel – Traffic Control and Surveillance System(TCSS) and Associated Works	Nil	N/A

Note:
(A) Watering for dust generation from haul road, stockpiles of dusty materials, exposed site area, excavation works and rock breaking activities;
(B) Noisy construction activity such as rock-breaking activities and piling works;
(C) Runoff from exposed slope or site area;
(D) Wastewater and runoff discharge from site;
(E) Accumulation of silt, mud and sand along U-channels and sedimentation tanks;
(F) Set up and implementation of temporary drainage system for the surface runoff;

(G) Storage of chemicals/fuel and chemical waste/waste oil on site;
(H) Accumulation and storage of general and construction waste on site; and
(I) Marine water quality impact and indirect impact to coral communities due to marine construction for TKO-LTT reclamation.

Key Issues for the Coming Month

13.3 Key environmental issues in the coming month include:

- Watering for dust generation from haul road, stockpiles of dusty materials, exposed site area, excavation works and rock breaking activities;
- Noisy construction activity such as rock-breaking activities and piling works;
- Runoff from exposed slope or site area;
- Wastewater and runoff discharge from site;
- Accumulation of silt, mud and sand along U-channels and sedimentation tanks;
- Set up and implementation of temporary drainage system for the surface runoff;
- Storage of chemicals/fuel and chemical waste/waste oil on site;
- Accumulation and storage of general and construction waste on site; and
- Marine water quality impact and indirect impact to coral communities due to marine construction for TKO-LTT reclamation.

14. CONCLUSIONS AND RECOMMENDATIONS

Conclusions

14.1 This is the 38th Environmental Monitoring and Audit (EM&A) Report which presents the EM&A works undertaken during the period in December 2019 in accordance with EM&A Manual and the requirement under EP.

Air Quality Monitoring

14.2 No Action/Limit Level exceedance for 1-hour TSP monitoring was recorded.

14.3 No Action/Limit Level exceedance for 24-hour TSP monitoring was recorded.

Construction Noise Monitoring

14.4 Five (5) Action Level exceedances were recorded due to the documented complaints received in this reporting month.

14.5 No Action/Limit Level exceedances was recorded for daytime construction noise in the reporting month. Three (3) limit level exceedances were recorded for night-time due to road traffic.

Water Quality Monitoring

14.6 Groundwater quality monitoring had been suspended since October 2019. Details shall be referred to **Section 5.1**.

14.7 Sixty-five (65) Action Level and two-hundred and twenty-five (225) Limit Level exceedances were recorded in marine water quality monitoring.

14.8 Tunnel construction activities are within +/- 50m of the piezometer gate in plan. Construction phase daily piezometer monitoring by the Contractor commenced in June 2018. It has switched to monthly basis since 3 October 2018 as the construction activity was 120m away from the piezometer gate. The daily piezometer monitoring has resumed on 19 November 2018, as the construction activity was within 50m. No Action Level exceedance was recorded in the reporting month. Details of the result are presented in **Appendix U**.

Ecological Monitoring

14.9 The post-translocation coral monitoring surveys were completed in November 2017.

Monitoring on Cultural Heritage

14.10 No Alert Alarm and Action (AAA) Level exceedance of cultural heritage monitoring on cultural heritage was recorded in the reporting month.

Landscape and Visual Monitoring and Audit

14.11 No non-compliance of the landscape and visual impact was recorded in the reporting month.

Landfill Gas Monitoring

14.12 Monitoring of landfill gases in the reporting month was carried out by the Contractor at excavation location, Portion III. No Limit Level exceedance was recorded.

Environmental Site Inspection

14.13 Joint weekly site inspections were conducted by representatives of the Contractor, Engineer and Environmental Team. During site inspections in the reporting month, no non-compliance was identified. The environmental deficiency observed during the reporting month are shown in Appendix K.

Complaint, Prosecution and Notification of Summons

14.14 Five (5) environmental complaints, no successful prosecution and notification of summon were received during the reporting period.

Recommendations

14.15 The following recommendations were made to the Contractor for the reporting month:
Air Quality Impact

- To regularly apply watering on dry surface should be applied to minimize erosion.
- To aim the water spray at the rock breaking point for effective dust suppression.
- To water materials before loading/unloading.
- To turn off idle equipment.

Construction Noise

- To provide sufficient noise barriers for noisy PMEs as practically at LTI according to CNMP.
- To repair the gaps between the noise barriers.
- To place compatible noise barrier close to the breaking point for effective noise screening.
- To erect sound proof canvases on derrick lighter barge

Water Quality Impact

- To clear the oil slick and check for any damage of the silt curtain.
- To repair damaged or missing silt curtain
- To check whether the curtain has been set to the seabed.
- To ensure that the pumping rate of bored pile is sufficient to avoid discharging waste water into the sea.
- To clear floating refuse between the cofferdam and silt curtain.
- To clear oil slick within and outside cofferdam.
- To control the amount of loading materials in the barge to avoiding spillage.
- To cover stockpile near seafront.
- To remove wastewater and oil in drip tray.
- To remove pond/still water.

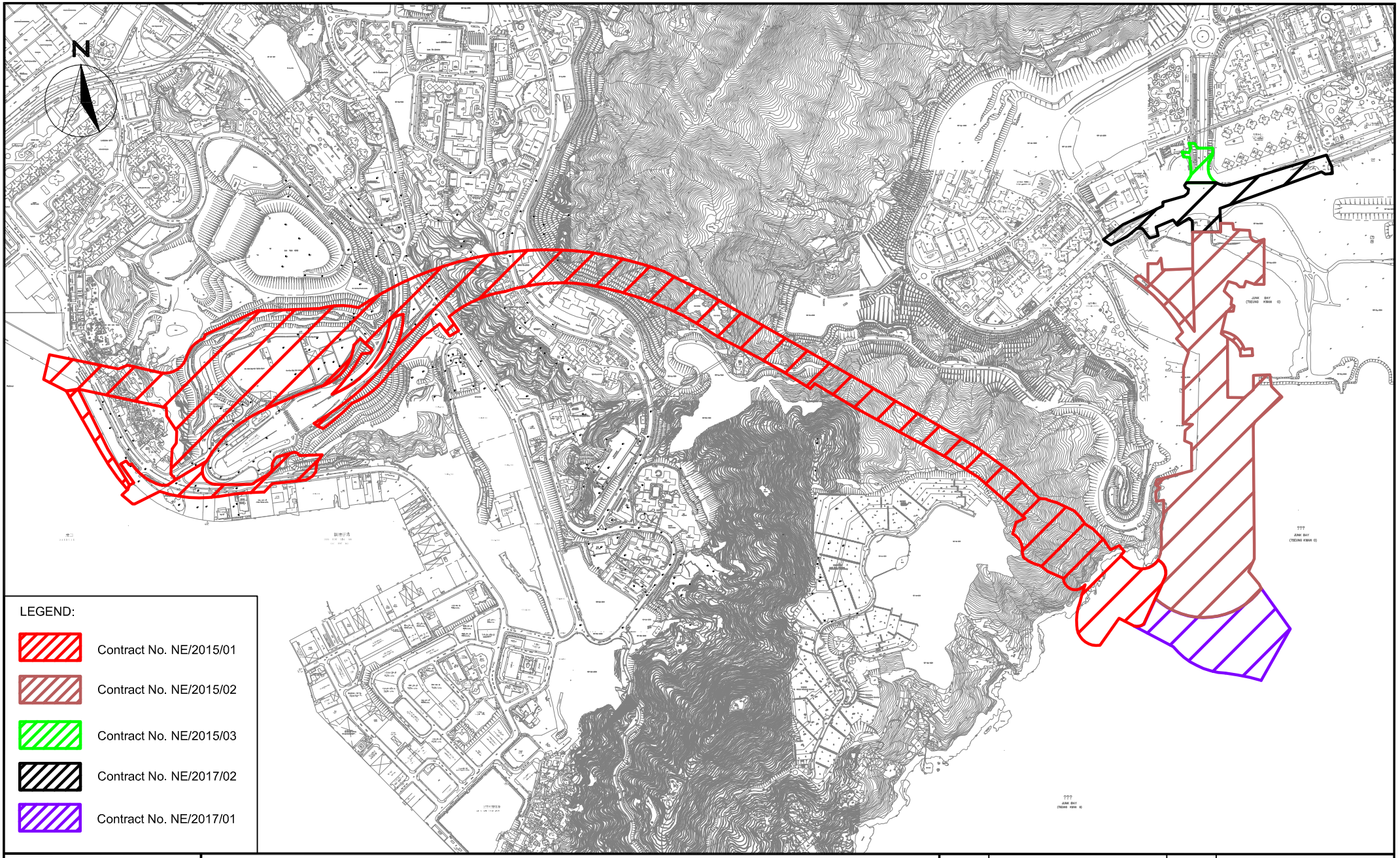
Waste/Chemical Management

- To bund or lock the chemical storage area.
- To clear dripping oil from bored piling machine.
- To clear oil slick on seawater.
- To clear oil on the floor.

Landscape and Visual

- To avoid placing any construction materials in the tree protection zone.

FIGURES



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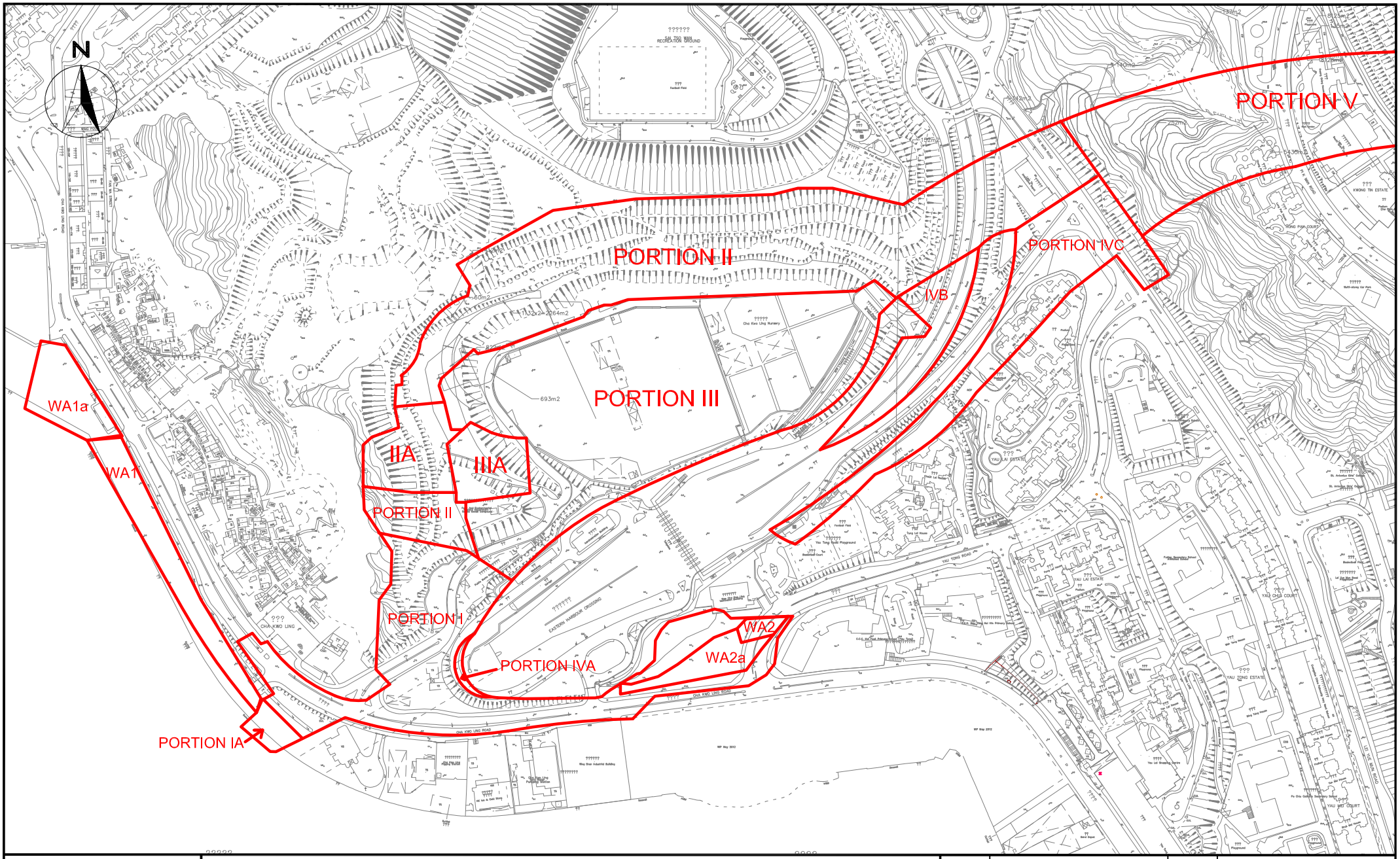
- Design and Construction

Site Layout Plan

SCALE	1:15000 @ A4	DATE	APR 2018
CHECK	JF	DRAWN	AC
JOB No.	MA16034	FIGURE NO. 1	REV -



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Site Portions under Works Contract No. NE/2015/01 (Lam, Tin Side)

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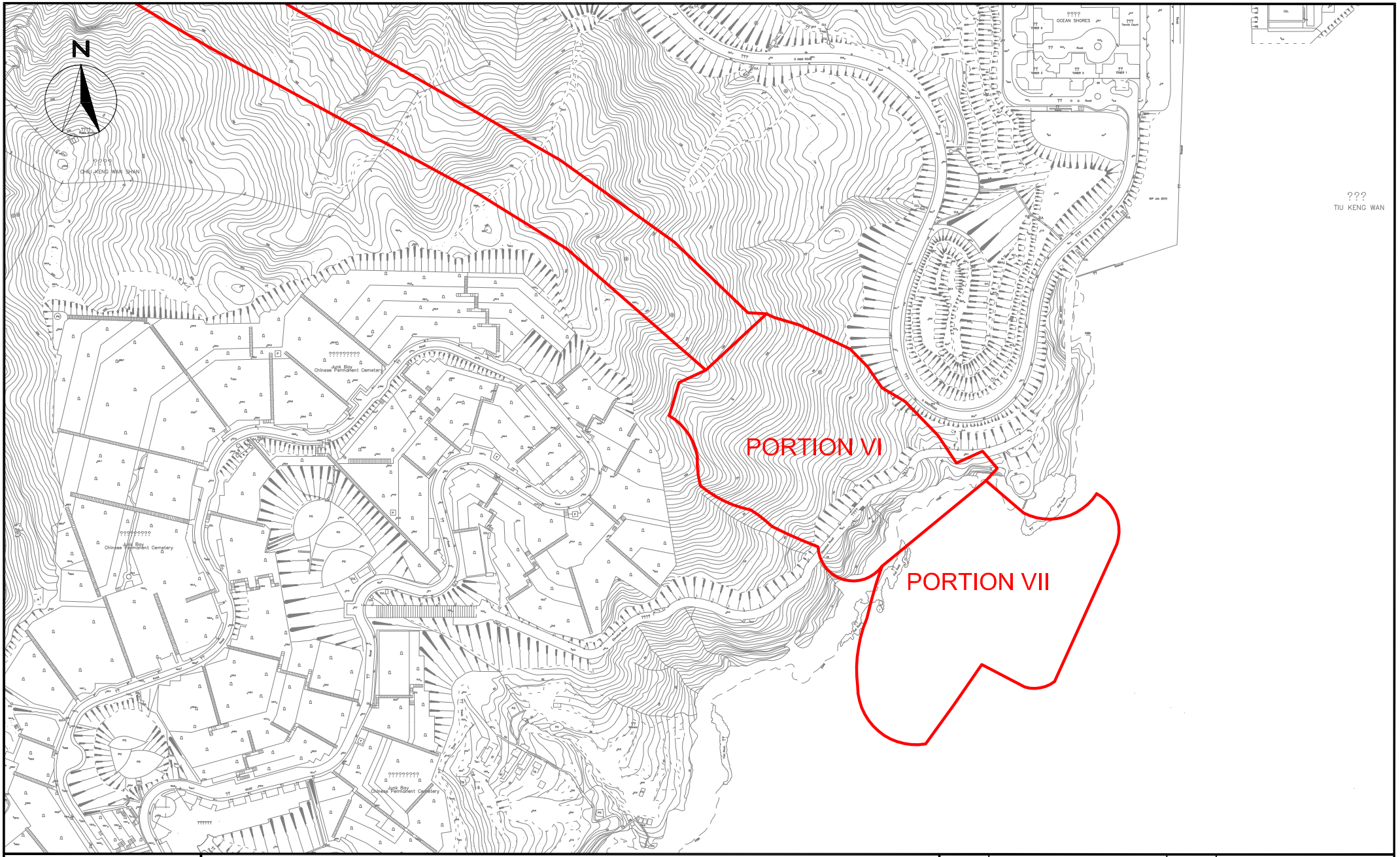

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- Design and Construction

Site Portions under Works Contract No. NE/2015/01 (Tsuneg Kwan O Side)

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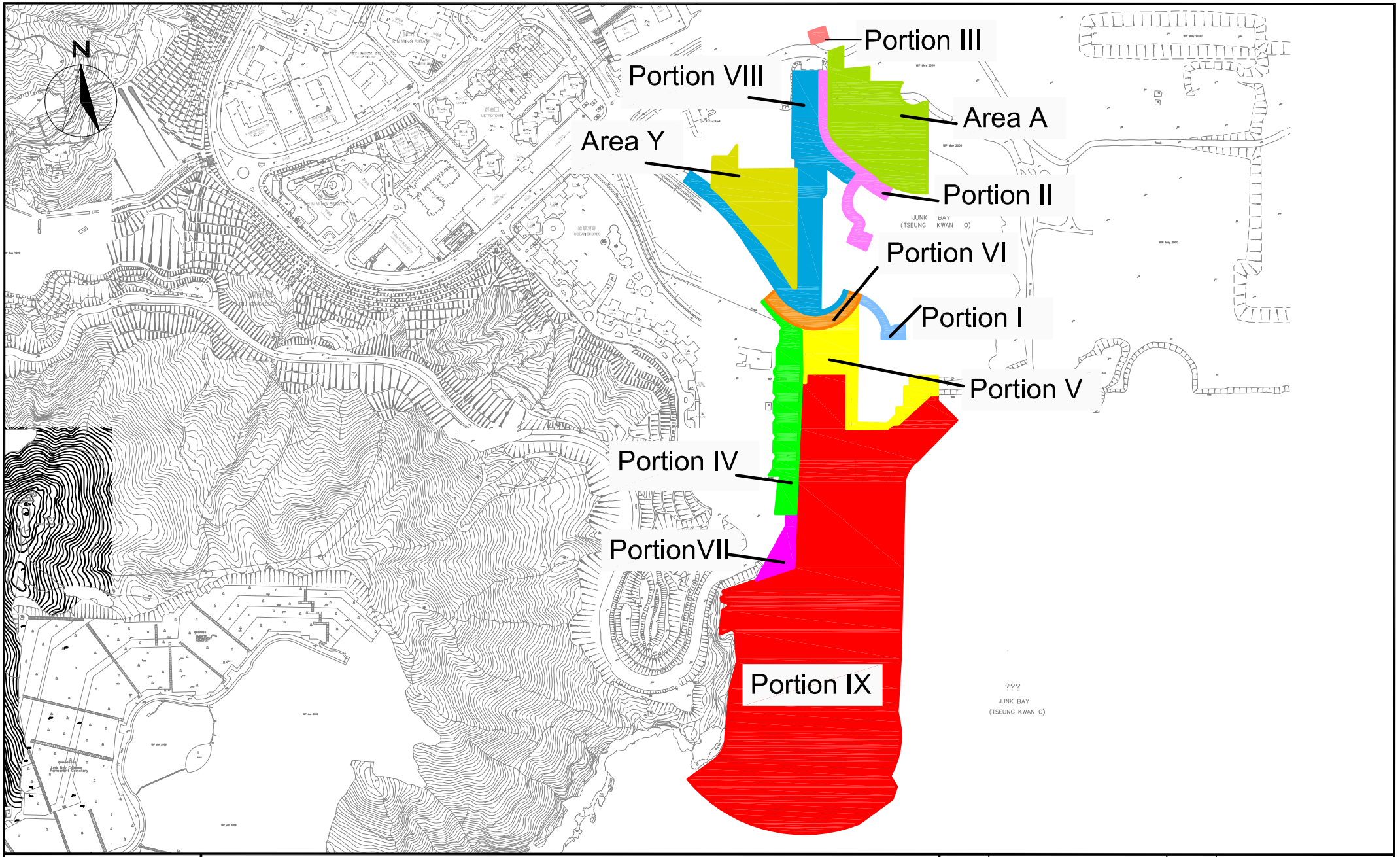

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Site Portions under Works Contract No. NE/2015/02

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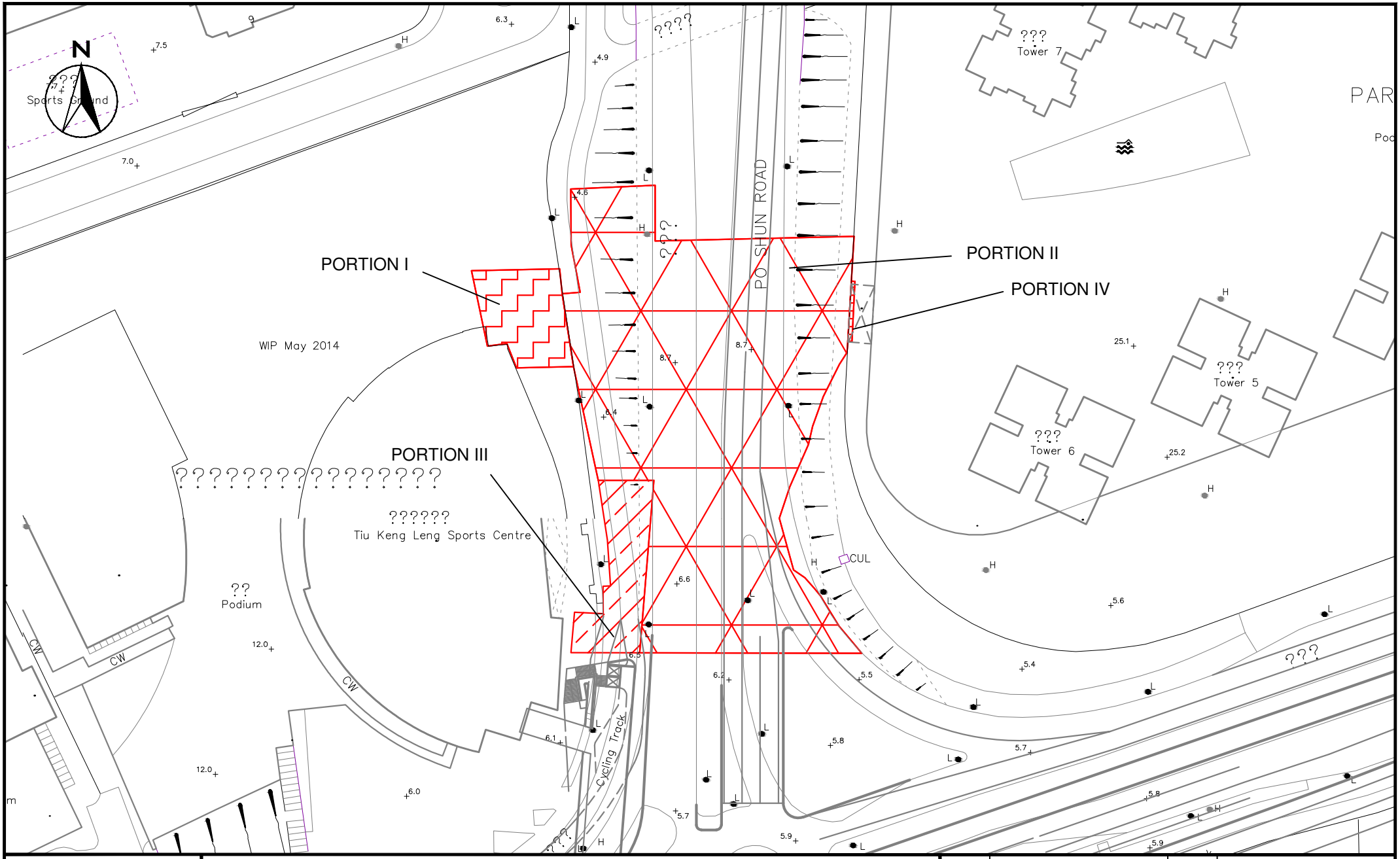

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Site Portions under Work Contract No. NE/2015/03

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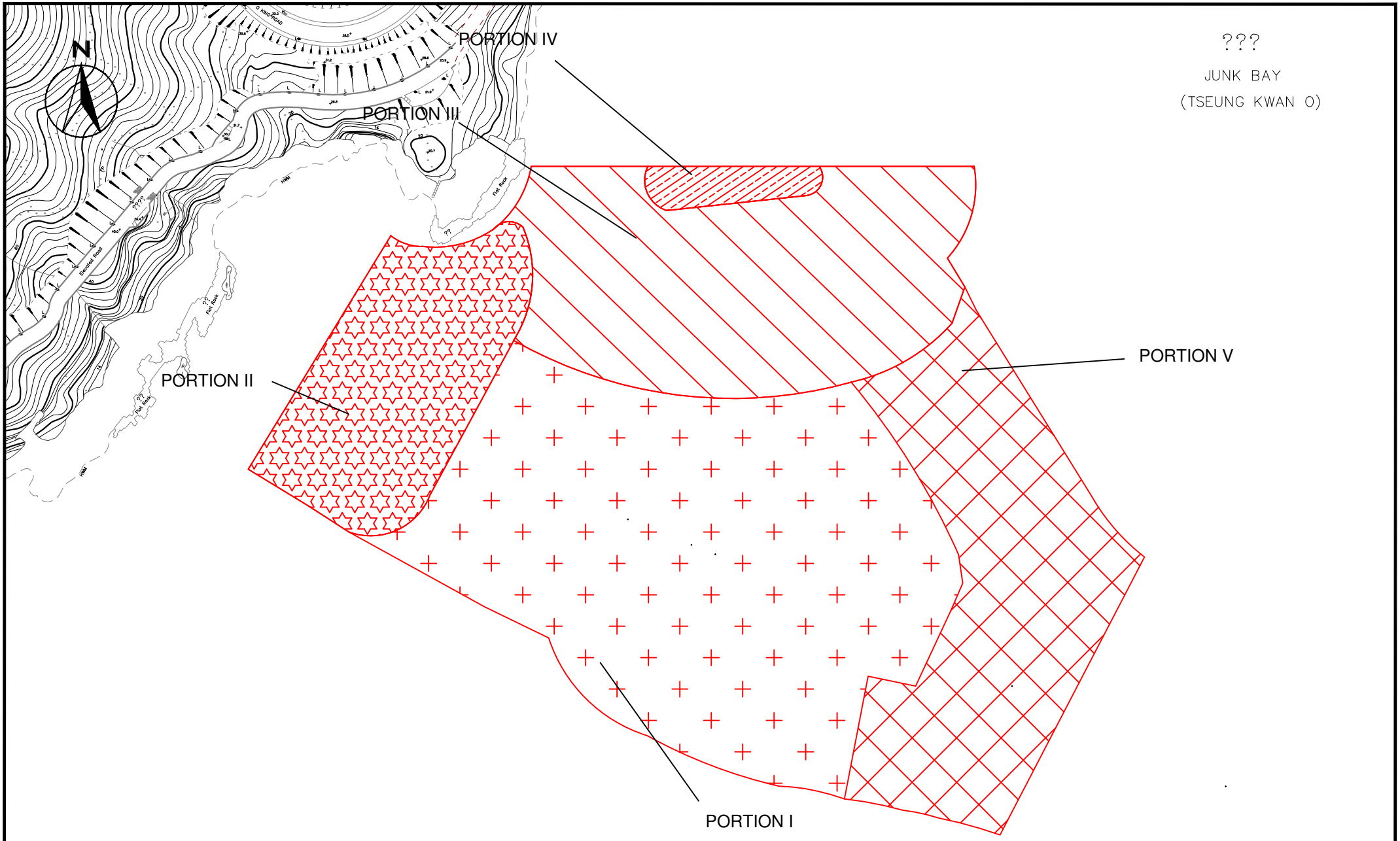

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- Design and Construction

Site Portions under Work Contract No. NE/2017/01

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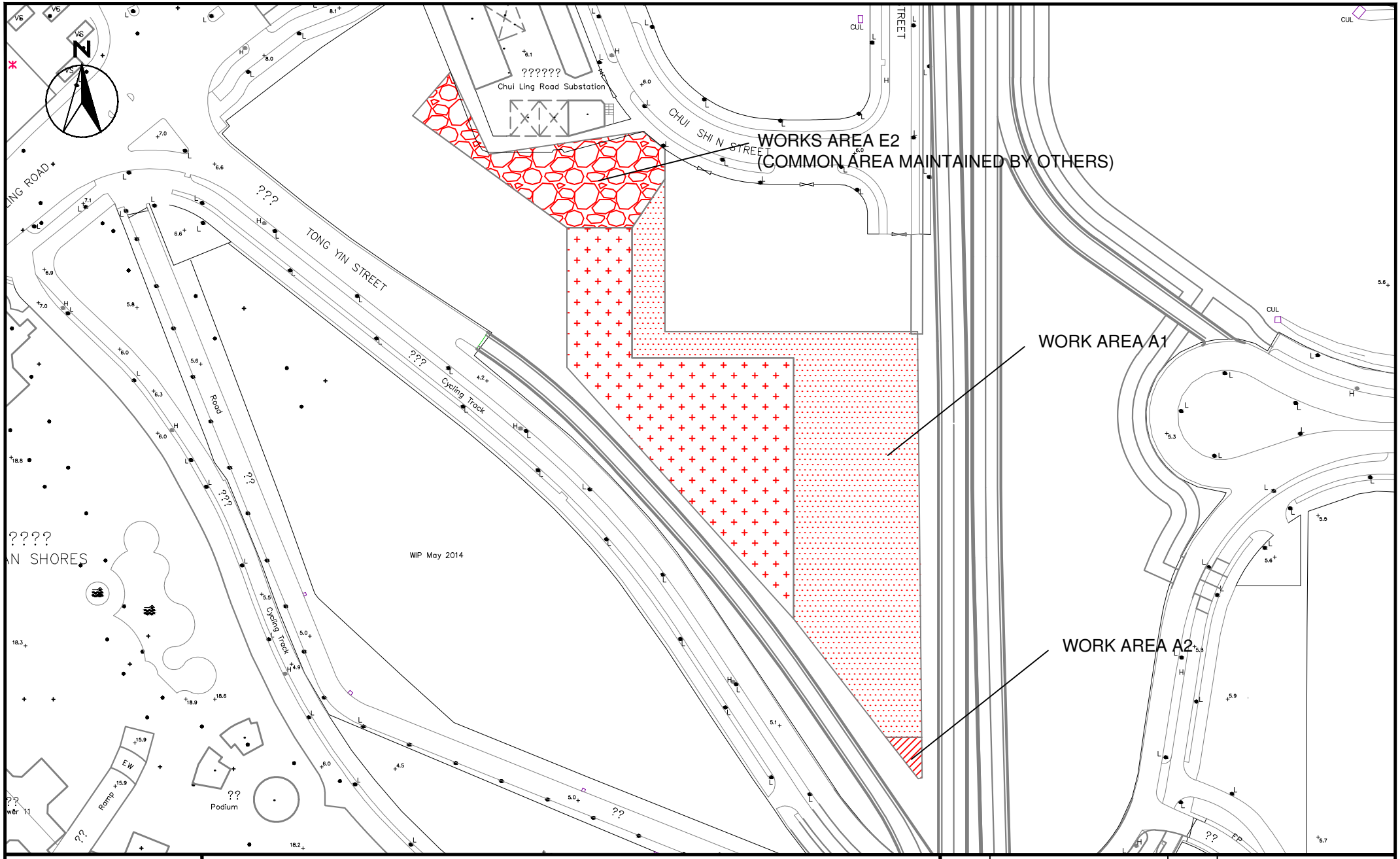

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- Design and Construction

Site Portions under Work Contract No. NE/2017/01

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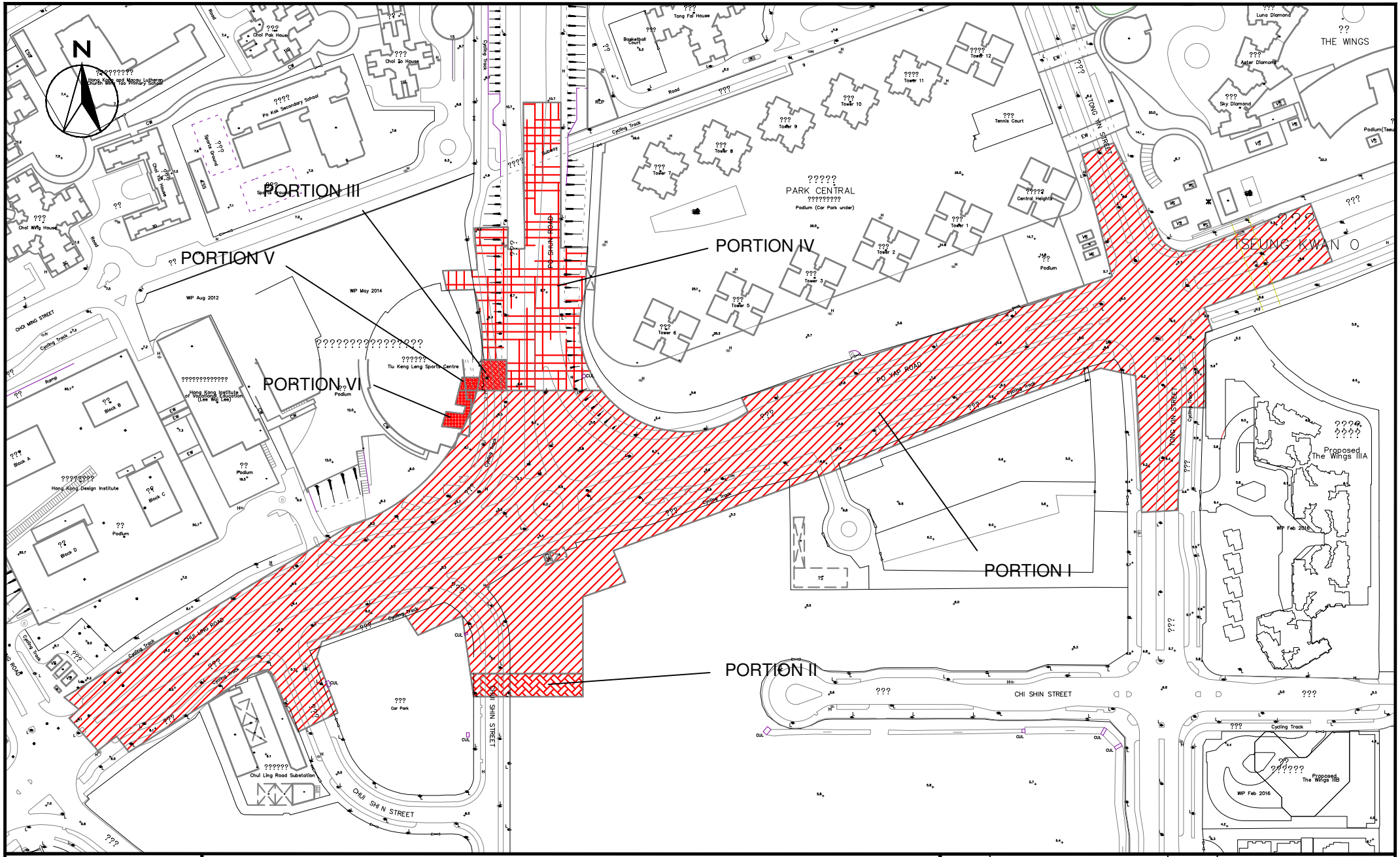

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- Design and Construction

Site Portions under Work Contract No. NE/2017/02

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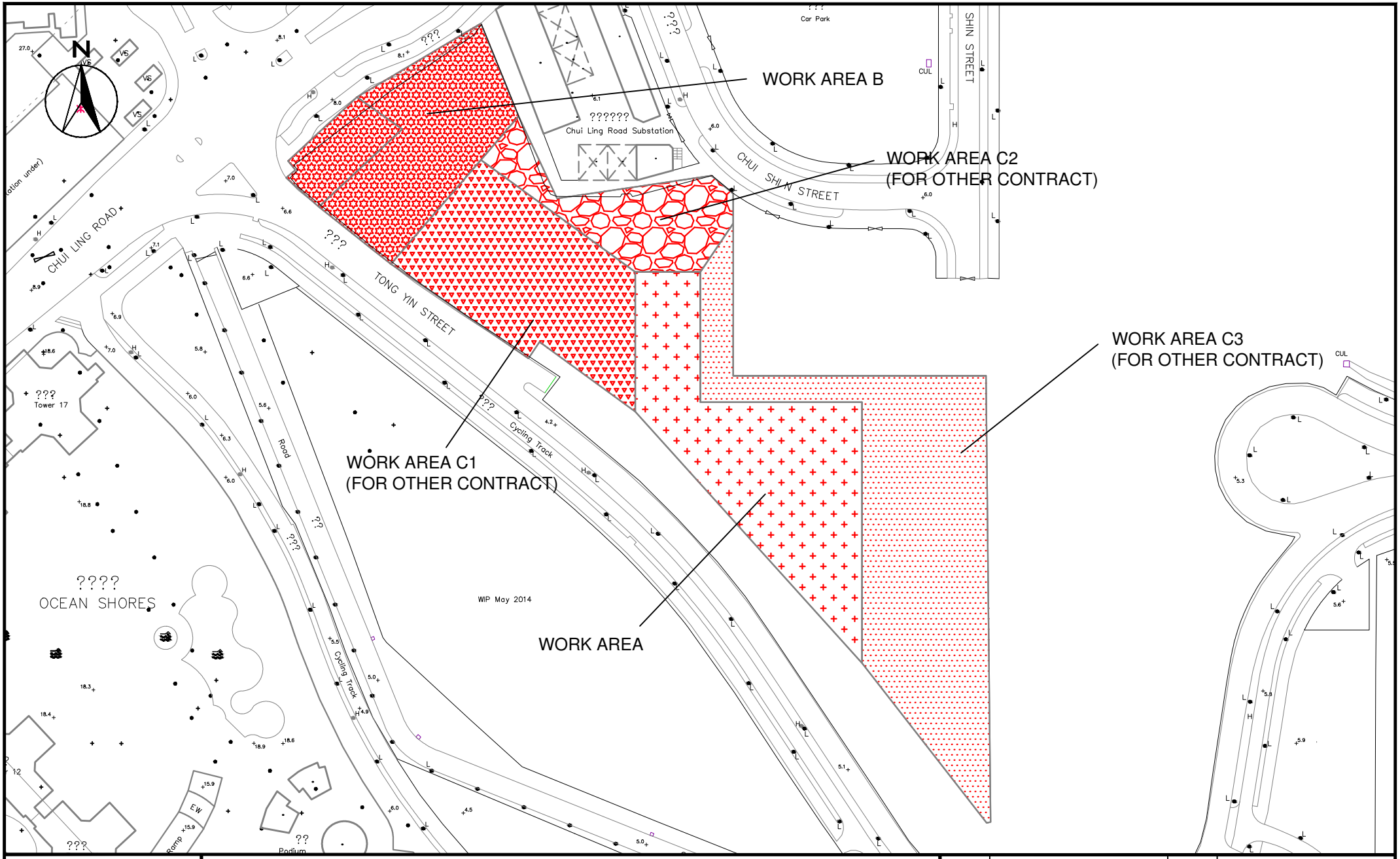

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- Design and Construction

Site Portions under Work Contract No. NE/2017/02

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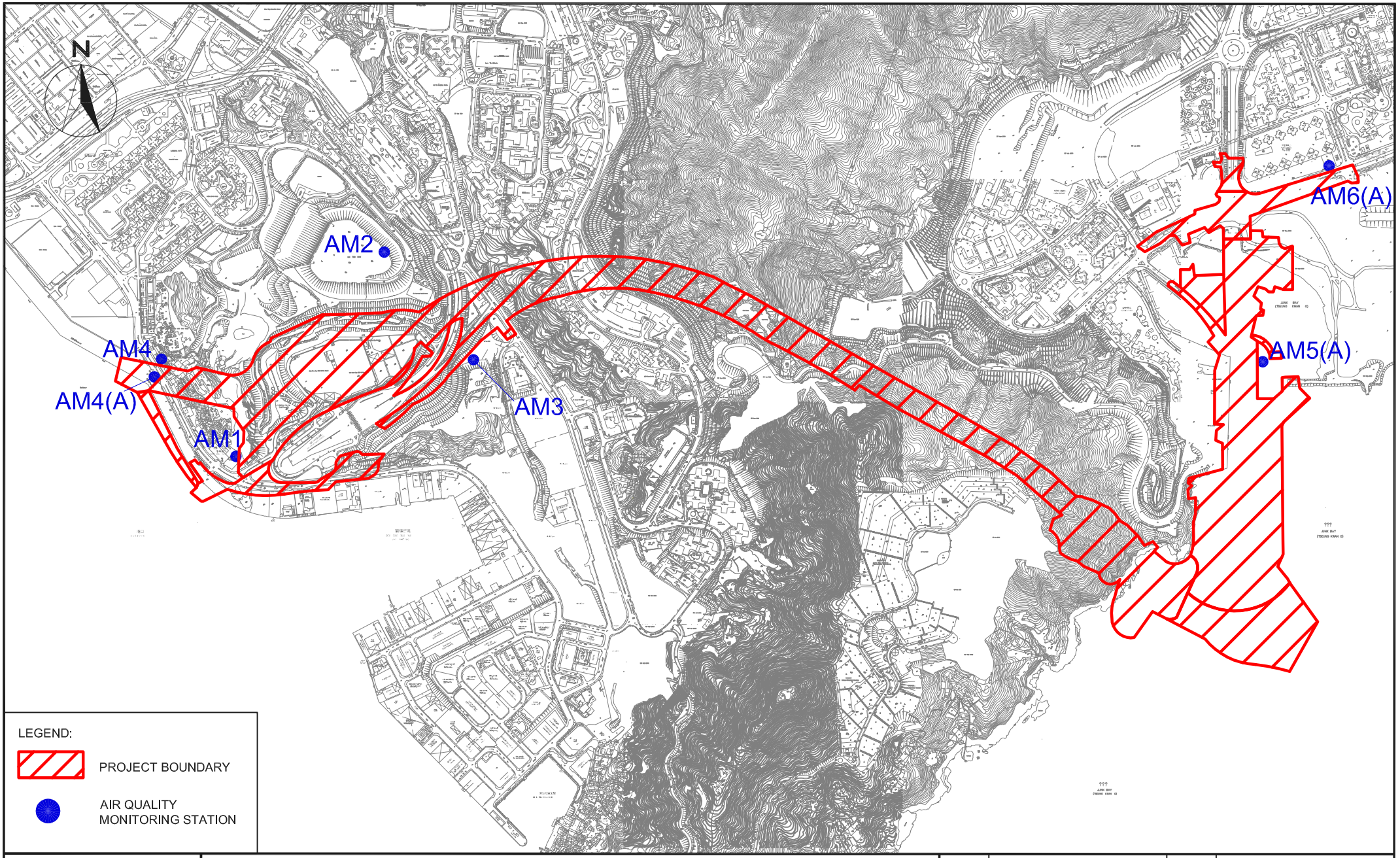

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Agreement No. CE/59/2015 (EP)
Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction
Air Quality Monitoring Stations

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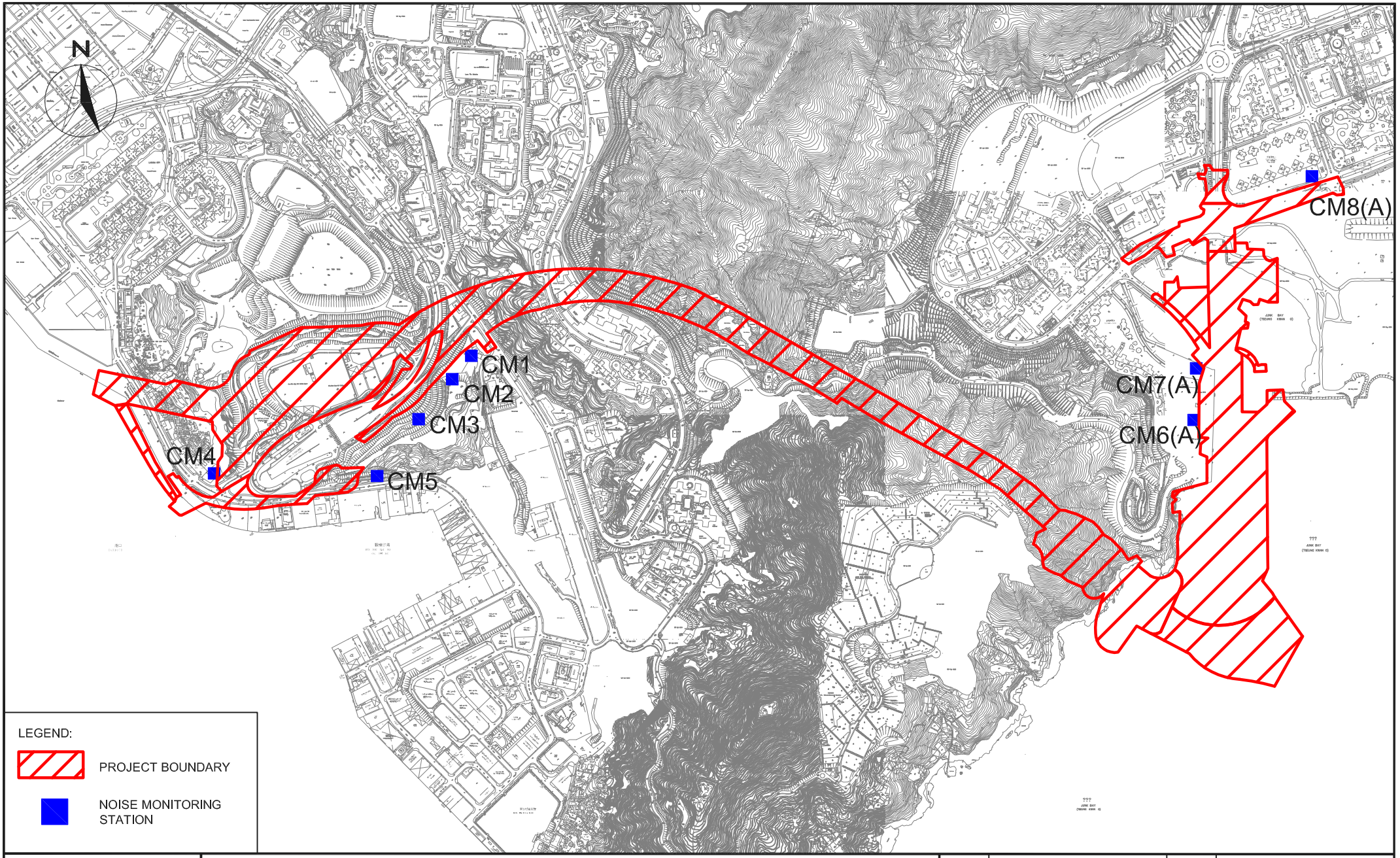

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Agreement No. CE/59/2015 (EP)
Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction
Noise Monitoring Stations

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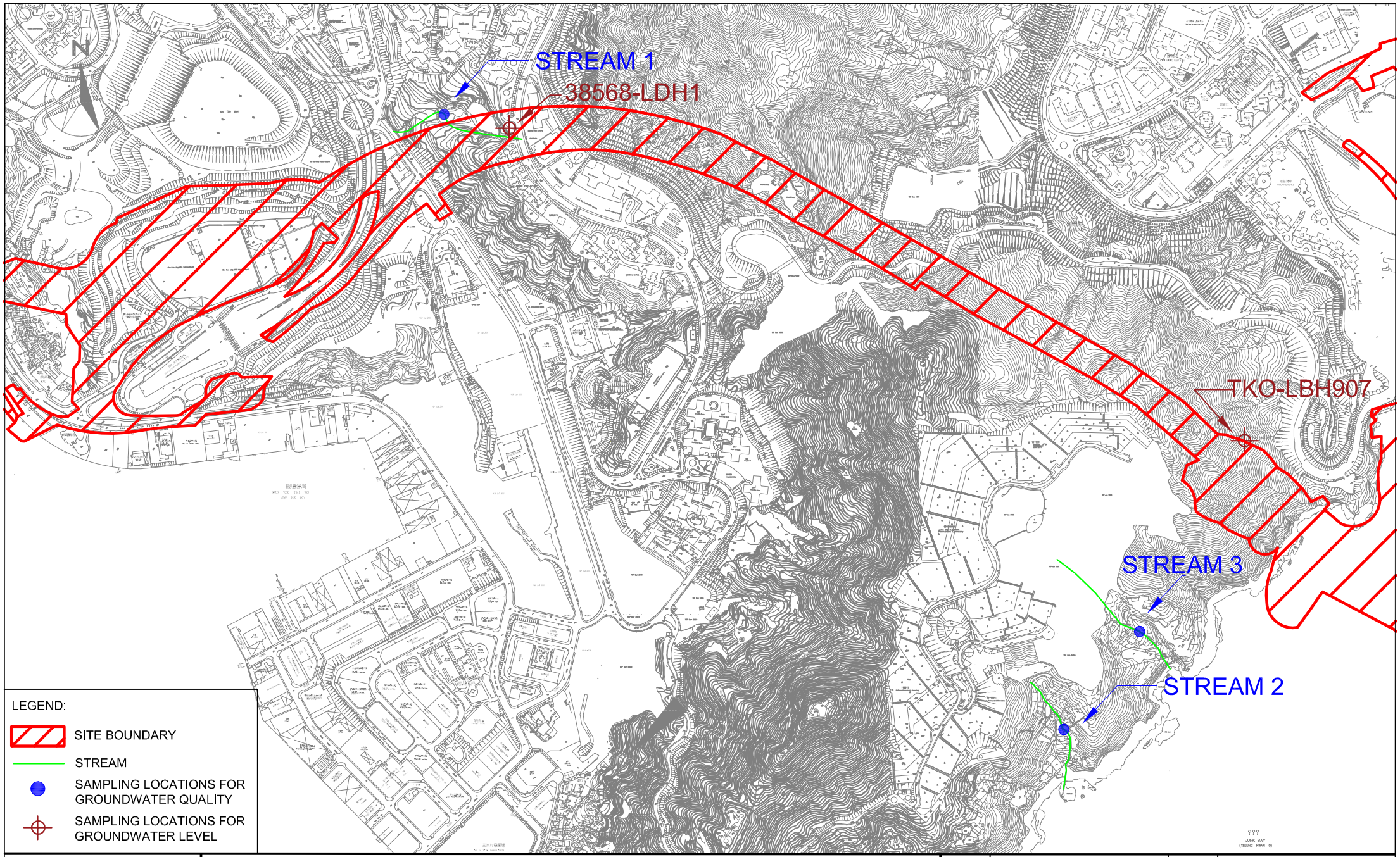

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Agreement No. CE/59/2015 (EP)
Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction
Location of Streams for Groundwater Quality and Groundwater Level Monitoring

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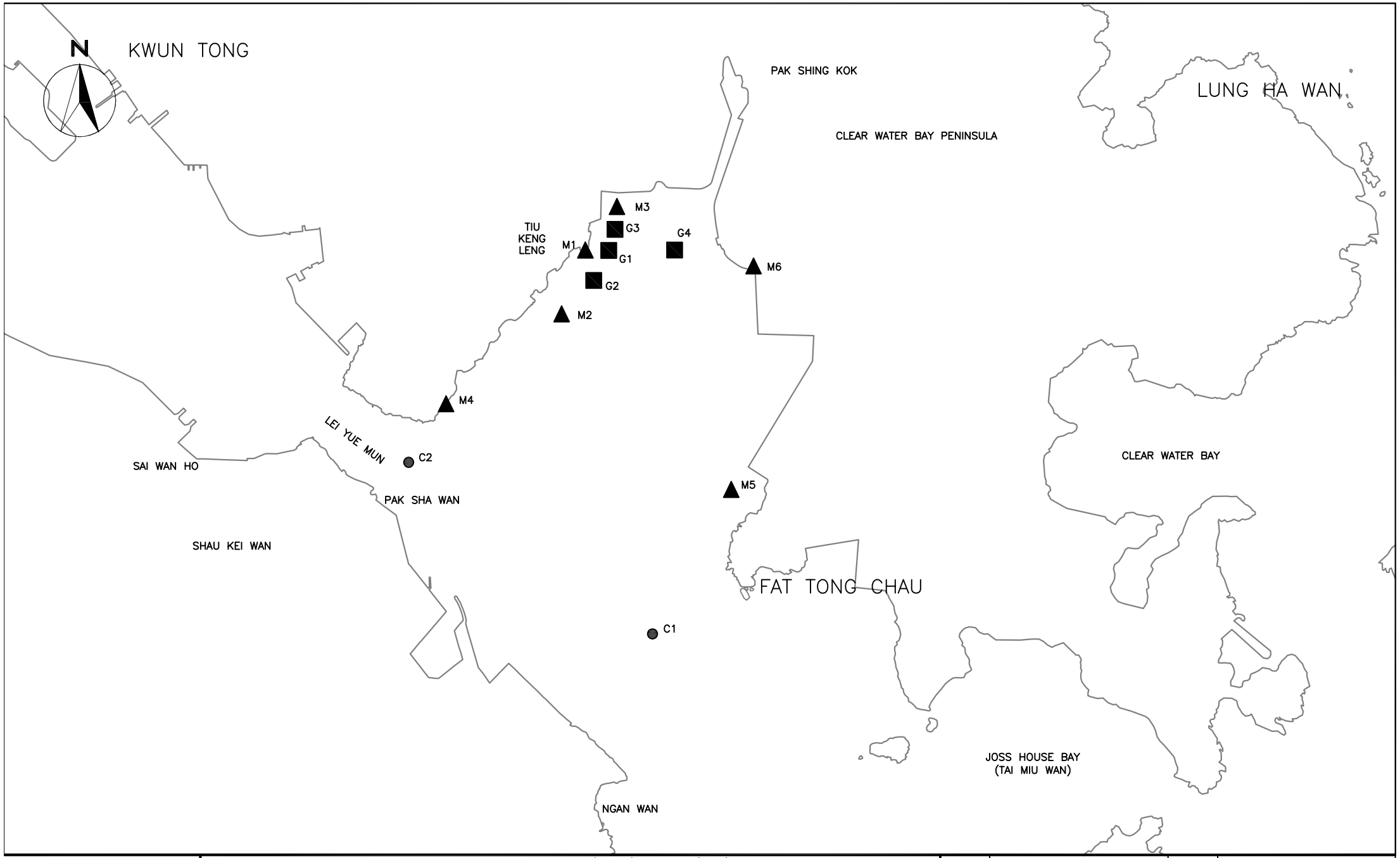

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Agreement No. CE/59/2015 (EP)
Environmental Team for Tseung Kwan O – Lam Tin Tunnel – Design and Construction

Locations of Water Quality Monitoring Stations

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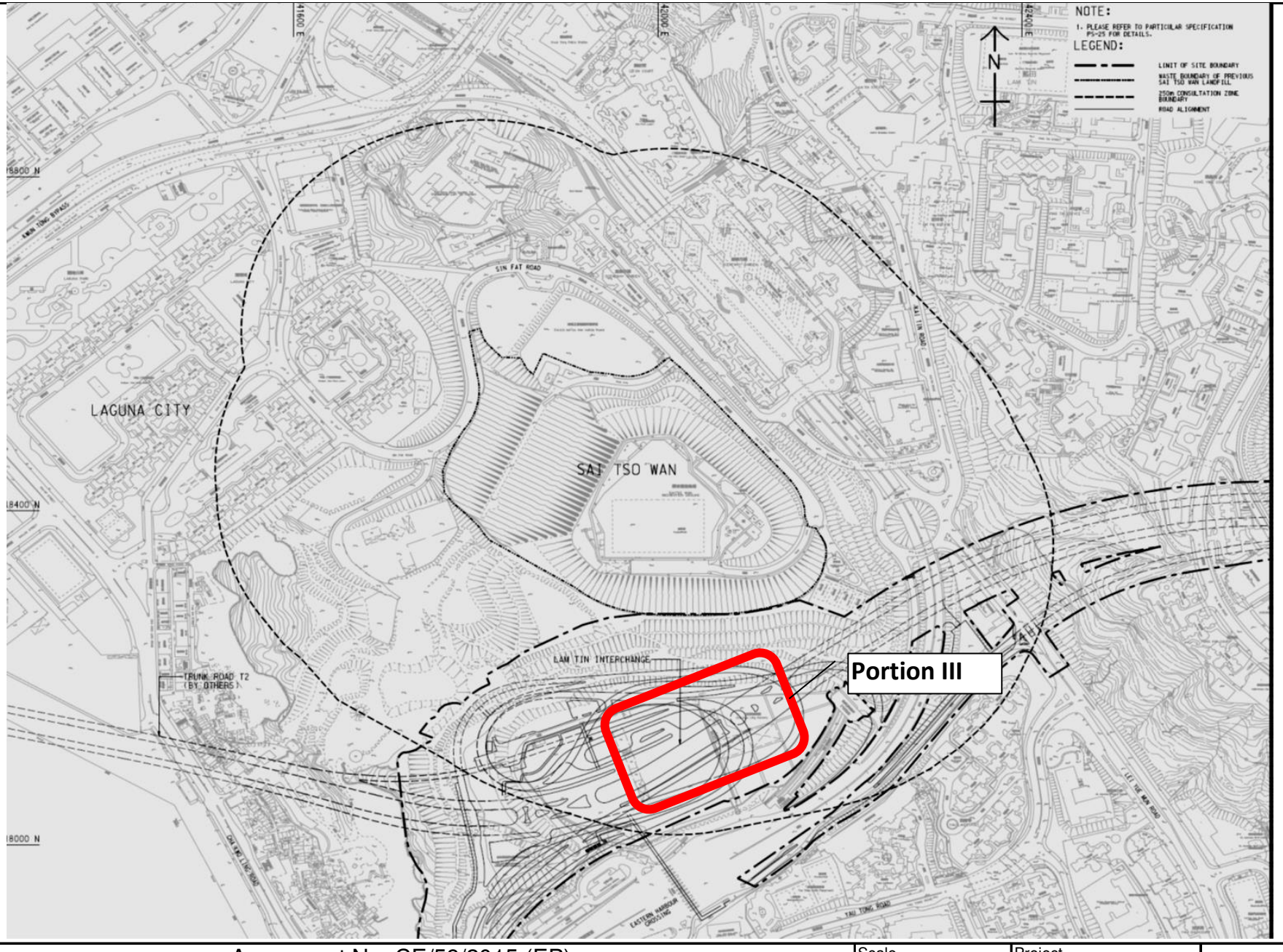
CHECK	JF	DRAWN	JW
PROJECT NO.	MA16034	FIGURE NO.	5
		REV	–



Title	Agreement No. CE/59/2015 (EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Locations of Landfill Gas Monitoring	Scale: N.T.S Date: Dec-16	Project No.: MA16034 Figure: 6

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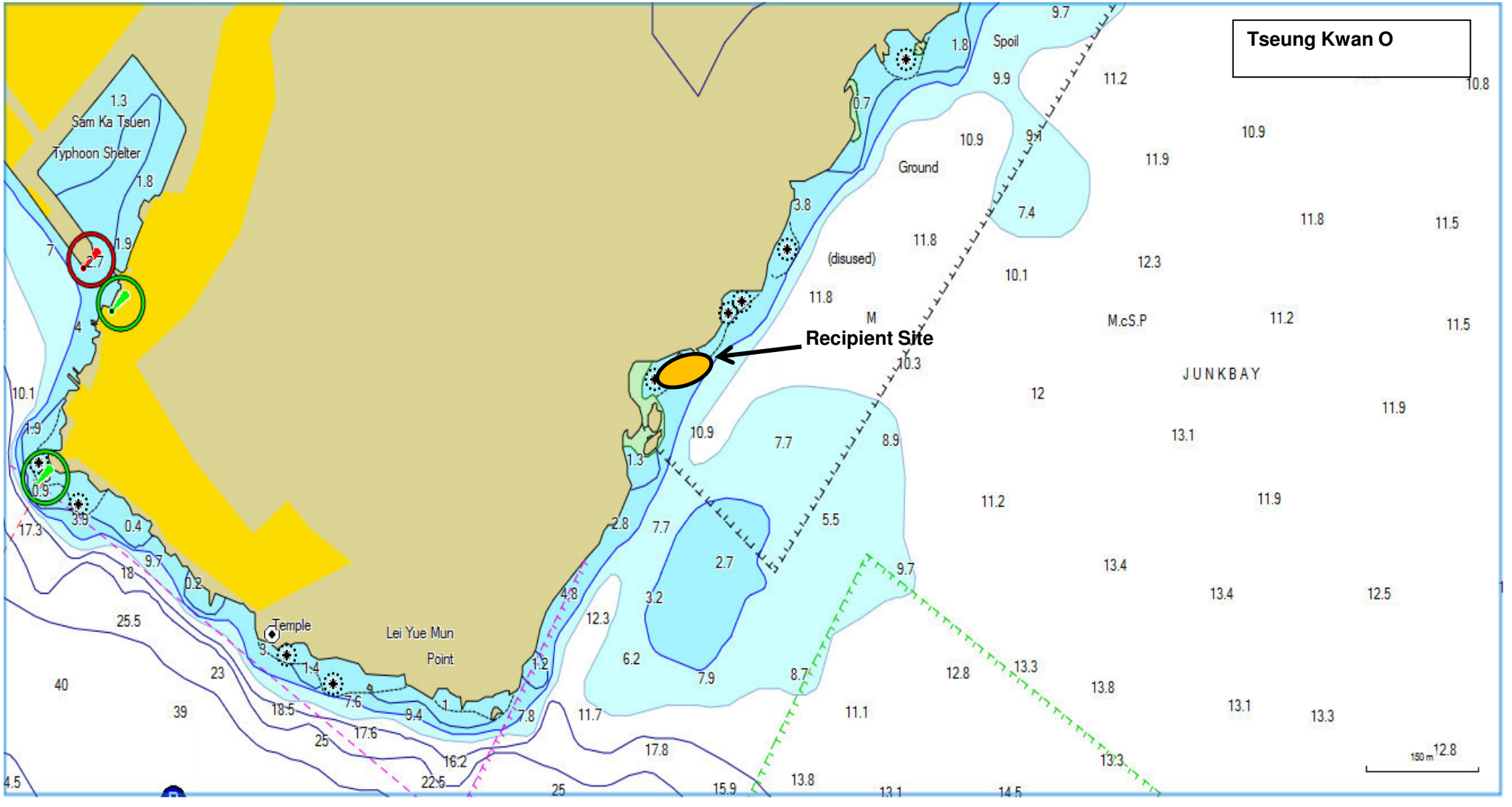
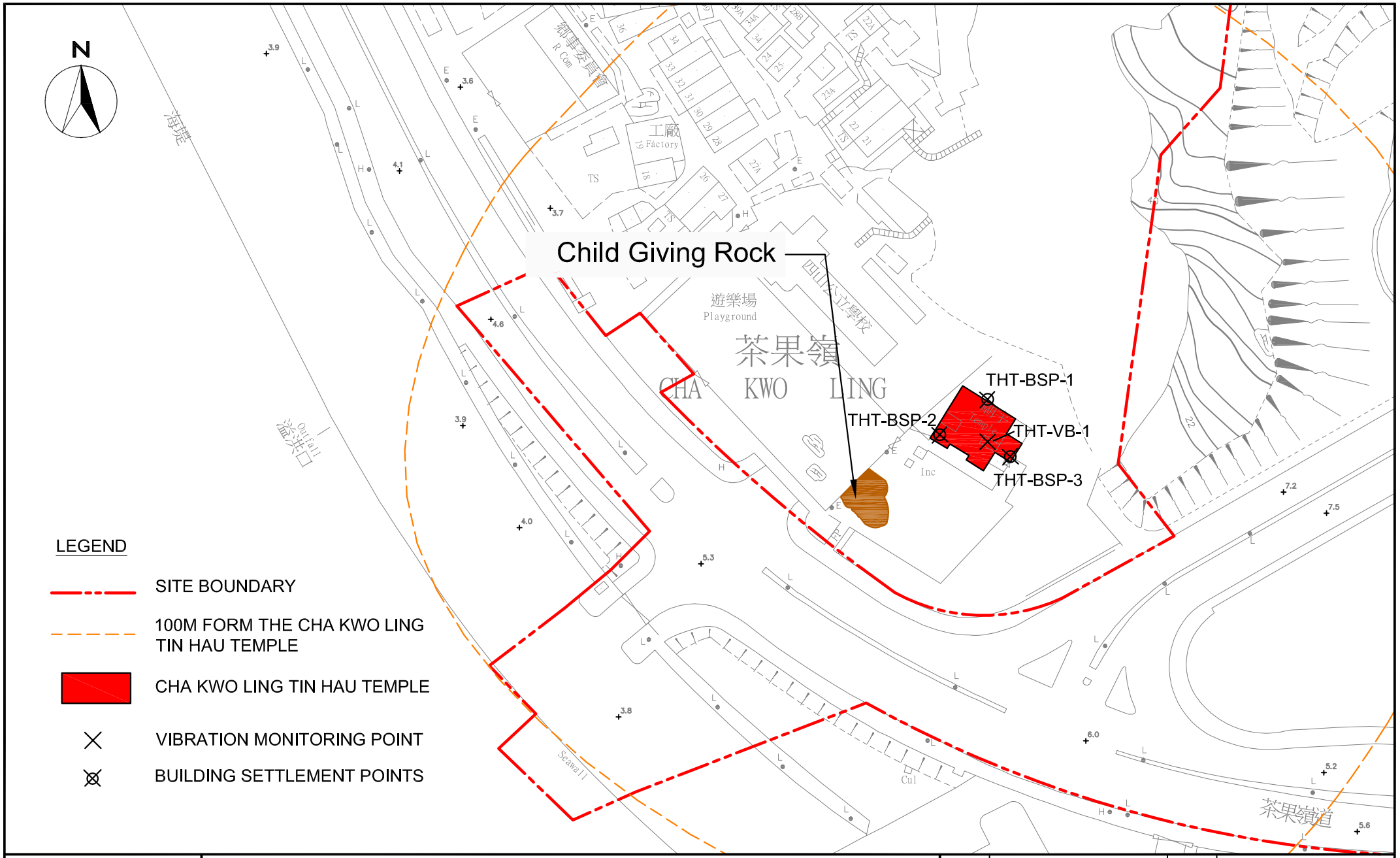


Title: Agreement No. CE/59/2015 (EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Location of Post-translocation Coral Monitoring	Scale: N.T.S	Project No.: MA16034	CINOTECH
	Date: Mar-17	Figure: 7	



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Agreement No. CE/59/2015 (EP)
Environmental Team for Tsueng Kwan O - Lam Tin Tunnel - Design and Construction

Locations of Monitirong for Cultural Heritage

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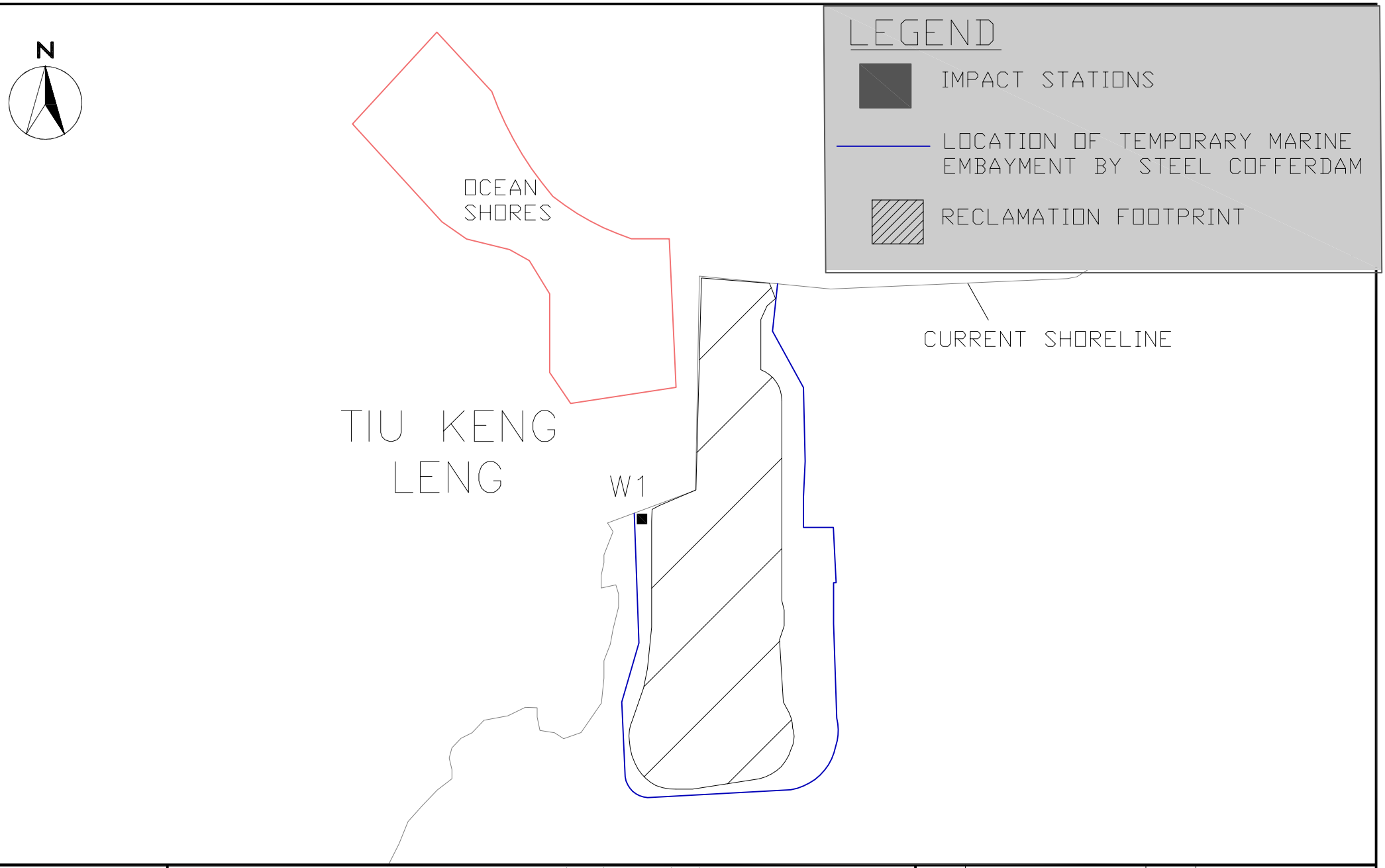
CHECK	JF	DRAWN	AC
JOB No.	MA16034	FIGURE NO. 8	REV -



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Agreement No. CE/59/2015 (EP)
Environmental Team for Tseung Kwan O – Lam Tin Tunnel – Design and Construction
Location of Water Quality Monitoring Stations within Temporary Marine Embayment

SCALE	N.T.S	DATE	MAY 2017
CHECK	JF	DRAWN	JW
PROJECT NO.	MA16034	FIGURE NO.	9
		REV	–

APPENDIX A
ACTION AND LIMIT LEVELS

APPENDIX A – Action and Limit Levels

Air Quality

1-hr TSP

Monitoring Stations	Location	Action Level, µg/m^3	Limit Level, µg/m^3
AM1	Tin Hau Temple	275	500
AM2	Sai Tso Wan Recreation Ground	273	
AM3	Yau Lai Estate Bik Lai House	271	
AM4	Sitting-out Area at Cha Kwo Ling Village	278	
AM5(A)	Tseung Kwan O DSD Desilting Compound	273	
AM6(A)	Park Central, L1/F Open Space Area	285	

24-hr TSP

Monitoring Stations	Location	Action Level, µg/m^3	Limit Level, µg/m^3
AM1	Tin Hau Temple	173	260
AM2	Sai Tso Wan Recreation Ground	192	
AM3	Yau Lai Estate Bik Lai House	167	
AM4(A)	Cha Kwo Ling Public Cargo Working Area Administrative Office	210	
AM5(A)	Tseung Kwan O DSD Desilting Compound	175	
AM6(A)	Park Central, L1/F Open Space Area	165	

Noise

Time Period	Action Level	Limit Level
0700-1900 hrs on normal weekdays	When one documented complaint is received	75 dB(A) [(1)]
1900-2300 on all days and 0700-2300 on general holidays (including Sundays)		60/65/70 dB(A)[(2)(3)]
2300-0700 on all days		45/50/55 dB(A)[(2)(3)]

[1] 70 dB(A) for schools and 65 dB(A) for schools during examination period.
[2] Acceptable Noise Levels for Area Sensitivity Rating of A/B/C
3 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.

Water Quality

Groundwater

Parameters	Action	Limit
DO in mg L^{-1}	7.6	7.6
pH	6.0 – 8.9	6.0 – 9.0
BOD_5 in mg L^{-1}	2.0	2.0
TOC in mg L^{-1}	Stream 1 and Stream 2: 9	Stream 1 and Stream 2: 9
	Stream 3: 6	Stream 3: 6
Total Nitrogen in mg L^{-1}	2.0	2.1
Ammonia-N in mg L^{-1}	0.15	0.20
Total Phosphate in mg L^{-1}	0.05	0.05
SS in mg L^{-1}	7.6	12.1
Turbidity in NTU	2.1	2.3

Notes:

1. For pH, non-compliance of the water quality limits occurs when monitoring result is out of the range of the limits.
2. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
3. For turbidity, SS, 5-day biochemical oxygen demand (BOD_5), Total organic carbon (TOC), Total Nitrogen, Ammonia-N and Total Phosphate, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
4. All the figures given in the table are used for reference only and the EPD may amend the figures whenever it is considered as necessary.

Groundwater Level Monitoring

Drill Hole No.	38568-LDH1	TKO-LBH907
Action Level (mPD)	+74.65	+17.59

Marine Water Quality

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2, 4 and 5)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU*** or 120% of upstream control station's Turbidity at the same tide of the same day	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2, 4 ad 5)	**Stations G1-G4**		
	Surface	***6.0 mg/L*** or 120% of upstream control station's SS at the same tide of the same day	***6.9mg/L*** or 130% of upstream control station's SS at the same tide of the same day
	Stations M1-M5		
	Surface	***6.2 mg/L*** or 120% of upstream control station's SS at the same tide of the same day	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L*** or 120% of upstream control station's SS at the same tide of the same day	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.
5. Refer to Appendix I – Marine Water Quality Monitoring Results and Graphical Presentations for results of upstream control stations at each tide on each day.

Water Quality Monitoring in Temporary Marine Embayment

Parameter (unit)	Depth	Action Level	Limit Level
DO in mg/L (See Note 1 and 2)	Depth Average	***4.8 mg/L*** (4)	***4 mg/L*** (3)
	Bottom	***2.4 mg/L*** (4)	***2 mg/L***(3)

Notes:
1. "depth-averaged" is calculated by taking the arithmetic means of reading of all sampling depths.
2. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
3. Current Water Quality Objectives (WQOs) for marine waters of Hong Kong
4. As an alert for adverse water quality impact, the Action Level is set as 120% of the Current WQOs for marine waters of Hong Kong.

Ecology

Post-translocation Coral Monitoring

Parameter	Action Level Definition	Limit Level Definition
Mortality	If during Impact Monitoring a 15% increase in the percentage of partial mortality on hard corals occurs at more than 20% of the tagged coral at any one Impact Monitoring Site that is not recorded at the Control Site, then the Action Level is exceeded.	If during the Impact Monitoring a 25% increase in the percentage of partial mortality occurs at more than 20% of the tagged coral at any one Impact Monitoring Site that is not recorded at the Control Site, then the Limit Level is exceeded.

Landfill Gas Monitoring

Parameter	Limit Level
Oxygen	<19%
	<18%
Methane	>10% LEL (i.e. > 0.5% by volume)
	>20% LEL (i.e. > 1% by volume)
Carbon Dioxide	>0.5%
	>1.5%

Alert, Alarm, Action Levels for Built Heritage Monitoring

Parameter	Alert Level	Alarm Level	Action Level
Vibration	ppv:4.5mm/s	ppv: 4.8mm/s	ppv: 5mm/s Maximum Allowable Vibration Amplitude: 0.1mm
Building Settlement Point	6mm	8mm	10mm
Building Tilting	1:2000	1:1500	1:1000

APPENDIX B
COPIES OF CALIBRATION CERTIFICATES

Cerificate of Calibration

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler

Description: Digital Dust Indicator

Date of Calibration 25-Nov-19

Manufacturer: Sibata Scientific Technology LTD.

Validity of Calibration Record 24-Jan-20

Model No.: LD-5R

Serial No.: 972780

Equipment No.: SA-01-09

Sensitivity 0.001 mg/m3

High Volume Sampler No.: A-01-01A

Before Sensitivity Adjustment 739 CPM

Tisch Calibration Orifice No.: 3607

After Sensitivity Adjustment 739 CPM

Calibration of 1 hr TSP		
Calibration Point	**Laser Dust Monitor**	**HVS**
	Mass Concentration (µg/m3) **X-axis**	Mass concentration (µg/m^3) **Y-axis**
1	21.0	71.0
2	39.0	125.5
3	56.0	179.2
Average	**38.7**	**125.2**

By Linear Regression of Y on X

Slope , mw = **3.0908** **Intercept, bw =** **5.7222**

Correlation coefficient* = **0.9999**

Set Correlation Factor	
Particaulate Concentration by High Volume Sampler (µg/m^3)	125.2
Particaulate Concentration by Dust Meter (µg/m^3)	38.7
Measureing time, (min)	60.0

Set Correlation Factor , SCF

SCF = [K=High Volume Sampler / Dust Meter, (µg/m3)] **3.2**

In-house method in according to the instruction manual:

The Dust Monitor was compared with a calibrated High Volume Sampler and The result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

Those filter papers are weighted by HOKLAS laboratory (Wellab Litimed)

Calibrated by: Wong Shing Kwai

Approved by: Henry Leung

Cerificate of Calibration

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler

Description: Digital Dust Indicator
Date of Calibration 25-Nov-19
Manufacturer: Sibata Scientific Technology LTD.
Validity of Calibration Record 24-Jan-20
Model No.: LD-5R
Serial No.: 972781
Equipment No.: SA-01-10
Sensitivity 0.001 mg/m3
High Volume Sampler No.: A-01-01A
Before Sensitivity Adjustment 734 CPM
Tisch Calibration Orifice No.: 3607
After Sensitivity Adjustment 734 CPM

Calibration of 1 hr TSP		
Calibration Point	**Laser Dust Monitor**	**HVS**
	Mass Concentration (µg/m3) **X-axis**	Mass concentration (µg/m^3) **Y-axis**
1	21.0	71.0
2	38.0	125.5
3	56.0	179.2
Average	**38.3**	**125.2**

By Linear Regression of Y on X

Slope , mw = **3.0904** **Intercept, bw =** **6.7692**

Correlation coefficient* = **0.9998**

Set Correlation Factor	
Particaulate Concentration by High Volume Sampler (µg/m^3)	125.2
Particaulate Concentration by Dust Meter (µg/m^3)	38.3
Measureing time, (min)	60.0

Set Correlation Factor , SCF

SCF = [K=High Volume Sampler / Dust Meter, (µg/m3)] **3.3**

In-house method in according to the instruction manual:
The Dust Monitor was compared with a calibrated High Volume Sampler and The result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

Those filter papers are weighted by HOKLAS laboratory (Wellab Litimed)

Calibrated by: Wong Shing Kwai

Approved by: Henry Leung

Cerificate of Calibration

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler

Description: Laser Dust Monitor

Date of Calibration 8-Oct-19

Manufacturer: Sibata Scientific Technology LTD.

Validity of Calibration Record 7-Dec-19

Model No.: LD-3B

Serial No.: 2Y6194

Equipment No.: SA-01-02

Sensitivity 0.001 mg/m3

High Volume Sampler No.: A-01-03

Before Sensitivity Adjustment 578

Tisch Calibration Orifice No.: 3607

After Sensitivity Adjustment 578

Calibration of 1 hr TSP			
Calibration Point	Laser Dust Monitor		HVS
	Total Count	Count / Minute **X-axis**	Mass concentration (μg/m^3) **Y-axis**
1	3450	102.0	215.4
2	3822	95.0	206.5
3	3984	86.0	196.5
Average		**94.33**	**206.13**

By Linear Regression of Y on X

Slope , mw = **1.1780**

Intercept, bw = **95.0106**

Correlation coefficient* = **0.9993**

Set Correlation Factor , SCF

SCF = [K=High Volume Sampler / Dust Meter, (μg/m3)] **2.2**

In-house method in according to the instruction manual:

The Dust Monitor was compared with a calibrated High Volume Sampler and The result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

Those filter papers are weighted by HOKLAS laboratory (Wellab Litimed)

Calibrated by: Wong Shing Kwai

Approved by: Henry Leung

Cerificate of Calibration

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler

Description: Digital Dust Indicator
Date of Calibration 8-Oct-19
Manufacturer: Sibata Scientific Technology LTD.
Validity of Calibration Record 7-Dec-19
Model No.: LD-5R
Serial No.: 972777
Equipment No.: SA-01-06
Sensitivity 0.001 mg/m3
High Volume Sampler No.: A-01-03
Before Sensitivity Adjustment 645
Tisch Calibration Orifice No.: 3607
After Sensitivity Adjustment 645

Calibration of 1 hr TSP		
Calibration Point	**Laser Dust Monitor** Mass Concentration (µg/m3) **X-axis**	**HVS** Mass concentration (µg/m^3) **Y-axis**
1	112.0	215.4
2	104.0	206.5
3	94.0	196.5
Average	**103.3**	**206.1**

By Linear Regression of Y on X

Slope , mw = **1.0480** **Intercept, bw =** **97.8451**

Correlation coefficient* = **0.9995**

Set Correlation Factor	
Particaulate Concentration by High Volume Sampler (µg/m^3)	206.1
Particaulate Concentration by Dust Meter (µg/m^3)	103.3
Measureing time, (min)	60.0

Set Correlation Factor , SCF

SCF = [K=High Volume Sampler / Dust Meter, (µg/m3)] **2.0**

In-house method in according to the instruction manual:
The Dust Monitor was compared with a calibrated High Volume Sampler and The result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

Those filter papers are weighted by HOKLAS laboratory (Wellab Litimed)

Calibrated by: Wong Shing Kwai

Approved by: Henry Leung

Cerificate of Calibration

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler

Description: Digital Dust Indicator
Date of Calibration 25-Nov-19
Manufacturer: Sibata Scientific Technology LTD.
Validity of Calibration Record 24-Jan-20
Model No.: LD-5R
Serial No.: 972778
Equipment No.: SA-01-07
Sensitivity 0.001 mg/m3
High Volume Sampler No.: A-01-01A
Before Sensitivity Adjustment 735 CPM
Tisch Calibration Orifice No.: 3607
After Sensitivity Adjustment 735 CPM

Calibration of 1 hr TSP		
Calibration Point	**Laser Dust Monitor** Mass Concentration (µg/m3) **X-axis**	**HVS** Mass concentration (µg/m^3) **Y-axis**
1	22.0	71.0
2	38.0	125.5
3	57.0	179.2
Average	**39.0**	**125.2**

By Linear Regression of Y on X

Slope , mw = **3.0832** **Intercept, bw =** **4.9876**

Correlation coefficient* = **0.9986**

Set Correlation Factor	
Particaulate Concentration by High Volume Sampler (µg/m^3)	125.2
Particaulate Concentration by Dust Meter (µg/m^3)	39.0
Measureing time, (min)	60.0

Set Correlation Factor , SCF

SCF = [K=High Volume Sampler / Dust Meter, (µg/m3)] **3.2**

In-house method in according to the instruction manual:
The Dust Monitor was compared with a calibrated High Volume Sampler and The result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

Those filter papers are weighted by HOKLAS laboratory (Wellab Litimed)

Calibrated by: Wong Shing Kwai

Approved by: Henry Leung

Cerificate of Calibration

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler

Description: Digital Dust Indicator

Date of Calibration 25-Nov-19

Manufacturer: Sibata Scientific Technology LTD.

Validity of Calibration Record 24-Jan-20

Model No.: LD-5R

Serial No.: 972779

Equipment No.: SA-01-08

Sensitivity 0.001 mg/m3

High Volume Sampler No.: A-01-01A

Before Sensitivity Adjustment 744 CPM

Tisch Calibration Orifice No.: 3607

After Sensitivity Adjustment 744 CPM

Calibration of 1 hr TSP		
Calibration Point	**Laser Dust Monitor**	**HVS**
	Mass Concentration (µg/m3) **X-axis**	Mass concentration (µg/m^3) **Y-axis**
1	20.0	71.0
2	39.0	125.5
3	55.0	179.2
Average	**38.0**	**125.2**

By Linear Regression of Y on X

Slope , mw = **3.0845** **Intercept, bw =** **8.0213**

Correlation coefficient* = **0.9990**

Set Correlation Factor	
Particaulate Concentration by High Volume Sampler (µg/m^3)	125.2
Particaulate Concentration by Dust Meter (µg/m^3)	38.0
Measureing time, (min)	60.0
Set Correlation Factor , SCF	
SCF = [K=High Volume Sampler / Dust Meter, (µg/m3)]	**3.3**

In-house method in according to the instruction manual:

The Dust Monitor was compared with a calibrated High Volume Sampler and The result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

Those filter papers are weighted by HOKLAS laboratory (Wellab Litimed)

Calibrated by: Wong Shing Kwai

Approved by: Henry Leung

TISCH Environmental

RECALIBRATION DUE DATE:
January 8, 2020

Certificate of Calibration

Calibration Certification Information					
Cal. Date:	January 8, 2019	**Rootsmeter S/N:** 438320	**Ta:** 294	°K	
Operator:	Jim Tisch		**Pa:** 748.0	mm Hg	
Calibration Model #:	TE-5025A	**Calibrator S/N:** **3607**			

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4340	3.2	2.00
2	3	4	1	1.0190	6.3	4.00
3	5	6	1	0.9110	7.8	5.00
4	7	8	1	0.8650	8.7	5.50
5	9	10	1	0.7150	12.6	8.00

Data Tabulation

Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H\left(Ta/Pa\right)}$ (y-axis)
0.9934	0.6927	1.4125	0.9957	0.6944	0.8866
0.9892	0.9708	1.9976	0.9916	0.9731	1.2538
0.9872	1.0837	2.2334	0.9896	1.0862	1.4018
0.9860	1.1399	2.3424	0.9884	1.1426	1.4703
0.9808	1.3718	2.8251	0.9832	1.3750	1.7732
QSTD	**m=**	**2.07879**	**QA**	**m=**	**1.30170**
	b=	**-0.02422**		**b=**	**-0.01520**
	r=	**0.99997**		**r=**	**0.99997**

Calculations

Vstd=	ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	**Va=**	ΔVol((Pa-ΔP)/Pa)
Qstd=	Vstd/ΔTime	**Qa=**	Va/ΔTime

For subsequent flow rate calculations:

Qstd= $1/m\left(\left(\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}\right)-b\right)$

Qa= $1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$

Standard Conditions	
Tstd:	298.15 °K
Pstd:	760 mm Hg

Key
ΔH: calibrator manometer reading (in H2O)
ΔP: rootsmeter manometer reading (mm Hg)
Ta: actual absolute temperature (°K)
Pa: actual barometric pressure (mm Hg)
b: intercept
m: slope

RECALIBRATION
US EPA recommends annual recalibration per 1998 40 Code of Federal Regulations Part 50 to 51, Appendix B to Part 50, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere, 9.2.17, page 30

sch Environmental, Inc.
15 South Miami Avenue
illage of Cleves, OH 45002

www.tisch-env.com
TOLL FREE: (877)263-7610
FAX: (513)467-9009

Cerificate of Calibration - Wind Monitoring Station

Description:	Yau Lai Estate, Bik Lai House
Manufacturer:	Davis Instruments
Model No.:	Davis7440
Serial No.:	MC01010A44
Equipment No.:	SA-03-04
Date of Calibration	22-Aug-2019
Next Due Date	21-Feb-2020

1. Performance check of Wind Speed

Wind Speed, m/s		Difference D (m/s)
Wind Speed Reading (V1)	Anemometer Value (V1)	D = V1 – V2
0.5	0.5	0.0
1.5	1.5	0.0
1.8	1.9	0.1
2.3	2.5	0.2

2. Performance check of Wind Direction

Wind Direction (^{o})		Difference D (^{o})
Wind Direction Reading (V1)	Marine Compass Value (V1)	D = W1 - W2
0	0	0.0
90.1	90	0.1
180	180	0.0
270.2	270	0.2

Test Specification:

1. Performance Wind Speed Test - The wind meter was on-site calibrated against the anemometer

2. Performance Wind Direction Test - The wind meter was on-site calibrated against the marine compass at four direction

Calibrated by: _____ Wong Shing Kwai

Approved by: _____ Henry Leung

High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET

File No. MA16034/05/0020

Project No. AM1 - Tin Hau Temple

Date: 14-Oct-19 Next Due Date: 13-Dec-19 Operator: SK

Equipment No.: A-01-05 Model No.: GS2310 Serial No. 10599

Ambient Condition			
Temperature, Ta (K)	298.8	Pressure, Pa (mmHg)	763.1

Orifice Transfer Standard Information					
Serial No.	3607	Slope, mc	0.0588	Intercept, bc	-0.02422
Last Calibration Date:	8-Jan-19	**mc x Qstd + bc = [ΔH x (Pa/760) x (298/Ta)]$^{1/2}$**			
Next Calibration Date:	8-Jan-20	**Qstd = {[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$ -bc} / mc**			

Calibration of TSP Sampler

Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$	Qstd (CFM) **X - axis**	ΔW (HVS), in. of water	[ΔW x (Pa/760) x (298/Ta)]$^{1/2}$ **Y-axis**
1	12.3	3.51	60.10	8.3	2.88
2	9.0	3.00	51.47	6.1	2.47
3	7.4	2.72	46.71	4.8	2.19
4	4.9	2.22	38.08	3.0	1.73
5	2.7	1.64	28.38	1.8	1.34

By Linear Regression of Y on X

Slope , mw = **0.0495** **Intercept, bw =** **-0.0982**

Correlation coefficient* = **0.9982**

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 43 CFM

From the Regression Equation, the "Y" value according to

mw x Qstd + bw = [ΔW x (Pa/760) x (298/Ta)]$^{1/2}$

Therefore, Set Point; W = (mw x Qstd + bw)^2 x (760 / Pa) x (Ta / 298) = **4.11**

Remarks:

Conducted by: SK Wong Signature: Date: 14 October 2019

Checked by: Henry Leung Signature: Date: 14 October 2019

High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET

File No. MA16034/05/0021

Project No. AM1 - Tin Hau Temple

Date: 13-Dec-19 Next Due Date: 12-Feb-20 Operator: SK

Equipment No.: A-01-05 Model No.: GS2310 Serial No. 10599

Ambient Condition			
Temperature, Ta (K)	292.1	Pressure, Pa (mmHg)	765.5

Orifice Transfer Standard Information					
Serial No.	3607	Slope, mc	0.0588	Intercept, bc	-0.02422
Last Calibration Date:	8-Jan-19	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	8-Jan-20	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler

Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) **X - axis**	ΔW (HVS), in. of water	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ **Y-axis**
1	12.7	3.61	61.85	8.5	2.96
2	9.3	3.09	52.99	6.3	2.54
3	7.6	2.79	47.94	4.9	2.24
4	5.0	2.27	38.96	3.1	1.78
5	2.8	1.70	29.26	1.9	1.40

By Linear Regression of Y on X

Slope , mw = 0.0487 **Intercept, bw =** -0.0643

Correlation coefficient* = 0.9983

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 43 CFM

From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ **4.01**

Remarks:

Conducted by: SK Wong Signature: Date: 13 December 2019

Checked by: Henry Leung Signature: Date: 13 December 2019

High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET

File No. MA16034/08/0020

Project No. AM2 - Sai Tso Wan Recreation Ground

Date: 14-Oct-19 Next Due Date: 13-Dec-19 Operator: SK

Equipment No.: A-01-08 Model No.: GS2310 Serial No. 1287

Ambient Condition			
Temperature, Ta (K)	298.8	Pressure, Pa (mmHg)	763.1

Orifice Transfer Standard Information					
Serial No.	3607	Slope, mc	0.0588	Intercept, bc	-0.02422
Last Calibration Date:	8-Jan-19	**mc x Qstd + bc = [ΔH x (Pa/760) x (298/Ta)]$^{1/2}$**			
Next Calibration Date:	8-Jan-20	**Qstd = {[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$ -bc} / mc**			

Calibration of TSP Sampler

Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$	Qstd (CFM) **X - axis**	ΔW (HVS), in. of water	[ΔW x (Pa/760) x (298/Ta)]$^{1/2}$ **Y-axis**
1	12.4	3.52	60.34	8.2	2.87
2	9.5	3.08	52.87	5.8	2.41
3	7.8	2.79	47.94	4.9	2.22
4	4.7	2.17	37.31	3.0	1.73
5	2.6	1.61	27.85	1.8	1.34

By Linear Regression of Y on X

Slope , mw = 0.0460 **Intercept, bw = 0.0304**

Correlation coefficient* = 0.9972

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 43 CFM

From the Regression Equation, the "Y" value according to

mw x Qstd + bw = [ΔW x (Pa/760) x (298/Ta)]$^{1/2}$

Therefore, Set Point; W = (mw x Qstd + bw)^2 x (760 / Pa) x (Ta / 298) = **4.03**

Remarks:

Conducted by: SK Wong Signature: Date: 14 October 2019

Checked by: Henry Leung Signature: Date: 14 October 2019

High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET

File No. MA16034/08/0021

Project No. AM2 - Sai Tso Wan Recreation Ground

Date: 13-Dec-19 Next Due Date: 12-Feb-20 Operator: SK

Equipment No.: A-01-08 Model No.: GS2310 Serial No. 1287

Ambient Condition			
Temperature, Ta (K)	292.1	Pressure, Pa (mmHg)	765.5

Orifice Transfer Standard Information					
Serial No.	3607	Slope, mc	0.0588	Intercept, bc	-0.02422
Last Calibration Date:	8-Jan-19	**mc x Qstd + bc = [ΔH x (Pa/760) x (298/Ta)]$^{1/2}$**			
Next Calibration Date:	8-Jan-20	**Qstd = {[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$ -bc} / mc**			

Calibration of TSP Sampler

Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$	Qstd (CFM) **X - axis**	ΔW (HVS), in. of water	[ΔW x (Pa/760) x (298/Ta)]$^{1/2}$ **Y-axis**
1	12.7	3.61	61.85	8.4	2.94
2	9.7	3.16	54.10	5.9	2.46
3	8.0	2.87	49.17	5.0	2.27
4	4.8	2.22	38.18	3.1	1.78
5	2.7	1.67	28.74	1.8	1.36

By Linear Regression of Y on X

Slope , mw = **0.0465** **Intercept, bw =** **0.0046**

Correlation coefficient* = **0.9974**

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 43 CFM

From the Regression Equation, the "Y" value according to

mw x Qstd + bw = [ΔW x (Pa/760) x (298/Ta)]$^{1/2}$

Therefore, Set Point; W = (mw x Qstd + bw)^2 x (760 / Pa) x (Ta / 298) = **3.91**

Remarks:

Conducted by: SK Wong Signature: Date: 13 December 2019

Checked by: Henry Leung Signature: Date: 13 December 2019

High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET

File No. MA16034/03/0020

Project No. AM3 - Yau Lai Estate, Bik Lai House

Date: 14-Oct-19 Next Due Date: 13-Dec-19 Operator: SK

Equipment No.: A-01-03 Model No.: GS2310 Serial No. 10379

Ambient Condition			
Temperature, Ta (K)	298.8	Pressure, Pa (mmHg)	763.1

Orifice Transfer Standard Information					
Serial No.	3607	Slope, mc	0.0588	Intercept, bc	-0.02422
Last Calibration Date:	8-Jan-19	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	8-Jan-20	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler

Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) **X - axis**	ΔW (HVS), in. of water	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ **Y-axis**
1	12.1	3.48	59.61	8.0	2.83
2	9.0	3.00	51.47	6.0	2.45
3	7.6	2.76	47.33	4.8	2.19
4	4.9	2.22	38.08	3.2	1.79
5	2.6	1.61	27.85	1.9	1.38

By Linear Regression of Y on X

Slope , mw = **0.0459** **Intercept, bw =** **0.0675**

Correlation coefficient* = **0.9980**

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 43 CFM

From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ **4.17**

Remarks:

Conducted by: SK Wong Signature: Date: 14 October 2019

Checked by: Henry Leung Signature: Date: 14 October 2019

High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET

File No. MA16034/03/0021

Project No. AM3 - Yau Lai Estate, Bik Lai House

Date: 13-Dec-19 Next Due Date: 12-Feb-20 Operator: SK

Equipment No.: A-01-03 Model No.: GS2310 Serial No. 10379

Ambient Condition			
Temperature, Ta (K)	292.1	Pressure, Pa (mmHg)	765.5

Orifice Transfer Standard Information					
Serial No.	3607	Slope, mc	0.0588	Intercept, bc	-0.02422
Last Calibration Date:	8-Jan-19	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	8-Jan-20	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler

Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) **X - axis**	ΔW (HVS), in. of water	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ **Y-axis**
1	12.5	3.58	61.36	8.3	2.92
2	9.3	3.09	52.99	6.2	2.52
3	7.9	2.85	48.87	5.0	2.27
4	5.1	2.29	39.34	3.3	1.84
5	2.7	1.67	28.74	2.0	1.43

By Linear Regression of Y on X

Slope , mw = **0.0459** **Intercept, bw =** **0.0740**

Correlation coefficient* = **0.9974**

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 43 CFM

From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ **4.08**

Remarks:

Conducted by: SK Wong Signature: Date: 13 December 2019

Checked by: Henry Leung Signature: Date: 13 December 2019

High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET

File No. MA16034/54/0020

Project No. AM4(A) - Cha Kwo Ling Public Cargo Working Area Administrative Office

Date: 14-Oct-19 Next Due Date: 13-Dec-19 Operator: SK

Equipment No.: A-01-54 Model No.: TE-5170 Serial No. 1536

Ambient Condition			
Temperature, Ta (K)	298.8	Pressure, Pa (mmHg)	763.1

Orifice Transfer Standard Information					
Serial No.	3607	Slope, mc	0.0588	Intercept, bc	-0.02422
Last Calibration Date:	8-Jan-19	**mc x Qstd + bc = [ΔH x (Pa/760) x (298/Ta)]$^{1/2}$**			
Next Calibration Date:	8-Jan-20	**Qstd = {[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$ -bc} / mc**			

Calibration of TSP Sampler

Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$	Qstd (CFM) **X - axis**	ΔW (HVS), in. of water	[ΔW x (Pa/760) x (298/Ta)]$^{1/2}$ **Y-axis**
1	12.3	3.51	60.10	8.2	2.87
2	9.4	3.07	52.59	6.0	2.45
3	7.3	2.70	46.39	5.0	2.24
4	5.0	2.24	38.47	3.3	1.82
5	2.9	1.70	29.39	1.8	1.34

By Linear Regression of Y on X

Slope , mw = 0.0489 **Intercept, bw = -0.0747**

Correlation coefficient* = 0.9984

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 43 CFM

From the Regression Equation, the "Y" value according to

mw x Qstd + bw = [ΔW x (Pa/760) x (298/Ta)]$^{1/2}$

Therefore, Set Point; W = (mw x Qstd + bw)^2 x (760 / Pa) x (Ta / 298) = **4.10**

Remarks:

Conducted by: SK Wong Signature: Date: 14 October 2019

Checked by: Henry Leung Signature: Date: 14 October 2019

High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET

File No. MA16034/54/0021

Project No. AM4(A) - Cha Kwo Ling Public Cargo Working Area Administrative Office

Date: 13-Dec-19 Next Due Date: 12-Feb-20 Operator: SK

Equipment No.: A-01-54 Model No.: TE-5170 Serial No. 1536

Ambient Condition			
Temperature, Ta (K)	292.1	Pressure, Pa (mmHg)	765.5

Orifice Transfer Standard Information					
Serial No.	3607	Slope, mc	0.0588	Intercept, bc	-0.02422
Last Calibration Date:	8-Jan-19	**mc x Qstd + bc = [ΔH x (Pa/760) x (298/Ta)]$^{1/2}$**			
Next Calibration Date:	8-Jan-20	**Qstd = {[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$ -bc} / mc**			

Calibration of TSP Sampler

Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$	Qstd (CFM) **X - axis**	ΔW (HVS), in. of water	[ΔW x (Pa/760) x (298/Ta)]$^{1/2}$ **Y-axis**
1	12.7	3.61	61.85	8.4	2.94
2	9.7	3.16	54.10	6.2	2.52
3	7.5	2.78	47.62	5.1	2.29
4	5.2	2.31	39.72	3.4	1.87
5	3.0	1.76	30.27	1.9	1.40

By Linear Regression of Y on X

Slope , mw = 0.0483 **Intercept, bw = -0.0525**

Correlation coefficient* = 0.9989

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 43 CFM

From the Regression Equation, the "Y" value according to

mw x Qstd + bw = [ΔW x (Pa/760) x (298/Ta)]$^{1/2}$

Therefore, Set Point; W = (mw x Qstd + bw)^2 x (760 / Pa) x (Ta / 298) = **3.99**

Remarks:

Conducted by: SK Wong Signature: Date: 13 December 2019

Checked by: Henry Leung Signature: Date: 13 December 2019

High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET

File No. MA16034/37/0020

Project No. AM5(A) - Tseung Kwan O DSD Desilting Compound

Date: 14-Oct-19 Next Due Date: 13-Dec-19 Operator: SK

Equipment No.: A-01-37 Model No.: GS2310 Serial No. 1704

Ambient Condition			
Temperature, Ta (K)	298.8	Pressure, Pa (mmHg)	763.1

Orifice Transfer Standard Information					
Serial No.	3607	Slope, mc	0.0588	Intercept, bc	-0.02422
Last Calibration Date:	8-Jan-19	**mc x Qstd + bc = [ΔH x (Pa/760) x (298/Ta)]$^{1/2}$**			
Next Calibration Date:	8-Jan-20	**Qstd = {[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$ -bc} / mc**			

Calibration of TSP Sampler

Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$	Qstd (CFM) **X - axis**	ΔW (HVS), in. of water	[ΔW x (Pa/760) x (298/Ta)]$^{1/2}$ **Y-axis**
1	12.4	3.52	60.34	8.4	2.90
2	9.7	3.12	53.42	6.2	2.49
3	7.7	2.78	47.64	5.0	2.24
4	5.1	2.26	38.85	3.2	1.79
5	3.0	1.73	29.89	2.0	1.42

By Linear Regression of Y on X

Slope , mw = **0.0485** **Intercept, bw =** **-0.0657**

Correlation coefficient* = **0.9983**

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 43 CFM

From the Regression Equation, the "Y" value according to

mw x Qstd + bw = [ΔW x (Pa/760) x (298/Ta)]$^{1/2}$

Therefore, Set Point; W = (mw x Qstd + bw)^2 x (760 / Pa) x (Ta / 298) = **4.08**

Remarks:

Conducted by: SK Wong Signature: Date: 14 October 2019

Checked by: Henry Leung Signature: Date: 14 October 2019

High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET

File No. MA16034/37/0021

Project No. AM5(A) - Tseung Kwan O DSD Desilting Compound

Date: 13-Dec-19 Next Due Date: 12-Feb-20 Operator: SK

Equipment No.: A-01-37 Model No.: GS2310 Serial No. 1704

Ambient Condition			
Temperature, Ta (K)	292.1	Pressure, Pa (mmHg)	765.5

Orifice Transfer Standard Information					
Serial No.	3607	Slope, mc	0.0588	Intercept, bc	-0.02422
Last Calibration Date:	8-Jan-19	**mc x Qstd + bc = [ΔH x (Pa/760) x (298/Ta)]$^{1/2}$**			
Next Calibration Date:	8-Jan-20	**Qstd = {[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$ -bc} / mc**			

Calibration of TSP Sampler

Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$	Qstd (CFM) **X - axis**	ΔW (HVS), in. of water	[ΔW x (Pa/760) x (298/Ta)]$^{1/2}$ **Y-axis**
1	12.6	3.60	61.61	8.6	2.97
2	9.8	3.17	54.38	6.3	2.54
3	7.8	2.83	48.56	5.1	2.29
4	5.2	2.31	39.72	3.3	1.84
5	3.0	1.76	30.27	2.0	1.43

By Linear Regression of Y on X

Slope , mw = 0.0488 **Intercept, bw = -0.0712**

Correlation coefficient* = 0.9985

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 43 CFM

From the Regression Equation, the "Y" value according to

mw x Qstd + bw = [ΔW x (Pa/760) x (298/Ta)]$^{1/2}$

Therefore, Set Point; W = (mw x Qstd + bw)^2 x (760 / Pa) x (Ta / 298) = **3.99**

Remarks:

Conducted by: SK Wong Signature: Date: 13 December 2019

Checked by: Henry Leung Signature: Date: 13 December 2019

High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET

File No. MA16034/07/0020

Project No. AM6 - Park Central

Date: 14-Nov-19 Next Due Date: 13-Jan-20 Operator: SK

Equipment No.: A-01-07 Model No.: GS2310 Serial No. 10592

Ambient Condition			
Temperature, Ta (K)	296	Pressure, Pa (mmHg)	764.0

Orifice Transfer Standard Information					
Serial No.	3607	Slope, mc	0.0588	Intercept, bc	-0.02422
Last Calibration Date:	8-Jan-19	**mc x Qstd + bc = [ΔH x (Pa/760) x (298/Ta)]$^{1/2}$**			
Next Calibration Date:	8-Jan-20	**Qstd = {[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$ -bc} / mc**			

Calibration of TSP Sampler

Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$	Qstd (CFM) **X - axis**	ΔW (HVS), in. of water	[ΔW x (Pa/760) x (298/Ta)]$^{1/2}$ **Y-axis**
1	11.8	3.45	59.08	7.0	2.67
2	8.8	2.99	51.22	5.6	2.38
3	7.2	2.71	46.46	4.5	2.13
4	4.5	2.14	36.77	2.9	1.70
5	2.9	1.72	29.75	1.8	1.36

By Linear Regression of Y on X

Slope , mw = 0.0450 **Intercept, bw = 0.0393**

Correlation coefficient* = 0.9988

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 43 CFM

From the Regression Equation, the "Y" value according to

mw x Qstd + bw = [ΔW x (Pa/760) x (298/Ta)]$^{1/2}$

Therefore, Set Point; W = (mw x Qstd + bw)^2 x (760 / Pa) x (Ta / 298) = **3.85**

Remarks:

Conducted by: SK Wong Signature: Date: 14 November 2019

Checked by: Henry Leung Signature: Date: 14 November 2019

Equipment no.: N-12-03

Calibration Certificate

0022523

Customer : Cinotech Consultants Limited RM 1710, Technology Park, 18 On Lai Street, Shatin, N.T. Hong Kong Customer Code : SVEC09005	Object 1 : BSWA 308 SLM Serial No. /Ref. No. : 570188 / 550850 Object 2 : Serial No. /Ref. No. : Manufacturer : BSWAtech
Date of calibration: 23/09/2019 Date of the recommended re-calibration: 23/09/2020	Certificate No.: 0022523 Handle by: E0002

Measuring results

Reference value	Indication value	Deviation	Allowed deviation	Object
94.0dB	94.0dB	0.0dB	+/- 1.5dB	1
114.0dB	114.0dB	0.0dB	+/- 1.5dB	1

Measuring equipment

index	Calibrator / Master	Traceability
1	Master Sound Meter, SVAN949,sn:8571	IEC61672
2	Sound Calibrator, SV30A sn:32580	IEC60942

Ambient conditions

Temperature (20...26)°C Humidity (20...60)%RH

Measuring procedure

Calibrated by Type 1 Sound Calibrator with Master Sound Level Meter under 1kHz Frequency.

Uncertainty

+/- 0.2 dB for probability not less than 95%.

Conformity

1.The resulted values were those obtained at the time of test and applies only to the item calibrated.
2.The measurement uncertainty was calculated according to the regulations of GUM with the coverage factor k=2 and contains the uncertainty of the measuring procedure and the uncertainty of the measuring system.
3.The equipment being used in this calibration are regularly calibrated by laboratory according to ISO/IEC17025.
4.HKAS has accredited this laboratory (HOKLAS 267) for specific calibration activities as listed in the HOKLAS directory of accredited laboratories.
5.The calibrations certificate may not be reproduced.

Measured value(s) **within** **the allowable deviation.**

Performed by

Calibration Technician

Approved by

Quality Manager

WELLAB LIMITED
Rms 816, 1516 & 1701, Technology Park,
18 On Lai Street, Shatin, N.T, Hong Kong.
Tel: 2898 7388 Fax: 2898 7076
Website: www.wellab.com.hk

TEST REPORT

APPLICANT: **Cinotech Consultants Limited**
Room 1710, Technology Park,
18 On Lai Street,
Shatin, NT, Hong Kong

Test Report No.:	C/N/181213/1
Date of Issue:	2018-12-13
Date Received:	2018-12-12
Date Tested:	2018-12-12
Date Completed:	2018-12-13
Next Due Date:	2019-12-12
Page:	1 of 1

Certificate of Calibration

Item for calibration:

Description	: 'SVANTEK' Integrating Sound Level Meter
Manufacturer	: SVANTEK
Model No.	: SVAN 979
Serial No.	: 27189
Microphone No.	: 165399
Equipment No.	: SN-01-01

Test conditions:

Room Temperatre	: 22 degree Celsius
Relative Humidity	: 58 %

Methodology:

The Sound Level Calibrator has been calibrated in accordance with the documented procedures and using standard(s) and instrument(s) which are recommended by the manufacturer, or equivalent.

Results:

Sound Pressure Level (1KHz)	Measured SPL	Tolerance
At 94.0 SPL	94.0	94.0 ± 0.1dB
At 114.0 SPL	114.0	114.0 ± 0.1dB

PREPARED AND CHECKED BY:
For and On Behalf of **WELLAB Ltd.**

Patrick Tse
PATRICK TSE
Laboratory Manager

WELLAB LIMITED
Rms 816, 1516 & 1701, Technology Park,
18 On Lai Street, Shatin, N.T, Hong Kong.
Tel: 2898 7388 Fax: 2898 7076
Website: www.wellab.com.hk

TEST REPORT

APPLICANT: **Cinotech Consultants Limited**
Room 1710, Technology Park,
18 On Lai Street,
Shatin, NT, Hong Kong

Test Report No.:	C/N/181221/1
Date of Issue:	2018-12-21
Date Received:	2018-12-19
Date Tested:	2018-12-19
Date Completed:	2018-12-21
Next Due Date:	2019-12-20

ATTN: **Mr. Henry Leung**

Page: 1 of 1

Certificate of Calibration

Item for calibration:

Description	: 'SVANTEK' Integrating Sound Level Meter
Manufacturer	: SVANTEK
Model No.	: SVAN 959
Serial No.	: 11275
Microphone No.	: 86553
Equipment No.	: N-08-01

Test conditions:

Room Temperatre	: 22 degree Celsius
Relative Humidity	: 55%

Methodology:

The Sound Level Calibrator has been calibrated in accordance with the documented procedures and using standard(s) and instrument(s) which are recommended by the manufacturer, or equivalent.

Results:

Sound Pressure Level (1KHz)	Measured SPL	Tolerance
At 94.0 SPL	94.0	94.0 ± 0.1dB
At 114.0 SPL	114.0	114.0 ± 0.1dB

PREPARED AND CHECKED BY:
For and On Behalf of **WELLAB Ltd.**

Patrick Tse

PATRICK TSE
Laboratory Manager

Calibration Certificate

0022999

Customer : Cinotech Consultants Limited RM 1710, Technology Park, 18 On Lai Street, Shatin, N.T. Hong Kong Customer Code : SVEC09005	Object 1 : SVAN957 SLM Serial No. /Ref. No. : 23851 / N-08-12 Object 2 : Microphone Serial No. /Ref. No. : 43676 Manufacturer : Svantek
Date of calibration: 19/12/2019 Date of the recommended re-calibration: 19/12/2020	Certificate No.: 0022999 Handle by: E0002

Measuring results

Reference value	Indication value	Deviation	Allowed deviation	Object
94.0dB	94.0dB	0.0dB	+/- 1.5dB	1
114.0dB	114.0dB	0.0dB	+/- 1.5dB	1

Measuring equipment

index	Calibrator / Master	Traceability
1	Master Sound Meter, SVAN949,sn:8571	IEC61672
2	Sound Calibrator, SV30A sn:32580	IEC60942

Ambient conditions

Temperature (20...26)°C Humidity (20...60)%RH

Measuring procedure

Calibrated by Type 1 Sound Calibrator with Master Sound Level Meter under 1kHz Frequency.

Uncertainty

+/- 0.2 dB for probability not less than 95%.

Conformity

1.The resulted values were those obtained at the time of test and applies only to the item calibrated.
2.The measurement uncertainty was calculated according to the regulations of GUM with the coverage factor k=2 and contains the uncertainty of the measuring procedure and the uncertainty of the measuring system.
3.The equipment being used in this calibration are regularly calibrated by laboratory according to ISO/IEC17025.
4.HKAS has accredited this laboratory (HOKLAS 267) for specific calibration activities as listed in the HOKLAS directory of accredited laboratories.
5.The calibrations certificate may not be reproduced.

Measured value(s) within **the allowable deviation.**

Performed by

Calibration Technician

Approved by

Quality Manager

Appleone Calibration Laboratory Ltd. Rm1309, 13/F, No.77 Wing Hong St, Kln, HKSAR Tel: +852 2370 4437 Fax: +852 2114 0393

Calibration Certificate

0022673

Customer : Cinotech Consultants Limited RM 1710, Technology Park, 18 On Lai Street, Shatin, N.T. Hong Kong Customer Code : SVEC09005	Object 1 : ST-120 sound calibrator Serial No. /Ref. No. : 181001608 Object 2 : Serial No. /Ref. No. : Manufacturer : Soundtek
Date of calibration: 24/10/2019 Date of the recommended re-calibration: 24/10/2020	Certificate No.: 0022673 Handle by: E0002

Measuring results

Reference value	Indication value	Deviation	Allowed deviation	Object
94.0dB	94.0dB	0.0dB	+/- 0.3dB	1
114.0dB	114.1dB	+0.1dB	+/- 0.5dB	1

Measuring equipment

index	Calibrator / Master	Traceability
1	Master Sound Meter, SVAN949,sn:8571	IEC61672
2	Sound Calibrator, SV30A sn:32580	IEC60942

Ambient conditions

Temperature (20...26)°C Humidity (20...60)%RH

Measuring procedure

Calibrated by Type 1 Sound Level Meter and 1kHz Sound Source .

Uncertainty

+/- 0.2 dB for probability not less than 95%.

Conformity

1.The resulted values were those obtained at the time of test and applies only to the item calibrated.
2.The measurement uncertainty was calculated according to the regulations of GUM with the coverage factor k=2 and contains the uncertainty of the measuring procedure and the uncertainty of the measuring system.
3.The equipment being used in this calibration are regularly calibrated by laboratory according to ISO/IEC17025.
4.HKAS has accredited this laboratory (HOKLAS 267) for specific calibration activities as listed in the HOKLAS directory of accredited laboratories.
5.The calibrations certificate may not be reproduced.

Measured value(s) within **the allowable deviation.**

Performed by

Calibration Technician

Approved by

Quality Manager

Appleone Calibration Laboratory Ltd. Rm1309, 13/F, No.77 Wing Hong St, Kln, HKSAR Tel: +852 2370 4437 Fax: +852 2114 0393

Calibration Certificate

0022675

Customer : Cinotech Consultants Limited RM 1710, Technology Park, 18 On Lai Street, Shatin, N.T. Hong Kong Customer Code : SVEC09005	Object 1 : ST-120 sound calibrator Serial No. /Ref. No. : 181001637 Object 2 : Serial No. /Ref. No. : Manufacturer : Soundtek
Date of calibration: 24/10/2019 Date of the recommended re-calibration: 24/10/2020	Certificate No.: 0022675 Handle by: E0002

Measuring results

Reference value	Indication value	Deviation	Allowed deviation	Object
94.0dB	94.0dB	0.0dB	+/- 0.3dB	1
114.0dB	114.0dB	0.0dB	+/- 0.5dB	1

Measuring equipment

index	Calibrator / Master	Traceability
1	Master Sound Meter, SVAN949,sn:8571	IEC61672
2	Sound Calibrator, SV30A sn:32580	IEC60942

Ambient conditions

Temperature (20...26)°C Humidity (20...60)%RH

Measuring procedure

Calibrated by Type 1 Sound Level Meter and 1kHz Sound Source .

Uncertainty

+/- 0.2 dB for probability not less than 95%.

Conformity

1.The resulted values were those obtained at the time of test and applies only to the item calibrated.
2.The measurement uncertainty was calculated according to the regulations of GUM with the coverage factor k=2 and contains the uncertainty of the measuring procedure and the uncertainty of the measuring system.
3.The equipment being used in this calibration are regularly calibrated by laboratory according to ISO/IEC17025.
4.HKAS has accredited this laboratory (HOKLAS 267) for specific calibration activities as listed in the HOKLAS directory of accredited laboratories.
5.The calibrations certificate may not be reproduced.

Measured value(s) within **the allowable deviation.**

Performed by

Calibration Technician

Approved by

Quality Manager

Appleone Calibration Laboratory Ltd. Rm1309, 13/F, No.77 Wing Hong St, Kln, HKSAR Tel: +852 2370 4437 Fax: +852 2114 0393

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consulting . testing . research

WELLAB LIMITED
Room 1701, Technology Park,
18 On Lai Street, Shatin,
N.T., Hong Kong.
Tel: 2898 7388 Fax: 2898 7076
Website: www.wellab.com.hk

TEST REPORT

APPLICANT: **Cinotech Consultants Limited**
RM 1710, Technology Park,
18 On Lai Street,
Shatin, N.T., Hong Kong

ATTN: **Mr. Henry Leung**

Test Report No.:	32340
Date of Issue:	2019-10-23
Date Received:	2019-10-23
Date Tested:	2019-10-23
Date Completed:	2019-10-23
Page:	1 of 2

Certificate of Calibration

Item for calibration:

YSI EXO1 Multiparameter Sondes	Equipment No.:	SW-08-91
Manufacturer:	YSI Incorporated, a Xylem brand	
Description:	Model No.	Serial No.
- EXO1 Sonde, 100 meter Depth, 4 Sensor ports	599501-02	17B100186
- EXO Optical DO Sensor, Ti	599100-01	17A105015
- EXO conductivity/Temperature Sensor, Ti	599870	17A105109
- EXO Turbuduty Sensor, Ti	599101-01	17A104098
- EXO pH Sensor Assembly, Guarded, Ti	599701	16J101302

Test conditions:

Room Temperatre : 17-22 degree Celsius
Relative Humidity : 40-70%

Test Specifications:

Performance checking for Conductivity, Temperature, pH, Dissolved oxygen (D.O.) and Turbidity

Methodology:

According to manufacturer instruction manual, APHA 20e 4500-O C

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PREPARED AND CHECKED BY:
For and On Behalf of **WELLAB Ltd.**

PATRICK TSE
General Manager

WELLAB 匯力
consulting . testing . research

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TEST REPORT

Test Report No.:	32340
Date of Issue:	2019-10-23
Date Received:	2019-10-23
Date Tested:	2019-10-23
Date Completed:	2019-10-23

Certificate of Calibration

Results:

Conductivity performance checking

	Instrument Readings (μS/cm)	Accetance Criteria	Comment
KCl stock solution (12890 μS/cm)	13000	12246-13534	Pass

Temperature performance checking

Reference thermometer-E431 Readings (°C)	Instrument Readings (°C)	Correction (°C)	Comment
20.0	20.001	0.001	N/A

pH performance checking

	Instrument Readings (pH unit)	Accetance Criteria	Comment
pH QC buffer 4.00	4.00	4.00 ± 0.10	Pass
pH QC buffer 6.86	6.89	6.86 ± 0.10	Pass
pH QC buffer 9.18	9.17	9.18 ± 0.10	Pass

D.O. performance checking

	Instrument Readings (mg/L)	Accetance Criteria	Comment
Zero DO soultion	0.08	<0.1mg/L	Pass

Winkler Titration value (mg/L)	Instrument Readings (mg/L)	Accetance Criteria	Comment
7.98	8.08	Difference between Titration value and instrument reading <0.2mg/L	Pass

Turbidity performance checking

Turbidity stock solution	Instrument Readings (NTU)	Accetance Criteria	Comment
10 NTU	10.02	9.0-11.0	Pass
50 NTU	50.01	45.0-55.0	Pass
100 NTU	102.1	90.0-110.0	Pass

Depth performance checking

Water Depth	Instrument Readings (m)	Accetance Criteria	Comment
0.5 meter	0.50	0.45-0.55	Pass

**********END OF REPORT**********

CALIBRATION CERTIFICATE

Calibration Item:	Minimate Plus Unit (Calibration with Geophone BG14849)
Model No.:	716A0403
Serial No.:	BE15892
Calibration Date:	19 March 2019
Next Calibration Date:	19 March 2020
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

INSTANTEL INC. hereby certifies that this unit has been calibrated and that the results are consistent with the specifications published regarding this instrument. The SENSORCHECK feature of the unit is sufficiently reliable to indicate proper operation, although it is recommended that this unit be sent to INSTANTEL or an authorized service center for regular calibration.

Authorized by: _____

(Isaac Au Yeung)

Date: 19 March 2019

CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit BE15892)
Part Number:	714A9701
Serial No.:	BG14849
Calibration Date:	19 March 2019
Next Calibration Date:	19 March 2020
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Isaac Au Yeung)

Date: 19 March 2019

CALIBRATION CERTIFICATE

Calibration Item:	Linear Microphone (Calibration with main unit BE15892)
Model No.:	714A9801
Serial No.:	BH10228
Calibration Date:	18 March 2019
Next Calibration Date:	18 March 2020
Method Used:	In-house Method MM-002
In-house Testing Procedure No.:	MM-002

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
Linear Microphone	714A9801	BH11561
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Microphone*	4193	2677340
Low Frequency Calibrator*	42AE	105366
Bruel & Kjaer Conditional Amplifier*	269	2152173

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 18 March 2019

CALIBRATION CERTIFICATE

Calibration Item:	Minimate Plus Unit (Calibration with Geophone BG14853)
Model No.:	716A0403
Serial No.:	BE17906
Calibration Date:	22 March 2019
Next Calibration Date:	22 March 2020
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Isaac Au Yeung)

Date: 22 March 2019

CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit BE17906)
Part Number:	714A9701
Serial No.:	BG14853
Calibration Date:	22 March 2019
Next Calibration Date:	22 March 2020
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

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Authorized by: _____

(Isaac Au Yeung)

Date: 22 March 2019

CALIBRATION CERTIFICATE

Calibration Item:	Linear Microphone (Calibration with main unit BE17906)
Model No.:	714A9801
Serial No.:	BH11454
Calibration Date:	22 March 2019
Next Calibration Date:	22 March 2020
Method Used:	In-house Method MM-002
In-house Testing Procedure No.:	MM-002

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
Linear Microphone	714A9801	BH11561
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Microphone*	4193	2677340
Low Frequency Calibrator*	42AE	105366
Bruel & Kjaer Conditional Amplifier*	269	2152173

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 22 March 2019

CALIBRATION CERTIFICATE

Calibration Item:	Minimate Plus Unit (Calibration with Geophone BG14852)
Model No.:	716A0403
Serial No.:	BE15890
Calibration Date:	22 March 2019
Next Calibration Date:	22 March 2020
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

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Authorized by: _____

(Isaac Au Yeung)

Date: 22 March 2019

CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit BE15890)
Part Number:	714A9701
Serial No.:	BG14852
Calibration Date:	22 March 2019
Next Calibration Date:	22 March 2020
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

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Authorized by: _____

(Isaac Au Yeung)

Date: 22 March 2019

CALIBRATION CERTIFICATE

Calibration Item:	Linear Microphone (Calibration with main unit BE15890)
Model No.:	714A9801
Serial No.:	BH11455
Calibration Date:	22 March 2019
Next Calibration Date:	22 March 2020
Method Used:	In-house Method MM-002
In-house Testing Procedure No.:	MM-002

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
Linear Microphone	714A9801	BH11561
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Microphone*	4193	2677340
Low Frequency Calibrator*	42AE	105366
Bruel & Kjaer Conditional Amplifier*	269	2152173

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 22 March 2019

CALIBRATION CERTIFICATE

Calibration Item:	Minimate Plus Unit (Calibration with Geophone BG16955)
Model No.:	716A0403
Serial No.:	BE16223
Calibration Date:	22 March 2019
Next Calibration Date:	22 March 2020
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Isaac Au Yeung)

Date: 22 March 2019

CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit BE16223)
Part Number:	714A9701
Serial No.:	BG16955
Calibration Date:	22 March 2019
Next Calibration Date:	22 March 2020
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

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Authorized by: _____

(Isaac Au Yeung)

Date: 22 March 2019

CALIBRATION CERTIFICATE

Calibration Item:	Linear Microphone (Calibration with main unit BE16223)
Model No.:	714A9801
Serial No.:	BH11458
Calibration Date:	22 March 2019
Next Calibration Date:	22 March 2020
Method Used:	In-house Method MM-002
In-house Testing Procedure No.:	MM-002

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
Linear Microphone	714A9801	BH11561
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Microphone*	4193	2677340
Low Frequency Calibrator*	42AE	105366
Bruel & Kjaer Conditional Amplifier*	269	2152173

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 22 March 2019

CALIBRATION CERTIFICATE

Calibration Item:	Minimate Plus Unit (Calibration with Geophone BG20672)
Model No.:	716A0403
Serial No.:	BE17504
Calibration Date:	15 April 2019
Next Calibration Date:	15 April 2020
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Isaac Au Yeung)

Date: 15 April 2019

CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit BE17504)
Part Number:	714A9701
Serial No.:	BG20672
Calibration Date:	15 April 2019
Next Calibration Date:	15 April 2020
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Isaac Au Yeung)

Date: 15 April 2019

CALIBRATION CERTIFICATE

Calibration Item:	Linear Microphone (Calibration with main unit BE17504)
Model No.:	714A9801
Serial No.:	BH11460
Calibration Date:	15 April 2019
Next Calibration Date:	15 April 2020
Method Used:	In-house Method MM-002
In-house Testing Procedure No.:	MM-002

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
Linear Microphone	714A9801	BH11561
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Microphone*	4193	2677340
Low Frequency Calibrator*	42AE	105366
Bruel & Kjaer Conditional Amplifier*	269	2152173

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 15 April 2019

CALIBRATION CERTIFICATE

Calibration Item:	Minimate Plus Unit (Calibration with Geophone BG16515)
Model No.:	716A0403
Serial No.:	BE16354
Calibration Date:	8 April 2019
Next Calibration Date:	8 April 2020
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Isaac Au Yeung)

Date: 8 April 2019

CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit BE16354)
Part Number:	714A9701
Serial No.:	BG16515
Calibration Date:	8 April 2019
Next Calibration Date:	8 April 2020
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Isaac Au Yeung)

Date: 8 April 2019

CALIBRATION CERTIFICATE

Calibration Item:	Linear Microphone (Calibration with main unit BE16354)
Model No.:	714A9801
Serial No.:	BH12477
Calibration Date:	8 April 2019
Next Calibration Date:	8 April 2020
Method Used:	In-house Method MM-002
In-house Testing Procedure No.:	MM-002

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
Linear Microphone	714A9801	BH11561
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Microphone*	4193	2677340
Low Frequency Calibrator*	42AE	105366
Bruel & Kjaer Conditional Amplifier*	269	2152173

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 8 April 2019

CALIBRATION CERTIFICATE

Calibration Item:	Minimate Plus Unit (Calibration with Geophone BG15353)
Model No.:	716A0403
Serial No.:	BE15891
Calibration Date:	28 February 2019
Next Calibration Date:	28 February 2020
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

INSTANTEL INC. hereby certifies that this unit has been calibrated and that the results are consistent with the specifications published regarding this instrument. The SENSORCHECK feature of the unit is sufficiently reliable to indicate proper operation, although it is recommended that this unit be sent to INSTANTEL or an authorized service center for regular calibration.

Authorized by: _____

(Isaac Au Yeung)

Date: 28 February 2019

CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit BE15891)
Part Number:	714A9701
Serial No.:	BG15353
Calibration Date:	28 February 2019
Next Calibration Date:	28 February 2020
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

INSTANTEL INC. hereby certifies that this unit has been calibrated and that the results are consistent with the specifications published regarding this instrument. The SENSORCHECK feature of the unit is sufficiently reliable to indicate proper operation, although it is recommended that this unit be sent to INSTANTEL or an authorized service center for regular calibration.

Authorized by: _____

(Isaac Au Yeung)

Date: 28 February 2019

CALIBRATION CERTIFICATE

Calibration Item:	Minimate Plus Unit (Calibration with Geophone BG15180)
Model No.:	716A0403
Serial No.:	BE15894
Calibration Date:	28 February 2019
Next Calibration Date:	28 February 2020
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

INSTANTEL INC. hereby certifies that this unit has been calibrated and that the results are consistent with the specifications published regarding this instrument. The SENSORCHECK feature of the unit is sufficiently reliable to indicate proper operation, although it is recommended that this unit be sent to INSTANTEL or an authorized service center for regular calibration.

Authorized by: _____

(Isaac Au Yeung)

Date: 28 February 2019

CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit BE15894)
Part Number:	714A9701
Serial No.:	BG15180
Calibration Date:	28 February 2019
Next Calibration Date:	28 February 2020
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

INSTANTEL INC. hereby certifies that this unit has been calibrated and that the results are consistent with the specifications published regarding this instrument. The SENSORCHECK feature of the unit is sufficiently reliable to indicate proper operation, although it is recommended that this unit be sent to INSTANTEL or an authorized service center for regular calibration.

Authorized by: _____

(Isaac Au Yeung)

Date: 28 February 2019

CALIBRATION CERTIFICATE

Calibration Item:	Linear Microphone (Calibration with main unit BE17905)
Model No.:	714A9801
Serial No.:	BH14079
Calibration Date:	8 April 2019
Next Calibration Date:	8 April 2020
Method Used:	In-house Method MM-002
In-house Testing Procedure No.:	MM-002

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
Linear Microphone	714A9801	BH11561
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Microphone*	4193	2677340
Low Frequency Calibrator*	42AE	105366
Bruel & Kjaer Conditional Amplifier*	269	2152173

*References are traceable to NIST or equivalent.

INSTANTEL INC. hereby certifies that this unit has been calibrated and that the results are consistent with the specifications published regarding this instrument. The SENSORCHECK feature of the unit is sufficiently reliable to indicate proper operation, although it is recommended that this unit be sent to INSTANTEL or an authorized service center for regular calibration.

Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 8 April 2019

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CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit BE17905)
Part Number:	714A9701
Serial No.:	BG16514
Calibration Date:	8 April 2019
Next Calibration Date:	8 April 2020
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

INSTANTEL INC. hereby certifies that this unit has been calibrated and that the results are consistent with the specifications published regarding this instrument. The SENSORCHECK feature of the unit is sufficiently reliable to indicate proper operation, although it is recommended that this unit be sent to INSTANTEL or an authorized service center for regular calibration.

Authorized by: _____

(Isaac Au Yeung)

Date: 8 April 2019

CALIBRATION CERTIFICATE

Calibration Item:	Minimate Plus Unit (Calibration with Geophone BG16514)
Model No.:	716A0403
Serial No.:	BE17905
Calibration Date:	8 April 2019
Next Calibration Date:	8 April 2020
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Isaac Au Yeung)

Date: 8 April 2019

CALIBRATION CERTIFICATE

Calibration Item:	Minimate Plus Unit (Calibration with Geophone BG20673)
Model No.:	716A0403
Serial No.:	BE13849
Calibration Date:	19 March 2019
Next Calibration Date:	19 March 2020
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

INSTANTEL INC. hereby certifies that this unit has been calibrated and that the results are consistent with the specifications published regarding this instrument. The SENSORCHECK feature of the unit is sufficiently reliable to indicate proper operation, although it is recommended that this unit be sent to INSTANTEL or an authorized service center for regular calibration.

Authorized by: _____

(Isaac Au Yeung)

Date: 19 March 2019

CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit BE13849)
Part Number:	714A9701
Serial No.:	BG20673
Calibration Date:	19 March 2019
Next Calibration Date:	19 March 2020
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

INSTANTEL INC. hereby certifies that this unit has been calibrated and that the results are consistent with the specifications published regarding this instrument. The SENSORCHECK feature of the unit is sufficiently reliable to indicate proper operation, although it is recommended that this unit be sent to INSTANTEL or an authorized service center for regular calibration.

Authorized by: _____

(Isaac Au Yeung)

Date: 19 March 2019

CALIBRATION CERTIFICATE

Calibration Item:	Linear Microphone (Calibration with main unit BE13849)
Model No.:	714A9801
Serial No.:	BH13154
Calibration Date:	18 March 2019
Next Calibration Date:	18 March 2020
Method Used:	In-house Method MM-002
In-house Testing Procedure No.:	MM-002

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
Linear Microphone	714A9801	BH11561
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Microphone*	4193	2677340
Low Frequency Calibrator*	42AE	105366
Bruel & Kjaer Conditional Amplifier*	269	2152173

*References are traceable to NIST or equivalent.

INSTANTEL INC. hereby certifies that this unit has been calibrated and that the results are consistent with the specifications published regarding this instrument. The SENSORCHECK feature of the unit is sufficiently reliable to indicate proper operation, although it is recommended that this unit be sent to INSTANTEL or an authorized service center for regular calibration.

Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 18 March 2019

CALIBRATION CERTIFICATE

Calibration Item:	Minimate Plus Unit (Calibration with Geophone BG16512)
Model No.:	716A0403
Serial No.:	BE13853
Calibration Date:	28 February 2019
Next Calibration Date:	28 February 2020
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

INSTANTEL INC. hereby certifies that this unit has been calibrated and that the results are consistent with the specifications published regarding this instrument. The SENSORCHECK feature of the unit is sufficiently reliable to indicate proper operation, although it is recommended that this unit be sent to INSTANTEL or an authorized service center for regular calibration.

Authorized by: _____

(Isaac Au Yeung)

Date: 28 February 2019

CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit BE13853)
Part Number:	714A9701
Serial No.:	BG16512
Calibration Date:	28 February 2019
Next Calibration Date:	28 February 2020
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Isaac Au Yeung)

Date: 28 February 2019

CALIBRATION CERTIFICATE

Calibration Item:	Minimate Plus Unit (Calibration with Geophone BG16959)
Model No.:	716A0403
Serial No.:	BE17506
Calibration Date:	8 April 2019
Next Calibration Date:	8 April 2020
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

INSTANTEL INC. hereby certifies that this unit has been calibrated and that the results are consistent with the specifications published regarding this instrument. The SENSORCHECK feature of the unit is sufficiently reliable to indicate proper operation, although it is recommended that this unit be sent to INSTANTEL or an authorized service center for regular calibration.

Authorized by: _____

(Isaac Au Yeung)

Date: 8 April 2019

CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit BE17506)
Part Number:	714A9701
Serial No.:	BG16959
Calibration Date:	8 April 2019
Next Calibration Date:	8 April 2020
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

INSTANTEL INC. hereby certifies that this unit has been calibrated and that the results are consistent with the specifications published regarding this instrument. The SENSORCHECK feature of the unit is sufficiently reliable to indicate proper operation, although it is recommended that this unit be sent to INSTANTEL or an authorized service center for regular calibration.

Authorized by: _____

(Isaac Au Yeung)

Date: 8 April 2019

CALIBRATION CERTIFICATE

Calibration Item:	Linear Microphone (Calibration with main unit BE17506)
Model No.:	714A9801
Serial No.:	BH10227
Calibration Date:	8 April 2019
Next Calibration Date:	8 April 2020
Method Used:	In-house Method MM-002
In-house Testing Procedure No.:	MM-002

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
Linear Microphone	714A9801	BH11561
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Microphone*	4193	2677340
Low Frequency Calibrator*	42AE	105366
Bruel & Kjaer Conditional Amplifier*	269	2152173

*References are traceable to NIST or equivalent.

INSTANTEL INC. hereby certifies that this unit has been calibrated and that the results are consistent with the specifications published regarding this instrument. The SENSORCHECK feature of the unit is sufficiently reliable to indicate proper operation, although it is recommended that this unit be sent to INSTANTEL or an authorized service center for regular calibration.

Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 8 April 2019

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CALIBRATION CERTIFICATE

Calibration Item:	Linear Microphone (Calibration with main unit BE17904)
Model No.:	714A9801
Serial No.:	BH14080
Calibration Date:	8 April 2019
Next Calibration Date:	8 April 2020
Method Used:	In-house Method MM-002
In-house Testing Procedure No.:	MM-002

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
Linear Microphone	714A9801	BH11561
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Microphone*	4193	2677340
Low Frequency Calibrator*	42AE	105366
Bruel & Kjaer Conditional Amplifier*	269	2152173

*References are traceable to NIST or equivalent.

INSTANTEL INC. hereby certifies that this unit has been calibrated and that the results are consistent with the specifications published regarding this instrument. The SENSORCHECK feature of the unit is sufficiently reliable to indicate proper operation, although it is recommended that this unit be sent to INSTANTEL or an authorized service center for regular calibration.

Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 8 April 2019

CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit BE17904)
Part Number:	714A9701
Serial No.:	BG14847
Calibration Date:	8 April 2019
Next Calibration Date:	8 April 2020
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

INSTANTEL INC. hereby certifies that this unit has been calibrated and that the results are consistent with the specifications published regarding this instrument. The SENSORCHECK feature of the unit is sufficiently reliable to indicate proper operation, although it is recommended that this unit be sent to INSTANTEL or an authorized service center for regular calibration.

Authorized by: _____

(Isaac Au Yeung)

Date: 8 April 2019

CALIBRATION CERTIFICATE

Calibration Item:	Minimate Plus Unit (Calibration with Geophone BG14847)
Model No.:	716A0403
Serial No.:	BE17904
Calibration Date:	8 April 2019
Next Calibration Date:	8 April 2020
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

INSTANTEL INC. hereby certifies that this unit has been calibrated and that the results are consistent with the specifications published regarding this instrument. The SENSORCHECK feature of the unit is sufficiently reliable to indicate proper operation, although it is recommended that this unit be sent to INSTANTEL or an authorized service center for regular calibration.

Authorized by: _____

(Isaac Au Yeung)

Date: 8 April 2019

CALIBRATION CERTIFICATE

Calibration Item:	Minimate Plus Unit (Calibration with Geophone BG16957)
Model No.:	716A0403
Serial No.:	BE17505
Calibration Date:	28 February 2019
Next Calibration Date:	28 February 2020
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

INSTANTEL INC. hereby certifies that this unit has been calibrated and that the results are consistent with the specifications published regarding this instrument. The SENSORCHECK feature of the unit is sufficiently reliable to indicate proper operation, although it is recommended that this unit be sent to INSTANTEL or an authorized service center for regular calibration.

Authorized by: _____

(Isaac Au Yeung)

Date: 28 February 2019

CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit BE17505)
Part Number:	714A9701
Serial No.:	BG16957
Calibration Date:	28 February 2019
Next Calibration Date:	28 February 2020
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Isaac Au Yeung)

Date: 28 February 2019

CALIBRATION CERTIFICATE

Calibration Item:	Minimate Plus Unit (Calibration with Geophone BG19189)
Model No.:	716A0403
Serial No.:	BE21658
Calibration Date:	15 April 2019
Next Calibration Date:	15 April 2020
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

INSTANTEL INC. hereby certifies that this unit has been calibrated and that the results are consistent with the specifications published regarding this instrument. The SENSORCHECK feature of the unit is sufficiently reliable to indicate proper operation, although it is recommended that this unit be sent to INSTANTEL or an authorized service center for regular calibration.

Authorized by: _____

(Isaac Au Yeung)

Date: 15 April 2019

CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit BE21658)
Part Number:	714A9701
Serial No.:	BG19189
Calibration Date:	15 April 2019
Next Calibration Date:	15 April 2020
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

INSTANTEL INC. hereby certifies that this unit has been calibrated and that the results are consistent with the specifications published regarding this instrument. The SENSORCHECK feature of the unit is sufficiently reliable to indicate proper operation, although it is recommended that this unit be sent to INSTANTEL or an authorized service center for regular calibration.

Authorized by: _____

(Isaac Au Yeung)

Date: 15 April 2019

CALIBRATION CERTIFICATE

Calibration Item:	Linear Microphone (Calibration with main unit BE21658)
Model No.:	714A9801
Serial No.:	BH12476
Calibration Date:	15 April 2019
Next Calibration Date:	15 April 2020
Method Used:	In-house Method MM-002
In-house Testing Procedure No.:	MM-002

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
Linear Microphone	714A9801	BH11561
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Microphone*	4193	2677340
Low Frequency Calibrator*	42AE	105366
Bruel & Kjaer Conditional Amplifier*	269	2152173

*References are traceable to NIST or equivalent.

INSTANTEL INC. hereby certifies that this unit has been calibrated and that the results are consistent with the specifications published regarding this instrument. The SENSORCHECK feature of the unit is sufficiently reliable to indicate proper operation, although it is recommended that this unit be sent to INSTANTEL or an authorized service center for regular calibration.

Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 15 April 2019

CALIBRATION CERTIFICATE

Calibration Item:	Minimate Plus Unit (Calibration with Geophone BG17240)
Model No.:	716A0403
Serial No.:	BE20015
Calibration Date:	19 March 2019
Next Calibration Date:	19 March 2020
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Isaac Au Yeung)

Date: 19 March 2019

CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit BE20015)
Part Number:	714A9701
Serial No.:	BG17240
Calibration Date:	19 March 2019
Next Calibration Date:	19 March 2020
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Isaac Au Yeung)

Date: 19 March 2019

CALIBRATION CERTIFICATE

Calibration Item:	Linear Microphone (Calibration with main unit BE20015)
Model No.:	714A9801
Serial No.:	BH12658
Calibration Date:	18 March 2019
Next Calibration Date:	18 March 2020
Method Used:	In-house Method MM-002
In-house Testing Procedure No.:	MM-002

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
Linear Microphone	714A9801	BH11561
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Microphone*	4193	2677340
Low Frequency Calibrator*	42AE	105366
Bruel & Kjaer Conditional Amplifier*	269	2152173

*References are traceable to NIST or equivalent.

INSTANTEL INC. hereby certifies that this unit has been calibrated and that the results are consistent with the specifications published regarding this instrument. The SENSORCHECK feature of the unit is sufficiently reliable to indicate proper operation, although it is recommended that this unit be sent to INSTANTEL or an authorized service center for regular calibration.

Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 18 March 2019

CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit UM12902)
Part Number:	721A2901
Serial No.:	UM12902
Calibration Date:	14 May 2019
Next Calibration Date:	14 May 2020
Method Used:	In-house Method MM-001
In-house Testing Procedure No.:	MM-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

INSTANTEL INC. hereby certifies that this unit has been calibrated and that the results are consistent with the specifications published regarding this instrument. The SENSORCHECK feature of the unit is sufficiently reliable to indicate proper operation, although it is recommended that this unit be sent to INSTANTEL or an authorized service center for regular calibration.

Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 14 May 2019

CALIBRATION CERTIFICATE

Calibration Item:	Micromate Unit (Calibration with Geophone UM12902)
Model No.:	721A2501
Serial No.:	UM12902
Calibration Date:	14 May 2019
Next Calibration Date:	14 May 2020
Method Used:	In-house Method MM-001
In-house Testing Procedure No.:	MM-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 14 May 2019

CALIBRATION CERTIFICATE

Calibration Item:	Micromate Linear Microphone (Calibration with main unit UM12902)
Model No.:	721A0201
Serial No.:	UL3397
Calibration Date:	14 May 2019
Next Calibration Date:	14 May 2020
Method Used:	In-house Method MM-002
In-house Testing Procedure No.:	MM-002

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
Linear Microphone	714A9801	BH11561
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Microphone*	4193	2677340
Low Frequency Calibrator*	42AE	105366
Bruel & Kjaer Conditional Amplifier*	269	2152173

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 14 May 2019

CALIBRATION CERTIFICATE

Calibration Item:	Micromate Linear Microphone (Calibration with main unit UM12904)
Model No.:	721A0201
Serial No.:	UL3400
Calibration Date:	14 May 2019
Next Calibration Date:	14 May 2020
Method Used:	In-house Method MM-002
In-house Testing Procedure No.:	MM-002

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
Linear Microphone	714A9801	BH11561
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Microphone*	4193	2677340
Low Frequency Calibrator*	42AE	105366
Bruel & Kjaer Conditional Amplifier*	269	2152173

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 14 May 2019

CALIBRATION CERTIFICATE

Calibration Item:	Micromate Unit (Calibration with Geophone UM12904)
Model No.:	721A2501
Serial No.:	UM12904
Calibration Date:	14 May 2019
Next Calibration Date:	14 May 2020
Method Used:	In-house Method MM-001
In-house Testing Procedure No.:	MM-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 14 May 2019

CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit UM12904)
Part Number:	721A2901
Serial No.:	UM12904
Calibration Date:	14 May 2019
Next Calibration Date:	14 May 2020
Method Used:	In-house Method MM-001
In-house Testing Procedure No.:	MM-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 14 May 2019

CALIBRATION CERTIFICATE

Calibration Item:	Micromate Linear Microphone (Calibration with main unit UM12905)
Model No.:	721A0201
Serial No.:	UL3401
Calibration Date:	14 May 2019
Next Calibration Date:	14 May 2020
Method Used:	In-house Method MM-002
In-house Testing Procedure No.:	MM-002

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
Linear Microphone	714A9801	BH11561
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Microphone*	4193	2677340
Low Frequency Calibrator*	42AE	105366
Bruel & Kjaer Conditional Amplifier*	269	2152173

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 14 May 2019

CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit UM12905)
Part Number:	721A2901
Serial No.:	UM12905
Calibration Date:	14 May 2019
Next Calibration Date:	14 May 2020
Method Used:	In-house Method MM-001
In-house Testing Procedure No.:	MM-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 14 May 2019

CALIBRATION CERTIFICATE

Calibration Item:	Micromate Unit (Calibration with Geophone UM12905)
Model No.:	721A2501
Serial No.:	UM12905
Calibration Date:	14 May 2019
Next Calibration Date:	14 May 2020
Method Used:	In-house Method MM-001
In-house Testing Procedure No.:	MM-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 14 May 2019

CALIBRATION CERTIFICATE

Calibration Item:	Micromate Unit (Calibration with Geophone UM12906)
Model No.:	721A2501
Serial No.:	UM12906
Calibration Date:	22 March 2019
Next Calibration Date:	22 March 2020
Method Used:	In-house Method MM-001
In-house Testing Procedure No.:	MM-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 22 March 2019

CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit UM12906)
Part Number:	721A2901
Serial No.:	UM12906
Calibration Date:	22 March 2019
Next Calibration Date:	22 March 2020
Method Used:	In-house Method MM-001
In-house Testing Procedure No.:	MM-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

INSTANTEL INC. hereby certifies that this unit has been calibrated and that the results are consistent with the specifications published regarding this instrument. The SENSORCHECK feature of the unit is sufficiently reliable to indicate proper operation, although it is recommended that this unit be sent to INSTANTEL or an authorized service center for regular calibration.

Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 22 March 2019

CALIBRATION CERTIFICATE

Calibration Item:	Micromate Linear Microphone (Calibration with main unit UM12906)
Model No.:	721A0201
Serial No.:	UL3399
Calibration Date:	22 March 2019
Next Calibration Date:	22 March 2020
Method Used:	In-house Method MM-002
In-house Testing Procedure No.:	MM-002

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
Linear Microphone	714A9801	BH11561
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Microphone*	4193	2677340
Low Frequency Calibrator*	42AE	105366
Bruel & Kjaer Conditional Amplifier*	269	2152173

*References are traceable to NIST or equivalent.

INSTANTEL INC. hereby certifies that this unit has been calibrated and that the results are consistent with the specifications published regarding this instrument. The SENSORCHECK feature of the unit is sufficiently reliable to indicate proper operation, although it is recommended that this unit be sent to INSTANTEL or an authorized service center for regular calibration.

Authorized by: _____

(Isaac Au Yeung)

Date: 22 March 2019

CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit UM12907)
Part Number:	721A2901
Serial No.:	UM12907
Calibration Date:	28 February 2019
Next Calibration Date:	28 February 2020
Method Used:	In-house Method MM-001
In-house Testing Procedure No.:	MM-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 28 February 2019

CALIBRATION CERTIFICATE

Calibration Item:	Micromate Unit (Calibration with Geophone UM12907)
Model No.:	721A2501
Serial No.:	UM12907
Calibration Date:	28 February 2019
Next Calibration Date:	28 February 2020
Method Used:	In-house Method MM-001
In-house Testing Procedure No.:	MM-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

INSTANTEL INC. hereby certifies that this unit has been calibrated and that the results are consistent with the specifications published regarding this instrument. The SENSORCHECK feature of the unit is sufficiently reliable to indicate proper operation, although it is recommended that this unit be sent to INSTANTEL or an authorized service center for regular calibration.

Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 28 February 2019

CALIBRATION CERTIFICATE

Calibration Item:	Micromate Linear Microphone (Calibration with main unit UM12907)
Model No.:	721A0201
Serial No.:	UL3398
Calibration Date:	28 February 2019
Next Calibration Date:	28 February 2020
Method Used:	In-house Method MM-002
In-house Testing Procedure No.:	MM-002

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
Linear Microphone	714A9801	BH11561
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Microphone*	4193	2677340
Low Frequency Calibrator*	42AE	105366
Bruel & Kjaer Conditional Amplifier*	269	2152173

*References are traceable to NIST or equivalent.

INSTANTEL INC. hereby certifies that this unit has been calibrated and that the results are consistent with the specifications published regarding this instrument. The SENSORCHECK feature of the unit is sufficiently reliable to indicate proper operation, although it is recommended that this unit be sent to INSTANTEL or an authorized service center for regular calibration.

Authorized by: _____

(Isaac Au Yeung)

Date: 28 February 2019

CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit UM12928)
Part Number:	721A2901
Serial No.:	UM12928
Calibration Date:	7 May 2019
Next Calibration Date:	7 May 2020
Method Used:	In-house Method MM-001
In-house Testing Procedure No.:	MM-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

INSTANTEL INC. hereby certifies that this unit has been calibrated and that the results are consistent with the specifications published regarding this instrument. The SENSORCHECK feature of the unit is sufficiently reliable to indicate proper operation, although it is recommended that this unit be sent to INSTANTEL or an authorized service center for regular calibration.

Authorized by: _____

(Leung Man Hin, Eric)

Date: 7 May 2019

CALIBRATION CERTIFICATE

Calibration Item:	Micromate Unit (Calibration with Geophone UM12928)
Model No.:	721A2501
Serial No.:	UM12928
Calibration Date:	7 May 2019
Next Calibration Date:	7 May 2020
Method Used:	In-house Method MM-001
In-house Testing Procedure No.:	MM-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

INSTANTEL INC. hereby certifies that this unit has been calibrated and that the results are consistent with the specifications published regarding this instrument. The SENSORCHECK feature of the unit is sufficiently reliable to indicate proper operation, although it is recommended that this unit be sent to INSTANTEL or an authorized service center for regular calibration.

Authorized by: _____

(Leung Man Hin, Eric)

Date: 7 May 2019

CALIBRATION CERTIFICATE

Calibration Item:	Micromate Linear Microphone (Calibration with main unit UM12928)
Model No.:	721A0201
Serial No.:	UL3383
Calibration Date:	7 May 2019
Next Calibration Date:	7 May 2020
Method Used:	In-house Method MM-002
In-house Testing Procedure No.:	MM-002

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Leung Man Hin, Eric)

Date: 7 May 2019

CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit UM12929)
Part Number:	721A2901
Serial No.:	UM12929
Calibration Date:	2 May 2019
Next Calibration Date:	2 May 2020
Method Used:	In-house Method MM-001
In-house Testing Procedure No.:	MM-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Leung Man Hin, Eric)

Date: 2 May 2019

CALIBRATION CERTIFICATE

Calibration Item:	Micromate Unit (Calibration with Geophone UM12929)
Model No.:	721A2501
Serial No.:	UM12929
Calibration Date:	2 May 2019
Next Calibration Date:	2 May 2020
Method Used:	In-house Method MM-001
In-house Testing Procedure No.:	MM-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

INSTANTEL INC. hereby certifies that this unit has been calibrated and that the results are consistent with the specifications published regarding this instrument. The SENSORCHECK feature of the unit is sufficiently reliable to indicate proper operation, although it is recommended that this unit be sent to INSTANTEL or an authorized service center for regular calibration.

Authorized by: _____

(Leung Man Hin, Eric)

Date: 2 May 2019

CALIBRATION CERTIFICATE

Calibration Item:	Micromate Linear Microphone (Calibration with main unit UM12929)
Model No.:	721A0201
Serial No.:	UL3384
Calibration Date:	2 May 2019
Next Calibration Date:	2 May 2020
Method Used:	In-house Method MM-002
In-house Testing Procedure No.:	MM-002

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

INSTANTEL INC. hereby certifies that this unit has been calibrated and that the results are consistent with the specifications published regarding this instrument. The SENSORCHECK feature of the unit is sufficiently reliable to indicate proper operation, although it is recommended that this unit be sent to INSTANTEL or an authorized service center for regular calibration.

Authorized by: _____

(Leung Man Hin, Eric)

Date: 2 May 2019

CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit UM13698)
Part Number:	721A2901
Serial No.:	UM13698
Calibration Date:	7 May 2019
Next Calibration Date:	7 May 2020
Method Used:	In-house Method MM-001
In-house Testing Procedure No.:	MM-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Leung Man Hin, Eric)

Date: 7 May 2019

CALIBRATION CERTIFICATE

Calibration Item:	Micromate Unit (Calibration with Geophone UM13698)
Model No.:	721A2501
Serial No.:	UM13698
Calibration Date:	7 May 2019
Next Calibration Date:	7 May 2020
Method Used:	In-house Method MM-001
In-house Testing Procedure No.:	MM-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Leung Man Hin, Eric)

Date: 7 May 2019

CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit UM13701)
Part Number:	721A2901
Serial No.:	UM13701
Calibration Date:	7 May 2019
Next Calibration Date:	7 May 2020
Method Used:	In-house Method MM-001
In-house Testing Procedure No.:	MM-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Leung Man Hin, Eric)

Date: 7 May 2019

CALIBRATION CERTIFICATE

Calibration Item:	Micromate Unit (Calibration with Geophone UM13701)
Model No.:	721A2501
Serial No.:	UM13701
Calibration Date:	7 May 2019
Next Calibration Date:	7 May 2020
Method Used:	In-house Method MM-001
In-house Testing Procedure No.:	MM-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Leung Man Hin, Eric)

Date: 7 May 2019

CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit UM13695)
Part Number:	721A2901
Serial No.:	UM13695
Calibration Date:	2 May 2019
Next Calibration Date:	2 May 2020
Method Used:	In-house Method MM-001
In-house Testing Procedure No.:	MM-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Leung Man Hin, Eric)

Date: 2 May 2019

CALIBRATION CERTIFICATE

Calibration Item:	Micromate Unit (Calibration with Geophone UM13695)
Model No.:	721A2501
Serial No.:	UM13695
Calibration Date:	2 May 2019
Next Calibration Date:	2 May 2020
Method Used:	In-house Method MM-001
In-house Testing Procedure No.:	MM-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Leung Man Hin, Eric)

Date: 2 May 2019

CALIBRATION CERTIFICATE

Calibration Item:	Micromate Linear Microphone (Calibration with main unit UM13695)
Model No.:	721A0201
Serial No.:	UL3396
Calibration Date:	2 May 2019
Next Calibration Date:	2 May 2020
Method Used:	In-house Method MM-002
In-house Testing Procedure No.:	MM-002

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

INSTANTEL INC. hereby certifies that this unit has been calibrated and that the results are consistent with the specifications published regarding this instrument. The SENSORCHECK feature of the unit is sufficiently reliable to indicate proper operation, although it is recommended that this unit be sent to INSTANTEL or an authorized service center for regular calibration.

Authorized by: _____

(Leung Man Hin, Eric)

Date: 2 May 2019

CALIBRATION CERTIFICATE

Calibration Item:	Micromate Linear Microphone (Calibration with main unit UM13696)
Model No.:	721A0201
Serial No.:	UL3394
Calibration Date:	30 April 2019
Next Calibration Date:	30 April 2020
Method Used:	In-house Method MM-002
In-house Testing Procedure No.:	MM-002

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

INSTANTEL INC. hereby certifies that this unit has been calibrated and that the results are consistent with the specifications published regarding this instrument. The SENSORCHECK feature of the unit is sufficiently reliable to indicate proper operation, although it is recommended that this unit be sent to INSTANTEL or an authorized service center for regular calibration.

Authorized by: _____

(Leung Man Hin, Eric)

Date: 30 April 2019

CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit UM13696)
Part Number:	721A2901
Serial No.:	UM13696
Calibration Date:	30 April 2019
Next Calibration Date:	30 April 2020
Method Used:	In-house Method MM-001
In-house Testing Procedure No.:	MM-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

INSTANTEL INC. hereby certifies that this unit has been calibrated and that the results are consistent with the specifications published regarding this instrument. The SENSORCHECK feature of the unit is sufficiently reliable to indicate proper operation, although it is recommended that this unit be sent to INSTANTEL or an authorized service center for regular calibration.

Authorized by: _____

(Leung Man Hin, Eric)

Date: 30 April 2019

CALIBRATION CERTIFICATE

Calibration Item:	Micromate Unit (Calibration with Geophone UM13696)
Model No.:	721A2501
Serial No.:	UM13696
Calibration Date:	30 April 2019
Next Calibration Date:	30 April 2020
Method Used:	In-house Method MM-001
In-house Testing Procedure No.:	MM-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

INSTANTEL INC. hereby certifies that this unit has been calibrated and that the results are consistent with the specifications published regarding this instrument. The SENSORCHECK feature of the unit is sufficiently reliable to indicate proper operation, although it is recommended that this unit be sent to INSTANTEL or an authorized service center for regular calibration.

Authorized by: _____

(Leung Man Hin, Eric)

Date: 30 April 2019

CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit UM13699)
Part Number:	721A2901
Serial No.:	UM13699
Calibration Date:	30 April 2019
Next Calibration Date:	30 April 2020
Method Used:	In-house Method MM-001
In-house Testing Procedure No.:	MM-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

INSTANTEL INC. hereby certifies that this unit has been calibrated and that the results are consistent with the specifications published regarding this instrument. The SENSORCHECK feature of the unit is sufficiently reliable to indicate proper operation, although it is recommended that this unit be sent to INSTANTEL or an authorized service center for regular calibration.

Authorized by: _____

(Leung Man Hin, Eric)

Date: 30 April 2019

CALIBRATION CERTIFICATE

Calibration Item:	Micromate Unit (Calibration with Geophone UM13699)
Model No.:	721A2501
Serial No.:	UM13699
Calibration Date:	30 April 2019
Next Calibration Date:	30 April 2020
Method Used:	In-house Method MM-001
In-house Testing Procedure No.:	MM-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

INSTANTEL INC. hereby certifies that this unit has been calibrated and that the results are consistent with the specifications published regarding this instrument. The SENSORCHECK feature of the unit is sufficiently reliable to indicate proper operation, although it is recommended that this unit be sent to INSTANTEL or an authorized service center for regular calibration.

Authorized by: _____

(Leung Man Hin, Eric)

Date: 30 April 2019

CALIBRATION CERTIFICATE

Calibration Item:	Micromate Unit (Calibration with Geophone UM13702)
Model No.:	721A2501
Serial No.:	UM13702
Calibration Date:	2 May 2019
Next Calibration Date:	2 May 2020
Method Used:	In-house Method MM-001
In-house Testing Procedure No.:	MM-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

INSTANTEL INC. hereby certifies that this unit has been calibrated and that the results are consistent with the specifications published regarding this instrument. The SENSORCHECK feature of the unit is sufficiently reliable to indicate proper operation, although it is recommended that this unit be sent to INSTANTEL or an authorized service center for regular calibration.

Authorized by: _____

(Leung Man Hin, Eric)

Date: 2 May 2019

CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit UM13702)
Part Number:	721A2901
Serial No.:	UM13702
Calibration Date:	2 May 2019
Next Calibration Date:	2 May 2020
Method Used:	In-house Method MM-001
In-house Testing Procedure No.:	MM-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

INSTANTEL INC. hereby certifies that this unit has been calibrated and that the results are consistent with the specifications published regarding this instrument. The SENSORCHECK feature of the unit is sufficiently reliable to indicate proper operation, although it is recommended that this unit be sent to INSTANTEL or an authorized service center for regular calibration.

Authorized by: _____

(Leung Man Hin, Eric)

Date: 2 May 2019

CALIBRATION CERTIFICATE

Calibration Item:	Micromate Linear Microphone (Calibration with main unit UM13702)
Model No.:	721A0201
Serial No.:	UL3395
Calibration Date:	2 May 2019
Next Calibration Date:	2 May 2020
Method Used:	In-house Method MM-002
In-house Testing Procedure No.:	MM-002

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Wong, Keefe Solomon)

Date: 2 May 2019

CALIBRATION CERTIFICATE

Calibration Item:	Micromate Unit (Calibration with Geophone UM13703)
Model No.:	721A2501
Serial No.:	UM13703
Calibration Date:	25 April 2019
Next Calibration Date:	25 April 2020
Method Used:	In-house Method MM-001
In-house Testing Procedure No.:	MM-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Leung Man Hin, Eric)

Date: 25 April 2019

CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit UM13703)
Part Number:	721A2901
Serial No.:	UM13703
Calibration Date:	25 April 2019
Next Calibration Date:	25 April 2020
Method Used:	In-house Method MM-001
In-house Testing Procedure No.:	MM-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Leung Man Hin, Eric)

Date: 25 April 2019

CALIBRATION CERTIFICATE

Calibration Item:	Micromate Unit (Calibration with Geophone UM13704)
Model No.:	721A2501
Serial No.:	UM13704
Calibration Date:	30 April 2019
Next Calibration Date:	30 April 2020
Method Used:	In-house Method MM-001
In-house Testing Procedure No.:	MM-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

INSTANTEL INC. hereby certifies that this unit has been calibrated and that the results are consistent with the specifications published regarding this instrument. The SENSORCHECK feature of the unit is sufficiently reliable to indicate proper operation, although it is recommended that this unit be sent to INSTANTEL or an authorized service center for regular calibration.

Authorized by: _____

(Leung Man Hin, Eric)

Date: 30 April 2019

CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit UM13704)
Part Number:	721A2901
Serial No.:	UM13704
Calibration Date:	30 April 2019
Next Calibration Date:	30 April 2020
Method Used:	In-house Method MM-001
In-house Testing Procedure No.:	MM-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Leung Man Hin, Eric)

Date: 30 April 2019

CALIBRATION CERTIFICATE

Calibration Item:	Micromate Linear Microphone (Calibration with main unit UM13704)
Model No.:	721A0201
Serial No.:	UL3385
Calibration Date:	25 April 2019
Next Calibration Date:	25 April 2020
Method Used:	In-house Method MM-002
In-house Testing Procedure No.:	MM-002

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
Linear Microphone	714A9801	BH11561
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Microphone*	4193	2677340
Low Frequency Calibrator*	42AE	105366
Bruel & Kjaer Conditional Amplifier*	269	2152173

*References are traceable to NIST or equivalent.

INSTANTEL INC. hereby certifies that this unit has been calibrated and that the results are consistent with the specifications published regarding this instrument. The SENSORCHECK feature of the unit is sufficiently reliable to indicate proper operation, although it is recommended that this unit be sent to INSTANTEL or an authorized service center for regular calibration.

Authorized by: _____

(Leung Man Hin, Eric)

Date: 25 April 2019

CALIBRATION CERTIFICATE

Calibration Item:	Micromate Unit (Calibration with Geophone UM13708)
Model No.:	721A2501
Serial No.:	UM13708
Calibration Date:	25 April 2019
Next Calibration Date:	25 April 2020
Method Used:	In-house Method MM-001
In-house Testing Procedure No.:	MM-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Leung Man Hin, Eric)

Date: 25 April 2019

CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit UM13708)
Part Number:	721A2901
Serial No.:	UM13708
Calibration Date:	25 April 2019
Next Calibration Date:	25 April 2020
Method Used:	In-house Method MM-001
In-house Testing Procedure No.:	MM-001

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Accelerometer*	4370	30323
Bruel & Kjaer Charge Amplifier*	2647	2518810
Bruel & Kjaer Conditional Amplifier*	269	2152173
LDS Air Cooled Vibrator	V556	92794/1
LDS Field Power Supply	FPS10L	ARA 04/05
LDS Power Amplifier	PA1000L	ARA 07/06

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Leung Man Hin, Eric)

Date: 25 April 2019

CALIBRATION CERTIFICATE

Calibration Item:	Micromate Linear Microphone (Calibration with main unit UM13708)
Model No.:	721A0201
Serial No.:	UL3386
Calibration Date:	25 April 2019
Next Calibration Date:	25 April 2020
Method Used:	In-house Method MM-002
In-house Testing Procedure No.:	MM-002

Test References	Model	Serial No.
Blastmate III	714A0801	BA15521
Linear Microphone	714A9801	BH11561
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
HP Distortion Meter*	339A	810699
Bruel & Kjaer Microphone*	4193	2677340
Low Frequency Calibrator*	42AE	105366
Bruel & Kjaer Conditional Amplifier*	269	2152173

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Leung Man Hin, Eric)

Date: 25 April 2019

The Safety Company
MSA Corporate Center • 1000 Cranberry Woods Drive • Cranberry Township, PA 16066
www.msasafety.com
Telephone: (800) MSA-2222

ALTAIR5X
CERTIFICATE OF CALIBRATION

Serial Number: 152097
Part Number: A-ALT5X-A-N-K-D-1-B-0-T-0-0-0

Factory Calibration Date: 03/29/19

Set Points

	METHANE 0-100.00 %LEL	O2 0-30.00 %VOL	CO 0-2000.00 PPM	H2S 0-200.00 PPM	NH3 0-100.00 PPM	CO2 0-9.99 %VOL
(Low)	10.00 %LEL	19.50 %VOL	25.00 PPM	10.00 PPM	25.00 PPM	0.50 %VOL
(High)	20.00 %LEL	23.00 %VOL	100.00 PPM	15.00 PPM	50.00 PPM	1.50 %VOL
STEL			100.00 PPM	15.00 PPM	35.00 PPM	0.50 %VOL
TWA			25.00 PPM	10.00 PPM	25.00 PPM	1.50 %VOL
Calibrated Value	Methane 1.460 %VOL	O2 14.99 %VOL	CO 59.90 PPM	H2S 20.13 PPM	NH3 25 PPM	CO2 2.502 %VOL
Cylinder Lot #	122-401221543-1A	122-401221543-1A	122-401221543-1A	122-401221543-1A	224895	141-401019452-1N461052

Calibration Certification
All applicable inspections, testing, and calibrations were performed using NIST traceable equipment, where available, in accordance with MSA's ISO 9001 Certified Quality System. Each material, component, and/or instrument must be installed, operated and maintained in strict accordance with its labels, cautions, warnings, instructions, and within the limitations stated in the supplied instruction manual. Routine calibration checks, equipment inspections, and applicable preventative maintenance measures must be performed to verify that the materials, components, and/or instruments are operating properly. Failure to perform these tasks on a routine basis, or suggested intervals, with specified equipment or methods, may result in inaccurate readings.

Conformance Statement
MSA certifies that the materials, components, and/or instruments delivered in this shipment conform to all applicable specifications. The items delivered have been processed through the appropriate approved document controlled procedures for Receiving, Manufacturing and Inspection. The materials, components, and/or instruments were inspected, tested, and calibrated, as applicable, per the associated drawings, standards requirements, and/or specifications, and were deemed acceptable by appropriate authorized personnel.

Process Certified By:

Jim Hoffman

JIM HOFFMAN
QUALITY ENGINEER

Calibrated By: T. Skal

APPENDIX C
WEATHER INFORMATION

APPENDIX C - WEATHERING CONDITINS DURING MONITORING PERIOD

December 2019

Day	Mean Pressure (hPa)	Air Temperature	Mean Relative Humidity (%)	Total Rainfall (mm)
		Mean (deg. C)		
1	1015.7	25.7	73	0
2	1014.6	25.3	74	0
3	1013.9	25.7	74	0
4	1014.5	25	56	0
5	1013.4	23.9	56	0
6	1012	23.8	69	0
7	1013.7	23.8	56	0
8	1017	23.3	51	0
9	1017.6	22.7	62	0
10	1016.1	22.7	70	0
11	1014.7	23.1	72	0
12	1016.4	23.3	78	0
13	1018.3	24.1	75	0
14	1018.9	23	64	0
15	1016.9	22.8	70	0
16	1015.7	22.5	76	0
17	1015	23.4	79	0
18	1015.7	24.3	69	0
19	1018.4	20.5	63	0
20	1019.5	21.1	66	0
21	1018.9	21.7	66	Trace
22	1017.1	22.3	66	0
23	1016.9	23.3	78	0
24	1017.5	23.4	77	0
25	1019.6	23.8	73	0
26	1020.7	22	76	Trace
27	1020	22.3	78	0
28	1021.9	20.3	61	0
29	1022.3	19.7	65	0
30	1020.4	20.4	71	0

APPENDIX C - WEATHERING CONDITINS DURING MONITORING PERIOD

Table II: Wind Speed and Directions			
Date	**Time**	**Wind Speed m-s**	**Direction**
1-Dec-19	0:00	0.4	NNW
1-Dec-19	1:00	0.4	ESE
1-Dec-19	2:00	0.4	SE
1-Dec-19	3:00	0.4	SE
1-Dec-19	4:00	0.4	SE
1-Dec-19	5:00	0.4	SE
1-Dec-19	6:00	0.4	ESE
1-Dec-19	7:00	0.4	SE
1-Dec-19	8:00	0.4	NW
1-Dec-19	9:00	0.4	NW
1-Dec-19	10:00	1.3	NNW
1-Dec-19	11:00	1.3	NNW
1-Dec-19	12:00	1.3	NNW
1-Dec-19	13:00	1.8	NNW
1-Dec-19	14:00	0.9	NNE
1-Dec-19	15:00	0.9	NNE
1-Dec-19	16:00	0.4	ENE
1-Dec-19	17:00	1.3	SE
1-Dec-19	18:00	0.4	NE
1-Dec-19	19:00	0.4	NE
1-Dec-19	20:00	0.4	SE
1-Dec-19	21:00	1.3	SE
1-Dec-19	22:00	0.9	N
1-Dec-19	23:00	1.3	E
2-Dec-19	0:00	1.3	ESE
2-Dec-19	1:00	1.3	E
2-Dec-19	2:00	1.3	E
2-Dec-19	3:00	1.8	E
2-Dec-19	4:00	1.3	E
2-Dec-19	5:00	1.3	E
2-Dec-19	6:00	1.8	ESE
2-Dec-19	7:00	1.8	E
2-Dec-19	8:00	2.2	E
2-Dec-19	9:00	1.3	SE
2-Dec-19	10:00	3.1	SE
2-Dec-19	11:00	3.1	E
2-Dec-19	12:00	3.6	ESE
2-Dec-19	13:00	2.2	E
2-Dec-19	14:00	1.8	E
2-Dec-19	15:00	1.8	ESE
2-Dec-19	16:00	1.8	ESE
2-Dec-19	17:00	1.8	E
2-Dec-19	18:00	1.8	ESE
2-Dec-19	19:00	1.8	E
2-Dec-19	20:00	2.2	E
2-Dec-19	21:00	1.8	E
2-Dec-19	22:00	2.2	E
2-Dec-19	23:00	2.2	E

Table II: Wind Speed and Directions			
Date	**Time**	**Wind Speed m-s**	**Direction**
3-Dec-19	0:00	1.8	ESE
3-Dec-19	1:00	0.9	E
3-Dec-19	2:00	0.9	E
3-Dec-19	3:00	0.9	ENE
3-Dec-19	4:00	1.3	E
3-Dec-19	5:00	1.8	E
3-Dec-19	6:00	1.3	E
3-Dec-19	7:00	1.3	ESE
3-Dec-19	8:00	1.8	ESE
3-Dec-19	9:00	1.3	ESE
3-Dec-19	10:00	1.8	ESE
3-Dec-19	11:00	1.3	ESE
3-Dec-19	12:00	0.9	ESE
3-Dec-19	13:00	1.3	ESE
3-Dec-19	14:00	1.3	ESE
3-Dec-19	15:00	2.2	ESE
3-Dec-19	16:00	1.8	ESE
3-Dec-19	17:00	0.4	WNW
3-Dec-19	18:00	0.9	SE
3-Dec-19	19:00	1.3	ESE
3-Dec-19	20:00	1.3	ESE
3-Dec-19	21:00	1.3	SE
3-Dec-19	22:00	0.9	SE
3-Dec-19	23:00	0.9	SE
4-Dec-19	0:00	0.9	E
4-Dec-19	1:00	0.9	ESE
4-Dec-19	2:00	0.9	ESE
4-Dec-19	3:00	1.8	E
4-Dec-19	4:00	1.3	ESE
4-Dec-19	5:00	1.3	E
4-Dec-19	6:00	1.3	E
4-Dec-19	7:00	1.3	NNW
4-Dec-19	8:00	1.3	E
4-Dec-19	9:00	1.8	E
4-Dec-19	10:00	1.8	SE
4-Dec-19	11:00	2.7	ESE
4-Dec-19	12:00	1.8	ESE
4-Dec-19	13:00	1.8	ESE
4-Dec-19	14:00	1.8	ESE
4-Dec-19	15:00	1.8	ESE
4-Dec-19	16:00	1.8	ESE
4-Dec-19	17:00	1.3	SE
4-Dec-19	18:00	1.3	ESE
4-Dec-19	19:00	1.3	ESE
4-Dec-19	20:00	1.3	E
4-Dec-19	21:00	1.8	E
4-Dec-19	22:00	1.8	E
4-Dec-19	23:00	1.3	ESE

APPENDIX C - WEATHERING CONDITINS DURING MONITORING PERIOD

Table II: Wind Speed and Directions			
Date	**Time**	**Wind Speed m-s**	**Direction**
5-Dec-19	0:00	0.9	E
5-Dec-19	1:00	1.3	ESE
5-Dec-19	2:00	1.3	SE
5-Dec-19	3:00	0.9	ESE
5-Dec-19	4:00	1.3	SE
5-Dec-19	5:00	0.9	E
5-Dec-19	6:00	1.3	ESE
5-Dec-19	7:00	0.9	SE
5-Dec-19	8:00	1.3	E
5-Dec-19	9:00	0.9	E
5-Dec-19	10:00	0.9	NNW
5-Dec-19	11:00	0.9	WNW
5-Dec-19	12:00	0.4	WNW
5-Dec-19	13:00	0.9	E
5-Dec-19	14:00	0.9	N
5-Dec-19	15:00	0.4	W
5-Dec-19	16:00	0.4	WNW
5-Dec-19	17:00	0.4	WNW
5-Dec-19	18:00	0.9	WNW
5-Dec-19	19:00	0.9	N
5-Dec-19	20:00	1.3	E
5-Dec-19	21:00	1.8	ESE
5-Dec-19	22:00	1.8	E
5-Dec-19	23:00	1.3	ESE
6-Dec-19	0:00	1.8	E
6-Dec-19	1:00	3.1	ESE
6-Dec-19	2:00	3.6	E
6-Dec-19	3:00	2.2	ESE
6-Dec-19	4:00	3.1	E
6-Dec-19	5:00	2.2	E
6-Dec-19	6:00	1.8	ESE
6-Dec-19	7:00	2.2	E
6-Dec-19	8:00	2.7	ESE
6-Dec-19	9:00	1.8	E
6-Dec-19	10:00	1.8	E
6-Dec-19	11:00	2.2	ESE
6-Dec-19	12:00	1.8	ESE
6-Dec-19	13:00	1.3	ESE
6-Dec-19	14:00	0.9	ESE
6-Dec-19	15:00	0.9	ESE
6-Dec-19	16:00	1.3	ESE
6-Dec-19	17:00	0.9	SE
6-Dec-19	18:00	0.9	NNW
6-Dec-19	19:00	0.9	NNW
6-Dec-19	20:00	0.4	WNW
6-Dec-19	21:00	0.4	WNW
6-Dec-19	22:00	0.4	NNW
6-Dec-19	23:00	0.4	ESE

Table II: Wind Speed and Directions			
Date	**Time**	**Wind Speed m-s**	**Direction**
7-Dec-19	0:00	0.9	ESE
7-Dec-19	1:00	0.4	ESE
7-Dec-19	2:00	0.9	ESE
7-Dec-19	3:00	0.9	SE
7-Dec-19	4:00	0.9	ESE
7-Dec-19	5:00	1.3	ESE
7-Dec-19	6:00	0.9	SE
7-Dec-19	7:00	0.9	ESE
7-Dec-19	8:00	1.3	ESE
7-Dec-19	9:00	1.8	E
7-Dec-19	10:00	1.8	ESE
7-Dec-19	11:00	1.3	E
7-Dec-19	12:00	1.3	WNW
7-Dec-19	13:00	0.9	NW
7-Dec-19	14:00	0.9	SE
7-Dec-19	15:00	0.9	WNW
7-Dec-19	16:00	0.9	W
7-Dec-19	17:00	0.9	WNW
7-Dec-19	18:00	0.9	NNW
7-Dec-19	19:00	0.4	WNW
7-Dec-19	20:00	0.4	NW
7-Dec-19	21:00	0.4	WNW
7-Dec-19	22:00	0	SE
7-Dec-19	23:00	0.4	WNW
8-Dec-19	0:00	0.9	WNW
8-Dec-19	1:00	0.9	NW
8-Dec-19	2:00	0.9	W
8-Dec-19	3:00	0.4	WNW
8-Dec-19	4:00	0.9	WNW
8-Dec-19	5:00	0.9	WNW
8-Dec-19	6:00	0.4	WNW
8-Dec-19	7:00	0.4	WNW
8-Dec-19	8:00	0.4	W
8-Dec-19	9:00	0.9	W
8-Dec-19	10:00	1.3	NNW
8-Dec-19	11:00	0.9	NNW
8-Dec-19	12:00	1.8	NNW
8-Dec-19	13:00	3.1	NNW
8-Dec-19	14:00	3.1	NNW
8-Dec-19	15:00	1.8	NNW
8-Dec-19	16:00	1.3	WNW
8-Dec-19	17:00	1.3	NNW
8-Dec-19	18:00	0.9	NNW
8-Dec-19	19:00	0.9	W
8-Dec-19	20:00	0.4	WNW
8-Dec-19	21:00	0.4	WNW
8-Dec-19	22:00	0.4	NW
8-Dec-19	23:00	0.4	W

APPENDIX C - WEATHERING CONDITINS DURING MONITORING PERIOD

Table II: Wind Speed and Directions			
Date	**Time**	**Wind Speed m-s**	**Direction**
9-Dec-19	0:00	0	SE
9-Dec-19	1:00	0.4	SSE
9-Dec-19	2:00	0.4	SSE
9-Dec-19	3:00	0	SSE
9-Dec-19	4:00	0.4	SE
9-Dec-19	5:00	0.9	ESE
9-Dec-19	6:00	0.4	E
9-Dec-19	7:00	0.9	ESE
9-Dec-19	8:00	1.8	ESE
9-Dec-19	9:00	2.2	E
9-Dec-19	10:00	1.8	ESE
9-Dec-19	11:00	1.8	SE
9-Dec-19	12:00	1.8	E
9-Dec-19	13:00	1.3	ESE
9-Dec-19	14:00	1.3	SSE
9-Dec-19	15:00	0.9	SE
9-Dec-19	16:00	0.9	ESE
9-Dec-19	17:00	0.4	WNW
9-Dec-19	18:00	0.9	ESE
9-Dec-19	19:00	1.3	ESE
9-Dec-19	20:00	1.3	ESE
9-Dec-19	21:00	1.8	E
9-Dec-19	22:00	1.3	ESE
9-Dec-19	23:00	1.8	ESE
10-Dec-19	0:00	1.8	ESE
10-Dec-19	1:00	1.8	ESE
10-Dec-19	2:00	2.2	ESE
10-Dec-19	3:00	1.8	ESE
10-Dec-19	4:00	1.8	E
10-Dec-19	5:00	1.3	E
10-Dec-19	6:00	1.8	ESE
10-Dec-19	7:00	1.8	SE
10-Dec-19	8:00	1.8	SE
10-Dec-19	9:00	1.8	ESE
10-Dec-19	10:00	1.8	ESE
10-Dec-19	11:00	1.8	NW
10-Dec-19	12:00	3.6	NW
10-Dec-19	13:00	4	NW
10-Dec-19	14:00	4.5	NW
10-Dec-19	15:00	3.1	NW
10-Dec-19	16:00	4	NW
10-Dec-19	17:00	1.8	NW
10-Dec-19	18:00	0.9	NW
10-Dec-19	19:00	0.9	W
10-Dec-19	20:00	0.4	N
10-Dec-19	21:00	0.4	NW
10-Dec-19	22:00	0.4	WNW
10-Dec-19	23:00	0.9	W

Table II: Wind Speed and Directions			
Date	**Time**	**Wind Speed m-s**	**Direction**
11-Dec-19	0:00	0.9	W
11-Dec-19	1:00	0.9	W
11-Dec-19	2:00	1.3	W
11-Dec-19	3:00	0.9	W
11-Dec-19	4:00	0.9	W
11-Dec-19	5:00	0.9	W
11-Dec-19	6:00	1.8	W
11-Dec-19	7:00	0.9	W
11-Dec-19	8:00	0.9	NNW
11-Dec-19	9:00	1.3	ENE
11-Dec-19	10:00	1.8	NW
11-Dec-19	11:00	1.3	W
11-Dec-19	12:00	1.8	W
11-Dec-19	13:00	1.3	W
11-Dec-19	14:00	0.9	NNW
11-Dec-19	15:00	1.3	NW
11-Dec-19	16:00	0.9	W
11-Dec-19	17:00	0.9	NW
11-Dec-19	18:00	1.3	NW
11-Dec-19	19:00	1.3	W
11-Dec-19	20:00	0.9	NW
11-Dec-19	21:00	1.3	WNW
11-Dec-19	22:00	1.8	NW
11-Dec-19	23:00	1.8	WNW
12-Dec-19	0:00	1.8	NW
12-Dec-19	1:00	1.8	NW
12-Dec-19	2:00	1.3	W
12-Dec-19	3:00	0.9	W
12-Dec-19	4:00	0.9	WNW
12-Dec-19	5:00	0.9	ENE
12-Dec-19	6:00	0.4	NW
12-Dec-19	7:00	0.9	W
12-Dec-19	8:00	1.3	W
12-Dec-19	9:00	1.3	W
12-Dec-19	10:00	1.3	W
12-Dec-19	11:00	1.8	W
12-Dec-19	12:00	1.3	WNW
12-Dec-19	13:00	1.8	NW
12-Dec-19	14:00	2.2	NW
12-Dec-19	15:00	3.6	NW
12-Dec-19	16:00	3.6	NW
12-Dec-19	17:00	1.3	NW
12-Dec-19	18:00	1.3	NW
12-Dec-19	19:00	0.9	NW
12-Dec-19	20:00	0.4	WNW
12-Dec-19	21:00	0.4	WNW
12-Dec-19	22:00	0.4	W
12-Dec-19	23:00	0.4	WNW

APPENDIX C - WEATHERING CONDITINS DURING MONITORING PERIOD

Table II: Wind Speed and Directions			
Date	**Time**	**Wind Speed m-s**	**Direction**
13-Dec-19	0:00	1.3	NW
13-Dec-19	1:00	1.8	NW
13-Dec-19	2:00	1.3	NW
13-Dec-19	3:00	1.3	NW
13-Dec-19	4:00	1.8	NW
13-Dec-19	5:00	1.3	NW
13-Dec-19	6:00	0.9	NW
13-Dec-19	7:00	0.9	NW
13-Dec-19	8:00	1.8	NW
13-Dec-19	9:00	1.3	NW
13-Dec-19	10:00	1.8	NW
13-Dec-19	11:00	1.3	W
13-Dec-19	12:00	1.8	W
13-Dec-19	13:00	1.3	W
13-Dec-19	14:00	1.8	NW
13-Dec-19	15:00	4	NW
13-Dec-19	16:00	3.6	NW
13-Dec-19	17:00	3.6	NW
13-Dec-19	18:00	1.3	NW
13-Dec-19	19:00	1.3	NW
13-Dec-19	20:00	1.3	NW
13-Dec-19	21:00	0.9	W
13-Dec-19	22:00	1.3	W
13-Dec-19	23:00	1.8	W
14-Dec-19	0:00	1.3	W
14-Dec-19	1:00	1.3	W
14-Dec-19	2:00	0.9	W
14-Dec-19	3:00	0.9	WNW
14-Dec-19	4:00	0.9	W
14-Dec-19	5:00	0.9	NW
14-Dec-19	6:00	1.3	WNW
14-Dec-19	7:00	1.3	W
14-Dec-19	8:00	1.3	W
14-Dec-19	9:00	1.3	NW
14-Dec-19	10:00	1.3	NW
14-Dec-19	11:00	1.3	NW
14-Dec-19	12:00	0.9	NW
14-Dec-19	13:00	0.9	NW
14-Dec-19	14:00	1.3	W
14-Dec-19	15:00	1.3	NW
14-Dec-19	16:00	1.3	W
14-Dec-19	17:00	2.2	NW
14-Dec-19	18:00	1.8	NW
14-Dec-19	19:00	1.3	NW
14-Dec-19	20:00	2.2	NW
14-Dec-19	21:00	2.2	NW
14-Dec-19	22:00	1.3	NW
14-Dec-19	23:00	1.8	NW

Table II: Wind Speed and Directions			
Date	**Time**	**Wind Speed m-s**	**Direction**
15-Dec-19	0:00	1.8	NW
15-Dec-19	1:00	1.3	NW
15-Dec-19	2:00	0.9	WNW
15-Dec-19	3:00	1.3	NW
15-Dec-19	4:00	0.9	W
15-Dec-19	5:00	1.3	W
15-Dec-19	6:00	1.3	NW
15-Dec-19	7:00	2.2	NW
15-Dec-19	8:00	1.8	NW
15-Dec-19	9:00	1.8	NW
15-Dec-19	10:00	1.8	E
15-Dec-19	11:00	1.3	NW
15-Dec-19	12:00	2.7	NW
15-Dec-19	13:00	1.8	NW
15-Dec-19	14:00	1.8	NW
15-Dec-19	15:00	2.7	NW
15-Dec-19	16:00	1.8	NW
15-Dec-19	17:00	1.8	NW
15-Dec-19	18:00	1.8	NW
15-Dec-19	19:00	1.8	NW
15-Dec-19	20:00	2.2	NW
15-Dec-19	21:00	1.8	NW
15-Dec-19	22:00	0.9	NW
15-Dec-19	23:00	1.3	NW
16-Dec-19	0:00	0.9	NE
16-Dec-19	1:00	0.4	NNE
16-Dec-19	2:00	0.4	NE
16-Dec-19	3:00	0.4	NW
16-Dec-19	4:00	0.4	N
16-Dec-19	5:00	0.9	NE
16-Dec-19	6:00	0.9	NE
16-Dec-19	7:00	0.9	NE
16-Dec-19	8:00	0.9	NW
16-Dec-19	9:00	0.9	NW
16-Dec-19	10:00	0.9	NW
16-Dec-19	11:00	1.3	NW
16-Dec-19	12:00	2.2	NW
16-Dec-19	13:00	2.2	NW
16-Dec-19	14:00	2.7	NW
16-Dec-19	15:00	4.5	NW
16-Dec-19	16:00	3.1	NW
16-Dec-19	17:00	2.7	NW
16-Dec-19	18:00	2.2	NW
16-Dec-19	19:00	1.8	NW
16-Dec-19	20:00	0.9	NW
16-Dec-19	21:00	0.4	NE
16-Dec-19	22:00	0	N
16-Dec-19	23:00	0	N

APPENDIX C - WEATHERING CONDITINS DURING MONITORING PERIOD

Table II: Wind Speed and Directions			
Date	**Time**	**Wind Speed m-s**	**Direction**
17-Dec-19	0:00	0	N
17-Dec-19	1:00	0	N
17-Dec-19	2:00	0	N
17-Dec-19	3:00	0	N
17-Dec-19	4:00	0	---
17-Dec-19	5:00	0	---
17-Dec-19	6:00	0	---
17-Dec-19	7:00	0	NNW
17-Dec-19	8:00	0.4	NNW
17-Dec-19	9:00	0.4	NE
17-Dec-19	10:00	0.9	NE
17-Dec-19	11:00	2.2	NW
17-Dec-19	12:00	1.8	NW
17-Dec-19	13:00	2.7	NW
17-Dec-19	14:00	3.1	NW
17-Dec-19	15:00	2.2	NW
17-Dec-19	16:00	1.3	W
17-Dec-19	17:00	1.3	W
17-Dec-19	18:00	1.8	NW
17-Dec-19	19:00	1.3	W
17-Dec-19	20:00	1.3	W
17-Dec-19	21:00	1.3	W
17-Dec-19	22:00	1.3	WNW
17-Dec-19	23:00	1.3	W
18-Dec-19	0:00	1.3	W
18-Dec-19	1:00	1.3	WNW
18-Dec-19	2:00	0.9	W
18-Dec-19	3:00	0.9	W
18-Dec-19	4:00	0.9	W
18-Dec-19	5:00	0.9	W
18-Dec-19	6:00	0.9	NW
18-Dec-19	7:00	0.9	NW
18-Dec-19	8:00	0.4	W
18-Dec-19	9:00	0.4	W
18-Dec-19	10:00	0.9	NW
18-Dec-19	11:00	1.3	NW
18-Dec-19	12:00	0.9	W
18-Dec-19	13:00	0.9	WSW
18-Dec-19	14:00	0.9	W
18-Dec-19	15:00	0.9	NW
18-Dec-19	16:00	0.9	W
18-Dec-19	17:00	1.8	ESE
18-Dec-19	18:00	1.8	ESE
18-Dec-19	19:00	2.2	E
18-Dec-19	20:00	2.2	E
18-Dec-19	21:00	1.3	ESE
18-Dec-19	22:00	0.9	SE
18-Dec-19	23:00	0.4	SE

Table II: Wind Speed and Directions			
Date	**Time**	**Wind Speed m-s**	**Direction**
19-Dec-19	0:00	1.3	ESE
19-Dec-19	1:00	0.9	ENE
19-Dec-19	2:00	0.9	ESE
19-Dec-19	3:00	1.3	E
19-Dec-19	4:00	0.9	ESE
19-Dec-19	5:00	0.9	ESE
19-Dec-19	6:00	0.9	E
19-Dec-19	7:00	1.3	E
19-Dec-19	8:00	0.9	E
19-Dec-19	9:00	1.8	ESE
19-Dec-19	10:00	1.8	NW
19-Dec-19	11:00	1.8	NW
19-Dec-19	12:00	2.7	NW
19-Dec-19	13:00	3.6	NW
19-Dec-19	14:00	2.7	NW
19-Dec-19	15:00	4	NW
19-Dec-19	16:00	2.7	NW
19-Dec-19	17:00	2.2	NW
19-Dec-19	18:00	0.9	W
19-Dec-19	19:00	0.9	W
19-Dec-19	20:00	0.4	W
19-Dec-19	21:00	0.4	WNW
19-Dec-19	22:00	0.4	SE
19-Dec-19	23:00	0.4	ESE
20-Dec-19	0:00	0	ESE
20-Dec-19	1:00	0.4	SE
20-Dec-19	2:00	0.9	E
20-Dec-19	3:00	1.3	ESE
20-Dec-19	4:00	1.3	ESE
20-Dec-19	5:00	0.9	ESE
20-Dec-19	6:00	0.9	ESE
20-Dec-19	7:00	0.9	E
20-Dec-19	8:00	0.4	ESE
20-Dec-19	9:00	1.8	NW
20-Dec-19	10:00	1.8	NW
20-Dec-19	11:00	2.2	NW
20-Dec-19	12:00	1.8	NW
20-Dec-19	13:00	2.7	NW
20-Dec-19	14:00	1.8	NW
20-Dec-19	15:00	2.7	NW
20-Dec-19	16:00	0.9	NE
20-Dec-19	17:00	1.8	NW
20-Dec-19	18:00	1.8	NW
20-Dec-19	19:00	0.9	NW
20-Dec-19	20:00	1.8	NW
20-Dec-19	21:00	2.2	NW
20-Dec-19	22:00	1.8	NW
20-Dec-19	23:00	1.3	NW

APPENDIX C - WEATHERING CONDITINS DURING MONITORING PERIOD

Table II: Wind Speed and Directions			
Date	**Time**	**Wind Speed m-s**	**Direction**
21-Dec-19	0:00	0.4	NW
21-Dec-19	1:00	0.4	NW
21-Dec-19	2:00	0.9	NW
21-Dec-19	3:00	0.4	WNW
21-Dec-19	4:00	0.4	WNW
21-Dec-19	5:00	0.9	NW
21-Dec-19	6:00	0.4	NW
21-Dec-19	7:00	1.3	NW
21-Dec-19	8:00	0.9	NW
21-Dec-19	9:00	1.8	NW
21-Dec-19	10:00	1.8	NW
21-Dec-19	11:00	1.3	NW
21-Dec-19	12:00	0.9	ESE
21-Dec-19	13:00	0.9	NW
21-Dec-19	14:00	0.9	NW
21-Dec-19	15:00	2.2	NW
21-Dec-19	16:00	1.8	NW
21-Dec-19	17:00	1.3	NW
21-Dec-19	18:00	0.4	NW
21-Dec-19	19:00	0.9	NW
21-Dec-19	20:00	0.4	NNW
21-Dec-19	21:00	0	NW
21-Dec-19	22:00	0.4	ESE
21-Dec-19	23:00	0.9	ESE
22-Dec-19	0:00	0.9	ESE
22-Dec-19	1:00	0	ESE
22-Dec-19	2:00	0	---
22-Dec-19	3:00	0	---
22-Dec-19	4:00	0	NNW
22-Dec-19	5:00	0	W
22-Dec-19	6:00	0.4	NW
22-Dec-19	7:00	1.3	NW
22-Dec-19	8:00	1.3	W
22-Dec-19	9:00	1.3	NW
22-Dec-19	10:00	0.9	W
22-Dec-19	11:00	1.3	NW
22-Dec-19	12:00	1.8	NW
22-Dec-19	13:00	1.3	NW
22-Dec-19	14:00	1.3	W
22-Dec-19	15:00	1.3	W
22-Dec-19	16:00	1.3	W
22-Dec-19	17:00	1.3	NW
22-Dec-19	18:00	1.3	W
22-Dec-19	19:00	1.3	NW
22-Dec-19	20:00	0.9	W
22-Dec-19	21:00	0.9	W
22-Dec-19	22:00	1.3	W
22-Dec-19	23:00	1.3	W

Table II: Wind Speed and Directions			
Date	**Time**	**Wind Speed m-s**	**Direction**
23-Dec-19	0:00	0.9	W
23-Dec-19	1:00	0.9	W
23-Dec-19	2:00	0.9	W
23-Dec-19	3:00	1.3	WNW
23-Dec-19	4:00	0.4	W
23-Dec-19	5:00	0.4	W
23-Dec-19	6:00	0.4	W
23-Dec-19	7:00	0.9	WNW
23-Dec-19	8:00	1.3	NW
23-Dec-19	9:00	0.9	W
23-Dec-19	10:00	1.3	W
23-Dec-19	11:00	1.8	NW
23-Dec-19	12:00	3.1	NW
23-Dec-19	13:00	4.9	NW
23-Dec-19	14:00	3.1	NW
23-Dec-19	15:00	3.1	NW
23-Dec-19	16:00	1.8	NW
23-Dec-19	17:00	1.3	NW
23-Dec-19	18:00	1.8	NW
23-Dec-19	19:00	0.9	NE
23-Dec-19	20:00	0.9	NW
23-Dec-19	21:00	1.3	NW
23-Dec-19	22:00	1.3	NW
23-Dec-19	23:00	1.3	NW
24-Dec-19	0:00	1.3	NW
24-Dec-19	1:00	1.3	E
24-Dec-19	2:00	1.8	E
24-Dec-19	3:00	1.8	E
24-Dec-19	4:00	1.3	E
24-Dec-19	5:00	1.3	ESE
24-Dec-19	6:00	1.3	ESE
24-Dec-19	7:00	1.3	ENE
24-Dec-19	8:00	0.9	ENE
24-Dec-19	9:00	1.3	NW
24-Dec-19	10:00	1.3	NW
24-Dec-19	11:00	1.3	NW
24-Dec-19	12:00	1.8	NW
24-Dec-19	13:00	0.9	ESE
24-Dec-19	14:00	1.3	NW
24-Dec-19	15:00	1.3	NNW
24-Dec-19	16:00	1.3	ENE
24-Dec-19	17:00	1.3	ESE
24-Dec-19	18:00	1.8	E
24-Dec-19	19:00	1.8	ESE
24-Dec-19	20:00	2.7	SE
24-Dec-19	21:00	2.2	E
24-Dec-19	22:00	2.2	E
24-Dec-19	23:00	1.8	E

APPENDIX C - WEATHERING CONDITINS DURING MONITORING PERIOD

Table II: Wind Speed and Directions			
Date	**Time**	**Wind Speed m-s**	**Direction**
25-Dec-19	0:00	1.3	E
25-Dec-19	1:00	1.3	E
25-Dec-19	2:00	0.9	NW
25-Dec-19	3:00	0.4	WNW
25-Dec-19	4:00	0.9	WNW
25-Dec-19	5:00	0.9	W
25-Dec-19	6:00	0.9	W
25-Dec-19	7:00	0.9	WNW
25-Dec-19	8:00	0.4	ESE
25-Dec-19	9:00	0.4	WNW
25-Dec-19	10:00	0.9	W
25-Dec-19	11:00	0.9	W
25-Dec-19	12:00	0.9	W
25-Dec-19	13:00	1.3	W
25-Dec-19	14:00	0.9	W
25-Dec-19	15:00	0.4	W
25-Dec-19	16:00	0.4	ESE
25-Dec-19	17:00	0.4	ENE
25-Dec-19	18:00	0.9	W
25-Dec-19	19:00	1.3	W
25-Dec-19	20:00	1.3	W
25-Dec-19	21:00	1.3	W
25-Dec-19	22:00	0.9	NW
25-Dec-19	23:00	1.3	E
26-Dec-19	0:00	1.3	NW
26-Dec-19	1:00	4.9	NW
26-Dec-19	2:00	3.1	NW
26-Dec-19	3:00	3.1	NW
26-Dec-19	4:00	1.3	NW
26-Dec-19	5:00	0.4	W
26-Dec-19	6:00	1.3	NW
26-Dec-19	7:00	0.9	NE
26-Dec-19	8:00	0.9	NW
26-Dec-19	9:00	0.4	NW
26-Dec-19	10:00	0.9	W
26-Dec-19	11:00	0.4	W
26-Dec-19	12:00	0.4	NW
26-Dec-19	13:00	0.4	ENE
26-Dec-19	14:00	0.4	ESE
26-Dec-19	15:00	0.4	NNW
26-Dec-19	16:00	0.4	ESE
26-Dec-19	17:00	0.4	NW
26-Dec-19	18:00	0.4	WNW
26-Dec-19	19:00	0.4	NE
26-Dec-19	20:00	0.4	NW
26-Dec-19	21:00	0.9	NW
26-Dec-19	22:00	0.9	WNW
26-Dec-19	23:00	0.4	NW

Table II: Wind Speed and Directions			
Date	**Time**	**Wind Speed m-s**	**Direction**
27-Dec-19	0:00	0.9	NW
27-Dec-19	1:00	0.9	NW
27-Dec-19	2:00	0.4	NW
27-Dec-19	3:00	0.4	NW
27-Dec-19	4:00	0	NW
27-Dec-19	5:00	0.4	WNW
27-Dec-19	6:00	0.9	NE
27-Dec-19	7:00	0.9	NE
27-Dec-19	8:00	0.4	NW
27-Dec-19	9:00	0.9	NW
27-Dec-19	10:00	1.3	NW
27-Dec-19	11:00	0.9	NW
27-Dec-19	12:00	0.4	NW
27-Dec-19	13:00	0.4	NE
27-Dec-19	14:00	0.4	NE
27-Dec-19	15:00	0.4	NW
27-Dec-19	16:00	0	NW
27-Dec-19	17:00	0.4	ESE
27-Dec-19	18:00	0	WSW
27-Dec-19	19:00	0	ESE
27-Dec-19	20:00	0.4	ESE
27-Dec-19	21:00	0.4	SE
27-Dec-19	22:00	1.3	ESE
27-Dec-19	23:00	1.3	WNW
28-Dec-19	0:00	0.9	NW
28-Dec-19	1:00	0.9	NW
28-Dec-19	2:00	0.9	W
28-Dec-19	3:00	1.3	NW
28-Dec-19	4:00	1.3	W
28-Dec-19	5:00	0.4	WNW
28-Dec-19	6:00	1.3	NW
28-Dec-19	7:00	0.9	W
28-Dec-19	8:00	1.8	W
28-Dec-19	9:00	1.3	W
28-Dec-19	10:00	0.9	W
28-Dec-19	11:00	0.9	W
28-Dec-19	12:00	0.4	NW
28-Dec-19	13:00	0.9	NW
28-Dec-19	14:00	1.3	NW
28-Dec-19	15:00	1.3	NW
28-Dec-19	16:00	1.3	NW
28-Dec-19	17:00	0.9	NW
28-Dec-19	18:00	0	---
28-Dec-19	19:00	0	---
28-Dec-19	20:00	0	NNW
28-Dec-19	21:00	0	NNW
28-Dec-19	22:00	0.4	NW
28-Dec-19	23:00	1.3	NW

Table II: Wind Speed and Directions			
Date	**Time**	**Wind Speed m-s**	**Direction**
29-Dec-19	0:00	2.2	NW
29-Dec-19	1:00	4	NW
29-Dec-19	2:00	4.9	NW
29-Dec-19	3:00	4	NW
29-Dec-19	4:00	3.1	NW
29-Dec-19	5:00	4	NW
29-Dec-19	6:00	4	NW
29-Dec-19	7:00	1.3	NW
29-Dec-19	8:00	1.8	NW
29-Dec-19	9:00	1.8	NW
29-Dec-19	10:00	0.9	NW
29-Dec-19	11:00	0.9	NW
29-Dec-19	12:00	1.3	NW
29-Dec-19	13:00	1.3	NW
29-Dec-19	14:00	0.9	WNW
29-Dec-19	15:00	0.9	W
29-Dec-19	16:00	0.9	W
29-Dec-19	17:00	0.9	W
29-Dec-19	18:00	0.9	WNW
29-Dec-19	19:00	1.3	W
29-Dec-19	20:00	1.8	WNW
29-Dec-19	21:00	1.8	WNW
29-Dec-19	22:00	0.9	WNW
29-Dec-19	23:00	1.3	WNW
30-Dec-19	0:00	2.2	WNW
30-Dec-19	1:00	1.3	WNW
30-Dec-19	2:00	1.8	NW
30-Dec-19	3:00	1.3	WNW
30-Dec-19	4:00	1.3	WNW
30-Dec-19	5:00	0.9	WNW
30-Dec-19	6:00	0.4	WNW
30-Dec-19	7:00	0.4	WNW
30-Dec-19	8:00	0.4	N
30-Dec-19	9:00	0.9	N
30-Dec-19	10:00	0.4	WNW
30-Dec-19	11:00	0.9	WNW
30-Dec-19	12:00	1.3	WNW
30-Dec-19	13:00	0.9	WNW
30-Dec-19	14:00	0.9	WNW
30-Dec-19	15:00	1.3	WNW
30-Dec-19	16:00	0.9	WNW
30-Dec-19	17:00	1.3	WNW
30-Dec-19	18:00	1.3	WNW
30-Dec-19	19:00	1.3	WNW
30-Dec-19	20:00	0.9	NNE
30-Dec-19	21:00	0.9	E
30-Dec-19	22:00	0.9	NNE
30-Dec-19	23:00	0.9	E

APPENDIX D
ENVIRONMENTAL MONITORING SCHEDULES

Agreement No. CE/59/2015 (EP)
Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction
Impact Air Quality and Noise Monitoring Schedule (December 2019)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1-Dec	2-Dec	3-Dec	4-Dec	5-Dec	6-Dec	7-Dec
			24 hrs TSP	**1 hr TSP X3** [AM5(A), AM6(A)] [AM1, AM2, AM3, AM4] **Noise [Daytime (07:00-19:00)]** [CM6(A), CM7(A), CM8(A),CM9(A)] [CM1, CM2, CM3, CM4, CM5] **Noise [Evening time (19:00-23:00)]** [CM6(A)]	**Noise [Evening time (19:00-23:00)]** [CM1, CM2, CM3] **Noise [Night-time (23:00-07:00)]** [CM1, CM2, CM3]	
8-Dec	9-Dec	10-Dec	11-Dec	12-Dec	13-Dec	14-Dec
		24 hrs TSP	**1 hr TSP X3** [AM5(A), AM6(A)] [AM1, AM2, AM3, AM4] **Noise [Daytime (07:00-19:00)]** [CM6(A), CM7(A), CM8(A))] [CM1, CM2, CM3, CM4, CM5] **Noise [Evening time (19:00-23:00)]** [CM6(A)]		**Noise [Evening time (19:00-23:00)]** [CM1, CM2, CM3] **Noise [Night-time (23:00-07:00)]** [CM1, CM2, CM3]	
15-Dec	16-Dec	17-Dec	18-Dec	19-Dec	20-Dec	21-Dec
	24 hrs TSP	**1 hr TSP X3** [AM5(A), AM6(A)] [AM1, AM2, AM3, AM4] **Noise [Daytime (07:00-19:00)]** [CM6(A), CM7(A), CM8(A))] [CM1, CM2, CM3, CM4, CM5] **Noise [Evening time (19:00-23:00)]** [CM6(A)]			**Noise [Evening time (19:00-23:00)]** [CM1, CM2, CM3] **Noise [Night-time (23:00-07:00)]** [CM1, CM2, CM3]	**24 hrs TSP**
22-Dec	23-Dec	24-Dec	25-Dec	26-Dec	27-Dec	28-Dec
	1 hr TSP X3 [AM5(A), AM6(A)] [AM1, AM2, AM3, AM4] **Noise [Daytime (07:00-19:00)]** [CM6(A), CM7(A), CM8(A))] [CM1, CM2, CM3, CM4, CM5] **Noise [Evening time (19:00-23:00)]** [CM6(A)]				**Noise [Evening time (19:00-23:00)]** [CM1, CM2, CM3] **Noise [Night-time (23:00-07:00)]** [CM1, CM2, CM3] **24 hrs TSP**	
29-Dec	30-Dec	31-Dec	1-Jan	2-Jan	3-Jan	4-Jan
	1 hr TSP X3 [AM5(A), AM6(A)] [AM1, AM2, AM3, AM4] **Noise [Daytime (07:00-19:00)]** [CM6(A), CM7(A), CM8(A))] [CM1, CM2, CM3, CM4, CM5] **Noise [Evening time (19:00-23:00)]** [CM6(A)]			**24 hrs TSP**	**1 hr TSP X3** [AM5(A), AM6(A)] [AM1, AM2, AM3, AM4] **Noise [Evening time (19:00-23:00)]** [CM1, CM2, CM3] **Noise [Night-time (23:00-07:00)]** [CM1, CM2, CM3]	

Air Quality Monitoring Station

AM1 - Tin Hau Temple
AM2 - Sai Tso Wan Recreation Ground
AM3 - Yau Lai Estate Bik Lai House
AM4(1) - Sitting-out Area at Cha Kwo Ling Village
AM4(A)(2) - Cha Kwo Ling Public Cargo Working Area Administrative Office
AM5(A) - Tseung Kwan O DSD Desilting Compound
AM6(A) - Park Central, L1/F Open Space Area

Note (1) For 1-hour TSP monitoring; (2) For 24-hour TSP monitoring

Noise Monitoring Station

CM1 - Nga Lai House, Yau Lai Estate Phase 1, Yau Tong
CM2 - Bik Lai House, Yau Lai Estate Phase 1, Yau Tong
CM3 - Block S, Yau Lai Estate Phase 5, Yau Tong
CM4 - Tin Hau Temple, Cha Kwo Ling
CM5 - CCC Kei Faat Primary School, Yau Tong
CM6(A) - Site Boundary of Contract No. NE/2015/02 near Tower 1, Ocean Shores
CM7(A) - Site Boundary of Contract No. NE/2015/02 near Tower 7, Ocean Shores
CM8(A) - Park Central, L1/F Open Space Area
CM9(A) - Rooftop of Capri Tower 10

Agreement No. CE/59/2015 (EP)
Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction
Tentative Impact Water Quality Monitoring Schedule (December 2019)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1-Dec	2-Dec	3-Dec	4-Dec	5-Dec	6-Dec	7-Dec
	Mid-Ebb N/A Mid-Flood 15:51		Mid-Ebb N/A Mid-Flood 17:00		Mid-Ebb 8:00 Mid-Flood 15:01	
8-Dec	9-Dec	10-Dec	11-Dec	12-Dec	13-Dec	14-Dec
	Mid-Ebb 10:14 Mid-Flood 16:17		Mid-Ebb 11:35 Mid-Flood 17:08		Mid-Ebb 12:47 Mid-Flood 18:05	
15-Dec	16-Dec	17-Dec	18-Dec	19-Dec	20-Dec	21-Dec
	Mid-Flood 10:06 Mid-Ebb 15:01		Mid-Flood 12:00 Mid-Ebb 17:19		Mid-Ebb 8:00 Mid-Flood 13:49	
22-Dec	23-Dec	24-Dec	25-Dec	26-Dec	27-Dec	28-Dec
	Mid-Ebb 10:06 Mid-Flood 15:56				Mid-Flood 8:00 Mid-Ebb 13:19	
29-Dec	30-Dec	31-Dec	1-Jan	2-Jan	3-Jan	4-Jan
	Mid-Flood 10:06 Mid-Ebb 15:13			Mid-Flood 12:24 Mid-Ebb 18:03		Mid-Ebb 8:00 Mid-Flood 13:45

The schedule may be changed due to unforeseen circumstances (adverse weather, etc)

Monitoring Station:

C1, C2, G1, G2, G3, G4, M1, M2, M3, M4, M5, M6

Agreement No. CE/59/2015 (EP)
Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction
Tentative Impact Water Quality Monitoring Schedule in Temporary Marine Embayment for December 2019)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1-Dec	2-Dec	3-Dec	4-Dec	5-Dec	6-Dec	7-Dec
	Mid-Ebb N/A Mid-Flood 15:51					
8-Dec	9-Dec	10-Dec	11-Dec	12-Dec	13-Dec	14-Dec
	Mid-Ebb 10:14 Mid-Flood 16:17					
15-Dec	16-Dec	17-Dec	18-Dec	19-Dec	20-Dec	21-Dec
	Mid-Flood 10:06 Mid-Ebb 15:01					
22-Dec	23-Dec	24-Dec	25-Dec	26-Dec	27-Dec	28-Dec
	Mid-Ebb 10:06 Mid-Flood 15:56					
29-Dec	30-Dec	31-Dec	1-Jan	2-Jan	3-Jan	4-Jan
	Mid-Flood 10:06 Mid-Ebb 15:13					

The schedule may be changed due to unforeseen circumstances (adverse weather, etc)

Monitoring Station:
W1

APPENDIX E
1-HOUR TSP MONITORING RESULTS AND GRAPHICAL PRESENTATIONS

APPENDIX E - 1-HOUR TSP MONITORING RESULTS

Location AM1 - Tin Hau Temple			
Date	Time	Weather	***Particulate Concentration (μg/m^3)***
5-Dec-19	9:00	Rainy	38.0
5-Dec-19	10:00	Rainy	39.0
5-Dec-19	11:00	Rainy	37.0
11-Dec-19	8:00	Sunny	66.0
11-Dec-19	9:00	Sunny	70.4
11-Dec-19	10:00	Sunny	72.6
17-Dec-19	16:00	Cloudy	73.6
17-Dec-19	17:00	Cloudy	73.6
17-Dec-19	18:00	Cloudy	70.4
23-Dec-19	16:00	Cloudy	76.8
23-Dec-19	17:00	Cloudy	67.2
23-Dec-19	18:00	Cloudy	67.2
30-Dec-19	9:00	Cloudy	75.9
30-Dec-19	10:00	Cloudy	82.5
30-Dec-19	11:00	Cloudy	79.2
		Average	66.0
		Maximum	82.5
		Minimum	37.0

Location AM2 - Sai Tso Wan Recreation Ground			
Date	Time	Weather	***Particulate Concentration (μg/m^3)***
5-Dec-19	14:15	Rainy	58.0
5-Dec-19	15:15	Rainy	50.0
5-Dec-19	16:15	Rainy	48.0
11-Dec-19	16:00	Sunny	60.8
11-Dec-19	17:00	Sunny	64.0
11-Dec-19	18:00	Sunny	64.0
17-Dec-19	9:00	Sunny	69.3
17-Dec-19	10:00	Sunny	62.7
17-Dec-19	11:00	Sunny	66.0
23-Dec-19	9:00	Cloudy	115.5
23-Dec-19	10:00	Cloudy	105.6
23-Dec-19	11:00	Cloudy	102.3
30-Dec-19	16:00	Cloudy	51.2
30-Dec-19	17:00	Cloudy	54.4
30-Dec-19	18:00	Cloudy	54.4
		Average	68.4
		Maximum	115.5
		Minimum	48.0

APPENDIX E - 1-HOUR TSP MONITORING RESULTS

Location AM3 - Yau Lai Estate Bik Lai House			
Date	Time	Weather	*Particulate Concentration (μg/m ^{3})*
5-Dec-19	13:00	Rainy	34.0
5-Dec-19	14:00	Rainy	30.0
5-Dec-19	15:00	Rainy	32.0
11-Dec-19	11:00	Sunny	77.0
11-Dec-19	13:00	Sunny	83.6
11-Dec-19	14:00	Sunny	77.0
17-Dec-19	9:00	Cloudy	86.4
17-Dec-19	10:00	Cloudy	83.2
17-Dec-19	11:00	Cloudy	83.2
23-Dec-19	9:00	Cloudy	86.4
23-Dec-19	10:00	Cloudy	73.6
23-Dec-19	11:00	Cloudy	83.2
30-Dec-19	13:00	Cloudy	89.1
30-Dec-19	14:00	Cloudy	85.8
30-Dec-19	15:00	Cloudy	82.5
		Average	72.5
		Maximum	89.1
		Minimum	30.0

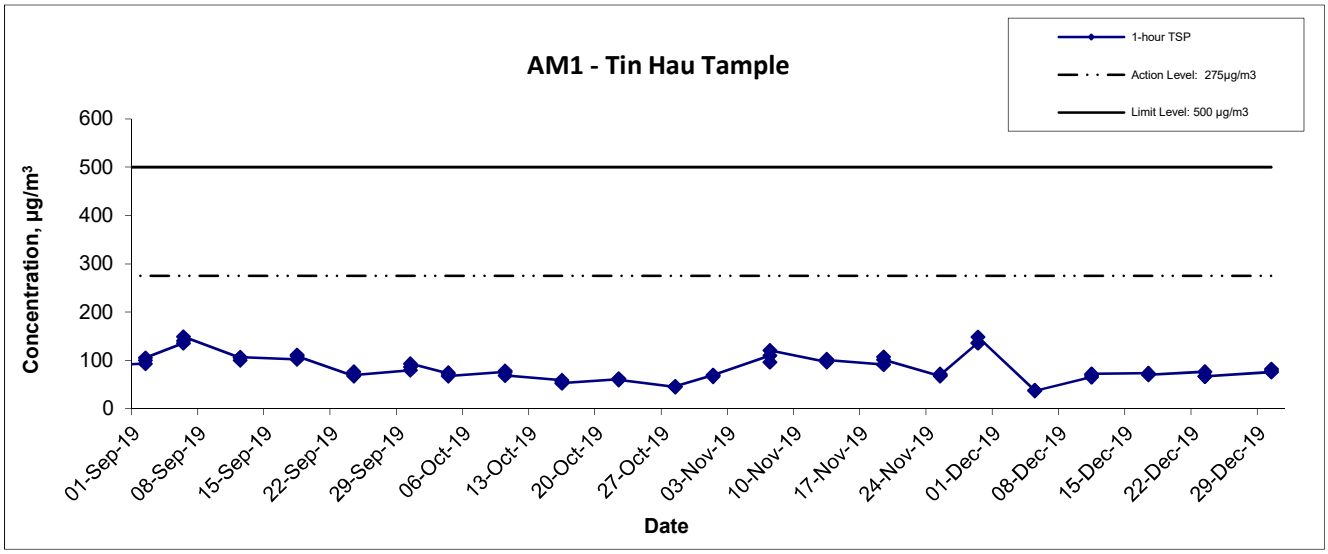
Location AM4 - Sitting-out Area at Cha Kwo Ling Village			
Date	Time	Weather	*Particulate Concentration (μg/m ^{3})*
5-Dec-19	16:00	Cloudy	41.0
5-Dec-19	17:00	Cloudy	40.0
5-Dec-19	18:00	Cloudy	42.0
11-Dec-19	15:30	Sunny	83.6
11-Dec-19	16:30	Sunny	81.4
11-Dec-19	17:30	Sunny	88.0
17-Dec-19	13:00	Cloudy	76.8
17-Dec-19	14:00	Cloudy	73.6
17-Dec-19	15:00	Cloudy	76.8
23-Dec-19	13:00	Cloudy	80.0
23-Dec-19	14:00	Cloudy	70.4
23-Dec-19	15:00	Cloudy	76.8
30-Dec-19	13:00	Cloudy	85.8
30-Dec-19	14:00	Cloudy	82.5
30-Dec-19	15:00	Cloudy	82.5
		Average	72.1
		Maximum	88.0
		Minimum	40.0

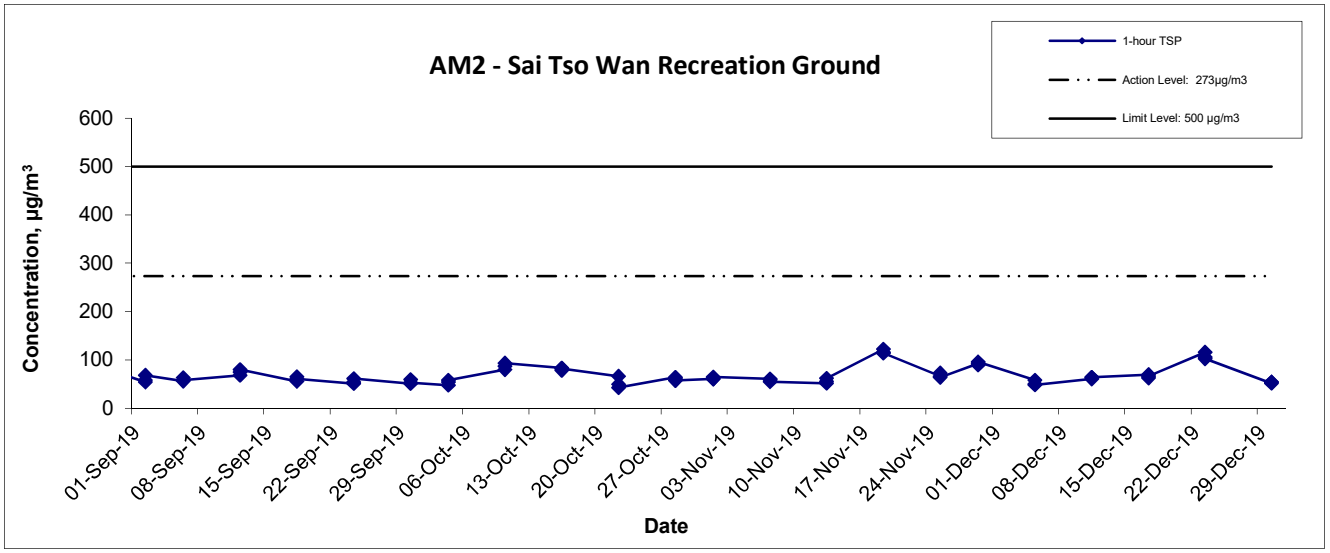
APPENDIX E - 1-HOUR TSP MONITORING RESULTS

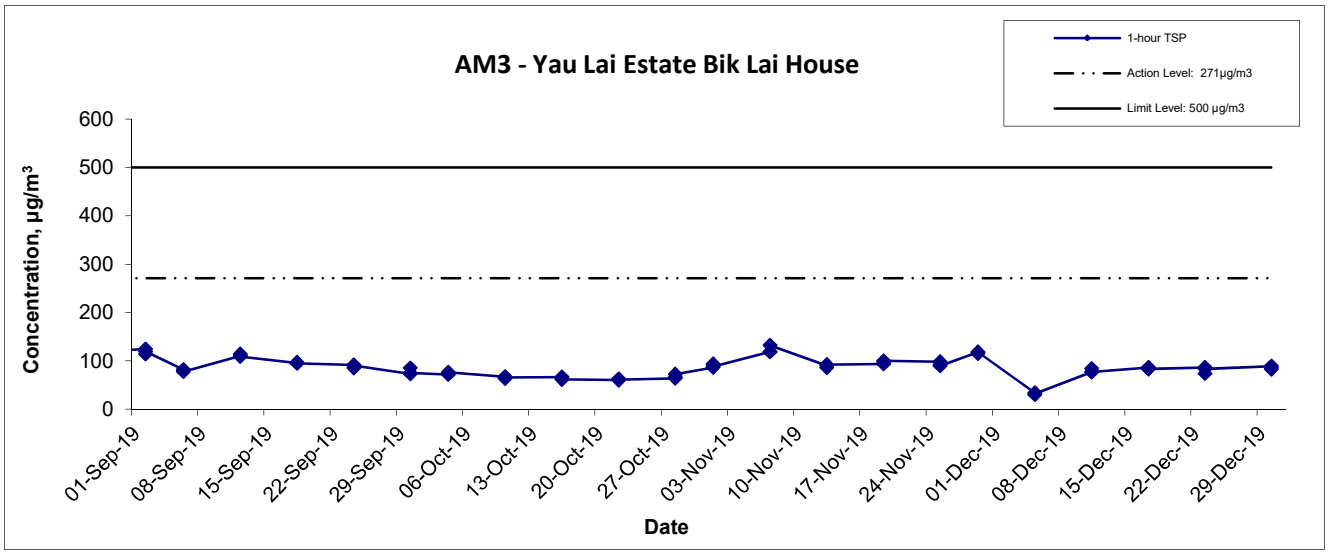
Location AM5(A) - Tseung Kwan O DSD Desilting Compound			
Date	Time	Weather	***Particulate Concentration (μg/m^3)***
5-Dec-19	9:00	Cloudy	59.4
5-Dec-19	10:00	Cloudy	55.0
5-Dec-19	11:00	Cloudy	57.2
11-Dec-19	13:00	Sunny	64.0
11-Dec-19	14:00	Sunny	60.8
11-Dec-19	15:00	Sunny	70.4
17-Dec-19	16:00	Sunny	72.6
17-Dec-19	17:00	Sunny	69.3
17-Dec-19	18:00	Sunny	75.9
23-Dec-19	13:00	Cloudy	108.9
23-Dec-19	14:00	Cloudy	115.5
23-Dec-19	15:00	Cloudy	112.2
30-Dec-19	16:00	Cloudy	105.6
30-Dec-19	17:00	Cloudy	83.2
30-Dec-19	18:00	Cloudy	96.0
		Average	80.4
		Maximum	115.5
		Minimum	55.0

Location AM6(A) - Park Central, L1/F Open Space Area			
Date	Time	Weather	Particulate Concentration (μg/m^3)
5-Dec-19	13:00	Cloudy	48.4
5-Dec-19	14:00	Cloudy	52.8
5-Dec-19	15:00	Cloudy	59.4
11-Dec-19	9:00	Sunny	64.0
11-Dec-19	10:00	Sunny	60.8
11-Dec-19	11:00	Sunny	67.2
17-Dec-19	13:00	Sunny	62.7
17-Dec-19	14:00	Sunny	69.3
17-Dec-19	15:00	Sunny	66.0
23-Dec-19	14:00	Cloudy	89.6
23-Dec-19	15:00	Cloudy	92.8
23-Dec-19	16:00	Cloudy	89.6
30-Dec-19	9:00	Cloudy	134.4
30-Dec-19	10:00	Cloudy	128.0
30-Dec-19	11:00	Cloudy	118.4
		Average	80.2
		Maximum	134.4
		Minimum	48.4

1-hr TSP Concentration Levels

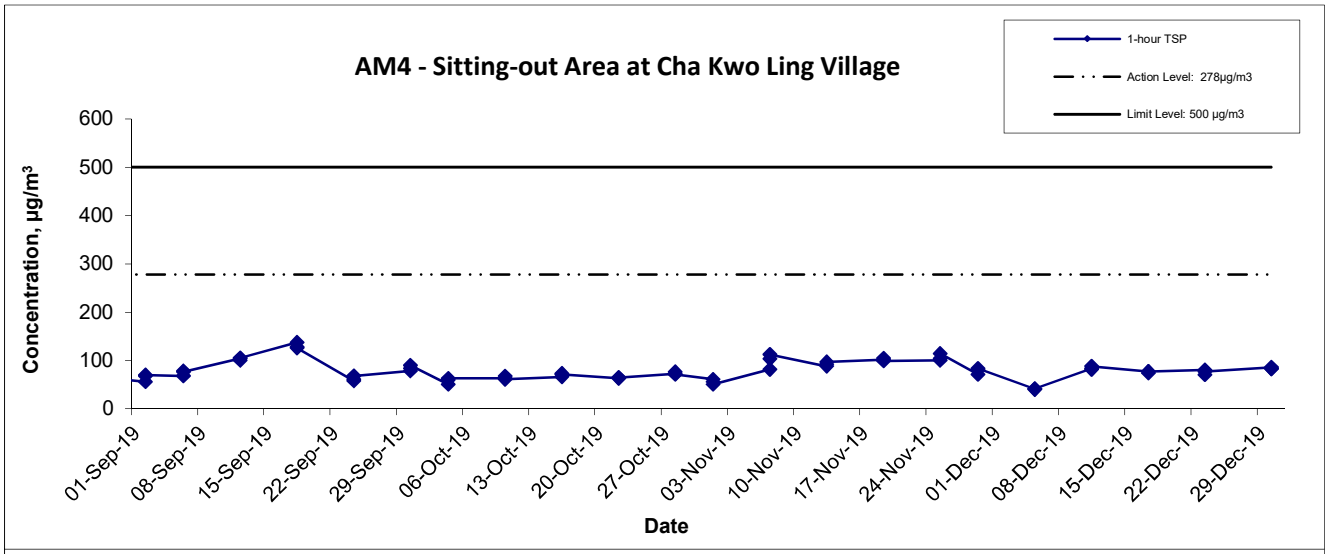


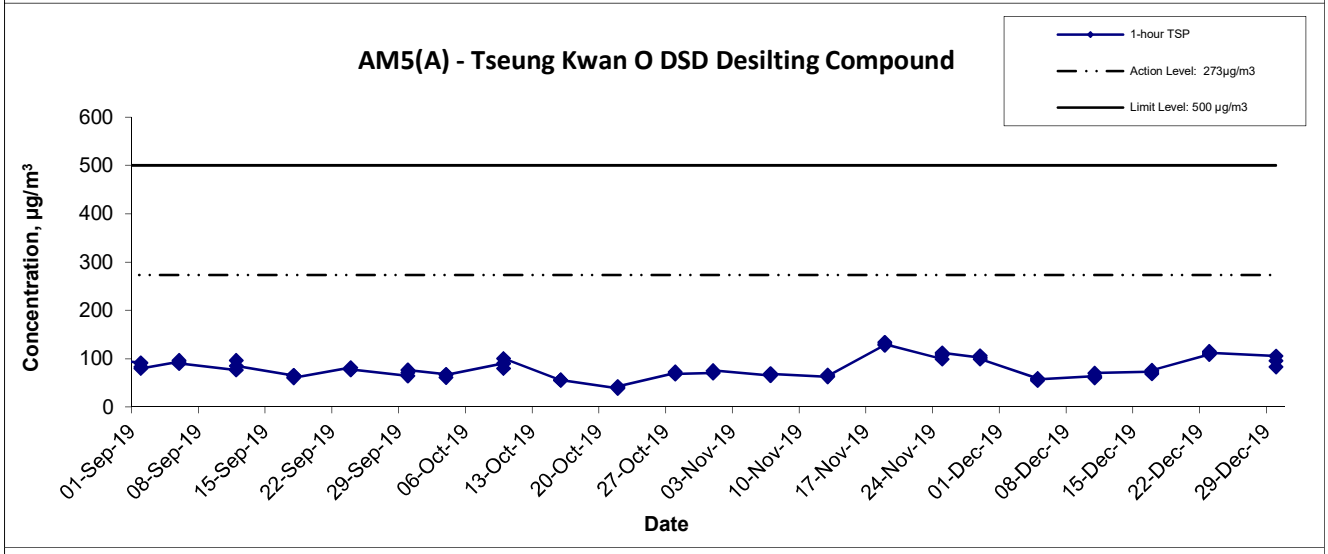


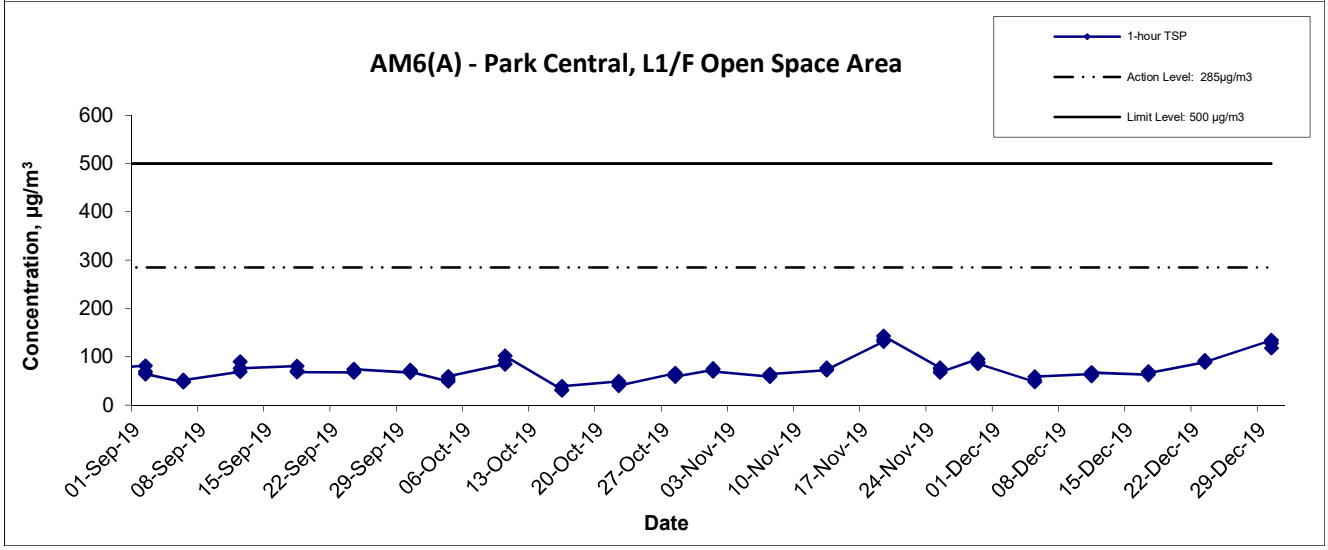


Agreement No. CE/59/2015 (EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Graphical Presentation of 1-hour TSP Monitoring Results	Scale N.T.S Date Dec-19	Project No. MA16034 Appendix E	CINOTECH

1-hr TSP Concentration Levels







Agreement No. CE/59/2015 (EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Graphical Presentation of 1-hour TSP Monitoring Results	Scale N.T.S Date Dec-19	Project No. MA16034 Appendix E	CINOTECH

APPENDIX F
24-HOUR TSP MONITORING RESULTS AND GRAPHICAL PRESENTATIONS

Appendix F - 24-hour TSP Monitoring Results

Location AM1 - Tin Hau Temple

Start Date	Weather	Air	Atmospheric	Filter Weight (g)		Particulate	Elapse Time		Sampling	Flow Rate (m^3/min.)		Av. flow	Total vol.	Conc.
	Condition	Temp. (K)	Pressure, Pa (mmHg)	Initial	Final	Weight (g)	Initial	Final	Time(hrs.)	Initial	Final	(m^3/min)	(m^3)	(μg/m^3)
4-Dec-19	Sunny	289.4	768.9	3.5043	3.5968	0.0925	6151.3	6175.3	24.0	1.24	1.24	1.24	1784.4	51.8
10-Dec-19	Sunny	291.8	764.9	3.4577	3.7078	0.2501	6175.3	6199.3	24.0	1.23	1.23	1.23	1773.1	141.1
16-Dec-19	Sunny	295.3	764.4	3.4975	3.6150	0.1175	6199.3	6223.3	24.0	1.21	1.21	1.21	1742.2	67.4
22-Dec-19	Sunny	295.1	763.2	3.4560	3.6022	0.1462	6223.3	6247.3	24.0	1.21	1.21	1.21	1741.2	84.0
													Min	51.8
													Max	141.1
													Average	68.9

Location AM2 - Sai Tso Wan Recreation Ground

Start Date	Weather	Air	Atmospheric	Filter Weight (g)		Particulate	Elapse Time		Sampling	Flow Rate (m^3/min.)		Av. flow	Total vol.	Conc.
	Condition	Temp. (K)	Pressure, Pa (mmHg)	Initial	Final	Weight (g)	Initial	Final	Time(hrs.)	Initial	Final	(m^3/min)	(m^3)	(μg/m^3)
4-Dec-19	Sunny	289.4	768.9	3.4504	3.5272	0.0768	27069.6	27093.6	24.0	1.24	1.24	1.24	1788.3	42.9
10-Dec-19	Sunny	291.8	764.9	3.5231	3.6552	0.1321	27093.6	27117.6	24.0	1.23	1.23	1.23	1776.2	74.4
16-Dec-19	Sunny	295.3	764.4	3.5294	3.6033	0.0739	27117.6	27141.6	24.0	1.23	1.23	1.23	1771.2	41.7
22-Dec-19	Sunny	295.1	763.2	3.4902	3.6022	0.1120	27141.6	27165.6	24.0	1.21	1.21	1.21	1741.1	64.3
													Min	41.7
													Max	74.4
													Average	44.7

Location AM3 - Yau Lai Estate, Bik Lai House

Start Date	Weather	Air	Atmospheric	Filter Weight (g)		Particulate	Elapse Time		Sampling	Flow Rate (m^3/min.)		Av. flow	Total vol.	Conc.
	Condition	Temp. (K)	Pressure, Pa (mmHg)	Initial	Final	Weight (g)	Initial	Final	Time(hrs.)	Initial	Final	(m^3/min)	(m^3)	(μg/m^3)
4-Dec-19	Sunny	289.4	768.9	3.4724	3.5407	0.0683	1377.1	1401.1	24.0	1.24	1.25	1.24	1790.6	38.1
10-Dec-19	Sunny	291.8	764.9	3.4929	3.5711	0.0782	1401.1	1425.1	24.0	1.24	1.23	1.23	1778.3	44.0
16-Dec-19	Sunny	295.3	764.4	3.5056	3.5711	0.0655	1425.1	1449.1	24.0	1.21	1.21	1.21	1741.2	37.6
22-Dec-19	Sunny	295.1	763.2	3.4774	3.5810	0.1036	1449.1	1473.1	24.0	1.21	1.21	1.21	1740.2	59.5
													Min	37.6
													Max	59.5
													Average	35.9

Appendix F - 24-hour TSP Monitoring Results

Location AM4(A) - Cha Kwo Ling Public Cargo Working Area Administrative Office

Start Date	Weather	Air	Atmospheric	Filter Weight (g)		Particulate	Elapse Time		Sampling	Flow Rate (m^3/min.)		Av. flow	Total vol.	Conc.
	Condition	Temp. (K)	Pressure, Pa (mmHg)	Initial	Final	Weight (g)	Initial	Final	Time(hrs.)	Initial	Final	(m^3/min)	(m^3)	(μg/m^3)
4-Dec-19	Sunny	289.4	768.9	3.5398	3.7655	0.2257	12337.3	12361.3	24.0	1.24	1.24	1.24	1784.6	126.5
10-Dec-19	Sunny	291.8	764.9	3.4759	3.7390	0.2631	12361.3	12385.3	24.0	1.23	1.23	1.23	1773.2	148.4
16-Dec-19	Sunny	295.3	764.4	3.4747	3.7280	0.2533	12385.3	12409.3	24.0	1.21	1.21	1.21	1742.4	145.4
22-Dec-19	Sunny	295.1	763.2	3.4976	3.6733	0.1757	12409.3	12433.3	24.0	1.21	1.21	1.21	1741.5	100.9
													Min	100.9
													Max	148.4
													Average	104.2

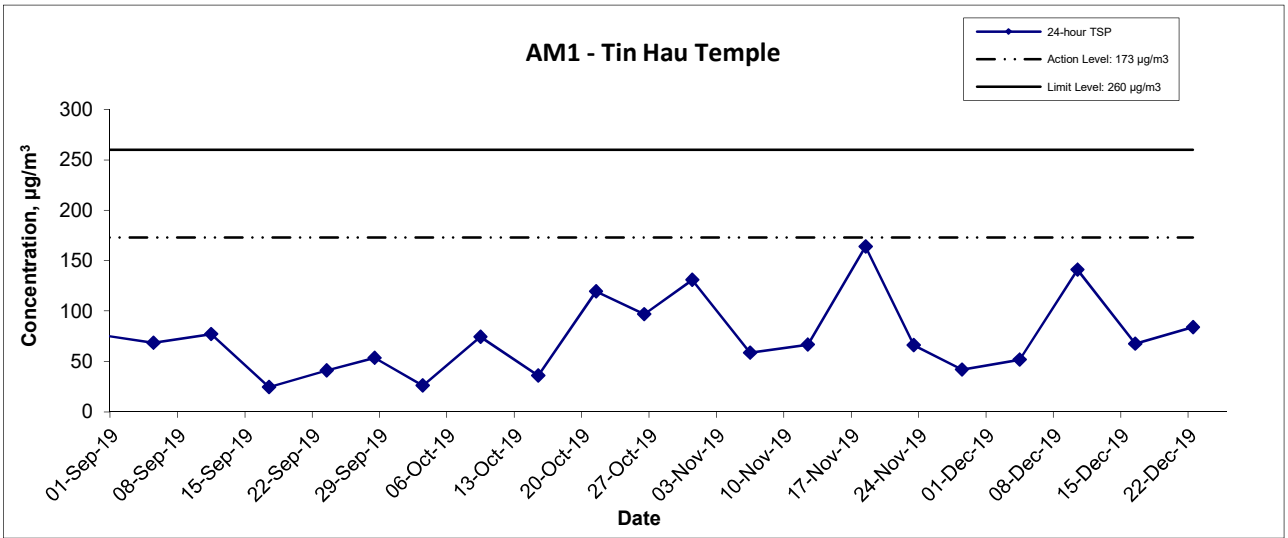
Location AM5(A) - Tseung Kwan O DSD Desilting Compound

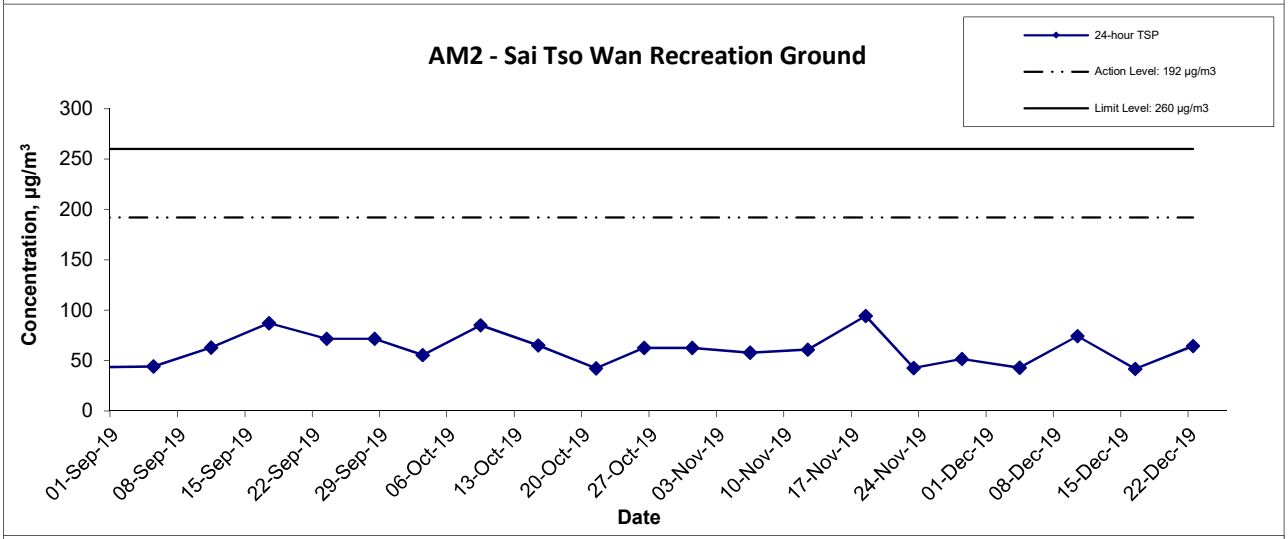
Start Date	Weather	Air	Atmospheric	Filter Weight (g)		Particulate	Elapse Time		Sampling	Flow Rate (m^3/min.)		Av. flow	Total vol.	Conc.
	Condition	Temp. (K)	Pressure, Pa (mmHg)	Initial	Final	Weight (g)	Initial	Final	Time(hrs.)	Initial	Final	(m^3/min)	(m^3)	(μg/m^3)
4-Dec-19	Sunny	289.4	768.9	3.5095	3.8027	0.2932	28773.1	28797.1	24.0	1.24	1.24	1.24	1787.5	164.0
10-Dec-19	Sunny	291.8	764.9	3.4735	3.6394	0.1659	28797.1	28821.1	24.0	1.23	1.23	1.23	1776.0	93.4
16-Dec-19	Sunny	295.3	764.4	3.4579	3.5854	0.1275	28821.1	28845.1	24.0	1.21	1.21	1.21	1740.2	73.3
22-Dec-19	Sunny	295.1	763.2	3.4878	3.5817	0.0939	28845.1	28869.1	24.0	1.21	1.21	1.21	1739.2	54.0
													Min	54.0
													Max	164.0
													Average	76.9

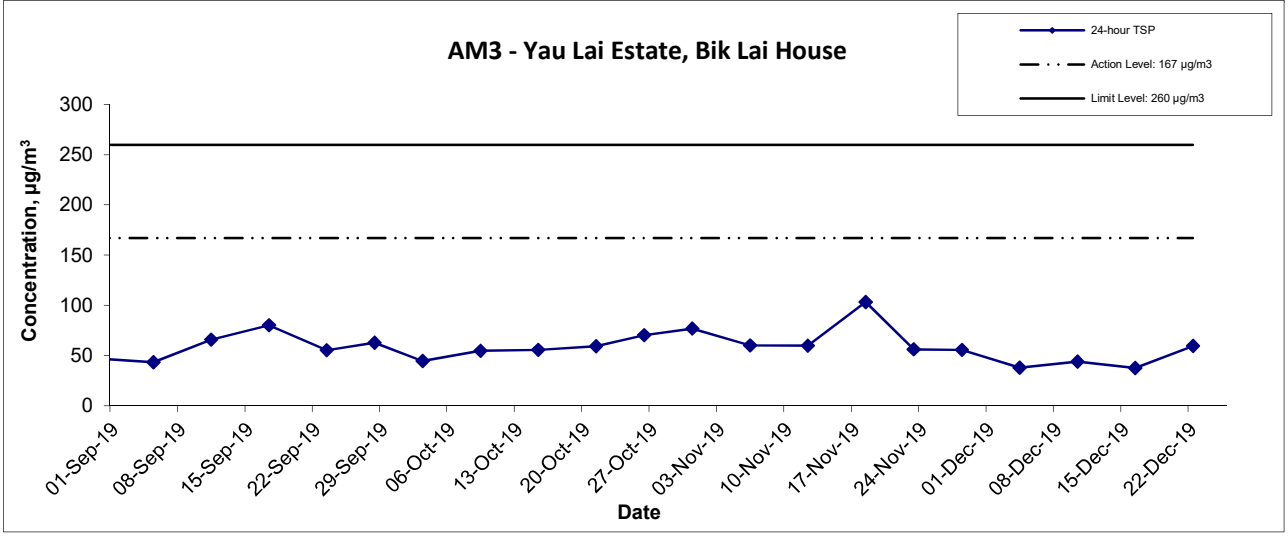
Location AM6(A) - Park Central, L1/F Open Space Area

Start Date	Weather	Air	Atmospheric	Filter Weight (g)		Particulate	Elapse Time		Sampling	Flow Rate (m^3/min.)		Av. flow	Total vol.	Conc.
	Condition	Temp. (K)	Pressure, Pa (mmHg)	Initial	Final	Weight (g)	Initial	Final	Time(hrs.)	Initial	Final	(m^3/min)	(m^3)	(μg/m^3)
4-Dec-19	Sunny	289.4	768.9	3.4711	3.5464	0.0753	1330.2	1354.2	24.0	1.23	1.24	1.23	1778.1	42.3
10-Dec-19	Sunny	291.8	764.9	3.5368	3.6022	0.0654	1354.2	1378.2	24.0	1.23	1.23	1.23	1766.0	37.0
16-Dec-19	Sunny	295.3	764.4	3.4960	3.5528	0.0568	1378.2	1402.2	24.0	1.22	1.22	1.22	1754.8	32.4
22-Dec-19	Sunny	295.1	763.2	3.4889	3.6058	0.1169	1402.2	1426.2	24.0	1.22	1.22	1.22	1753.8	66.7
													Min	32.4
													Max	66.7
													Average	35.7

24-hr TSP Concentration Levels

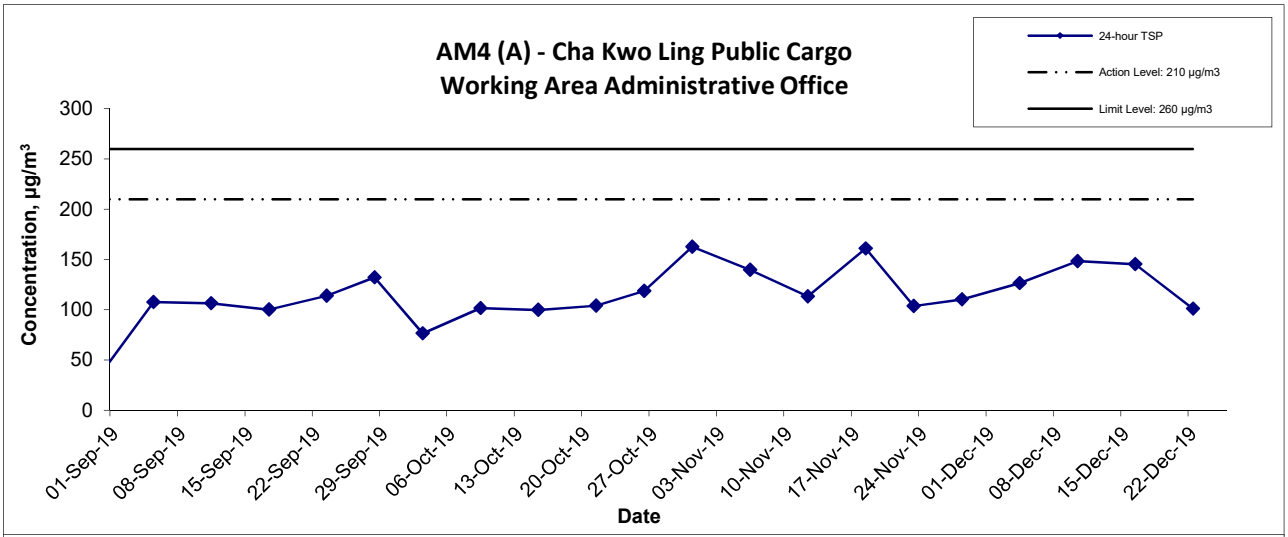


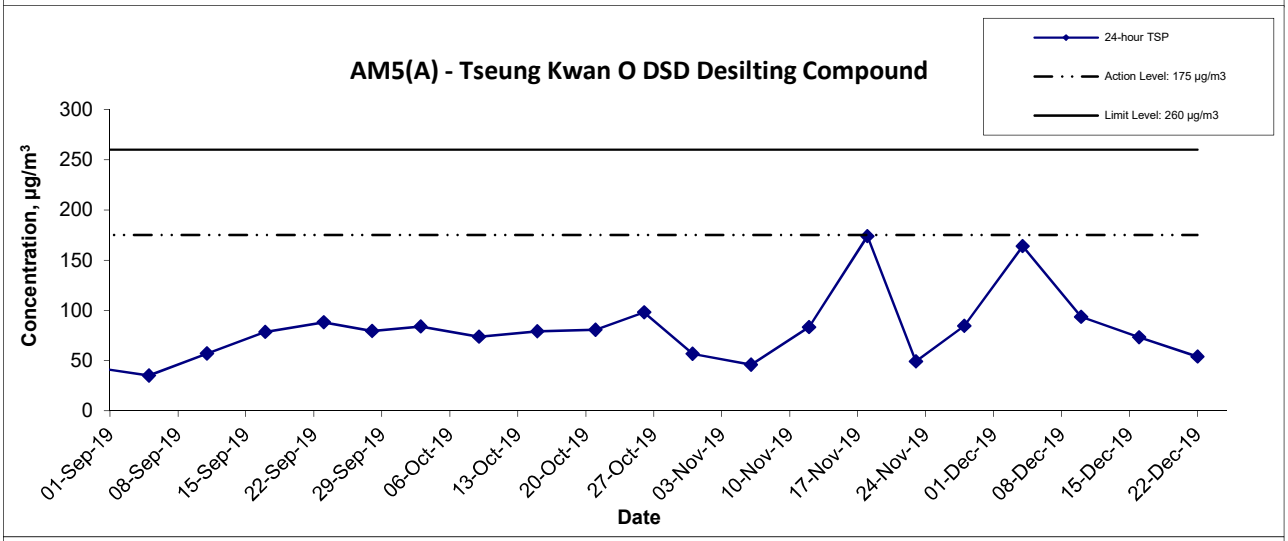


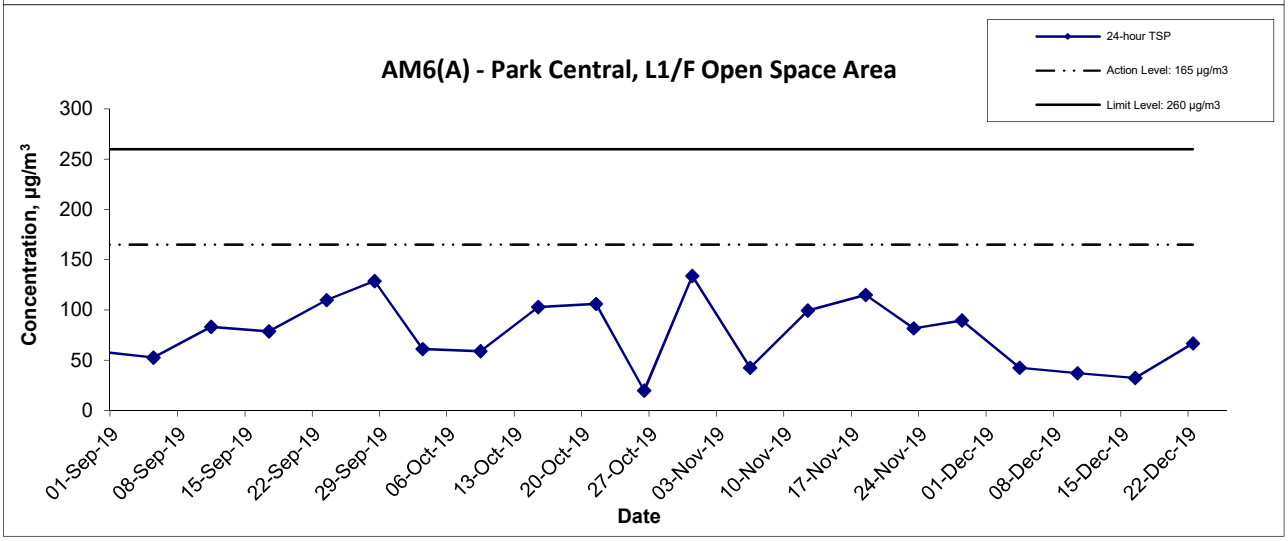


Agreement No. CE/59/2015 (EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Graphical Presentation of 24-hour TSP Monitoring Results	Scale N.T.S Date Dec-19	Project No. MA16034 Appendix F	CINOTECH

24-hr TSP Concentration Levels







Agreement No. CE/59/2015 (EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Graphical Presentation of 24-hour TSP Monitoring Results	Scale N.T.S Date Dec-19	Project No. MA16034 Appendix F	CINOTECH

APPENDIX G
NOISE MONITORING RESULTS AND GRAPHICAL PRESENTATIONS

Appendix G - Noise Monitoring Results

(0700-1900 hrs on Normal Weekdays)

Location CM1 - Nga Lai House, Yau Lai Estate Phase 1, Yau Tong							
Date	Time	Weather	Unit: dB (A) (30-min)				
			Measured Noise Level			Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}
5-Dec-19	13:35	Rainy	73.5	76.1	70.6	65.5	73
11-Dec-19	9:25	Sunny	72.5	74.2	70.7		72
17-Dec-19	9:00	Cloudy	74.6	78.6	71.0		74
23-Dec-19	14:59	Sunny	73.6	77.5	70.8		73
30-Dec-19	15:10	Cloudy	72.0	73.5	70.3		71

Location CM2 - Bik Lai House, Yau Lai Estate Phase 1, Yau Tong							
Date	Time	Weather	Unit: dB (A) (30-min)				
			Measured Noise Level			Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}
5-Dec-19	14:18	Rainy	73.9	76.0	71.2	63.6	73
11-Dec-19	10:03	Sunny	74.7	76.0	73.1		74
17-Dec-19	10:00	Cloudy	74.5	77.9	71.3		74
23-Dec-19	14:15	Sunny	73.9	76.0	69.8		73
30-Dec-19	15:44	Cloudy	72.2	73.5	70.3		72

Location CM3 - Block S, Yau Lai Estate Phase 5, Yau Tong							
Date	Time	Weather	Unit: dB (A) (30-min)				
			Measured Noise Level			Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}
5-Dec-19	14:55	Rainy	72.9	75.0	69.2	65.6	72
11-Dec-19	10:41	Sunny	74.8	76.7	72.3		74
17-Dec-19	11:00	Cloudy	73.7	76.2	70.6		73
23-Dec-19	17:46	Sunny	74.7	76.0	70.1		74
30-Dec-19	16:30	Cloudy	72.0	73.4	70.3		71

Location CM4 - Tin Hau Temple, Cha Kwo Ling							
Date	Time	Weather	Unit: dB (A) (30-min)				
			Measured Noise Level			Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}
5-Dec-19	10:02	Rainy	65.3	68.4	62.1	62	63
11-Dec-19	13:05	Sunny	68.2	71.4	65.5		67
17-Dec-19	14:00	Cloudy	70.0	73.1	67.2		69
23-Dec-19	16:02	Sunny	69.3	72.8	67.1		68
30-Dec-19	9:00	Cloudy	68.2	71.2	65.6		67

Location CM5 - CCC Kei Faat Primary School, Yau Tong							
Date	Time	Weather	Unit: dB (A) (30-min)				
			Measured Noise Level			Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}
5-Dec-19	9:00	Rainy	69.2	72.8	65.1	68.2	62
11-Dec-19	11:21	Sunny	70.4	73.1	65.8		66
17-Dec-19	13:00	Cloudy	70.9	73.0	68.0		68
23-Dec-19	10:05	Sunny	71.3	74.1	68.2		68
30-Dec-19	9:45	Cloudy	69.8	71.3	66.4		65

Appendix G - Noise Monitoring Results

(0700-1900 hrs on Normal Weekdays)

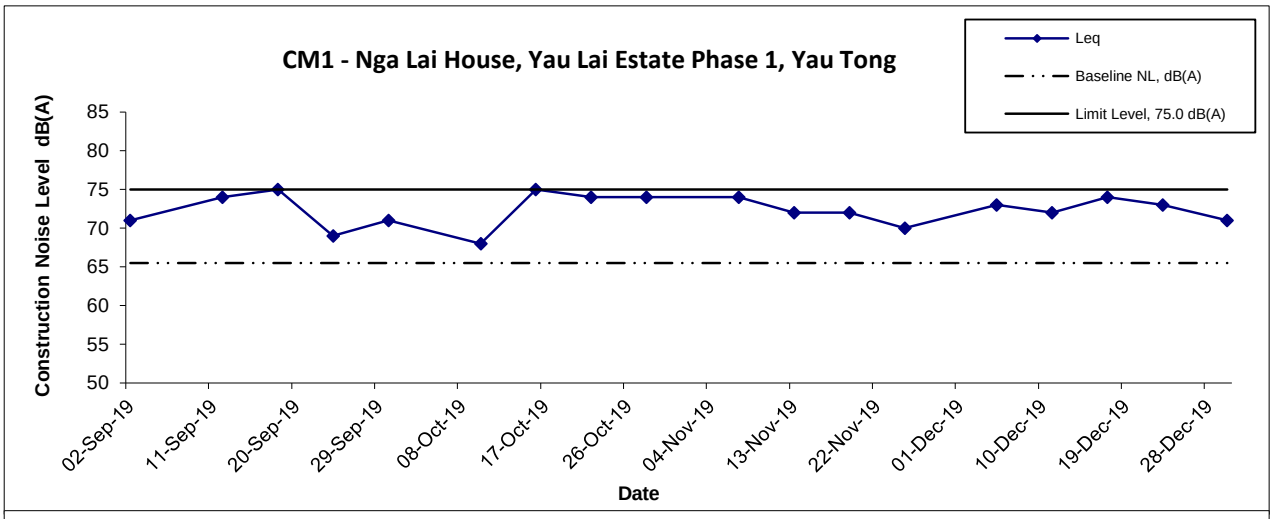
Location CM6(A) - Site Boundary of Contract No. NE/2015/02 near Tower 1, Ocean Shores							
Date	Time	Weather	Unit: dB (A) (30-min)				
			Measured Noise Level			Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}
5-Dec-19	10:00	Cloudy	67.1	68.4	65.4	61.9	66
11-Dec-19	13:56	Sunny	70.4	73.1	65.8		70
17-Dec-19	16:30	Cloudy	69.2	72.3	67.1		68
23-Dec-19	14:00	Sunny	65.2	66.7	61.5		62
30-Dec-19	13:00	Cloudy	71.9	75.6	68.1		71

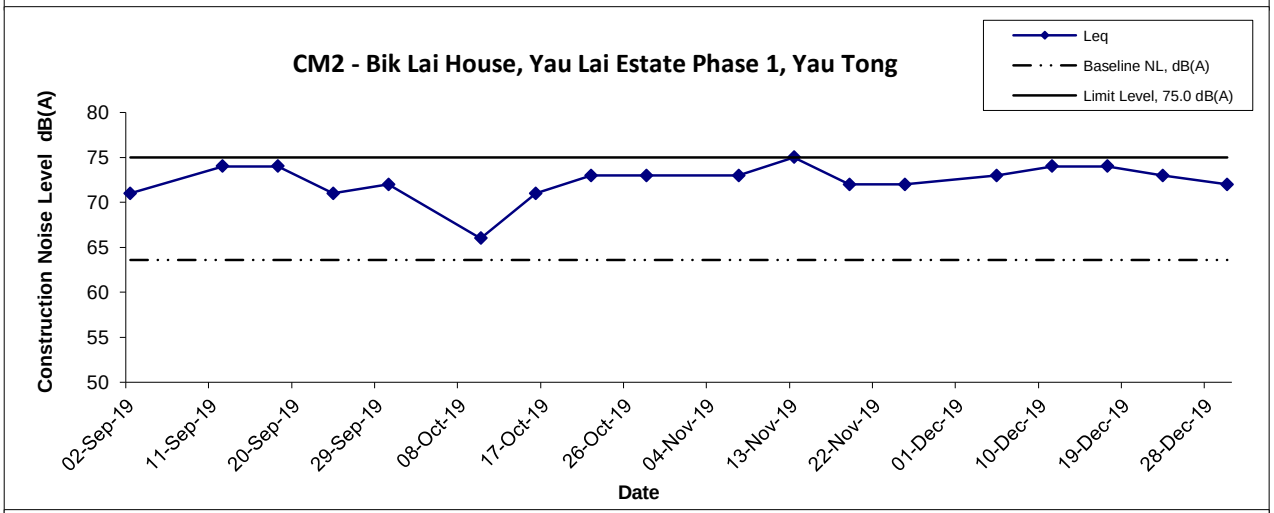
Location CM7(A) - Site Boundary of Contract No. NE/2015/02 near Tower 7, Ocean Shores							
Date	Time	Weather	Unit: dB (A) (30-min)				
			Measured Noise Level			Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}
5-Dec-19	9:15	Cloudy	62.8	63.4	60.4	58.3	61
11-Dec-19	13:05	Sunny	67.1	71.9	61.1		66
17-Dec-19	15:00	Cloudy	64.3	66.8	61.3		63
23-Dec-19	15:00	Sunny	64.4	66.9	61.4		63
30-Dec-19	16:00	Cloudy	67.6	70.4	65.2		67

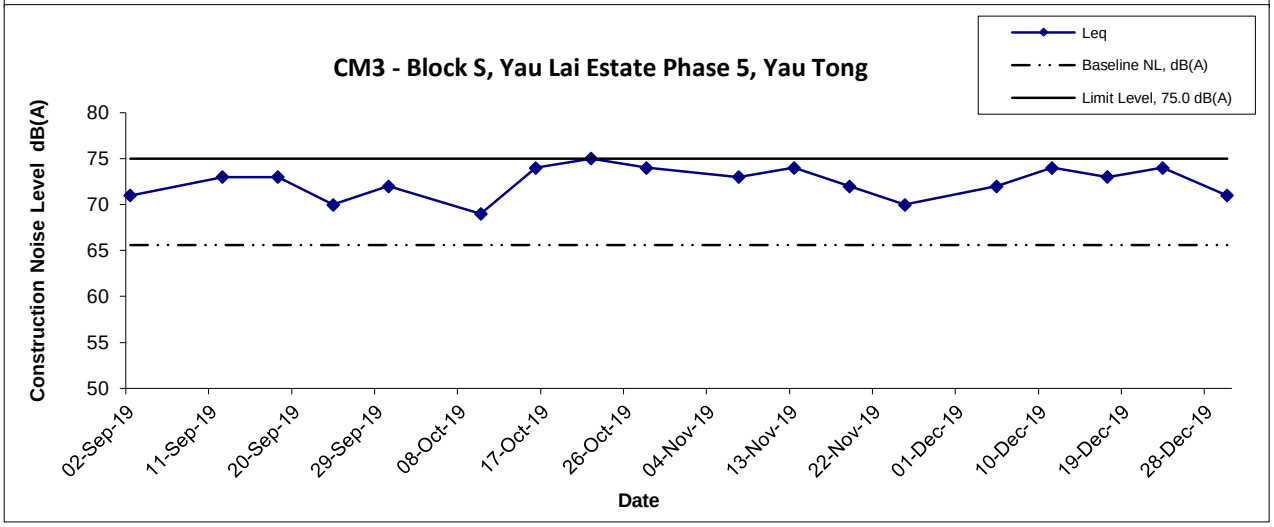
Location CM8(A) - Park Central, L1/F Open Space Area							
Date	Time	Weather	Unit: dB (A) (30-min)				
			Measured Noise Level			Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}
5-Dec-19	13:00	Cloudy	65.9	66.8	63.9	69.1	66Measured ≦ Baseline
11-Dec-19	17:15	Sunny	64.1	66.9	58.8		64Measured ≦ Baseline
17-Dec-19	13:10	Cloudy	67.3	69.2	65.1		67Measured ≦ Baseline
23-Dec-19	16:00	Sunny	65.3	67.2	63.1		65Measured ≦ Baseline
30-Dec-19	9:00	Cloudy	65.6	67.1	63.4		66Measured ≦ Baseline

Location CM9(A) - Roof top of the Capri Tower 10							
Date	Time	Weather	Unit: dB (A) (30-min)				
			Measured Noise Level			Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}
5-Dec-19	10:45	Cloudy	55.0	56.4	53.6	58.5	55Measured ≦ Baseline

Noise Levels







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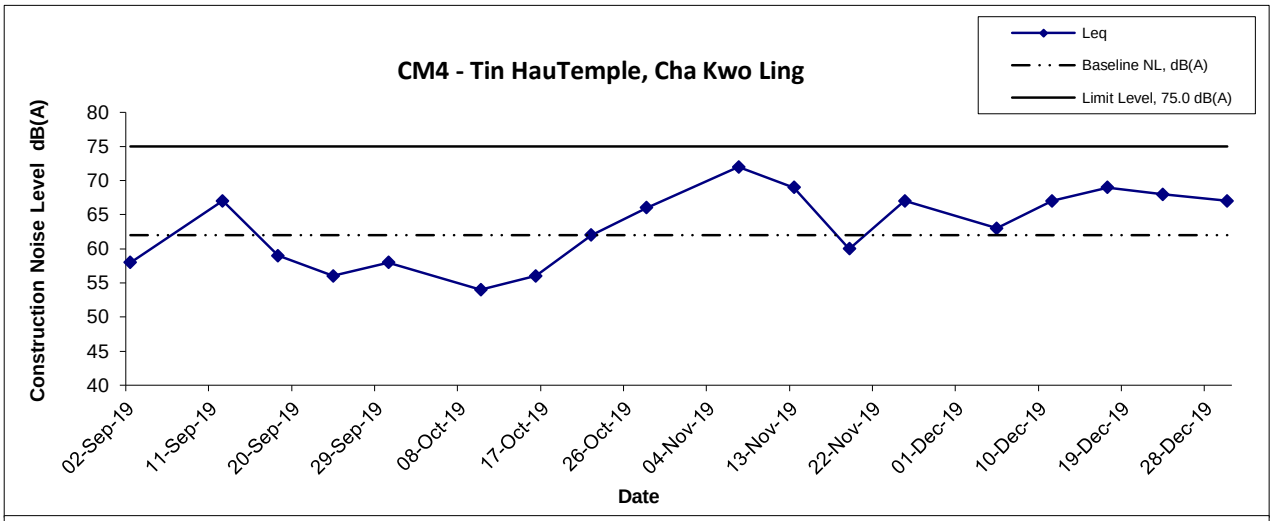
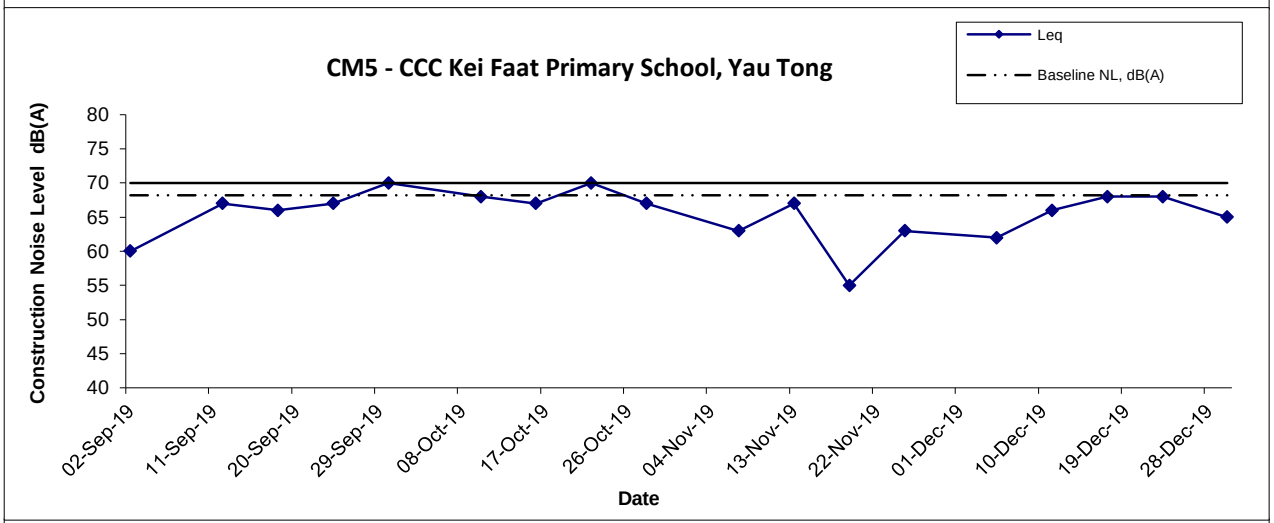
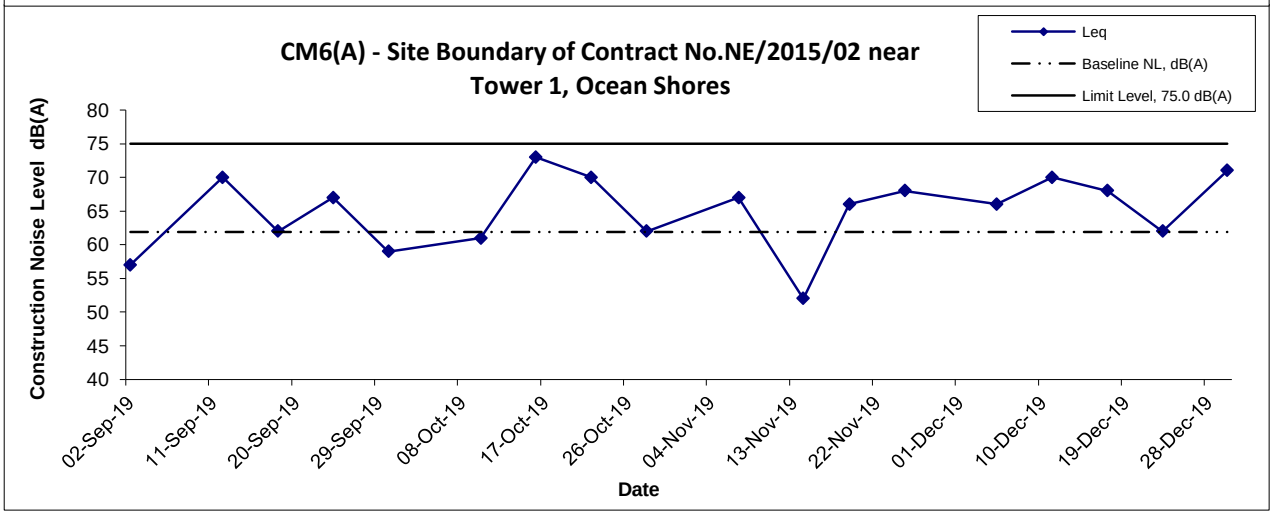
	Date: Dec 19	Appendix: G	

Noise Levels







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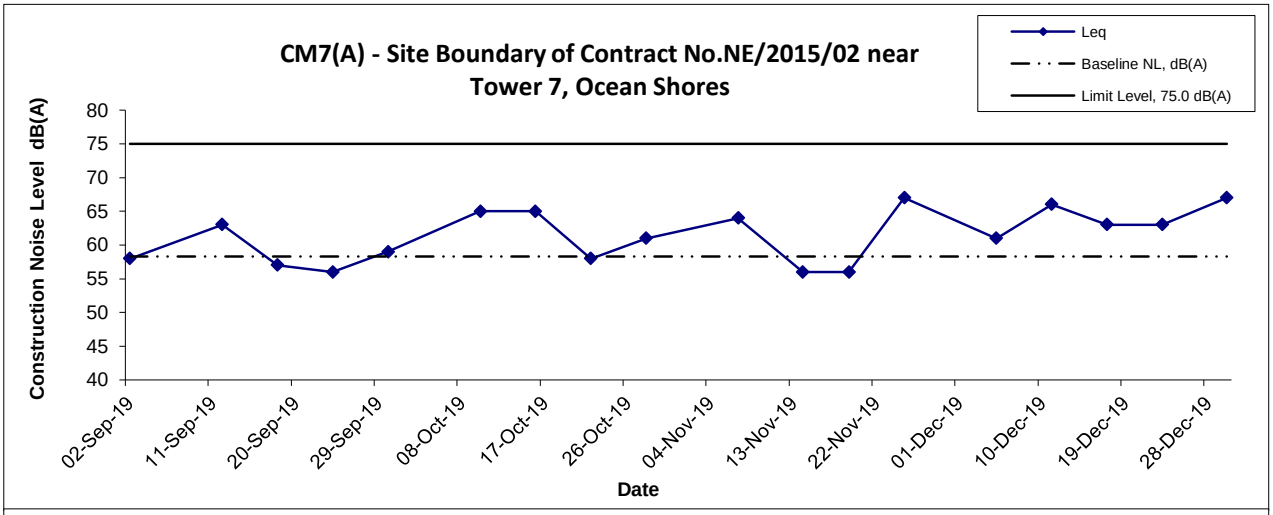
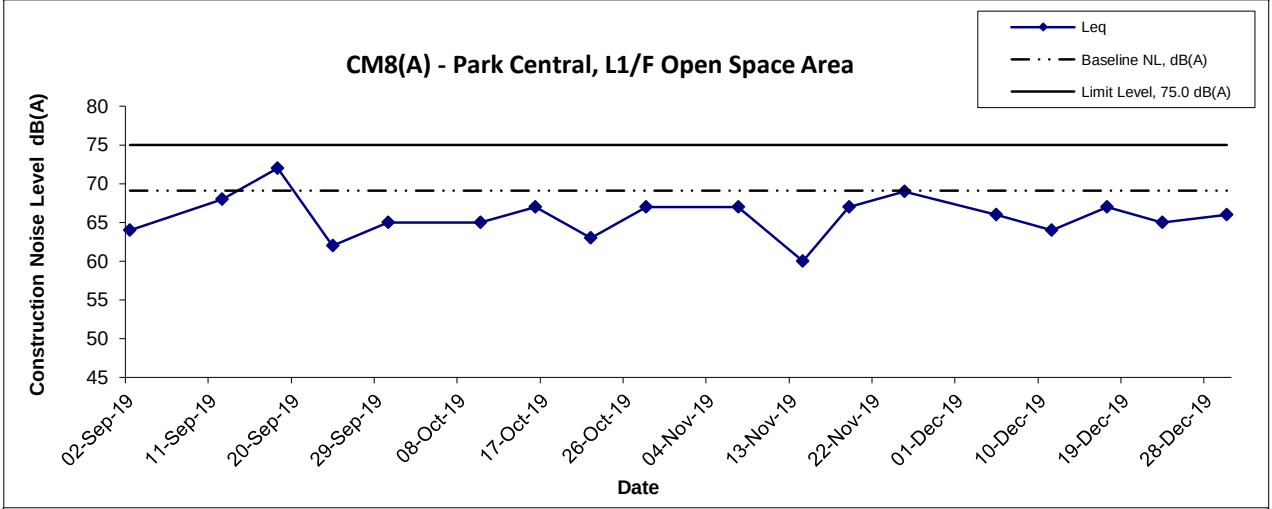
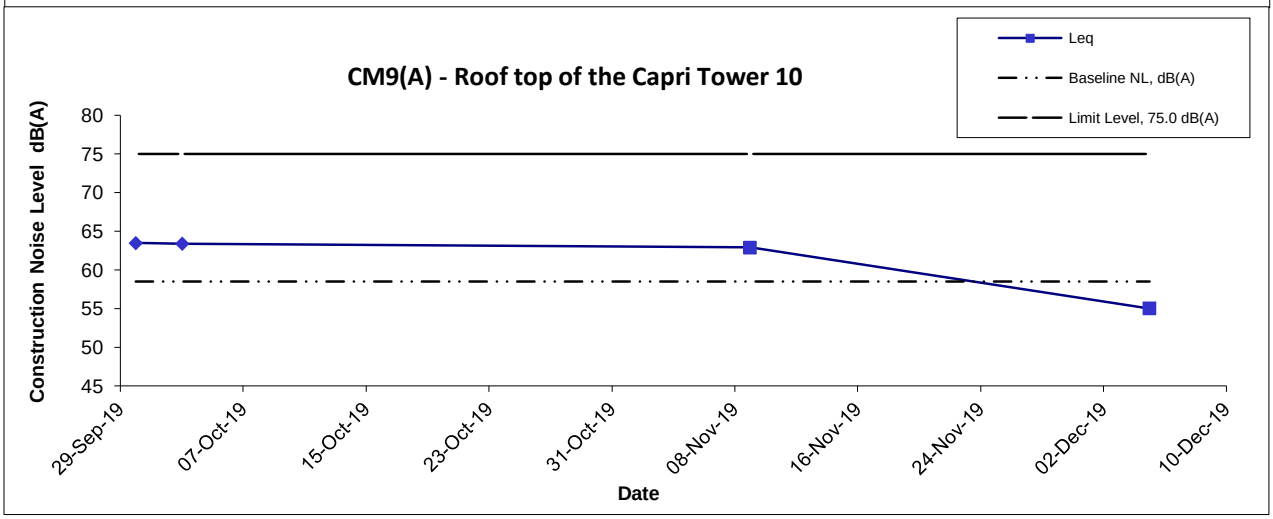
Noise Levels







Title: Agreement No. CE/59/2015 (EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Graphical Presentation of Construction Noise Monitoring Results	Scale: N.T.S Date: Dec 19	Project No. MA16034 Appendix G	CINOTECH

Appendix G - Noise Monitoring Results

(Restricted Hours - 19:00 to 23:00 on all other days & 07:00 to 23:00 holidays)

Location CM1 - Nga Lai House, Yau Lai Estate Phase 1, Yau Tong

Date	Time	Weather	dB (A) (5-min)				Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	Average L_{eq}	L_{eq}	L_{eq}
6-Dec-19	20:35	Fine	65.2	69.4	62.1	65.5	64.4	59
	20:40		65.4	69.7	62.0			
	20:45		65.8	69.8	62.1			
13-Dec-19	22:00	Cloudy	65.7	67.2	64.3	65.7		60
	22:05		65.6	67.5	63.3			
	22:10		65.7	67.0	64.2			
20-Dec-19	22:35	Rainy	66.9	69.0	64.8	67.0		64
	22:40		66.7	68.8	64.9			
	22:45		67.3	68.0	66.4			
27-Dec-19	20:35	Fine	68.4	69.6	63.0	68.1		66
	20:40		68.0	69.5	63.4			
	20:45		67.8	69.4	63.3			

Location CM2 - Bik Lai House, Yau Lai Estate Phase 1, Yau Tong

Date	Time	Weather	dB (A) (5-min)				Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	Average L_{eq}	L_{eq}	L_{eq}
6-Dec-19	21:00	Fine	63.7	66.7	59.8	63.9	62.2	59
	21:05		63.9	67.0	59.6			
	21:10		64.0	66.9	59.7			
13-Dec-19	22:15	Cloudy	66.7	67.9	65.0	66.8		65
	22:20		66.7	67.7	65.1			
	22:25		67.1	68.3	65.6			
20-Dec-19	22:10	Rainy	66.4	67.3	65.5	66.6		65
	22:15		66.8	67.6	65.7			
	22:20		66.5	67.2	65.6			
27-Dec-19	21:00	Fine	67.9	69.5	62.8	68.1		67
	21:05		68.0	69.7	62.8			
	21:10		68.3	69.1	62.7			

Location CM3 - Block S, Yau Lai Estate Phase 5, Yau Tong

Date	Time	Weather	dB (A) (5-min)				Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	Average L_{eq}	L_{eq}	L_{eq}
6-Dec-19	21:30	Fine	68.5	70.2	65.2	68.7	64.7	66
	21:35		68.7	70.3	65.4			
	21:40		68.9	70.1	65.5			
13-Dec-19	22:30	Cloudy	68.0	69.7	65.8	67.8		65
	22:35		68.2	69.5	65.1			
	22:40		67.0	68.1	65.4			
20-Dec-19	21:45	Rainy	64.1	64.8	63.0	65.5		58
	21:50		66.4	67.7	64.7			
	21:55		65.6	66.6	59.0			
27-Dec-19	21:30	Fine	67.2	68.8	62.7	67.3		64
	21:35		67.7	68.6	63.1			
	21:40		67.0	68.8	63.2			

Location CM6(A) - Site Boundary of Contract No. NE/2015/02 near Tower 1, Ocean Shores

Date	Time	Weather	dB (A) (5-min)				Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	Average L_{eq}	L_{eq}	L_{eq}
5-Dec-19	19:00	Cloudy	63.2	64.5	61.1	63.2	60.2	60
	19:05		62.6	64.2	60.8			
	19:10		63.8	65.0	61.4			
11-Dec-19	19:00	Sunny	62.1	64.2	59.0	62.8		59
	19:05		63.1	65.0	55.1			
	19:10		63.0	64.8	57.6			
17-Dec-19	19:00	Sunny	63.5	66.2	60.2	63.2		60
	19:05		62.8	65.8	59.8			
	19:10		63.3	66.1	60.1			
23-Dec-19	19:00	Sunny	62.3	64.9	59.0	61.8		57
	19:05		61.7	63.1	59.6			
	19:10		61.3	62.8	60.1			
30-Dec-19	19:00	Sunny	60.6	61.4	58.1	60.6		50
	19:05		60.9	62.0	58.8			
	19:10		60.2	61.2	57.9			

Appendix G - Noise Monitoring Results

(Restricted Hours - 2300-0700 on all days)

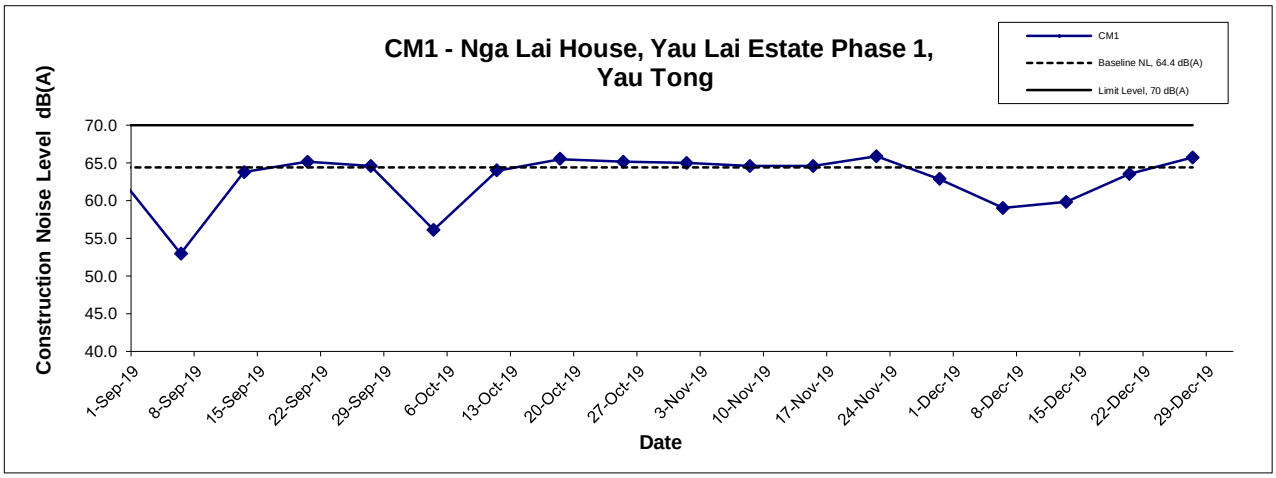
Location CM1 - Nga Lai House, Yau Lai Estate Phase 1, Yau Tong								
Date	Time	Weather	dB (A) (5-min)				Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	Average L_{eq}	L_{eq}	L_{eq}
6-Dec-19	23:00	Fine	60.4	63.8	57.4	60.3	63.7	60Measured ≦ Baseline
	23:05		60.5	63.9	57.1			
	23:10		60.1	63.4	57.0			
13-Dec-19	23:30	Cloudy	61.4	64.0	59.3	61.2	62.8	61Measured ≦ Baseline
	23:35		61.1	63.6	59.1			
	23:40		61.2	63.7	59.2			
20-Dec-19	23:00	Rainy	67.7	69.0	65.7	67.5	63.7	***65***
	23:05		67.5	68.7	66.2			
	23:10		67.4	69.1	65.8			
27-Dec-19	23:30	Fine	61.9	63.7	56.4	62.1	62.8	62Measured ≦ Baseline
	23:35		62.0	63.9	56.3			
	23:40		62.5	64.4	56.3			

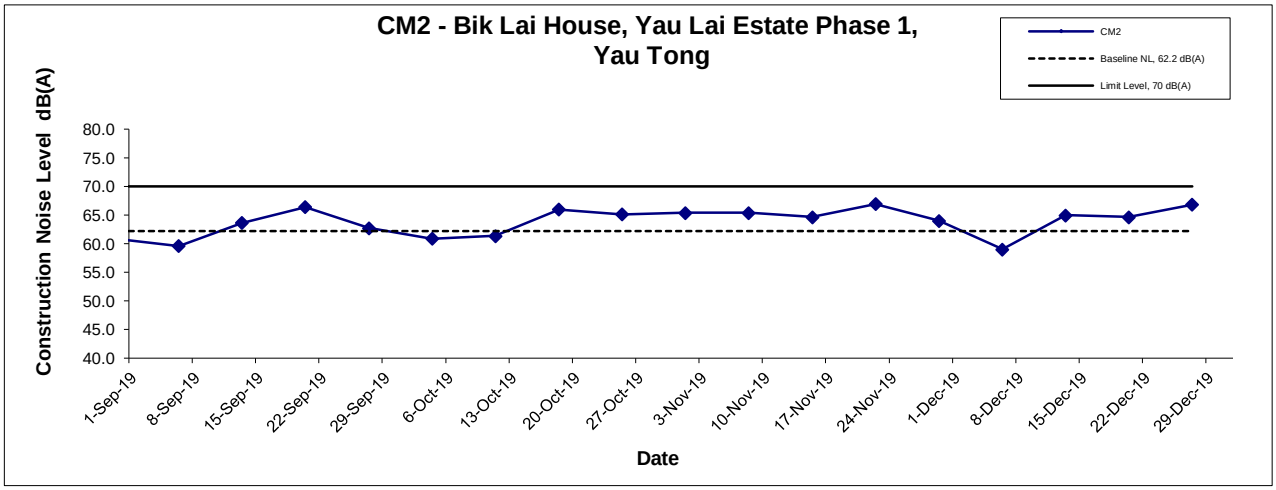
Location CM2 - Bik Lai House, Yau Lai Estate Phase 1, Yau Tong								
Date	Time	Weather	dB (A) (5-min)				Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	Average L_{eq}	L_{eq}	L_{eq}
6-Dec-19	23:30	Cloudy	59.8	62.8	55.0	59.7	60.8	60Measured ≦ Baseline
	23:35		59.5	62.5	54.9			
	23:40		59.7	63.0	55.2			
13-Dec-19	23:15	Cloudy	60.8	61.3	58.1	60.8	61.2	61Measured ≦ Baseline
	23:20		60.7	61.1	58.8			
	23:25		60.8	61.3	58.2			
20-Dec-19	23:25	Rainy	65.0	67.1	62.9	65.6	61.6	***63***
	23:30		65.0	66.2	63.7			
	23:35		66.5	66.7	64.6			
27-Dec-19	23:15	Fine	61.8	64.8	58.1	61.8	61.2	53
	23:20		61.6	64.7	59.3			
	23:25		62.0	63.6	58.6			

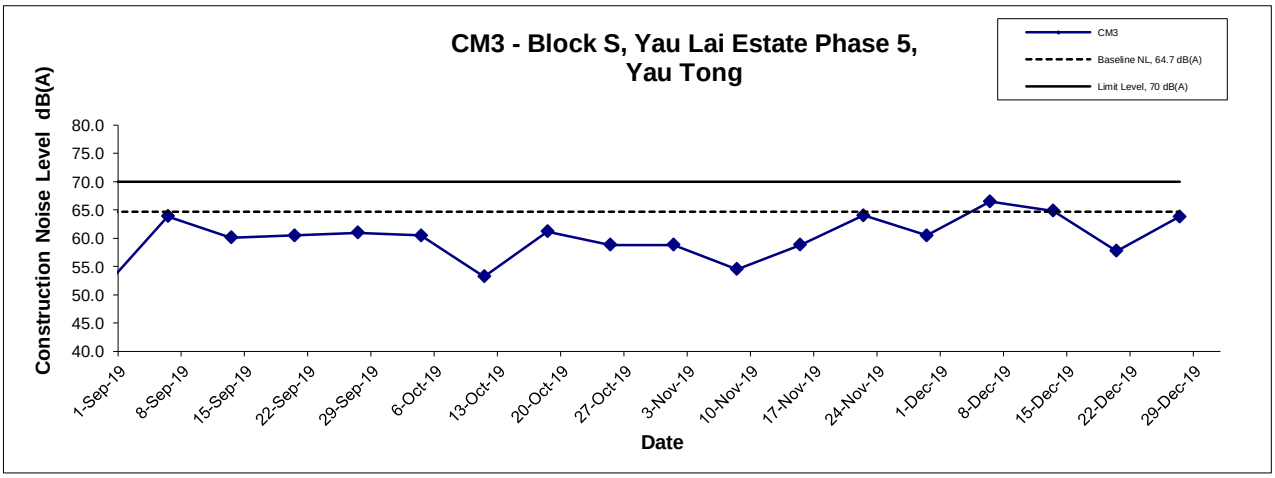
Location CM3 - Block S, Yau Lai Estate Phase 5, Yau Tong								
Date	Time	Weather	dB (A) (5-min)				Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	Average L_{eq}	L_{eq}	L_{eq}
6-Dec-19	23:45	Cloudy	63.7	65.7	55.4	63.4	64.0	63Measured ≦ Baseline
	23:50		63.6	65.8	55.2			
	23:55		63.0	65.3	55.1			
13-Dec-19	23:00	Cloudy	63.1	65.2	56.1	63.2	64.0	63Measured ≦ Baseline
	23:05		63.2	65.4	57.0			
	23:10		63.2	65.3	56.2			
21-Dec-19	0:05	Rainy	64.0	65.2	55.8	63.5	61.8	***59***
	0:10		63.2	64.2	62.2			
	0:15		63.4	64.6	61.9			
27-Dec-19	23:00	Fine	64.1	67.1	60.0	64.2	64.0	51
	23:05		64.3	67.2	60.2			
	23:10		64.3	67.4	60.3			

Remark: The exceedanes of night time noise limit level (55dB(A)) were not due to the Project but the road traffic near Eastern Harbour Crossing tunnel.
"Measured ≦ Baseline" means that the averaged measured Leq is smaller than the baseline Leq, and therefore the measured levels are not valid exceedances.

Noise Levels
(Restricted Hours - 19:00 - 23:00 on normal weekdays)

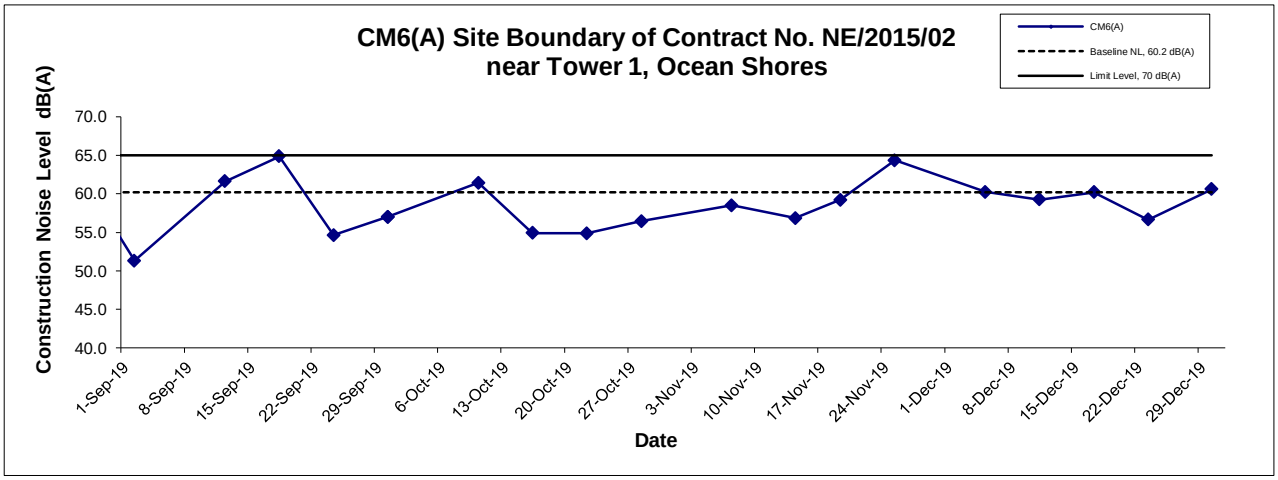






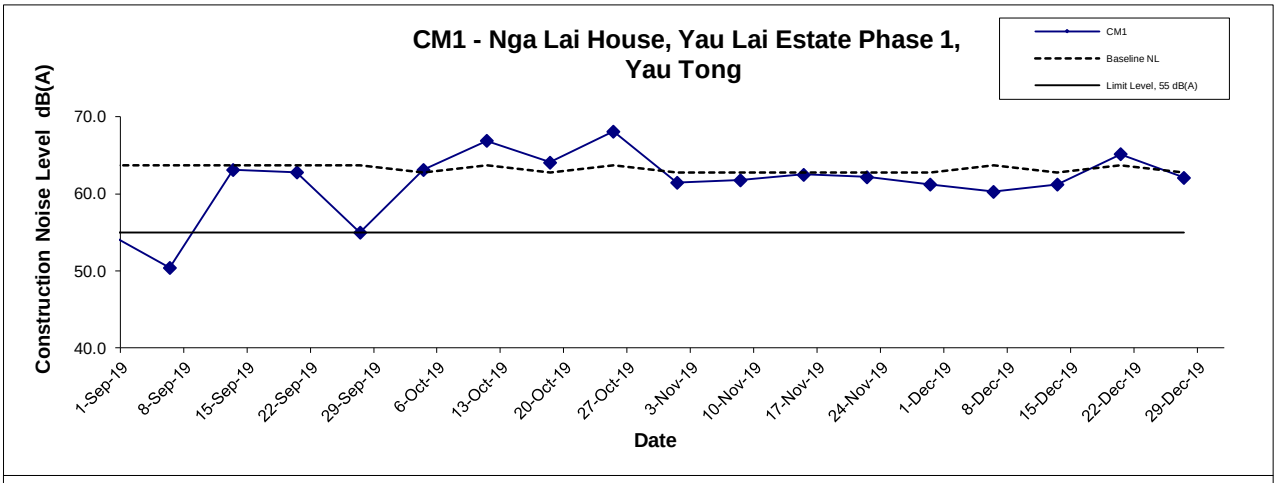
Title: Agreement No. CE/59/2015 (EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Graphical Presentation of Restricted Noise Monitoring Results	Scale: N.T.S	Project No.: MA16034	CINOTECH
	Date: Dec 19	Appendix: G	

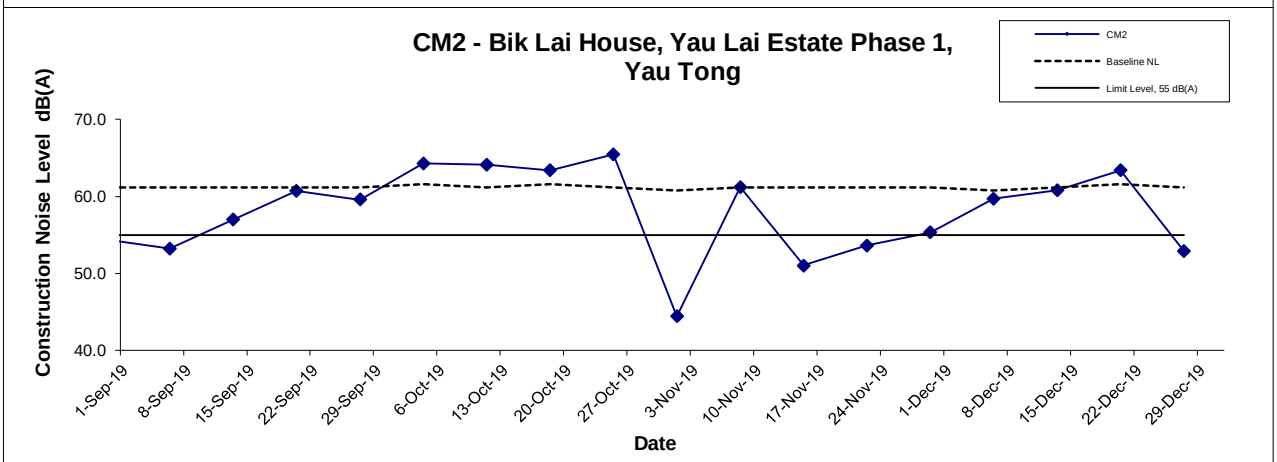
Noise Levels
(Restricted Hours - 19:00 - 23:00 on normal weekdays)

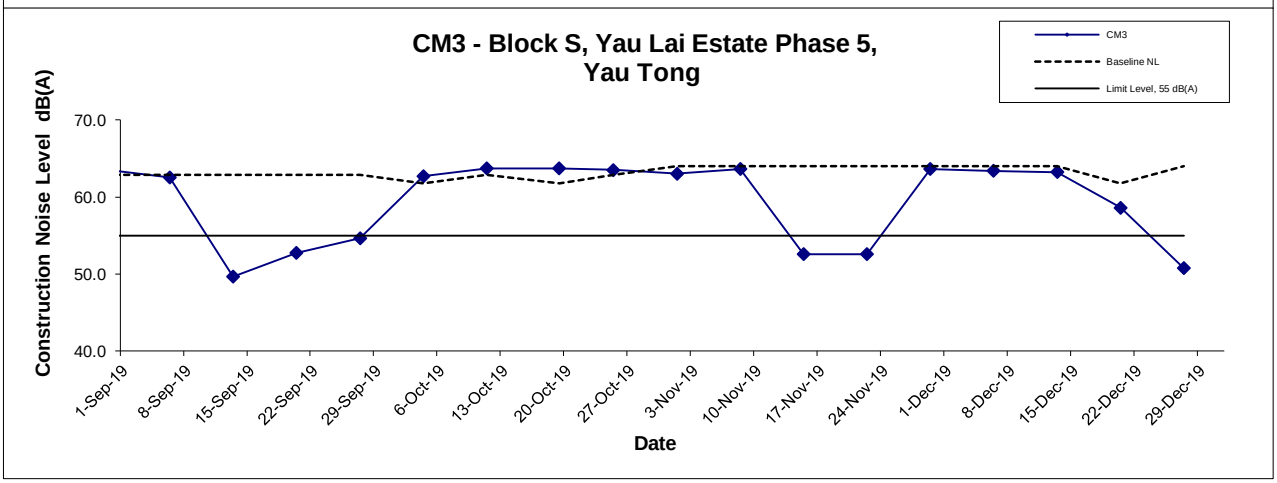


Title: Agreement No. CE/59/2015 (EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Graphical Presentation of Restricted Noise Monitoring Results	Scale: N.T.S Date: Dec 19	Project No.: MA16034 Appendix: G	CINOTECH

Noise Levels
(Restricted Hours - 2300-0700 on normal weekdays)







Title: Graphical Presentation of Restricted Noise Monitoring Results	Agreement No. CE/59/2015 (EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction	Scale: N.T.S Date: Dec 19	Project No.: MA16034 Appendix: G

CINOTECH

APPENDIX I
MARINE WATER QUALITY MONITORING RESULTS AND GRAPHICAL PRESENTATIONS

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 02 December 2019

(Mid-Flood Tide)

Location	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
C1	Sunny	Calm	16:13	Surface	1.0	24.7 24.7	24.7	8.3 8.4	8.3	31.8 32.0	31.9	86.7 83.7	85.2	5.9 5.7	5.8	5.7	2.2 2.6	2.4	3.0	2.3 2.4	2.4	2.8
				Middle	9.0	24.5 24.5	24.5	8.4 8.4	8.4	32.7 32.6	32.6	83.5 83.1	83.3	5.7 5.7	5.7		3.3 3.1	3.2		2.8 2.8	2.8	
				Bottom	17.0	24.3 24.0	24.1	8.4 8.4	8.4	33.6 34.5	34.1	83.9 83.8	83.9	5.7 5.7	5.7	5.7	3.3 3.7	3.5		3.3 3.3	3.3	
C2	Sunny	Calm	15:11	Surface	1.0	25.0 25.0	25.0	8.5 8.5	8.5	30.9 30.9	30.9	87.2 84.2	85.7	5.9 5.8	5.8	5.7	2.8 3.3	3.0	4.7	4.2 4.2	4.2	4.4
				Middle	16.0	24.4 24.4	24.4	8.5 8.5	8.5	33.0 33.2	33.1	82.5 83.3	82.9	5.6 5.7	5.6		5.5 5.3	5.4		4.0 4.0	4.0	
				Bottom	31.0	24.4 24.4	24.4	8.5 8.5	8.5	33.2 33.2	33.2	82.9 83.3	83.1	5.6 5.7	5.7	5.7	5.8 5.4	5.6		5.1 5.0	5.1	
G1	Sunny	Calm	15:37	Surface	1.0	24.7 24.7	24.7	8.4 8.4	8.4	32.3 32.5	32.4	96.0 92.3	94.2	6.5 6.3	6.4	6.3	1.7 1.8	1.8	1.7	4.2 4.1	4.2	5.4
				Middle	4.0	24.6 24.6	24.6	8.4 8.4	8.4	32.7 32.7	32.7	91.4 92.7	92.1	6.2 6.3	6.3		1.4 1.7	1.6		5.2 5.2	5.2	
				Bottom	7.0	24.5 24.6	24.6	8.4 8.4	8.4	33.1 32.9	33.0	90.4 90.9	90.7	6.1 6.2	6.2	6.2	1.7 2.0	1.9		6.8 6.9	6.9	
G2	Sunny	Calm	15:26	Surface	1.0	24.7 24.6	24.7	8.5 8.5	8.5	32.7 32.9	32.8	94.6 90.1	92.4	6.4 6.1	6.3	6.2	2.3 2.2	2.3	2.3	2.8 2.9	2.9	3.1
				Middle	5.0	24.6 24.6	24.6	8.5 8.5	8.5	32.9 33.1	33.0	92.1 89.4	90.8	6.3 6.1	6.2		2.2 2.1	2.2		2.6 2.6	2.6	
				Bottom	9.0	24.5 24.5	24.5	8.5 8.4	8.4	33.3 33.4	33.3	89.4 88.3	88.9	6.1 6.0	6.0	6.0	2.5 2.2	2.4		3.7 3.9	3.8	
G3	Sunny	Calm	15:42	Surface	1.1	24.9 24.5	24.7	8.4 8.4	8.4	31.4 31.7	31.6	95.6 92.4	94.0	6.5 6.3	6.4	6.4	1.7 2.0	1.9	1.5	3.3 3.3	3.3	3.4
				Middle	4.1	24.6 24.5	24.6	8.4 8.4	8.4	32.8 32.9	32.8	94.4 92.5	93.5	6.4 6.3	6.4		1.2 1.1	1.1		3.6 3.7	3.7	
				Bottom	7.1	24.5 24.5	24.5	8.4 8.4	8.4	33.2 33.1	33.2	86.8 86.3	86.6	5.9 5.9	5.9	5.9	1.6 1.5	1.6		3.1 3.1	3.1	
G4	Sunny	Calm	15:54	Surface	1.0	24.6 24.9	24.8	8.2 8.2	8.2	32.3 31.3	31.8	94.4 96.4	95.4	6.4 6.6	6.5	6.4	2.8 2.4	2.6	2.8	5.3 5.3	5.3	5.4
				Middle	4.5	24.6 24.5	24.6	8.2 8.2	8.2	32.7 32.9	32.8	92.6 92.3	92.5	6.3 6.3	6.3		2.7 2.8	2.7		5.1 5.3	5.2	
				Bottom	7.0	24.5 24.5	24.5	8.2 8.2	8.2	33.2 33.3	33.2	87.5 85.7	86.6	5.9 5.8	5.9	5.9	3.0 3.5	3.3		5.8 5.7	5.8	
M1	Sunny	Calm	15:32	Surface	1.0	25.0 24.6	24.8	8.4 8.4	8.4	31.9 32.9	32.4	95.6 88.0	91.8	6.5 6.0	6.2	6.2	3.0 3.3	3.1	3.2	5.3 5.2	5.3	5.2
				Middle	3.0	24.7 24.6	24.7	8.4 8.4	8.4	32.4 32.7	32.6	92.3 88.8	90.6	6.3 6.0	6.1		2.9 3.0	2.9		5.7 5.6	5.7	
				Bottom	5.0	24.6 24.6	24.6	8.4 8.4	8.4	33.0 33.0	33.0	87.8 87.5	87.7	6.0 5.9	6.0	6.0	3.2 3.6	3.4		4.7 4.7	4.7	
M2	Sunny	Calm	15:22	Surface	0.9	24.8 24.5	24.7	8.6 8.6	8.6	32.5 33.1	32.8	96.1 89.8	93.0	6.5 6.1	6.3	6.2	1.3 1.2	1.3	1.6	4.8 4.7	4.8	4.6
				Middle	6.0	24.5 24.6	24.5	8.6 8.5	8.6	33.2 33.0	33.1	91.0 91.4	91.2	6.2 6.2	6.2		0.6 0.8	0.7		4.8 4.8	4.8	
				Bottom	11.1	24.3 24.2	24.2	8.6 8.5	8.6	33.9 34.1	34.0	88.6 86.5	87.6	6.0 5.9	5.9	5.9	2.5 2.9	2.7		4.2 4.1	4.2	
M3	Sunny	Calm	15:50	Surface	1.0	24.7 24.5	24.6	8.3 8.3	8.3	31.9 32.8	32.3	94.4 90.8	92.6	6.4 6.2	6.3	6.1	3.0 2.8	2.9	2.8	3.1 3.2	3.2	2.9
				Middle	4.0	24.6 24.6	24.6	8.3 8.3	8.3	32.8 32.8	32.8	88.2 86.6	87.4	6.0 5.9	5.9		2.5 2.6	2.5		3.5 3.4	3.5	
				Bottom	7.0	24.5 24.5	24.5	8.3 8.3	8.3	33.1 33.3	33.2	87.4 84.9	86.2	5.9 5.8	5.9	5.9	3.0 2.9	3.0		2.2 2.2	2.2	
M4	Sunny	Calm	15:17	Surface	1.0	25.0 24.6	24.8	8.5 8.5	8.5	31.6 32.1	31.9	88.9 83.1	86.0	6.0 5.7	5.9	5.8	3.8 3.7	3.7	3.8	4.8 4.8	4.8	5.8
				Middle	4.9	24.6 24.6	24.6	8.5 8.6	8.5	32.3 32.5	32.4	83.5 83.3	83.4	5.7 5.7	5.7		3.4 3.8	3.6		7.3 7.1	7.2	
				Bottom	9.0	24.5 24.5	24.5	8.5 8.5	8.5	32.8 32.8	32.8	85.1 85.1	85.1	5.8 5.8	5.8	5.8	4.2 3.8	4.0		5.6 5.4	5.5	
M5	Sunny	Calm	16:07	Surface	1.0	24.9 24.7	24.8	8.3 8.3	8.3	32.1 32.2	32.1	90.0 84.1	87.1	6.1 5.7	5.9	5.8	2.9 2.7	2.8	2.6	6.3 6.4	6.4	4.8
				Middle	6.0	24.7 24.7	24.7	8.3 8.3	8.3	32.2 32.3	32.3	85.6 83.9	84.8	5.8 5.7	5.8		2.7 2.2	2.4		4.7 4.8	4.8	
				Bottom	11.1	24.7 24.7	24.7	8.3 8.3	8.3	32.3 32.3	32.3	84.1 83.9	84.0	5.7 5.7	5.7	5.7	2.4 2.6	2.5		3.3 3.2	3.3	
M6	Sunny	Calm	16:00	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	6.4	- -	-	1.8	- -	-	5.6
				Middle	2.1	24.8 24.6	24.7	8.3 8.3	8.3	32.0 32.8	32.4	95.8 92.6	94.2	6.5 6.3	6.4		1.8 1.9	1.8		5.6 5.5	5.6	
				Bottom	-	- -	-	- -	-	- -	-	- -	-	- -	-	-	- -	-		- -	-	

Remarks: *DA: Depth-Averaged
**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

Appendix I - Action and Limit Levels for Marine Water Quality on 2 December 2019 (Mid-Flood Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU*** or 120% of upstream control station's Turbidity at the same tide of the same day ***C1: 4.2 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C1: 4.5 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 2.8 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 3.1 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 2.8 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 3.1 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 4.0 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 4.3 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 04 December 2019

(Mid-Flood Tide)

Location	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
C1	Sunny	Calm	17:34	Surface	1.1	22.1 21.9	22.0	8.4 8.5	8.5	32.8 32.8	32.8	101.3 97.1	99.2	7.3 7.0	7.2	7.2	3.1 3.9	3.5	3.3	4.4 4.4	4.4	5.6
				Middle	9.6	22.0 22.1	22.1	8.5 8.5	8.5	32.8 32.8	32.8	101.0 100.6	100.8	7.3 7.3	7.3		2.2 2.3	2.2		6.3 6.2	6.3	
				Bottom	18.0	21.9 22.1	22.0	8.5 8.5	8.5	32.8 32.8	32.8	97.1 100.9	99.0	7.0 7.3	7.2	7.2	4.1 4.0	4.0		6.2 6.2	6.2	
C2	Sunny	Calm	15:53	Surface	1.0	22.2 22.2	22.2	8.0 8.3	8.2	30.2 31.9	31.0	103.5 102.9	103.2	7.6 7.5	7.5	7.4	2.1 2.0	2.1	3.0	4.7 4.6	4.7	4.2
				Middle	16.0	22.2 22.0	22.1	8.2 8.3	8.3	31.2 32.1	31.7	103.0 98.6	100.8	7.5 7.2	7.3		2.3 2.6	2.4		3.9 3.9	3.9	
				Bottom	31.0	22.0 22.0	22.0	8.3 8.4	8.3	31.6 32.2	31.9	97.7 97.4	97.6	7.1 7.1	7.1	7.1	4.1 5.0	4.5		3.9 3.9	3.9	
G1	Sunny	Calm	17:00	Surface	1.1	22.3 22.3	22.3	8.5 8.5	8.5	32.8 32.7	32.7	105.2 103.1	104.2	7.6 7.4	7.5	7.5	2.6 2.8	2.7	2.7	6.2 6.1	6.2	5.8
				Middle	4.1	22.3 22.3	22.3	8.5 8.5	8.5	32.7 32.7	32.7	104.3 103.0	103.7	7.5 7.4	7.5		2.7 2.8	2.7		4.6 4.4	4.5	
				Bottom	7.0	22.3 22.3	22.3	8.5 8.5	8.5	32.7 32.7	32.7	103.1 103.9	103.5	7.4 7.5	7.4	7.4	2.7 2.7	2.7		6.8 6.6	6.7	
G2	Sunny	Calm	16:46	Surface	1.0	22.3 22.3	22.3	8.5 8.5	8.5	32.8 32.7	32.7	106.9 104.8	105.9	7.7 7.5	7.6	7.4	2.2 2.0	2.1	3.6	7.3 7.1	7.2	5.0
				Middle	5.1	22.1 22.2	22.1	8.5 8.5	8.5	32.7 32.7	32.7	99.6 99.4	99.5	7.2 7.2	7.2		3.3 3.4	3.4		4.9 5.1	5.0	
				Bottom	9.0	22.1 22.1	22.1	8.5 8.5	8.5	32.7 32.7	32.7	96.5 96.8	96.7	7.0 7.0	7.0	7.0	5.7 5.1	5.4		2.8 2.8	2.8	
G3	Sunny	Calm	17:07	Surface	1.1	22.3 22.2	22.2	8.5 8.5	8.5	32.6 32.7	32.7	100.4 92.9	96.7	7.2 6.7	7.0	6.9	3.3 3.4	3.3	3.8	4.3 4.3	4.3	5.8
				Middle	4.1	22.3 22.3	22.3	8.5 8.5	8.5	32.7 32.7	32.7	94.6 94.1	94.4	6.8 6.8	6.8		4.7 4.7	4.7		6.6 6.5	6.6	
				Bottom	7.1	22.2 22.4	22.3	8.5 8.5	8.5	32.7 32.7	32.7	92.8 98.5	95.7	6.7 7.1	6.9	6.9	3.5 3.3	3.4		6.6 6.7	6.7	
G4	Sunny	Calm	17:17	Surface	1.0	22.2 22.2	22.2	8.5 8.5	8.5	32.7 32.8	32.7	102.5 99.2	100.9	7.4 7.2	7.3	7.3	2.6 2.7	2.6	3.8	3.8 3.8	3.8	5.7
				Middle	4.1	22.2 22.2	22.2	8.5 8.5	8.5	32.7 32.7	32.7	101.7 100.4	101.1	7.3 7.2	7.3		2.6 3.2	2.9		5.8 5.8	5.8	
				Bottom	7.1	22.2 22.2	22.2	8.5 8.5	8.5	32.8 32.7	32.7	99.4 100.9	100.2	7.2 7.3	7.2	7.2	6.0 5.7	5.9		7.3 7.4	7.4	
M1	Sunny	Calm	16:55	Surface	1.0	22.3 22.3	22.3	8.5 8.5	8.5	32.8 32.8	32.8	102.7 100.9	101.8	7.4 7.3	7.3	7.3	4.0 4.2	4.1	3.8	9.6 9.5	9.6	8.2
				Middle	3.0	22.3 22.3	22.3	8.5 8.5	8.5	32.8 32.8	32.8	102.3 100.9	101.6	7.4 7.3	7.3		3.5 3.7	3.6		6.6 6.7	6.7	
				Bottom	5.2	22.3 22.3	22.3	8.5 8.5	8.5	32.8 32.8	32.8	101.7 101.0	101.4	7.3 7.3	7.3	7.3	3.7 3.5	3.6		8.5 8.2	8.4	
M2	Sunny	Calm	16:32	Surface	1.1	22.3 22.2	22.2	8.5 8.5	8.5	32.7 32.7	32.7	104.5 102.8	103.7	7.5 7.4	7.5	7.3	2.1 2.3	2.2	3.3	7.1 6.9	7.0	6.9
				Middle	5.5	22.1 22.0	22.0	8.5 8.5	8.5	32.7 32.8	32.8	99.3 97.2	98.3	7.2 7.0	7.1		2.7 2.8	2.8		8.7 8.7	8.7	
				Bottom	10.0	22.0 22.0	22.0	8.5 8.5	8.5	32.8 32.8	32.8	96.7 96.9	96.8	7.0 7.0	7.0	7.0	4.7 5.6	5.1		4.9 4.9	4.9	
M3	Sunny	Calm	17:12	Surface	1.1	22.3 22.1	22.2	8.4 8.5	8.4	32.6 32.7	32.7	98.9 94.6	96.8	7.1 6.8	7.0	6.9	3.5 3.9	3.7	5.2	4.9 4.9	4.9	6.4
				Middle	4.1	22.3 22.3	22.3	8.5 8.5	8.5	32.7 32.7	32.7	95.7 94.7	95.2	6.9 6.8	6.8		5.1 5.2	5.1		7.4 7.7	7.6	
				Bottom	7.1	22.2 22.3	22.2	8.5 8.5	8.5	32.7 32.6	32.7	94.7 96.5	95.6	6.8 6.9	6.9	6.9	6.7 6.9	6.8		6.6 6.8	6.7	
M4	Sunny	Calm	16:20	Surface	1.1	22.1 22.2	22.1	8.4 8.4	8.4	33.1 32.9	33.0	103.6 102.5	103.1	7.5 7.4	7.4	7.4	2.4 2.2	2.3	3.3	7.4 7.2	7.3	4.7
				Middle	5.1	22.1 22.1	22.1	8.4 8.4	8.4	33.0 32.8	32.9	101.6 100.8	101.2	7.3 7.3	7.3		2.6 2.4	2.5		3.4 3.3	3.4	
				Bottom	9.0	22.0 22.0	22.0	8.4 8.4	8.4	33.0 32.8	32.9	97.3 97.8	97.6	7.0 7.1	7.0	7.0	5.0 5.1	5.1		3.5 3.5	3.5	
M5	Sunny	Calm	17:28	Surface	1.1	22.1 22.1	22.1	8.4 8.5	8.5	32.8 32.8	32.8	102.3 98.0	100.2	7.4 7.1	7.2	7.2	3.4 4.0	3.7	4.2	6.4 6.3	6.4	5.0
				Middle	5.1	22.1 22.1	22.1	8.5 8.5	8.5	32.8 32.8	32.8	99.5 99.2	99.4	7.2 7.2	7.2		3.7 3.5	3.6		4.4 4.2	4.3	
				Bottom	9.1	22.1 22.1	22.1	8.5 8.5	8.5	32.8 32.7	32.8	97.9 101.0	99.5	7.1 7.3	7.2	7.2	5.5 5.1	5.3		4.2 4.4	4.3	
M6	Sunny	Calm	17:25	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	7.1	- -	-	4.6	- -	-	5.7
				Middle	2.1	22.1 22.1	22.1	8.5 8.5	8.5	32.7 32.7	32.7	98.0 98.2	98.1	7.1 7.1	7.1		4.7 4.5	4.6		5.7 5.7	5.7	
				Bottom	-	- -	-	- -	-	- -	-	- -	-	- -	-	-	- -	-		- -	-	

Remarks: *DA: Depth-Averaged
**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

Appendix I - Action and Limit Levels for Marine Water Quality on 4 December 2019 (Mid-Flood Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU*** or 120% of upstream control station's Turbidity at the same tide of the same day ***C1: 4.8 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C1: 5.3 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 5.3 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 5.7 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 5.3 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 5.7 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 7.4 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 8.1 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 06 December 2019

(Mid-Ebb Tide)

Location	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
C1	Fine	Calm	9:28	Surface	1.1	21.0 21.0	21.0	8.5 8.5	8.5	32.8 32.8	32.8	97.6 97.4	97.5	7.2 7.2	7.2	7.1	3.8 3.8	3.8	4.2	10.5 10.3	10.4	7.7
				Middle	9.1	21.1 21.1	21.1	8.5 8.5	8.5	32.8 32.8	32.8	96.8 97.0	96.9	7.1 7.1	7.1		4.2 4.1	4.1		7.3 7.4	7.4	
				Bottom	17.0	21.1 21.1	21.1	8.5 8.5	8.5	32.8 32.8	32.8	96.0 96.0	96.0	7.1 7.1	7.1	7.1	4.4 4.6	4.5		5.3 5.3	5.3	
C2	Fine	Calm	7:58	Surface	1.1	21.2 21.2	21.2	8.5 8.5	8.5	32.3 32.3	32.3	97.7 97.5	97.6	7.2 7.2	7.2	7.1	3.1 3.2	3.1	4.0	6.3 6.6	6.5	6.3
				Middle	16.6	21.2 21.2	21.2	8.6 8.6	8.6	32.4 32.4	32.4	95.9 95.9	95.9	7.0 7.1	7.0		4.2 4.2	4.2		6.2 6.4	6.3	
				Bottom	32.1	21.2 21.2	21.2	8.6 8.6	8.6	32.4 32.4	32.4	95.0 95.0	95.0	7.0 7.0	7.0	7.0	4.7 4.9	4.8		6.0 6.2	6.1	
G1	Fine	Calm	8:38	Surface	1.0	21.3 21.3	21.3	8.5 8.5	8.5	32.6 32.6	32.6	97.5 97.2	97.4	7.2 7.1	7.1	7.1	3.7 3.9	3.8	4.0	3.9 4.0	4.0	6.9
				Middle	4.1	21.3 21.3	21.3	8.5 8.5	8.5	32.6 32.6	32.6	96.3 96.3	96.3	7.1 7.1	7.1		3.9 4.0	3.9		8.8 8.7	8.8	
				Bottom	7.0	21.2 21.2	21.2	8.5 8.5	8.5	32.7 32.7	32.7	96.5 96.1	96.3	7.1 7.1	7.1	7.1	4.4 4.4	4.4		7.9 7.8	7.9	
G2	Fine	Calm	8:19	Surface	1.1	21.2 21.2	21.2	8.5 8.5	8.5	32.7 32.6	32.6	100.2 100.0	100.1	7.4 7.3	7.3	7.3	2.5 2.5	2.5	2.8	3.0 2.9	3.0	4.7
				Middle	5.1	21.3 21.2	21.2	8.5 8.5	8.5	32.6 32.6	32.6	98.3 97.7	98.0	7.2 7.2	7.2		2.5 2.6	2.5		5.4 5.5	5.5	
				Bottom	9.1	21.2 21.2	21.2	8.5 8.5	8.5	32.6 32.6	32.6	96.9 96.8	96.9	7.1 7.1	7.1	7.1	3.3 3.2	3.2		5.7 5.8	5.8	
G3	Fine	Calm	8:44	Surface	1.0	21.3 21.3	21.3	8.5 8.5	8.5	32.5 32.5	32.5	94.9 94.9	94.9	7.0 7.0	7.0	6.9	3.8 3.9	3.9	4.4	10.4 10.2	10.3	7.9
				Middle	4.0	21.2 21.2	21.2	8.5 8.5	8.5	32.6 32.6	32.6	93.0 93.1	93.1	6.8 6.8	6.8		4.5 4.7	4.6		8.7 8.5	8.6	
				Bottom	7.1	21.2 21.2	21.2	8.5 8.5	8.5	32.6 32.6	32.6	92.4 92.4	92.4	6.8 6.8	6.8	6.8	4.5 5.1	4.8		4.7 4.7	4.7	
G4	Fine	Calm	8:59	Surface	1.0	21.2 21.2	21.2	8.4 8.4	8.4	32.5 32.5	32.5	97.3 97.3	97.3	7.2 7.1	7.1	7.1	2.7 2.7	2.7	3.6	6.0 6.2	6.1	5.8
				Middle	4.0	21.3 21.3	21.3	8.5 8.5	8.5	32.6 32.6	32.6	96.4 96.3	96.4	7.1 7.1	7.1		3.9 4.0	4.0		6.5 6.3	6.4	
				Bottom	7.1	21.3 21.3	21.3	8.5 8.5	8.5	32.7 32.7	32.7	96.0 95.7	95.9	7.0 7.0	7.0	7.0	4.3 4.0	4.2		4.8 5.0	4.9	
M1	Fine	Calm	8:25	Surface	1.0	21.2 21.2	21.2	8.5 8.5	8.5	32.6 32.6	32.6	96.9 96.8	96.9	7.1 7.1	7.1	7.1	3.9 3.9	3.9	3.9	8.4 8.3	8.4	6.4
				Middle	3.0	21.2 21.2	21.2	8.5 8.5	8.5	32.6 32.6	32.6	95.9 95.9	95.9	7.0 7.0	7.0		3.9 3.8	3.8		5.5 5.3	5.4	
				Bottom	5.1	21.2 21.2	21.2	8.5 8.5	8.5	32.6 32.6	32.6	95.8 95.6	95.7	7.0 7.0	7.0	7.0	3.9 3.9	3.9		5.3 5.3	5.3	
M2	Fine	Calm	8:11	Surface	1.0	21.2 21.2	21.2	8.4 8.4	8.4	32.6 32.6	32.6	101.0 100.9	101.0	7.4 7.4	7.4	7.3	2.4 2.4	2.4	2.3	5.0 5.1	5.1	5.3
				Middle	5.6	21.3 21.3	21.3	8.5 8.5	8.5	32.6 32.6	32.6	99.1 99.3	99.2	7.3 7.3	7.3		2.2 2.3	2.2		5.6 5.8	5.7	
				Bottom	10.0	21.3 21.3	21.3	8.5 8.5	8.5	32.6 32.6	32.6	98.7 98.6	98.7	7.2 7.2	7.2	7.2	2.1 2.2	2.1		5.0 5.3	5.2	
M3	Fine	Calm	8:53	Surface	1.1	21.3 21.3	21.3	8.5 8.5	8.5	32.6 32.6	32.6	94.5 94.4	94.5	6.9 6.9	6.9	6.9	4.0 4.9	4.5	4.4	5.9 5.8	5.9	6.0
				Middle	4.0	21.2 21.2	21.2	8.5 8.5	8.5	32.6 32.6	32.6	93.2 93.3	93.3	6.8 6.8	6.8		4.1 4.4	4.3		4.3 4.2	4.3	
				Bottom	7.0	21.2 21.2	21.2	8.5 8.5	8.5	32.6 32.6	32.6	92.3 92.3	92.3	6.8 6.8	6.8	6.8	4.4 4.3	4.4		8.0 7.9	8.0	
M4	Fine	Calm	8:06	Surface	1.1	21.2 21.2	21.2	8.5 8.5	8.5	32.6 32.6	32.6	100.8 100.6	100.7	7.4 7.4	7.4	7.3	2.3 2.2	2.3	2.8	5.7 5.8	5.8	5.5
				Middle	5.0	21.3 21.3	21.3	8.5 8.5	8.5	32.5 32.5	32.5	99.3 99.7	99.5	7.3 7.3	7.3		2.2 2.2	2.2		4.8 5.0	4.9	
				Bottom	9.1	21.2 21.2	21.2	8.5 8.5	8.5	32.5 32.5	32.5	96.8 96.7	96.8	7.1 7.1	7.1	7.1	3.7 4.1	3.9		5.8 5.9	5.9	
M5	Fine	Calm	9:17	Surface	1.0	21.1 21.1	21.1	8.4 8.5	8.5	32.7 32.7	32.7	96.9 96.6	96.8	7.1 7.1	7.1	7.1	3.6 3.5	3.5	3.5	3.0 2.9	3.0	4.7
				Middle	6.0	21.1 21.1	21.1	8.5 8.5	8.5	32.7 32.7	32.7	95.5 95.8	95.7	7.0 7.0	7.0		3.3 3.4	3.4		5.9 6.0	6.0	
				Bottom	11.1	21.1 21.1	21.1	8.5 8.5	8.5	32.7 32.7	32.7	95.5 95.5	95.5	7.0 7.0	7.0	7.0	3.5 3.5	3.5		5.2 5.4	5.3	
M6	Fine	Calm	9:08	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	6.9	- -	-	4.5	- -	-	10.9
				Middle	2.2	21.2 21.2	21.2	8.5 8.5	8.5	32.6 32.6	32.6	94.2 94.1	94.2	6.9 6.9	6.9		4.1 5.0	4.5		10.6 11.1	10.9	
				Bottom	-	- -	-	- -	-	- -	-	- -	-	- -	-	-	- -	-		- -	-	

Remarks: *DA: Depth-Averaged
**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

Appendix I - Action and Limit Levels for Marine Water Quality on 6 December 2019 (Mid-Ebb Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU*** or 120% of upstream control station's Turbidity at the same tide of the same day ***C2: 5.8 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C2: 6.2 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 7.7 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 8.4 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 7.7 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 8.4 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 7.3 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 7.9 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 06 December 2019

(Mid-Flood Tide)

Location	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
C1	Fine	Calm	15:46	Surface	1.1	21.1 21.0	21.1	8.5 8.5	8.5	32.9 32.8	32.8	97.9 97.8	97.9	7.2 7.2	7.2	7.2	4.0 3.9	3.9	4.2	13.0 12.4	12.7	8.7
				Middle	8.5	21.1 22.1	21.6	8.5 8.5	8.5	32.8 32.8	32.8	96.6 96.7	96.7	7.1 7.1	7.1		4.2 4.2	4.2		6.5 6.4	6.5	
				Bottom	16.1	21.1 21.1	21.1	8.5 8.5	8.5	32.8 32.8	32.8	96.1 96.1	96.1	7.1 7.1	7.1	7.1	4.4 4.4	4.4		6.8 6.9	6.9	
C2	Fine	Calm	14:05	Surface	1.1	21.7 21.3	21.5	8.5 8.5	8.5	32.3 32.3	32.3	97.4 97.4	97.4	7.2 7.2	7.2	7.1	3.2 3.1	3.2	3.9	5.3 5.3	5.3	5.3
				Middle	16.1	21.2 21.3	21.3	8.6 8.6	8.6	32.4 32.4	32.4	95.8 95.8	95.8	7.0 7.0	7.0		4.0 3.8	3.9		5.4 5.5	5.5	
				Bottom	31.1	21.3 21.2	21.2	8.6 8.6	8.6	32.4 32.4	32.4	94.9 94.9	94.9	7.0 7.0	7.0	7.0	4.8 4.8	4.8		5.2 5.2	5.2	
G1	Fine	Calm	14:44	Surface	1.1	21.8 21.3	21.5	8.5 8.5	8.5	32.6 32.6	32.6	97.9 97.6	97.8	7.2 7.2	7.2	7.1	3.7 3.7	3.7	3.9	5.3 5.5	5.4	6.7
				Middle	3.8	21.3 21.3	21.3	8.5 8.5	8.5	32.6 32.6	32.6	96.3 96.3	96.3	7.1 7.1	7.1		3.9 4.0	3.9		6.8 6.8	6.8	
				Bottom	6.6	21.3 21.3	21.3	8.5 8.5	8.5	32.6 32.7	32.6	96.3 96.6	96.5	7.1 7.1	7.1	7.1	4.0 4.2	4.1		7.8 7.7	7.8	
G2	Fine	Calm	14:24	Surface	1.0	22.1 21.2	21.7	8.5 8.5	8.5	32.7 32.7	32.7	100.5 100.3	100.4	7.4 7.4	7.4	7.3	2.5 2.5	2.5	2.5	7.1 7.0	7.1	5.9
				Middle	5.0	21.3 21.3	21.3	8.5 8.5	8.5	32.6 32.6	32.6	98.5 98.5	98.5	7.2 7.2	7.2		2.2 2.3	2.2		5.5 5.7	5.6	
				Bottom	9.1	21.3 21.3	21.3	8.5 8.5	8.5	32.6 32.6	32.6	95.9 97.0	96.5	7.0 7.1	7.1	7.1	2.8 3.0	2.9		5.1 4.9	5.0	
G3	Fine	Calm	14:52	Surface	1.1	22.0 21.4	21.7	8.5 8.5	8.5	32.5 32.5	32.5	94.7 94.7	94.7	6.9 6.9	6.9	6.9	4.0 3.8	3.9	4.4	12.4 12.2	12.3	9.3
				Middle	3.8	21.3 21.3	21.3	8.5 8.5	8.5	32.6 32.6	32.6	93.3 93.7	93.5	6.8 6.9	6.9		4.3 5.0	4.6		9.0 8.6	8.8	
				Bottom	6.6	21.2 21.3	21.3	8.5 8.5	8.5	32.6 32.6	32.6	92.5 92.5	92.5	6.8 6.8	6.8	6.8	4.7 4.5	4.6		6.9 6.8	6.9	
G4	Fine	Calm	15:05	Surface	1.0	22.2 21.3	21.7	8.5 8.5	8.5	32.5 32.5	32.5	97.0 96.9	97.0	7.1 7.1	7.1	7.1	2.7 2.9	2.8	4.6	8.2 8.5	8.4	9.5
				Middle	3.7	21.3 21.3	21.3	8.5 8.5	8.5	32.6 32.6	32.6	96.3 96.4	96.4	7.1 7.1	7.1		5.3 5.0	5.2		7.9 7.9	7.9	
				Bottom	6.6	21.3 21.3	21.3	8.5 8.5	8.5	32.7 32.7	32.7	95.4 95.1	95.3	7.0 7.0	7.0	7.0	5.2 6.3	5.7		12.3 12.4	12.4	
M1	Fine	Calm	14:32	Surface	1.0	21.5 21.2	21.4	8.5 8.5	8.5	32.6 32.6	32.6	96.7 96.7	96.7	7.1 7.1	7.1	7.1	3.9 3.9	3.9	3.9	6.7 6.7	6.7	7.8
				Middle	3.0	21.3 21.2	21.2	8.5 8.5	8.5	32.6 32.6	32.6	96.0 96.1	96.1	7.0 7.1	7.0		3.9 3.9	3.9		9.8 10.1	10.0	
				Bottom	5.1	21.3 21.2	21.3	8.5 8.5	8.5	32.6 32.6	32.6	95.6 95.5	95.6	7.0 7.0	7.0	7.0	3.8 3.9	3.8		6.7 7.0	6.9	
M2	Fine	Calm	14:19	Surface	1.0	21.5 21.3	21.4	8.4 8.4	8.4	32.6 32.6	32.6	100.8 100.8	100.8	7.4 7.4	7.4	7.4	2.4 2.3	2.3	2.3	8.8 8.6	8.7	7.2
				Middle	5.3	21.3 21.3	21.3	8.5 8.5	8.5	32.6 32.6	32.6	99.6 100.0	99.8	7.3 7.3	7.3		2.4 2.4	2.4		5.6 5.6	5.6	
				Bottom	9.5	21.3 21.3	21.3	8.5 8.5	8.5	32.6 32.6	32.6	98.5 98.4	98.5	7.2 7.2	7.2	7.2	2.1 2.1	2.1		7.2 7.2	7.2	
M3	Fine	Calm	14:59	Surface	1.1	21.9 21.3	21.6	8.5 8.5	8.5	32.6 32.6	32.6	94.9 94.7	94.8	7.0 7.0	7.0	6.9	4.1 4.1	4.1	3.8	6.6 6.4	6.5	7.6
				Middle	3.7	21.3 21.3	21.3	8.5 8.5	8.5	32.6 32.6	32.6	93.2 93.2	93.2	6.8 6.8	6.8		3.6 3.7	3.7		10.9 10.5	10.7	
				Bottom	6.6	21.3 21.3	21.3	8.5 8.5	8.5	32.6 32.6	32.6	92.7 92.5	92.6	6.8 6.8	6.8	6.8	3.7 3.6	3.6		5.6 5.5	5.6	
M4	Fine	Calm	14:13	Surface	1.0	21.4 21.2	21.3	8.5 8.5	8.5	32.6 32.6	32.6	101.2 101.0	101.1	7.4 7.4	7.4	7.3	2.3 2.2	2.2	2.6	4.7 4.7	4.7	5.5
				Middle	5.1	21.3 21.3	21.3	8.5 8.5	8.5	32.5 32.5	32.5	98.6 99.0	98.8	7.2 7.3	7.2		2.3 2.3	2.3		4.8 4.9	4.9	
				Bottom	9.0	21.3 21.3	21.3	8.5 8.5	8.5	32.5 32.5	32.5	97.6 97.2	97.4	7.2 7.1	7.2	7.2	3.2 3.5	3.3		7.2 6.9	7.1	
M5	Fine	Calm	15:36	Surface	1.0	21.1 21.1	21.1	8.5 8.5	8.5	32.7 32.7	32.7	96.6 96.4	96.5	7.1 7.1	7.1	7.1	3.5 3.4	3.4	3.5	6.5 6.7	6.6	7.0
				Middle	5.5	21.1 21.5	21.3	8.5 8.5	8.5	32.7 32.7	32.7	95.9 95.9	95.9	7.0 7.1	7.0		3.4 3.5	3.5		6.9 7.1	7.0	
				Bottom	10.1	21.1 21.1	21.1	8.5 8.5	8.5	32.7 32.7	32.7	95.4 95.4	95.4	7.0 7.0	7.0	7.0	3.5 3.5	3.5		7.5 7.3	7.4	
M6	Fine	Calm	15:17	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	6.9	- -	-	5.7	- -	-	5.9
				Middle	2.0	21.3 21.2	21.3	8.5 8.5	8.5	32.6 32.6	32.6	94.2 94.2	94.2	6.9 6.9	6.9		5.9 5.5	5.7		5.8 5.9	5.9	
				Bottom	-	- -	-	- -	-	- -	-	- -	-	- -	-	-	- -	-		- -	-	

Remarks: *DA: Depth-Averaged
**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

Appendix I - Action and Limit Levels for Marine Water Quality on 6 December 2019 (Mid-Flood Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU*** or 120% of upstream control station's Turbidity at the same tide of the same day ***C1: 5.3 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C1: 5.7 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 15.2 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 16.5 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 15.2 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 16.5 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 8.2 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 8.9 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 09 December 2019

(Mid-Ebb Tide)

Location	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
C1	Sunny	Moderate	10:46	Surface	1.0	20.4 20.5	20.5	8.5 8.5	8.5	32.4 32.4	32.4	96.8 97.0	96.9	7.2 7.2	7.2	7.2	2.1 2.1	2.1	2.1	5.1 4.9	5.0	5.8
				Middle	9.0	20.4 20.4	20.4	8.5 8.5	8.5	32.4 32.4	32.4	95.1 95.1	95.1	7.1 7.1	7.1		2.2 2.2	2.2		5.8 5.9	5.9	
				Bottom	17.0	20.3 20.3	20.3	8.5 8.5	8.5	32.4 32.5	32.4	93.7 93.6	93.7	7.0 7.0	7.0		2.1 2.1	2.1		6.5 6.5	6.5	
C2	Sunny	Moderate	9:49	Surface	1.1	20.5 20.5	20.5	8.4 8.4	8.4	30.0 30.1	30.1	97.3 97.2	97.3	7.4 7.3	7.3	7.2	2.1 2.1	2.1	2.2	5.7 5.9	5.8	6.2
				Middle	16.1	20.3 20.3	20.3	8.5 8.5	8.5	31.9 31.9	31.9	94.2 94.2	94.2	7.1 7.1	7.1		2.2 2.3	2.2		6.6 6.5	6.6	
				Bottom	31.0	20.3 20.3	20.3	8.5 8.5	8.5	32.1 32.1	32.1	93.4 93.4	93.4	7.0 7.0	7.0		2.2 2.2	2.2		6.1 6.3	6.2	
G1	Sunny	Moderate	10:16	Surface	1.1	20.4 20.4	20.4	8.5 8.5	8.5	32.7 32.7	32.7	96.7 96.6	96.7	7.2 7.2	7.2	7.2	3.1 3.2	3.1	3.3	3.9 4.0	4.0	5.6
				Middle	4.0	20.4 20.4	20.4	8.5 8.5	8.5	32.7 32.7	32.7	95.3 95.4	95.4	7.1 7.1	7.1		3.1 3.2	3.1		7.2 7.5	7.4	
				Bottom	7.0	20.3 20.3	20.3	8.5 8.5	8.5	32.7 32.7	32.7	95.0 95.0	95.0	7.1 7.1	7.1	7.1	3.5 3.6	3.5		5.5 5.5	5.5	
G2	Sunny	Moderate	10:06	Surface	1.0	20.4 20.4	20.4	8.5 8.5	8.5	32.7 32.7	32.7	98.4 98.1	98.3	7.3 7.3	7.3	7.3	2.2 2.3	2.3	2.8	4.9 4.9	4.9	6.1
				Middle	5.1	20.3 20.3	20.3	8.5 8.5	8.5	32.7 32.7	32.7	96.6 96.8	96.7	7.2 7.2	7.2		2.7 2.5	2.6		5.1 5.1	5.1	
				Bottom	9.0	20.2 20.2	20.2	8.5 8.5	8.5	32.7 32.7	32.7	93.9 94.0	94.0	7.0 7.0	7.0	7.0	3.6 3.5	3.6		8.3 8.1	8.2	
G3	Sunny	Moderate	10:19	Surface	1.1	20.3 20.3	20.3	8.5 8.5	8.5	32.5 32.5	32.5	95.6 95.4	95.5	7.1 7.1	7.1	7.1	4.7 4.7	4.7	4.1	6.9 6.7	6.8	6.0
				Middle	4.0	20.3 20.3	20.3	8.5 8.5	8.5	32.6 32.6	32.6	94.2 94.4	94.3	7.0 7.0	7.0		4.3 4.3	4.3		5.9 5.8	5.9	
				Bottom	7.0	20.2 20.2	20.2	8.5 8.5	8.5	32.7 32.7	32.7	93.7 93.6	93.7	7.0 7.0	7.0	7.0	3.5 3.3	3.4		5.3 5.5	5.4	
G4	Sunny	Moderate	10:30	Surface	1.0	20.4 20.5	20.5	8.6 8.6	8.6	32.7 32.7	32.7	96.6 96.5	96.6	7.2 7.2	7.2	7.2	2.5 2.4	2.5	2.7	6.8 6.4	6.6	7.7
				Middle	4.1	20.3 20.4	20.4	8.6 8.6	8.6	32.8 32.7	32.7	95.5 95.8	95.7	7.1 7.1	7.1		2.5 2.5	2.5		6.6 6.2	6.4	
				Bottom	7.2	20.2 20.2	20.2	8.5 8.5	8.5	32.8 32.8	32.8	93.8 93.7	93.8	7.0 7.0	7.0	7.0	3.0 3.2	3.1		9.8 10.5	10.2	
M1	Sunny	Moderate	10:10	Surface	1.0	20.4 20.4	20.4	8.5 8.5	8.5	32.6 32.6	32.6	96.2 96.0	96.1	7.2 7.2	7.2	7.1	3.0 3.1	3.1	3.2	4.3 4.5	4.4	4.4
				Middle	2.9	20.4 20.4	20.4	8.5 8.5	8.5	32.6 32.7	32.6	94.6 94.4	94.5	7.1 7.0	7.0		3.3 3.4	3.4		4.1 4.1	4.1	
				Bottom	5.0	20.3 20.3	20.3	8.5 8.5	8.5	32.6 32.6	32.6	95.0 94.8	94.9	7.1 7.1	7.1	7.1	3.2 3.4	3.3		4.7 4.8	4.8	
M2	Sunny	Moderate	10:02	Surface	1.1	20.5 20.5	20.5	8.5 8.5	8.5	32.6 32.6	32.6	100.2 100.1	100.2	7.5 7.4	7.4	7.4	1.9 1.9	1.9	2.4	8.1 8.1	8.1	7.2
				Middle	6.1	20.5 20.5	20.5	8.5 8.5	8.5	32.7 32.7	32.7	98.4 98.4	98.4	7.3 7.3	7.3		2.1 2.1	2.1		7.8 7.9	7.9	
				Bottom	11.0	20.3 20.3	20.3	8.5 8.5	8.5	32.6 32.6	32.6	96.2 96.0	96.1	7.2 7.2	7.2	7.2	3.3 3.5	3.4		5.5 5.7	5.6	
M3	Sunny	Moderate	10:26	Surface	1.0	20.4 20.4	20.4	8.5 8.5	8.5	32.5 32.5	32.5	94.0 94.0	94.0	7.0 7.0	7.0	7.0	3.8 3.8	3.8	4.9	7.3 7.0	7.2	9.2
				Middle	4.1	20.3 20.3	20.3	8.5 8.5	8.5	32.7 32.7	32.7	93.6 93.5	93.6	7.0 7.0	7.0		5.0 5.2	5.1		11.5 11.2	11.4	
				Bottom	7.0	20.3 20.3	20.3	8.5 8.5	8.5	32.7 32.7	32.7	92.9 92.7	92.8	6.9 6.9	6.9	6.9	5.7 5.9	5.8		9.2 9.0	9.1	
M4	Sunny	Moderate	9:56	Surface	1.0	20.4 20.4	20.4	8.5 8.5	8.5	32.6 32.6	32.6	98.4 98.4	98.4	7.3 7.3	7.3	7.3	2.0 2.1	2.1	2.3	9.0 8.8	8.9	6.4
				Middle	4.9	20.4 20.4	20.4	8.5 8.5	8.5	32.6 32.6	32.6	97.1 97.1	97.1	7.2 7.2	7.2		2.4 2.4	2.4		4.8 5.0	4.9	
				Bottom	9.1	20.4 20.4	20.4	8.5 8.5	8.5	32.6 32.6	32.6	96.8 96.8	96.8	7.2 7.2	7.2	7.2	2.6 2.4	2.5		5.4 5.5	5.5	
M5	Sunny	Moderate	10:41	Surface	1.0	20.5 20.5	20.5	8.5 8.5	8.5	32.3 32.3	32.3	97.2 97.1	97.2	7.2 7.2	7.2	7.2	2.0 2.0	2.0	2.1	5.6 5.6	5.6	7.3
				Middle	6.1	20.4 20.4	20.4	8.5 8.5	8.5	32.3 32.3	32.3	96.1 96.3	96.2	7.2 7.2	7.2		2.1 2.1	2.1		8.1 8.7	8.4	
				Bottom	11.0	20.4 20.4	20.4	8.5 8.5	8.5	32.3 32.4	32.3	95.4 94.4	94.9	7.1 7.1	7.1	7.1	2.1 2.1	2.1		7.8 7.7	7.8	
M6	Sunny	Moderate	10:34	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	7.3	- -	-	2.2	- -	-	8.2
				Middle	2.2	20.4 20.4	20.4	8.5 8.5	8.5	32.8 32.8	32.8	98.4 98.3	98.4	7.3 7.3	7.3		2.2 2.2	2.2		8.3 8.0	8.2	
				Bottom	-	- -	-	- -	-	- -	-	- -	-	- -	-	-	- -	-		- -	-	

Remarks: *DA: Depth-Averaged
**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

Appendix I - Action and Limit Levels for Marine Water Quality on 9 December 2019 (Mid-Ebb Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU***	***22.2 NTU***
		or 120% of upstream control station's Turbidity at the same tide of the same day ***C2: 2.6 NTU***	or 130% of upstream control station's Turbidity at the same tide of the same day ***C2: 2.8 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L***	***6.9 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C2: 7.0 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C2: 7.5 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L***	***7.4 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C2: 7.0 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C2: 7.5 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L***	***7.9 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C2: 7.4 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C2: 8.1 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 09 December 2019

(Mid-Flood Tide)

Location	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
C1	Sunny	Moderate	16:32	Surface	1.0	20.5 20.5	20.5	8.5 8.5	8.5	32.4 32.4	32.4	97.1 97.8	97.5	7.2 7.3	7.3	7.2	2.0 2.0	2.0	2.1	8.0 8.1	8.1	9.7
				Middle	9.0	20.4 20.4	20.4	8.5 8.5	8.5	32.4 32.4	32.4	95.3 95.4	95.4	7.1 7.1	7.1		2.1 2.1	2.1		7.8 7.5	7.7	
				Bottom	17.0	20.3 20.3	20.3	8.5 8.5	8.5	32.5 32.5	32.5	93.5 93.6	93.6	7.0 7.0	7.0	7.0	2.1 2.1	2.1		13.4 13.3	13.4	
C2	Sunny	Moderate	15:30	Surface	1.0	20.4 20.5	20.4	8.5 8.5	8.5	32.2 32.2	32.2	96.8 97.0	96.9	7.2 7.2	7.2	7.1	2.1 2.1	2.1	2.1	8.5 8.8	8.7	7.1
				Middle	16.1	20.3 20.3	20.3	8.5 8.5	8.5	32.2 32.2	32.2	93.9 93.8	93.9	7.0 7.0	7.0		2.2 2.2	2.2		5.7 5.9	5.8	
				Bottom	31.0	20.3 20.3	20.3	8.5 8.5	8.5	32.1 32.1	32.1	93.4 93.5	93.5	7.0 7.0	7.0	7.0	2.1 2.2	2.1		6.8 6.9	6.9	
G1	Sunny	Moderate	15:56	Surface	1.1	20.4 20.4	20.4	8.5 8.5	8.5	32.7 32.7	32.7	96.5 96.3	96.4	7.2 7.2	7.2	7.1	3.1 3.2	3.1	3.3	9.2 9.4	9.3	8.9
				Middle	4.0	20.4 20.4	20.4	8.5 8.5	8.5	32.7 32.7	32.7	95.4 95.4	95.4	7.1 7.1	7.1		3.2 3.3	3.2		9.4 9.5	9.5	
				Bottom	7.2	20.3 20.3	20.3	8.5 8.5	8.5	32.7 32.7	32.7	94.9 94.8	94.9	7.1 7.1	7.1	7.1	3.6 3.6	3.6		8.0 8.1	8.1	
G2	Sunny	Moderate	15:45	Surface	1.0	20.4 20.4	20.4	8.5 8.5	8.5	32.7 32.7	32.7	98.2 98.1	98.2	7.3 7.3	7.3	7.3	2.3 2.3	2.3	2.6	11.3 11.2	11.3	8.0
				Middle	5.1	20.4 20.4	20.4	8.5 8.5	8.5	32.7 32.7	32.7	97.0 97.3	97.2	7.2 7.3	7.2		2.5 2.4	2.4		6.8 6.9	6.9	
				Bottom	9.0	20.3 20.3	20.3	8.5 8.5	8.5	32.7 32.7	32.7	94.6 95.0	94.8	7.1 7.1	7.1	7.1	3.2 3.0	3.1		5.6 5.9	5.8	
G3	Sunny	Moderate	16:01	Surface	1.0	20.3 20.3	20.3	8.5 8.5	8.5	32.5 32.5	32.5	95.8 95.7	95.8	7.2 7.1	7.1	7.1	5.3 5.0	5.1	4.5	8.9 8.8	8.9	8.7
				Middle	4.0	20.3 20.3	20.3	8.5 8.5	8.5	32.7 32.7	32.7	93.9 94.0	94.0	7.0 7.0	7.0		4.5 4.5	4.5		7.2 6.8	7.0	
				Bottom	7.0	20.3 20.3	20.3	8.5 8.5	8.5	32.7 32.7	32.7	93.9 93.8	93.9	7.0 7.0	7.0	7.0	4.0 3.7	3.8		10.4 10.3	10.4	
G4	Sunny	Moderate	16:13	Surface	1.0	20.4 20.4	20.4	8.5 8.6	8.6	32.7 32.7	32.7	96.9 96.7	96.8	7.2 7.2	7.2	7.1	2.5 2.5	2.5	2.6	11.8 11.8	11.8	8.2
				Middle	4.2	20.3 20.3	20.3	8.6 8.6	8.6	32.8 32.8	32.8	95.2 95.3	95.3	7.1 7.1	7.1		2.6 2.5	2.5		7.1 7.3	7.2	
				Bottom	7.1	20.2 20.2	20.2	8.6 8.5	8.5	32.8 32.8	32.8	94.1 94.0	94.1	7.0 7.0	7.0	7.0	2.7 2.8	2.8		5.6 5.6	5.6	
M1	Sunny	Moderate	15:51	Surface	1.1	20.3 20.4	20.4	8.5 8.5	8.5	32.6 32.6	32.6	96.5 96.3	96.4	7.2 7.2	7.2	7.1	3.2 3.0	3.1	3.0	10.0 10.4	10.2	8.6
				Middle	2.9	20.3 20.3	20.3	8.5 8.5	8.5	32.6 32.6	32.6	95.2 94.9	95.1	7.1 7.1	7.1		2.8 3.0	2.9		6.1 6.1	6.1	
				Bottom	5.0	20.3 20.3	20.3	8.5 8.5	8.5	32.6 32.6	32.6	95.2 95.2	95.2	7.1 7.1	7.1	7.1	3.0 3.1	3.0		9.3 9.8	9.6	
M2	Sunny	Moderate	15:41	Surface	1.0	20.5 20.5	20.5	8.5 8.5	8.5	32.6 32.6	32.6	100.4 100.3	100.4	7.5 7.5	7.5	7.4	1.9 1.9	1.9	2.3	5.8 6.0	5.9	6.7
				Middle	6.0	20.5 20.5	20.5	8.5 8.5	8.5	32.7 32.7	32.7	98.3 98.4	98.4	7.3 7.3	7.3		2.0 2.1	2.1		5.6 5.5	5.6	
				Bottom	11.0	20.4 20.3	20.4	8.5 8.5	8.5	32.7 32.6	32.6	96.4 96.2	96.3	7.2 7.2	7.2	7.2	2.8 3.0	2.9		8.8 8.5	8.7	
M3	Sunny	Moderate	16:09	Surface	1.1	20.4 20.4	20.4	8.5 8.5	8.5	32.5 32.5	32.5	92.6 94.1	93.4	6.9 7.0	7.0	7.0	4.0 4.1	4.0	5.2	8.6 8.6	8.6	7.1
				Middle	4.1	20.3 20.3	20.3	8.5 8.5	8.5	32.7 32.7	32.7	93.4 93.4	93.4	7.0 7.0	7.0		5.3 5.6	5.5		7.3 7.2	7.3	
				Bottom	7.0	20.3 20.3	20.3	8.5 8.5	8.5	32.7 32.7	32.7	92.7 92.7	92.7	6.9 6.9	6.9	6.9	6.2 6.0	6.1		5.5 5.6	5.6	
M4	Sunny	Moderate	15:36	Surface	1.0	20.4 20.4	20.4	8.5 8.5	8.5	32.6 32.6	32.6	98.2 98.2	98.2	7.3 7.3	7.3	7.3	2.1 2.1	2.1	2.3	12.0 12.0	12.0	10.0
				Middle	5.0	20.4 20.4	20.4	8.5 8.5	8.5	32.6 32.6	32.6	97.1 97.1	97.1	7.2 7.2	7.2		2.4 2.4	2.4		8.2 8.1	8.2	
				Bottom	9.0	20.4 20.4	20.4	8.5 8.5	8.5	32.6 32.6	32.6	96.8 96.9	96.9	7.2 7.2	7.2	7.2	2.3 2.4	2.4		9.9 9.9	9.9	
M5	Sunny	Moderate	16:26	Surface	1.0	20.5 20.5	20.5	8.5 8.5	8.5	32.3 32.3	32.3	98.6 97.0	97.8	7.4 7.2	7.3	7.2	2.0 2.0	2.0	2.1	7.7 7.6	7.7	9.7
				Middle	6.1	20.4 20.4	20.4	8.5 8.5	8.5	32.3 32.3	32.3	95.7 95.9	95.8	7.1 7.2	7.1		2.1 2.1	2.1		11.5 11.6	11.6	
				Bottom	11.0	20.4 20.4	20.4	8.5 8.5	8.5	32.3 32.3	32.3	94.8 94.6	94.7	7.1 7.1	7.1	7.1	2.2 2.1	2.2		9.8 9.8	9.8	
M6	Sunny	Moderate	16:19	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	7.3	- -	-	2.3	- -	-	7.4
				Middle	2.2	20.4 20.4	20.4	8.5 8.5	8.5	32.8 32.8	32.8	98.2 98.2	98.2	7.3 7.3	7.3		2.3 2.3	2.3		7.4 7.4	7.4	
				Bottom	-	- -	-	- -	-	- -	-	- -	-	- -	-	-	- -	-		- -	-	

Remarks: *DA: Depth-Averaged
**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

Appendix I - Action and Limit Levels for Marine Water Quality on 9 December 2019 (Mid-Flood Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU***	***22.2 NTU***
		or 120% of upstream control station's Turbidity at the same tide of the same day ***C1: 2.5 NTU***	or 130% of upstream control station's Turbidity at the same tide of the same day ***C1: 2.7 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L***	***6.9 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C1: 16.0 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C1: 17.4 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L***	***7.4 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C1: 9.7 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C1: 10.5 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L***	***7.9 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C1: 16.0 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C1: 17.4 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

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Water Quality Monitoring Results on 11 December 2019

(Mid-Ebb Tide)

Location	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
C1	Sunny	Calm	11:56	Surface	1.0	19.1 19.1	19.1	8.3 8.3	8.3	34.1 34.2	34.1	105.6 104.0	104.8	8.0 7.9	7.9	7.8	2.7 2.6	2.6	2.6	6.9 6.9	6.9	6.0
				Middle	9.1	19.1 19.1	19.1	8.3 8.3	8.3	34.3 34.3	34.3	102.7 102.1	102.4	7.8 7.7	7.7		2.5 2.6	2.5		4.8 4.8	4.8	
				Bottom	17.1	19.1 19.1	19.1	8.3 8.3	8.3	34.3 34.3	34.3	101.1 101.3	101.2	7.6 7.7	7.6	7.6	2.7 2.7	2.7		6.2 6.1	6.2	
C2	Sunny	Calm	10:51	Surface	1.0	19.1 19.1	19.1	8.2 8.3	8.2	34.0 34.0	34.0	104.5 103.8	104.2	7.9 7.9	7.9	7.8	2.7 2.7	2.7	2.7	8.9 9.0	9.0	8.0
				Middle	16.0	19.1 19.1	19.1	8.2 8.3	8.2	34.0 34.0	34.0	102.5 101.7	102.1	7.8 7.7	7.7		2.6 2.6	2.6		7.2 7.0	7.1	
				Bottom	31.1	19.1 19.1	19.1	8.3 8.3	8.3	34.2 34.2	34.2	100.7 101.0	100.9	7.6 7.6	7.6	7.6	2.7 2.7	2.7		7.9 7.8	7.9	
G1	Sunny	Calm	11:22	Surface	1.1	19.1 19.1	19.1	8.3 8.3	8.3	34.0 33.7	33.8	106.4 103.0	104.7	8.1 7.8	7.9	7.9	2.4 2.3	2.3	2.4	6.5 6.5	6.5	7.1
				Middle	4.1	19.1 19.1	19.1	8.3 8.3	8.3	34.1 34.1	34.1	103.7 103.4	103.6	7.8 7.8	7.8		2.2 2.2	2.2		5.9 6.0	6.0	
				Bottom	7.1	19.2 19.2	19.2	8.3 8.3	8.3	34.2 34.2	34.2	97.4 96.6	97.0	7.3 7.3	7.3	7.3	2.7 2.7	2.7		8.6 8.8	8.7	
G2	Sunny	Calm	11:11	Surface	1.1	19.1 19.1	19.1	8.3 8.3	8.3	34.0 34.0	34.0	105.9 105.2	105.6	8.0 8.0	8.0	8.0	2.2 2.2	2.2	2.2	12.2 11.9	12.1	15.7
				Middle	5.1	19.1 19.1	19.1	8.3 8.3	8.3	34.0 34.1	34.1	105.8 105.1	105.5	8.0 8.0	8.0		2.2 2.2	2.2		23.2 22.8	23.0	
				Bottom	9.1	19.1 19.1	19.1	8.3 8.3	8.3	34.1 34.1	34.1	103.3 104.0	103.7	7.8 7.9	7.8	7.8	2.2 2.2	2.2		12.0 12.2	12.1	
G3	Sunny	Calm	11:28	Surface	1.0	19.2 19.2	19.2	8.3 8.3	8.3	34.0 33.9	34.0	105.6 103.8	104.7	8.0 7.8	7.9	7.8	2.8 2.8	2.8	2.6	10.6 10.2	10.4	8.4
				Middle	4.0	19.2 19.2	19.2	8.3 8.3	8.3	34.1 34.1	34.1	100.9 102.7	101.8	7.6 7.8	7.7		2.5 2.5	2.5		8.4 8.2	8.3	
				Bottom	7.0	19.2 19.2	19.2	8.3 8.3	8.3	34.2 34.2	34.2	99.6 99.1	99.4	7.5 7.5	7.5	7.5	2.6 2.6	2.6		6.3 6.5	6.4	
G4	Sunny	Calm	11:41	Surface	1.1	19.2 19.2	19.2	8.3 8.3	8.3	34.0 34.1	34.1	104.1 102.9	103.5	7.9 7.8	7.8	7.8	2.5 2.5	2.5	2.5	6.7 6.7	6.7	6.6
				Middle	4.1	19.2 19.2	19.2	8.3 8.3	8.3	34.2 34.2	34.2	102.4 102.2	102.3	7.7 7.7	7.7		2.7 2.8	2.7		5.2 5.1	5.2	
				Bottom	7.0	19.1 19.1	19.1	8.3 8.3	8.3	34.2 34.2	34.2	102.2 102.1	102.2	7.7 7.7	7.7	7.7	2.3 2.3	2.3		7.9 8.2	8.1	
M1	Sunny	Calm	11:16	Surface	1.0	19.1 19.1	19.1	8.3 8.3	8.3	33.9 34.0	34.0	104.8 102.5	103.7	7.9 7.8	7.8	7.9	2.6 2.5	2.5	2.5	7.4 7.2	7.3	6.1
				Middle	3.0	19.1 19.1	19.1	8.3 8.3	8.3	34.0 34.0	34.0	104.4 103.5	104.0	7.9 7.8	7.9		2.5 2.5	2.5		5.0 4.8	4.9	
				Bottom	5.0	19.1 19.1	19.1	8.3 8.3	8.3	34.0 34.0	34.0	102.9 102.4	102.7	7.8 7.7	7.8	7.8	2.4 2.4	2.4		6.3 6.1	6.2	
M2	Sunny	Calm	11:06	Surface	1.1	19.1 19.1	19.1	8.3 8.3	8.3	33.9 33.9	33.9	106.9 106.8	106.9	8.1 8.1	8.1	8.0	2.1 2.1	2.1	2.2	7.1 7.2	7.2	5.7
				Middle	6.1	19.1 19.1	19.1	8.3 8.3	8.3	34.1 34.1	34.1	103.8 105.1	104.5	7.9 8.0	7.9		2.2 2.2	2.2		4.6 4.5	4.6	
				Bottom	11.1	19.1 19.1	19.1	8.3 8.3	8.3	34.2 34.2	34.2	102.9 103.4	103.2	7.8 7.8	7.8	7.8	2.2 2.2	2.2		5.6 5.4	5.5	
M3	Sunny	Calm	11:35	Surface	1.0	19.2 19.2	19.2	8.3 8.3	8.3	33.9 34.1	34.0	104.8 100.5	102.7	7.9 7.6	7.8	7.8	2.7 2.6	2.7	2.7	5.8 5.7	5.8	4.5
				Middle	4.1	19.2 19.2	19.2	8.3 8.3	8.3	34.1 34.1	34.1	103.8 101.9	102.9	7.8 7.7	7.8		2.6 2.6	2.6		3.9 4.0	4.0	
				Bottom	7.0	19.2 19.2	19.2	8.3 8.3	8.3	34.2 34.2	34.2	100.9 100.1	100.5	7.6 7.6	7.6	7.6	2.7 2.7	2.7		3.6 3.8	3.7	
M4	Sunny	Calm	11:01	Surface	1.1	19.1 19.1	19.1	8.3 8.3	8.3	34.0 34.0	34.0	105.1 104.7	104.9	8.0 7.9	7.9	7.9	2.2 2.2	2.2	2.3	5.6 5.8	5.7	6.6
				Middle	5.1	19.1 19.1	19.1	8.3 8.3	8.3	34.2 34.1	34.1	103.8 103.6	103.7	7.8 7.8	7.8		2.4 2.4	2.4		6.3 6.1	6.2	
				Bottom	9.1	19.1 19.1	19.1	8.3 8.3	8.3	34.2 34.2	34.2	102.0 102.3	102.2	7.7 7.7	7.7	7.7	2.4 2.6	2.5		7.8 7.9	7.9	
M5	Sunny	Calm	11:50	Surface	1.0	19.1 19.1	19.1	8.3 8.3	8.3	34.0 34.0	34.0	104.0 103.2	103.6	7.9 7.8	7.8	7.8	2.4 2.4	2.4	2.5	11.6 11.3	11.5	7.8
				Middle	5.6	19.1 19.1	19.1	8.3 8.3	8.3	34.1 34.1	34.1	103.1 102.5	102.8	7.8 7.7	7.8		2.5 2.4	2.5		5.5 5.6	5.6	
				Bottom	10.1	19.1 19.1	19.1	8.3 8.3	8.3	34.1 34.2	34.2	101.7 101.0	101.4	7.7 7.6	7.7	7.7	2.6 2.5	2.6		6.1 6.4	6.3	
M6	Sunny	Calm	11:45	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	8.0	- -	-	2.5	- -	-	7.1
				Middle	2.1	19.2 19.2	19.2	8.3 8.3	8.3	34.2 34.2	34.2	106.3 106.0	106.2	8.0 8.0	8.0		2.5 2.5	2.5		7.2 7.0	7.1	
				Bottom	-	- -	-	- -	-	- -	-	- -	-	- -	-	-	- -	-		- -	-	

Remarks: *DA: Depth-Averaged
**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

Appendix I - Action and Limit Levels for Marine Water Quality on 11 December 2019 (Mid-Ebb Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU***	***22.2 NTU***
		or 120% of upstream control station's Turbidity at the same tide of the same day ***C2: 3.2 NTU***	or 130% of upstream control station's Turbidity at the same tide of the same day ***C2: 3.5 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L***	***6.9 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C2: 10.7 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C2: 11.6 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L***	***7.4 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C2: 9.4 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C2: 10.2 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L***	***7.9 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C2: 10.7 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C2: 11.6 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 11 December 2019

(Mid-Flood Tide)

Location	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
C1	Sunny	Calm	17:12	Surface	1.1	19.1 19.1	19.1	8.3 8.3	8.3	34.1 34.1	34.1	104.6 104.8	104.7	7.9 7.9	7.9	7.9	2.2 2.1	2.2	2.3	4.7 4.8	4.8	5.8
				Middle	9.0	19.1 19.1	19.1	8.3 8.3	8.3	34.2 34.2	34.2	104.3 103.7	104.0	7.9 7.8	7.9		2.1 2.2	2.1		6.4 6.2	6.3	
				Bottom	17.0	19.1 19.1	19.1	8.3 8.3	8.3	34.3 34.3	34.3	100.2 100.9	100.6	7.6 7.6	7.6	7.6	2.6 2.5	2.6		6.2 6.2	6.2	
C2	Sunny	Calm	16:17	Surface	1.0	19.1 19.1	19.1	8.3 8.3	8.3	34.1 34.1	34.1	106.1 106.2	106.2	8.0 8.0	8.0	7.9	2.6 2.7	2.7	2.6	5.8 6.0	5.9	5.9
				Middle	16.1	19.1 19.1	19.1	8.3 8.3	8.3	34.1 34.2	34.2	104.8 102.4	103.6	7.9 7.7	7.8		2.5 2.6	2.6		5.8 5.7	5.8	
				Bottom	31.1	19.1 19.1	19.1	8.3 8.3	8.3	34.2 34.2	34.2	102.3 101.9	102.1	7.7 7.7	7.7	7.7	2.5 2.6	2.5		5.9 6.2	6.1	
G1	Sunny	Calm	16:41	Surface	1.0	19.1 19.1	19.1	8.3 8.3	8.3	34.1 34.1	34.1	104.2 104.5	104.4	7.9 7.9	7.9	7.9	2.3 2.3	2.3	2.5	9.9 9.8	9.9	7.8
				Middle	4.0	19.1 19.1	19.1	8.3 8.3	8.3	34.1 34.1	34.1	104.8 104.2	104.5	7.9 7.9	7.9		2.4 2.4	2.4		6.6 6.4	6.5	
				Bottom	7.0	19.2 19.2	19.2	8.3 8.3	8.3	34.2 34.1	34.1	104.9 104.6	104.8	7.9 7.9	7.9	7.9	3.1 2.9	3.0		6.9 7.1	7.0	
G2	Sunny	Calm	16:30	Surface	1.0	19.1 19.1	19.1	8.3 8.3	8.3	34.1 34.1	34.1	104.6 102.5	103.6	7.9 7.8	7.8	7.8	2.3 2.3	2.3	2.4	4.5 4.4	4.5	5.0
				Middle	5.0	19.1 19.1	19.1	8.3 8.3	8.3	34.1 34.2	34.2	104.4 102.7	103.6	7.9 7.8	7.8		2.3 2.3	2.3		5.0 5.0	5.0	
				Bottom	9.0	19.1 19.1	19.1	8.3 8.3	8.3	34.2 34.2	34.2	101.7 101.4	101.6	7.7 7.7	7.7	7.7	2.5 2.6	2.5		5.6 5.6	5.6	
G3	Sunny	Calm	16:46	Surface	1.0	19.1 19.1	19.1	8.3 8.3	8.3	34.1 34.1	34.1	101.9 103.4	102.7	7.7 7.8	7.8	7.8	3.4 3.3	3.3	3.3	6.4 6.1	6.3	5.2
				Middle	4.1	19.2 19.2	19.2	8.3 8.3	8.3	34.1 34.2	34.1	102.7 103.7	103.2	7.8 7.8	7.8		3.2 3.2	3.2		5.3 5.3	5.3	
				Bottom	7.0	19.2 19.2	19.2	8.3 8.3	8.3	34.2 34.2	34.2	104.3 103.3	103.8	7.9 7.8	7.8	7.8	3.2 3.4	3.3		4.1 4.2	4.2	
G4	Sunny	Calm	16:57	Surface	1.1	19.2 19.2	19.2	8.3 8.3	8.3	34.0 34.1	34.0	108.2 107.7	108.0	8.2 8.1	8.2	8.0	2.4 2.5	2.4	2.5	8.4 8.4	8.4	6.3
				Middle	4.0	19.2 19.2	19.2	8.3 8.3	8.3	34.1 34.2	34.2	106.5 103.6	105.1	8.1 7.8	7.9		2.4 2.4	2.4		4.7 4.7	4.7	
				Bottom	7.0	19.2 19.2	19.2	8.3 8.3	8.3	34.2 34.2	34.2	102.9 101.8	102.4	7.8 7.7	7.7	7.7	2.6 2.6	2.6		5.7 5.8	5.8	
M1	Sunny	Calm	16:36	Surface	1.0	19.1 19.1	19.1	8.3 8.3	8.3	34.0 34.0	34.0	102.1 102.6	102.4	7.7 7.8	7.7	7.8	2.3 2.4	2.3	2.3	7.1 7.3	7.2	6.5
				Middle	3.1	19.1 19.1	19.1	8.3 8.3	8.3	34.1 34.0	34.1	103.0 102.5	102.8	7.8 7.8	7.8		2.3 2.4	2.3		5.9 5.9	5.9	
				Bottom	5.0	19.1 19.1	19.1	8.3 8.3	8.3	34.1 34.1	34.1	102.7 103.0	102.9	7.8 7.8	7.8	7.8	2.3 2.3	2.3		6.4 6.4	6.4	
M2	Sunny	Calm	16:26	Surface	1.1	19.1 19.1	19.1	8.3 8.3	8.3	34.1 34.1	34.1	104.7 105.3	105.0	7.9 8.0	7.9	7.9	2.0 2.0	2.0	2.1	4.5 4.5	4.5	5.4
				Middle	6.1	19.1 19.1	19.1	8.3 8.3	8.3	34.1 34.1	34.1	105.1 105.1	105.1	8.0 8.0	8.0		2.1 2.1	2.1		6.1 6.2	6.2	
				Bottom	11.0	19.1 19.1	19.1	8.3 8.3	8.3	34.1 34.2	34.1	104.4 103.5	104.0	7.9 7.8	7.9	7.9	2.2 2.2	2.2		5.6 5.7	5.7	
M3	Sunny	Calm	16:51	Surface	1.0	19.2 19.2	19.2	8.3 8.3	8.3	33.9 33.9	33.9	107.8 102.8	105.3	8.1 7.8	8.0	7.8	2.7 2.7	2.7	2.6	10.7 10.6	10.7	6.5
				Middle	4.0	19.2 19.2	19.2	8.3 8.3	8.3	34.1 34.1	34.1	100.9 103.3	102.1	7.6 7.8	7.7		2.4 2.4	2.4		4.3 4.6	4.5	
				Bottom	7.0	19.2 19.2	19.2	8.3 8.3	8.3	34.2 34.2	34.2	100.1 100.0	100.1	7.6 7.6	7.6	7.6	2.6 2.6	2.6		4.4 4.4	4.4	
M4	Sunny	Calm	16:22	Surface	1.1	19.1 19.1	19.1	8.3 8.3	8.3	34.1 34.1	34.1	105.6 105.5	105.6	8.0 8.0	8.0	8.0	2.1 2.1	2.1	2.2	4.7 4.7	4.7	7.2
				Middle	5.0	19.1 19.1	19.1	8.3 8.3	8.3	34.1 34.1	34.1	105.4 105.6	105.5	8.0 8.0	8.0		2.2 2.2	2.2		10.2 10.5	10.4	
				Bottom	9.0	19.1 19.1	19.1	8.3 8.3	8.3	34.2 34.2	34.2	104.1 103.3	103.7	7.9 7.8	7.8	7.8	2.2 2.2	2.2		6.6 6.6	6.6	
M5	Sunny	Calm	17:06	Surface	1.0	19.2 19.2	19.2	8.3 8.3	8.3	34.2 34.2	34.2	101.8 101.9	101.9	7.7 7.7	7.7	7.7	4.0 3.9	4.0	3.0	5.6 5.6	5.6	6.9
				Middle	5.5	19.1 19.1	19.1	8.3 8.3	8.3	34.2 34.2	34.2	101.0 101.3	101.2	7.6 7.7	7.6		2.6 2.5	2.5		10.7 10.9	10.8	
				Bottom	10.0	19.1 19.1	19.1	8.3 8.3	8.3	34.3 34.3	34.3	100.3 100.6	100.5	7.6 7.6	7.6	7.6	2.5 2.4	2.5		4.3 4.3	4.3	
M6	Sunny	Calm	17:01	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	8.4	- -	-	2.3	- -	-	7.8
				Middle	2.0	19.2 19.2	19.2	8.3 8.3	8.3	34.2 34.2	34.2	111.4 111.5	111.5	8.4 8.4	8.4		2.3 2.3	2.3		7.6 7.9	7.8	
				Bottom	-	- -	-	- -	-	- -	-	- -	-	- -	-	-	- -	-		- -	-	

Remarks: *DA: Depth-Averaged
**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

Appendix I - Action and Limit Levels for Marine Water Quality on 11 December 2019 (Mid-Flood Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU***	***22.2 NTU***
		or 120% of upstream control station's Turbidity at the same tide of the same day ***C1: 3.1 NTU***	or 130% of upstream control station's Turbidity at the same tide of the same day ***C1: 3.4 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L***	***6.9 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C1: 5.7 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C1: 6.2 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L***	***7.4 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C1: 7.4 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C1: 8.1 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L***	***7.9 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C1: 5.7 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C1: 6.2 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 13 December 2019

(Mid-Ebb Tide)

Location	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
C1	Cloudy	Moderate	13:18	Surface	1.0	21.1 21.1	21.1	8.6 8.6	8.6	32.1 32.1	32.1	87.7 87.7	87.7	5.6 5.6	5.6	5.5	1.5 1.5	1.5	2.6	10.9 11.2	11.1	9.0
				Middle	9.0	21.0 21.0	21.0	8.6 8.6	8.6	32.6 32.6	32.6	86.1 86.1	86.1	5.5 5.5	5.5		1.2 1.2	1.2		7.4 6.9	7.2	
				Bottom	17.1	21.0 21.0	21.0	8.6 8.6	8.6	32.8 32.8	32.8	86.0 86.0	86.0	5.5 5.5	5.5	5.5	5.2 5.2	5.2		8.7 8.7	8.7	
C2	Cloudy	Moderate	12:13	Surface	1.1	21.1 21.1	21.1	8.4 8.4	8.4	32.2 32.2	32.2	88.9 88.9	88.9	5.7 5.7	5.7	5.6	1.7 1.7	1.7	2.9	8.2 8.0	8.1	9.6
				Middle	16.1	21.0 21.0	21.0	8.5 8.5	8.5	32.9 32.9	32.9	86.4 86.4	86.4	5.5 5.5	5.5		3.4 3.4	3.4		9.8 10.3	10.1	
				Bottom	31.1	21.0 21.0	21.0	8.5 8.5	8.5	32.9 32.9	32.9	85.9 85.9	85.9	5.5 5.5	5.5	5.5	3.8 3.8	3.8		10.7 10.5	10.6	
G1	Cloudy	Moderate	12:40	Surface	1.0	21.1 21.2	21.1	8.7 8.7	8.7	32.6 32.5	32.5	91.0 91.2	91.1	5.8 5.8	5.8	5.8	1.4 1.4	1.4	1.4	8.2 8.0	8.1	8.1
				Middle	4.1	21.1 21.1	21.1	8.7 8.7	8.7	33.0 33.0	33.0	91.7 91.7	91.7	5.8 5.8	5.8		1.3 1.3	1.3		10.9 10.6	10.8	
				Bottom	7.1	21.1 21.1	21.1	8.7 8.7	8.7	33.1 33.1	33.1	91.5 91.5	91.5	5.8 5.8	5.8	5.8	1.3 1.3	1.3		5.6 5.4	5.5	
G2	Cloudy	Moderate	12:30	Surface	1.1	21.2 21.2	21.2	8.8 8.8	8.8	32.4 32.4	32.4	99.7 99.6	99.7	6.3 6.3	6.3	6.2	1.2 1.2	1.2	2.4	7.2 7.1	7.2	6.8
				Middle	5.1	21.1 21.1	21.1	8.8 8.8	8.8	32.7 32.7	32.7	96.1 96.3	96.2	6.1 6.1	6.1		1.2 1.2	1.2		6.3 6.3	6.3	
				Bottom	9.1	20.9 20.9	20.9	8.8 8.8	8.8	33.3 33.3	33.3	91.5 91.2	91.4	5.8 5.8	5.8	5.8	4.6 4.8	4.7		6.8 7.2	7.0	
G3	Cloudy	Moderate	12:45	Surface	1.1	21.1 21.1	21.1	8.8 8.8	8.8	31.4 31.4	31.4	98.1 98.0	98.1	6.3 6.3	6.3	6.1	1.8 1.8	1.8	1.3	10.1 9.9	10.0	9.9
				Middle	4.1	21.1 21.1	21.1	8.8 8.8	8.8	33.1 33.1	33.1	92.4 92.4	92.4	5.9 5.9	5.9		1.1 1.1	1.1		10.1 10.8	10.5	
				Bottom	7.1	21.1 21.1	21.1	8.8 8.8	8.8	33.1 33.1	33.1	91.8 91.7	91.8	5.8 5.8	5.8	5.8	1.0 1.1	1.1		9.1 9.2	9.2	
G4	Cloudy	Moderate	12:58	Surface	1.1	21.2 21.2	21.2	8.8 8.8	8.8	32.1 32.1	32.1	95.6 95.6	95.6	6.1 6.1	6.1	6.0	1.0 1.0	1.0	1.1	9.1 8.4	8.8	8.7
				Middle	4.1	21.2 21.2	21.2	8.8 8.8	8.8	32.9 32.9	32.9	94.0 94.1	94.1	6.0 6.0	6.0		0.9 0.9	0.9		8.4 8.3	8.4	
				Bottom	7.1	21.1 21.1	21.1	8.8 8.8	8.8	33.1 33.1	33.1	91.9 91.8	91.9	5.8 5.8	5.8	5.8	1.4 1.4	1.4		8.9 9.2	9.1	
M1	Cloudy	Moderate	12:36	Surface	1.1	21.0 21.0	21.0	8.7 8.7	8.7	31.9 31.9	31.9	91.6 91.5	91.6	5.9 5.9	5.9	5.8	3.8 3.8	3.8	4.1	8.0 8.5	8.3	7.6
				Middle	3.1	21.0 21.0	21.0	8.7 8.7	8.7	32.6 32.5	32.5	89.5 89.6	89.6	5.7 5.7	5.7		4.1 4.0	4.1		7.4 7.4	7.4	
				Bottom	5.1	21.0 21.0	21.0	8.7 8.7	8.7	32.9 32.9	32.9	88.8 88.8	88.8	5.7 5.7	5.7	5.7	4.5 4.6	4.6		7.2 7.1	7.2	
M2	Cloudy	Moderate	12:25	Surface	1.1	21.1 21.1	21.1	8.8 8.8	8.8	32.1 32.1	32.1	99.9 99.9	99.9	6.4 6.4	6.4	6.1	1.3 1.3	1.3	2.1	6.7 6.8	6.8	7.3
				Middle	6.0	20.9 20.9	20.9	8.7 8.7	8.7	33.2 33.2	33.2	93.0 93.0	93.0	5.9 5.9	5.9		1.0 1.0	1.0		7.6 8.0	7.8	
				Bottom	11.0	20.9 20.9	20.9	8.7 8.7	8.7	33.3 33.3	33.3	91.1 91.0	91.1	5.8 5.8	5.8	5.8	4.0 4.1	4.1		7.4 7.3	7.4	
M3	Cloudy	Moderate	12:50	Surface	1.1	21.2 21.2	21.2	8.8 8.8	8.8	31.3 31.3	31.3	93.4 93.5	93.5	6.0 6.0	6.0	6.0	1.5 1.4	1.4	2.2	6.5 6.8	6.7	7.2
				Middle	4.1	21.2 21.2	21.2	8.8 8.8	8.8	32.4 32.3	32.4	94.0 94.1	94.1	6.0 6.0	6.0		1.0 1.0	1.0		8.1 7.8	8.0	
				Bottom	7.1	21.1 21.1	21.1	8.8 8.8	8.8	33.2 33.2	33.2	80.7 80.6	80.7	5.1 5.1	5.1	5.1	4.0 4.1	4.1		6.8 6.9	6.9	
M4	Cloudy	Moderate	12:20	Surface	1.1	21.0 21.0	21.0	8.7 8.7	8.7	32.6 32.6	32.6	92.5 92.4	92.5	5.9 5.9	5.9	5.8	1.5 1.4	1.4	1.6	8.4 8.6	8.5	8.4
				Middle	5.1	21.0 21.0	21.0	8.7 8.7	8.7	32.9 32.9	32.9	89.5 89.5	89.5	5.7 5.7	5.7		1.9 1.9	1.9		9.4 9.3	9.4	
				Bottom	9.1	20.9 20.9	20.9	8.7 8.7	8.7	33.1 33.1	33.1	90.2 90.2	90.2	5.7 5.7	5.7	5.7	1.4 1.4	1.4		7.3 7.5	7.4	
M5	Cloudy	Moderate	13:12	Surface	1.1	21.1 21.1	21.1	8.6 8.6	8.6	32.0 32.0	32.0	87.3 87.4	87.4	5.6 5.6	5.6	5.5	1.8 1.7	1.7	2.3	8.0 8.4	8.2	9.1
				Middle	6.1	21.0 21.0	21.0	8.6 8.6	8.6	32.5 32.5	32.5	86.2 86.3	86.3	5.5 5.5	5.5		2.4 2.4	2.4		8.4 8.2	8.3	
				Bottom	10.1	21.0 21.0	21.0	8.6 8.6	8.6	32.7 32.7	32.7	85.7 85.7	85.7	5.5 5.5	5.5	5.5	2.7 2.7	2.7		10.9 10.6	10.8	
M6	Cloudy	Moderate	13:05	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	5.8	- -	-	2.3	- -	-	7.6
				Middle	2.1	21.1 21.1	21.1	8.8 8.8	8.8	32.8 32.8	32.8	90.6 90.6	90.6	5.8 5.8	5.8		2.3 2.3	2.3		7.5 7.6	7.6	
				Bottom	-	- -	-	- -	-	- -	-	- -	-	- -	-	-	- -	-		- -	-	

Remarks: *DA: Depth-Averaged
**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

Appendix I - Action and Limit Levels for Marine Water Quality on 13 December 2019 (Mid-Ebb Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU***	***22.2 NTU***
		or 120% of upstream control station's Turbidity at the same tide of the same day ***C2: 4.6 NTU***	or 130% of upstream control station's Turbidity at the same tide of the same day ***C2: 4.9 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L***	***6.9 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C2: 9.7 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C2: 10.5 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L***	***7.4 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C2: 9.7 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C2: 10.5 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L***	***7.9 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C2: 12.7 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C2: 13.8 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 13 December 2019

(Mid-Flood Tide)

Location	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
C1	Cloudy	Moderate	18:24	Surface	1.0	20.7 20.7	20.7	8.6 8.6	8.6	32.1 32.1	32.1	87.6 87.6	87.6	5.6 5.6	5.6	5.5	1.7 1.8	1.7	2.9	8.0 7.9	8.0	9.0
				Middle	9.1	20.6 20.6	20.6	8.6 8.6	8.6	32.6 32.6	32.6	86.0 86.0	86.0	5.5 5.5	5.5		1.0 1.0	1.0		10.4 10.6	10.5	
				Bottom	17.0	20.6 20.6	20.6	8.6 8.6	8.6	32.8 32.8	32.8	86.0 86.0	86.0	5.5 5.5	5.5	5.5	6.1 6.0	6.1		8.9 8.4	8.7	
C2	Cloudy	Moderate	17:19	Surface	1.1	20.7 20.7	20.7	8.4 8.4	8.4	32.1 32.1	32.1	88.8 88.8	88.8	5.7 5.7	5.7	5.6	1.6 1.6	1.6	2.9	8.0 8.1	8.1	9.0
				Middle	16.0	20.6 20.6	20.6	8.5 8.5	8.5	32.8 32.8	32.8	86.4 86.3	86.4	5.5 5.5	5.5		3.3 3.2	3.2		8.9 8.7	8.8	
				Bottom	31.1	20.5 20.5	20.5	8.5 8.5	8.5	32.9 32.9	32.9	85.8 85.8	85.8	5.5 5.5	5.5	5.5	3.8 3.8	3.8		10.3 10.0	10.2	
G1	Cloudy	Moderate	17:46	Surface	1.0	20.7 20.7	20.7	8.7 8.7	8.7	30.4 30.4	30.4	95.3 95.3	95.3	6.1 6.1	6.1	6.0	1.9 1.9	1.9	1.5	7.5 7.4	7.5	8.0
				Middle	4.1	20.7 20.7	20.7	8.7 8.7	8.7	33.0 33.0	33.0	91.7 91.7	91.7	5.8 5.8	5.8		1.2 1.2	1.2		9.1 9.2	9.2	
				Bottom	7.1	20.7 20.6	20.6	8.7 8.7	8.7	33.1 33.1	33.1	91.6 91.5	91.6	5.8 5.8	5.8	5.8	1.3 1.3	1.3		7.6 7.3	7.5	
G2	Cloudy	Moderate	17:36	Surface	1.0	20.8 20.8	20.8	8.8 8.8	8.8	32.4 32.4	32.4	99.9 99.8	99.9	6.4 6.3	6.3	6.2	1.1 1.1	1.1	2.1	7.2 7.5	7.4	8.1
				Middle	5.0	20.6 20.6	20.6	8.8 8.8	8.8	32.7 32.7	32.7	96.0 96.0	96.0	6.1 6.1	6.1		1.1 1.1	1.1		7.9 7.9	7.9	
				Bottom	9.0	20.5 20.5	20.5	8.8 8.8	8.8	33.3 33.3	33.3	91.7 91.5	91.6	5.8 5.8	5.8	5.8	4.1 4.3	4.2		9.5 8.8	9.2	
G3	Cloudy	Moderate	17:51	Surface	1.1	20.7 20.7	20.7	8.8 8.8	8.8	31.4 31.4	31.4	97.8 97.7	97.8	6.3 6.3	6.3	6.1	1.3 1.4	1.3	1.2	14.8 14.8	14.8	10.0
				Middle	4.1	20.7 20.7	20.7	8.8 8.8	8.8	33.1 33.1	33.1	92.5 92.5	92.5	5.9 5.9	5.9		1.1 1.1	1.1		9.7 9.4	9.6	
				Bottom	7.1	20.6 20.6	20.6	8.8 8.8	8.8	33.1 33.1	33.1	91.6 91.6	91.6	5.8 5.8	5.8	5.8	1.0 1.1	1.0		5.7 5.6	5.7	
G4	Cloudy	Moderate	18:04	Surface	1.1	20.8 20.8	20.8	8.8 8.8	8.8	32.1 32.1	32.1	95.7 95.7	95.7	6.1 6.1	6.1	6.0	1.0 1.0	1.0	1.0	11.0 10.2	10.6	10.7
				Middle	4.1	20.7 20.7	20.7	8.8 8.8	8.8	32.9 32.9	32.9	93.9 94.0	94.0	6.0 6.0	6.0		0.9 0.9	0.9		12.7 12.3	12.5	
				Bottom	7.1	20.6 20.6	20.6	8.8 8.8	8.8	33.1 33.1	33.1	92.0 91.9	92.0	5.8 5.8	5.8	5.8	1.3 1.3	1.3		9.0 8.9	9.0	
M1	Cloudy	Moderate	17:42	Surface	1.1	20.6 20.6	20.6	8.7 8.7	8.7	31.9 32.0	31.9	91.5 91.4	91.5	5.9 5.8	5.8	5.8	4.0 4.0	4.0	4.3	11.4 12.1	11.8	10.2
				Middle	3.1	20.6 20.6	20.6	8.7 8.7	8.7	32.5 32.5	32.5	89.7 89.8	89.8	5.7 5.7	5.7		4.3 4.3	4.3		8.7 9.2	9.0	
				Bottom	5.1	20.6 20.6	20.6	8.7 8.7	8.7	33.0 33.0	33.0	88.8 88.9	88.9	5.7 5.7	5.7	5.7	4.5 4.6	4.5		9.9 9.9	9.9	
M2	Cloudy	Moderate	17:31	Surface	1.0	20.7 20.7	20.7	8.8 8.8	8.8	32.1 32.1	32.1	99.7 99.5	99.6	6.4 6.3	6.4	6.1	1.3 1.3	1.3	2.4	7.9 7.4	7.7	8.3
				Middle	6.0	20.5 20.5	20.5	8.7 8.7	8.7	33.2 33.2	33.2	93.1 93.1	93.1	5.9 5.9	5.9		0.9 0.9	0.9		9.6 9.5	9.6	
				Bottom	10.9	20.5 20.5	20.5	8.7 8.7	8.7	33.3 33.3	33.3	90.8 90.7	90.8	5.8 5.8	5.8	5.8	4.8 5.0	4.9		7.8 7.8	7.8	
M3	Cloudy	Moderate	17:56	Surface	1.0	20.8 20.8	20.8	8.8 8.8	8.8	31.6 31.6	31.6	94.8 94.8	94.8	6.1 6.1	6.1	6.0	1.2 1.2	1.2	2.1	8.9 8.8	8.9	7.1
				Middle	4.1	20.8 20.8	20.8	8.8 8.8	8.8	32.3 32.2	32.3	94.1 94.2	94.2	6.0 6.0	6.0		1.0 1.0	1.0		6.1 6.1	6.1	
				Bottom	7.1	20.6 20.6	20.6	8.8 8.8	8.8	33.2 33.2	33.2	80.6 80.5	80.6	5.1 5.1	5.1	5.1	4.1 4.1	4.1		6.3 6.4	6.4	
M4	Cloudy	Moderate	17:26	Surface	1.1	20.6 20.6	20.6	8.7 8.7	8.7	32.6 32.6	32.6	92.5 92.5	92.5	5.9 5.9	5.9	5.8	1.4 1.4	1.4	1.5	8.3 8.7	8.5	7.5
				Middle	5.1	20.6 20.6	20.6	8.7 8.7	8.7	32.9 32.9	32.9	89.5 89.5	89.5	5.7 5.7	5.7		1.9 1.9	1.9		7.9 7.4	7.7	
				Bottom	9.1	20.5 20.5	20.5	8.7 8.7	8.7	33.1 33.1	33.1	90.1 90.1	90.1	5.7 5.7	5.7	5.7	1.4 1.4	1.4		6.6 6.2	6.4	
M5	Cloudy	Moderate	18:17	Surface	1.1	20.7 20.7	20.7	8.6 8.6	8.6	32.0 32.0	32.0	87.5 87.6	87.6	5.6 5.6	5.6	5.5	1.6 1.6	1.6	2.2	7.1 7.3	7.2	8.4
				Middle	5.5	20.6 20.6	20.6	8.6 8.6	8.6	32.5 32.5	32.5	86.3 86.4	86.4	5.5 5.5	5.5		2.3 2.3	2.3		7.7 7.9	7.8	
				Bottom	10.0	20.6 20.6	20.6	8.6 8.6	8.6	32.7 32.7	32.7	85.7 85.7	85.7	5.5 5.5	5.5	5.5	2.6 2.6	2.6		10.2 9.9	10.1	
M6	Cloudy	Moderate	18:11	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	5.8	- -	-	2.3	- -	-	10.4
				Middle	2.0	20.7 20.7	20.7	8.8 8.8	8.8	32.8 32.8	32.8	90.5 90.5	90.5	5.8 5.8	5.8		2.3 2.3	2.3		10.3 10.5	10.4	
				Bottom	-	- -	-	- -	-	- -	-	- -	-	- -	-	-	- -	-		- -	-	

Remarks: *DA: Depth-Averaged
**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

Appendix I - Action and Limit Levels for Marine Water Quality on 13 December 2019 (Mid-Flood Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU***	***22.2 NTU***
		or 120% of upstream control station's Turbidity at the same tide of the same day ***C1: 7.3 NTU***	or 130% of upstream control station's Turbidity at the same tide of the same day ***C1: 7.9 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L***	***6.9 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C1: 9.5 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C1: 10.3 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L***	***7.4 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C1: 9.5 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C1: 10.3 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L***	***7.9 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C1: 10.4 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C1: 11.2 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 16 December 2019

(Mid-Ebb Tide)

Location	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
C1	Calm	Cloudy	12:25	Surface	1.1	23.8 23.8	23.8	8.5 8.5	8.5	32.8 32.8	32.8	88.2 83.9	86.1	5.8 5.5	5.6	5.6	1.8 1.8	1.8	3.1	5.5 5.3	5.4	5.5
				Middle	8.5	23.5 23.6	23.6	8.5 8.5	8.5	33.6 33.4	33.5	84.7 84.0	84.4	5.6 5.5	5.5		0.9 0.9	0.9		5.3 5.4	5.4	
				Bottom	16.1	23.5 23.5	23.5	8.5 8.5	8.5	33.7 33.7	33.7	84.3 83.9	84.1	5.5 5.5	5.5	5.5	6.5 6.5	6.5		5.8 5.6	5.7	
C2	Calm	Cloudy	11:28	Surface	1.1	23.9 23.8	23.8	8.6 8.7	8.6	32.0 32.0	32.0	83.2 82.4	82.8	5.5 5.4	5.4	5.5	0.5 0.6	0.5	1.0	10.4 10.8	10.6	8.5
				Middle	16.5	23.5 23.5	23.5	8.6 8.7	8.6	33.8 33.6	33.7	83.4 83.5	83.5	5.5 5.5	5.5		1.1 1.0	1.0		5.8 6.0	5.9	
				Bottom	31.1	23.5 23.4	23.5	8.6 8.6	8.6	33.7 33.9	33.8	83.4 83.2	83.3	5.5 5.5	5.5	5.5	1.6 1.5	1.5		8.9 9.2	9.1	
G1	Calm	Cloudy	11:54	Surface	1.1	23.8 23.8	23.8	8.6 8.6	8.6	33.0 33.0	33.0	89.8 88.3	89.1	5.9 5.8	5.8	5.8	1.6 1.6	1.6	1.6	5.8 5.8	5.8	6.8
				Middle	3.7	23.7 23.7	23.7	8.6 8.6	8.6	33.0 33.0	33.0	88.9 88.5	88.7	5.8 5.8	5.8		1.7 1.7	1.7		8.5 8.3	8.4	
				Bottom	6.5	23.7 23.7	23.7	8.6 8.6	8.6	33.1 33.1	33.1	88.0 87.7	87.9	5.8 5.8	5.8	5.8	1.4 1.8	1.6		6.0 6.1	6.1	
G2	Calm	Cloudy	11:45	Surface	1.0	23.6 23.6	23.6	8.6 8.6	8.6	33.2 33.3	33.2	94.0 86.9	90.5	6.2 5.7	5.9	5.9	2.5 2.3	2.4	1.8	12.7 12.9	12.8	8.5
				Middle	5.1	23.7 23.6	23.7	8.7 8.6	8.7	33.2 33.2	33.2	89.4 87.6	88.5	5.9 5.7	5.8		1.5 1.5	1.5		6.1 6.1	6.1	
				Bottom	9.0	23.4 23.5	23.5	8.6 8.6	8.6	34.1 33.8	33.9	85.9 85.9	85.9	5.6 5.6	5.6	5.6	1.5 1.7	1.6		6.6 6.6	6.6	
G3	Calm	Cloudy	11:57	Surface	1.1	23.7 23.7	23.7	8.5 8.6	8.5	31.9 32.7	32.3	86.9 84.7	85.8	5.7 5.6	5.6	5.6	0.7 0.6	0.6	2.5	6.3 6.5	6.4	7.2
				Middle	3.7	23.7 23.8	23.7	8.5 8.5	8.5	33.1 32.6	32.8	84.8 84.4	84.6	5.6 5.5	5.5		0.7 0.7	0.7		6.4 6.3	6.4	
				Bottom	6.5	23.4 23.7	23.6	8.6 8.5	8.6	34.0 33.1	33.6	84.9 84.0	84.5	5.6 5.5	5.5	5.5	6.1 6.1	6.1		8.7 8.7	8.7	
G4	Calm	Cloudy	12:08	Surface	1.1	23.8 23.7	23.8	8.5 8.5	8.5	31.5 32.5	32.0	91.2 86.2	88.7	6.0 5.7	5.9	5.7	1.7 1.7	1.7	1.5	6.0 6.2	6.1	6.7
				Middle	3.7	23.8 23.8	23.8	8.5 8.5	8.5	32.9 33.1	33.0	84.3 83.6	84.0	5.5 5.5	5.5		0.9 1.0	0.9		7.1 7.2	7.2	
				Bottom	6.5	23.6 23.5	23.6	8.5 8.5	8.5	33.6 33.9	33.7	84.0 84.3	84.2	5.5 5.5	5.5	5.5	1.9 2.0	2.0		6.8 7.0	6.9	
M1	Calm	Cloudy	11:49	Surface	1.1	23.8 23.7	23.7	8.6 8.6	8.6	32.2 32.9	32.6	89.0 87.2	88.1	5.9 5.7	5.8	5.8	2.0 2.1	2.0	3.0	6.0 6.1	6.1	5.5
				Middle	3.1	23.7 23.7	23.7	8.6 8.6	8.6	32.6 32.8	32.7	88.0 86.9	87.5	5.8 5.7	5.7		2.2 2.1	2.1		6.2 6.0	6.1	
				Bottom	5.1	23.6 23.6	23.6	8.6 8.6	8.6	33.2 33.2	33.2	87.4 87.0	87.2	5.7 5.7	5.7	5.7	4.9 5.0	5.0		4.4 4.4	4.4	
M2	Calm	Cloudy	11:41	Surface	1.1	23.7 23.6	23.6	8.6 8.6	8.6	33.3 33.3	33.3	90.3 87.1	88.7	5.9 5.7	5.8	5.7	1.1 1.0	1.1	0.9	9.5 9.6	9.6	6.0
				Middle	5.2	23.4 23.6	23.5	8.6 8.6	8.6	34.1 33.6	33.8	85.9 86.7	86.3	5.6 5.7	5.7		0.9 0.9	0.9		3.3 3.4	3.4	
				Bottom	9.5	23.4 23.4	23.4	8.7 8.7	8.7	34.2 34.2	34.2	85.8 86.0	85.9	5.6 5.6	5.6	5.6	0.9 0.9	0.9		5.1 5.0	5.1	
M3	Calm	Cloudy	12:04	Surface	1.0	23.7 23.7	23.7	8.5 8.5	8.5	31.6 33.0	32.3	87.0 84.1	85.6	5.8 5.5	5.6	5.6	1.7 1.8	1.8	1.0	4.1 4.0	4.1	4.1
				Middle	3.7	23.7 23.7	23.7	8.5 8.5	8.5	33.0 32.8	32.9	84.3 83.8	84.1	5.5 5.5	5.5		0.4 0.4	0.4		3.7 3.5	3.6	
				Bottom	6.5	23.5 23.5	23.5	8.5 8.5	8.5	33.9 34.0	33.9	83.7 83.7	83.7	5.5 5.5	5.5	5.5	1.0 1.0	1.0		4.4 4.6	4.5	
M4	Calm	Cloudy	11:35	Surface	1.1	23.7 23.6	23.7	8.6 8.6	8.6	32.5 33.2	32.9	83.8 84.4	84.1	5.5 5.5	5.5	5.5	0.7 0.7	0.7	1.2	7.3 7.4	7.4	8.0
				Middle	5.0	23.6 23.6	23.6	8.7 8.7	8.7	33.4 33.3	33.4	84.4 84.2	84.3	5.5 5.5	5.5		1.2 1.2	1.2		9.7 9.7	9.7	
				Bottom	9.0	23.5 23.6	23.6	8.7 8.6	8.6	33.6 33.6	33.6	84.4 85.1	84.8	5.5 5.6	5.6	5.6	1.6 1.6	1.6		6.9 7.0	7.0	
M5	Calm	Cloudy	12:20	Surface	1.1	23.7 23.7	23.7	8.5 8.5	8.5	33.0 33.1	33.0	88.3 85.3	86.8	5.8 5.6	5.7	5.6	1.2 1.2	1.2	3.3	6.2 6.4	6.3	8.1
				Middle	5.5	23.7 23.7	23.7	8.5 8.5	8.5	33.1 33.1	33.1	85.6 85.1	85.4	5.6 5.6	5.6		3.5 3.4	3.4		6.1 6.3	6.2	
				Bottom	10.0	23.6 23.6	23.6	8.5 8.5	8.5	33.3 33.3	33.3	84.9 84.7	84.8	5.6 5.6	5.6	5.6	5.5 4.8	5.2		11.7 11.8	11.8	
M6	Calm	Cloudy	12:13	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	5.9	- -	-	2.3	- -	-	4.4
				Middle	2.1	23.8 23.7	23.8	8.5 8.5	8.5	32.4 32.4	32.4	90.6 88.9	89.8	6.0 5.9	5.9		2.3 2.3	2.3		4.3 4.4	4.4	
				Bottom	-	- -	-	- -	-	- -	-	- -	-	- -	-	-	- -	-		- -	-	

Remarks: *DA: Depth-Averaged
**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

Appendix I - Action and Limit Levels for Marine Water Quality on 16 December 2019 (Mid-Ebb Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU***	***22.2 NTU***
		or 120% of upstream control station's Turbidity at the same tide of the same day ***C2: 1.8 NTU***	or 130% of upstream control station's Turbidity at the same tide of the same day ***C2: 2.0 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L***	***6.9 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C2: 12.7 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C2: 13.8 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L***	***7.4 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C2: 12.7 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C2: 13.8 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L***	***7.9 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C2: 10.9 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C2: 11.8 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 16 December 2019

(Mid-Flood Tide)

Location	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
C1	Calm	Cloudy	17:39	Surface	1.0	24.0 23.9	24.0	8.4 8.4	8.4	31.7 31.9	31.8	84.0 81.0	82.5	5.5 5.3	5.4	5.4	2.3 2.7	2.5	3.1	24.5 25.4	25.0	14.5
				Middle	8.9	23.8 23.8	23.8	8.5 8.4	8.4	32.5 32.5	32.5	80.8 80.4	80.6	5.3 5.3	5.3		3.4 3.2	3.3		6.0 6.3	6.2	
				Bottom	17.0	23.5 23.2	23.4	8.5 8.5	8.5	33.5 34.4	34.0	81.2 81.1	81.2	5.3 5.3	5.3	5.3	3.3 3.7	3.5		12.4 12.1	12.3	
C2	Calm	Cloudy	16:38	Surface	1.0	24.3 24.2	24.3	8.6 8.6	8.6	30.7 30.8	30.8	84.5 81.5	83.0	5.6 5.4	5.5	5.4	2.9 3.3	3.1	4.7	5.5 5.6	5.6	6.7
				Middle	15.9	23.7 23.6	23.7	8.6 8.6	8.6	32.9 33.1	33.0	79.8 80.6	80.2	5.2 5.3	5.3		5.6 5.3	5.5		7.3 7.1	7.2	
				Bottom	31.0	23.6 23.6	23.6	8.6 8.6	8.6	33.1 33.1	33.1	80.2 80.6	80.4	5.3 5.3	5.3	5.3	5.9 5.4	5.7		7.4 7.3	7.4	
G1	Calm	Cloudy	17:04	Surface	1.0	24.0 23.9	23.9	8.5 8.5	8.5	32.2 32.4	32.3	93.3 89.6	91.5	6.1 5.9	6.0	5.9	1.7 1.9	1.8	1.8	12.8 12.8	12.8	8.2
				Middle	4.0	23.9 23.9	23.9	8.5 8.5	8.5	32.5 32.6	32.6	88.7 90.0	89.4	5.8 5.9	5.9		1.5 1.8	1.6		5.5 5.8	5.7	
				Bottom	7.0	23.8 23.8	23.8	8.5 8.4	8.5	33.0 32.8	32.9	87.7 88.2	88.0	5.7 5.8	5.8	5.8	1.8 2.1	1.9		6.2 6.3	6.3	
G2	Calm	Cloudy	16:53	Surface	1.0	24.0 23.9	23.9	8.6 8.6	8.6	32.6 32.8	32.7	91.9 87.4	89.7	6.0 5.7	5.9	5.8	2.4 2.3	2.3	2.3	6.9 6.8	6.9	7.9
				Middle	5.0	23.9 23.8	23.8	8.6 8.6	8.6	32.8 33.0	32.9	89.4 86.7	88.1	5.9 5.7	5.8		2.3 2.2	2.2		5.9 5.8	5.9	
				Bottom	9.0	23.8 23.7	23.7	8.6 8.5	8.5	33.2 33.2	33.2	86.7 85.6	86.2	5.7 5.6	5.6	5.6	2.6 2.3	2.4		10.9 11.3	11.1	
G3	Calm	Cloudy	17:09	Surface	1.0	24.2 23.8	24.0	8.5 8.5	8.5	31.3 31.6	31.4	92.9 89.7	91.3	6.1 5.9	6.0	6.0	1.8 2.1	1.9	1.6	5.8 6.1	6.0	6.9
				Middle	4.0	23.9 23.8	23.8	8.5 8.5	8.5	32.7 32.7	32.7	91.7 89.8	90.8	6.0 5.9	6.0		1.2 1.2	1.2		6.3 6.4	6.4	
				Bottom	7.0	23.7 23.7	23.7	8.5 8.5	8.5	33.1 33.0	33.0	84.1 83.6	83.9	5.5 5.5	5.5	5.5	1.7 1.6	1.6		8.2 8.4	8.3	
G4	Calm	Cloudy	17:21	Surface	1.0	23.9 24.1	24.0	8.3 8.3	8.3	32.2 31.2	31.7	91.7 93.7	92.7	6.0 6.2	6.1	6.0	2.9 2.4	2.6	2.9	7.1 7.2	7.2	6.9
				Middle	4.5	23.8 23.8	23.8	8.3 8.3	8.3	32.6 32.8	32.7	89.9 89.6	89.8	5.9 5.9	5.9		2.8 2.8	2.8		7.5 7.3	7.4	
				Bottom	7.0	23.7 23.7	23.7	8.3 8.3	8.3	33.1 33.2	33.1	84.8 83.0	83.9	5.6 5.4	5.5	5.5	3.1 3.6	3.3		6.2 6.1	6.2	
M1	Calm	Cloudy	16:59	Surface	1.0	24.2 23.8	24.0	8.5 8.5	8.5	31.8 32.8	32.3	92.9 85.3	89.1	6.1 5.6	5.8	5.8	3.1 3.3	3.2	3.2	6.6 6.5	6.6	6.1
				Middle	3.0	24.0 23.9	23.9	8.5 8.5	8.5	32.3 32.6	32.4	89.6 86.1	87.9	5.9 5.6	5.8		3.0 3.0	3.0		5.7 5.6	5.7	
				Bottom	4.9	23.8 23.8	23.8	8.5 8.5	8.5	32.9 32.9	32.9	85.1 84.8	85.0	5.6 5.6	5.6	5.6	3.3 3.7	3.5		6.0 6.2	6.1	
M2	Calm	Cloudy	16:48	Surface	0.9	24.1 23.8	23.9	8.7 8.6	8.6	32.4 33.0	32.7	93.4 87.1	90.3	6.1 5.7	5.9	5.9	1.4 1.3	1.3	1.6	6.7 6.6	6.7	8.7
				Middle	6.0	23.7 23.8	23.8	8.7 8.6	8.6	33.1 32.9	33.0	88.3 88.7	88.5	5.8 5.8	5.8		0.7 0.9	0.8		11.4 11.4	11.4	
				Bottom	11.0	23.5 23.5	23.5	8.7 8.6	8.6	33.8 34.0	33.9	85.9 83.8	84.9	5.6 5.5	5.6	5.6	2.6 3.0	2.8		8.2 8.0	8.1	
M3	Calm	Cloudy	17:17	Surface	1.0	23.9 23.8	23.8	8.4 8.4	8.4	31.8 32.7	32.2	91.7 88.1	89.9	6.1 5.8	5.9	5.7	3.1 2.8	2.9	2.9	8.6 8.7	8.7	7.1
				Middle	4.0	23.8 23.8	23.8	8.4 8.4	8.4	32.7 32.7	32.7	85.5 83.9	84.7	5.6 5.5	5.6		2.5 2.7	2.6		7.5 7.6	7.6	
				Bottom	7.0	23.8 23.7	23.7	8.4 8.4	8.4	33.0 33.2	33.1	84.7 82.2	83.5	5.5 5.4	5.5	5.5	3.1 3.0	3.0		5.0 5.0	5.0	
M4	Calm	Cloudy	16:43	Surface	1.0	24.2 23.9	24.0	8.6 8.6	8.6	31.5 32.0	31.7	86.2 80.4	83.3	5.7 5.3	5.5	5.4	3.9 3.7	3.8	3.8	6.5 6.5	6.5	6.4
				Middle	4.9	23.8 23.8	23.8	8.6 8.7	8.6	32.2 32.4	32.3	80.8 80.6	80.7	5.3 5.3	5.3		3.4 3.8	3.6		6.6 6.7	6.7	
				Bottom	9.0	23.8 23.8	23.8	8.6 8.6	8.6	32.7 32.7	32.7	82.4 82.4	82.4	5.4 5.4	5.4	5.4	4.2 3.9	4.0		6.0 6.0	6.0	
M5	Calm	Cloudy	17:33	Surface	1.0	24.1 23.9	24.0	8.4 8.4	8.4	32.0 32.1	32.0	87.3 81.4	84.4	5.7 5.3	5.5	5.5	3.0 2.7	2.9	2.6	8.5 8.7	8.6	8.3
				Middle	6.0	23.9 23.9	23.9	8.4 8.4	8.4	32.1 32.2	32.1	82.9 81.2	82.1	5.4 5.3	5.4		2.7 2.3	2.5		9.4 9.6	9.5	
				Bottom	11.1	23.9 23.9	23.9	8.4 8.4	8.4	32.1 32.2	32.2	81.4 81.2	81.3	5.3 5.3	5.3	5.3	2.5 2.7	2.6		6.6 6.8	6.7	
M6	Calm	Cloudy	17:27	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	6.0	- -	-	1.9	- -	-	7.6
				Middle	2.0	24.0 23.8	23.9	8.3 8.3	8.3	31.9 32.7	32.3	93.1 89.9	91.5	6.1 5.9	6.0		1.8 2.0	1.9		7.6 7.6	7.6	
				Bottom	-	- -	-	- -	-	- -	-	- -	-	- -	-	-	- -	-		- -	-	

Remarks: *DA: Depth-Averaged
**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

Appendix I - Action and Limit Levels for Marine Water Quality on 16 December 2019 (Mid-Flood Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU***	***22.2 NTU***
		or 120% of upstream control station's Turbidity at the same tide of the same day ***C1: 4.2 NTU***	or 130% of upstream control station's Turbidity at the same tide of the same day ***C1: 4.6 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L***	***6.9 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C1: 29.9 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C1: 32.4 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L***	***7.4 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C1: 29.9 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C1: 32.4 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L***	***7.9 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C1: 14.7 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C1: 15.9 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 18 December 2019

(Mid-Ebb Tide)

Location	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (^{o}C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
C1	Calm	Sunny	17:38	Surface	1.0	20.1 20.1	20.1	11.2 11.2	11.2	33.8 32.8	33.3	98.1 97.9	98.0	7.3 7.3	7.3	7.2	1.6 1.4	1.5	1.7	4.5 4.6	4.6	4.4
				Middle	9.0	20.0 20.1	20.0	11.2 11.2	11.2	33.9 33.9	33.9	95.4 97.1	96.3	7.1 7.2	7.2		1.8 1.5	1.7		4.6 4.7	4.7	
				Bottom	17.0	20.0 20.0	20.0	11.2 11.2	11.2	33.9 33.9	33.9	93.0 93.4	93.2	6.9 7.0	6.9	6.9	2.1 1.9	2.0		4.0 4.1	4.1	
C2	Calm	Sunny	16:20	Surface	1.1	20.4 20.6	20.5	11.8 11.4	11.6	33.9 33.9	33.9	98.6 98.6	98.6	7.3 7.3	7.3	7.1	1.3 1.5	1.4	2.1	4.2 4.2	4.2	10.8
				Middle	16.1	20.2 20.2	20.2	11.7 11.5	11.6	34.0 34.0	34.0	92.5 93.1	92.8	6.9 6.9	6.9		2.0 2.5	2.2		22.5 23.3	22.9	
				Bottom	22.2	20.1 20.2	20.2	11.6 11.5	11.5	34.0 34.0	34.0	91.0 91.2	91.1	6.8 6.8	6.8	6.8	2.4 2.9	2.6		5.2 5.3	5.3	
G1	Calm	Sunny	17:01	Surface	1.0	20.9 20.8	20.9	11.3 11.2	11.2	33.9 33.6	33.7	98.3 97.8	98.1	7.2 7.2	7.2	7.1	2.0 1.9	1.9	2.6	5.1 5.4	5.3	6.1
				Middle	4.1	20.3 20.5	20.4	11.3 11.2	11.3	33.9 33.9	33.9	93.9 96.1	95.0	7.0 7.1	7.0		2.9 2.7	2.8		5.8 5.9	5.9	
				Bottom	7.1	20.2 20.2	20.2	11.3 11.3	11.3	34.0 34.0	34.0	93.5 93.8	93.7	6.9 7.0	7.0	7.0	3.0 3.1	3.0		7.4 7.1	7.3	
G2	Calm	Sunny	16:44	Surface	1.0	20.8 20.8	20.8	11.3 11.3	11.3	33.9 33.8	33.9	97.8 97.4	97.6	7.2 7.2	7.2	7.1	2.1 2.1	2.1	2.7	10.4 10.5	10.5	8.9
				Middle	5.0	20.5 20.5	20.5	11.4 11.4	11.4	33.9 33.9	33.9	95.7 95.5	95.6	7.1 7.1	7.1		2.9 2.9	2.9		7.6 7.8	7.7	
				Bottom	9.0	20.3 20.3	20.3	11.4 11.4	11.4	34.0 34.0	34.0	93.4 93.0	93.2	6.9 6.9	6.9	6.9	3.4 2.9	3.2		8.7 8.4	8.6	
G3	Calm	Sunny	17:06	Surface	1.1	21.1 21.0	21.0	11.2 11.2	11.2	33.7 32.4	33.0	99.0 98.6	98.8	7.2 7.3	7.3	7.2	1.6 1.7	1.6	1.9	4.2 4.2	4.2	5.6
				Middle	4.0	20.7 20.6	20.6	11.2 11.2	11.2	33.9 33.6	33.7	97.6 97.7	97.7	7.2 7.2	7.2		2.1 1.9	2.0		4.1 4.3	4.2	
				Bottom	7.0	20.2 20.2	20.2	11.3 11.3	11.3	34.0 34.0	34.0	94.8 96.1	95.5	7.0 7.1	7.1	7.1	2.1 1.9	2.0		8.3 8.4	8.4	
G4	Calm	Sunny	17:17	Surface	1.1	20.7 20.8	20.8	11.2 11.2	11.2	33.9 33.9	33.9	99.0 99.0	99.0	7.3 7.3	7.3	7.2	1.5 1.4	1.4	2.2	6.6 6.8	6.7	6.9
				Middle	4.0	20.4 20.4	20.4	11.2 11.2	11.2	34.0 33.9	34.0	96.9 96.4	96.7	7.2 7.1	7.1		1.7 1.8	1.7		8.2 8.3	8.3	
				Bottom	7.0	20.2 20.2	20.2	11.3 11.3	11.3	34.0 34.0	34.0	93.2 93.4	93.3	6.9 6.9	6.9	6.9	3.6 3.0	3.3		5.7 6.0	5.9	
M1	Calm	Sunny	16:52	Surface	1.2	20.5 20.5	20.5	11.3 11.3	11.3	33.4 33.9	33.7	95.4 95.2	95.3	7.1 7.0	7.0	7.0	6.0 5.0	5.5	4.5	7.4 7.4	7.4	10.7
				Middle	3.1	20.6 20.5	20.6	11.3 11.3	11.3	33.9 33.9	33.9	95.8 95.1	95.5	7.1 7.0	7.0		3.7 4.1	3.9		12.7 12.5	12.6	
				Bottom	5.0	20.6 20.5	20.6	11.3 11.3	11.3	33.9 33.9	33.9	94.5 94.7	94.6	7.0 7.0	7.0	7.0	3.9 4.5	4.2		11.9 12.2	12.1	
M2	Calm	Sunny	16:36	Surface	1.1	20.4 20.3	20.3	11.4 11.4	11.4	33.5 33.0	33.2	95.8 96.0	95.9	7.1 7.1	7.1	7.1	2.0 1.7	1.8	1.9	7.7 7.9	7.8	6.4
				Middle	5.1	20.2 20.3	20.3	11.5 11.4	11.4	33.9 33.9	33.9	95.7 95.6	95.7	7.1 7.1	7.1		1.9 1.8	1.8		5.4 5.6	5.5	
				Bottom	8.9	20.2 20.2	20.2	11.4 11.4	11.4	34.0 34.0	34.0	94.4 94.4	94.4	7.0 7.0	7.0	7.0	2.0 2.0	2.0		6.0 5.8	5.9	
M3	Calm	Sunny	17:11	Surface	1.1	21.1 21.1	21.1	11.2 11.2	11.2	33.4 33.6	33.5	98.8 98.4	98.6	7.2 7.2	7.2	7.2	1.6 1.6	1.6	2.6	5.8 5.8	5.8	6.6
				Middle	4.1	20.4 20.4	20.4	11.3 11.2	11.3	33.9 33.9	33.9	96.2 96.8	96.5	7.1 7.2	7.1		4.9 4.1	4.5		9.2 8.9	9.1	
				Bottom	7.0	20.2 20.2	20.2	11.3 11.3	11.3	34.0 33.9	34.0	95.8 96.2	96.0	7.1 7.1	7.1	7.1	1.8 1.9	1.9		4.9 4.9	4.9	
M4	Calm	Sunny	16:29	Surface	1.1	20.3 20.2	20.2	11.5 11.4	11.5	33.5 33.0	33.2	97.0 96.3	96.7	7.2 7.2	7.2	7.2	1.8 1.8	1.8	1.8	8.7 8.7	8.7	7.5
				Middle	5.1	20.3 20.2	20.2	11.5 11.4	11.5	33.8 33.9	33.9	96.4 96.1	96.3	7.2 7.1	7.1		1.8 1.7	1.7		6.1 6.3	6.2	
				Bottom	9.0	20.2 20.3	20.3	11.5 11.4	11.4	33.9 34.0	33.9	95.8 94.1	95.0	7.1 7.0	7.0	7.0	1.8 1.8	1.8		7.4 7.7	7.6	
M5	Calm	Sunny	17:31	Surface	1.0	20.3 20.3	20.3	11.2 11.2	11.2	33.9 33.2	33.6	93.2 90.5	91.9	6.9 6.7	6.8	6.7	1.8 1.9	1.8	2.3	11.5 11.0	11.3	7.4
				Middle	5.6	20.2 20.3	20.3	11.2 11.2	11.2	34.0 33.9	34.0	90.0 89.5	89.8	6.7 6.6	6.7		2.3 2.2	2.2		5.5 5.4	5.5	
				Bottom	10.0	20.2 20.2	20.2	11.2 11.2	11.2	34.0 34.0	34.0	88.6 88.0	88.3	6.6 6.5	6.6	6.6	2.9 2.8	2.9		5.5 5.4	5.5	
M6	Calm	Sunny	17:26	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	6.8	- -	-	2.1	- -	-	3.9
				Middle	2.2	20.4 20.4	20.4	11.2 11.2	11.2	34.0 34.0	34.0	91.9 91.9	91.9	6.8 6.8	6.8		2.1 2.0	2.1		3.8 3.9	3.9	
				Bottom	-	- -	-	- -	-	- -	-	- -	-	- -	-	-	- -	-		- -	-	

Remarks: *DA: Depth-Averaged
**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

Appendix I - Action and Limit Levels for Marine Water Quality on 18 December 2019 (Mid-Ebb Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU*** or 120% of upstream control station's Turbidity at the same tide of the same day ***C2: 3.2 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C2: 3.4 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 5.0 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 5.5 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 5.0 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 5.5 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 6.3 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 6.8 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. (Not used)
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 18 December 2019

(Mid-Flood Tide)

Location	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
C1	Calm	Overcast	12:52	Surface	1.4	20.1 20.2	20.2	11.4 11.3	11.4	33.7 33.9	33.8	97.8 98.7	98.3	7.3 7.3	7.3	7.3	1.5 1.4	1.4	2.3	3.2 3.2	3.2	5.1
				Middle	9.0	19.8 19.8	19.8	11.5 11.4	11.4	33.9 33.9	33.9	97.4 97.2	97.3	7.3 7.3	7.3		1.8 1.8	1.8		4.1 4.1	4.1	
				Bottom	17.0	19.8 19.8	19.8	11.4 11.4	11.4	33.9 33.9	33.9	95.1 95.1	95.1	7.1 7.1	7.1	7.1	3.5 3.6	3.6		8.0 7.7	7.9	
C2	Calm	Overcast	11:22	Surface	1.0	20.3 20.3	20.3	11.5 11.4	11.4	33.9 34.0	34.0	94.5 93.6	94.1	7.0 6.9	7.0	6.8	2.3 2.2	2.2	2.5	5.9 5.7	5.8	4.5
				Middle	16.0	20.2 20.3	20.2	11.3 11.3	11.3	34.0 34.0	34.0	90.3 88.3	89.3	6.7 6.5	6.6		2.0 2.2	2.1		4.3 4.1	4.2	
				Bottom	31.0	20.0 20.0	20.0	11.3 11.4	11.3	34.0 34.0	34.0	89.9 89.8	89.9	6.7 6.7	6.7	6.7	3.4 3.0	3.2		3.5 3.6	3.6	
G1	Calm	Overcast	12:17	Surface	1.1	20.5 20.6	20.5	11.5 11.5	11.5	33.8 33.8	33.8	95.8 95.8	95.8	7.1 7.1	7.1	7.1	2.2 2.0	2.1	2.7	5.8 6.0	5.9	6.7
				Middle	4.0	20.2 20.2	20.2	11.6 11.5	11.6	33.7 33.9	33.8	96.8 95.0	95.9	7.2 7.0	7.1		2.6 2.8	2.7		6.4 6.5	6.5	
				Bottom	7.0	20.1 20.2	20.1	11.6 11.6	11.6	33.9 34.0	33.9	96.7 94.4	95.6	7.2 7.0	7.1	7.1	3.1 3.2	3.2		7.9 7.7	7.8	
G2	Calm	Overcast	12:01	Surface	1.1	20.2 20.2	20.2	11.4 11.4	11.4	34.0 33.8	33.9	94.9 94.3	94.6	7.0 7.0	7.0	7.0	3.8 3.5	3.6	4.0	8.2 8.2	8.2	7.2
				Middle	5.0	20.1 20.1	20.1	11.4 11.4	11.4	34.0 34.0	34.0	93.6 93.2	93.4	6.9 6.9	6.9		3.1 3.0	3.0		5.8 5.8	5.8	
				Bottom	9.1	20.1 20.1	20.1	11.4 11.4	11.4	34.0 34.0	34.0	91.4 91.4	91.4	6.8 6.8	6.8	6.8	5.1 5.5	5.3		7.4 7.6	7.5	
G3	Calm	Overcast	12:22	Surface	1.0	20.8 20.8	20.8	11.5 11.5	11.5	32.9 32.8	32.9	95.8 96.3	96.1	7.1 7.1	7.1	7.1	1.8 1.9	1.9	2.0	6.3 6.3	6.3	5.3
				Middle	4.1	20.2 20.2	20.2	11.6 11.6	11.6	33.9 33.9	33.9	95.7 95.4	95.6	7.1 7.1	7.1		1.9 2.0	1.9		5.4 5.6	5.5	
				Bottom	7.0	20.1 20.1	20.1	11.6 11.6	11.6	34.0 33.9	34.0	94.9 95.4	95.2	7.0 7.1	7.1	7.1	2.1 2.2	2.1		4.1 4.3	4.2	
G4	Calm	Overcast	12:33	Surface	1.1	20.8 20.9	20.9	11.4 11.4	11.4	33.7 33.0	33.4	95.1 94.4	94.8	7.0 7.0	7.0	7.0	1.7 1.6	1.6	2.2	4.2 4.3	4.3	5.1
				Middle	4.0	20.2 20.2	20.2	11.5 11.4	11.5	34.0 33.9	33.9	95.7 95.4	95.6	7.1 7.1	7.1		1.7 1.7	1.7		6.1 6.4	6.3	
				Bottom	7.0	20.1 20.1	20.1	11.5 11.5	11.5	34.0 34.0	34.0	93.1 93.9	93.5	6.9 7.0	6.9	6.9	3.1 3.3	3.2		4.8 4.9	4.9	
M1	Calm	Overcast	12:08	Surface	1.1	20.8 20.9	20.9	11.6 11.5	11.5	34.0 33.1	33.5	94.8 94.0	94.4	7.0 6.9	6.9	6.9	3.4 2.6	3.0	4.0	9.6 9.6	9.6	9.9
				Middle	3.0	20.8 20.3	20.5	11.6 11.6	11.6	33.6 33.9	33.7	94.2 92.1	93.2	6.9 6.8	6.9		3.7 4.2	4.0		9.9 10.0	10.0	
				Bottom	5.0	20.2 20.2	20.2	11.6 11.6	11.6	33.9 34.0	33.9	91.2 91.4	91.3	6.8 6.8	6.8	6.8	5.2 5.2	5.2		10.2 10.2	10.2	
M2	Calm	Overcast	11:55	Surface	1.1	20.3 20.5	20.4	11.4 11.4	11.4	33.8 33.8	33.8	96.1 95.4	95.8	7.1 7.1	7.1	7.0	2.6 2.1	2.3	4.6	7.5 7.4	7.5	11.8
				Middle	5.5	20.1 20.1	20.1	11.4 11.4	11.4	33.9 33.9	33.9	91.7 92.2	92.0	6.8 6.9	6.8		4.0 4.2	4.1		11.7 11.5	11.6	
				Bottom	10.1	20.1 20.1	20.1	11.4 11.4	11.4	34.0 34.0	34.0	90.9 90.9	90.9	6.8 6.8	6.8	6.8	7.4 7.4	7.4		16.3 16.5	16.4	
M3	Calm	Overcast	12:26	Surface	1.0	20.9 21.0	21.0	11.4 11.4	11.4	32.0 32.6	32.3	95.0 92.3	93.7	7.0 6.8	6.9	6.9	1.4 1.3	1.3	1.9	7.0 6.9	7.0	6.0
				Middle	4.1	20.3 20.5	20.4	11.5 11.4	11.4	33.9 33.6	33.8	93.7 92.6	93.2	6.9 6.9	6.9		2.0 1.9	1.9		5.4 5.3	5.4	
				Bottom	7.0	20.2 20.1	20.2	11.5 11.5	11.5	34.0 34.0	34.0	93.9 93.5	93.7	7.0 6.9	7.0	7.0	2.5 2.4	2.5		5.7 5.5	5.6	
M4	Calm	Overcast	11:49	Surface	1.0	20.4 20.5	20.4	11.6 11.4	11.5	33.9 33.8	33.9	95.6 95.2	95.4	7.1 7.0	7.1	7.0	2.3 2.1	2.2	3.1	4.2 4.2	4.2	8.1
				Middle	5.0	20.0 20.0	20.0	11.6 11.4	11.5	34.0 34.0	34.0	91.9 92.6	92.3	6.8 6.9	6.9		3.4 3.6	3.5		11.6 12.1	11.9	
				Bottom	9.0	20.0 20.0	20.0	11.5 11.4	11.5	34.0 34.0	34.0	91.4 91.7	91.6	6.8 6.8	6.8	6.8	3.5 4.0	3.8		8.1 8.2	8.2	
M5	Calm	Overcast	12:46	Surface	1.1	20.5 20.3	20.4	11.4 11.4	11.4	33.8 34.0	33.9	91.5 90.1	90.8	6.8 6.7	6.7	6.7	2.1 2.3	2.2	2.9	9.5 9.3	9.4	9.3
				Middle	6.1	20.1 20.2	20.1	11.4 11.4	11.4	33.9 34.0	34.0	89.8 89.5	89.7	6.7 6.6	6.7		3.0 3.0	3.0		10.3 10.3	10.3	
				Bottom	11.0	20.1 20.1	20.1	11.4 11.4	11.4	34.0 34.0	34.0	89.3 89.1	89.2	6.6 6.6	6.6	6.6	3.4 3.5	3.4		8.3 8.1	8.2	
M6	Calm	Overcast	12:39	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	6.9	- -	-	2.2	- -	-	7.1
				Middle	2.2	20.3 20.3	20.3	11.4 11.4	11.4	33.9 33.9	33.9	93.5 93.7	93.6	6.9 6.9	6.9		2.3 2.1	2.2		7.1 7.1	7.1	
				Bottom	-	- -	-	- -	-	- -	-	- -	-	- -	-	-	- -	-		- -	-	

Remarks: *DA: Depth-Averaged
**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

Appendix I - Action and Limit Levels for Marine Water Quality on 18 December 2019 (Mid-Flood Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU*** or 120% of upstream control station's Turbidity at the same tide of the same day ***C1: 4.3 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C1: 4.7 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 3.8 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 4.2 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 3.8 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 4.2 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 9.4 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 10.2 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. (Not used)
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 12/20/2019

(Mid-Ebb Tide)

Location	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
C1	Moderate	Cloudy	8:44	Surface	1.1	19.9 19.9	19.9	8.5 8.5	8.5	32.9 32.9	32.9	100.2 100.2	100.2	7.5 7.5	7.5	7.5	1.1 1.1	1.1	1.5	6.6 6.8	6.7	5.7
				Middle	9.0	19.9 19.9	19.9	8.5 8.5	8.5	33.9 33.9	33.9	99.3 99.4	99.4	7.4 7.4	7.4		1.2 1.2	1.2		5.0 4.8	4.9	
				Bottom	17.0	19.9 19.9	19.9	8.5 8.5	8.5	33.9 33.9	33.9	97.1 97.0	97.1	7.3 7.2	7.2	7.2	2.1 2.2	2.1		5.5 5.7	5.6	
C2	Moderate	Cloudy	7:47	Surface	1.0	20.0 20.0	20.0	8.4 8.4	8.4	33.8 33.8	33.8	97.5 97.6	97.6	7.3 7.3	7.3	7.2	1.4 1.4	1.4	1.5	5.6 5.9	5.8	5.5
				Middle	16.0	19.9 19.9	19.9	8.5 8.5	8.5	33.9 33.9	33.9	96.5 96.5	96.5	7.2 7.2	7.2		1.5 1.5	1.5		4.9 4.7	4.8	
				Bottom	31.0	19.9 19.9	19.9	8.5 8.5	8.5	33.9 33.9	33.9	95.5 95.5	95.5	7.1 7.1	7.1	7.1	1.7 1.7	1.7		5.7 6.0	5.9	
G1	Moderate	Cloudy	8:13	Surface	1.1	20.4 20.4	20.4	8.5 8.5	8.5	32.6 32.6	32.6	98.4 98.1	98.3	7.3 7.3	7.3	7.2	1.8 1.7	1.8	2.1	4.5 4.2	4.4	5.6
				Middle	4.0	20.2 20.2	20.2	8.5 8.5	8.5	33.7 33.5	33.6	94.7 94.8	94.8	7.0 7.0	7.0		2.4 2.4	2.4		6.6 6.6	6.6	
				Bottom	7.3	20.0 20.0	20.0	8.5 8.5	8.5	33.8 33.8	33.8	95.1 95.2	95.2	7.1 7.1	7.1	7.1	2.1 2.0	2.0		5.7 6.0	5.9	
G2	Moderate	Cloudy	8:04	Surface	0.9	20.2 20.2	20.2	8.5 8.5	8.5	33.2 33.3	33.2	98.4 98.3	98.4	7.3 7.3	7.3	7.3	2.1 2.1	2.1	2.1	5.3 5.4	5.4	5.2
				Middle	4.1	20.0 20.2	20.1	8.5 8.5	8.5	33.7 33.3	33.5	96.7 98.2	97.5	7.2 7.3	7.3		2.1 2.1	2.1		5.6 5.1	5.4	
				Bottom	7.2	20.0 20.0	20.0	8.5 8.5	8.5	33.8 33.8	33.8	96.6 96.6	96.6	7.2 7.2	7.2	7.2	2.1 2.1	2.1		4.9 4.9	4.9	
G3	Moderate	Cloudy	8:16	Surface	0.8	20.6 20.6	20.6	8.5 8.5	8.5	32.9 32.9	32.9	97.2 96.8	97.0	7.2 7.2	7.2	6.9	5.8 5.7	5.8	4.8	21.3 20.9	21.1	11.8
				Middle	4.0	20.3 20.3	20.3	8.5 8.5	8.5	33.7 33.7	33.7	89.9 90.0	90.0	6.7 6.7	6.7		5.8 6.1	5.9		8.0 7.7	7.9	
				Bottom	7.1	20.0 20.0	20.0	8.5 8.5	8.5	33.9 33.9	33.9	91.6 91.9	91.8	6.8 6.8	6.8	6.8	2.9 2.9	2.9		6.1 6.5	6.3	
G4	Moderate	Cloudy	8:27	Surface	1.0	20.4 20.4	20.4	8.6 8.6	8.6	33.3 33.3	33.3	95.5 95.3	95.4	7.1 7.1	7.1	7.1	1.9 1.9	1.9	2.0	5.0 5.3	5.2	4.9
				Middle	4.2	20.0 20.0	20.0	8.6 8.5	8.6	33.9 33.9	33.9	94.8 94.7	94.8	7.1 7.1	7.1		2.1 2.1	2.1		5.0 4.9	5.0	
				Bottom	6.9	20.0 20.0	20.0	8.6 8.5	8.6	33.9 33.9	33.9	95.3 95.3	95.3	7.1 7.1	7.1	7.1	2.0 2.0	2.0		4.4 4.5	4.5	
M1	Moderate	Cloudy	8:08	Surface	1.0	19.9 20.0	20.0	8.5 8.5	8.5	33.3 33.2	33.3	98.2 98.0	98.1	7.4 7.3	7.3	7.2	1.9 2.0	2.0	2.8	5.2 5.1	5.2	4.9
				Middle	3.0	20.2 20.2	20.2	8.5 8.5	8.5	33.8 33.8	33.8	94.4 94.4	94.4	7.0 7.0	7.0		3.0 3.0	3.0		5.5 5.5	5.5	
				Bottom	4.9	20.1 20.1	20.1	8.5 8.5	8.5	33.8 33.8	33.8	94.2 94.2	94.2	7.0 7.0	7.0	7.0	3.4 3.4	3.4		4.1 3.9	4.0	
M2	Moderate	Cloudy	8:00	Surface	0.9	20.2 20.2	20.2	8.5 8.5	8.5	33.8 33.8	33.8	98.7 98.6	98.7	7.3 7.3	7.3	7.3	3.0 2.9	2.9	2.1	4.5 4.5	4.5	7.6
				Middle	5.0	20.1 20.1	20.1	8.5 8.5	8.5	33.9 33.9	33.9	96.8 96.8	96.8	7.2 7.2	7.2		1.7 1.7	1.7		8.4 8.8	8.6	
				Bottom	8.0	20.1 20.1	20.1	8.5 8.5	8.5	33.9 33.9	33.9	96.7 96.7	96.7	7.2 7.2	7.2	7.2	1.8 1.8	1.8		9.8 9.6	9.7	
M3	Moderate	Cloudy	8:23	Surface	1.0	20.8 20.8	20.8	8.5 8.5	8.5	33.5 33.5	33.5	93.5 93.4	93.5	6.9 6.9	6.9	6.8	1.5 1.5	1.5	2.7	7.5 7.0	7.3	5.0
				Middle	4.1	20.2 20.2	20.2	8.5 8.5	8.5	33.9 33.9	33.9	89.5 89.6	89.6	6.6 6.6	6.6		3.1 3.1	3.1		3.9 3.9	3.9	
				Bottom	7.0	20.2 20.2	20.2	8.5 8.5	8.5	34.0 34.0	34.0	89.6 89.6	89.6	6.6 6.6	6.6	6.6	3.5 3.6	3.6		3.8 3.7	3.8	
M4	Moderate	Cloudy	7:54	Surface	1.0	20.1 20.1	20.1	8.5 8.5	8.5	34.0 33.9	33.9	97.7 97.6	97.7	7.3 7.3	7.3	7.2	2.8 2.6	2.7	2.0	7.6 7.3	7.5	7.4
				Middle	4.0	20.1 20.1	20.1	8.5 8.5	8.5	33.9 33.9	33.9	97.0 97.1	97.1	7.2 7.2	7.2		1.8 1.8	1.8		7.5 7.9	7.7	
				Bottom	7.0	20.1 20.1	20.1	8.5 8.5	8.5	34.0 34.0	34.0	96.3 96.3	96.3	7.2 7.2	7.2	7.2	1.5 1.5	1.5		7.1 6.9	7.0	
M5	Moderate	Cloudy	8:39	Surface	1.0	20.2 20.2	20.2	8.5 8.5	8.5	33.8 33.8	33.8	91.7 92.0	91.9	6.8 6.8	6.8	6.9	1.8 1.8	1.8	2.1	22.6 22.7	22.7	13.0
				Middle	6.1	20.0 20.0	20.0	8.5 8.5	8.5	33.9 33.9	33.9	93.9 93.9	93.9	7.0 7.0	7.0		2.1 2.1	2.1		9.9 10.1	10.0	
				Bottom	11.0	20.0 20.0	20.0	8.5 8.5	8.5	34.0 34.0	34.0	93.6 93.3	93.5	7.0 7.0	7.0	7.0	2.4 2.7	2.5		6.5 6.4	6.5	
M6	Moderate	Cloudy	8:32	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	6.9	- -	-	2.4	- -	-	6.1
				Middle	2.1	20.3 20.4	20.4	8.5 8.5	8.5	34.0 34.0	34.0	92.7 92.6	92.7	6.9 6.9	6.9		2.4 2.4	2.4		6.2 6.0	6.1	
				Bottom	-	- -	-	- -	-	- -	-	- -	-	- -	-	-	- -	-		- -	-	

Remarks: *DA: Depth-Averaged
**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

Appendix I - Action and Limit Levels for Marine Water Quality on 20 December 2019 (Mid-Ebb Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU*** or 120% of upstream control station's Turbidity at the same tide of the same day ***C2: 2.0 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C2: 2.2 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 6.9 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 7.5 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 6.9 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 7.5 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 7.0 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 7.6 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 12/20/2019

(Mid-Flood Tide)

Location	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
C1	Moderate	Cloudy	14:29	Surface	1.1	19.9 19.9	19.9	8.5 8.5	8.5	33.0 33.0	33.0	100.3 100.3	100.3	7.5 7.5	7.5	7.5	1.1 1.1	1.1	1.5	7.3 7.1	7.2	5.4
				Middle	9.0	19.9 19.9	19.9	8.5 8.5	8.5	33.9 33.9	33.9	99.2 99.2	99.2	7.4 7.4	7.4		1.3 1.2	1.3		4.5 4.3	4.4	
				Bottom	17.1	19.9 19.9	19.9	8.5 8.5	8.5	33.9 33.9	33.9	97.4 97.3	97.4	7.3 7.3	7.3	7.3	2.1 2.1	2.1		4.4 4.6	4.5	
C2	Moderate	Cloudy	13:28	Surface	1.0	20.0 20.0	20.0	8.5 8.5	8.5	33.8 33.8	33.8	97.7 97.7	97.7	7.3 7.3	7.3	7.2	1.4 1.4	1.4	1.5	3.9 3.7	3.8	4.8
				Middle	16.0	19.9 19.9	19.9	8.5 8.5	8.5	33.9 33.9	33.9	96.5 96.6	96.6	7.2 7.2	7.2		1.5 1.5	1.5		3.0 2.9	3.0	
				Bottom	31.0	19.9 19.9	19.9	8.5 8.5	8.5	33.9 33.9	33.9	95.4 95.3	95.4	7.1 7.1	7.1	7.1	1.8 1.8	1.8		7.8 7.5	7.7	
G1	Moderate	Cloudy	13:54	Surface	1.1	20.4 20.4	20.4	8.5 8.5	8.5	32.6 32.6	32.6	99.5 98.7	99.1	7.4 7.4	7.4	7.2	2.5 2.4	2.4	2.3	4.4 4.2	4.3	4.3
				Middle	4.1	20.1 20.2	20.1	8.5 8.5	8.5	33.7 33.7	33.7	94.6 94.6	94.6	7.0 7.0	7.0		2.4 2.4	2.4		4.3 4.6	4.5	
				Bottom	7.2	20.0 20.0	20.0	8.5 8.5	8.5	33.8 33.8	33.8	95.0 95.0	95.0	7.1 7.1	7.1	7.1	2.2 2.1	2.1		4.2 4.2	4.2	
G2	Moderate	Cloudy	13:43	Surface	0.9	20.2 20.2	20.2	8.5 8.5	8.5	33.2 33.2	33.2	98.9 98.5	98.7	7.4 7.3	7.3	7.3	2.2 2.1	2.2	2.1	4.8 4.9	4.9	5.7
				Middle	4.2	20.0 20.0	20.0	8.5 8.5	8.5	33.7 33.7	33.7	96.7 96.7	96.7	7.2 7.2	7.2		2.1 2.1	2.1		5.7 5.7	5.7	
				Bottom	7.1	20.0 20.0	20.0	8.5 8.5	8.5	33.8 33.8	33.8	96.6 96.6	96.6	7.2 7.2	7.2	7.2	2.1 2.1	2.1		6.9 6.4	6.7	
G3	Moderate	Cloudy	13:59	Surface	1.1	20.6 20.6	20.6	8.5 8.5	8.5	32.9 32.9	32.9	96.3 96.0	96.2	7.1 7.1	7.1	6.9	5.7 5.7	5.7	4.9	6.7 6.4	6.6	5.6
				Middle	4.0	20.3 20.3	20.3	8.5 8.5	8.5	33.6 33.6	33.6	90.2 90.4	90.3	6.7 6.7	6.7		6.1 6.2	6.1		4.8 4.8	4.8	
				Bottom	7.1	20.0 20.0	20.0	8.5 8.5	8.5	33.9 33.9	33.9	92.2 92.4	92.3	6.9 6.9	6.9	6.9	2.9 2.8	2.9		5.4 5.4	5.4	
G4	Moderate	Cloudy	14:11	Surface	1.0	20.4 20.4	20.4	8.5 8.6	8.5	33.3 33.3	33.3	95.2 95.0	95.1	7.1 7.1	7.1	7.0	1.9 1.9	1.9	2.0	8.1 8.3	8.2	7.6
				Middle	4.1	20.0 20.0	20.0	8.6 8.6	8.6	33.9 33.9	33.9	94.6 94.5	94.6	7.0 7.0	7.0		2.1 2.1	2.1		6.1 6.1	6.1	
				Bottom	6.9	20.0 20.0	20.0	8.6 8.5	8.6	33.9 33.9	33.9	95.4 95.5	95.5	7.1 7.1	7.1	7.1	2.0 1.9	1.9		8.7 8.3	8.5	
M1	Moderate	Cloudy	13:49	Surface	1.0	20.1 20.3	20.2	8.5 8.5	8.5	33.2 33.1	33.1	97.7 97.5	97.6	7.3 7.3	7.3	7.1	2.1 2.2	2.2	2.8	5.5 5.3	5.4	6.0
				Middle	3.0	20.2 20.2	20.2	8.5 8.5	8.5	33.8 33.7	33.7	94.4 94.4	94.4	7.0 7.0	7.0		3.0 2.9	2.9		6.6 6.2	6.4	
				Bottom	4.9	20.1 20.1	20.1	8.5 8.5	8.5	33.8 33.8	33.8	94.1 94.1	94.1	7.0 7.0	7.0	7.0	3.4 3.3	3.3		6.2 5.9	6.1	
M2	Moderate	Cloudy	13:38	Surface	1.0	20.2 20.2	20.2	8.5 8.5	8.5	33.8 33.8	33.8	98.4 98.2	98.3	7.3 7.3	7.3	7.2	2.8 2.7	2.7	2.1	5.6 5.8	5.7	8.2
				Middle	5.0	20.1 20.1	20.1	8.5 8.5	8.5	33.9 33.9	33.9	96.8 96.8	96.8	7.2 7.2	7.2		1.7 1.7	1.7		10.3 10.0	10.2	
				Bottom	8.0	20.1 20.1	20.1	8.5 8.5	8.5	33.9 33.9	33.9	96.6 96.6	96.6	7.2 7.2	7.2	7.2	1.8 1.8	1.8		8.6 9.1	8.9	
M3	Moderate	Cloudy	14:07	Surface	1.0	20.7 20.7	20.7	8.5 8.5	8.5	33.6 33.6	33.6	93.6 93.6	93.6	6.9 6.9	6.9	6.8	1.6 1.5	1.5	2.7	5.2 5.0	5.1	11.2
				Middle	4.1	20.2 20.2	20.2	8.5 8.5	8.5	33.9 33.9	33.9	89.6 89.6	89.6	6.6 6.6	6.6		3.3 3.2	3.2		5.5 5.2	5.4	
				Bottom	7.0	20.2 20.2	20.2	8.5 8.5	8.5	33.9 34.0	33.9	89.7 89.7	89.7	6.7 6.7	6.7	6.7	3.4 3.5	3.4		22.9 23.4	23.2	
M4	Moderate	Cloudy	13:33	Surface	1.2	20.1 20.1	20.1	8.5 8.5	8.5	34.0 34.0	34.0	97.9 97.8	97.9	7.3 7.3	7.3	7.2	3.1 3.0	3.0	2.1	7.1 7.5	7.3	5.5
				Middle	4.0	20.1 20.1	20.1	8.5 8.5	8.5	33.9 33.9	33.9	97.0 97.0	97.0	7.2 7.2	7.2		1.7 1.8	1.7		5.4 5.5	5.5	
				Bottom	7.0	20.1 20.1	20.1	8.5 8.5	8.5	34.0 34.0	34.0	96.4 96.4	96.4	7.2 7.2	7.2	7.2	1.6 1.6	1.6		3.8 3.7	3.8	
M5	Moderate	Cloudy	14:23	Surface	1.0	20.2 20.2	20.2	8.5 8.5	8.5	33.8 33.8	33.8	92.2 92.5	92.4	6.9 6.9	6.9	6.9	1.8 1.7	1.8	2.2	6.2 6.4	6.3	6.5
				Middle	6.1	20.0 20.1	20.0	8.5 8.5	8.5	33.9 33.9	33.9	93.9 93.8	93.9	7.0 7.0	7.0		2.1 2.1	2.1		8.6 8.9	8.8	
				Bottom	11.0	20.0 20.0	20.0	8.5 8.5	8.5	34.0 34.0	34.0	93.3 93.3	93.3	7.0 6.9	6.9	6.9	2.7 2.6	2.7		4.4 4.2	4.3	
M6	Moderate	Cloudy	14:17	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	6.9	- -	-	2.3	- -	-	3.9
				Middle	2.1	20.3 20.3	20.3	8.5 8.5	8.5	34.0 34.0	34.0	92.7 92.7	92.7	6.9 6.9	6.9		2.4 2.3	2.3		3.8 4.0	3.9	
				Bottom	-	- -	-	- -	-	- -	-	- -	-	- -	-	-	- -	-		- -	-	

Remarks: *DA: Depth-Averaged
**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

Appendix I - Action and Limit Levels for Marine Water Quality on 20 December 2019 (Mid-Flood Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU*** or 120% of upstream control station's Turbidity at the same tide of the same day ***C1: 2.5 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C1: 2.7 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 8.6 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 9.4 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 8.6 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 9.4 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 5.4 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 5.9 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 23 December 2019

(Mid-Ebb Tide)

Location	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
C1	Cloudy	Moderate	11:25	Surface	1.1	21.1 21.1	21.1	8.5 8.5	8.5	32.6 32.5	32.5	101.1 101.4	101.3	7.0 7.0	7.0	6.9	1.5 1.5	1.5	1.3	4.1 4.1	4.1	5.5
				Middle	9.1	20.9 20.9	20.9	8.5 8.5	8.5	32.6 32.6	32.6	100.3 100.4	100.4	6.9 6.9	6.9		1.0 1.0	1.0		4.8 4.8	4.8	
				Bottom	17.0	20.7 20.7	20.7	8.5 8.5	8.5	32.9 32.9	32.9	96.3 96.3	96.3	6.7 6.7	6.7	6.7	1.6 1.6	1.6		7.7 7.6	7.7	
C2	Cloudy	Moderate	9:52	Surface	1.1	21.2 21.2	21.2	8.4 8.4	8.4	32.5 32.5	32.5	103.0 103.0	103.0	7.1 7.1	7.1	6.9	0.4 0.4	0.4	1.3	5.2 4.9	5.1	5.1
				Middle	16.0	20.7 20.7	20.7	8.4 8.4	8.4	32.8 32.8	32.8	97.5 97.7	97.6	6.7 6.8	6.7		1.0 1.0	1.0		5.3 5.7	5.5	
				Bottom	31.0	20.7 20.7	20.7	8.5 8.5	8.5	32.8 32.8	32.8	95.9 96.0	96.0	6.6 6.6	6.6	6.6	2.8 2.3	2.6		4.8 4.9	4.9	
G1	Cloudy	Moderate	10:34	Surface	1.0	21.2 21.2	21.2	8.5 8.5	8.5	32.5 32.5	32.5	101.8 102.0	101.9	7.0 7.0	7.0	7.0	1.3 1.3	1.3	0.9	6.0 5.9	6.0	13.7
				Middle	4.1	21.1 21.1	21.1	8.5 8.5	8.5	32.6 32.6	32.6	101.9 101.9	101.9	7.0 7.0	7.0		0.8 0.8	0.8		8.4 8.4	8.4	
				Bottom	7.0	21.1 21.1	21.1	8.5 8.5	8.5	32.6 32.6	32.6	101.7 101.7	101.7	7.0 7.0	7.0	7.0	0.8 0.8	0.8		26.6 26.8	26.7	
G2	Cloudy	Moderate	10:13	Surface	1.1	21.2 21.2	21.2	8.5 8.5	8.5	32.5 32.5	32.5	102.4 102.4	102.4	7.0 7.0	7.0	7.0	1.6 1.6	1.6	1.1	23.9 23.7	23.8	12.0
				Middle	5.1	21.0 21.0	21.0	8.5 8.5	8.5	32.6 32.6	32.6	100.9 100.9	100.9	6.9 6.9	6.9		0.9 1.0	0.9		5.7 5.8	5.8	
				Bottom	9.1	20.9 20.9	20.9	8.5 8.5	8.5	32.7 32.7	32.7	100.0 99.7	99.9	6.9 6.9	6.9	6.9	0.6 0.6	0.6		6.2 6.4	6.3	
G3	Cloudy	Moderate	10:41	Surface	1.0	21.1 21.1	21.1	8.5 8.5	8.5	32.5 32.5	32.5	102.1 102.1	102.1	7.0 7.0	7.0	7.0	1.0 1.0	1.0	0.9	3.6 3.7	3.7	5.2
				Middle	4.1	21.1 21.1	21.1	8.5 8.5	8.5	32.6 32.6	32.6	101.8 101.9	101.9	7.0 7.0	7.0		0.8 0.8	0.8		5.3 5.4	5.4	
				Bottom	7.0	21.1 21.1	21.1	8.5 8.5	8.5	32.6 32.6	32.6	101.5 101.5	101.5	7.0 7.0	7.0	7.0	1.0 1.1	1.0		6.7 6.6	6.7	
G4	Cloudy	Moderate	10:56	Surface	1.1	21.1 21.2	21.1	8.5 8.5	8.5	32.5 32.5	32.5	102.3 102.3	102.3	7.0 7.0	7.0	7.0	1.1 1.1	1.1	0.9	3.3 3.4	3.4	5.5
				Middle	4.1	21.1 21.1	21.1	8.5 8.5	8.5	32.5 32.5	32.5	102.1 102.2	102.2	7.0 7.0	7.0		0.8 0.8	0.8		8.1 8.1	8.1	
				Bottom	7.0	21.1 21.1	21.1	8.5 8.5	8.5	32.6 32.6	32.6	101.6 101.5	101.6	7.0 7.0	7.0	7.0	0.6 0.7	0.7		5.2 5.0	5.1	
M1	Cloudy	Moderate	10:21	Surface	1.1	21.2 21.2	21.2	8.5 8.5	8.5	32.5 32.5	32.5	102.6 102.6	102.6	7.0 7.0	7.0	7.0	1.4 1.4	1.4	1.1	4.2 4.1	4.2	3.9
				Middle	3.1	21.2 21.2	21.2	8.5 8.5	8.5	32.5 32.5	32.5	102.5 102.5	102.5	7.0 7.0	7.0		1.3 1.4	1.3		3.8 3.7	3.8	
				Bottom	5.1	21.1 21.1	21.1	8.5 8.5	8.5	32.6 32.6	32.6	101.9 101.9	101.9	7.0 7.0	7.0	7.0	0.5 0.5	0.5		3.8 4.0	3.9	
M2	Cloudy	Moderate	10:06	Surface	1.1	21.2 21.2	21.2	8.5 8.5	8.5	32.5 32.5	32.5	102.5 102.5	102.5	7.0 7.0	7.0	7.0	1.4 1.4	1.4	1.5	5.0 5.3	5.2	5.2
				Middle	6.2	21.0 21.0	21.0	8.5 8.5	8.5	32.6 32.6	32.6	101.1 101.2	101.2	7.0 7.0	7.0		1.4 1.4	1.4		4.6 4.5	4.6	
				Bottom	11.1	20.8 20.8	20.8	8.5 8.5	8.5	32.8 32.8	32.8	98.3 98.2	98.3	6.8 6.8	6.8	6.8	1.7 1.7	1.7		5.7 6.2	6.0	
M3	Cloudy	Moderate	10:50	Surface	1.1	21.1 21.1	21.1	8.5 8.5	8.5	32.5 32.5	32.5	102.2 102.2	102.2	7.0 7.0	7.0	7.0	1.5 1.5	1.5	1.2	4.2 4.4	4.3	3.8
				Middle	4.1	21.1 21.1	21.1	8.5 8.5	8.5	32.5 32.5	32.5	102.2 102.3	102.3	7.0 7.0	7.0		1.2 1.3	1.2		3.1 3.1	3.1	
				Bottom	7.1	21.0 21.0	21.0	8.5 8.5	8.5	32.6 32.6	32.6	101.5 101.5	101.5	7.0 7.0	7.0	7.0	0.9 0.8	0.8		3.9 4.0	4.0	
M4	Cloudy	Moderate	10:00	Surface	1.1	21.2 21.2	21.2	8.5 8.5	8.5	32.5 32.5	32.5	102.4 102.4	102.4	7.0 7.0	7.0	7.0	1.5 1.5	1.5	1.3	4.9 5.2	5.1	5.5
				Middle	5.0	21.1 21.1	21.1	8.5 8.5	8.5	32.6 32.6	32.6	101.7 101.8	101.8	7.0 7.0	7.0		1.5 1.6	1.5		4.7 4.9	4.8	
				Bottom	9.1	20.9 20.9	20.9	8.5 8.5	8.5	32.6 32.7	32.6	99.9 99.8	99.9	6.9 6.9	6.9	6.9	0.9 0.9	0.9		6.6 6.6	6.6	
M5	Cloudy	Moderate	11:15	Surface	1.1	21.1 21.1	21.1	8.5 8.5	8.5	32.5 32.5	32.5	102.1 102.1	102.1	7.0 7.0	7.0	7.0	1.3 1.4	1.3	1.0	7.0 6.9	7.0	7.2
				Middle	6.1	21.0 21.0	21.0	8.5 8.5	8.5	32.6 32.6	32.6	101.6 101.6	101.6	7.0 7.0	7.0		0.8 0.8	0.8		7.0 7.3	7.2	
				Bottom	11.0	20.8 20.8	20.8	8.5 8.5	8.5	32.7 32.7	32.7	99.1 99.0	99.1	6.8 6.8	6.8	6.8	0.9 1.0	1.0		7.4 7.7	7.6	
M6	Cloudy	Moderate	11:04	Surface	0.0	- -	0.0	0.0 0.0	0.0	0.0 0.0	0.0	0.0 0.0	0.0	0.0 0.0	0.0	7.0	0.0 0.0	0.0	1.3	0.0 0.0	0.0	7.3
				Middle	2.1	21.1 21.1	21.1	8.5 8.5	8.5	32.5 32.5	32.5	102.2 102.2	102.2	7.0 7.0	7.0		1.3 1.3	1.3		7.1 7.4	7.3	
				Bottom	0.0	0.0 0.0	0.0	0.0 0.0	0.0	0.0 0.0	0.0	0.0 0.0	0.0	0.0 0.0	0.0	0.0	0.0 0.0	0.0		0.0 0.0	0.0	

Remarks: *DA: Depth-Averaged
**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

Appendix I - Action and Limit Levels for Marine Water Quality on 23 December 2019 (Mid-Ebb Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU*** or 120% of upstream control station's Turbidity at the same tide of the same day ***C2: 3.1 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C2: 3.3 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 6.1 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 6.6 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 6.1 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 6.6 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 5.8 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 6.3 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

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Water Quality Monitoring Results on 23 December 2019

(Mid-Flood Tide)

Location	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
C1	Cloudy	Moderate	16:13	Surface	1.1	21.1 21.1	21.1	8.5 8.5	8.5	32.5 32.5	32.5	102.8 102.9	102.9	7.1 7.1	7.1	7.0	1.5 1.5	1.5	1.4	3.8 3.9	3.9	4.4
				Middle	9.1	20.9 21.0	21.0	8.5 8.5	8.5	32.6 32.6	32.6	101.6 101.8	101.7	7.0 7.0	7.0		1.1 1.1	1.1		3.6 3.6	3.6	
				Bottom	17.1	20.7 20.7	20.7	8.5 8.5	8.5	32.9 32.9	32.9	97.2 97.2	97.2	6.7 6.7	6.7	6.7	1.6 1.7	1.7		5.6 5.7	5.7	
C2	Cloudy	Moderate	14:41	Surface	1.1	21.2 21.2	21.2	8.4 8.4	8.4	32.5 32.5	32.5	104.0 104.0	104.0	7.1 7.1	7.1	7.0	0.4 0.4	0.4	1.5	4.5 4.8	4.7	4.4
				Middle	16.0	20.7 20.7	20.7	8.4 8.4	8.4	32.8 32.8	32.8	99.0 99.1	99.1	6.8 6.8	6.8		1.0 1.0	1.0		3.1 3.0	3.1	
				Bottom	31.0	20.7 20.7	20.7	8.5 8.5	8.5	32.8 32.8	32.8	97.0 97.1	97.1	6.7 6.7	6.7	6.7	3.0 2.9	2.9		5.7 5.4	5.6	
G1	Cloudy	Moderate	15:22	Surface	1.0	21.2 21.2	21.2	8.5 8.5	8.5	32.5 32.5	32.5	103.1 103.2	103.2	7.1 7.1	7.1	7.1	1.3 1.2	1.2	1.0	9.7 10.1	9.9	6.1
				Middle	4.0	21.1 21.1	21.1	8.5 8.5	8.5	32.6 32.6	32.6	103.0 103.0	103.0	7.1 7.1	7.1		0.9 1.0	0.9		4.6 4.3	4.5	
				Bottom	7.0	21.1 21.0	21.1	8.5 8.5	8.5	32.6 32.6	32.6	102.6 102.6	102.6	7.1 7.0	7.0	7.0	0.8 0.9	0.8		4.1 3.9	4.0	
G2	Cloudy	Moderate	15:02	Surface	1.1	21.2 21.2	21.2	8.5 8.5	8.5	32.5 32.5	32.5	103.3 103.3	103.3	7.1 7.1	7.1	7.1	1.7 1.7	1.7	1.0	7.1 7.0	7.1	5.2
				Middle	5.0	21.1 21.0	21.1	8.5 8.5	8.5	32.6 32.6	32.6	102.2 102.1	102.2	7.0 7.0	7.0		0.9 0.9	0.9		3.1 3.1	3.1	
				Bottom	9.0	20.9 20.9	20.9	8.5 8.5	8.5	32.6 32.7	32.7	101.5 101.3	101.4	7.0 7.0	7.0	7.0	0.5 0.5	0.5		5.3 5.3	5.3	
G3	Cloudy	Moderate	15:29	Surface	1.0	21.1 21.1	21.1	8.5 8.5	8.5	32.5 32.5	32.5	103.2 103.3	103.3	7.1 7.1	7.1	7.1	1.1 1.2	1.1	1.1	7.4 7.9	7.7	6.7
				Middle	4.1	21.1 21.1	21.1	8.5 8.5	8.5	32.6 32.6	32.6	103.0 103.0	103.0	7.1 7.1	7.1		0.9 0.9	0.9		8.0 8.6	8.3	
				Bottom	7.1	21.1 21.1	21.1	8.5 8.5	8.5	32.6 32.6	32.6	102.5 102.5	102.5	7.0 7.0	7.0	7.0	1.1 1.2	1.1		4.2 4.2	4.2	
G4	Cloudy	Moderate	15:44	Surface	1.1	21.2 21.2	21.2	8.5 8.5	8.5	32.5 32.5	32.5	103.4 103.5	103.5	7.1 7.1	7.1	7.1	1.2 1.1	1.2	0.9	2.8 2.6	2.7	3.6
				Middle	4.0	21.1 21.1	21.1	8.5 8.5	8.5	32.5 32.5	32.5	103.3 103.3	103.3	7.1 7.1	7.1		0.9 1.0	0.9		3.5 3.4	3.5	
				Bottom	7.0	21.0 21.0	21.0	8.5 8.5	8.5	32.6 32.6	32.6	102.5 102.5	102.5	7.0 7.0	7.0	7.0	0.7 0.7	0.7		4.8 4.7	4.8	
M1	Cloudy	Moderate	15:09	Surface	1.0	21.2 21.2	21.2	8.5 8.5	8.5	32.5 32.5	32.5	103.6 103.6	103.6	7.1 7.1	7.1	7.1	1.4 1.4	1.4	1.1	8.7 8.3	8.5	5.9
				Middle	2.9	21.2 21.2	21.2	8.5 8.5	8.5	32.5 32.5	32.5	103.5 103.5	103.5	7.1 7.1	7.1		1.2 1.3	1.3		3.6 3.5	3.6	
				Bottom	5.1	21.1 21.1	21.1	8.5 8.5	8.5	32.6 32.6	32.6	103.0 103.0	103.0	7.1 7.1	7.1	7.1	0.7 0.6	0.6		5.9 5.6	5.8	
M2	Cloudy	Moderate	14:55	Surface	1.1	21.2 21.2	21.2	8.5 8.5	8.5	32.5 32.5	32.5	103.5 103.6	103.6	7.1 7.1	7.1	7.1	1.4 1.4	1.4	1.5	5.2 5.0	5.1	4.9
				Middle	6.1	21.0 21.0	21.0	8.5 8.5	8.5	32.6 32.6	32.6	102.4 102.5	102.5	7.0 7.0	7.0		1.4 1.4	1.4		4.6 4.6	4.6	
				Bottom	11.0	20.8 20.7	20.7	8.5 8.5	8.5	32.8 32.8	32.8	98.9 98.8	98.9	6.8 6.8	6.8	6.8	1.7 1.8	1.7		4.9 4.9	4.9	
M3	Cloudy	Moderate	15:38	Surface	1.0	21.1 21.1	21.1	8.5 8.5	8.5	32.5 32.5	32.5	103.0 103.0	103.0	7.1 7.1	7.1	7.1	1.5 1.5	1.5	1.2	5.4 5.7	5.6	5.1
				Middle	4.1	21.1 21.1	21.1	8.5 8.5	8.5	32.5 32.5	32.5	103.1 103.2	103.2	7.1 7.1	7.1		1.2 1.2	1.2		4.6 4.6	4.6	
				Bottom	7.1	21.1 21.1	21.1	8.5 8.5	8.5	32.6 32.6	32.6	102.6 102.6	102.6	7.1 7.0	7.0	7.0	1.0 0.9	0.9		5.0 5.0	5.0	
M4	Cloudy	Moderate	14:48	Surface	1.0	21.2 21.2	21.2	8.5 8.5	8.5	32.5 32.5	32.5	103.4 103.4	103.4	7.1 7.1	7.1	7.1	1.6 1.6	1.6	1.3	3.1 3.1	3.1	7.6
				Middle	5.0	21.0 21.0	21.0	8.5 8.5	8.5	32.6 32.6	32.6	102.4 102.5	102.5	7.0 7.0	7.0		1.4 1.4	1.4		4.9 5.2	5.1	
				Bottom	9.2	20.9 20.9	20.9	8.5 8.5	8.5	32.6 32.6	32.6	101.2 101.0	101.1	7.0 7.0	7.0	7.0	1.0 1.0	1.0		14.3 14.7	14.5	
M5	Cloudy	Moderate	16:03	Surface	1.0	21.1 21.1	21.1	8.5 8.5	8.5	32.5 32.5	32.5	103.2 103.3	103.3	7.1 7.1	7.1	7.1	1.4 1.5	1.4	1.1	9.4 9.1	9.3	6.9
				Middle	6.0	21.0 21.1	21.1	8.5 8.5	8.5	32.6 32.6	32.6	102.7 102.9	102.8	7.1 7.1	7.1		0.9 1.0	0.9		7.7 7.8	7.8	
				Bottom	11.0	20.8 20.8	20.8	8.5 8.5	8.5	32.7 32.7	32.7	99.8 99.6	99.7	6.9 6.9	6.9	6.9	1.0 1.0	1.0		3.7 3.8	3.8	
M6	Cloudy	Moderate	15:52	Surface	0.0	0.0 0.0	0.0	0.0 0.0	0.0	0.0 0.0	0.0	0.0 0.0	0.0	0.0 0.0	0.0	7.1	0.0 0.0	0.0	1.3	0.0 0.0	0.0	6.4
				Middle	2.1	21.1 21.1	21.1	8.5 8.5	8.5	32.5 32.5	32.5	103.1 103.1	103.1	7.1 7.1	7.1		1.3 1.3	1.3		6.4 6.4	6.4	
				Bottom	0.0	0.0 0.0	0.0	0.0 0.0	0.0	0.0 0.0	0.0	0.0 0.0	0.0	0.0 0.0	0.0	0.0	0.0 0.0	0.0		0.0 0.0	0.0	

Remarks: *DA: Depth-Averaged
**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

Appendix I - Action and Limit Levels for Marine Water Quality on 23 December 2019 (Mid-Flood Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU*** or 120% of upstream control station's Turbidity at the same tide of the same day ***C1: 2.0 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C1: 2.1 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 4.6 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 5.0 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 4.6 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 5.0 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 6.8 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 7.3 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 12/27/2019

(Mid-Ebb Tide)

Location	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
C1	Calm	Cloudy	14:36	Surface	1.0	20.2 20.2	20.2	8.3 8.3	8.3	33.6 33.6	33.6	96.4 96.4	96.4	7.2 7.2	7.2	7.2	1.7 1.7	1.7	1.5	6.2 6.3	6.3	5.7
				Middle	8.9	20.0 20.0	20.0	8.3 8.3	8.3	33.6 33.6	33.6	96.6 96.6	96.6	7.2 7.2	7.2		1.5 1.5	1.5		6.2 6.3	6.3	
				Bottom	16.8	19.8 19.8	19.8	8.3 8.3	8.3	33.7 33.7	33.7	96.5 96.5	96.5	7.2 7.2	7.2		1.4 1.4	1.4		4.6 4.6	4.6	
C2	Calm	Cloudy	13:07	Surface	1.1	20.3 20.3	20.3	8.4 8.4	8.4	32.9 33.0	32.9	92.7 92.7	92.7	6.9 6.9	6.9	6.9	2.6 2.6	2.6	2.2	9.0 9.0	9.0	20.1
				Middle	16.0	20.0 20.0	20.0	8.6 8.6	8.6	33.6 33.6	33.6	93.2 93.2	93.2	7.0 7.0	7.0		2.0 1.9	1.9		27.2 26.4	26.8	
				Bottom	31.0	19.9 19.9	19.9	8.6 8.6	8.6	33.7 33.7	33.7	92.9 92.9	92.9	6.9 6.9	6.9	6.9	2.0 2.0	2.0		24.7 24.1	24.4	
G1	Calm	Cloudy	13:50	Surface	1.0	20.3 20.3	20.3	8.2 8.2	8.2	33.6 33.6	33.6	96.2 96.2	96.2	7.1 7.1	7.1	7.1	1.9 1.9	1.9	3.1	5.4 5.5	5.5	5.6
				Middle	4.1	20.2 20.2	20.2	8.1 8.1	8.1	33.6 33.6	33.6	95.5 95.5	95.5	7.1 7.1	7.1		2.3 2.3	2.3		6.1 5.9	6.0	
				Bottom	7.1	20.0 20.0	20.0	8.2 8.2	8.2	33.7 33.7	33.7	94.0 93.9	94.0	7.0 7.0	7.0	7.0	5.0 5.0	5.0		5.3 5.5	5.4	
G2	Calm	Cloudy	13:31	Surface	1.0	20.4 20.4	20.4	8.4 8.4	8.4	33.5 33.5	33.5	98.2 98.1	98.2	7.3 7.3	7.3	7.2	1.7 1.7	1.7	2.0	6.3 6.1	6.2	6.4
				Middle	5.1	20.1 20.1	20.1	8.4 8.4	8.4	33.6 33.6	33.6	95.3 95.3	95.3	7.1 7.1	7.1		1.9 1.9	1.9		6.2 6.4	6.3	
				Bottom	9.1	19.9 19.9	19.9	8.4 8.4	8.4	33.7 33.7	33.7	94.5 94.5	94.5	7.1 7.1	7.1	7.1	2.4 2.4	2.4		6.6 6.7	6.7	
G3	Calm	Cloudy	13:58	Surface	1.0	20.3 20.3	20.3	8.2 8.2	8.2	33.3 33.3	33.3	94.1 94.1	94.1	7.0 7.0	7.0	7.0	2.6 2.6	2.6	2.7	25.4 24.7	25.1	12.4
				Middle	4.1	20.3 20.3	20.3	8.2 8.2	8.2	33.5 33.5	33.5	93.5 93.5	93.5	6.9 7.0	6.9		2.6 2.6	2.6		7.6 7.5	7.6	
				Bottom	7.1	20.2 20.2	20.2	8.2 8.2	8.2	33.7 33.7	33.7	92.8 92.8	92.8	6.9 6.9	6.9	6.9	2.9 2.9	2.9		4.7 4.7	4.7	
G4	Calm	Cloudy	14:13	Surface	1.1	20.3 20.3	20.3	8.3 8.3	8.3	33.4 33.4	33.4	98.1 98.0	98.1	7.3 7.3	7.3	7.3	2.1 2.0	2.0	2.2	6.8 6.8	6.8	6.8
				Middle	4.1	20.2 20.2	20.2	8.3 8.3	8.3	33.5 33.5	33.5	97.1 97.1	97.1	7.2 7.2	7.2		2.0 2.0	2.0		4.6 4.7	4.7	
				Bottom	6.9	20.1 20.1	20.1	8.2 8.2	8.2	33.6 33.6	33.6	96.0 95.9	96.0	7.1 7.1	7.1	7.1	2.6 2.7	2.7		8.9 8.9	8.9	
M1	Calm	Cloudy	13:41	Surface	1.0	20.3 20.3	20.3	8.3 8.3	8.3	33.4 33.4	33.4	96.3 96.3	96.3	7.2 7.2	7.2	7.1	1.5 1.5	1.5	1.7	4.5 4.5	4.5	3.8
				Middle	3.0	20.3 20.3	20.3	8.2 8.2	8.2	33.5 33.5	33.5	95.8 95.8	95.8	7.1 7.1	7.1		1.7 1.7	1.7		3.4 3.5	3.5	
				Bottom	5.1	20.2 20.2	20.2	8.2 8.2	8.2	33.6 33.6	33.6	95.6 95.6	95.6	7.1 7.1	7.1	7.1	2.0 2.0	2.0		3.5 3.6	3.6	
M2	Calm	Cloudy	13:24	Surface	1.0	20.4 20.4	20.4	8.3 8.3	8.3	33.6 33.6	33.6	95.7 95.7	95.7	7.1 7.1	7.1	7.1	1.7 1.7	1.7	1.9	4.6 4.4	4.5	5.5
				Middle	6.0	20.2 20.2	20.2	8.3 8.3	8.3	33.7 33.7	33.7	95.1 95.1	95.1	7.1 7.1	7.1		1.9 1.9	1.9		7.3 7.5	7.4	
				Bottom	11.0	20.0 20.0	20.0	8.3 8.3	8.3	33.7 33.7	33.7	94.7 94.6	94.7	7.1 7.1	7.1	7.1	2.2 2.2	2.2		4.5 4.5	4.5	
M3	Calm	Cloudy	14:05	Surface	1.0	20.5 20.5	20.5	8.2 8.2	8.2	33.1 33.1	33.1	94.7 94.7	94.7	7.0 7.0	7.0	7.1	2.0 2.0	2.0	2.1	5.7 5.7	5.7	6.8
				Middle	4.0	20.3 20.3	20.3	8.2 8.2	8.2	33.7 33.7	33.7	95.6 95.6	95.6	7.1 7.1	7.1		1.7 1.7	1.7		7.4 7.5	7.5	
				Bottom	7.2	20.2 20.2	20.2	8.2 8.2	8.2	33.7 33.7	33.7	95.8 95.7	95.8	7.1 7.1	7.1	7.1	2.6 2.7	2.7		7.3 7.3	7.3	
M4	Calm	Cloudy	13:16	Surface	1.0	20.1 20.1	20.1	8.5 8.5	8.5	33.5 33.5	33.5	94.9 94.9	94.9	7.1 7.1	7.1	7.0	1.9 1.9	1.9	2.0	6.0 5.8	5.9	5.7
				Middle	5.1	20.0 20.0	20.0	8.4 8.4	8.4	33.6 33.6	33.6	94.3 94.3	94.3	7.0 7.0	7.0		1.9 1.9	1.9		5.7 5.8	5.8	
				Bottom	9.0	20.0 20.0	20.0	8.4 8.4	8.4	33.7 33.7	33.7	94.4 94.4	94.4	7.0 7.0	7.0	7.0	2.2 2.2	2.2		5.3 5.3	5.3	
M5	Calm	Cloudy	14:28	Surface	1.1	20.3 20.3	20.3	8.2 8.2	8.2	33.0 33.0	33.0	95.1 95.0	95.1	7.1 7.1	7.1	7.0	1.9 1.9	1.9	2.4	6.0 5.9	6.0	8.3
				Middle	6.0	20.1 20.1	20.1	8.2 8.2	8.2	33.5 33.5	33.5	94.2 94.2	94.2	7.0 7.0	7.0		2.3 2.3	2.3		8.9 9.0	9.0	
				Bottom	11.0	20.0 20.0	20.0	8.2 8.2	8.2	33.6 33.7	33.6	93.9 93.9	93.9	7.0 7.0	7.0	7.0	2.8 2.9	2.9		10.0 10.1	10.1	
M6	Calm	Cloudy	14:20	Surface	0.0	- -	0.0	0.0 0.0	0.0	0.0 0.0	0.0	0.0 0.0	0.0	0.0 0.0	0.0	7.3	0.0 0.0	0.0	2.7	0.0 0.0	0.0	4.5
				Middle	2.1	20.1 20.1	20.1	8.4 8.4	8.4	33.6 33.6	33.6	98.2 98.1	98.2	7.3 7.3	7.3		2.7 2.7	2.7		4.5 4.4	4.5	
				Bottom	0.0	0.0 0.0	0.0	0.0 0.0	0.0	0.0 0.0	0.0	0.0 0.0	0.0	0.0 0.0	0.0	0.0	0.0 0.0	0.0		0.0 0.0	0.0	

Remarks: *DA: Depth-Averaged
**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

Appendix I - Action and Limit Levels for Marine Water Quality on 27 December 2019 (Mid-Ebb Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU*** or 120% of upstream control station's Turbidity at the same tide of the same day ***C2: 2.4 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C2: 2.6 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 10.8 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 11.7 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 10.8 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 11.7 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 29.3 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 31.7 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 12/27/2019

(Mid-Flood Tide)

Location	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
C1	Calm	Cloudy	9:20	Surface	1.1	20.2 20.2	20.2	8.3 8.3	8.3	33.6 33.6	33.6	96.4 96.4	96.4	7.2 7.2	7.2	7.2	1.7 1.7	1.7	1.6	5.2 5.2	5.2	5.0
				Middle	9.0	20.0 20.0	20.0	8.3 8.3	8.3	33.6 33.6	33.6	96.5 96.5	96.5	7.2 7.2	7.2		1.5 1.5	1.5		5.1 5.0	5.1	
				Bottom	16.8	19.8 19.8	19.8	8.3 8.3	8.3	33.7 33.7	33.7	96.5 96.5	96.5	7.2 7.2	7.2		1.4 1.4	1.4		4.8 4.7	4.8	
C2	Calm	Cloudy	7:51	Surface	1.0	20.3 20.3	20.3	8.4 8.4	8.4	32.9 32.9	32.9	92.8 92.8	92.8	6.9 6.9	6.9	6.9	2.6 2.6	2.6	2.2	8.2 8.0	8.1	8.0
				Middle	16.0	20.0 20.0	20.0	8.6 8.6	8.6	33.6 33.6	33.6	93.3 93.2	93.3	7.0 7.0	7.0		1.9 1.9	1.9		9.3 9.4	9.4	
				Bottom	31.0	19.9 19.9	19.9	8.6 8.6	8.6	33.7 33.7	33.7	92.8 92.8	92.8	6.9 6.9	6.9	6.9	2.1 2.0	2.0		6.5 6.4	6.5	
G1	Calm	Cloudy	8:34	Surface	1.0	20.3 20.3	20.3	8.2 8.1	8.1	33.6 33.6	33.6	96.1 96.1	96.1	7.1 7.1	7.1	7.1	1.9 1.9	1.9	3.0	7.1 6.9	7.0	8.0
				Middle	4.1	20.2 20.2	20.2	8.1 8.1	8.1	33.6 33.6	33.6	95.6 95.6	95.6	7.1 7.1	7.1		2.3 2.3	2.3		7.8 7.7	7.8	
				Bottom	7.1	20.0 20.0	20.0	8.2 8.2	8.2	33.7 33.7	33.7	93.9 93.9	93.9	7.0 7.0	7.0	7.0	5.0 4.9	4.9		9.2 9.2	9.2	
G2	Calm	Cloudy	8:15	Surface	1.0	20.4 20.4	20.4	8.4 8.4	8.4	33.5 33.5	33.5	98.1 98.0	98.1	7.3 7.3	7.3	7.2	1.7 1.7	1.7	2.0	11.0 10.7	10.9	6.4
				Middle	5.1	20.1 20.1	20.1	8.4 8.4	8.4	33.6 33.6	33.6	95.5 95.5	95.5	7.1 7.1	7.1		1.9 1.8	1.8		3.4 3.3	3.4	
				Bottom	9.2	19.9 19.9	19.9	8.4 8.4	8.4	33.7 33.7	33.7	94.5 94.5	94.5	7.1 7.1	7.1	7.1	2.4 2.3	2.3		5.0 5.2	5.1	
G3	Calm	Cloudy	8:42	Surface	1.0	20.3 20.3	20.3	8.2 8.2	8.2	33.3 33.3	33.3	94.1 94.1	94.1	7.0 7.0	7.0	7.0	2.5 2.5	2.5	2.7	26.1 25.1	25.6	22.7
				Middle	4.2	20.3 20.3	20.3	8.2 8.2	8.2	33.6 33.5	33.5	93.4 93.5	93.5	6.9 6.9	6.9		2.6 2.6	2.6		26.8 27.3	27.1	
				Bottom	7.0	20.2 20.2	20.2	8.2 8.2	8.2	33.7 33.7	33.7	92.8 92.8	92.8	6.9 6.9	6.9	6.9	2.9 3.0	2.9		15.2 15.5	15.4	
G4	Calm	Cloudy	8:57	Surface	1.1	20.3 20.3	20.3	8.3 8.3	8.3	33.4 33.4	33.4	98.3 98.2	98.3	7.3 7.3	7.3	7.3	2.1 2.1	2.1	2.2	5.3 5.1	5.2	4.9
				Middle	4.1	20.2 20.2	20.2	8.3 8.3	8.3	33.5 33.5	33.5	97.1 97.1	97.1	7.2 7.2	7.2		2.0 2.0	2.0		5.8 5.6	5.7	
				Bottom	6.9	20.1 20.1	20.1	8.2 8.2	8.2	33.6 33.6	33.6	96.2 96.1	96.2	7.2 7.2	7.2	7.2	2.4 2.5	2.5		3.7 3.6	3.7	
M1	Calm	Cloudy	8:25	Surface	1.0	20.3 20.3	20.3	8.3 8.3	8.3	33.4 33.4	33.4	96.4 96.4	96.4	7.2 7.2	7.2	7.1	1.5 1.5	1.5	1.7	16.3 15.9	16.1	8.8
				Middle	3.0	20.3 20.3	20.3	8.2 8.2	8.2	33.5 33.5	33.5	95.8 95.8	95.8	7.1 7.1	7.1		1.7 1.7	1.7		5.1 5.1	5.1	
				Bottom	5.1	20.2 20.2	20.2	8.2 8.2	8.2	33.6 33.6	33.6	95.6 95.6	95.6	7.1 7.1	7.1	7.1	1.9 2.0	2.0		5.1 5.2	5.2	
M2	Calm	Cloudy	8:08	Surface	1.0	20.4 20.4	20.4	8.3 8.3	8.3	33.6 33.6	33.6	95.7 95.7	95.7	7.1 7.1	7.1	7.1	1.7 1.7	1.7	1.9	8.3 8.6	8.5	8.0
				Middle	6.0	20.1 20.1	20.1	8.3 8.3	8.3	33.7 33.7	33.7	95.1 95.1	95.1	7.1 7.1	7.1		1.9 1.9	1.9		8.3 8.4	8.4	
				Bottom	11.0	20.0 20.0	20.0	8.3 8.3	8.3	33.7 33.7	33.7	94.7 94.7	94.7	7.1 7.1	7.1	7.1	2.1 2.1	2.1		7.1 7.1	7.1	
M3	Calm	Cloudy	8:49	Surface	1.2	20.5 20.5	20.5	8.2 8.2	8.2	33.1 33.1	33.1	94.7 94.6	94.7	7.0 7.0	7.0	7.0	2.0 2.0	2.0	2.2	5.0 4.8	4.9	6.5
				Middle	4.1	20.3 20.2	20.2	8.2 8.2	8.2	33.7 33.7	33.7	95.3 95.3	95.3	7.1 7.1	7.1		1.8 1.8	1.8		4.8 4.8	4.8	
				Bottom	7.3	20.2 20.2	20.2	8.2 8.2	8.2	33.7 33.7	33.7	95.7 95.5	95.6	7.1 7.1	7.1	7.1	2.8 2.9	2.9		9.7 9.6	9.7	
M4	Calm	Cloudy	8:00	Surface	1.0	20.1 20.1	20.1	8.5 8.5	8.5	33.5 33.5	33.5	94.8 94.8	94.8	7.1 7.1	7.1	7.0	1.9 1.9	1.9	2.0	5.3 5.4	5.4	5.8
				Middle	5.1	20.1 20.1	20.1	8.4 8.4	8.4	33.6 33.6	33.6	94.3 94.3	94.3	7.0 7.0	7.0		1.9 1.9	1.9		5.0 4.8	4.9	
				Bottom	9.0	20.0 20.0	20.0	8.4 8.4	8.4	33.7 33.7	33.7	94.5 94.5	94.5	7.0 7.0	7.0	7.0	2.1 2.1	2.1		7.1 7.3	7.2	
M5	Calm	Cloudy	9:13	Surface	1.1	20.3 20.3	20.3	8.3 8.2	8.2	33.0 33.0	33.0	95.2 95.1	95.2	7.1 7.1	7.1	7.0	1.9 1.9	1.9	2.3	6.6 6.9	6.8	12.9
				Middle	6.0	20.1 20.1	20.1	8.2 8.2	8.2	33.5 33.5	33.5	94.2 94.2	94.2	7.0 7.0	7.0		2.3 2.3	2.3		10.1 10.0	10.1	
				Bottom	11.0	20.0 20.0	20.0	8.2 8.2	8.2	33.6 33.6	33.6	93.9 93.9	93.9	7.0 7.0	7.0	7.0	2.8 2.8	2.8		22.0 21.8	21.9	
M6	Calm	Cloudy	9:04	Surface	0.0	0.0 0.0	0.0	0.0 0.0	0.0	0.0 0.0	0.0	0.0 0.0	0.0	0.0 0.0	0.0	7.3	0.0 0.0	0.0	2.7	0.0 0.0	0.0	6.7
				Middle	2.1	20.1 20.1	20.1	8.4 8.4	8.4	33.6 33.6	33.6	97.9 97.9	97.9	7.3 7.3	7.3		2.7 2.7	2.7		6.5 6.8	6.7	
				Bottom	0.0	0.0 0.0	0.0	0.0 0.0	0.0	0.0 0.0	0.0	0.0 0.0	0.0	0.0 0.0	0.0	0.0	0.0 0.0	0.0		0.0 0.0	0.0	

Remarks: *DA: Depth-Averaged
**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

Appendix I - Action and Limit Levels for Marine Water Quality on 27 December 2019 (Mid-Flood Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU*** or 120% of upstream control station's Turbidity at the same tide of the same day ***C1: 1.7 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C1: 1.8 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 6.2 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 6.8 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 6.2 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 6.8 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 5.7 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 6.2 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 12/30/2019

(Mid-Ebb Tide)

Location	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
C1	Moderate	Sunny	16:22	Surface	1.1	20.6 20.6	20.6	8.4 8.4	8.4	32.7 32.7	32.7	101.3 100.9	101.1	6.9 6.8	6.8	6.8	1.0 0.9	0.9	1.0	5.2 5.0	5.1	6.0
				Middle	9.1	20.6 20.6	20.6	8.4 8.4	8.4	32.7 32.7	32.7	100.0 100.0	100.0	6.8 6.8	6.8		0.7 0.7	0.7		5.7 5.8	5.8	
				Bottom	17.1	20.6 20.6	20.6	8.4 8.4	8.4	32.7 32.7	32.7	99.8 99.8	99.8	6.8 6.8	6.8	6.8	1.4 1.4	1.4		6.9 7.2	7.1	
C2	Moderate	Sunny	14:42	Surface	1.0	20.6 20.6	20.6	8.4 8.4	8.4	32.7 32.7	32.7	98.6 98.6	98.6	6.7 6.7	6.7	6.7	0.8 0.9	0.9	0.8	8.1 8.3	8.2	6.2
				Middle	16.0	20.6 20.6	20.6	8.4 8.4	8.4	32.7 32.7	32.7	98.2 98.2	98.2	6.6 6.6	6.6		0.8 0.8	0.8		4.5 4.3	4.4	
				Bottom	31.1	20.6 20.6	20.6	8.4 8.4	8.4	32.7 32.7	32.7	98.0 98.0	98.0	6.6 6.6	6.6	6.6	0.8 0.8	0.8		6.2 6.0	6.1	
G1	Moderate	Sunny	15:21	Surface	1.0	20.6 20.6	20.6	8.4 8.4	8.4	32.6 32.6	32.6	96.9 97.3	97.1	6.6 6.6	6.6	6.7	1.8 1.9	1.8	1.2	5.0 4.8	4.9	6.1
				Middle	4.0	20.5 20.5	20.5	8.4 8.4	8.4	32.7 32.7	32.7	99.0 99.2	99.1	6.7 6.7	6.7		1.4 1.6	1.5		7.1 7.0	7.1	
				Bottom	7.0	20.5 20.5	20.5	8.4 8.4	8.4	32.7 32.7	32.7	99.7 99.8	99.8	6.8 6.8	6.8	6.8	0.4 0.4	0.4		6.5 6.4	6.5	
G2	Moderate	Sunny	15:00	Surface	1.1	20.5 20.5	20.5	8.4 8.4	8.4	32.7 32.7	32.7	100.7 100.6	100.7	6.8 6.8	6.8	6.8	0.7 0.7	0.7	1.3	4.7 4.9	4.8	5.8
				Middle	5.0	20.5 20.5	20.5	8.4 8.4	8.4	32.7 32.7	32.7	99.1 99.1	99.1	6.7 6.7	6.7		2.2 2.1	2.2		6.1 6.2	6.2	
				Bottom	9.1	20.5 20.5	20.5	8.4 8.4	8.4	32.7 32.7	32.7	98.7 98.7	98.7	6.7 6.7	6.7	6.7	0.9 0.8	0.9		6.5 6.6	6.6	
G3	Moderate	Sunny	15:27	Surface	1.0	20.6 20.6	20.6	8.4 8.4	8.4	32.5 32.5	32.5	100.1 100.0	100.1	6.8 6.8	6.8	6.7	1.0 1.0	1.0	1.0	5.5 5.7	5.6	8.8
				Middle	4.1	20.7 20.7	20.7	8.4 8.4	8.4	32.7 32.7	32.7	97.3 96.8	97.1	6.6 6.5	6.6		0.8 0.7	0.7		10.6 11.2	10.9	
				Bottom	7.1	20.6 20.6	20.6	8.4 8.4	8.4	32.7 32.7	32.7	96.5 96.6	96.6	6.5 6.5	6.5	6.5	1.3 1.3	1.3		9.7 10.2	10.0	
G4	Moderate	Sunny	15:41	Surface	1.0	20.5 20.5	20.5	8.4 8.4	8.4	32.6 32.6	32.6	95.4 95.7	95.6	6.5 6.5	6.5	6.6	1.2 1.2	1.2	1.7	5.1 5.0	5.1	7.2
				Middle	4.1	20.5 20.5	20.5	8.4 8.4	8.4	32.7 32.7	32.7	99.0 99.0	99.0	6.7 6.7	6.7		1.9 1.9	1.9		11.0 10.8	10.9	
				Bottom	7.0	20.5 20.5	20.5	8.4 8.4	8.4	32.7 32.7	32.7	98.4 98.3	98.4	6.7 6.7	6.7	6.7	2.1 2.1	2.1		5.7 5.5	5.6	
M1	Moderate	Sunny	15:07	Surface	1.0	20.4 20.4	20.4	8.4 8.4	8.4	32.7 32.7	32.7	101.0 100.8	100.9	6.9 6.9	6.9	6.8	1.3 1.3	1.3	1.3	3.9 3.9	3.9	5.2
				Middle	3.0	20.4 20.4	20.4	8.4 8.4	8.4	32.7 32.7	32.7	99.8 99.7	99.8	6.8 6.8	6.8		1.4 1.4	1.4		7.3 7.7	7.5	
				Bottom	5.1	20.4 20.4	20.4	8.4 8.4	8.4	32.7 32.7	32.7	98.9 98.9	98.9	6.7 6.7	6.7	6.7	1.3 1.2	1.2		4.1 4.2	4.2	
M2	Moderate	Sunny	14:55	Surface	1.0	20.6 20.6	20.6	8.4 8.4	8.4	32.7 32.7	32.7	98.9 98.9	98.9	6.7 6.7	6.7	6.7	1.1 1.1	1.1	1.0	4.7 5.0	4.9	5.6
				Middle	6.0	20.6 20.6	20.6	8.4 8.4	8.4	32.7 32.7	32.7	97.9 97.9	97.9	6.6 6.6	6.6		0.8 0.8	0.8		4.7 4.7	4.7	
				Bottom	11.0	20.5 20.5	20.5	8.4 8.4	8.4	32.7 32.7	32.7	97.5 97.5	97.5	6.6 6.6	6.6	6.6	1.0 1.1	1.1		7.5 7.2	7.4	
M3	Moderate	Sunny	15:35	Surface	1.0	20.8 20.8	20.8	8.4 8.4	8.4	32.5 32.6	32.6	92.4 92.8	92.6	6.2 6.3	6.2	6.4	1.6 1.6	1.6	1.9	4.9 4.5	4.7	6.1
				Middle	4.1	20.6 20.6	20.6	8.4 8.4	8.4	32.7 32.7	32.7	96.5 96.8	96.7	6.5 6.5	6.5		1.0 1.0	1.0		5.0 5.0	5.0	
				Bottom	7.0	20.6 20.6	20.6	8.4 8.4	8.4	32.7 32.7	32.7	94.5 94.4	94.5	6.4 6.4	6.4	6.4	3.0 3.1	3.1		8.4 8.7	8.6	
M4	Moderate	Sunny	14:48	Surface	1.1	20.6 20.6	20.6	8.4 8.4	8.4	32.7 32.7	32.7	98.3 98.3	98.3	6.7 6.7	6.7	6.6	0.4 0.4	0.4	0.5	8.6 8.3	8.5	6.4
				Middle	5.1	20.6 20.6	20.6	8.4 8.4	8.4	32.7 32.7	32.7	98.1 98.1	98.1	6.6 6.6	6.6		0.4 0.5	0.4		5.1 4.8	5.0	
				Bottom	9.1	20.6 20.6	20.6	8.4 8.4	8.4	32.7 32.7	32.7	97.8 97.8	97.8	6.6 6.6	6.6	6.6	0.6 0.7	0.6		5.6 6.0	5.8	
M5	Moderate	Sunny	16:12	Surface	1.0	20.4 20.4	20.4	8.4 8.4	8.4	32.7 32.7	32.7	99.7 99.6	99.7	6.8 6.8	6.8	6.7	1.7 1.6	1.7	1.6	2.6 2.5	2.6	5.0
				Middle	6.0	20.4 20.4	20.4	8.4 8.4	8.4	32.7 32.7	32.7	97.5 97.5	97.5	6.6 6.6	6.6		1.8 1.8	1.8		5.9 5.8	5.9	
				Bottom	11.0	20.4 20.4	20.4	8.4 8.4	8.4	32.7 32.7	32.7	97.0 97.0	97.0	6.6 6.6	6.6	6.6	1.5 1.5	1.5		6.8 6.5	6.7	
M6	Moderate	Sunny	15:53	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	6.6	- -	-	1.6	- -	-	4.8
				Middle	2.1	20.5 20.5	20.5	8.4 8.4	8.4	32.7 32.7	32.7	97.0 97.0	97.0	6.6 6.6	6.6		1.6 1.6	1.6		4.9 4.7	4.8	
				Bottom	-	- -	-	- -	-	- -	-	- -	-	- -	-	-	- -	-		- -	-	

Remarks: *DA: Depth-Averaged
**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

Appendix I - Action and Limit Levels for Marine Water Quality on 30 December 2019 (Mid-Ebb Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU*** or 120% of upstream control station's Turbidity at the same tide of the same day ***C2: 0.9 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C2: 1.0 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 9.8 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 10.7 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 9.8 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***#VALUE!***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 7.3 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 7.9 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 12/30/2019

(Mid-Flood Tide)

Location	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
C1	Moderate	Sunny	11:28	Surface	1.1	20.6 20.6	20.6	8.4 8.4	8.4	32.7 32.7	32.7	101.2 101.0	101.1	6.9 6.8	6.8	6.8	1.0 0.9	0.9	0.7	3.6 3.7	3.7	4.5
				Middle	9.0	20.6 20.6	20.6	8.4 8.4	8.4	32.7 32.7	32.7	100.0 100.0	100.0	6.8 6.8	6.8		0.7 0.7	0.7		4.6 4.7	4.7	
				Bottom	17.0	20.6 20.6	20.6	8.4 8.4	8.4	32.7 32.7	32.7	99.9 99.8	99.9	6.8 6.8	6.8	6.8	0.5 0.6	0.5		5.2 5.0	5.1	
C2	Moderate	Sunny	09:53	Surface	1.0	20.6 20.6	20.6	8.4 8.4	8.4	32.7 32.7	32.7	98.7 98.6	98.7	6.7 6.7	6.7	6.7	0.8 0.8	0.8	0.8	4.6 4.4	4.5	6.4
				Middle	16.0	20.6 20.6	20.6	8.4 8.4	8.4	32.7 32.7	32.7	98.2 98.2	98.2	6.6 6.6	6.6		0.8 0.8	0.8		8.0 7.9	8.0	
				Bottom	31.1	20.6 20.6	20.6	8.4 8.4	8.4	32.7 32.7	32.7	98.0 98.0	98.0	6.6 6.6	6.6	6.6	0.8 0.8	0.8		6.6 6.7	6.7	
G1	Moderate	Sunny	10:33	Surface	1.0	20.5 20.6	20.6	8.4 8.4	8.4	32.6 32.6	32.6	96.7 96.8	96.8	6.6 6.6	6.6	6.6	1.8 1.8	1.8	1.9	7.8 7.6	7.7	6.7
				Middle	4.0	20.5 20.5	20.5	8.4 8.4	8.4	32.7 32.7	32.7	99.1 99.2	99.2	6.7 6.7	6.7		1.4 1.5	1.5		6.5 6.4	6.5	
				Bottom	7.0	20.5 20.5	20.5	8.4 8.4	8.4	32.7 32.7	32.7	99.7 99.7	99.7	6.8 6.8	6.8	6.8	2.3 2.3	2.3		5.9 6.2	6.1	
G2	Moderate	Sunny	10:13	Surface	1.0	20.5 20.5	20.5	8.4 8.4	8.4	32.7 32.7	32.7	100.7 100.7	100.7	6.8 6.8	6.8	6.8	0.8 0.8	0.8	0.7	7.8 7.5	7.7	6.5
				Middle	5.1	20.5 20.5	20.5	8.4 8.4	8.4	32.7 32.7	32.7	99.6 99.2	99.4	6.8 6.7	6.7		0.4 0.4	0.4		4.8 4.9	4.9	
				Bottom	9.1	20.5 20.5	20.5	8.4 8.4	8.4	32.7 32.7	32.7	98.7 98.7	98.7	6.7 6.7	6.7	6.7	0.9 0.9	0.9		6.9 6.9	6.9	
G3	Moderate	Sunny	10:41	Surface	1.0	20.6 20.6	20.6	8.4 8.4	8.4	32.5 32.5	32.5	100.2 100.2	100.2	6.8 6.8	6.8	6.7	0.9 0.9	0.9	1.0	5.4 5.3	5.4	6.0
				Middle	4.1	20.7 20.7	20.7	8.4 8.4	8.4	32.6 32.7	32.7	99.1 97.4	98.3	6.7 6.6	6.6		1.0 0.9	0.9		9.1 8.6	8.9	
				Bottom	7.0	20.6 20.6	20.6	8.4 8.4	8.4	32.7 32.7	32.7	96.5 96.5	96.5	6.5 6.5	6.5	6.5	1.2 1.2	1.2		4.0 3.8	3.9	
G4	Moderate	Sunny	10:55	Surface	1.0	20.5 20.5	20.5	8.4 8.4	8.4	32.6 32.6	32.6	94.8 95.2	95.0	6.4 6.5	6.4	6.6	1.2 1.2	1.2	1.7	6.7 6.8	6.8	5.8
				Middle	4.0	20.5 20.5	20.5	8.4 8.4	8.4	32.7 32.7	32.7	99.0 99.0	99.0	6.7 6.7	6.7		1.7 1.8	1.8		4.7 4.8	4.8	
				Bottom	7.1	20.5 20.5	20.5	8.4 8.4	8.4	32.7 32.7	32.7	98.5 98.4	98.5	6.7 6.7	6.7	6.7	1.9 2.1	2.0		5.7 5.8	5.8	
M1	Moderate	Sunny	10:20	Surface	1.1	20.4 20.4	20.4	8.4 8.4	8.4	32.7 32.7	32.7	101.3 101.1	101.2	6.9 6.9	6.9	6.8	1.3 1.3	1.3	1.4	8.7 8.9	8.8	8.7
				Middle	3.1	20.4 20.4	20.4	8.4 8.4	8.4	32.7 32.7	32.7	99.9 99.8	99.9	6.8 6.8	6.8		1.4 1.4	1.4		5.6 5.7	5.7	
				Bottom	5.0	20.4 20.4	20.4	8.4 8.4	8.4	32.7 32.7	32.7	99.0 98.9	99.0	6.7 6.7	6.7	6.7	1.4 1.3	1.4		11.3 11.8	11.6	
M2	Moderate	Sunny	10:06	Surface	1.1	20.6 20.6	20.6	8.4 8.4	8.4	32.7 32.7	32.7	99.1 99.1	99.1	6.7 6.7	6.7	6.7	1.3 1.3	1.3	1.0	4.4 4.5	4.5	6.2
				Middle	6.0	20.6 20.6	20.6	8.4 8.4	8.4	32.7 32.7	32.7	97.9 97.9	97.9	6.6 6.6	6.6		0.8 0.8	0.8		5.8 5.5	5.7	
				Bottom	11.0	20.6 20.6	20.6	8.4 8.4	8.4	32.7 32.7	32.7	97.5 97.5	97.5	6.6 6.6	6.6	6.6	1.0 1.0	1.0		8.4 8.3	8.4	
M3	Moderate	Sunny	10:49	Surface	1.1	20.8 20.8	20.8	8.4 8.4	8.4	32.4 32.5	32.5	92.0 92.2	92.1	6.2 6.2	6.2	6.4	1.6 1.6	1.6	1.8	10.8 10.1	10.5	9.4
				Middle	4.0	20.7 20.7	20.7	8.4 8.4	8.4	32.7 32.7	32.7	95.9 96.2	96.1	6.5 6.5	6.5		1.0 1.0	1.0		6.9 6.5	6.7	
				Bottom	7.0	20.6 20.6	20.6	8.4 8.4	8.4	32.7 32.7	32.7	94.8 94.6	94.7	6.4 6.4	6.4	6.4	2.9 3.0	2.9		11.1 11.1	11.1	
M4	Moderate	Sunny	09:59	Surface	1.1	20.6 20.6	20.6	8.4 8.4	8.4	32.7 32.7	32.7	98.3 98.3	98.3	6.7 6.7	6.7	6.6	0.6 0.6	0.6	0.5	8.1 7.9	8.0	6.9
				Middle	5.1	20.6 20.6	20.6	8.4 8.4	8.4	32.7 32.7	32.7	98.2 98.1	98.2	6.6 6.6	6.6		0.4 0.4	0.4		7.0 7.1	7.1	
				Bottom	9.0	20.6 20.6	20.6	8.4 8.4	8.4	32.7 32.7	32.7	97.8 97.8	97.8	6.6 6.6	6.6	6.6	0.5 0.6	0.5		5.6 5.7	5.7	
M5	Moderate	Sunny	11:18	Surface	1.0	20.4 20.4	20.4	8.4 8.4	8.4	32.7 32.7	32.7	99.9 99.8	99.9	6.8 6.8	6.8	6.7	1.7 1.7	1.7	1.6	4.6 4.7	4.7	12.7
				Middle	6.1	20.4 20.4	20.4	8.4 8.4	8.4	32.7 32.7	32.7	97.7 97.6	97.7	6.6 6.6	6.6		1.7 1.8	1.8		6.4 6.5	6.5	
				Bottom	11.1	20.4 20.4	20.4	8.4 8.4	8.4	32.7 32.7	32.7	97.0 97.0	97.0	6.6 6.6	6.6	6.6	1.4 1.5	1.5		26.6 27.3	27.0	
M6	Moderate	Sunny	11:04	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	6.6	- -	-	1.7	- -	-	7.6
				Middle	2.0	20.5 20.5	20.5	8.4 8.4	8.4	32.7 32.7	32.7	97.0 97.0	97.0	6.6 6.6	6.6		1.7 1.7	1.7		7.6 7.6	7.6	
				Bottom	-	- -	-	- -	-	- -	-	- -	-	- -	-	-	- -	-		- -	-	

Remarks: *DA: Depth-Averaged
**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

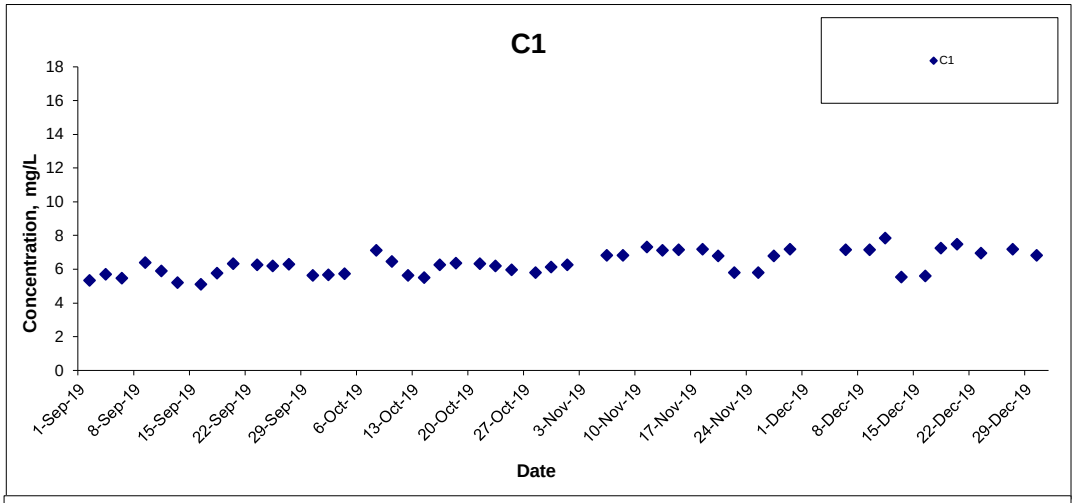
Appendix I - Action and Limit Levels for Marine Water Quality on 30 December 2019 (Mid-Flood Tide)

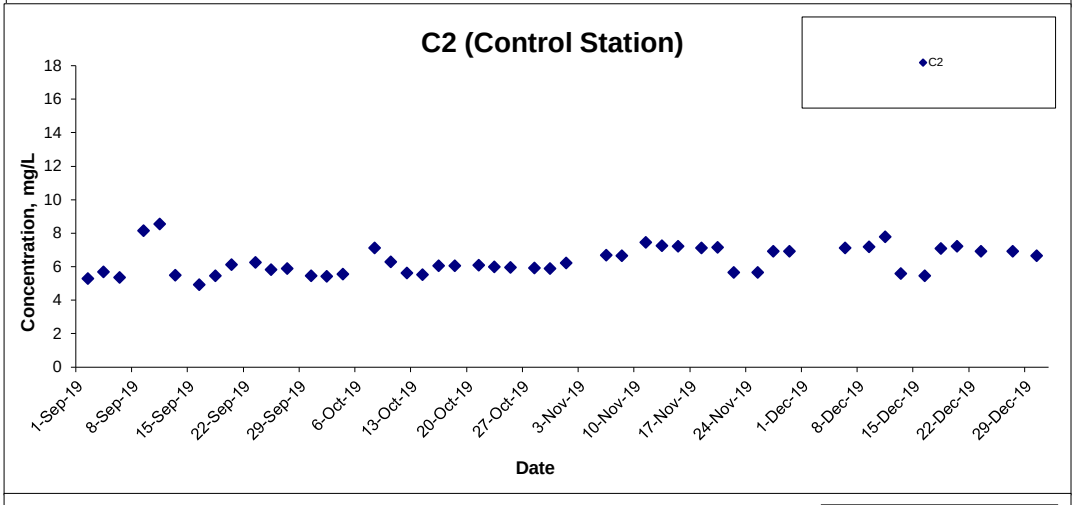
Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU*** or 120% of upstream control station's Turbidity at the same tide of the same day ***C1: 0.6 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C1: 0.7 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 4.4 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 4.7 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 4.4 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 4.7 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 6.1 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 6.6 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

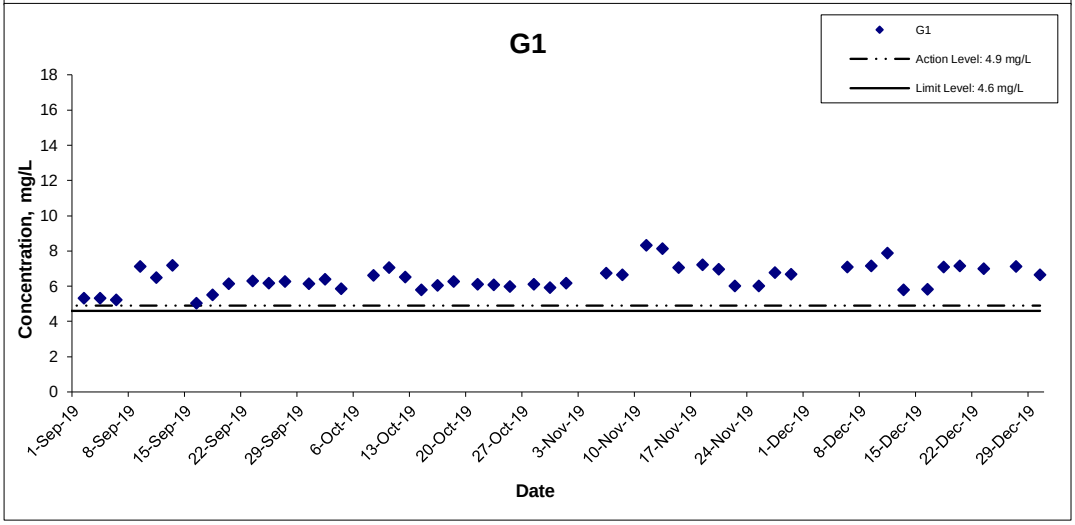
Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Dissolved Oxygen (Depth-averaged) at Mid-Ebb Tide







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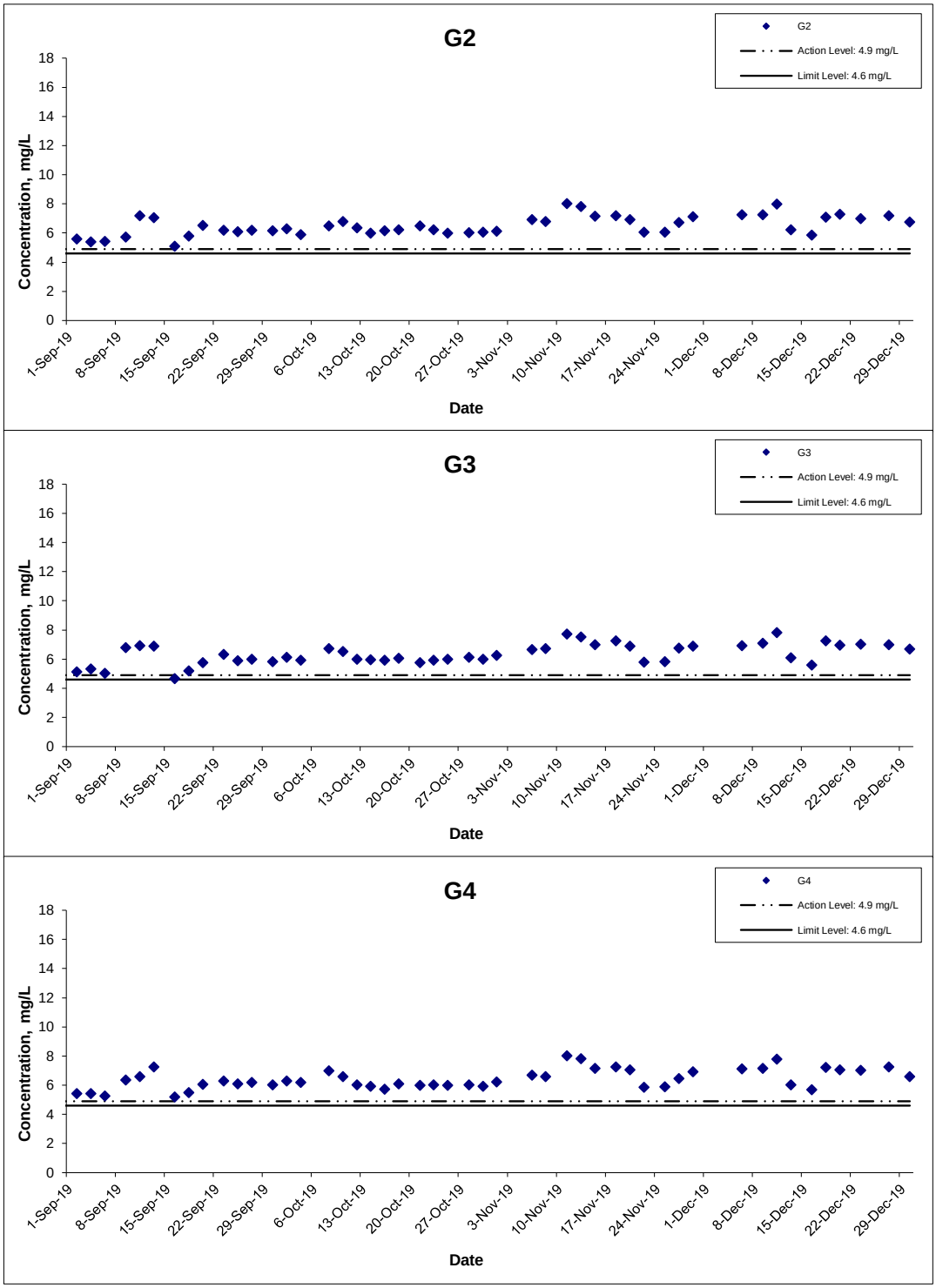
Dissolved Oxygen (Depth-averaged) at Mid-Ebb Tide



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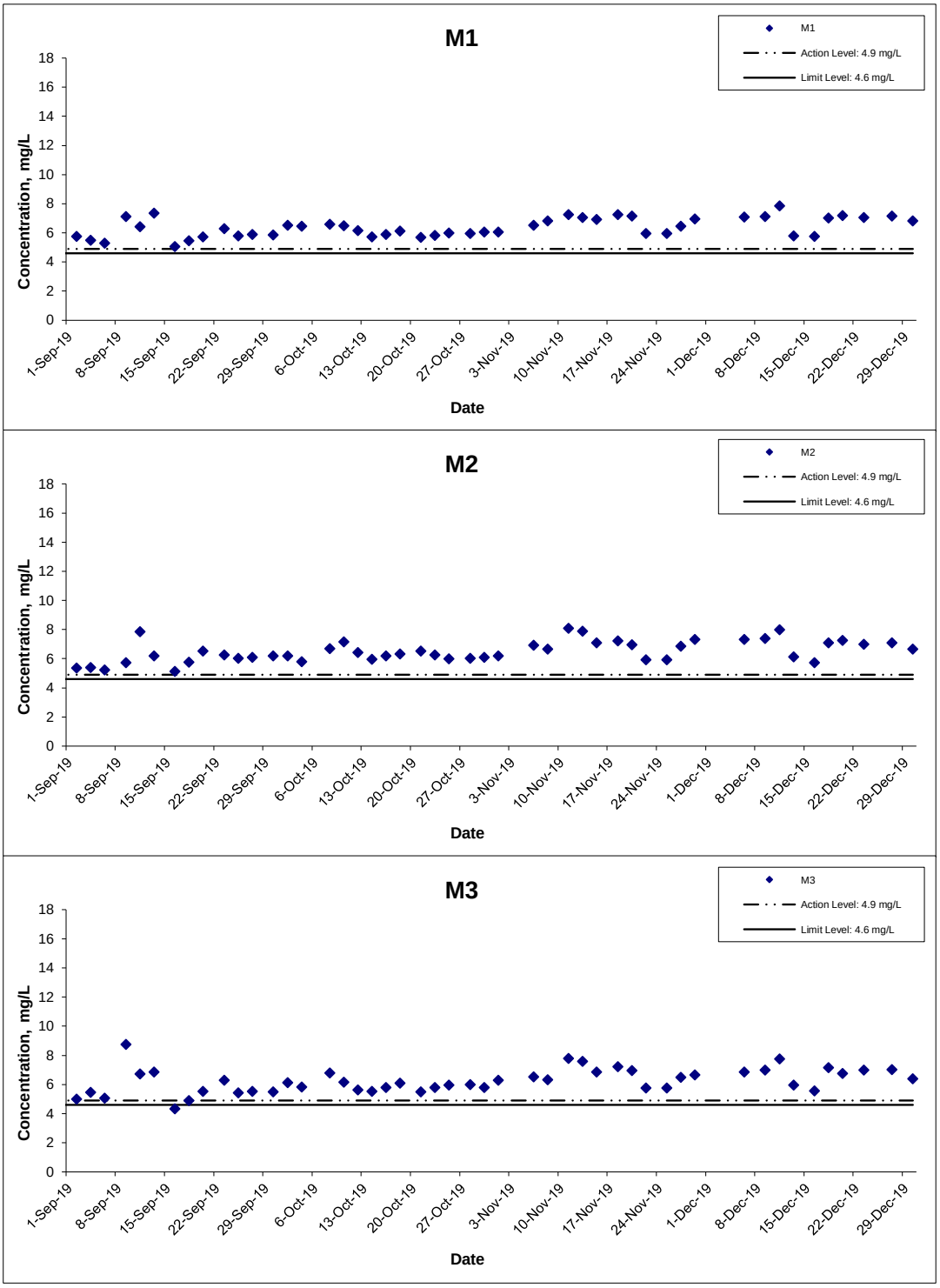
Dissolved Oxygen (Depth-averaged) at Mid-Ebb Tide



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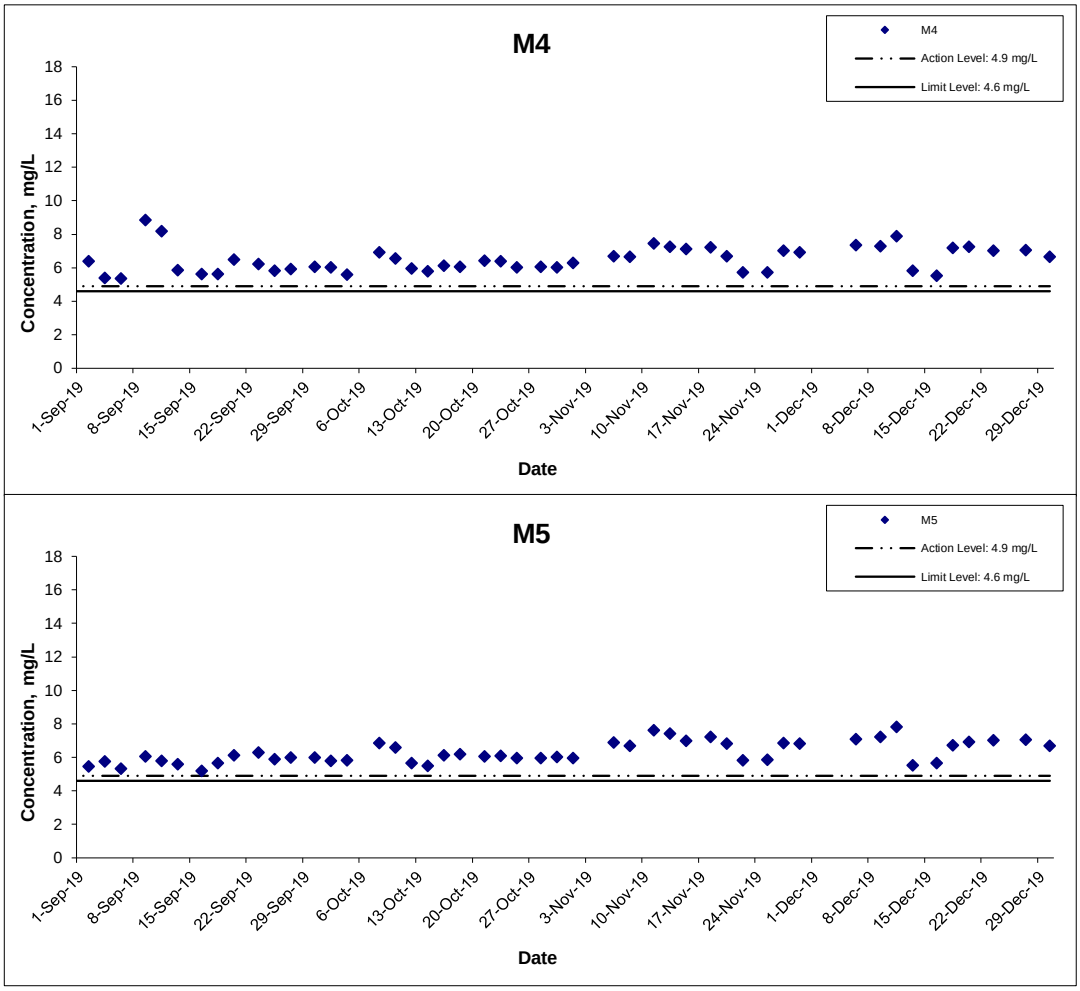
Dissolved Oxygen (Depth-averaged) at Mid-Ebb Tide



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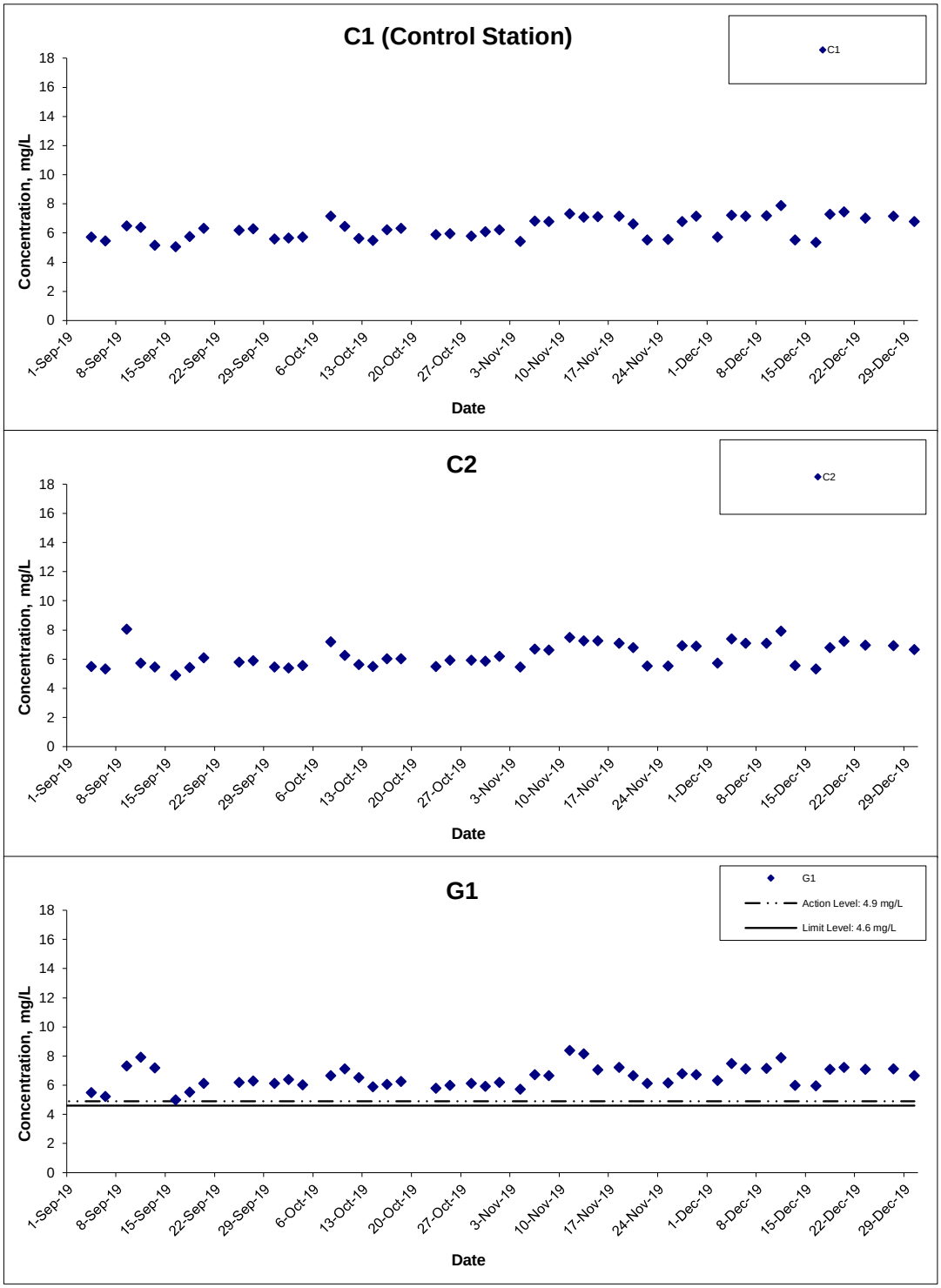
Dissolved Oxygen (Depth-averaged) at Mid-Flood Tide



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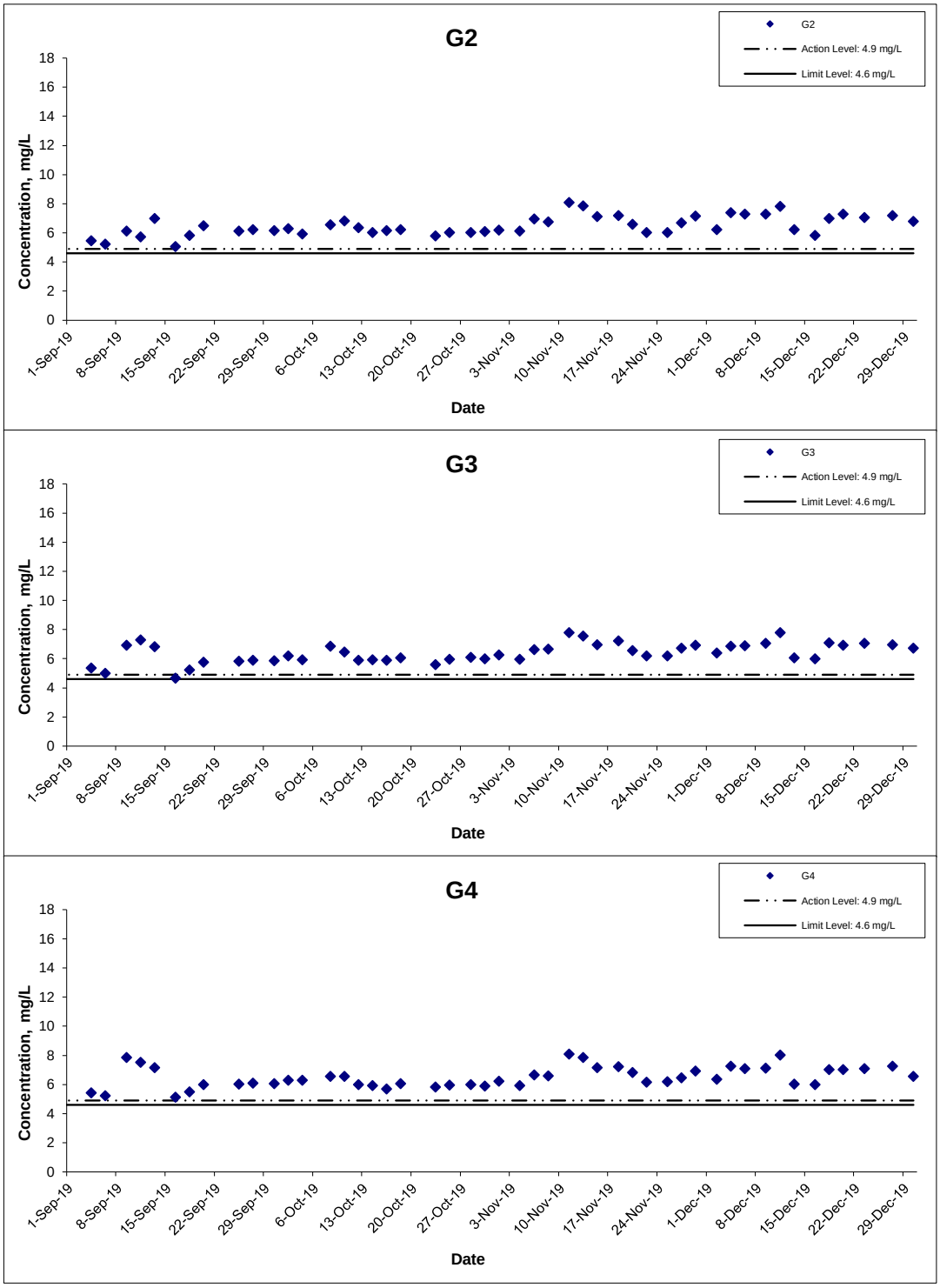
Dissolved Oxygen (Depth-averaged) at Mid-Flood Tide



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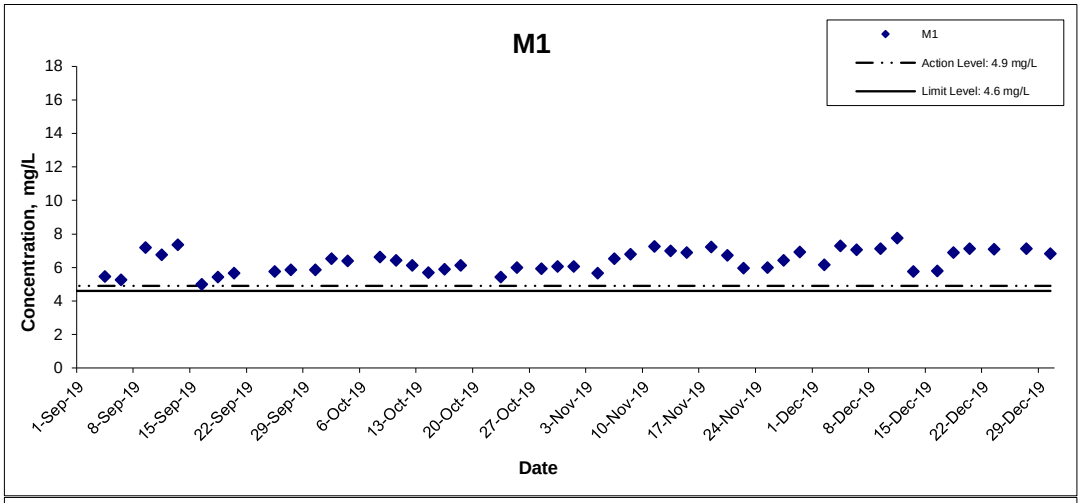
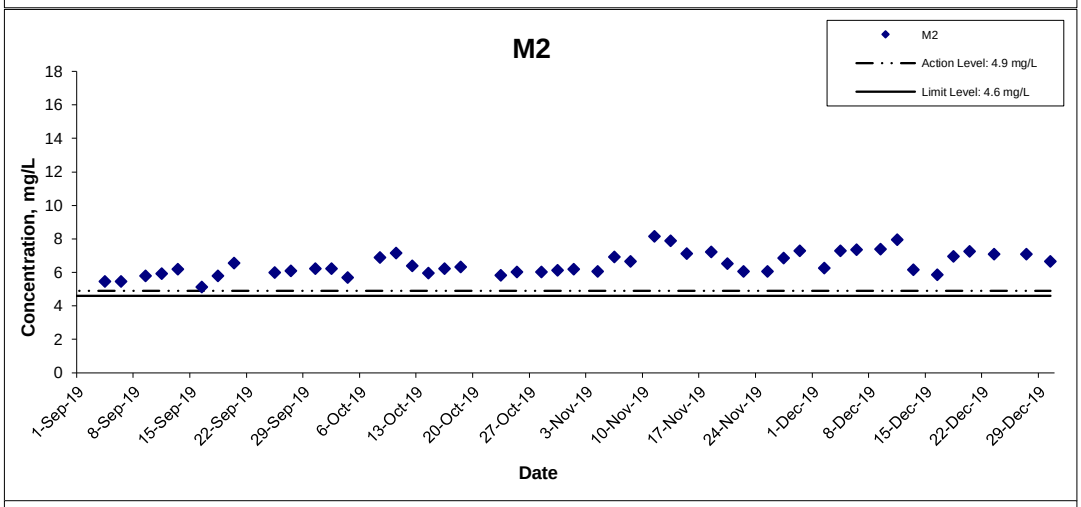
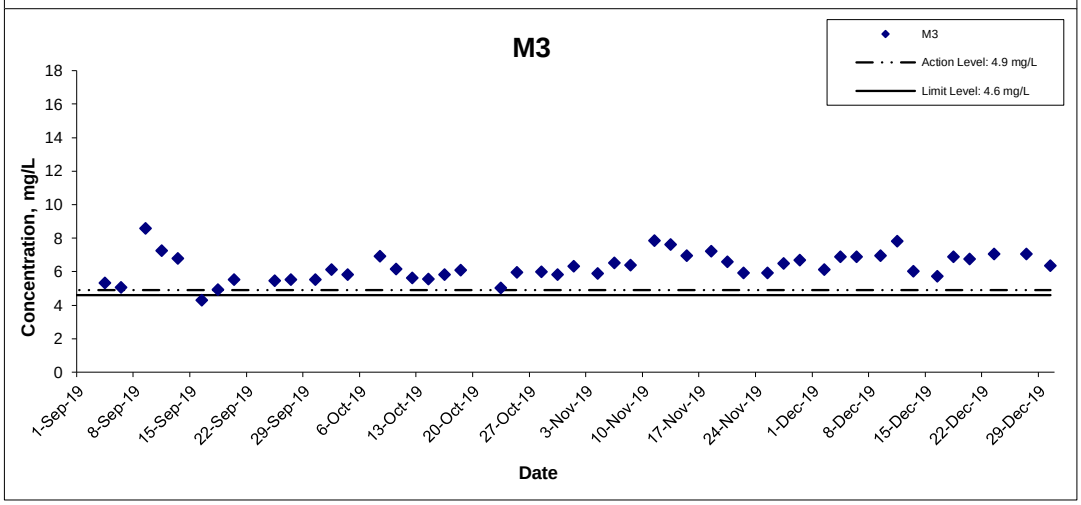
Dissolved Oxygen (Depth-averaged) at Mid-Flood Tide







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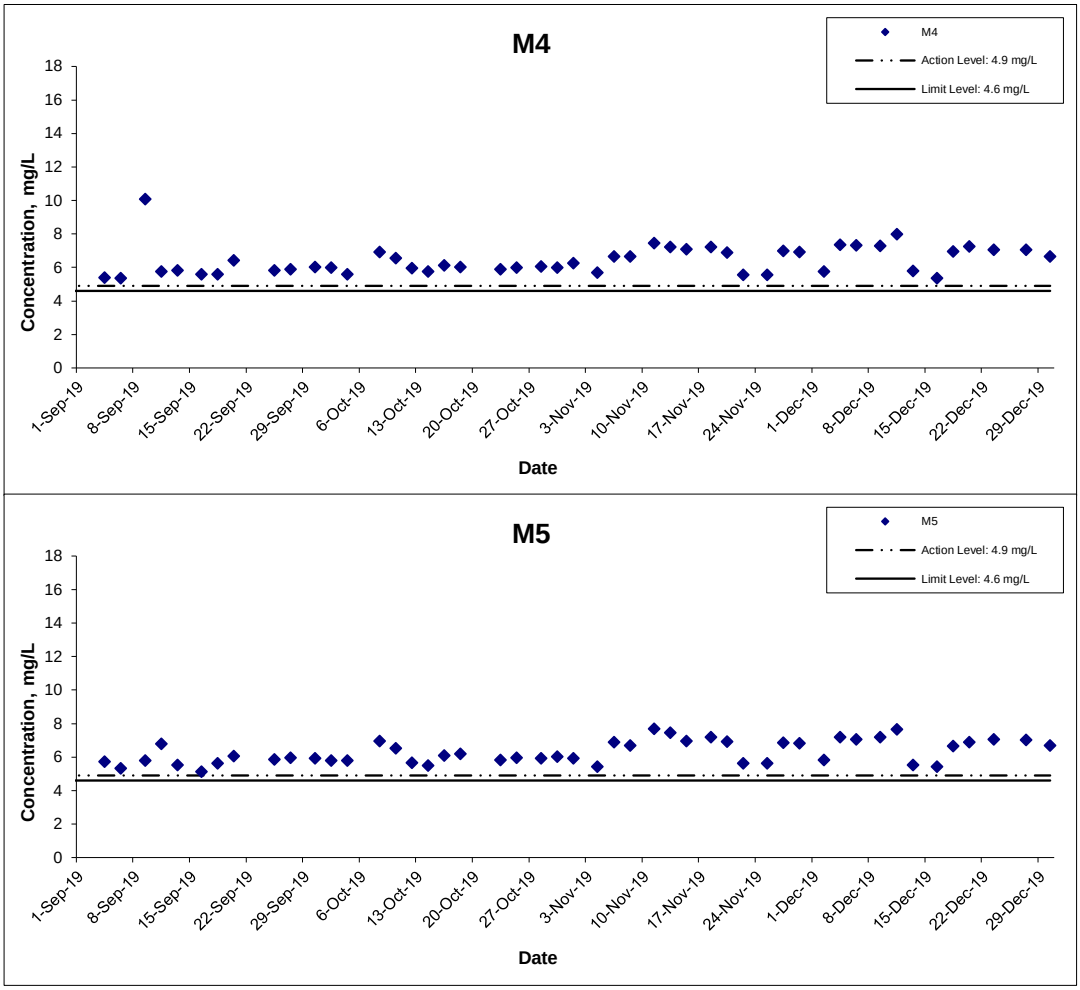
Dissolved Oxygen (Depth-averaged) at Mid-Flood Tide



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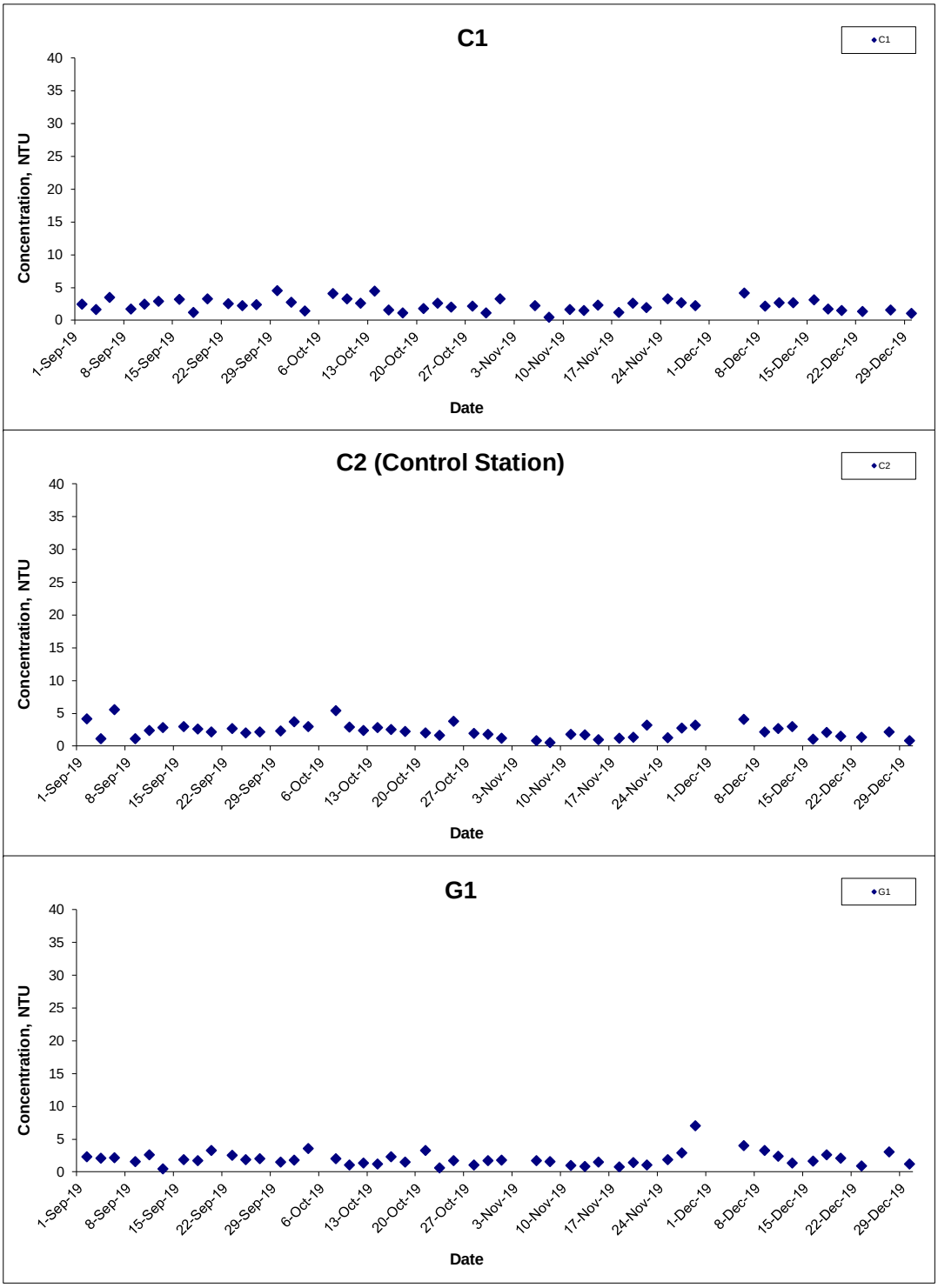
Turbidity (Depth-averaged) at Mid-Ebb Tide



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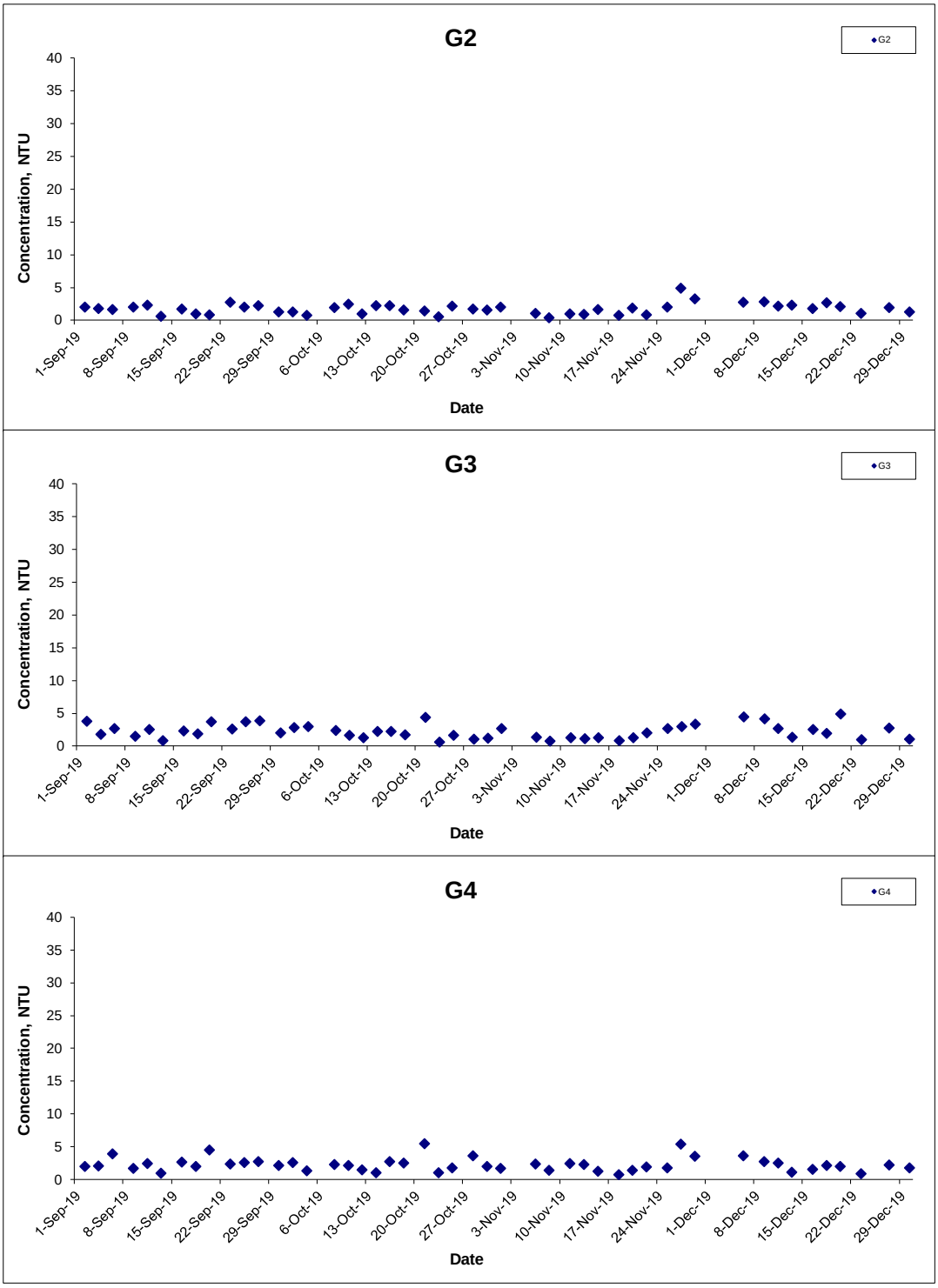
Turbidity (Depth-averaged) at Mid-Ebb Tide



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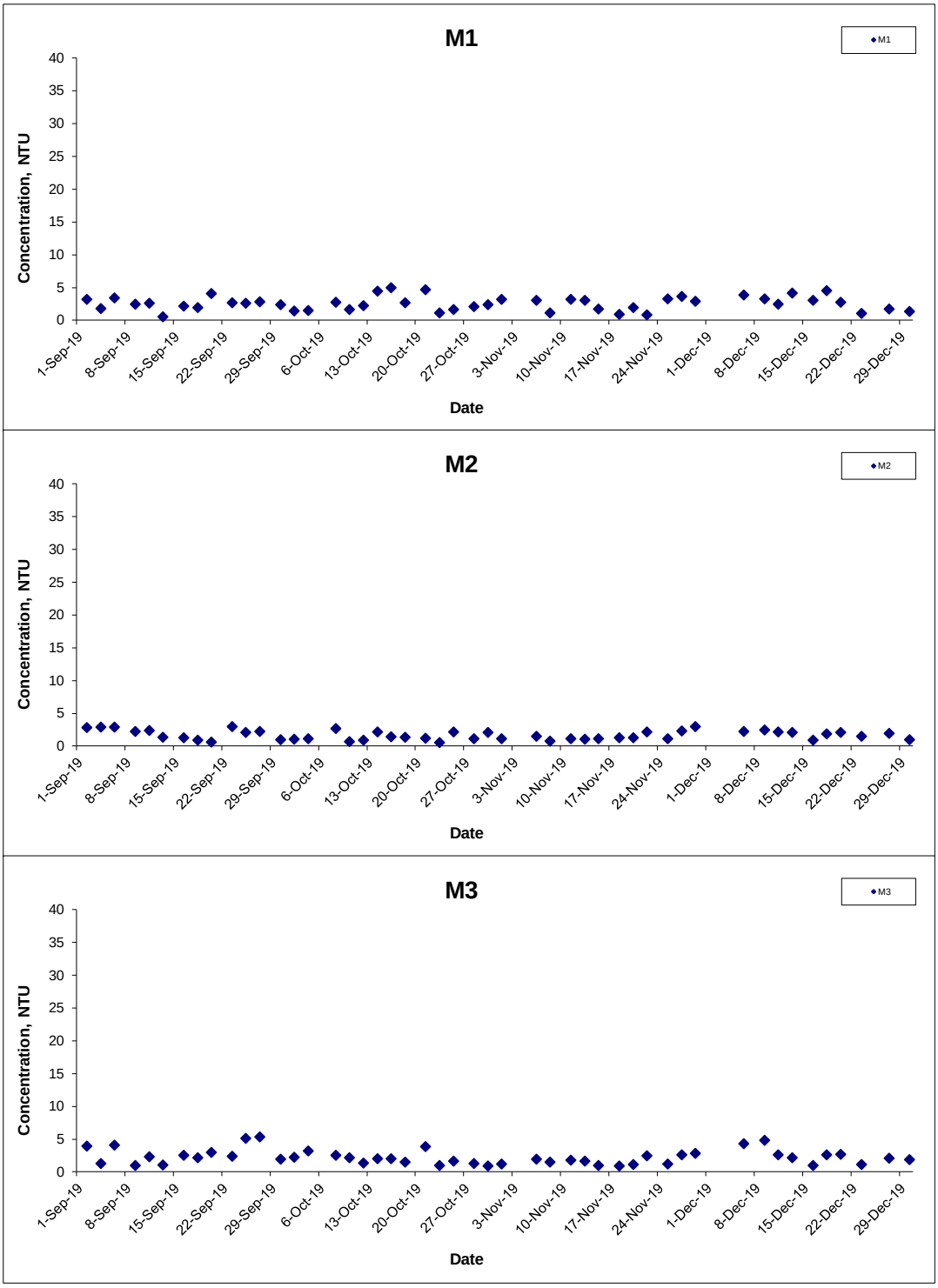

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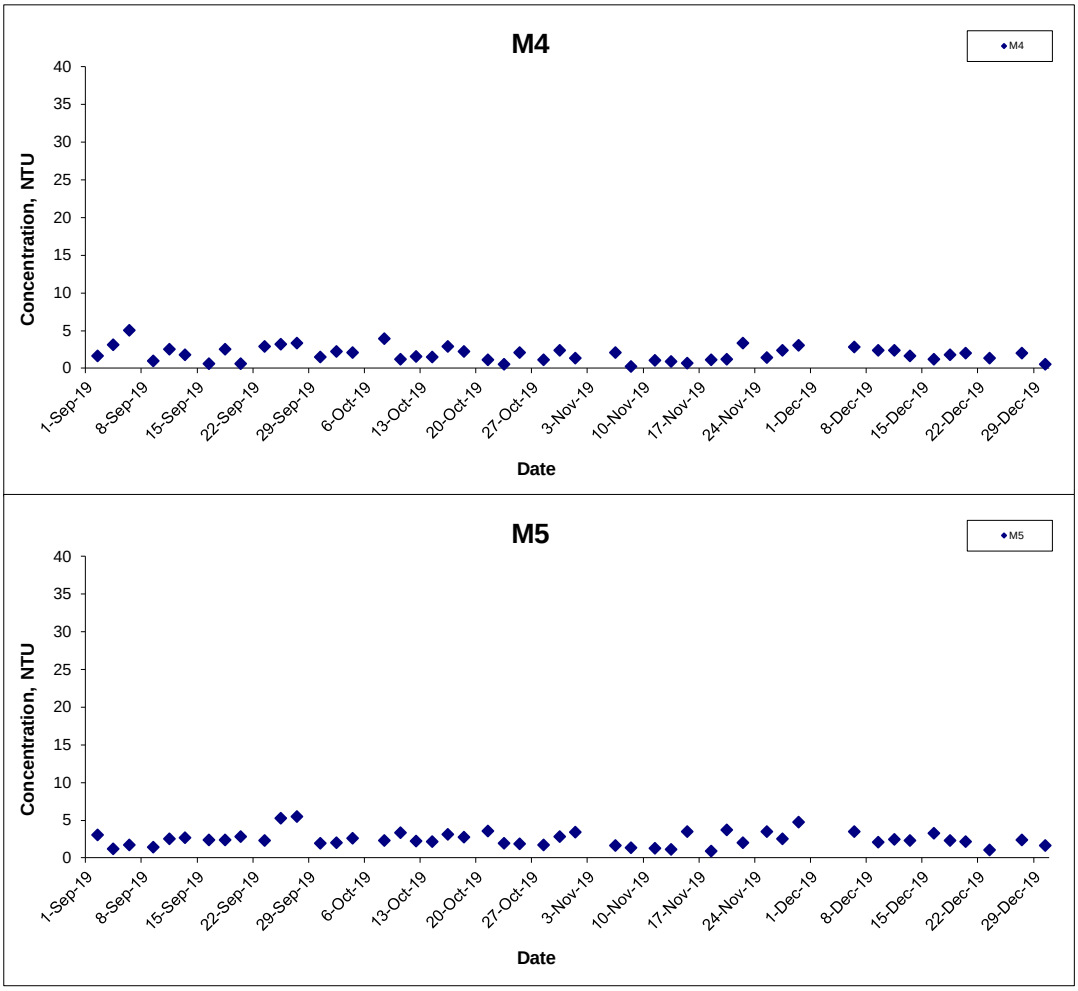

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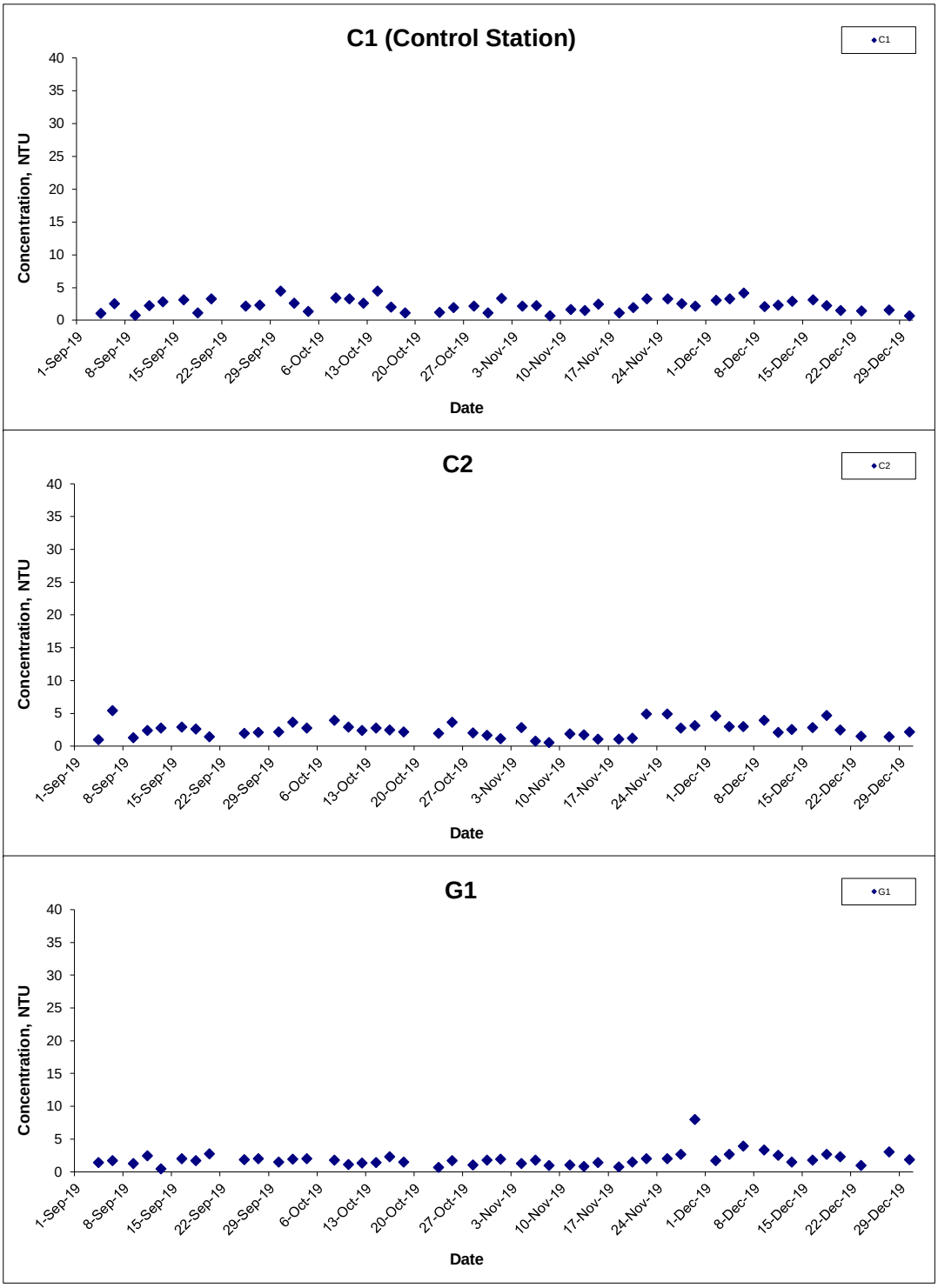
Turbidity (Depth-averaged) at Mid-Flood Tide



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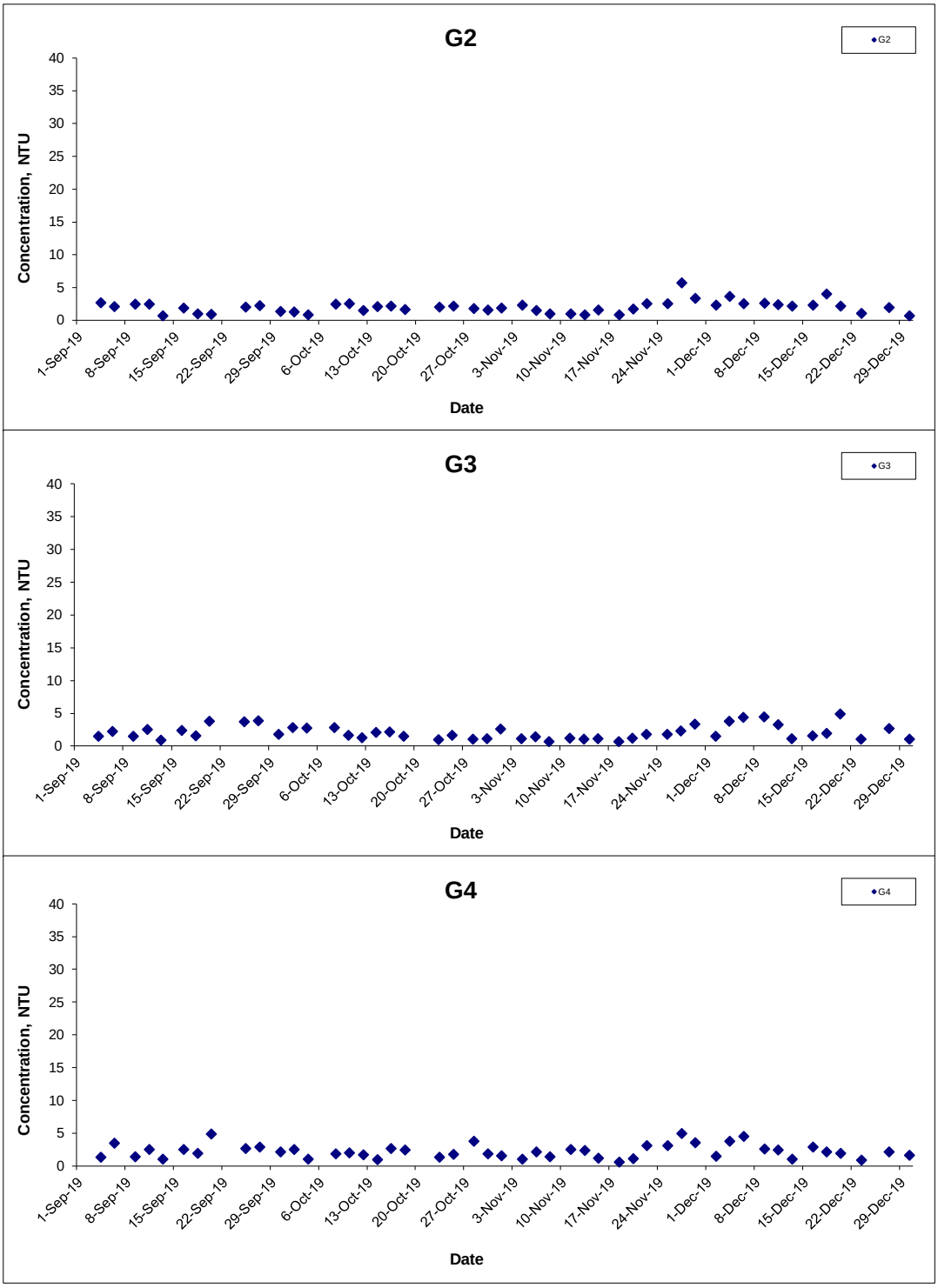
Turbidity (Depth-averaged) at Mid-Flood Tide



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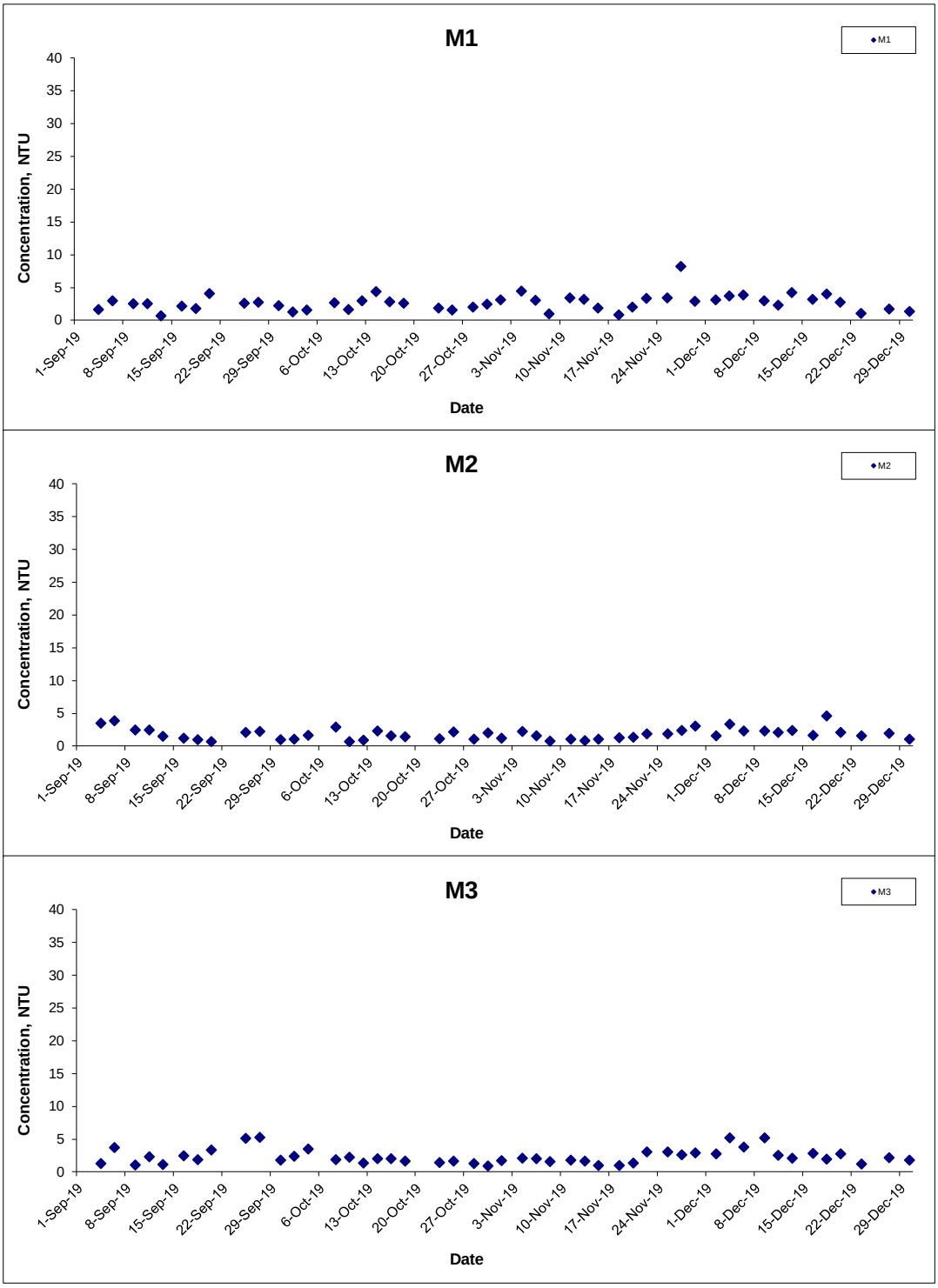
Turbidity (Depth-averaged) at Mid-Flood Tide



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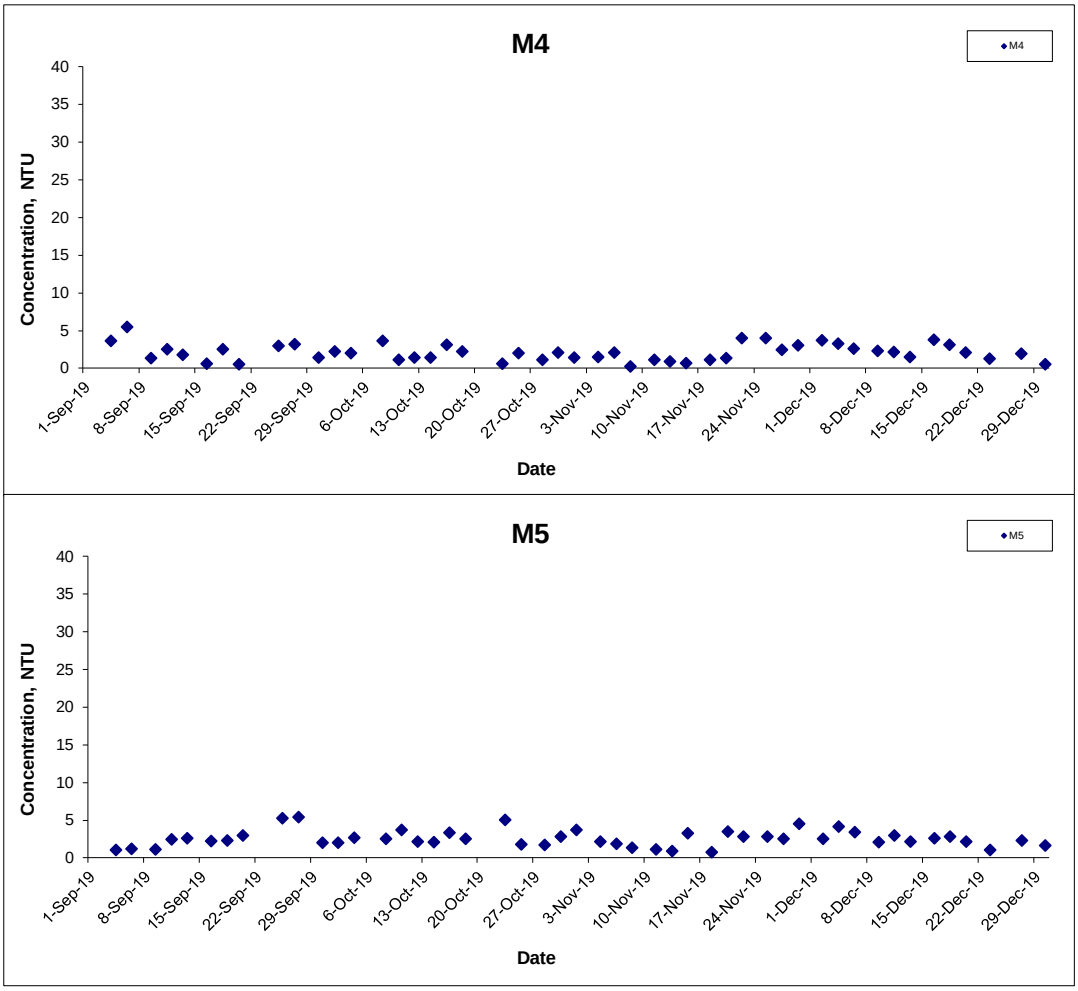

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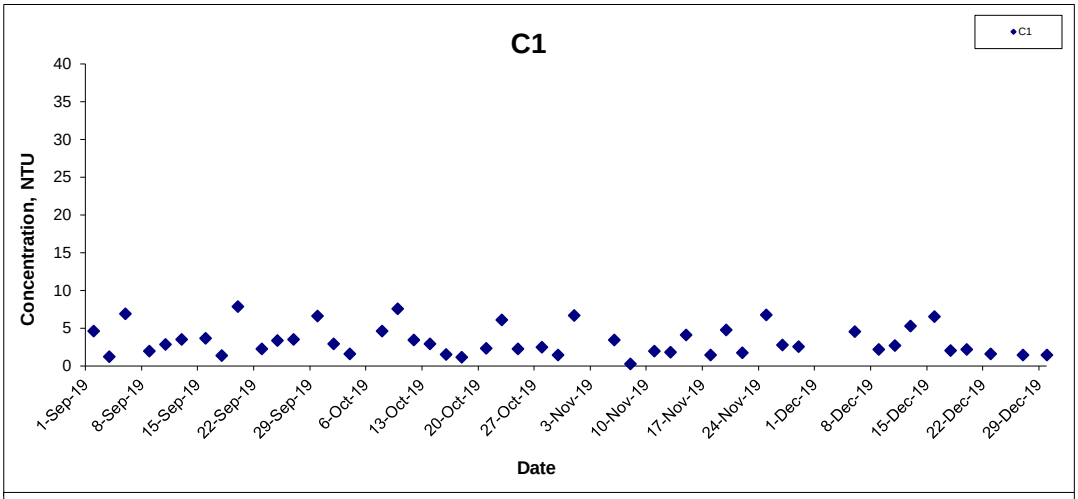
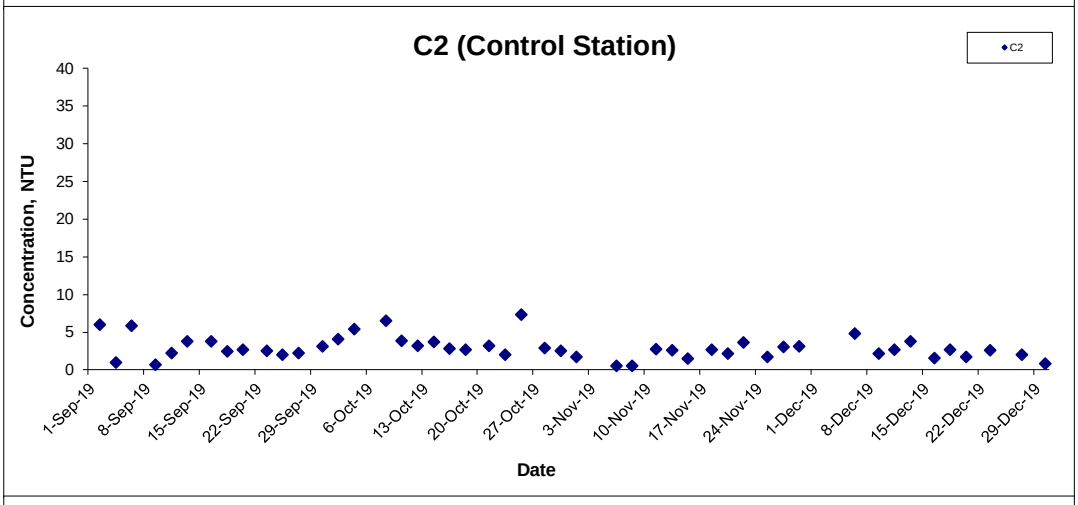
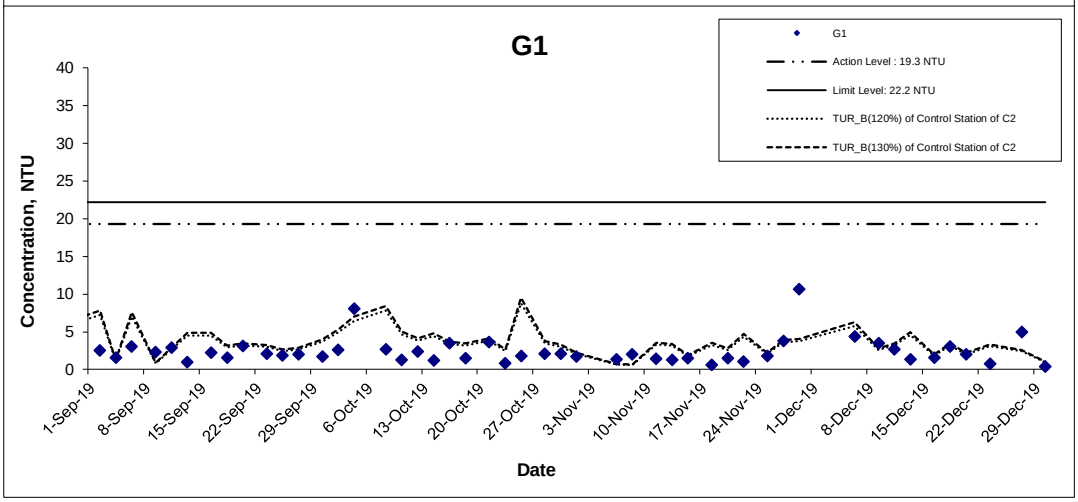
Turbidity (Bottom) at Mid-Ebb Tide







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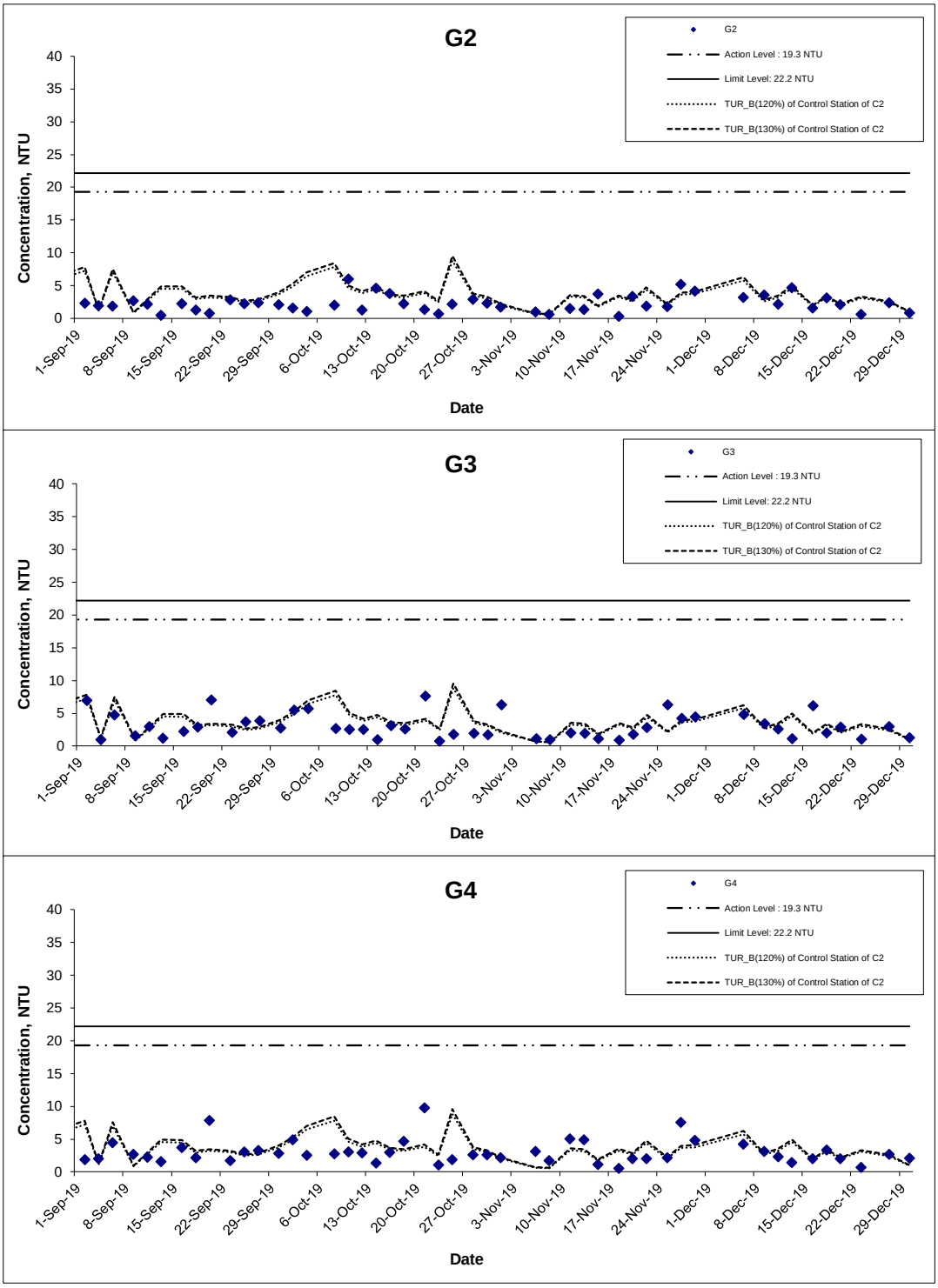
Turbidity (Bottom) at Mid-Ebb Tide



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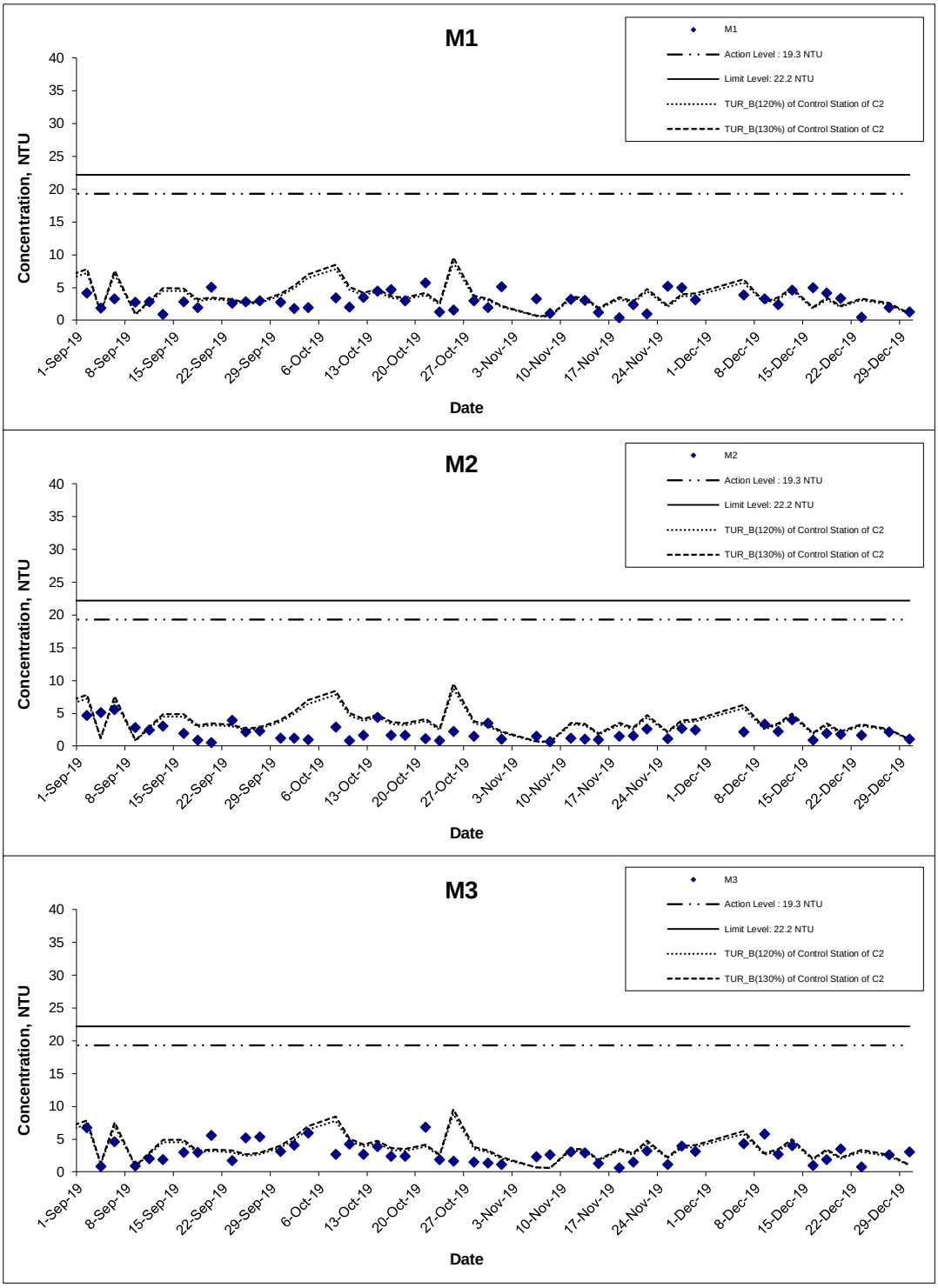
Turbidity (Bottom) at Mid-Ebb Tide



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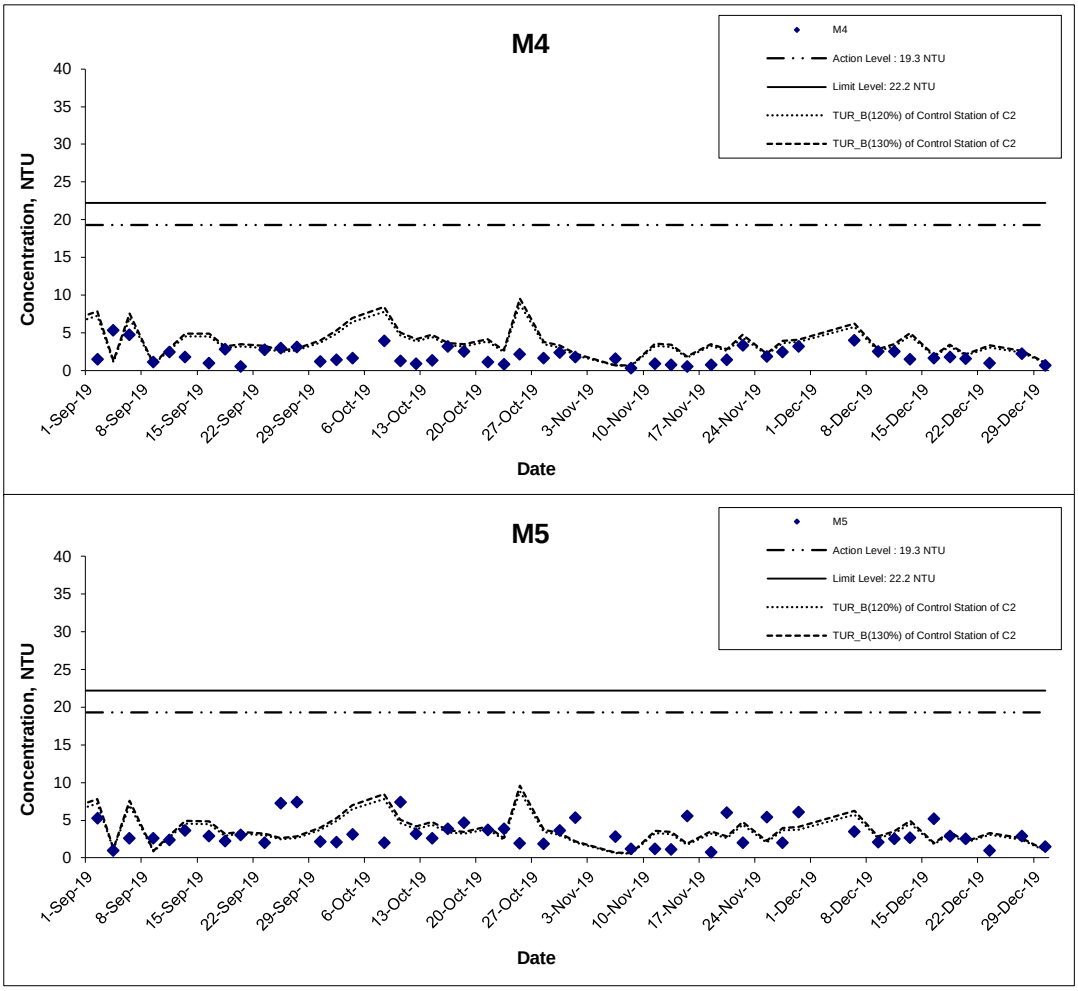
Turbidity (Bottom) at Mid-Ebb Tide



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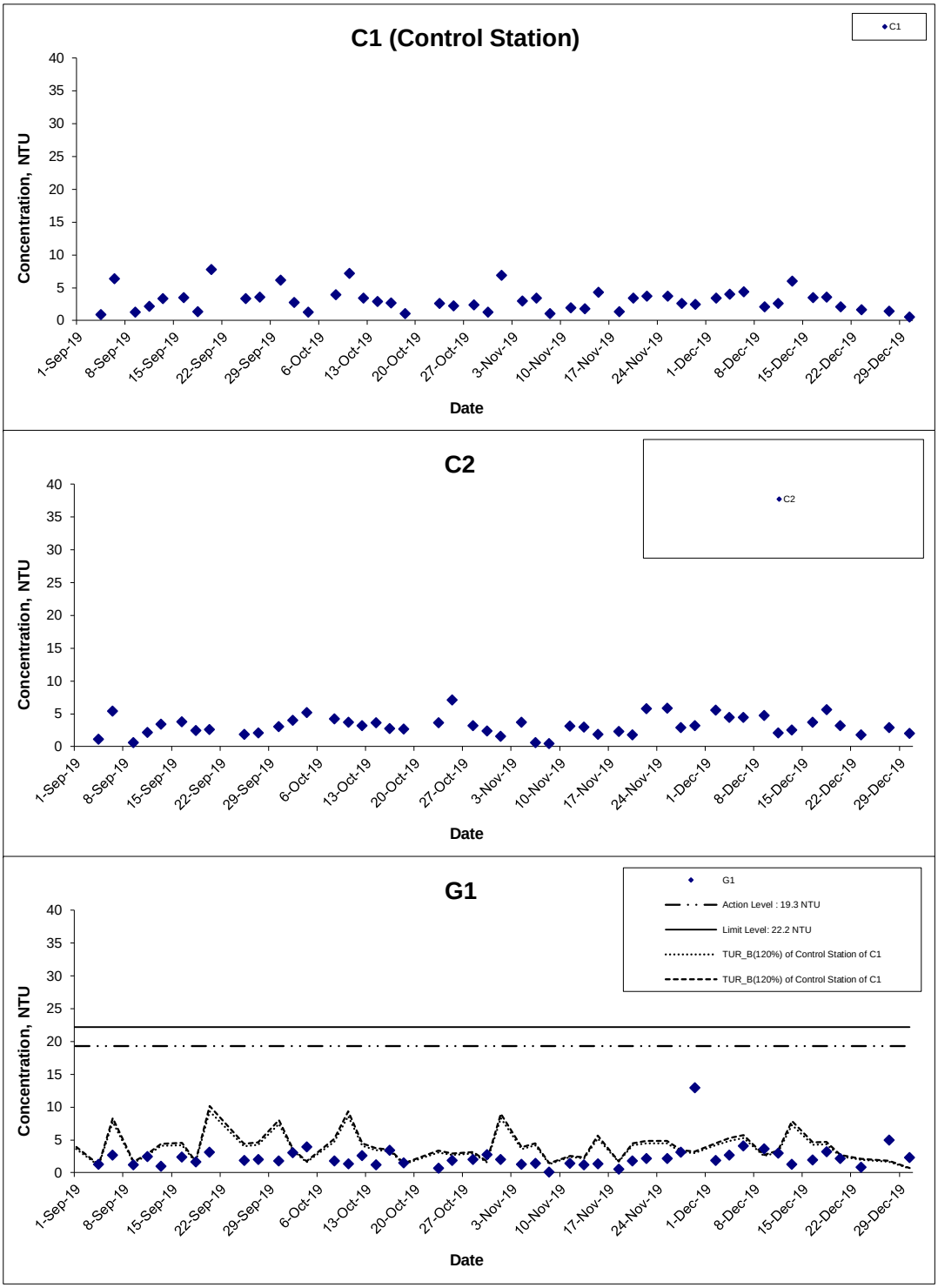
Turbidity (Bottom) at Mid-Flood Tide



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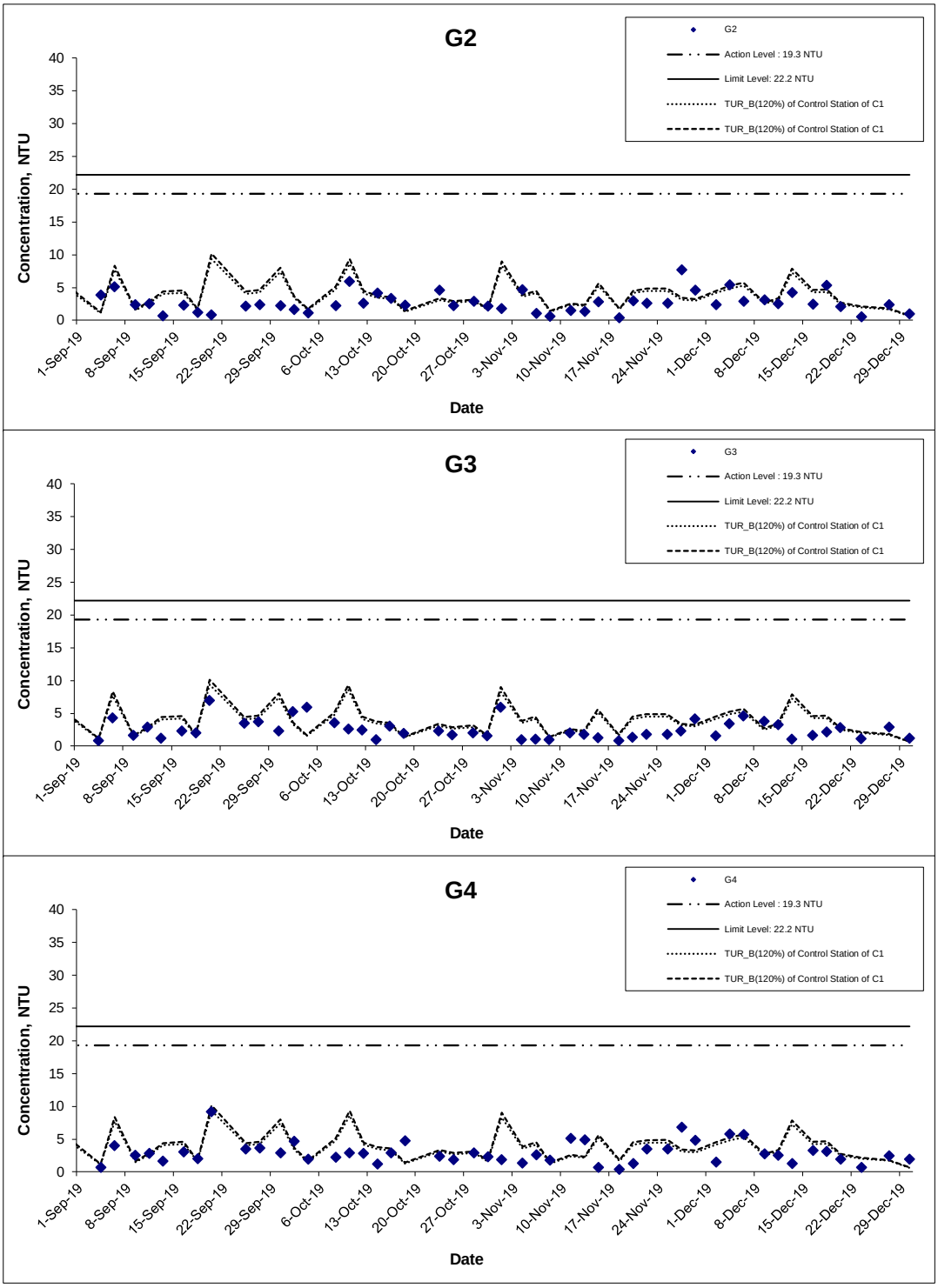
Turbidity (Bottom) at Mid-Flood Tide



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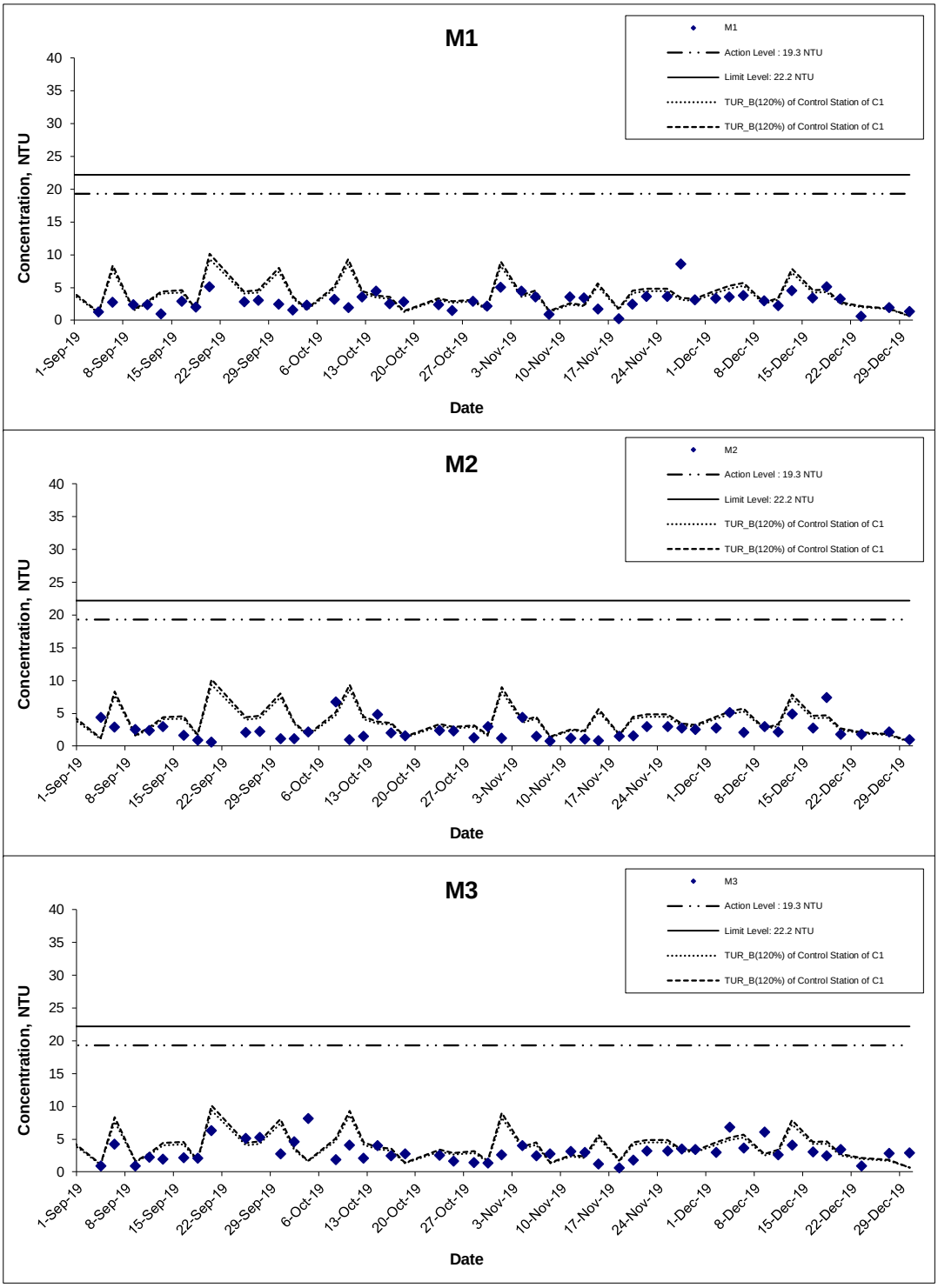
Turbidity (Bottom) at Mid-Flood Tide



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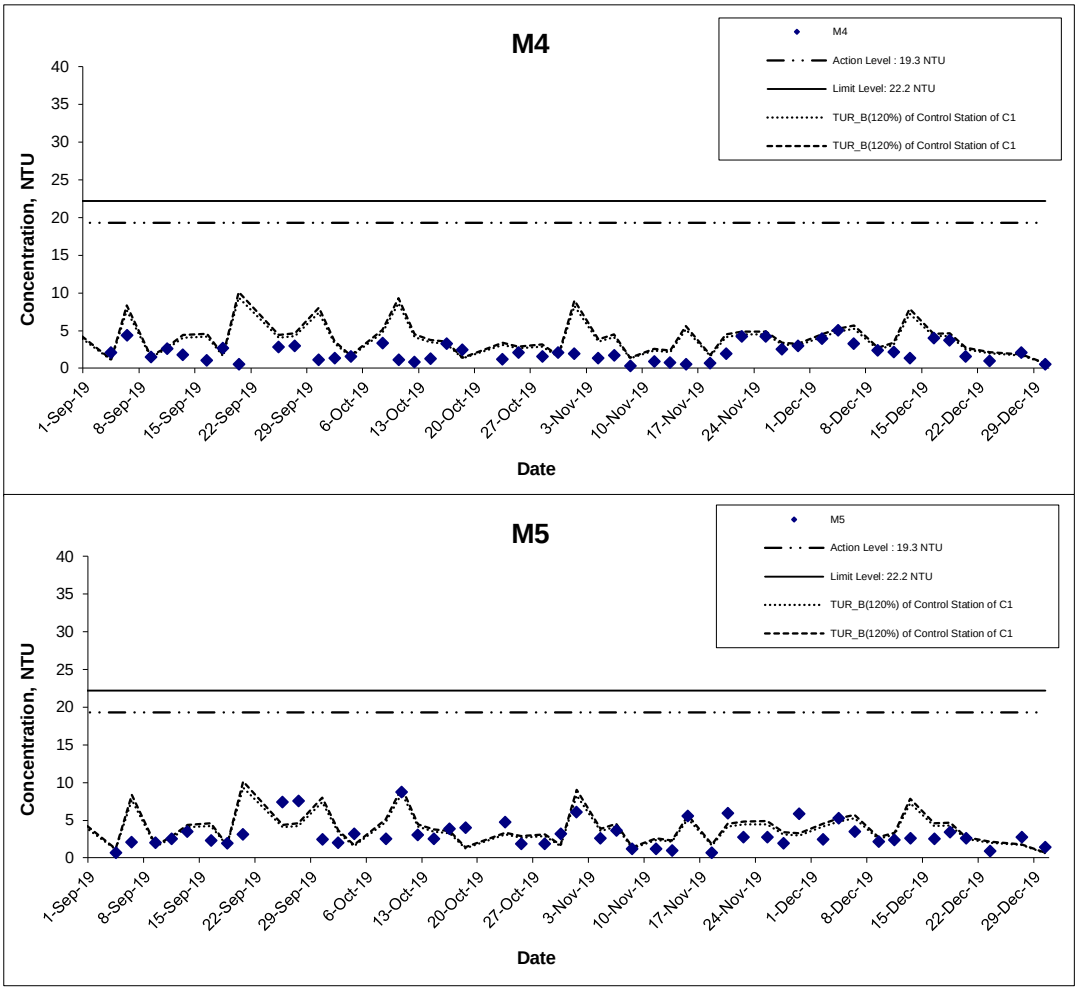
Turbidity (Bottom) at Mid-Flood Tide



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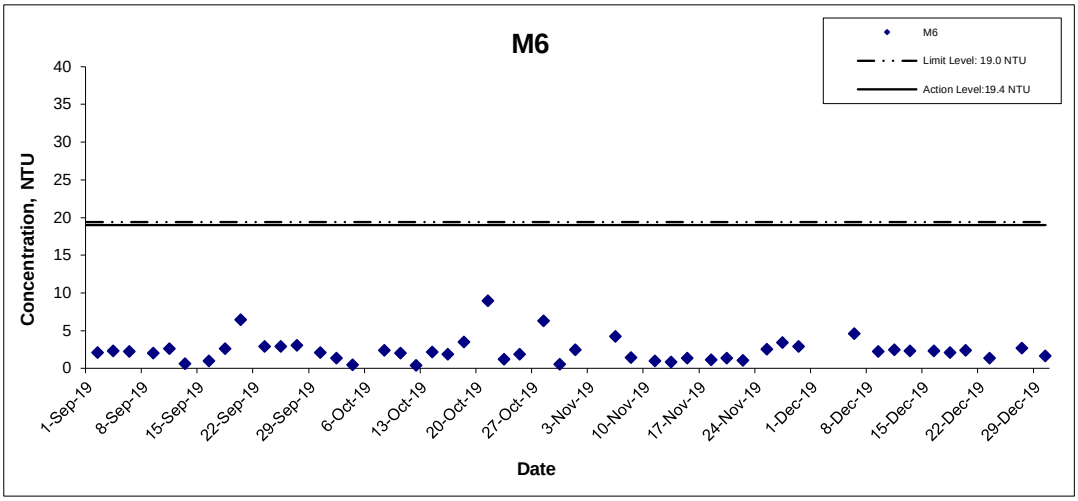
Turbidity (Intake Level of WSD Salt Water Intake) at Mid-Ebb Tide



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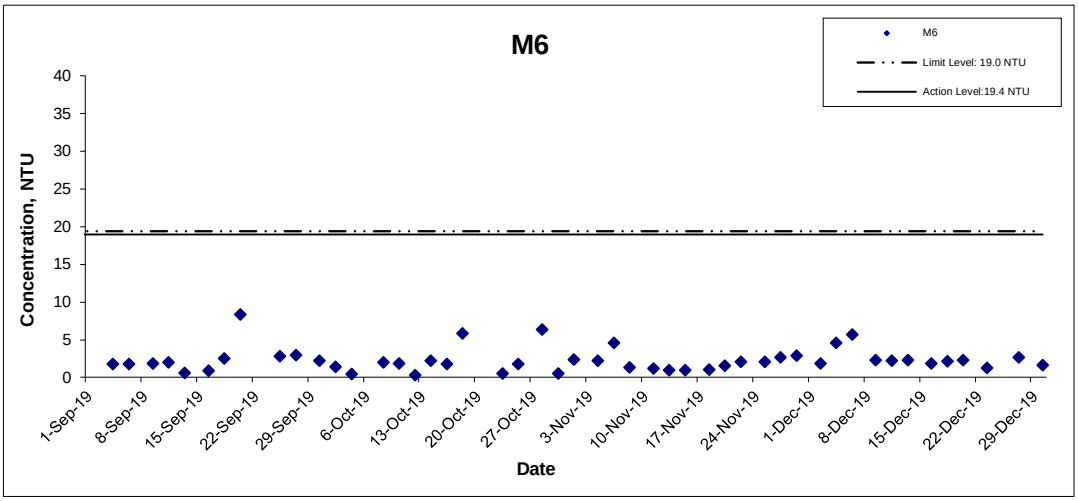
Turbidity (Intake Level of WSD Salt Water Intake) at Mid-Flood Tide



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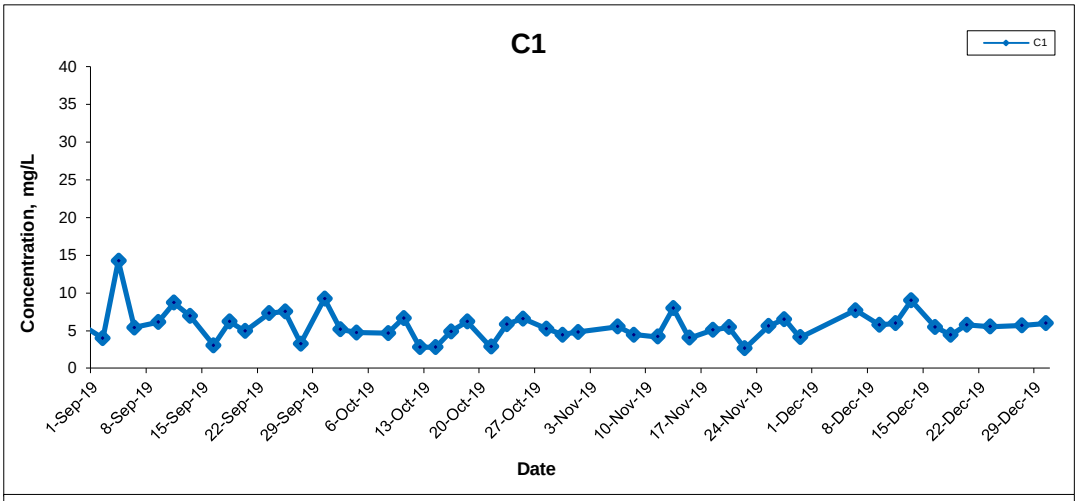
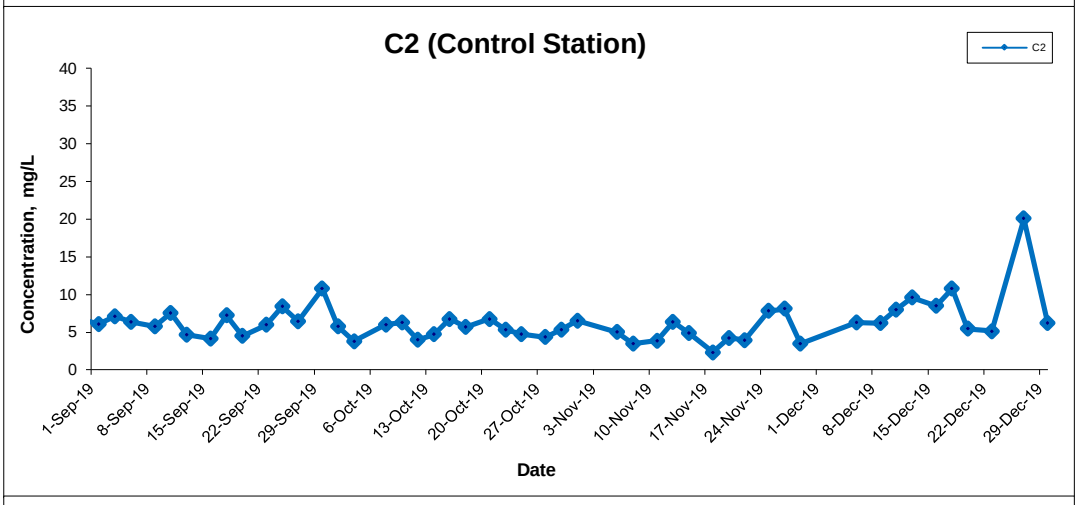
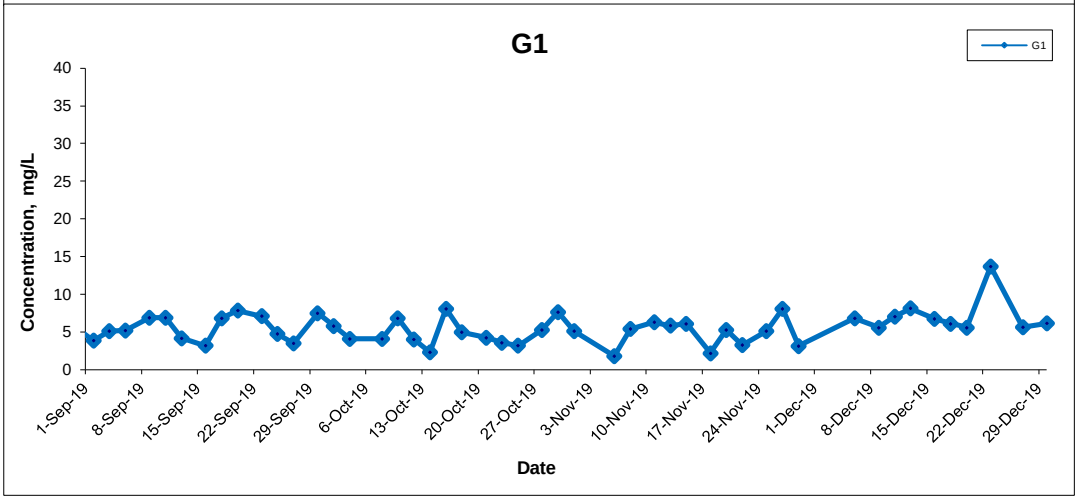
Suspended Solids (Depth-averaged) at Mid-Ebb Tide







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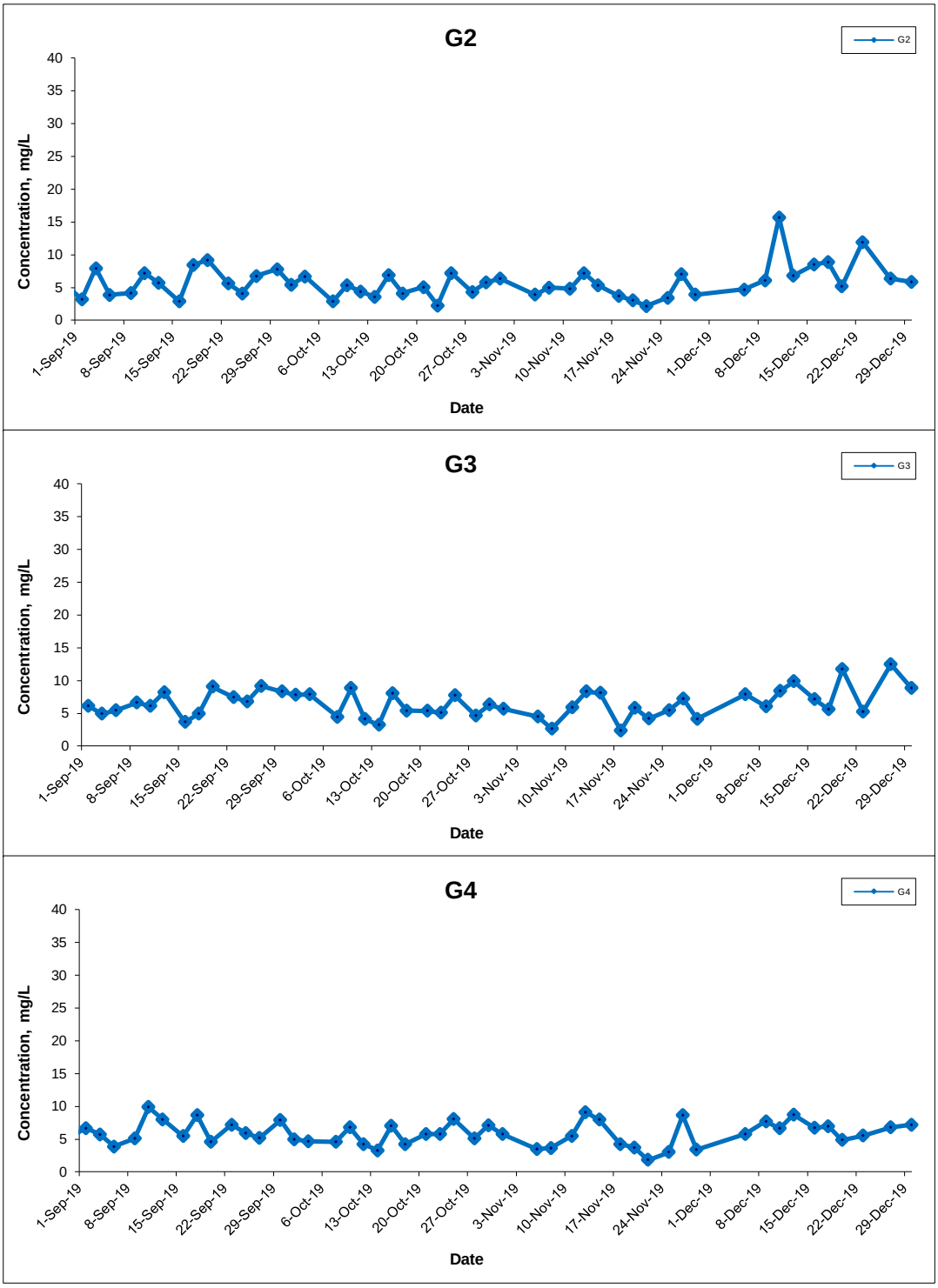
Suspended Solids (Depth-averaged) at Mid-Ebb Tide



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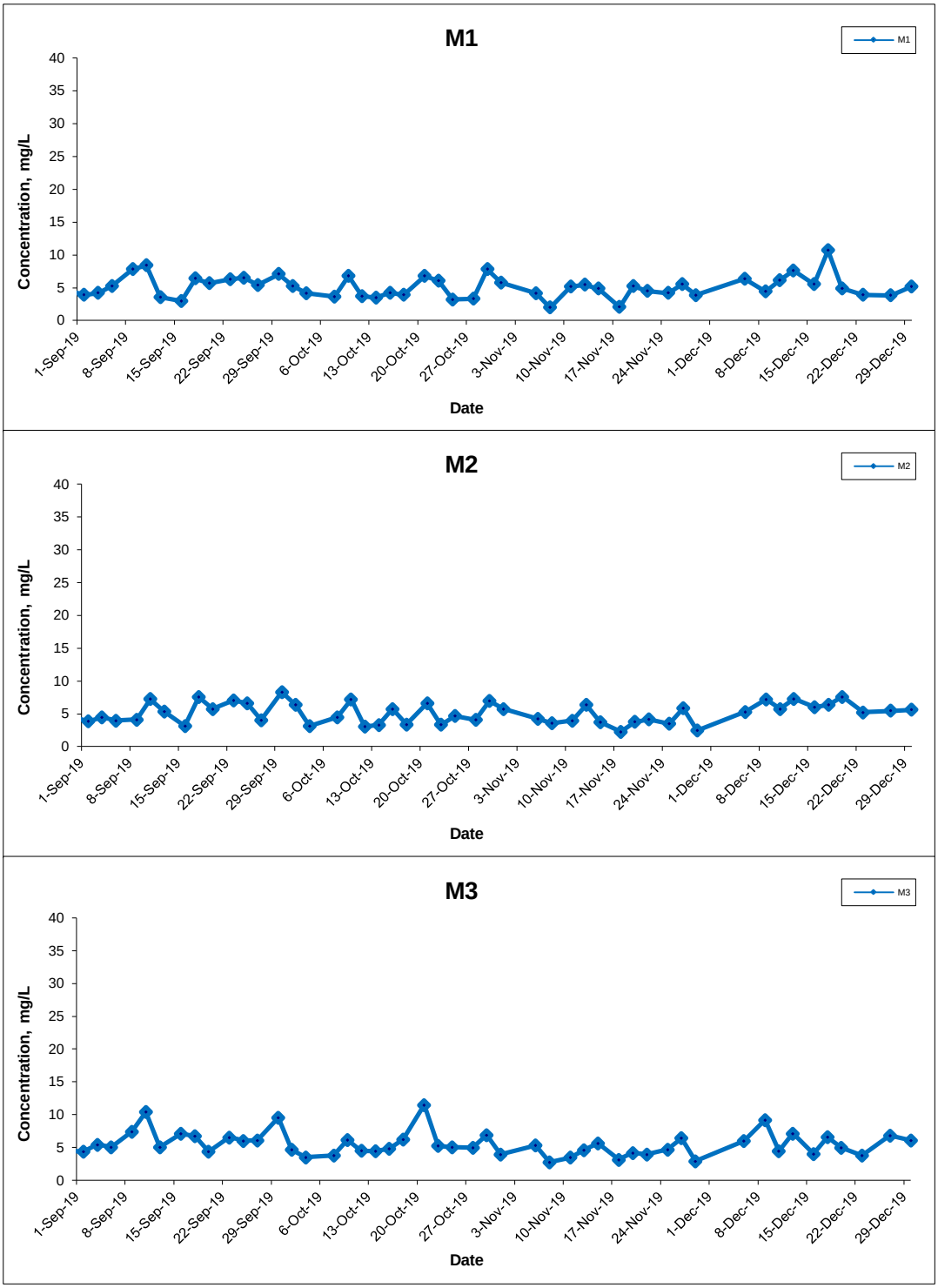
Suspended Solids (Depth-averaged) at Mid-Ebb Tide



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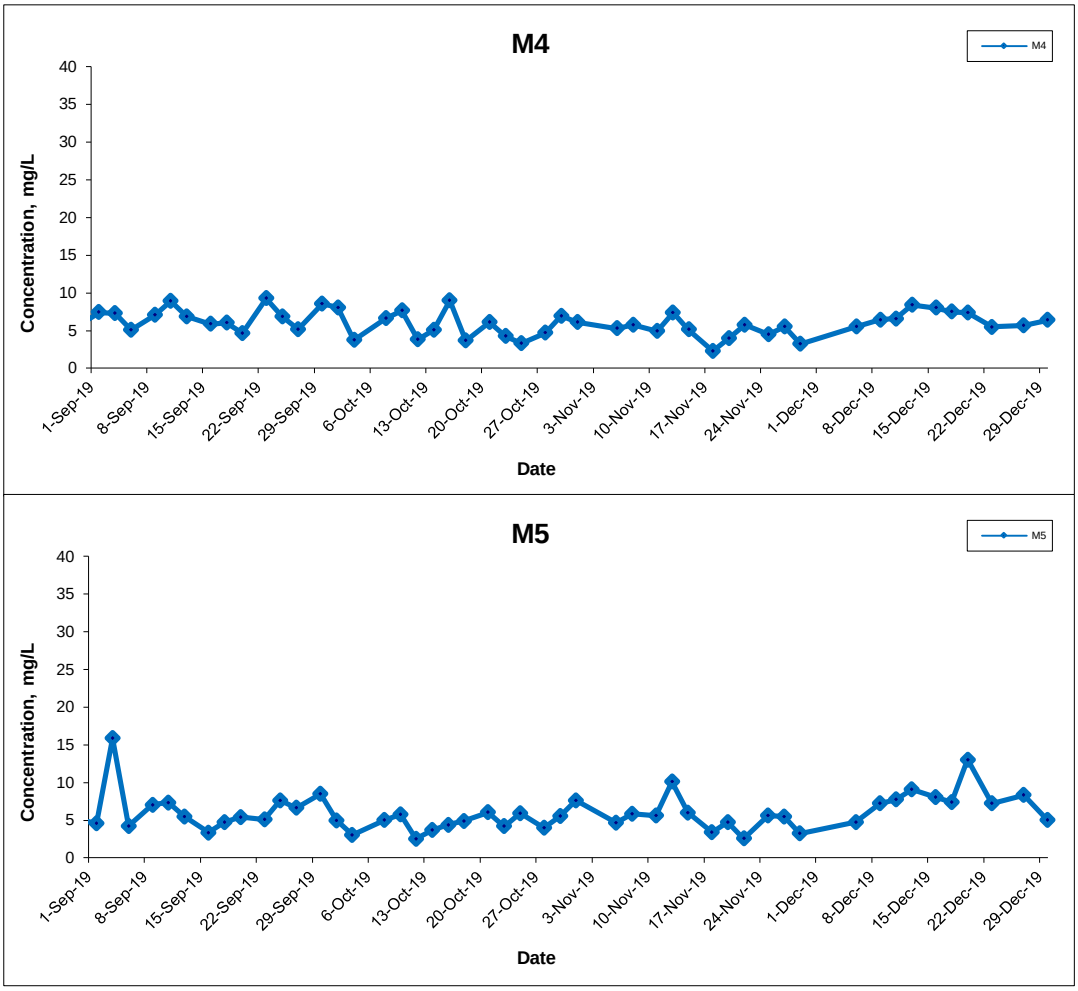
Suspended Solids (Depth-averaged) at Mid-Ebb Tide



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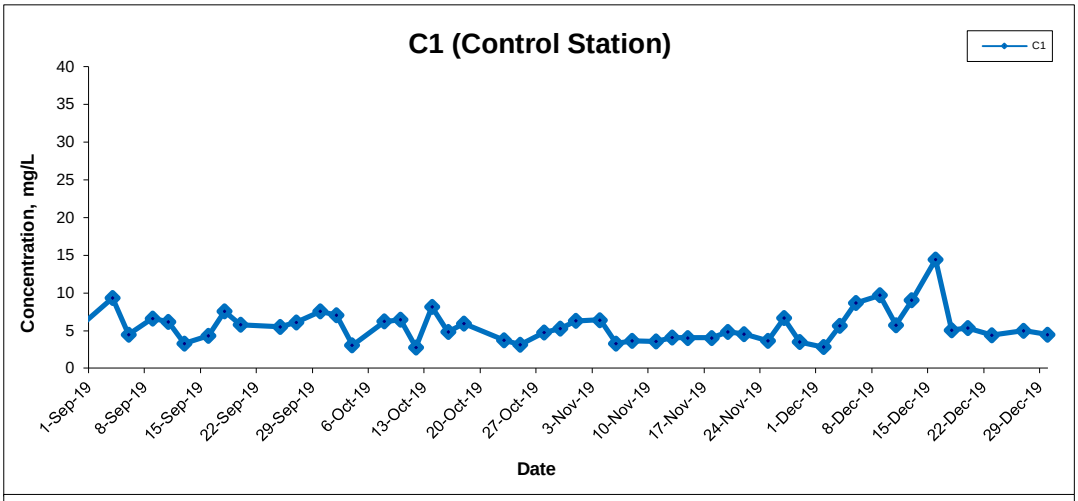
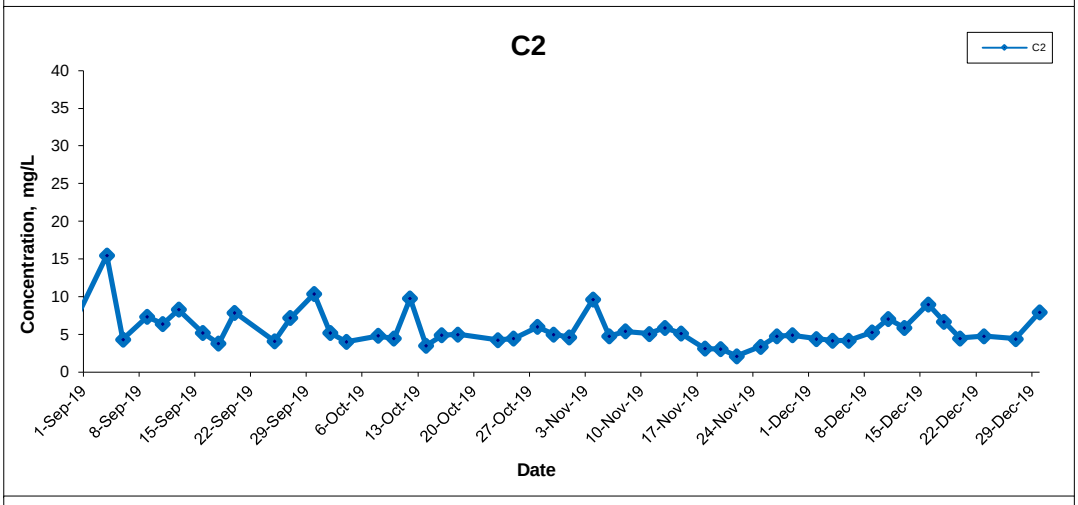
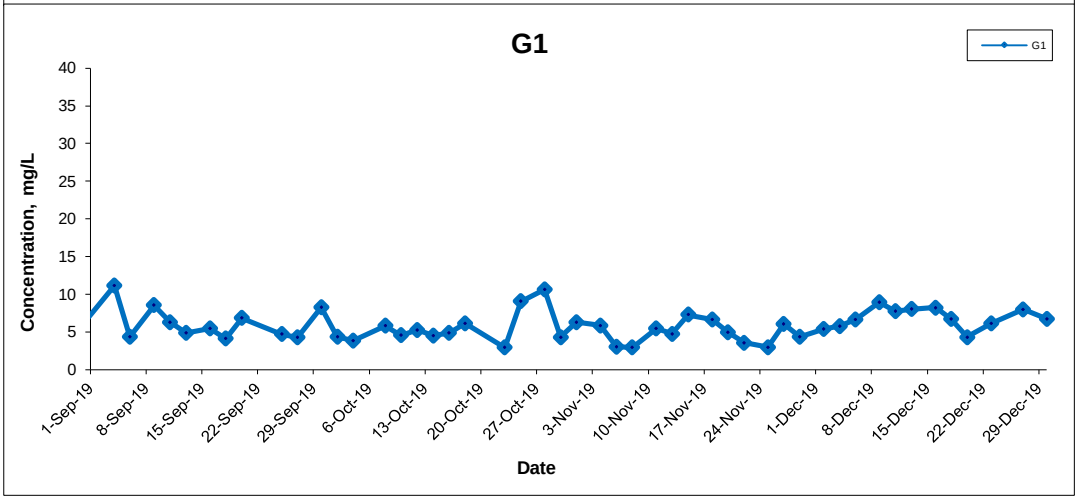
Suspended Solids (Depth-averaged) at Mid-Flood Tide







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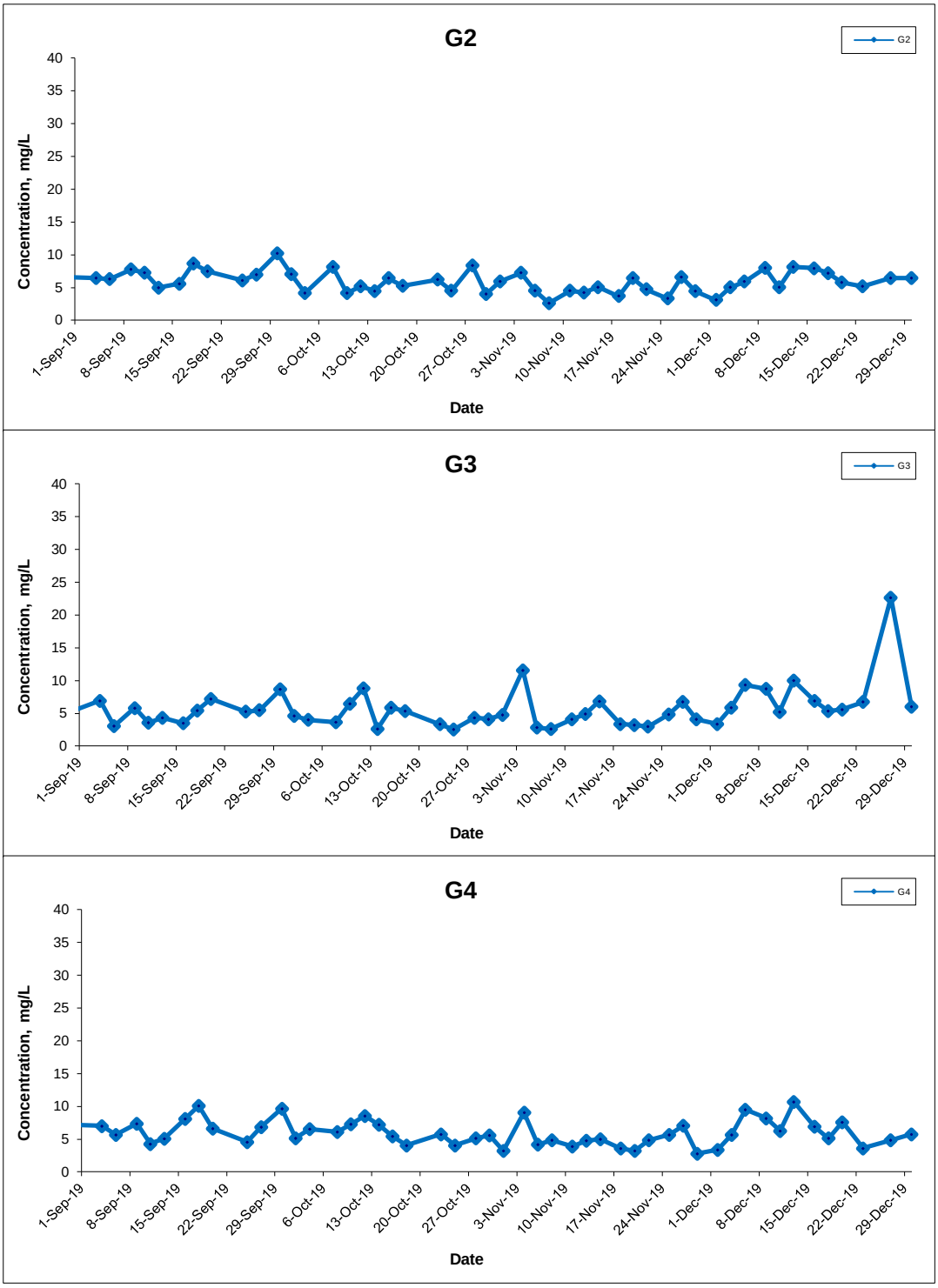
Suspended Solids (Depth-averaged) at Mid-Flood Tide



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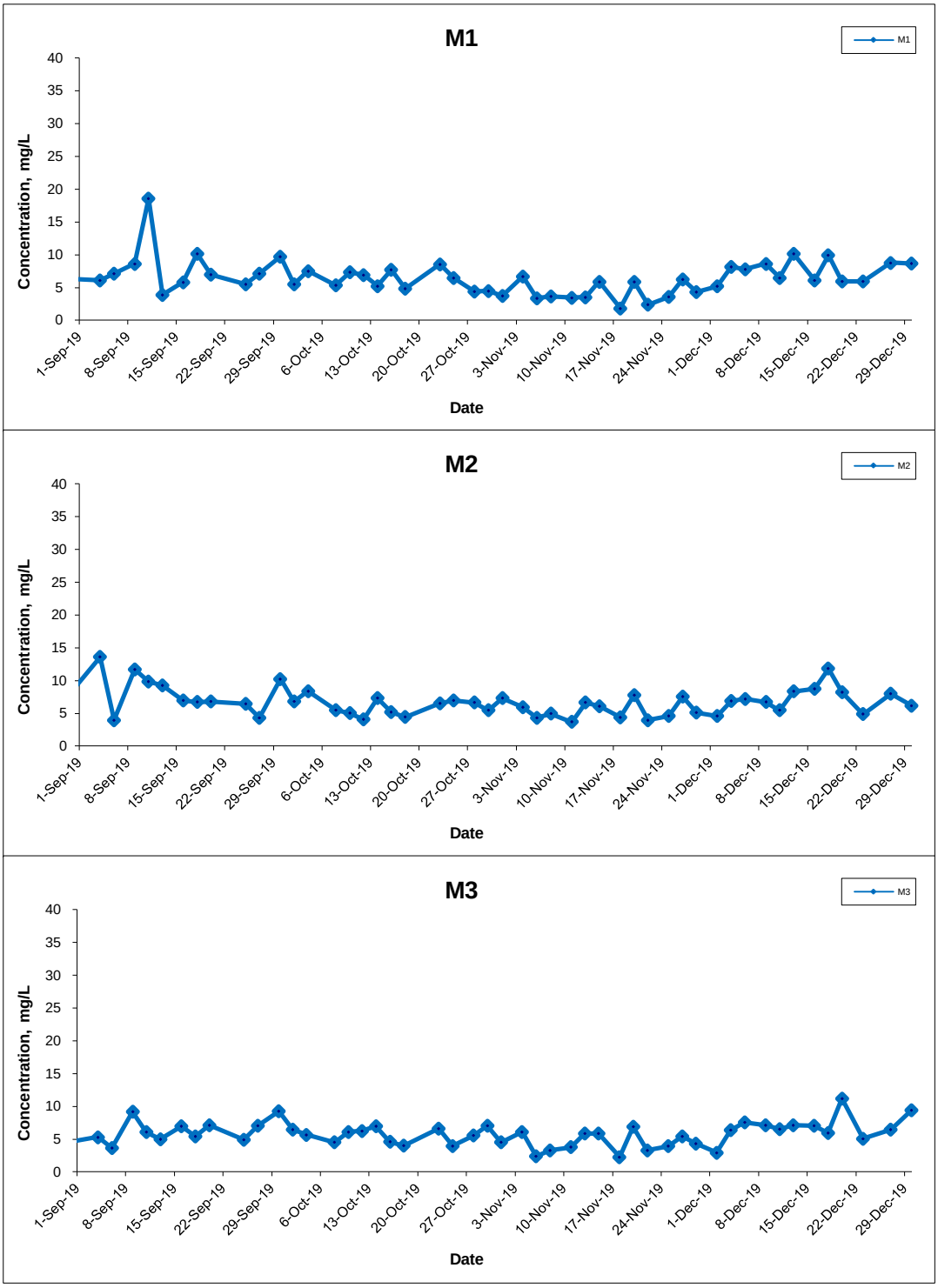
Suspended Solids (Depth-averaged) at Mid-Flood Tide



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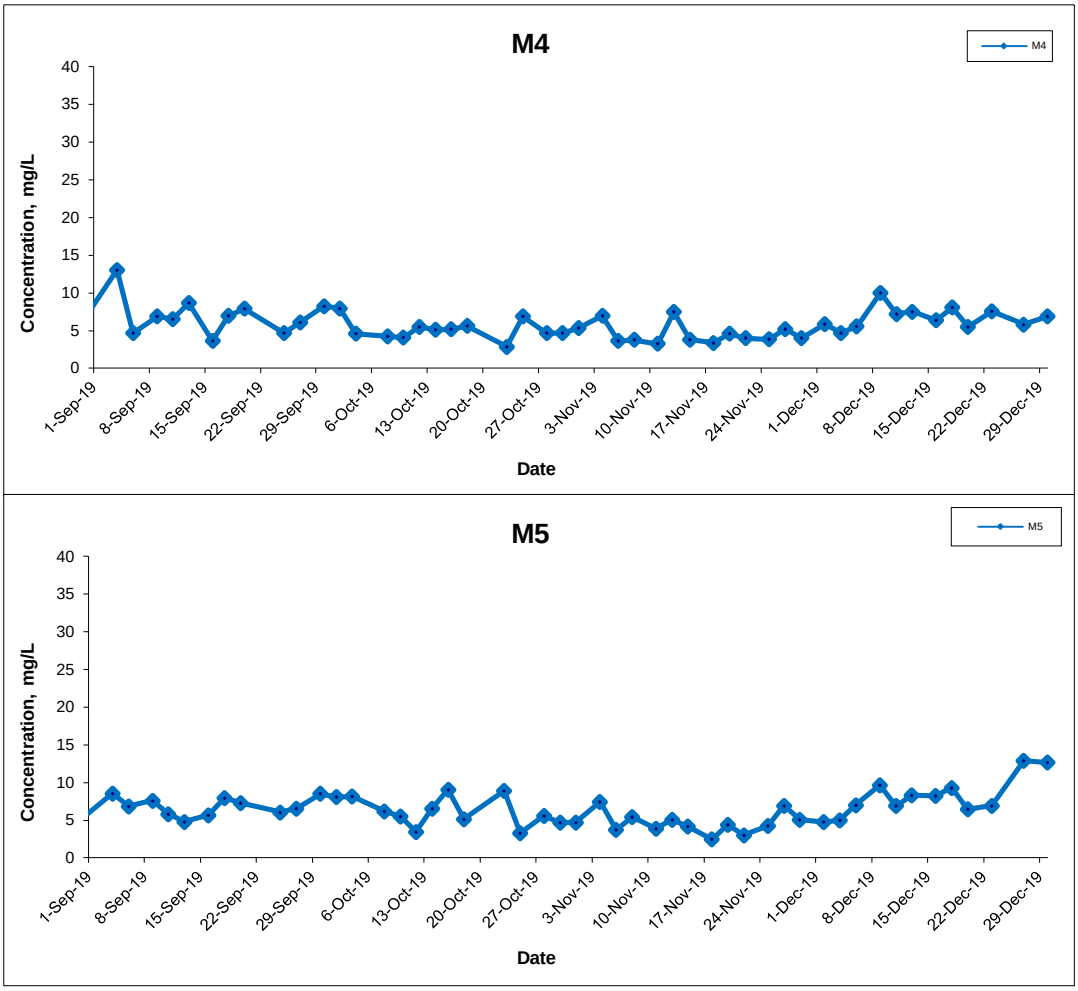
Suspended Solids (Depth-averaged) at Mid-Flood Tide



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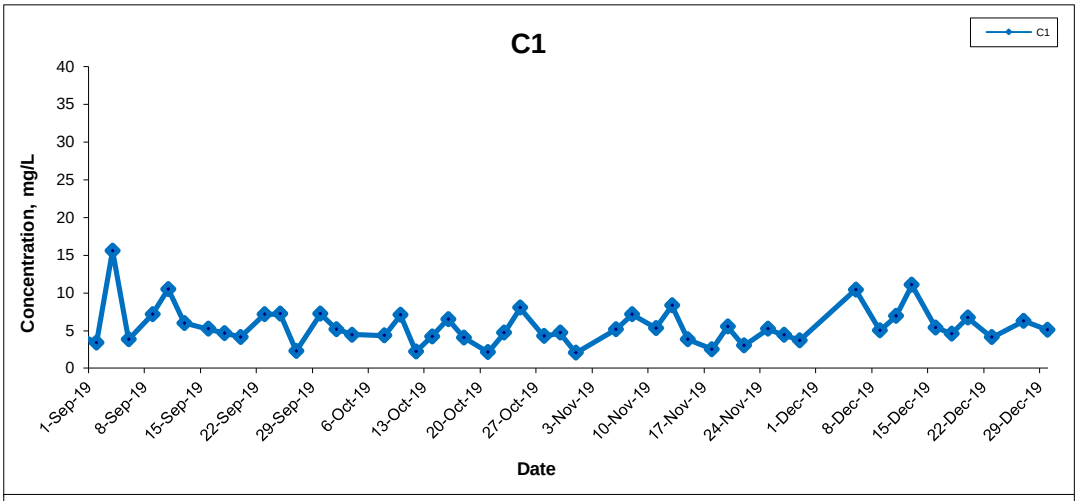
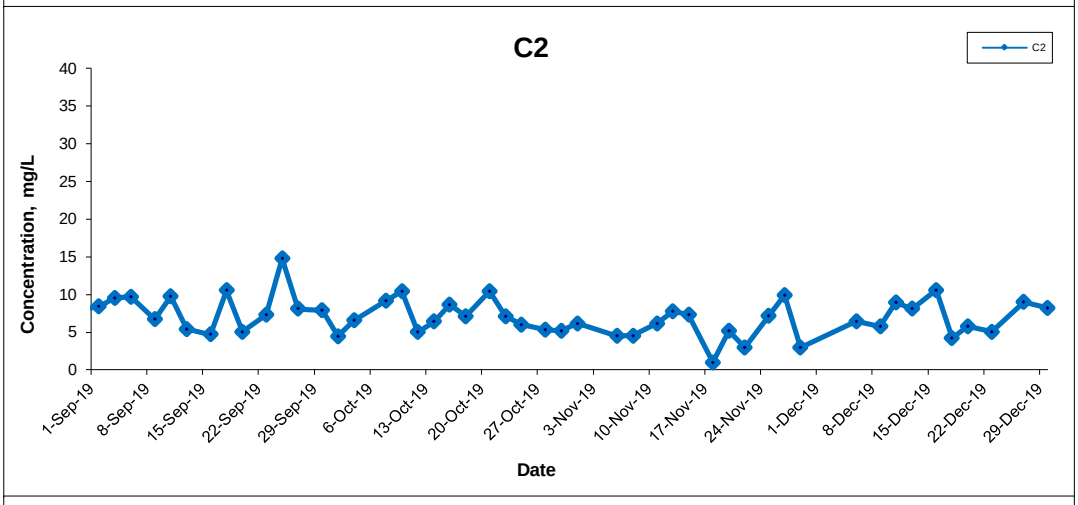
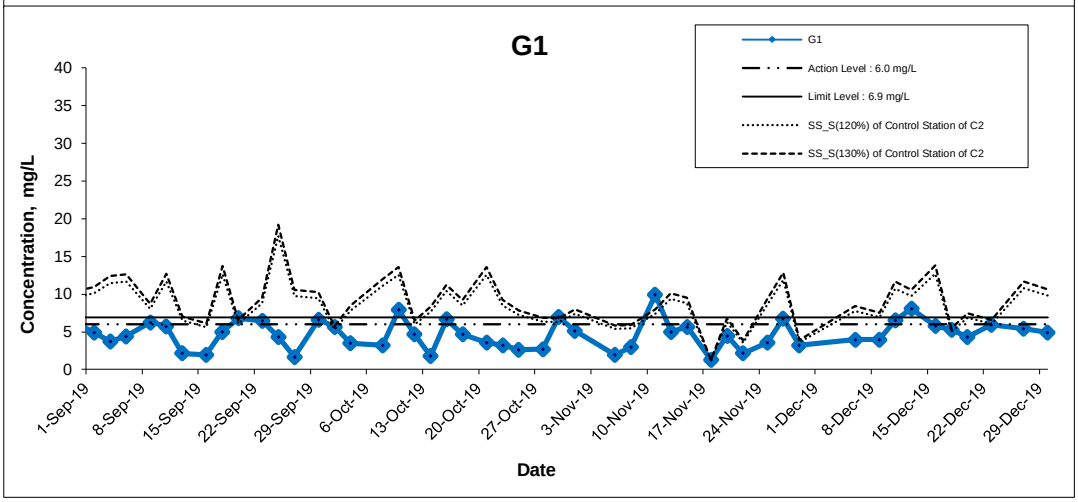
Suspended Solids (Surface) at Mid-Ebb Tide







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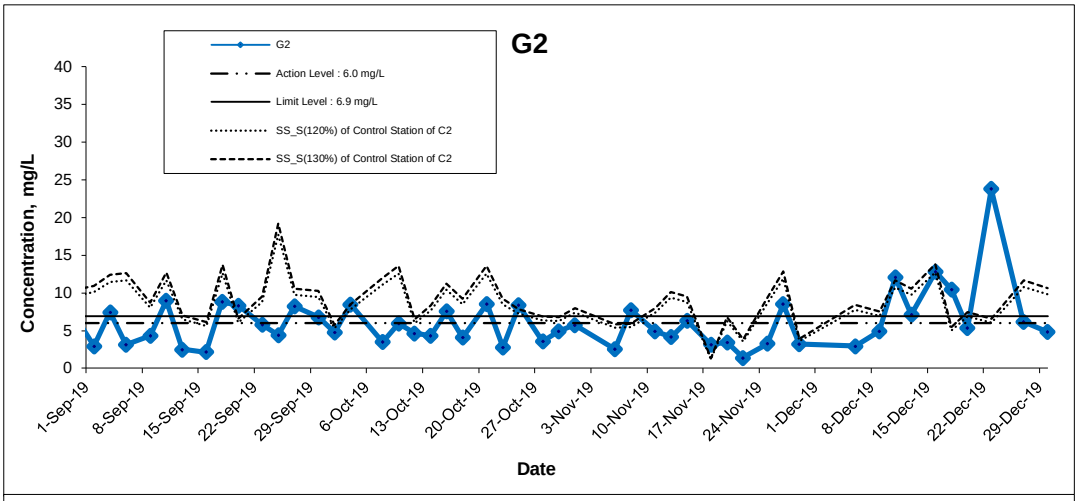
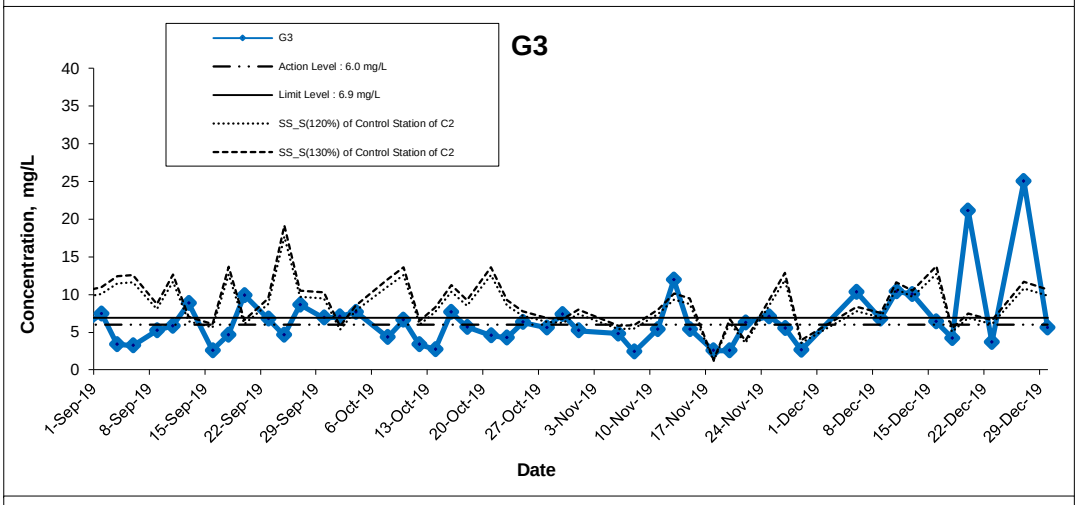
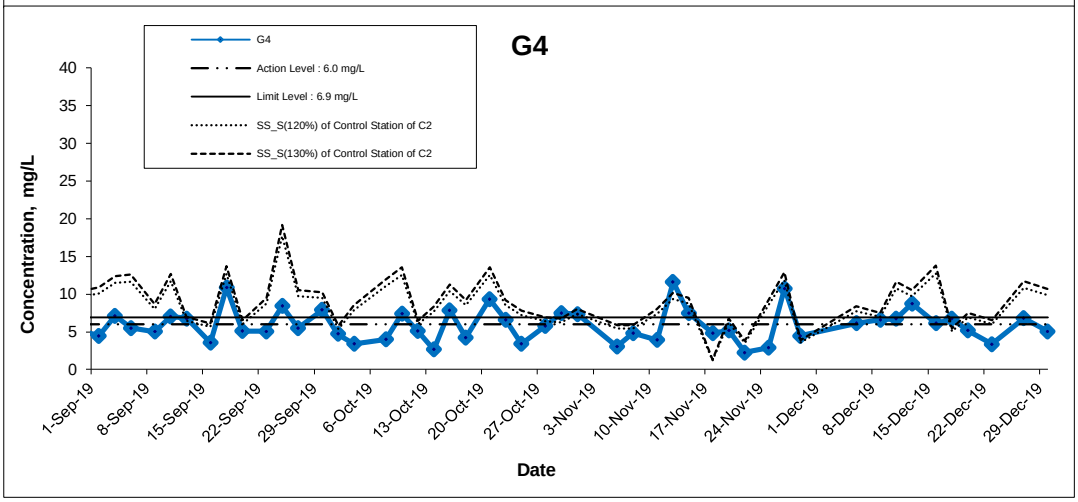
Suspended Solids (Surface) at Mid-Ebb Tide







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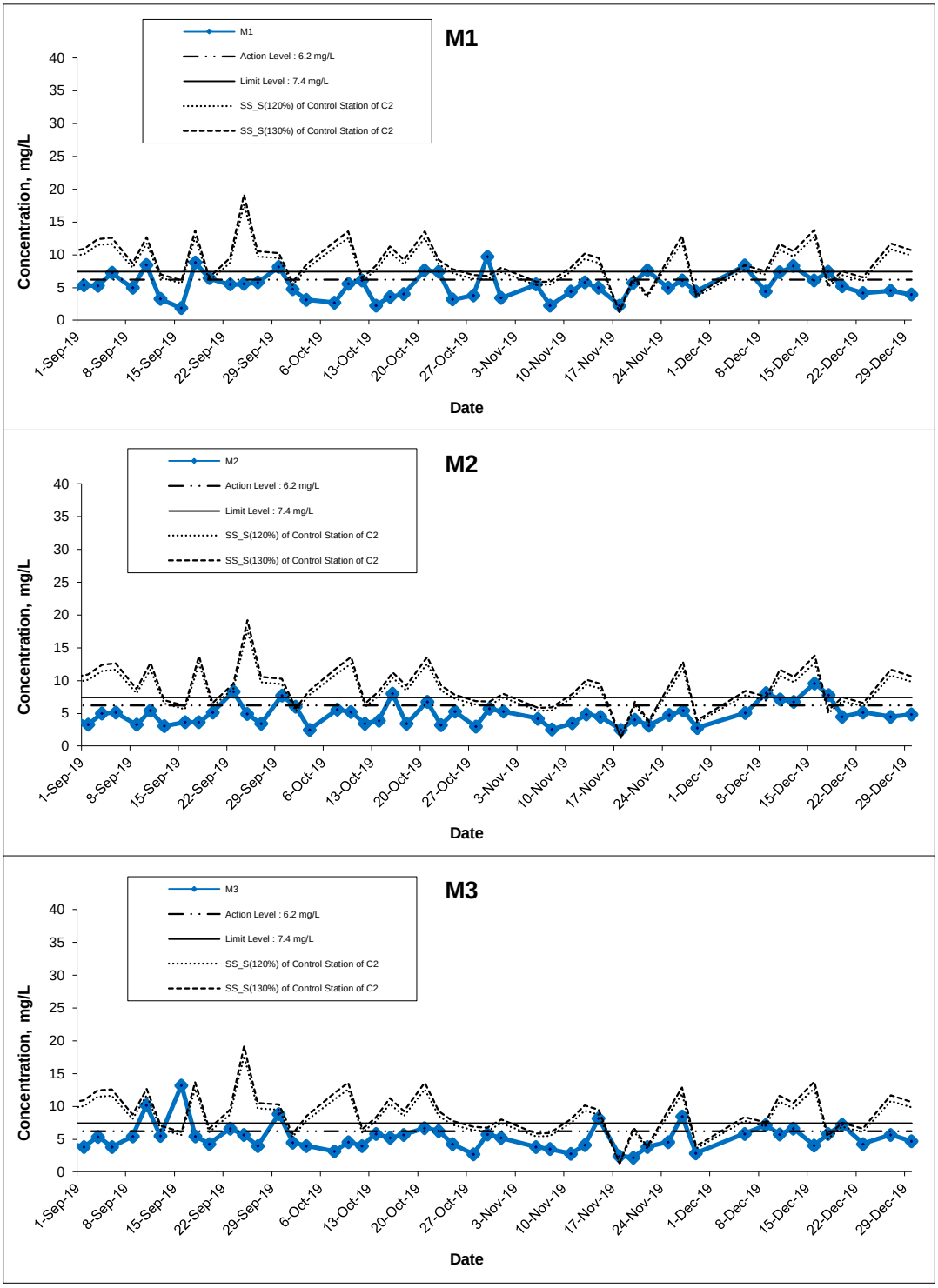
Suspended Solids (Surface) at Mid-Ebb Tide



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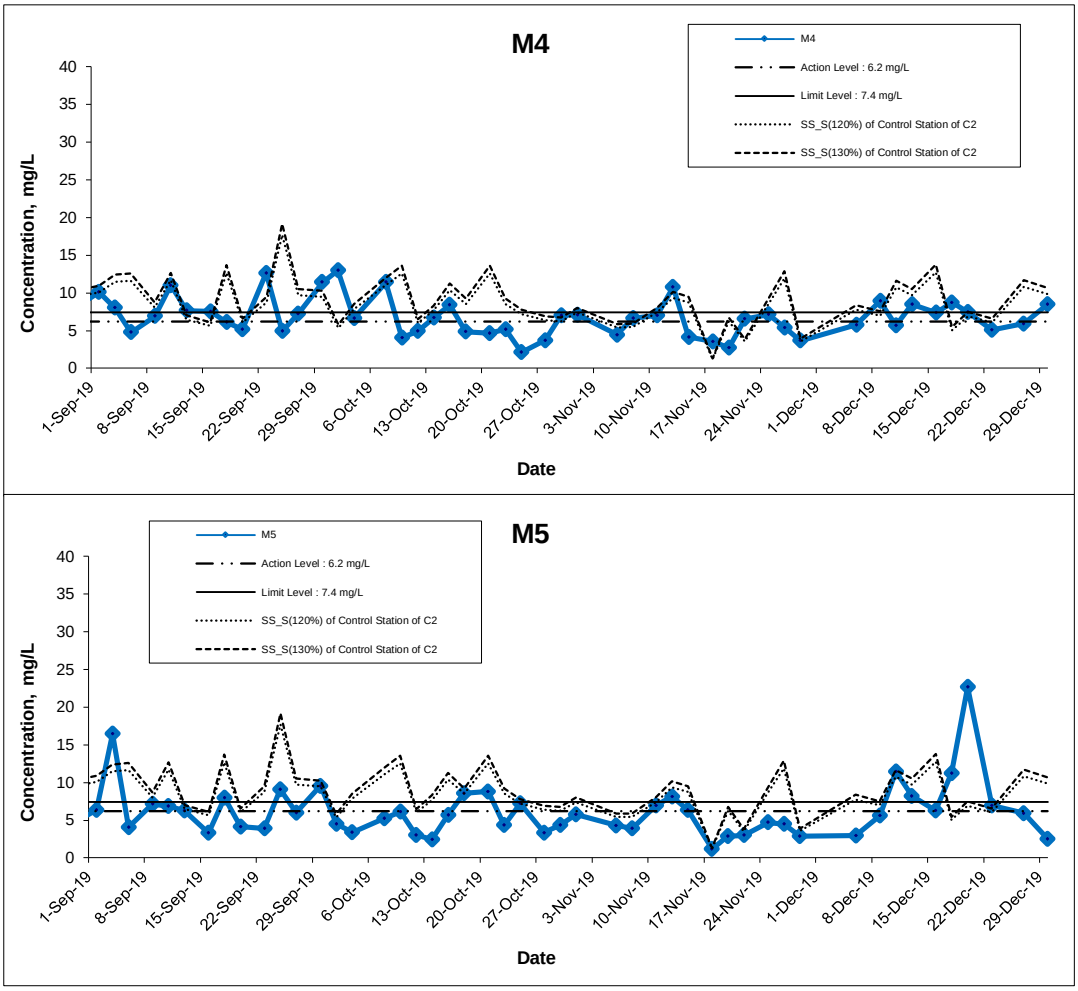
Suspended Solids (Surface) at Mid-Ebb Tide



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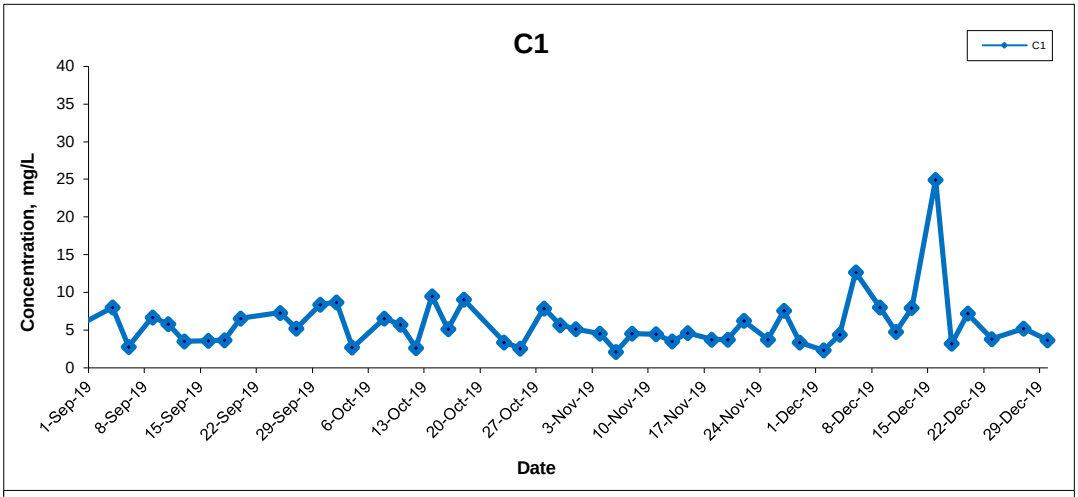
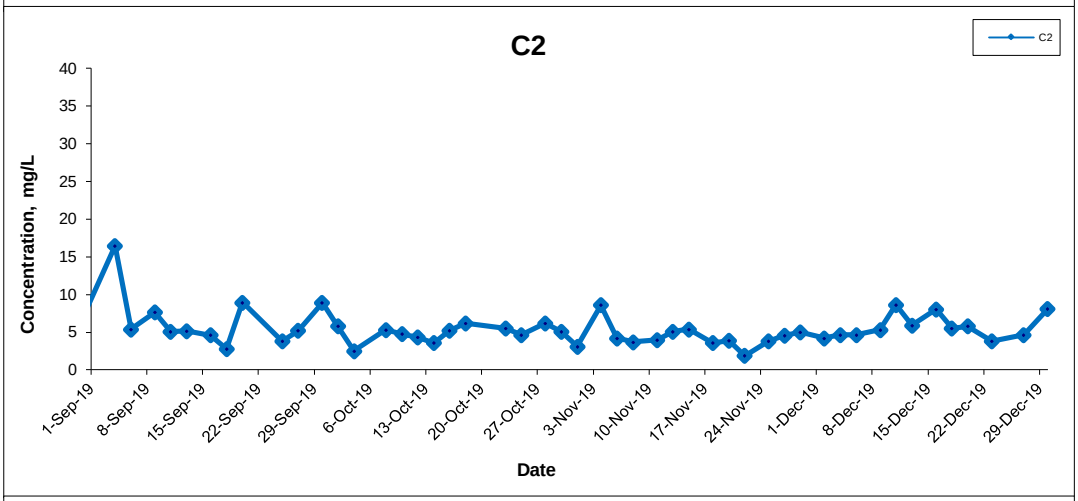
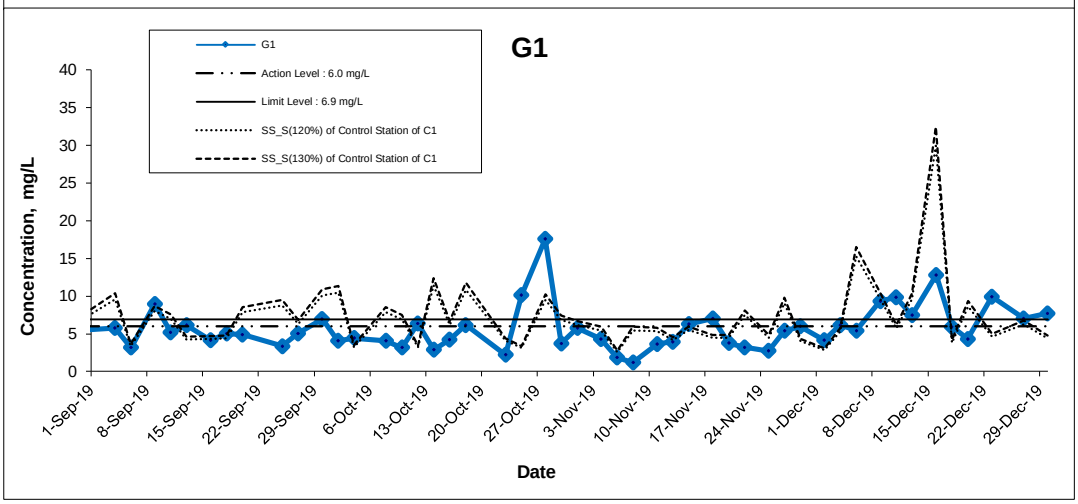
Suspended Solids (Surface) at Mid-Flood Tide







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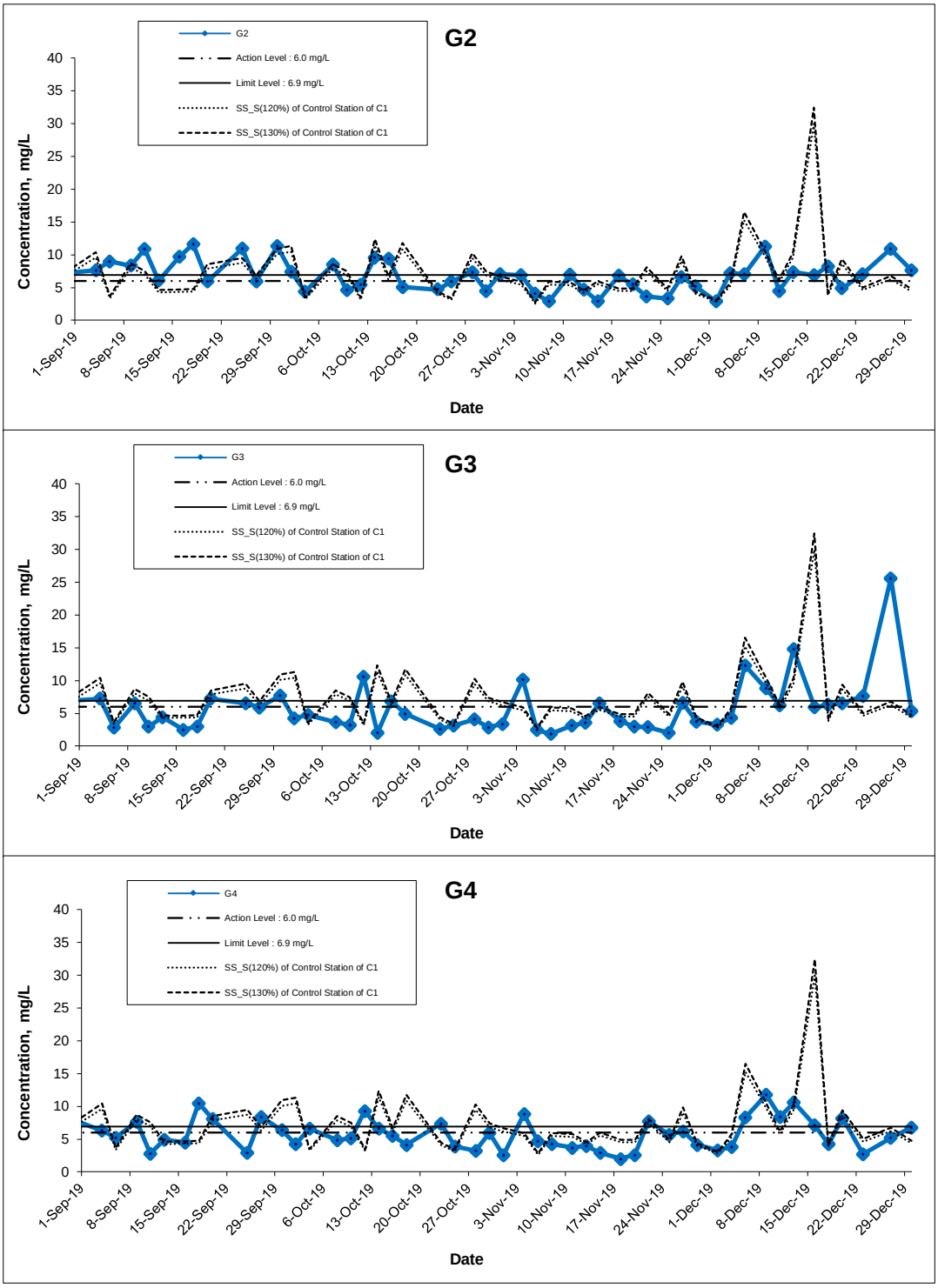
Suspended Solids (Surface) at Mid-Flood Tide



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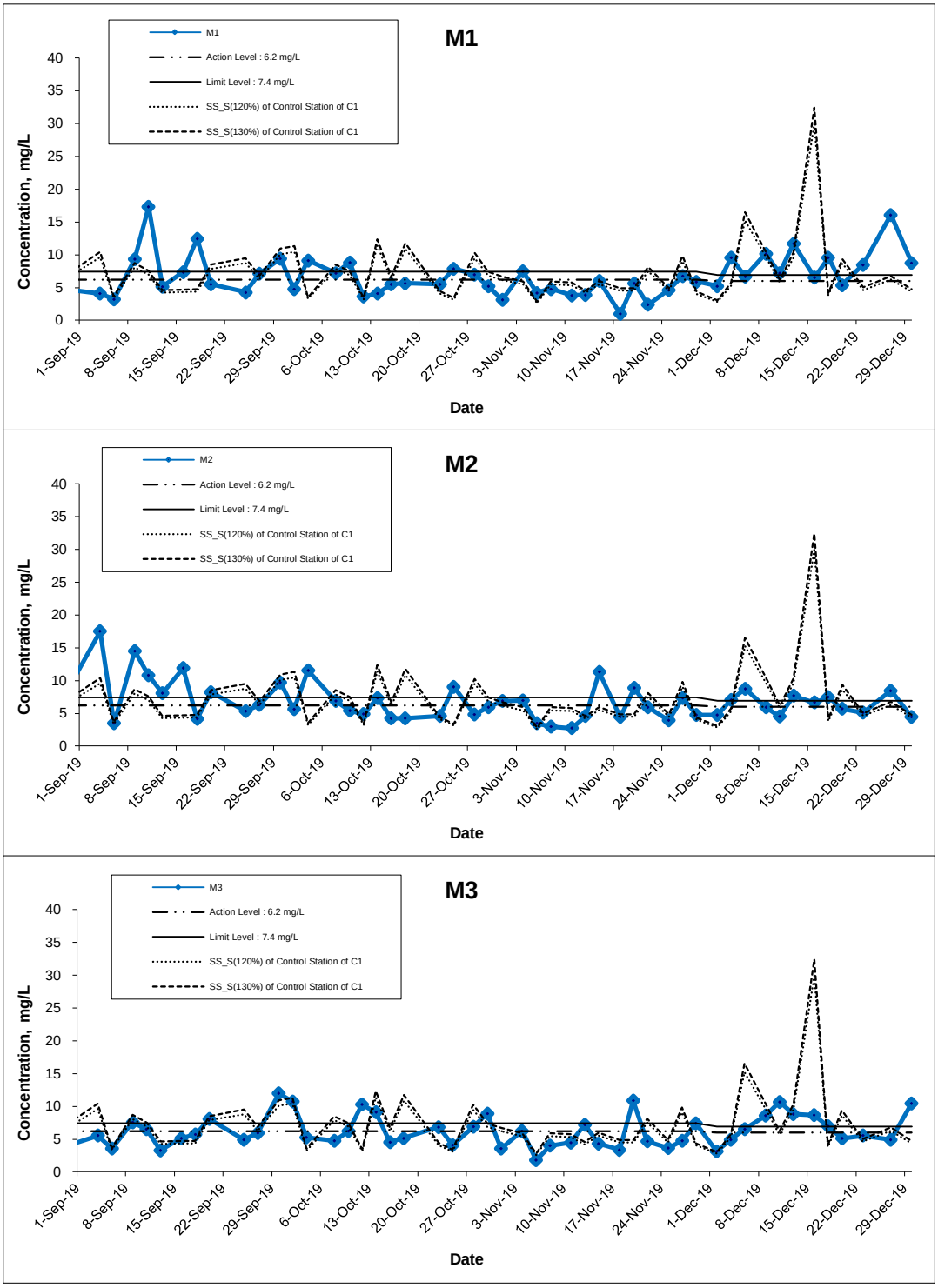
Suspended Solids (Surface) at Mid-Flood Tide



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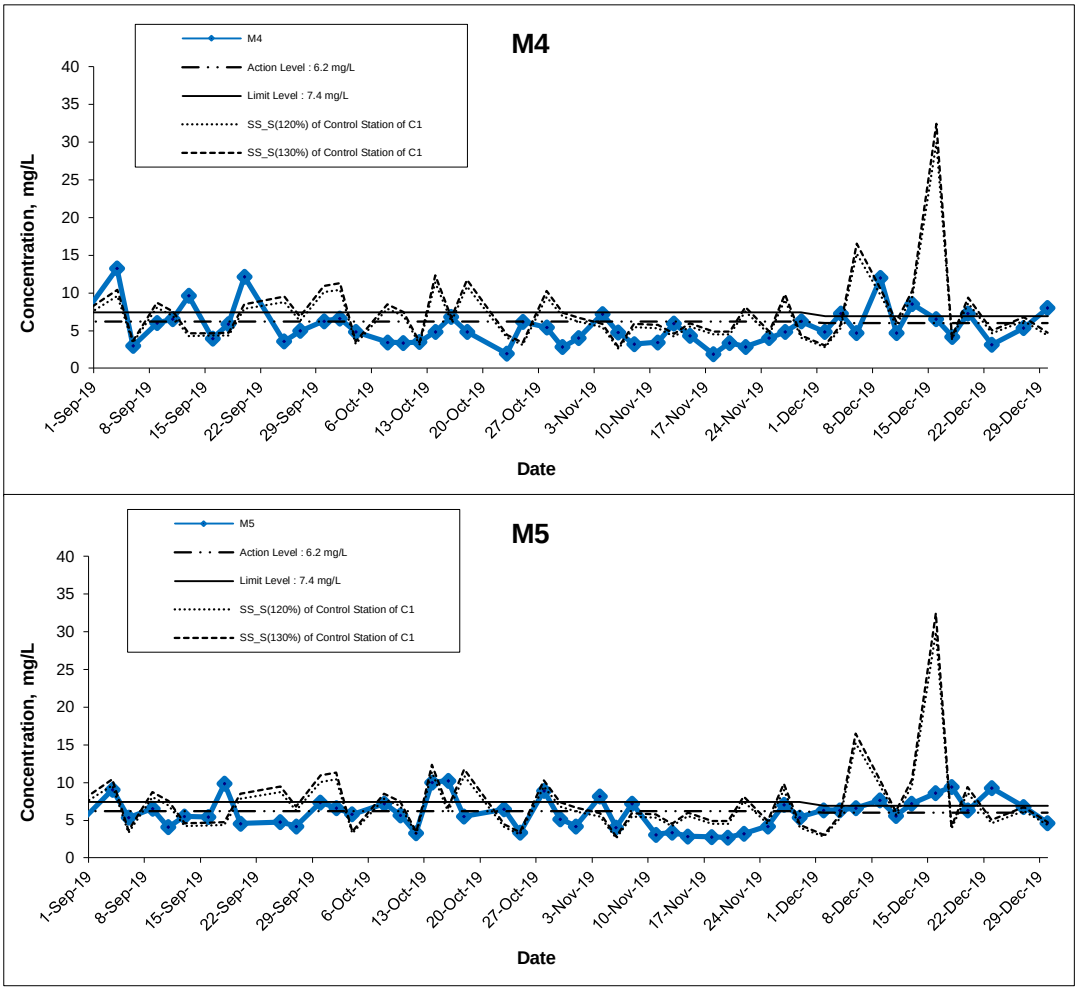
Suspended Solids (Surface) at Mid-Flood Tide



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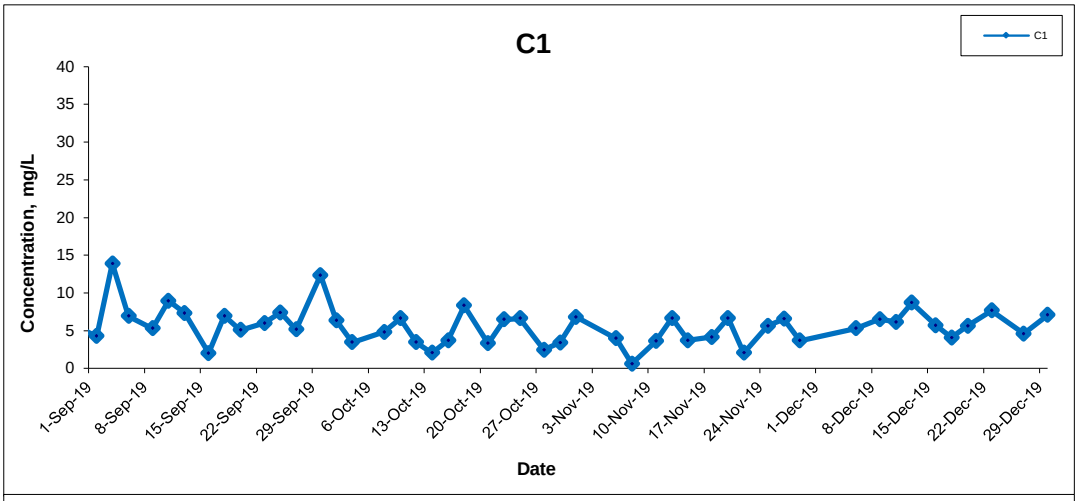
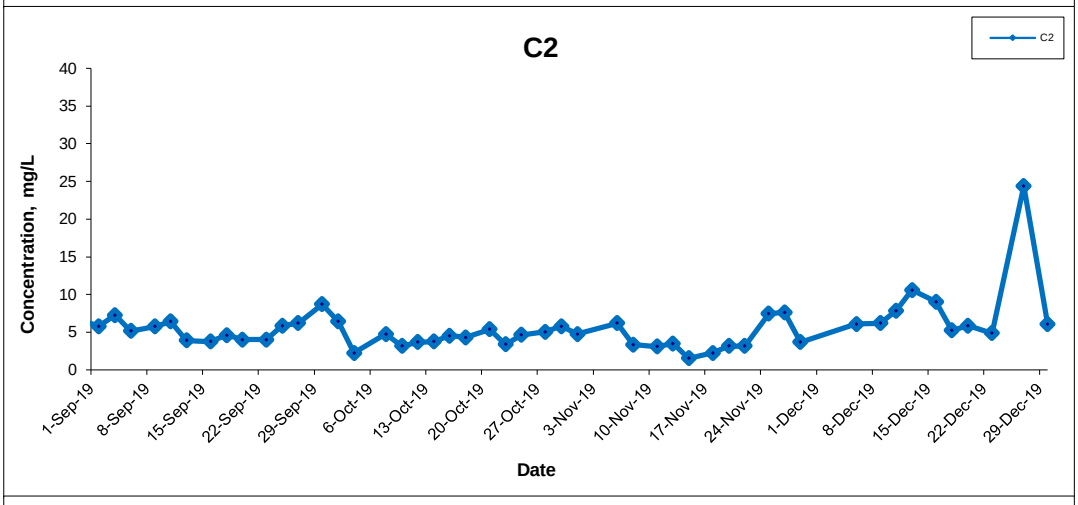
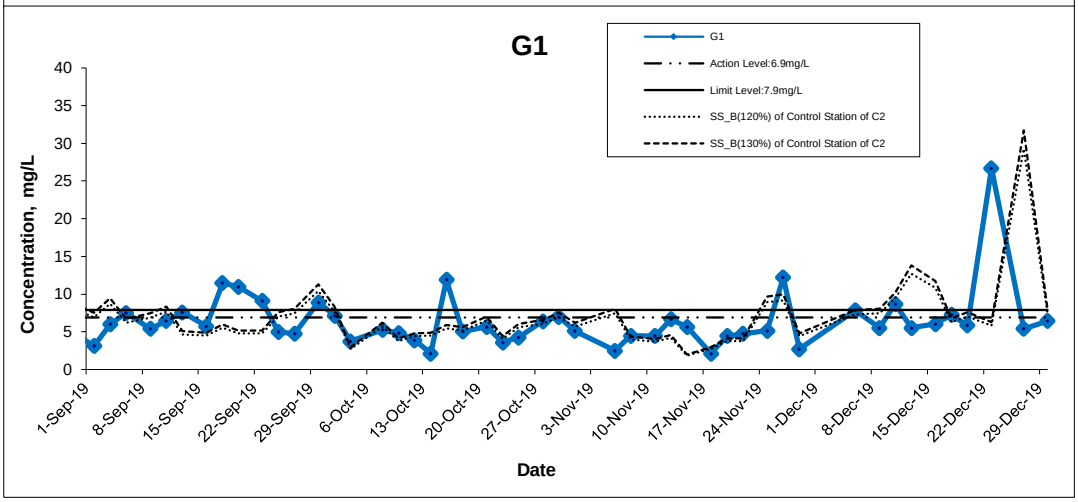
Suspended Solids (Bottom) at Mid-Ebb Tide







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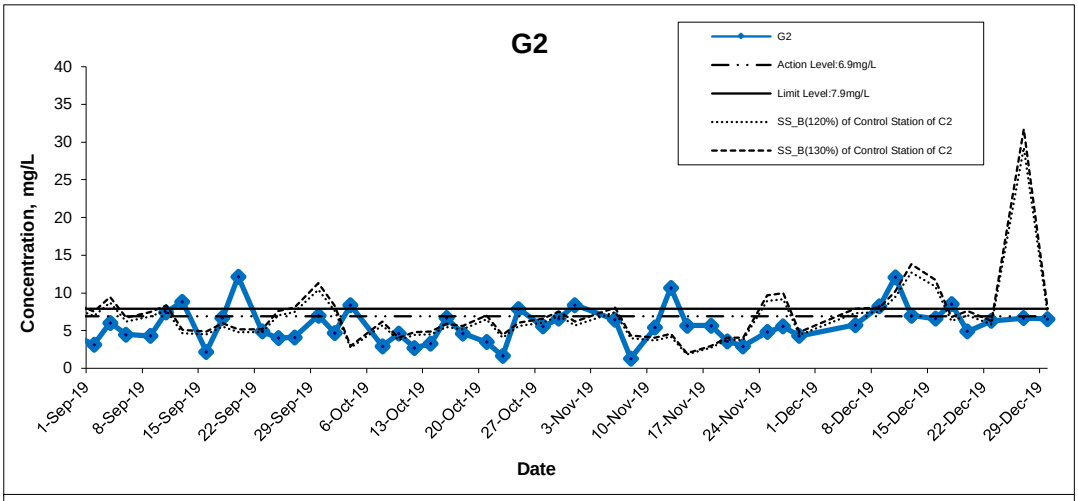
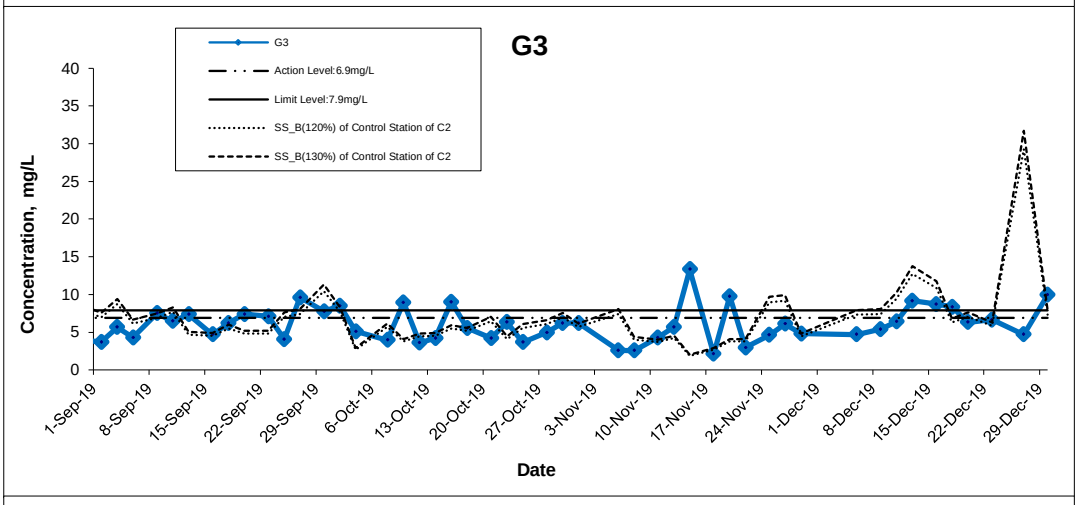
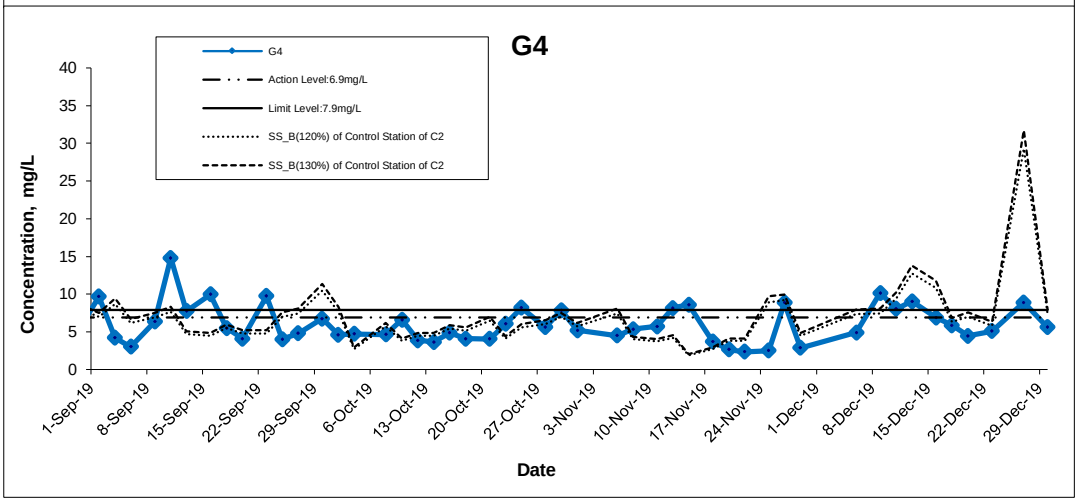
Suspended Solids (Bottom) at Mid-Ebb Tide







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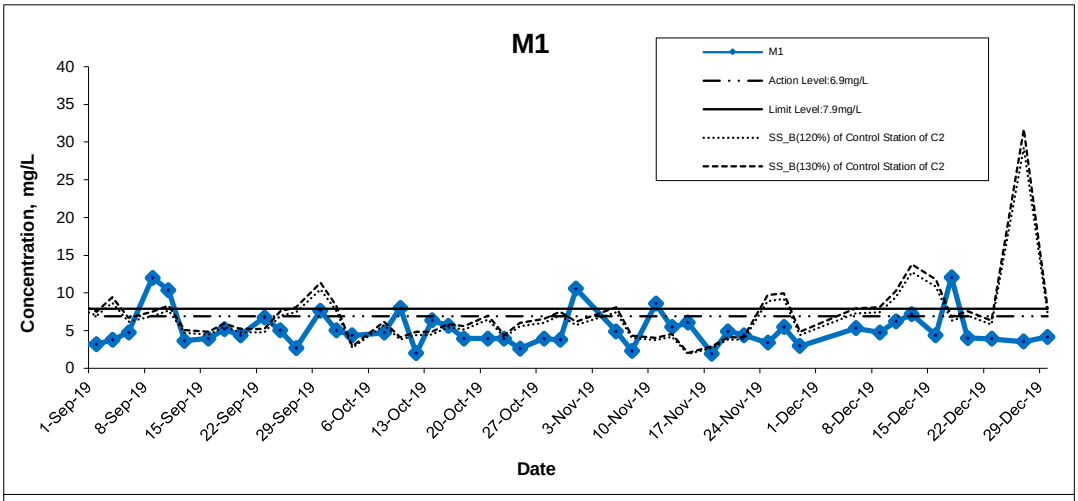
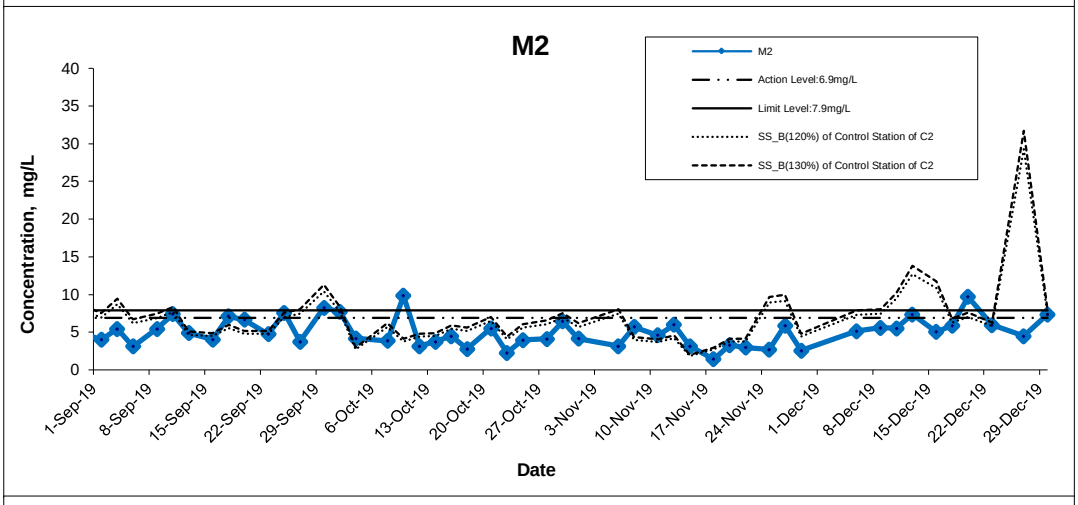
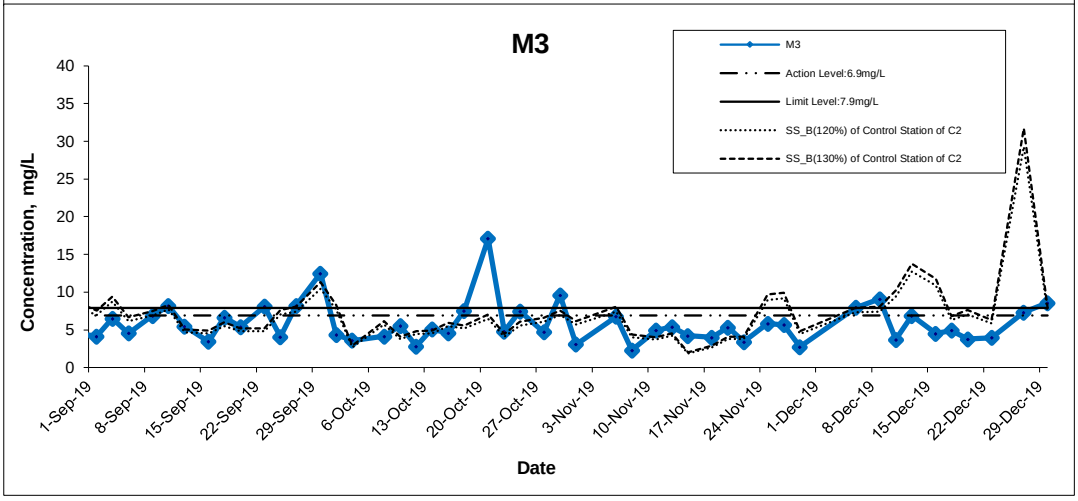
Suspended Solids (Bottom) at Mid-Ebb Tide







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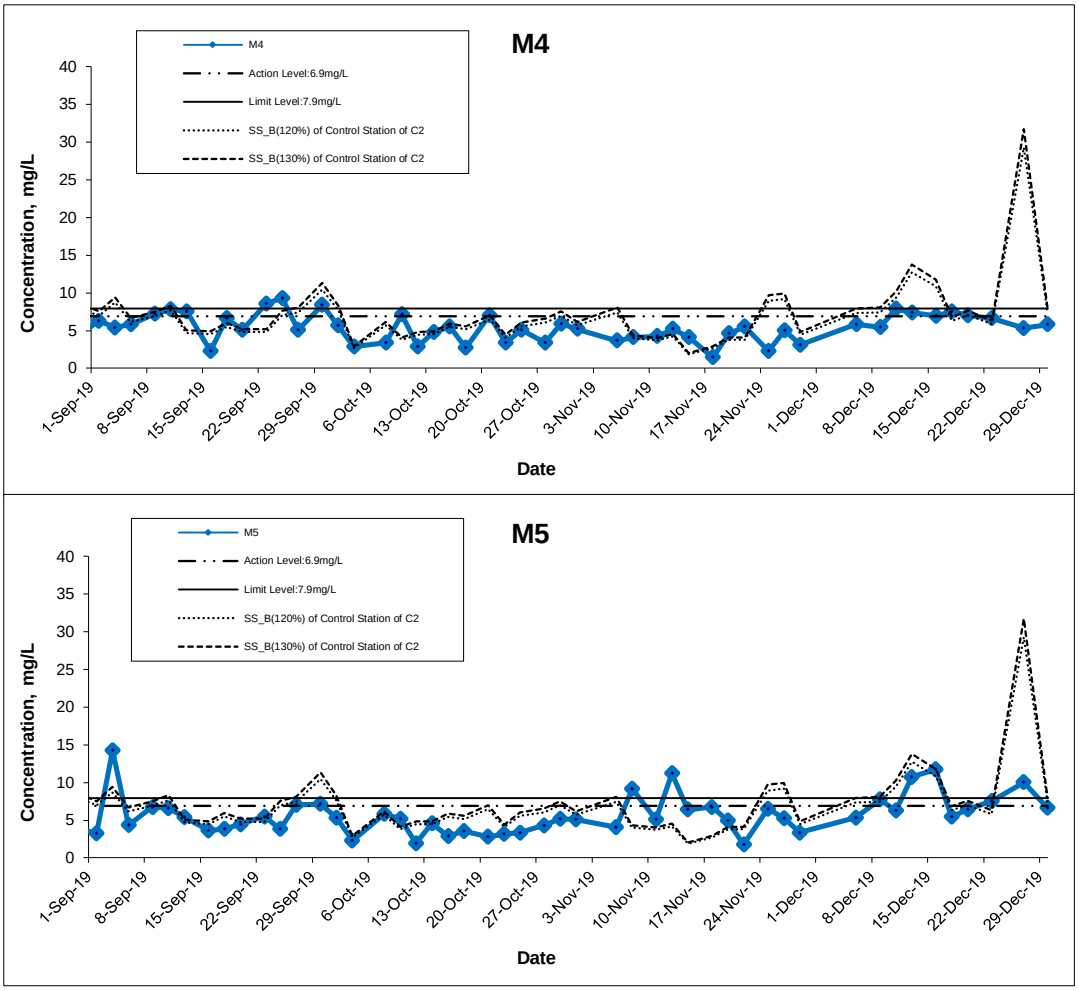
Suspended Solids (Bottom) at Mid-Ebb Tide



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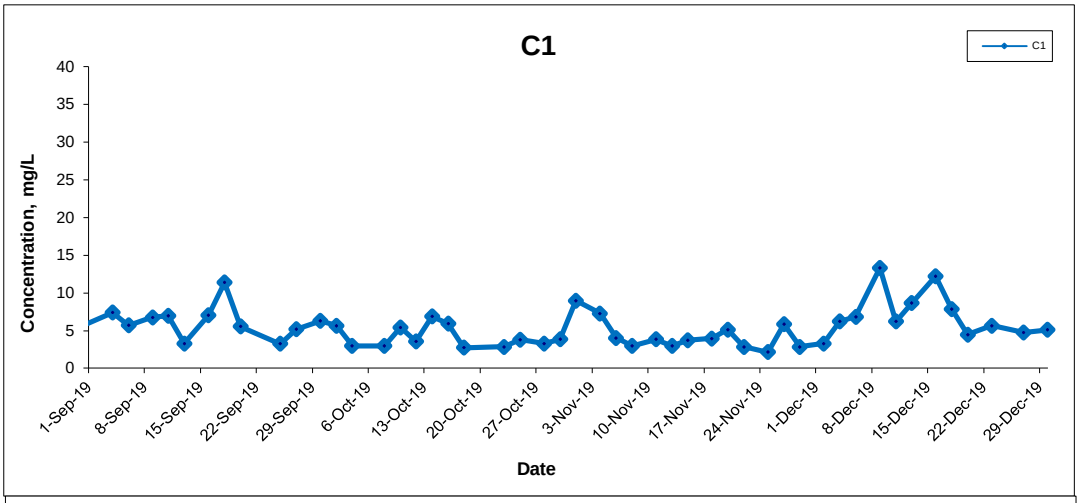
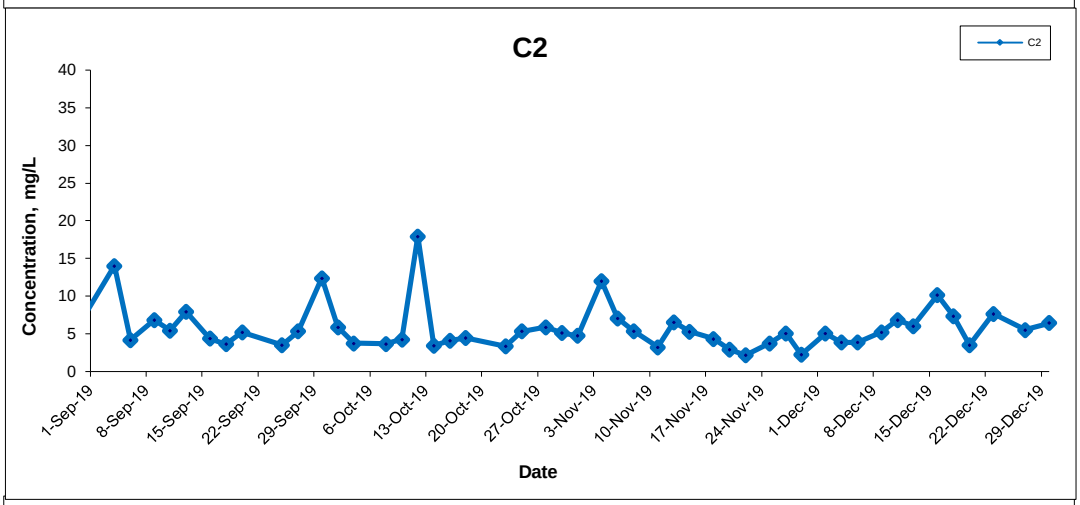
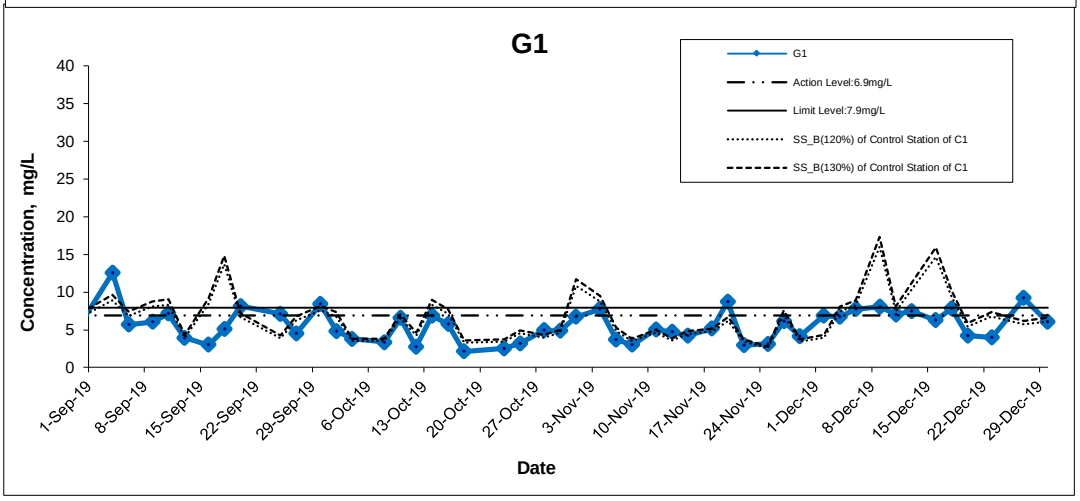
Suspended Solids (Bottom) at Mid-Flood Tide







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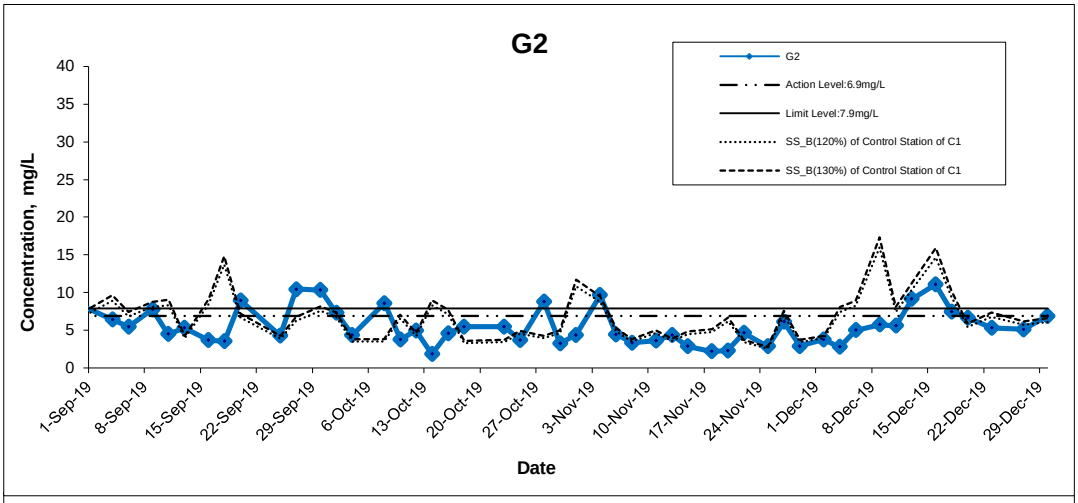
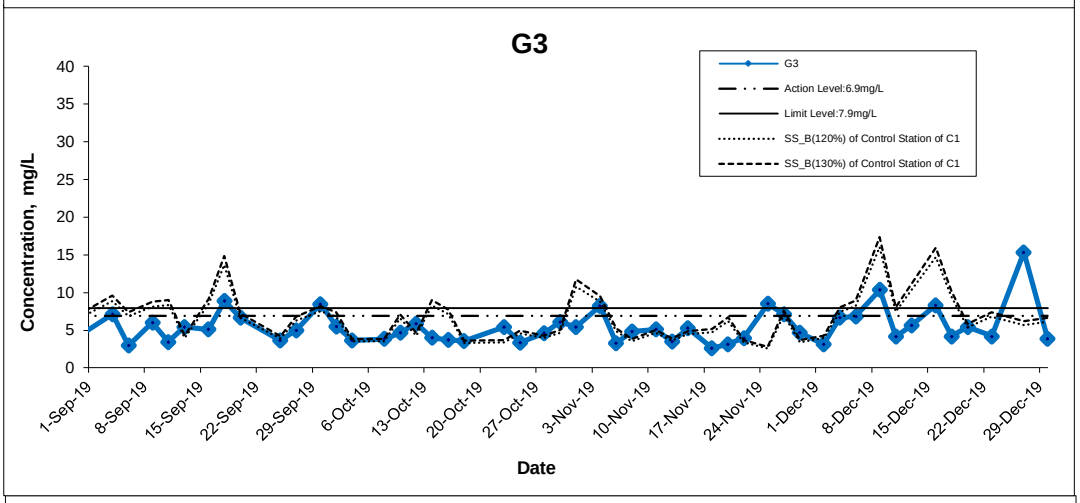
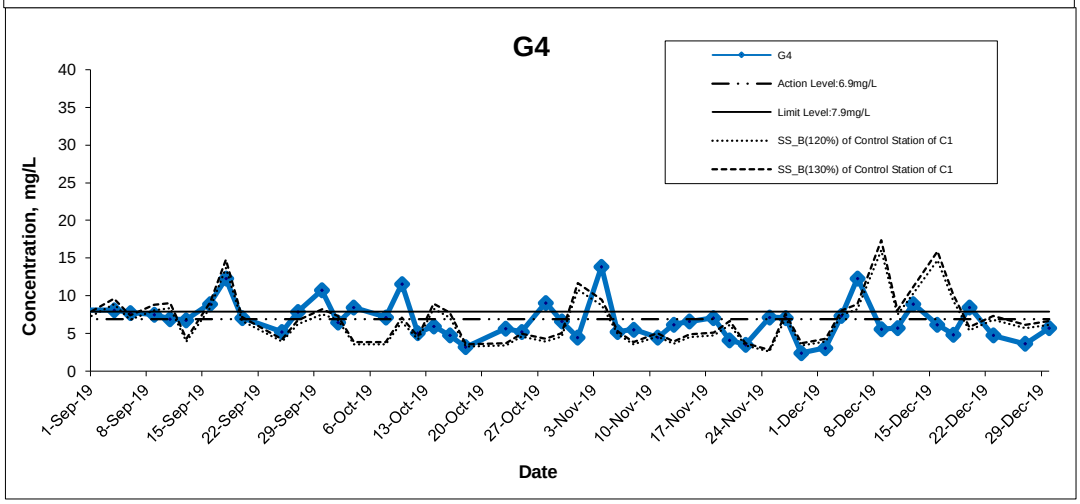
Suspended Solids (Bottom) at Mid-Flood Tide







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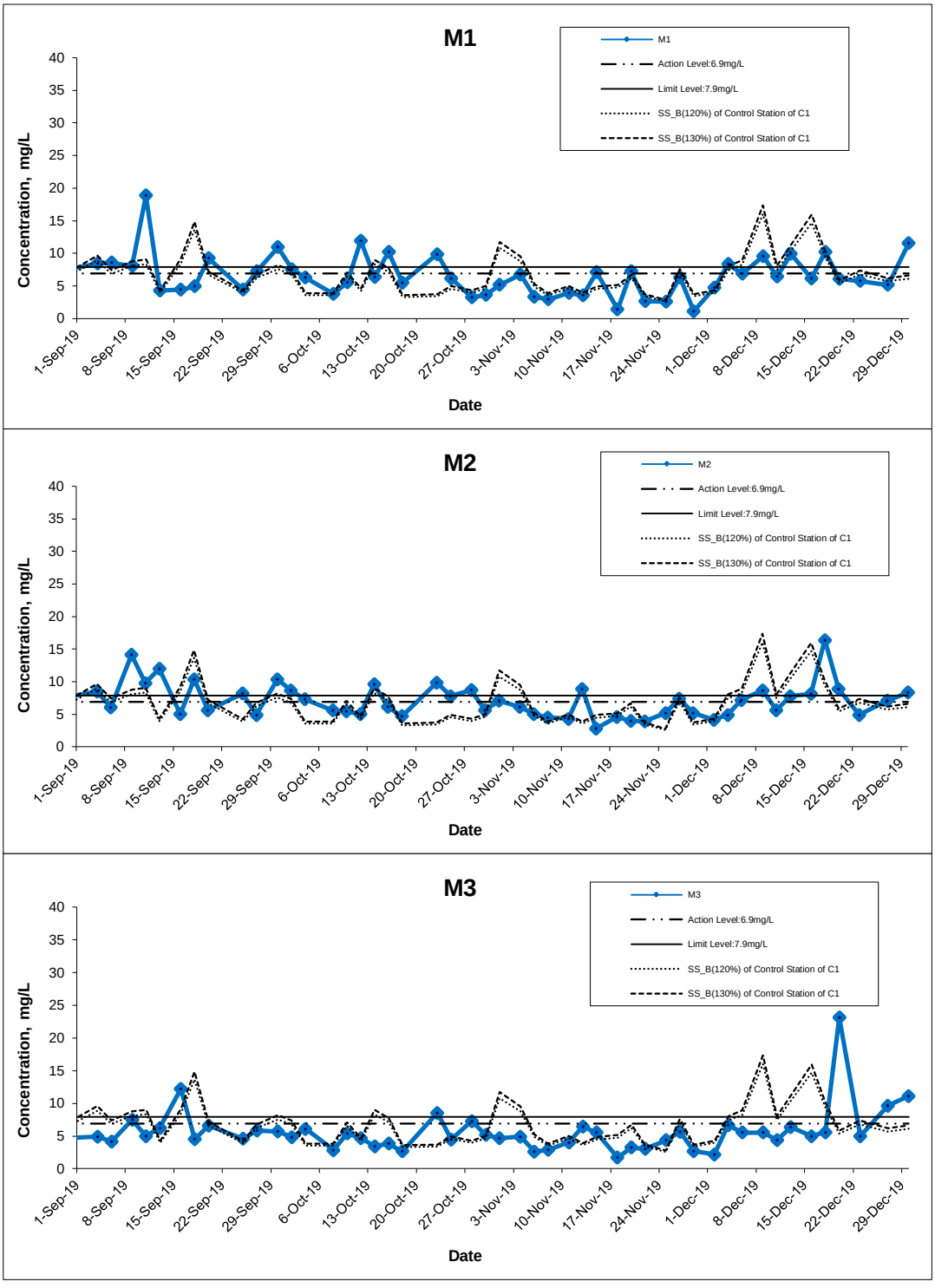
Suspended Solids (Bottom) at Mid-Flood Tide



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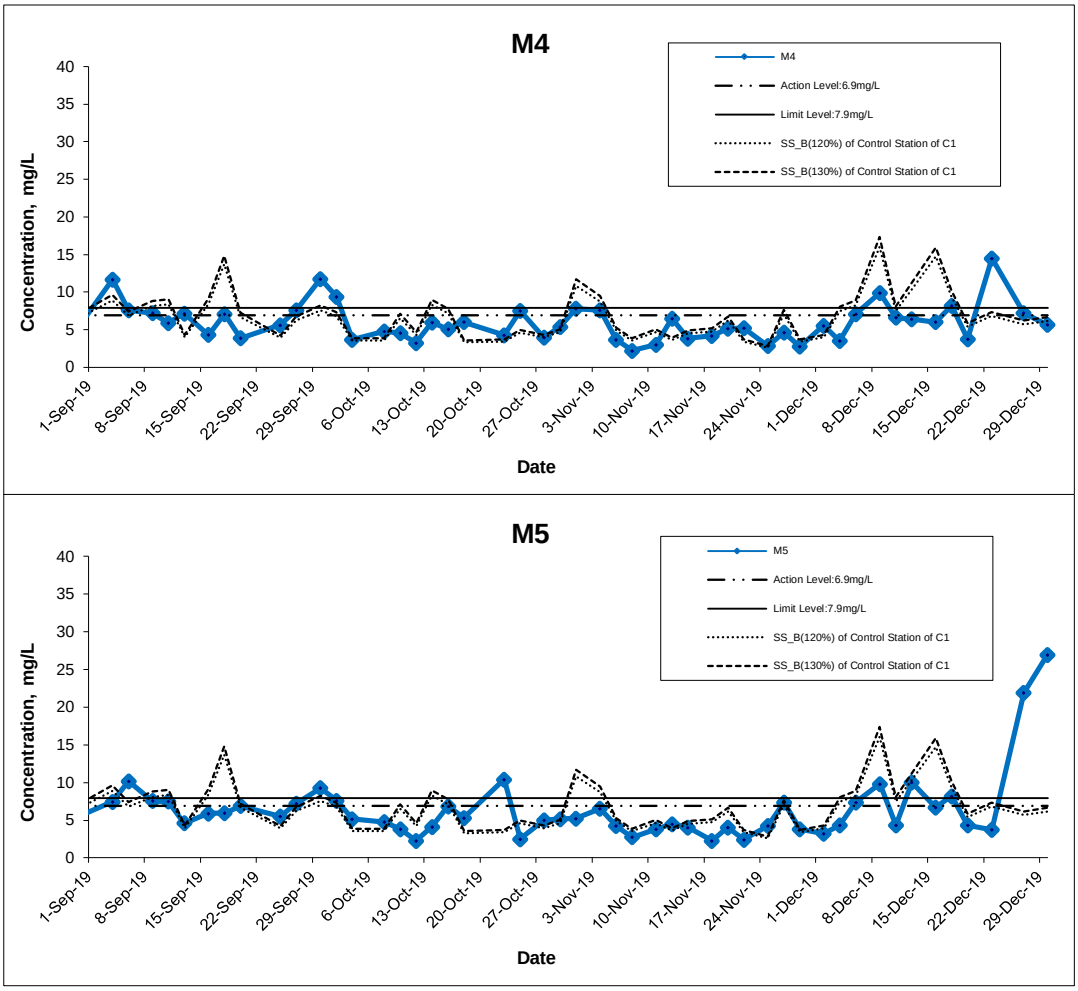
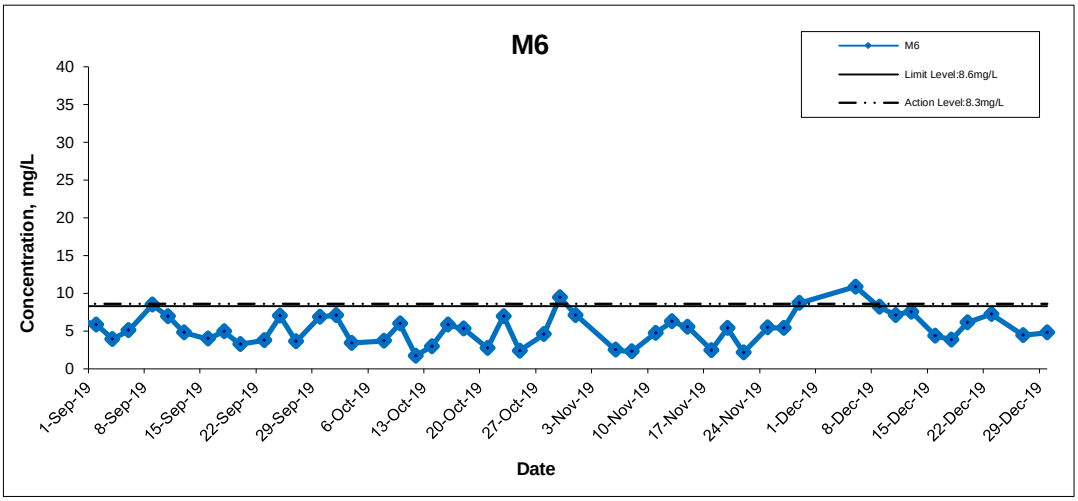
Suspended Solids (Bottom) at Mid-Flood Tide



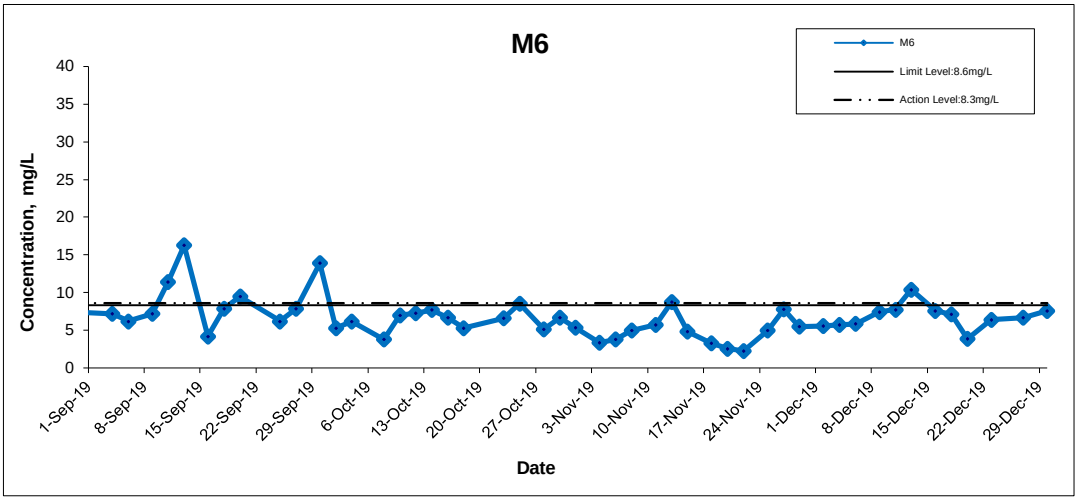
Title	Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA16034	CINOTECH
		Date Dec 19	Appendix I	

Suspended Solids (Intake Level of WSD Salt Water Intake) at Mid-Ebb Tide



Title	Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S Date Dec 19	Project No. MA16034 Appendix I	CINOTECH

Suspended Solids (Intake Level of WSD Salt Water Intake) at Mid-Flood Tide



Title	Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S Date Dec 19	Project No. MA16034 Appendix I	CINOTECH

Water Quality Monitoring Results at W1 - Mid-Ebb Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*
2-Dec-19	-	-	-	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	-
				Middle	-	-	-	-	-	-	-	-	-	-	-	
				Bottom	-	- -	-	- -	-	- -	-	- -	-	- -	-	-
9-Dec-19	Sunny	Calm	10:30	Surface	1.0	25.0 25.0	25.0	8.3 8.3	8.3	32.6 32.6	32.6	90.3 90.6	90.5	6.1 6.1	6.1	6.1
				Middle	-	-	-	-	-	-	-	-	-	-	-	
				Bottom	3.0	24.8 24.8	24.8	8.3 8.3	8.3	32.6 32.6	32.6	88.9 88.9	88.9	6.0 6.0	6.0	6.0
16-Dec-19	Cloudy	Calm	11:59	Surface	1.0	23.4 23.8	23.6	8.6 8.5	8.5	34.0 32.6	33.3	84.9 84.4	84.6	5.5 5.5	5.5	5.5
				Middle	-	-	-	-	-	-	-	-	-	-	-	
				Bottom	3.0	23.7 23.7	23.7	8.5 8.5	8.5	32.7 33.1	32.9	84.7 84.0	84.3	5.5 5.5	5.5	5.5
23-Dec-19	Cloudy	Calm	11:00	Surface	1.0	21.0 20.9	20.9	8.3 8.3	8.3	32.6 32.6	32.6	90.3 90.6	90.5	6.1 6.1	6.1	6.1
				Middle	-	-	-	-	-	-	-	-	-	-	-	
				Bottom	3.0	20.7 20.7	20.7	8.3 8.3	8.3	32.6 32.6	32.6	88.9 88.9	88.9	6.0 6.0	6.0	6.0
30-Dec-19	Sunny	Calm	10:08	Surface	1.0	21.0 21.0	21.0	8.0 8.0	8.0	31.0 32.0	32.0	85.0 85.0	85.0	5.0 5.0	5.0	5.0
				Middle	-	-	-	-	-	-	-	-	-	-	-	
				Bottom	3.0	21.0 21.0	21.0	8.0 8.0	8.0	33.0 32.0	32.0	83.0 83.0	83.0	5.0 5.0	5.0	5.0

Water Quality Monitoring Results at W1 - Mid-Flood Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*
2-Dec-19	Sunny	Calm	17:32	Surface	1.0	25.4 25.3	25.3	8.4 8.4	8.4	34.9 34.9	34.9	86.0 85.7	85.9	5.5 5.5	5.5	5.5
				Middle	-	-	-	-	-	-	-	-	-	-	-	
				Bottom	3.0	25.4 25.3	25.3	8.4 8.4	8.4	34.9 34.9	34.9	83.3 83.3	83.3	5.3 5.3	5.3	5.3
9-Dec-19	Sunny	Calm	16:08	Surface	1.0	25.0 25.0	25.0	8.3 8.3	8.3	32.6 32.6	32.6	89.7 90.0	89.9	6.0 6.1	6.0	6.0
				Middle	-	-	-	-	-	-	-	-	-	-	-	
				Bottom	3.0	24.8 24.8	24.8	8.3 8.3	8.3	32.6 32.6	32.6	88.3 88.3	88.3	5.9 5.9	5.9	5.9
16-Dec-19	Cloudy	Calm	17:05	Surface	1.0	23.8 23.9	23.8	8.5 8.4	8.4	32.9 32.6	32.7	87.7 90.0	88.9	5.7 5.9	5.8	5.8
				Middle	-	-	-	-	-	-	-	-	-	-	-	
				Bottom	3.0	23.9 23.8	23.9	8.4 8.4	8.4	32.3 32.8	32.6	89.6 88.2	88.9	5.9 5.8	5.8	5.8
23-Dec-19	Cloudy	Calm	16:38	Surface	1.0	21.0 20.9	20.9	8.3 8.3	8.3	32.6 32.6	32.6	89.7 90.0	89.9	6.0 6.1	6.0	6.0
				Middle	-	-	-	-	-	-	-	-	-	-	6.0	
				Bottom	3.0	20.7 20.7	20.7	8.3 8.3	8.3	32.6 32.6	32.6	88.3 88.3	88.3	5.9 5.9	5.9	5.9
30-Dec-19	Sunny	Calm	15:45	Surface	1.0	21.6 21.2	21.4	8.7 8.7	8.7	31.3 31.6	31.4	86.0 85.7	85.9	5.5 5.5	5.5	5.5
				Middle	-	-	-	-	-	-	-	-	-	-	-	
				Bottom	3.0	21.3 21.2	21.3	8.7 8.7	8.7	32.7 32.7	32.7	83.3 83.3	83.3	5.3 5.3	5.3	5.3

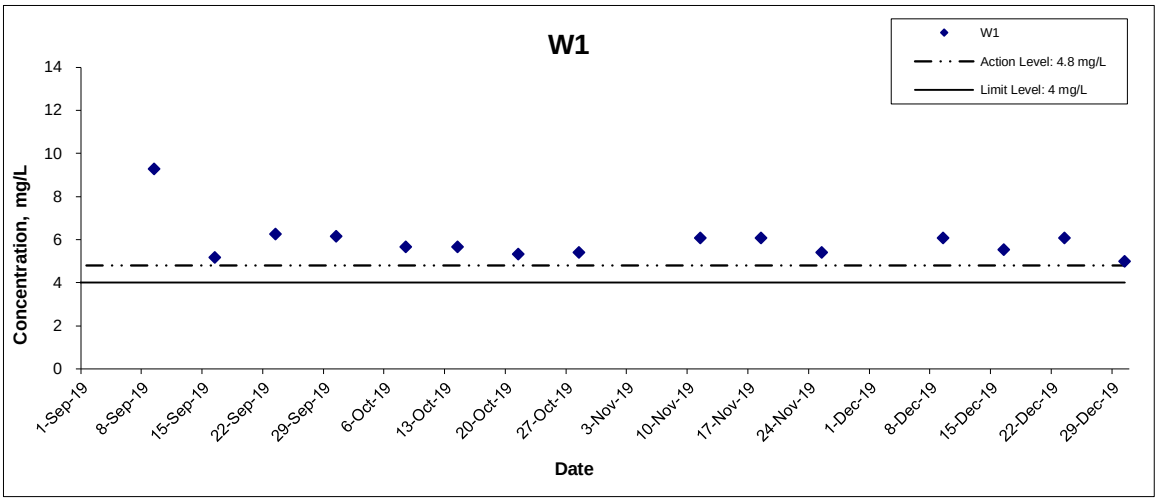
Remark:

*DA: Depth-Averaged

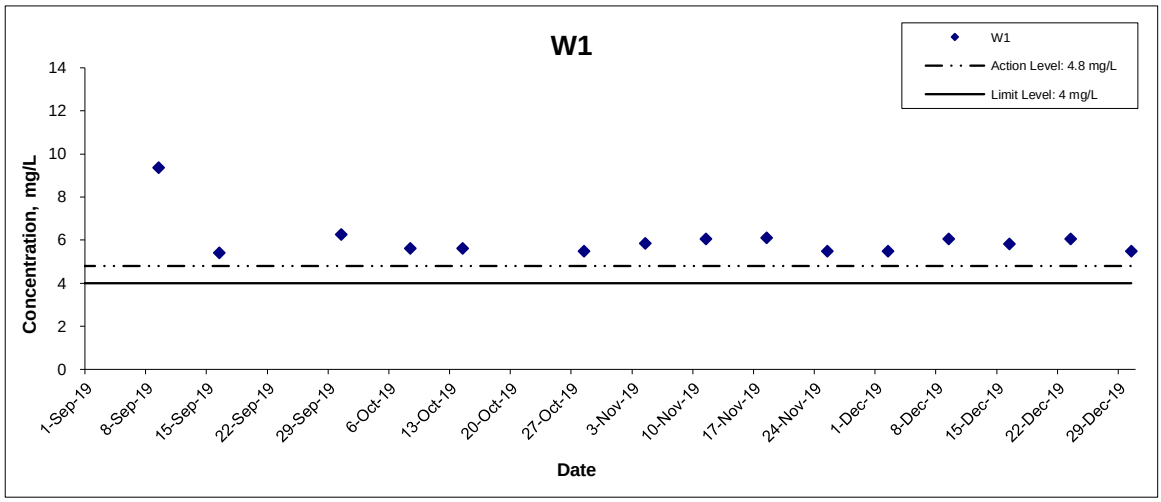
**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

***As the mid - ebb tide on 02 December 2019 was occurred during none construction hours, no water quality monitoring was required.

Dissolved Oxygen (Depth-Averaged) at Mid-Ebb Tide

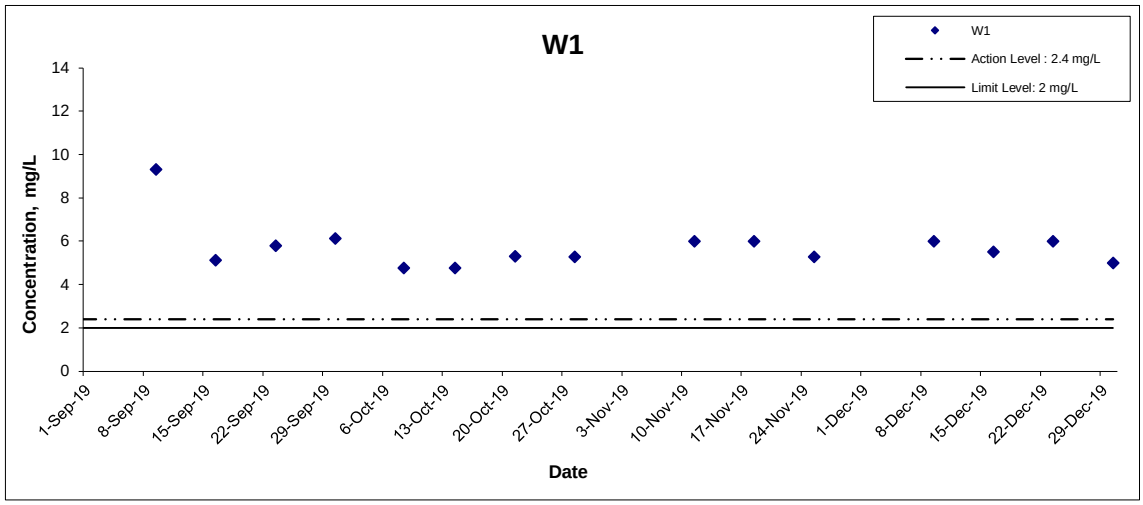


Dissolved Oxygen (Depth-Averaged) at Mid-Flood Tide

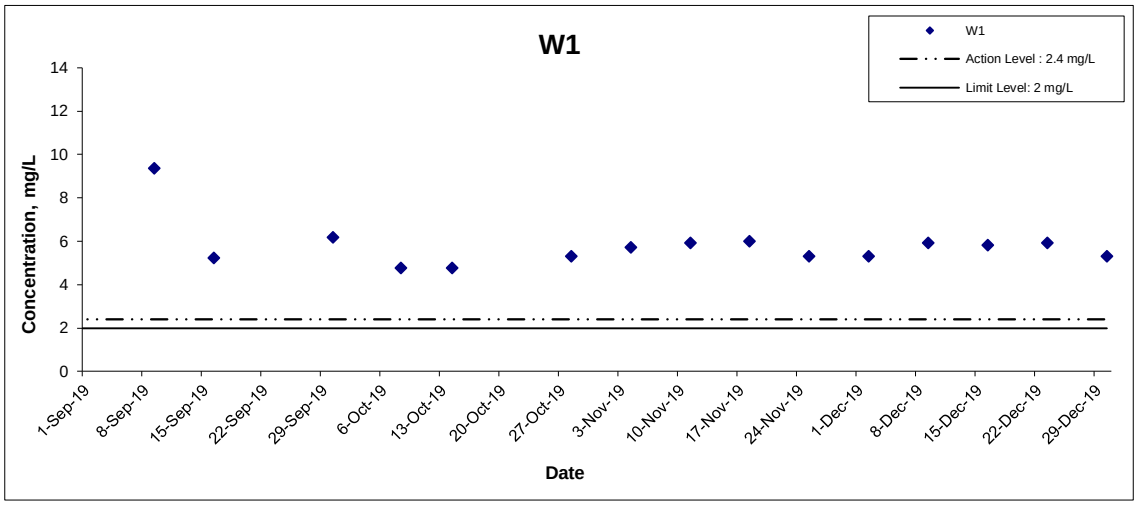


Title		Scale	Project No.	
	Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction	N.T.S	MA16034	CINOTECH
	Graphical Presentation of Additional Water Quality Monitoring Results	Date: Dec-19	Appendix: I	

Dissolved Oxygen (Bottom) at Mid-Ebb Tide



Dissolved Oxygen (Bottom) at Mid-Flood Tide



Title	Scale	Project No.
Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction Graphical Presentation of Additional Water Quality Monitoring Results	N.T.S	MA16034
	Date: Dec-19	Appendix: I

CINOTECH

APPENDIX K
SUMMARY OF EXCEEDANCE

Agreement No. CE 59/2015 (EP)
Environmental Team for Tseung Kwan O - Lam Tin Tunnel – Design and Construction

Appendix K – Summary of Exceedance

Reporting Period: December 2019

(A) Exceedance Report for Air Quality
(NIL in the reporting month)

(B) Exceedance Report for Construction Noise

Action Level for Construction Noise
Five (5) Action Level exceedances were recorded due to the documented complaints received in this reporting month.

Limit Level for Construction Noise
No exceedance for daytime and evening-time construction noise monitoring was recorded in the reporting month.

Three (3) limit level exceedances for nighttime construction noise monitoring was recorded in the reporting month.

Exceedance recorded during daytime
(NIL in the reporting month)

Exceedance recorded during night-time

Date	Monitoring Location	Measured Level (L_{eq} dB(A))	Baseline Noise Level (L_{eq} dB(A))	Construction Noise Level (L_{eq} dB(A))	Limit Level
20 – 21 December 2019	CM1	67.5	63.7	***65***	55
	CM2	65.6	61.6	***63***	
	CM3	63.5	61.8	***59***	

Agreement No. CE 59/2015 (EP)
Environmental Team for Tseung Kwan O - Lam Tin Tunnel – Design and Construction

Appendix K – Summary of Exceedance

(C) Exceedance Report for Water Quality

Sixty-five (65) Action Level and two-hundred and twenty-five (225) Limit Level exceedances in marine water quality monitoring. Refer to the attached notifications for details. The reasons are under investigation.

Since October 2019, groundwater monitoring had been suspended.

(D) Exceedance Report for Ecology

(NIL in the reporting month)

(E) Exceedance Report for Cultural Heritage

(NIL in the reporting month)

(F) Exceedance Report for Landfill Gas

(NIL in the reporting month)

Agreement No. CE 59/2015 (EP) Environmental Team for Tseung Kwan O – Lam Tin Tunnel
- Notification of Exceedances

NOE No. 191220_noise (CM1-3) **Exceedance Level**: Limit

Time of Measurement: 23:00-00:20

Date of Noise Monitoring: 20-21 December 2019

Part A – Exceedance Summary Tables

Table I: Parameter(s) – Construction Noise

Station	Location	Time	Measured Level (L_{eq} dB(A))	Baseline Noise Level (L_{eq} dB(A))	Construction Noise Level (L_{eq} dB(A))	Action Level	Limit Level (L_{eq} dB(A))	Level exceeded
CM1	Nga Lai House, Yau Lai Estate Phase 1, Yau Tong	23:00-23:15	67.5	63.7	***65***	When one documented complaint is received.	**55**	Limit
CM2	Bik Lai House, Yau Lai Estate Phase 1, Yau Tong	23:25-23:40	65.6	61.6	***63***	When one documented complaint is received.	**55**	Limit
CM3	Block S, Yau Lai Estate Phase 5, Yau Tong	00:05-00:20	63.5	61.8	***59***	When one documented complaint is received.	**55**	Limit

Field Observation(s) and Conclusion

(a) Statement of exceedance(s)

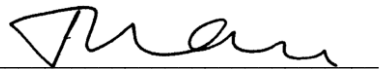
Construction noise measured at CM1-3 exceeded the construction noise (night time) limit level.

(b) Cause of exceedance(s)

The exceedance was not considered related to the Project works:

- According to our field observation, road traffic noise was identified as the dominant noise source. No noticeable noise from the tunneling works was identified.
- No construction activity was observed in Lam Tin Interchange during monitoring.

Part B – Conclusion: The exceedances of night time noise limit levels were not due to the Project, the road traffic noise was identified as the dominant noise source.
Part C – Recommendation: No further action is required.

ETL Signature:  Date: 23 December, 2019

Date of Water Quality Monitoring: **02 December 2019**

Part A – Exceedance Summary Tables

Table I: Parameter(s) – ~~Dissolved Oxygen (DO) / Turbidity (TURB) /~~ Suspended Solids (SS)

Tide	Control Station(s)	Depth	Measured Value at Control Station (mg/L)	Station(s)	Time (hrs)	Baseline Action Level (mg/L)	Baseline Limit Level (mg/L)	120% of Control Station Action Level (mg/L)	130% of Control Station Limit Level (mg/L)	Measured Value (mg/L)
Mid-Flood	C1	surface	2.4	G1	15:37	6.0	6.9	2.8	3.1	***4.2***
Mid-Flood	C1	surface	2.4	G2	15:26	6.0	6.9	2.8	3.1	***2.9***
Mid-Flood	C1	surface	2.4	G3	15:42	6.0	6.9	2.8	3.1	***3.3***
Mid-Flood	C1	surface	2.4	G4	15:54	6.0	6.9	2.8	3.1	***5.3***
Mid-Flood	C1	surface	2.4	M1	15:32	6.2	7.4	2.8	3.1	***5.3***
Mid-Flood	C1	surface	2.4	M2	15:22	6.2	7.4	2.8	3.1	***4.8***
Mid-Flood	C1	surface	2.4	M3	15:50	6.2	7.4	2.8	3.1	***3.2***
Mid-Flood	C1	surface	2.4	M4	15:17	6.2	7.4	2.8	3.1	***4.8***
Mid-Flood	C1	surface	2.4	M5	16:07	6.2	7.4	2.8	3.1	***6.4***
Mid-Flood	C1	bottom	3.3	G1	15:37	6.9	7.9	4.0	4.3	***6.9***
Mid-Flood	C1	bottom	3.3	G4	15:54	6.9	7.9	4.0	4.3	***5.8***
Mid-Flood	C1	bottom	3.3	M1	15:32	6.9	7.9	4.0	4.3	***4.7***
Mid-Flood	C1	bottom	3.3	M2	15:22	6.9	7.9	4.0	4.3	***4.2***
Mid-Flood	C1	bottom	3.3	M4	15:17	6.9	7.9	4.0	4.3	***5.5***

Note: ***Bold Italic*** means Action Level exceedance

Bold Italic with underline means Limit Level exceedance

Date of Water Quality Monitoring: **04 December 2019**

Part A – Exceedance Summary Tables

Table I: Parameter(s) – ~~Dissolved Oxygen (DO) / Turbidity (TURB) /~~ Suspended Solids (SS)

Tide	Control Station(s)	Depth	Measured Value at Control Station (mg/L)	Station(s)	Time (hrs)	Baseline Action Level (mg/L)	Baseline Limit Level (mg/L)	120% of Control Station Action Level (mg/L)	130% of Control Station Limit Level (mg/L)	Measured Value (mg/L)
Mid-Flood	C1	surface	4.4	G1	17:00	6.0	6.9	5.3	5.7	***6.2***
Mid-Flood	C1	surface	4.4	G2	16:46	6.0	6.9	5.3	5.7	***7.2***
Mid-Flood	C1	surface	4.4	M1	16:55	6.2	7.4	5.3	5.7	***9.6***
Mid-Flood	C1	surface	4.4	M2	16:32	6.2	7.4	5.3	5.7	***7.0***
Mid-Flood	C1	surface	4.4	M4	16:20	6.2	7.4	5.3	5.7	***7.3***
Mid-Flood	C1	surface	4.4	M5	17:28	6.2	7.4	5.3	5.7	***6.4***
Mid-Flood	C1	bottom	6.2	G4	17:17	6.9	7.9	7.4	8.1	***7.4***
Mid-Flood	C1	bottom	6.2	M1	16:55	6.9	7.9	7.4	8.1	***8.4***

Note: ***Bold Italic*** means Action Level exceedance

Bold Italic with underline means Limit Level exceedance

Date of Water Quality Monitoring: **04 December 2019**

Part A – Exceedance Summary Tables

Table II: Parameter(s) – ~~Dissolved Oxygen (DO)~~ / Turbidity (TURB) / ~~Suspended Solids (SS)~~

Depth	Baseline Action Level (NTU)	Baseline Limit Level (NTU)	Tide	Control Station(s)	Measured Value at Control Station (NTU)	Station(s)	Time (hrs)	120% of Control Station Action Level (NTU)	130% of Control Station Limit Level (NTU)	Measured Value (NTU)
Bottom	19.3	22.2	Mid-flood	C1	4.0	G2	16:46	4.8	5.3	***5.4***
Bottom	19.3	22.2	Mid-flood	C1	4.0	G4	17:17	4.8	5.3	***5.9***
Bottom	19.3	22.2	Mid-flood	C1	4.0	M2	16:32	4.8	5.3	***5.1***
Bottom	19.3	22.2	Mid-flood	C1	4.0	M3	17:12	4.8	5.3	***6.8***
Bottom	19.3	22.2	Mid-flood	C1	4.0	M4	16:20	4.8	5.3	***5.1***
Bottom	19.3	22.2	Mid-flood	C1	4.0	M5	17:28	4.8	5.3	***5.3***

Note: ***Bold Italic*** means Action Level exceedance

Bold Italic with underline means Limit Level exceedance

Date of Water Quality Monitoring: **06 December 2019**

Part A – Exceedance Summary Tables

Table I: Parameter(s) – ~~Dissolved Oxygen (DO) / Turbidity (TURB) /~~ Suspended Solids (SS)

Tide	Control Station(s)	Depth	Measured Value at Control Station (mg/L)	Station(s)	Time (hrs)	Baseline Action Level (mg/L)	Baseline Limit Level (mg/L)	120% of Control Station Action Level (mg/L)	130% of Control Station Limit Level (mg/L)	Measured Value (mg/L)
Mid-Ebb	C2	surface	6.5	G3	8:44	6.0	6.9	7.7	8.4	***10.3***
Mid-Ebb	C2	surface	6.5	G4	8:59	6.0	6.9	7.7	8.4	***6.1***
Mid-Ebb	C2	surface	6.5	M1	8:25	6.2	7.4	7.7	8.4	***8.4***
Mid-Ebb	C2	intake	n.a.	M6	9:08	8.3	8.6	n.a.	n.a.	***10.9***
Mid-Ebb	C2	bottom	6.1	G1	8:38	6.9	7.9	7.3	7.9	***7.9***
Mid-Ebb	C2	bottom	6.1	M3	8:53	6.9	7.9	7.3	7.9	***8.0***
Mid-Flood	C1	surface	12.7	G2	14:24	6.0	6.9	15.2	16.5	***7.1***
Mid-Flood	C1	surface	12.7	G3	14:52	6.0	6.9	15.2	16.5	***12.3***
Mid-Flood	C1	surface	12.7	G4	15:05	6.0	6.9	15.2	16.5	***8.4***
Mid-Flood	C1	surface	12.7	M1	14:32	6.2	7.4	15.2	16.5	***6.7***
Mid-Flood	C1	surface	12.7	M2	14:19	6.2	7.4	15.2	16.5	***8.7***
Mid-Flood	C1	surface	12.7	M3	14:59	6.2	7.4	15.2	16.5	***6.5***
Mid-Flood	C1	surface	12.7	M5	15:36	6.2	7.4	15.2	16.5	***6.6***
Mid-Flood	C1	bottom	6.85	G1	14:44	6.9	7.9	8.2	8.9	***7.8***
Mid-Flood	C1	bottom	6.9	G4	15:05	6.9	7.9	8.2	8.9	***12.4***
Mid-Flood	C1	bottom	6.9	M2	14:19	6.9	7.9	8.2	8.9	***7.2***
Mid-Flood	C1	bottom	6.85	M4	14:13	6.9	7.9	8.2	8.9	***7.1***
Mid-Flood	C1	bottom	6.9	M5	15:36	6.9	7.9	8.2	8.9	***7.4***

Note: ***Bold Italic*** means Action Level exceedance
Bold Italic with underline means Limit Level exceedance

Date of Water Quality Monitoring: **06 December 2019**

Part A – Exceedance Summary Tables

Table II: Parameter(s) – ~~Dissolved Oxygen (DO)~~ / Turbidity (TURB) / ~~Suspended Solids (SS)~~

Depth	Baseline Action Level (NTU)	Baseline Limit Level (NTU)	Tide	Control Station(s)	Measured Value at Control Station (NTU)	Station(s)	Time (hrs)	120% of Control Station Action Level (NTU)	130% of Control Station Limit Level (NTU)	Measured Value (NTU)
Bottom	19.3	22.2	Mid-flood	C1	4.4	G4	15:05	5.3	5.7	***5.7***

Note: ***Bold Italic*** means Action Level exceedance

Bold Italic with underline means Limit Level exceedance

Contract No. CE 59/2015 (EP)

Environmental Team for Tseung Kwan O – Lam Tin Tunnel Design and Construction

- Investigation Report of Environmental Quality Limit Exceedances (Dec 2019)

Part A Details of Investigation

For the first week of December, exceedances for suspended solids and turbidity have been recorded continuously at various monitoring stations. During marine water quality monitoring, the water outside the site boundary seemed to be clear and clean (Photo 1 and 2)

During site inspections, the water appears to be clear in the discharge point (Photo 3). The sediment tank was free from silt and sediments and the drainage system remained well-maintained. No sand plumes were observed during the site inspection. The sea at the Eastern side enclosed by the double water gate and silt curtain looks similar to the open ocean in colour (Photo 4).

No direct evidence that the recent exceedances were due to the ongoing reclamation activities of the Project. Therefore, no additional marine water quality monitoring is required.

Part B Photo Record

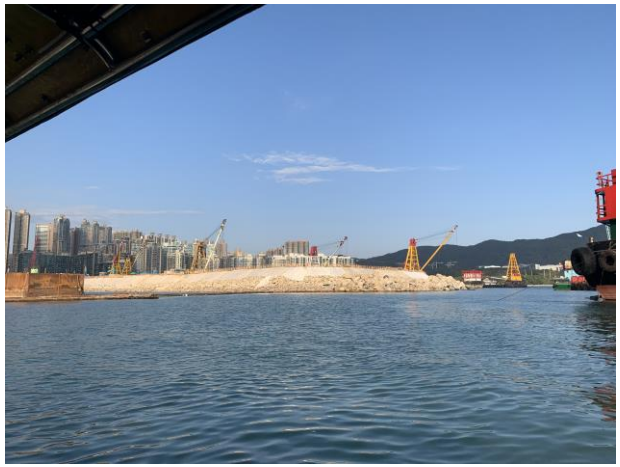
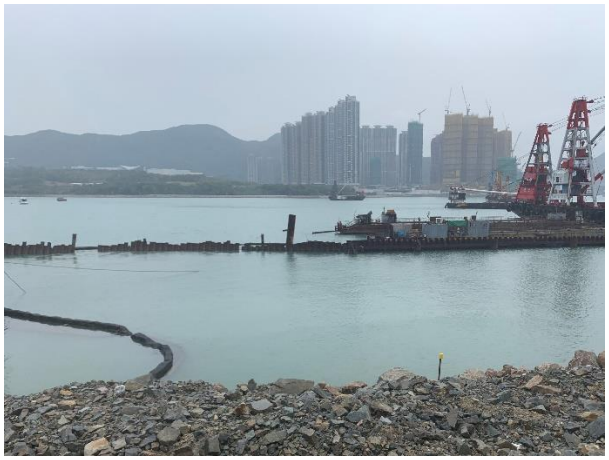


Photo 1 (Recorded on 4th December)	Photo 2 (Recorded on 4th December)
	
Photo 3 (Recorded on 5th December)	Photo 4 (Recorded on 5th November)

Part C – Recommendations

Despite the wet season has ended, heavy rainfall bring along by monsoon wind is highly anticipated. Contractor is reminded to provide sufficient drainage channels and keep sediment tanks free from mud and silt. In addition, the exposed of ground shall be covered tarpaulin fabric to reduce runoff. Local silt curtains' condition shall be checked before operation of construction plants.

Appropriate diversion of received rainwater to the wastewater treatment system within the site should be provided to minimise the chance of accidental runoff. Cofferdam and silt curtain should be checked and maintained regularly; diver inspection for checking damage and leakage should be conducted weekly to ensure the functionality of cofferdam and silt curtains.

Reviewed by:  (Environmental Team Leader:(Dr. HF Chan)

Date: 17 December 2019

Date of Water Quality Monitoring: **09 December 2019**

Part A – Exceedance Summary Tables

Table I: Parameter(s) – ~~Dissolved Oxygen (DO) / Turbidity (TURB) /~~ Suspended Solids (SS)

Tide	Control Station(s)	Depth	Measured Value at Control Station (mg/L)	Station(s)	Time (hrs)	Baseline Action Level (mg/L)	Baseline Limit Level (mg/L)	120% of Control Station Action Level (mg/L)	130% of Control Station Limit Level (mg/L)	Measured Value (mg/L)
Mid-Ebb	C2	surface	5.8	G3	10:19	6.0	6.9	7.0	7.5	***6.8***
Mid-Ebb	C2	surface	5.8	G4	10:30	6.0	6.9	7.0	7.5	***6.6***
Mid-Ebb	C2	surface	5.8	M2	10:02	6.2	7.4	7.0	7.5	***8.1***
Mid-Ebb	C2	surface	5.8	M3	10:26	6.2	7.4	7.0	7.5	***7.2***
Mid-Ebb	C2	surface	5.8	M4	9:56	6.2	7.4	7.0	7.5	***8.9***
Mid-Ebb	C2	bottom	6.2	G2	10:06	6.9	7.9	7.4	8.1	***8.2***
Mid-Ebb	C2	bottom	6.2	G4	10:30	6.9	7.9	7.4	8.1	***10.2***
Mid-Ebb	C2	bottom	6.2	M3	10:26	6.9	7.9	7.4	8.1	***9.1***
Mid-Ebb	C2	bottom	6.2	M5	10:41	6.9	7.9	7.4	8.1	***7.8***
Mid-Flood	C1	surface	8.1	G1	15:56	6.0	6.9	9.7	10.5	***9.3***
Mid-Flood	C1	surface	8.1	G2	15:45	6.0	6.9	9.7	10.5	***11.3***
Mid-Flood	C1	surface	8.1	G3	16:01	6.0	6.9	9.7	10.5	***8.9***
Mid-Flood	C1	surface	8.1	G4	16:13	6.0	6.9	9.7	10.5	***11.8***
Mid-Flood	C1	surface	8.1	M1	15:51	6.2	7.4	9.7	10.5	***10.2***
Mid-Flood	C1	surface	8.1	M3	16:09	6.2	7.4	9.7	10.5	***8.6***
Mid-Flood	C1	surface	8.1	M4	15:36	6.2	7.4	9.7	10.5	***12.0***
Mid-Flood	C1	surface	8.1	M5	16:26	6.2	7.4	9.7	10.5	***7.7***
Mid-Flood	C1	bottom	13.35	G1	15:56	6.9	7.9	16.0	17.4	***8.1***
Mid-Flood	C1	bottom	13.4	G3	16:01	6.9	7.9	16.0	17.4	***10.4***
Mid-Flood	C1	bottom	13.4	M1	15:51	6.9	7.9	16.0	17.4	***9.6***

Mid-Flood	C1	bottom	13.4	M2	15:41	6.9	7.9	16.0	17.4	***8.7***
Mid-Flood	C1	bottom	13.35	M4	15:36	6.9	7.9	16.0	17.4	***9.9***
Mid-Flood	C1	bottom	13.4	M5	16:26	6.9	7.9	16.0	17.4	***9.8***

Note: ***Bold Italic*** means Action Level exceedance
Bold Italic with underline means Limit Level exceedance

Date of Water Quality Monitoring: **09 December 2019**

Part A – Exceedance Summary Tables

Table II: Parameter(s) – ~~Dissolved Oxygen (DO)~~ / Turbidity (TURB) / ~~Suspended Solids (SS)~~

Depth	Baseline Action Level (NTU)	Baseline Limit Level (NTU)	Tide	Control Station(s)	Measured Value at Control Station (NTU)	Station(s)	Time (hrs)	120% of Control Station Action Level (NTU)	130% of Control Station Limit Level (NTU)	Measured Value (NTU)
Bottom	19.3	22.2	Mid-Ebb	C2	2.2	G1	10:16	2.6	2.8	***3.5***
Bottom	19.3	22.2	Mid-Ebb	C2	2.2	G2	10:06	2.6	2.8	***3.6***
Bottom	19.3	22.2	Mid-Ebb	C2	2.2	G3	10:19	2.6	2.8	***3.4***
Bottom	19.3	22.2	Mid-Ebb	C2	2.2	G4	10:30	2.6	2.8	***3.1***
Bottom	19.3	22.2	Mid-Ebb	C2	2.2	M1	10:10	2.6	2.8	***3.3***
Bottom	19.3	22.2	Mid-Ebb	C2	2.2	M2	10:02	2.6	2.8	***3.4***
Bottom	19.3	22.2	Mid-Ebb	C2	2.2	M3	10:26	2.6	2.8	***5.8***
Bottom	19.3	22.2	Mid-flood	C1	2.1	G1	15:56	2.5	2.7	***3.6***
Bottom	19.3	22.2	Mid-flood	C1	2.1	G2	15:45	2.5	2.7	***3.1***
Bottom	19.3	22.2	Mid-flood	C1	2.1	G3	16:01	2.5	2.7	***3.8***
Bottom	19.3	22.2	Mid-flood	C1	2.1	G4	16:13	2.5	2.7	***2.8***
Bottom	19.3	22.2	Mid-flood	C1	2.1	M1	15:51	2.5	2.7	***3.0***
Bottom	19.3	22.2	Mid-flood	C1	2.1	M2	15:41	2.5	2.7	***2.9***
Bottom	19.3	22.2	Mid-flood	C1	2.1	M3	16:09	2.5	2.7	***6.1***

Note: ***Bold Italic*** means Action Level exceedance

Bold Italic with underline means Limit Level exceedance

Date of Water Quality Monitoring: **11 December 2019**

Part A – Exceedance Summary Tables

Table I: Parameter(s) – ~~Dissolved Oxygen (DO) / Turbidity (TURB) /~~ Suspended Solids (SS)

Tide	Control Station(s)	Depth	Measured Value at Control Station (mg/L)	Station(s)	Time (hrs)	Baseline Action Level (mg/L)	Baseline Limit Level (mg/L)	120% of Control Station Action Level (mg/L)	130% of Control Station Limit Level (mg/L)	Measured Value (mg/L)
Mid-Ebb	C2	surface	8.95	G1	11:22	6.0	6.9	10.7	11.6	***6.5***
Mid-Ebb	C2	surface	9.0	G2	11:11	6.0	6.9	10.7	11.6	***12.1***
Mid-Ebb	C2	surface	9.0	G3	11:28	6.0	6.9	10.7	11.6	***10.4***
Mid-Ebb	C2	surface	9.0	G4	11:41	6.0	6.9	10.7	11.6	***6.7***
Mid-Ebb	C2	surface	9.0	M1	11:16	6.2	7.4	10.7	11.6	***7.3***
Mid-Ebb	C2	surface	8.95	M2	11:06	6.2	7.4	10.7	11.6	***7.2***
Mid-Ebb	C2	surface	9.0	M5	11:50	6.2	7.4	10.7	11.6	***11.5***
Mid-Ebb	C2	bottom	7.85	G1	11:22	6.9	7.9	9.4	10.2	***8.7***
Mid-Ebb	C2	bottom	7.85	G2	11:11	6.9	7.9	9.4	10.2	***12.1***
Mid-Ebb	C2	bottom	7.9	G4	11:41	6.9	7.9	9.4	10.2	***8.1***
Mid-Flood	C1	surface	4.8	G1	16:41	6.0	6.9	5.7	6.2	***9.9***
Mid-Flood	C1	surface	4.8	G3	16:46	6.0	6.9	5.7	6.2	***6.3***
Mid-Flood	C1	surface	4.8	G4	16:57	6.0	6.9	5.7	6.2	***8.4***
Mid-Flood	C1	surface	4.8	M1	16:36	6.2	7.4	5.7	6.2	***7.2***
Mid-Flood	C1	surface	4.8	M3	16:51	6.2	7.4	5.7	6.2	***10.7***
Mid-Flood	C1	bottom	6.2	G1	16:41	6.9	7.9	7.4	8.1	***7.0***

Note: ***Bold Italic*** means Action Level exceedance

Bold Italic with underline means Limit Level exceedance

Date of Water Quality Monitoring: **11 December 2019**

Part A – Exceedance Summary Tables

Table II: Parameter(s) – ~~Dissolved Oxygen (DO)~~ / Turbidity (TURB) / ~~Suspended Solids (SS)~~

Depth	Baseline Action Level (NTU)	Baseline Limit Level (NTU)	Tide	Control Station(s)	Measured Value at Control Station (NTU)	Station(s)	Time (hrs)	120% of Control Station Action Level (NTU)	130% of Control Station Limit Level (NTU)	Measured Value (NTU)
Bottom	19.3	22.2	Mid-flood	C1	2.6	G3	16:46	3.1	3.4	***3.3***

Note: ***Bold Italic*** means Action Level exceedance

Bold Italic with underline means Limit Level exceedance

Contract No. CE 59/2015 (EP)
Environmental Team for Tseung Kwan O – Lam Tin Tunnel
Design and Construction
- Notification of Environmental Quality Limit Exceedances

Date of Water Quality Monitoring: **13 December 2019**

Part A – Exceedance Summary Tables

Table I: Parameter(s) – ~~Dissolved Oxygen (DO) / Turbidity (TURB) /~~ Suspended Solids (SS)

Tide	Control Station(s)	Depth	Measured Value at Control Station (mg/L)	Station(s)	Time (hrs)	Baseline Action Level (mg/L)	Baseline Limit Level (mg/L)	120% of Control Station Action Level (mg/L)	130% of Control Station Limit Level (mg/L)	Measured Value (mg/L)
Mid-Ebb	C2	surface	8.1	G1	12:40	6.0	6.9	9.7	10.5	***8.1***
Mid-Ebb	C2	surface	8.1	G2	12:30	6.0	6.9	9.7	10.5	***7.2***
Mid-Ebb	C2	surface	8.1	G3	12:45	6.0	6.9	9.7	10.5	***10.0***
Mid-Ebb	C2	surface	8.1	G4	12:58	6.0	6.9	9.7	10.5	***8.8***
Mid-Ebb	C2	surface	8.1	M1	12:36	6.2	7.4	9.7	10.5	***8.3***
Mid-Ebb	C2	surface	8.1	M2	12:25	6.2	7.4	9.7	10.5	***6.8***
Mid-Ebb	C2	surface	8.1	M3	12:50	6.2	7.4	9.7	10.5	***6.7***
Mid-Ebb	C2	surface	8.1	M4	12:20	6.2	7.4	9.7	10.5	***8.5***
Mid-Ebb	C2	surface	8.1	M5	13:12	6.2	7.4	9.7	10.5	***8.2***
Mid-Ebb	C2	bottom	10.6	G2	12:30	6.9	7.9	12.7	13.8	***7.0***
Mid-Ebb	C2	bottom	10.6	G3	12:45	6.9	7.9	12.7	13.8	***9.2***
Mid-Ebb	C2	bottom	10.6	G4	12:58	6.9	7.9	12.7	13.8	***9.1***
Mid-Ebb	C2	bottom	10.6	M1	12:36	6.9	7.9	12.7	13.8	***7.2***
Mid-Ebb	C2	bottom	10.6	M2	12:25	6.9	7.9	12.7	13.8	***7.4***
Mid-Ebb	C2	bottom	10.6	M5	13:12	6.9	7.9	12.7	13.8	***10.8***
Mid-Flood	C1	surface	8.0	G1	17:46	6.0	6.9	9.5	10.3	***7.5***
Mid-Flood	C1	surface	8.0	G2	17:36	6.0	6.9	9.5	10.3	***7.4***
Mid-Flood	C1	surface	8.0	G3	17:51	6.0	6.9	9.5	10.3	***14.8***
Mid-Flood	C1	surface	8.0	G4	18:04	6.0	6.9	9.5	10.3	***10.6***
Mid-Flood	C1	surface	8.0	M1	17:42	6.2	7.4	9.5	10.3	***11.8***

Mid-Flood	C1	surface	8.0	M2	17:31	6.2	7.4	9.5	10.3	***7.7***
Mid-Flood	C1	surface	8.0	M3	17:56	6.2	7.4	9.5	10.3	***8.9***
Mid-Flood	C1	surface	8.0	M4	17:26	6.2	7.4	9.5	10.3	***8.5***
Mid-Flood	C1	surface	8.0	M5	18:17	6.2	7.4	9.5	10.3	***7.2***
Mid-Flood	C1	intake	n.a.	M6	18:11	8.3	8.6	n.a.	n.a.	***10.4***
Mid-Flood	C1	bottom	8.65	G1	17:46	6.9	7.9	10.4	11.2	***7.5***
Mid-Flood	C1	bottom	8.65	G2	17:36	6.9	7.9	10.4	11.2	***9.2***
Mid-Flood	C1	bottom	8.7	G4	18:04	6.9	7.9	10.4	11.2	***9.0***
Mid-Flood	C1	bottom	8.7	M1	17:42	6.9	7.9	10.4	11.2	***9.9***
Mid-Flood	C1	bottom	8.7	M2	17:31	6.9	7.9	10.4	11.2	***7.8***
Mid-Flood	C1	bottom	8.7	M5	18:17	6.9	7.9	10.4	11.2	***10.1***

Note: ***Bold Italic*** means Action Level exceedance
Bold Italic with underline means Limit Level exceedance

Date of Water Quality Monitoring: **13 December 2019**

Part A – Exceedance Summary Tables

Table II: Parameter(s) – ~~Dissolved Oxygen (DO)~~ / Turbidity (TURB) / ~~Suspended Solids (SS)~~

Depth	Baseline Action Level (NTU)	Baseline Limit Level (NTU)	Tide	Control Station(s)	Measured Value at Control Station (NTU)	Station(s)	Time (hrs)	120% of Control Station Action Level (NTU)	130% of Control Station Limit Level (NTU)	Measured Value (NTU)
Bottom	19.3	22.2	Mid-Ebb	C2	3.8	G2	12:30	4.6	4.9	***4.7***

Note: ***Bold Italic*** means Action Level exceedance

Bold Italic with underline means Limit Level exceedance

Contract No. CE 59/2015 (EP)

Environmental Team for Tseung Kwan O – Lam Tin Tunnel Design and Construction

- Investigation Report of Environmental Quality Limit Exceedances (Dec 2019)

Part A Details of Investigation

For the second week of December, exceedances for suspended solids and turbidity have been recorded continuously at various monitoring stations. During marine water quality monitoring, the water outside the site boundary seemed to be clear and clean (Photo 1 and 2)

During site inspections, no sand plumes and muddy water were observed during the site inspection (Photo 3). The sea at the Western side enclosed by the cofferdam and silt curtain looks similar to the open ocean in colour (Photo 4).

No direct evidence that the recent exceedances were due to the ongoing reclamation activities of the Project. Therefore, no additional marine water quality monitoring is required.

Part B Photo Record

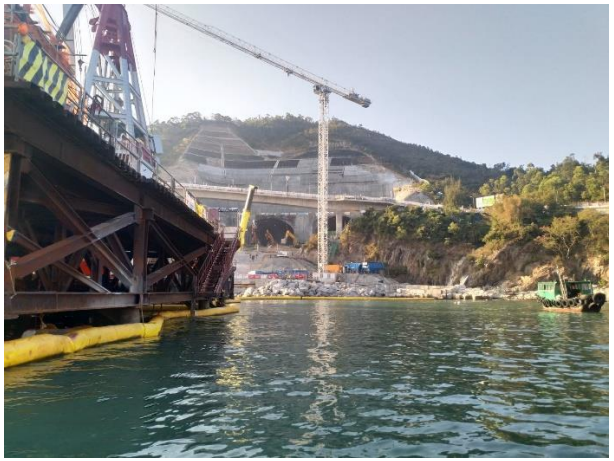


Photo 1 (Recorded on 11th December)	Photo 2 (Recorded on 11th December)
	
Photo 3 (Recorded on 12th December)	Photo 4 (Recorded on 12th November)

Part C – Recommendations

Despite the wet season has ended, occasional rainfall can still occur. Contractor is reminded to provide sufficient drainage channels and keep sediment tanks free from mud and silt. In addition, the exposed of ground shall be covered tarpaulin fabric to reduce runoff. Local silt curtains' condition shall be checked before operation of construction plants.

Appropriate diversion of received rainwater to the wastewater treatment system within the site should be provided to minimise the chance of accidental runoff. Cofferdam and silt curtain should be checked and maintained regularly; diver inspection for checking damage and leakage should be conducted weekly to ensure the functionality of cofferdam and silt curtains.

Reviewed by:  Date: 20 December 2019

(Environmental Team Leader:(Dr. HF Chan)

Date of Water Quality Monitoring: **16 December 2019**

Part A – Exceedance Summary Tables

Table I: Parameter(s) – ~~Dissolved Oxygen (DO) / Turbidity (TURB) /~~ Suspended Solids (SS)

Tide	Control Station(s)	Depth	Measured Value at Control Station (mg/L)	Station(s)	Time (hrs)	Baseline Action Level (mg/L)	Baseline Limit Level (mg/L)	120% of Control Station Action Level (mg/L)	130% of Control Station Limit Level (mg/L)	Measured Value (mg/L)
Mid-Ebb	C2	surface	10.6	G2	11:45	6.0	6.9	12.7	13.8	***12.8***
Mid-Ebb	C2	surface	10.6	G3	11:57	6.0	6.9	12.7	13.8	***6.4***
Mid-Ebb	C2	surface	10.6	G4	12:08	6.0	6.9	12.7	13.8	***6.1***
Mid-Ebb	C2	surface	10.6	M2	11:41	6.2	7.4	12.7	13.8	***9.6***
Mid-Ebb	C2	surface	10.6	M4	11:35	6.2	7.4	12.7	13.8	***7.4***
Mid-Ebb	C2	surface	10.6	M5	12:20	6.2	7.4	12.7	13.8	***6.3***
Mid-Ebb	C2	bottom	9.05	G3	11:57	6.9	7.9	10.9	11.8	***8.7***
Mid-Ebb	C2	bottom	9.1	M5	12:20	6.9	7.9	10.9	11.8	***11.8***
Mid-Flood	C1	surface	25.0	G1	17:04	6.0	6.9	29.9	32.4	***12.8***
Mid-Flood	C1	surface	25.0	G2	16:53	6.0	6.9	29.9	32.4	***6.9***
Mid-Flood	C1	surface	25.0	G4	17:21	6.0	6.9	29.9	32.4	***7.2***
Mid-Flood	C1	surface	25.0	M1	16:59	6.2	7.4	29.9	32.4	***6.6***
Mid-Flood	C1	surface	25.0	M2	16:48	6.2	7.4	29.9	32.4	***6.7***
Mid-Flood	C1	surface	25.0	M3	17:17	6.2	7.4	29.9	32.4	***8.7***
Mid-Flood	C1	surface	25.0	M4	16:43	6.2	7.4	29.9	32.4	***6.5***
Mid-Flood	C1	surface	25.0	M5	17:33	6.2	7.4	29.9	32.4	***8.6***
Mid-Flood	C1	bottom	12.25	G2	16:53	6.9	7.9	14.7	15.9	***11.1***
Mid-Flood	C1	bottom	12.3	G3	17:09	6.9	7.9	14.7	15.9	***8.3***
Mid-Flood	C1	bottom	12.3	M2	16:48	6.9	7.9	14.7	15.9	***8.1***

Note: ***Bold Italic*** means Action Level exceedance

Bold Italic with underline means Limit Level exceedance

Date of Water Quality Monitoring: **16 December 2019**

Part A – Exceedance Summary Tables

Table II: Parameter(s) – ~~Dissolved Oxygen (DO)~~ / Turbidity (TURB) / ~~Suspended Solids (SS)~~

Depth	Baseline Action Level (NTU)	Baseline Limit Level (NTU)	Tide	Control Station(s)	Measured Value at Control Station (NTU)	Station(s)	Time (hrs)	120% of Control Station Action Level (NTU)	130% of Control Station Limit Level (NTU)	Measured Value (NTU)
Bottom	19.3	22.2	Mid-Ebb	C2	1.5	G3	11:57	1.8	2.0	***6.1***
Bottom	19.3	22.2	Mid-Ebb	C2	1.5	G4	12:08	1.8	2.0	***2.0***
Bottom	19.3	22.2	Mid-Ebb	C2	1.5	M1	11:49	1.8	2.0	***5.0***
Bottom	19.3	22.2	Mid-Ebb	C2	1.5	M5	12:20	1.8	2.0	***5.2***

Note: ***Bold Italic*** means Action Level exceedance

Bold Italic with underline means Limit Level exceedance

Date of Water Quality Monitoring: **18 December 2019**

Part A – Exceedance Summary Tables

Table I: Parameter(s) – ~~Dissolved Oxygen (DO) / Turbidity (TURB)~~ / Suspended Solids (SS)

Tide	Control Station(s)	Depth	Measured Value at Control Station (mg/L)	Station(s)	Time (hrs)	Baseline Action Level (mg/L)	Baseline Limit Level (mg/L)	120% of Control Station Action Level (mg/L)	130% of Control Station Limit Level (mg/L)	Measured Value (mg/L)
Mid-Ebb	C2	surface	4.2	G1	17:01	6.0	6.9	5.0	5.5	***5.3***
Mid-Ebb	C2	surface	4.2	G2	16:44	6.0	6.9	5.0	5.5	***10.5***
Mid-Ebb	C2	surface	4.2	G4	17:17	6.0	6.9	5.0	5.5	***6.7***
Mid-Ebb	C2	surface	4.2	M1	16:52	6.2	7.4	5.0	5.5	***7.4***
Mid-Ebb	C2	surface	4.2	M2	16:36	6.2	7.4	5.0	5.5	***7.8***
Mid-Ebb	C2	surface	4.2	M3	17:11	6.2	7.4	5.0	5.5	***5.8***
Mid-Ebb	C2	surface	4.2	M4	16:29	6.2	7.4	5.0	5.5	***8.7***
Mid-Ebb	C2	surface	4.2	M5	17:31	6.2	7.4	5.0	5.5	***11.3***
Mid-Ebb	C2	bottom	5.25	G1	17:01	6.9	7.9	6.3	6.8	***7.3***
Mid-Ebb	C2	bottom	5.25	G2	16:44	6.9	7.9	6.3	6.8	***8.6***
Mid-Ebb	C2	bottom	5.25	G3	17:06	6.9	7.9	6.3	6.8	***8.4***
Mid-Ebb	C2	bottom	5.3	M1	16:52	6.9	7.9	6.3	6.8	***12.1***
Mid-Flood	C1	surface	3.2	G1	12:17	6.0	6.9	3.8	4.2	***5.9***
Mid-Flood	C1	surface	3.2	G2	12:01	6.0	6.9	3.8	4.2	***8.2***
Mid-Flood	C1	surface	3.2	G3	12:22	6.0	6.9	3.8	4.2	***6.3***
Mid-Flood	C1	surface	3.2	G4	12:33	6.0	6.9	3.8	4.2	***4.3***
Mid-Flood	C1	surface	3.2	M1	12:08	6.2	7.4	3.8	4.2	***9.6***
Mid-Flood	C1	surface	3.2	M2	11:55	6.2	7.4	3.8	4.2	***7.5***
Mid-Flood	C1	surface	3.2	M3	12:26	6.2	7.4	3.8	4.2	***7.0***
Mid-Flood	C1	surface	3.2	M4	11:49	6.2	7.4	3.8	4.2	***4.2***

Mid-Flood	C1	surface	3.2	M5	12:46	6.2	7.4	3.8	4.2	***9.4***
Mid-Flood	C1	bottom	7.85	G1	12:17	6.9	7.9	9.4	10.2	***7.8***
Mid-Flood	C1	bottom	7.85	G2	12:01	6.9	7.9	9.4	10.2	***7.5***
Mid-Flood	C1	bottom	7.9	M1	12:08	6.9	7.9	9.4	10.2	***10.2***
Mid-Flood	C1	bottom	7.9	M2	11:55	6.9	7.9	9.4	10.2	***16.4***
Mid-Flood	C1	bottom	7.85	M4	11:49	6.9	7.9	9.4	10.2	***8.2***
Mid-Flood	C1	bottom	7.9	M5	12:46	6.9	7.9	9.4	10.2	***8.2***

Note: ***Bold Italic*** means Action Level exceedance
Bold Italic with underline means Limit Level exceedance

Date of Water Quality Monitoring: **18 December 2019**

Part A – Exceedance Summary Tables

Table II: Parameter(s) – ~~Dissolved Oxygen (DO) /~~ Turbidity (TURB) /~~ Suspended Solids (SS)~~

Depth	Baseline Action Level (NTU)	Baseline Limit Level (NTU)	Tide	Control Station(s)	Measured Value at Control Station (NTU)	Station(s)	Time (hrs)	120% of Control Station Action Level (NTU)	130% of Control Station Limit Level (NTU)	Measured Value (NTU)
Bottom	19.3	22.2	Mid-Ebb	C2	2.6	G4	17:17	3.2	3.4	***3.3***
Bottom	19.3	22.2	Mid-Ebb	C2	2.6	M1	16:52	3.2	3.4	***4.2***
Bottom	19.3	22.2	Mid-flood	C1	3.6	G2	12:01	4.3	4.7	***5.3***
Bottom	19.3	22.2	Mid-flood	C1	3.6	M1	12:08	4.3	4.7	***5.2***
Bottom	19.3	22.2	Mid-flood	C1	3.6	M2	11:55	4.3	4.7	***7.4***

Note: ***Bold Italic*** means Action Level exceedance

Bold Italic with underline means Limit Level exceedance

Contract No. CE 59/2015 (EP)
Environmental Team for Tseung Kwan O – Lam Tin Tunnel
Design and Construction
- Notification of Environmental Quality Limit Exceedances

Date of Water Quality Monitoring: **20 December 2019**

Part A – Exceedance Summary Tables

Table I: Parameter(s) – ~~Dissolved Oxygen (DO) / Turbidity (TURB) /~~ Suspended Solids (SS)

Tide	Control Station(s)	Depth	Measured Value at Control Station (mg/L)	Station(s)	Time (hrs)	Baseline Action Level (mg/L)	Baseline Limit Level (mg/L)	120% of Control Station Action Level (mg/L)	130% of Control Station Limit Level (mg/L)	Measured Value (mg/L)
Mid-Ebb	C2	surface	5.8	G3	8:16	6.0	6.9	6.9	7.5	***21.1***
Mid-Ebb	C2	surface	5.8	M3	8:23	6.2	7.4	6.9	7.5	***7.3***
Mid-Ebb	C2	surface	5.8	M4	7:54	6.2	7.4	6.9	7.5	***7.5***
Mid-Ebb	C2	surface	5.8	M5	8:39	6.2	7.4	6.9	7.5	***22.7***
Mid-Ebb	C2	bottom	5.85	M2	8:00	6.9	7.9	7.0	7.6	***9.7***
Mid-Flood	C1	surface	7.2	G3	13:59	6.0	6.9	8.6	9.4	***6.6***
Mid-Flood	C1	surface	7.2	G4	14:11	6.0	6.9	8.6	9.4	***8.2***
Mid-Flood	C1	surface	7.2	M4	13:33	6.2	7.4	8.6	9.4	***7.3***
Mid-Flood	C1	surface	7.2	M5	14:23	6.2	7.4	8.6	9.4	***6.3***
Mid-Flood	C1	bottom	4.5	G2	13:43	6.9	7.9	5.4	5.9	***6.7***
Mid-Flood	C1	bottom	4.5	G4	14:11	6.9	7.9	5.4	5.9	***8.5***
Mid-Flood	C1	bottom	4.5	M1	13:49	6.9	7.9	5.4	5.9	***6.1***
Mid-Flood	C1	bottom	4.5	M2	13:38	6.9	7.9	5.4	5.9	***8.9***
Mid-Flood	C1	bottom	4.5	M3	14:07	6.9	7.9	5.4	5.9	***23.2***

Note: ***Bold Italic*** means Action Level exceedance
Bold Italic with underline means Limit Level exceedance

Date of Water Quality Monitoring: **20 December 2019**

Part A – Exceedance Summary Tables

Table II: Parameter(s) – ~~Dissolved Oxygen (DO)~~ / Turbidity (TURB) / ~~Suspended Solids (SS)~~

Depth	Baseline Action Level (NTU)	Baseline Limit Level (NTU)	Tide	Control Station(s)	Measured Value at Control Station (NTU)	Station(s)	Time (hrs)	120% of Control Station Action Level (NTU)	130% of Control Station Limit Level (NTU)	Measured Value (NTU)
Bottom	19.3	22.2	Mid-Ebb	C2	1.7	G2	8:04	2.0	2.2	***2.1***
Bottom	19.3	22.2	Mid-Ebb	C2	1.7	G3	8:16	2.0	2.2	***2.9***
Bottom	19.3	22.2	Mid-Ebb	C2	1.7	M1	8:08	2.0	2.2	***3.4***
Bottom	19.3	22.2	Mid-Ebb	C2	1.7	M3	8:23	2.0	2.2	***3.6***
Bottom	19.3	22.2	Mid-Ebb	C2	1.7	M5	8:39	2.0	2.2	***2.5***
Bottom	19.3	22.2	Mid-flood	C1	2.1	G3	13:59	2.5	2.7	***2.9***
Bottom	19.3	22.2	Mid-flood	C1	2.1	M1	13:49	2.5	2.7	***3.3***
Bottom	19.3	22.2	Mid-flood	C1	2.1	M3	14:07	2.5	2.7	***3.4***
Bottom	19.3	22.2	Mid-flood	C1	2.1	M5	14:23	2.5	2.7	***2.7***

Note: ***Bold Italic*** means Action Level exceedance

Bold Italic with underline means Limit Level exceedance

Contract No. CE 59/2015 (EP)

Environmental Team for Tseung Kwan O – Lam Tin Tunnel Design and Construction

- Investigation Report of Environmental Quality Limit Exceedances (Dec 2019)

Part A Details of Investigation

For the third week of December, exceedances for suspended solids and turbidity have been recorded continuously at various monitoring stations. During marine water quality monitoring, the water outside the site boundary seemed to be clear and clean (Photo 1 and 2)

During site inspections, it is observed that the sediment tank removes silt and sediments regularly (Photo 3) and the water at discharge point appears to be clear and free from silt (Photo 4)

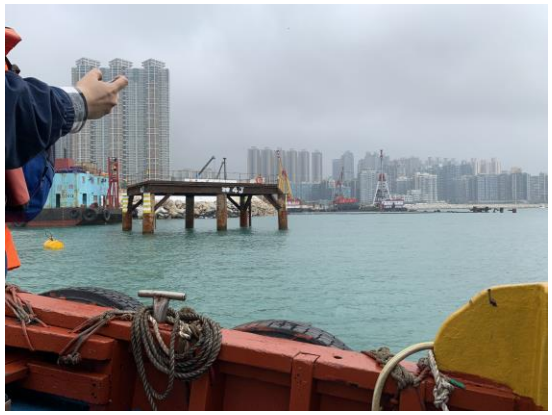
No direct evidence that the recent exceedances were due to the ongoing reclamation activities of the Project. Therefore, no additional marine water quality monitoring is required.

Contract No. CE 59/2015 (EP)

Environmental Team for Tseung Kwan O – Lam Tin Tunnel Design and Construction

- Investigation Report of Environmental Quality Limit Exceedances (Dec 2019)

Part B Photo Record

	
Photo 1 (Recorded on 18th December)	Photo 2 (Recorded on 20th December)
	
Photo 3 (Recorded on 19th December)	Photo 4 (Recorded on 19th November)

Part C – Recommendations

Contractor is suggested to keep sediment tanks free from mud and silt. In addition, the exposed of ground shall be covered tarpaulin fabric to reduce runoff. Local silt curtains' condition shall be checked before operation of construction plants.

Appropriate diversion of received rainwater to the wastewater treatment system within the site should be provided to minimise the chance of accidental runoff. Cofferdam and silt curtain should be checked and maintained regularly; diver inspection for checking damage and leakage should be conducted weekly to ensure the functionality of cofferdam and silt curtains.

Reviewed by:  (Environmental Team Leader:(Dr. HF Chan)

Date: 27 December 2019

Contract No. CE 59/2015 (EP)
Environmental Team for Tseung Kwan O – Lam Tin Tunnel
Design and Construction
- Notification of Environmental Quality Limit Exceedances

Date of Water Quality Monitoring: **23 December 2019**

Part A – Exceedance Summary Tables

Table I: Parameter(s) – ~~Dissolved Oxygen (DO) / Turbidity (TURB) /~~ Suspended Solids (SS)

Tide	Control Station(s)	Depth	Measured Value at Control Station (mg/L)	Station(s)	Time (hrs)	Baseline Action Level (mg/L)	Baseline Limit Level (mg/L)	120% of Control Station Action Level (mg/L)	130% of Control Station Limit Level (mg/L)	Measured Value (mg/L)
Mid-Ebb	C2	surface	5.1	G2	10:13	6.0	6.9	6.1	6.6	***23.8***
Mid-Ebb	C2	surface	5.1	M5	11:15	6.2	7.4	6.1	6.6	***7.0***
Mid-Ebb	C2	bottom	4.85	G1	10:34	6.9	7.9	5.8	6.3	***26.7***
Mid-Ebb	C2	bottom	4.85	G2	10:13	6.9	7.9	5.8	6.3	***6.3***
Mid-Ebb	C2	bottom	4.85	G3	10:41	6.9	7.9	5.8	6.3	***6.7***
Mid-Ebb	C2	bottom	4.85	M2	10:06	6.9	7.9	5.8	6.3	***6.0***
Mid-Ebb	C2	bottom	4.9	M5	11:15	6.9	7.9	5.8	6.3	***7.6***
Mid-Flood	C1	surface	3.9	G1	15:22	6.0	6.9	4.6	5.0	***9.9***
Mid-Flood	C1	surface	3.9	G2	15:02	6.0	6.9	4.6	5.0	***7.1***
Mid-Flood	C1	surface	3.9	G3	15:29	6.0	6.9	4.6	5.0	***7.7***
Mid-Flood	C1	surface	3.9	M1	15:09	6.2	7.4	4.6	5.0	***8.5***
Mid-Flood	C1	surface	3.9	M2	14:55	6.2	7.4	4.6	5.0	***5.1***
Mid-Flood	C1	surface	3.9	M3	15:38	6.2	7.4	4.6	5.0	***5.6***
Mid-Flood	C1	surface	3.9	M5	16:03	6.2	7.4	4.6	5.0	***9.3***
Mid-Flood	C1	bottom	5.65	M4	14:48	6.9	7.9	6.8	7.3	***14.5***

Note: ***Bold Italic*** means Action Level exceedance

Bold Italic with underline means Limit Level exceedance

Contract No. CE 59/2015 (EP)
Environmental Team for Tseung Kwan O – Lam Tin Tunnel
Design and Construction
- Notification of Environmental Quality Limit Exceedances

Date of Water Quality Monitoring: **27 December 2019**

Part A – Exceedance Summary Tables

Table I: Parameter(s) – ~~Dissolved Oxygen (DO) / Turbidity (TURB) /~~ Suspended Solids (SS)

Tide	Control Station(s)	Depth	Measured Value at Control Station (mg/L)	Station(s)	Time (hrs)	Baseline Action Level (mg/L)	Baseline Limit Level (mg/L)	120% of Control Station Action Level (mg/L)	130% of Control Station Limit Level (mg/L)	Measured Value (mg/L)
Mid-Ebb	C2	surface	9.0	G2	13:31	6.0	6.9	10.8	11.7	***6.2***
Mid-Ebb	C2	surface	9.0	G3	13:58	6.0	6.9	10.8	11.7	***25.1***
Mid-Ebb	C2	surface	9.0	G4	14:13	6.0	6.9	10.8	11.7	***6.8***
Mid-Ebb	C2	bottom	24.4	G4	14:13	6.9	7.9	29.3	31.7	***8.9***
Mid-Ebb	C2	bottom	24.4	M3	14:05	6.9	7.9	29.3	31.7	***7.3***
Mid-Ebb	C2	bottom	24.4	M5	14:28	6.9	7.9	29.3	31.7	***10.1***
Mid-Flood	C1	surface	5.2	G1	8:34	6.0	6.9	6.2	6.8	***7.0***
Mid-Flood	C1	surface	5.2	G2	8:15	6.0	6.9	6.2	6.8	***10.9***
Mid-Flood	C1	surface	5.2	G3	8:42	6.0	6.9	6.2	6.8	***25.6***
Mid-Flood	C1	surface	5.2	M1	8:25	6.2	7.4	6.2	6.8	***16.1***
Mid-Flood	C1	surface	5.2	M2	8:08	6.2	7.4	6.2	6.8	***8.5***
Mid-Flood	C1	surface	5.2	M5	9:13	6.2	7.4	6.2	6.8	***6.8***
Mid-Flood	C1	bottom	4.75	G1	8:34	6.9	7.9	5.7	6.2	***9.2***
Mid-Flood	C1	bottom	4.8	G3	8:42	6.9	7.9	5.7	6.2	***15.4***
Mid-Flood	C1	bottom	4.8	M2	8:08	6.9	7.9	5.7	6.2	***7.1***
Mid-Flood	C1	bottom	4.8	M3	8:49	6.9	7.9	5.7	6.2	***9.7***
Mid-Flood	C1	bottom	4.75	M4	8:00	6.9	7.9	5.7	6.2	***7.2***
Mid-Flood	C1	bottom	4.8	M5	9:13	6.9	7.9	5.7	6.2	***21.9***

Note: ***Bold Italic*** means Action Level exceedance

Bold Italic with underline means Limit Level exceedance

Date of Water Quality Monitoring: **27 December 2019**

Part A – Exceedance Summary Tables

Table II: Parameter(s) – ~~Dissolved Oxygen (DO)~~ / Turbidity (TURB) / ~~Suspended Solids (SS)~~

Depth	Baseline Action Level (NTU)	Baseline Limit Level (NTU)	Tide	Control Station(s)	Measured Value at Control Station (NTU)	Station(s)	Time (hrs)	120% of Control Station Action Level (NTU)	130% of Control Station Limit Level (NTU)	Measured Value (NTU)
Bottom	19.3	22.2	Mid-Ebb	C2	2.0	G1	13:50	2.4	2.6	***5.0***
Bottom	19.3	22.2	Mid-Ebb	C2	2.0	G3	13:58	2.4	2.6	***2.9***
Bottom	19.3	22.2	Mid-Ebb	C2	2.0	G4	14:13	2.4	2.6	***2.7***
Bottom	19.3	22.2	Mid-Ebb	C2	2.0	M3	14:05	2.4	2.6	***2.7***
Bottom	19.3	22.2	Mid-Ebb	C2	2.0	M5	14:28	2.4	2.6	***2.9***
Bottom	19.3	22.2	Mid-flood	C1	1.4	G1	8:34	1.7	1.8	***4.9***
Bottom	19.3	22.2	Mid-flood	C1	1.4	G2	8:15	1.7	1.8	***2.3***
Bottom	19.3	22.2	Mid-flood	C1	1.4	G3	8:42	1.7	1.8	***2.9***
Bottom	19.3	22.2	Mid-flood	C1	1.4	G4	8:57	1.7	1.8	***2.5***
Bottom	19.3	22.2	Mid-flood	C1	1.4	M1	8:25	1.7	1.8	***2.0***
Bottom	19.3	22.2	Mid-flood	C1	1.4	M2	8:08	1.7	1.8	***2.1***
Bottom	19.3	22.2	Mid-flood	C1	1.4	M3	8:49	1.7	1.8	***2.9***
Bottom	19.3	22.2	Mid-flood	C1	1.4	M4	8:00	1.7	1.8	***2.1***
Bottom	19.3	22.2	Mid-flood	C1	1.4	M5	9:13	1.7	1.8	***2.8***

Note: ***Bold Italic*** means Action Level exceedance

Bold Italic with underline means Limit Level exceedance

Contract No. CE 59/2015 (EP)
Environmental Team for Tseung Kwan O – Lam Tin Tunnel
Design and Construction
- Notification of Environmental Quality Limit Exceedances

Date of Water Quality Monitoring: **30 December 2019**

Part A – Exceedance Summary Tables

Table I: Parameter(s) – ~~Dissolved Oxygen (DO) / Turbidity (TURB) /~~ Suspended Solids (SS)

Tide	Control Station(s)	Depth	Measured Value at Control Station (mg/L)	Station(s)	Time (hrs)	Baseline Action Level (mg/L)	Baseline Limit Level (mg/L)	120% of Control Station Action Level (mg/L)	130% of Control Station Limit Level (mg/L)	Measured Value (mg/L)
Mid-Ebb	C2	surface	8.2	M4	14:48	6.2	7.4	9.8	10.7	***8.5***
Mid-Ebb	C2	bottom	6.1	G3	15:27	6.9	7.9	7.3	7.9	***10.0***
Mid-Ebb	C2	bottom	6.1	M2	14:55	6.9	7.9	7.3	7.9	***7.4***
Mid-Ebb	C2	bottom	6.1	M3	15:35	6.9	7.9	7.3	7.9	***8.6***
Mid-Flood	C1	surface	3.7	G1	10:33	6.0	6.9	4.4	4.7	***7.7***
Mid-Flood	C1	surface	3.7	G2	10:13	6.0	6.9	4.4	4.7	***7.7***
Mid-Flood	C1	surface	3.7	G3	10:41	6.0	6.9	4.4	4.7	***5.4***
Mid-Flood	C1	surface	3.7	G4	10:55	6.0	6.9	4.4	4.7	***6.8***
Mid-Flood	C1	surface	3.7	M1	10:20	6.2	7.4	4.4	4.7	***8.8***
Mid-Flood	C1	surface	3.7	M2	10:06	6.2	7.4	4.4	4.7	***4.5***
Mid-Flood	C1	surface	3.7	M3	10:49	6.2	7.4	4.4	4.7	***10.5***
Mid-Flood	C1	surface	3.7	M4	9:59	6.2	7.4	4.4	4.7	***8.0***
Mid-Flood	C1	surface	3.7	M5	11:18	6.2	7.4	4.4	4.7	***4.7***
Mid-Flood	C1	bottom	5.1	G2	10:13	6.9	7.9	6.1	6.6	***6.9***
Mid-Flood	C1	bottom	5.1	M1	10:20	6.9	7.9	6.1	6.6	***11.6***
Mid-Flood	C1	bottom	5.1	M2	10:06	6.9	7.9	6.1	6.6	***8.4***
Mid-Flood	C1	bottom	5.1	M3	10:49	6.9	7.9	6.1	6.6	***11.1***
Mid-Flood	C1	bottom	5.1	M5	11:18	6.9	7.9	6.1	6.6	***27.0***

Note: ***Bold Italic*** means Action Level exceedance

Bold Italic with underline means Limit Level exceedance

Date of Water Quality Monitoring: **30 December 2019**

Part A – Exceedance Summary Tables

Table II: Parameter(s) – ~~Dissolved Oxygen (DO)~~ / Turbidity (TURB) / ~~Suspended Solids (SS)~~

Depth	Baseline Action Level (NTU)	Baseline Limit Level (NTU)	Tide	Control Station(s)	Measured Value at Control Station (NTU)	Station(s)	Time (hrs)	120% of Control Station Action Level (NTU)	130% of Control Station Limit Level (NTU)	Measured Value (NTU)
Bottom	19.3	22.2	Mid-Ebb	C2	0.8	G3	15:27	0.9	1.0	***1.3***
Bottom	19.3	22.2	Mid-Ebb	C2	0.8	G4	15:41	0.9	1.0	***2.1***
Bottom	19.3	22.2	Mid-Ebb	C2	0.8	M1	15:07	0.9	1.0	***1.2***
Bottom	19.3	22.2	Mid-Ebb	C2	0.8	M2	14:55	0.9	n.a.	***1.1***
Bottom	19.3	22.2	Mid-Ebb	C2	0.8	M3	15:35	0.9	1.0	***3.1***
Bottom	19.3	22.2	Mid-Ebb	C2	0.8	M5	16:12	0.9	1.0	***1.5***
Bottom	19.3	22.2	Mid-flood	C1	0.5	G1	10:33	0.6	0.7	***2.3***
Bottom	19.3	22.2	Mid-flood	C1	0.5	G2	10:13	0.6	0.7	***0.9***
Bottom	19.3	22.2	Mid-flood	C1	0.5	G3	10:41	0.6	0.7	***1.2***
Bottom	19.3	22.2	Mid-flood	C1	0.5	G4	10:55	0.6	0.7	***2.0***
Bottom	19.3	22.2	Mid-flood	C1	0.5	M1	10:20	0.6	0.7	***1.4***
Bottom	19.3	22.2	Mid-flood	C1	0.5	M2	10:06	0.6	0.7	***1.0***
Bottom	19.3	22.2	Mid-flood	C1	0.5	M3	10:49	0.6	0.7	***2.9***
Bottom	19.3	22.2	Mid-flood	C1	0.5	M5	11:18	0.6	0.7	***1.5***

Note: ***Bold Italic*** means Action Level exceedance

Bold Italic with underline means Limit Level exceedance

Contract No. CE 59/2015 (EP)

Environmental Team for Tseung Kwan O – Lam Tin Tunnel Design and Construction

- Investigation Report of Environmental Quality Limit Exceedances (Dec 2019)

Part A Details of Investigation

For the 4th week of December, exceedances for suspended solids and turbidity have been recorded continuously at various monitoring stations. During marine water quality monitoring, the water outside the site boundary seemed to be clear and clean (Photo 1 and 2)

During site inspections, it is observed that the sediment tank removes silt and sediments regularly (Photo 3) and the water at discharge point appears to be clear and free from silt (Photo 4)

No direct evidence that the recent exceedances were due to the ongoing reclamation activities of the Project. Therefore, no additional marine water quality monitoring is required.

Part B Photo Record

	
Photo 1 (Recorded on 27th December)	Photo 2 (Recorded on 27th December)

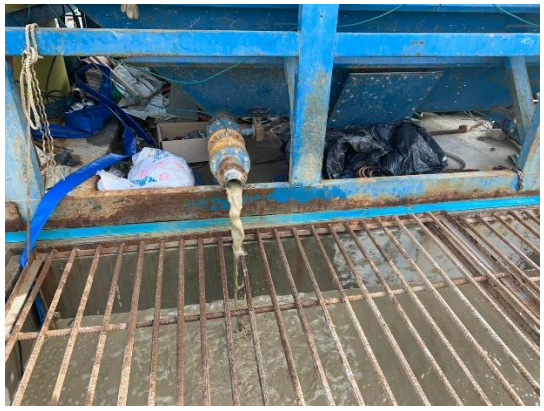



Photo 3 (Recorded on 23rd December)	Photo 4 (Recorded on 23rd December)

Part C – Recommendations

Contractor is suggested to keep sediment tanks free from mud and silt. In addition, the exposed of ground shall be covered tarpaulin fabric to reduce runoff. Local silt curtains' condition shall be checked before operation of construction plants.

Appropriate diversion of received rainwater to the wastewater treatment system within the site should be provided to minimise the chance of accidental runoff. Cofferdam and silt curtain should be checked and maintained regularly; diver inspection for checking damage and leakage should be conducted weekly to ensure the functionality of cofferdam and silt curtains.

Reviewed by:  (Environmental Team Leader:(Dr. HF Chan)

Date: 06 January 2020

APPENDIX L
SITE AUDIT SUMMARY

Appendix L - Site Audit Summary (December 2019)

Contract No. NE/2015/01
Tseung Kwan O - Lam Tin Tunnel - Main Tunnel and Associated Works

Items	Date	Status*	Follow up Action
Water Quality			
Floating debris was found at sea and near shores. Contractor is reminded to avoid and clear floating objects on sea regularly	4 Dec 19	✓	18 Dec 19 Floating debris was removed.
Stains from muds were observed at sea and sandbags at edges of the barge were insufficient to block the surface runoff of muds. Contractor is reminded to prevent surface runoff onto the nearby waters and clean stains on sea.	18 Dec 19	✓	24 Dec 19 Sandbags were set properly and mud stains were cleared at sea
Silt curtains were stranded on shores and need to be repaired.	18 Dec 19	✓	24 Dec 19 Silt curtains were repaired.
Silt curtain was floating and needs to be anchored to seabed.	31 Dec 19	#	
Ecology			
--	--	--	--
Noise			
An acoustic sheet for a breaker was broken. It should be maintained to minimize the noise impact.	24 Dec 19	#	
Landscape and Visual			
--	--	--	--
Air Quality			
Pale black smoke was emitting from a generator in Portion III. Contractor is reminded to check and repair machines regularly to reduce dust emission.	31 Dec 19	#	
Waste / Chemical Management			
Patches of oil stain were found on the road in Portion V. The contractor is reminded to prevent oil leakage from possible sources such as fuel trucks/PMEs to prevent pollution.	27 Nov 19	✓	4 Dec 19 Oil stains were cleaned.
Chemicals for septic tanks were required to be stored at a dry and cool place or be covered with tarpaulins to prevent reactions.	18 Dec 19	✓	24 Dec 19 Coagulants were covered with tarpaulins.
Oil stains were found and need to be cleaned.	24 Dec 19	✓	31 Dec 19 Oil stains were cleaned.
Impact on Cultural Heritage			
--	--	--	--
Permits / Licenses			
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✓ Observation/reminder was made during site audit but improved/rectified by the contractor in the next site audit
✕ Observation/reminder was made during site audit but not yet improved/rectified by the contractor in the next site audit
\# Follow up action will be reported in next reporting month

Appendix L - Site Audit Summary (December 2019)

✻ Non-compliance of mitigation measure

- Non-compliance but improved by the contractor

Appendix L - Site Audit Summary (December 2019)

Contract No. NE/2015/02
Tseung Kwan O - Lam Tin Tunnel - Road P2 and Associated Works

Items	Date	Status*	Follow up Action
Water Quality			
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Noise			
The silence-up for the wetseaep in Area Z is not fully closed, the Contractor should ensure that no gaps should be found within the noise enclosure system.	12 Dec 19	✓	19 Dec 19 The gap has been closed
Landscape and Visual			
--	--	--	--
Air Quality			
The Contractor is reminded that water spraying should be provided regularly at CH105-318, Portion IX.	28 Nov 19	✓	5 Dec 19 Since it was raining during site inspection on 6th December 2019, the item shall be inspected during the next audit session. 12 Dec 19 The area had been excavated and water had been sprinkled to reduce dust impact
The Contractor is reminded to regularly sprinkle water on the haul roads within the works area to reduce dust impact.	12 Dec 19	✓	18 Dec 19 Regular watering had been applied to reduce dust emission due to traffic.
Waste / Chemical Management			
The Contractor is reminded to remove the polystyrene lunch boxes near the entrance of Area Z	23 Dec 19	#	
Impact on Cultural Heritage			
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Permits / Licenses			
--	--	--	--

✓ Observation/reminder was made during site audit but improved/rectified by the contractor in the next site audit
✕ Observation/reminder was made during site audit but not yet improved/rectified by the contractor in the next site audit
\# Follow up action will be reported in next reporting month
✻ Non-compliance of mitigation measure
• Non-compliance but rectified by the contractor

Appendix L - Site Audit Summary (December 2019)

Contract No. NE/2017/02
Tseung Kwan O – Lam Tin Tunnel – Road P2/D4 and Associated Works

Items	Date	Status *	Follow up Action
Water Quality			
--	--	--	--
Noise			
--	--	--	--
Landscape and Visual			
--	--	--	--
Air Quality			
--	--	--	--
Waste / Chemical Management			
--	--	--	--
Impact on Cultural Heritage			
--	--	--	--
Permits / Licenses			
--	--	--	--

✓ Observation/reminder was made during site audit but improved/rectified by the contractor in the next site audit
✗ Observation/reminder was made during site audit but not yet improved/rectified by the contractor in the next site audit
\# Follow up action will be reported in next reporting month

✻ Non-compliance of mitigation measure
• Non-compliance but rectified by the contractor

Appendix L - Site Audit Summary (December 2019)

Contract No. NE/2015/03
Tseung Kwan O - Lam Tin Tunnel - Northern Footbridge

Items	Date	Status *	Follow up Action
Water Quality			
--	--	--	--
Noise			
--	--	--	--
Landscape and Visual			
--	--	--	--
Air Quality			
--	--	--	--
Waste / Chemical Management			
--	--	--	--
Impact on Cultural Heritage			
--	--	--	--
Permits / Licenses			
--	--	--	--

✓ Observation/reminder was made during site audit but improved/rectified by the contractor in the next site audit
✗ Observation/reminder was made during site audit but not yet improved/rectified by the contractor in the next site audit
\# Follow up action will be reported in next reporting month

✻ Non-compliance of mitigation measure
• Non-compliance but rectified by the contractor

Appendix L - Site Audit Summary (December 2019)

Contract No. NE/2017/01
Tseung Kwan O - Lam Tin Tunnel – Tsueng Kwan O Interchange and Associated Works

Items	Date	Status*	Follow up Action
Water Quality			
--	--	--	--
Noise			
--	--	--	--
Landscape and Visual			
--	--	--	--
Air Quality			
--	--	--	--
Waste / Chemical Management			
--	--	--	--
Impact on Cultural Heritage			
--	--	--	--
Permits / Licenses			
--	--	--	--

✓ Observation/reminder was made during site audit but improved/rectified by the contractor in the next site audit
✕ Observation/reminder was made during site audit but not yet improved/rectified by the contractor in the next site audit
\# Follow up action will be reported in next reporting month

✻ Non-compliance of mitigation measure
• Non-compliance but rectified by the contractor

APPENDIX M
EVENT AND ACTION PLANS

Event and Action Plan for Air Quality (Dust)

EVENT	ACTION			
	ET	**IEC**	**ER**	**CONTRACTOR**
Action level being exceeded by one sampling	1. Identify source, investigate the causes of complaint and propose remedial measures; 2. Inform IEC and ER; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method.	1. Notify Contractor.	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
Action level being exceeded by two or more consecutive sampling	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;	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.	1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Submit proposals for remedial actions to IEC within three working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.

EVENT	ACTION			
	ET	**IEC**	**ER**	**CONTRACTOR**
	8. If exceedance stops, cease additional monitoring.			
Limit level being exceeded by one sampling	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform Contractor ,IEC, ER, 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.	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.	1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within three working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.
Limit level being exceeded by two or more consecutive sampling	1. Notify IEC, ER, Contractor and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily;	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;	1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented;	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within three working days of notification; 3. Implement the agreed proposals;

EVENT	ACTION			
	ET	**IEC**	**ER**	**CONTRACTOR**
	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.	3. Supervise the implementation of remedial measures.	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.	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.

Event and Action Plan for Construction Noise

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Action Level	1. Notify IEC 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.	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.	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.	1. Submit noise mitigation proposals to IEC; 2. Implement noise mitigation proposals.
Limit Level	1. Identify source; 2. Inform IEC, ER, EPD and Contractor; 3. Repeat measurements 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;	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.	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.	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.

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
	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.			

Event and Action Plan for Marine Water Quality

Event	Action			
	ET	**IEC**	**ER**	**CONTRACTOR**
Action level being exceeded by one sampling day at water sensitive receiver(s)	• Identify the source(s) of impact by comparing the results with those collected at the control stations as appropriate; • If exceedance is found to be caused by the reclamation activities, repeat *in-situ* measurement to confirm findings; • Inform IEC and contractor; • Check monitoring data, all plant, equipment and Contractor's working methods; • If exceedance occurs at WSD salt water intake, inform WSD; • Discuss mitigation measures with IEC and Contractor; • Repeat measurement on next day of exceedance.	• Discuss with ET and Contractor on the mitigation measures; • Review proposal on mitigation measures submitted by Contractor and advise the ER accordingly; • Assess the effectiveness of the implemented mitigation measures.	• Discuss with IEC on the proposed mitigation measures; • Make agreement on the mitigation proposal.	• Inform the ER and confirm notification of the non-compliance in writing; • Rectify unacceptable practice; • Check all plant and equipment; • Amend working methods if appropriate; • Discuss with ET and IEC and propose mitigation measures to IEC and ER; • Implement the agree mitigation measures.
Action level being exceeded by two or more consecutive	• Identify the source(s) of impact by comparing the results with those collected at the control stations as appropriate;	• Discuss with ET and Contractor on the mitigation measures;	• Discuss with IEC on the proposed mitigation measures; • Make agreement on the mitigation proposal;	• Inform the Engineer and confirm notification of the non-compliance in writing; • Rectify unacceptable practice;

Event	Action			
	ET	**IEC**	**ER**	**CONTRACTOR**
sampling days at water sensitive receiver(s)	• If exceedance is found to be caused by the reclamation activities, repeat in-situ measurement to confirm findings; • Inform IEC and contractor; • Check monitoring data, all plant, equipment and Contractor's working methods; • Discuss mitigation measures with IEC and Contractor; • Ensure mitigation measures are implemented; • Prepare to increase the monitoring frequency to daily; • If exceedance occurs at WSD salt water intake, inform WSD; • Repeat measurement on next day of exceedance.	• Review proposal on mitigation measures submitted by Contractor and advise the ER accordingly; • Assess the effectiveness of the implemented mitigation measures.	• Assess the effectiveness of the implemented mitigation measures.	• Check all plant and equipment and consider changes of working methods; • Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within 3 working days; • Implement the agreed mitigation measures.
Limit level being exceeded by one sampling day at water sensitive receiver(s)	• Identify the source(s) of impact by comparing the results with those collected at the control stations as appropriate;	• Discuss with ET and Contractor on the mitigation measures; • Review proposal on mitigation measures submitted by Contractor and advise the ER accordingly;	• Discuss with IEC, ET and Contractor on the proposed mitigation measures; • Request Contractor to critically review the working methods;	• Inform the ER and confirm notification of the non-compliance in writing; • Rectify unacceptable practice;

Event	Action			
	ET	**IEC**	**ER**	**CONTRACTOR**
	• If exceedance is found to be caused by the reclamation activities, repeat *in-situ* measurement to confirm findings; • Inform IEC, contractor, AFCD and EPD • Check monitoring data, all plant, equipment and Contractor's working methods; • Discuss mitigation measures with IEC, ER and Contractor; • Ensure mitigation measures are implemented; • Increase the monitoring frequency to daily until no exceedance of Limit level; • If exceedance occurs at WSD salt water intake, inform WSD.	• Assess the effectiveness of the implemented mitigation measures.	• Make agreement on the mitigation measures to be implemented; • Assess the effectiveness of the implemented mitigation measures.	• Check all plant and equipment and consider changes of working methods; • Discuss with ET, IEC and ER and submit proposal of mitigation measures to IEC and ER within 3 working days of notification; • Implement the agreed mitigation measures.
Limit level being exceeded by two or more consecutive sampling days at	• Identify the source(s) of impact by comparing the results with those collected at the control stations as appropriate;	• Discuss with ET and Contractor on the mitigation measures; • Review proposal on mitigation measures submitted by Contractor and advise the ER accordingly;	• Discuss with IC(E), ET and Contractor on the proposed mitigation measures; • Request Contractor to critically review the working methods;	• Inform the ER and confirm notification of the non-compliance in writing; • Rectify unacceptable practice;

Event	Action			
	ET	**IEC**	**ER**	**CONTRACTOR**
water sensitive receiver(s)	• If exceedance is found to be caused by the reclamation activities, repeat in-situ measurement to confirm findings; • Inform IC(E), AFCD, contractor and EPD; • Check monitoring data, all plant, equipment and Contractor's working methods; • Discuss mitigation measures with IC(E), ER and Contractor; • Ensure mitigation measures are implemented; • Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days; • If exceedance occurs at WSD salt water intake, inform WSD.	• Assess the effectiveness of the implemented mitigation measures.	• Make agreement on the mitigation measures to be implemented; • Assess the effectiveness of the implemented mitigation measures; • Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the marine work until no exceedance of Limit level.	• Check all plant and equipment and consider changes of working methods; • Discuss with ET, IC(E) and ER and submit proposal of mitigation measures to IC(E) and ER within 3 working days of notification; • Implement the agreed mitigation measures; • As directed by the Engineer, to slow down or to stop all or part of the construction activities.

Limit Levels and Action Plan for Landfill Gas

Parameter	Limit Level	Action
Oxygen	<19%	• Ventilate to restore oxygen to >19%
	<18%	• Stop works • Evacuate personnel/prohibit entry • Increase ventilation to restore oxygen to >19%
Methane	>10% LEL (i.e. > 0.5% by volume)	• Prohibit hot works • Ventilate to restore methane to <10% LEL
	>20% LEL (i.e. > 1% by volume)	• Stop works • Evacuate personnel / prohibit entry • Increase ventilation to restore methane to <10% LEL
Carbon Dioxide	>0.5%	• Ventilate to restore carbon dioxide to < 0.5%
	>1.5%	• Stop works • Evacuate personnel / prohibit entry • Increase ventilation to restore carbon dioxide to < 0.5%

Event and Action Plan for Coral Post-Translocation Monitoring

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Action Level Exceedance	1. Check monitoring data; 2. Inform the IEC, ER and Contractor of the findings; 3. Increase the monitoring to at least once a month to confirm findings; 4. Propose mitigation measures for consideration	1.Discuss monitoring with the ET and the Contractor; 2. Review proposals for additional Monitoring and any other measures submitted by the Contractor and advise the ER accordingly.	1. Discuss with the IEC additional monitoring requirements and any other measures proposed by the ET; 2. Make agreement on the measures to be implemented.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Discuss with the ET and the IEC and propose measures to the IEC and the ER; 3. Implement the agreed measures.
Limit Level Exceedance	Undertake Steps 1-4 as in the Action Level Exceedance. If further exceedance of Limit Level, suspend construction works until an effective solution is identified.	1.Discuss monitoring with the ET and the Contractor; 2. Review proposals for additional Monitoring and any other measures submitted by the Contractor and advise the ER accordingly.	1. Discuss with the IEC additional monitoring requirements and any other measures proposed by the ET; 2. Make agreement on the measures to be implemented.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Discuss with the ET and the IEC and propose measures to the IEC and the ER; 3. Implement the agreed measures.

Mitigation Measures for Vibration Monitoring

Level	Contingency Action
Alert Level	● The Engineer shall be informed immediately. ● The Contractor shall submit an investigation report to describe works being undertaken. To review the instrument responses and to study the cause of undue response. ● The Contractor shall review and increase the instrumentation monitoring and reporting frequency, if applicable. ● The Contractor shall submit a detailed plan of action describing the measures to be taken should the concerned instrument reach the action level to the Engineer for approval.
Alarm Level	● The Engineer shall be informed immediately. ● The active construction works may require to be suspended subject to the Engineer's review of monitoring data. ● The Contractor shall immediately implement the measures as defined in the detailed plan of action to prevent further ground movement and groundwater drawdown etc. ● The Contractor shall prepare a detailed investigation report to study the cause of the exceedance ● The Contractor shall propose a contingency plan for the Engineer's approval in the event that alarm value is reached or exceeded ● The Contractor shall develop an emergency plan for the Engineer's approval in the event the applied contingency measures cannot control the situation. ● The Contractor shall meet the Engineer to discuss the instrument response and review the effectiveness of the implemented measures. ● The Contractor shall carry out design review of the works

Action Level	● Consideration shall be given to suspend all active construction works and the Engineer shall be informed immediately ● The Contractor shall immediately implement the measures defined in the contingency plan ● The Contractor shall implement the measures defined in the emergency plan in the event that the applied contingency measures are found inadequate ● The Contractor shall provide a complete report to examine the construction method and review the response of the instruments with full history of the monitoring data and construction activities and necessary design update ● To resume the suspended activities, the Contractor shall demonstrate to the Engineer's satisfaction that it is safe to do so with approval from the Engineer.

APPENDIX N
ENVIRONMENTAL MITIGATION
IMPLEMENTATION SCHEDULE (EMIS)

Table I – Recommended Mitigation Measures stipulated in EM&A Manual of the Project

(Further information on observations/reminders/non-compliance made during site audit should refer to Table II)

Contract:NE/2015/01

Key:
^ Mitigation measure was fully implemented.
* Observation/reminder was made during site audit but improved/rectified by the contractor.
\# Observation/reminder was made during site audit but not yet improved/rectified by the contractor.
X Non-compliance of mitigation measure
• Non-compliance but rectified by the contractor
N/A Not Applicable

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
Air Quality impact							
S3.8.1	Watering eight times a day on active works areas, exposed areas and paved haul roads	To minimize the dust impact	Contractor	All Active Work Sites	Construction phase	APCO	^
S3.8.1	Enclosing the unloading process at barging point by a 3-sided screen with top tipping hall / mixing area in Work Area A, provision of water spraying and flexible dust curtains	To minimize the dust impact	Contractor	Barging Points	Construction phase	APCO	^
S3.8.7	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. • Use of frequent watering for particularly dusty construction areas and areas close to ASRs.. • Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be	To minimize the dust impact	Contractor#	All Construction Work Sites	Construction phase	APCO and Air Pollution Control (Construction Dust) Regulation	^ ^

	applied to aggregate fines. • Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs. • Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations. • Establishment and use of vehicle wheel and body washing facilities at the exit points of the site. • Provision of wind shield and dust extraction units or similar dust mitigation measures at the loading area of barging point, and use of water sprinklers at the loading area where dust generation is likely during the loading process of loose material, particularly in dry seasons/ periods. • Provision of not less than 2.4m high hoarding from ground level along site boundary where adjoins a road, streets or other accessible to the public except for a site entrance or exit. • Imposition of speed controls for vehicles on site haul roads. • Where possible, routing of vehicles and positioning of construction plant should be at the maximum possible distance from ASRs • 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. • Instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise.						^ ^ ^ ^ ^ ^ ^ ^ ^
/	Emission from Vehicles and Plants • All vehicles shall be shut down in intermittent use. • Only well-maintained plant should be operated on-site and plant should be serviced regularly to avoid emission of black smoke. • All diesel fuelled construction plant within the works areas shall be powered by ultra	Reduce air pollution emission from construction vehicles and plants	Contractor	All construction sites	Construction stage	• APCO	^ *(1) ^

	low sulphur diesel fuel (ULSD)						
/	Valid No-road Mobile Machinery (NRMM) labels should be provided to regulated machines	Reduce air pollution emission from construction vehicles and plants	Contractor	All construction sites	Construction stage	• APCO	^
Noise Impact (Construction Phase)							
S4.8	• Use of quiet PME. Use of movable noise barriers for Excavator, Lorry, Dump Truck, Mobile Crane, Compactor, Concrete Mixer Truck, Concrete Lorry Mixer, Breaker, Mobile Crusher, Backhoe, Vibratory Poker, Saw, Asphalt Paver, Vibratory Roller, Vibrolance, Hydraulic Vibratory Lance and Piling (Vibration Hammer). Use of full enclosure for Air Compressor, Compressor, Bar Bender, Generator, Drilling Rig, Chisel, Large Diameter Bore Piling, Grout Mixer & Pump and Concrete Pump.	To minimize construction noise impact arising from the Project at the affected NSRs	Contractor	Work Sites	Construction phase	EIAO-TM, NCO	^
Noise Mitigation Plan	Use of Temporary Noise Barriers (i.e Acoustic box, SilentUp and etc.) or Full Enclosure for PME according to the approved Noise Mitigation Plan	To minimize construction noise impact arising from the Project at the affected NSRs	Contractor	Work Sites	Construction phase	EIAO-TM, NCO	*(2)
S4.9	Good Site Practice • Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program • Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction program. • Mobile plant, if any, should be sited as far away from NSRs as possible. • Machines and plant (such as trucks) that may be in intermittent use should be shut down between works periods or should be throttled down to a minimum. • Plant known to emit noise strongly in one direction should, wherever possible, be	To minimize construction noise impact arising from the Project at the affected NSRs	Project Proponent	Work sites	Construction Period	EIAO-TM, NCO	^ ^ ^ ^ ^

	orientated so that the noise is directed away from the nearby NSRs. • Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities.						^
S4.9	Scheduling of Construction Works during School Examination Period	To minimize construction noise impact arising from the Project at the affected NSRs	Contractor	Work site near school	Construction phase	EIAO-TM, NCO	N/A
Water Quality Impact (Construction Phase)							
S5.6.24	The dry density of filling material for the TKO-LT Tunnel reclamation should be 1,900kg/m^3, with fine content of 25% or less	Control potential impacts from filling activities	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO	N/A
S5.8.1	Non-dredged method by constructing steel cellular caisson structure with stone column shall be adopted for construction of seawall foundation. During the stone column installation (also including the installation of steel cellular caisson), silt curtain shall be employed around the active stone column installation points.	Control potential impacts from filling activities	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO	N/A
S5.8.2	Formation of seawall enclosing the reclamation for Road P2 (notwithstanding an opening of about 50m for marine access) shall be completed prior to the filling activities. The seawall opening of about 50m wide for marine access shall be selected at a location as indicatively shown in Appendix 5.10. No more than 3 filling barge trips per day shall be made with a maximum daily rate of 3,000m^3 (i.e. 1,000 m^3 per trip) for the filling operation at the reclamation area for Road P2. All filling works shall be carried out behind the seawall with the use of single silt curtain at the marine access.	Control potential impacts from filling activities	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO	N/A
Silt Curtain Deployment Plan	• Silt curtains should be deployed properly to surround the works area. • Maintenance of silt curtain should be provided. • Sufficient stock of silt curtain should be provided on site.	Control potential impacts from marine woroks	Contractor	NE/2015/01	Construction stage	EIAO	

S5.8.3	Other good site practices should be undertaken during filling operations include: • all marine works should adopt the environmental friendly construction methods as far as practically possible including the use of cofferdams to cover the construction area to separate the construction works from the sea; • floating single silt curtain shall be employed for all marine works; • 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; • all hopper barges should be fitted with tight fitting seals to their bottom openings to prevent leakage of material; • excess material shall be cleaned from the decks and exposed fittings of barges before the vessel is moved; • adequate freeboard shall be maintained on barges to reduce the likelihood of decks being washed by wave action; • loading of barges and hoppers should be controlled to prevent splashing of filling material into the surrounding water. Barges or hoppers should not be filled to a level that will cause the overflow of materials or polluted water during loading or transportation; • any pipe leakages shall be repaired quickly. Plant should not be operated with leaking pipes; • construction activities should not cause foam, oil, grease, scum, litter or other objectionable matter to be present on the water within the site or dumping grounds; and • before commencement of the reclamation works, the holder of Environmental Permit has to submit plans showing the phased construction of the reclamation, design and operation of the silt curtain.	Control potential impacts from filling activities and marine-based construction	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO, Waste Disposal Ordinance (WDO)	^ ^ ^ ^ ^ ^ ^ ^ ^ N/A
S5.8.4	Site specific mitigation plan for reclamation areas using public fill materials should be submitted for EPD agreement before commencement of construction phase with due consideration of good site practices.	Control potential impacts from filling activities	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A

		and marine based construction					
ERR S5.6.1	To minimize water quality impact arising from the dredging and filling works for Reclamation for Road P2, the following mitigation measures shall be implemented: - Before carrying out any dredging and underwater filling works, a temporary barrier shall first be constructed to a height above the high water mark to completely enclose the works site (without any opening at the barrier wall) - The temporary barrier fully enclosing the dredging and underwater filling works site shall not be removed before completion of all dredging and underwater filling works. - Water quality sampling and testing shall be carried out to demonstrate that the water quality inside the enclosed barrier is comparable to the ambient or baseline levels prior to the removal of the fully enclosed barrier. - Silt curtains shall be deployed for the installation and removal of the temporary barrier and at the double water gates marine access opening during its operation.	Control potential impacts from dredging and filling works for Reclamation for Road P2	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A N/A N/A N/A
S5.8.5	It is important that appropriate measures are implemented to control runoff and drainage and prevent high loading of SS from entering the marine environment. Proper site management is essential to minimise surface water runoff, soil erosion and sewage effluents.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.6	Any practical options for the diversion and realignment of drainage should comply with both engineering and environmental requirements in order to ensure adequate hydraulic capacity of all drains.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Design Stage and Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO, TM-DSS	^

S5.8.7	Construction site runoff and drainage should be prevented or minimised in accordance with the guidelines stipulated in the EPD's Practice Note for Professional Persons, Construction Site Drainage (ProPECC PN 1/94). Good housekeeping and stormwater best management practices, as detailed in below, should be implemented to ensure that all construction runoff complies with WPCO standards and no unacceptable impact on the WSRs arises due to construction of the TKO-LT Tunnel. All discharges from the construction site should be controlled to comply with the standards for effluents discharged into the corresponding WCZ under the TM-DSS.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO, TM-DSS	*(3)
S5.8.8	Exposed soil areas should be minimised to reduce the potential for increased siltation, contamination of runoff, and erosion. Construction runoff related impacts associated with the above ground construction activities can be readily controlled through the use of appropriate mitigation measures which include: • use of sediment traps; and • adequate maintenance of drainage systems to prevent flooding and overflow.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^ N/A ^
S5.8.9	Construction site should be provided with adequately designed perimeter channel and pretreatment facilities and proper maintenance. The boundaries of critical areas of earthworks should be marked and surrounded by dykes or embankments for flood protection. Temporary ditches should be provided to facilitate runoff discharge into the appropriate watercourses, via a silt retention pond. Permanent drainage channels should incorporate sediment basins or traps and baffles to enhance deposition rates. The design of efficient silt removal facilities should be based on the guidelines in Appendix A1 of ProPECC PN 1/94.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.10	Ideally, construction works should be programmed to minimise surface excavation works during the rainy season (April to September). All exposed earth areas should be completed as soon as possible after earthworks have been completed, or alternatively, within 14 days of the cessation of earthworks where practicable. 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.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^

S5.8.11	Sedimentation tanks of sufficient capacity, constructed from pre-formed individual cells of approximately 6 to 8m^3 capacity, are recommended as a general mitigation measure which can be used for settling surface runoff prior to disposal. The system capacity is flexible and able to handle multiple inputs from a variety of sources and particularly suited to applications where the influent is pumped.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO S5	^
S5.8.12	Earthworks final surfaces should be well compacted and the subsequent permanent work or surface protection should be carried out immediately after the final surfaces are formed to prevent erosion caused by rainstorms. Appropriate drainage like intercepting channels should be provided where necessary.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO S5	^
S5.8.13	Measures should be taken to minimize the ingress of rainwater into trenches. If excavation of trenches in wet seasons is necessary, they should be dug and backfilled in short sections. Rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO S5	*(4)
S5.8.14	Open stockpiles of construction materials (for examples, aggregates, sand and fill material) of more than 50m^3 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.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.15	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 directed into foul sewers. Discharge of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul sewerage system.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.16	Precautions to be taken at any time of year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecast, and actions to be taken during or after rainstorms are	Control potential impacts from	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^

	summarised in Appendix A2 of ProPECC PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events, especially for areas located near steep slopes.	construction site runoff and land-based construction					
S5.8.17	Oil interceptors should be provided in the drainage system and regularly cleaned to prevent the release of oils and grease into the storm water drainage system after accidental spillages. The interceptor should have a bypass to prevent flushing during periods of heavy rain.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A
S5.8.18	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 located wheel washing bay should be provided at every site exit, and washwater 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 wheelwash 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.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.19	Silt removal facilities, channels and manholes should be maintained and the deposited silt and grit should be removed regularly, at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.20	It is recommended that on-site drainage system should be installed prior to the commencement of other construction activities. Sediment traps should be installed in order to minimise the sediment loading of the effluent prior to discharge into foul sewers. There shall be no direct discharge of effluent from the site into the sea.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.21	All temporary and permanent drainage pipes and culverts provided to facilitate runoff discharge should be adequately designed for the controlled release of storm flows. All	Control potential impacts from	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^

	sediment control measures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly following rain storms. The temporarily diverted drainage should be reinstated to its original condition when the construction work has finished or the temporary diversion is no longer required.	construction site runoff and land-based construction					
S5.8.22	All fuel tanks and storage areas should be provided with locks and be located 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 the coastal waters.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.23	Minimum distances of 100m shall be maintained between the existing or planned stormwater discharges and the existing or planned seawater intakes during construction and operational phases	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO, TMDSS	^
S5.8.24	Under normal circumstances, groundwater pumped out of wells, etc. for the lowering of ground water level in basement or foundation construction, and groundwater seepage pumped out of tunnels or caverns under construction should be discharged into storm drains after the removal of silt in silt removal facilities.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.25 - S5.8.27 & Table 5.18	Grouting would be adopted as measure to reduce the groundwater inflow into the tunnel. During the tunnel excavation, the inflow rate of groundwater into the tunnel will be measured during the excavation. The groundwater levels above the tunnel will also be monitored by piezometers. If the inflow rate exceeds the pre-determined groundwater control criteria or the groundwater drawdown exceeds the required limit, pre-excavation grouting will be required to reduce the groundwater inflow. No significant change of groundwater levels would therefore be expected. Any chemicals/ foaming agents which would be entrained to the groundwater should be biodegradable and non-toxic throughout the tunnel construction. Potential	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO, Buildings Ordinance	N/A

	groundwater quality impact would be minimal as the used material is non-toxic and biodegradable. No adverse groundwater quality would therefore be expected. Prescriptive measures in the form of an Action Plan with pre-emptive and re-active to preserve the groundwater levels at all times during the tunnel construction are set out in Table 5.18.						
S5.8.28	Water used in ground boring and drilling for site investigation or rock / soil anchoring should as far as practicable be recirculated after sedimentation. When there is a need for final disposal, the wastewater should be discharged into storm drains via silt removal facilities.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Design Stage and Construction Phas	ProPECC PN 1/94, EIAOTM, WPCO	N/A
S5.8.29 - S5.8.31	Wastewater generated from the washing down of mixing trucks and drum mixers and similar equipment should whenever practicable be recycled. The discharge of wastewater should be kept to a minimum. To prevent pollution from wastewater overflow, the pump sump of any water recycling system should be provided with an online standby pump of adequate capacity and with automatic alternating devices. Under normal circumstances, surplus wastewater may be discharged into foul sewers after treatment in silt removal and pH adjustment facilities (to within the pH range of 6 to 10). Disposal of wastewater into storm drains will require more elaborate treatment.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.32	All vehicles and plant should be cleaned before they leave a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. A wheel washing bay should be provided at every site exit if practicable and wash-water should have sand and silt settled out or removed before discharging into storm drains. The section of construction road between the wheel washing bay and the public road should be paved with backfall to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.33	Bentonite slurries used in diaphragm wall and borepile construction should be reconditioned and reused wherever practicable. If the disposal of a certain residual quantity cannot be avoided, the used slurry may be disposed of at the marine spoil grounds subject to obtaining a marine dumping licence from EPD on a case-by-case basis.	Control potential impacts from construction site runoff and land-	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A

		based construction					
S5.8.34	If the used bentonite slurry is intended to be disposed of through the public drainage system, it should be treated to the respective effluent standards applicable to foul sewer, storm drains or the receiving waters as set out in the WPCO Technical Memorandum on Effluent Standards.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A
S5.8.35	Water used in water testing to check leakage of structures and pipes should be reused for other purposes as far as practicable. Surplus unpolluted water could be discharged into storm drains.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A
S5.8.36	Sterilization is commonly accomplished by chlorination. Specific advice from EPD should be sought during the design stage of the works with regard to the disposal of the sterilizing water. The sterilizing water should be reused wherever practicable.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Design Stage and Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A
S5.8.37	Before commencing any demolition works, all sewer and drainage connections should be sealed to prevent building debris, soil, sand etc. from entering public sewers/drains.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A
S5.8.38	Wastewater generated from building construction activities including concreting, plastering, internal decoration, cleaning of works and similar activities should not be discharged into the stormwater drainage system. If the wastewater is to be discharged into foul sewers, it should undergo the removal of settleable solids in a silt removal facility, and pH adjustment as necessary	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^

S5.8.39	Acidic wastewater generated from acid cleaning, etching, pickling and similar activities should be neutralized to within the pH range of 6 to 10 before discharging into foul sewers. If there is no public foul sewer in the vicinity, the neutralized wastewater should be tinkered off site for disposal into foul sewers or treated to a standard acceptable to storm drains and the receiving waters	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.40	Wastewater collected from canteen kitchens, including that from basins, sinks and floor drains, should be discharged into foul sewer via grease traps capable of providing at least 20 minutes retention during peak flow.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A
S5.8.41	Drainage serving an open oil filling point should be connected to storm drains via a petrol interceptor with peak storm bypass.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.42	Vehicle and plant servicing areas, vehicle wash bays and lubrication bays should as far as possible be located within roofed areas. The drainage in these covered areas should be connected to foul sewers via a petrol interceptor. Oil leakage or spillage should be contained and cleaned up immediately. Waste oil should be collected and stored for recycling or disposal in accordance with the Waste Disposal Ordinance.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.43	Construction work force sewage discharges on site are expected to be connected to the existing trunk sewer or sewage treatment facilities. The construction sewage may need to be handled by portable chemical toilets prior to the commission of the on-site sewer system. Appropriate numbers of portable toilets shall be provided by a licensed contractor to serve the large number of construction workers over the construction site. The Contractor shall also be responsible for waste disposal and maintenance practices.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^

S5.8.44	Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes.	Control potential impacts from accidental spillage of chemicals	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO, WDO	^
S5.8.45	Any service shop and maintenance facilities should be located on hard standings within a bunded area, and sumps and oil interceptors should be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage should only be undertaken within the areas appropriately equipped to control these discharges.	Control potential impacts from accidental spillage of chemicals	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO	^
S5.8.46	Disposal of chemical wastes should be carried out in compliance with the Waste Disposal Ordinance. The "Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes" published under the Waste Disposal Ordinance details the requirements to deal with chemical wastes. General requirements are given as follows: • suitable containers should be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport; • chemical waste containers should be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents; and • storage area should be selected at a safe location on site and adequate space should be allocated to the storage area.	Control potential impacts from accidental spillage of chemicals	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO, WDO	^ ^ ^
S5.8.47	Collection and removal of floating refuse should be performed at regular intervals on a daily basis. The contractor should be responsible for keeping the water within the site boundary and the neighbouring water free from rubbish.	Control potential impacts from floating refuse and debris	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO,	^
Ecological Impact							
S6.8.4	***Measures to Minimize Disturbance*** • Use of Quiet Mechanical Plant during the construction phase should be adopted wherever possible. • Hoarding or fencing should be erected around the works area boundaries during the	Minimize noise, human and traffic disturbance to terrestrial habitat	Design Team / Contractor	Land-based works are	Construction Phase	N/A	^ ^

	construction phase. The hoarding would screen adjacent habitats from construction phase activities, reduce noise disturbance to these habitats and also to restrict access to habitats adjacent to works areas by site workers; • Regular spraying of haul roads to minimize impacts of dust deposition on adjacent vegetation and habitats during the construction activities	and wildlife; and reduce dust generation					^
S6.8.5	***Standard Good Site Practice*** • Placement of equipment or stockpile in designated works areas and access routes selected on existing disturbed land to minimise disturbance to natural habitats. • Construction activities should be restricted to works areas that should be clearly demarcated. The works areas should be reinstated after completion of the works. • Waste skips should be provided to collect general refuse and construction wastes. The wastes should be properly disposed off-site in a timely manner. • General drainage arrangements should include sediment and oil traps to collect and control construction site run-off. • Open burning on works sites is illegal, and should be strictly prohibited. • Measures should also be put into place so that litter, fuel and solvents do not enter the nearby watercourses.	Reduce disturbance to surrounding habitats	Contractor	Land-based works are	Construction Phase	N/A	^ ^ ^ ^ ^ ^
S6.8.6	***Measure to Minimize Groundwater Inflow*** • The drained tunnel construction method with groundwater inflow control measures would generally be adopted. • During the tunnel excavation, pre-excavation grouting could be adopted to reduce the groundwater inflow and ensure that the tunnel would meet the long term water tightness requirements.	Minimize groundwater inflow	Contractor	Tunnel	Construction Phase	N/A	N/A N/A
S6.8.8	***Measure to Minimize Impact on Corals*** <u>Coral translocation</u> • It is recommended to translocate the affected coral colonies, except the locally common *Oulastrea crispata*, within the reclamation area and bridge footprint to the other suitable	Minimize loss of coral	Design team, contractor, project operator	Within reclamation areas and pier footprint	Prior construction	N/A	^

	locations as far as practicable. • The coral translocation should be conducted during the winter months (November-March) in order to avoid disturbance during their spawning period (i.e. July to October). • A detailed coral translocation plan with a description on the methodology for pretranslocation coral survey, translocation methodology, identification/proposal of coral recipient site, monitoring methodology for posttranslocation should be prepared during the detailed design stage. • The coral translocation plan should be subject to approval by relevant authorities (e.g. EPD and AFCD) before commencement of the coral translocation. All the translocation exercises should be conducted by experienced marine ecologist(s) who is/are approved by AFCD prior to commencement of coral translocation. <u>Post translocation Monitoring</u> • A coral monitoring programme is recommended to assess any adverse and unacceptable impacts to the translocated coral communities • Information gathered during each posttranslocation monitoring survey should include observations on the presence, survival, health condition and growth of the translocated coral colonies. These parameters should then be compared with the baseline results collected from the pre-translocation survey.						^ ^ ^ ^ ^
S6.8.9 S6.8.10	***Measure to Control Water Quality Impact*** • Deployment of silt curtains around the active stone column installation points, opening of newly installed seawall and marine works area. • Diverting of the site runoff to silt trap facilities before discharging into storm drain; • Proper waste and dumping management; and • Standard good-site practice for land-based construction.	Control water quality impact, especially on suspended solid level; minimize the contamination of wastewater discharge, accidental chemical spillage	Design Team, contractor	Marine and landbased works area	Construction phase	WQO	N/A ^ ^ ^

		and construction site runoff to the receiving water bodies					
S6.8.11	***Compensation for Vegetation Loss*** • Felling of mature trees should be compensated by planting of standard or heavy standard trees within or in vicinity of the affected area as far as practicable. Such compensatory planting for trees should be provided with at least a 1:1 ratio. In addition, vegetation at the temporarily affected area should be reinstated with species similar to the existing condition.	Compensate for the vegetation loss	Design Team, contractor	Land-based works area	Construction phase	N/A	^
Fisheries Impact							
S7.7.3	***Measure to Control Water Quality Impact*** • Deployment of silt curtains around the active stone column installation points, opening of newly installed seawall and marine works area.	Control water quality impact, especially on suspended solid level	Design Team / Contractor	Marine work area	Construction phase	WQO	^
Waste Management (Construction Phase)							
S8.6.3	***Good Site Practices and Waste Reduction Measures*** • Nomination of an approved person, such as a site manager, to be responsible for 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, proper waste management and chemical handling procedures; • Provision of sufficient waste disposal points and regular collection of waste; • Appropriate measures to minimize windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers; and	To reduce waste management impacts	Contractor	All work sites	Construction Phase	Waste Disposal Ordinance (Cap. 354) Land (Miscellaneous Provisions) Ordinance (Cap. 28)	^ ^ ^ ^

	• Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors.						^
S8.6.4	***Good Site Practices and Waste Reduction Measures (con't)*** • Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal; • Encourage collection of aluminium cans by providing separate labelled bins to enable this waste to be segregated from other general refuse generated by the workforce; • Proper storage and site practices to minimize the potential for damage or contamination of construction materials; and • Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste.	To achieve waste reduction	Contractor	All work sites	Construction Phase	Waste Disposal Ordinance (Cap. 354) Land (Miscellaneous Provisions) Ordinance (Cap. 28)	^ ^ ^ ^
S8.6.5	***Good Site Practices and Waste Reduction Measures (con't)*** The Contractor shall prepare and implement a WMP as part of the EMP in accordance with ETWB TCW No. 19/2005 which describes the arrangements for avoidance, reuse, recovery, recycling, storage, collection, treatment and disposal of different categories of waste to be generated from the construction activities. Such a management plan should incorporate site specific factors, such as the designation of areas for segregation and temporary storage of reusable and recyclable materials. The EMP should be submitted to the Engineer for approval. The Contractor should implement the waste management practices in the EMP throughout the construction stage of the Project. The EMP should be reviewed regularly and updated by the Contractor.	To achieve waste reduction	Contractor	All work sites	Construction Phase	ETWB TCW No. 19/2005	^
S8.6.6	***Good Site Practices and Waste Reduction Measures (con't)*** • C&D materials would be reused in the project and other local concurrent projects as far as possible.	To achieve waste reduction	Contractor	All work sites	Construction Phase	ETWB TCW No. 19/2005	^
S8.6.7	***Storage, Collection and Transportation of Waste*** Should any temporary storage or stockpiling of waste is required, recommendations to	To minimize potential adverse	Contractor	All work sites	Construction Phase	-	

	minimize the impacts include: • Waste, such as soil, should be handled and stored well to ensure secure containment, thus minimizing the potential of pollution; • Maintain and clean storage areas routinely; • Stockpiling area should be provided with covers and water spraying system to prevent materials from wind-blown or being washed away; and • Different locations should be designated to stockpile each material to enhance reuse.	environmental impacts arising from waste storage					^ ^ ^ ^
S8.6.8/ Waste Management Plan	***Storage, Collection and Transportation of Waste (con't)*** • Remove waste in timely manner; • Waste collectors should only collect wastes prescribed by their permits; • Impacts during transportation, such as dust and odour, should be mitigated by the use of covered trucks or in enclosed containers; • Obtain relevant waste disposal permits from the appropriate authorities, in accordance with the Waste Disposal Ordinance (Cap. 354), Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 345) and the Land (Miscellaneous Provisions) Ordinance (Cap. 28); • Waste should be disposed of at licensed waste disposal facilities/ alternative disposal ground approved by RE and DEP; and • Maintain records of quantities of waste generated, recycled and disposed.	To minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	All work sites	Construction Phase		^ ^ ^ ^ ^ ^
S8.6.9/ Waste Management Plan	***Storage, Collection and Transportation of Waste (con't)*** • Implementation of trip ticket system with reference to DEVB TC(W) No. 6/2010, Trip Ticket System for Disposal of Construction & Demolition Materials, to monitor disposal of waste and to control fly-tipping at PFRFs or landfills. A recording system for the amount of waste generated, recycled and disposed (including disposal sites) should be proposed.	To minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	All work sites	Construction Phase	DEVB TCW No. 6/2010	^
S8.6.11 -	***Sorting of C&D Materials***	To minimize	Contractor	All work sites	Construction	DEVB TCW No.	

S8.6.13/ Waste Management Plan	• Sorting to be performed to recover the inert materials, reusable and recyclable materials before disposal off-site. • Specific areas shall be provided by the Contractors for sorting and to provide temporary storage areas for the sorted materials. • The C&D materials should at least be segregated into inert and non-inert materials, in which the inert portion could be reused and recycled in the reclamation as far as practicable before delivery to PFRFs. While opportunities for reusing the non-inert portion should be investigated before disposal of at designated landfills	potential adverse environmental			Phase	6/2010 ETWB TCW No. 33/2002 ETWB TCW No. 19/2005	^ ^ ^
S8.6.17 – S8.6.20	***Sediments (con't)*** • Requirements of the Air Pollution Control (Construction Dust) Regulation, where relevant, shall be adhered to during boring, excavation, transportation and disposal of sediments or cement stabilization of sediment. • A treatment area should be confined for carrying out the cement stabilization mixing and temporary stockpile. The area should be designed to prevent leachate from entering the ground. Leachate, if any, should be collected and discharged according to the Water Pollution Control Ordinance (WPCO). • In order to minimise the potential odour / dust emissions during boring, excavation and transportation of the sediment, the excavated sediments should be kept wet during excavation/boring and should be properly covered when placed on barges/trucks. Loading of the excavated sediment to the barge should be controlled to avoid splashing and overflowing of the sediment slurry to the surrounding water. • In order to minimise the exposure to contaminated materials, workers should, when necessary, wear appropriate personal protective equipments (PPE) when handling contaminated sediments. Adequate washing and cleaning facilities should also be provided on site.	To determine the best handling and treatment of sediment	Contractor	All works areas with sediments concern	Construction Phase		^ ^ ^ N/A
S8.6.24 - S8.6.28/	***Sediments (con't)*** • The excavated sediments is expected to be loaded onto the barge and transported to the	To ensure handling of	Contractor	All works areas with	Construction Phase	ETWB TC(W) No. 34/2002 & Dumping	^

Waste Management Plan	designated disposal sites allocated by the MFC. The excaveted sediment would be disposed of according to its determined disposal options and ETWB TC(W) No. 34/2002. • Stockpiling of contaminated sediments should be avoided as far as possible. If temporary stockpiling of contaminated sediments is necessary, the excavated sediment should be covered by tarpaulin and the area should be placed within earth bunds or sand bags to prevent leachate from entering the ground, nearby drains and surrounding water bodies. The stockpiling areas should be completely paved or covered by linings in order to avoid contamination to underlying soil or groundwater. Separate and clearly defined areas should be provided for stockpiling of contaminated and uncontaminated materials. Leachate, if any, should be collected and discharged according to the Water Pollution Control Ordinance (WPCO). • In order to minimise the potential odour / dust emissions during boring and transportation of the sediment, the excavated sediments should be kept wet during excavation/boring and should be properly covered when placed on barges. Loading of the excavated sediment to the barge should be controlled to avoid splashing and overflowing of the sediment slurry to the surrounding water. • The barge transporting the sediments to the designated disposal sites should be equipped with tight fitting seals to prevent leakage and should not be filled to a level that would cause overflow of materials or laden water during loading or transportation. In addition, monitoring of the barge loading shall be conducted to ensure that loss of material does not take place during transportation. Transport barges or vessels shall be equipped with automatic self-monitoring devices as specified by the DEP. • In order to minimise the exposure to contaminated materials, workers should, when necessary, wear appropriate personal protective equipments (PPE) when handling contaminated sediments. Adequate washing and cleaning facilities should also be provided on site. • Another possible arrangement for Type 3 disposal is by geosynthetic containment. A geosynthetic containment method is a method whereby the sediments are sealed in	sediments are in accordance to statutory requirements		sediments concern		at Sea Ordinance	^ ^ ^ N/A

	geosynthetic containers and, at the disposal site, 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, thereby meeting the requirements for fully confined mud disposal.						N/A
S8.6.26/ Waste Management Plan	***Chemical Wastes.*** • If chemical wastes are produced at the construction site, the Contractor would be required to register with the EPD as a Chemical Waste Producer and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. The Contractor shall use a licensed collector to transport and dispose of the chemical wastes, to either the Chemical Waste Treatment Centre at Tsing Yi, or other licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.	To ensure proper management of chemical waste	Contractor	All works sites	Construction Phase	Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes Waste Disposal (Chemical Waste) (General) Regulation	^
S8.6.27/ Waste Management Plan	***General Refuse*** • General refuse should be stored in enclosed bins or compaction units separate from C&D material. A reputable waste collector should be employed by the contractor to remove general refuse from the site, separately from C&D material. Preferably an enclosed and covered area should be provided to reduce the occurrence of 'wind blown' light material.	To ensure proper management of general refuse	Contractor	All works sites	Construction Phase	Public Health and Municipal Services Ordinance (Cap. 132)	^
Impact on Cultural Heritage (Construction Phase)							
S9.6.4	Dust and visual impacts • Temporarily fenced off buffer zone with allowance for public access (minimum 1 m) should be provided; • The open yard in front of the temple should be kept as usual for annual Tin Hau festival; • Monitoring of vibration impacts should be conducted when the construction works are	To prevent dust and visual impacts	Contractors	Work areas	Construction Phase	EIAO; GCHIA; AMO	^ ^ ^

	less than 100m from the temple.						
S9.6.4	Indirect vibration impact • Vibration level is suggest to be controlled within a peak particle velocity (ppv) limit of 5mm/s measured inside the historical buildings; • Monitoring of vibration should be carried out during construction phase. • Tilting and settlement monitoring should will be applied on the Cha Kwo Ling Tin Hau Temple as well. • A proposal with details for the mitigation measures and monitoring of impacts on built heritage shall be submitted to AMO for comments before commencement of work.	To prevent indirect vibration impact	Contractors	Work areas	Construction Phase	Vibration Limits on Heritage Buildings by CEDD; GCHIA; AMO.	^ ^ ^ ^
Built Heritage Mitigation Plan	• Established Alert, Alarm and Action Level for the monitoring parameters. • To increase the instrumentation monitoring and reporting frequency. • To propose detailed action plan or contingency plan for the Engineer's approval when AAA Level is reached or exceeded.	To prevent vibration impacts	NE/2015/01	Tin Hau Temple	Construction Phase	Vibration Limits on Heritage Buildings by CEDD; GCHIA; AMO.	^ ^ ^
Landscape and Visual Impact (Construction Phase)							
Table 10.8.1/ Landscape Mitigation Plan	CM1 - Construction area and contractor's temporary works areas to be minimised to avoid impacts on adjacent landscape.	Avoid impact on adjacent landscape areas	CEDD (via Contractor)	General	Construction planning and during construction period	N/A	^
Table 10.8.1/ Landscape Mitigation Plan	CM2 - Reduction of construction period to practical minimum.	Minimise duration of impact	CEDD (via Contractor)	N/A	Construction planning	N/A	^
Table 10.8.1/	CM3 - Topsoil, where the soil material meets acceptable criteria and where practical, to be stripped and stored for re-use in the construction of the soft landscape works. The Contract	To allow re-use of topsoil	CEDD (via Contractor)	General	Site clearance	As per the Particular Specification	^

Landscape Mitigation Plan	Specification shall include storage and reuse of topsoil as appropriate.						
Table 10.8.1/ Landscape Mitigation Plan	CM4 - Existing trees at boundary of site and retained trees within site boundary to be carefully protected during construction. Detailed Tree Protection Specification shall be provided in the Contract Specification, under which 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. (Tree protection measures will be detailed at Tree Removal Application stage).	To minimize tree loss	CEDD (via Contractor)	As per approved Tree Removal Application(s)	Site clearance and throughout construction period	ETWB TC 3/2006 and as per tree protection measures in Particular Specification	^
Table 10.8.1/ Landscape Mitigation Plan	CM5 - Trees unavoidably affected by the works shall be transplanted where practicable. Where possible, trees should be transplanted direct to permanent locations rather than temporary holding nurseries. A detailed tree transplanting specification shall be provided in the Contract Specification and sufficient time for preparation shall be allowed in the construction programme.	To maximize preservation of existing trees	CEDD (via Contractor)	As per approved Tree Removal Application(s)	Site clearance	ETWB TC 3/2006 and as per tree protection measures in Particular Specification	^
Table 10.8.1/ Landscape Mitigation Plan	CM6 - Advance screen planting of fast growing tree and shrub species to noise barriers and hoardings. Trees shall be capable of reaching a height >10m within 10 years.	To maximize screening of the works	CEDD (via Contractor)	At Lam Tin Interchange and edge of Road P2 landscape deck, TKO	Beginning of construction period	N/A	^
Table 10.8.1/ Landscape Mitigation Plan	CM7 - Hydroseeding or sheeting of soil stockpiles with visually unobtrusive material	To reduce visual intrusion	CEDD (via Contractor)	General	Throughout construction period	As per Particular Specification	N/A
Table 10.8.1/	CM8 - Control of night-time lighting by hooding all lights and through minimisation of night working periods.	To reduce visual intrusion	CEDD (via Contractor)	General	Throughout construction	N/A	^

Landscape Mitigation Plan					period		
Table 10.8.1/ Landscape Mitigation Plan	CM9 - Screening of works areas with hoardings with appropriate colours compatible with the surrounding area	Reduction of visual intrusion	CEDD (via Contractor)	Project site Boundary	Excretion of site hoarding	N/A	^
Table 10.8.1/ Landscape Mitigation Plan	CM10 - Avoidance of excessive height and bulk of site buildings and structure	Reduction of visual intrusion and integration with environment	CEDD (via Contractor)	Built structures	Design and construction stage	N/A	^
Table 10.8.1/ Landscape Mitigation Plan	CM11 - Limitation of run-off into freshwater streams, ponds and sea areas	Avoidance of contamination of water courses and water bodie	CEDD (via Contractor)	TKO reclamation, TKO tunnel portal, Cha Kwo Ling roadworks	Throughout construction period	N/A	^
Table 10.8.1	CM12 - Minimise area of reclamation and design the edges sensitively to tie in with adjacent coastline characte	Minimise loss of Junk Bay and integration with existing coastlin	CEDD (via Contractor)	Temporary reclamation for barging points at TKO and Lam Tin and permanent reclamation	Construction planning and reclamation stages	N/A	N/A

				for TKO Interchange slip roads and Road P2			
Landfill Gas Hazard (Design and Construction Phase)							
S11.5.9	A Safety Officer, trained in the use of gas detection equipment and landfill gas-related hazards, should be present on site throughout the groundworks phase. The Safety Officer should be provided with an intrinsically safe portable instrument, which is appropriately calibrated and able to measure the following gases in the ranges indicated below: Methane 0-100% LEL and 0100% v/v Carbon dioxide 0-100% Oxygen 0-21%	Protect the workers from landfill gas hazards	Contractor	Project sites within the Sai Tso Wan Landfill Consultation Zone	Construction phase	EPD's Landfill Gas Hazard Assessment Guidance Note	^
S11.5.10 S11.5.25	***Safety Measures*** • For staff who work in, or have responsibility for "at risk" area, such as all excavation workers, supervisors and engineers working within the Consultation Zone, should receive appropriate training on working in areas susceptible to landfill gas, fire and explosion hazards. • An excavation procedure or code of practice to minimize landfill gas related risk should be devised and carried out. • No worker should be allowed to work alone at any time in or near to any excavation. At least one other worker should be available to assist with a rescue if needed. • Smoking, naked flames and all other sources of ignition should be prohibited within 15m of any excavation or ground-level confined space. "No smoking" and "No naked flame" notices should be posted prominently on the construction site and, if necessary, special areas should be designed for smoking. • Welding, flame-cutting or other hot works should be confined to open areas at least 15m	Protect the workers from landfill gas hazards	Contractor	Project sites within the Sai Tso Wan Landfill Consultation Zone	Construction phase	EPD's Landfill Gas Hazard Assessment Guidance Note Labour Department's Code of Practice for Safety and Health at Work in Confined Space	^ ^ ^ ^

	from any trench or excavation. • Welding, flame-cutting or other hot works may only be carried out in trenches or confined spaces when controlled by a "permit to work" procedure, properly authorized by the Safety Officer (or, in the case of small developments, other appropriately qualified person). • The permit to work procedure should set down clearly the requirements for continuous monitoring for methane, carbon dioxide and oxygen throughout the period during which the hot works are in progress. The procedure should also require the presence of an appropriately qualified person, in attendance outside the 'confined area', who should be responsible for reviewing the gas measurements as they are made, and who should have executive responsibility for suspending the work in the event of unacceptable or hazardous conditions. Only those workers who are appropriately trained and fully aware of the potentially hazardous conditions which may arise should be permitted to carry out hot works in confined areas. • Where there are any temporary site offices, or any other buildings located within the Sai Tso Wan Landfill Consultation Zone which have enclosed spaces with the capacity to accumulate landfill gas, then they should either be located in an area which has been proven to be free of landfill gas (by survey using portable gas detectors); or be raised clear of the ground by a minimum of 500mm. This aims to create a clear void under the structure which is ventilated by natural air movement such that emission of gas from the ground are mixed and diluted by air. • Any electrical equipment, such as motors and extension cords, should be intrinsically safe. During piping assembly or conduiting construction, all valves/seals should be closed immediately after installation. As construction progresses, all valves/seals should be closed to prevent the migration of gases through the pipeline/conduit. All piping /conduiting should be capped at the end of each working day. • During construction, adequate fire extinguishing equipment, fire-resistant clothing and breathing apparatus (BA) sets should be made available on site.						^ ^ ^ ^ ^

	• Fire drills should be organized at not less than six monthly intervals. • The contractor should formulate a health and safety policy, standards and instructions for site personnel to follow. • All personnel who work on the site and all visitors to the site should be made aware of the possibility of ignition of gas in the vicinity of excavations. Safety notices (in Chinese and English) should be posted at prominent position around the site warning danger of the potential hazards. • Service runs within the Consultation Zone should be designated as "special routes"; utilities companies should be informed of this and precautionary measures should be implemented. Precautionary measures should include ensuring that staff members are aware of the potential hazards of working in confined spaces such as manholes and service chambers, and that appropriate monitoring procedures are in place to prevent hazards due to asphyxiating atmospheres in confined spaces. Detailed guidance on entry into confined spaces is given in Code of Practice on Safety and Health at Work in Confined Spaces (Labour Department, Hong Kong). • Periodically during ground-works construction within the 250m Consultation Zone, the works area should be monitored for methane, carbon dioxide and oxygen using appropriately calibrated portable gas detection equipment. The monitoring frequency and areas to be monitored should be set down prior to commencement of ground-works either by the Safety Officer or an approved and appropriately qualified person.						^ ^ ^ ^ ^ ^
S11.5.26 - S11.5.31	***Monitoring*** ● Routine monitoring should be carried out in all excavations, manholes, chambers, relocation of monitoring wells and any other confined spaces that may have been created. All measurements in excavations should be made with the extended monitoring tube located not more than 10 mm from the exposed ground surface. Monitoring should be performed properly to make sure that the area is free of landfill	Protect the workers from landfill gas hazards	Contractor	Project sites within the Sai Tso Wan Landfill Consultation Zone	Construction phase	EPD's Landfill Gas Hazard Assessment Guidance Note	^

	gas before any man enters into the area. ● For excavations **deeper than 1m**, measurements should be carried out: • at the ground surface before excavation commences;- • immediately before any worker enters the excavation; • at the beginning of each working day for the entire period the excavation remains open; and • periodically throughout the working day whilst workers are in the excavation. ● For excavations **between 300mm and 1m deep**, measurements should be carried out: • directly after the excavation has been completed; and • periodically whilst the excavation remains open. ● For excavations less than 300mm deep, monitoring may be omitted, at the discretion of the Safety Officer or other appropriately qualified person. ● Depending on the results of the measurements, actions required will vary and should be set down by the Safety Officer or other appropriately qualified person. ● The exact frequency of monitoring should be determined prior to the commencement of works, but should be at least once per day, and be carried out by a suitably qualified or qualified person before starting the work of the day. Measurements shall be recorded and kept as a record of safe working conditions with copies of the site diary and submitted to the Engineer for approval. The Contractor may elect to carry out monitoring via an automated monitoring system.						^ ^ ^ ^ ^
S11.5.32	The hazards from landfill gas during the construction stage within the Sai Tso Wan Landfill Consultation Zone should be minimized by suitable precautionary measures recommended in Chapter 8 of the Landfill Gas Hazard Assessment Guidance Note.	construction stage within the Sai Tso Wan Protect the workers from landfill gas hazards	Contractor	Project sites within the Sai Tso Wan Landfill Consultation Zone	Construction phase	EPD's Landfill Gas Hazard Assessment Guidance Note	N/A

Table II - Observations/reminders/non-compliance made during Site Audit

Key: * Observation/reminder was made during site audit but improved/rectified by the contractor.

\# Observation/reminder was made during site audit but not yet improved/rectified by the contractor.

X Non-compliance of mitigation measure

• Non-compliance but rectified by the contractor

Status / Remark	EIA Ref.	Recommended Mitigation Measures	Contract No.	Work Sites	Details of Observation/Reminder
Air Quality Impact					
*(1)	/	• Emission from Vehicles and Plants • All vehicles shall be shut down in intermittent use. • Only well-maintained plant should be operated on-site and plant should be serviced regularly to avoid emission of black smoke. • All diesel fuelled construction plant within the works areas shall be powered by ultra low sulphur diesel fuel (ULSD) Reduce air pollution emission from construction vehicles and plants	NE/2015/01	Construction of Lam Tin Interchange	• Pale black smoke was emitting from a generator in Portion III. Contractor is reminded to check and repair machines regularly to reduce dust emission.
Noise Impact (Construction Phase)					
*(2)	Noise Mitigation Plan	• Use of Temporary Noise Barriers (i.e Acoustic box, SilentUp and etc.) or	NE/2015/01	Construction of Lam Tin Interchange	• An acoustic sheet for a breaker was broken. It should be maintained to minimize the noise impact.

		Full Enclosure for PME according to the approved Noise Mitigation Plan			
Water Quality					
*(3)	S5.8.7	• Construction site runoff and drainage should be prevented or minimised in accordance with the guidelines stipulated in the EPD's Practice Note for Professional Persons, Construction Site Drainage (ProPECC PN 1/94). Good housekeeping and stormwater best management practices, as detailed in below, should be implemented to ensure that all construction runoff complies with WPCO standards and no unacceptable impact on the WSRs arises due to construction of the TKO-LT Tunnel. All discharges from the construction site should be controlled to comply with the standards for effluents discharged into the corresponding WCZ under the TM-DSS.	NE/2015/01	Marine Works area TKO side Tunnel Exit	• Floating debris was found at sea and near shores. Contractor is reminded to avoid and clear floating objects on sea regularly • Stains from muds were observed at sea and sandbags at edges of the barge were insufficient to block the surface runoff of muds. Contractor is reminded to prevent surface runoff onto the nearby waters and clean stains on sea • Silt curtains were stranded on shores and need to be repaired • Silt curtain was floating and needs to be anchored to seabed.
Waste / Chemical Management					
*(4)	S5.8.46	• Disposal of chemical wastes should be carried out in compliance with the Waste Disposal Ordinance. The "Code	NE/2015/01	Portion V	• Patches of oil stain were found on the road in Portion V. The contractor is reminded to prevent oil leakage from possible sources such as fuel trucks/PMEs to prevent pollution.

		of Practice on the Packaging, Labelling and Storage of Chemical Wastes" published under the Waste Disposal Ordinance details the requirements to deal with chemical wastes. General requirements are given as follows: - suitable containers should be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport; • - chemical waste containers should be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents; and - storage area should be selected at a safe location on site and adequate space should be allocated to the storage area.			• Chemicals for septic tanks were required to be stored at a dry and cool place or be covered with tarpaulins to prevent reactions. • Oil stains were found and need to be cleaned.

Table I – Recommended Mitigation Measures stipulated in EM&A Manual of the Project

(Further information on observations/reminders/non-compliance made during site audit should refer to Table II)

Contract: NE/2015/02

Key:
^ Mitigation measure was fully implemented.
* Observation/reminder was made during site audit but improved/rectified by the contractor.
# Observation/reminder was made during site audit but not yet improved/rectified by the contractor.
X Non-compliance of mitigation measure
• Non-compliance but rectified by the contractor
N/A Not Applicable

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
Air Quality Impact							
S3.8.1	Watering eight times a day on active works areas, exposed areas and paved haul roads	To minimize the dust impact	Contractor	All Active Work Sites	Construction phase	APCO	^
S3.8.1	Enclosing the unloading process at barging point by a 3-sided screen with top tipping hall / mixing area in Work Area A, provision of water spraying and flexible dust curtains	To minimize the dust impact	Contractor	Barging Points	Construction phase	APCO	^
S3.8.7	Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices: - Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather. - Use of frequent watering for particularly dusty construction areas and areas close to ASRs. - Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines.	To minimize the dust impact	Contractor	All Construction Work Sites	Construction phase	APCO and Air Pollution Control (Construction Dust) Regulation	^ ^ ^ ^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	- Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs. - Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations. - Establishment and use of vehicle wheel and body washing facilities at the exit points of the site. - Provision of wind shield and dust extraction units or similar dust mitigation measures at the loading area of barging point, and use of water sprinklers at the loading area where dust generation is likely during the loading process of loose material, particularly in dry seasons/ periods. - Provision of not less than 2.4m high hoarding from ground level along site boundary where adjoins a road, streets or other accessible to the public except for a site entrance or exit. - Imposition of speed controls for vehicles on site haul roads. - Where possible, routing of vehicles and positioning of construction plant should be at the maximum possible distance from ASRs - 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. - Instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise.						^ ^ ^ *(1) ^ ^ ^ ^ ^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
/	Emission from Vehicles and Plants - All vehicles shall be shut down in intermittent use. - Only well-maintained plant should be operated on-site and plant should be serviced regularly to avoid emission of black smoke. - All diesel fuelled construction plant within the works areas shall be powered by ultra low sulphur diesel fuel (ULSD)	Reduce air pollution emission from construction vehicles and plants	Contractor	All construction sites	Construction stage	• APCO	^ ^ ^
/	Valid No-road Mobile Machinery (NRMM) labels should be provided to regulated machines	Reduce air pollution emission from construction vehicles and plants	Contractor	All construction sites	Construction stage	• APCO	^
Sediment Management Plan	- Tarpaulin sheets will be provided to cover dredged materials during transportation offsite. - Water Sprinklers will be installed along outer steel frame. Dusty materials will be dampened by spraying water to suppress dust generation during mixing operation - Subject to the odour intensity and instruction by the *Supervisor*, odour suppressant will be applied over the marine sediments via water blaster to minimize the impact. - The unloading / loading areas of the marine sediments will be barricaded with minimum 3.5m high barrier facing the nearest resident to minimize the dust impact. The mixing area and curing area will be enclosed with 3-sides and roof to minimize the dust impact.	Control potential impacts from Cement s/s process	Contractor	NE/2015/02	Construction stage	EIAO, APCO	^ ^ ^ ^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	- The mixing area will be established with retractable roof on top and with corrugated steel sheet at side enclosure by 5.4m high concrete block walls to prevent spread of dust during the mixing process with cement. - Handling and mixing of cement will follow the Air Pollution Control (Construction Dust) Regulation to avoid fugitive dust emissions. - The discharge of cement from silo hopper to the concrete mixer truck will be 4-side enclosed by Tarpaulin to minimize the dust emission. - The mixing of cement and water will be confined in the concrete mixer truck until the pre-mixing completed. The hydrated cement will then be unloaded to the mixing area to mix with the sediment. - Treated marine sediments in the stockpiling area shall be covered by tarpaulin sheets or similar material except the operating earthwork front. - The soil filled platform is covered by a layer of sand fill material, and frequent water spray will be carried out on the sand surface for dust control. - Any excessive air emissions will be inspected and recorded. - Sediment height of treated marine sediment being kept 0.9 m below the top level of concrete block wall during rainy season.						^ ^ ^ ^ ^ ^ ^ ^
Noise Impact (Construction Phase)							
S4.8	- Use of quiet PME. Use of movable noise barriers for Excavator, Lorry, Dump Truck, Mobile Crane, Compactor, Concrete Mixer Truck, Concrete Lorry Mixer, Breaker, Mobile Crusher, Backhoe, Vibratory Poker, Saw, Asphalt Paver, Vibratory Roller, Vibrolance, Hydraulic Vibratory	To minimize construction noise impact	Contractor	Work Sites	Construction phase	EIAO-TM, NCO	^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	Lance and Piling (Vibration Hammer). Use of full enclosure for Air Compressor, Compressor, Bar Bender, Generator, Drilling Rig, Chisel, Large Diameter Bore Piling, Grout Mixer & Pump and Concrete Pump.	arising from the Project at the affected NSRs					
Noise Mitigation Plan	Use of Temporary Noise Barriers (i.e Acoustic box, SilentUp and etc.) or Full Enclosure for PME according to the approved Noise Mitigation Plan	To minimize construction noise impact arising from the Project at the affected NSRs	Contractor	Work Sites	Construction phase	EIAO-TM, NCO	*(2)
S4.9	Good Site Practice - Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program - Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction program. - Mobile plant, if any, should be sited as far away from NSRs as possible. - Machines and plant (such as trucks) that may be in intermittent use should be shut down between works periods or should be throttled down to a minimum. - Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs. - Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities.	To minimize construction noise impact arising from the Project at the affected NSRs	Project Proponent	Work sites	Construction Period	EIAO-TM, NCO	^ ^ ^ ^ ^ ^ ^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
S4.9	Scheduling of Construction Works during School Examination Period	To minimize construction noise impact arising from the Project at the affected NSRs	Contractor	Work site near school	Construction phase	EIAO-TM, NCO	N/A
Water Quality Impact (Construction Phase)							
S5.6.24	The dry density of filling material for the TKO-LT Tunnel reclamation should be 1,900kg/m^3, with fine content of 25% or less	Control potential impacts from filling activities	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO	N/A
S5.8.1	Non-dredged method by constructing steel cellular caisson structure with stone column shall be adopted for construction of seawall foundation. During the stone column installation (also including the installation of steel cellular caisson), silt curtain shall be employed around the active stone column installation points.	Control potential impacts from filling activities	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO	N/A
S5.8.2	Formation of seawall enclosing the reclamation for Road P2 (notwithstanding an opening of about 50m for marine access) shall be completed prior to the filling activities. The seawall opening of about 50m wide for marine access shall be selected at a location as indicatively shown in Appendix 5.10. No more than 3 filling barge trips per day shall be made with a maximum daily rate of 3,000m^3 (i.e. 1,000 m^3 per trip) for the filling operation at the reclamation area for Road P2. All filling works shall be carried out behind the seawall with the use of single silt curtain at the marine access.	Control potential impacts from filling activities	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO	N/A
Silt Curtain Deployment	- Silt curtains should be deployed properly to surround the works area. - Maintenance of silt curtain should be provided.	Control potential impacts from	Contractor	NE/2015/02	Construction stage	EIAO	^ ^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
Plan	- Sufficient stock of silt curtain should be provided on site.	marine woroks					^
Sediment Management Plan	- Loading of barges and hoppers will be controlled to prevent splashing of dredged materials into the surrounding water. Barges or hoppers will not be filled to a level that will cause the overflow of materials or pollute water during loading or transportation. - Bottom opening of barges shall be fitted with tight fitting seals to prevent leakage of material. Excess material shall be cleaned from the decks and exposed fittings of barges and hopper dredgers before the vessel is moved. - Monitoring of the barge loading shall be conducted to ensure that loss of material does not take during transportation. - Transport barges or vessels shall be equipped with automatic self-monitoring devices. - Vehicles containing any untreated / treated marine sediments will be suitably covered to limit potential dust emissions or potential contaminated wastewater run-off, and truck bodies and tailgates will be sealed to prevent any discharge during transport or wet conditions. - The leachate from the untreated marine sediment will be collected and treated in the mixing pool for cement s/s treatment. - A 300mm diameter U-channel will be constructed along the perimeter of the cement s/s treatment facility to collect the run-off, if any, shall be collected and discharged according to the Water Pollution Control Ordinance (WPCO). Cleaning for the u-channel and desilting pits shall be conducted on weekly basic. - The stockpile area of treated marine sediment will be surrounded by the perimeter concrete block walls with geotextile membranes installed at the inner face of the concrete block walls. The types	Control potential impacts from Cement s/s process	Contractor	NE/2015/02	Construction stage	EIAO, WPCO	^ ^ ^ ^ ^ ^

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	of perimeter wall can be used interchangeably. The Structural Feasibility of the perimeter wall for the changes of height of the stockpile had been checked and certified by ICE. - The mixing areas will be completely paved or covered by linings in order to avoid contamination to underlying soil or groundwater and will be confined by partition concrete block walls for carrying out the mixing and temporary stockpile of treated sediment.						^ ^
S5.8.3	Other good site practices should be undertaken during filling operations include: - all marine works should adopt the environmental friendly construction methods as far as practically possible including the use of cofferdams to cover the construction area to sepFarate the construction works from the sea; - floating single silt curtain shall be employed for all marine works; - 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; - all hopper barges should be fitted with tight fitting seals to their bottom openings to prevent leakage of material; - excess material shall be cleaned from the decks and exposed fittings of barges before the vessel is moved;	Control potential impacts from filling activities and marine-based construction	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO, Waste Disposal Ordinance (WDO)	^ ^ ^ ^ ^ ^

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	- adequate freeboard shall be maintained on barges to reduce the likelihood of decks being washed by wave action; - loading of barges and hoppers should be controlled to prevent splashing of filling material into the surrounding water. Barges or hoppers should not be filled to a level that will cause the overflow of materials or polluted water during loading or transportation; - any pipe leakages shall be repaired quickly. Plant should not be operated with leaking pipes; - construction activities should not cause foam, oil, grease, scum, litter or other objectionable matter to be present on the water within the site or dumping grounds; and - before commencement of the reclamation works, the holder of Environmental Permit has to submit plans showing the phased construction of the reclamation, design and operation of the silt curtain.						^ ^ ^ N/A
S5.8.4	Site specific mitigation plan for reclamation areas using public fill materials should be submitted for EPD agreement before commencement of construction phase with due consideration of good site practices.	Control potential impacts from filling activities and marine based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A
ERR S5.6.1	To minimize water quality impact arising from the dredging and filling works for Reclamation for Road P2, the following mitigation measures shall be implemented: - Before carrying out any dredging and underwater filling works, a temporary barrier shall first be constructed to a height above the high water mark to completely enclose the works site (without any opening at the barrier wall) - The temporary barrier fully enclosing the dredging and underwater filling works site shall not be removed before completion of all dredging and underwater filling works.	Control potential impacts from dredging and filling works for Reclamation for Road P2	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^ ^

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	- Water quality sampling and testing shall be carried out to demonstrate that the water quality inside the enclosed barrier is comparable to the ambient or baseline levels prior to the removal of the fully enclosed barrier. - Silt curtains shall be deployed for the installation and removal of the temporary barrier and at the double water gates marine access opening during its operation.						N/A ^
S5.8.5	It is important that appropriate measures are implemented to control runoff and drainage and prevent high loading of SS from entering the marine environment. Proper site management is essential to minimise surface water runoff, soil erosion and sewage effluents.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.6	Any practical options for the diversion and realignment of drainage should comply with both engineering and environmental requirements in order to ensure adequate hydraulic capacity of all drains.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Design Stage and Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO, TM-DSS	^
S5.8.7	Construction site runoff and drainage should be prevented or minimised in accordance with the guidelines stipulated in the EPD's Practice Note for Professional Persons, Construction Site Drainage (ProPECC PN 1/94). Good housekeeping and stormwater best management practices, as detailed in below, should be	Control potential impacts from construction site	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO, TM-DSS	^

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	implemented to ensure that all construction runoff complies with WPCO standards and no unacceptable impact on the WSRs arises due to construction of the TKO-LT Tunnel. All discharges from the construction site should be controlled to comply with the standards for effluents discharged into the corresponding WCZ under the TM-DSS.	runoff and land-based construction					
S5.8.8	Exposed soil areas should be minimised to reduce the potential for increased siltation, contamination of runoff, and erosion. Construction runoff related impacts associated with the above ground construction activities can be readily controlled through the use of appropriate mitigation measures which include: - use of sediment traps; and - adequate maintenance of drainage systems to prevent flooding and overflow.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A ^
S5.8.9	Construction site should be provided with adequately designed perimeter channel and pretreatment facilities and proper maintenance. The boundaries of critical areas of earthworks should be marked and surrounded by dykes or embankments for flood protection. Temporary ditches should be provided to facilitate runoff discharge into the appropriate watercourses, via a silt retention pond. Permanent drainage channels should incorporate sediment basins or traps and baffles to enhance deposition rates. The design of efficient silt removal facilities should be based on the guidelines in Appendix A1 of ProPECC PN 1/94.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.10	Ideally, construction works should be programmed to minimise surface excavation works during the rainy season (April to September). All exposed earth areas should be completed as soon as possible after earthworks have been completed, or alternatively, within 14 days of the cessation of earthworks where practicable. 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.	Control potential impacts from construction site runoff and land-based	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^

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		construction					
S5.8.11	Sedimentation tanks of sufficient capacity, constructed from pre-formed individual cells of approximately 6 to 8m^3 capacity, are recommended as a general mitigation measure which can be used for settling surface runoff prior to disposal. The system capacity is flexible and able to handle multiple inputs from a variety of sources and particularly suited to applications where the influent is pumped.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO S5	^
S5.8.12	Earthworks final surfaces should be well compacted and the subsequent permanent work or surface protection should be carried out immediately after the final surfaces are formed to prevent erosion caused by rainstorms. Appropriate drainage like intercepting channels should be provided where necessary.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO S5	^
S5.8.13	Measures should be taken to minimize the ingress of rainwater into trenches. If excavation of trenches in wet seasons is necessary, they should be dug and backfilled in short sections. Rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO S5	^
S5.8.14	Open stockpiles of construction materials (for examples, aggregates, sand and fill material) of more than 50m^3 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.	Control potential impacts from construction site	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^

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		runoff and land-based construction					
S5.8.15	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 directed into foul sewers. Discharge of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul sewerage system.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.16	Precautions to be taken at any time of year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecast, and actions to be taken during or after rainstorms are summarised in Appendix A2 of ProPECC PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events, especially for areas located near steep slopes.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	*(5)
S5.8.17	Oil interceptors should be provided in the drainage system and regularly cleaned to prevent the release of oils and grease into the storm water drainage system after accidental spillages. The interceptor should have a bypass to prevent flushing during periods of heavy rain.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A

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S5.8.18	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 located wheel washing bay should be provided at every site exit, and washwater 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 wheelwash 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.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.19	Silt removal facilities, channels and manholes should be maintained and the deposited silt and grit should be removed regularly, at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.20	It is recommended that on-site drainage system should be installed prior to the commencement of other construction activities. Sediment traps should be installed in order to minimise the sediment loading of the effluent prior to discharge into foul sewers. There shall be no direct discharge of effluent from the site into the sea.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.21	All temporary and permanent drainage pipes and culverts provided to facilitate runoff discharge should be adequately designed for the controlled release of storm flows. All sediment control measures should be regularly inspected and maintained to ensure proper and efficient operation at all times and	Control potential impacts from construction site	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^

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	particularly following rain storms. The temporarily diverted drainage should be reinstated to its original condition when the construction work has finished or the temporary diversion is no longer required.	runoff and land-based construction					
S5.8.22	All fuel tanks and storage areas should be provided with locks and be located 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 the coastal waters.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.23	Minimum distances of 100m shall be maintained between the existing or planned stormwater discharges and the existing or planned seawater intakes during construction and operational phases	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO, TMDSS	^
S5.8.24	Under normal circumstances, groundwater pumped out of wells, etc. for the lowering of ground water level in basement or foundation construction, and groundwater seepage pumped out of tunnels or caverns under construction should be discharged into storm drains after the removal of silt in silt removal facilities.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^

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S5.8.25 - S5.8.27 & Table 5.18	Grouting would be adopted as measure to reduce the groundwater inflow into the tunnel. During the tunnel excavation, the inflow rate of groundwater into the tunnel will be measured during the excavation. The groundwater levels above the tunnel will also be monitored by piezometers. If the inflow rate exceeds the pre-determined groundwater control criteria or the groundwater drawdown exceeds the required limit, pre-excavation grouting will be required to reduce the groundwater inflow. No significant change of groundwater levels would therefore be expected. Any chemicals/ foaming agents which would be entrained to the groundwater should be biodegradable and non-toxic throughout the tunnel construction. Potential groundwater quality impact would be minimal as the used material is non-toxic and biodegradable. No adverse groundwater quality would therefore be expected. Prescriptive measures in the form of an Action Plan with pre-emptive and re-active to preserve the groundwater levels at all times during the tunnel construction are set out in Table 5.18.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO, Buildings Ordinance	N/A
S5.8.28	Water used in ground boring and drilling for site investigation or rock / soil anchoring should as far as practicable be recirculated after sedimentation. When there is a need for final disposal, the wastewater should be discharged into storm drains via silt removal facilities.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Design Stage and Construction Phas	ProPECC PN 1/94, EIAOTM, WPCO	N/A
S5.8.29 - S5.8.31	Wastewater generated from the washing down of mixing trucks and drum mixers and similar equipment should whenever practicable be recycled. The discharge of wastewater should be kept to a minimum. To prevent pollution from wastewater overflow, the pump sump of any water recycling system should be provided with an online standby pump of adequate capacity and with automatic alternating devices. Under normal circumstances, surplus wastewater may be discharged into foul sewers after treatment in	Control potential impacts from construction site runoff and land-based	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^

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	silt removal and pH adjustment facilities (to within the pH range of 6 to 10). Disposal of wastewater into storm drains will require more elaborate treatment.	construction					
S5.8.32	All vehicles and plant should be cleaned before they leave a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. A wheel washing bay should be provided at every site exit if practicable and wash-water should have sand and silt settled out or removed before discharging into storm drains. The section of construction road between the wheel washing bay and the public road should be paved with backfall to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.33	Bentonite slurries used in diaphragm wall and borepile construction should be reconditioned and reused wherever practicable. If the disposal of a certain residual quantity cannot be avoided, the used slurry may be disposed of at the marine spoil grounds subject to obtaining a marine dumping licence from EPD on a case-by-case basis.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A
S5.8.34	If the used bentonite slurry is intended to be disposed of through the public drainage system, it should be treated to the respective effluent standards applicable to foul sewer, storm drains or the receiving waters as set out in the WPCO Technical Memorandum on Effluent Standards.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A

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S5.8.35	Water used in water testing to check leakage of structures and pipes should be reused for other purposes as far as practicable. Surplus unpolluted water could be discharged into storm drains.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A
S5.8.36	Sterilization is commonly accomplished by chlorination. Specific advice from EPD should be sought during the design stage of the works with regard to the disposal of the sterilizing water. The sterilizing water should be reused wherever practicable.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Design Stage and Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A
S5.8.37	Before commencing any demolition works, all sewer and drainage connections should be sealed to prevent building debris, soil, sand etc. from entering public sewers/drains.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A
S5.8.38	Wastewater generated from building construction activities including concreting, plastering, internal decoration, cleaning of works and similar activities should not be discharged into the stormwater drainage system. If the wastewater is to be discharged into foul sewers, it should undergo the removal of settleable solids in a silt removal facility, and pH adjustment as necessary	Control potential impacts from construction site runoff and land-	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^

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		based construction					
S5.8.39	Acidic wastewater generated from acid cleaning, etching, pickling and similar activities should be neutralized to within the pH range of 6 to 10 before discharging into foul sewers. If there is no public foul sewer in the vicinity, the neutralized wastewater should be tinkered off site for disposal into foul sewers or treated to a standard acceptable to storm drains and the receiving waters	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.40	Wastewater collected from canteen kitchens, including that from basins, sinks and floor drains, should be discharged into foul sewer via grease traps capable of providing at least 20 minutes retention during peak flow.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A
S5.8.41	Drainage serving an open oil filling point should be connected to storm drains via a petrol interceptor with peak storm bypass.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^

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S5.8.42	Vehicle and plant servicing areas, vehicle wash bays and lubrication bays should as far as possible be located within roofed areas. The drainage in these covered areas should be connected to foul sewers via a petrol interceptor. Oil leakage or spillage should be contained and cleaned up immediately. Waste oil should be collected and stored for recycling or disposal in accordance with the Waste Disposal Ordinance.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.43	Construction work force sewage discharges on site are expected to be connected to the existing trunk sewer or sewage treatment facilities. The construction sewage may need to be handled by portable chemical toilets prior to the commission of the on-site sewer system. Appropriate numbers of portable toilets shall be provided by a licensed contractor to serve the large number of construction workers over the construction site. The Contractor shall also be responsible for waste disposal and maintenance practices.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.44	Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes.	Control potential impacts from accidental spillage of chemicals	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO, WDO	^
S5.8.45	Any service shop and maintenance facilities should be located on hard standings within a bunded area, and sumps and oil interceptors should be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage should only be undertaken within the areas appropriately equipped to control these discharges.	Control potential impacts from accidental spillage of chemicals	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO	^

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S5.8.46	Disposal of chemical wastes should be carried out in compliance with the Waste Disposal Ordinance. The "Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes" published under the Waste Disposal Ordinance details the requirements to deal with chemical wastes. General requirements are given as follows: - suitable containers should be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport; - chemical waste containers should be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents; and - storage area should be selected at a safe location on site and adequate space should be allocated to the storage area.	Control potential impacts from accidental spillage of chemicals	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO, WDO	^ ^ ^
S5.8.47	Collection and removal of floating refuse should be performed at regular intervals on a daily basis. The contractor should be responsible for keeping the water within the site boundary and the neighbouring water free from rubbish.	Control potential impacts from floating refuse and debris	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO,	^
Ecological Impact							
S6.8.4	***Measures to Minimize Disturbance*** - Use of Quiet Mechanical Plant during the construction phase should be adopted wherever possible. - Hoarding or fencing should be erected around the works area boundaries during the construction phase. The hoarding would screen adjacent habitats from construction phase activities, reduce noise disturbance to these habitats and also to restrict access to habitats adjacent to works areas by site workers;	Minimize noise, human and traffic disturbance to terrestrial habitat and wildlife; and reduce dust	Design Team / Contractor	Land-based works are	Construction Phase	N/A	^ ^

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	- Regular spraying of haul roads to minimize impacts of dust deposition on adjacent vegetation and habitats during the construction activities	generation					^
S6.8.5	***Standard Good Site Practice*** - Placement of equipment or stockpile in designated works areas and access routes selected on existing disturbed land to minimise disturbance to natural habitats. - Construction activities should be restricted to works areas that should be clearly demarcated. The works areas should be reinstated after completion of the works. - Waste skips should be provided to collect general refuse and construction wastes. The wastes should be properly disposed off-site in a timely manner. - General drainage arrangements should include sediment and oil traps to collect and control construction site run-off. - Open burning on works sites is illegal, and should be strictly prohibited. - Measures should also be put into place so that litter, fuel and solvents do not enter the nearby watercourses.	Reduce disturbance to surrounding habitats	Contractor	Land-based works are	Construction Phase	N/A	^ ^ ^ ^ ^ ^
S6.8.6	***Measure to Minimize Groundwater Inflow*** - The drained tunnel construction method with groundwater inflow control measures would generally be adopted. - During the tunnel excavation, pre-excavation grouting could be adopted to reduce the groundwater inflow and ensure that the tunnel would meet the long term water tightness requirements.	Minimize groundwater inflow	Contractor	Tunnel	Construction Phase	N/A	N/A N/A
S6.8.8	***Measure to Minimize Impact on Corals***	Minimize loss of	Design team,	Within	Prior	N/A	

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	<u>Coral translocation</u> - It is recommended to translocate the affected coral colonies, except the locally common *Oulastrea crispata*, within the reclamation area and bridge footprint to the other suitable locations as far as practicable. - The coral translocation should be conducted during the winter months (November-March) in order to avoid disturbance during their spawning period (i.e. July to October). - A detailed coral translocation plan with a description on the methodology for pretranslocation coral survey, translocation methodology, identification/proposal of coral recipient site, monitoring methodology for posttranslocation should be prepared during the detailed design stage. - The coral translocation plan should be subject to approval by relevant authorities (e.g. EPD and AFCD) before commencement of the coral translocation. All the translocation exercises should be conducted by experienced marine ecologist(s) who is/are approved by AFCD prior to commencement of coral translocation. <u>Post translocation Monitoring</u> - A coral monitoring programme is recommended to assess any adverse and unacceptable impacts to the translocated coral communities - Information gathered during each posttranslocation monitoring survey should include observations on the presence, survival, health condition and growth of the translocated coral colonies. These parameters should then be compared with the baseline results collected from the pre-translocation survey.	coral	contractor, project operator	reclamation areas and pier footprint	construction		^ ^ ^ ^ ^ ^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
S6.8.9 S6.8.10	***Measure to Control Water Quality Impact*** - Deployment of silt curtains around the active stone column installation points, opening of newly installed seawall and marine works area. - Diverting of the site runoff to silt trap facilities before discharging into storm drain; - Proper waste and dumping management; and - Standard good-site practice for land-based construction.	Control water quality impact, especially on suspended solid level; minimize the contamination of wastewater discharge, accidental chemical spillage and construction site runoff to the receiving water bodies	Design Team, contractor	Marine and landbased works area	Construction phase	WQO	N/A ^ ^ ^ ^
S6.8.11	***Compensation for Vegetation Loss*** - Felling of mature trees should be compensated by planting of standard or heavy standard trees within or in vicinity of the affected area as far as practicable. Such compensatory planting for trees should be provided with at least a 1:1 ratio. In addition, vegetation at the temporarily affected area should be reinstated with species similar to the existing condition.	Compensate for the vegetation loss	Design Team, contractor	Land-based works area	Construction phase	N/A	^
Fisheries Impact							
S7.7.3	***Measure to Control Water Quality Impact***	Control water	Design Team	Marine work	Construction	WQO	

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	- Deployment of silt curtains around the active stone column installation points, opening of newly installed seawall and marine works area.	quality impact, especially on suspended solid level	/ Contractor	area	phase		^
Waste Management (Construction Phase)							
S8.6.3	***Good Site Practices and Waste Reduction Measures*** - Nomination of an approved person, such as a site manager, to be responsible for 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, proper waste management and chemical handling procedures; - Provision of sufficient waste disposal points and regular collection of waste; - Appropriate measures to minimize windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers; and - Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors.	To reduce waste management impacts	Contractor	All work sites	Construction Phase	Waste Disposal Ordinance (Cap. 354) Land (Miscellaneous Provisions) Ordinance (Cap. 28)	^ ^ ^ ^ ^
S8.6.4	***Good Site Practices and Waste Reduction Measures (con't)*** - Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal; - Encourage collection of aluminium cans by providing separate labelled bins to enable this waste to be segregated from other general refuse generated by the workforce; - Proper storage and site practices to minimize the potential for damage or contamination of construction materials; and	To achieve waste reduction	Contractor	All work sites	Construction Phase	Waste Disposal Ordinance (Cap. 354) Land (Miscellaneous Provisions)	^ ^ ^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	- Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste.					Ordinance (Cap. 28)	^
S8.6.5	***Good Site Practices and Waste Reduction Measures (con't)*** The Contractor shall prepare and implement a WMP as part of the EMP in accordance with ETWB TCW No. 19/2005 which describes the arrangements for avoidance, reuse, recovery, recycling, storage, collection, treatment and disposal of different categories of waste to be generated from the construction activities. Such a management plan should incorporate site specific factors, such as the designation of areas for segregation and temporary storage of reusable and recyclable materials. The EMP should be submitted to the Engineer for approval. The Contractor should implement the waste management practices in the EMP throughout the construction stage of the Project. The EMP should be reviewed regularly and updated by the Contractor.	To achieve waste reduction	Contractor	All work sites	Construction Phase	ETWB TCW No. 19/2005	^
S8.6.6	***Good Site Practices and Waste Reduction Measures (con't)*** - C&D materials would be reused in the project and other local concurrent projects as far as possible.	To achieve waste reduction	Contractor	All work sites	Construction Phase	ETWB TCW No. 19/2005	^
S8.6.7	***Storage, Collection and Transportation of Waste*** Should any temporary storage or stockpiling of waste is required, recommendations to minimize the impacts include: - Waste, such as soil, should be handled and stored well to ensure secure containment, thus minimizing the potential of pollution; - Maintain and clean storage areas routinely; - Stockpiling area should be provided with covers and water spraying system to prevent materials from wind-blown or being washed away; and	To minimize potential adverse environmental impacts arising from waste storage	Contractor	All work sites	Construction Phase	-	^ ^ ^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	- Different locations should be designated to stockpile each material to enhance reuse.						^
S8.6.8/ Waste Management Plan	***Storage, Collection and Transportation of Waste (con't)*** - Remove waste in timely manner; - Waste collectors should only collect wastes prescribed by their permits; - Impacts during transportation, such as dust and odour, should be mitigated by the use of covered trucks or in enclosed containers; - Obtain relevant waste disposal permits from the appropriate authorities, in accordance with the Waste Disposal Ordinance (Cap. 354), Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 345) and the Land (Miscellaneous Provisions) Ordinance (Cap. 28); - Waste should be disposed of at licensed waste disposal facilities/ alternative disposal ground approved by RE and DEP; and - Maintain records of quantities of waste generated, recycled and disposed.	To minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	All work sites	Construction Phase		*(3) ^ ^ ^ ^ ^
S8.6.9/ Waste Management Plan	***Storage, Collection and Transportation of Waste (con't)*** - Implementation of trip ticket system with reference to DEVB TC(W) No. 6/2010, Trip Ticket System for Disposal of Construction & Demolition Materials, to monitor disposal of waste and to control fly-tipping at PFRFs or landfills. A recording system for the amount of waste generated, recycled and disposed (including disposal sites) should be proposed.	To minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	All work sites	Construction Phase	DEVB TCW No. 6/2010	^
S8.6.11 - S8.6.13/	***Sorting of C&D Materials*** - Sorting to be performed to recover the inert materials, reusable and recyclable materials before	To minimize potential adverse	Contractor	All work sites	Construction Phase	DEVB TCW No. 6/2010	^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
Waste Management Plan	disposal off-site. - Specific areas shall be provided by the Contractors for sorting and to provide temporary storage areas for the sorted materials. - The C&D materials should at least be segregated into inert and non-inert materials, in which the inert portion could be reused and recycled in the reclamation as far as practicable before delivery to PFRFs. While opportunities for reusing the non-inert portion should be investigated before disposal of at designated landfills	environmental				ETWB TCW No. 33/2002 ETWB TCW No. 19/2005	^ ^
S8.6.15 – S8.6.16/ Waste Management Plan	***Sediments*** - Sediment encountered may be reused as filling material on-site after cement stabilization. Cement-stabilization process is undertaken by mixing sediment and cement and will convert sediment to earth filling material. The treated sediment has to comply with Risk-Based Remediation Goals (RBRGs) before being reused in order not to raise any land contamination issue. The adoption of RBRGs to assess stabilized sediment has been proposed in the current C&DMMP. MFC has no adverse comment on the current C&DMMP. The sediment quality indicates that all sediments comply with most stringent RBRGs except for one sediment sample (TKO-EBH501 3-3.95m) with lead exceeding the RBRG. Except for the sediment sample (TKO-EBH501 3-3.95m), the chemical screening results do not indicate sediment as contaminated soil. It is anticipated that reuse of sediment except sediment sample (TKO-EBH501 3-3.95m) will not lead to land contamination. - Despite exceedance of RBRG, onsite reuse of sediment under sample (TKO-EBH501 33.95m) as filling material after cement stabilization is also a suitable treatment. Sediment quality indicates the sediment sample (TKO-EBH501 3-3.95m) exceed RBRG for lead. While cement stabilization will immobilize metal contaminants, it is capable to treat the exceedance on lead. The stabilized	To ensure the sediment to be disposed of in an authorized and least impacted way	NE/2015/02	All works areas with sediments concern	Construction Phase	RBRG	N/A N/A

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	material should comply with UTS of Lead and UCS. If the treated material do not comply with UTS or UCS, re-stabilization have to be undertaken to meet compliance of UTS and UCS before reusing the treated sediment as filling material. However, further agreement on final disposal/treatment on sediment under sample (TKO-EBH501 3-3.95m) has to be sought from DEP						
S8.6.17 – S8.6.20	***Sediments (con't)*** - Requirements of the Air Pollution Control (Construction Dust) Regulation, where relevant, shall be adhered to during boring, excavation, transportation and disposal of sediments or cement stabilization of sediment. - A treatment area should be confined for carrying out the cement stabilization mixing and temporary stockpile. The area should be designed to prevent leachate from entering the ground. Leachate, if any, should be collected and discharged according to the Water Pollution Control Ordinance (WPCO). - In order to minimise the potential odour / dust emissions during boring, excavation and transportation of the sediment, the excavated sediments should be kept wet during excavation/boring and should be properly covered when placed on barges/trucks. Loading of the excavated sediment to the barge should be controlled to avoid splashing and overflowing of the sediment slurry to the surrounding water. - In order to minimise the exposure to contaminated materials, workers should, when necessary, wear appropriate personal protective equipments (PPE) when handling contaminated sediments. Adequate washing and cleaning facilities should also be provided on site.	To determine the best handling and treatment of sediment	Contractor	All works areas with sediments concern	Construction Phase		^ ^ ^ N/A N/A
S8.6.21/ Waste	***Sediments (con't)*** - Alternatively, excavated sediment can be treated with marine disposal. The basic requirements and	To ensure the sediment to be	NE/2015/02	All works areas with sediments	Construction Phase	ETWB TC(W) No. 34/2002 &	N/A

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
Management Plan	procedures for excavated sediment disposal specified under ETWB TC(W) No. 34/2002 shall be followed. MFC is responsible for the provision and management of disposal capacity and facilities for the excavated sediment, while the permit of marine dumping is required under the Dumping at Sea Ordinance and is the responsibility of the DEP.	disposed of in an authorized and least impacted way		concern		Dumping at Sea Ordinance	
S8.6.23	***Sediments (con't)*** - For allocation of sediment disposal sites and application of marine dumping permit, separate SSTP has to be submitted to EPD for agreement under DASO. Additional site investigation, based on the SSTP, maybe carried out in order to confirm the disposal arrangements for the proposed sediments removal. A Sediment Quality Report (SQR) shall then be required for EPD agreement under DASO prior to the tendering of the construction contract, discussing in details the site investigation, testing results as well as the delineation of each of the categories of excavated materials and the corresponding types of disposal.	To determine the best handling and disposal option of sediment	Contractor	All works areas with sediments concern	Construction Phase	ETWB TC(W) No. 34/2002 & Dumping at Sea Ordinance	N/A
S8.6.24 - S8.6.28/ Waste Management Plan	***Sediments (con't)*** - The excavated sediments is expected to be loaded onto the barge and transported to the designated disposal sites allocated by the MFC. The excaveted sediment would be disposed of according to its determined disposal options and ETWB TC(W) No. 34/2002. - Stockpiling of contaminated sediments should be avoided as far as possible. If temporary stockpiling of contaminated sediments is necessary, the excavated sediment should be covered by tarpaulin and the area should be placed within earth bunds or sand bags to prevent leachate from entering the ground, nearby drains and surrounding water bodies. The stockpiling areas should be completely paved or covered by linings in order to avoid contamination to underlying soil or groundwater. Separate and clearly defined areas should be provided for stockpiling of	To ensure handling of sediments are in accordance to statutory requirements	Contractor	All works areas with sediments concern	Construction Phase	ETWB TC(W) No. 34/2002 & Dumping at Sea Ordinance	^ ^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	contaminated and uncontaminated materials. Leachate, if any, should be collected and discharged according to the Water Pollution Control Ordinance (WPCO). - In order to minimise the potential odour / dust emissions during boring and transportation of the sediment, the excavated sediments should be kept wet during excavation/boring and should be properly covered when placed on barges. Loading of the excavated sediment to the barge should be controlled to avoid splashing and overflowing of the sediment slurry to the surrounding water. - The barge transporting the sediments to the designated disposal sites should be equipped with tight fitting seals to prevent leakage and should not be filled to a level that would cause overflow of materials or laden water during loading or transportation. In addition, monitoring of the barge loading shall be conducted to ensure that loss of material does not take place during transportation. Transport barges or vessels shall be equipped with automatic self-monitoring devices as specified by the DEP. - In order to minimise the exposure to contaminated materials, workers should, when necessary, wear appropriate personal protective equipments (PPE) when handling contaminated sediments. Adequate washing and cleaning facilities should also be provided on site. - Another possible arrangement for Type 3 disposal is by geosynthetic containment. A geosynthetic containment method is a method whereby the sediments are sealed in geosynthetic containers and, at the disposal site, 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, thereby meeting the requirements for fully confined mud disposal.						^ ^ N/A N/A
S8.6.26/ Waste	***Chemical Wastes.*** - If chemical wastes are produced at the construction site, the Contractor would be required to	To ensure proper management of	Contractor	All works sites	Construction Phase	Code of Practice on the Packaging,	^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
Management Plan	register with the EPD as a Chemical Waste Producer and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. The Contractor shall use a licensed collector to transport and dispose of the chemical wastes, to either the Chemical Waste Treatment Centre at Tsing Yi, or other licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.	chemical waste				Labelling and Storage of Chemical Wastes Waste Disposal (Chemical Waste) (General) Regulation	
S8.6.27/ Waste Management Plan	***General Refuse*** - General refuse should be stored in enclosed bins or compaction units separate from C&D material. A reputable waste collector should be employed by the contractor to remove general refuse from the site, separately from C&D material. Preferably an enclosed and covered area should be provided to reduce the occurrence of 'wind blown' light material.	To ensure proper management of general refuse	Contractor	All works sites	Construction Phase	Public Health and Municipal Services Ordinance (Cap. 132)	
Impact on Cultural Heritage (Construction Phase)							
S9.6.4	Dust and visual impacts - Temporarily fenced off buffer zone with allowance for public access (minimum 1 m) should be provided; - The open yard in front of the temple should be kept as usual for annual Tin Hau festival; - Monitoring of vibration impacts should be conducted when the construction works are less than 100m from the temple.	To prevent dust and visual impacts	Contractors	Work areas	Construction Phase	EIAO; GCHIA; AMO	^ ^ ^
S9.6.4	Indirect vibration impact	To prevent	Contractors	Work areas	Construction	Vibration Limits	

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	- Vibration level is suggest to be controlled within a peak particle velocity (ppv) limit of 5mm/s measured inside the historical buildings; - Monitoring of vibration should be carried out during construction phase. - Tilting and settlement monitoring should will be applied on the Cha Kwo Ling Tin Hau Temple as well. - A proposal with details for the mitigation measures and monitoring of impacts on built heritage shall be submitted to AMO for comments before commencement of work.	indirect vibration impact			Phase	on Heritage Buildings by CEDD; GCHIA; AMO.	^ ^ ^ ^
Landscape and Visual Impact (Construction Phase)							
Table 10.8.1/ Landscape Mitigation Plan	CM1 - Construction area and contractor's temporary works areas to be minimised to avoid impacts on adjacent landscape.	Avoid impact on adjacent landscape areas	CEDD (via Contractor)	General	Construction planning and during construction period	N/A	^
Table 10.8.1/ Landscape Mitigation Plan	CM2 - Reduction of construction period to practical minimum.	Minimise duration of impact	CEDD (via Contractor)	N/A	Construction planning	N/A	^
Table 10.8.1/ Landscape Mitigation Plan	CM3 - Topsoil, where the soil material meets acceptable criteria and where practical, to be stripped and stored for re-use in the construction of the soft landscape works. The Contract Specification shall include storage and reuse of topsoil as appropriate.	To allow re-use of topsoil	CEDD (via Contractor)	General	Site clearance	As per the Particular Specification	^
Table 10.8.1/	CM4 - Existing trees at boundary of site and retained trees within site boundary to be carefully protected	To minimize tree	CEDD (via	As per	Site clearance	ETWB TC	^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
Landscape Mitigation Plan	during construction. Detailed Tree Protection Specification shall be provided in the Contract Specification, under which 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. (Tree protection measures will be detailed at Tree Removal Application stage).	loss	Contractor)	approved Tree Removal Application(s)	and throughout construction period	3/2006 and as per tree protection measures in Particular Specification	
Table 10.8.1/ Landscape Mitigation Plan	CM5 - Trees unavoidably affected by the works shall be transplanted where practicable. Where possible, trees should be transplanted direct to permanent locations rather than temporary holding nurseries. A detailed tree transplanting specification shall be provided in the Contract Specification and sufficient time for preparation shall be allowed in the construction programme.	To maximize preservation of existing trees	CEDD (via Contractor)	As per approved Tree Removal Application(s)	Site clearance	ETWB TC 3/2006 and as per tree protection measures in Particular Specification	^
Table 10.8.1/ Landscape Mitigation Plan	CM6 - Advance screen planting of fast growing tree and shrub species to noise barriers and hoardings. Trees shall be capable of reaching a height >10m within 10 years.	To maximize screening of the works	CEDD (via Contractor)	At Lam Tin Interchange and edge of Road P2 landscape deck, TKO	Beginning of construction period	N/A	^
Table 10.8.1/ Landscape Mitigation Plan	CM7 - Hydroseeding or sheeting of soil stockpiles with visually unobtrusive material	To reduce visual intrusion	CEDD (via Contractor)	General	Throughout construction period	As per Particular Specification	N/A
Table 10.8.1/ Landscape	CM8 - Control of night-time lighting by hooding all lights and through minimisation of night working periods.	To reduce visual intrusion	CEDD (via Contractor)	General	Throughout construction	N/A	^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
Mitigation Plan					period		
Table 10.8.1/ Landscape Mitigation Plan	CM9 - Screening of works areas with hoardings with appropriate colours compatible with the surrounding area	Reduction of visual intrusion	CEDD (via Contractor)	Project site Boundary	Excretion of site hoarding	N/A	^
Table 10.8.1/ Landscape Mitigation Plan	CM10 - Avoidance of excessive height and bulk of site buildings and structure	Reduction of visual intrusion and integration with environment	CEDD (via Contractor)	Built structures	Design and construction stage	N/A	^
Table 10.8.1/ Landscape Mitigation Plan	CM11 - Limitation of run-off into freshwater streams, ponds and sea areas	Avoidance of contamination of water courses and water bodie	CEDD (via Contractor)	TKO reclamation, TKO tunnel portal, Cha Kwo Ling roadworks	Throughout construction period	N/A	^
Table 10.8.1	CM12 - Minimise area of reclamation and design the edges sensitively to tie in with adjacent coastline characte	Minimise loss of Junk Bay and integration with existing coastlin	CEDD (via Contractor)	Temporary reclamation for barging points at TKO and permanent reclamation for	Construction planning and reclamation stages	N/A	N/A

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
				TKO Interchange slip roads and Road P2.			

Table II - Observations/reminders/non-compliance made during Site Audit

Key: * Observation/reminder was made during site audit but improved/rectified by the contractor.

\# Observation/reminder was made during site audit but not yet improved/rectified by the contractor.

X Non-compliance of mitigation measure

• Non-compliance but rectified by the contractor

Status / Remark	EIA Ref.	Recommended Mitigation Measures	Contract No.	Work Sites	Details of Observation/Reminder
Air Quality Impact					
*(1)	S3.8.7	- Use of frequent watering for particularly dusty construction areas and areas close to ASRs. - Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations.	NE/2015/02	Portion IX	• The Contractor is reminded that water spraying should be provided regularly at CH105-318, Portion IX • The Contractor is reminded to regularly sprinkle water on the haul roads within the works area to reduce dust impact
Noise Impact					
*(2)	Noise Mitigation Plan	- Use of Temporary Noise Barriers (i.e Acoustic box, SilentUp and etc.) or Full Enclosure for PME according to the approved Noise Mitigation Plan	NE/2015/02	Area Z	• The silence-up for the wetseaep in Area Z is not fully closed, the Contractor should ensure that no gaps should be found within the noise enclosure system.
Waste / Chemical Management					
*(3)	S8.6.8/ Waste Management Plan	- Remove waste in timely manner.	NE/2015/02	Area Z	• The Contractor is reminded to remove the polystyrene lunch boxes near the entrance of Area Z

Table I – Recommended Mitigation Measures stipulated in EM&A Manual of the Project

(Further information on observations/reminders/non-compliance made during site audit should refer to Table II)

Contract: NE/2017/02

Key:
^ Mitigation measure was fully implemented.
* Observation/reminder was made during site audit but improved/rectified by the contractor.
# Observation/reminder was made during site audit but not yet improved/rectified by the contractor.
X Non-compliance of mitigation measure
• Non-compliance but rectified by the contractor
N/A Not Applicable

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
Air Quality (Construction Phase)							
S3.8.1	Watering eight times a day on active works areas, exposed areas and paved haul roads	To minimize the dust impact	Contractor	All Active Work Sites	Construction phase	APCO	^
S3.8.1	Enclosing the unloading process at barging point by a 3-sided screen with top tipping hall / mixing area in Work Area A, provision of water spraying and flexible dust curtains	To minimize the dust impact	Contractor	Barging Points	Construction phase	APCO	^
S3.8.7	Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices: x - Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather. - Use of frequent watering for particularly dusty construction areas and areas close to ASRs. - Side enclosure and covering of any aggregate or dusty material storage piles to	To minimize the dust impact	Contractor	All Construction Work Sites	Construction phase	APCO and Air Pollution Control (Construction Dust) Regulation	^ ^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines.						^
	- Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs.						*(1)
	- Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations.						^
	- Establishment and use of vehicle wheel and body washing facilities at the exit points of the site.						^
	- Provision of wind shield and dust extraction units or similar dust mitigation measures at the loading area of barging point, and use of water sprinklers at the loading area where dust generation is likely during the loading process of loose material, particularly in dry seasons/ periods.						
	- Provision of not less than 2.4m high hoarding from ground level along site boundary where adjoins a road, streets or other accessible to the public except for a site entrance or exit.						^
	- Imposition of speed controls for vehicles on site haul roads.						^
	- Where possible, routing of vehicles and positioning of construction plant should be at the maximum possible distance from ASRs						^
	- 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.						^
	- Instigation of an environmental monitoring and auditing program to monitor the						^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	construction process in order to enforce controls and modify method of work if dusty conditions arise.						
/	Emission from Vehicles and Plants • All vehicles shall be shut down in intermittent use. • Only well-maintained plant should be operated on-site and plant should be serviced regularly to avoid emission of black smoke. • All diesel fuelled construction plant within the works areas shall be powered by ultra low sulphur diesel fuel (ULSD)	Reduce air pollution emission from construction vehicles and plants	Contractor	All construction sites	Construction stage	• APCO	^ ^ ^
/	Valid No-road Mobile Machinery (NRMM) labels should be provided to regulated machines	Reduce air pollution emission from construction vehicles and plants	Contractor	All construction sites	Construction stage	• APCO	^
Sediment Management Plan	- Tarpaulin sheets will be provided to cover dredged materials during transportation offsite. - Water Sprinklers will be installed along outer steel frame. Dusty materials will be dampened by spraying water to suppress dust generation during mixing operation - Subject to the odour intensity and instruction by the *Supervisor*, odour suppressant will be applied over the marine sediments via water blaster to minimize the impact.	Control potential impacts from Cement s/s process	Contractor	NE/2015/02	Construction stage	EIAO, APCO	^ ^ ^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	- The unloading / loading areas of the marine sediments will be barricaded with minimum 3.5m high barrier facing the nearest resident to minimize the dust impact. The mixing area and curing area will be enclosed with 3-sides and roof to minimize the dust impact. - The mixing area will be established with retractable roof on top and with corrugated steel sheet at side enclosure by 5.4m high concrete block walls to prevent spread of dust during the mixing process with cement. - Handling and mixing of cement will follow the Air Pollution Control (Construction Dust) Regulation to avoid fugitive dust emissions. - The discharge of cement from silo hopper to the concrete mixer truck will be 4-side enclosed by Tarpaulin to minimize the dust emission. - The mixing of cement and water will be confined in the concrete mixer truck until the pre-mixing completed. The hydrated cement will then be unloaded to the mixing area to mix with the sediment. - Treated marine sediments in the stockpiling area shall be covered by tarpaulin sheets or similar material except the operating earthwork front. - The soil filled platform is covered by a layer of sand fill material, and frequent water spray will be carried out on the sand surface for dust control. - Any excessive air emissions will be inspected and recorded. - Sediment height of treated marine sediment being kept 0.9 m below the top level of concrete block wall during rainy season.						^ ^ ^ ^ ^ ^ ^ ^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
Noise Impact (Construction Phase)							
S4.8	- Use of quiet PME. Use of movable noise barriers for Excavator, Lorry, Dump Truck, Mobile Crane, Compactor, Concrete Mixer Truck, Concrete Lorry Mixer, Breaker, Mobile Crusher, Backhoe, Vibratory Poker, Saw, Asphalt Paver, Vibratory Roller, Vibrolance, Hydraulic Vibratory Lance and Piling (Vibration Hammer). Use of full enclosure for Air Compressor, Compressor, Bar Bender, Generator, Drilling Rig, Chisel, Large Diameter Bore Piling, Grout Mixer & Pump and Concrete Pump.	To minimize construction noise impact arising from the Project at the affected NSRs	Contractor	Work Sites	Construction phase	EIAO-TM, NCO	^
Noise Mitigation Plan	Use of Temporary Noise Barriers (i.e Acoustic box, SilentUp and etc.) or Full Enclosure for PME according to the approved Noise Mitigation Plan	To minimize construction noise impact arising from the Project at the affected NSRs	Contractor	Work Sites	Construction phase	EIAO-TM, NCO	^
S4.9	Good Site Practice - Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program - Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction program. - Mobile plant, if any, should be sited as far away from NSRs as possible. - Machines and plant (such as trucks) that may be in intermittent use should be shut down between works periods or should be throttled down to a minimum.	To minimize construction noise impact arising from the Project at the affected NSRs	Project Proponent	Work sites	Construction Period	EIAO-TM, NCO	^ ^ ^

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	- Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs. - Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities.						^ ^
S4.9	Scheduling of Construction Works during School Examination Period	To minimize construction noise impact arising from the Project at the affected NSRs	Contractor	Work site near school	Construction phase	EIAO-TM, NCO	^
Water Quality Impact (Construction Phase)							
S5.6.24	The dry density of filling material for the TKO-LT Tunnel reclamation should be 1,900kg/m^3, with fine content of 25% or less	Control potential impacts from filling activities	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO	N/A
S5.8.1	Non-dredged method by constructing steel cellular caisson structure with stone column shall be adopted for construction of seawall foundation. During the stone column installation (also including the installation of steel cellular caisson), silt curtain shall be employed around the active stone column installation points.	Control potential impacts from filling activities	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO	N/A
S5.8.2	Formation of seawall enclosing the reclamation for Road P2 (notwithstanding an opening of about 50m for marine access) shall be completed prior to the filling activities. The seawall opening of about 50m wide for marine access shall be selected at a location as indicatively shown in Appendix 5.10. No more than 3 filling	Control potential impacts from filling activities	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO	N/A

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	barge trips per day shall be made with a maximum daily rate of 3,000m^3 (i.e. 1,000 m^3 per trip) for the filling operation at the reclamation area for Road P2. All filling works shall be carried out behind the seawall with the use of single silt curtain at the marine access.						
S5.8.4	Site specific mitigation plan for reclamation areas using public fill materials should be submitted for EPD agreement before commencement of construction phase with due consideration of good site practices.	Control potential impacts from filling activities and marine based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A
S5.8.5	It is important that appropriate measures are implemented to control runoff and drainage and prevent high loading of SS from entering the marine environment. Proper site management is essential to minimise surface water runoff, soil erosion and sewage effluents.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.6	Any practical options for the diversion and realignment of drainage should comply with both engineering and environmental requirements in order to ensure adequate hydraulic capacity of all drains.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Design Stage and Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO, TM-DSS	^

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S5.8.7	Construction site runoff and drainage should be prevented or minimised in accordance with the guidelines stipulated in the EPD's Practice Note for Professional Persons, Construction Site Drainage (ProPECC PN 1/94). Good housekeeping and stormwater best management practices, as detailed in below, should be implemented to ensure that all construction runoff complies with WPCO standards and no unacceptable impact on the WSRs arises due to construction of the TKO-LT Tunnel. All discharges from the construction site should be controlled to comply with the standards for effluents discharged into the corresponding WCZ under the TM-DSS.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO, TM-DSS	^
S5.8.8	Exposed soil areas should be minimised to reduce the potential for increased siltation, contamination of runoff, and erosion. Construction runoff related impacts associated with the above ground construction activities can be readily controlled through the use of appropriate mitigation measures which include: - use of sediment traps; and - adequate maintenance of drainage systems to prevent flooding and overflow.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^ N/A ^
S5.8.9	Construction site should be provided with adequately designed perimeter channel and pretreatment facilities and proper maintenance. The boundaries of critical areas of earthworks should be marked and surrounded by dykes or embankments for flood protection. Temporary ditches should be provided to facilitate runoff discharge into the appropriate watercourses, via a silt retention pond. Permanent drainage channels should incorporate sediment basins or traps and baffles to enhance deposition rates. The design of efficient silt removal facilities should be based on the guidelines in Appendix A1 of ProPECC PN 1/94.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^

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S5.8.10	Ideally, construction works should be programmed to minimise surface excavation works during the rainy season (April to September). All exposed earth areas should be completed as soon as possible after earthworks have been completed, or alternatively, within 14 days of the cessation of earthworks where practicable. 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.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.11	Sedimentation tanks of sufficient capacity, constructed from pre-formed individual cells of approximately 6 to 8m^3 capacity, are recommended as a general mitigation measure which can be used for settling surface runoff prior to disposal. The system capacity is flexible and able to handle multiple inputs from a variety of sources and particularly suited to applications where the influent is pumped.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO S5	^
S5.8.12	Earthworks final surfaces should be well compacted and the subsequent permanent work or surface protection should be carried out immediately after the final surfaces are formed to prevent erosion caused by rainstorms. Appropriate drainage like intercepting channels should be provided where necessary.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO S5	^
S5.8.13	Measures should be taken to minimize the ingress of rainwater into trenches. If excavation of trenches in wet seasons is necessary, they should be dug and backfilled in short sections. Rainwater pumped out from trenches or foundation excavations	Control potential impacts from construction site	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	should be discharged into storm drains via silt removal facilities.	runoff and land-based construction				S5	
S5.8.14	Open stockpiles of construction materials (for examples, aggregates, sand and fill material) of more than 50m^3 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.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.15	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 directed into foul sewers. Discharge of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul sewerage system.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.16	Precautions to be taken at any time of year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecast, and actions to be taken during or after rainstorms are summarised in Appendix A2 of ProPECC PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events, especially for areas located near steep slopes.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^

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S5.8.17	Oil interceptors should be provided in the drainage system and regularly cleaned to prevent the release of oils and grease into the storm water drainage system after accidental spillages. The interceptor should have a bypass to prevent flushing during periods of heavy rain.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	*(2)
S5.8.18	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 located wheel washing bay should be provided at every site exit, and washwater 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 wheelwash 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.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	*(2)
S5.8.19	Silt removal facilities, channels and manholes should be maintained and the deposited silt and grit should be removed regularly, at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^

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S5.8.20	It is recommended that on-site drainage system should be installed prior to the commencement of other construction activities. Sediment traps should be installed in order to minimise the sediment loading of the effluent prior to discharge into foul sewers. There shall be no direct discharge of effluent from the site into the sea.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.21	All temporary and permanent drainage pipes and culverts provided to facilitate runoff discharge should be adequately designed for the controlled release of storm flows. All sediment control measures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly following rain storms. The temporarily diverted drainage should be reinstated to its original condition when the construction work has finished or the temporary diversion is no longer required.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.22	All fuel tanks and storage areas should be provided with locks and be located 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 the coastal waters.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.23	Minimum distances of 100m shall be maintained between the existing or planned stormwater discharges and the existing or planned seawater intakes during construction and operational phases	Control potential impacts from construction site runoff and land-	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO, TMDSS	^

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		based construction					
S5.8.24	Under normal circumstances, groundwater pumped out of wells, etc. for the lowering of ground water level in basement or foundation construction, and groundwater seepage pumped out of tunnels or caverns under construction should be discharged into storm drains after the removal of silt in silt removal facilities.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.25 - S5.8.27 & Table 5.18	Grouting would be adopted as measure to reduce the groundwater inflow into the tunnel. During the tunnel excavation, the inflow rate of groundwater into the tunnel will be measured during the excavation. The groundwater levels above the tunnel will also be monitored by piezometers. If the inflow rate exceeds the pre-determined groundwater control criteria or the groundwater drawdown exceeds the required limit, pre-excavation grouting will be required to reduce the groundwater inflow. No significant change of groundwater levels would therefore be expected. Any chemicals/ foaming agents which would be entrained to the groundwater should be biodegradable and non-toxic throughout the tunnel construction. Potential groundwater quality impact would be minimal as the used material is non-toxic and biodegradable. No adverse groundwater quality would therefore be expected. Prescriptive measures in the form of an Action Plan with pre-emptive and re-active to preserve the groundwater levels at all times during the tunnel construction are set out in Table 5.18.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO, Buildings Ordinance	N/A

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S5.8.28	Water used in ground boring and drilling for site investigation or rock / soil anchoring should as far as practicable be recirculated after sedimentation. When there is a need for final disposal, the wastewater should be discharged into storm drains via silt removal facilities.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Design Stage and Construction Phas	ProPECC PN 1/94, EIAOTM, WPCO	N/A
S5.8.29 - S5.8.31	Wastewater generated from the washing down of mixing trucks and drum mixers and similar equipment should whenever practicable be recycled. The discharge of wastewater should be kept to a minimum. To prevent pollution from wastewater overflow, the pump sump of any water recycling system should be provided with an online standby pump of adequate capacity and with automatic alternating devices. Under normal circumstances, surplus wastewater may be discharged into foul sewers after treatment in silt removal and pH adjustment facilities (to within the pH range of 6 to 10). Disposal of wastewater into storm drains will require more elaborate treatment.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.32	All vehicles and plant should be cleaned before they leave a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. A wheel washing bay should be provided at every site exit if practicable and wash-water should have sand and silt settled out or removed before discharging into storm drains. The section of construction road between the wheel washing bay and the public road should be paved with backfall to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^

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S5.8.33	Bentonite slurries used in diaphragm wall and borepile construction should be reconditioned and reused wherever practicable. If the disposal of a certain residual quantity cannot be avoided, the used slurry may be disposed of at the marine spoil grounds subject to obtaining a marine dumping licence from EPD on a case-by-case basis.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A
S5.8.34	If the used bentonite slurry is intended to be disposed of through the public drainage system, it should be treated to the respective effluent standards applicable to foul sewer, storm drains or the receiving waters as set out in the WPCO Technical Memorandum on Effluent Standards.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A
S5.8.35	Water used in water testing to check leakage of structures and pipes should be reused for other purposes as far as practicable. Surplus unpolluted water could be discharged into storm drains.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A
S5.8.36	Sterilization is commonly accomplished by chlorination. Specific advice from EPD should be sought during the design stage of the works with regard to the disposal of the sterilizing water. The sterilizing water should be reused wherever practicable.	Control potential impacts from construction site runoff and land-	CEDD's Contractors	Work site	Design Stage and Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A

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		based construction					
S5.8.37	Before commencing any demolition works, all sewer and drainage connections should be sealed to prevent building debris, soil, sand etc. from entering public sewers/drains.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A
S5.8.38	Wastewater generated from building construction activities including concreting, plastering, internal decoration, cleaning of works and similar activities should not be discharged into the stormwater drainage system. If the wastewater is to be discharged into foul sewers, it should undergo the removal of settleable solids in a silt removal facility, and pH adjustment as necessary	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.39	Acidic wastewater generated from acid cleaning, etching, pickling and similar activities should be neutralized to within the pH range of 6 to 10 before discharging into foul sewers. If there is no public foul sewer in the vicinity, the neutralized wastewater should be tinkered off site for disposal into foul sewers or treated to a standard acceptable to storm drains and the receiving waters	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^

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S5.8.40	Wastewater collected from canteen kitchens, including that from basins, sinks and floor drains, should be discharged into foul sewer via grease traps capable of providing at least 20 minutes retention during peak flow.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A
S5.8.41	Drainage serving an open oil filling point should be connected to storm drains via a petrol interceptor with peak storm bypass.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.42	Vehicle and plant servicing areas, vehicle wash bays and lubrication bays should as far as possible be located within roofed areas. The drainage in these covered areas should be connected to foul sewers via a petrol interceptor. Oil leakage or spillage should be contained and cleaned up immediately. Waste oil should be collected and stored for recycling or disposal in accordance with the Waste Disposal Ordinance.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.43	Construction work force sewage discharges on site are expected to be connected to the existing trunk sewer or sewage treatment facilities. The construction sewage may need to be handled by portable chemical toilets prior to the commission of the on-site sewer system. Appropriate numbers of portable toilets shall be provided by a licensed	Control potential impacts from construction site runoff and land-	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^

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	contractor to serve the large number of construction workers over the construction site. The Contractor shall also be responsible for waste disposal and maintenance practices.	based construction					
S5.8.44	Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes.	Control potential impacts from accidental spillage of chemicals	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO, WDO	^
S5.8.45	Any service shop and maintenance facilities should be located on hard standings within a bunded area, and sumps and oil interceptors should be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage should only be undertaken within the areas appropriately equipped to control these discharges.	Control potential impacts from accidental spillage of chemicals	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO	^
S5.8.46	Disposal of chemical wastes should be carried out in compliance with the Waste Disposal Ordinance. The "Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes" published under the Waste Disposal Ordinance details the requirements to deal with chemical wastes. General requirements are given as follows: - suitable containers should be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport; - chemical waste containers should be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents; and	Control potential impacts from accidental spillage of chemicals	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO, WDO	^ ^

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	- storage area should be selected at a safe location on site and adequate space should be allocated to the storage area.						^
S5.8.47	Collection and removal of floating refuse should be performed at regular intervals on a daily basis. The contractor should be responsible for keeping the water within the site boundary and the neighbouring water free from rubbish.	Control potential impacts from floating refuse and debris	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO,	^
Ecological Impact							
S6.8.4	***Measures to Minimize Disturbance*** - Use of Quiet Mechanical Plant during the construction phase should be adopted wherever possible. - Hoarding or fencing should be erected around the works area boundaries during the construction phase. The hoarding would screen adjacent habitats from construction phase activities, reduce noise disturbance to these habitats and also to restrict access to habitats adjacent to works areas by site workers; - Regular spraying of haul roads to minimize impacts of dust deposition on adjacent vegetation and habitats during the construction activities	Minimize noise, human and traffic disturbance to terrestrial habitat and wildlife; and reduce dust generation	Design Team / Contractor	Land-based works are	Construction Phase	N/A	^ ^ ^
S6.8.5	***Standard Good Site Practice*** - Placement of equipment or stockpile in designated works areas and access routes selected on existing disturbed land to minimise disturbance to natural habitats. - Construction activities should be restricted to works areas that should be clearly demarcated. The works areas should be reinstated after completion of the works.	Reduce disturbance to surrounding habitats	Contractor	Land-based works are	Construction Phase	N/A	^ ^

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	- Waste skips should be provided to collect general refuse and construction wastes. The wastes should be properly disposed off-site in a timely manner. - General drainage arrangements should include sediment and oil traps to collect and control construction site run-off. - Open burning on works sites is illegal, and should be strictly prohibited. - Measures should also be put into place so that litter, fuel and solvents do not enter the nearby watercourses.						^ ^ ^ ^
S6.8.6	***Measure to Minimize Groundwater Inflow*** - The drained tunnel construction method with groundwater inflow control measures would generally be adopted. - During the tunnel excavation, pre-excavation grouting could be adopted to reduce the groundwater inflow and ensure that the tunnel would meet the long term water tightness requirements.	Minimize groundwater inflow	Contractor	Tunnel	Construction Phase	N/A	N/A N/A
S6.8.8	***Measure to Minimize Impact on Corals*** <u>Coral translocation</u> - It is recommended to translocate the affected coral colonies, except the locally common *Oulastrea crispata*, within the reclamation area and bridge footprint to the other suitable locations as far as practicable. - The coral translocation should be conducted during the winter months (November-March) in order to avoid disturbance during their spawning period (i.e. July to October). - A detailed coral translocation plan with a description on the methodology for	Minimize loss of coral	Design team, contractor, project operator	Within reclamation areas and pier footprint	Prior construction	N/A	^ ^ ^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	pretranslocation coral survey, translocation methodology, identification/proposal of coral recipient site, monitoring methodology for posttranslocation should be prepared during the detailed design stage. - The coral translocation plan should be subject to approval by relevant authorities (e.g. EPD and AFCD) before commencement of the coral translocation. All the translocation exercises should be conducted by experienced marine ecologist(s) who is/are approved by AFCD prior to commencement of coral translocation. <u>Post translocation Monitoring</u> - A coral monitoring programme is recommended to assess any adverse and unacceptable impacts to the translocated coral communities - Information gathered during each posttranslocation monitoring survey should include observations on the presence, survival, health condition and growth of the translocated coral colonies. These parameters should then be compared with the baseline results collected from the pre-translocation survey.						^ ^ ^
S6.8.9 S6.8.10	***Measure to Control Water Quality Impact*** - Deployment of silt curtains around the active stone column installation points, opening of newly installed seawall and marine works area. - Diverting of the site runoff to silt trap facilities before discharging into storm drain; - Proper waste and dumping management; and - Standard good-site practice for land-based construction.	Control water quality impact, especially on suspended solid level; minimize the contamination of wastewater	Design Team, contractor	Marine and landbased works area	Construction phase	WQO	N/A ^ ^ ^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
		discharge, accidental chemical spillage and construction site runoff to the receiving water bodies					
S6.8.11	***Compensation for Vegetation Loss*** - Felling of mature trees should be compensated by planting of standard or heavy standard trees within or in vicinity of the affected area as far as practicable. Such compensatory planting for trees should be provided with at least a 1:1 ratio. In addition, vegetation at the temporarily affected area should be reinstated with species similar to the existing condition.	Compensate for the vegetation loss	Design Team, contractor	Land-based works area	Construction phase	N/A	^
Fisheries Impact							
S7.7.3	***Measure to Control Water Quality Impact*** - Deployment of silt curtains around the active stone column installation points, opening of newly installed seawall and marine works area.	Control water quality impact, especially on suspended solid level	Design Team / Contractor	Marine work area	Construction phase	WQO	^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
Waste Management (Construction Phase)							
S8.6.3	***Good Site Practices and Waste Reduction Measures*** - Nomination of an approved person, such as a site manager, to be responsible for 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, proper waste management and chemical handling procedures; - Provision of sufficient waste disposal points and regular collection of waste; - Appropriate measures to minimize windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers; and - Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors.	To reduce waste management impacts	Contractor	All work sites	Construction Phase	Waste Disposal Ordinance (Cap. 354) Land (Miscellaneous Provisions) Ordinance (Cap. 28)	^ ^ ^ ^ ^
S8.6.4	***Good Site Practices and Waste Reduction Measures (con't)*** - Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal; - Encourage collection of aluminium cans by providing separate labelled bins to enable this waste to be segregated from other general refuse generated by the workforce; - Proper storage and site practices to minimize the potential for damage or contamination of construction materials; and	To achieve waste reduction	Contractor	All work sites	Construction Phase	Waste Disposal Ordinance (Cap. 354) Land (Miscellaneous Provisions) Ordinance (Cap. 28)	^ ^ ^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	- Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste.						^
S8.6.5	***Good Site Practices and Waste Reduction Measures (con't)*** The Contractor shall prepare and implement a WMP as part of the EMP in accordance with ETWB TCW No. 19/2005 which describes the arrangements for avoidance, reuse, recovery, recycling, storage, collection, treatment and disposal of different categories of waste to be generated from the construction activities. Such a management plan should incorporate site specific factors, such as the designation of areas for segregation and temporary storage of reusable and recyclable materials. The EMP should be submitted to the Engineer for approval. The Contractor should implement the waste management practices in the EMP throughout the construction stage of the Project. The EMP should be reviewed regularly and updated by the Contractor.	To achieve waste reduction	Contractor	All work sites	Construction Phase	ETWB TCW No. 19/2005	^
S8.6.6	***Good Site Practices and Waste Reduction Measures (con't)*** - C&D materials would be reused in the project and other local concurrent projects as far as possible.	To achieve waste reduction	Contractor	All work sites	Construction Phase	ETWB TCW No. 19/2005	^
S8.6.7	***Storage, Collection and Transportation of Waste*** Should any temporary storage or stockpiling of waste is required, recommendations to minimize the impacts include: - Waste, such as soil, should be handled and stored well to ensure secure containment, thus minimizing the potential of pollution; - Maintain and clean storage areas routinely;	To minimize potential adverse environmental impacts arising from waste	Contractor	All work sites	Construction Phase	-	^ ^ ^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	- Stockpiling area should be provided with covers and water spraying system to prevent materials from wind-blown or being washed away; and - Different locations should be designated to stockpile each material to enhance reuse.	storage					^
S8.6.8/ Waste Management Plan	***Storage, Collection and Transportation of Waste (con't)*** - Remove waste in timely manner; - Waste collectors should only collect wastes prescribed by their permits; - Impacts during transportation, such as dust and odour, should be mitigated by the use of covered trucks or in enclosed containers; - Obtain relevant waste disposal permits from the appropriate authorities, in accordance with the Waste Disposal Ordinance (Cap. 354), Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 345) and the Land (Miscellaneous Provisions) Ordinance (Cap. 28); - Waste should be disposed of at licensed waste disposal facilities/ alternative disposal ground approved by RE and DEP; and - Maintain records of quantities of waste generated, recycled and disposed.	To minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	All work sites	Construction Phase		^ ^ ^ ^ ^ ^
S8.6.9/ Waste Management Plan	***Storage, Collection and Transportation of Waste (con't)*** - Implementation of trip ticket system with reference to DEVB TC(W) No. 6/2010, Trip Ticket System for Disposal of Construction & Demolition Materials, to monitor disposal of waste and to control fly-tipping at PFRFs or landfills. A recording system for the amount of waste generated, recycled and disposed	To minimize potential adverse environmental impacts arising	Contractor	All work sites	Construction Phase	DEVB TCW No. 6/2010	^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	(including disposal sites) should be proposed.	from waste collection and disposal					
S8.6.11 - S8.6.13/ Waste Management Plan	***Sorting of C&D Materials*** - Sorting to be performed to recover the inert materials, reusable and recyclable materials before disposal off-site. - Specific areas shall be provided by the Contractors for sorting and to provide temporary storage areas for the sorted materials. - The C&D materials should at least be segregated into inert and non-inert materials, in which the inert portion could be reused and recycled in the reclamation as far as practicable before delivery to PFRFs. While opportunities for reusing the non-inert portion should be investigated before disposal of at designated landfills	To minimize potential adverse environmental	Contractor	All work sites	Construction Phase	DEVB TCW No. 6/2010 ETWB TCW No. 33/2002 ETWB TCW No. 19/2005	^ ^ ^
S8.6.15 – S8.6.16/ Waste Management Plan	***Sediments*** - Sediment encountered may be reused as filling material on-site after cement stabilization. Cement-stabilization process is undertaken by mixing sediment and cement and will convert sediment to earth filling material. The treated sediment has to comply with Risk-Based Remediation Goals (RBRGs) before being reused in order not to raise any land contamination issue. The adoption of RBRGs to assess stabilized sediment has been proposed in the current C&DMMP. MFC has no adverse comment on the current C&DMMP. The sediment quality indicates that all sediments comply with most stringent RBRGs except for one	To ensure the sediment to be disposed of in an authorized and least impacted way	NE/2015/02, NE/2017/01	All works areas with sediments concern	Construction Phase	RBRG	N/A

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	sediment sample (TKO-EBH501 3-3.95m) with lead exceeding the RBRG. Except for the sediment sample (TKO-EBH501 3-3.95m), the chemical screening results do not indicate sediment as contaminated soil. It is anticipated that reuse of sediment except sediment sample (TKO-EBH501 3-3.95m) will not lead to land contamination. - Despite exceedance of RBRG, onsite reuse of sediment under sample (TKO-EBH501 33.95m) as filling material after cement stabilization is also a suitable treatment. Sediment quality indicates the sediment sample (TKO-EBH501 3-3.95m) exceed RBRG for lead. While cement stabilization will immobilize metal contaminants, it is capable to treat the exceedance on lead. The stabilized material should comply with UTS of Lead and UCS. If the treated material do not comply with UTS or UCS, re-stabilization have to be undertaken to meet compliance of UTS and UCS before reusing the treated sediment as filling material. However, further agreement on final disposal/treatment on sediment under sample (TKO-EBH501 3-3.95m) has to be sought from DEP						N/A
S8.6.17 – S8.6.20	***Sediments (con't)*** - Requirements of the Air Pollution Control (Construction Dust) Regulation, where relevant, shall be adhered to during boring, excavation, transportation and disposal of sediments or cement stabilization of sediment. - A treatment area should be confined for carrying out the cement stabilization mixing and temporary stockpile. The area should be designed to prevent leachate from entering the ground. Leachate, if any, should be collected and	To determine the best handling and treatment of sediment	Contractor	All works areas with sediments concern	Construction Phase		^ ^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	discharged according to the Water Pollution Control Ordinance (WPCO). - In order to minimise the potential odour / dust emissions during boring, excavation and transportation of the sediment, the excavated sediments should be kept wet during excavation/boring and should be properly covered when placed on barges/trucks. Loading of the excavated sediment to the barge should be controlled to avoid splashing and overflowing of the sediment slurry to the surrounding water. - In order to minimise the exposure to contaminated materials, workers should, when necessary, wear appropriate personal protective equipments (PPE) when handling contaminated sediments. Adequate washing and cleaning facilities should also be provided on site.						^ N/A
S8.6.21/ Waste Management Plan	***Sediments (con't)*** - Alternatively, excavated sediment can be treated with marine disposal. The basic requirements and procedures for excavated sediment disposal specified under ETWB TC(W) No. 34/2002 shall be followed. MFC is responsible for the provision and management of disposal capacity and facilities for the excavated sediment, while the permit of marine dumping is required under the Dumping at Sea Ordinance and is the responsibility of the DEP.	To ensure the sediment to be disposed of in an authorized and least impacted way	NE/2015/02, NE/2017/01	All works areas with sediments concern	Construction Phase	ETWB TC(W) No. 34/2002 & Dumping at Sea Ordinance	N/A
S8.6.23	***Sediments (con't)*** - For allocation of sediment disposal sites and application of marine dumping permit, separate SSTP has to be submitted to EPD for agreement under DASO. Additional site investigation, based on the SSTP, maybe carried out in order to	To determine the best handling and disposal option of	Contractor	All works areas with sediments concern	Construction Phase	ETWB TC(W) No. 34/2002 & Dumping at Sea Ordinance	N/A

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	confirm the disposal arrangements for the proposed sediments removal. A Sediment Quality Report (SQR) shall then be required for EPD agreement under DASO prior to the tendering of the construction contract, discussing in details the site investigation, testing results as well as the delineation of each of the categories of excavated materials and the corresponding types of disposal.	sediment					
S8.6.24 - S8.6.28/ Waste Management Plan	***Sediments (con't)*** - The excavated sediments is expected to be loaded onto the barge and transported to the designated disposal sites allocated by the MFC. The excaveted sediment would be disposed of according to its determined disposal options and ETWB TC(W) No. 34/2002. - Stockpiling of contaminated sediments should be avoided as far as possible. If temporary stockpiling of contaminated sediments is necessary, the excavated sediment should be covered by tarpaulin and the area should be placed within earth bunds or sand bags to prevent leachate from entering the ground, nearby drains and surrounding water bodies. The stockpiling areas should be completely paved or covered by linings in order to avoid contamination to underlying soil or groundwater. Separate and clearly defined areas should be provided for stockpiling of contaminated and uncontaminated materials. Leachate, if any, should be collected and discharged according to the Water Pollution Control Ordinance (WPCO). - In order to minimise the potential odour / dust emissions during boring and transportation of the sediment, the excavated sediments should be kept wet	To ensure handling of sediments are in accordance to statutory requirements	Contractor	All works areas with sediments concern	Construction Phase	ETWB TC(W) No. 34/2002 & Dumping at Sea Ordinance	^ ^ ^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	during excavation/boring and should be properly covered when placed on barges. Loading of the excavated sediment to the barge should be controlled to avoid splashing and overflowing of the sediment slurry to the surrounding water. - The barge transporting the sediments to the designated disposal sites should be equipped with tight fitting seals to prevent leakage and should not be filled to a level that would cause overflow of materials or laden water during loading or transportation. In addition, monitoring of the barge loading shall be conducted to ensure that loss of material does not take place during transportation. Transport barges or vessels shall be equipped with automatic self-monitoring devices as specified by the DEP. - In order to minimise the exposure to contaminated materials, workers should, when necessary, wear appropriate personal protective equipments (PPE) when handling contaminated sediments. Adequate washing and cleaning facilities should also be provided on site. - Another possible arrangement for Type 3 disposal is by geosynthetic containment. A geosynthetic containment method is a method whereby the sediments are sealed in geosynthetic containers and, at the disposal site, 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, thereby meeting the requirements for fully confined mud disposal.						^ N/A N/A
S8.6.26/ Waste	***Chemical Wastes.*** - If chemical wastes are produced at the construction site, the Contractor would be	To ensure proper	Contractor	All works sites	Construction Phase	Code of Practice on the Packaging,	^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
Management Plan	required to register with the EPD as a Chemical Waste Producer and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. The Contractor shall use a licensed collector to transport and dispose of the chemical wastes, to either the Chemical Waste Treatment Centre at Tsing Yi, or other licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.	management of chemical waste				Labelling and Storage of Chemical Wastes Waste Disposal (Chemical Waste) (General) Regulation	
S8.6.27/ Waste Management Plan	***General Refuse*** - General refuse should be stored in enclosed bins or compaction units separate from C&D material. A reputable waste collector should be employed by the contractor to remove general refuse from the site, separately from C&D material. Preferably an enclosed and covered area should be provided to reduce the occurrence of 'wind blown' light material.	To ensure proper management of general refuse	Contractor	All works sites	Construction Phase	Public Health and Municipal Services Ordinance (Cap. 132)	^
Landscape and Visual Impact (Construction Phase)							
Table 10.8.1/ Landscape	CM1 - Construction area and contractor's temporary works areas to be minimised to avoid impacts on adjacent landscape.	Avoid impact on adjacent landscape areas	CEDD (via Contractor)	General	Construction planning and during construction	N/A	^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
Mitigation Plan					period		
Table 10.8.1/ Landscape Mitigation Plan	CM2 - Reduction of construction period to practical minimum.	Minimise duration of impact	CEDD (via Contractor)	N/A	Construction planning	N/A	^
Table 10.8.1/ Landscape Mitigation Plan	CM3 - Topsoil, where the soil material meets acceptable criteria and where practical, to be stripped and stored for re-use in the construction of the soft landscape works. The Contract Specification shall include storage and reuse of topsoil as appropriate.	To allow re-use of topsoil	CEDD (via Contractor)	General	Site clearance	As per the Particular Specification	^
Table 10.8.1/ Landscape Mitigation Plan	CM4 - Existing trees at boundary of site and retained trees within site boundary to be carefully protected during construction. Detailed Tree Protection Specification shall be provided in the Contract Specification, under which 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. (Tree protection measures will be detailed at Tree Removal Application stage).	To minimize tree loss	CEDD (via Contractor)	As per approved Tree Removal Application(s)	Site clearance and throughout construction period	ETWB TC 3/2006 and as per tree protection measures in Particular Specification	^
Table	CM5 - Trees unavoidably affected by the works shall be transplanted where	To maximize	CEDD (via	As per	Site clearance	ETWB TC 3/2006	^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
10.8.1/ Landscape Mitigation Plan	practicable. Where possible, trees should be transplanted direct to permanent locations rather than temporary holding nurseries. A detailed tree transplanting specification shall be provided in the Contract Specification and sufficient time for preparation shall be allowed in the construction programme.	preservation of existing trees	Contractor)	approved Tree Removal Application(s)		and as per tree protection measures in Particular Specification	
Table 10.8.1/ Landscape Mitigation Plan	CM6 - Advance screen planting of fast growing tree and shrub species to noise barriers and hoardings. Trees shall be capable of reaching a height >10m within 10 years.	To maximize screening of the works	CEDD (via Contractor)	At Lam Tin Interchange and edge of Road P2 landscape deck, TKO	Beginning of construction period	N/A	^
Table 10.8.1/ Landscape Mitigation Plan	CM7 - Hydroseeding or sheeting of soil stockpiles with visually unobtrusive material	To reduce visual intrusion	CEDD (via Contractor)	General	Throughout construction period	As per Particular Specification	N/A
Table 10.8.1/ Landscape Mitigation	CM8 - Control of night-time lighting by hooding all lights and through minimisation of night working periods.	To reduce visual intrusion	CEDD (via Contractor)	General	Throughout construction period	N/A	^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
Plan							
Table 10.8.1/ Landscape Mitigation Plan	CM9 - Screening of works areas with hoardings with appropriate colours compatible with the surrounding area	Reduction of visual intrusion	CEDD (via Contractor)	Project site Boundary	Excretion of site hoarding	N/A	^
Table 10.8.1/ Landscape Mitigation Plan	CM10 - Avoidance of excessive height and bulk of site buildings and structure	Reduction of visual intrusion and integration with environment	CEDD (via Contractor)	Built structures	Design and construction stage	N/A	^
Table 10.8.1/ Landscape Mitigation Plan	CM11 - Limitation of run-off into freshwater streams, ponds and sea areas	Avoidance of contamination of water courses and water bodies	CEDD (via Contractor)	TKO reclamation, TKO tunnel portal, Cha Kwo Ling roadworks	Throughout construction period	N/A	^
Table 10.8.1	CM12 - Minimise area of reclamation and design the edges sensitively to tie in with adjacent coastline character	Minimise loss of Junk Bay and	CEDD (via Contractor)	Temporary reclamation	Construction planning and	N/A	N/A

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
		integration with existing coastline		for barging points at TKO and Lam Tin and permanent reclamation for TKO Interchange slip roads and Road P2	reclamation stages		

Table II - Observations/reminders/non-compliance made during Site Audit

NIL IN THE REPORTING MONTH

Key:

*	Observation/reminder was made during site audit but improved/rectified by the contractor.
#	Observation/reminder was made during site audit but not yet improved/rectified by the contractor.
X	Non-compliance of mitigation measure
•	Non-compliance but rectified by the contractor

Table I – Recommended Mitigation Measures stipulated in EM&A Manual of the Project

(Further information on observations/reminders/non-compliance made during site audit should refer to Table II)

Contract: NE/2015/03

Key:
^ Mitigation measure was fully implemented.
* Observation/reminder was made during site audit but improved/rectified by the contractor.
# Observation/reminder was made during site audit but not yet improved/rectified by the contractor.
X Non-compliance of mitigation measure
• Non-compliance but rectified by the contractor
N/A Not Applicable

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
S3.8.1	Watering eight times a day on active works areas, exposed areas and paved haul roads	To minimize the dust impact	Contractor	All Active Work Sites	Construction phase	APCO	^
S3.8.1	Enclosing the unloading process at barging point by a 3-sided screen with top tipping hall / mixing area in Work Area A, provision of water spraying and flexible dust curtains	To minimize the dust impact	Contractor	Barging Points	Construction phase	APCO	^
S3.8.7	Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices: - Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather. - Use of frequent watering for particularly dusty construction areas and areas close to ASRs. - Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage,	To minimize the dust impact	Contractor	All Construction Work Sites	Construction phase	APCO and Air Pollution Control (Construction Dust) Regulation	^ ^ ^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	watering shall be applied to aggregate fines.						
	- Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs.						^
	- Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations.						^
	- Establishment and use of vehicle wheel and body washing facilities at the exit points of the site.						N/A
	- Provision of wind shield and dust extraction units or similar dust mitigation measures at the loading area of barging point, and use of water sprinklers at the loading area where dust generation is likely during the loading process of loose material, particularly in dry seasons/ periods.						*(1)
	- Provision of not less than 2.4m high hoarding from ground level along site boundary where adjoins a road, streets or other accessible to the public except for a site entrance or exit.						^
	- Imposition of speed controls for vehicles on site haul roads.						^
	- Where possible, routing of vehicles and positioning of construction plant should be at the maximum possible distance from ASRs						^
	- 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.						^
	- Instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if						^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	dusty conditions arise.						
/	Emission from Vehicles and Plants • All vehicles shall be shut down in intermittent use. • Only well-maintained plant should be operated on-site and plant should be serviced regularly to avoid emission of black smoke. • All diesel fuelled construction plant within the works areas shall be powered by ultra low sulphur diesel fuel (ULSD)	Reduce air pollution emission from construction vehicles and plants	Contractor	All construction sites	Construction stage	• APCO	^ ^ ^
/	Valid No-road Mobile Machinery (NRMM) labels should be provided to regulated machines	Reduce air pollution emission from construction vehicles and plants	Contractor	All construction sites	Construction stage	• APCO	^
Noise Impact (Construction Phase)							
S4.8	- Use of quiet PME. Use of movable noise barriers for Excavator, Lorry, Dump Truck, Mobile Crane, Compactor, Concrete Mixer Truck, Concrete Lorry Mixer, Breaker, Mobile Crusher, Backhoe, Vibratory Poker, Saw, Asphalt Paver, Vibratory Roller, Vibrolance, Hydraulic Vibratory Lance and Piling (Vibration Hammer). Use of full enclosure for Air Compressor, Compressor, Bar Bender, Generator, Drilling Rig, Chisel, Large Diameter Bore Piling, Grout Mixer & Pump and Concrete Pump.	To minimize construction noise impact arising from the Project at the affected NSRs	Contractor	Work Sites	Construction phase	EIAO-TM, NCO	^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
Noise Mitigation Plan	Use of Temporary Noise Barriers (i.e Acoustic box, SilentUp and etc.) or Full Enclosure for PME according to the approved Noise Mitigation Plan	To minimize construction noise impact arising from the Project at the affected NSRs	Contractor	Work Sites	Construction phase	EIAO-TM, NCO	^
S4.9	Good Site Practice - Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program - Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction program. - Mobile plant, if any, should be sited as far away from NSRs as possible. - Machines and plant (such as trucks) that may be in intermittent use should be shut down between works periods or should be throttled down to a minimum. - Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs. - Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities.	To minimize construction noise impact arising from the Project at the affected NSRs	Project Proponent	Work sites	Construction Period	EIAO-TM, NCO	^ ^ ^ ^ ^ ^
S4.9	Scheduling of Construction Works during School Examination Period	To minimize construction noise impact arising from the	Contractor	Work site near school	Construction phase	EIAO-TM, NCO	N/A

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
		Project at the affected NSRs					
Water Quality Impact (Construction Phase)							
S5.8.5	It is important that appropriate measures are implemented to control runoff and drainage and prevent high loading of SS from entering the marine environment. Proper site management is essential to minimise surface water runoff, soil erosion and sewage effluents.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.6	Any practical options for the diversion and realignment of drainage should comply with both engineering and environmental requirements in order to ensure adequate hydraulic capacity of all drains.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Design Stage and Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO, TM-DSS	^
S5.8.7	Construction site runoff and drainage should be prevented or minimised in accordance with the guidelines stipulated in the EPD's Practice Note for Professional Persons, Construction Site Drainage (ProPECC PN 1/94). Good housekeeping and stormwater best management practices, as detailed in below, should be implemented to ensure that all construction runoff complies with WPCO standards and no unacceptable impact on the WSRs arises due to construction of the TKO-LT Tunnel. All discharges from the construction site should be controlled to comply with the standards for effluents	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO, TM-DSS	^

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	discharged into the corresponding WCZ under the TM-DSS.						
S5.8.8	Exposed soil areas should be minimised to reduce the potential for increased siltation, contamination of runoff, and erosion. Construction runoff related impacts associated with the above ground construction activities can be readily controlled through the use of appropriate mitigation measures which include: - use of sediment traps; and - adequate maintenance of drainage systems to prevent flooding and overflow.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^ N/A ^
S5.8.9	Construction site should be provided with adequately designed perimeter channel and pretreatment facilities and proper maintenance. The boundaries of critical areas of earthworks should be marked and surrounded by dykes or embankments for flood protection. Temporary ditches should be provided to facilitate runoff discharge into the appropriate watercourses, via a silt retention pond. Permanent drainage channels should incorporate sediment basins or traps and baffles to enhance deposition rates. The design of efficient silt removal facilities should be based on the guidelines in Appendix A1 of ProPECC PN 1/94.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.10	Ideally, construction works should be programmed to minimise surface excavation works during the rainy season (April to September). All exposed earth areas should be completed as soon as possible after earthworks have been completed, or alternatively, within 14 days of the cessation of earthworks where practicable. 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.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^

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S5.8.11	Sedimentation tanks of sufficient capacity, constructed from pre-formed individual cells of approximately 6 to 8m^3 capacity, are recommended as a general mitigation measure which can be used for settling surface runoff prior to disposal. The system capacity is flexible and able to handle multiple inputs from a variety of sources and particularly suited to applications where the influent is pumped.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO S5	^
S5.8.12	Earthworks final surfaces should be well compacted and the subsequent permanent work or surface protection should be carried out immediately after the final surfaces are formed to prevent erosion caused by rainstorms. Appropriate drainage like intercepting channels should be provided where necessary.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO S5	^
S5.8.13	Measures should be taken to minimize the ingress of rainwater into trenches. If excavation of trenches in wet seasons is necessary, they should be dug and backfilled in short sections. Rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO S5	^
S5.8.14	Open stockpiles of construction materials (for examples, aggregates, sand and fill material) of more than 50m^3 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.	Control potential impacts from construction site runoff and land-	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^

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		based construction					
S5.8.15	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 directed into foul sewers. Discharge of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul sewerage system.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.16	Precautions to be taken at any time of year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecast, and actions to be taken during or after rainstorms are summarised in Appendix A2 of ProPECC PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events, especially for areas located near steep slopes.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.17	Oil interceptors should be provided in the drainage system and regularly cleaned to prevent the release of oils and grease into the storm water drainage system after accidental spillages. The interceptor should have a bypass to prevent flushing during periods of heavy rain.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A

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S5.8.18	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 located wheel washing bay should be provided at every site exit, and washwater 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 wheelwash 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.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.19	Silt removal facilities, channels and manholes should be maintained and the deposited silt and grit should be removed regularly, at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.20	It is recommended that on-site drainage system should be installed prior to the commencement of other construction activities. Sediment traps should be installed in order to minimise the sediment loading of the effluent prior to discharge into foul sewers. There shall be no direct discharge of effluent from the site into the sea.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^

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S5.8.21	All temporary and permanent drainage pipes and culverts provided to facilitate runoff discharge should be adequately designed for the controlled release of storm flows. All sediment control measures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly following rain storms. The temporarily diverted drainage should be reinstated to its original condition when the construction work has finished or the temporary diversion is no longer required.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.22	All fuel tanks and storage areas should be provided with locks and be located 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 the coastal waters.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.23	Minimum distances of 100m shall be maintained between the existing or planned stormwater discharges and the existing or planned seawater intakes during construction and operational phases	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO, TMDSS	^
S5.8.24	Under normal circumstances, groundwater pumped out of wells, etc. for the lowering of ground water level in basement or foundation construction, and groundwater seepage pumped out of tunnels or caverns under construction should be discharged into storm drains after the removal of silt in silt removal facilities.	Control potential impacts from construction site runoff and land-	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^

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		based construction					
S5.8.25 - S5.8.27 & Table 5.18	Grouting would be adopted as measure to reduce the groundwater inflow into the tunnel. During the tunnel excavation, the inflow rate of groundwater into the tunnel will be measured during the excavation. The groundwater levels above the tunnel will also be monitored by piezometers. If the inflow rate exceeds the pre-determined groundwater control criteria or the groundwater drawdown exceeds the required limit, pre-excavation grouting will be required to reduce the groundwater inflow. No significant change of groundwater levels would therefore be expected. Any chemicals/ foaming agents which would be entrained to the groundwater should be biodegradable and non-toxic throughout the tunnel construction. Potential groundwater quality impact would be minimal as the used material is non-toxic and biodegradable. No adverse groundwater quality would therefore be expected. Prescriptive measures in the form of an Action Plan with pre-emptive and re-active to preserve the groundwater levels at all times during the tunnel construction are set out in Table 5.18.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO, Buildings Ordinance	N/A
S5.8.28	Water used in ground boring and drilling for site investigation or rock / soil anchoring should as far as practicable be recirculated after sedimentation. When there is a need for final disposal, the wastewater should be discharged into storm drains via silt removal facilities.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Design Stage and Construction Phas	ProPECC PN 1/94, EIAOTM, WPCO	N/A

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S5.8.29 - S5.8.31	Wastewater generated from the washing down of mixing trucks and drum mixers and similar equipment should whenever practicable be recycled. The discharge of wastewater should be kept to a minimum. To prevent pollution from wastewater overflow, the pump sump of any water recycling system should be provided with an online standby pump of adequate capacity and with automatic alternating devices. Under normal circumstances, surplus wastewater may be discharged into foul sewers after treatment in silt removal and pH adjustment facilities (to within the pH range of 6 to 10). Disposal of wastewater into storm drains will require more elaborate treatment.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.32	All vehicles and plant should be cleaned before they leave a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. A wheel washing bay should be provided at every site exit if practicable and wash-water should have sand and silt settled out or removed before discharging into storm drains. The section of construction road between the wheel washing bay and the public road should be paved with backfall to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.33	Bentonite slurries used in diaphragm wall and borepile construction should be reconditioned and reused wherever practicable. If the disposal of a certain residual quantity cannot be avoided, the used slurry may be disposed of at the marine spoil grounds subject to obtaining a marine dumping licence from EPD on a case-by-case basis.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A

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S5.8.34	If the used bentonite slurry is intended to be disposed of through the public drainage system, it should be treated to the respective effluent standards applicable to foul sewer, storm drains or the receiving waters as set out in the WPCO Technical Memorandum on Effluent Standards.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A
S5.8.35	Water used in water testing to check leakage of structures and pipes should be reused for other purposes as far as practicable. Surplus unpolluted water could be discharged into storm drains.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A
S5.8.36	Sterilization is commonly accomplished by chlorination. Specific advice from EPD should be sought during the design stage of the works with regard to the disposal of the sterilizing water. The sterilizing water should be reused wherever practicable.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Design Stage and Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A
S5.8.37	Before commencing any demolition works, all sewer and drainage connections should be sealed to prevent building debris, soil, sand etc. from entering public sewers/drains.	Control potential impacts from construction site runoff and land-	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A

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		based construction					
S5.8.38	Wastewater generated from building construction activities including concreting, plastering, internal decoration, cleaning of works and similar activities should not be discharged into the stormwater drainage system. If the wastewater is to be discharged into foul sewers, it should undergo the removal of settleable solids in a silt removal facility, and pH adjustment as necessary	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.39	Acidic wastewater generated from acid cleaning, etching, pickling and similar activities should be neutralized to within the pH range of 6 to 10 before discharging into foul sewers. If there is no public foul sewer in the vicinity, the neutralized wastewater should be tinkered off site for disposal into foul sewers or treated to a standard acceptable to storm drains and the receiving waters	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.40	Wastewater collected from canteen kitchens, including that from basins, sinks and floor drains, should be discharged into foul sewer via grease traps capable of providing at least 20 minutes retention during peak flow.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A

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S5.8.41	Drainage serving an open oil filling point should be connected to storm drains via a petrol interceptor with peak storm bypass.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.42	Vehicle and plant servicing areas, vehicle wash bays and lubrication bays should as far as possible be located within roofed areas. The drainage in these covered areas should be connected to foul sewers via a petrol interceptor. Oil leakage or spillage should be contained and cleaned up immediately. Waste oil should be collected and stored for recycling or disposal in accordance with the Waste Disposal Ordinance.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.43	Construction work force sewage discharges on site are expected to be connected to the existing trunk sewer or sewage treatment facilities. The construction sewage may need to be handled by portable chemical toilets prior to the commission of the on-site sewer system. Appropriate numbers of portable toilets shall be provided by a licensed contractor to serve the large number of construction workers over the construction site. The Contractor shall also be responsible for waste disposal and maintenance practices.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.44	Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste)	Control potential impacts from accidental	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO, WDO	^

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	(General) Regulation should be observed and complied with for control of chemical wastes.	spillage of chemicals					
S5.8.45	Any service shop and maintenance facilities should be located on hard standings within a bunded area, and sumps and oil interceptors should be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage should only be undertaken within the areas appropriately equipped to control these discharges.	Control potential impacts from accidental spillage of chemicals	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO	^
S5.8.46	Disposal of chemical wastes should be carried out in compliance with the Waste Disposal Ordinance. The "Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes" published under the Waste Disposal Ordinance details the requirements to deal with chemical wastes. General requirements are given as follows: - suitable containers should be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport; - chemical waste containers should be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents; and - storage area should be selected at a safe location on site and adequate space should be allocated to the storage area.	Control potential impacts from accidental spillage of chemicals	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO, WDO	^ ^ ^
S5.8.47	Collection and removal of floating refuse should be performed at regular intervals on a daily basis. The contractor should be responsible for keeping the water within the site boundary and the neighbouring water free from rubbish.	Control potential impacts from floating refuse and debris	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO,	^

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Ecological Impact							
S6.8.4	***Measures to Minimize Disturbance*** - Use of Quiet Mechanical Plant during the construction phase should be adopted wherever possible. - Hoarding or fencing should be erected around the works area boundaries during the construction phase. The hoarding would screen adjacent habitats from construction phase activities, reduce noise disturbance to these habitats and also to restrict access to habitats adjacent to works areas by site workers; - Regular spraying of haul roads to minimize impacts of dust deposition on adjacent vegetation and habitats during the construction activities	Minimize noise, human and traffic disturbance to terrestrial habitat and wildlife; and reduce dust generation	Design Team / Contractor	Land-based works are	Construction Phase	N/A	^ ^ ^
S6.8.5	***Standard Good Site Practice*** - Placement of equipment or stockpile in designated works areas and access routes selected on existing disturbed land to minimise disturbance to natural habitats. - Construction activities should be restricted to works areas that should be clearly demarcated. The works areas should be reinstated after completion of the works. - Waste skips should be provided to collect general refuse and construction wastes. The wastes should be properly disposed off-site in a timely manner. - General drainage arrangements should include sediment and oil traps to collect and control construction site run-off. - Open burning on works sites is illegal, and should be strictly prohibited. - Measures should also be put into place so that litter, fuel and solvents do not enter	Reduce disturbance to surrounding habitats	Contractor	Land-based works are	Construction Phase	N/A	^ ^ ^ ^ ^ ^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	the nearby watercourses.						
S6.8.8	-						
S6.8.9 S6.8.10	***Measure to Control Water Quality Impact*** - Proper waste and dumping management; and - Standard good-site practice for land-based construction.	Control water quality impact, especially on suspended solid level; minimize the contamination of wastewater discharge, accidental chemical spillage and construction site runoff to the receiving water bodies	Design Team, contractor	Marine and landbased works area	Construction phase	WQO	^ ^

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S6.8.11	***Compensation for Vegetation Loss*** - Felling of mature trees should be compensated by planting of standard or heavy standard trees within or in vicinity of the affected area as far as practicable. Such compensatory planting for trees should be provided with at least a 1:1 ratio. In addition, vegetation at the temporarily affected area should be reinstated with species similar to the existing condition.	Compensate for the vegetation loss	Design Team, contractor	Land-based works area	Construction phase	N/A	^
Waste Management (Construction Phase)							
S8.6.3	***Good Site Practices and Waste Reduction Measures*** - Nomination of an approved person, such as a site manager, to be responsible for 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, proper waste management and chemical handling procedures; - Provision of sufficient waste disposal points and regular collection of waste; - Appropriate measures to minimize windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers; and - Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors.	To reduce waste management impacts	Contractor	All work sites	Construction Phase	Waste Disposal Ordinance (Cap. 354) Land (Miscellaneous Provisions) Ordinance (Cap. 28)	^ ^ ^ ^ ^
S8.6.4	***Good Site Practices and Waste Reduction Measures (con't)*** - Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper	To achieve waste reduction	Contractor	All work sites	Construction Phase	Waste Disposal Ordinance (Cap. 354)	^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	disposal; - Encourage collection of aluminium cans by providing separate labelled bins to enable this waste to be segregated from other general refuse generated by the workforce; - Proper storage and site practices to minimize the potential for damage or contamination of construction materials; and - Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste.					Land (Miscellaneous Provisions) Ordinance (Cap. 28)	^ ^ ^
S8.6.5	***Good Site Practices and Waste Reduction Measures (con't)*** The Contractor shall prepare and implement a WMP as part of the EMP in accordance with ETWB TCW No. 19/2005 which describes the arrangements for avoidance, reuse, recovery, recycling, storage, collection, treatment and disposal of different categories of waste to be generated from the construction activities. Such a management plan should incorporate site specific factors, such as the designation of areas for segregation and temporary storage of reusable and recyclable materials. The EMP should be submitted to the Engineer for approval. The Contractor should implement the waste management practices in the EMP throughout the construction stage of the Project. The EMP should be reviewed regularly and updated by the Contractor.	To achieve waste reduction	Contractor	All work sites	Construction Phase	ETWB TCW No. 19/2005	^
S8.6.6	***Good Site Practices and Waste Reduction Measures (con't)*** - C&D materials would be reused in the project and other local concurrent projects as far as possible.	To achieve waste reduction	Contractor	All work sites	Construction Phase	ETWB TCW No. 19/2005	^

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S8.6.7	***Storage, Collection and Transportation of Waste*** Should any temporary storage or stockpiling of waste is required, recommendations to minimize the impacts include: - Waste, such as soil, should be handled and stored well to ensure secure containment, thus minimizing the potential of pollution; - Maintain and clean storage areas routinely; - Stockpiling area should be provided with covers and water spraying system to prevent materials from wind-blown or being washed away; and - Different locations should be designated to stockpile each material to enhance reuse.	To minimize potential adverse environmental impacts arising from waste storage	Contractor	All work sites	Construction Phase	-	^ ^ ^ ^
S8.6.8/ Waste Management Plan	***Storage, Collection and Transportation of Waste (con't)*** - Remove waste in timely manner; - Waste collectors should only collect wastes prescribed by their permits; - Impacts during transportation, such as dust and odour, should be mitigated by the use of covered trucks or in enclosed containers; - Obtain relevant waste disposal permits from the appropriate authorities, in accordance with the Waste Disposal Ordinance (Cap. 354), Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 345) and the Land (Miscellaneous Provisions) Ordinance (Cap. 28); - Waste should be disposed of at licensed waste disposal facilities/ alternative disposal ground approved by RE and DEP; and - Maintain records of quantities of waste generated, recycled and disposed.	To minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	All work sites	Construction Phase		^ ^ ^ ^ ^ ^

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S8.6.9/ Waste Management Plan	***Storage, Collection and Transportation of Waste (con't)*** - Implementation of trip ticket system with reference to DEVB TC(W) No. 6/2010, Trip Ticket System for Disposal of Construction & Demolition Materials, to monitor disposal of waste and to control fly-tipping at PFRFs or landfills. A recording system for the amount of waste generated, recycled and disposed (including disposal sites) should be proposed.	To minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	All work sites	Construction Phase	DEVB TCW No. 6/2010	^
S8.6.11 - S8.6.13/ Waste Management Plan	***Sorting of C&D Materials*** - Sorting to be performed to recover the inert materials, reusable and recyclable materials before disposal off-site. - Specific areas shall be provided by the Contractors for sorting and to provide temporary storage areas for the sorted materials. - The C&D materials should at least be segregated into inert and non-inert materials, in which the inert portion could be reused and recycled in the reclamation as far as practicable before delivery to PFRFs. While opportunities for reusing the non-inert portion should be investigated before disposal of at designated landfills	To minimize potential adverse environmental	Contractor	All work sites	Construction Phase	DEVB TCW No. 6/2010 ETWB TCW No. 33/2002 ETWB TCW No. 19/2005	^ ^ ^
	-						
S8.6.17 – S8.6.20	***Sediments (con't)*** - Requirements of the Air Pollution Control (Construction Dust) Regulation, where	To determine the best handling	Contractor	All works areas with	Construction Phase		^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	relevant, shall be adhered to during boring, excavation, transportation and disposal of sediments or cement stabilization of sediment. - A treatment area should be confined for carrying out the cement stabilization mixing and temporary stockpile. The area should be designed to prevent leachate from entering the ground. Leachate, if any, should be collected and discharged according to the Water Pollution Control Ordinance (WPCO). - In order to minimise the potential odour / dust emissions during boring, excavation and transportation of the sediment, the excavated sediments should be kept wet during excavation/boring and should be properly covered when placed on barges/trucks. Loading of the excavated sediment to the barge should be controlled to avoid splashing and overflowing of the sediment slurry to the surrounding water. - In order to minimise the exposure to contaminated materials, workers should, when necessary, wear appropriate personal protective equipments (PPE) when handling contaminated sediments. Adequate washing and cleaning facilities should also be provided on site.	and treatment of sediment		sediments concern			^ ^ N/A
	-						
	-						
S8.6.26/ Waste Management	***Chemical Wastes.*** - If chemical wastes are produced at the construction site, the Contractor would be required to register with the EPD as a Chemical Waste Producer and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and	To ensure proper management of chemical waste	Contractor	All works sites	Construction Phase	Code of Practice on the Packaging, Labelling and Storage of	^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
Plan	Storage of Chemical Wastes. Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. The Contractor shall use a licensed collector to transport and dispose of the chemical wastes, to either the Chemical Waste Treatment Centre at Tsing Yi, or other licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.					Chemical Wastes Waste Disposal (Chemical Waste) (General) Regulation	
S8.6.27/ Waste Management Plan	***General Refuse*** - General refuse should be stored in enclosed bins or compaction units separate from C&D material. A reputable waste collector should be employed by the contractor to remove general refuse from the site, separately from C&D material. Preferably an enclosed and covered area should be provided to reduce the occurrence of 'wind blown' light material.	To ensure proper management of general refuse	Contractor	All works sites	Construction Phase	Public Health and Municipal Services Ordinance (Cap. 132)	^
Impact on Cultural Heritage (Construction Phase)							
S9.6.4	Dust and visual impacts - Temporarily fenced off buffer zone with allowance for public access (minimum 1 m) should be provided; - The open yard in front of the temple should be kept as usual for annual Tin Hau festival; - Monitoring of vibration impacts should be conducted when the construction	To prevent dust and visual impacts	Contractors	Work areas	Construction Phase	EIAO; GCHIA; AMO	^ ^ ^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	works are less than 100m from the temple.						
Landscape and Visual Impact (Construction Phase)							
Table 10.8.1/ Landscape Mitigation Plan	CM1 - Construction area and contractor's temporary works areas to be minimised to avoid impacts on adjacent landscape.	Avoid impact on adjacent landscape areas	CEDD (via Contractor)	General	Construction planning and during construction period	N/A	^
Table 10.8.1/ Landscape Mitigation Plan	CM2 - Reduction of construction period to practical minimum.	Minimise duration of impact	CEDD (via Contractor)	N/A	Construction planning	N/A	^
Table 10.8.1/ Landscape Mitigation Plan	CM3 - Topsoil, where the soil material meets acceptable criteria and where practical, to be stripped and stored for re-use in the construction of the soft landscape works. The Contract Specification shall include storage and reuse of topsoil as appropriate.	To allow re-use of topsoil	CEDD (via Contractor)	General	Site clearance	As per the Particular Specification	^
Table 10.8.1/	CM4 - Existing trees at boundary of site and retained trees within site boundary to be carefully protected during construction. Detailed Tree Protection Specification shall be	To minimize tree loss	CEDD (via Contractor)	As per approved	Site clearance and	ETWB TC 3/2006 and as per tree	^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
Landscape Mitigation Plan	provided in the Contract Specification, under which 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. (Tree protection measures will be detailed at Tree Removal Application stage).			Tree Removal Application(s)	throughout construction period	protection measures in Particular Specification	
Table 10.8.1/ Landscape Mitigation Plan	CM5 - Trees unavoidably affected by the works shall be transplanted where practicable. Where possible, trees should be transplanted direct to permanent locations rather than temporary holding nurseries. A detailed tree transplanting specification shall be provided in the Contract Specification and sufficient time for preparation shall be allowed in the construction programme.	To maximize preservation of existing trees	CEDD (via Contractor)	As per approved Tree Removal Application(s)	Site clearance	ETWB TC 3/2006 and as per tree protection measures in Particular Specification	^
Table 10.8.1/ Landscape Mitigation Plan	CM6 - Advance screen planting of fast growing tree and shrub species to noise barriers and hoardings. Trees shall be capable of reaching a height >10m within 10 years.	To maximize screening of the works	CEDD (via Contractor)	At Lam Tin Interchange and edge of Road P2 landscape deck, TKO	Beginning of construction period	N/A	^
Table 10.8.1/ Landscape Mitigation	CM7 - Hydroseeding or sheeting of soil stockpiles with visually unobtrusive material	To reduce visual intrusion	CEDD (via Contractor)	General	Throughout construction period	As per Particular Specification	N/A

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
Plan							
Table 10.8.1/ Landscape Mitigation Plan	CM8 - Control of night-time lighting by hooding all lights and through minimisation of night working periods.	To reduce visual intrusion	CEDD (via Contractor)	General	Throughout construction period	N/A	^
Table 10.8.1/ Landscape Mitigation Plan	CM9 - Screening of works areas with hoardings with appropriate colours compatible with the surrounding area	Reduction of visual intrusion	CEDD (via Contractor)	Project site Boundary	Excretion of site hoarding	N/A	^
Table 10.8.1/ Landscape Mitigation Plan	CM10 - Avoidance of excessive height and bulk of site buildings and structure	Reduction of visual intrusion and integration with environment	CEDD (via Contractor)	Built structures	Design and construction stage	N/A	^
Table 10.8.1/ Landsca	CM11 - Limitation of run-off into freshwater streams, ponds and sea areas	Avoidance of contamination of water courses	CEDD (via Contractor)	TKO reclamation, TKO	Throughout construction period	N/A	^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
pe Mitigation Plan		and water bodie		tunnel portal, Cha Kwo Ling roadworks			
Table 10.8.1	CM12 - Minimise area of reclamation and design the edges sensitively to tie in with adjacent coastline characte	Minimise loss of Junk Bay and integration with existing coastlin	CEDD (via Contractor)	Temporary reclamation for barging points at TKO and Lam Tin and permanent reclamation for TKO Interchange slip roads and Road P2	Construction planning and reclamation stages	N/A	N/A

Table II - Observations/reminders/non-compliance made during Site Audit

NIL IN THE REPORTING MONTH

Key:

*	Observation/reminder was made during site audit but improved/rectified by the contractor.
#	Observation/reminder was made during site audit but not yet improved/rectified by the contractor.
X	Non-compliance of mitigation measure
•	Non-compliance but rectified by the contractor

Table I – Recommended Mitigation Measures stipulated in EM&A Manual of the Project

(Further information on observations/reminders/non-compliance made during site audit should refer to Table II)

Contract: NE/2017/01

Key:
^ Mitigation measure was fully implemented.
* Observation/reminder was made during site audit but improved/rectified by the contractor.
# Observation/reminder was made during site audit but not yet improved/rectified by the contractor.
X Non-compliance of mitigation measure
• Non-compliance but rectified by the contractor
N/A Not Applicable

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
Air Quality Impact (Construction Phase)							
S3.8.1	Watering eight times a day on active works areas, exposed areas and paved haul roads	To minimize the dust impact	Contractor	All Active Work Sites	Construction phase	APCO	N/A
S3.8.1	Enclosing the unloading process at barging point by a 3-sided screen with top tipping hall / mixing area in Work Area A, provision of water spraying and flexible dust curtains	To minimize the dust impact	Contractor	Barging Points	Construction phase	APCO	N/A
S3.8.7	Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices: - Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather. - Use of frequent watering for particularly dusty construction areas and areas close to ASRs.	To minimize the dust impact	Contractor	All Construction Work Sites	Construction phase	APCO and Air Pollution Control (Construction Dust) Regulation	N/A N/A

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	- Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines.						N/A
	- Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs.						N/A
	- Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations.						N/A
	- Establishment and use of vehicle wheel and body washing facilities at the exit points of the site.						N/A
	- Provision of wind shield and dust extraction units or similar dust mitigation measures at the loading area of barging point, and use of water sprinklers at the loading area where dust generation is likely during the loading process of loose material, particularly in dry seasons/ periods.						N/A
	- Provision of not less than 2.4m high hoarding from ground level along site boundary where adjoins a road, streets or other accessible to the public except for a site entrance or exit.						N/A
	- Imposition of speed controls for vehicles on site haul roads.						N/A
	- Where possible, routing of vehicles and positioning of construction plant should be at the maximum possible distance from ASRs						^
	- 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.						N/A

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	- Instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise.						N/A
/	Emission from Vehicles and Plants • All vehicles shall be shut down in intermittent use. • Only well-maintained plant should be operated on-site and plant should be serviced regularly to avoid emission of black smoke. • All diesel fuelled construction plant within the works areas shall be powered by ultra low sulphur diesel fuel (ULSD)	Reduce air pollution emission from construction vehicles and plants	Contractor	All construction sites	Construction stage	• APCO	^ ^ ^
/	Valid No-road Mobile Machinery (NRMM) labels should be provided to regulated machines	Reduce air pollution emission from construction vehicles and plants	Contractor	All construction sites	Construction stage	• APCO	^
Sediment Management Plan	- Tarpaulin sheets will be provided to cover dredged materials during transportation offsite. - Water Sprinklers will be installed along outer steel frame. Dusty materials will be dampened by spraying water to suppress dust generation during mixing operation	Control potential impacts from Cement s/s process	Contractor	NE/2015/02	Construction stage	EIAO, APCO	N/A N/A

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	- Subject to the odour intensity and instruction by the *Supervisor*, odour suppressant will be applied over the marine sediments via water blaster to minimize the impact.						N/A
	- The unloading / loading areas of the marine sediments will be barricaded with minimum 3.5m high barrier facing the nearest resident to minimize the dust impact. The mixing area and curing area will be enclosed with 3-sides and roof to minimize the dust impact.						N/A
	- The mixing area will be established with retractable roof on top and with corrugated steel sheet at side enclosure by 5.4m high concrete block walls to prevent spread of dust during the mixing process with cement.						N/A
	- Handling and mixing of cement will follow the Air Pollution Control (Construction Dust) Regulation to avoid fugitive dust emissions.						N/A
	- The discharge of cement from silo hopper to the concrete mixer truck will be 4-side enclosed by Tarpaulin to minimize the dust emission.						^
	- The mixing of cement and water will be confined in the concrete mixer truck until the pre-mixing completed. The hydrated cement will then be unloaded to the mixing area to mix with the sediment.						N/A
	- Treated marine sediments in the stockpiling area shall be covered by tarpaulin sheets or similar material except the operating earthwork front.						N/A
	- The soil filled platform is covered by a layer of sand fill material, and frequent water spray will be carried out on the sand surface for dust control.						N/A
	- Any excessive air emissions will be inspected and recorded.						

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	- Sediment height of treated marine sediment being kept 0.9 m below the top level of concrete block wall during rainy season.						N/A
Noise Impact (Construction Phase)							
S4.8	- Use of quiet PME. Use of movable noise barriers for Excavator, Lorry, Dump Truck, Mobile Crane, Compactor, Concrete Mixer Truck, Concrete Lorry Mixer, Breaker, Mobile Crusher, Backhoe, Vibratory Poker, Saw, Asphalt Paver, Vibratory Roller, Vibrolance, Hydraulic Vibratory Lance and Piling (Vibration Hammer). Use of full enclosure for Air Compressor, Compressor, Bar Bender, Generator, Drilling Rig, Chisel, Large Diameter Bore Piling, Grout Mixer & Pump and Concrete Pump.	To minimize construction noise impact arising from the Project at the affected NSRs	Contractor	Work Sites	Construction phase	EIAO-TM, NCO	^
Noise Mitigation Plan	Use of Temporary Noise Barriers (i.e Acoustic box, SilentUp and etc.) or Full Enclosure for PME according to the approved Noise Mitigation Plan	To minimize construction noise impact arising from the Project at the affected NSRs	Contractor	Work Sites	Construction phase	EIAO-TM, NCO	^
S4.9	Good Site Practice - Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program - Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction program.	To minimize construction noise impact arising from the Project at the	Project Proponent	Work sites	Construction Period	EIAO-TM, NCO	^ ^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	- Mobile plant, if any, should be sited as far away from NSRs as possible. - Machines and plant (such as trucks) that may be in intermittent use should be shut down between works periods or should be throttled down to a minimum. - Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs. - Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities.	affected NSRs					^ ^ ^ ^
S4.9	Scheduling of Construction Works during School Examination Period	To minimize construction noise impact arising from the Project at the affected NSRs	Contractor	Work site near school	Construction phase	EIAO-TM, NCO	N/A
Water Quality Impact (Construction Phase)							
S5.6.24	The dry density of filling material for the TKO-LT Tunnel reclamation should be 1,900kg/m^3, with fine content of 25% or less	Control potential impacts from filling activities	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO	N/A
S5.8.1	Non-dredged method by constructing steel cellular caisson structure with stone column shall be adopted for construction of seawall foundation. During the stone column installation (also including the installation of steel cellular caisson), silt curtain shall be employed around the active stone column installation points.	Control potential impacts from filling activities	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO	N/A

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
S5.8.2	Formation of seawall enclosing the reclamation for Road P2 (notwithstanding an opening of about 50m for marine access) shall be completed prior to the filling activities. The seawall opening of about 50m wide for marine access shall be selected at a location as indicatively shown in Appendix 5.10. No more than 3 filling barge trips per day shall be made with a maximum daily rate of 3,000m^3 (i.e. 1,000 m^3 per trip) for the filling operation at the reclamation area for Road P2. All filling works shall be carried out behind the seawall with the use of single silt curtain at the marine access.	Control potential impacts from filling activities	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO	N/A
Silt Curtain Deployment Plan	- Silt curtains should be deployed properly to surround the works area. - Maintenance of silt curtain should be provided. - Sufficient stock of silt curtain should be provided on site.	Control potential impacts from marine woroks	Contractor	NE/2015/01, NE/2015/02, NE/2017/01	Construction stage	EIAO	^ ^ ^
Sediment Management Plan	- Loading of barges and hoppers will be controlled to prevent splashing of dredged materials into the surrounding water. Barges or hoppers will not be filled to a level that will cause the overflow of materials or pollute water during loading or transportation. - Bottom opening of barges shall be fitted with tight fitting seals to prevent leakage of material. Excess material shall be cleaned from the decks and exposed fittings of barges and hopper dredgers before the vessel is moved. - Monitoring of the barge loading shall be conducted to ensure that loss of material does not take during transportation.	Control potential impacts from Cement s/s process	Contractor	NE/2015/02	Construction stage	EIAO, WPCO	N/A N/A N/A

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	- Transport barges or vessels shall be equipped with automatic self-monitoring devices.						N/A
	- Vehicles containing any untreated / treated marine sediments will be suitably covered to limit potential dust emissions or potential contaminated wastewater run-off, and truck bodies and tailgates will be sealed to prevent any discharge during transport or wet conditions.						N/A
	- The leachate from the untreated marine sediment will be collected and treated in the mixing pool for cement s/s treatment.						N/A
	- A 300mm diameter U-channel will be constructed along the perimeter of the cement s/s treatment facility to collect the run-off, if any, shall be collected and discharged according to the Water Pollution Control Ordinance (WPCO). Cleaning for the u-channel and desilting pits shall be conducted on weekly basic.						N/A
	- The stockpile area of treated marine sediment will be surrounded by the perimeter concrete block walls with geotextile membranes installed at the inner face of the concrete block walls. The types of perimeter wall can be used interchangeably. The Structural Feasibility of the perimeter wall for the changes of height of the stockpile had been checked and certified by ICE.						N/A
	- The mixing areas will be completely paved or covered by linings in order to avoid contamination to underlying soil or groundwater and will be confined by partition concrete block walls for carrying out the mixing and temporary stockpile of treated sediment.						N/A

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S5.8.3	Other good site practices should be undertaken during filling operations include: - all marine works should adopt the environmental friendly construction methods as far as practically possible including the use of cofferdams to cover the construction area to separate the construction works from the sea; - floating single silt curtain shall be employed for all marine works; - 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; - all hopper barges should be fitted with tight fitting seals to their bottom openings to prevent leakage of material; - excess material shall be cleaned from the decks and exposed fittings of barges before the vessel is moved; - adequate freeboard shall be maintained on barges to reduce the likelihood of decks being washed by wave action; - loading of barges and hoppers should be controlled to prevent splashing of filling material into the surrounding water. Barges or hoppers should not be filled to a level that will cause the overflow of materials or polluted water during loading or transportation; - any pipe leakages shall be repaired quickly. Plant should not be operated with leaking pipes; - construction activities should not cause foam, oil, grease, scum, litter or other objectionable matter to be present on the water within the site or dumping	Control potential impacts from filling activities and marine-based construction	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO, Waste Disposal Ordinance (WDO)	^ ^ ^ ^ ^ ^ N/A ^ ^ ^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	grounds; and - before commencement of the reclamation works, the holder of Environmental Permit has to submit plans showing the phased construction of the reclamation, design and operation of the silt curtain.						N/A
S5.8.4	Site specific mitigation plan for reclamation areas using public fill materials should be submitted for EPD agreement before commencement of construction phase with due consideration of good site practices.	Control potential impacts from filling activities and marine based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A
ERR S5.6.1	To minimize water quality impact arising from the dredging and filling works for Reclamation for Road P2, the following mitigation measures shall be implemented: - Before carrying out any dredging and underwater filling works, a temporary barrier shall first be constructed to a height above the high water mark to completely enclose the works site (without any opening at the barrier wall) - The temporary barrier fully enclosing the dredging and underwater filling works site shall not be removed before completion of all dredging and underwater filling works. - Water quality sampling and testing shall be carried out to demonstrate that the water quality inside the enclosed barrier is comparable to the ambient or baseline levels prior to the removal of the fully enclosed barrier. - Silt curtains shall be deployed for the installation and removal of the temporary	Control potential impacts from dredging and filling works for Reclamation for Road P2	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A N/A N/A N/A

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	barrier and at the double water gates marine access opening during its operation.						
S5.8.5	It is important that appropriate measures are implemented to control runoff and drainage and prevent high loading of SS from entering the marine environment. Proper site management is essential to minimise surface water runoff, soil erosion and sewage effluents.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A
S5.8.6	Any practical options for the diversion and realignment of drainage should comply with both engineering and environmental requirements in order to ensure adequate hydraulic capacity of all drains.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Design Stage and Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO, TM-DSS	N/A
S5.8.7	Construction site runoff and drainage should be prevented or minimised in accordance with the guidelines stipulated in the EPD's Practice Note for Professional Persons, Construction Site Drainage (ProPECC PN 1/94). Good housekeeping and stormwater best management practices, as detailed in below, should be implemented to ensure that all construction runoff complies with WPCO standards and no unacceptable impact on the WSRs arises due to construction of the TKO-LT Tunnel. All discharges from the construction site should be controlled to comply with the standards for effluents	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO, TM-DSS	N/A

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	discharged into the corresponding WCZ under the TM-DSS.						
S5.8.8	Exposed soil areas should be minimised to reduce the potential for increased siltation, contamination of runoff, and erosion. Construction runoff related impacts associated with the above ground construction activities can be readily controlled through the use of appropriate mitigation measures which include: - use of sediment traps; and - adequate maintenance of drainage systems to prevent flooding and overflow.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A N/A N/A
S5.8.9	Construction site should be provided with adequately designed perimeter channel and pretreatment facilities and proper maintenance. The boundaries of critical areas of earthworks should be marked and surrounded by dykes or embankments for flood protection. Temporary ditches should be provided to facilitate runoff discharge into the appropriate watercourses, via a silt retention pond. Permanent drainage channels should incorporate sediment basins or traps and baffles to enhance deposition rates. The design of efficient silt removal facilities should be based on the guidelines in Appendix A1 of ProPECC PN 1/94.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.10	Ideally, construction works should be programmed to minimise surface excavation works during the rainy season (April to September). All exposed earth areas should be completed as soon as possible after earthworks have been completed, or alternatively, within 14 days of the cessation of earthworks where practicable. 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.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
S5.8.11	Sedimentation tanks of sufficient capacity, constructed from pre-formed individual cells of approximately 6 to 8m^3 capacity, are recommended as a general mitigation measure which can be used for settling surface runoff prior to disposal. The system capacity is flexible and able to handle multiple inputs from a variety of sources and particularly suited to applications where the influent is pumped.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO S5	N/A
S5.8.12	Earthworks final surfaces should be well compacted and the subsequent permanent work or surface protection should be carried out immediately after the final surfaces are formed to prevent erosion caused by rainstorms. Appropriate drainage like intercepting channels should be provided where necessary.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO S5	N/A
S5.8.13	Measures should be taken to minimize the ingress of rainwater into trenches. If excavation of trenches in wet seasons is necessary, they should be dug and backfilled in short sections. Rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO S5	N/A
S5.8.14	Open stockpiles of construction materials (for examples, aggregates, sand and fill material) of more than 50m^3 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.	Control potential impacts from construction site runoff and land-	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A

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		based construction					
S5.8.15	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 directed into foul sewers. Discharge of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul sewerage system.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A
S5.8.16	Precautions to be taken at any time of year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecast, and actions to be taken during or after rainstorms are summarised in Appendix A2 of ProPECC PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events, especially for areas located near steep slopes.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A
S5.8.17	Oil interceptors should be provided in the drainage system and regularly cleaned to prevent the release of oils and grease into the storm water drainage system after accidental spillages. The interceptor should have a bypass to prevent flushing during periods of heavy rain.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A

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S5.8.18	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 located wheel washing bay should be provided at every site exit, and washwater 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 wheelwash 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.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A
S5.8.19	Silt removal facilities, channels and manholes should be maintained and the deposited silt and grit should be removed regularly, at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A
S5.8.20	It is recommended that on-site drainage system should be installed prior to the commencement of other construction activities. Sediment traps should be installed in order to minimise the sediment loading of the effluent prior to discharge into foul sewers. There shall be no direct discharge of effluent from the site into the sea.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A

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S5.8.21	All temporary and permanent drainage pipes and culverts provided to facilitate runoff discharge should be adequately designed for the controlled release of storm flows. All sediment control measures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly following rain storms. The temporarily diverted drainage should be reinstated to its original condition when the construction work has finished or the temporary diversion is no longer required.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A
S5.8.22	All fuel tanks and storage areas should be provided with locks and be located 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 the coastal waters.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.23	Minimum distances of 100m shall be maintained between the existing or planned stormwater discharges and the existing or planned seawater intakes during construction and operational phases	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO, TMDSS	N/A
S5.8.24	Under normal circumstances, groundwater pumped out of wells, etc. for the lowering of ground water level in basement or foundation construction, and groundwater seepage pumped out of tunnels or caverns under construction should be discharged into storm drains after the removal of silt in silt removal facilities.	Control potential impacts from construction site runoff and land-	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A

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		based construction					
S5.8.25 - S5.8.27 & Table 5.18	Grouting would be adopted as measure to reduce the groundwater inflow into the tunnel. During the tunnel excavation, the inflow rate of groundwater into the tunnel will be measured during the excavation. The groundwater levels above the tunnel will also be monitored by piezometers. If the inflow rate exceeds the pre-determined groundwater control criteria or the groundwater drawdown exceeds the required limit, pre-excavation grouting will be required to reduce the groundwater inflow. No significant change of groundwater levels would therefore be expected. Any chemicals/ foaming agents which would be entrained to the groundwater should be biodegradable and non-toxic throughout the tunnel construction. Potential groundwater quality impact would be minimal as the used material is non-toxic and biodegradable. No adverse groundwater quality would therefore be expected. Prescriptive measures in the form of an Action Plan with pre-emptive and re-active to preserve the groundwater levels at all times during the tunnel construction are set out in Table 5.18.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO, Buildings Ordinance	N/A
S5.8.28	Water used in ground boring and drilling for site investigation or rock / soil anchoring should as far as practicable be recirculated after sedimentation. When there is a need for final disposal, the wastewater should be discharged into storm drains via silt removal facilities.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Design Stage and Construction Phas	ProPECC PN 1/94, EIAOTM, WPCO	N/A

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S5.8.29 - S5.8.31	Wastewater generated from the washing down of mixing trucks and drum mixers and similar equipment should whenever practicable be recycled. The discharge of wastewater should be kept to a minimum. To prevent pollution from wastewater overflow, the pump sump of any water recycling system should be provided with an online standby pump of adequate capacity and with automatic alternating devices. Under normal circumstances, surplus wastewater may be discharged into foul sewers after treatment in silt removal and pH adjustment facilities (to within the pH range of 6 to 10). Disposal of wastewater into storm drains will require more elaborate treatment.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A
S5.8.32	All vehicles and plant should be cleaned before they leave a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. A wheel washing bay should be provided at every site exit if practicable and wash-water should have sand and silt settled out or removed before discharging into storm drains. The section of construction road between the wheel washing bay and the public road should be paved with backfall to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A
S5.8.33	Bentonite slurries used in diaphragm wall and borepile construction should be reconditioned and reused wherever practicable. If the disposal of a certain residual quantity cannot be avoided, the used slurry may be disposed of at the marine spoil grounds subject to obtaining a marine dumping licence from EPD on a case-by-case basis.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A

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S5.8.34	If the used bentonite slurry is intended to be disposed of through the public drainage system, it should be treated to the respective effluent standards applicable to foul sewer, storm drains or the receiving waters as set out in the WPCO Technical Memorandum on Effluent Standards.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A
S5.8.35	Water used in water testing to check leakage of structures and pipes should be reused for other purposes as far as practicable. Surplus unpolluted water could be discharged into storm drains.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A
S5.8.36	Sterilization is commonly accomplished by chlorination. Specific advice from EPD should be sought during the design stage of the works with regard to the disposal of the sterilizing water. The sterilizing water should be reused wherever practicable.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Design Stage and Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A
S5.8.37	Before commencing any demolition works, all sewer and drainage connections should be sealed to prevent building debris, soil, sand etc. from entering public sewers/drains.	Control potential impacts from construction site runoff and land-	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A

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		based construction					
S5.8.38	Wastewater generated from building construction activities including concreting, plastering, internal decoration, cleaning of works and similar activities should not be discharged into the stormwater drainage system. If the wastewater is to be discharged into foul sewers, it should undergo the removal of settleable solids in a silt removal facility, and pH adjustment as necessary	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A
S5.8.39	Acidic wastewater generated from acid cleaning, etching, pickling and similar activities should be neutralized to within the pH range of 6 to 10 before discharging into foul sewers. If there is no public foul sewer in the vicinity, the neutralized wastewater should be tinkered off site for disposal into foul sewers or treated to a standard acceptable to storm drains and the receiving waters	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A
S5.8.40	Wastewater collected from canteen kitchens, including that from basins, sinks and floor drains, should be discharged into foul sewer via grease traps capable of providing at least 20 minutes retention during peak flow.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A

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S5.8.41	Drainage serving an open oil filling point should be connected to storm drains via a petrol interceptor with peak storm bypass.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A
S5.8.42	Vehicle and plant servicing areas, vehicle wash bays and lubrication bays should as far as possible be located within roofed areas. The drainage in these covered areas should be connected to foul sewers via a petrol interceptor. Oil leakage or spillage should be contained and cleaned up immediately. Waste oil should be collected and stored for recycling or disposal in accordance with the Waste Disposal Ordinance.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A
S5.8.43	Construction work force sewage discharges on site are expected to be connected to the existing trunk sewer or sewage treatment facilities. The construction sewage may need to be handled by portable chemical toilets prior to the commission of the on-site sewer system. Appropriate numbers of portable toilets shall be provided by a licensed contractor to serve the large number of construction workers over the construction site. The Contractor shall also be responsible for waste disposal and maintenance practices.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.44	Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste)	Control potential impacts from accidental	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO, WDO	^

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	(General) Regulation should be observed and complied with for control of chemical wastes.	spillage of chemicals					
S5.8.45	Any service shop and maintenance facilities should be located on hard standings within a bunded area, and sumps and oil interceptors should be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage should only be undertaken within the areas appropriately equipped to control these discharges.	Control potential impacts from accidental spillage of chemicals	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO	^
S5.8.46	Disposal of chemical wastes should be carried out in compliance with the Waste Disposal Ordinance. The "Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes" published under the Waste Disposal Ordinance details the requirements to deal with chemical wastes. General requirements are given as follows: - suitable containers should be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport; - chemical waste containers should be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents; and - storage area should be selected at a safe location on site and adequate space should be allocated to the storage area.	Control potential impacts from accidental spillage of chemicals	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO, WDO	* (1) ^
S5.8.47	Collection and removal of floating refuse should be performed at regular intervals on a daily basis. The contractor should be responsible for keeping the water within the site boundary and the neighbouring water free from rubbish.	Control potential impacts from floating refuse and debris	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO,	^

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Ecological Impact							
S6.8.4	***Measures to Minimize Disturbance*** - Use of Quiet Mechanical Plant during the construction phase should be adopted wherever possible. - Hoarding or fencing should be erected around the works area boundaries during the construction phase. The hoarding would screen adjacent habitats from construction phase activities, reduce noise disturbance to these habitats and also to restrict access to habitats adjacent to works areas by site workers; - Regular spraying of haul roads to minimize impacts of dust deposition on adjacent vegetation and habitats during the construction activities	Minimize noise, human and traffic disturbance to terrestrial habitat and wildlife; and reduce dust generation	Design Team / Contractor	Land-based works are	Construction Phase	N/A	^ N/A N/A
S6.8.5	***Standard Good Site Practice*** - Placement of equipment or stockpile in designated works areas and access routes selected on existing disturbed land to minimise disturbance to natural habitats. - Construction activities should be restricted to works areas that should be clearly demarcated. The works areas should be reinstated after completion of the works. - Waste skips should be provided to collect general refuse and construction wastes. The wastes should be properly disposed off-site in a timely manner. - General drainage arrangements should include sediment and oil traps to collect and control construction site run-off. - Open burning on works sites is illegal, and should be strictly prohibited. - Measures should also be put into place so that litter, fuel and solvents do not enter	Reduce disturbance to surrounding habitats	Contractor	Land-based works are	Construction Phase	N/A	N/A ^ ^ N/A ^ ^

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	the nearby watercourses.						
S6.8.6	***Measure to Minimize Groundwater Inflow*** - The drained tunnel construction method with groundwater inflow control measures would generally be adopted. - During the tunnel excavation, pre-excavation grouting could be adopted to reduce the groundwater inflow and ensure that the tunnel would meet the long term water tightness requirements.	Minimize groundwater inflow	Contractor	Tunnel	Construction Phase	N/A	N/A N/A
S6.8.8	***Measure to Minimize Impact on Corals*** <u>Coral translocation</u> - It is recommended to translocate the affected coral colonies, except the locally common *Oulastrea crispata*, within the reclamation area and bridge footprint to the other suitable locations as far as practicable. - The coral translocation should be conducted during the winter months (November-March) in order to avoid disturbance during their spawning period (i.e. July to October). - A detailed coral translocation plan with a description on the methodology for pretranslocation coral survey, translocation methodology, identification/proposal of coral recipient site, monitoring methodology for posttranslocation should be prepared during the detailed design stage. - The coral translocation plan should be subject to approval by relevant authorities (e.g. EPD and AFCD) before commencement of the coral translocation. All the translocation exercises should be conducted by experienced marine ecologist(s)	Minimize loss of coral	Design team, contractor, project operator	Within reclamation areas and pier footprint	Prior construction	N/A	N/A N/A N/A N/A

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	who is/are approved by AFCD prior to commencement of coral translocation. <u>Post translocation Monitoring</u> - A coral monitoring programme is recommended to assess any adverse and unacceptable impacts to the translocated coral communities - Information gathered during each posttranslocation monitoring survey should include observations on the presence, survival, health condition and growth of the translocated coral colonies. These parameters should then be compared with the baseline results collected from the pre-translocation survey.						N/A N/A
S6.8.9 S6.8.10	***Measure to Control Water Quality Impact*** - Deployment of silt curtains around the active stone column installation points, opening of newly installed seawall and marine works area. - Diverting of the site runoff to silt trap facilities before discharging into storm drain; - Proper waste and dumping management; and - Standard good-site practice for land-based construction.	Control water quality impact, especially on suspended solid level; minimize the contamination of wastewater discharge, accidental chemical spillage and construction site runoff to the	Design Team, contractor	Marine and land based works area	Construction phase	WQO	N/A ^ ^ N/A

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		receiving water bodies					
S6.8.11	***Compensation for Vegetation Loss*** - Felling of mature trees should be compensated by planting of standard or heavy standard trees within or in vicinity of the affected area as far as practicable. Such compensatory planting for trees should be provided with at least a 1:1 ratio. In addition, vegetation at the temporarily affected area should be reinstated with species similar to the existing condition.	Compensate for the vegetation loss	Design Team, contractor	Land-based works area	Construction phase	N/A	N/A
Fisheries Impact							
S7.7.3	***Measure to Control Water Quality Impact*** - Deployment of silt curtains around the active stone column installation points, opening of newly installed seawall and marine works area.	Control water quality impact, especially on suspended solid level	Design Team / Contractor	Marine work area	Construction phase	WQO	^
Waste Management (Construction Phase)							
S8.6.3	***Good Site Practices and Waste Reduction Measures*** - Nomination of an approved person, such as a site manager, to be responsible for 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, proper waste management and chemical handling procedures; - Provision of sufficient waste disposdral points and regular collection of waste;	To reduce waste management impacts	Contractor	All work sites	Construction Phase	Waste Disposal Ordinance (Cap. 354) Land (Miscellaneous Provisions)	^ ^ ^

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	- Appropriate measures to minimize windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers; and - Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors.					Ordinance (Cap. 28)	^ N/A
S8.6.4	***Good Site Practices and Waste Reduction Measures (con't)*** - Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal; - Encourage collection of aluminium cans by providing separate labelled bins to enable this waste to be segregated from other general refuse generated by the workforce; - Proper storage and site practices to minimize the potential for damage or contamination of construction materials; and - Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste.	To achieve waste reduction	Contractor	All work sites	Construction Phase	Waste Disposal Ordinance (Cap. 354) Land (Miscellaneous Provisions) Ordinance (Cap. 28)	^ N/A ^ ^
S8.6.5	***Good Site Practices and Waste Reduction Measures (con't)*** The Contractor shall prepare and implement a WMP as part of the EMP in accordance with ETWB TCW No. 19/2005 which describes the arrangements for avoidance, reuse, recovery, recycling, storage, collection, treatment and disposal of different categories of waste to be generated from the construction activities. Such a management plan should incorporate site specific factors, such as the designation of	To achieve waste reduction	Contractor	All work sites	Construction Phase	ETWB TCW No. 19/2005	^

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	areas for segregation and temporary storage of reusable and recyclable materials. The EMP should be submitted to the Engineer for approval. The Contractor should implement the waste management practices in the EMP throughout the construction stage of the Project. The EMP should be reviewed regularly and updated by the Contractor.						
S8.6.6	***Good Site Practices and Waste Reduction Measures (con't)*** - C&D materials would be reused in the project and other local concurrent projects as far as possible.	To achieve waste reduction	Contractor	All work sites	Construction Phase	ETWB TCW No. 19/2005	N/A
S8.6.7	***Storage, Collection and Transportation of Waste*** Should any temporary storage or stockpiling of waste is required, recommendations to minimize the impacts include: - Waste, such as soil, should be handled and stored well to ensure secure containment, thus minimizing the potential of pollution; - Maintain and clean storage areas routinely; - Stockpiling area should be provided with covers and water spraying system to prevent materials from wind-blown or being washed away; and - Different locations should be designated to stockpile each material to enhance reuse.	To minimize potential adverse environmental impacts arising from waste storage	Contractor	All work sites	Construction Phase	-	^ ^ N/A ^
S8.6.8/ Waste Management	***Storage, Collection and Transportation of Waste (con't)*** - Remove waste in timely manner; - Waste collectors should only collect wastes prescribed by their permits; - Impacts during transportation, such as dust and odour, should be mitigated by	To minimize potential adverse environmental	Contractor	All work sites	Construction Phase		^ ^ ^

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Plan	the use of covered trucks or in enclosed containers; - Obtain relevant waste disposal permits from the appropriate authorities, in accordance with the Waste Disposal Ordinance (Cap. 354), Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 345) and the Land (Miscellaneous Provisions) Ordinance (Cap. 28); - Waste should be disposed of at licensed waste disposal facilities/ alternative disposal ground approved by RE and DEP; and - Maintain records of quantities of waste generated, recycled and disposed.	impacts arising from waste collection and disposal					^ ^ ^
S8.6.9/ Waste Management Plan	***Storage, Collection and Transportation of Waste (con't)*** - Implementation of trip ticket system with reference to DEVB TC(W) No. 6/2010, Trip Ticket System for Disposal of Construction & Demolition Materials, to monitor disposal of waste and to control fly-tipping at PFRFs or landfills. A recording system for the amount of waste generated, recycled and disposed (including disposal sites) should be proposed.	To minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	All work sites	Construction Phase	DEVB TCW No. 6/2010	^
S8.6.11 - S8.6.13/ Waste Management Plan	***Sorting of C&D Materials*** - Sorting to be performed to recover the inert materials, reusable and recyclable materials before disposal off-site. - Specific areas shall be provided by the Contractors for sorting and to provide temporary storage areas for the sorted materials. - The C&D materials should at least be segregated into inert and non-inert	To minimize potential adverse environmental	Contractor	All work sites	Construction Phase	DEVB TCW No. 6/2010 ETWB TCW No. 33/2002	^ ^ ^

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	materials, in which the inert portion could be reused and recycled in the reclamation as far as practicable before delivery to PFRFs. While opportunities for reusing the non-inert portion should be investigated before disposal of at designated landfills					ETWB TCW No. 19/2005	
S8.6.15 – S8.6.16/ Waste Management Plan	***Sediments*** - Sediment encountered may be reused as filling material on-site after cement stabilization. Cement-stabilization process is undertaken by mixing sediment and cement and will convert sediment to earth filling material. The treated sediment has to comply with Risk-Based Remediation Goals (RBRGs) before being reused in order not to raise any land contamination issue. The adoption of RBRGs to assess stabilized sediment has been proposed in the current C&DMMP. MFC has no adverse comment on the current C&DMMP. The sediment quality indicates that all sediments comply with most stringent RBRGs except for one sediment sample (TKO-EBH501 3-3.95m) with lead exceeding the RBRG. Except for the sediment sample (TKO-EBH501 3-3.95m), the chemical screening results do not indicate sediment as contaminated soil. It is anticipated that reuse of sediment except sediment sample (TKO-EBH501 3-3.95m) will not lead to land contamination. - Despite exceedance of RBRG, onsite reuse of sediment under sample (TKO-EBH501 33.95m) as filling material after cement stabilization is also a suitable treatment. Sediment quality indicates the sediment sample (TKO-EBH501 3-3.95m) exceed RBRG for lead. While cement stabilization will immobilize metal	To ensure the sediment to be disposed of in an authorized and least impacted way	NE/2015/02, NE/2017/01	All works areas with sediments concern	Construction Phase	RBRG	N/A N/A

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	contaminants, it is capable to treat the exceedance on lead. The stabilized material should comply with UTS of Lead and UCS. If the treated material do not comply with UTS or UCS, re-stabilization have to be undertaken to meet compliance of UTS and UCS before reusing the treated sediment as filling material. However, further agreement on final disposal/treatment on sediment under sample (TKO-EBH501 3-3.95m) has to be sought from DEP						
S8.6.17 – S8.6.20	***Sediments (con't)*** - Requirements of the Air Pollution Control (Construction Dust) Regulation, where relevant, shall be adhered to during boring, excavation, transportation and disposal of sediments or cement stabilization of sediment. - A treatment area should be confined for carrying out the cement stabilization mixing and temporary stockpile. The area should be designed to prevent leachate from entering the ground. Leachate, if any, should be collected and discharged according to the Water Pollution Control Ordinance (WPCO). - In order to minimise the potential odour / dust emissions during boring, excavation and transportation of the sediment, the excavated sediments should be kept wet during excavation/boring and should be properly covered when placed on barges/trucks. Loading of the excavated sediment to the barge should be controlled to avoid splashing and overflowing of the sediment slurry to the surrounding water. - In order to minimise the exposure to contaminated materials, workers should, when necessary, wear appropriate personal protective equipments (PPE) when	To determine the best handling and treatment of sediment	Contractor	All works areas with sediments concern	Construction Phase		^ ^ ^ N/A

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	handling contaminated sediments. Adequate washing and cleaning facilities should also be provided on site.						
S8.6.21/ Waste Management Plan	***Sediments (con't)*** - Alternatively, excavated sediment can be treated with marine disposal. The basic requirements and procedures for excavated sediment disposal specified under ETWB TC(W) No. 34/2002 shall be followed. MFC is responsible for the provision and management of disposal capacity and facilities for the excavated sediment, while the permit of marine dumping is required under the Dumping at Sea Ordinance and is the responsibility of the DEP.	To ensure the sediment to be disposed of in an authorized and least impacted way	NE/2015/02, NE/2017/01	All works areas with sediments concern	Construction Phase	ETWB TC(W) No. 34/2002 & Dumping at Sea Ordinance	^
S8.6.23	***Sediments (con't)*** - For allocation of sediment disposal sites and application of marine dumping permit, separate SSTP has to be submitted to EPD for agreement under DASO. Additional site investigation, based on the SSTP, maybe carried out in order to confirm the disposal arrangements for the proposed sediments removal. A Sediment Quality Report (SQR) shall then be required for EPD agreement under DASO prior to the tendering of the construction contract, discussing in details the site investigation, testing results as well as the delineation of each of the categories of excavated materials and the corresponding types of disposal.	To determine the best handling and disposal option of sediment	Contractor	All works areas with sediments concern	Construction Phase	ETWB TC(W) No. 34/2002 & Dumping at Sea Ordinance	^
S8.6.24 - S8.6.28/ Waste Manage	***Sediments (con't)*** - The excavated sediments is expected to be loaded onto the barge and transported to the designated disposal sites allocated by the MFC. The excaveted sediment would be disposed of according to its determined disposal	To ensure handling of sediments are in accordance to	Contractor	All works areas with sediments concern	Construction Phase	ETWB TC(W) No. 34/2002 & Dumping at Sea Ordinance	^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
ment Plan	options and ETWB TC(W) No. 34/2002. - Stockpiling of contaminated sediments should be avoided as far as possible. If temporary stockpiling of contaminated sediments is necessary, the excavated sediment should be covered by tarpaulin and the area should be placed within earth bunds or sand bags to prevent leachate from entering the ground, nearby drains and surrounding water bodies. The stockpiling areas should be completely paved or covered by linings in order to avoid contamination to underlying soil or groundwater. Separate and clearly defined areas should be provided for stockpiling of contaminated and uncontaminated materials. Leachate, if any, should be collected and discharged according to the Water Pollution Control Ordinance (WPCO). - In order to minimise the potential odour / dust emissions during boring and transportation of the sediment, the excavated sediments should be kept wet during excavation/boring and should be properly covered when placed on barges. Loading of the excavated sediment to the barge should be controlled to avoid splashing and overflowing of the sediment slurry to the surrounding water. - The barge transporting the sediments to the designated disposal sites should be equipped with tight fitting seals to prevent leakage and should not be filled to a level that would cause overflow of materials or laden water during loading or transportation. In addition, monitoring of the barge loading shall be conducted to ensure that loss of material does not take place during transportation. Transport barges or vessels shall be equipped with automatic self-monitoring devices as	statutory requirements					^ ^ ^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	specified by the DEP. - In order to minimise the exposure to contaminated materials, workers should, when necessary, wear appropriate personal protective equipments (PPE) when handling contaminated sediments. Adequate washing and cleaning facilities should also be provided on site. - Another possible arrangement for Type 3 disposal is by geosynthetic containment. A geosynthetic containment method is a method whereby the sediments are sealed in geosynthetic containers and, at the disposal site, 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, thereby meeting the requirements for fully confined mud disposal.						N/A N/A
S8.6.26/ Waste Management Plan	***Chemical Wastes.*** - If chemical wastes are produced at the construction site, the Contractor would be required to register with the EPD as a Chemical Waste Producer and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. The Contractor shall use a licensed collector to transport and dispose of the chemical wastes, to either the Chemical Waste Treatment Centre	To ensure proper management of chemical waste	Contractor	All works sites	Construction Phase	Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes Waste Disposal (Chemical Waste) (General) Regulation	^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	at Tsing Yi, or other licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.						
S8.6.27/ Waste Management Plan	***General Refuse*** - General refuse should be stored in enclosed bins or compaction units separate from C&D material. A reputable waste collector should be employed by the contractor to remove general refuse from the site, separately from C&D material. Preferably an enclosed and covered area should be provided to reduce the occurrence of 'wind blown' light material.	To ensure proper management of general refuse	Contractor	All works sites	Construction Phase	Public Health and Municipal Services Ordinance (Cap. 132)	^
Impact on Cultural Heritage (Construction Phase)							
S9.6.4	Dust and visual impacts - Temporarily fenced off buffer zone with allowance for public access (minimum 1 m) should be provided; - The open yard in front of the temple should be kept as usual for annual Tin Hau festival; - Monitoring of vibration impacts should be conducted when the construction works are less than 100m from the temple.	To prevent dust and visual impacts	Contractors	Work areas	Construction Phase	EIAO; GCHIA; AMO	N/A N/A N/A
S9.6.4	Indirect vibration impact - Vibration level is suggest to be controlled within a peak particle velocity (ppv) limit of 5mm/s measured inside the historical buildings; - Monitoring of vibration should be carried out during construction phase. - Tilting and settlement monitoring should will be applied on the Cha Kwo Ling Tin Hau Temple as well.	To prevent indirect vibration impact	Contractors	Work areas	Construction Phase	Vibration Limits on Heritage Buildings by CEDD; GCHIA; AMO.	N/A N/A N/A

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	- A proposal with details for the mitigation measures and monitoring of impacts on built heritage shall be submitted to AMO for comments before commencement of work.						N/A
Built Heritage Mitigation Plan	- Established Alert, Alarm and Action Level for the monitoring parameters. - To increase the instrumentation monitoring and reporting frequency. - To propose detailed action plan or contingency plan for the Engineer's approval when AAA Level is reached or exceeded.	To prevent vibration impacts	NE/2015/01	Tin Hau Temple	Construction Phase	Vibration Limits on Heritage Buildings by CEDD; GCHIA; AMO.	N/A N/A N/A
Landscape and Visual Impact (Construction Phase)							
Table 10.8.1/ Landscape Mitigation Plan	CM1 - Construction area and contractor's temporary works areas to be minimised to avoid impacts on adjacent landscape.	Avoid impact on adjacent landscape areas	CEDD (via Contractor)	General	Construction planning and during construction period	N/A	N/A
Table 10.8.1/ Landscape Mitigation Plan	CM2 - Reduction of construction period to practical minimum.	Minimise duration of impact	CEDD (via Contractor)	N/A	Construction planning	N/A	N/A
Table	CM3 - Topsoil, where the soil material meets acceptable criteria and where practical,	To allow re-use	CEDD (via	General	Site clearance	As per the	N/A

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
10.8.1/ Landscape Mitigation Plan	to be stripped and stored for re-use in the construction of the soft landscape works. The Contract Specification shall include storage and reuse of topsoil as appropriate.	of topsoil	Contractor)			Particular Specification	
Table 10.8.1/ Landscape Mitigation Plan	CM4 - Existing trees at boundary of site and retained trees within site boundary to be carefully protected during construction. Detailed Tree Protection Specification shall be provided in the Contract Specification, under which 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. (Tree protection measures will be detailed at Tree Removal Application stage).	To minimize tree loss	CEDD (via Contractor)	As per approved Tree Removal Application(s)	Site clearance and throughout construction period	ETWB TC 3/2006 and as per tree protection measures in Particular Specification	N/A
Table 10.8.1/ Landscape Mitigation Plan	CM5 - Trees unavoidably affected by the works shall be transplanted where practicable. Where possible, trees should be transplanted direct to permanent locations rather than temporary holding nurseries. A detailed tree transplanting specification shall be provided in the Contract Specification and sufficient time for preparation shall be allowed in the construction programme.	To maximize preservation of existing trees	CEDD (via Contractor)	As per approved Tree Removal Application(s)	Site clearance	ETWB TC 3/2006 and as per tree protection measures in Particular Specification	N/A
Table 10.8.1/ Landscape	CM6 - Advance screen planting of fast growing tree and shrub species to noise barriers and hoardings. Trees shall be capable of reaching a height >10m within 10 years.	To maximize screening of the works	CEDD (via Contractor)	At Lam Tin Interchange and edge of Road P2	Beginning of construction period	N/A	N/A

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
Mitigation Plan				landscape deck, TKO			
Table 10.8.1/ Landscape Mitigation Plan	CM7 - Hydroseeding or sheeting of soil stockpiles with visually unobtrusive material	To reduce visual intrusion	CEDD (via Contractor)	General	Throughout construction period	As per Particular Specification	N/A
Table 10.8.1/ Landscape Mitigation Plan	CM8 - Control of night-time lighting by hooding all lights and through minimisation of night working periods.	To reduce visual intrusion	CEDD (via Contractor)	General	Throughout construction period	N/A	N/A
Table 10.8.1/ Landscape Mitigation Plan	CM9 - Screening of works areas with hoardings with appropriate colours compatible with the surrounding area	Reduction of visual intrusion	CEDD (via Contractor)	Project site Boundary	Excretion of site hoarding	N/A	N/A
Table 10.8.1/	CM10 - Avoidance of excessive height and bulk of site buildings and structure	Reduction of visual intrusion	CEDD (via Contractor)	Built structures	Design and construction	N/A	N/A

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
Landscape Mitigation Plan		and integration with environment			stage		
Table 10.8.1/ Landscape Mitigation Plan	CM11 - Limitation of run-off into freshwater streams, ponds and sea areas	Avoidance of contamination of water courses and water bodie	CEDD (via Contractor)	TKO reclamation, TKO tunnel portal, Cha Kwo Ling roadworks	Throughout construction period	N/A	N/A
Table 10.8.1	CM12 - Minimise area of reclamation and design the edges sensitively to tie in with adjacent coastline characte	Minimise loss of Junk Bay and integration with existing coastlin	CEDD (via Contractor)	Temporary reclamation for barging points at TKO and Lam Tin and permanent reclamation for TKO Interchange slip roads	Construction planning and reclamation stages	N/A	N/A

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
				and Road P2			

Table II - Observations/reminders/non-compliance made during Site Audit

NIL IN THE REPORTING MONTH

Key:

* Observation/reminder was made during site audit but improved/rectified by the contractor.

\# Observation/reminder was made during site audit but not yet improved/rectified by the contractor.

X Non-compliance of mitigation measure

• Non-compliance but rectified by the contractor

APPENDIX O
SUMMARIES OF ENVIRONMENTAL COMPLAINT, WARNING, SUMMON AND NOTIFICATION OF SUCCESSFUL PROSECUTION

Appendix O - Cumulative Log for Complaints, Notifications of Summons and Successful Prosecutions

Cumulative Complaint Log for Tseung Kwan O - Lam Tin Tunnel

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
416	29-Dec-19	29-Dec-19 / Non-specific	Resident of Hong Pak Court	Noise	Groundborne Noise from Works area	Y	Project-related with valid CNP. Contractor is reminded to reduce noise emissionfeaf and prevent breaking and noisy activities during restricted hours.	On-going
415	27-Dec-19	25-Dec-19 / Lam Tin Interchange (Portion IVC)	Resident of Yau Estate	Noise	Noise nuisance from Portion IVC	Y	Non project-related due to maintenance works of East Cross-harbor Tunnel.	On-going
414	24-Dec-19	22-Dec-19 / Lam Tin Interchange (Portion IVC)	Resident of Yau Estate	Noise	Piling noise nuisance near Lam Tin Interchange	Y	Project-related with valid CNP. Contractor is reminded to reduce noise emission and prevent breaking and noisy activities during restricted hours.	On-going
413	24-Dec-19	24-Dec-19 / Portion IX of Contract 2	Resident of Capri & Ocean Shores	Noise	Loud and continuous noise emission from Portion IX	Y	No breaking activity was conducted by the C3. The complaint was still under investigation.	On-going
412	19-Dec-19	14-Dec-19 / marine works area	Resident of Ocean Shores	Noise	Noise nuisance from the marine works area	Y	The major construction work was driven by pin piles. The noise emitted due to the construction activities is considered to be reduced to an acceptable level as no NSR falls under the ambit of 300m study area of the work site.	Draft CIR submitted
411	2-Dec-19	30-Nov-19 / Construction Sites Outside TKL Sports Center	Resident of Park Central	Air / Noise	Non-effective noise mitigation measures and related dust and noise nuisance	Y	The construction noise created by breaking works are considered non-project related due to the large separation distance between noise source and the Complainant's Location. Major dust emission from the works area next to C3 was recorded. The Contractor is reminded to provide regular watering to dusty works. Details should be referred to CIR-C31.	Draft CIR submitted

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
410	28-Nov-19	25-Nov-19 / Portion 4C	Anonymous	Noise	Noise nuisance from Lam Tin Works Area and operation hours	Y	Refer to Complaint #408	Draft CIR submitted
409	27-Nov-19	20-Nov-19 27-Nov-19 / Construction Sites near Po Yap Road & Chui Ling Road	Resident of Park Central	Air / Noise	Dust emission due to excavation works and noise nuisance from Piling works	Y	Although noise barrier had been erected and around the breakers, the direct line of sight to the NSRs at Park Central could not be totally blocked. The Contractor is recommended to provide cantilevered noise barrier with noise absorbing materials to minimise noise impact as far as practicable. Details should be referred to CIR-C31.	Draft CIR submitted
408	25-Nov-19	Non-specific (Nov-19) / Portion 4C	Resident of Yau Lai Estate	Noise	Serious Noise Nuisance from Lam Tin Works Area	Y	Despite the Contractor had applied different noise mitigation measures (e.g. semi enclosure and noise barrier). Environmental deficiency was observed during site audit session. The Contractor is recommended to apply alternative noise mitigation measures to improve the situation. The details shall be refer to CIR-N89.	Draft CIR submitted
407	12-Nov-19	Non-specific (Nov-19) / LT Construction Site	Non-specified(Complainant has previously made complaints on LTI)	Operation Hours	Inquiries on operating hours & Noise Nuisance	N	The time of complaint falls under day-time. According to the Contractor and RE, the general starting time of construction works are 08:15 on normal week days. The Contractor had avoid conduct noisy works on morning to minimize noise impacts for the nearby residents. The details shall be refer to CIR-O3	Draft CIR submitted
406	5-Nov-19	5-Nov-19 / Tunnel near TKO	District Council Member (Mr. Chan)	Noise	Noise nuisance from Blasting activities during night-time	Y	No blasting was carried out on that night. The construction activities were conducted inside the tunnel with the blast door closed. The CNP that the Contractor held remained valid during the time of complaint. The details shall be refer to CIR-N88	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
405	29-Oct-19	17-Oct-2019 / Marine Works area near Ocean Shore	District Council Member (Mr. Chan)	Noise	Daytime times noise nuisance	Y	The complaint details does not tally up with the information provided with the Contractor and RE. Referring to the Contractor, there was construction works was starting at 09:00. Noise mitigation measures, such as acoustic mats, were applied to minimize noise impact. The details shall be refer to CIR-N87	Closed
404	15-Oct-19	12-Oct-19 / Marine Works area near Ocean Shore	Residents of Ocean Shores	Noise / Working Hours	Noise nuisance due to operation of barge on Saturday early morning	Y	The time of complaint falls within daytime and the major works conducted are dredging and reclamation. The contractor did not require any extra mitigation measures. The contractor had applied sound-proofing mat on the engine floor of the barges and is recommended to strictly follow the requirements of noise mitigation plan. The details shall be refer to CIR-N86	Draft CIR submitted
403	15-Oct-19	Oct-19 (Not Specified) / C2 Construction Site	Residents of Ocean Shores	Noise / Working Hours	Operation of marine construction works during late hours	Y	The major construction works is trimming works for the rock mount during the time period of complaint. Mitigation measures provided by the Contractor included provision of noise insulating mats to the engine floor of the barges and shorten the work hours by ending construction works on or before 21:00 since early Oct 2019. Details shall be referred to CIR-N85.	Closed
402	10-Oct-19	09-Oct-2019/ Site near TKO CPC	Residents of Ocean Shores	Noise	Noise nuisance of construction works at marine work area during early morning	Y	No construction activity at both the Cavern near the BCMCP Bridge and Platform 1B, including the barge, in particular during the complaint period between 2am and 3am on 9 Oct 2019. Since no works had conducted during the time of complaint, no mitigation measures are required. The details shall be referred to CIR-N84.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
401	5-Oct-19	05-Oct-2019 / C2 Portion IX	District Council Member (Mr. Chan)	Noise	High noise level from works area during daytime	Y	The time period of complaint falls under day-time and therefore the Contractor is required to carry out mitigation measures according to the latest CNMP only. The construction activities had been reviewed and no non-compliance was identified. No Limit Level of Exceedance at daytime was recorded during October 2019. For mitigation measures, the Contractor had set up sound-proofing mats and SlientUp to reduce noise impact. The details shall be refer to CIR-N83.	Closed
400	16-Sep-19	10-Sep-19 / TKO Marine Works Area	District Council Member (Mr. Chan)	Water	Muddy water discharge and deficiency in water quality mitigation measures	N	With accordance to the Contractor and RE, the silt curtains were deployed regarding to SCDP ver. 8 since 10-Sep-19, site inspection on 12-Sep-19 also showed the silt curtains were deployed properly. Despite there are chances of accidental muddy water discharge due to the removal of cofferdam on 13-Sep-19, local silt curtain had been place in order to minimize the unavoidable impact by related loading and unloading of fill materials. No muddy water had been observed outside the silt curtain area. Nevertheless, the Contractor is recommend to expand the coverage of the local silt curtain in order to well-confine the muddy water released from the grab. On top of that, the Contractor shall always follow the SCDP to ensure the minimization of impacts. Details should be referred to CIR-C30.	Closed
399	16-Sep-19	16-Sep-19 (Not Specified) / LT Interchange Potion III	Resident of Bik Lai House, Yau Lai Estate	Noise	Noise emission from the tunnel entrance (Potion III)	Y	No construction works was carried out during the time of complaint. Details should be referred to CIR-N82.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
398	16-Sep-19	13-Sep-19 / Works Area of LT-TKO Tunnel outside Tiu King Leng MTR Station	Anonymous	Air / Water	Dark smoke emission and muddy water discharge from the marine work vessels near shore	N	No dark smoke emission was observed during the site inspection conducted in the week of the complaint. The Contractor has applied an air filtering tank to clean the exhaust from the barge before emission. Details should be referred to CIR-C30.	Closed
397	6-Sep-19	30 Aug-19 / Works area near Ocean Shores	Resident of Ocean Shores	Noise / Working hours	Noise emitted from Barge during Evening times	Y	The unloading works had been reviewed and no limit level of exceedance were recorded during August to early September. Since the period of complaint falls under evening times, no mitigation measures were required by the CNP. Details should be referred to CIR-N81.	Closed
396	6-Sep-19	30 Aug-19 / Works area near Ocean Shores	Resident	Noise	Noise nuisance from LT-TKO Tunnel	Y	The major works conducted were shortcreting, mucking out, maintaining, drilling and unloading. No limit level of exceedance in the restricted hours (19:00-23:00) between late August and early September were recorded. The Contractor is recommended to keep following noise mitigation plan to minimize noise nuisance. Details should be referred to CIR-N80.	Closed
395	6-Sep-19	31 Aug-19 / Works area near Ocean Shores	District Council Member (Mr. Chan)	Noise	Noise Nuisance during evening and night times	Y		Closed
394	6-Sep-19	Not specified (Sep-19) / Works area near Ocean Shores	Anonymous	Noise / Operating Hours	Noise nuisance during Evening & occasionally in Night time	Y		Closed
393	30-Aug-19	30 Aug-19 / Marine works Area	District Council Member (Mr. Chan)	Water	Alleged muddy water discharge	N	High rainfall was recorded during period of complaint, therefore muddy water discharge at outfall from upstream and some surface runoff within the site is expected. However, no major silt curtain deficiency was observed during on-site observation and no leakage of muddy water from the marine works area was observed. Details should be referred to CIR-W12.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
392	29-Aug-19	20-27 Aug-19/ Portion 4C	Resident of Bik Lai House, Yau Lai Estate	Noise	Noise nuisance from the operation of heavy machineries and missing of noise mitigation measures at Portion 4C	Y	A noise insulating cover was erected before the period of complaint, however, due to restricted site condition in the relocated breaking works area, the erection of the cover could not be carried out. Nevertheless, movable noise barriers and local semi-enclosure was adopted for breaking works. Details should be referred to CIR-N79.	Closed
391	26-Aug-19	10-Jul-19 / Construction site near Ocean shore	District Council Member (Mr. Chan)	Noise	Operation of construction works during late hours	Y	1 derrick barge was operated during the period of complaint with valid CNP. Regular maintenance and checking should be conducted for all operating barges. Details should be referred to CIR-N78.	Closed
390	26-Aug-19	31-Jul-19 / Construction site near Ocean shore	District Council Member (Mr. Chan)	Noise	Intermittent noise emitted from collision during night-time	Y	The noise source is suspected to be the collision between cofferdam and its broken part as the cofferdam was found damaged next morning. No construction was conducted at night time of 31 July. The contractor is recommended to maintain and check cofferdam regularly. Details should be referred to CIR-N77.	Closed
389	29-Jul-19	17 to 24-Jul-19 / Marine Construction Site near O King Road	Resident of Ocean Shore	Noise	Noise nuisance from the barge operating in reclamation works area near O King Road during evening times.	Y	1 derrick barge was operated during the period of complaint with valid CNP. Regular maintenance should be provided for all operating barges. Details shall refer to CIR-N76.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
388	12-Jul-19	8-Jul-19 / Construction Site near Ocean Shores	District Council Member (Mr. Chan)	Noise	Noise nuisance and inadequate noise barrier at the construction site near Ocean shore	Y	Although Contractor has adopted a noise mitigation measure of drill rigs at Portion IV near Ocean Shore such as noise barrier with sound insulating fabric, the existing noise barrier in Portion IX and some in Portion IV are not adequate in screening the direct line of sight to Ocean Shore. Details should be referred to CIR-N75.	Closed
387	12-Jul-19	8 to 12-Jul-19 / Portion 4C of C1 Construction Site	Resident of Bik Lai House	Noise	Breaking noise emitted from the operation of 2 PMEs at Portion 4C during weekday daytime.	Y	Two breakers were operated intermittently at the Portion 4C of C1 construction site during the period of complaint between 07:00 to 19:00. As observed during the site inspection/noise monitoring, movable noise barrier could not completely screen off the direct line-of-sight from PMEs to Yau Lai Estate. Contractor has adopted mitigation measure to minimize the noise impact from breakers including using a noise barrier with noise insulating fabric, adopted a less noisy hydraulic spiting method for breaking works and has been developing a semi-enclosure noise barrier to replace the existing movable noise barrier. Details should be referred to CIR-N74.	Closed
386	10-Jul-19	9 to 10-Jul-19 / Not Specific	District Council Member (Mr. Chan)	Noise	Noise nuisance and disturbance from the TKOLT tunnel construction site involves intermittent noise emitted from collision during night-time.	Y	No construction works was carried out during the time of complaint. Details should be referred to CIR-N73.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
385	4-Jul-19	Late Jun-19 to 4-Jul-19 / Reclamation Area	Resident of Ocean Shore	Noise	The reclamation works continued into the evening during weekdays and works were also operated on Sunday.	Y	See Complaint no 384.	Closed
384	3-Jul-19	3-Jul-19 / Near Ocean Shore	District Council	Noise	The construction site was constantly emitting metallic percussion noise in the early morning.	Y	The concerned metallic percussion noise source was suspected from the collision between the detached sheet pile and the adjacent sheet pile of the broken cofferdam. The detached sheet pile was fixed by re-sealing it to the adjacent sheet pile. Details should be referred to CIR-N72.	Closed
383	29-Jun-19	Jun-19 / Lam Tin Interchange	Resident of Yau Lai Estate, Yung Lai House	Noise	Noise nuisance from construction works during weekday daytime and evening times. Noise barriers was found missing in certain parts of the construction areas.	Y	Some noise mitigation measures were observed during the site inspection including idle equipment were turned off and noise barrier has been erected close to noisy PMEs in the right direction facing Yau Lai Estate. However, the above mitigation measures were not applied to whole construction site such as noise barriers were not placed close enough to the noisy PMEs due to the uneven surface and other inconvenience. Details should be referred to CIR-N71.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
382 (N08/RE/00 011019-19)	17-Jun-19	6-Jun-19 / Cofferdam area	District Council	Air	Dark smoke nuisance from the tug boat inside the cofferdam area.	N	During site audit, no violation of the Air Pollution Control (Smoke) Regulation from the construction site was observed by the ET. Air filter has been replaced on derrick barge to reduce the dark smoke emission upon the receipt of the complaint. The Contractor is recommended to replace the air filters regularly. Details should be referred to CIR-A15.	Closed
381 (N08/RE/00 015098-19)	11-Jun-19	1-Jun-19 / Near confferdam	District Council	Water	Muddy water discharge from construction site near the cofferdam area on 4 June 19	N	High volume of upstream muddy water was collected due high rainfall according to reports and observation. As a result, the muddy water from upstream was discharged into the Junk Bay via various outfalls in Junk Bay, as observed during the rainstorm events. No sand plume within the cofferdam area and no muddy water discharge at the designated discharge point within the Site was identified during the site inspection and water quality monitoring. Details should be referred to CIR-W11.	Closed
380	11-Jun-19	6-Jun-19 / Near Tong Yin Street	Resident of Ocean Shore	Air	Odour nuisance from construction site near Tong Yin Street	N	No oil leakage from mobile crane was observed during the site inspection in June 2019. According to the testing reports, all ULSD fuel applied in the PMEs during the construction period contains sulphur content lower than 0.005% by weight, which complied with the Air Pollution Control (Fuel Restriction) Regulations. Details should be referred to CIR-A14.	Closed
379	11-Jun-19	4-Jun-19 / Near cofferdam area	General Public	Water	Discharge of mud water into Junk Bay from TKOLT construction site	N	See Complaint no 381.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
378	11-Jun-19	13-Apr-19 / Near cofferdam area	General Public	Air	Dark smoke nuisance from construction site involves derrick barge operation near cofferdam area (daytime)	N	No violation of the Air Pollution Control (Smoke) Regulation was recorded from the construction site was observed. The contractor was recommended to install carbon filter at smoke exhaust of the barge as a more effective mitigation measures. Details should be referred to CIR-C27.	Closed
377	11-Jun-19	2-Jun-19 / Lam Tin Interchange	General Public	Noise	Complaint about the noise nuisance from Lam Tin Interchange construction site in daytime holiday.	Y	Only drilling works inside the tunnel was conducted during daytime under valid CNP. Groundborne noise is considered as the major factor contributing to the noise nuisance, the Contractor are recommended to re-schedule the drilling works inside the tunnel to less sensitive hours. Details should be referred to CIR-N70.	Closed
376	11-Jun-19	9-Jun-19 / Near Yau Lai Estate	Resident of Yau Lai Estate	Noise	Complaint about the noise nuisance near Yau Lai Estate involves vehicle movement (roller) during morning to 15:00 in holiday.	Y	No works involving roller was involved. Only drilling works inside the tunnel and ddismantling of crusher shelter was conducted during Sunday daytime under valid CNP. Groundborne noise is considered as the major factor contributing to the noise nuisance, the Contractor are recommended to re-schedule the drilling works inside the tunnel to less sensitive hours. Details should be referred to CIR-N70.	Closed
375	11-Jun-19	9-Jun-19 / Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Complaint about the noise nuisance from Lam Tin Interchange construction site in daytime holiday.	Y	See Complaint no. 376.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
374	4-Jun-19	3-Jun-19 / Near Ping Tin Estate	Resident of Ping Sin House in Ping Tin Estate	Noise	Vibration from the construction of Lam Tin Interchange in evening time at around 20:00	Y	Groundborne noise is considered as the major factor contributing to the noise nuisance. The reverse circulation drilling works may have emitted groundborne noise, however, only 1 unit was used in Portion II. Therefore, blasting is considered as the major cause for the vibration. Details should be referred to CIR-N69.	Closed
373	4-Jun-19	2-Jun-19 / Near ocean Shore	Resident of Ocean Shore	Noise	Complaint about the noise nuisance from the construction site near Ocean Shore and the construction site operation in day time holiday.	Y	No construction activity was conducted at the time of complaint as confirmed by Engineer. Therefore, the noise nuisance was not due to the construction site. Details should be referred to CIR-N68.	Closed
372	4-Jun-19	1-Jun-19 / Near ocean Shore	Resident of Ocean Shore	Others	Complaint about the construction site operation in the early morning on Saturday.	N	See Complaint no. 373.	Closed
371	30-May-19	30-May-19 / Near Ocean Shore	Resident of Ocean Shore	Noise	Noise nuisance from construction site near Ocean Shore during night time.	Y	See Complaint no. 373.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
370 (N08/RE/00 015098-19)	29-May-19	19 & 26-May-19 / Near Ocean Shore	Resident of Ocean Shore	Noise	Noise nuisance about dredging mud and loudspeaker in the construction site near Ocean Shore during daytime holiday.	Y	Noise barriers/ Noise absorptive materials have been used to mitigate the noise generated from the construction works. Only walkie-talkies were used for communication in the construction site. Details should be referred to CIR-N67.	Closed
369	13-May-19	Not specific / Lam Tin interchange	Resident of Yau Lai Estate	Noise	Noise nuisance from the blasting work inside tunnel which involves explosion noise impact during midnight	Y	Contractor has adopted a mitigation measure for reduce the blasting noise impact from the tunnel such as blasting doors and did not conduct blasting works during mid-night blasting since mid-May 2019. Details should be referred to CIR-N66.	Closed
368	19-May-19	19-May-19 / Near cofferdam area	General Public	Noise	Noise nuisance from barge with in cofferdam area in daytime holiday	Y	See Investigation / Mitigation Action for complaint no. 361.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
367	5-May-19	5-May-19 / Lam Tin Tunnel - TKO entrance	Resident near Lam Tin Tunnel - TKO entrance	Noise & Air	Noise and air nuisance from construction near Lam Tin Tunnel - TKO entrance	Y	The major works during the period of complaint is scaling by breaker on day time holiday (Sunday). The works is compiled with CNP and no air quality action and noise limit level exceedance during the monitoring. Regarding the existing air quality mitigation measures, the water spray for the breaker was insufficient and the dust emission during unloading of dusty materials was observed. As the review of exiting noise mitigation measure, a broken noise SilentMat was found on the hammer of breaker. According to the above observation, Contractor has adopted serval improvement such as conduct a sufficient water spray during breaking and unloading materials, replaced the noise SilentMat of the breaker and placed the noise barrier between PME and NSRs. Details should be referred to CIR-C29.	Closed
366	4-May-19	4-May-19 / Lam Tin Interchange	Resident of Ping Tin Estate	Noise	Noise nuisance from construction of Lam Tin Interchange in daytime.	Y	Regarding the observation during site inspection, the hammer of the breaker was surrounded by a broken noise absorption material and a noise barrier of a driller was placed in the incorrect direction of NSRs. Contractor has improved the above mitigation measures including replaced the noise absorption materials and relocated the noise barrier to facing the NSRs. Details should be referred to CIR-N65.	Closed
365	1-May-19	1-May-19 / Lam Tin Interchange	Resident of Ping Tin Estate	Noise	Noise nuisance from construction of Lam Tin Interchange in daytime.	Y	See investigation / mitigation actions for Complaint No.366	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
364	1-May-19	1-May-19 / Lam Tin Interchange	Resident of Ping Tin Estate	Noise	Noise nuisance from construction of Lam Tin Interchange in daytime	Y	See investigation / mitigation actions for Complaint No.366	Closed
363	30-Apr-19	6th – 22th April -19 / Lam Tin Interchange	Resident of Ping Tin Estate	Noise	Noise nuisance from construction of Lam Tin Interchange in daytime and evening time	Y	See investigation / mitigation actions for Complaint No.366	Closed
362 (N08/RE/00 013396-19)	8-May-19	7-May-2019 / Junk Bay	District Council	Noise	Noise nuisance from marine works in the Junk Bay in the night-time (06:45)	Y	No marine works in the Junk Bay was conducted as confirmed by RE. No CCTV footage was recorded during the time of complaint. It was suggested that Contractor should conduct 24 hours CCTV monitoring. Details should be referred to CIR-N64.	Closed
361	7-May-19	28 Apr 2019 / Cofferdam Area	General Public	Noise	Noise nuisance from construction site at cofferdam area in holiday	Y	The reclamation works involves barges during the time of complaints has been compiled with the CNP. As review of existing mitigation measure, the sound proofing canvases for the barges were hanged up. Details should be referred to CIR-N63.	Closed
360	2-May-19	27-04-2019/ Construction in Tong Tin Street	General Public	Noise	The complaint about the noise nuisance from cofferdam area during daytime and evening-time.	Y	The light source was found from the lighting of derrick barge within the cofferdam area and the noise source was found from the barge during filling works. Contractor has adopted The sound proofing canvases for the derrick barge was hanged up but no light mitigation measure. Details should be referred to CIR-C28.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
359	30-Apr-19	30-04-2019/ Near Ocean Shore	Resident of Ocean Shore	Noise	The complaint about the noise nuisance involve percussion noise near Ocean Shore during daytime.	Y		Closed
358	30-Apr-19	27-04-2019/ Near cofferdam area	General Public	Noise	The complaint about the noise nuisance during evening time.	Y		Closed
357	23-Apr-19	20-04-2019/ Near cofferdam area	General Public	Noise	The complaint about the noise nuisance near cofferdam area during daytime.	Y		Closed
356	23-Apr-19	19-04-2019/ Near cofferdam area	General Public	Noise	The complaint about the noise nuisance near cofferdam area during holiday.	Y		Closed
355	17-Apr-19	17-04-2019/ Near cofferdam area	General Public	Noise & light	The complaint about the noise nuisance and light pollution near cofferdam area during evening-time.	Y		Closed
354	30-Apr-19	20 Apr 2019 / Cofferdam Area 19 Apr 2019 / Cofferdam Area	Resident of Ocean Shore (Mr. Chan)	Others	The construction site near O King Road is operated in holiday during	N	The marine reclamation works at the Portion IX in C2 construction site was the major construction activity during the period of complaints. The concerned reclamation works is compiled with the relevant CNP. Details should be referred to CIR-O2.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
		15 Apr 2019 / Cofferdam Area 07 Apr 2019 / Cofferdam Area 31 Mar 2019 / Cofferdam Area			day-time and weekday during night-time.			
353	13-Apr-19	13-04-2019/Cofferdam Area	Resident of Ocean Shore (Mr. Chan)	Air	According to the complainant, large amount of smoke and exhaust was seen emitting from barges working within the cofferdam	N	See Investigation / Mitigation Action for complaint no. 329.	Closed
352	13-Apr-19	13-04-2019/Cofferdam Area	Resident of Ocean Shore	Noise	The complainant complained about the noise nuisance from the cofferdam area in Tiu Keng Leng during day-time.	Y	The major works during the time of complaints was a crawler crane unloading H piles to the Portion V of C2 construction site. Noise barriers were erected between the crane and NSRs to reduce noise impact. Details should be referred to CIR-N62.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
351	13-Apr-19	13-04-2019/Cofferdam Area	Resident of Ocean Shore	Noise	The complainant complained the noise nuisance from the cofferdam area in Tiu Keng Leng during day-time.	Y		
350	8-Apr-19	07 Apr 2019 / Cofferdam Area in TKO	-	Air & Others	The complainant complained the dark smoke generation and the construction works from the cofferdam area in Tiu Keng Leng during holiday.	N	See Investigation / Mitigation Action for complaint no. 329.	Closed
349	7-Apr-19	07-04-2019/Cofferdam Area	Resident of Ocean Shore	Air	Dark smoke generation from the cofferdam area in Tiu Keng Leng during day-time.	N		Closed
348	2-Apr-19	02 Apr 2019 / LTT-TKO	-	Others	The complainant complained the LTT construction site was working during holiday.	N		Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
347	1-Apr-19	01 Apr 2019 / Cofferdam Area	Resident of Ocean Shore	Noise	Percussive noise from the cofferdam area in Tiu Keng Leng during day-time.	Y		Closed
346	31-Mar-19	31st March 2019 / Construction of Road P2	District Council	Others	Complaint about the construction site operation of Road P2 in day time holiday	N	A tug boat and a derrick barge were operated for the marine reclamation work within the cofferdam area during the time of complaint. As the review of relevant CNP, no violation was observed. Details should be referred to CIR-O1.	Closed
345	26-Mar-19	26th March 2019 / Construction of Road D4	Resident of Park Central	Noise	Complaint about the noise nuisance in day time.	Y	See Investigation / Mitigation Action for complaint no. 329.	Closed
344	28-Mar-19	26th March 2019 / Construction of Road P2	District Council	Noise	Complaint letter received regarding noise nuisance and dark smoke generation from the marine barges	Y	See Investigation / Mitigation Action for complaint no. 378.	Closed
343	25-Mar-19	25th March 2019 / Construction of Road D4	Resident of Park Central	Noise	Complaint about the noise nuisance sound like a breaking works in day time.	Y	See Investigation / Mitigation Action for complaint no. 329.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
342	25-Mar-19	24th March 2019 / Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	Complaint about the noise nuisance from the construction of Lam Tin Interchange in day time hoilday (Sunday). The noise monitoring was conducted in Hong Nga Court by staff after the complaint and the noise level is result in acceptable level, but the complainant replied that the noise monitoring is meaningless and the noise nuisance is not acceptable for her.	Y	See Investigation / Mitigation Action for complaint no. 330.	Closed
341	24-Mar-19	24th March 2019 / Construction of Lam Tin Interchange	Management Section of Hong Nga Court	Noise	Complaint about the noise nuisance from Lam Tin Tunnel construction works in day time.	Y		Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
340	24-Mar-19	24th March 2019 / Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	Complaint about the noise nuisance from the construction site day time holiday (Sunday).	Y		Closed
339	21-Mar-19	21st March 2019 / Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	Complaint about the construction noise nuisance involving percussive noise in early morning (07:00)	Y		Closed
338	21-Mar-19	21st March 2019 / Construction of Lam Tin Interchange	Resident of Ocean Shore	Noise	Construction noise nuisance in night time (03:00 – 04:00)	Y	See Investigation / Mitigation Action for complaint no. 323.	Closed
337	20-Mar-19	19th March 2019 / Construction of Road D4 and Footbridge between Tiu Keng Leng Sport Centre and Park Central	Resident of Park Central	Noise	Complaint about the noise nuisance from the construction vehicle near Park Central in night time.	Y	See Investigation / Mitigation Action for complaint no. 329.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
336	20-Mar-19	20th March 2019 / Construction of Road	Resident of Park Central	Noise & Pest	Complaint about the noise and pest nuisance from the construction site near Park Central in evening time.	Y		Closed
335	19-Mar-19	19th March 2019 / Construction of Road P2	Resident of Ocean Shore	Noise	Construction noise nuisance from reclamation works near the TKO-LTT reclamation site during the evening time (19:00-23:00).	Y	See Investigation / Mitigation Action for complaint no. 323.	Closed
334	19-Mar-19	19th March 2019 / Construction of Road P2	District Council	Noise	Construction noise nuisance from the TKO-LTT reclamation site during evening time (after 19:00).	Y		Closed
333	19-Mar-19	18th - 19th March 2019 / Construction of Road P2	Resident of Ocean Shore	Noise	Construction noise nuisance from construction noise in evening time (around 20:30).	Y		Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
332	18-Mar-19	18th March 2019 / Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Complaint about the noise nuisance during day time, evening time and night time.	Y	The construction activities in the complaint dates are complied with CNP. No noise limited level exceedance was recorded. During the site inspection, no noise barriers were erected between noisy PMEs and NSRs at LTI. Regarding the observation in the inspection, Contractor has adopted an improvement such as placed the noise barriers between the PMEs and NSPs to reduce noise nuisance. Details should be referred to CIR-N61.	Closed
331	18-Mar-19	18th March 2019 / Construction of Lam Tin Interchange	Resident of Hong Pak Court	Noise	Complaint about the noise nuisance in night time and the past few days. (Before 07:00)	Y		Closed
330	17-Mar-19	17th March 2019 / Construction of Lam Tin Interchange	General Public	Noise	Complaint about the noise nuisance from in night time holiday.	Y		Closed
329	15-Mar-19	15th March 2019 / Construction of Road D4	Resident of Park Central	Noise & Air	Complaint about the noise from the construction works and the odour nuisance involves engine oil from construction machine	Y	The construction activities in the complaint dates are compiled with the CNMP. No noise and air quality limit level exceedance were recorded. Contractor had implemented the mitigation measures for the noise and odour nuisances including acoustic mat was erected between the PME and NSR, ultra-low sulphur diesel was applied as fuel oil in PME and general refuses were disposed properly. Details should be referred to CIR-C26.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
328	14-Mar-19	9th March 2019 / Construction Site of Footbridge between Tiu Keng Leng Sport Centre and Park Central	Resident of Park Central	Noise	Complaint about the noise nuisance involve drilling work in the day time (08:00).	Y	A formation works was conducted in 7 am to 7pm on 9 Mar 2019. No noise limit level exceedance was recorded in the nearest noise monitoring result. However, there was no any adoption of mitigation measure to minimize the noise nuisance from the site. As response the received complaint, the contractor should place the noise barrier between the PMEs and NSR. Details should be referred to CIR-N58.	Closed
327	13-Mar-19	13th March 2019 / Construction of Lam Tin Interchange	Resident of Bik Lai House	Noise	Noise nuisance suspected from the construction works involving chiseling during evening time (22:07).	Y	A handing processed rock at Lam Tin Interchange was conducted on the complaint date in 7 pm to 11 pm involving dump truck and excavator which construction activities was compiled with the CNP. No noise limit level exceedance was record in the evening time monitoring. However, the noise barrier was not placed in the direction of the Yau Lai Estate during breaking works, the contractor had implemented a mitigation measure such as placed the noise barrier to reduce noise level from the breaker but the noise barrier was far from the concerned breaker. Details should be referred to CIR-N59.	Closed
326	13-Mar-19	13th March 2019 / Construction of Road P2	Resident of Ocean Shore	Noise	Noise nuisance suspected from marine works near Ocean Shores in the day time (16:30)	Y	See Investigation / Mitigation Action for complaint no. 322.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
325	9-Mar-19	9th March 2019 / Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	Complaint about the noise nuisance involve machine and percussive noise in night time (02:00 - 03:00).	Y	Only drilling works were conducted inside the tunnel in early morning under valid CNP. Groundborne noise is considered as the factor that contributes to the noise nuisance. The Contractor is recommended to reschedule drilling works to less sensitive hours. Details should be referred to CIR-N56.	Closed
324	7-Mar-19	7th March 2019 / Construction of Lam Tin Interchange	Resident of Hong Pak Court	Noise	Complaint about the noise nuisance involving chiseling noise from the construction site near Hong Pak Court during day time and evening time in the past few months.	Y	Only drilling works were conducted inside the tunnel in early morning and daytime under valid CNP. Groundborne noise is considered as the factor that contributes to the noise nuisance. The Contractor is recommended to reschedule drilling works to less sensitive hours. Details should be referred to CIR-N56.	Closed
323 (EPD-N08/RE/00006523-19)	4-Mar-19	4th March 2019/ Cofferdam Area	Resident of Ocean Shore	Noise	Construction noise (Evening time)	Y	Only 1 derrick barge and a tug boat was used in the evening time under valid CNP. No Limit Level Exceedances were recorded at Station CM6(A) during evening time. Acoustic mat should be used to screen the engine of the barge to reduce the noise nuisance from the reclamation works. Lubricants should be applied to the barge to reduce the noise emission during barge movement.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
322	13-Mar-19	1st March 2019 / Construction of Road P2	Resident of Ocean Shore	Noise	Noise nuisance suspected from a yellow excavator near Ocean Shores in day time (15:44).	Y	No noise limit level exceedance was recorded and the number of operating PMEs complied with the CNMP. The sound proofing canvases were not always adopted as a mitigation measure to screen the noise emitted from the engine of the barge. Contractor should adopt the aforementioned mitigation measures as far as practicable. The contractor was also be recommended to enhance the mitigation measure including frequently checking the noise barriers/sound proofing canvases, frequent checking and repair the gaps or broken acoustic sheets and continue to strictly follow the requirements in the approved CNMP.	Closed
321	28-Feb-19	28th February 2019 / Construction of Lam Tin Interchange	Management Section of Yau Lai Estate	Noise	Construction noise (Night time)	Y	Only drilling works were conducted inside the tunnel in early morning under valid CNP. Groundborne noise is considered as the factor that contributes to the noise nuisance. The Contractor is recommended to reschedule drilling works to less sensitive hours. Details should be referred to CIR-N55.	Closed
320	22-Feb-19	22nd February 2019 / Construction of Lam Tin Interchange	Resident of Hong Pak Court	Noise	Complaint about the noise nuisance involving percussive noise in early morning (Day time). Complainant said the construction should be operated after 08:00.	Y	See Investigation / Mitigation Action for complaint no. 313.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
319	21-Feb-19	21st February 2019 / Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	Complaint about the noise nuisance involving percussive noise in night time	Y		Closed
318	21-Feb-19	21st February 2019 / Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	Complaint about the noise nuisance involving percussive noise from the construction in night time	Y		Closed
317	25-Feb-19	23th February 2019 / Construction of Road P2	Resident in O King Road	Air	Complained about the odour nuisance of petroleum smell	N	See Investigation/ Mitigation Action on Complaint no.294. Details should be referred to CIR-A12.	Closed
316	18-Feb-19	18th February 2019 / Construction of Road P2	Resident in O King Road	Air	Complaint about the dark smoke and odour nuisances	N		Closed
315	17-Feb-19	15th February 2019 / Construction of Lam Tin Interchange, Road P2 and Tseung Kwan O Interchange	General Public	Noise	Complained about construction noise (Daytime)	Y	The metal wire used for anchoring the barge inside the cofferdam area are the source for the noise nuisance. Ropes were used to replace metal wire to reduce noise nuisance from metal collision while mooring boats. Details should be referred to CIR-N54.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
314	17-Feb-19	16th February 2019 / Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Air	Dust nuisance suspected from the construction works and absence of water spraying near Lam Tin Interchange in daytime.	N	No Air Quality action level or limit level exceedance during the monitoring conducted by ETL. Contractor had implemented mitigation measure to reduce and prevent dust emission including conducted water sprays and covered the cement bags. Details should be referred to CIR-A13.	Closed
313	17-Feb-19	17th February 2019 / Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	Construction noise nuisance from the drilling and breaking works at Branch Tunnel in the morning (Day time)	Y	Breaking and drilling works were conducted during the time of complaint. The breakers were often seen wrapped with acoustic mat, however, they are easily damaged during the breaking works. Noise barrier are more effective in reducing the noise nuisance than the acoustic mat, but the erection of noise barrier are not often adopted properly to screen the noise from the NSR due to the additional works involved and the landform on site. Groundborne noise could also be a factor contributing to noise nuisance. Details should be referred to CIR-N53.	Closed
312	16-Feb-19	16th February 2019 / Construction of Lam Tin Interchange	District Council	Noise	Complained about the explosion noise (Daytime)	Y	No exceedances were recorded and recommendation were made to further enhance the mitigation measures, such as regularly and reviewing the noise control activities that are being carried out on site regularly to ensure compliance with statutory requirement, provide training for the workers to prevent unnecessary noise disturbance and frequently check and maintain the absorptive lining adhered on blasting doors on a regular basis.	Closed
311	15-Feb-19	15th February 2019 / Construction of Lam Tin Interchange	Public	Noise	Complained about the explosion noise (Daytime)	Y	See Investigation / Mitigation Action for complaint no. 312.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
310	14-Feb-19	14th February 2019 / Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Construction noise nuisance about the rock handling work at LTI (Daytime)	Y	Dump truck and excavator was used to transfer crushed rocks from the crusher with valid CNP. Additional noise barrier was added at the site boundary near Shun Lai house, Yau Lai Estate to reduce the direct-line of sight from the NSRs to the site. Details should be referred to the CIR-N51.	Closed
309	13-Feb-19	13th February 2019 / Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Construction noise nuisance about the rock handling work at LTI (evening time)	Y		Closed
308	13-Feb-19	1th - 13th February 2019 / Construction of works at the TKO-Lam Tin tunnel	Management Section of Kwong Tin Estate	Noise	Complaint about construction noise (Night time)	Y	See Investigation/ Mitigation Action on Complaint no.302. Details should be referred to CIR-N48.	Closed
307	13-Feb-19	13th February 2019 / Construction at Tsueng Kwan O (C1)	Resident of Ocean Shore	Noise	The complaint about the noise nuisance in day time	Y	Noise nuisance was originated from the beeping noise emitted during vehicle reversing of the loader. The total length of beeping noise should be less than 5 mins. The reverse alarm system is a necessary safety measure that cannot be revoked. Details should be referred to CIR-N50.	Closed
306	13-Feb-19	13th February 2019 / Construction of works at the TKO-Lam Tin tunnel	Resident of Hong Nga Court	Noise	Noise nuisance suspected from the construction works involving chiseling noise in night time	Y	See Investigation/ Mitigation Action on Complaint no.302. Details should be referred to CIR-N48.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
305	12-Feb-19	12th February 2019 / Construction of works at the TKO-Lam Tin tunnel	Resident of Hong Nga Court	Noise	Noise nuisance suspected from the construction works involving chiseling noise in night time.	Y		Closed
304	8-Feb-19	8th February 2019 / Construction of Road P2 and Associated Works	Resident of Ocean Shore	Noise	Noise nuisance suspected from marine works near Ocean Shores in the day time	Y	There were two construction activities in the site including dredging and trimming in day time on 8 Feb 2019. Details should be referred to CIR-N49.	Closed
303	2-Feb-19	27th January - 2nd February 2019 / Construction of works at the TKO-Lam Tin tunnel	Resident of Ping Tin Estate	Noise	Noise nuisance suspected from the construction works involving chiseling noise during day time, evening time and night time.	Y	Project-related. The following recommendations were made to further enhance the mitigation measures: Frequent checking and repair the gaps or broken acoustic sheets; Replace any broken SilentMat for wrapping the breaker head; To adopt Cantilever noise barriers at Lam Tin Interchange to screen noise effectively; The deployment of Cantilever noise barrier should screen the line-of-sight from sensitive receivers To continue to strictly follow the requirements in the approved CNMP. To conduct an ad hoc ground-borne noise monitoring with the coordination of the Engineer; and Engineer should monitor the plant and machine to ensure construction activities are in compliance of CNP.	Closed
302	2-Feb-19	27th January - 2nd February 2019 / Construction of works at the TKO-Lam Tin tunnel	Resident of Hong Pak Court	Noise	Noise nuisance suspected from the construction works involving chiseling noise during day time	Y		Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
301	31th January 2019	27th - 31th January 2019 / Construction of Lam Tin Interchange	Management Section of Hong Nga Court	Noise	Noise nuisance suspected from the construction involving chiselling works	Y	See Investigation/ Mitigation Action on Complaint no.290. Details should be referred to CIR-N45.	Closed
300	30th January 2019	30th January 2019 / Construction Site of Footbridge between Tiu Keng Leng Sport Centre and Park Central	Resident of Park Central	Noise	Beeping Noise nuisance suspected from the construction works involving mobile crane	Y	See investigation / Mitigation Action for complaint no. 296. Details should be referred to CIR-N47.	Closed
299	30th January 2019	27th - 29th January 2019 / Construction Site of Footbridge between Tiu Keng Leng Sport Centre and Park Central	Resident of Park Central	Noise	Beeping Noise nuisance suspected from the construction works involving mobile crane and also suspected from elevation platform	Y	See investigation / Mitigation Action for complaint no. 296. Details should be referred to CIR-N47.	Closed
298	30th January 2019	Not specific / Near Po Shun Road	Resident of Park Central	Noise & Air Quality	The dust generation and noise nuisance from the construction site near Po Shun Road	Y	There were several construction activities in the site including the removal of steel mould & scaffolding of bridge deck, erection of scaffolding for staircase and construction of Pour 1 of main deck (GL4-5) during time of complaint. Details should be referred to CIR-C25.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
297	30th January 2019	27th - 30th January 2019 / Construction works at TKO-Lam Tin tunnel	Resident of Hong Nga Court	Noise	Noise nuisance suspected from the construction involving chiselling works	Y	See Investigation/ Mitigation Action on Complaint no.290. Details should be referred to CIR-N45.	Closed
296	29th January 2019	27th - 29th January 2019 / Construction Site of Footbridge near Tiu Keng Leng Sport Centre.	Resident of Park Central	Noise	Beeping Noise nuisance suspected from the mobile crane at the Footbridge near Park Central Block 6	Y	Project-related. The following recommendations were made to further enhance the mitigation measures: To arrange a signalman instead of mobile crane reversing signal for minimize the beeping noise disturbance; Frequent checking and repair the operating PME; The deployment of Cantilever noise barrier should screen the line-of-sight from sensitive receivers To continue to strictly follow the requirements in the approved CNMP; To ensure noise barrier and sound proofing canvases wrapped on PME are intact and in good condition.	Closed
295	29th January 2019	29th January 2019 / Construction of Road P2	Resident of Ocean Shore	Noise	Complaint about the noise nuisance from the steel cable wire for anchoring between barge and pier	Y	There was a salvage works for the sunken barge (CS306) in a whole day on 27 Jan, 12 am to 3 pm on 28 Jan and 11:40 am on 29 Jan 2019. Details should be referred to CIR-N46.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
294	29th January 2019	29th January 2019 / Construction of Road P2	Resident in O King Road	Air Quality	Complaint about the dark smoke and odour nuisances from barge.	Y	The sulphur content percentage of the adopted diesel fuel was lower than 0.05% which is compiled with the Hong Kong Air Pollution Control (Marine Light Diesel) Regulation, therefore the odour problem should be minimised. Smoke filtering tanks were adopted on deck level of derrick barges to reduce emission of dark smoke and exhaust smell. The situation has improved after the filter has been replaced. Details should be referred to CIR-A12.	Closed
293 (EPD-K15/RE/00003291-19)	29th January 2019	29th January 2019 / Construction of Lam Tin Interchange	Cha Kwo Ling Tsuen	Noise & Air Quality	Complained about construction noise & dust (Day & Night time)	Y	See investigation / Mitigation Action for complaint no. 270. Details should be referred to CIR-C29.	Closed
292	29th January 2019	29th January 2019 / Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	Complained about the construction noise from breaking work.	Y	Project-related. The following recommendations were made to further enhance the mitigation measures: Frequent checking and repair the gaps or broken acoustic sheets; Replace any broken SilentMat for wrapping the breaker head; To adopt Cantilever noise barriers at Lam Tin Interchange to screen noise effectively; The deployment of Cantilever noise barrier should screen the line-of-sight from sensitive receivers To continue to strictly follow the requirements in the approved CNMP. RE/RSS should monitor the plant and machine to ensure construction activities are in compliance of CNP.	Closed
291	29th January 2019	29th January 2019 / Construction of Lam Tin Interchange	Resident of Hong Pak Court	Noise	Complained about the construction noise from breaking work.	Y		Closed
290	29th January 2019	29th January 2019 / Construction of Lam Tin Interchange	District Council	Noise	Complained about the construction noise from Tunnel Works	Y		Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
289 (EPD-N08/RE/00000859-19)	24th January 2019	Early December 2018 -24-Jan-2019 / Construction of Road P2	Resident of Ocean Shore	Noise	Complained about the construction noise from Tunnel Works	Y	See Investigation/ Mitigation Action on Complaint no.288. Details should be referred to CIR-N44.	Closed
288	18th January 2019	18th January 2019 (Unknown)/ Construction of Road P2	Public	Noise	Complained about the construction noise from Tunnel Works	Y	No major construction works at the concerned night time. There was only salvage operation carried out in 11 pm to 12 pm on 17 Jan 2019. No violation of CNP nor Noise Control Ordinance is found in this regard. Details should be referred to CIR-N44.	Closed
287	17th January 2019	17th January 2019 / Construction of Lam Tin Interchange	Resident of Yung Lai House	Noise	Complained about the construction noise from Kam Tin Interchange.	Y	Project-related. The following recommendations are made to further enhance the mitigation measures: To regularly check and review the noise control activities that are being carried out on site to ensure compliance with statutory requirement. Machines may be in intermittent use should be shut down between works periods or should be throttled down to a minimum. To provide training for the workers to prevent unnecessary noise disturbance. To provide cantilever barrier to screen the construction noise from the NSRs	Closed
286	17th January 2019	17th January 2019 / Construction of Road D4	Resident of Park Central	Noise	High frequency machine noise nuisance involving air compressor from the construction site near the Park Central in day time	N	See Investigation/ Mitigation Action on Complaint no. 285. The concerned air compressor has been removed on 16th Jan 2019. Details should be referred to CIR-N41.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
285	17th January 2019	17th January 2019 / Construction of Road D4	Resident of Park Central	Noise	Complained about the construction noise from an air blower/fan with generator near Tiu Keng Leng Sport Centre and Park Central.	N	The concerned air compressor was removed from the construction site since 16 January 2019 afternoon, but the high frequency noise nuisance complaints were received on 17 January 2019. According to the CM8(A) noise monitoring record by environmental team, the other noise source from construction site are beeping noise of the reverse alarm system of the plant. Therefore, the high frequency noise nuisance is considered project related after 16 January 2019. Details should be referred to CIR-N41.	Closed
284	16th January 2019	16th January 2019 / Construction of Road D4	Resident of Park Central	Noise	Complained about the construction noise from an air compressor near Tiu Keng Leng Sport Centre and Park Central.	N	See Investigation/ Mitigation Action on Complaint no. 272. Additional noise barrier was erected around the said air compressor. Details should be referred to CIR-N41.	Closed
283	15th January 2019	15th January 2019 / Construction of Road D4	Resident of Park Central	Noise	Complained about the construction noise from an air compressor near Tiu Keng Leng Sport Centre and Park Central.	N	See Investigation/ Mitigation Action on Complaint no. 272. Additional noise barrier was erected around the said air compressor. Details should be referred to CIR-N41.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
282	15th January 2019	15th January 2019 / Construction of Road D4	Resident of Park Central	Noise	Complained about the construction noise from an air compressor near Tiu Keng Leng Sport Centre and Park Central.	N	See Investigation/ Mitigation Action on Complaint no. 272. Additional noise barrier was erected around the said air compressor. Details should be referred to CIR-N41.	Closed
281	15th January 2019	15th January 2019 / Construction of Road D4	Resident of Park Central	Noise	High frequency machine noise nuisance involving air compressor from the construction site near Chui Ling Road roundabout and Tiu Keng Leng Sport Centre in day time.	N	See Investigation/ Mitigation Action on Complaint no. 272. Additional noise barrier was erected around the said air compressor. Details should be referred to CIR-N41.	Closed
280	14th January 2019	14th January 2019 / Construction of Road D4	Resident of Park Central	Noise	High frequency machine noise nuisance involving air compressor from the construction site near Chui Ling Road roundabout and Tiu Keng Leng Sport Centre in day time.	N	See Investigation/ Mitigation Action on Complaint no. 272. Details should be referred to CIR-N41.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
279	14th January 2019	14th January 2019 / Construction of Road D4	Resident of Park Central	Noise	High frequency machine noise nuisance involving air compressor from the construction site near Tiu Keng Leng Sport Centre in day time Saturday and Holiday (Sunday).	N	See Investigation/ Mitigation Action on Complaint no. 272. Details should be referred to CIR-N41.	Closed
278	12th January 2019	12th January 2019 / Construction of Road D4	Resident of Park Central	Noise	High frequency machine noise nuisance involving air compressor from the construction site between Tiu Keng Leng Sport Centre and Park Central in day time	Y	See Investigation/ Mitigation Action on Complaint no. 272. Details should be referred to CIR-N41.	Closed
277	12th January 2019	12th January 2019 / Construction of Road P2	Resident of Ocean Shore	Noise	Complained about the noise from breaking activities.	N	See investigation/ Mitigation Action on Complaint no. 264. Details should be referred to N39.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
276	11th - 12th January 2019	11th - 12th January 2019 / Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	Complained about the construction noise from Tunnel Works	Y	The complaints are considered as project-related. The following recommendations were made to further enhance the mitigation measures: Frequent checking and repair the gaps or broken acoustic sheets; Replace any broken SilentMat for wrapping the breaker head; To adopt Cantilever noise barriers at Lam Tin Interchange to screen noise effectively; The deployment of Cantilever noise barrier To continue to strictly follow the requirements in the relevant CNP. To conduct an ad hoc ground-borne noise monitoring with the coordination of the Engineer. Engineer should monitor the plant and machine to ensure construction activities are in compliance of CNP. Details refer to CIR-N40.	Closed
275	11th January 2019	11th January 2019 / Construction of Road D4	Resident of Park Central	Noise	Complained about the construction noise from a crane near footbridge between Tiu Keng Leng Sport Centre and Park Central	Y	See Investigation/ Mitigation Action on Complaint no. 272.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
274 (EPD-N08/RE/00001234-19)	11th January 2019	11th January 2019 / Construction of Road D4	Public	Noise	Complaint about the high frequency machine noise nuisance from the construction site of footbridge between Tiu Keng Leng Sport Centre and park Central.	Y	No high-frequency noise was detected near the complaint location, however, the noise similar to description was detected within the renovation works inside Park Central. Details should be referred to complaint no. 272 and CIR-N41.	Closed
273	10th January 2019	10th January 2019 / Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	Complained about the construction noise from Tunnel Works	Y	The complaints are considered as project-related. The following recommendations were made to further enhance the mitigation measures: Frequent checking and repair the gaps or broken acoustic sheets; Replace any broken SilentMat for wrapping the breaker head; To adopt Cantilever noise barriers at Lam Tin Interchange to screen noise effectively; The deployment of Cantilever noise barrier To continue to strictly follow the requirements in the relevant CNP. To conduct an ad hoc ground-borne noise monitoring with the coordination of the Engineer. Engineer should monitor the plant and machine to ensure construction activities are in compliance of CNP.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
272	8th January 2019	8th January 2019 / Construction of Road D4	Resident of Park Central	Noise	Complaint about the high frequency machine noise nuisance from the construction site near Park Central in day time.	Y	High frequency noise emitted from an air compressor was suspected. Noise barrier was seen erected. Noise barrier using material with higher absorption coefficient such as mineral wool is recommended. Details should be referred to CIR-N41.	Closed
271	8th January 2019	8th January 2019 / Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	Complained about the construction noise from Tunnel Works	Y	The complaints are considered as project-related. The following recommendations were made to further enhance the mitigation measures: Frequent checking and repair the gaps or broken acoustic sheets; Replace any broken SilentMat for wrapping the breaker head; To adopt Cantilever noise barriers at Lam Tin Interchange to screen noise effectively; The deployment of Cantilever noise barrier To continue to strictly follow the requirements in the relevant CNP. To conduct an ad hoc ground-borne noise monitoring with the coordination of the Engineer. Engineer should monitor the plant and machine to ensure construction activities are in compliance of CNP.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
270 (EPD-K15/RE/00000691-19)	7th January 2019	7th January 2019 / Construction of Lam Tin Interchange	Cha Kwo Ling Tsuen	Noise & Air Quality	Complained about construction noise & dust (Day & Night-time)	Y	Regular noise monitoring results for day time and night time show full compliance of the noise criteria. Air quality monitoring result in all stations show that no adverse air quality impact has been brought about to the nearby sensitive receivers during the time of complain. During Site audit, damaged acoustic material on the breaker was observed. Watering was provided at during rock breaking to avoid dust generation. The Contractor was reminded to deploy noise barrier to screen the line-of-sight from sensitive receiver; during breaking works.	Closed
269	7th January 2019	7th January 2019 / Construction of Road D4	Resident of Park Central	Noise	Complained about the night time construction noise near Park Central.	Y	No noticeable high frequency noise was detected from the air compressor and noise barrier was seen erected in the line-of-sight from the NSR to the Air compressor. Refer to CIR-41 for details.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
268	7th January 2019	7th January 2019 / Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Complained about the construction noise at Lam Tin Interchange.	Y	No exceedances were record at the nearest monitoring station. The following recommendation were made to further enhance the mitigation measure: • Frequent checking and repair the gaps or broken acoustic sheets; • Replace any broken Silent Mat for wrapping the breaker head; • To adopt Cantilever noise barriers at Lam Tin Interchange to screen noise effectively; • The deployment of Cantilever noise barrier should screen the line-of-sight from sensitive receiver; • To continue to strictly follow the requirements in the relevant CNP; • To conduct an ad hoc ground-borne noise monitoring with the coordination of the Engineer; and • Engineer should monitor the plant and machine to ensure construction activities are in compliance of CNP.	Closed
267	7th January 2019	7th January 2019 / Construction of Road P2	Resident of Ocean Shore	Noise	Complained about the construction noise from breaking activities.	Y	Refer to Investigation/ Mitigation Action on Complaint no. 264. Details should be referred to N39.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
266	7th January 2019	7th January 2019 / Construction of Road P2	Resident of Ocean Shore	Noise	Complained about the construction noise from breaking activities.	Y	No exceedances were recorded at the nearest monitoring station, however, the approved location for noise monitoring was located at the podium of Ocean Shores. Due to inaccessibility to private unit, it is not possible to perform monitoring at higher floor. ET will keep approaching Ocean Shore Management Office for impact noise monitoring at higher floor. The recommendations for Contractor is as follows: • only well-maintained plant on-site and plant should be serviced regularly during the construction program; • Plants known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby noise sensitive receivers; Machines and plants that may be in intermittent use should be shut down between works periods or should be throttled down to minimum.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
265	7th January 2019	7th January 2019 / Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	Complained about the construction noise from Tunnel Works	Y	No exceedances were record at the nearest monitoring station. The following recommendation were made to further enhance the mitigation measure: • Frequent checking and repair the gaps or broken acoustic sheets; • Replace any broken Silent Mat for wrapping the breaker head; • To adopt Cantilever noise barriers at Lam Tin Interchange to screen noise effectively; • The deployment of Cantilever noise barrier should screen the line-of-sight from sensitive receiver; • To continue to strictly follow the requirements in the relevant CNP; • To conduct an ad hoc ground-borne noise monitoring with the coordination of the Engineer; and • Engineer should monitor the plant and machine to ensure construction activities are in compliance of CNP.	Closed
264	2nd January 2019	2nd January 2019 / Construction of Road P2	Resident of Ocean Shore	Noise	Complained about the construction noise from breaking activities.	Y	No noise limit level exceedance was recorded at the noise monitoring stations near ocean shores. The contractor has applied lubricants to the joint of the excavators to dampen the noise emitted from the PMEs. The contractor is recommended to use noise barriers to screen the PMEs from the NSRs as per the Noise mitigation plan.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
263 (EPD-)	1st January 2019	31st December 2018 / Coastal near TKO cemetery	General Public	Water	Complained concerning oil leakage/ on the sea surface near the sunken barge at C2 site.	N	Oil leakage happened due to the derrick lighter was submerged to the sea within the cofferdam. As the oil leakage was found outside the cofferdam during site inspection, there was a gap in the cofferdam. The oil leakage was cleaned up and the floating oil absorber has been used to surround the cofferdam by Contractor. The Contractor are reminded to1) regular check if the site vessels and cofferdam are in good-condition; 2) To regular monitor the operation of any activities in the cofferdam area; 3) To implement the proposed site vessels safety and the emergency responses including clearance measures Details of the investigation should be referred to CIR-W10	Closed
262	30th December 2018	26th December 2018/ Construction of Lam Tin Interchange	Resident of Hong Pak Court	Noise	Complained about the construction noise from tunnel works of Lam Tin Interchange.	Y	Refer to investigation for complaint no. 254	Closed
261	26th December 2018	26th December 2018/ Construction of Lam Tin Interchange	Management Section of Hong Nga Court	Noise	Complained about the construction noise from tunnel works of Lam Tin Interchange.	Y	Refer to investigation for complaint no. 254	Closed
260	26th December 2018	26th December 2018/ Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	Complained about the construction noise of Lam Tin Interchange.	Y	Refer to investigation for complaint no. 254	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
259	26th December 2018	26th December 2018/ Construction of Lam Tin Interchange	Management Section of Hong Nga Court	Noise	Complained about the construction noise of Lam Tin Interchange.	Y	Refer to investigation for complaint no. 254	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
258	18th December 2018	18th December 2018/ Construction of Lam Tin Interchange	Engineering Section of Ocean Shore	Noise	Complained about the construction noise from the marine works.	Y	There was no major construction works at the concerned area during the time of complaint and confirmed by the Resident Engineer. Steel cable wire for anchoring between barge and pier is considered as a possible noise source. The complaint is considered project related. Mitigation measures: Cable wire for anchoring between barge and pier has been replaced by rope between 27 Dec and 2 Jan to reduce noise impact. In addition, other good site practices recommended in the "Implementation Schedule of Proposed Mitigation Measures" of EM&A Manual and the approved CNMP of this Contract had been implemented by the Contractor, including the following: • Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program; • Plants known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby noise sensitive receivers; • Machines and plants that may be in intermittent use should be shut down between works periods or should be throttled down to minimum.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
257	18th December 2018	18th December 2018/ Construction of Road P2	Resident of Ocean Shore	Noise	Complained about the construction noise from the marine works.	Y	There was no major construction works at the concerned area during the time of complaint and confirmed by the Resident Engineer. Steel cable wire for anchoring between barge and pier is considered as a possible noise source. The Contractor has replaced the cable wire for anchoring between barge and pier with ropes between 27 Dec and 2 Jan to reduce noise impact.	Closed
256	17th December 2018	15th December 2018/ Construction of Road P2	Resident of Ocean Shore	Noise	Complained about the construction noise from breaking and piling activities	N	No exceedance was recorded in the noise monitoring result. The number of PME operated in LTI was consistent with the proposed Construction Noise mitigation Plan (CNMP) The following recommendations were made for the Contractor to enhance the mitigation measures: • To frequently check and repair operating PME if any loosen or worn parts of the equipment to reduce excessive noise disturbance; • Noise barriers should be designed and erected around the noise sources to block the direct line-of-sight from the NSR as per the CNMP; To ensure all erected noise barriers and sound proofing canvases wrapped on PME are intact and in good condition.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
254	16th December 2018	16th December 2018/ Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	Complained about the construction noise from Tunnel Works	Y	• The night-time works were only conducted inside the tunnels with valid CNP. The noise nuisances are not considered as air-borne in nature, but ground-borne noise. 2.17 In order to confirm the possible ground-borne nature of the noise nuisances for complaints summarized in this report, CEDD has engaged the environmental team to conduct ad hoc ground-borne noise monitoring with the coordination of the Engineer. The findings will be provided in a separate report for the ad hoc monitoring.	Closed
253	15th December 2018	15th December 2018/ Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	Complained about the construction noise from Tunnel Works	Y	Refer to the investigation for complaint no. 254	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
252	30th November 2018	30th November 2018/ Construction of Road D4	Resident of Park Central	Noise & Air	Complained about the construction noise and dust resuspension in Road D4.	Y	The number of PMEs operated on site and on-time percentage from 19 to 30 November complied with the CNMP, thus, no violation was identified. Based on the noise and air monitoring results in November 2018, no Limit Level Exceedance was recorded. **Mitigation Measures** • A more effective acoustic barrier was erected between the drill rig and Park Central. • Frequent water spraying along the Po Yap Road for eight times a day, Stockpile are covered with impervious material to avoid dust resuspension	Closed
251	28th November 2018	27th November 2018/ Construction of TKO portal	Public	Noise	Complained about the construction noise from the marine works.	Y	The complaint lodged on 25th November 2018 is considered as non-project related, as no works was conducted on that day. The complaint on 27th November 2018 is considered project related. The contractor is reminded to 1) frequently check and repair operating PME if any loosen or worn parts of the equipment to reduce excessive noise disturbance; 2) Ensure no further use of PA system for marine works.	Closed
250	26th November 2018	26th November 2018/ Public sea in TKO	Resident of Ocean Shore	Noise	Complained about the noise nuisance from the operation of derrick barge on Sunday.	Y	Refer to the investigation for complaint no. 251	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
249	25th November 2018	20th November 2018/ Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Complained about the noise nuisance from the Excavators in LTI on Sunday morning.	Y	Refer to the investigation for complaint no. 251	Closed
248	20th November 2018	20th November 2018/ Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Complained about the noise nuisance during transfer of material in evening time at LTI	Y	Regular noise monitoring results for restricted and non-restricted hours show full compliance of the noise criteria (night-time noise exceedance is considered non-project related). The contractor is reminded to adopt cantilever noise barriers at Lam Tin Interchange to screen noise effectively by screening the line-of-sight from sensitive receivers	Closed
247	20th November 2018	19th November 2018/ Lam Tin Interchange	Public	Noise	Complained about the noise nuisance from rock dropping during evening time	Y	Refer to the investigation for complaint no. 248	Closed
246	19th November 2018	19th November 2018/ Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Complained about the noise nuisance from dump truck in evening time	Y	Refer to the investigation for complaint no. 248	Closed
245	8th November 2018	8th November 2018/ Lam Tin Interchange	Public	Noise	Complained about construction noise during night time from LTI	Y	Refer to the investigation for complaint no. 248	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
243	8th November 2018	8th November 2018/ Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Complained about the construction noise during evening time from LTI.	Y	Refer to the investigation for complaint no. 248	Closed
242	7th November 2018	7th November 2018/ Lam Tin Interchange	Public	Noise	Complained about the construction noise and dust nuisance.	Y	Refer to the investigation for complaint no. 248	Closed
241	6th November 2018	6th November 2018/ Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Complained about the noise nuisance from LTI during evening time	Y	Refer to the investigation for complaint no. 248	Closed
240	6th November 2018	6th November 2018/ Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Complained about the noise nuisance from LTI during evening time	Y	Refer to the investigation for complaint no. 248	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
239	25th October 2018	25th October 2018/ Construction of Road P2	Resident of Ocean Shore	Noise	Complained about daytime construction noise near Ocean Shore.	Y	No exceedance was recorded in the noise monitoring result. The number of PME operated in LTI was consistent with the proposed Construction Noise mitigation Plan (CNMP) **Additional mitigation measures adopted by Contractor upon receipt of complaint:** ➢ A more effective acoustic barrier was erected that covered the direct line of sight from the entire Ocean Shore during piling works. **Existing Mitigation Measures adopted by Contractor** ➢ Silent up barrier was provided for drill rig/vibration hammer. Acoustic barriers was erected along site boundary); ➢ Maintenance for acoustic barriers along the site boundary to ensure the integrity effectiveness of sound barrier; ➢ Metal chain attached on the vibration hammer was wrapped with rubbery material to reduce the excessive noise produced during piling works.	Closed
238	23rd October 2018	23rd October 2018/ Construction of Road P2	Resident of Ocean Shore	Noise	Complained about the noise created by an excavator during morning	Y	See Investigation / Mitigation Measures for Complaint No. 239	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
237	18th October 2018	18th October 2018/ Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Complained about construction noise at LTI	Y	See Investigation / Mitigation Measures for Complaint No. 227	Closed
236	18th October 2018	18th October 2018/ Lam Tin Interchange	Resident of Cha Kwo Ling Village	Noise	Complained about the vibration and noise near	Y	See Investigation / Mitigation Measures for Complaint No. 227	Closed
235	18th October 2018	18th October 2018/ Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Complained about the noise nuisance from LTI and Portion 4C	Y	See Investigation / Mitigation Measures for Complaint No. 227	Closed
234	18th October 2018	18th October 2018/ Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Complained about the Excavator in LTI was not properly wrapped and produce noise nuisance from LTI.	Y	See Investigation / Mitigation Measures for Complaint No. 227	Closed
233	15th October 2018	15th October 2018/ Lam Tin Interchange	DC member	Noise	Complained about the noise and dust nuisance from LTI	Y	See Investigation / Mitigation Measures for Complaint No. 227	Closed
232	14th October 2018	14th October 2018/ Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Complained about the noise nuisance from LTI during night time	Y	See Investigation / Mitigation Measures for Complaint No. 227	Closed
231	12th October 2018	12th October 2018/ Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Complained about the noise nuisance from LTI	Y	See Investigation / Mitigation Measures for Complaint No. 227	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
230	11th October 2018	11th October 2018/ Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Complained about the noise from rocks unloading in LTI	Y	See Investigation / Mitigation Measures for Complaint No. 227	Closed
229	9th October 2018	9th October 2018/ Lam Tin Interchange	Resident of Bik Lai House, Yau Lai Estate	Noise	Complained about the noise nuisance from LTI, and lack of effective noise barrier.	Y	See Investigation / Mitigation Measures for Complaint No. 227	Closed
228	9th October 2018	9th October 2018/ Lam Tin Interchange	Public	Noise	Complained about the noise nuisance from LTI	Y	See Investigation / Mitigation Measures for Complaint No. 227	Closed
227	3rd October 2018	3rd October 2018/ Lam Tin Interchange	Resident of Yung Lai House, Yau Lai Estate	Noise	Complained about the noise nuisance from LTI during night time	Y	No exceedance was recorded in the noise monitoring result. The number of PME operated in LTI was consistent with the proposed Construction Noise mitigation Plan (CNMP) and approved Construction Noise Permit (CNP). **Mitigation Measures adopted by Contractor** <u>Noise:</u> ➢ Noise barriers were repaired to reduce noise nuisance at Portion 4C; ➢ Noise barriers were erected between the PMEs and NSR to reduce noise nuisance at Portion 4C; Powered mechanical equipment (PME) for breaker was equipped with noise barriers at Portion 4C.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
226	28th September 2018	28th September 2018/ Construction of Road P2	Resident of Ocean Shores	Noise	Complained about noise nuisance from portion IV	Y	➢ See Investigation / Mitigation Measures for Complaint No. 222	Closed
225	26th September 2018	26th September 2018/ Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Complained about the noise from rocks unloading in LTI	Y	See Investigation / Mitigation Measures for Complaint No. 218	Closed
224	18th September 2018	18th September 2018/ Construction of Road P2	Public	Noise	Complained about noise nuisance from derrick barge	Y	See Investigation / Mitigation Measures for Complaint No. 219	Closed
223	13th September 2018	9th September 2018/Construction of Portion VII on TKO side	Resident of Ocean Shores	Noise	Complained about noise nuisance from derrick barges	Y	See Investigation / Mitigation Measures for Complaint No. 218	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
222	12th September 2018	12th September 2018/ Construction of Road P2	Resident of Ocean Shores	Noise	Complained about the noise nuisance from piling works	Y	**Mitigation Measures adopted by the Contractor** ➢ Acoustics barriers were provided to the vibration hammer for piling works. ➢ Maintenance for acoustic barriers on the PME and along the site boundary to ensure the integrity and effectiveness of sound barriers. ➢ Regular site checking would be performed to ensure the type and quantity of powered mechanical equipment are in order with the updated Construction Noise Assessment. ➢ Acoustics mats were provided to cover the noise source from vibration hammer. ➢ The metal chain on vibration hammer was wrapped with rubbery material to minimize sound impact. ➢ The schedule for piling works was set with a 5 minutes interval to reduce the accumulated noise level.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
221	11th September 2018	9th September 2018/ Construction of Portion VII on TKO side	Public	Noise	Complained about the noise from broadcasting at barging point	Y	The Contractor had implemented environmental mitigation measures in accordance with the "Implementation Schedule of Proposed Mitigation Measures" of EM&A Manual as follows: <u>Noise:</u> Walkie-talkie was used instead of broadcasting to reduce the noise nuisance.	Closed
220	11th September 2018	26th September 2018/ Lam Tin Interchange	Public	Noise	Complained about the construction noise	Y	➢ See Investigation / Mitigation Measures for Complaint No. 218	Closed
219	7th September 2018	7th September 2018/ Construction of Road P2	Resident of Ocean Shores	Noise	Complained about the noise from sheet piling	Y	**Mitigation Measures adopted by the Contractor** ➢ Silent up barrier was provided for piling works in between vibration hammer and Ocean Shores. Acoustic barriers was erected along site boundary ➢ Noise barrier surround the engine of the derrick barge ➢ Acoustic material wrapped on vibration hammer for sheet piling works	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
218	6th September 2018	6th September 2018/ Construction in LTI	Public	Noise	Complained about noise nuisance in LTI	Y	The Contractor had implemented environmental mitigation measures in accordance with the "Implementation Schedule of Proposed Mitigation Measures" of EM&A Manual as follows: <u>Noise:</u> ➢ Noise barriers were erected between the PMEs and NSR to reduce noise nuisance at Portion 4C; ➢ Powered mechanical equipment (PME) for breaker was equipped with noise barriers at Portion 4C.	Closed
217	5th September 2018	5th September 2018/ Construction of Road P2	Public	Air Quality	Complained about dark smoke emission from derrick barges.	N	The Contractors has adopted the following environmental mitigation measures to reduce dark smoke nuisance from construction barges since June for dark smoke complaints: ➢ Smoke filtering tanks were adopted on deck level of derrick barges to reduce emission of dark smoke and exhaust smell; ➢ New engine has been installed on derrick barge to reduce the dark smoke emission.	Closed
216	5th September 2018	5th September 2018/ Construction of Road P2	Public	Air Quality	Complained about dark smoke emission from derrick barges.	N	See Investigation / Mitigation Measures for Complaint No. 217	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
215	5th September 2018	5th September 2018/ Construction of Road P2	Public	Water Quality	Complained about the oil leakage within the cofferdam	N	The Contractors had taken measures to clean up and prevent any further oil spillage for marine works in the future: ➢ Oil was absorbed and cleared with sorbents ➢ Wire was applied with suitable amount of oil to prevent further oil spill ➢ Training was provided for frontline staff on applying lubricant oil on wire rope of derrick barge. The Contractor had implemented environmental measures in accordance with the "Implementation Schedule of Proposed Mitigation Measures" of EM&A Manual as below: ➢ Construction activities should not cause foam, oil, grease, scum, little or other objectionable matter to be present on the water within the site. Standard good-site practice is adopted to prevent any fuels and solvent entering the nearby watercourses.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
214	4th September 2018	4th September 2018/ Construction of Road P2	Ocean Shores Management Office	Air Quality	Follow up complaint on 21 and 22 August, regarding dark smoke emission from derrick barges.	N	➢ See Investigation / Mitigation Measures for Complaint No. 217	Closed
213	31st August 2018	31st August 2018/ Construction of Lam Tin Interchange	Public	Air Quality	The complainant complained about the dust nuisance at LTI.	N	See Investigation / Mitigation Measures for Complaint No. 207	Closed
212	27th August 2018	27th August 2018/ Construction of Road P2	Resident of Yau Lai Estate	Noise	The complainant complained about the noise nuisance from breaker and excavator in LTI.	Y	See Investigation / Mitigation Measures for Complaint No. 203	Closed
211	22nd August 2018	22nd August 2018/ Construction of Road P2	Public	Air Quality	The complainant complained about the dark smoke emitted from derrick barge outside Ocean Shores.	N	See Investigation / Mitigation Measures for Complaint No. 209	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
210	21st August 2018	21st August 2018/ Construction of Road P2	Public	Air Quality	The complainant complained about the dark smoke emitted from derrick barge outside Ocean Shores.	N	See Investigation / Mitigation Measures for Complaint No. 209	Closed
209	21st August 2018	20th & 21st August 2018/ Construction of Road P2	DC Member	Air Quality	The complainant complained about the dark smoke emitted from derrick barge outside Ocean Shores on 20 and 21 of August.	N	The Contractors had implemented environmental mitigation measures to reduce dark smoke nuisance from construction barges to the nearby sensitive receivers as follows: ➢ Additional water filter tank was adopted on deck level of derrick barges to reduce emission of dark smoke and exhaust smell ➢ There were five derrick barges operating on 20 & 22 of August and four of them had water filter installed. The one without water filter was demobilized away from the site on 22 August.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
208	20th August 2018	17th August/ Construction of Road P2	DC Member	Water Quality	The complainant complained that muddy water was discharged from the construction site.	N	Based on the information gathered in the investigation. As the location of muddy discharge was appeared adjoining the Tseung Kwan O DSD Desilting Compound, a high volume of upstream discharge collected from rain events is a possible cause of such muddy discharge event. There are no direct evidence that the muddy discharge near the outfall of DSD Desilting Compound was due to the Project. Measure Taken by the Contractor The Contractors had taken initiatives to ensure the quality of wastewater discharge from land-based works and to enhance mitigation measure to prevent silt from marine works from entering surrounding waters: ➢ Additional geotextile was installed between steel tanks to prevent migration of filling materials outside the cofferdam ➢ Cofferdams in form of steel tanks filled with aggregated material were covered with geotextile to prevent spillage of silty materials into nearby waters	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
207	18th August 2018	18th August 2018/ Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Air Quality	The complainant complained about dust nuisance from surface blasting.	N	According to the EM&A Manual of this Project, regular air quality monitoring has been carried out at following Stations. AM2 – Sai Tso Wan Recreation Ground; AM3 Yau Lai Estate, Bik Lai House. No exceedance was recorded in the above station during August. Mitigation Measures and Follow up Actions by Contractor The Contractor had implemented environmental mitigation measures in accordance with the "Implementation Schedule of Proposed Mitigation Measures" of EM&A Manual as follows: Air Quality: ➢ Blasting cage were surrounded with impervious material during surface blasting ➢ Water spraying was provided at the blasting cage and stone crusher to enhance dust suppression	Closed
206	13th August 2018	13th August 2018/ Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	The complainant complained about the noise nuisance from the breaker at LTI and complained lack of noise barrier.	Y	See Investigation / Mitigation Measures for Complaint No. 203	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
205	10th August 2018	10th August 2018/ Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	The complainant complained about the noise nuisance of construction work starting from 7 am and lack of noise barrier.	Y	See Investigation / Mitigation Measures for Complaint No. 203	Closed
204	9th August 2018	9th August 2018/ Construction of Lam Tin Interchange	Resident of Tak Tin Estate	Noise	The complainant complained about noise nuisance and vibration from blasting activity	Y	According to the EM&A Manual of this Project, weekly noise monitoring in Cha Kwo Ling and Lam Tin during s been carried out at the following Stations. CM1 – Nga Lai House, Yau Lai Estate Phase 1, Yau Tong, Station; CM2 – Bik Lai House, Yau Lai Estate Phase 1, Yau Tong; CM3 - Block S, Yau Lai Estate Phase 5, Yau Tong. There was no exceedance recorded in the above station during daytime in August.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
203	9th August 2018	9th August 2018/ Construction of Lam Tin Interchange	Property Management of Tak Tin Estate	Noise	The complainant complained about the noise nuisance during 8pm	Y	Mitigation Measures and Follow up Actions by Contractor The Contractor had implemented environmental mitigation measures in accordance with the "Implementation Schedule of Proposed Mitigation Measures" of EM&A Manual as follows: Noise: ➢ Noise barriers were erected between the PMEs and NSR to reduce noise nuisance at Portion 4C ➢ Powered mechanical equipment (PME) for rock breaking were equipped with noise barriers at Portion 4C According to the EM&A Manual of this Project, weekly noise monitoring in Cha Kwo Ling and Lam Tin during s been carried out at the following Stations. CM1 – Nga Lai House, Yau Lai Estate Phase 1, Yau Tong, Station; CM2 – Bik Lai House, Yau Lai Estate Phase 1, Yau Tong; CM3 - Block S, Yau Lai Estate Phase 5, Yau Tong. There was no exceedance recorded in the above station during daytime in August.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
202	1st August 2018	1st August 2018/ Construction of Lam Tin Interchange	Resident of Yeung Mei House	Noise	The complainant complained about the construction noise during night-time.	Y	A valid Construction Noise Permit (CNP) (No. GW-RE0421-18) was granted to the Contractor for the construction site at Lam Tin Interchange The number of excavators that were used on 01 August was covered by the CNP. The Contractor had implemented environmental mitigation measures in accordance with the "Implementation Schedule of Proposed Mitigation Measures" of EM&A Manual as follows: ➢ Noise barriers were erected between the PMEs and NSR to reduce noise nuisance ➢ Powered mechanical equipment (PME) for rock breaking were equipped with TMD and SilentMat	Closed
201	26th July 2018	26th July 2018 / Construction of P2/D4	Public	Water quality	The complainant complained about the polluted effluent at the nearby surface drain near the construction of elevator.	N	The Contractor had implemented environmental mitigation measures in accordance with the "Implementation Schedule of Proposed Mitigation Measures" of EM&A Manual as follows: ➢ Sandbags barrier was placed along the working area to prevent direct discharge	Closed
200	26th July 2018	26th July 2018 / Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Follow up on 24th July 2018, the situation has yet been addressed.	Y	See Investigation / Mitigation Measures for Complaint No. 197	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
199	24th July 2018	23rd July 2018 / Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	The complainant complained about a yellow breaker working without noise barrier.	Y	See Investigation / Mitigation Measures for Complaint No. 197	Closed
	25th July 2018	25th July 2018 / Construction of Road P2	SKDC member	Noise	The complainant complained about the noise from piling works at Portion IV.	Y	See Investigation / Mitigation Measures for Complaint No. 198	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
198	21st July 2018	21st July 2018 / Construction of Road P2	SKDC member	Noise	The complainant complained about the noise from metal occasionally in the marine works area.	Y	Based on the noise monitoring results in July 2018, no Limit Level Exceedance was recorded at Station CM6(A) and CM7(A). It is considered that no adverse construction noise impact was brought to the nearby sensitive receivers during the construction. The Contractors had implemented environmental mitigation measures to reduce construction nuisance from construction activities to the nearby sensitive receivers as follows: <u>Noise:</u> ➢ Acoustic box was utilized for breaking works to minimize noise nuisance ➢ Acoustic barriers were provided for pre-boring works ➢ Regular site checking would be performed to ensure the type and quantity of PME are in order with the updated Construction Noise Assessment. ➢ Additional acoustic materials were wrapped around the vibration hammer ➢ Quieter plant, i.e. quality powered mechanical equipment was used as far as practicable to minimize noise impact from PME	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
197	21st July 2018	21st July 2018 / Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	The complainant complained about the noise nuisance from breaker.	Y	According to the EM&A Manual of this Project, additional weekly noise monitoring in Cha Kwo Ling and Lam Tin during night-time has been carried out at Station CM1 – Nga Lai House, Yau Lai Estate Phase 1, Yau Tong, Station CM2 – Bik Lai House, Yau Lai Estate Phase 1, Yau Tong, CM3 - Block S, Yau Lai Estate Phase 5, Yau Tong. no Limit Level Exceedance was recorded at Station CM1, CM2 and CM3. The summary of daytime and evening time noise monitoring results which conducted by ET in July and early August 2018 at Station CM1, CM2 and CM3 The Contractor had implemented environmental mitigation measures in accordance with the "Implementation Schedule of Proposed Mitigation Measures" of EM&A Manual as follows: ➢ Noise barriers were erected between the PMEs and NSR to reduce noise nuisance ➢ Powered mechanical equipment (PME) for rock breaking were equipped with TMD and SilentMat	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
196	20th July 2018	Not specified / Construction of Lam Tin Interchange	Property Management Office of Hong Pak Court	Air Quality	The complainant complained about the dust problem after blasting work in the afternoon.	N	The Contractor had implemented environmental mitigation measures in accordance with the "Implementation Schedule of Proposed Mitigation Measures" of EM&A Manual as follows: ➢ Blasting cage were surrounded with impervious material during surface blasting ➢ Water spraying was provided at the blasting cage to enhance dust suppression	Closed
195	17th July 2018	16th July 2018 / Construction of Road P2	SKDC member	Noise	The complainant complained the noise from works area near Ocean Shores	Y	See Investigation / Mitigation Measures for Complaint No. 198	Closed
194	12th July 2018	12th July 2018/ Construction of Road P2/ D4 and Northern Footbridge	Residents of Metrotown	Air Quality	The complainant complained the dusty problem next to Chui Ling Road Substation.	N	The Contractor had implemented environmental mitigation measures in accordance with the "Implementation Schedule of Proposed Mitigation Measures" of EM&A Manual as follows: ➢ Water spraying was provided at least 8 times a day. ➢ Access road was paved to minimize dust emission from truck traffic.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
193	12th July 2018	12th July 2018 / Construction of Road P2	Residents of Metrotown	Air Quality	The complainant complained the dust problem from the partially covered stockpile in Work Area A.	N	According to the information provided and confirmed by the Engineer, loading and unloading of treated sediment was conducted in Work Area A. According to the EM&A Manual of this Project, regular air quality monitoring has been carried out at Station AM5(A) – Tseung Kwan O DSD Desilting Compound and AM6(A) – Park Central, L1/F Open Space Area. no Action or Limit Level Exceedance was recorded at Station AM5(A) and AM6(A) from 3 to 12 July 2018. It is considered that no adverse air quality impact was brought to the nearby sensitive receivers during the construction period The Contractors had implemented environmental mitigation measures to reduce dust nuisance from construction activities to the nearby sensitive receivers as follows: ➢ Covered the stockpile of treated marine sediment with tarpaulin sheets	Closed
192	23rd July 2018	Not specified/ Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Follow up on the complaint on 27th June, 2nd and 3rd July 2018, the complainant complained that the situation has not yet been addressed.	Y	The Contractor had implemented environmental mitigation measures in accordance with the "Implementation Schedule of Proposed Mitigation Measures" of EM&A Manual as follows: ➢ Replaced and fixed the uneven metal plate on Lei Yue Mun Road near ambulance depot	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
191	3rd July 2018	3rd July 2018/ Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Follow up on the complaint on 27th June, 2nd July 2018, the complainant complained that the situation has not yet been addressed.	Y	The Contractor had implemented environmental mitigation measures in accordance with the "Implementation Schedule of Proposed Mitigation Measures" of EM&A Manual as follows: ➢ Replaced and fixed the uneven metal plate on Lei Yue Mun Road near ambulance depot According to the information provided and confirmed by the Engineer, dredging and welding works are conducted on 23 June 2018 during the time of complaint. The Contractors had implemented environmental mitigation measures to reduce odour nuisance from construction activities to the nearby sensitive receivers as follows: ➢ Air blowers were provided at the location where welding works to be carried out to dilute the smell ➢ Additional water filter tank was adopted on deck level of derrick barges to reduce emission of dark smoke and exhaust smell	Closed
	2nd July 2018	2nd July 2018/ Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Follow up on the complaint on 27th June 2018, the complainant complained that the situation has not yet been addressed.	Y		Closed
	27th June 2018	26th and 27th June 2018/ Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	The complainant complained the construction noise at Lam Tin Interchange during night-time.	Y		Closed
	25th June 2018	23rd June 2018/ Construction of Road P2	Public	Air Quality	The complainant complained the dark smoke emission from construction barge and the smell from welding works.	N		Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
190	22nd June 2018	Not Specific/ Construction of Lam Tin Interchange	Public	Waste Management	The complainant complaint about the housekeeping of the construction site.	N	From the Daily Record Summary provided by the Contractor and confirmation by the RE, there was no irregularity, and together with the site inspection conducted by the environmental team in June, construction waste on pavement was not observed. Despite, the Contractor was reminded to follow the relevant mitigation measures related to waste management: ➢ Ensure trucks have enclosed the containers before leaving the site to reduce the impact during transportation (Photo 3); ➢ Training of site personnel in proper waste management and chemical handling procedures to ensure proper disposal of construction waste; ➢ Proper storage and site practices to minimize the potential for damage or contamination of construction materials	Closed
189	20th June 2018	28th May 2018/ Construction of Road P2	SKDC member	Air Quality	The complainant complained the dark smoke emission from the same construction vessel.	N	See Investigation / Mitigation Measures for Complaint No. 181.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
188	20th June 2018	20th June 2018/ Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	The complainant complained about construction noise starting from 6 am.	Y	The construction activities in Lam Tin Interchange (Work site No.101) on 20th of June possessed of 6 no. of excavators between 7-8 am, 6 no. of breakers, excavator mounted between 8-10 am. The quantity of excavators and breakers were consistent with the Construction Noise Mitigation Plan (Construction Activity Group 1.1) The Contractor had implemented environmental mitigation measures in accordance with the "Implementation Schedule of Proposed Mitigation Measures" of EM&A Manual as follows: ➢ Powered mechanical equipment (PME) for rock breaking were equipped with TMD and SilentMat	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
187	7th June 2018	7th June 2018/ Construction of Road P2	Resident of Ocean Shores	Air Quality	The complainant complained about the smell of machinery exhaust affecting the podium of Ocean Shores (swimming pool). The complainant suspected the exhaust was originated from the nearby barges.	N	According to the information provided and confirmed by the Engineer, dredging works and placing rock fill were conducted during the time of complaint. Dredger, derrick barge, tug boat and hopper barge were being operated for the mentioned works. According to the site inspections conducted by ET and IEC in May and June 2018, no exhausted smell from construction vessel was identified in Portion IV, VII and IX. The Contractors had implemented environmental mitigation measures to minimize the air nuisance to the nearby sensitive receivers as follows: *Odour Emission from Exhausted Gas:* ➢ Additional water filter tank was adopted on the deck level of derrick barges to reduce emission of dark smoke and exhaust smell	Closed
186	6th June 2018	6th June 2018/ Construction of Lam Tin Interchange	Resident of Chung Pak House, Hong Pak Court	Noise	The complainant complained about the construction noise at Lam Tin Interchange.	Y	A valid Construction Noise Permit (CNP) (No. GW-RE0278-18) was granted to the Contractor for the construction site at Lam Tin Interchange. The number of excavator and dump trucks that were used on 6 June were covered by the CNP.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
185	6th June 2018	30th May and 30th September 2017/ Construction of Road P2	SKDC member	Noise	The complainant complained about the noise affecting nearby resident in early morning near Ocean Shores.	Y	See Investigation / Mitigation Measures for Complaint No. 50 and 81.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
184	6th June 2018	Not specified / Construction of Road P2	SKDC member	Landscape	The complainant complained about excessive tree felling near Ocean Shores.	N	According to the information provided and confirmed by the Engineer, tree removal application for the concerned area has granted approval from District Lands Office (DLO) on 1 August 2017 and 18 April 2018 together with the tree compensatory plans. The felling of a total of 85 trees at the concerned area were in accordance with the approved tree removal application by the DLO. None of them are registered Old and Valuable Tree and neither of them are rare nor endangered species. The number of retained trees at the concerned location complies with the latest tree removal application. The Contractor had taken initiatives to minimize nuisance from construction works to the nearby sensitive receivers as follows: ➢ Tree protection zones were established and surrounded by fences to protect retained trees adjacent to the construction area. ➢ Tree protection zone were free of machinery and material that are likely to be injurious to the tree. ➢ Regular tree assessments were conducted by qualified Arborist to monitor the condition of retained trees.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
183	4th June 2018	4th June 2018/ Construction of Lam Tin Interchange	Resident of Hong Pak Court	N/A	The complainant complained about the blasting works during night-time.	N	The Contractor had implemented environmental mitigation measures in accordance with the "Implementation Schedule of Proposed Mitigation Measures" ➢ Ensured blasting doors were closed while blasting associated works was undertaken in the tunnel ➢ Installed steel-type blasting door mounted with sound absorptive lining to absorb construction noise in the tunnel	Closed
182	1st June 2018	Not specified/ Construction of Lam Tin Interchange	Sin Fat Road Tennis Court	Air Quality	The complainant complained about the dust	N	The Contractor had taken initiatives to minimize nuisance from construction works to the nearby sensitive receivers as follows: ➢ Frequent water spraying along the slope area at LTI. ➢ Tarpaulin sheets were provided along the slope adjacent to the tennis court during preparation of surface blasting.	Closed

Cumulative Complaint Log since commencement of Project

Reporting Month	Number of Complaints in Reporting Month	Number of Summons in Reporting Month	Number of Prosecutions in Reporting Month
November 2016	0	0	0
December 2016	11	0	0
January 2017	15	0	0
February 2017	4	0	0
March 2017	6	0	0
April 2017	1	0	0
May 2017	10	0	0
June 2017	8	0	0
July 2017	3	0	0
August 2017	8	0	0
September 2017	14	0	0
October 2017	8	0	0
November 2017	12	0	0
December 2017	10	1	0
January 2018	11	0	0
February 2018	6	0	0
March 2018	17	0	0
April 2018	15	0	0
May 2018	22	0	0
June 2018	11	0	1
July 2018	9	0	0
August 2018	12	0	0
September 2018	11	0	0
October 2018	13	0	0
November 2018	13	0	0

Reporting Month	Number of Complaints in Reporting Month	Number of Summons in Reporting Month	Number of Prosecutions in Reporting Month
December 2018	10	0	0
January 2019	39	0	0
February 2019	20	0	0
March 2019	25	0	0
April 2019	17[1]	0	0
May 2019	11	0	0
June 2019	11	0	0
July 2019	8[2]	0	0
August 2019	5	0	0
September 2019	4	0	0
October 2019	5	0	0
November 2019	6	0	0
December 2019	5	0	0
Total	**416**	**1**	**1**

1. Complaint No. 378, 363, 362 were received after the submission of EMA Monthly Report (April 2019)
2. Two new complaints was received after the submission of the EMA Report (July 2019)

Cumulative Log for Notifications of Summons

Contract No.	Log Ref.	Date/Location	Subject	Status	Total no. Received in this reporting month	Total no. Received since project commencement
NE/2015/01	--	--	--	--	--	--
NE/2015/02	KTS24 138/2017	25 June 2017/ Marine construction site at Junk Bay	Contrary to: Sections 6 (1) (b) and 6 (5), Noise Control Ordinance, Cap.400	The Summon was issued on 22 Dec 2017 First hearing on 29 Mar 2018	0	1
NE/2015/03	--	--	--	--	--	--
NE/2017/01	--	--	--	--	--	--
NE/2017/02	--	--	--	--	--	--

Cumulative Log for Successful Prosecutions

Contract No.	Log Ref.	Date/Location	Subject	Status	Total no. Received in this reporting month	Total no. Received since project commencement
NE/2015/01	--	--	--	--	--	--
NE/2015/02	KTS24 138/2017	25 June 2017/ Marine construction site at Junk Bay	Contrary to: Sections 6 (1) (b) and 6 (5), Noise Control Ordinance, Cap.400	Successful prosecution to the subcontractor on 27 June 2018	1	1
NE/2015/03	--	--	--	--	--	--
NE/2017/01	--	--	--	--	--	--
NE/2017/02	--	--	--	--	--	--

APPENDIX P
WASTE GENERATION IN THE REPORTING MONTH

Name of Department: Civil Engineering Development Department

Contract No.: NE/2015/01

Monthly Summary Waste Flow Table for Dec 2019

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	a.Total Quantity Generated (see Note 8)	b. Hard Rock and Large Broken Concrete	c. Reused in the Contract	d. Reused in Other Projects	e. Disposed as Public Fill	f. Imported Fill	g. Metals (see Note 5)	h. Paper / Cardboard Packaging (see Note 5)	i. Plastics (see Note 3) (see Note 5)	j. Chemical Waste	k. Others, e.g. general refuse
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m^3)
January	131.655	73.591	0.000	103.085	28.570	0.000	0.000	0.421	0.000	2.400	0.140
February	105.752	52.675	0.000	55.650	50.103	0.000	0.000	0.320	0.000	0.000	0.088
March	147.872	85.219	0.000	85.219	62.653	0.000	0.000	0.654	0.000	0.000	0.102
April	86.872	63.871	0.000	65.710	21.162	0.000	0.000	0.000	0.000	0.000	0.101
May	88.182	56.127	0.000	56.5945	31.587	0.000	0.000	0.410	0.000	3.200	0.126
June	103.458	59.644	0.000	59.644	43.814	0.000	0.000	0.240	0.000	1.120	0.102
Sub-total	663.791	391.127	0.000	425.903	237.888	0.000	0.000	2.045	0.000	6.720	0.658
July	119.093	75.619	0.000	75.619	43.474	0.000	0.000	0.000	0.000	3.444	0.206
August	107.353	67.789	0.000	67.789	39.564	0.000	0.000	0.000	0.000	0.000	0.260
September	103.041	67.690	0.000	67.690	35.351	0.000	0.000	0.000	0.000	3.200	0.301
October	128.926	52.998	0.000	52.998	75.928	0.000	0.000	0.000	0.000	0.000	0.323
November	132.790	52.217	0.000	52.217	80.573	0.000	0.000	0.000	0.000	2.880	0.444
December	152.850	53.658	0.000	53.658	99.192	0.000	0.000	0.000	0.000	0.000	0.483
Total	1407.844	761.098	0.000	795.874	611.970	0.000	0.000	2.045	0.000	16.244	2.675

Total inert C&D waste generated = c+d+e

Total inert C&D waste recycled = c+d

% of recycled inert C&D waste = Total C&D waste recycled / Total C&D waste generated

Notes: (1) The performance target are given in PS Clause 6(14)

(2) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site

(3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material

(4) The Contractor shall also submit the latest forecast of the amount of C&D materials expected to be generated from the Works, together with a break down of the nature where the total amount of C&D materials expected to be generated from the Works is equal to or exceeding 50,000m3. (PS Clause 1.105(4) refers)

(5) All recyclable materials, including metals, paper / cardboard packaging, plastics, etc. will be collected by registered collector for recycling.

(6) Conversion factors for reporting purpose:

in-situ: rock = 2.5 tonnes/m^3; soil = 2.0 tonnes/m^3

(7) excavated: rock = 2.0 tonnes/m^3; soil = 1.8 tonnes/m^3; broken concrete and bitumen = 2.4 tonnes/m^3, soil and rock = 1.9 tonnes/m^3

(8) C&D Waste = 0.9 tonnes/m^3; bentonite slurry = 2.8 tonnes/m^3

Diesel density: 0.8kg/l

Numbers are rounded off to the nearest three decimal places

The "Total Quantity Generated" equals to the sum of "Reuse in the Contract", "Reuse in Other Projects" and "Disposed as Public Fill"

Monthly Summary Waste Flow Table for 2019 Year

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Borken Concrete	Reused in the Contract	Reused in other Projects	Disposal as Public Fill	Imported Fill	Metals	Paper / Cardboard Packaging	Plastics (See note 3)	Chemical Waste	Other, e.g. general refuse
	[in '000m^3]	[in '000m^3]	[in '000m^3]	[in '000m^3]	[in '000m^3]	[in '000m^3]	[in '000kg]	[in '000kg]	[in '000kg]	[in '000kg]	[in '000m^3]
Jan	39.06133	0.00000	1.09752	0.00000	2.94501	35.01880	140.97000	0.00000	0.00000	4.11000	0.07932
Feb	27.16095	0.00000	0.73212	0.00000	1.09407	25.33476	0.00000	0.00000	0.00000	0.72000	0.01610
Mar	48.33586	0.00000	0.00000	0.00000	3.29905	45.03681	18.33000	0.00000	0.00000	0.00000	0.04866
Apr	103.60117	0.00000	0.00000	0.00000	2.04236	101.55882	0.00000	0.00000	0.00000	0.00000	0.03052
May	179.02844	0.00000	7.33100	0.00000	4.51844	167.17900	0.00000	0.00000	0.00000	0.00000	0.07562
June	119.91265	0.00000	30.10000	0.00000	2.16472	87.64793	95.27000	0.00000	0.00000	0.00000	0.03852
SUB-TOTAL	517.10039	0.00000	39.26064	0.00000	16.06364	461.77612	254.57000	0.00000	0.00000	4.83000	0.28874
Jul	96.20817	0.00000	31.19800	0.00000	1.79282	63.21735	27.25000	0.00000	0.00000	0.00000	0.03452
Aug	63.31885	0.00000	5.70210	0.00000	0.95750	56.65926	211.19000	0.00000	0.00000	0.00000	0.05126
Sep	80.82131	0.00000	19.19073	0.00000	0.15133	61.47926	70.20000	0.00000	0.00000	0.00000	0.05146
Oct	66.19248	0.00000	0.00000	0.00000	7.50708	58.68541	0.00000	0.00000	0.00000	0.00000	0.09922
Nov	18.03684	0.00000	0.00000	0.0000	17.42498	0.61187	135.00000	0.00000	0.00000	0.16500	0.06022
Dec	45.28080	0.00000	0.00000	0.0000	44.38340	0.89740	0.00000	0.00000	0.00000	0.00000	0.04210
TOTAL	886.95884	0.00000	95.35147	0.00000	88.28072	703.32665	698.21000	0.00000	0.00000	4.99500	0.62752

Note: **Conversion to 1000m^3 for general refuse is weight in 1000kg multiply by 0.002**

Conversion to 1000m^3 for Inert C&D is weight in 1000kg multiply by 0.0005

Plastics refer to plastic bottles / containers, plastic sheets / foam from packaging material

Plastics refer to plastic bottles / containers, plastic sheets / foam from packaging material

Monthly Summary of Waste Flow Table for 2019

Name of Person completing the Record: Martin Yiu

Month	Actual Quantities of Inert C&D Materials Generated Monthly					Actual Quantities of Non-inert C&D Wastes Generated Monthly				
	Total Quantity Generated	Broken Concrete *(see Note 1)*	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Metals	Paper/ cardboard packaging	Plastics *(see Note 2)*	Chemical Waste	Others, e.g. general refuse
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000 Kg)	(in '000 Kg)	(in '000 Kg)	(in '000 Kg)	(in '000m^3)
Jan	0.3363	0	0	0	0.3363	0	0	0	0	0.0065
Feb	0.0650	0	0	0	0.0650	0	0	0	0	0.0065
Mar	0.2925	0	0	0	0.2925	0	0	0	0	0.0065
Apr	0.3331	0	0	0	0.3331	0	0	0	0	0.0065
May	0.4330	0	0	0	0.4330	0	0	0	0	0.0065
Jun	0.8912	0	0	0	0.8912	0	0	0	0	0.0065
Sub-total	2.3511	0	0	0	2.3511	0	0	0	0	0.0390
Jul	0.3006	0	0	0	0.3006	0	0	0	0	0.0065
Aug	1.1213	0	0	0	1.1213	0	0	0	0	0.0260
Sep	0.4794	0	0	0	0.4794	0	0	0	0	0.0065
Oct	0.3006	0	0	0	0.3006	0	0	0	0	0.0260
Nov	0.6906	0	0	0	0.6906	0	0	0	0	0.0130
Dec	0.5688	0	0	0	0.5688	0	0	0	0	0.0130
Total	5.8124	0	0	0	5.8124	0	0	0	0	0.1300

Notes:

(1) Broken concrete for recycling into aggregates.

(2) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.

(3) Use the conversion factor: 1 full load of 24t / 30t dumping truck being equivalent to 6.5m3 / 8.125 m3 by volume.

GTECH Services (Hong Kong) Limited

Name of Department: Civil Engineering & Development Department

Contract No.: NE/2017/06

Monthly Summary Waste Flow Table For 2019

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock & Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ Cardboard Packaging	Plastics	Chemical Waste	Others, e.g. General Refuse
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m^3)
Jan	0	0	0	0	0	0	0	0	0	0	0
Feb	0	0	0	0	0	0	0	0	0	0	0.018
Mar	0	0	0	0	0	0	0	0	0	0	0
Apr	0	0	0	0	0	0	0	0	0	0	0
May	0	0	0	0	0	0	0	0	0	0	0
Jun	0	0	0	0	0	0	0	0	0	0	0
Sub-total	0	0	0	0	0	0	0	0	0	0	0.018
Jul	0	0	0	0	0	0	0	0	0	0	0
Aug	0	0	0	0	0	0	0	0	0	0	0
Sep	0	0	0	0	0	0	0	0	0	0	0
Oct	0	0	0	0	0	0	0	0	0	0	0
Nov	0	0	0	0	0	0	0	0	0	0	0
Dec	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0.018

Notes: (1) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.

(2) Plastics refer to plastic bottles / containers, plastic sheets / foam from packaging material.

(3) Each dump truck carries 6m^3 of general refuse.

(4) The commencement date of the Contract is 9 November 2018. The current reporting period is from 1 December 2019 to 31 December 2019.

Name of Department : CEDD Contract No. : NE/2015/03

Monthly Summary Waste Flow Table for December 2019 (year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock & Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemicals Waste	Others, e.g. general refuse
	(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 kg)	(in '000 kg)	(in '000 kg)	(in '000 kg)	(in '000 m^3)
Accumulated From 2018	1.23485	0	0.175365	0.427405	0.59793	0.03056	0	0	0	0	0.038188
Jan	0.00022	0	0	0	0.00022	0	0	0	0	0	0
Feb	0.0026	0	0	0	0.0026	0	0	0	0	0	0
Mar	0.0048	0	0	0	0.0048	0	0	0	0	0	0
Apr	0	0	0	0	0	0	0	0	0	0	0
May	0.5493	0	0	0	0.5493	0	0	0	0	0	0
June	0.48376	0	0	0	0.48376	0	0	0	0	0	0.0146
Sub-total	2.27553	0	0.175365	0.427405	1.63861	0.03056	0	0	0	0	0.05278
July	0.0669	0	0	0	0.0669	0	0	0	0	0	0.14297
Aug	0.00020	0	0	0	0.00020	0	0	0	0	0	0.00025
Sept	0.113	0	0	0	0.113	0	0	0	0	0	0.00056
Oct	0.0115	0	0	0	0.0115	0	0	0	0	0	0.0228
Nov	0	0	0	0	0	0	0	0	0	0	0.0025
Dec	0.004	0	0	0	0.004	0	0	0	0	0	0.0049
Total	2.47194	0	0.17365	0.427405	1.83421	0.03056	0	0	0	0	0.22676

Notes: (1) The performance targets are given in PS Clause 6.14.
(2) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
(3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging materials.
(4) The *Contractor* shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the *works*, together with a breakdown of the nature where the total amount of C&D materials expected to be generated from the *works* is equal to or exceeding 50,000 m3.

Monthly Summary Waste Flow Table for 2019

Name of Department: Civil Engineering and Development Department

Contract No.: NE/2017/01

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics	Chemical Waste	Others, e.g. general refuse
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m^3)
Jan	0.0400	0.0000	0.0000	0.0400	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0015
Feb	0.0400	0.0000	0.0000	0.0400	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0017
Mar	0.0400	0.0000	0.0000	0.0400	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0006
Apr	0.0420	0.0000	0.0000	0.0000	0.0420	0.0000	0.0000	0.0000	0.0000	0.0000	0.0012
May	0.0608	0.0000	0.0000	0.0000	0.0608	0.0000	0.0148	0.0000	0.0080	0.0000	0.0010
Jun	0.1055	0.0000	0.0000	0.0400	0.0655	0.0000	0.0000	0.0000	0.0000	0.0000	0.0040
Sub-total	0.3283	0.0000	0.0000	0.1600	0.1683	0.0000	0.0148	0.0000	0.0080	0.0000	0.0100
Jul	0.0949	0.0000	0.0000	0.0200	0.0749	0.0000	12.440	0.0000	0.0000	0.0000	0.0020
Aug	0.0633	0.0000	0.0000	0.0000	0.0633	0.0000	0.0000	0.0000	0.0000	0.0000	0.0036
Sep	0.0588	0.0000	0.0000	0.0000	0.0588	0.0000	0.0000	0.0000	0.0000	0.0000	0.0010
Oct	0.0678	0.0000	0.0000	0.0000	0.0678	0.0000	4.6300	0.0000	0.0000	0.0000	0.0036
Nov	0.4115	0.0000	0.0000	0.0000	0.4115	0.0000	0.0000	0.0000	0.0155	0.0000	0.0057
Dec	0.0534	0.0000	0.0000	0.0000	0.0534	0.0000	8.8800	0.0000	0.0000	0.0000	0.0046
Total	1.0780	0.0000	0.0000	0.1800	0.8980	0.0000	25.9648	0.0000	0.0235	0.0000	0.0305

Notes:

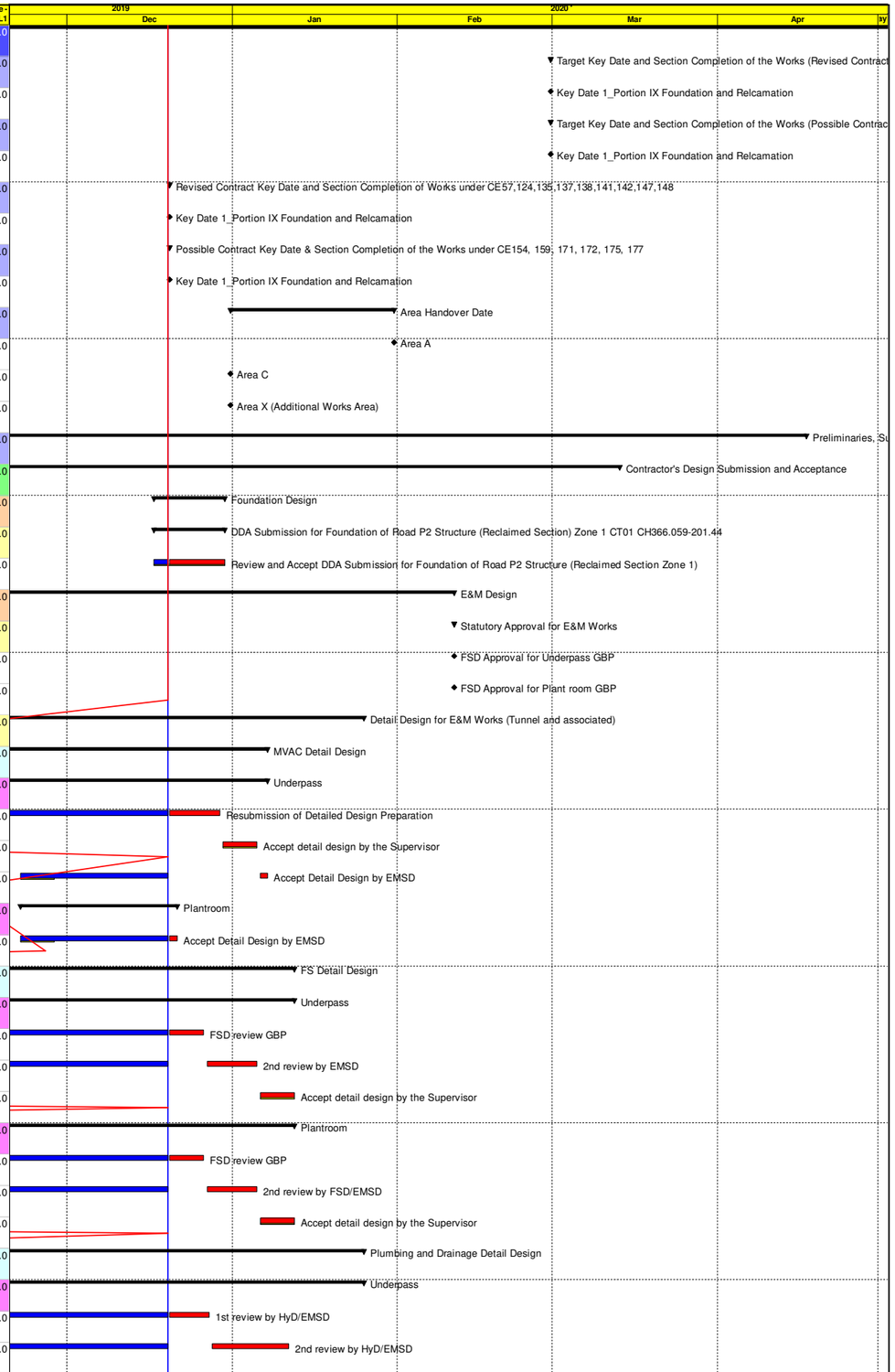
1. Assume the density of soil fill is 2 ton/m^3.
2. Assume the density of rock and broken concrete is 2.5 ton/m^3.
3. Assume the density of mixed rock and soil is 1.9 ton/m^3.
4. Assume the density of slurry and bentonite is 2.8 ton/m^3.
5. The slurry and bentonite are disposed at Tseung Kwan O Area 137 Fill Bank.
6. Assume the density of C&D waste is 0.9 ton/m^3.
7. The non-inert C&D wastes are disposed at NENT.

APPENDIX Q
TENTATIVE CONSTRUCTION PROGRAMME

High Level 3 Months Look Ahead Programme

Activities	Jan-20	Feb-20	Mar-20
Lam Tin Interchange			
EHC2 U-Trough			
Site Formation - Area 1G1 & 1G2 &5			
Site Formation - Area 2			
Site Formation - Area 3			
Site Formation - Area 4			
Administration Building			
Main Tunnel			
MT Excavation			
MT Lining Works			
TKO Interchange			
Haul Road Construction, Site Formation & Slope Works			
Bridge Construction			
Cavern Excavation			
East Ventilation Building			

Activity ID	Activity Name	Calendar	Original Duration	Remaining Duration	Start	Finish	Total Float	Activity % Complete	TRA	Variance - BL1
NE/2015/02 Tseung Kwan O - Lam Tin Tunnel-Road P2 and Associated Works (Dec-19)			1609.0	655.0	12-Jan-17 A	04-Oct-21	-128.5			-118.0
Target Key Date and Section Completion of the Works (Revised Contract Key Date)		P2-Cal.A	0.0	0.0	29-Feb-20	29-Feb-20	-179.5			0.0
A10420	Key Date 1_Portion IX Foundation and Relcamation	P2-Cal.A	0.0	0.0		29-Feb-20*	-179.5	0%		0.0
Target Key Date and Section Completion of the Works (Possible Contract Key Date)		P2-Cal.A	0.0	0.0	29-Feb-20	29-Feb-20	-166.5			0.0
A10770	Key Date 1_Portion IX Foundation and Relcamation	P2-Cal.A	0.0	0.0		29-Feb-20*	-166.5	0%		0.0
Revised Contract Key Date and Section Completion of Works under CE57,124,135,137,138,1		P2-Cal.A	0.0	0.0	20-Dec-19	20-Dec-19	-107.5			0.0
K10402	Key Date 1_Portion IX Foundation and Relcamation	P2-Cal.A	0.0	0.0		20-Dec-19*	-107.5	0%		0.0
Possible Contract Key Date & Section Completion of the Works under CE154, 159, 171, 172,		P2-Cal.A	0.0	0.0	20-Dec-19	20-Dec-19	-94.5			0.0
K10419-11	Key Date 1_Portion IX Foundation and Relcamation	P2-Cal.A	0.0	0.0		20-Dec-19*	-94.5	0%		0.0
Area Handover Date		P2-Cal.A	30.0	30.0	31-Dec-19	31-Jan-20	0.0			0.0
A10620	Area A	P2-Cal.A	0.0	0.0		31-Jan-20*	0.0	0%		0.0
A10660	Area C	P2-Cal.A	0.0	0.0		31-Dec-19*	0.0	0%		0.0
A10700	Area X (Additional Works Area)	P2-Cal.A	0.0	0.0		31-Dec-19*	0.0	0%		0.0
Preliminaries, Submission, Contractor's Design Submission and Approval		P2-Cal.A	1184.0	120.0	20-Jan-17 A	17-Apr-20	185.5			0.0
Contractor's Design Submission and Acceptance		P2-Cal.A	908.0	85.0	01-Apr-17 A	13-Mar-20	56.5			-170.0
Foundation Design		P2-Cal.A	14.0	11.0	17-Dec-19 A	30-Dec-19	-120.5			0.0
DDA Submission for Foundation of Road P2 Structure (Reclaimed Section) Zone 1 CT01 CH366.059-201.44		P2-Cal.A	14.0	11.0	17-Dec-19 A	30-Dec-19	-120.5			0.0
S11420	Review and Accept DDA Submission for Foundation of Road P2 Structure (Reclaimed Section Zone 1)	P2-Cal.A	14.0	11.0	17-Dec-19 A	30-Dec-19	-120.5	21.43%		0.0
E&M Design		P2-Cal.A	877.0	54.0	01-Apr-17 A	11-Feb-20	-75.5			-170.0
Statutory Approval for E&M Works		P2-Cal.A	0.0	0.0	11-Feb-20	11-Feb-20	-75.5			0.0
S11570-11	FSD Approval for Underpass GBP	P2-Cal.A	0.0	0.0		11-Feb-20	-75.5	0%		0.0
S11570-12	FSD Approval for Plant room GBP	P2-Cal.A	0.0	0.0		11-Feb-20	-75.5	0%		0.0
Detail Design for E&M Works (Tunnel and associated)		P2-Cal.A	860.0	37.0	01-Apr-17 A	25-Jan-20	-58.5			-170.0
MVAC Detail Design		P2-Cal.A	215.0	19.0	05-Jun-19 A	07-Jan-20	-78.5			-2.0
Underpass		P2-Cal.A	215.0	19.0	05-Jun-19 A	07-Jan-20	-78.5			-2.0
S11640-01	Resubmission of Detailed Design Preparation	P2-Cal.A	7.0	10.0	05-Jun-19 A	29-Dec-19	-78.5	0%		-201.0
S11640-02	Accept detail design by the Supervisor	P2-Cal.A	7.0	7.0	30-Dec-19	05-Jan-20	-78.5	0%		0.0
S11640-03	Accept Detail Design by EMSD	P2-Cal.A	7.0	2.0	22-Nov-19 A	07-Jan-20	-78.5	71.43%		-40.0
Plantroom		P2-Cal.A	7.0	2.0	22-Nov-19 A	21-Dec-19	-61.5			-23.0
S11578-03	Accept Detail Design by EMSD	P2-Cal.A	7.0	2.0	22-Nov-19 A	21-Dec-19	-61.5	71.43%		-23.0
FS Detail Design		P2-Cal.A	847.0	24.0	19-Oct-17 A	12-Jan-20	-75.5			31.0
Underpass		P2-Cal.A	847.0	24.0	19-Oct-17 A	12-Jan-20	-75.5			31.0
S11649	FSD review GBP	P2-Cal.A	28.0	7.0	19-Oct-17 A	26-Dec-19	-75.5	75%		-771.0
S11650-01	2nd review by EMSD	P2-Cal.A	15.0	10.0	19-Mar-18 A	05-Jan-20	-75.5	33.33%		-643.0
S11651	Accept detail design by the Supervisor	P2-Cal.A	7.0	7.0	06-Jan-20	12-Jan-20	-75.5	0%		0.0
Plantroom		P2-Cal.A	777.0	24.0	19-Oct-17 A	12-Jan-20	-75.5			-39.0
S11652-10	FSD review GBP	P2-Cal.A	28.0	7.0	19-Oct-17 A	26-Dec-19	-75.5	75%		-771.0
S11652-21	2nd review by FSD/EMSD	P2-Cal.A	15.0	10.0	19-Mar-18 A	05-Jan-20	-75.5	33.33%		-643.0
S11652-23	Accept detail design by the Supervisor	P2-Cal.A	7.0	7.0	06-Jan-20	12-Jan-20	-75.5	0%		0.0
Plumbing and Drainage Detail Design		P2-Cal.A	721.0	37.0	01-Apr-17 A	25-Jan-20	-58.5			-309.0
Underpass		P2-Cal.A	639.0	37.0	09-Apr-18 A	25-Jan-20	-58.5			-18.0
S11657	1st review by HyD/EMSD	P2-Cal.A	15.0	8.0	09-Apr-18 A	27-Dec-19	-58.5	46.67%		-613.0
S11657-01	2nd review by HyD/EMSD	P2-Cal.A	15.0	15.0	23-Jul-19 A	11-Jan-20	-58.5	0%		-158.0



Primary Baseline
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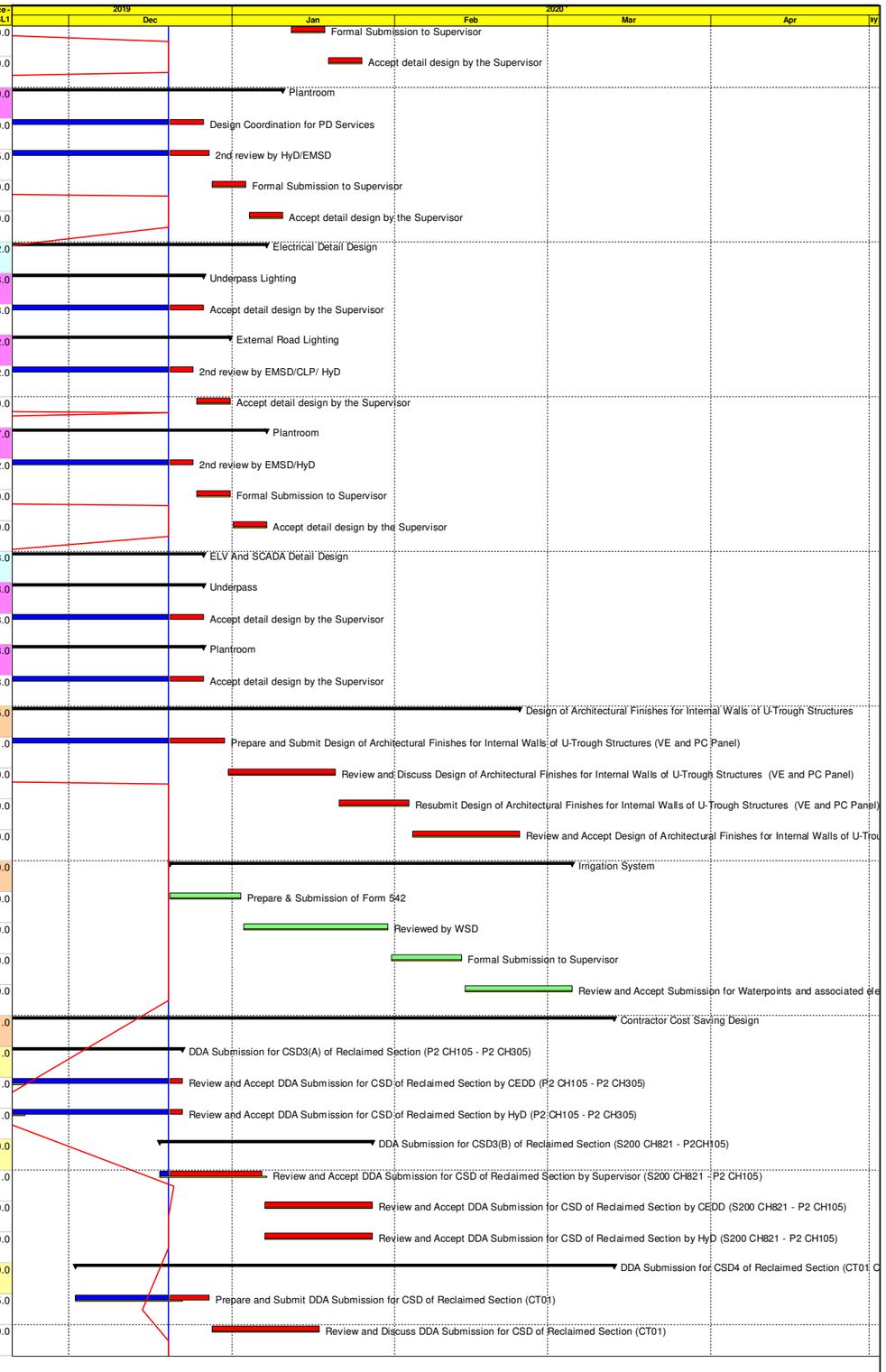
NE/2015/02 Tseung Kwan O - Lam Tin Tunnel-Road P2 and Associated Works (Dec-19)

3 Monthly Rolling Programme
(Data Date : 20-Dec-2019)

Date	Revision	Checked	Approved
20-Dec-19			

Activity ID	Activity Name	Calendar	Original Duration	Remaining Duration	Start	Finish	Total Float	Activity % Complete	TRA	Variance - BL1
S11658	Formal Submission to Supervisor	P2-Cal.A	7.0	7.0	12-Jan-20	18-Jan-20	-58.5	0%		0.0
S11659	Accept detail design by the Supervisor	P2-Cal.A	7.0	7.0	19-Jan-20	25-Jan-20	-58.5	0%		0.0
Plantroom		P2-Cal.A	706.0	22.0	01-Apr-17 A	10-Jan-20	-43.5			-309.0
S11660-07	Design Coordination for PD Services	P2-Cal.A	60.0	7.0	01-Apr-17 A	26-Dec-19	-43.5	88.33%		-940.0
S11660-09	2nd review by HyD/EMSD	P2-Cal.A	15.0	8.0	17-May-18 A	27-Dec-19	-43.5	46.67%		-575.0
S11660-10	Formal Submission to Supervisor	P2-Cal.A	7.0	7.0	28-Dec-19	03-Jan-20	-43.5	0%		0.0
S11660-11	Accept detail design by the Supervisor	P2-Cal.A	7.0	7.0	04-Jan-20	10-Jan-20	-43.5	0%		0.0
Electrical Detail Design		P2-Cal.A	803.0	19.0	06-Jul-18 A	07-Jan-20	-40.5			252.0
Underpass Lighting		P2-Cal.A	7.0	7.0	21-May-19 A	26-Dec-19	-28.5			-213.0
S11660-20	Accept detail design by the Supervisor	P2-Cal.A	7.0	7.0	21-May-19 A	26-Dec-19	-28.5	0%		-213.0
External Road Lighting		P2-Cal.A	796.0	12.0	06-Jul-18 A	31-Dec-19	-33.5			252.0
S11660-25	2nd review by EMSD/CLP/ HyD	P2-Cal.A	15.0	5.0	06-Jul-18 A	24-Dec-19	-33.5	66.67%		-522.0
S11660-28	Accept detail design by the Supervisor	P2-Cal.A	7.0	7.0	25-Dec-19	31-Dec-19	-33.5	0%		0.0
Plantroom		P2-Cal.A	618.0	19.0	06-Jul-18 A	07-Jan-20	-40.5			67.0
S11666	2nd review by EMSD/HyD	P2-Cal.A	15.0	5.0	06-Jul-18 A	24-Dec-19	-40.5	66.67%		-522.0
S11667	Formal Submission to Supervisor	P2-Cal.A	7.0	7.0	25-Dec-19	31-Dec-19	-40.5	0%		0.0
S11668	Accept detail design by the Supervisor	P2-Cal.A	7.0	7.0	01-Jan-20	07-Jan-20	-40.5	0%		0.0
ELV And SCADA Detail Design		P2-Cal.A	7.0	7.0	21-May-19 A	26-Dec-19	-28.5			-213.0
Underpass		P2-Cal.A	7.0	7.0	21-May-19 A	26-Dec-19	-28.5			-213.0
S11669-30	Accept detail design by the Supervisor	P2-Cal.A	7.0	7.0	21-May-19 A	26-Dec-19	-28.5	0%		-213.0
Plantroom		P2-Cal.A	7.0	7.0	21-May-19 A	26-Dec-19	-28.5			-213.0
S11670-30	Accept detail design by the Supervisor	P2-Cal.A	7.0	7.0	21-May-19 A	26-Dec-19	-28.5	0%		-213.0
Design of Architectural Finishes for Internal Walls of U-Trough Structures		P2-Cal.A	523.0	67.0	15-Sep-18 A	24-Feb-20	-71.5			-5.0
S11675	Prepare and Submit Design of Architectural Finishes for Internal Walls of U-Trough Structures (VE and PC Panel)	P2-Cal.A	21.0	11.0	15-Sep-18 A	30-Dec-19	-71.5	47.62%		-451.0
S11680	Review and Discuss Design of Architectural Finishes for Internal Walls of U-Trough Structures (VE and PC Panel)	P2-Cal.A	21.0	21.0	31-Dec-19	20-Jan-20	-71.5	0%		0.0
S11700	Resubmit Design of Architectural Finishes for Internal Walls of U-Trough Structures (VE and PC Panel)	P2-Cal.A	14.0	14.0	21-Jan-20	03-Feb-20	-71.5	0%		0.0
S11720	Review and Accept Design of Architectural Finishes for Internal Walls of U-Trough Structures (VE and PC Panel)	P2-Cal.A	21.0	21.0	04-Feb-20	24-Feb-20	-71.5	0%		0.0
Irrigation System		P2-Cal.A	77.0	77.0	20-Dec-19	05-Mar-20	64.5			0.0
S11788	Prepare & Submission of Form 542	P2-Cal.A	14.0	14.0	20-Dec-19	02-Jan-20	64.5	0%		0.0
S11789	Reviewed by WSD	P2-Cal.A	28.0	28.0	03-Jan-20	30-Jan-20	64.5	0%		0.0
S11790	Formal Submission to Supervisor	P2-Cal.A	14.0	14.0	31-Jan-20	13-Feb-20	64.5	0%		0.0
S11800	Review and Accept Submission for Waterpoints and associated elements	P2-Cal.A	21.0	21.0	14-Feb-20	05-Mar-20	64.5	0%		0.0
Contractor Cost Saving Design		P2-Cal.A	133.0	85.0	01-Nov-19 A	13-Mar-20	-17.5			-1.0
DDA Submission for CSD3(A) of Reclaimed Section (P2 CH105 - P2 CH305)		P2-Cal.A	21.0	3.0	01-Nov-19 A	22-Dec-19	-73.5			-31.0
S11978	Review and Accept DDA Submission for CSD of Reclaimed Section by CEDD (P2 CH105 - P2 CH305)	P2-Cal.A	21.0	3.0	01-Nov-19 A	22-Dec-19	-73.5	85.71%		-31.0
S11979	Review and Accept DDA Submission for CSD of Reclaimed Section by HyD (P2 CH105 - P2 CH305)	P2-Cal.A	21.0	3.0	01-Nov-19 A	22-Dec-19	-73.5	85.71%		-31.0
DDA Submission for CSD3(B) of Reclaimed Section (S200 CH821 - P2CH105)		P2-Cal.A	41.0	39.0	18-Dec-19 A	27-Jan-20	-109.5			0.0
S18078	Review and Accept DDA Submission for CSD of Reclaimed Section by Supervisor (S200 CH821 - P2 CH105)	P2-Cal.A	21.0	18.0	18-Dec-19 A	06-Jan-20	-109.5	14.29%		1.0
S18088	Review and Accept DDA Submission for CSD of Reclaimed Section by CEDD (S200 CH821 - P2 CH105)	P2-Cal.A	21.0	21.0	07-Jan-20	27-Jan-20	-109.5	0%		0.0
S18108	Review and Accept DDA Submission for CSD of Reclaimed Section by HyD (S200 CH821 - P2 CH105)	P2-Cal.A	21.0	21.0	07-Jan-20	27-Jan-20	-109.5	0%		0.0
DDA Submission for CSD4 of Reclaimed Section (CT01 CH226.440 - CH251.440)		P2-Cal.A	103.0	85.0	02-Dec-19 A	13-Mar-20	-17.5			0.0
S18128	Prepare and Submit DDA Submission for CSD of Reclaimed Section (CT01)	P2-Cal.A	21.0	8.0	02-Dec-19 A	27-Dec-19	-17.5	61.9%		-5.0
S18138	Review and Discuss DDA Submission for CSD of Reclaimed Section (CT01)	P2-Cal.A	21.0	21.0	28-Dec-19	17-Jan-20	-17.5	0%		0.0



Primary Baseline
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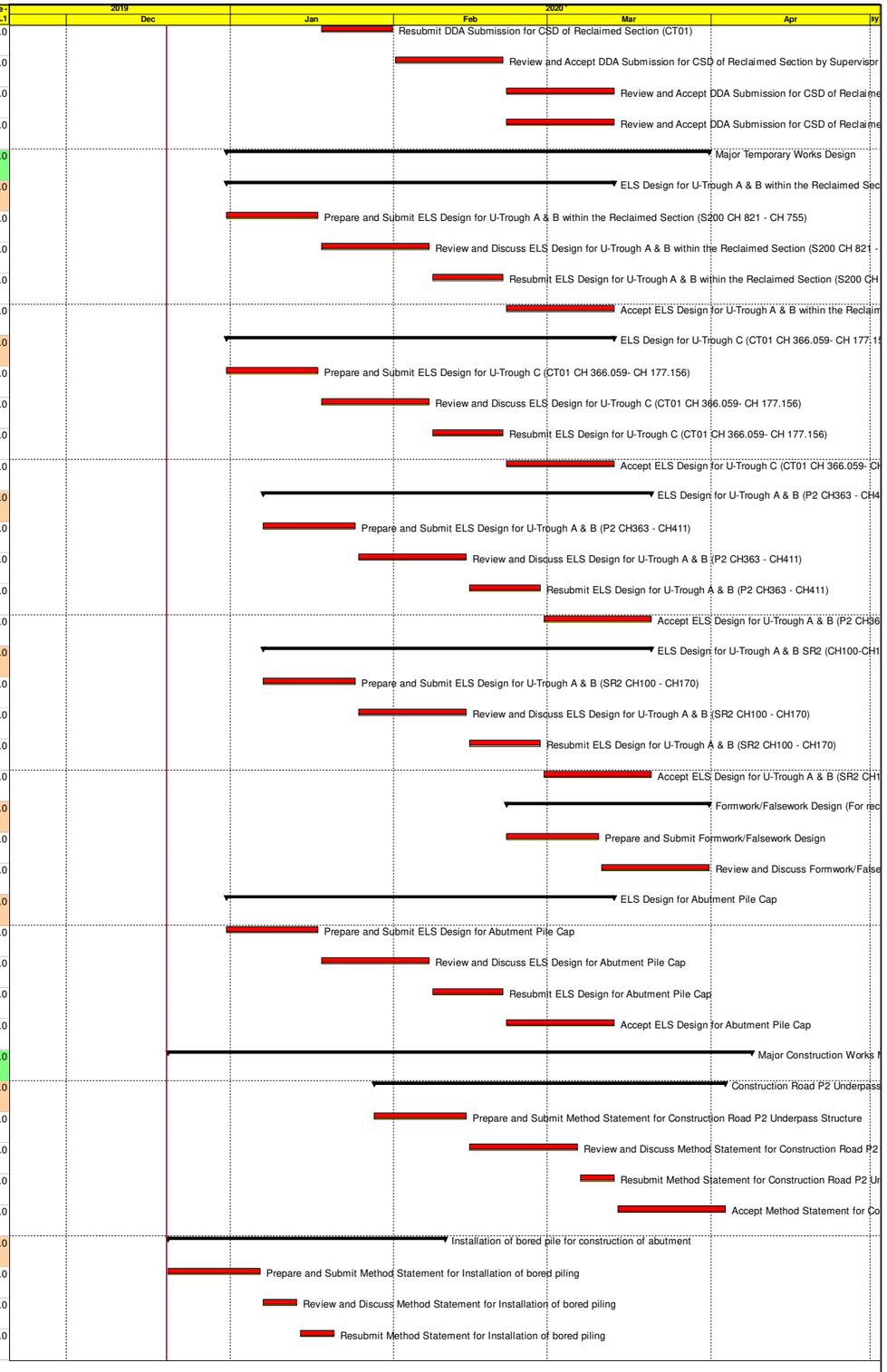
NE/2015/02 Tseung Kwan O - Lam Tin Tunnel-Road P2 and Associated Works (Dec-19)

3 Monthly Rolling Programme
(Data Date : 20-Dec-2019)

Date	Revision	Checked	Approved
20-Dec-19			

Activity ID	Activity Name	Calendar	Original Duration	Remaining Duration	Start	Finish	Total Float	Activity % Complete	TRA	Variance - BL1
S18148	Resubmit DDA Submission for CSD of Reclaimed Section (CT01)	P2-Cal.A	14.0	14.0	18-Jan-20	31-Jan-20	-17.5	0%		0.0
S18158	Review and Accept DDA Submission for CSD of Reclaimed Section by Supervisor (CT01)	P2-Cal.A	21.0	21.0	01-Feb-20	21-Feb-20	-17.5	0%		0.0
S18168	Review and Accept DDA Submission for CSD of Reclaimed Section by CEDD (CT01)	P2-Cal.A	21.0	21.0	22-Feb-20	13-Mar-20	-17.5	0%		0.0
S18178	Review and Accept DDA Submission for CSD of Reclaimed Section by HyD (CT01)	P2-Cal.A	21.0	21.0	22-Feb-20	13-Mar-20	-17.5	0%		0.0
Major Temporary Works Design		P2-Cal.A	92.0	92.0	31-Dec-19	31-Mar-20	-18.5			0.0
ELS Design for U-Trough A & B within the Reclaimed Section (S200 CH 821 - CH 755)		P2-Cal.A	74.0	74.0	31-Dec-19	13-Mar-20	-120.5			0.0
S12620	Prepare and Submit ELS Design for U-Trough A & B within the Reclaimed Section (S200 CH 821 - CH 755)	P2-Cal.A	18.0	18.0	31-Dec-19	17-Jan-20	-120.5	0%		0.0
S12640	Review and Discuss ELS Design for U-Trough A & B within the Reclaimed Section (S200 CH 821 - CH 755)	P2-Cal.A	21.0	21.0	18-Jan-20	07-Feb-20	-120.5	0%		0.0
S12660	Resubmit ELS Design for U-Trough A & B within the Reclaimed Section (S200 CH 821 - CH 755)	P2-Cal.A	14.0	14.0	08-Feb-20	21-Feb-20	-120.5	0%		0.0
S12680	Accept ELS Design for U-Trough A & B within the Reclaimed Section (S200 CH 821 - CH 755)	P2-Cal.A	21.0	21.0	22-Feb-20	13-Mar-20	-120.5	0%		0.0
ELS Design for U-Trough C (CT01 CH 366.059- CH 177.156)		P2-Cal.A	74.0	74.0	31-Dec-19	13-Mar-20	-84.5			0.0
S12780	Prepare and Submit ELS Design for U-Trough C (CT01 CH 366.059- CH 177.156)	P2-Cal.A	18.0	18.0	31-Dec-19	17-Jan-20	-84.5	0%		0.0
S12800	Review and Discuss ELS Design for U-Trough C (CT01 CH 366.059- CH 177.156)	P2-Cal.A	21.0	21.0	18-Jan-20	07-Feb-20	-84.5	0%		0.0
S12820	Resubmit ELS Design for U-Trough C (CT01 CH 366.059- CH 177.156)	P2-Cal.A	14.0	14.0	08-Feb-20	21-Feb-20	-84.5	0%		0.0
S12840	Accept ELS Design for U-Trough C (CT01 CH 366.059- CH 177.156)	P2-Cal.A	21.0	21.0	22-Feb-20	13-Mar-20	-84.5	0%		0.0
ELS Design for U-Trough A & B (P2 CH363 - CH411)		P2-Cal.A	74.0	74.0	07-Jan-20	20-Mar-20	-48.5			0.0
S12940	Prepare and Submit ELS Design for U-Trough A & B (P2 CH363 - CH411)	P2-Cal.A	18.0	18.0	07-Jan-20	24-Jan-20	-48.5	0%		0.0
S12960	Review and Discuss ELS Design for U-Trough A & B (P2 CH363 - CH411)	P2-Cal.A	21.0	21.0	25-Jan-20	14-Feb-20	-48.5	0%		0.0
S12980	Resubmit ELS Design for U-Trough A & B (P2 CH363 - CH411)	P2-Cal.A	14.0	14.0	15-Feb-20	28-Feb-20	-48.5	0%		0.0
S13000	Accept ELS Design for U-Trough A & B (P2 CH363 - CH411)	P2-Cal.A	21.0	21.0	29-Feb-20	20-Mar-20	-48.5	0%		0.0
ELS Design for U-Trough A & B SR2 (CH100-CH170)		P2-Cal.A	74.0	74.0	07-Jan-20	20-Mar-20	-7.5			0.0
S13002	Prepare and Submit ELS Design for U-Trough A & B (SR2 CH100 - CH170)	P2-Cal.A	18.0	18.0	07-Jan-20	24-Jan-20	-7.5	0%		0.0
S13004	Review and Discuss ELS Design for U-Trough A & B (SR2 CH100 - CH170)	P2-Cal.A	21.0	21.0	25-Jan-20	14-Feb-20	-7.5	0%		0.0
S13006	Resubmit ELS Design for U-Trough A & B (SR2 CH100 - CH170)	P2-Cal.A	14.0	14.0	15-Feb-20	28-Feb-20	-7.5	0%		0.0
S13008	Accept ELS Design for U-Trough A & B (SR2 CH100 - CH170)	P2-Cal.A	21.0	21.0	29-Feb-20	20-Mar-20	-7.5	0%		0.0
Formwork/Falsework Design (For reclamation area)		P2-Cal.A	39.0	39.0	22-Feb-20	31-Mar-20	-70.5			0.0
S13161	Prepare and Submit Formwork/Falsework Design	P2-Cal.A	18.0	18.0	22-Feb-20	10-Mar-20	-70.5	0%		0.0
S13161-1	Review and Discuss Formwork/Falsework Design	P2-Cal.A	21.0	21.0	11-Mar-20	31-Mar-20	-70.5	0%		0.0
ELS Design for Abutment Pile Cap		P2-Cal.A	74.0	74.0	31-Dec-19	13-Mar-20	-44.5			0.0
S13179-11	Prepare and Submit ELS Design for Abutment Pile Cap	P2-Cal.A	18.0	18.0	31-Dec-19	17-Jan-20	-44.5	0%		0.0
S13179-12	Review and Discuss ELS Design for Abutment Pile Cap	P2-Cal.A	21.0	21.0	18-Jan-20	07-Feb-20	-44.5	0%		0.0
S13179-13	Resubmit ELS Design for Abutment Pile Cap	P2-Cal.A	14.0	14.0	08-Feb-20	21-Feb-20	-44.5	0%		0.0
S13179-14	Accept ELS Design for Abutment Pile Cap	P2-Cal.A	21.0	21.0	22-Feb-20	13-Mar-20	-44.5	0%		0.0
Major Construction Works Method Statement		P2-Cal.A	111.0	111.0	20-Dec-19	08-Apr-20	4.5			0.0
Construction Road P2 Underpass Structure CH105-318		P2-Cal.A	67.0	67.0	28-Jan-20	03-Apr-20	-109.5			0.0
S13190	Prepare and Submit Method Statement for Construction Road P2 Underpass Structure	P2-Cal.A	18.0	18.0	28-Jan-20	14-Feb-20	-109.5	0%		0.0
S13200	Review and Discuss Method Statement for Construction Road P2 Underpass Structure	P2-Cal.A	21.0	21.0	15-Feb-20	06-Mar-20	-109.5	0%		0.0
S13220	Resubmit Method Statement for Construction Road P2 Underpass Structure	P2-Cal.A	7.0	7.0	07-Mar-20	13-Mar-20	-109.5	0%		0.0
S13240	Accept Method Statement for Construction Road P2 Underpass Structure	P2-Cal.A	21.0	21.0	14-Mar-20	03-Apr-20	-109.5	0%		0.0
Installation of bored pile for construction of abutment		P2-Cal.A	53.0	53.0	20-Dec-19	10-Feb-20	-58.5			0.0
S13420	Prepare and Submit Method Statement for Installation of bored piling	P2-Cal.A	18.0	18.0	20-Dec-19	06-Jan-20	-58.5	0%		0.0
S13440	Review and Discuss Method Statement for Installation of bored piling	P2-Cal.A	7.0	7.0	07-Jan-20	13-Jan-20	-58.5	0%		0.0
S13460	Resubmit Method Statement for Installation of bored piling	P2-Cal.A	7.0	7.0	14-Jan-20	20-Jan-20	-58.5	0%		0.0



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NE/2015/02 Tseung Kwan O - Lam Tin Tunnel-Road P2 and Associated Works (Dec-19)

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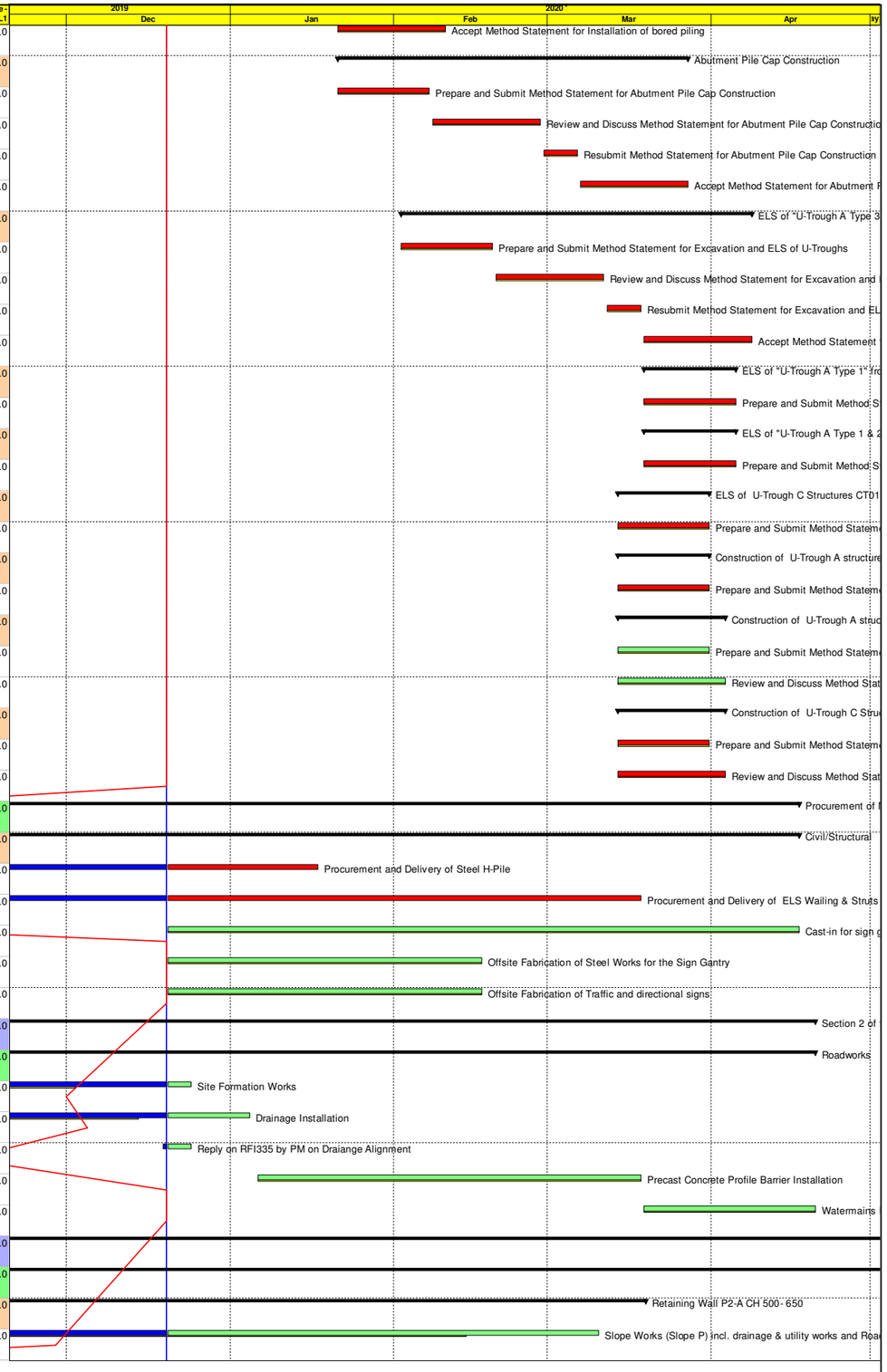
S13480	Accept Method Statement for Installation of bored piling	P2-Cal.A	21.0	21.0	21-Jan-20	10-Feb-20	-58.5	0%		0.0
Abutment Pile Cap Construction		P2-Cal.A	67.0	67.0	21-Jan-20	27-Mar-20	-50.5			0.0
S13500	Prepare and Submit Method Statement for Abutment Pile Cap Construction	P2-Cal.A	18.0	18.0	21-Jan-20	07-Feb-20	-50.5	0%		0.0
S13520	Review and Discuss Method Statement for Abutment Pile Cap Construction	P2-Cal.A	21.0	21.0	08-Feb-20	28-Feb-20	-50.5	0%		0.0
S13540	Resubmit Method Statement for Abutment Pile Cap Construction	P2-Cal.A	7.0	7.0	29-Feb-20	06-Mar-20	-50.5	0%		0.0
S13560	Accept Method Statement for Abutment Pile Cap Construction	P2-Cal.A	21.0	21.0	07-Mar-20	27-Mar-20	-50.5	0%		0.0
ELS of "U-Trough A Type 3 and U-Trough B Type 4" from S200 CH821 to P2 CH105		P2-Cal.A	67.0	67.0	02-Feb-20	08-Apr-20	-120.5			0.0
S14121-01	Prepare and Submit Method Statement for Excavation and ELS of U-Troughs	P2-Cal.A	18.0	18.0	02-Feb-20	19-Feb-20	-120.5	0%		0.0
S14121-02	Review and Discuss Method Statement for Excavation and ELS of U-Troughs	P2-Cal.A	21.0	21.0	20-Feb-20	11-Mar-20	-120.5	0%		0.0
S14121-03	Resubmit Method Statement for Excavation and ELS of U-Troughs	P2-Cal.A	7.0	7.0	12-Mar-20	18-Mar-20	-120.5	0%		0.0
S14121-04	Accept Method Statement for Excavation and ELS of U-Troughs	P2-Cal.A	21.0	21.0	19-Mar-20	08-Apr-20	-120.5	0%		0.0
ELS of "U-Trough A Type 1" from S200 CH674 - CH755		P2-Cal.A	18.0	18.0	19-Mar-20	05-Apr-20	-30.5			0.0
S14121-09	Prepare and Submit Method Statement for Excavation and ELS of U-Troughs	P2-Cal.A	18.0	18.0	19-Mar-20	05-Apr-20	-30.5	0%		0.0
ELS of "U-Trough A Type 1 & 2" from S300 CH326 - 355 and S400 CH124 - 158		P2-Cal.A	18.0	18.0	19-Mar-20	05-Apr-20	-30.5			0.0
S14121-13	Prepare and Submit Method Statement for Excavation and ELS of U-Troughs	P2-Cal.A	18.0	18.0	19-Mar-20	05-Apr-20	-30.5	0%		0.0
ELS of U-Trough C Structures CT01 CH201 - CH366 & CT01 CH117 - CH201		P2-Cal.A	18.0	18.0	14-Mar-20	31-Mar-20	-84.5			0.0
S14121-17	Prepare and Submit Method Statement for Excavation and ELS of U-Troughs	P2-Cal.A	18.0	18.0	14-Mar-20	31-Mar-20	-84.5	0%		0.0
Construction of U-Trough A structure Type 3 and U-Trough B Type 4" from S200 CH821 to P2 CH105		P2-Cal.A	18.0	18.0	14-Mar-20	31-Mar-20	-62.5			0.0
S14201	Prepare and Submit Method Statement for Construction of U-Troughs Structure	P2-Cal.A	18.0	18.0	14-Mar-20	31-Mar-20	-62.5	0%		0.0
Construction of U-Trough A structure Type 1" from S200 CH674 - CH755		P2-Cal.A	21.0	21.0	14-Mar-20	03-Apr-20	9.5			0.0
S14209	Prepare and Submit Method Statement for Construction of U-Troughs Structure	P2-Cal.A	18.0	18.0	14-Mar-20	31-Mar-20	9.5	0%		0.0
S14210	Review and Discuss Method Statement for Construction of U-Troughs Structure	P2-Cal.A	21.0	21.0	14-Mar-20	03-Apr-20	9.5	0%		0.0
Construction of U-Trough C Structures CT01 CH201 - CH366 & CT01 CH117 - CH201		P2-Cal.A	21.0	21.0	14-Mar-20	03-Apr-20	-73.5			0.0
S14217	Prepare and Submit Method Statement for Construction of U-Troughs Structure	P2-Cal.A	18.0	18.0	14-Mar-20	31-Mar-20	-73.5	0%		0.0
S14218	Review and Discuss Method Statement for Construction of U-Troughs Structure	P2-Cal.A	21.0	21.0	14-Mar-20	03-Apr-20	-73.5	0%		0.0
Procurement of Major Material		P2-Cal.A	1184.0	120.0	20-Jan-17 A	17-Apr-20	185.5			0.0
Civil/Structural		P2-Cal.A	1184.0	120.0	20-Jan-17 A	17-Apr-20	185.5			0.0
S14981	Procurement and Delivery of Steel H-Pile	P2-Cal.A	800.0	29.0	31-Jan-17 A	17-Jan-20	-84.5	96.38%		-282.0
S14983	Procurement and Delivery of ELS Wailing & Struts Members	P2-Cal.A	1015.0	90.0	20-Jan-17 A	18-Mar-20	-84.5	91.13%		-139.0
S14987	Cast-in for sign gantry and Road Works	P2-Cal.A	120.0	120.0	20-Dec-19	17-Apr-20	151.5	0%		0.0
S14997	Offsite Fabrication of Steel Works for the Sign Gantry	P2-Cal.A	60.0	60.0	20-Dec-19	17-Feb-20	211.5	0%		0.0
S14999	Offsite Fabrication of Traffic and directional signs	P2-Cal.A	60.0	60.0	20-Dec-19	17-Feb-20	245.5	0%		0.0
Section 2 of the Works (All Works Within Portion II)		P2-Cal.C	134.0	95.0	12-Nov-19 A	20-Apr-20	11.0			6.0
Roadworks		P2-Cal.C	134.0	95.0	12-Nov-19 A	20-Apr-20	11.0			6.0
LC12004	Site Formation Works	P2-Cal.C	18.0	4.0	12-Nov-19 A	24-Dec-19	18.0	77.78%		-19.0
LC12014	Drainage Installation	P2-Cal.C	25.0	11.0	16-Nov-19 A	04-Jan-20	11.0	56%		-15.0
LC12014-01	Reply on RFI335 by PM on Draiange Alignment	P2-Cal.C	5.0	4.0	19-Dec-19 A	24-Dec-19	11.0	20%		0.0
LC12024	Precast Concrete Profile Barrier Installation	P2-Cal.C	60.0	60.0	06-Jan-20	18-Mar-20	11.0	0%		0.0
LC12026	Watermains Installation	P2-Cal.C	24.0	24.0	19-Mar-20	20-Apr-20	11.0	0%		0.0
Section 3 of the Works All Works within Portion IV, V, VI, VII,VIII, and IX			1045.0	536.0	06-Apr-18 A	07-Jun-21	-9.5			-114.0
Existing Land Section		P2-Cal.C	496.0	241.0	06-Apr-18 A	14-Oct-20	94.5			-255.0
Retaining Wall P2-A CH 500- 650		P2-Cal.C	348.0	72.0	07-Aug-18 A	19-Mar-20	263.5			-133.0
LC11933	Slope Works (Slope P) incl. drainage & utility works and Road Works at Tong Yin Street	P2-Cal.C	120.0	64.0	20-Sep-19 A	10-Mar-20	271.5	46.67%		-20.0



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NE/2015/02 Tseung Kwan O - Lam Tin Tunnel-Road P2 and Associated Works (Dec-19)

3 Monthly Rolling Programme
(Data Date : 20-Dec-2019)

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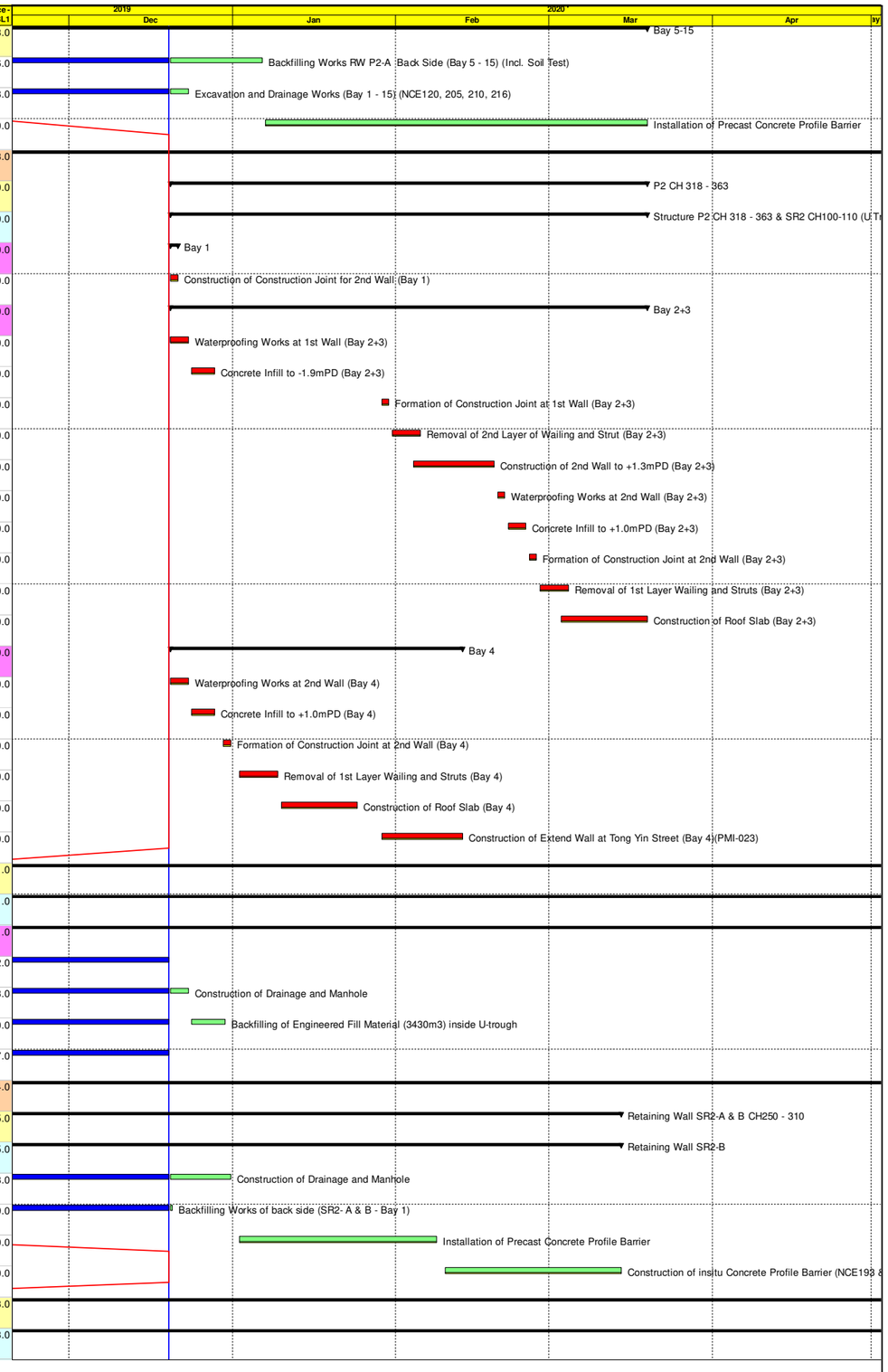
20-Dec-19			

Activity ID	Activity Name	Calendar	Original Duration	Remaining Duration	Start	Finish	Total Float	Activity % Complete	TRA	Variance - BL1
Bay 5-15		P2-Cal.C	348.0	72.0	07-Aug-18 A	19-Mar-20	50.5			-133.0
LC11988	Backfilling Works RW P2-A Back Side (Bay 5 - 15) (Incl. Soil Test)	P2-Cal.C	35.0	12.0	07-Aug-18 A	06-Jan-20	50.5	65.71%		-386.0
LC11989	Excavation and Drainage Works (Bay 1 - 15) (NCE120, 205, 210, 216)	P2-Cal.C	60.0	3.0	24-Jul-19 A	23-Dec-19	59.5	95%		-68.0
LC11990	Installation of Precast Concrete Profile Barrier	P2-Cal.C	60.0	60.0	07-Jan-20	19-Mar-20	50.5	0%		0.0
P2 Road		P2-Cal.C	488.0	241.0	06-Apr-18 A	14-Oct-20	-57.5			-263.0
P2 CH 318 - 363		P2-Cal.C	72.0	72.0	20-Dec-19 A	19-Mar-20	-42.5			0.0
Structure P2 CH 318 - 363 & SR2 CH100-110 (U Trough B)		P2-Cal.C	72.0	72.0	20-Dec-19 A	19-Mar-20	-42.5			0.0
Bay 1		P2-Cal.C	2.0	2.0	20-Dec-19	21-Dec-19	-0.5			0.0
LC08160	Construction of Construction Joint for 2nd Wall (Bay 1)	P2-Cal.C	2.0	2.0	20-Dec-19	21-Dec-19	-0.5	0%		0.0
Bay 2+3		P2-Cal.C	72.0	72.0	20-Dec-19 A	19-Mar-20	-70.5			0.0
LC08370	Waterproofing Works at 1st Wall (Bay 2+3)	P2-Cal.C	3.0	3.0	20-Dec-19 A	23-Dec-19	-48.5	0%		0.0
LC08380	Concrete Infill to -1.9mPD (Bay 2+3)	P2-Cal.C	3.0	3.0	24-Dec-19	28-Dec-19	-48.5	0%		0.0
LC08390	Formation of Construction Joint at 1st Wall (Bay 2+3)	P2-Cal.C	2.0	2.0	29-Jan-20	30-Jan-20	-70.5	0%		0.0
LC08400	Removal of 2nd Layer of Wailing and Strut (Bay 2+3)	P2-Cal.C	5.0	5.0	31-Jan-20	05-Feb-20	-70.5	0%		0.0
LC08460	Construction of 2nd Wall to +1.3mPD (Bay 2+3)	P2-Cal.C	14.0	14.0	04-Feb-20	19-Feb-20	-70.5	0%		0.0
LC08470	Waterproofing Works at 2nd Wall (Bay 2+3)	P2-Cal.C	2.0	2.0	20-Feb-20	21-Feb-20	-70.5	0%		0.0
LC08480	Concrete Infill to +1.0mPD (Bay 2+3)	P2-Cal.C	3.0	3.0	22-Feb-20	25-Feb-20	-70.5	0%		0.0
LC08490	Formation of Construction Joint at 2nd Wall (Bay 2+3)	P2-Cal.C	2.0	2.0	26-Feb-20	27-Feb-20	-70.5	0%		0.0
LC08500	Removal of 1st Layer Wailing and Struts (Bay 2+3)	P2-Cal.C	5.0	5.0	28-Feb-20	04-Mar-20	-70.5	0%		0.0
LC08530	Construction of Roof Slab (Bay 2+3)	P2-Cal.C	15.0	15.0	03-Mar-20	19-Mar-20	-70.5	0%		0.0
Bay 4		P2-Cal.C	42.0	42.0	20-Dec-19	13-Feb-20	-12.5			0.0
LC08420	Waterproofing Works at 2nd Wall (Bay 4)	P2-Cal.C	3.0	3.0	20-Dec-19	23-Dec-19	-70.5	0%		0.0
LC08430	Concrete Infill to +1.0mPD (Bay 4)	P2-Cal.C	3.0	3.0	24-Dec-19	28-Dec-19	-70.5	0%		0.0
LC08440	Formation of Construction Joint at 2nd Wall (Bay 4)	P2-Cal.C	2.0	2.0	30-Dec-19	31-Dec-19	-70.5	0%		0.0
LC08450	Removal of 1st Layer Wailing and Struts (Bay 4)	P2-Cal.C	7.0	7.0	02-Jan-20	09-Jan-20	-70.5	0%		0.0
LC08510	Construction of Roof Slab (Bay 4)	P2-Cal.C	13.0	13.0	10-Jan-20	24-Jan-20	-70.5	0%		0.0
LC08520	Construction of Extend Wall at Tong Yin Street (Bay 4)(PMI-023)	P2-Cal.C	14.0	14.0	29-Jan-20	13-Feb-20	-12.5	0%		0.0
P2 CH 411- 500		P2-Cal.C	320.0	241.0	06-Apr-18 A	14-Oct-20	-57.5			-431.0
Structure P2 CH 411 - 500 (U Trough A)		P2-Cal.C	320.0	241.0	06-Apr-18 A	14-Oct-20	-57.5			-431.0
Wall Stem		P2-Cal.C	320.0	241.0	06-Apr-18 A	14-Oct-20	-57.5			-431.0
LC15240	Backfilling and Removal of Sheetpile at the edge	P2-Cal.C	35.0	14.0	19-Mar-19 A	30-Sep-20	-57.5	60%		-422.0
LC15250	Construction of Drainage and Manhole	P2-Cal.C	60.0	3.0	06-Apr-18 A	23-Dec-19	115.5	95%		-453.0
LC15260	Backfilling of Engineered Fill Material (3430m3) inside U-trough	P2-Cal.C	15.0	4.0	15-May-18 A	30-Dec-19	115.5	73.33%		-470.0
LC15270	Installation of Precast Concrete Profile Barrier	P2-Cal.C	30.0	10.0	23-Jul-19 A	14-Oct-20	-57.5	66.67%		-337.0
SR2		P2-Cal.C	329.0	231.0	28-Feb-19 A	30-Sep-20	104.5			-144.0
Retaining Wall SR2-A & B CH250 - 310		P2-Cal.C	321.0	68.0	01-Jun-19 A	14-Mar-20	267.5			85.0
Retaining Wall SR2-B		P2-Cal.C	321.0	68.0	01-Jun-19 A	14-Mar-20	267.5			85.0
LC16860	Construction of Drainage and Manhole	P2-Cal.C	40.0	8.0	18-Jul-19 A	31-Dec-19	267.5	80%		-98.0
LC16865	Backfilling Works of back side (SR2- A & B - Bay 1)	P2-Cal.C	30.0	1.0	01-Jun-19 A	20-Dec-19	121.5	96.67%		-139.0
LC16880	Installation of Precast Concrete Profile Barrier	P2-Cal.C	30.0	30.0	02-Jan-20	08-Feb-20	267.5	0%		0.0
LC16880-01	Construction of insitu Concrete Profile Barrier (NCE193 & NCE219)	P2-Cal.C	30.0	30.0	10-Feb-20	14-Mar-20	267.5	0%		0.0
SR2 CH170 - 250		P2-Cal.C	40.0	10.0	28-Feb-19 A	30-Sep-20	-8.5			-433.0
Structure SR2 CH 170 - 250 (U Trough A)		P2-Cal.C	40.0	10.0	28-Feb-19 A	30-Sep-20	-8.5			-433.0



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NE/2015/02 Tseung Kwan O - Lam Tin Tunnel-Road P2 and Associated Works (Dec-19)

3 Monthly Rolling Programme
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LC17510	Waterproofing, Backfilling and Remove sheetpile	P2-Cal.C	40.0	10.0	28-Feb-19 A	30-Sep-20	-8.5	75%		-433.0
Portion IV & VII		P2-Cal.C	92.0	80.0	06-Dec-19 A	28-Mar-20	-64.5			0.0
Construction of DN2100 stormwater at Portion IV & VII		P2-Cal.C	92.0	80.0	06-Dec-19 A	28-Mar-20	-64.5			0.0
Drainage works		P2-Cal.C	92.0	80.0	06-Dec-19 A	28-Mar-20	-64.5			0.0
SMH9102-SMH9103		P2-Cal.C	92.0	80.0	06-Dec-19 A	28-Mar-20	-64.5			0.0
LC17689-057	Inspection Trenches, Utilties record and review of design of ELS (PMI162)	P2-Cal.C	50.0	38.0	06-Dec-19 A	08-Feb-20	-64.5	24%		0.0
LC17689-06	Preboring and sheet pile installation for Dia. 900 Drain Pipe SMH9102 to SMH9103	P2-Cal.C	20.0	20.0	10-Feb-20	03-Mar-20	-64.5	0%		0.0
LC17689-07	Trench Excavation and Strut Installation for Constrcution of Dia. 900 Drain Pipe (SMH9102 to SMH9103)	P2-Cal.C	7.0	7.0	04-Mar-20	11-Mar-20	-64.5	0%		0.0
LC17689-08	Bedding And Inspection	P2-Cal.C	3.0	3.0	12-Mar-20	14-Mar-20	-64.5	0%		0.0
LC17689-09	Manhole construction and Pipe Laying (SMH9102)	P2-Cal.C	14.0	14.0	13-Mar-20	28-Mar-20	-64.5	0%		0.0
TKO Town Centre South Reinstatement (PS Cl. 1.45)		P2-Cal.C	68.0	68.0	02-Jan-20	24-Mar-20	194.5			0.0
LC17720	TTA application of road works (After handover of Area C)	P2-Cal.C	35.0	35.0	02-Jan-20*	14-Feb-20	194.5	0%		0.0
LC17721	TTA Implementation	P2-Cal.C	3.0	3.0	15-Feb-20	18-Feb-20	194.5	0%		0.0
LC17722	Reinstatement of existing footpath	P2-Cal.C	30.0	30.0	19-Feb-20	24-Mar-20	194.5	0%		0.0
New Reclaimed Section			886.0	536.0	07-Dec-18 A	07-Jun-21	-9.5			-28.0
Marine Works			440.0	91.0	07-Dec-18 A	19-Mar-20	392.5			-29.0
Construction of Vertical Seawall		P2-Cal.C	3.0	2.0	07-Dec-18 A	21-Dec-19	-91.5			-306.0
Construction of Vertical Seawall (Type 2 & 3)		P2-Cal.C	3.0	2.0	07-Dec-18 A	21-Dec-19	-91.5			-306.0
MC11950	Connection of existing Vertical Seawall - 3 Layer (RFI-151)(PMI-097)	P2-Cal.C	3.0	2.0	07-Dec-18 A	21-Dec-19	-91.5	33.33%		-306.0
Surcharge			124.0	27.0	13-Sep-19 A	15-Jan-20	-36.5			-1.0
Surcharging		P2-Cal.A	120.0	22.0	13-Sep-19 A	10-Jan-20	-122.5			0.0
MC13235	Surcharge Area 3 (CH304-363 E) (3043m3)	P2-Cal.A	120.0	22.0	13-Sep-19 A	10-Jan-20	-122.5	81.67%		0.0
Removal of Surcharge		P2-Cal.C	22.0	20.0	18-Dec-19 A	15-Jan-20	-28.5			0.0
MC13355	Removal of Surcharge Area 4a (CH300-340 W) (2384m3)	P2-Cal.C	6.0	4.0	18-Dec-19 A	24-Dec-19	-89.5	33.33%		0.0
MC13355-01	Removal of Surcharge Area 4b (CH340-380 W) (2200m3)	P2-Cal.C	6.0	4.0	18-Dec-19 A	24-Dec-19	-12.5	33.33%		0.0
MC13375	Removal of Surcharge Area 3 (CH304-363 E) (3043m3)	P2-Cal.C	4.0	4.0	11-Jan-20	15-Jan-20	-99.5	0%		0.0
MC13395	Removal of Surcharge Area 5 (CH380-440) (4260m3)	P2-Cal.C	8.0	8.0	20-Dec-19	31-Dec-19	-104.5	0%		0.0
MC13415	Removal of Surcharge Area 6 (CH440-510) (7707m3)	P2-Cal.C	8.0	8.0	20-Dec-19	31-Dec-19	-104.5	0%		0.0
Armour Protection		P2-Cal.C	186.0	71.0	15-Jul-19 A	18-Mar-20	174.5			-18.0
Laying of Underlayer Armour Rock (West)		P2-Cal.C	16.0	32.0	15-Oct-19 A	07-Feb-20	185.5			-78.0
MC13635	Armour CH311-335 (2501m3)	P2-Cal.C	10.0	13.0	22-Oct-19 A	07-Feb-20	185.5	0%	5	-78.0
MC13655	Armour CH415-440 (2559m3)	P2-Cal.C	10.0	6.0	22-Oct-19 A	20-Jan-20	183.5	40%	5	-65.0
MC13675	Armour CH440-500 (2604m3)	P2-Cal.C	10.0	13.0	15-Oct-19 A	13-Jan-20	174.5	0%	5	-65.0
Laying of Armour Rock (West)		P2-Cal.C	53.0	53.0	14-Jan-20	18-Mar-20	174.5			0.0
MC13695	Armour CH271-311 (1833m3)	P2-Cal.C	8.0	8.0	10-Mar-20	18-Mar-20	174.5	0%	5	0.0
MC13715	Armour CH311-375 (4767m3)	P2-Cal.C	15.0	15.0	21-Feb-20	09-Mar-20	174.5	0%	5	0.0
MC13735	Armour CH375-440 (4882m3)	P2-Cal.C	15.0	15.0	04-Feb-20	20-Feb-20	174.5	0%	5	0.0
MC13755	Armour CH440-500 (4735m3)	P2-Cal.C	15.0	15.0	14-Jan-20	03-Feb-20	174.5	0%	5	0.0
Laying of Underlayer Armour Rock (East)		P2-Cal.C	177.0	62.0	15-Jul-19 A	07-Mar-20	148.5			-18.0
MC13775	Armour CH71-190 (berm stone 820m3)	P2-Cal.C	15.0	15.0	20-Feb-20	07-Mar-20	148.5	0%	5	0.0
MC13795	Armour CH190-250 (1218m3)	P2-Cal.C	10.0	5.0	02-Dec-19 A	19-Feb-20	148.5	50%	5	-53.0
MC13815	Armour CH250-300 (1674m3)	P2-Cal.C	10.0	5.0	02-Dec-19 A	13-Feb-20	148.5	50%	5	-48.0
MC13835	Armour CH300-375 (2501m3)	P2-Cal.C	15.0	15.0	18-Jan-20	07-Feb-20	148.5	0%	5	0.0

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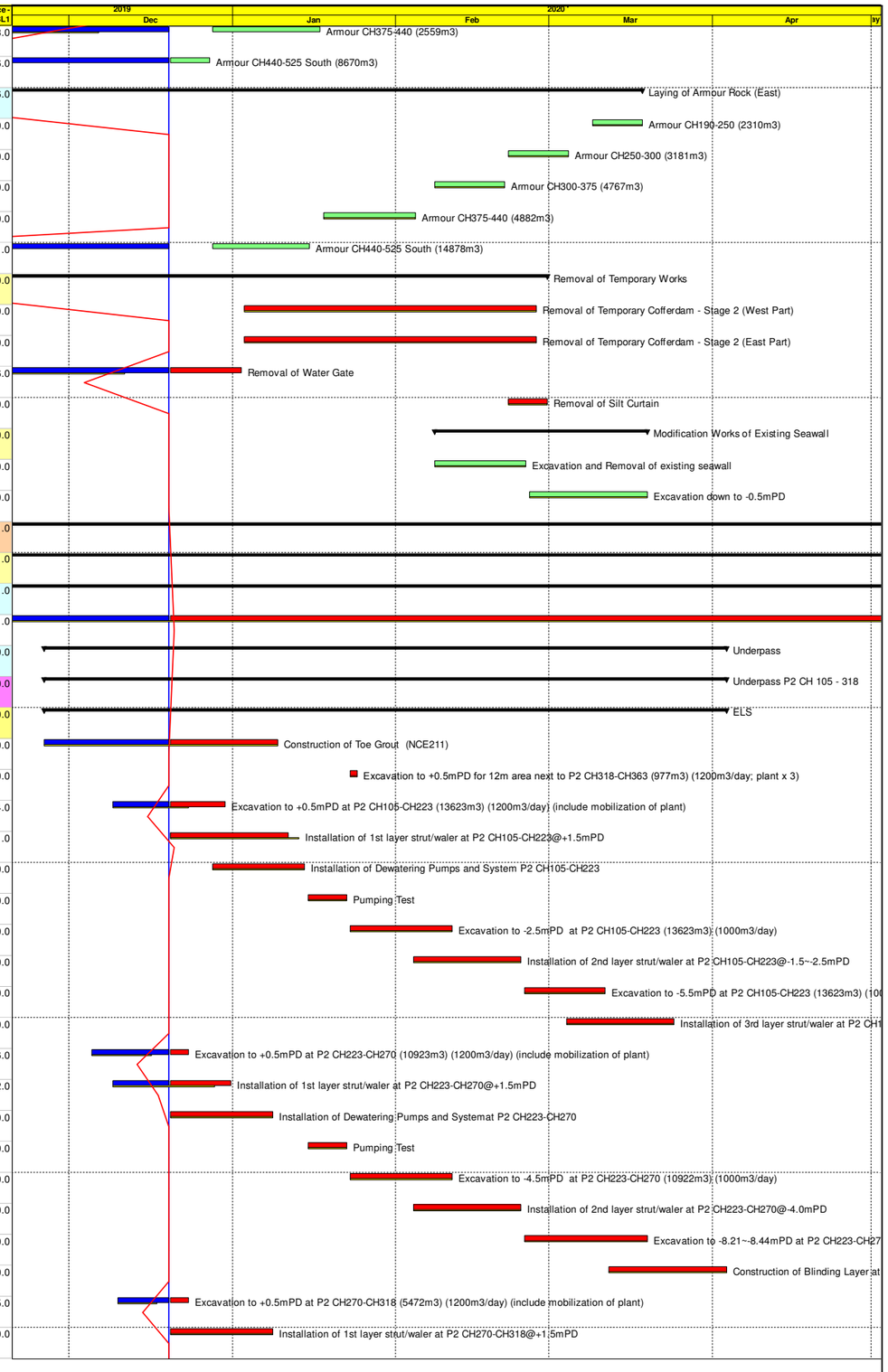
MC13855	Armour CH375-440 (2559m3)	P2-Cal.C	20.0	17.0	14-Nov-19 A	17-Jan-20	148.5	15%	5	-33.0
MC13875	Armour CH440-525 South (8670m3)	P2-Cal.C	12.0	5.0	15-Jul-19 A	27-Dec-19	148.5	58.33%	5	-126.0
Laying of Armour Rock (East)		P2-Cal.C	176.0	66.0	09-Aug-19 A	18-Mar-20	169.5			-6.0
MC13895	Armour CH190-250 (2310m3)	P2-Cal.C	9.0	9.0	09-Mar-20	18-Mar-20	169.5	0%	5	0.0
MC13915	Armour CH250-300 (3181m3)	P2-Cal.C	10.0	10.0	22-Feb-20	04-Mar-20	172.5	0%	5	0.0
MC13935	Armour CH300-375 (4767m3)	P2-Cal.C	12.0	12.0	08-Feb-20	21-Feb-20	172.5	0%	5	0.0
MC13955	Armour CH375-440 (4882m3)	P2-Cal.C	12.0	12.0	18-Jan-20	04-Feb-20	175.5	0%	5	0.0
MC13975	Armour CH440-525 South (14878m3)	P2-Cal.C	20.0	15.0	09-Aug-19 A	15-Jan-20	177.5	25%	5	-111.0
Removal of Temporary Works		P2-Cal.C	84.0	56.0	18-Nov-19 A	29-Feb-20	-145.5			0.0
MC14095	Removal of Temporary Cofferdam - Stage 2 (West Part)	P2-Cal.C	45.0	45.0	03-Jan-20	27-Feb-20	-145.5	0%	22	0.0
MC14095-01	Removal of Temporary Cofferdam - Stage 2 (East Part)	P2-Cal.C	45.0	45.0	03-Jan-20	27-Feb-20	-145.5	0%	22	0.0
MC14115	Removal of Water Gate	P2-Cal.C	21.0	9.0	18-Nov-19 A	02-Jan-20	-145.5	57.14%	22	-16.0
MC14135	Removal of Silt Curtain	P2-Cal.C	7.0	7.0	22-Feb-20	29-Feb-20	-145.5	0%		0.0
Modification Works of Existing Seawall		P2-Cal.C	35.0	35.0	08-Feb-20	19-Mar-20	315.5			0.0
MC14145	Excavation and Removal of existing seawall	P2-Cal.C	15.0	15.0	08-Feb-20	25-Feb-20	315.5	0%		0.0
MC14165	Excavation down to -0.5mPD	P2-Cal.C	20.0	20.0	26-Feb-20	19-Mar-20	315.5	0%		0.0
Land Works		P2-Cal.C	473.0	430.0	01-Nov-19 A	07-Jun-21	-7.5			1.0
Road P2 Underpass (CH105-CH318)		P2-Cal.C	460.0	430.0	16-Nov-19 A	07-Jun-21	-7.5			1.0
Instrumentation and Monitoring for Road P2 Structure Construction		P2-Cal.C	460.0	430.0	16-Nov-19 A	07-Jun-21	-7.5			1.0
LC17760	Monitoring of Instrumentation	P2-Cal.C	460.0	430.0	16-Nov-19 A	07-Jun-21	-7.5	6.52%		1.0
Underpass		P2-Cal.C	106.0	85.0	26-Nov-19 A	03-Apr-20	-96.5			0.0
Underpass P2 CH 105 - 318		P2-Cal.C	106.0	85.0	26-Nov-19 A	03-Apr-20	-96.5			0.0
ELS		P2-Cal.C	106.0	85.0	26-Nov-19 A	03-Apr-20	-96.5			0.0
LC18000-5	Construction of Toe Grout (NCE211)	P2-Cal.C	36.0	15.0	26-Nov-19 A	09-Jan-20	-135.5	58.33%		0.0
LC18020-01	Excavation to +0.5mPD for 12m area next to P2 CH318-CH363 (977m3) (1200m3/day; plant x 3)	P2-Cal.C	2.0	2.0	23-Jan-20	24-Jan-20	-89.5	0%		0.0
LC30000	Excavation to +0.5mPD at P2 CH105-CH223 (13623m3) (1200m3/day) (include mobilization of plant)	P2-Cal.C	13.0	7.0	09-Dec-19 A	30-Dec-19	-139.5	46.15%		-4.0
LC30010	Installation of 1st layer strut/waler at P2 CH105-CH223@+1.5mPD	P2-Cal.C	18.0	17.0	20-Dec-19 A	11-Jan-20	-139.5	5.56%		1.0
LC30020	Installation of Dewatering Pumps and System P2 CH105-CH223	P2-Cal.C	14.0	14.0	28-Dec-19	14-Jan-20	-139.5	0%		0.0
LC30030	Pumping Test	P2-Cal.C	7.0	7.0	15-Jan-20	22-Jan-20	-139.5	0%		0.0
LC30040	Excavation to -2.5mPD at P2 CH105-CH223 (13623m3) (1000m3/day)	P2-Cal.C	14.0	14.0	23-Jan-20	11-Feb-20	-114.5	0%		0.0
LC30050	Installation of 2nd layer strut/waler at P2 CH105-CH223@-1.5~-2.5mPD	P2-Cal.C	18.0	18.0	04-Feb-20	24-Feb-20	-114.5	0%		0.0
LC30060	Excavation to -5.5mPD at P2 CH105-CH223 (13623m3) (1000m3/day)	P2-Cal.C	14.0	14.0	25-Feb-20	11-Mar-20	-114.5	0%		0.0
LC30070	Installation of 3rd layer strut/waler at P2 CH105-CH223@ -3.5~-4.5mPD	P2-Cal.C	18.0	18.0	04-Mar-20	24-Mar-20	-114.5	0%		0.0
LC30100	Excavation to +0.5mPD at P2 CH223-CH270 (10923m3) (1200m3/day) (include mobilization of plant)	P2-Cal.C	10.0	3.0	05-Dec-19 A	23-Dec-19	-134.5	70%		-6.0
LC30200	Installation of 1st layer strut/waler at P2 CH223-CH270@+1.5mPD	P2-Cal.C	16.0	8.0	09-Dec-19 A	31-Dec-19	-134.5	50%		-2.0
LC30230	Installation of Dewatering Pumps and Systemat P2 CH223-CH270	P2-Cal.C	14.0	14.0	20-Dec-19	08-Jan-20	-134.5	0%		0.0
LC30240	Pumping Test	P2-Cal.C	7.0	7.0	15-Jan-20	22-Jan-20	-139.5	0%		0.0
LC30250	Excavation to -4.5mPD at P2 CH223-CH270 (10922m3) (1000m3/day)	P2-Cal.C	14.0	14.0	23-Jan-20	11-Feb-20	-139.5	0%		0.0
LC30260	Installation of 2nd layer strut/waler at P2 CH223-CH270@-4.0mPD	P2-Cal.C	18.0	18.0	04-Feb-20	24-Feb-20	-139.5	0%		0.0
LC30270	Excavation to -8.21~-8.44mPD at P2 CH223-CH270 (17064m3) (1000m3/day)	P2-Cal.C	21.0	21.0	25-Feb-20	19-Mar-20	-139.5	0%		0.0
LC30300	Construction of Blinding Layer at P2 CH223-CH270	P2-Cal.C	20.0	20.0	12-Mar-20	03-Apr-20	-139.5	0%		0.0
LC30305	Excavation to +0.5mPD at P2 CH270-CH318 (5472m3) (1200m3/day) (include mobilization of plant)	P2-Cal.C	7.0	3.0	10-Dec-19 A	23-Dec-19	-89.5	57.14%		-5.0
LC30310	Installation of 1st layer strut/waler at P2 CH270-CH318@+1.5mPD	P2-Cal.C	14.0	14.0	20-Dec-19	08-Jan-20	-89.5	0%		0.0



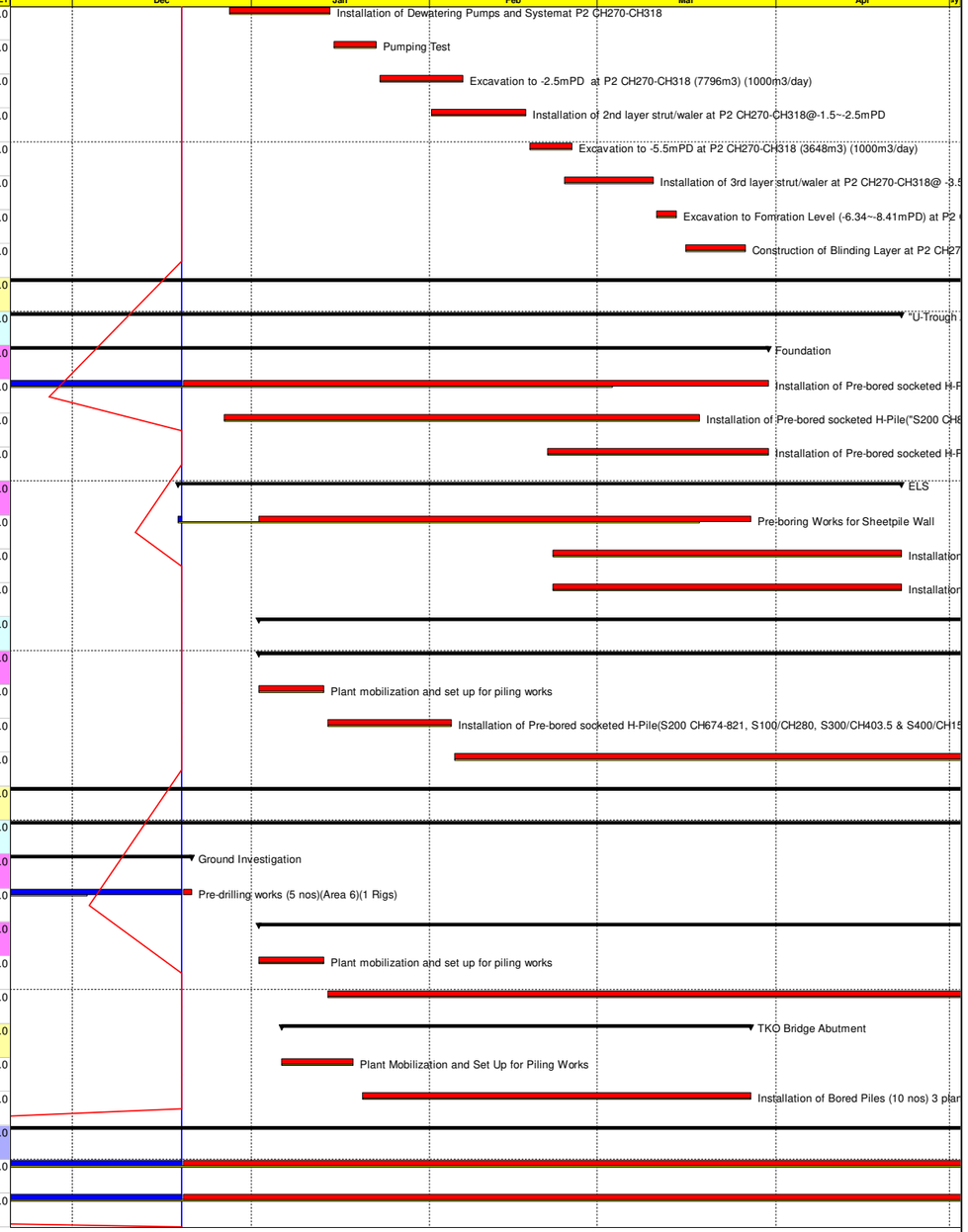
Primary Baseline
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

NE/2015/02 Tseung Kwan O - Lam Tin Tunnel-Road P2 and Associated Works (Dec-19)

3 Monthly Rolling Programme
(Data Date : 20-Dec-2019)

Date	Revision	Checked	Approved
20-Dec-19			

Activity ID	Activity Name	Calendar	Original Duration	Remaining Duration	Start	Finish	Total Float	Activity % Complete	TRA	Variance - BL1
LC30320	Installation of Dewatering Pumps and Systemat P2 CH270-CH318	P2-Cal.C	14.0	14.0	28-Dec-19	14-Jan-20	-89.5	0%		0.0
LC30330	Pumping Test	P2-Cal.C	7.0	7.0	15-Jan-20	22-Jan-20	-89.5	0%		0.0
LC30340	Excavation to -2.5mPD at P2 CH270-CH318 (7796m3) (1000m3/day)	P2-Cal.C	10.0	10.0	23-Jan-20	06-Feb-20	-89.5	0%		0.0
LC30350	Installation of 2nd layer strut/waler at P2 CH270-CH318@-1.5~-2.5mPD	P2-Cal.C	14.0	14.0	01-Feb-20	17-Feb-20	-89.5	0%		0.0
LC30360	Excavation to -5.5mPD at P2 CH270-CH318 (3648m3) (1000m3/day)	P2-Cal.C	7.0	7.0	18-Feb-20	25-Feb-20	-89.5	0%		0.0
LC30370	Installation of 3rd layer strut/waler at P2 CH270-CH318@ -3.5~-4.5mPD	P2-Cal.C	14.0	14.0	24-Feb-20	10-Mar-20	-89.5	0%		0.0
LC30380	Excavation to Fomration Level (-6.34~-8.41mPD) at P2 CH270-CH318 (2948m3) (1000m3/day)	P2-Cal.C	4.0	4.0	11-Mar-20	14-Mar-20	-89.5	0%		0.0
LC30390	Construction of Blinding Layer at P2 CH270-CH318	P2-Cal.C	10.0	10.0	16-Mar-20	26-Mar-20	-89.5	0%		0.0
U-Trough A and B		P2-Cal.C	163.0	121.0	01-Nov-19 A	22-May-20	-40.5			0.0
"U-Trough A Type 3 and U-Trough B Type 4" from S200 CH821 to P2 CH105		P2-Cal.C	139.0	97.0	01-Nov-19 A	22-Apr-20	-105.5			0.0
Foundation		P2-Cal.C	123.0	81.0	01-Nov-19 A	30-Mar-20	-99.5			0.0
LC20830	Installation of Pre-bored socketed H-Pile("S200 CH905 to P2 CH105")(56 nos)(Area 2b)(3 Rigs)	P2-Cal.C	100.0	81.0	01-Nov-19 A	30-Mar-20	-105.5	19%		-23.0
LC20840	Installation of Pre-bored socketed H-Pile("S200 CH821 - 905")(21 nos)(Area 4)(2 Rigs)	P2-Cal.C	67.0	67.0	27-Dec-19	18-Mar-20	-89.5	0%		0.0
LC20850	Installation of Pre-bored socketed H-Pile("S200 CH821 - 905")(7 nos)(Area 3)(2 Rigs)	P2-Cal.C	33.0	33.0	21-Feb-20	30-Mar-20	-99.5	0%		0.0
ELS		P2-Cal.C	98.0	89.0	19-Dec-19 A	22-Apr-20	-105.5			0.0
LC20990	Pre-boring Works for Sheetpile Wall	P2-Cal.C	72.0	71.0	19-Dec-19 A	27-Mar-20	-105.5	1.39%		-8.0
LC21000	Installation of sheetpile wall (368m, 920pcs. @20pcs/d)	P2-Cal.C	48.0	48.0	22-Feb-20	22-Apr-20	-105.5	0%		0.0
LC21010	Installation of dewatering well and king posts	P2-Cal.C	48.0	48.0	22-Feb-20	22-Apr-20	-105.5	0%		0.0
"U-Trough A Type 1 & 2" from S200 CH674 - CH821, S100/CH280, S300/CH403.5 & S400/CH158.1		P2-Cal.C	113.0	113.0	02-Jan-20	22-May-20	-40.5			0.0
Foundation		P2-Cal.C	113.0	113.0	02-Jan-20	22-May-20	-40.5			0.0
LC22160	Plant mobilization and set up for piling works	P2-Cal.C	10.0	10.0	02-Jan-20	13-Jan-20	-40.5	0%		0.0
LC22180	Installation of Pre-bored socketed H-Pile(S200 CH674-821, S100/CH280, S300/CH403.5 & S400/CH158.1)(16nos)(Area5)(4-5Rig)	P2-Cal.C	16.0	16.0	14-Jan-20	04-Feb-20	-40.5	0%		0.0
LC22200	Installation of Pre-bored socketed H-Pile(S200 CH674-821, S100/CH280, S300/CH403.5 & S400/CH158.1)(87nos)(Area6)(4-5Rig)	P2-Cal.C	87.0	87.0	05-Feb-20	22-May-20	-40.5	0%		0.0
U-Trough C Structures		P2-Cal.C	173.0	138.0	09-Nov-19 A	11-Jun-20	-104.5			0.0
"U-Trough C Type 1, 2, 3 & 4" from CT01 CH117.156 - CH366		P2-Cal.C	173.0	138.0	09-Nov-19 A	11-Jun-20	-104.5			0.0
Ground Investigation		P2-Cal.C	21.0	2.0	09-Nov-19 A	21-Dec-19	-98.5			-16.0
LC23385	Pre-drilling works (5 nos)(Area 6)(1 Rigs)	P2-Cal.C	21.0	2.0	09-Nov-19 A	21-Dec-19	-98.5	90.48%		-16.0
Foundation		P2-Cal.C	130.0	130.0	02-Jan-20	11-Jun-20	-104.5			0.0
LC23400	Plant mobilization and set up for piling works	P2-Cal.C	10.0	10.0	02-Jan-20	13-Jan-20	-104.5	0%		0.0
LC23420	Installation of Pre-bored socketed H-Pile (96 nos)(4 Rigs)	P2-Cal.C	120.0	120.0	14-Jan-20	11-Jun-20	-104.5	0%		0.0
TKO Bridge Abutment		P2-Cal.C	68.0	68.0	06-Jan-20	27-Mar-20	-70.5			0.0
LC24920	Plant Mobilization and Set Up for Piling Works	P2-Cal.C	12.0	12.0	06-Jan-20	18-Jan-20	-70.5	0%		0.0
LC24940	Installation of Bored Piles (10 nos) 3 plants, 14D/pile	P2-Cal.C	56.0	56.0	20-Jan-20	27-Mar-20	-70.5	0%		0.0
Section 4 of the Works - Preservation and Protection of Existing Trees		P2-Cal.A	1563.0	655.0	12-Jan-17 A	04-Oct-21	-128.5			-164.0
LC25260	Preservation and Protection of Existing Trees	P2-Cal.A	1451.0	655.0	12-Jan-17 A	04-Oct-21	-128.5	54.86%		-276.0
LC25280	Nursery Transplanted Trees at the Contractor's holding nursery	P2-Cal.A	1177.0	655.0	28-Apr-17 A	04-Oct-21	-128.5	44.35%		-444.0



Primary Baseline
Actual Work
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Summary

NE/2015/02 Tseung Kwan O - Lam Tin Tunnel-Road P2 and Associated Works (Dec-19)

3 Monthly Rolling Programme
(Data Date : 20-Dec-2019)

Date	Revision	Checked	Approved
20-Dec-19			

High Level 3 Months Look Ahead Programme			
Activities	Jan-20	Feb-20	Mar-20
Trial pit			
Underground utilities detection			
Temporary traffic arrangement Setup			
Construction of drainage and watermain			
Bored Piles			
Pile Cap construction			
Pre-bored Socket-H Pile			

Activity ID	Activity Name	Original Duration	Start	Finish	Late Start	Late Finish	Total Float
NE/2017/06-4	NE/2017/06 TKO-LTT TCSS_3MRP	70	02-Dec-19 A	25-Mar-20	30-Dec-19	04-Dec-23	1127
NE/2017/06-4.CW	Contract Award / Commencement of Wor	0					0
NE/2017/06-4.AD	Access Date	0					0
NE/2017/06-4.KD	Key Date and Stages / Sections of the Acl	0					0
NE/2017/06-4.MD	Cost Centre Milestone Dates	34	26-Jan-20	08-Mar-20	27-Jun-21	02-Sep-22	750
NE/2017/06-4.MD.1	General	34	26-Jan-20	08-Mar-20	27-Jun-21	02-Sep-22	750
NE/2017/06-4.MD.1.1	CC B - Central System - TKOLTT	0	09-Feb-20	09-Feb-20	27-Jun-21	27-Jun-21	504
DWP8840	Acceptance of Final System Proposal for Works	0		09-Feb-20		27-Jun-21	504
NE/2017/06-4.MD.1.2	CC B1 - Central System - CBL	0	09-Feb-20	09-Feb-20	02-Sep-22	02-Sep-22	936
DWP8900	Acceptance of Final System Proposal for Works	0		09-Feb-20		02-Sep-22	936
NE/2017/06-4.MD.1.3	CC C - Traffic Control Devices - TKOLTT	0	08-Mar-20	08-Mar-20	27-Jun-21	27-Jun-21	476
DWP8960	Acceptance of Final System Proposal for Works	0		08-Mar-20		27-Jun-21	476
NE/2017/06-4.MD.1.4	CC C1 - Traffic Control Devices - CBL	0	08-Mar-20	08-Mar-20	02-Sep-22	02-Sep-22	908
DWP9020	Acceptance of Final System Proposal for Works	0		08-Mar-20		02-Sep-22	908
NE/2017/06-4.MD.1.5	CC D - Communication System - TKOLTT	0	26-Jan-20	26-Jan-20	27-Jun-21	27-Jun-21	518
DWP9140	Acceptance of Final System Proposal for Works	0		26-Jan-20		27-Jun-21	518
NE/2017/06-4.MD.1.6	CC D1 - Communication System - CBL	0	26-Jan-20	26-Jan-20	02-Sep-22	02-Sep-22	950
DWP9080	Acceptance of Final System Proposal for Works	0		26-Jan-20		02-Sep-22	950
NE/2017/06-4.MD.1.7	CC E - CCTV System - TKOLTT	0	08-Mar-20	08-Mar-20	27-Jun-21	27-Jun-21	476
DWP9200	Acceptance of Final System Proposal for Works	0		08-Mar-20		27-Jun-21	476
NE/2017/06-4.MD.1.8	CC E1 - CCTV System - CBL	0	08-Mar-20	08-Mar-20	02-Sep-22	02-Sep-22	908
DWP9260	Acceptance of Final System Proposal for Works	0		08-Mar-20		02-Sep-22	908
NE/2017/06-4.MD.1.9	CC F - Building PABX System - TKOLTT	0	09-Feb-20	09-Feb-20	27-Jun-21	27-Jun-21	504
DWP9320	Acceptance of Final System Proposal for Works	0		09-Feb-20		27-Jun-21	504
NE/2017/06-4.MD.1.11	CC G - ET System - TKOLTT	0	08-Mar-20	08-Mar-20	27-Jun-21	27-Jun-21	476
DWP9440	Acceptance of Final System Proposal for Works	0		08-Mar-20		27-Jun-21	476
NE/2017/06-4.MD.1.10	CC H - PA System - TKOLTT	0	09-Feb-20	09-Feb-20	27-Jun-21	27-Jun-21	504
DWP9380	Acceptance of Final System Proposal for Works	0		09-Feb-20		27-Jun-21	504
NE/2017/06-4.MD.1.12	CC I - Radio System - TKOLTT	0	09-Feb-20	09-Feb-20	27-Jun-21	27-Jun-21	504
DWP9500	Acceptance of Final System Proposal for Works	0		09-Feb-20		27-Jun-21	504
NE/2017/06-4.MD.1.13	CC J - Detection System - TKOLTT	0	09-Feb-20	09-Feb-20	27-Jun-21	27-Jun-21	504
DWP9560	Acceptance of Final System Proposal for Works	0		09-Feb-20		27-Jun-21	504
NE/2017/06-4.MD.1.15	CC J1 - Detection System - CBL	0	09-Feb-20	09-Feb-20	02-Sep-22	02-Sep-22	936
DWP9680	Acceptance of Final System Proposal for Works	0		09-Feb-20		02-Sep-22	936
NE/2017/06-4.MD.1.14	CC K - Manual Fallback System - TKOLTT	0	26-Jan-20	26-Jan-20	27-Jun-21	27-Jun-21	518
DWP9620	Acceptance of Final System Proposal for Works	0		26-Jan-20		27-Jun-21	518
NE/2017/06-4.MD.1.16	CC L - Operation Facilities - TKOLTT	0	09-Feb-20	09-Feb-20	27-Jun-21	27-Jun-21	504
DWP9740	Acceptance of Final System Proposal for Works	0		09-Feb-20		27-Jun-21	504
NE/2017/06-4.MD.1.17	CC M - Power Distribution System - TKOLTT	0					0
NE/2017/06-4.MD.1.18	CC M1 - Power Distribution System - CBL	0					0
NE/2017/06-4.MD.1.19	CC N - Speed Enforcement System - TKOLTT	42	26-Jan-20	08-Mar-20	27-Jun-21	27-Jun-21	476
DWP9910	Acceptance of Preliminary System Proposal for Works	0		26-Jan-20		27-Jun-21	518
DWP9920	Acceptance of Final System Proposal for Works	0		08-Mar-20		27-Jun-21	476
NE/2017/06-4.MD.1.20	CC N1 - Speed Enforcement System - CBL	42	26-Jan-20	08-Mar-20	02-Sep-22	02-Sep-22	908
DWP10390	Acceptance of Preliminary System Proposal for Works	0		26-Jan-20		02-Sep-22	950
DWP10400	Acceptance of Final System Proposal for Works	0		08-Mar-20		02-Sep-22	908
NE/2017/06-4.MD.1.21	CC O - Government Optical Fibre System - TKOLTT	0	26-Jan-20	26-Jan-20	27-Jun-21	27-Jun-21	518
DWP10040	Acceptance of Final System Proposal for Works	0		26-Jan-20		27-Jun-21	518
NE/2017/06-4.MD.1.22	CC O1 - Government Optical Fibre System - CBL	0	26-Jan-20	26-Jan-20	02-Sep-22	02-Sep-22	950
DWP10100	Acceptance of Final System Proposal for Works	0		26-Jan-20		02-Sep-22	950
NE/2017/06-4.MD.1.23	CC P - Training and Documentation - TKOLTT	0					0
NE/2017/06-4.MD.1.24	CC P1 - Training and Documentation - CBL	0					0
NE/2017/06-4.MD.1.25	CC Q - Comprehensive Maintenance Services and DL	0					0
NE/2017/06-4.MD.1.26	CC Q1 - Comprehensive Maintenance Services and D	0					0
NE/2017/06-4.1	Preliminary	14	30-Dec-19	16-Jan-20	17-Nov-23	04-Dec-23	1183
NE/2017/06-4.1.A0	Preliminary and General	14	30-Dec-19	16-Jan-20	17-Nov-23	04-Dec-23	1183
NE/2017/06-4.1.A0.GEN	General	0					0
NE/2017/06-4.1.A0.3	Management System	14	30-Dec-19	16-Jan-20	17-Nov-23	04-Dec-23	1183
NE/2017/06-4.1.A0.3.0	QP Quality Management Plan	0					0
NE/2017/06-4.1.A0.3.2	Safety Management	17	30-Dec-19	16-Jan-20	17-Nov-23	04-Dec-23	1418
GEN.0.05C	Prepare and submit the Materials - Personal Protectiv	12	30-Dec-19	11-Jan-20	22-Nov-23	04-Dec-23	1423
GEN.0.05D	Prepare and submit the Site Traffic Safety Managem	17	30-Dec-19	16-Jan-20	17-Nov-23	04-Dec-23	1418
NE/2017/06-4.1.A0.3.1	Environmenta; Management Plan	0					0
NE/2017/06-4.1.A0.3.3	Sub-Contract Management	0					0
NE/2017/06-4.1.A0.3.4	Risk Management	0					0
NE/2017/06-4.1.A0.3.5	Software Management	0					0
NE/2017/06-4.1.A0.3.6	Interface Management	0					0
NE/2017/06-4.DS	Design Stage	70	02-Dec-19 A	25-Mar-20	30-Dec-19	04-Dec-23	1127
NE/2017/06-4.DS.PSP	Prepare / Submission of PSP for TKO-LTT TCSS and	22	30-Dec-19	26-Jan-20	03-Sep-20	01-Oct-20	203
NE/2017/06-4.DS.PSP.S	Preliminary Design (Software)	0					0
NE/2017/06-4.DS.PSP.H	Preliminary Design (Hardware)	0					0
NE/2017/06-4.DS.PSP.1	Central System	0					0
NE/2017/06-4.DS.PSP.2	Traffic Control Devices	0					0
NE/2017/06-4.DS.PSP.3	Communication System	0					0
NE/2017/06-4.DS.PSP.4	CCTV System	0					0
NE/2017/06-4.DS.PSP.5	Building PABX System	0					0
NE/2017/06-4.DS.PSP.6	Emergancy Telephone System	0					0
NE/2017/06-4.DS.PSP.7	Public Address System	0					0
NE/2017/06-4.DS.PSP.8	Radio System	0					0
NE/2017/06-4.DS.PSP.9	Detection System	0					0

Actual Level of Effort | Actual Work | Remaining Work | Critical Remaining Work | Milestone

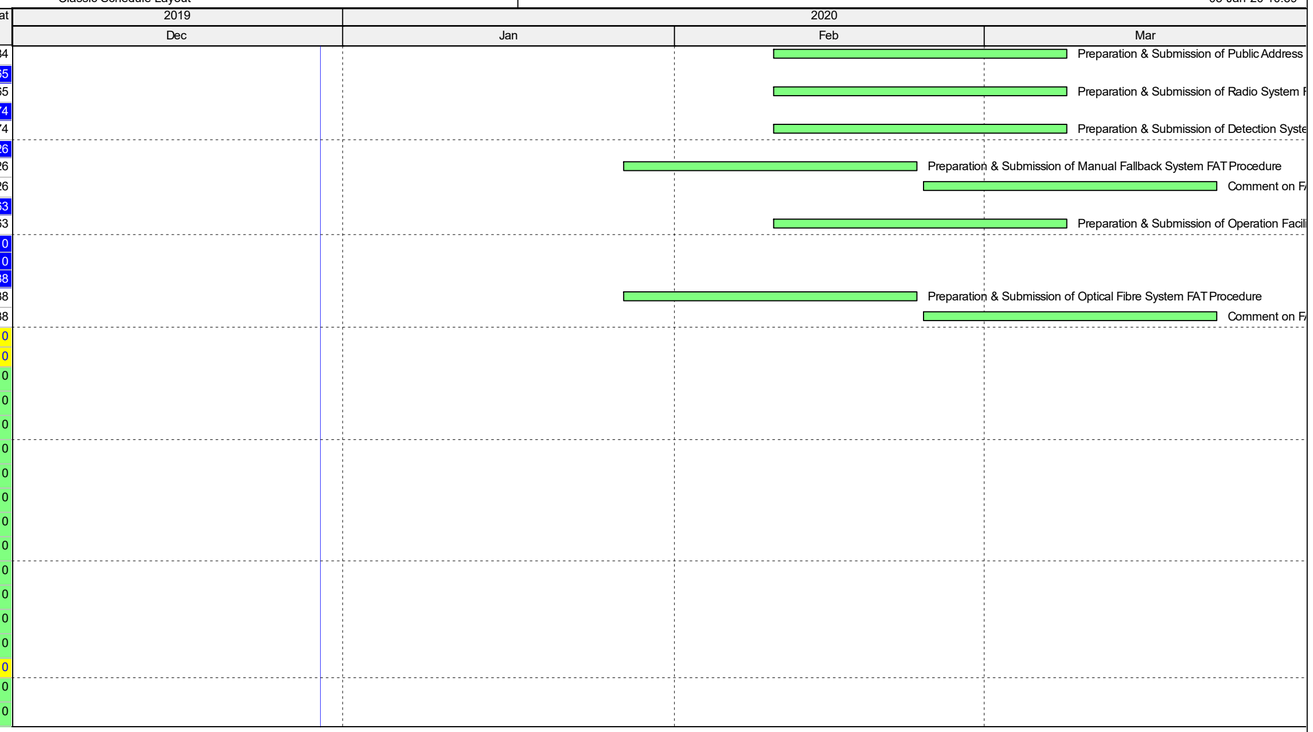
TASK filter: 3M-C2.

Activity ID	Activity Name	Original Duration	Start	Finish	Late Start	Late Finish	Total Float
NE/2017/06-4.DS.PSP.10	Manual Fallback System	0					0
NE/2017/06-4.DS.PSP.11	Operation Facilities	0					0
NE/2017/06-4.DS.PSP.12	Power Distribution System	0					0
NE/2017/06-4.DS.PSP.13	Speed Enforcement System	28	30-Dec-19	26-Jan-20	03-Sep-20	01-Oct-20	249
DWP1670	Approval of PSP Proposal	28	30-Dec-19	26-Jan-20	03-Sep-20	01-Oct-20	249
NE/2017/06-4.DS.PSP.14	Optical Fibre System	0					0
NE/2017/06-4.DS.FSP	Prepare / Submission of FSP For TKO-LTT TCSS and	68	02-Dec-19 A	22-Mar-20	20-May-20	17-Dec-20	221
NE/2017/06-4.DS.FSP.S	Final Design (Software)	0					0
NE/2017/06-4.DS.FSP.H	Final Design (Hardware)	0					0
NE/2017/06-4.DS.FSP.1	Central System	42	30-Dec-19	09-Feb-20	06-Jul-20	17-Aug-20	190
DWP1780	Resubmission of FSP	14	30-Dec-19	12-Jan-20	06-Jul-20	20-Jul-20	190
DWP1790	Approval of FSP Proposal	28	13-Jan-20	09-Feb-20	20-Jul-20	17-Aug-20	190
NE/2017/06-4.DS.FSP.2	Traffic Control Devices	42	02-Dec-19 A	08-Mar-20	04-Jun-20	13-Aug-20	158
DWP1810	Comment on FSP / Meeting With Engineer	28	02-Dec-19 A	26-Jan-20	04-Jun-20	02-Jul-20	158
DWP1820	Resubmission of FSP	14	27-Jan-20	09-Feb-20	02-Jul-20	16-Jul-20	158
DWP1830	Approval of FSP Proposal	28	10-Feb-20	08-Mar-20	16-Jul-20	13-Aug-20	158
NE/2017/06-4.DS.FSP.3	Communication System	28	30-Dec-19	26-Jan-20	17-Jul-20	14-Aug-20	200
DWP1870	Approval of FSP Proposal	28	30-Dec-19	26-Jan-20	17-Jul-20	14-Aug-20	200
NE/2017/06-4.DS.FSP.4	CCTV System	42	27-Jan-20	08-Mar-20	18-Jun-20	30-Jul-20	144
DWP1900	Resubmission of FSP	14	27-Jan-20	09-Feb-20	18-Jun-20	02-Jul-20	144
DWP1910	Approval of FSP Proposal	28	10-Feb-20	08-Mar-20	02-Jul-20	30-Jul-20	144
NE/2017/06-4.DS.FSP.5	Building PABX System	42	30-Dec-19	09-Feb-20	24-Jun-20	05-Aug-20	177
DWP1940	Resubmission of FSP	14	30-Dec-19	12-Jan-20	24-Jun-20	08-Jul-20	177
DWP1950	Approval of FSP Proposal	28	13-Jan-20	09-Feb-20	08-Jul-20	05-Aug-20	177
NE/2017/06-4.DS.FSP.6	Emergancy Telephone System	70	30-Dec-19	08-Mar-20	30-May-20	08-Aug-20	153
DWP1970	Comment on FSP / Meeting With Engineer	28	30-Dec-19	26-Jan-20	30-May-20	27-Jun-20	153
DWP1980	Resubmission of FSP	14	27-Jan-20	09-Feb-20	27-Jun-20	11-Jul-20	153
DWP1990	Approval of FSP Proposal	28	10-Feb-20	08-Mar-20	11-Jul-20	08-Aug-20	153
NE/2017/06-4.DS.FSP.7	Public Address System	42	30-Dec-19	09-Feb-20	30-Jun-20	11-Aug-20	184
DWP2020	Resubmission of FSP	14	30-Dec-19	12-Jan-20	30-Jun-20	14-Jul-20	184
DWP2030	Approval of FSP Proposal	28	13-Jan-20	09-Feb-20	14-Jul-20	11-Aug-20	184
NE/2017/06-4.DS.FSP.8	Radio System	42	30-Dec-19	09-Feb-20	12-Jun-20	24-Jul-20	165
DWP2060	Resubmission of FSP	14	30-Dec-19	12-Jan-20	12-Jun-20	26-Jun-20	165
DWP2070	Approval of FSP Proposal	28	13-Jan-20	09-Feb-20	26-Jun-20	24-Jul-20	165
NE/2017/06-4.DS.FSP.9	Detection System	28	13-Jan-20	09-Feb-20	04-Jul-20	01-Aug-20	174
DWP2110	Approval of FSP Proposal	28	13-Jan-20	09-Feb-20	04-Jul-20	01-Aug-20	174
NE/2017/06-4.DS.FSP.10	Manual Fallback System	28	30-Dec-19	26-Jan-20	20-Nov-20	17-Dec-20	326
DWP2150	Approval of FSP Proposal	28	30-Dec-19	26-Jan-20	20-Nov-20	17-Dec-20	326
NE/2017/06-4.DS.FSP.11	Operation Facilities	28	13-Jan-20	09-Feb-20	02-Oct-20	29-Oct-20	263
DWP2190	Approval of FSP Proposal	28	13-Jan-20	09-Feb-20	02-Oct-20	29-Oct-20	263
NE/2017/06-4.DS.FSP.12	Power Distribution System	42	10-Feb-20	22-Mar-20	20-May-20	01-Jul-20	100
DWP2210	Comment on FSP / Meeting With Engineer	28	10-Feb-20	08-Mar-20	20-May-20	17-Jun-20	100
DWP2220	Resubmission of FSP	14	09-Mar-20	22-Mar-20	17-Jun-20	01-Jul-20	100
NE/2017/06-4.DS.FSP.13	Speed Enforcement System	42	27-Jan-20	08-Mar-20	01-Oct-20	12-Nov-20	249
DWP2260	Resubmission of FSP	14	27-Jan-20	09-Feb-20	01-Oct-20	15-Oct-20	249
DWP2270	Approval of FSP Proposal	28	10-Feb-20	08-Mar-20	15-Oct-20	12-Nov-20	249
NE/2017/06-4.DS.FSP.14	Optical Fibre System	28	30-Dec-19	26-Jan-20	24-Aug-20	20-Sep-20	238
DWP2310	Approval of FSP Proposal	28	30-Dec-19	26-Jan-20	24-Aug-20	20-Sep-20	238
NE/2017/06-4.DS.FDS	Preparation of Functional Design Specification (FDS)	58	30-Dec-19	10-Mar-20	30-Dec-19	11-Mar-20	0
NE/2017/06-4.DS.FDS.1	Preparation of Software Project Plan (SPP)	0					0
NE/2017/06-4.DS.FDS.2	Preparation of Software Architect Document	0					0
NE/2017/06-4.DS.FDS.3	Preparation of Software requirment Specification	0					0
NE/2017/06-4.DS.FDS.4	Preparation & Submission of Function Design Specif	72	30-Dec-19	10-Mar-20	30-Dec-19	11-Mar-20	0
DWP7730	Preparation of Submission of Function Design Specci	30	30-Dec-19	28-Jan-20	30-Dec-19	29-Jan-20	0
DWP8230	Comment on FDS / Discussion with Engineer	28	29-Jan-20	25-Feb-20	29-Jan-20	26-Feb-20	0
DWP8240	Resubmission of FDS	14	26-Feb-20	10-Mar-20	26-Feb-20	11-Mar-20	0
NE/2017/06-4.DS.SWD	Software Development (except GUI) for TKO-LTT TC	55	16-Jan-20	24-Mar-20	26-Jul-20	04-Dec-23	1128
DWP7630	Prepare Design of Software Tractability Matrix w.r.t. Sp	10	16-Jan-20	26-Jan-20	26-Jul-20	05-Aug-20	192
DWP7650	Configuration / Interface with other TCSS Systems / E	40	26-Jan-20	06-Mar-20	05-Aug-20	14-Sep-20	192
NE/2017/06-4.DS.SWD.2	Allocation of New Functionality to Existing or New M	0					0
NE/2017/06-4.DS.SWD.6	Traffic Plan Coding	40	13-Feb-20	24-Mar-20	25-Oct-23	04-Dec-23	1350
DWP2440	Plan Verification	25	13-Feb-20	09-Mar-20	25-Oct-23	19-Nov-23	1350
DWP2450	Plan Finalization	15	09-Mar-20	24-Mar-20	19-Nov-23	04-Dec-23	1350
NE/2017/06-4.DS.GUI	GUI Development for TKO-LTT TCSS and CBL TCSS	50	04-Feb-20	25-Mar-20	04-Oct-20	04-Dec-23	1349
DWP2510	Development of Detailed Display	50	04-Feb-20	25-Mar-20	15-Oct-23	04-Dec-23	1349
DWP2520	Prpulate Base Map with Icons	50	04-Feb-20	25-Mar-20	15-Oct-23	04-Dec-23	1349
DWP2530	Development of Page Based Display	50	04-Feb-20	25-Mar-20	04-Oct-20	23-Nov-20	243
DWP2540	GUI Development Completion	0	25-Mar-20	25-Mar-20	23-Nov-20	23-Nov-20	243
NE/2017/06-4.DS.FAT	Preparation / Submission of FAT Procedures	46	27-Jan-20	22-Mar-20	24-Jul-20	11-Feb-21	266
NE/2017/06-4.DS.FAT.1	Central System	28	10-Feb-20	08-Mar-20	17-Aug-20	14-Sep-20	190
DWP2550	Preparation & Submission of Central System FAT Proc	28	10-Feb-20	08-Mar-20	17-Aug-20	14-Sep-20	190
NE/2017/06-4.DS.FAT.2	Traffic Control Devices	0					0
NE/2017/06-4.DS.FAT.3	Communication System	56	27-Jan-20	22-Mar-20	14-Aug-20	09-Oct-20	200
DWP2630	Preparation & Submission of Communication System	28	27-Jan-20	23-Feb-20	14-Aug-20	11-Sep-20	200
DWP2640	Comment on FAT Procedure / Meeting With Engineer	28	24-Feb-20	22-Mar-20	11-Sep-20	09-Oct-20	200
NE/2017/06-4.DS.FAT.4	CCTV System	0					0
NE/2017/06-4.DS.FAT.5	Building PABX System	28	10-Feb-20	08-Mar-20	05-Aug-20	02-Sep-20	177
DWP2710	Preparation & Submission of Building PABX System F	28	10-Feb-20	08-Mar-20	05-Aug-20	02-Sep-20	177
NE/2017/06-4.DS.FAT.6	Emergancy Telephone System	0					0
NE/2017/06-4.DS.FAT.7	Public Address System	28	10-Feb-20	08-Mar-20	11-Aug-20	08-Sep-20	184

Actual Level of Effort | Remaining Work | Milestone
Actual Work | Critical Remaining Work

TASK filter: 3M-C2.

Activity ID	Activity Name	Original Duration	Start	Finish	Late Start	Late Finish	Total Float
DWP2790	Preparation & Submission of Public Address System I	28	10-Feb-20	08-Mar-20	11-Aug-20	08-Sep-20	184
NE/2017/06-4.DS.FAT8	Radio System	28	10-Feb-20	08-Mar-20	24-Jul-20	21-Aug-20	165
DWP2830	Preparation & Submission of Radio System FAT Proce	28	10-Feb-20	08-Mar-20	24-Jul-20	21-Aug-20	165
NE/2017/06-4.DS.FAT9	Detection System	28	10-Feb-20	08-Mar-20	01-Aug-20	29-Aug-20	174
DWP2870	Preparation & Submission of Detection System FAT P	28	10-Feb-20	08-Mar-20	01-Aug-20	29-Aug-20	174
NE/2017/06-4.DS.FAT10	Manual Fallback System	56	27-Jan-20	22-Mar-20	18-Dec-20	11-Feb-21	326
DWP2910	Preparation & Submission of Manual Fallback Systerr	28	27-Jan-20	23-Feb-20	18-Dec-20	14-Jan-21	326
DWP2920	Comment on FAT Procedure / Meeting With Engineer	28	24-Feb-20	22-Mar-20	15-Jan-21	11-Feb-21	326
NE/2017/06-4.DS.FAT11	Operation Facilities	28	10-Feb-20	08-Mar-20	30-Oct-20	26-Nov-20	263
DWP2950	Preparation & Submission of Operation Facilites FAT I	28	10-Feb-20	08-Mar-20	30-Oct-20	26-Nov-20	263
NE/2017/06-4.DS.FAT12	Power Distribution System	0					0
NE/2017/06-4.DS.FAT13	Speed Enforcement System	0					0
NE/2017/06-4.DS.FAT14	Optical Fibre system	56	27-Jan-20	22-Mar-20	21-Sep-20	15-Nov-20	238
DWP3070	Preparation & Submission of Optical Fibre System FA	28	27-Jan-20	23-Feb-20	21-Sep-20	18-Oct-20	238
DWP3080	Comment on FAT Procedure / Meeting With Engineer	28	24-Feb-20	22-Mar-20	19-Oct-20	15-Nov-20	238
NE/2017/06-4.DS.SCT	Preparation / Submission of SCT Procedures	0					0
NE/2017/06-4.DS.SAT	Preparation / Submission of SAT Procedures	0					0
NE/2017/06-4.EMT	Equipment Manufacturing and FAT Stag	0					0
NE/2017/06-4.CST	Construction Stage for TKO-LTT TCSS	0					0
NE/2017/06-4.SATT	SAT for TKO-LTT TCSS	0					0
NE/2017/06-4.OPTT	Operability Period Test for the TKO-LTT	0					0
NE/2017/06-4.DLPT	DLP for the TKO-LTT TCSS	0					0
NE/2017/06-4.DOC1	Documentation Submission for TKO-L	0					0
NE/2017/06-4.TRT	Training for TKO-LTT TCSS	0					0
NE/2017/06-4.EMC	Equipment Manufacturing and Delivery	0					0
NE/2017/06-4.CSC1	Construction Stage for CBL TCSS	0					0
NE/2017/06-4.SATC	SAT for CBL TCSS	0					0
NE/2017/06-4.OPTC	Operability Period Test For the CBL TC	0					0
NE/2017/06-4.DLPC	DLP for the CBL TCSS	0					0
NE/2017/06-4.DLPC.1	General	0					0
NE/2017/06-4.DOC	Documentation Submission for CBL TC	0					0
NE/2017/06-4.TRC	Training for CBL TCSS	0					0



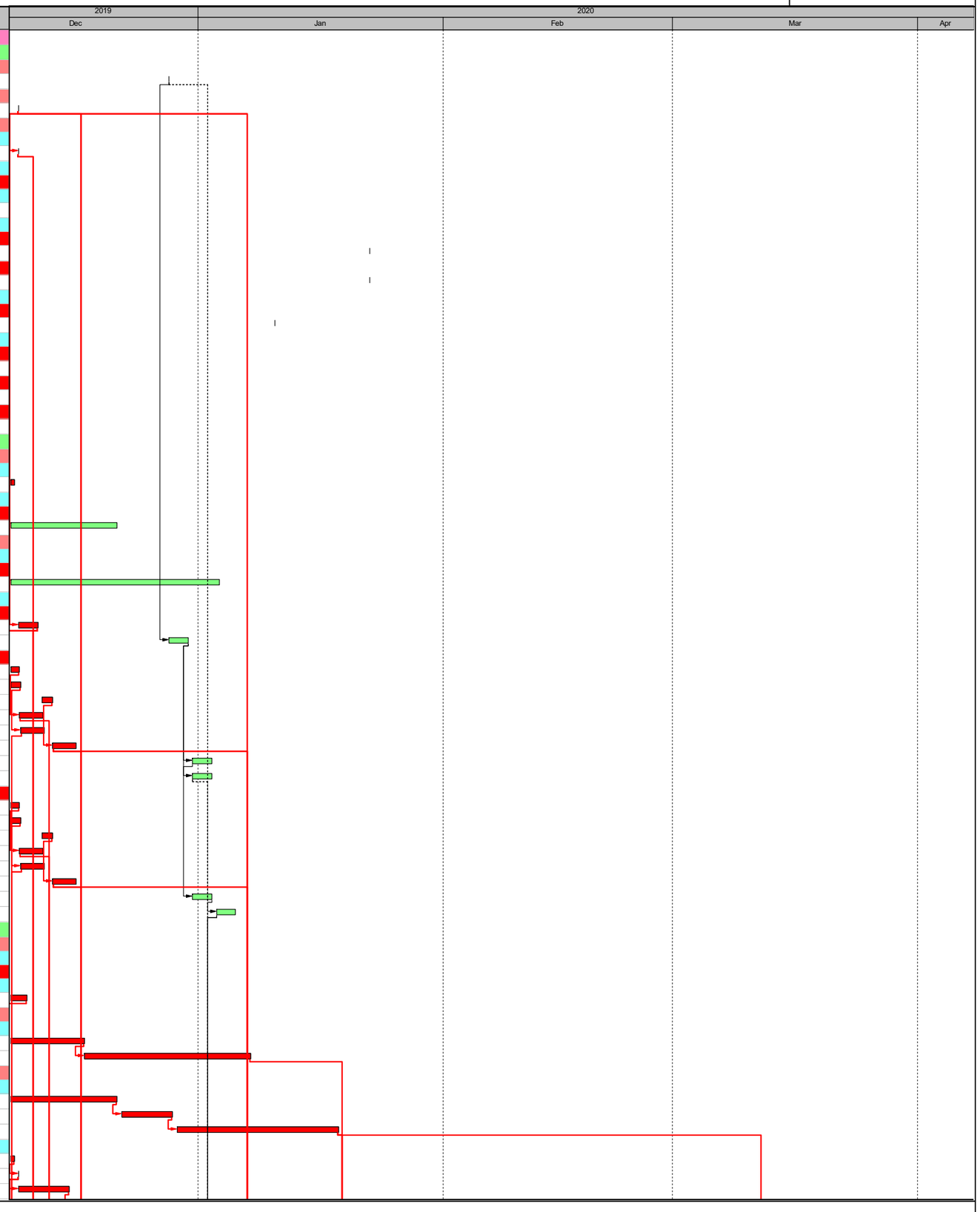
Actual Level of Effort | Remaining Work | Milestone
Actual Work | Critical Remaining Work

TASK filter: 3M-C2.

NE/2017/01 Tseung Kwan O - Lam Tin Tunnel- Tseung Kwan O Interchange and Associated Works

Rolling programme (Dec 2019 to Mar 2020)

Activity ID	Activity Name	Original Duration	Start	Finish
Tseung Kwan O Interchange and Associated Works 201912 _191211		875	10-Jan-18 A	02-Jun-20
Contract Key Date & Milestone		74	09-Dec-19	20-Feb-20
Contract Access Date		0	28-Dec-19	28-Dec-19
CD-10060	Portion II ((705 days after starting date or earlier date noticed by the Project Manager) - ** 28/12/2019	0	28-Dec-19*	
Tentative Access Date		0	09-Dec-19	09-Dec-19
CD-10052	Tentative Access Date for Portion III (Bridge S100 - (3D,3E) , Bridge S200 - (2B, 2C))	0	09-Dec-19*	
Contractor's Target Key Date		74	09-Dec-19	20-Feb-20
Sloping Seawall Structure		0	09-Dec-19	09-Dec-19
CD-10161	Accept and Possession of the Sloping Seawall Structure (Portion III - 2B, 3E)	0	09-Dec-19	
Major Design Work		0	10-Dec-19	10-Dec-19
Superstructure		0	10-Dec-19	10-Dec-19
Bridge S200		0	10-Dec-19	10-Dec-19
CD-10330	Acceptance of Detail Design of Bridge S200 (Pier and Deck)	0		10-Dec-19
Major Safety/ Environment Element		0	22-Jan-20	22-Jan-20
Independent Safety Audit		0	22-Jan-20	22-Jan-20
CD-10430	Completion of 4th Independent Safety Audit	0		22-Jan-20*
Safety Bulletin Board		0	22-Jan-20	22-Jan-20
CD-10461	Completion of 2nd Safety Bulletin Board	0		22-Jan-20*
Miscellaneous Work		0	10-Jan-20	10-Jan-20
Video Film		0	10-Jan-20	10-Jan-20
CD-10480	Completion of Construction Video Film for Release II	0		10-Jan-20*
Major Construction Work		12	08-Feb-20	20-Feb-20
Bridge S300		0	20-Feb-20	20-Feb-20
CD-10590	Completion of Pre-drilling Bridge S300	0		20-Feb-20
Bridge S200		0	08-Feb-20	08-Feb-20
CD-10680	Completion of Pre-drilling Bridge S200	0		08-Feb-20
Bridge S100		0	08-Feb-20	08-Feb-20
CD-10770	Completion of Pre-drilling Bridge S100	0		08-Feb-20
Preliminary & Pre-Construction Work		749	10-Jan-18 A	05-Jan-20
Initial Document Submission		749	10-Jan-18 A	21-Dec-19
Insurance		60	10-Jan-18 A	08-Dec-19
PRE-10570	Prepare, Submit and Acceptance of Professional Indemnity Insurance for the Work in Respect of the Designer	60	10-Jan-18 A	08-Dec-19
BIM & Simulation of Construction Method		120	10-Jul-19 A	21-Dec-19
Construction Method Simulation (CMS)		120	10-Jul-19 A	21-Dec-19
PRE-10810	Prepare and Submit the Construction Method Simulation - Span Segment Erection	120	10-Jul-19 A	21-Dec-19
Pre-Construction Work		577	07-Mar-18 A	05-Jan-20
Site Accommodation		90	07-Mar-18 A	03-Jan-20
Site Accommodation (Construction Work)		90	07-Mar-18 A	03-Jan-20
PRE-11770	Hoarding Erection	90	07-Mar-18 A	03-Jan-20
Survey		116	05-Sep-19 A	05-Jan-20
Survey (Construction Work)		22	09-Dec-19	30-Dec-19
PRE-11964	Initial Survey & Conditional Survey of Existing Structure (Portion III -3D,3E, 2B,2C)	3	09-Dec-19	11-Dec-19
PRE-11962	Initial Survey & Conditional Survey of Existing Structure (Portion II)	3	28-Dec-19	30-Dec-19
Conditional Survey (Documentation)		113	05-Sep-19 A	02-Jan-20
PRE-11931	Prepare and Submit Report for Condition Survey (Portion III - 4K)	3	05-Sep-19 A	09-Dec-19
PRE-11939	Prepare and Submit Report for Condition Survey (Portion III -4J)	3	01-Nov-19 A	09-Dec-19
PRE-11937	Prepare and Submit Report for Condition Survey (Portion III –3D,3E, 2B,2C)	3	07-Dec-19 A	13-Dec-19
PRE-11932	Project Manager to acknowledge the Report Submission of Condition Survey (Portion III -4K)	3	09-Dec-19	12-Dec-19
PRE-11939a	Project Manager to acknowledge the Report Submission of Condition Survey (Portion III -4J)	3	09-Dec-19	12-Dec-19
PRE-11938	Project Manager to acknowledge the Report Submission of Condition Survey (Portion III -3D,3E, 2B,2C)	3	13-Dec-19	16-Dec-19
PRE-11933	Prepare and Submit Report for Condition Survey (Portion II)	3	31-Dec-19	02-Jan-20
PRE-11934	Project Manager to acknowledge the Report Submission of Condition Survey (Portion II)	3	31-Dec-19	02-Jan-20
Initial Survey (Documentation)		116	05-Sep-19 A	05-Jan-20
PRE-11951	Prepare and Submit Report for Initial Survey (Portion III -4K)	3	05-Sep-19 A	09-Dec-19
PRE-11959	Prepare and Submit Report for Initial Survey (Portion III -4J)	3	01-Nov-19 A	09-Dec-19
PRE-11957	Prepare and Submit Report for Initial Survey (Portion III -3D,3E, 2B,2C)	3	07-Dec-19 A	13-Dec-19
PRE-11952	Project Manager to acknowledge the Report Submission of Initial Survey (Portion III -4K)	3	09-Dec-19	12-Dec-19
PRE-11959a	Project Manager to acknowledge the Report Submission of Initial Survey (Portion III -4J)	3	09-Dec-19	12-Dec-19
PRE-11958	Project Manager to acknowledge the Report Submission of Initial Survey (Portion III -3D,3E, 2B,2C)	3	13-Dec-19	16-Dec-19
PRE-11953	Prepare and Submit Report for Initial Survey (Portion II)	3	31-Dec-19	02-Jan-20
PRE-11954	Project Manager to acknowledge the Report Submission of Initial Survey (Portion II)	3	03-Jan-20	05-Jan-20
Document Submission (Design, Drawing , Method Statement, Application etc)		272	06-Jul-19 A	12-Apr-20
Contractor's Alternative Design (AD) & Contractor's Design		21	06-Jul-19 A	10-Dec-19
Superstructure Design (Pier and Deck) [Contractor's Alternative Design (AD)]		21	06-Jul-19 A	10-Dec-19
Bridge S200		21	06-Jul-19 A	10-Dec-19
Detail Design [Deck]		21	06-Jul-19 A	10-Dec-19
PRE-15620	Project Manager to Review & Approve the Detail Design of Bridge S200 (Deck)	21	06-Jul-19 A	10-Dec-19
Major Material Submission		92	08-Oct-19 A	07-Jan-20
Bridge Strands		92	08-Oct-19 A	07-Jan-20
PRE-13320	Sample Testing & Result to Submit to Project Manager	14	08-Oct-19 A	17-Dec-19
PRE-13330	Result Submission and Review & Acceptance by the Project Manager	21	17-Dec-19	07-Jan-20
Major Method Statement		201	29-Jul-19 A	12-Apr-20
Span Segment Erection		88	16-Aug-19 A	18-Jan-20
PRE-14070	Contractor's Review with Project Manager, Revised Method Statement Construction of Span Segment Erection	21	16-Aug-19 A	21-Dec-19
PRE-14090	ICE Certification & Submit Revised Method Statement for Construction of Span Segment Erection	7	22-Dec-19	28-Dec-19
PRE-14100	Project Manager to review and approve Method Statement Construction of Span Segment Erection	21	29-Dec-19	18-Jan-20
Bridge Stressing (Internal & External)		103	29-Jul-19 A	05-Jan-20
PRE-14110	Prepare 1st Submission of Method Statement Bridge Stressing (Internal & External)	28	29-Jul-19 A	08-Dec-19
PRE-14130	Contractor's Review with Project Manager, Revised Method Statement for Bridge Stressing (Internal & External)	0	09-Dec-19	09-Dec-19
PRE-14150	ICE Certification & Submit Revised Method Statement for Bridge Stressing (Internal & External)	7	09-Dec-19	15-Dec-19

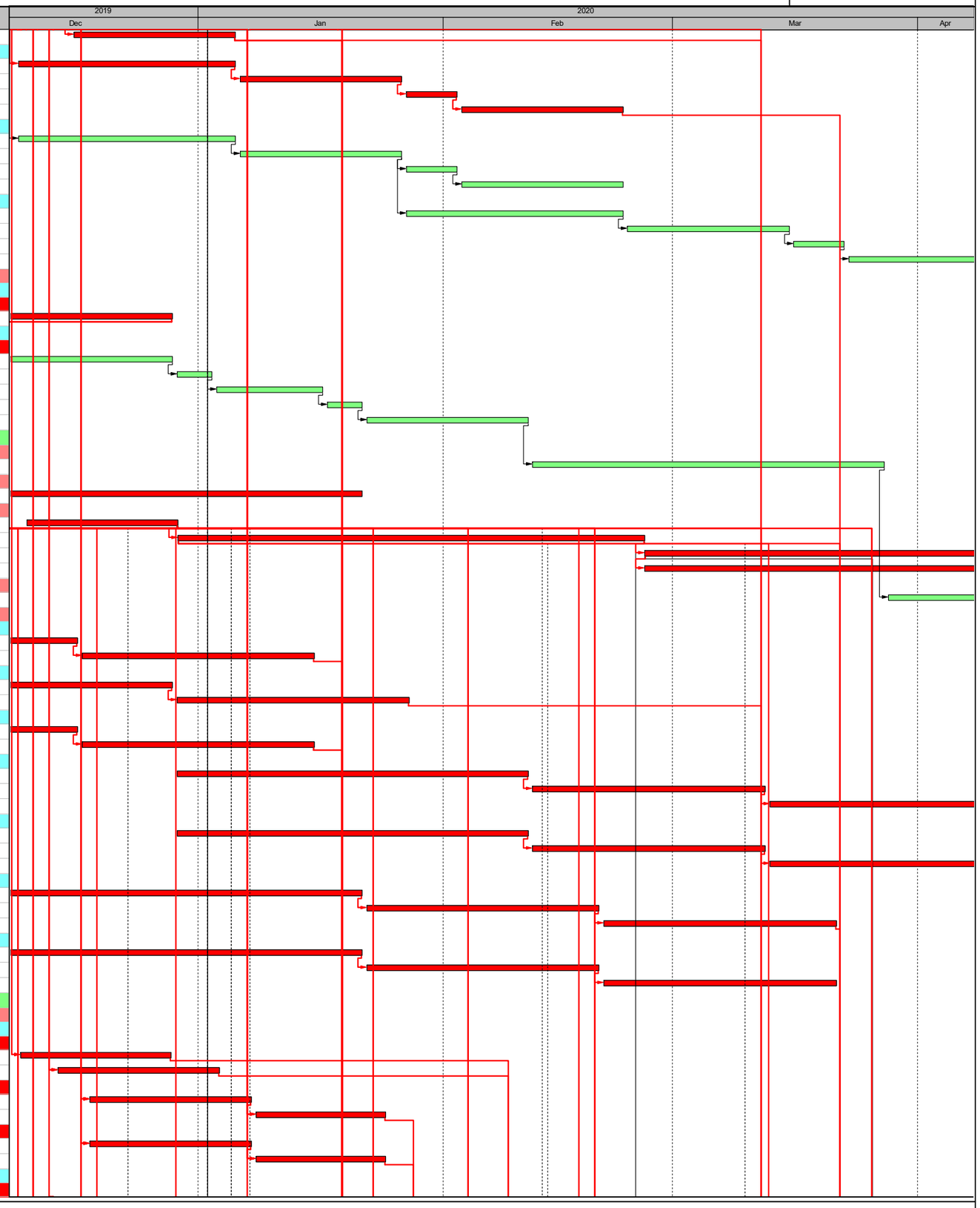


Works Critical Works Actual

NE/2017/01 Tseung Kwan O - Lam Tin Tunnel- Tseung Kwan O Interchange and Associated Works

Rolling programme (Dec 2019 to Mar 2020)

Activity ID	Activity Name	Original Duration	Start	Finish
PRE-14160	Project Manager to review and approve Method Statement Bridge Stressing (Internal & External)	21	16-Dec-19	05-Jan-20
Key Segment Erection		77	09-Dec-19	23-Feb-20
PRE-14170	Prepare 1st Submission of Method Statement Construction of Key Segment Erection	28	09-Dec-19	05-Jan-20
PRE-14190	Contractor's Review with Project Manager, Revised Method Statement for Construction of Key Segment Erection	21	06-Jan-20	26-Jan-20
PRE-14210	ICE Certification & Submit Revised Method Statement for Construction of Key Segment Erection	7	27-Jan-20	02-Feb-20
PRE-14220	Project Manager to review and approve Method Statement Construction of Key Segment Erection	21	03-Feb-20	23-Feb-20
Construction of Parapet & Installation of Utility Through		77	09-Dec-19	23-Feb-20
PRE-14230	Prepare1st Submission of Method Statement Parapet Construction & Installation of Utility Through	28	09-Dec-19	05-Jan-20
PRE-14250	Contractor's Review with Project Manager, Revised Method Statement	21	06-Jan-20	26-Jan-20
PRE-14270	ICE Certification & Submit Revised Method Statement for Parapet Construction & Installation of Utility Through	7	27-Jan-20	02-Feb-20
PRE-14280	Project Manager to review and approve Method Statement Parapet Construction & Installation of Utility Through	21	03-Feb-20	23-Feb-20
Installation of Bridge Furniture		77	27-Jan-20	12-Apr-20
PRE-14290	Prepare 1st Submission of Method Statement Installation of Bridge Furniture	28	27-Jan-20	23-Feb-20
PRE-14310	Contractor's Review with Project Manager, Revised Method Statement for Installation of Bridge Furniture	21	24-Feb-20	15-Mar-20
PRE-14330	ICE Certification & Submit Revised Method Statement for Installation of Bridge Furniture	7	16-Mar-20	22-Mar-20
PRE-14340	Project Manager to review and approve Method Statement Installation of Bridge Furniture	21	23-Mar-20	12-Apr-20
Design Calculation/ Drawing of Temporary Work		88	31-Oct-19 A	11-Feb-20
Fabrication Drawing for the Segment Erector		21	31-Oct-19 A	28-Dec-19
Truss Beam		21	31-Oct-19 A	28-Dec-19
PRE-14820	Project Manager to review and approve the Design & Fabrication Drawing for Truss Beam	21	31-Oct-19 A	28-Dec-19
Fabrication Drawing for the Mould of Precast Element		66	08-Dec-19	11-Feb-20
Mould for Precast Parapet Skin		66	08-Dec-19	11-Feb-20
PRE-15010	Prepare Design & Fabrication Drawing for Mould of Precast Parapet Skin	21	08-Dec-19	28-Dec-19
PRE-15020	ICE Certification and Submit the Design & Fabrication Drawing for Mould of Precast Parapet Skin	5	29-Dec-19	02-Jan-20
PRE-15030	Contractor's Review with Project Manager,Revised & Resubmit of the Fabrication Drawing for Mould of Precast Parapet Skin	14	03-Jan-20	16-Jan-20
PRE-15050	ICE Certification and Submit the Revised Design & Fabrication Drawing for Mould of Precast Parapet Skin	5	17-Jan-20	21-Jan-20
PRE-15060	Project Manager to Review and Approve Design & Fabrication Drawing for Mould of Precast Parapet Skin	21	22-Jan-20	11-Feb-20
Pre-Fabrication Element		330	15-Jul-19 A	02-Jun-20
Pre- Fabrication of Precast Mould		45	12-Feb-20	27-Mar-20
FD-10120	Pre-fabrication of Precast Mould for Precast Parapet Skin	45	12-Feb-20	27-Mar-20
Pre-Fabrication of Precast Shell		50	05-Sep-19 A	21-Jan-20
FD-10180	Pre-Fabrication for Precast Shell for the 26 to 30 nos. shell.	50	05-Sep-19 A	21-Jan-20
Pre-Fabrication of Precast Segment		292	11-Sep-19 A	26-Apr-20
FD-10190	Pre-Fabrication for Segment for 1 to 80 nos. Pier Head/ Span/ Key Segment	48	11-Sep-19 A	29-Dec-19
FD-10200	Pre-Fabrication for Segment for 81 to 178 nos. Pier Head/ Span/ Key Segment	59	29-Dec-19	26-Feb-20
FD-10210	Pre-Fabrication for Segment for 179 to 306 nos. Pier Head/ Span/ Key Segment	60	26-Feb-20	26-Apr-20
FD-10220	Pre-Fabrication for Segment for 307 to 386 nos.Pier Head/ Span/ Key Segment	48	26-Feb-20	14-Apr-20
Pre-Fabrication of Parapet Skin		67	28-Mar-20	02-Jun-20
FD-10260	Pre-Fabrication for Parapet Skin for Bridge ML (402m Length x 2 Sides) - 6 Sets Mould	67	28-Mar-20	02-Jun-20
Pre-Fabrication of Segment Erector		252	15-Jul-19 A	11-Apr-20
Segment Lifting Frame		117	16-Aug-19 A	15-Jan-20
FD-10310	Test & Commisioning of Segment Lifting Fame	30	16-Aug-19 A	16-Dec-19
FD-10320	Delivery of Segment Lifting Frame	30	17-Dec-19	15-Jan-20
Segment Hanging Beam No. 1		129	16-Aug-19 A	27-Jan-20
FD-10340	Test & Commisioning of Segment Hanging Beam No.1	30	16-Aug-19 A	28-Dec-19
FD-10350	Delivery of Segment Hangng Beam No. 1	30	29-Dec-19	27-Jan-20
Segment Hanging Beam No. 2		119	16-Aug-19 A	15-Jan-20
FD-10370	Test & Commisioning of Segment Hanging Beam No.2	30	16-Aug-19 A	16-Dec-19
FD-10380	Delivery of Segment Hangng Beam No. 2	30	17-Dec-19	15-Jan-20
Segment Truss Beam No. 1		197	15-Jul-19 A	11-Apr-20
FD-10390	Pre-Fabrication of Segment Truss Beam No.1	90	15-Jul-19 A	11-Feb-20
FD-10400	Test & Commisioning of Segment Truss Beam No.1	30	12-Feb-20	12-Mar-20
FD-10410	Delivery of Segment Truss Beam No. 1	30	13-Mar-20	11-Apr-20
Segment Truss Beam No. 2		197	15-Jul-19 A	11-Apr-20
FD-10420	Pre-Fabrication of Segment Truss Beam No.2	90	15-Jul-19 A	11-Feb-20
FD-10430	Test & Commisioning of Segment Truss Beam No.2	30	12-Feb-20	12-Mar-20
FD-10440	Delivery of Segment Truss Beam No.2	30	13-Mar-20	11-Apr-20
Segment Key Segment Erector No. 1		231	23-Jul-19 A	21-Mar-20
FD-10450	Pre-Fabrication of Key Segment Erector No.1	90	23-Jul-19 A	21-Jan-20
FD-10460	Test & Commisioning of Segment ErectorNo.1	30	22-Jan-20	20-Feb-20
FD-10470	Delivery of Segment Erector No.1	30	21-Feb-20	21-Mar-20
Segment Key Segment Erector No. 2		231	23-Jul-19 A	21-Mar-20
FD-10480	Pre-Fabrication of Key Segment Erector No.2	90	23-Jul-19 A	21-Jan-20
FD-10490	Test & Commisioning of Segment Erector No.2	30	22-Jan-20	20-Feb-20
FD-10500	Delivery of Segment Erector No.2	30	21-Feb-20	21-Mar-20
Construction Work		184	30-Sep-19 A	24-Apr-20
Pre-Drilling & Piling Work		108	09-Dec-19	23-Apr-20
Temporary Platform erection for Pre-drilling & Piling		38	09-Dec-19	24-Jan-20
Bridge S300		20	09-Dec-19	03-Jan-20
CON-10150	Temporary Platform Erection & Silt Curtain Installation for Pier 4J (Portion III Possession)	15	09-Dec-19	28-Dec-19
CON-10160	Temporary Platform Erection & Silt Curtain Installation for Pier 4K (Portion III Possession)	15	14-Dec-19	03-Jan-20
Bridge S200		30	18-Dec-19	24-Jan-20
CON-10230	Temporary Platform Erection & Silt Curtain Installation for Pier 2B (Portion III Possession)	15	18-Dec-19	07-Jan-20
CON-10240	Temporary Platform Erection & Silt Curtain Installation for Pier 2C (Portion III Possession)	15	08-Jan-20	24-Jan-20
Bridge S100		30	18-Dec-19	24-Jan-20
CON-10280	Temporary Platform Erection & Silt Curtain Installation for Pier 3E (Portion III Possession)	15	18-Dec-19	07-Jan-20
CON-10270	Temporary Platform Erection & Silt Curtain Installation for Pier 3D (Portion III Possession)	15	08-Jan-20	24-Jan-20
Sloping Sea Wall for Pier 2B(Bridge S200) , 3E (Bridge S100) and 4K (Bridge S300)		8	09-Dec-19	17-Dec-19
Work to Facilitate Piling		8	09-Dec-19	17-Dec-19

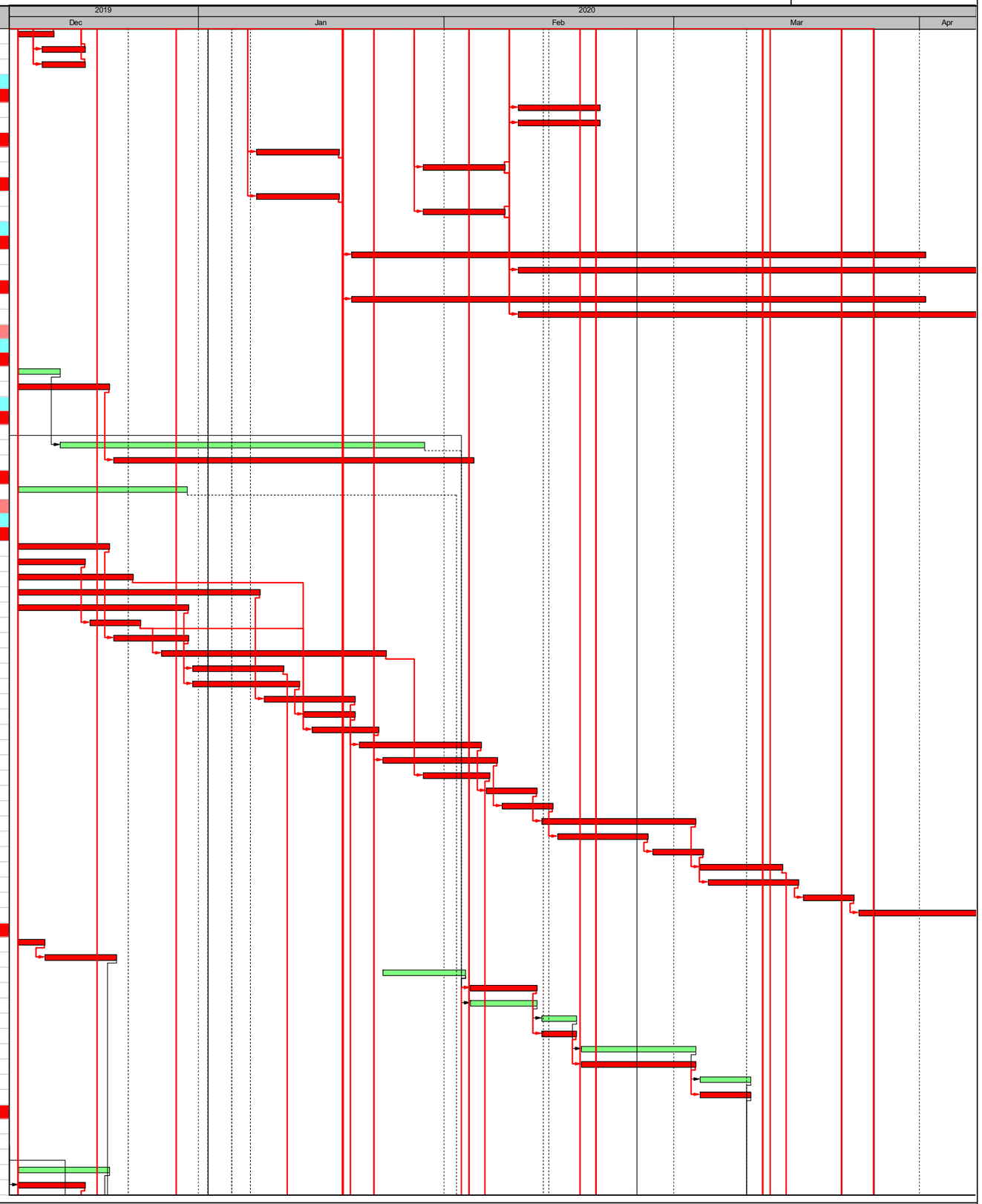


Works Critical Works Actual

NE/2017/01 Tseung Kwan O - Lam Tin Tunnel- Tseung Kwan O Interchange and Associated Works

Rolling programme (Dec 2019 to Mar 2020)

Activity ID	Activity Name	Original Duration	Start	Finish
CON-10310	Removal of Armour Rock and All Necessary Work To Facilitate piling work at Pier 4K	5	09-Dec-19	13-Dec-19
CON-10290	Removal of Armour Rock and All Necessary Work To Facilitate piling work at Pier 2B	5	12-Dec-19	17-Dec-19
CON-10300	Removal of Armour Rock and All Necessary Work To Facilitate piling work at Pier 3E	5	12-Dec-19	17-Dec-19
Pre-drilling		35	08-Jan-20	20-Feb-20
Bridge S300		10	10-Feb-20	20-Feb-20
CON-10500	Pre-drill 4J Including Plant Mobilisation and Demobilisation (2 nos./Team 2)	10	10-Feb-20	20-Feb-20
CON-10510	Pre-drill 4K Including Plant Mobilisation and Demobilisation (2 nos./Team 1)	10	10-Feb-20	20-Feb-20
Bridge S200		25	08-Jan-20	08-Feb-20
CON-10580	Pre-drill 2B Including Plant Mobilisation and Demobilisation (2 nos./Team 4)	10	08-Jan-20	18-Jan-20
CON-10590	Pre-drill 2C Including Plant Mobilisation and Demobilisation (2 nos./Team 2)	10	29-Jan-20	08-Feb-20
Bridge S100		25	08-Jan-20	08-Feb-20
CON-10630	Pre-drill 3E Including Plant Mobilisation and Demobilisation (2 nos./Team 3)	10	08-Jan-20	18-Jan-20
CON-10620	Pre-drill 3D Including Plant Mobilisation and Demobilisation (2 nos./Team 1)	10	29-Jan-20	08-Feb-20
Bored Pile Include Fabrication & Delivery of Pile Cage and Casing		75	20-Jan-20	23-Apr-20
Bridge S200		75	20-Jan-20	23-Apr-20
CON-10820	Bored Pile 2B Including Plant Mobilisation and Demobilisation (2 nos. Pile / Team 4)	60	20-Jan-20	01-Apr-20
CON-10830	Bored Pile 2C Including Plant Mobilisation and Demobilisation (2 nos. Pile / Team 3)	60	10-Feb-20	23-Apr-20
Bridge S100		75	20-Jan-20	23-Apr-20
CON-10930	Bored Pile 3E Including Plant Mobilisation and Demobilisation (2 nos. Pile / Team 2)	60	20-Jan-20	01-Apr-20
CON-10920	Bored Pile 3D Including Plant Mobilisation and Demobilisation (2 nos. Pile / Team 1)	60	10-Feb-20	23-Apr-20
Pile Cap Construction		70	05-Nov-19 A	04-Feb-20
Trimming of Bored Pile Head		32	14-Nov-19 A	20-Dec-19
Bridge S300		32	14-Nov-19 A	20-Dec-19
CON-11960	Trimming Bored Pile 4G	11	14-Nov-19 A	14-Dec-19
CON-11970	Trimming Bored Pile 4H	11	09-Dec-19	20-Dec-19
Pile Cap Rebar Erection, Concreting and Curing		70	05-Nov-19 A	04-Feb-20
Bridge S300		70	05-Nov-19 A	04-Feb-20
CON-12250	Pile Cap Rebar Erection, Concreting and Curing for Pier 4F (1 nos.Pile Cap/Team 1)	33	05-Nov-19 A	07-Dec-19 A
CON-12260	Pile Cap Rebar Erection, Concreting and Curing for Pier 4G (1 nos.Pile Cap/Team 2)	33	14-Dec-19	29-Jan-20
CON-12270	Pile Cap Rebar Erection, Concreting and Curing for Pier 4H (1 nos.Pile Cap/Team 3)	33	21-Dec-19	04-Feb-20
Bridge S200		33	16-Nov-19 A	30-Dec-19
CON-12320	Pile Cap Rebar Erection, Concreting and Curing for Pier 2D (1 nos.Pile Cap/Team 4)	33	16-Nov-19 A	30-Dec-19
Construction Pier Element		176	30-Sep-19 A	15-Apr-20
Construction of Pier		176	30-Sep-19 A	15-Apr-20
Bridge ML		127	08-Nov-19 A	15-Apr-20
CON-12462	Construction of Pier 1J ,Type 4 (5 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 5)- 2nd Pour	11	08-Nov-19 A	20-Dec-19
CON-12422	Construction of Pier 1G, Type 4M (3 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 1) - 2nd Pour	10	04-Dec-19 A	17-Dec-19
CON-12470	Construction of Pier 1K , Type 4M (5 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 1) -1st Pour	13	09-Dec-19	23-Dec-19
CON-12434	Construction of Pier 1F, Type 3 (3 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 2)-3rd Pour	24	09-Dec-19	08-Jan-20
CON-12456	Construction of Pier 1H, Type 4 (4 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 5) - 4th Pour	17	09-Dec-19	30-Dec-19
CON-12423	Construction of Pier 1G, Type 4M (3 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 1)- 2nd Pour	6	18-Dec-19	24-Dec-19
CON-12463	Construction of Pier 1J ,Type 4 (5 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 5) - 2nd Pour	6	21-Dec-19	30-Dec-19
CON-12424	Construction of Pier 1G, Type 4M (3 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 1) - 3rd Pour	24	27-Dec-19	24-Jan-20
CON-12457	Construction of Pier 1H, Type 4 (4 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 5) - 4th Pour	10	31-Dec-19	11-Jan-20
CON-12464	Construction of Pier 1J ,Type 4 (5 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 5)- 3rd Pour	11	31-Dec-19	13-Jan-20
CON-12435	Construction of Pier 1F, Type 3 (3 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 2) -3rd Pour	10	09-Jan-20	20-Jan-20
CON-12465	Construction of Pier 1J ,Type 4 (5 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 5) - 3rd Pour	6	14-Jan-20	20-Jan-20
CON-12471	Construction of Pier 1K , Type 4M (5 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 1) - 1st Pour	8	15-Jan-20	23-Jan-20
CON-12466	Construction of Pier 1J ,Type 4 (5 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 5)- 4th Pour	11	21-Jan-20	05-Feb-20
CON-12472	Construction of Pier 1K , Type 4M (5 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 1) -2nd Pour	10	24-Jan-20	07-Feb-20
CON-12425	Construction of Pier 1G, Type 4M (3 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 1)- 3rd Pour	8	29-Jan-20	06-Feb-20
CON-12467	Construction of Pier 1J ,Type 4 (5 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 5) - 4th Pour	6	06-Feb-20	12-Feb-20
CON-12473	Construction of Pier 1K , Type 4M (5 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 1) -2nd Pour	6	08-Feb-20	14-Feb-20
CON-12468	Construction of Pier 1J ,Type 4 (5 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 5)- 5th Pour	17	13-Feb-20	03-Mar-20
CON-12474	Construction of Pier 1K , Type 4M (5 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 1) -3rd Pour	10	15-Feb-20	26-Feb-20
CON-12475	Construction of Pier 1K , Type 4M (5 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 1) - 3rd Pour	6	27-Feb-20	04-Mar-20
CON-12469	Construction of Pier 1J ,Type 4 (5 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 5) - 5th Pour	10	04-Mar-20	14-Mar-20
CON-12476	Construction of Pier 1K , Type 4M (5 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 1) -4th Pour	10	05-Mar-20	16-Mar-20
CON-12477	Construction of Pier 1K , Type 4M (5 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 1) - 4th Pour	6	17-Mar-20	23-Mar-20
CON-12478	Construction of Pier 1K , Type 4M (5 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 1) -5th Pour	16	24-Mar-20	15-Apr-20
Bridge S300		149	30-Sep-19 A	10-Mar-20
CON-12482	Construction of Pier 4A, type 1M (2 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 3) - 2nd Pour	19	30-Sep-19 A	12-Dec-19
CON-12483	Construction of Pier 4A, type 1M (2 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 3) - 2nd Pour	8	12-Dec-19	21-Dec-19
CON-12523	Construction of Pier 4B, type 1 (2 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 4) - 2nd Pour	6	24-Jan-20	03-Feb-20
CON-12550	Construction of Pier 4F, type 1 (2 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 7) - 1st Pour	8	04-Feb-20	12-Feb-20
CON-12540	Construction of Pier 4G, type 1 (2 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 4) - 1st Pour	8	04-Feb-20	12-Feb-20
CON-12541	Construction of Pier 4G, type 1 (2 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 4)- 1st Pour	4	13-Feb-20	17-Feb-20
CON-12551	Construction of Pier 4F, type 1 (2 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 7)-1st Pour	4	13-Feb-20	17-Feb-20
CON-12542	Construction of Pier 4G, type 1 (2 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 4)- 2nd Pour	13	18-Feb-20	03-Mar-20
CON-12552	Construction of Pier 4F, type 1 (2 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 7)- 2nd Pour	13	18-Feb-20	03-Mar-20
CON-12543	Construction of Pier 4G, type 1 (2 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 4)- 2nd Pour	6	04-Mar-20	10-Mar-20
CON-12553	Construction of Pier 4F, type 1 (2 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 7)- 2nd Pour	6	04-Mar-20	10-Mar-20
Bridge S200		103	25-Nov-19 A	06-Apr-20
CON-12602	Construction of Pier 2E, type 1 (4 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 4) - 2nd Pour	8	25-Nov-19 A	03-Dec-19 A
CON-12621	Construction of Pier 2H, type 1 (4 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 7)-1st Pour	4	02-Dec-19 A	05-Dec-19 A
CON-12603	Construction of Pier 2E, type 1 (4 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 4)- 2nd Pour	4	04-Dec-19 A	07-Dec-19 A
CON-12582	Construction of Pier 2F, type 6 (4 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 6) -2nd Pour	11	09-Dec-19	20-Dec-19
CON-12622	Construction of Pier 2H, type 1 (4 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 7)-2nd Pour	8	09-Dec-19	17-Dec-19

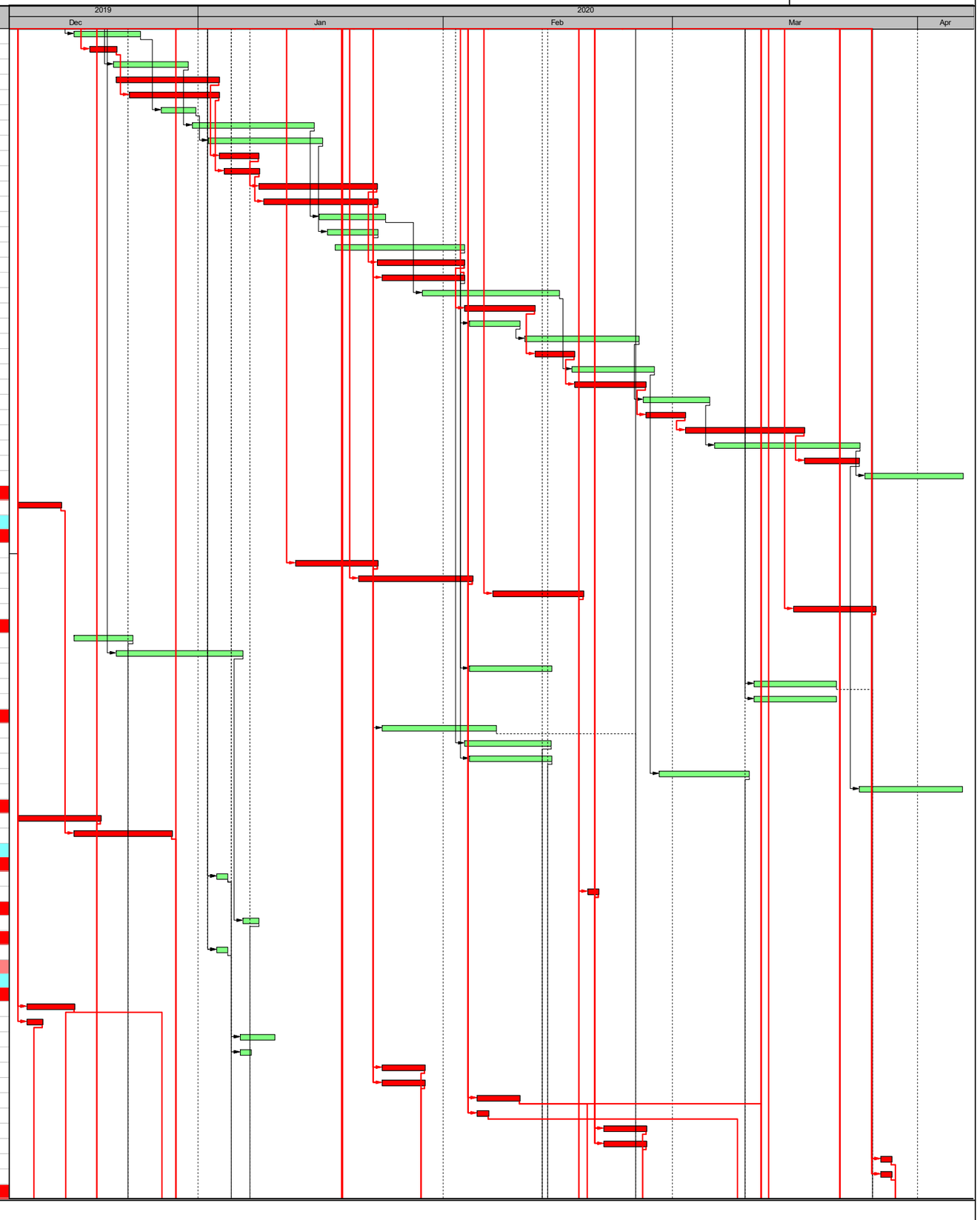


Works Critical Works Actual

NE/2017/01 Tseung Kwan O - Lam Tin Tunnel- Tseung Kwan O Interchange and Associated Works

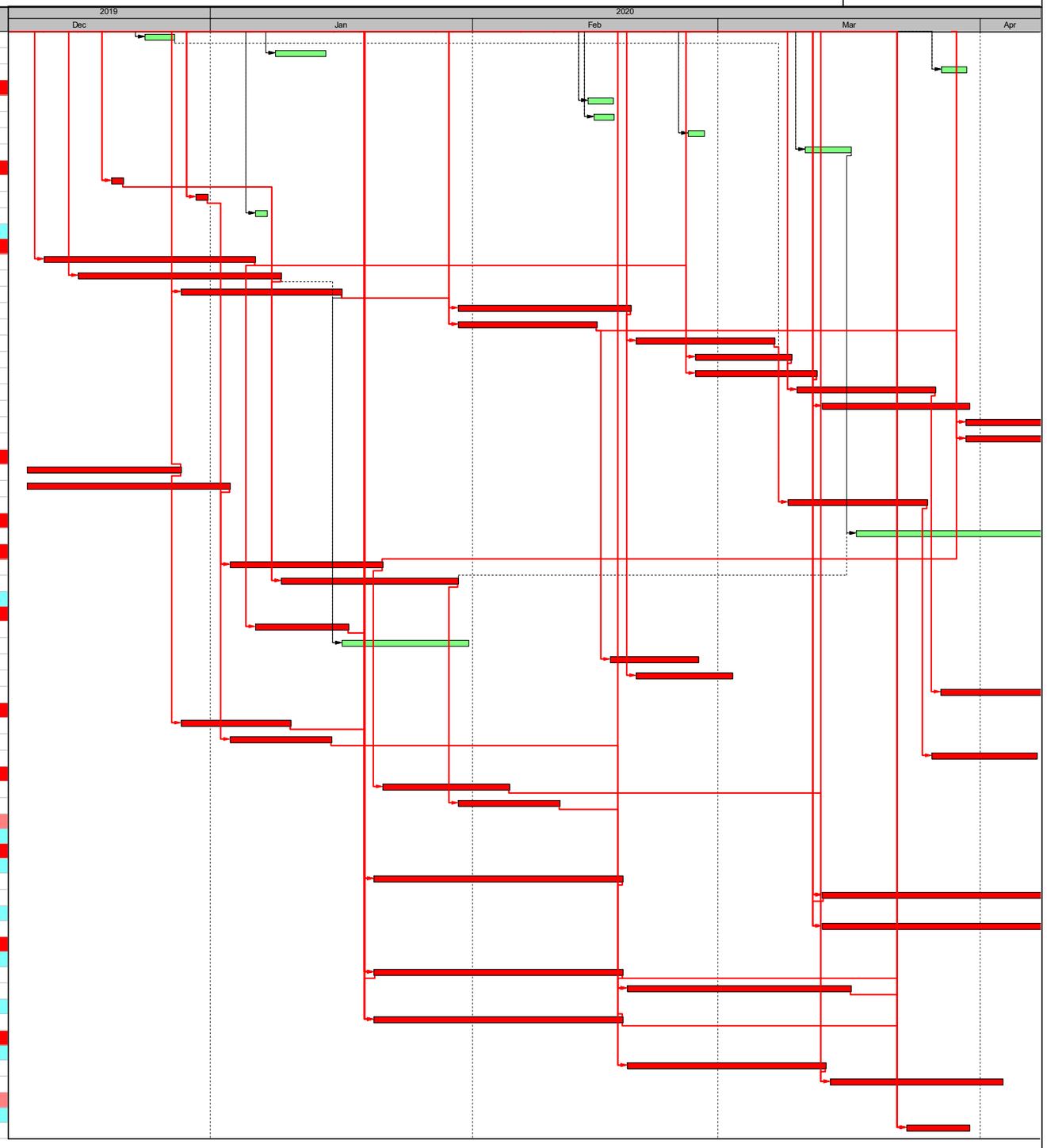
Rolling programme (Dec 2019 to Mar 2020)

Activity ID	Activity Name	Original Duration	Start	Finish
CON-12604	Construction of Pier 2E, type 1 (4 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 4)- 3rd Pour	8	16-Dec-19	24-Dec-19
CON-12623	Construction of Pier 2H, type 1 (4 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 7)-2nd Pour	4	18-Dec-19	21-Dec-19
CON-12583	Construction of Pier 2F, type 6 (4 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 6) -2nd Pour	6	21-Dec-19	30-Dec-19
CON-12594	Construction of Pier 2G, type 1 (4 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 3) -3rd Pour	8	21-Dec-19	03-Jan-20
CON-12624	Construction of Pier 2H, type 1 (4 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 7)- 3rd Pour	8	23-Dec-19	03-Jan-20
CON-12605	Construction of Pier 2E, type 1 (4 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 4)- 3rd Pour	4	27-Dec-19	31-Dec-19
CON-12584	Construction of Pier 2F, type 6 (4 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 6)-3rd Pour	13	31-Dec-19	15-Jan-20
CON-12606	Construction of Pier 2E, type 1 (4 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 4)- 4th Pour	13	02-Jan-20	16-Jan-20
CON-12595	Construction of Pier 2G, type 1 (4 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 3) -3rd Pour	4	03-Jan-20	08-Jan-20
CON-12625	Construction of Pier 2H, type 1 (4 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 7)- 3rd Pour	4	04-Jan-20	08-Jan-20
CON-12596	Construction of Pier 2G, type 1 (4 Pours) Including Erection of Formwork & Temp. Work (1 nos.Pier /Team 3) -4th Pour	13	08-Jan-20	23-Jan-20
CON-12626	Construction of Pier 2H, type 1 (4 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 7)- 4th Pour	13	09-Jan-20	23-Jan-20
CON-12585	Construction of Pier 2F, type 6 (4 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 6)-3rd Pour	8	16-Jan-20	24-Jan-20
CON-12607	Construction of Pier 2E, type 1 (4 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 4)- 4th Pour	6	17-Jan-20	23-Jan-20
CON-12612	Construction of Pier 2J, type 6 (4 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 6)- 2nd Pour	11	18-Jan-20	03-Feb-20
CON-12597	Construction of Pier 2G, type 1 (4 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 3) -4th Pour	6	23-Jan-20	03-Feb-20
CON-12627	Construction of Pier 2H, type 1 (4 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 7)- 4th Pour	6	24-Jan-20	03-Feb-20
CON-12586	Construction of Pier 2F, type 6 (4 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 6)-4th Pour	16	29-Jan-20	15-Feb-20
CON-12630	Construction of Pier 2D, type 1 (3 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 3) -1st Pour	8	03-Feb-20	12-Feb-20
CON-12613	Construction of Pier 2J, type 6 (4 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 6)-2rd pour	6	04-Feb-20	10-Feb-20
CON-12614	Construction of Pier 2J, type 6 (4 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 6)- 3rd Pour	13	11-Feb-20	25-Feb-20
CON-12631	Construction of Pier 2D, type 1 (3 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 3) -1st Pour	4	12-Feb-20	17-Feb-20
CON-12587	Construction of Pier 2F, type 6 (4 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 6)- 4th Pour	10	17-Feb-20	27-Feb-20
CON-12632	Construction of Pier 2D, type 1 (3 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 3)-2nd Pour	8	17-Feb-20	26-Feb-20
CON-12615	Construction of Pier 2J, type 6 (4 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 6) - 3rd Pour	8	26-Feb-20	05-Mar-20
CON-12633	Construction of Pier 2D, type 1 (3 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 3)-2nd Pour	4	26-Feb-20	02-Mar-20
CON-12634	Construction of Pier 2D, type 1 (3 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 3)-3rd Pour	13	02-Mar-20	17-Mar-20
CON-12616	Construction of Pier 2J, type 6 (4 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 6)- 4th Pour	16	06-Mar-20	24-Mar-20
CON-12635	Construction of Pier 2D, type 1 (3 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 3)-3rd Pour	6	17-Mar-20	24-Mar-20
CON-12617	Construction of Pier 2J, type 6 (4 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 6) - 4th Pour	10	25-Mar-20	06-Apr-20
Bridge S100		6	09-Dec-19	14-Dec-19
CON-12673	Construction of Pier 3C, type 1 (2 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 4) - 2nd Pour	6	09-Dec-19	14-Dec-19
Concrete Curing and Removal of Temp. Work		103	06-Nov-19 A	06-Apr-20
Bridge ML		88	27-Nov-19 A	26-Mar-20
CON-12720	Concrete Curing and Removal Temp. Work of Pier 1E	10	27-Nov-19 A	07-Dec-19 A
CON-12730	Concrete Curing and Removal Temp. Work of Pier 1H	10	13-Jan-20	23-Jan-20
CON-12710	Concrete Curing and Removal Temp. Work of Pier 1F	10	21-Jan-20	04-Feb-20
CON-12700	Concrete Curing and Removal Temp. Work of Pier 1G	10	07-Feb-20	18-Feb-20
CON-12740	Concrete Curing and Removal Temp. Work of Pier 1J	10	16-Mar-20	26-Mar-20
Bridge S300		91	06-Nov-19 A	21-Mar-20
CON-12780	Concrete Curing and Removal Temp. Work of Pier 4C	10	06-Nov-19 A	23-Dec-19
CON-12760	Concrete Curing and Removal Temp. Work of Pier 4A	10	21-Dec-19	06-Jan-20
CON-12800	Concrete Curing and Removal Temp. Work of Pier 4B	10	04-Feb-20	14-Feb-20
CON-12830	Concrete Curing and Removal Temp. Work of Pier 4F	10	11-Mar-20	21-Mar-20
CON-12820	Concrete Curing and Removal Temp. Work of Pier 4G	10	11-Mar-20	21-Mar-20
Bridge S200		59	24-Jan-20	06-Apr-20
CON-12860	Concrete Curing and Removal Temp. Work of Pier 2E	10	24-Jan-20	07-Feb-20
CON-12870	Concrete Curing and Removal Temp. Work of Pier 2G	10	03-Feb-20	14-Feb-20
CON-12890	Concrete Curing and Removal Temp. Work of Pier 2H	10	04-Feb-20	14-Feb-20
CON-12880	Concrete Curing and Removal Temp. Work of Pier 2F	10	28-Feb-20	10-Mar-20
CON-12900	Concrete Curing and Removal Temp. Work of Pier 2D	10	24-Mar-20	06-Apr-20
Bridge S100		16	09-Dec-19	28-Dec-19
CON-12940	Concrete Curing and Removal Temp. Work of Pier 3B	10	09-Dec-19	19-Dec-19
CON-12950	Concrete Curing and Removal Temp. Work of Pier 3C	10	16-Dec-19	28-Dec-19
Bearing Installation		39	03-Jan-20	20-Feb-20
Bridge ML		39	03-Jan-20	20-Feb-20
CON-13030	Bearing Installation Pier 1DN & 1DS (Portion II)	2	03-Jan-20	04-Jan-20
CON-12980	Bearing Installation Pier 1GN & GS	2	19-Feb-20	20-Feb-20
Bridge S300		2	06-Jan-20	08-Jan-20
CON-13050	Bearing Installation Pier 4A	2	06-Jan-20	08-Jan-20
Bridge S100		2	03-Jan-20	04-Jan-20
CON-13250	Bearing Installation Pier 3A (Portion II)	2	03-Jan-20	04-Jan-20
Construction of Pier Head Segment Diaphragm		115	02-Dec-19 A	24-Apr-20
Installation of Pier Head Segment & Temporary Works		89	10-Dec-19	30-Mar-20
Bridge ML		89	10-Dec-19	28-Mar-20
CON-13370	Installation Pier Head Segment 1ES (2 no. Pier Head Segment)	5	10-Dec-19	16-Dec-19
CON-13380	Installation Pier Head Segment 1EN(1 no. Pier Head Segment)	2	10-Dec-19	12-Dec-19
CON-13410	Installation Pier Head Segment 1DS (2 no. Pier Head Segment)	5	06-Jan-20	10-Jan-20
CON-13420	Installation Pier Head Segment 1DN (1 no. Pier Head Segment)	2	06-Jan-20	07-Jan-20
CON-13350	Installation Pier Head Segment 1HS (1 no. Pier Head Segment)	2	24-Jan-20	29-Jan-20
CON-13360	Installation Pier Head Segment 1HN (1 no. Pier Head Segment)	2	24-Jan-20	29-Jan-20
CON-13330	Installation Pier Head Segment 1FS (2 no. Pier Head Segment)	5	05-Feb-20	10-Feb-20
CON-13340	Installation Pier Head Segment 1FN (1 no. Pier Head Segment)	2	05-Feb-20	06-Feb-20
CON-13310	Installation Pier Head Segment 1GS (2 no. Pier Head Segment)	5	21-Feb-20	26-Feb-20
CON-13320	Installation Pier Head Segment 1GN (2 nos Pier Head Segment)	5	21-Feb-20	26-Feb-20
CON-13390	Installation Pier Head Segment 1JS(1 no. Pier Head Segment)	2	27-Mar-20	28-Mar-20
CON-13400	Installation Pier Head Segment 1JN (1 no. Pier Head Segment)	2	27-Mar-20	28-Mar-20
Bridge S300		77	24-Dec-19	30-Mar-20



Works Critical Works Actual

Activity ID	Activity Name	Original Duration	Start	Finish
CON-13480	Installation Pier Head Segment 4C (1 no. Pier Head Segment)	2	24-Dec-19	27-Dec-19
CON-13450	Installation Pier Head Segment 4A (2 no. Pier Head Segment)	5	08-Jan-20	14-Jan-20
CON-13520	Installation Pier Head Segment 4F (1 no. Pier Head Segment)	2	27-Mar-20	30-Mar-20
Bridge S200		26	14-Feb-20	16-Mar-20
CON-13570	Installation Pier Head Segment 2G (1 no. Pier Head Segment)	2	14-Feb-20	17-Feb-20
CON-13590	Installation Pier Head Segment 2H (1 no. Pier Head Segment)	2	15-Feb-20	17-Feb-20
CON-13580	Installation Pier Head Segment 2E (1 no. Pier Head Segment)	2	26-Feb-20	28-Feb-20
CON-13560	Installation Pier Head Segment 2F (2 no. Pier Head Segment)	5	11-Mar-20	16-Mar-20
Bridge S100		13	20-Dec-19	07-Jan-20
CON-13660	Installation Pier Head Segment 3B (1 no. Pier Head Segment)	2	20-Dec-19	21-Dec-19
CON-13670	Installation Pier Head Segment 3C (1 no. Pier Head Segment)	2	30-Dec-19	31-Dec-19
CON-13650	Installation Pier Head Segment 3A (1 no. Pier Head Segment)	2	06-Jan-20	07-Jan-20
Construction Cast-in-situ Diaphragm		115	02-Dec-19 A	24-Apr-20
Bridge ML		102	12-Dec-19	20-Apr-20
CON-13730	Rebar, Formwork/Falsework & Concreting for Pier Head Segment Diaphragm 1EN (1 no. Pier Head Segment/ Team 3)	18	12-Dec-19	06-Jan-20
CON-13741	Rebar, Formwork/Falsework & Concreting for Pier Head Segment Diaphragm 1ES-2 (1 no. Pier Head Segment/ Team 4)	18	16-Dec-19	09-Jan-20
CON-13740	Rebar, Formwork/Falsework & Concreting for Pier Head Segment Diaphragm 1ES-1 (1 no. Pier Head Segment/ Team 1)	15	28-Dec-19	16-Jan-20
CON-13800	Rebar, Formwork/Falsework & Concreting for Pier Head Segment Diaphragm 1HS (1 no. Pier Head Segment/ Team 6)	18	30-Jan-20	19-Feb-20
CON-13790	Rebar, Formwork/Falsework & Concreting for Pier Head Segment Diaphragm 1HN (1 no. Pier Head Segment/ Team 1)	15	30-Jan-20	15-Feb-20
CON-13761	Rebar, Formwork/Falsework & Concreting for Pier Head Segment Diaphragm 1FS- 2 (1 no. Pier Head Segment/ Team 6)	15	20-Feb-20	07-Mar-20
CON-13780	Alignment and Miscellaneous Work Pier Head Segment Diaphragm 1GS (Precast Diaphragm) (2 no. Pier Head Segment/ Team 3)	10	27-Feb-20	09-Mar-20
CON-13770	Alignment and Miscellaneous Work Pier Head Segment Diaphragm 1GN (Precast Diaphragm) (2 nos. Pier Head Segment/ Team 2	13	27-Feb-20	12-Mar-20
CON-13750	Rebar, Formwork/Falsework & Concreting for Pier Head Segment Diaphragm 1FN (1 no. Pier Head Segment/ Team 3)	15	10-Mar-20	26-Mar-20
CON-13760	Rebar, Formwork/Falsework & Concreting for Pier Head Segment Diaphragm 1FS - 1 (1 no. Pier Head Segment/ Team 2)	15	13-Mar-20	30-Mar-20
CON-13820	Rebar, Formwork/Falsework & Concreting for Pier Head Segment Diaphragm 1JS (1 no. Pier Head Segment/ Team 5)	15	30-Mar-20	20-Apr-20
CON-13810	Rebar, Formwork/Falsework & Concreting for Pier Head Segment Diaphragm 1JN (1 no. Pier Head Segment/ Team 1)	15	30-Mar-20	20-Apr-20
Bridge S300		93	02-Dec-19 A	25-Mar-20
CON-13890	Rebar, Formwork/Falsework & Concreting for Pier Head Segment Diaphragm 4E (1 no. Pier Head Segment/ Team 1)	18	02-Dec-19 A	28-Dec-19
CON-13880	Rebar, Formwork/Falsework & Concreting for Pier Head Segment Diaphragm 4D (1 no. Pier Head Segment/ Team 5)	18	10-Dec-19	03-Jan-20
CON-13870	Rebar, Formwork/Falsework & Concreting for Pier Head Segment Diaphragm 4C (1 no. Pier Head Segment/ Team 6)	15	09-Mar-20	25-Mar-20
Bridge S200		30	17-Mar-20	24-Apr-20
CON-14010	Rebar, Formwork/Falsework & Concreting for Pier Head Segment Diaphragm 2F (2 no. Pier Head Segment/ Team 4)	30	17-Mar-20	24-Apr-20
Bridge S100		20	03-Jan-20	30-Jan-20
CON-14070	Rebar, Formwork/Falsework & Concreting for Pier Head Segment Diaphragm 3C (1 no. Pier Head Segment/ Team 5)	15	03-Jan-20	21-Jan-20
CON-14060	Rebar, Formwork/Falsework & Concreting for Pier Head Segment Diaphragm 3B (1 no. Pier Head Segment/ Team 4)	15	09-Jan-20	30-Jan-20
Concrete Curing and Formwork Removal		83	28-Dec-19	08-Apr-20
Bridge ML		77	06-Jan-20	08-Apr-20
CON-14170	Concrete Curing & Formwork Removal for Pier Head Segment Diaphragm 1EN (1 no.)	10	06-Jan-20	17-Jan-20
CON-14190	Concrete Curing & Formwork Removal for Pier Head Segment Diaphragm 1ES (2 nos.)	10	16-Jan-20	31-Jan-20
CON-14160	Concrete Curing & Formwork Removal for Pier Head Segment Diaphragm 1HN (1 no.)	10	17-Feb-20	27-Feb-20
CON-14150	Concrete Curing & Formwork Removal for Pier Head Segment Diaphragm 1HS (1 no.)	10	20-Feb-20	02-Mar-20
CON-14110	Concrete Curing & Formwork Removal for Pier Head Segment Diaphragm 1FN (1 no.)	10	27-Mar-20	08-Apr-20
Bridge S300		82	28-Dec-19	07-Apr-20
CON-14260	Concrete Curing & Formwork Removal for Pier Head Segment Diaphragm 4E (1 no.)	10	28-Dec-19	10-Jan-20
CON-14290	Concrete Curing & Formwork Removal for Pier Head Segment Diaphragm 4D (1 no.)	10	03-Jan-20	15-Jan-20
CON-14270	Concrete Curing & Formwork Removal for Pier Head Segment Diaphragm 4C (1 no.)	10	26-Mar-20	07-Apr-20
Bridge S100		15	21-Jan-20	11-Feb-20
CON-14470	Concrete Curing & Formwork Removal for Pier Head Segment Diaphragm 3C (1 no.)	10	21-Jan-20	05-Feb-20
CON-14460	Concrete Curing & Formwork Removal for Pier Head Segment Diaphragm 3B (1 no.)	10	30-Jan-20	11-Feb-20
Span Segment Erection		65	20-Jan-20	08-Apr-20
Span Segment Erection (Including Plant Mobilisation, Erection & removal of Temp. Work)		65	20-Jan-20	08-Apr-20
Bridge ML		65	20-Jan-20	08-Apr-20
Span Segment ML-2N		65	20-Jan-20	08-Apr-20
CON-14530	[LF1-1] Erection of Span Segment@Bridge ML- 2N - Span 1E-N (14 nos./ 7 Pairs - LF)	23	20-Jan-20	18-Feb-20
CON-14520	[HB1-1a] Erection of Span Segment@Bridge ML- 2N - Span 1G-N (7 nos. - HB 1)	22	13-Mar-20	08-Apr-20
Span Segment ML-3N		22	13-Mar-20	08-Apr-20
CON-14620	[HB1-1b] Erection of Span Segment@Bridge ML- 3N- Span 1G-N (7 nos. - HB 1)	22	13-Mar-20	08-Apr-20
Bridge S300		46	20-Jan-20	16-Mar-20
Span Segment S300-1		46	20-Jan-20	16-Mar-20
CON-14700	[HB2-1a] Erection of Span Segment@Bridge S300-1 - Span 4E (6nos. - HB 2)	23	20-Jan-20	18-Feb-20
CON-14720	[HB2-2] Erection of Span Segment@Bridge S300-1 - Span 4D (14 nos./ 7 Pairs- HB2)	23	19-Feb-20	16-Mar-20
Span Segment S300-2		23	20-Jan-20	18-Feb-20
CON-14750	[HB2-1b] Erection of Span Segment@Bridge S300-2- Span 4E (6 nos - HB 2)	23	20-Jan-20	18-Feb-20
Bridge S100		39	19-Feb-20	03-Apr-20
Span Segment S100		39	19-Feb-20	03-Apr-20
CON-14930	[LF1-2] Erection of Span Segment@Bridge S100 - Span 3B (12 nos./ D-7 nos, U - 5 nos.- LF)	21	19-Feb-20	13-Mar-20
CON-14940	[LF1-3] Erection of Span Segment@Bridge S100 - Span 3C (10 nos./ 5 Pairs- LF)	18	14-Mar-20	03-Apr-20
Key Segment Erection (Including Plant Setting of Segment Erector, Segment Erection and Stitch Joint)		7	23-Mar-20	30-Mar-20
Bridge S300		7	23-Mar-20	30-Mar-20
CON-15130	Erect Key Segment,Stitching & Mid -Span Stressing @S300 4D - 4E (1 no.- Key Segment)	7	23-Mar-20	30-Mar-20



Works Critical Works Actual

APPENDIX R
RECORD OF LANDFILL GAS MONITORING BY CONTRACTOR

APPENDIX R - RECORD OF LANDFILL GAS MONITORING BY THE CONTRACTOR

Location	Date of Measurement	Sampling time	Weather Condition	Temperature (°C)	Methane (%)	Carbon dioxide (%)	Oxygen (%)
Portion III	2-Dec-19	8:28	Sunny	17	0	0	20.9
	2-Dec-19	13:21	Sunny	17	0	0	20.9
	2-Dec-19	13:39	Sunny	17	0	0	20.9
	2-Dec-19	13:51	Sunny	17	0	0	20.9
	2-Dec-19	14:15	Sunny	17	0	0	20.9
	3-Dec-19	9:12	Sunny	16	0	0	20.9
	3-Dec-19	13:45	Sunny	16	0	0	20.9
	3-Dec-19	13:59	Sunny	16	0	0	20.9
	3-Dec-19	14:14	Sunny	16	0	0	20.9
	3-Dec-19	14:32	Sunny	16	0	0	20.9
	4-Dec-19	8:10	Sunny	18	0	0	20.9
	4-Dec-19	13:21	Sunny	18	0	0	20.9
	4-Dec-19	13:42	Sunny	18	0	0	20.9
	4-Dec-19	14:08	Sunny	18	0	0	20.9
	4-Dec-19	14:25	Sunny	18	0	0	20.9
	5-Dec-19	8:21	Cloudy	15	0	0	20.9
	5-Dec-19	13:18	Cloudy	15	0	0	20.9
	5-Dec-19	13:28	Cloudy	15	0	0	20.9
	5-Dec-19	14:02	Cloudy	15	0	0	20.9
	5-Dec-19	14:25	Cloudy	15	0	0	20.9
	6-Dec-19	8:30	Sunny	17	0	0	20.9
	6-Dec-19	13:18	Sunny	17	0	0	20.9
	6-Dec-19	13:29	Sunny	17	0	0	20.9
	6-Dec-19	13:48	Sunny	17	0	0	20.9
	6-Dec-19	14:03	Sunny	17	0	0	20.9
	7-Dec-19	8:09	Sunny	16	0	0	20.9
	7-Dec-19	13:15	Sunny	16	0	0	20.9
	7-Dec-19	13:28	Sunny	16	0	0	20.9
	7-Dec-19	13:42	Sunny	16	0	0	20.9
	7-Dec-19	14:03	Sunny	16	0	0	20.9
	9-Dec-19	8:18	Sunny	17	0	0	20.9
	9-Dec-19	13:28	Sunny	17	0	0	20.9
	9-Dec-19	13:43	Sunny	17	0	0	20.9
	9-Dec-19	13:59	Sunny	17	0	0	20.9
	9-Dec-19	14:12	Sunny	17	0	0	20.9
	10-Dec-19	8:24	Sunny	18	0	0	20.9
	10-Dec-19	13:15	Sunny	18	0	0	20.9
	10-Dec-19	13:32	Sunny	18	0	0	20.9
	10-Dec-19	13:54	Sunny	18	0	0	20.9
	10-Dec-19	14:13	Sunny	18	0	0	20.9

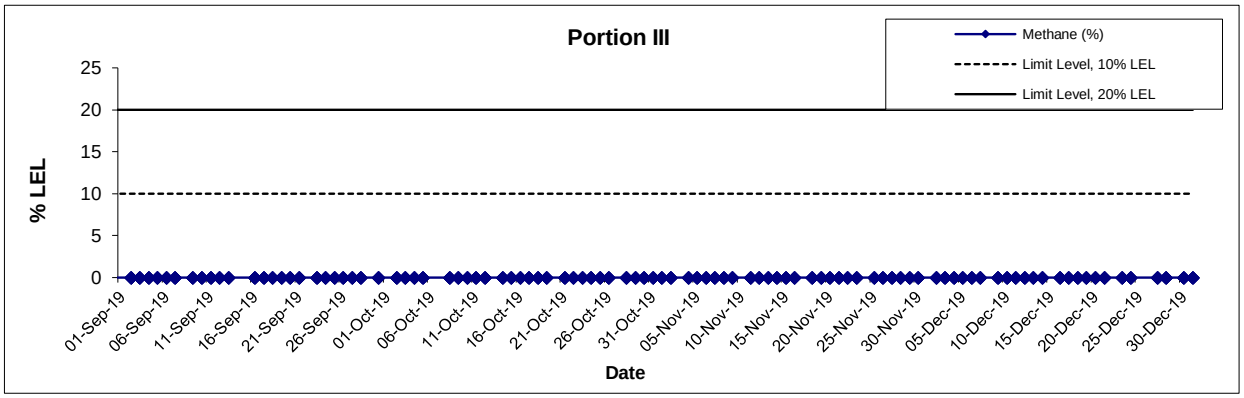
APPENDIX R - RECORD OF LANDFILL GAS MONITORING BY THE CONTRACTOR

Location	Date of Measurement	Sampling time	Weather Condition	Temperature (°C)	Methane (%)	Carbon dioxide (%)	Oxygen (%)
Portion III	11-Dec-19	8:24	Sunny	19	0	0	20.9
	11-Dec-19	13:12	Sunny	19	0	0	20.9
	11-Dec-19	13:23	Sunny	19	0	0	20.9
	11-Dec-19	13:39	Sunny	19	0	0	20.9
	11-Dec-19	13:48	Sunny	19	0	0	20.9
	12-Dec-19	8:32	Sunny	19	0	0	20.9
	12-Dec-19	13:52	Sunny	19	0	0	20.9
	12-Dec-19	14:08	Sunny	19	0	0	20.9
	12-Dec-19	14:19	Sunny	19	0	0	20.9
	12-Dec-19	14:38	Sunny	19	0	0	20.9
	13-Dec-19	8:32	Sunny	19	0	0	20.9
	13-Dec-19	13:08	Sunny	19	0	0	20.9
	13-Dec-19	13:18	Sunny	19	0	0	20.9
	13-Dec-19	13:32	Sunny	19	0	0	20.9
	13-Dec-19	13:51	Sunny	19	0	0	20.9
	14-Dec-19	9:05	Sunny	20	0	0	20.9
	14-Dec-19	13:18	Sunny	20	0	0	20.9
	14-Dec-19	13:32	Sunny	20	0	0	20.9
	14-Dec-19	13:48	Sunny	20	0	0	20.9
	14-Dec-19	14:06	Sunny	20	0	0	20.9
	16-Dec-19	8:32	Sunny	20	0	0	20.9
	16-Dec-19	13:21	Sunny	20	0	0	20.9
	16-Dec-19	13:48	Sunny	20	0	0	20.9
	16-Dec-19	14:08	Sunny	20	0	0	20.9
	16-Dec-19	14:22	Sunny	20	0	0	20.9
	17-Dec-19	8:16	Sunny	23	0	0	20.9
	17-Dec-19	13:21	Sunny	23	0	0	20.9
	17-Dec-19	13:38	Sunny	23	0	0	20.9
	17-Dec-19	13:56	Sunny	23	0	0	20.9
	17-Dec-19	14:13	Sunny	23	0	0	20.9
	18-Dec-19	8:21	Sunny	23	0	0	20.9
	18-Dec-19	13:18	Sunny	23	0	0	20.9
	18-Dec-19	13:29	Sunny	23	0	0	20.9
	18-Dec-19	13:41	Sunny	23	0	0	20.9
	18-Dec-19	13:59	Sunny	23	0	0	20.9
	19-Dec-19	8:32	Sunny	20	0	0	20.9
	19-Dec-19	13:18	Sunny	20	0	0	20.9
	19-Dec-19	13:29	Sunny	20	0	0	20.9
	19-Dec-19	13:57	Sunny	20	0	0	20.9
	19-Dec-19	14:15	Sunny	20	0	0	20.9

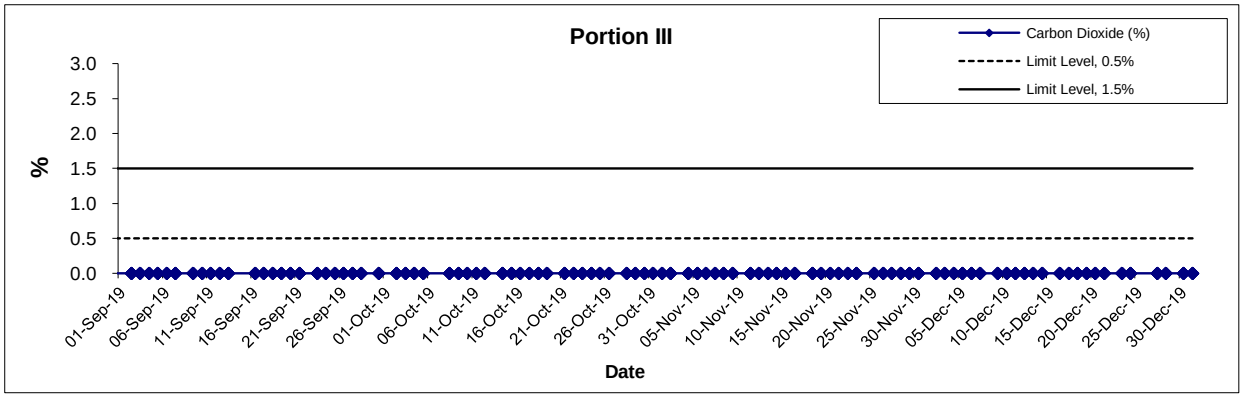
APPENDIX R - RECORD OF LANDFILL GAS MONITORING BY THE CONTRACTOR

Location	Date of Measurement	Sampling time	Weather Condition	Temperature (°C)	Methane (%)	Carbon dioxide (%)	Oxygen (%)
Portion III	20-Dec-19	8:27	Sunny	19	0	0	20.9
	20-Dec-19	13:19	Sunny	19	0	0	20.9
	20-Dec-19	13:27	Sunny	19	0	0	20.9
	20-Dec-19	13:39	Sunny	19	0	0	20.9
	20-Dec-19	13:58	Sunny	19	0	0	20.9
	21-Dec-19	8:41	Sunny	19	0	0	20.9
	21-Dec-19	13:37	Sunny	19	0	0	20.9
	21-Dec-19	13:53	Sunny	19	0	0	20.9
	21-Dec-19	14:09	Sunny	19	0	0	20.9
	21-Dec-19	14:18	Sunny	19	0	0	20.9
	23-Dec-19	8:22	Sunny	20	0	0	20.9
	23-Dec-19	13:42	Sunny	20	0	0	20.9
	23-Dec-19	14:01	Sunny	20	0	0	20.9
	23-Dec-19	14:18	Sunny	20	0	0	20.9
	23-Dec-19	14:39	Sunny	20	0	0	20.9
	24-Dec-19	8:23	Sunny	20	0	0	20.9
	24-Dec-19	13:12	Sunny	20	0	0	20.9
	24-Dec-19	13:28	Sunny	20	0	0	20.9
	24-Dec-19	13:41	Sunny	20	0	0	20.9
	24-Dec-19	14:02	Sunny	20	0	0	20.9
	27-Dec-19	8:19	Sunny	18	0	0	20.9
	27-Dec-19	13:18	Sunny	18	0	0	20.9
	27-Dec-19	13:31	Sunny	18	0	0	20.9
	27-Dec-19	13:49	Sunny	18	0	0	20.9
	27-Dec-19	14:03	Sunny	18	0	0	20.9
	28-Dec-19	8:28	Sunny	19	0	0	20.9
	28-Dec-19	13:17	Sunny	19	0	0	20.9
	28-Dec-19	13:29	Sunny	19	0	0	20.9
	28-Dec-19	13:42	Sunny	19	0	0	20.9
	28-Dec-19	13:59	Sunny	19	0	0	20.9
	30-Dec-19	8:32	Sunny	20	0	0	20.9
	30-Dec-19	13:17	Sunny	20	0	0	20.9
	30-Dec-19	13:29	Sunny	20	0	0	20.9
	30-Dec-19	13:47	Sunny	20	0	0	20.9
	30-Dec-19	14:05	Sunny	20	0	0	20.9
	31-Dec-19	8:51	Sunny	19	0	0	20.9
	31-Dec-19	13:10	Sunny	19	0	0	20.9
	31-Dec-19	13:22	Sunny	19	0	0	20.9
	31-Dec-19	13:37	Sunny	19	0	0	20.9
	31-Dec-19	13:58	Sunny	19	0	0	20.9

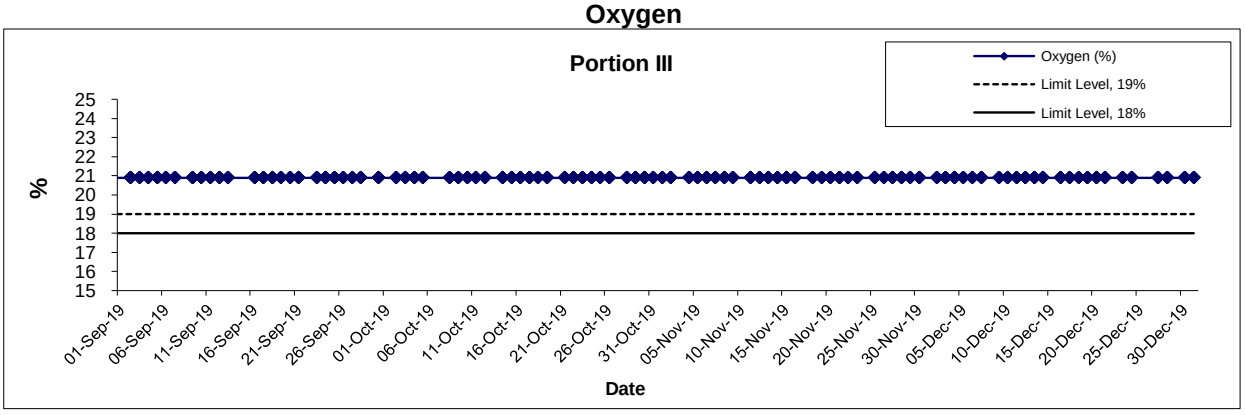
Methane



Carbon Dioxide



Oxygen



Agreement No. CE 59/2015 (EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel – Design and Construction	Scale N.T.S	Project No. MA16034	CINOTECH
	Date Dec-19	Appendix R	

APPENDIX S
UPDATED CONSTRUCTION NOISE ASSESSMENT

CRBC - Build King Joint Venture

Construction Noise Assessment

Period: 0700 to 1900 (except general holidays)

Noise Sensitive Receiver: CM6(0-39m)

Noise Criteria: 75dB(A)

Mitigation Measures Scenario

Portion	Activity	PME	TM Ref. / other Ref.	No. of plants	SWL	Total SWL	On-time, %	Time Factor	Distance from Notional Sources, m	Distance Attenuation*, dB(A)	Barrier Correction, dB(A)	Façade Correction, dB(A)	Predicted Noise Level, dB(A)	Total Predicted Noise Level for each group, dB(A)
VI	Road P2 U-Trough B CH318-363 (Removal of Existing Abandoned Box Culvert)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	162	-52.22	0	3	50.77	
		Piling, large diameter bored, oscillator	CNP 165	1	115	115	30	-5	162	-52.22	0	3	62.77	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	162	-52.22	0	3	52.77	
		Water pump, subersible (electric)	CNP 283	2	85	88	50	-3	162	-52.22	0	3	35.78	63.44
VI	Road P2 U-Trough B CH318-363 (Installation of Dewatering System)	Air Compressor	CNP 002	3	102	107	50	-3	162	-52.22	0	3	54.54	
		Drill Rig, Rotary Type (Diesel)	CNP 072	3	110	115	50	-3	162	-52.22	-5	3	57.54	59.31
VI	Road P2 U-Trough B CH318-363 (Preboring) (Scenario 1)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	162	-52.22	0	3	50.77	
		Drill Rig, Rotary Type (Diesel)	CNP 072	1	110	110	50	-3	162	-52.22	0	3	57.77	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	162	-52.22	0	3	47.77	
		Air Compressor	CNP 002	2	102	105	50	-3	162	-52.22	0	3	52.78	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	162	-52.22	0	3	52.77	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	162	-52.22	0	3	43.77	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	162	-52.22	0	3	38.79	
		Welding Machine	CNP 107	4	99	105	50	-3	162	-52.22	0	3	52.79	61.4
VI	Road P2 U-Trough B CH318-363 (Preboring) (Scenario 2)	Crane (240 kw) (105T)	BS C4/52	2	103	106	50	-3	162	-52.22	0	3	53.78	
		Drill Rig, Rotary Type (Diesel)	CNP 072	2	110	113	50	-3	162	-52.22	0	3	53.57	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	162	-52.22	0	3	47.77	
		Air Compressor	CNP 002	4	102	108	50	-3	162	-52.22	0	3	53.58	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	162	-52.22	0	3	52.77	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	162	-52.22	0	3	43.77	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	162	-52.22	0	3	38.79	
		Welding Machine	CNP 107	4	99	105	50	-3	162	-52.22	0	3	52.79	60.66
VI	Road P2 U-Trough B CH318-363 (Sheet Piling)	Piling, Vibration Hammer	CNP 172	1	115	115	50	-3	162	-52.22	-5	3	57.77	
		Power pack (diesel)	CNP 174	1	100	100	50	-3	162	-52.22	-5	3	42.77	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	162	-52.22	0	3	38.79	
		Welding Machine	CNP 107	4	99	105	50	-3	162	-52.22	0	3	52.79	59.12
VI	Road P2 U-Trough B CH318-363 (ELS)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	162	-52.22	0	3	50.77	
		Excavator (223 kw) (40T)	BS C4/63	2	105	108	50	-3	162	-52.22	0	3	55.78	
		Dump Truck	CNP 068	1	105	105	50	-3	162	-52.22	0	3	52.77	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	162	-52.22	0	3	38.79	
		Welding Machine	CNP 107	4	99	105	50	-3	162	-52.22	0	3	52.79	59.47
VI	Road P2 U-Trough B CH318-363 (Structure)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	162	-52.22	0	3	50.77	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	162	-52.22	0	3	52.77	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	162	-52.22	0	3	50.78	
		Saw, Circular Wood	CNP 201	2	108	111	50	-3	162	-52.22	0	3	58.78	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	162	-52.22	0	3	43.77	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	162	-52.22	0	3	38.79	
		Welding Machine	CNP 107	4	99	105	50	-3	162	-52.22	0	3	52.79	61.48
VI	Road P2 U-Trough B CH318-363 Road and Drainage Works	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	162	-52.22	0	3	50.77	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	162	-52.22	0	3	52.77	
		Roller, Vibratory	BS D8/30	1	101	101	50	-3	162	-52.22	0	3	48.77	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	162	-52.22	0	3	43.77	
		Light goods vehicle, gross vehicle weight < 5.5 tonne	CNP 143	1	101	101	50	-3	162	-52.22	0	3	48.77	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	162	-52.22	0	3	38.79	
		Dump Truck	CNP 068	1	105	105	50	-3	162	-52.22	0	3	52.77	
		Road Roller	CNP 185	1	108	108	50	-3	162	-52.22	0	3	55.77	
		Welding Machine	CNP 107	4	99	105	50	-3	162	-52.22	0	3	52.79	60.96

Note: SPL = SWL + TF + DC + BC + FC, where

SPL = Predicted noise level in dB(A)

SWL = Sound Power Level in dB(A)

TF = Time factor in dB(A) = 10 log (P)

P = On-time percentage

DC = Distance attenuation correction in dB(A) = -(20 log D + 8)

D = Distance in m between the noise source and the receiver

BC = Barrier correction in dB(A)

FC = Façade correction in dB(A) = 3 dB(A)

CRBC - Build King Joint Venture

Construction Noise Assessment

Period: 0700 to 1900 (except general holidays)

Noise Sensitive Receiver: CM6(0-39m)

Mitigation Measures Scenario

Noise Criteria: 75dB(A)

Portion	Activity	PME	TM Ref. / other Ref.	No. of plants	SWL	Total SWL	On-time, %	Time Factor	Distance from Notional Sources, m	Distance Attenuation*, dB(A)	Barrier Correction, dB(A)	Façade Correction, dB(A)	Predicted Noise Level, dB(A)	Total Predicted Noise Level for each group, dB(A)
IV	DN2100 SMH9101 - 9108 (Pre-boring) (Scenario 1) - 3 drill rig	Crane (240 kw) (105T)	BS C4/52	3	103	108	50	-3	47	-41.39	-5	3	61.37	
		Drill Rig, Rotary Type (Diesel)	CNP 072	3	110	115	50	-3	178	-53.03	-11.7	3	59.46	
		Air Compressor	CNP 002	6	102	110	50	-3	47	-41.39	-5	3	61.17	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	47	-41.39	-5	3	49.60	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	47	-41.39	-5	3	44.62	
		Breaker, excavator mounted (hydraulic)	CNP 028	1	122	122	50	-3	47	-41.39	-10	3	70.60	71.81
IV	DN2100 SMH9101 - 9108 (Pre-boring) (Scenario 2) - 1 dill rig	Crane (240 kw) (105T)	BS C4/52	1	103	108	50	-3	47	-41.39	-5	3	56.60	
		Drill Rig, Rotary Type (Diesel)	CNP 072	1	110	115	50	-3	47	-41.39	-11.7	3	54.68	
		Air Compressor	CNP 002	2	102	110	50	-3	47	-41.39	-5	3	56.39	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	47	-41.39	-5	3	49.60	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	47	-41.39	-5	3	44.62	
		Breaker, excavator mounted (hydraulic)	CNP 028	1	122	122	50	-3	47	-41.39	-10	3	63.61	65.57
IV	DN2100 SMH9101 - 9108 (Sheet Piling)	Piling, Vibration Hammer	CNP 172	1	115	115	50	-3	47	-41.39	-5	3	66.38	
		Power pack (diesel)	CNP 174	1	100	100	50	-3	47	-41.39	-5	3	51.38	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	47	-41.39	-5	3	44.62	
		Excavator (223 kw) (40T)	BS C4/63	3	105	110	50	-3	47	-41.39	-5	3	63.37	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	47	-41.39	-5	3	56.61	
		Welding Machine	CNP 107	4	99	105	50	-3	47	-41.39	-5	3	58.62	68.96
IV	DN2100 SMH9101 - 9108 (ELS)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	47	-41.39	-5	3	56.60	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	47	-41.39	-5	3	44.62	
		Excavator (223 kw) (40T)	BS C4/63	3	105	110	50	-3	47	-41.39	-5	3	63.37	
		Dump Truck	CNP 068	2	105	108	50	-3	47	-41.39	-5	3	61.61	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	47	-41.39	-5	3	56.61	
		Welding Machine	CNP 107	4	99	105	50	-3	47	-41.39	-5	3	58.62	67.24
IV	Installation of DN2100 and Manhole Construction (Scenario 1)	Crane (240 kw) (105T)	BS C4/52	3	103	108	50	-3	47	-41.39	-5	3	61.37	
		Excavator (223 kw) (40T)	BS C4/63	3	105	110	50	-3	47	-41.39	-5	3	63.37	
		Dump Truck	CNP 068	2	105	108	50	-3	47	-41.39	-5	3	61.61	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	47	-41.39	-5	3	56.61	66.11
IV	Installation of DN2100 and Manhole Construction (Scenario 2)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	47	-41.39	-5	3	56.60	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	47	-41.39	-5	3	58.60	
		Roller, Vibratory	BS D8/30	1	101	101	50	-3	47	-41.39	-5	3	54.60	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	47	-41.39	-5	3	49.60	
		Light goods vehicle, gross vehicle weight < 5.5 tonne	CNP 143	1	101	101	50	-3	47	-41.39	-5	3	54.60	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	47	-41.39	-5	3	44.62	
		Dump Truck	CNP 068	1	105	105	50	-3	47	-41.39	-5	3	58.60	
		Road Roller	CNP 185	1	108	108	50	-3	47	-41.39	-5	3	61.60	66.08
IV	Road P2 Underpass CH105-318, (Non Surcharge & On Top Surcharge)(Pre Drill) (Scenario 1)	G.I. drilling rig	BS C2/43	2	102	105	50	-3	47	-41.39	-5	3	58.61	
		Drill Rig, Rotary Type (Diesel)	CNP 072	1	110	110	50	-3	47	-41.39	-5	3	63.60	
		Air Compressor	CNP 002	1	102	102	50	-3	47	-41.39	-5	3	55.60	65.29
IV	Road P2 Underpass CH105-318, (Non Surcharge & On Top Surcharge)(Pre Drill) (Scenario 2)	G.I. drilling rig	BS C2/43	4	102	108	50	-3	47	-41.39	-5	3	61.62	
		Drill Rig, Rotary Type (Diesel)	CNP 072	1	110	110	50	-3	47	-41.39	-5	3	63.60	
		Air Compressor	CNP 002	1	102	102	50	-3	47	-41.39	-5	3	55.60	66.14
IV	Road P2 Underpass CH105-318, (Non Surcharge & On Top Surcharge)(Piling) (Scenario 1)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	47	-41.39	-5	3	56.60	
		Drill Rig, Rotary Type (Diesel)	CNP 072	2	110	113	50	-3	47	-41.39	-11.7	3	59.91	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	47	-41.39	-5	3	53.60	
		Air Compressor	CNP 002	4	102	108	50	-3	47	-41.39	-5	3	61.62	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	47	-41.39	-5	3	58.60	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	47	-41.39	-5	3	49.60	
		Water pump, submersible (electric)	CNP 283	4	85	91	50	-3	47	-41.39	-5	3	44.62	65.98
IV	Road P2 Underpass CH105-318, (Non Surcharge & On Top Surcharge)(Piling) (Scenario 2)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	47	-41.39	-5	3	56.60	
		Drill Rig, Rotary Type (Diesel)	CNP 072	3	110	115	50	-3	47	-41.39	-11.7	3	61.67	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	47	-41.39	-5	3	53.60	
		Air Compressor	CNP 002	6	102	110	50	-3	47	-41.39	-5	3	63.38	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	47	-41.39	-5	3	58.60	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	47	-41.39	-5	3	49.60	
		Water pump, submersible (electric)	CNP 283	4	85	91	50	-3	47	-41.39	-5	3	44.62	67.14
IV	Road P2 Underpass CH103.5 (Sheet Piling)	Piling, Vibration Hammer	CNP 172	1	115	115	50	-3	47	-41.39	-5	3	68.60	
		Power pack (diesel)	CNP 174	1	100	100	50	-3	47	-41.39	0	3	58.60	
		Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	47	-41.39	0	3	61.60	69.74
V	Road P2 U-Trough B CH318-363 (Pre-boring) (Scenario 1)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	146	-51.26	0	3	51.73	
		Drill Rig, Rotary Type (Diesel)	CNP 072	1	110	110	50	-3	146	-51.26	-5	3	53.73	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	146	-51.26	0	3	48.73	
		Air Compressor	CNP 002	2	102	105	50	-3	146	-51.26	-5	3	48.74	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	146	-51.26	0	3	53.73	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	146	-51.26	0	3	44.73	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	146	-51.26	0	3	39.75	
		Breaker, excavator mounted (hydraulic)	CNP 028	1	122	122	50	-3	146	-51.26	-10	3	60.73	62.99
V	Road P2 U-Trough B CH318-363 (Pre-boring) (Scenario 2)	Crane (240 kw) (105T)	BS C4/52	2	103	106	50	-3	146	-51.26	0	3	54.74	
		Drill Rig, Rotary Type (Diesel)	CNP 072	2	110	113	50	-3	146	-51.26	-5	3	54.52	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	146	-51.26	0	3	48.73	
		Air Compressor	CNP 002	4	102	108	50	-3	146	-51.26	-5	3	49.53	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	146	-51.26	0	3	53.73	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	146	-51.26	0	3	44.73	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	146	-51.26	0	3	39.75	60.09
V	Road P2 U-Trough B CH318-363 (Sheet Piling)	Piling, Vibration Hammer	CNP 172	1	115	115	50	-3	146	-51.26	-5	3	58.73	
		Power pack (diesel)	CNP 174	1	100	100	50	-3	146	-51.26	-5	3	43.73	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	146	-51.26	0	3	39.75	58.92
V	Road P2 U-Trough B CH318-363 (ELS)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	146	-51.26	0	3	51.73	
		Excavator (223 kw) (40T)	BS C4/63	2	105	108	50	-3	146	-51.26	0	3	56.74	
		Dump Truck	CNP 068	1	105	105	50	-3	146	-51.26	0	3	53.73	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	146	-51.26	0	3	39.75	
		Welding Machine	CNP 107	4	99	105	50	-3	146	-51.26	0	3	53.75	60.43
V	Road P2 U-Trough B CH318-363 (Structure)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	146	-51.26	0	3	51.73	
		Excavator (223 kw) (40T)	BS C4/63	2	105	108	50	-3	146	-51.26	0	3	56.74	
		Dump Truck	CNP 068	1	105	105	50	-3	146	-51.26	0	3	53.73	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	146	-51.26	0	3	51.74	
		Saw, Circular Wood	CNP 201	2	108	111	50	-3	146	-51.26	0	3	59.74	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	146	-51.26	0	3	44.73	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	146	-51.26	0	3	39.75	
														62.90
V	Road P2 U-Trough B CH318-363 Road and Drainage Works	Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	146	-51.26	0	3	53.73	
		Roller, Vibratory	BS D8/30	1	101	101	50	-3	146	-51.26	0	3	49.73	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	146	-51.26	0	3	44.73	
		Light goods vehicle, gross vehicle weight < 5.5 tonne	CNP 143	1	101	101	50	-3	146	-51.26	0	3	49.73	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	146	-51.26	0	3	39.75	
		Dump Truck	CNP 068	1	105	105	50	-3	146	-51.26	0	3	53.73	
		Road Roller	CNP 185	1	108	108	50	-3	146	-51.26	0	3	56.73	60.68
V	Modification of Vertical Seawall	Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	146	-51.26	0	3	53.73	
		Drill Rig, Rotary Type (Diesel)	CNP 072	1	110	101	50	-3	146	-51.26	0	3	58.73	
		Derrick Barge	CNP 061	1	104	96	50	-3	146	-51.26	0	3	52.73	60.68
VII	DN2100 SMH9108-Outfall (Pre-boring)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	119	-49.49	0	3	53.50	
		Drill Rig, Rotary Type (Diesel)	CNP 072	1	110	110	50	-3	119	-49.49	0	3	60.50	
		Air Compressor	CNP 002	2	102	105	50	-3	119	-49.49	0	3	55.51	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	119	-49.49	0	3	55.50	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	119	-49.49	0	3	46.50	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	119	-49.49	0	3	41.52	63.26
VII	DN2100 SMH9108-Outfall (Sheet Piling)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	119	-49.49	0	3	53.50	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	119	-49.49	0	3	50.50	
		Breaker, excavator mounted (hydraulic)	CNP 028	1	122	122	50	-3	119	-49.49	0	3	72.50	
		Piling, Vibration Hammer	CNP 172	1	115	115	50	-3	119	-49.49	0	3	65.50	
		Power pack (diesel)	CNP 174	1	100	100	50	-3	119	-49.49	0	3	50.50	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	119	-49.49	0	3	55.50	
		Dump Truck	CNP 068	1	105	105	50	-3	119	-49.49	0	3	55.50	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	119	-49.49	0	3	41.52	75.53
VII	Installation of DN2100 and Manhole Construction and Outfall Installation	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	119	-49.49	0	3	53.50	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	119	-49.49	0	3	55.50	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	119	-49.49	0	3	46.50	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	119	-49.49	0	3	41.52	
		Road Roller	CNP 185	1	108	108	50	-3	119	-49.49	0	3	58.50	61.29
VII	U Trough A&B S200 CH890 - CH980 (Pre Drill)	G.I. drilling rig	BS C2/43	1	102	102	50	-3	119	-49.49	0	3	52.50	52.50
VII	U Trough A&B S200 CH890 - CH980 (Piling)	Drill Rig, Rotary Type (Diesel)	CNP 072	2	110	113	50	-3	119	-49.49	-5	3	58.51	
		Air Compressor	CNP 002	4	102	108	50	-3	119	-49.49	0	3	58.52	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	119	-49.49	0	3	55.50	62.5
VII	U Trough A&B S200 CH890 - CH980 (Sheet Piling)	Piling, Vibration Hammer	CNP 172	1	115	115	50	-3	119	-49.49	-5	3	60.50	
		Power pack (diesel)	CNP 174	1	100	100	50	-3	119	-49.49	0	3	50.50	
		Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	119	-49.49	0	3	53.50	61.64
IX	Seawall Construction	Dredger	CNP 070	2	103	106	50	-3	225	-55.06	0	3	50.94	
		Derrick Barge	CNP 061	4	104	110	50	-3	225	-55.06	-5	3	49.95	
		Tug boat	CNP 221	1	110	110	50	-3	225	-55.06	0	3	54.93	
		Water pump, subersible (electric)	CNP 283	6	85	93	50	-3	225	-55.06	0	3	37.71	
		Dump Truck	CNP 068	1	105	105	50	-3	225	-55.06	0	3	49.93	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	225	-55.06	0	3	47.94	
		Winch (Electric)	CNP 262	4	95	101	50	-3	225	-55.06	-5	3	40.95	
		Excavator (223 kw) (40T)	BS C4/63	3	105	110	50	-3	225	-55.06	0	3	54.70	
		Vibration Hammer	CNP 172	1	115	115	50	-3	225	-55.06	0	3	59.93	
		Breaker, excavator mounted (hydraulic)	CNP 028	3	122	127	50	-3	225	-55.06	-10	3	61.70	
		Ro-Ro Barge	-	1	-	-	50	-3	225	-55.06	-	3	-	
		Hopper barge	-	6	-	-	50	-3	225	-55.06	0	3	-	65.41
IX	Steel Cofferdam and Water Gate Installation	Derrick Barge	CNP 061	3	104	109	50	-3	225	-55.06	0	3	60.19	
		Tug boat	CNP 221	2	110	113	50	-3	225	-55.06	0	3	64.43	65.82
IX	Marine Ground Treatment	Band Drain Machine (hydarulic Vibratory lance starting up)	BS D4/107a	2	113	116	50	-3	225	-55.06	-5	3	55.94	55.94

Note: SPL = SWL + TF + DC + BC + FC, where

SPL = Predicted noise level in dB(A)

SWL = Sound Power Level in dB(A)

TF = Time factor in dB(A) = 10 log (P)

P = On-time percentage

DC = Distance attenuation correction in dB(A) = -(20 log D + 8)

D = Distance in m between the noise source and the receiver

BC = Barrier correction in dB(A)

FC = Façade correction in dB(A) = 3 dB(A)

CRBC - Build King Joint Venture

Construction Noise Assessment

Period: 0700 to 1900 (except general holidays)

Noise Sensitive Receiver: CM6(0-39m)

Noise Criteria: 75dB(A)

Mitigation Measures Scenario

Portion	Activity	PME	TM Ref. / other Ref.	No. of plants	SWL	Total SWL	On-time, %	Time Factor	Distance from Notional Sources, m	Distance Attenuation*,dB(A)	Barrier Correction, dB(A)	Façade Correction, dB(A)	Predicted Noise Level, dB(A)	Total Predicted Noise Level for each group, dB(A)
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Backfilling)	Road Roller	CNP 185	1	108	108	50	-3	225	-55.06	0	3	52.93	
		Excavator (223 kw) (40T)	BS C4/63	2	105	108	50	-3	225	-55.06	0	3	52.94	55.95
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888(Pre Drill) (Scenario 1)	G.I. drilling rig	BS C2/43	2	102	105	50	-3	225	-55.06	0	3	49.94	49.94
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888(Pre Drill) (Scenario 2)	G.I. drilling rig	BS C2/43	3	102	107	50	-3	225	-55.06	0	3	51.70	51.70
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888(Pre Drill) (Scenario 3)	G.I. drilling rig	BS C2/43	4	102	108	50	-3	225	-55.06	0	3	52.95	52.95
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888(Pre Drill) (Scenario 4)	G.I. drilling rig	BS C2/43	5	102	109	50	-3	225	-55.06	0	3	53.92	53.92
IX	Road P2 Underpass CH105-318 (Removal of Temporary 1500 Drain)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	225	-55.06	0	3	47.92	
		Piling, large diameter bored, oscillator	CNP 165	1	115	115	50	-3	225	-55.06	0	3	59.92	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	225	-55.06	0	3	44.92	
		Water pump, subersible (electric)	CNP 283	2	85	88	50	-3	225	-55.06	0	3	32.93	60.32
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 1)	Crane (240 kw) (105T)	BS C4/52	2	103	106	50	-3	225	-55.06	0	3	50.94	
		Drill Rig, Rotary Type (Diesel)	CNP 072	2	110	113	50	-3	225	-55.06	-5	3	52.94	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	225	-55.06	0	3	47.94	
		Air Compressor	CNP 002	4	102	108	50	-3	225	-55.06	0	3	52.95	
		Excavator (223 kw) (40T)	BS C4/63	3	105	110	50	-3	225	-55.06	0	3	54.70	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	225	-55.06	0	3	40.93	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	225	-55.06	0	3	35.95	
		Dump Truck	CNP 068	1	105	105	50	-3	225	-55.06	0	3	49.93	
		Welding Machine	CNP 107	2	99	102	50	-3	225	-55.06	0	3	46.94	60.17
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 2)	Crane (240 kw) (105T)	BS C4/52	6	103	111	50	-3	225	-55.06	0	3	55.71	
		Drill Rig, Rotary Type (Diesel)	CNP 072	6	110	118	50	-3	225	-55.06	-5	3	57.71	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	6	100	108	50	-3	225	-55.06	0	3	52.71	
		Air Compressor	CNP 002	12	102	113	50	-3	225	-55.06	0	3	57.72	
		Excavator (223 kw) (40T)	BS C4/63	4	105	111	50	-3	225	-55.06	0	3	55.95	
		Concrete Lorry Mixer	BS D6/33	2	96	99	50	-3	225	-55.06	0	3	43.94	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	225	-55.06	0	3	35.95	
		Dump Truck	CNP 068	3	105	110	50	-3	225	-55.06	0	3	54.70	
		Welding Machine	CNP 107	4	99	105	50	-3	225	-55.06	0	3	49.95	64.08
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 3)	Crane (240 kw) (105T)	BS C4/52	7	103	111	50	-3	225	-55.06	0	3	56.38	
		Drill Rig, Rotary Type (Diesel)	CNP 072	7	110	118	50	-3	225	-55.06	-5	3	58.38	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	7	100	108	50	-3	225	-55.06	0	3	53.38	
		Air Compressor	CNP 002	14	102	113	50	-3	225	-55.06	0	3	58.39	
		Excavator (223 kw) (40T)	BS C4/63	4	105	111	50	-3	225	-55.06	0	3	55.95	
		Concrete Lorry Mixer	BS D6/33	4	96	102	50	-3	225	-55.06	0	3	46.95	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	225	-55.06	0	3	35.95	
		Dump Truck	CNP 068	4	105	111	50	-3	225	-55.06	0	3	55.95	
		Welding Machine	CNP 107	7	99	107	50	-3	225	-55.06	0	3	52.38	64.84
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 4)	Crane (240 kw) (105T)	BS C4/52	8	103	112	50	-3	225	-55.06	0	3	56.96	
		Drill Rig, Rotary Type (Diesel)	CNP 072	8	110	119	50	-3	225	-55.06	-5	3	58.96	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	8	100	109	50	-3	225	-55.06	0	3	53.96	
		Air Compressor	CNP 002	16	102	114	50	-3	225	-55.06	0	3	58.97	
		Excavator (223 kw) (40T)	BS C4/63	6	105	113	50	-3	225	-55.06	0	3	57.71	
		Concrete Lorry Mixer	BS D6/33	6	96	104	50	-3	225	-55.06	0	3	48.71	
		Water pump, subersible (electric)	CNP 283	8	85	94	50	-3	225	-55.06	0	3	38.96	
		Dump Truck	CNP 068	6	105	113	50	-3	225	-55.06	0	3	57.71	
		Welding Machine	CNP 107	8	99	108	50	-3	225	-55.06	0	3	52.96	65.78
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 5)	Crane (240 kw) (105T)	BS C4/52	9	103	113	50	-3	225	-55.06	0	3	57.48	
		Drill Rig, Rotary Type (Diesel)	CNP 072	9	110	120	50	-3	225	-55.06	-5	3	59.48	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	9	100	110	50	-3	225	-55.06	0	3	54.48	
		Air Compressor	CNP 002	18	102	115	50	-3	225	-55.06	0	3	59.49	
		Excavator (223 kw) (40T)	BS C4/63	6	105	113	50	-3	225	-55.06	0	3	57.71	
		Concrete Lorry Mixer	BS D6/33	6	96	104	50	-3	225	-55.06	0	3	48.71	
		Water pump, subersible (electric)	CNP 283	9	85	95	50	-3	225	-55.06	0	3	39.48	
		Dump Truck	CNP 068	6	105	113	50	-3	225	-55.06	0	3	57.71	
		Welding Machine	CNP 107	9	99	109	50	-3	225	-55.06	0	3	53.48	66.13
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 6)	Crane (240 kw) (105T)	BS C4/52	12	103	114	50	-3	225	-55.06	0	3	58.72	
		Drill Rig, Rotary Type (Diesel)	CNP 072	12	110	121	50	-3	225	-55.06	-5	3	60.72	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	8	100	109	50	-3	225	-55.06	0	3	53.96	
		Air Compressor	CNP 002	24	102	116	50	-3	225	-55.06	0	3	60.73	
		Excavator (223 kw) (40T)	BS C4/63	6	105	113	50	-3	225	-55.06	0	3	57.71	
		Concrete Lorry Mixer	BS D6/33	6	96	104	50	-3	225	-55.06	0	3	48.71	
		Water pump, subersible (electric)	CNP 283	8	85	94	50	-3	225	-55.06	0	3	38.96	
		Dump Truck	CNP 068	6	105	113	50	-3	225	-55.06	0	3	57.71	
		Welding Machine	CNP 107	8	99	108	50	-3	225	-55.06	0	3	52.96	66.83
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 7)	Crane (240 kw) (105T)	BS C4/52	15	103	115	50	-3	225	-55.06	0	3	59.69	
		Drill Rig, Rotary Type (Diesel)	CNP 072	15	110	122	50	-3	225	-55.06	-5	3	61.69	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	10	100	110	50	-3	225	-55.06	0	3	54.93	
		Air Compressor	CNP 002	30	102	117	50	-3	225	-55.06	0	3	61.70	
		Excavator (223 kw) (40T)	BS C4/63	10	105	115	50	-3	225	-55.06	0	3	59.93	
		Concrete Lorry Mixer	BS D6/33	8	96	105	50	-3	225	-55.06	0	3	49.96	
		Water pump, subersible (electric)	CNP 283	15	85	97	50	-3	225	-55.06	0	3	41.69	
		Dump Truck	CNP 068	8	105	114	50	-3	225	-55.06	0	3	58.96	
		Welding Machine	CNP 107	12	99	110	50	-3	225	-55.06	0	3	54.72	68.05
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Installation of Dewatering System)	Drill Rig, Rotary Type (Diesel)	CNP 072	2	110	113	50	-3	225	-55.06	-5	3	52.94	
		Air Compressor	CNP 002	2	102	105	50	-3	225	-55.06	0	3	49.94	54.71
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (ELS) (Sheet Piling) (Scenario 1)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	225	-55.06	0	3	47.93	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	225	-55.06	0	3	44.93	
		Piling, Vibration Hammer	CNP 172	1	115	115	50	-3	225	-55.06	0	3	59.93	
		Power pack (diesel)	CNP 174	1	100	100	50	-3	225	-55.06	0	3	44.93	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	225	-55.06	0	3	35.95	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	225	-55.06	0	3	49.93	
		Welding Machine	CNP 107	4	99	105	50	-3	225	-55.06	0	3	49.95	61.17
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (ELS) (Sheet Piling) (Scenario 2)	Crane (240 kw) (105T)	BS C4/52	2	103	106	50	-3	225	-55.06	0	3	50.94	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	225	-55.06	0	3	47.94	
		Piling, Vibration Hammer	CNP 172	2	115	118	50	-3	225	-55.06	0	3	62.94	
		Power pack (diesel)	CNP 174	2	100	103	50	-3	225	-55.06	0	3	47.94	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	225	-55.06	0	3	35.95	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	225	-55.06	0	3	49.93	
		Welding Machine	CNP 107	4	99	105	50	-3	225	-55.06	0	3	49.95	63.84
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (ELS) (Welding & Excavation) (Scenario 1)	Crane (240 kw) (105T)	BS C4/52	2	103	106	50	-3	225	-55.06	0	3	50.94	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	225	-55.06	0	3	47.94	
		Excavator (223 kw) (40T)	BS C4/63	2	105	108	50	-3	225	-55.06	0	3	52.94	
		Dump Truck	CNP 068	2	105	108	50	-3	225	-55.06	0	3	52.94	
		Water pump, subersible (electric)	CNP 283	5	85	92	50	-3	225	-55.06	0	3	36.92	
		Welding Machine	CNP 107	2	99	102	50	-3	225	-55.06	0	3	46.94	
		Derrick Barge	CNP 061	1	104	104	50	-3	225	-55.06	0	3	48.93	58.53
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (ELS) (Welding & Excavation) (Scenario 2)	Crane (240 kw) (105T)	BS C4/52	4	103	109	50	-3	225	-55.06	0	3	53.95	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	4	100	106	50	-3	225	-55.06	0	3	50.95	
		Excavator (223 kw) (40T)	BS C4/63	4	105	111	50	-3	225	-55.06	0	3	55.95	
		Dump Truck	CNP 068	2	105	108	50	-3	225	-55.06	0	3	52.94	
		Water pump, subersible (electric)	CNP 283	20	85	98	50	-3	225	-55.06	0	3	42.94	
		Welding Machine	CNP 107	4	99	105	50	-3	225	-55.06	0	3	49.95	
		Derrick Barge	CNP 061	2	104	107	50	-3	225	-55.06	0	3	51.94	60.93
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Structure) (Scenario 1)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	225	-55.06	0	3	47.93	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	225	-55.06	0	3	44.93	
		Air Blower	CNP 006	1	95	95	50	-3	225	-55.06	0	3	39.93	
		Saw, Circular Wood	CNP 201	1	108	108	50	-3	225	-55.06	0	3	52.93	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	225	-55.06	0	3	40.93	
		Concrete pump, stationary/lorry mounted	CNP 047	1	109	109	50	-3	225	-55.06	0	3	53.93	
		Poker, vibratory, hand-held	CNP 170	1	113	113	50	-3	225	-55.06	0	3	57.93	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	225	-55.06	0	3	35.95	60.74
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Structure) (Scenario 2)	Crane (240 kw) (105T)	BS C4/52	3	103	108	50	-3	225	-55.06	0	3	52.70	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	3	100	105	50	-3	225	-55.06	0	3	49.70	
		Air Blower	CNP 006	3	95	100	50	-3	225	-55.06	0	3	44.70	
		Saw, Circular Wood	CNP 201	3	108	113	50	-3	225	-55.06	0	3	57.70	
		Concrete Lorry Mixer	BS D6/33	3	96	101	50	-3	225	-55.06	0	3	45.70	
		Concrete pump, stationary/lorry mounted	CNP 047	3	109	114	50	-3	225	-55.06	0	3	58.70	
		Poker, vibratory, hand-held	CNP 170	3	113	118	50	-3	225	-55.06	0	3	62.70	
		Water pump, subersible (electric)	CNP 283	6	85	93	50	-3	225	-55.06	0	3	37.71	65.50
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Structure) (Scenario 3)	Crane (240 kw) (105T)	BS C4/52	5	103	110	50	-3	225	-55.06	0	3	54.92	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	5	100	107	50	-3	225	-55.06	0	3	51.92	
		Air Blower	CNP 006	5	95	102	50	-3	225	-55.06	0	3	46.92	
		Saw, Circular Wood	CNP 201	5	108	115	50	-3	225	-55.06	0	3	59.92	
		Concrete Lorry Mixer	BS D6/33	5	96	103	50	-3	225	-55.06	0	3	47.92	
		Concrete pump, stationary/lorry mounted	CNP 047	5	109	116	50	-3	225	-55.06	0	3	60.92	
		Poker, vibratory, hand-held	CNP 170	5	113	120	50	-3	225	-55.06	0	3	64.92	
		Water pump, subersible (electric)	CNP 283	6	85	93	50	-3	225	-55.06	0	3	37.71	67.71
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Structure) (Scenario 4)	Crane (240 kw) (105T)	BS C4/52	6	103	111	50	-3	225	-55.06	0	3	55.71	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	6	100	108	50	-3	225	-55.06	0	3	52.71	
		Air Blower	CNP 006	6	95	103	50	-3	225	-55.06	0	3	47.71	
		Saw, Circular Wood	CNP 201	6	108	116	50	-3	225	-55.06	0	3	60.71	
		Concrete Lorry Mixer	BS D6/33	6	96	104	50	-3	225	-55.06	0	3	48.71	
		Concrete pump, stationary/lorry mounted	CNP 047	6	109	117	50	-3	225	-55.06	0	3	61.71	
		Poker, vibratory, hand-held	CNP 170	6	113	121	50	-3	225	-55.06	0	3	65.71	
		Water pump, subersible (electric)	CNP 283	6	85	93	50	-3	225	-55.06	0	3	37.71	68.51
IX	U - Trough (Road and Drainage Works)	Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	225	-55.06	0	3	49.93	
		Roller, Vibratory	BS D8/30	1	101	101	50	-3	225	-55.06	0	3	45.93	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	225	-55.06	0	3	40.93	
		Light goods vehicle, gross vehicle weight < 5.5 tonne	CNP 143	1	101	101	50	-3	225	-55.06	0	3	45.93	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	225	-55.06	0	3	35.95	
		Dump Truck	CNP 068	1	105	105	50	-3	225	-55.06	0	3	49.93	
		Road Roller	CNP 185	1	108	108	50	-3	225	-55.06	0	3	52.93	56.89

Note: SPL = SWL + TF + DC + BC + FC, where

SPL = Predicted noise level in dB(A)

SWL = Sound Power Level in dB(A)

TF = Time factor in dB(A) = 10 log (P)

P = On-time percentage

DC = Distance attenuation correction in dB(A) = -(20 log D + 8)

D = Distance in m between the noise source and the receiver

BC = Barrier correction in dB(A)

FC = Façade correction in dB(A) = 3 dB(A)

CRBC - Build King Joint Venture

Construction Noise Assessment

Period: 0700 to 1900 (except general holidays)

Noise Sensitive Receiver: CM7(0-39m)

Noise Criteria: 75dB(A)

Mitigation Measures Scenario

Portion	Activity	PME	TM Ref. / other Ref.	No. of plants	SWL	Total SWL	On-time, %	Time Factor	Distance from Notional Sources, m	Distance Attenuation*, dB(A)	Barrier Correction, dB(A)	Façade Correction, dB(A)	Predicted Noise Level, dB(A)	Total Predicted Noise Level for each group, dB(A)
VI	Road P2 U-Trough B CH318-363 (Removal of Existing Abandoned Box Culvert)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	157	-51.95	0	3	51.04	
		Piling, large diameter bored, oscillator	CNP 165	1	115	115	30	-5	157	-51.95	0	3	60.83	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	157	-51.95	0	3	53.04	
		Water pump, subersible (electric)	CNP 283	2	85	88	50	-3	157	-51.95	0	3	36.05	61.88
VI	Road P2 U-Trough B CH318-363 (Installation of Dewatering System)	Air Compressor	CNP 002	3	102	107	50	-3	157	-51.95	0	3	54.82	
		Drill Rig, Rotary Type (Diesel)	CNP 072	3	110	115	50	-3	157	-51.95	-5	3	57.82	59.58
VI	Road P2 U-Trough B CH318-363 (Preboring) (Scenario 1)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	157	-51.95	0	3	51.04	
		Drill Rig, Rotary Type (Diesel)	CNP 072	1	110	110	50	-3	157	-51.95	0	3	58.04	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	157	-51.95	0	3	48.04	
		Air Compressor	CNP 002	2	102	105	50	-3	157	-51.95	0	3	53.05	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	157	-51.95	0	3	53.04	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	157	-51.95	0	3	44.04	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	157	-51.95	0	3	39.06	
		Welding Machine	CNP 107	4	99	105	50	-3	157	-51.95	0	3	53.06	61.67
VI	Road P2 U-Trough B CH318-363 (Preboring) (Scenario 2)	Crane (240 kw) (105T)	BS C4/52	2	103	106	50	-3	157	-51.95	0	3	54.05	
		Drill Rig, Rotary Type (Diesel)	CNP 072	2	110	113	50	-3	157	-51.95	0	3	53.84	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	157	-51.95	0	3	48.04	
		Air Compressor	CNP 002	4	102	108	50	-3	157	-51.95	0	3	53.85	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	157	-51.95	0	3	53.04	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	157	-51.95	0	3	44.04	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	157	-51.95	0	3	39.06	
		Welding Machine	CNP 107	4	99	105	50	-3	157	-51.95	0	3	53.06	60.93
VI	Road P2 U-Trough B CH318-363 (Sheet Piling)	Piling, Vibration Hammer	CNP 172	1	115	115	50	-3	157	-51.95	-5	3	58.04	
		Power pack (diesel)	CNP 174	1	100	100	50	-3	157	-51.95	-5	3	43.04	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	157	-51.95	0	3	39.06	
		Welding Machine	CNP 107	4	99	105	50	-3	157	-51.95	0	3	53.06	59.39
VI	Road P2 U-Trough B CH318-363 (ELS)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	157	-51.95	0	3	51.04	
		Excavator (223 kw) (40T)	BS C4/63	2	105	108	50	-3	157	-51.95	0	3	56.05	
		Dump Truck	CNP 068	1	105	105	50	-3	157	-51.95	0	3	53.04	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	157	-51.95	0	3	39.06	
		Welding Machine	CNP 107	4	99	105	50	-3	157	-51.95	0	3	53.06	59.74
VI	Road P2 U-Trough B CH318-363 (Structure)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	157	-51.95	0	3	51.04	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	157	-51.95	0	3	53.04	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	157	-51.95	0	3	51.05	
		Saw, Circular Wood	CNP 201	2	108	111	50	-3	157	-51.95	0	3	59.05	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	157	-51.95	0	3	44.04	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	157	-51.95	0	3	39.06	
		Welding Machine	CNP 107	4	99	105	50	-3	157	-51.95	0	3	53.06	61.75
VI	Road P2 U-Trough B CH318-363 Road and Drainage Works	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	157	-51.95	0	3	51.04	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	157	-51.95	0	3	53.04	
		Roller, Vibratory	BS D8/30	1	101	101	50	-3	157	-51.95	0	3	49.04	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	157	-51.95	0	3	44.04	
		Light goods vehicle, gross vehicle weight < 5.5 tonne	CNP 143	1	101	101	50	-3	157	-51.95	0	3	49.04	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	157	-51.95	0	3	39.06	
		Dump Truck	CNP 068	1	105	105	50	-3	157	-51.95	0	3	53.04	
		Road Roller	CNP 185	1	108	108	50	-3	157	-51.95	0	3	56.04	
		Welding Machine	CNP 107	4	99	105	50	-3	157	-51.95	0	3	53.06	61.24
VIII	Road P2 U-Trough A&B CH363-411 & Road SR2 U-Trough B CH110-170 (Pre-boring)	Crane (240 kw) (105T)	BS C4/52	2	103	106	50	-3	224	-55.02	0	3	50.98	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	4	100	106	50	-3	224	-55.02	0	3	50.99	
		Air Compressor	CNP 002	4	102	108	50	-3	224	-55.02	0	3	52.99	
		Drill Rig, Rotary Type (Diesel)	CNP 072	2	110	113	50	-3	224	-55.02	-5	3	52.98	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	224	-55.02	0	3	49.97	
		Concrete Lorry Mixer	BS D6/33	2	96	99	50	-3	224	-55.02	0	3	43.98	
		Piling, Vibration Hammer	CNP 172	1	115	115	50	-3	224	-55.02	0	3	59.97	
		Power pack (diesel)	CNP 174	1	100	100	50	-3	224	-55.02	0	3	44.97	
		Water pump, subersible (electric)	CNP 283	2	85	88	50	-3	224	-55.02	0	3	32.98	62.55
VIII	Road P2 U-Trough A&B CH363-411 & Road SR2 U-Trough B CH110-170 (ELS)	Crane (240 kw) (105T)	BS C4/52	2	103	106	50	-3	224	-55.02	0	3	50.98	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	4	100	106	50	-3	224	-55.02	0	3	50.99	
		Air Compressor	CNP 002	4	102	108	50	-3	224	-55.02	0	3	52.99	
		Piling, Vibration Hammer	CNP 172	2	115	118	50	-3	224	-55.02	0	3	62.98	
		Power pack (diesel)	CNP 174	2	100	103	50	-3	224	-55.02	0	3	47.98	
		Excavator (223 kw) (40T)	BS C4/63	4	105	111	50	-3	224	-55.02	0	3	55.99	
		Breaker, excavator mounted (hydraulic)	CNP 028	1	122	122	50	-3	224	-55.02	-10	3	56.97	
		Dump Truck	CNP 068	2	105	108	50	-3	224	-55.02	0	3	52.98	
		Water pump, subersible (electric)	CNP 283	16	85	97	50	-3	224	-55.02	0	3	42.01	65.57
VIII	Road P2 U-Trough A&B CH363-411 & Road SR2 U-Trough B CH110-170(Backfilling)	Piling, Vibration Hammer	CNP 172	2	115	118	50	-3	224	-55.02	0	3	62.98	
		Excavator (223 kw) (40T)	BS C4/63	4	105	111	50	-3	224	-55.02	0	3	55.99	
		Roller, Vibratory	BS D8/30	2	101	104	50	-3	224	-55.02	0	3	48.98	
		Breaker, excavator mounted (hydraulic)	CNP 028	1	122	122	50	-3	224	-55.02	0	3	56.97	
		Dump Truck	CNP 068	2	105	108	50	-3	224	-55.02	0	3	52.98	
		Water pump, subersible (electric)	CNP 283	16	85	97	50	-3	224	-55.02	0	3	42.01	65.02
VIII	Road P2 U-Trough B CH318-363 (Installation of Dewatering System)	Air Compressor	CNP 002	3	102	107	50	-3	224	-55.02	-5	3	46.74	
		Drill Rig, Rotary Type (Diesel)	CNP 072	3	110	115	50	-3	224	-55.02	-5	3	54.74	55.38
VIII	Road P2 U-Trough A&B CH363-411 & Road SR2 U-Trough B CH110-170 (Structure)	Crane (240 kw) (105T)	BS C4/52	2	103	106	50	-3	224	-55.02	0	3	50.98	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	224	-55.02	0	3	47.98	
		Air Compressor	CNP 002	2	102	105	50	-3	224	-55.02	0	3	49.98	
		Saw, Circular Wood	CNP 201	2	108	111	50	-3	224	-55.02	0	3	55.98	
		Concrete Lorry Mixer	BS D6/33	2	96	99	50	-3	224	-55.02	0	3	43.98	
		Poker, Vibratory, Handheld	CNP 170	2	113	116	50	-3	224	-55.02	0	3	60.98	
		Concrete Pump	CNP 047	2	109	112	50	-3	224	-55.02	0	3	56.98	
		Water pump, subersible (electric)	CNP 283	16	85	97	50	-3	224	-55.02	0	3	42.01	63.94
VIII	Road P2 U-Trough A&B CH363-411 & Road SR2 U-Trough B CH110-170 Road and Drainage Works	Excavator (223 kw) (40T)	BS C4/63	2	105	108	50	-3	224	-55.02	0	3	52.98	
		Roller, Vibratory	BS D8/30	2	101	104	50	-3	224	-55.02	0	3	48.98	
		Saw, Circular Wood	CNP 201	2	108	111	50	-3	224	-55.02	0	3	55.98	
		Asphalt Paver	BS DB/24	1	101	101	50	-3	224	-55.02	0	3	45.97	
		Dump Truck	CNP 068	2	105	108	50	-3	224	-55.02	0	3	52.98	
		Lorry	BS D8/25	2	96	99	50	-3	224	-55.02	0	3	43.98	
		Crane	BS D7/114	2	101	104	50	-3	224	-55.02	0	3	48.98	
		Concrete Pump	CNP 047	1	109	109	50	-3	224	-55.02	0	3	53.97	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	224	-55.02	0	3	40.97	
		Poker, Vibratory, Handheld	CNP 170	1	113	113	50	-3	224	-55.02	0	3	57.97	
		Power Rammer Petrol	CNP 169	1	108	108	50	-3	224	-55.02	0	3	52.97	
		Water pump, subersible (electric)	CNP 283	16	85	97	50	-3	224	-55.02	0	3	42.01	63.26

Note: SPL = SWL + TF + DC + BC + FC, where

SPL = Predicted noise level in dB(A)

SWL = Sound Power Level in dB(A)

TF = Time factor in dB(A) = 10 log (P)

P = On-time percentage

DC = Distance attenuation correction in dB(A) = -(20 log D + 8)

D = Distance in m between the noise source and the receiver

BC = Barrier correction in dB(A)

FC = Façade correction in dB(A) = 3 dB(A)

CRBC - Build King Joint Venture

Construction Noise Assessment

Period: 0700 to 1900 (except general holidays)

Noise Sensitive Receiver: CM8

Noise Criteria: 75dB(A)

Portion	Activity	PME	TM Ref. / other Ref.	No. of plants	SWL	Total SWL	On-time, %	Time Factor	Distance from Notional Sources, m	Distance Attenuation*,dB(A)	Barrier Correction, dB(A)	Façade Correction, dB(A)	Predicted Noise Level, dB(A)	Total Predicted Noise Level for each group, dB(A)	Total Predicted Noise Level Portion II dB(A)
III	Demolition of DSD Transformer Room	Breaker, excavator mounted (hydraulic)	CNP 028	1	122	122	50	-3	116	-49.29	-5	3	67.70		
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	116	-49.29	0	3	60.70		
		Lorry	BS D8/25	1	96	96	50	-3	116	-49.29	0	3	46.70		
		Water pump, subersible (electric)	CNP 283	2	85	88	50	-3	116	-49.29	0	3	38.71	68	68
II	Retaining Wall	Excavator (223 kw) (40T)	BS C4/63	2	105	108	50	-3	257	-56.20	0	3	51.80		
		Dump Truck	CNP 068	2	105	108	50	-3	257	-56.20	0	3	51.80		
		Saw, Circular Wood	CNP 201	4	108	114	50	-3	257	-56.20	0	3	57.81		
		Bar Bender and Cutter	CNP 021	4	90	96	50	-3	257	-56.20	0	3	39.81		
		Water pump, subersible (electric)	CNP 283	2	85	88	50	-3	257	-56.20	0	3	31.80		
		Concrete Lorry Mixer	BS D6/33	2	96	99	50	-3	257	-56.20	0	3	42.80		
		Roller, Vibratory	BS D8/30	1	101	101	50	-3	257	-56.20	0	3	44.79	59.86	59.86
	Area A	Excavator (223 kw) (40T)	BS C4/63	4	105	111	50	-3	217	-54.73	0	3	56.28		
		Dump Truck	CNP 068	1	105	105	50	-3	217	-54.73	0	3	50.26		
		Breaker, excavator mounted (hydraulic)	CNP 028	1	122	122	50	-3	217	-54.73	-10	3	57.26		
		Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	217	-54.73	0	3	48.26		
		Water pump, subersible (electric)	CNP 283	3	85	90	50	-3	217	-54.73	0	3	35.03	60.54	60.54
Construction of Northern Footbridge	Pre-drilling works (Near Tiu Keng Leng Sports Centre) Feb 17 to Mar, 17	Drill Rig	CNP 072	1	110	110	20	-7	60	-43.56	-5	3	57.45		
		Breaker, excavator mounted (hydraulic)	CNP 028	1	122	122	20	-7	60	-43.56	-5	3	69.45	69.71	69.71
Construction of Northern Footbridge	Construction of soldier wall (Near Tiu Keng Leng Sports Centre) Apr 17 to Oct 17	Air Compressor	CNP 002	1	102	102	20	-7	60	-43.56	-5	3	49.45		
		Crane	BS D7/114	1	101	101	20	-7	60	-43.56	0	3	53.45		
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	40	-4	60	-43.56	0	3	55.46		
		Concrete Lorry Mixer	BS D6/33	2	96	99	20	-7	60	-43.56	0	3	51.46		
		Piling, Vibration Hammer	CNP 172	1	115	115	20	-7	60	-43.56	-5	3	62.45		
		Water Pump, Submersible (electric)	CNP 283	1	85	85	10	-10	60	-43.56	0	3	34.44		
		Excavator	BS D8/13	1	110	110	20	-7	60	-43.56	0	3	62.45	66.35	
Construction of Northern Footbridge	Pre-drilling & Piling works (Near Park Central Block 6) Aug 17 to Oct, 17	Drill Rig	CNP 072	1	110	110	30	-5	93	-47.37	-5	3	55.40		
		Breaker, excavator mounted (hydraulic)	CNP 028	1	122	122	30	-5	93	-47.37	-5	3	67.40		
		Air Compressor	CNP 002	1	102	102	20	-7	93	-47.37	-5	3	45.64		
		Crane	BS D7/114	1	101	101	20	-7	93	-47.37	0	3	49.64		
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	40	-4	93	-47.37	0	3	51.65		
		Concrete Lorry Mixer	BS D6/33	2	96	99	20	-7	93	-47.37	0	3	47.65		
		Piling, Vibration Hammer	CNP 172	1	115	115	20	-7	93	-47.37	-5	3	58.64		
		Water Pump, Submersible (electric)	CNP 283	1	85	85	10	-10	93	-47.37	0	3	30.63		
		Excavator	BS D8/13	1	110	110	20	-7	93	-47.37	0	3	58.64	68.83	70.78
Construction of Northern Footbridge	Construction of Footbridge (Near Park Central Block 6) Nov 17 to Apr 19	Crane	BS D7/114	1	101	101	40	-4	60	-43.56	0	3	56.46		
		Dump Truck	BS D8/25	1	105	105	20	-7	60	-43.56	0	3	57.45		
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	70	-2	60	-43.56	0	3	57.89		
		Concrete Lorry Mixer	BS D6/33	2	96	99	30	-5	60	-43.56	0	3	53.22		
		Saw, Circular Wood	CNP 201	4	108	114	60	-2	60	-43.56	-5	3	66.22		
		Water Pump, Submersible (electric)	CNP 283	1	85	85	20	-7	60	-43.56	0	3	37.45	67.79	
Construction of Northern Footbridge	Construction of Footbridge (Near Tiu Keng Leng Sports Centre) Nov 17 to Apr 19	Crane	BS D7/114	1	101	101	40	-4	93	-47.37	0	3	52.65		
		Dump Truck	BS D8/25	1	105	105	20	-7	93	-47.37	0	3	53.64		
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	70	-2	93	-47.37	0	3	54.08		
		Concrete Lorry Mixer	BS D6/33	2	96	99	30	-5	93	-47.37	0	3	49.41		
		Saw, Circular Wood	CNP 201	4	108	114	60	-2	93	-47.37	-5	3	62.41		
		Water Pump, Submersible (electric)	CNP 283	1	85	85	20	-7	93	-47.37	0	3	33.64	63.99	69.30

Note: SPL = SWL + TF + DC + BC + FC, where

SPL = Predicted noise level in dB(A)

SWL = Sound Power Level in dB(A)

TF = Time factor in dB(A) = 10 log (P)

P = On-time percentage

DC = Distance attenuation correction in dB(A) = -(20 log D + 8)

D = Distance in m between the noise source and the receiver

BC = Barrier correction in dB(A)

FC = Façade correction in dB(A) = 3 dB(A)

NE/2015/02

Associated Cumulative Noise Levels

NSR CM6 (0-39m)

Portion	Activity	2018				2019												2020												2021			
		Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
I	DSD Transformer Room																																
IV	DN2100 SMBP101 - 9108 (Pre-boring) (Scenario 1) - 3 drill rig																																
IV	DN2100 SMBP101 - 9108 (Pre-boring) (Scenario 2) - 1 drill rig	65.6	65.6	65.6																													
IV	DN2100 SMBP101 - 9108 (Sheet Piling)	69.0	69.0	69.0	69.0																												
IV	DN2100 SMBP101 - 9108 (ELS)	67.2	67.2	67.2	67.2	67.2																											
IV	Installation of DN2100 and Manhole Construction (Scenario 1)	66.1	66.1	66.1	66.1																												
IV	Installation of DN2100 and Manhole Construction (Scenario 2)					66.1	66.1	66.1																									
IV	Road P2 Underpass CH105-318, (Non Surcharge & On Top Surcharge) (Pre Drill) (Scenario 1) - 2 G.I. Rig				65.3		65.3	65.3																									
IV	Road P2 Underpass CH105-318, (Non Surcharge & On Top Surcharge) (Pre Drill) (Scenario 2) - 4 G.I. Rig					66.1																											
IV	Road P2 Underpass CH105-318, (Non Surcharge & On Top Surcharge) (Piling) (Scenario 1) - 2 Drill Rig													66.0	66.0																		
IV	Road P2 Underpass CH105-318, (Non Surcharge & On Top Surcharge) (Piling) (Scenario 2) - 3 Drill Rig							67.1	67.1	67.1	67.1	67.1	67.1																				
IV	Road P2 Underpass CH103.5 (Sheet Piling)													69.7	69.7																		
V	Road P2 U-Trough B CH318-363 (Pre-boring) (Scenario 1) - Drill Rig																																
V	Road P2 U-Trough B CH318-363 (Pre-boring) (Scenario 2) - 2 Drill Rig	60.1	60.1	60.1																													
V	Road P2 U-Trough B CH318-363 (Sheet Piling)	58.9	58.9	58.9	58.9	58.9																											
V	Road P2 U-Trough B CH318-363 (ELS)		60.4	60.4	60.4																												
V	Road P2 U-Trough B CH318-363 (Structure)					63.0	63.0	63.0	63.0	63.0	63.0	63.0	63.0	63.0																				
V	Road P2 U-Trough B CH318-363 Road and Drainage Works							60.7	60.7	60.7	60.7	60.7	60.7	60.7																				
V	Modification of Vertical Seawall										60.7	60.7	60.7	60.7	60.7	60.7	60.7																
VI	Road P2 U Trough B CH318 363 (Removal of Existing Abandoned Box Culvert)																																
VI	Road P2 U-Trough B CH318-363 (Installation of Dewatering System)	59.3	59.3	59.3	59.3	59.3																											
VI	Road P2 U-Trough B CH318-363 (Preboring) (Scenario 1)																																
VI	Road P2 U-Trough B CH318-363 (Preboring) (Scenario 2)	60.7																															
VI	Road P2 U-Trough B CH318-363 (Sheet Piling)	59.1																															
VI	Road P2 U-Trough B CH318-363 (ELS)		59.5	59.5	59.5																												
VI	Road P2 U-Trough B CH318-363 (Structure)					61.5	61.5	61.5	61.5	61.5	61.5	61.5	61.5	61.5																				
VI	Road P2 U-Trough B CH318-363 Road and Drainage Works							61.0	61.0	61.0	61.0	61.0	61.0	61.0																				
VII	DN2100 SMBP108-Outfall (Pre-boring)																																
VII	DN2100 SMBP108-Outfall (Sheet Piling)																																
VII	Installation of DN2100 and Manhole Construction and Outfall Installation	61.3	61.3	61.3	61.3	61.3	61.3																										
VII	U Trough A&B S200 CH890 - CH980 (Pre Drill)												52.5	52.5	52.5	52.5																	
VII	U Trough A&B S200 CH890 - CH980 (Piling)												62.5	62.5	62.5	62.5	62.5																
VII	U Trough A&B S200 CH890 - CH980 (Sheet Piling)														61.6	61.6	61.6																
IX	Steel Cofferdam & Water Gate Installation																																
IX	Seawall Construction	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4												
IX	Marine Ground Treatment	55.9	55.9	55.9	55.9	55.9	55.9																										
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Backfilling)	56.0	56.0	56.0	56.0	56.0	56.0																										
IX	Road P2 Underpass CH105-318, (Removal of Temporary 1500 Drain)								60.3	60.3																							
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888(Pre Drill) (Scenario 1) - 2 G.I. Rig									49.9			49.9	49.9						49.9	49.9	49.9	49.9										
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888(Pre Drill) (Scenario 2) - 3 G.I. Rig							51.7										51.7	51.7														
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888(Pre Drill) (Scenario 3) - 4 G.I. Rig					53.0																											
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888(Pre Drill) (Scenario 4) - 5 G.I. Rig						53.9					53.9			53.9	53.9	53.9																
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 1) - 2 Drill Rig					60.2	60.2																										
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 2) - 6 Drill Rig													64.1	64.1																		
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 3) - 7 Drill Rig															64.8	64.8	64.8	64.8														
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 4) - 8 Drill Rig											65.8	65.8																				
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 5) - 9 Drill Rig																			66.1	66.1	66.1	66.1	66.1									
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 6) - 12 Drill Rig									66.8																							
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 7) - 15 Drill Rig										68.1																						
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Installation of Dewatering System)											54.7	54.7																				
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (ELS) (Sheet Piling) (Scenario 1) - 1 Vibration hammer						61.2																										
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (ELS) (Sheet Piling) (Scenario 2) - 2 Vibration hammer							63.8	63.8	63.8			63.8	63.8	63.8	63.8	63.8	63.8	63.8	63.8													
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (ELS) (Welding & Excavation) (Scenario 1)											58.5	58.5	58.5	58.5	58.5	58.5			58.5													
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (ELS) (Welding & Excavation) (Scenario 2)																	60.9	60.9														
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Structure) (Scenario 1) - 1 Set																															60.7	
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Structure) (Scenario 2) - 3 Set																															65.5	
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Structure) (Scenario 3) - 5 Set																	67.7	67.7	67.7			67.7	67.7	67.7	67.7	67.7						
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Structure) (Scenario 4) - 6 Set																					68.5											
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888Road and Drainage Works																													56.9	56.9	56.9	56.9	56.9	56.9	56.9
	Cumulative Noise / dB(A)	75	75	75	75	74	73	74	73	74	73	73	74	75	74	72	72	70	72	72	71	71	70	70	68	68	68	66	62	57	57	57	57
		Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
		2018				2019												2020												2021			

NSR CM7

Portion	Activity	2018				2019												2020											
		Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
VI	Road P2 U-Trough B CH318-363 (Removal of Existing Abandoned Box Culvert)																												
VI	Road P2 U-Trough B CH318-363 (Installation of Dewatering System)	59.6	59.6																										
VI	Road P2 U-Trough B CH318-363 (Preboring) (Scenario 1)																												
VI	Road P2 U-Trough B CH318-363 (Preboring) (Scenario 2)	60.9																											
VI	Road P2 U-Trough B CH318-363 (Sheet Piling)	59.4																											
VI	Road P2 U-Trough B CH318-363 (ELS)		59.7	59.7	59.7																								
VI	Road P2 U-Trough B CH318-363 (Structure)					61.8	61.8	61.8	61.8	61.8	61.8	61.8	61.8	61.8															
VI	Road P2 U-Trough B CH318-363 Road and Drainage Works							61.2	61.2	61.2	61.2	61.2	61.2	61.2															
VIII	Road P2 U-Trough A&B CH363-411 & Road SR2 U-Trough B CH110-170 (Pre-boring)																												
VIII	Road P2 U-Trough A&B CH363-411 & Road SR2 U-Trough B CH110-170 (ELS)															65.6	65.6	65.6	65.6										
VIII	Road P2 U-Trough A&B CH363-411 & Road SR2 U-Trough B CH110-170 (Installation of Dewatering system)																55.4	55.4											
VIII	Road P2 U-Trough A&B CH363-411 & Road SR2 U-Trough B CH110-170(Backfilling)																									65.0	65.0	65.0	
VIII	Road P2 U-Trough A&B CH363-411 & Road SR2 U-Trough B CH110-170 (Structure)																									63.9	63.9	63.9	
VIII	Road P2 U-Trough A&B CH363-411 & Road SR2 U-Trough B CH110-170 Road and Drainage Works															63.3	63.3	63.3	63.3	63.3	63.3	63.3	63.3	63.3	63.3	63.3	63.3	63.3	63.3
	Cumulative Noise / dB(A)	65	63	60	60	62	62	65	65	65	65	65	65	0	68	68	68	68	63	63	63	63	63	63	69	69	69	63	63
		Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		2018				2019												2020											

NSR CM8

Portion	Activity	2018				2019												2020				
		Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
III	Demolition of DSD Transformer Room																					
II	Retaining Wall					59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9
Area A		63.6	63.6	63.6	63.6	63.6	63.6	63.6	63.6	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5					
Construction of Northern Footbridge	Pre-drilling works (Near Tiu Keng Leng Sports Centre)																					
Construction of Northern Footbridge	Construction of soldier wall (Near Tiu Keng Leng Sports Centre)																					
Construction of Northern Footbridge	Pre-drilling & Piling works (Near Park Central Block 6)																					
Construction of Northern Footbridge	Construction of Footbridge (Near Park Central Block 6)	67.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8													
Construction of Northern Footbridge	Construction of Footbridge (Near Tiu Keng Leng Sports Centre)	64.0	64.0	64.0	64.0	64.0	64.0	64.0	64.0													
	Cumulative Noise / dB(A)	70	70	70	70	71	71	71	71	63	63	63	63	63	63	63	63	60	60	60	60	60
		Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
		2018				2019												2020				

CRBC - Build King Joint Venture

Construction Noise Assessment

Period: 0700 to 1900 (except general holidays)

Noise Sensitive Receiver: CM6(Above 39m)

Noise Criteria: 75dB(A)

Mitigation Measures Scenario

Portion	Activity	PME	TM Ref. / other Ref.	No. of plants	SWL	Total SWL	On-time, %	Time Factor	Distance from Notional Sources, m	Distance Attenuation*, dB(A)	Barrier Correction, dB(A)	Façade Correction, dB(A)	Predicted Noise Level, dB(A)	Total Predicted Noise Level for each group, dB(A)
VI	Road P2 U-Trough B CH318-363 (Removal of Existing Abandoned Box Culvert)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	167	-52.43	0	3	50.55	
		Piling, large diameter bored, oscillator	CNP 165	1	115	115	30	-5	167	-52.43	0	3	62.55	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	167	-52.43	0	3	52.55	
		Water pump, subersible (electric)	CNP 283	2	85	88	50	-3	167	-52.43	0	3	35.57	63.22
VI	Road P2 U-Trough B CH318-363 (Installation of Dewatering System)	Air Compressor	CNP 002	3	102	107	50	-3	167	-52.43	0	3	54.33	
		Drill Rig, Rotary Type (Diesel)	CNP 072	3	110	115	50	-3	167	-52.43	-5	3	57.33	59.09
VI	Road P2 U-Trough B CH318-363 (Preboring) (Scenario 1)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	167	-52.43	0	3	50.55	
		Drill Rig, Rotary Type (Diesel)	CNP 072	1	110	110	50	-3	167	-52.43	0	3	57.55	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	167	-52.43	0	3	47.55	
		Air Compressor	CNP 002	2	102	105	50	-3	167	-52.43	0	3	52.57	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	167	-52.43	0	3	52.55	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	167	-52.43	0	3	43.55	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	167	-52.43	0	3	38.58	
		Welding Machine	CNP 107	4	99	105	50	-3	167	-52.43	0	3	52.58	61.18
VI	Road P2 U-Trough B CH318-363 (Preboring) (Scenario 2)	Crane (240 kw) (105T)	BS C4/52	2	103	106	50	-3	167	-52.43	0	3	53.57	
		Drill Rig, Rotary Type (Diesel)	CNP 072	2	110	113	50	-3	167	-52.43	0	3	53.35	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	167	-52.43	0	3	47.55	
		Air Compressor	CNP 002	4	102	108	50	-3	167	-52.43	0	3	53.36	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	167	-52.43	0	3	52.55	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	167	-52.43	0	3	43.55	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	167	-52.43	0	3	38.58	
		Welding Machine	CNP 107	4	99	105	50	-3	167	-52.43	0	3	52.58	60.44
VI	Road P2 U-Trough B CH318-363 (Sheet Piling)	Piling, Vibration Hammer	CNP 172	1	115	115	50	-3	167	-52.43	-5	3	57.55	
		Power pack (diesel)	CNP 174	1	100	100	50	-3	167	-52.43	-5	3	42.55	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	167	-52.43	0	3	38.58	
		Welding Machine	CNP 107	4	99	105	50	-3	167	-52.43	0	3	52.58	58.9
VI	Road P2 U-Trough B CH318-363 (ELS)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	167	-52.43	0	3	50.55	
		Excavator (223 kw) (40T)	BS C4/63	2	105	108	50	-3	167	-52.43	0	3	55.57	
		Dump Truck	CNP 068	1	105	105	50	-3	167	-52.43	0	3	52.55	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	167	-52.43	0	3	38.58	
		Welding Machine	CNP 107	4	99	105	50	-3	167	-52.43	0	3	52.58	59.25
VI	Road P2 U-Trough B CH318-363 (Structure)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	167	-52.43	0	3	50.55	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	167	-52.43	0	3	52.55	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	167	-52.43	0	3	50.57	
		Saw, Circular Wood	CNP 201	2	108	111	50	-3	167	-52.43	0	3	58.57	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	167	-52.43	0	3	43.55	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	167	-52.43	0	3	38.58	
		Welding Machine	CNP 107	4	99	105	50	-3	167	-52.43	0	3	52.58	61.26
VI	Road P2 U-Trough B CH318-363 Road and Drainage Works	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	167	-52.43	0	3	50.55	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	167	-52.43	0	3	52.55	
		Roller, Vibratory	BS D8/30	1	101	101	50	-3	167	-52.43	0	3	48.55	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	167	-52.43	0	3	43.55	
		Light goods vehicle, gross vehicle weight < 5.5 tonne	CNP 143	1	101	101	50	-3	167	-52.43	0	3	48.55	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	167	-52.43	0	3	38.58	
		Dump Truck	CNP 068	1	105	105	50	-3	167	-52.43	0	3	52.55	
		Road Roller	CNP 185	1	108	108	50	-3	167	-52.43	0	3	55.55	
		Welding Machine	CNP 107	4	99	105	50	-3	167	-52.43	0	3	52.58	60.75

Note: SPL = SWL + TF + DC + BC + FC, where

SPL = Predicted noise level in dB(A)

SWL = Sound Power Level in dB(A)

TF = Time factor in dB(A) = 10 log (P)

P = On-time percentage

DC = Distance attenuation correction in dB(A) = -(20 log D + 8)

D = Distance in m between the noise source and the receiver

BC = Barrier correction in dB(A)

FC = Façade correction in dB(A) = 3 dB(A)

CRBC - Build King Joint Venture

Construction Noise Assessment

Period: 0700 to 1900 (except general holidays)

Noise Sensitive Receiver: CM6(Above 39m)

Mitigation Measures Scenario

Noise Criteria: 75dB(A)

Portion	Activity	PME	TM Ref. / other Ref.	No. of plants	SWL	Total SWL	On-time, %	Time Factor	Distance from Notional Sources, m	Distance Attenuation*, dB(A)	Barrier Correction, dB(A)	Façade Correction, dB(A)	Predicted Noise Level, dB(A)	Total Predicted Noise Level for each group, dB(A)
IV	DN2100 SMH9101 - 9108 (Pre-boring) (Scenario 1) - 3 drill rig	Crane (240 kw) (105T)	BS C4/52	3	103	108	50	-3	60	-43.50	-5	3	59.26	
		Drill Rig, Rotary Type (Diesel)	CNP 072	3	110	115	50	-3	60	-43.50	0	3	69.05	
		Air Compressor	CNP 002	6	102	110	50	-3	60	-43.50	-5	3	59.06	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	60	-43.50	-5	3	47.49	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	60	-43.50	-5	3	42.51	
		Breaker, excavator mounted (hydraulic)	CNP 028	1	122	122	50	-3	60	-43.50	-10	3	68.49	72.26
IV	DN2100 SMH9101 - 9108 (Pre-boring) (Scenario 2) - 1 dill rig	Crane (240 kw) (105T)	BS C4/52	1	103	108	50	-3	60	-43.50	-5	3	54.49	
		Drill Rig, Rotary Type (Diesel)	CNP 072	1	110	115	50	-3	60	-43.50	0	3	64.27	
		Air Compressor	CNP 002	2	102	110	50	-3	60	-43.50	-5	3	54.28	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	60	-43.50	-5	3	47.49	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	60	-43.50	-5	3	42.51	
		Breaker, excavator mounted (hydraulic)	CNP 028	1	122	122	50	-3	60	-43.50	-10	3	61.50	66.73
IV	DN2100 SMH9101 - 9108 (Sheet Piling)	Piling, Vibration Hammer	CNP 172	1	115	115	50	-3	60	-43.50	-5	3	64.27	
		Power pack (diesel)	CNP 174	1	100	100	50	-3	60	-43.50	-5	3	49.27	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	60	-43.50	-5	3	42.51	
		Excavator (223 kw) (40T)	BS C4/63	3	105	110	50	-3	60	-43.50	-5	3	61.26	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	60	-43.50	-5	3	56.61	
		Welding Machine	CNP 107	4	99	105	50	-3	60	-43.50	-5	3	56.51	67.01
IV	DN2100 SMH9101 - 9108 (ELS)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	60	-43.50	-5	3	54.49	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	60	-43.50	-5	3	42.51	
		Excavator (223 kw) (40T)	BS C4/63	3	105	110	50	-3	60	-43.50	-5	3	61.26	
		Dump Truck	CNP 068	2	105	108	50	-3	60	-43.50	-5	3	59.50	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	60	-43.50	-5	3	56.61	
		Welding Machine	CNP 107	4	99	105	50	-3	60	-43.50	-5	3	56.51	65.36
IV	Installation of DN2100 and Manhole Construction (Scenario 1)	Crane (240 kw) (105T)	BS C4/52	3	103	108	50	-3	60	-43.50	-5	3	59.26	
		Excavator (223 kw) (40T)	BS C4/63	3	105	110	50	-3	60	-43.50	-5	3	61.26	
		Dump Truck	CNP 068	2	105	108	50	-3	60	-43.50	-5	3	59.50	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	60	-43.50	-5	3	54.50	64.00
IV	Installation of DN2100 and Manhole Construction (Scenario 2)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	60	-43.50	-5	3	54.49	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	60	-43.50	-5	3	56.49	
		Roller, Vibratory	BS D8/30	1	101	101	50	-3	60	-43.50	-5	3	52.49	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	60	-43.50	-5	3	47.49	
		Light goods vehicle, gross vehicle weight < 5.5 tonne	CNP 143	1	101	101	50	-3	60	-43.50	-5	3	52.49	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	60	-43.50	-5	3	42.51	
		Dump Truck	CNP 068	1	105	105	50	-3	60	-43.50	-5	3	56.49	
		Road Roller	CNP 185	1	108	108	50	-3	60	-43.50	-5	3	59.49	63.97
IV	Road P2 Underpass CH105-318, (Non Surcharge & On Top Surcharge)(Pre Drill) (Scenario 1)	G.I. drilling rig	BS C2/43	2	102	105	50	-3	60	-43.50	-5	3	56.50	
		Drill Rig, Rotary Type (Diesel)	CNP 072	1	110	110	50	-3	60	-43.50	-5	3	61.49	
		Air Compressor	CNP 002	1	102	102	50	-3	60	-43.50	-5	3	53.49	63.18
IV	Road P2 Underpass CH105-318, (Non Surcharge & On Top Surcharge)(Pre Drill) (Scenario 2)	G.I. drilling rig	BS C2/43	4	102	108	50	-3	60	-43.50	-5	3	59.51	
		Drill Rig, Rotary Type (Diesel)	CNP 072	1	110	110	50	-3	60	-43.50	-5	3	61.49	
		Air Compressor	CNP 002	1	102	102	50	-3	60	-43.50	-5	3	53.49	64.03
IV	Road P2 Underpass CH105-318, (Non Surcharge & On Top Surcharge)(Piling) (Scenario 1)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	60	-43.50	-5	3	54.49	
		Drill Rig, Rotary Type (Diesel)	CNP 072	2	110	113	50	-3	60	-43.50	0	3	69.50	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	60	-43.50	-5	3	51.49	
		Air Compressor	CNP 002	4	102	108	50	-3	60	-43.50	-5	3	59.51	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	60	-43.50	-5	3	56.49	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	60	-43.50	-5	3	47.49	
		Water pump, submersible (electric)	CNP 283	4	85	91	50	-3	60	-43.50	-5	3	42.51	70.32
IV	Road P2 Underpass CH105-318, (Non Surcharge & On Top Surcharge)(Piling) (Scenario 2)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	60	-43.50	-5	3	54.49	
		Drill Rig, Rotary Type (Diesel)	CNP 072	3	110	115	50	-3	60	-43.50	0	3	71.26	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	60	-43.50	-5	3	51.49	
		Air Compressor	CNP 002	6	102	110	50	-3	60	-43.50	-5	3	61.27	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	60	-43.50	-5	3	56.49	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	60	-43.50	-5	3	47.49	
		Water pump, submersible (electric)	CNP 283	4	85	91	50	-3	60	-43.50	-5	3	42.51	71.95
IV	Road P2 Underpass CH103.5 (Sheet Piling)	Piling, Vibration Hammer	CNP 172	1	115	115	50	-3	60	-43.50	-5	3	66.49	
		Power pack (diesel)	CNP 174	1	100	100	50	-3	60	-43.50	0	3	56.49	
		Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	60	-43.50	0	3	59.49	67.63
V	Road P2 U-Trough B CH318-363 (Pre-boring) (Scenario 1)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	150	-51.53	0	3	51.73	
		Drill Rig, Rotary Type (Diesel)	CNP 072	1	110	110	50	-3	150	-51.53	-5	3	53.73	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	150	-51.53	0	3	48.73	
		Air Compressor	CNP 002	2	102	105	50	-3	150	-51.53	-5	3	48.74	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	150	-51.53	0	3	53.73	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	150	-51.53	0	3	44.73	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	150	-51.53	0	3	39.75	
		Breaker, excavator mounted (hydraulic)	CNP 028	1	122	122	50	-3	150	-51.53	-10	3	60.73	62.99
V	Road P2 U-Trough B CH318-363 (Pre-boring) (Scenario 2)	Crane (240 kw) (105T)	BS C4/52	2	103	106	50	-3	150	-51.53	0	3	54.74	
		Drill Rig, Rotary Type (Diesel)	CNP 072	2	110	113	50	-3	150	-51.53	-5	3	54.52	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	150	-51.53	0	3	48.73	
		Air Compressor	CNP 002	4	102	108	50	-3	150	-51.53	-5	3	49.53	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	150	-51.53	0	3	53.73	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	150	-51.53	0	3	44.73	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	150	-51.53	0	3	39.75	60.09
V	Road P2 U-Trough B CH318-363 (Sheet Piling)	Piling, Vibration Hammer	CNP 172	1	115	115	50	-3	150	-51.53	-5	3	58.73	
		Power pack (diesel)	CNP 174	1	100	100	50	-3	150	-51.53	0	3	43.73	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	150	-51.53	0	3	39.75	58.92
V	Road P2 U-Trough B CH318-363 (ELS)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	150	-51.53	0	3	51.73	
		Excavator (223 kw) (40T)	BS C4/63	2	105	108	50	-3	150	-51.53	0	3	56.74	
		Dump Truck	CNP 068	1	105	105	50	-3	150	-51.53	0	3	53.73	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	150	-51.53	0	3	39.75	
		Welding Machine	CNP 107	4	99	105	50	-3	150	-51.53	0	3	53.75	60.43
V	Road P2 U-Trough B CH318-363 (Structure)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	150	-51.53	0	3	51.73	
		Excavator (223 kw) (40T)	BS C4/63	2	105	108	50	-3	150	-51.53	0	3	56.74	
		Dump Truck	CNP 068	1	105	105	50	-3	150	-51.53	0	3	53.73	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	150	-51.53	0	3	51.74	
		Saw, Circular Wood	CNP 201	2	108	111	50	-3	150	-51.53	0	3	59.74	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	150	-51.53	0	3	44.73	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	150	-51.53	0	3	39.75	
														62.98
V	Road P2 U-Trough B CH318-363 Road and Drainage Works	Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	150	-51.53	0	3	53.73	
		Roller, Vibratory	BS D8/30	1	101	101	50	-3	150	-51.53	0	3	49.73	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	150	-51.53	0	3	44.73	
		Light goods vehicle, gross vehicle weight < 5.5 tonne	CNP 143	1	101	101	50	-3	150	-51.53	0	3	49.73	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	150	-51.53	0	3	39.75	
		Dump Truck	CNP 068	1	105	105	50	-3	150	-51.53	0	3	53.73	
		Road Roller	CNP 185	1	108	108	50	-3	150	-51.53	0	3	56.73	60.68
V	Modification of Vertical Seawall	Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	150	-51.53	0	3	53.46	
		Drill Rig, Rotary Type (Diesel)	CNP 072	1	110	101	50	-3	150	-51.53	0	3	58.46	
		Derrick Barge	CNP 061	1	104	96	50	-3	150	-51.53	0	3	52.46	60.41
VII	DN2100 SMH9108-Outfall (Pre-boring)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	124	-49.89	0	3	53.10	
		Drill Rig, Rotary Type (Diesel)	CNP 072	1	110	110	50	-3	124	-49.89	0	3	60.10	
		Air Compressor	CNP 002	2	102	105	50	-3	124	-49.89	0	3	55.11	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	124	-49.89	0	3	55.10	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	124	-49.89	0	3	46.10	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	124	-49.89	0	3	41.12	62.86
VII	DN2100 SMH9108-Outfall (Sheet Piling)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	124	-49.89	0	3	53.10	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	124	-49.89	0	3	50.10	
		Breaker, excavator mounted (hydraulic)	CNP 028	1	122	122	50	-3	124	-49.89	0	3	72.10	
		Piling, Vibration Hammer	CNP 172	1	115	115	50	-3	124	-49.89	0	3	65.10	
		Power pack (diesel)	CNP 174	1	100	100	50	-3	124	-49.89	0	3	50.10	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	124	-49.89	0	3	55.10	
		Dump Truck	CNP 068	1	105	105	50	-3	124	-49.89	0	3	55.10	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	124	-49.89	0	3	41.12	73.12
VII	Installation of DN2100 and Manhole Construction and Outfall Installation	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	124	-49.89	0	3	53.10	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	124	-49.89	0	3	55.10	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	124	-49.89	0	3	46.10	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	124	-49.89	0	3	41.12	
		Road Roller	CNP 185	1	108	108	50	-3	124	-49.89	0	3	58.10	60.89
VII	U Trough A&B S200 CH890 - CH980 (Pre Drill)	G.I. drilling rig	BS C2/43	1	102	102	50	-3	124	-49.89	0	3	52.10	52.10
VII	U Trough A&B S200 CH890 - CH980 (Piling)	Drill Rig, Rotary Type (Diesel)	CNP 072	2	110	113	50	-3	124	-49.89	-5	3	58.11	
		Air Compressor	CNP 002	4	102	108	50	-3	124	-49.89	0	3	58.12	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	124	-49.89	0	3	55.10	62.1
VII	U Trough A&B S200 CH890 - CH980 (Sheet Piling)	Piling, Vibration Hammer	CNP 172	1	115	115	50	-3	124	-49.89	-5	3	60.10	
		Power pack (diesel)	CNP 174	1	100	100	50	-3	124	-49.89	0	3	50.10	
		Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	124	-49.89	0	3	53.10	61.24
IX	Seawall Construction	Dredger	CNP 070	2	103	106	50	-3	228	-55.17	0	3	50.83	
		Derrick Barge	CNP 061	4	104	110	50	-3	228	-55.17	-5	3	49.84	
		Tug boat	CNP 221	1	110	110	50	-3	228	-55.17	0	3	54.82	
		Water pump, subersible (electric)	CNP 283	6	85	93	50	-3	228	-55.17	0	3	37.60	
		Dump Truck	CNP 068	1	105	105	50	-3	228	-55.17	0	3	49.82	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	228	-55.17	0	3	47.83	
		Winch (Electric)	CNP 262	4	95	101	50	-3	228	-55.17	-5	3	40.84	
		Excavator (223 kw) (40T)	BS C4/63	3	105	110	50	-3	228	-55.17	0	3	54.59	
		Vibration Hammer	CNP 172	1	115	115	50	-3	228	-55.17	0	3	59.82	
		Breaker, excavator mounted (hydraulic)	CNP 028	3	122	127	50	-3	228	-55.17	-10	3	61.70	
		Ro-Ro Barge	-	1	-	-	50	-3	228	-55.17	-	3	-	
		Hopper barge	-	6	-	-	50	-3	228	-55.17	0	3	-	65.41
IX	Steel Cofferdam and Water Gate Installation	Derrick Barge	CNP 061	3	104	109	50	-3	228	-55.17	0	3	60.19	
		Tug boat	CNP 221	2	110	113	50	-3	228	-55.17	0	3	64.43	65.82
IX	Marine Ground Treatment	Band Drain Machine (hydarulic Vibratory lance starting up)	BS D4/107a	2	113	116	50	-3	228	-55.17	-5	3	55.83	55.83

Note: SPL = SWL + TF + DC + BC + FC, where

SPL = Predicted noise level in dB(A)

SWL = Sound Power Level in dB(A)

TF = Time factor in dB(A) = 10 log (P)

P = On-time percentage

DC = Distance attenuation correction in dB(A) = -(20 log D + 8)

D = Distance in m between the noise source and the receiver

BC = Barrier correction in dB(A)

FC = Façade correction in dB(A) = 3 dB(A)

CRBC - Build King Joint Venture

Construction Noise Assessment

Period: 0700 to 1900 (except general holidays)

Noise Sensitive Receiver: CM6(Above 39m)

Noise Criteria: 75dB(A)

Mitigation Measures Scenario

Portion	Activity	PME	TM Ref. / other Ref.	No. of plants	SWL	Total SWL	On-time, %	Time Factor	Distance from Notional Sources, m	Distance Attenuation*,dB(A)	Barrier Correction, dB(A)	Façade Correction, dB(A)	Predicted Noise Level, dB(A)	Total Predicted Noise Level for each group, dB(A)
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Backfilling)	Road Roller	CNP 185	1	108	108	50	-3	228	-55.17	0	3	52.82	
		Excavator (223 kw) (40T)	BS C4/63	2	105	108	50	-3	228	-55.17	0	3	52.83	55.83
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888(Pre Drill) (Scenario 1)	G.I. drilling rig	BS C2/43	2	102	105	50	-3	228	-55.17	0	3	49.83	49.83
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888(Pre Drill) (Scenario 2)	G.I. drilling rig	BS C2/43	3	102	107	50	-3	228	-55.17	0	3	51.59	51.59
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888(Pre Drill) (Scenario 3)	G.I. drilling rig	BS C2/43	4	102	108	50	-3	228	-55.17	0	3	52.84	52.84
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888(Pre Drill) (Scenario 4)	G.I. drilling rig	BS C2/43	5	102	109	50	-3	228	-55.17	0	3	53.81	53.81
IX	Road P2 Underpass CH105-318 (Removal of Temporary 1500 Drain)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	228	-55.17	0	3	47.81	
		Piling, large diameter bored, oscillator	CNP 165	1	115	115	50	-3	228	-55.17	0	3	59.81	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	228	-55.17	0	3	44.81	
		Water pump, subersible (electric)	CNP 283	2	85	88	50	-3	228	-55.17	0	3	32.82	60.21
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 1)	Crane (240 kw) (105T)	BS C4/52	2	103	106	50	-3	228	-55.17	0	3	50.83	
		Drill Rig, Rotary Type (Diesel)	CNP 072	2	110	113	50	-3	228	-55.17	-5	3	52.83	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	228	-55.17	0	3	47.83	
		Air Compressor	CNP 002	4	102	108	50	-3	228	-55.17	0	3	52.84	
		Excavator (223 kw) (40T)	BS C4/63	3	105	110	50	-3	228	-55.17	0	3	54.59	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	228	-55.17	0	3	40.82	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	228	-55.17	0	3	35.84	
		Dump Truck	CNP 068	1	105	105	50	-3	228	-55.17	0	3	49.82	
		Welding Machine	CNP 107	2	99	102	50	-3	228	-55.17	0	3	46.83	60.06
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 2)	Crane (240 kw) (105T)	BS C4/52	6	103	111	50	-3	228	-55.17	0	3	55.60	
		Drill Rig, Rotary Type (Diesel)	CNP 072	6	110	118	50	-3	228	-55.17	-5	3	57.60	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	6	100	108	50	-3	228	-55.17	0	3	52.60	
		Air Compressor	CNP 002	12	102	113	50	-3	228	-55.17	0	3	57.61	
		Excavator (223 kw) (40T)	BS C4/63	4	105	111	50	-3	228	-55.17	0	3	55.84	
		Concrete Lorry Mixer	BS D6/33	2	96	99	50	-3	228	-55.17	0	3	43.83	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	228	-55.17	0	3	35.84	
		Dump Truck	CNP 068	3	105	110	50	-3	228	-55.17	0	3	54.59	
		Welding Machine	CNP 107	4	99	105	50	-3	228	-55.17	0	3	49.84	63.97
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 3)	Crane (240 kw) (105T)	BS C4/52	7	103	111	50	-3	228	-55.17	0	3	56.27	
		Drill Rig, Rotary Type (Diesel)	CNP 072	7	110	118	50	-3	228	-55.17	-5	3	58.27	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	7	100	108	50	-3	228	-55.17	0	3	53.27	
		Air Compressor	CNP 002	14	102	113	50	-3	228	-55.17	0	3	58.28	
		Excavator (223 kw) (40T)	BS C4/63	4	105	111	50	-3	228	-55.17	0	3	55.84	
		Concrete Lorry Mixer	BS D6/33	4	96	102	50	-3	228	-55.17	0	3	46.84	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	228	-55.17	0	3	35.84	
		Dump Truck	CNP 068	4	105	111	50	-3	228	-55.17	0	3	55.84	
		Welding Machine	CNP 107	7	99	107	50	-3	228	-55.17	0	3	52.27	64.72
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 4)	Crane (240 kw) (105T)	BS C4/52	8	103	112	50	-3	228	-55.17	0	3	56.85	
		Drill Rig, Rotary Type (Diesel)	CNP 072	8	110	119	50	-3	228	-55.17	-5	3	58.85	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	8	100	109	50	-3	228	-55.17	0	3	53.85	
		Air Compressor	CNP 002	16	102	114	50	-3	228	-55.17	0	3	58.86	
		Excavator (223 kw) (40T)	BS C4/63	6	105	113	50	-3	228	-55.17	0	3	57.60	
		Concrete Lorry Mixer	BS D6/33	6	96	104	50	-3	228	-55.17	0	3	48.60	
		Water pump, subersible (electric)	CNP 283	8	85	94	50	-3	228	-55.17	0	3	38.85	
		Dump Truck	CNP 068	6	105	113	50	-3	228	-55.17	0	3	57.60	
		Welding Machine	CNP 107	8	99	108	50	-3	228	-55.17	0	3	52.85	65.67
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 5)	Crane (240 kw) (105T)	BS C4/52	9	103	113	50	-3	228	-55.17	0	3	57.36	
		Drill Rig, Rotary Type (Diesel)	CNP 072	9	110	120	50	-3	228	-55.17	-5	3	59.36	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	9	100	110	50	-3	228	-55.17	0	3	54.36	
		Air Compressor	CNP 002	18	102	115	50	-3	228	-55.17	0	3	59.37	
		Excavator (223 kw) (40T)	BS C4/63	6	105	113	50	-3	228	-55.17	0	3	57.60	
		Concrete Lorry Mixer	BS D6/33	6	96	104	50	-3	228	-55.17	0	3	48.60	
		Water pump, subersible (electric)	CNP 283	9	85	95	50	-3	228	-55.17	0	3	39.36	
		Dump Truck	CNP 068	6	105	113	50	-3	228	-55.17	0	3	57.60	
		Welding Machine	CNP 107	9	99	109	50	-3	228	-55.17	0	3	53.36	66.01
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 6)	Crane (240 kw) (105T)	BS C4/52	12	103	114	50	-3	228	-55.17	0	3	58.61	
		Drill Rig, Rotary Type (Diesel)	CNP 072	12	110	121	50	-3	228	-55.17	-5	3	60.61	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	8	100	109	50	-3	228	-55.17	0	3	53.85	
		Air Compressor	CNP 002	24	102	116	50	-3	228	-55.17	0	3	60.62	
		Excavator (223 kw) (40T)	BS C4/63	6	105	113	50	-3	228	-55.17	0	3	57.60	
		Concrete Lorry Mixer	BS D6/33	6	96	104	50	-3	228	-55.17	0	3	48.60	
		Water pump, subersible (electric)	CNP 283	8	85	94	50	-3	228	-55.17	0	3	38.85	
		Dump Truck	CNP 068	6	105	113	50	-3	228	-55.17	0	3	57.60	
		Welding Machine	CNP 107	8	99	108	50	-3	228	-55.17	0	3	52.85	66.72
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 7)	Crane (240 kw) (105T)	BS C4/52	15	103	115	50	-3	228	-55.17	0	3	59.58	
		Drill Rig, Rotary Type (Diesel)	CNP 072	15	110	122	50	-3	228	-55.17	-5	3	61.58	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	10	100	110	50	-3	228	-55.17	0	3	54.82	
		Air Compressor	CNP 002	30	102	117	50	-3	228	-55.17	0	3	61.59	
		Excavator (223 kw) (40T)	BS C4/63	10	105	115	50	-3	228	-55.17	0	3	59.82	
		Concrete Lorry Mixer	BS D6/33	8	96	105	50	-3	228	-55.17	0	3	49.85	
		Water pump, subersible (electric)	CNP 283	15	85	97	50	-3	228	-55.17	0	3	41.58	
		Dump Truck	CNP 068	8	105	114	50	-3	228	-55.17	0	3	58.85	
		Welding Machine	CNP 107	12	99	110	50	-3	228	-55.17	0	3	54.61	67.94
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Installation of Dewatering System)	Drill Rig, Rotary Type (Diesel)	CNP 072	2	110	113	50	-3	228	-55.17	-5	3	52.83	
		Air Compressor	CNP 002	2	102	105	50	-3	228	-55.17	0	3	49.83	54.59
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (ELS) (Sheet Piling) (Scenario 1)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	228	-55.17	0	3	47.82	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	228	-55.17	0	3	44.82	
		Piling, Vibration Hammer	CNP 172	1	115	115	50	-3	228	-55.17	0	3	59.82	
		Power pack (diesel)	CNP 174	1	100	100	50	-3	228	-55.17	0	3	44.82	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	228	-55.17	0	3	35.84	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	228	-55.17	0	3	49.82	
		Welding Machine	CNP 107	4	99	105	50	-3	228	-55.17	0	3	49.84	61.06
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (ELS) (Sheet Piling) (Scenario 2)	Crane (240 kw) (105T)	BS C4/52	2	103	106	50	-3	228	-55.17	0	3	50.83	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	228	-55.17	0	3	47.83	
		Piling, Vibration Hammer	CNP 172	2	115	118	50	-3	228	-55.17	0	3	62.83	
		Power pack (diesel)	CNP 174	2	100	103	50	-3	228	-55.17	0	3	47.83	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	228	-55.17	0	3	35.84	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	228	-55.17	0	3	49.82	
		Welding Machine	CNP 107	4	99	105	50	-3	228	-55.17	0	3	49.84	63.72
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (ELS) (Welding & Excavation) (Scenario 1)	Crane (240 kw) (105T)	BS C4/52	2	103	106	50	-3	228	-55.17	0	3	50.83	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	228	-55.17	0	3	47.83	
		Excavator (223 kw) (40T)	BS C4/63	2	105	108	50	-3	228	-55.17	0	3	52.83	
		Dump Truck	CNP 068	2	105	108	50	-3	228	-55.17	0	3	52.83	
		Water pump, subersible (electric)	CNP 283	5	85	92	50	-3	228	-55.17	0	3	36.81	
		Welding Machine	CNP 107	2	99	102	50	-3	228	-55.17	0	3	46.83	
		Derrick Barge	CNP 061	1	104	104	50	-3	228	-55.17	0	3	48.82	58.42
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (ELS) (Welding & Excavation) (Scenario 2)	Crane (240 kw) (105T)	BS C4/52	4	103	109	50	-3	228	-55.17	0	3	53.84	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	4	100	106	50	-3	228	-55.17	0	3	50.84	
		Excavator (223 kw) (40T)	BS C4/63	4	105	111	50	-3	228	-55.17	0	3	55.84	
		Dump Truck	CNP 068	2	105	108	50	-3	228	-55.17	0	3	52.83	
		Water pump, subersible (electric)	CNP 283	20	85	98	50	-3	228	-55.17	0	3	42.83	
		Welding Machine	CNP 107	4	99	105	50	-3	228	-55.17	0	3	49.84	
		Derrick Barge	CNP 061	2	104	107	50	-3	228	-55.17	0	3	51.83	60.82
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Structure) (Scenario 1)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	228	-55.17	0	3	47.82	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	228	-55.17	0	3	44.82	
		Air Blower	CNP 006	1	95	95	50	-3	228	-55.17	0	3	39.82	
		Saw, Circular Wood	CNP 201	1	108	108	50	-3	228	-55.17	0	3	52.82	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	228	-55.17	0	3	40.82	
		Concrete pump, stationary/lorry mounted	CNP 047	1	109	109	50	-3	228	-55.17	0	3	53.82	
		Poker, vibratory, hand-held	CNP 170	1	113	113	50	-3	228	-55.17	0	3	57.82	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	228	-55.17	0	3	35.84	60.62
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Structure) (Scenario 2)	Crane (240 kw) (105T)	BS C4/52	3	103	108	50	-3	228	-55.17	0	3	52.59	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	3	100	105	50	-3	228	-55.17	0	3	49.59	
		Air Blower	CNP 006	3	95	100	50	-3	228	-55.17	0	3	44.59	
		Saw, Circular Wood	CNP 201	3	108	113	50	-3	228	-55.17	0	3	57.59	
		Concrete Lorry Mixer	BS D6/33	3	96	101	50	-3	228	-55.17	0	3	45.59	
		Concrete pump, stationary/lorry mounted	CNP 047	3	109	114	50	-3	228	-55.17	0	3	58.59	
		Poker, vibratory, hand-held	CNP 170	3	113	118	50	-3	228	-55.17	0	3	62.59	
		Water pump, subersible (electric)	CNP 283	6	85	93	50	-3	228	-55.17	0	3	37.60	65.38
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Structure) (Scenario 3)	Crane (240 kw) (105T)	BS C4/52	5	103	110	50	-3	228	-55.17	0	3	54.81	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	5	100	107	50	-3	228	-55.17	0	3	51.81	
		Air Blower	CNP 006	5	95	102	50	-3	228	-55.17	0	3	46.81	
		Saw, Circular Wood	CNP 201	5	108	115	50	-3	228	-55.17	0	3	59.81	
		Concrete Lorry Mixer	BS D6/33	5	96	103	50	-3	228	-55.17	0	3	47.81	
		Concrete pump, stationary/lorry mounted	CNP 047	5	109	116	50	-3	228	-55.17	0	3	60.81	
		Poker, vibratory, hand-held	CNP 170	5	113	120	50	-3	228	-55.17	0	3	64.81	
		Water pump, subersible (electric)	CNP 283	6	85	93	50	-3	228	-55.17	0	3	37.60	67.6
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Structure) (Scenario 4)	Crane (240 kw) (105T)	BS C4/52	6	103	111	50	-3	228	-55.17	0	3	55.60	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	6	100	108	50	-3	228	-55.17	0	3	52.60	
		Air Blower	CNP 006	6	95	103	50	-3	228	-55.17	0	3	47.60	
		Saw, Circular Wood	CNP 201	6	108	116	50	-3	228	-55.17	0	3	60.60	
		Concrete Lorry Mixer	BS D6/33	6	96	104	50	-3	228	-55.17	0	3	48.60	
		Concrete pump, stationary/lorry mounted	CNP 047	6	109	117	50	-3	228	-55.17	0	3	61.60	
		Poker, vibratory, hand-held	CNP 170	6	113	121	50	-3	228	-55.17	0	3	65.60	
		Water pump, subersible (electric)	CNP 283	6	85	93	50	-3	228	-55.17	0	3	37.60	68.39
IX	U - Trough (Road and Drainage Works)	Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	228	-55.17	0	3	49.82	
		Roller, Vibratory	BS D8/30	1	101	101	50	-3	228	-55.17	0	3	45.82	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	228	-55.17	0	3	40.82	
		Light goods vehicle, gross vehicle weight < 5.5 tonne	CNP 143	1	101	101	50	-3	228	-55.17	0	3	45.82	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	228	-55.17	0	3	35.84	
		Dump Truck	CNP 068	1	105	105	50	-3	228	-55.17	0	3	49.82	
		Road Roller	CNP 185	1	108	108	50	-3	228	-55.17	0	3	52.82	56.77

Note: SPL = SWL + TF + DC + BC + FC, where

SPL = Predicted noise level in dB(A)

SWL = Sound Power Level in dB(A)

TF = Time factor in dB(A) = 10 log (P)

P = On-time percentage

DC = Distance attenuation correction in dB(A) = -(20 log D + 8)

D = Distance in m between the noise source and the receiver

BC = Barrier correction in dB(A)

FC = Façade correction in dB(A) = 3 dB(A)

NE/2015/02
Associated Cumulative Noise Levels

NSR CM6 (Above 39m)

Portion	Activity	2018				2019												2020												2021			
		Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
I	DSD Transformer Room																																
IV	DN2100 SMH9101 - 9108 (Pre-boring) (Scenario 1) - 3 drill rig																																
IV	DN2100 SMH9101 - 9108 (Pre-boring) (Scenario 2) - 1 dill rig	66.7	66.7	66.7																													
IV	DN2100 SMH9101 - 9108 (Sheet Piling)	67.0	67.0	67.0	67.0																												
IV	DN2100 SMH9101 - 9108 (ELS)	65.4	65.4	65.4	65.4	65.4																											
IV	Installation of DN2100 and Manhole Construction (Scenario 1)	64.0	64.0	64.0	64.0																												
IV	Installation of DN2100 and Manhole Construction (Scenario 2)					64.0	64.0	64.0																									
IV	Road P2 Underpass CH105-318, (Non Surcharge & On Top Surcharge) (Pre Drill) (Scenario 1) - 2 G.I. Rig				63.2		63.2	63.2																									
IV	Road P2 Underpass CH105-318, (Non Surcharge & On Top Surcharge) (Pre Drill) (Scenario 2) - 4 G.I. Rig					64.0																											
IV	Road P2 Underpass CH105-318, (Non Surcharge & On Top Surcharge) (Piling) (Scenario 1) - 2 Drill Rig													70.3	70.3																		
IV	Road P2 Underpass CH105-318, (Non Surcharge & On Top Surcharge) (Piling) (Scenario 2) - 3 Drill Rig							72.0	72.0	72.0	72.0	72.0	72.0																				
IV	Road P2 Underpass CH103.5 (Sheet Piling)													67.6	67.6																		
V	Road P2 U-Trough B CH318-363 (Pre-boring) (Scenario 1) - Drill Rig																																
V	Road P2 U-Trough B CH318-363 (Pre-boring) (Scenario 2) - 2 Drill Rig	59.8	59.8	59.8																													
V	Road P2 U-Trough B CH318-363 (Sheet Piling)	58.7	58.7	58.7	58.7	58.7																											
V	Road P2 U-Trough B CH318-363 (ELS)		60.2	60.2	60.2																												
V	Road P2 U-Trough B CH318-363 (Structure)					62.7	62.7	62.7	62.7	62.7	62.7	62.7	62.7	62.7																				
V	Road P2 U-Trough B CH318-363 Road and Drainage Works							60.4	60.4	60.4	60.4	60.4	60.4	60.4																				
V	Modification of Vertical Seawall										60.4	60.4	60.4	60.4	60.4	60.4	60.4																
VI	Road P2 U-Trough B CH318-363 (Removal of Existing Abandoned Box Culvert)																																
VI	Road P2 U-Trough B CH318-363 (Installation of Dewatering System)	59.1	59.1	59.1	59.1	59.1																											
VI	Road P2 U-Trough B CH318-363 (Preboring) (Scenario 1)																																
VI	Road P2 U-Trough B CH318-363 (Preboring) (Scenario 2)	60.4																															
VI	Road P2 U-Trough B CH318-363 (Sheet Piling)	58.9																															
VI	Road P2 U-Trough B CH318-363 (ELS)		59.3	59.3	59.3																												
VI	Road P2 U-Trough B CH318-363 (Structure)					61.3	61.3	61.3	61.3	61.3	61.3	61.3	61.3	61.3																				
VI	Road P2 U-Trough B CH318-363 Road and Drainage Works							60.8	60.8	60.8	60.8	60.8	60.8	60.8																				
VII	DN2100 SMH9108-Outfall (Pre-boring)																																
VII	DN2100 SMH9108-Outfall (Sheet Piling)																																
VII	Installation of DN2100 and Manhole Construction and Outfall Installation	60.9	60.9	60.9	60.9	60.9	60.9																										
VII	U Trough A&B S200 CH890 - CH980 (Pre Drill)												52.1	52.1	52.1	52.1																	
VII	U Trough A&B S200 CH890 - CH980 (Piling)												62.1	62.1	62.1	62.1	62.1																
VII	Road P2 Underpass CH103.5 (Sheet Piling)														61.2	61.2	61.2																
IX	Steel Cofferdam & Water Gate Installation																																
IX	Seawall Construction	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4												
IX	Marine Ground Treatment	55.8	55.8	55.8	55.8	55.8	55.8																										
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Backfilling)	55.8	55.8	55.8	55.8	55.8	55.8																										
IX	Road P2 Underpass CH105-318, (Removal of Temporary 1500 Drain)								60.2	60.2																							
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888(Pre Drill) (Scenario 1) - 2 G.I Rig									49.8			49.8	49.8						49.8	49.8	49.8	49.8										
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888(Pre Drill) (Scenario 2) - 3 G.I. Rig							51.6										51.6	51.6														
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888(Pre Drill) (Scenario 3) - 4 G.I. Rig					52.8																											
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888(Pre Drill) (Scenario 4) - 5 G.I. Rig						53.8					53.8			53.8	53.8	53.8																
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 1) - 2 Drill Rig					60.1	60.1																										
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 2) - 6 Drill Rig													64.0	64.0																		
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 3) - 7 Drill Rig															64.7	64.7	64.7	64.7														
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 4) - 8 Drill Rig											65.7	65.7																				
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 5) - 9 Drill Rig																			66.0	66.0	66.0	66.0	66.0									
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 6) - 12 Drill Rig									66.7																							
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 7) - 15 Drill Rig										67.9																						
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Installation of Dewatering System)											54.6	54.6																				
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (ELS) (Sheet Piling) (Scenario 1) - 1 Vibration hammer						61.1																										
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (ELS) (Sheet Piling) (Scenario 2) - 2 Vibration hammer							63.7	63.7	63.7			63.7	63.7	63.7	63.7	63.7	63.7	63.7	63.7													
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (ELS) (Welding & Excavation) (Scenario 1)											58.4	58.4	58.4	58.4	58.4	58.4			58.4													
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (ELS) (Welding & Excavation) (Scenario 2)																	60.8	60.8														
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Structure) (Scenario 1) - 1 Set																												60.6				
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Structure) (Scenario 2) - 3 Set																											65.4					
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Structure) (Scenario 3) - 5 Set																		67.6	67.6	67.6		67.6	67.6	67.6	67.6	67.6						
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Structure) (Scenario 4) - 6 Set																				68.4												
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888Road and Drainage Works																										56.8	56.8	56.8	56.8	56.8	56.8	56.8
	Cumulative Noise / dB(A)	74	74	74	73	73	72	75	74	75	75	75	75	75	75	71	71	70	72	72	71	70	70	70	68	68	68	66	62	57	57	57	57
		Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
		2018				2019												2020												2021			

Note: Regarding to the noise assessment before Sept 2018 (Refer to previous revision for the details of noise assessment)

APPENDIX T
CULTURAL HERITAGE MONITORING RESULTS

Appendix T – Cultural Heritage Monitoring Results

Date	Tilting				Settlement (mm)			Vibration (mm/s)		
								Measurement Direction		
	THT-TM-01	THT-TM-02	THT-TM-03	THT-TM-04	THT-BSP-1	THT-BSP-2	THT-BSP-3	Tran	Vertical	Longitudinal
2-Dec-19	1 : 26469	-1 : 8490	1 : 4091	1 : 18000	+5	Stop monitoring	Stop monitoring	0.126	0.142	0.095
3-Dec-19	1 : 19564	-1 : 10227	1 : 3435	1 : 34615	+5	Stop monitoring	Stop monitoring	0.197	0.134	0.181
4-Dec-19	1 : 10227	-1 : 11842	1 : 3516	1 : 64285	+5	Stop monitoring	Stop monitoring	0.134	0.166	0.102
5-Dec-19	1 : 17306	-1 : 14062	1 : 2960	1 : 18000	+4	Stop monitoring	Stop monitoring	0.126	0.126	0.110
6-Dec-19	1 : 10975	-1 : 26469	1 : 3285	1 : 12162	+6	Stop monitoring	Stop monitoring	0.134	0.134	0.110
7-Dec-19	1 : 15516	-1 : 40907	1 : 3147	1 : 10465	+4	Stop monitoring	Stop monitoring	0.126	0.197	0.102
9-Dec-19	-1 : 64281	1 : 34614	1 : 2848	1 : 20454	+5	Stop monitoring	Stop monitoring	0.134	0.166	0.102
10-Dec-19	1 : 89993	1 : 17999	1 : 2960	1 : 34615	+4	Stop monitoring	Stop monitoring	0.126	0.110	0.087
11-Dec-19	1 : 224983	1 : 16071	1 : 2795	1 : 16071	+6	Stop monitoring	Stop monitoring	0.126	0.150	0.095
12-Dec-19	-1 : 449967	1 : 12162	1 : 2744	1 : 12162	+4	Stop monitoring	Stop monitoring	0.126	0.134	0.095
13-Dec-19	1 : 32140	1 : 23683	1 : 3020	1 : 18000	+6	Stop monitoring	Stop monitoring	0.134	0.110	0.102
14-Dec-19	1 : 19564	1 : 13235	1 : 2960	1 : 10465	+5	Stop monitoring	Stop monitoring	0.134	0.110	0.126
16-Dec-19	1 : 10975	1 : 11250	1 : 3435	1 : 16071	+6	Stop monitoring	Stop monitoring	0.213	0.221	0.252
17-Dec-19	1 : 8999	1 : 17999	1 : 3214	1 : 14516	+4	Stop monitoring	Stop monitoring	0.173	0.173	0.150
18-Dec-19	1 : 6338	1 : 34614	1 : 3147	1 : 10465	+6	Stop monitoring	Stop monitoring	0.189	0.189	0.166
19-Dec-19	1 : 5844	1 : 449981	1 : 3285	1 : 8182	+5	Stop monitoring	Stop monitoring	0.181	0.189	0.126
20-Dec-19	1 : 12856	-1 : 40907	1 : 3600	1 : 12162	+4	Stop monitoring	Stop monitoring	0.134	0.142	0.102

Date	Tilting				Settlement (mm)			Vibration (mm/s)		
								Measurement Direction		
	THT-TM-01	THT-TM-02	THT-TM-03	THT-TM-04	THT-BSP-1	THT-BSP-2	THT-BSP-3	Tran	Vertical	Longitudinal
21-Dec-19	1 : 19564	-1 : 19564	1 : 3688	1 : 23684	+6	Stop monitoring	Stop monitoring	0.181	0.166	0.102
23-Dec-19	1 : 17306	-1 : 56248	1 : 3982	1 : 14516	+6	Stop monitoring	Stop monitoring	0.166	0.252	0.142
24-Dec-19	1 : 26469	-1 : 26469	1 : 4592	1 : 10465	+6	Stop monitoring	Stop monitoring	0.134	0.126	0.110
27-Dec-19	1 : 11841	1 : 13235	1 : 3688	1 : 6716	+5	Stop monitoring	Stop monitoring	0.126	0.189	0.095
28-Dec-19	1 : 8035	1 : 449981	1 : 3358	1 : 7377	+4	Stop monitoring	Stop monitoring	0.126	0.118	0.102
30-Dec-19	1 : 12856	1 : 11250	1 : 2960	1 : 12162	+4	Stop monitoring	Stop monitoring	0.166	0.150	0.102
31-Dec-19	1 : 8490	1 : 14516	1 : 3082	1 : 14516	+5	Stop monitoring	Stop monitoring	0.166	0.236	0.126
Alert Level	1:2000				6			4.5		
Alarm Level	1:1500				8			4.8		
Action Level	1:1000				10			5		

Note:
Bold means Alert Level exceedance
Bold Italic means Alarm Level exceedance
Bold Italic with underline means Action Level exceedance

APPENDIX U
PIEZOMETER MONITORING RESULTS

Construction Phase Daily Piezometer Monitoring Results in December 2019

Date	Daily Piezometer Monitoring	
	38568-LDH1 (P)	**TKO-LBH907**
2-Dec-19	87.65	n.a.
3-Dec-19	n.a.	
4-Dec-19	n.a.	
5-Dec-19	n.a.	
6-Dec-19	n.a.	
7-Dec-19	n.a.	
9-Dec-19	n.a.	
10-Dec-19	n.a.	
11-Dec-19	n.a.	
12-Dec-19	n.a.	
13-Dec-19	n.a.	
14-Dec-19	n.a.	
16-Dec-19	n.a.	
17-Dec-19	n.a.	
18-Dec-19	n.a.	
19-Dec-19	n.a.	
20-Dec-19	n.a.	
21-Dec-19	n.a.	
23-Dec-19	n.a.	
24-Dec-19	n.a.	
27-Dec-19	n.a.	
28-Dec-19	n.a.	
30-Dec-19	n.a.	
31-Dec-19	n.a.	
Action Level (mPD)	+74.65	+17.59

Note:
Bold Italic with underline means Action Level exceedance
n.a – The daily ground water level monitoring was not required as the tunnel construction activities were conducted out of +/- 50m of the piezometer gate.