


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 April 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.

CINOTECH CONSULTANTS LTD

Room 1710, Technology Park,
18 On Lai Street,

Shatin, NT, Hong Kong

Tel: (852) 2151 2083 Fax: (852) 3107

1388

Email: info@cinotech.com.hk



Civil Engineering and Development Department
New Territories East Development Office
Suite 1213, Chinachem Golden Plaza
77 Mody Road
Tsimshatsui
Kowloon

Your reference:

Our reference: HKCEDD08/50/105763

Date: 15 May 2019

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 April 2019 (version 1.0)

We refer to emails of 8, 10 and 14 May 2019 from Cinotech Consultants Limited attaching the Monthly Environmental Monitoring and Audit Report for April 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

cc CEDD – Mr Kenny Chan (email: hpchan@cedd.gov.hk)
AECOM – Mr K Y Chan (email: ky.chan@tko-ltt1-aecom.com)
AECOM – Mr Dominic Lam (email: dominic.cw.lam@tko-ltt1-aecom.com)
AECOM – Ms Mandy Fu (email: mandy.ky.fu@tko-ltt1-aecom.com)
AECOM – Mr Jason Yu (email: jason.hk.yu@tko-ltt1-aecom.com)
Cinotech – Dr H F Chan (email: hf.chan@cinotech.com.hk)
Cinotech – Mr K S Lee (email: ks.lee@cinotech.com.hk)

TABLE OF CONTENTS

EXECUTIVE SUMMARY.....	1
Introduction.....	1
Environmental Monitoring Works.....	1
Key Information in the Reporting Month.....	4
Key Construction Work in the reporting month & the next reporting month.....	4
Future Key Issues.....	6
1. INTRODUCTION.....	8
Purpose of the Report.....	8
Structure of the Report.....	8
2. PROJECT INFORMATION.....	10
Background.....	10
Project Organizations.....	10
Construction Activities undertaken during the Reporting Month.....	11
Status of Environmental Licences, Notification and Permits.....	13
Summary of EM&A Requirements.....	15
3. AIR QUALITY.....	16
Monitoring Requirements.....	16
Monitoring Locations.....	16
Monitoring Equipment.....	16
Monitoring Parameters and Frequency.....	17
Monitoring Methodology.....	17
Results and Observations.....	20
4. NOISE.....	21
Monitoring Requirements.....	21
Monitoring Locations.....	21
Monitoring Equipment.....	21
Monitoring Methodology and QA/QC Procedure.....	22
Results and Observations.....	23
5. WATER QUALITY.....	26
Monitoring Requirements.....	26
Monitoring Locations.....	27
Monitoring Equipment.....	27
Monitoring Parameters and Frequency.....	29
Monitoring Methodology.....	30
Laboratory Analytical Methods.....	31
QA/QC Requirements.....	31
Decontamination Procedures.....	31
Sampling Management and Supervision.....	32
Results and Observations.....	32
6. ECOLOGY.....	34
Post-Translocation Coral Monitoring.....	34

7. CULTURAL HERITAGE	35
Monitoring Requirement.....	35
Monitoring Locations.....	35
Monitoring Equipment.....	35
Monitoring Methodology.....	36
Alert, Alarm and Action Levels.....	36
Results.....	36
Mitigation Measures for Cultural Heritage.....	36
8. LANDSCAPE AND VISUAL IMPACT REQUIREMENTS.....	37
9. LANDFILL GAS MONITORING.....	38
Monitoring Requirement.....	38
Monitoring Parameters and Frequency.....	38
Monitoring Locations.....	38
Monitoring Equipment.....	38
Results and Observations.....	39
10. ENVIRONMENTAL AUDIT.....	40
Site Audits.....	40
Implementation Status of Environmental Mitigation Measures.....	40
11. WASTE MANAGEMENT.....	41
12. ENVIRONMENTAL NON-CONFORMANCE.....	42
Summary of Exceedances.....	42
Summary of Environmental Non-Compliance.....	42
Summary of Environmental Complaint.....	42
Summary of Environmental Summon and Successful Prosecution.....	42
13. FUTURE KEY ISSUES.....	43
Key Issues for the Coming Month.....	44
14. CONCLUSIONS AND RECOMMENDATIONS.....	46
Conclusions.....	46
Recommendations.....	47

LIST OF TABLES

Table I	Non-compliance (exceedance) Recorded for the Project in the Reporting Month
Table II	Summary Table for Key Information in the Reporting Month
Table III	Summary Table for Key Construction Work in the Reporting Month
Table IV	Summary Table for Site Activities in the next Reporting Period
Table 2.1	Key Project Contacts
Table 2.2	Summary Table for Major Site Activities in the Reporting Month
Table 2.3	Construction Programme Showing the Inter-Relationship with Environmental Protection/Mitigation Measures
Table 2.4	Summary of the Status of Environmental Licences, Notification and Permits
Table 3.1	Locations for Air Quality Monitoring
Table 3.2	Air Quality Monitoring Equipment
Table 3.3	Impact Dust Monitoring Parameters, Frequency and Duration
Table 3.4	Major Dust Source during Air Quality Monitoring
Table 4.1	Noise Monitoring Stations
Table 4.2	Noise Monitoring Equipment
Table 4.3	Noise Monitoring Parameters, Frequency and Duration
Table 4.4	Major Noise Source during Noise Monitoring
Table 4.5	Baseline Noise Level and Noise Limit Level for Monitoring Stations
Table 4.6	Baseline Noise Level and Noise Limit Level for Monitoring Stations (Evening-time & Daytime (Holiday))
Table 4.7	Baseline Noise Level and Noise Limit Level for Monitoring Stations (Night-time)
Table 5.1	Groundwater Quality Monitoring Stations
Table 5.2	Marine Water Quality Monitoring Stations
Table 5.3	Water Quality Monitoring Equipment
Table 5.4	Water Quality Monitoring Parameters and Frequency
Table 5.5	Methods for Laboratory Analysis for Water Samples
Table 5.6	Summary of Groundwater Quality Monitoring Results
Table 7.1	Cultural Heritage Monitoring Equipment
Table 7.2	AAA Levels for Monitoring for Cultural Heritage
Table 9.1	Landfill Gas Monitoring Equipment
Table 13.1	Summary Table for Site Activities in the next Reporting Period

LIST OF FIGURES

Figure 1	Site Layout Plan
Figure 1a	Site Portions under Works Contract No. NE/2015/01 (Lam Tin Side)
Figure 1b	Site Portions under Works Contract No. NE/2015/01 (Tseung Kwan O Side)
Figure 1c	Site Portions under Works Contract No. NE/2015/02
Figure 1d	Site Portions under Works Contract No. NE/2015/03
Figure 1e	Site Portions under Works Contract No. NE/2017/01
Figure 1f	Site Portions under Works Contract No. NE/2017/01
Figure 1g	Site Portions under Works Contract No. NE/2017/02
Figure 1h	Site Portions under Works Contract No. NE/2017/02
Figure 2	Locations of Air Quality Monitoring Stations
Figure 3	Locations of Construction Noise Monitoring Stations
Figure 4	Locations of Groundwater Quality Monitoring Stations
Figure 5	Locations of Marine Water Quality Monitoring Stations
Figure 6	Locations of Landfill Gas Monitoring
Figure 7	Location of Post-translocation Coral Monitoring
Figure 8	Location of Monitoring for Cultural Heritage
Figure 9	Location of Water Quality Monitoring in Temporary Embayment

LIST OF APPENDICES

Appendix A	Action and Limit Levels
Appendix B	Copies of Calibration Certificates
Appendix C	Weather Information
Appendix D	Environmental Monitoring Schedules
Appendix E	1-hour TSP Monitoring Results and Graphical Presentations
Appendix F	24-hour TSP Monitoring Results and Graphical Presentations
Appendix G	Noise Monitoring Results and Graphical Presentations
Appendix H	Groundwater Quality Monitoring Results, Graphical Presentations and Laboratory Testing Reports
Appendix I	Marine Water Quality Monitoring Results and Graphical Presentations
Appendix J	Quality Control Reports for Laboratory Analysis
Appendix K	Summary of Exceedance
Appendix L	Site Audit Summary
Appendix M	Event and Action Plans
Appendix N	Implementation Schedule And Recommended Mitigation Measures
Appendix O	Summaries of Environmental Complaint, Warning, Summon and Notification of Successful Prosecution
Appendix P	Waste Generation in the Reporting Month
Appendix Q	Tentative Construction Programme
Appendix R	Record of Landfill Gas Monitoring by Contractor
Appendix S	Construction Noise Mitigation Plan for Contract NE/2017/01
Appendix T	Cultural Heritage Monitoring Results
Appendix U	Piezometer Monitoring Results
Appendix V	Silt Curtain Deployment Plan for Contract NE/2017/01

EXECUTIVE SUMMARY

Introduction

1. This is the 30th 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 April 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.
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	8	9	Under investigation	0	Refer to Appendix K & O
Groundwater Quality	0	0	0	0	Refer to Appendix K
Marine Water Quality	30	235	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

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

Construction Noise Monitoring

- Eight (8) Action Level exceedances were recorded due to the documented complaints received in this reporting month. Most exceedances are received complaints on construction noise / works during restricted hours from NE/2015/02. However, all construction works were conducted under valid CNPs with confirmation from RE and CCTV footage of the works area. No noise limit levels were also recorded in the relevant monitoring station in this reporting month. Contractors are reminded to check and repair noise absorbing materials and barriers, strictly follow the requirements in the relevant CNP, review the construction program and arrange the works in less sensitive hours for minimizing noise impacts generated from construction activities.
- Nine (9) Limit Level exceedances were recorded in the reporting month. The exceedances were considered due to road traffic near the Eastern Cross Harbour Tunnel Toll Plaza and therefore non-Project related.

Water Quality Monitoring

- No exceedance in groundwater quality monitoring was recorded in the reporting month.
- All marine water quality monitoring was conducted as scheduled in the reporting month, except that monitoring on 24th and 26th April is rescheduled on 23th, 25th and 27th April. There were thirty (30) Action Level and two-hundred and thirty-five (235) 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**. Weekly silt curtain inspection (including diving inspection) have been carried out by contractor, the record, 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 April 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, 25, 25, 30 and 25 March 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 Summary Table for Key Information in the Reporting Month

Event	Event Details		Action Taken	Status
	Number	Nature		
Complaint received by Project Team / Complaint referred by EPD (April 2019)	13	Noise nuisance/ Light/ Smoke/ Working hour	Details refer to App O	On-going
Complaint received by Project Team / Complaint referred by EPD (March 2019)	25	Noise nuisance/ Odour/ Mosquitos	Details refer to App O	On-going
Complaint received by Project Team / Complaint referred by EPD (February 2019)	20	Noise nuisance/ Dust / Smoke / Odour	Details refer to App O	On-going
Complaint received by Project Team / Complaint referred by EPD (January 2019)	39	Noise nuisance/ Construction dust/ Water Pollution	Details refer to App O	On-going / Closed
Notifications of any summons & prosecutions received	0	---	N/A	N/A

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

19. Summary of key construction work in the reporting month is tabulated in **Table III**.

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

Contract No.	Project Title	Site Activities (April 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
		Main Tunnel	3) Main Tunnel Excavation 4) Main Tunnel Lining Works
		TKO Interchange	5) Haul Road Construction and Site Formation & Slope Works 6) Cavern Excavation 7) Steel Platform for Bridge Construction
NE/2015/02	Tseung Kwan O – Lam Tin Tunnel – Road P2 and Associated Works	1) Backfilling works at P2 U-trough CH411 – CH500 2) Sheet pile works for decked U-trough at CH318.00 – CH363.50 3) Installation of 2100 storm water pipe at Portion IV / VII 4) Backfilling work of pipe trench for 2100 storm water drain pipe at Portion VII	

Contract No.	Project Title	Site Activities (April 2019)
		5) King post and de-watering system for proposed U-trough CH318.00 – CH363.50 at Portion V/VI 6) Fabrication of ELS members for proposed ELS system at CH318.00 – CH363.50 7) Street lighting duct installation works at Portion IV near Ocean Shores EVA 8) Backfilling of P2A retaining wall 9) ELS works for CH318 – CH363.50 10) Construction of manhole for 2100 pipe (upper part) 11) Surcharging at surcharge Areas 1b1, 1b2, 2a1 12) Backfilling of surcharge Area 2a2 13) Reclamation works at Portion IX (ECH170 – 200) 14) Reinstatement of existing seawall at Portion VII 15) Pre-drilling at P2 CH105 – CH264 16) Installation of socket H-pile at P2 CH290 – CH305 17) Pre-boring for s/p installation at P2 CH105 – CH318 18) Installation of interlock pipe pile wall
NE/2015/03	Tseung Kwan O – Lam Tin Tunnel – Northern Footbridge	1) Erection of scaffolding for Pour 1 of Staircase 2 2) Construction of Pour 2 of main deck (GL4 – 5) 3) Remove steel mould & scaffolding of bridge deck (GL4-5) 4) Construction of Staircase 1
NE/2017/01	Tseung Kwan O – Lam Tin Tunnel – Tseung Kwan O Interchange and Associated Works	1) Installation of Precast Pile Cap Shell 2) Pre-drilling 3) Bored Piling 4) Dismantling Works for Temporary Working Platform 5) Construction of Temporary Working Platform
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) Bored Piles 5) Construction of Temporary carriageway 6) Modification of traffic Island 7) Predrilling 8) Construction of Temporary cycle track 9) Construction of drainage and watermain
NE/2017/06	Tseung Kwan O – Lam Tin Tunnel – Traffic Control and Surveillance System(TCSS) and Associated Works	1) Erection of Contractor's site accommodation and project signboard at Po Yap Road, Tseung Kwan O

Future Key Issues

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

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

Contract No. and Project Title	Site Activities (May 2019)		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	(A) / (B) / (C) / (D) / (E) / (G)
	Main Tunnel	3) Main Tunnel Excavation 4) Main Tunnel Lining Works	(B)
	TKO Interchange	5) Haul Road Construction and Site Formation & Slope Works 6) Cavern Excavation 7) Steel Platform for Bridge Construction	(A) / (C) / (D) / (E) / (F) / (I)
NE/2015/02 - Tseung Kwan O – Lam Tin Tunnel – Road P2 and Associated Works	1) Excavation of U-trough CH318.00 – CH363.50 2) Backfilling of 2100 pipe 3) Fabrication of ELS members for proposed ELS system at CH318.00 – CH 363.50 4) Street lighting duct installation works at Portion IV near Ocean Shores EVA 5) Backfilling of P2A retaining wall 6) ELS works for CH318 – CH363.50 7) Construction of manhole for 2100 pipe (upper part) 8) Construction of irrigation pipe at Portion IV adjacent to Ocean Shores EVA 9) Construction of pillow box and ducting system at Portion IV adjacent to Ocean Shores EVA 10) Construction of utility trough at road P2 (land section) 11) CCTV works for completed 2100 pipe 12) Site formation at existing land 13) Surcharging at surcharge Area 1b1, 1b2, 2a1 14) Backfilling of surcharge Area 2a2 15) Reclamation works at Portion IX 16) Reinstatement of seawall at Portion VII 17) Pre-drilling at P2 CH105 – CH264 18) Pre-boring at P2 H-pile CH105 – CH305 19) ELS at P2 CH105 – CH318 (Pre-boring for s/p installation and interlock pipe pile installation)		(A) / (B) / (C) / (D) / (E) / (G) / (I)
NE/2015/03 - Tseung Kwan O – Lam Tin Tunnel – Northern Footbridge	1) Installation of Skylight glazing on Main Deck 2) Modification work of temporary platform on Main Deck		(A) / (B) / (C) / (D) / (E)

Contract No. and Project Title	Site Activities (May 2019)	Key Environmental Issues *
NE/2017/01 – Tseung Kwan O Interchange and Associated Works	1) Installation of Precast Pile Cap Shell 2) Pre-drilling 3) Bored piling 4) Dismantling Works for Temporary Working Platform 5) Construction of Temporary Working Platform 6) Construction of Pile Cap 7) Construction of Pier	(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) Bored Piles 5) Construction of Temporary carriageway 6) Modification of traffic Island 7) Predrilling 8) Construction of Temporary cycle track 9) Construction of drainage and watermain	(A) / (B) / (E) / (F) / (G)
NE/2017/06 – Tseung Kwan O – Lam Tin Tunnel – Traffic Control and Surveillance System(TCSS) and Associated Works	1) Erection of Contractor's site accommodation and project signboard at Po Yap Road, Tseung Kwan O	(A) / (B) / (C) / (D) / (E) / (F) / (G) / (H)

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 30th Monthly EM&A report summarizing the EM&A works for the Project in April 2019.

Purpose of the Report

- 1.2 This is the 30th Monthly EM&A Report which summarises the impact monitoring results and audit findings for the EM&A programme during the reporting period in April 2019.

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**.
- 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 April 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 (April 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
		Main Tunnel	3) Main Tunnel Excavation 4) Main Tunnel Lining Works
		TKO Interchange	5) Haul Road Construction and Site Formation & Slope Works 6) Cavern Excavation 7) Steel Platform for Bridge Construction
NE/2015/02	Tseung Kwan O – Lam Tin Tunnel – Road P2 and Associated Works	1) Backfilling works at P2 U-trough CH411 – CH500 2) Sheet pile works for decked U-trough at CH318.00 – CH363.50 3) Installation of 2100 storm water pipe at Portion IV / VII 4) Backfilling work of pipe trench for 2100 storm water drain pipe at Portion VII 5) King post and de-watering system for proposed U-trough CH318.00 – CH363.50 at Portion V/VI 6) Fabrication of ELS members for proposed ELS system at CH318.00 – CH363.50 7) Street lighting duct installation works at Portion IV near Ocean Shores EVA 8) Backfilling of P2A retaining wall 9) ELS works for CH318 – CH363.50 10) Construction of manhole for 2100 pipe (upper part)	

Contract No.	Project Title	Site Activities (April 2019)
		11) Surcharging at surcharge Areas 1b1, 1b2, 2a1 12) Backfilling of surcharge Area 2a2 13) Reclamation works at Portion IX (ECH170 – 200) 14) Reinstatement of existing seawall at Portion VII 15) Pre-drilling at P2 CH105 – CH264 16) Installation of socket H-pile at P2 CH290 – CH305 17) Pre-boring for s/p installation at P2 CH105 – CH318 18) Installation of interlock pipe pile wall
NE/2015/03	Tseung Kwan O – Lam Tin Tunnel – Northern Footbridge	1) Erection of scaffolding for Pour 1 of Staircase 2 2) Construction of Pour 2 of main deck (GL4 – 5) 3) Remove steel mould & scaffolding of bridge deck (GL4-5) 4) Construction of Staircase 1
NE/2017/01	Tseung Kwan O – Lam Tin Tunnel – Tseung Kwan O Interchange and Associated Works	1) Installation of Precast Pile Cap Shell 2) Pre-drilling 3) Bored Piling 4) Dismantling Works for Temporary Working Platform 5) Construction of Temporary Working Platform
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) Bored Piles 5) Construction of Temporary carriageway 6) Modification of traffic Island 7) Predrilling 8) Construction of Temporary cycle track 9) Construction of drainage and watermain
NE/2017/06	Tseung Kwan O – Lam Tin Tunnel – Traffic Control and Surveillance System(TCSS) and Associated Works	1) Erection of Contractor’s site accommodation and project signboard at Po Yap Road, Tseung Kwan O

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	<ul style="list-style-type: none"> Sufficient watering of the works site with active dust emitting activities

	generation	<ul style="list-style-type: none"> • 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
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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	N/A	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
Vessel Billing Account under construction waste disposal charging scheme				
NE2015/01	Account No. 7027764	24/01/2019	10/05/2019	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

Contract No.	Permit / License No.	Valid Period		Status
		From	To	
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
	WT-00028495-2017	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
NE/2015/03	WT00027295-2017	20/03/2017	18/04/2019	Expired on 18 Apr 2019
	WT00027266-2017	08/03/2017	18/04/2019	Expired on 18 Apr 2019
	WT00030654-2018	16/04/2018	30/04/2023	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-RE0881-18	24/12/2018	22/06/2019	Valid
	GW-RE0102-19	26/02/2019	17/04/2019	Expired on 17 Apr 2019
	GW-RE0109-19	23/02/2019	22/04/2019	Expired on 22 Apr 2019
	GW-RE0188-19	20/03/2019	13/05/2019	Valid
	GW-RE0171-19	08/03/2019	07/06/2019	Valid
	GW-RE0202-19	31/03/2019	30/06/2019	Valid
	GW-RE0272-19	22/04/2019	21/06/2019	Valid
NE/2015/02	GW-RE0680-18	11/10/2018	10/04/2019	Expired on 10 Apr 2019
	GW-RE0833-18	02/12/2018	01/06/2019	Valid
	GW-RE0004-19	30/01/2019	29/04/2019	Expired on 29 Apr 2019
	GW-RE0008-19	15/01/2019	14/07/2019	Valid
	GW-RE0755-18	07/11/2018	06/05/2019	Valid
	GW-RE0228-19	11/04/2019	10/10/2019	Valid
	GW-RE0299-19	26/04/2019	16/10/2019	Valid
GW-RE0218-19	30/04/2019	29/06/2019	Valid	
Marine Dumping Permit				

Contract No.	Permit / License No.	Valid Period		Status
		From	To	
NE/2017/01	EP/MD/19-064	01/12/2018	31/05/2019	Valid
	EP/MD/19-086	14/01/2019	13/07/2019	Valid
	EP/MD/20-012	01/05/2019	31/05/2019	Effective from 1 May 2019
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 April 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	3
	Met One Instruments Model No.: AEROCET-831	0
	Handheld Particle Counter Hal-HPC300 / Hal-HPC301	3
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)

- 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 0.5 μ m and 5 μ m channels will show the cumulative counts of particles larger than 0.5 μ m and 5 μ m 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 MonitoringInstrumentation

- 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 m³/min. and 1.4 m³/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 aluminum 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.
- 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)/Refuge floor (26/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

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.

[#] Monitoring location has changed from 41/f to 26/f on 23rd Nov 2018.

Monitoring Equipment

- 4.3 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	6
Calibrator	SV30A	1
	Brüel & Kjær 4231	1

- 4.4 **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) , night-time (2300 – 0700 hours) and daytime (0700- 1900 hours) during general holidays including Sundays for monitoring stations CM1, CM2, CM3 and CM4.

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
CM1	L ₁₀ (5 min) dB(A) L ₉₀ (5 min) dB(A) L _{eq} (5 min) dB(A)	1900 – 0700 hrs on all days		Façade
CM2				Façade
CM3				Façade
CM4				Façade
CM6(A)				Free Field

Monitoring Methodology and QA/QC Procedure

- 4.5 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

- 4.6 The microphone head of the sound level meter and calibrator was cleaned with a soft cloth at quarterly intervals.
- 4.7 The sound level meter and calibrator was checked and calibrated at yearly intervals.
- 4.8 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

- 4.9 Eight (8) Action Level exceedances were recorded due to the documented complaints received in this reporting month. Nine (9) Limit Level exceedances for night-time construction noise monitoring were recorded and they were considered due to the road traffic near Eastern Cross Harbour Tunnel Toll Plaza, therefore non-Project related. No Limit Level exceedance for day time was recorded in the reporting month.
- 4.10 Noise monitoring results and graphical presentations are shown in **Appendix G**.
- 4.11 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

- 4.12 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	

(*) Noise Limit Level is 65 dB(A) during school examination periods.

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

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

- 4.13 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.

- 4.14 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.

5. WATER QUALITY

Monitoring Requirements

Groundwater Quality

- 5.1 Groundwater quality monitoring shall be conducted as identified in the EIA report (locations refer to **Figure 4**, Stream 1 to 3). According to the EM&A Manual, dissolved oxygen (DO), pH, temperature, turbidity, suspended solids (SS), 5-day biochemical oxygen demand (BOD₅), Total organic carbon (TOC), Total Nitrogen, Ammonia-N and Total Phosphate are the parameters for the monitoring. **Appendix A** shows the established Action and Limit Levels.
- 5.2 As stated in the Baseline Environmental Monitoring Plan submitted to EPD in September 2016, Groundwater quality monitoring could not be conducted at the other identified monitoring station in the EIA Report, Stream 4, as it was found to be not accessible due to safety reason. EPD has no further comment on the Plan in October 2016.

Marine Water Quality

- 5.3 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.
- 5.4 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.
- 5.5 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)

- 5.6 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

- 5.7 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

- 5.8 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

- 5.9 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, BOD₅, TOC, Total Nitrogen, Ammonia-N and Total Phosphate.

Dissolved Oxygen (DO) and Temperature Measuring Equipment

- 5.10 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.
- 5.11 It has a membrane electrode with automatic temperature compensation complete with a cable.
- 5.12 Sufficient stocks of spare electrodes and cables were available for replacement where necessary.
- 5.13 Salinity compensation was built-in in the DO equipment.

Turbidity

- 5.14 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

- 5.15 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

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

Water Sampler

- 5.17 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

- 5.18 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

- 5.19 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.

- 5.20 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.
- 5.21 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.
- 5.22 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.
- 5.23 **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	2
Monitoring Position Equipment	"Magellan" Handheld GPS Model GPS-320	1
Water Depth Detector	Fishfinder 140	1

Monitoring Parameters and Frequency

- 5.24 **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
Groundwater Quality			
Stream 1- Stream 3	<ul style="list-style-type: none"> • DO, mg/L • DO Saturation, % • pH • Water Temperature (°C) • Turbidity, NTU • SS, mg/L • BOD₅, mg O₂/L • TOC, mg-TOC/L • Total Nitrogen, mg/L • Ammonia-N, mg NH₃-N/L • Total Phosphate, mg-P/L 	Mid-depth	Biweekly (When the tunnel construction works are found within 50m of the location, weekly.)
Marine Water Quality			
M1 M2 M3 M4 M5 M6 C1	<u>In-situ:</u> Dissolved oxygen (DO) concentration, DO saturation, turbidity, pH, temperature and salinity <u>Laboratory Testing:</u>	<u>M1-M5, C1-C2, G1-G4</u> <ul style="list-style-type: none"> • 3 water depths: 1m below water surface, mid-depth and 1m above sea bed. 	3 days per week / 2 per monitoring day (1 for mid-ebb and 1 for mid-flood)

Monitoring Stations	Parameters, unit	Depth	Frequency
C2 G1 G2 G3 G4	Suspended Solids (SS)	<ul style="list-style-type: none"> If the water depth is less than 3m, mid-depth sampling only. If the water depth is less than 6m, omit mid-depth sampling. <u>M6</u> at the vertical level where the water abstraction point of the intake is located(i.e. approximately mid-depth level) 	
Water Quality Monitoring in Temporary Marine Embayment			
W1	<ul style="list-style-type: none"> DO, mg/L DO Saturation, % pH Water Temperature (°C) Salinity, ppt 	<ul style="list-style-type: none"> 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

Groundwater Quality

- 5.25 At each monitoring location, two consecutive in-situ measurements for DO concentration, DO saturation, pH, temperature and turbidity were taken for water samples on site. The probes were retrieved out of the water after the first measurement and then re-deployed for the second measurement. Where the difference in the value between the first and second readings of each set was more than 25% of the value of the first reading, the reading was discarded and further readings were taken.
- 5.26 For SS, BOD₅, TOC, Total Nitrogen, Ammonia-N and Total Phosphate, measurement and grab samples of surface water was collected. Water samples of about adequate volume was collected and stored in high density polythene bottles. Following collection, water samples was stored in high density polythene bottles. Preservation H₂SO₄ was appropriately added for water samples for TOC, Total Nitrogen, Ammonia-N and Total Phosphate testing. Water samples was packed in ice and cooled to 4°C (without being frozen), delivered to the HOKLAS accredited laboratory, Wellab Limited and analyzed.

Marine Water Quality

- 5.27 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.
- 5.28 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

- 5.29 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 RequirementsDecontamination Procedures

- 5.30 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

- 5.31 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.
- 5.32 QA/QC procedures as attached in **Appendix J** are available for the parameters analysed in the HOKLAS-accredited laboratory, WELLAB Ltd.

Results and ObservationsGroundwater Quality Monitoring

- 5.33 Summary of groundwater quality monitoring results is shown in **Table 5.6**. Groundwater quality monitoring results, graphical presentations and laboratory testing reports are shown in **Appendix H**.
- 5.34 Other relevant data was also recorded, such as monitoring location / position, time, sampling depth, weather conditions and any special phenomena or work underway nearby.
- 5.35 Action and Limit Level for groundwater quality monitoring has been reviewed with consideration of monitoring results obtained from November 2016 to June 2017, as there was no tunnel boring or tunnel construction works from November 2016 to June 2017. A “Review Report for Action and Limit Levels of Groundwater Quality Monitoring” was submitted to EPD in August 2017. EPD has no further comment on the report and the updated Action and Limit Level is shown in **Appendix A**.

Table 5.6 Summary of Groundwater Quality Monitoring Results

Date	Location	Parameters (unit)								
		pH	Dissolved Oxygen (mg/L)	Turbidity (NTU)	SS (mg/L)	BOD ₅ (mg O ₂ /L)	TOC (mg-TOC/L)	Total Nitrogen (mg/L)	NH ₃ -N (mg NH ₃ -N/L)	Total Phosphorus (mg-P/L)
10 Apr 2019	Stream 1	8.0	8.5	1.8	<2	2	4	1.0	0.04	0.03
	Stream 2	8.0	7.8	1.5	2	<2	3	1	0.05	0.02
	Stream 3	7.5	7.7	0.7	<2	<2	2	1.4	0.01	0.01
15 Apr 2019	Stream 1	7.7	8.7	0.9	<2	<2	5	1	0.04	0.03
	Stream 2	8.1	8.0	0.8	<2	<2	5	1	0.03	0.03
	Stream 3	7.6	8.4	0.5	<2	<2	5	1	0.04	0.03
No. of Exceedance	Action Level	0	0	0	0	0	0	0	0	0
	Limit Level	0	0	0	0	0	0	0	0	0

Note: ***Bold Italic*** means Action Level exceedance
Bold Italic with underline means Limit Level exceedance

- 5.36 No exceedance in groundwater quality monitoring was recorded in the reporting month.

Marine Water Quality Monitoring

- 5.37 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.

- 5.38 Calculated Action and Limit Levels for Marine Water Quality is presented in **Appendix I**. Thirty (30) Action Level and two-hundred and thirty-five (235) exceedance were recorded in marine water quality monitoring.
- 5.39 The exceedance in the reporting month was reported for the whole month and the key parameter was suspended solids (SS). As mentioned in the Monthly EM&A Report for December 2018, an emergency sand discharge incident within the Junk Bay occurred on 15 December 2018 due to damage of a sand hopper barge outside the double watergate of Contract No. NE/2015/02. Subsequently, the dumped sandfill was retrieved on 21 December 2018. As the elevation of SS concentration coincided with the hopper barge incident in December 2018, the SS exceedance was considered due to sandfill dumping and retrieval activities. However, it is abnormal that the exceedance lasted for a few months after sand retrieval. Therefore, the RE and ET have requested the Contractor of NE/2015/02 to carry out dive survey to confirm if there is any residual sand from the incident on the seabed. If affirmative, the Contractor should carry out remedial measure for restoring the water quality to baseline level.
- 5.40 Based on the findings from the dive survey conducted on 16 March, no sand was observed at and near the sand dumping area, confirming that no residual sand is present. On the other hand, sand was observed around the outfall near Lohas Park. A number of construction sites are present in Tseung Kwan O and sightings of silty water discharge from other outfalls in Junk Bay not managed by the Contractor of this project were reported. These suggests that there are other sources of suspended solids in the Junk Bay in addition to this Project. Since no major deficiency of the silt curtain and cofferdam of this project nor discharge of silty water was observed during site audits and water quality monitoring by the ET, there is no direct evidence that the recent exceedances were due to the ongoing reclamation activities of the Project.

Groundwater Level Monitoring (Piezometer Monitoring)

- 5.41 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.
- 5.42 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**.

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 April 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 Instatel. 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 Instatel 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 25 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

- 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 108 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: 3, 10, 17, 24 and 30 April 2019
 - Contract No. NE/2015/02: 4, 11, 18 and 25 April 2019
 - Contract No. NE/2015/03: 4, 11, 18 and 25 April 2019
 - Contract No. NE/2017/01: 2, 9, 16, 23 and 30 April 2019
 - Contract No. NE/2017/02: 4, 11, 18 and 25 April 2019
- 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, 25, 25, 30 and 25 April 2019 respectively.

Implementation Status of Environmental Mitigation Measures

- 10.3 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**.
- 10.4 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 Eight (8) Action Level exceedances were recorded due to the documented complaints received in the reporting month. Zero (0) and nine (9) 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 No exceedance for groundwater quality monitoring was recorded in the reporting month.
- 12.3 Thirty (30) Action Level and two-hundred and thirty-five (235) exceedance were recorded in marine water quality monitoring.
- 12.4 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

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

Summary of Environmental Complaint

- 12.6 Thirteen (13) 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

- 12.7 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 (May 2019)		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	(A) / (B) / (C) / (D) / (E) / (G)
	Main Tunnel	3) Main Tunnel Excavation 4) Main Tunnel Lining Works	(B)
	TKO Interchange	5) Haul Road Construction and Site Formation & Slope Works 6) Cavern Excavation 7) Steel Platform for Bridge Construction	(A) / (C) / (D) / (E) / (F) / (I)
NE/2015/02 - Tseung Kwan O – Lam Tin Tunnel – Road P2 and Associated Works	1) Excavation of U-trough CH318.00 – CH363.50 2) Backfilling of 2100 pipe 3) Fabrication of ELS members for proposed ELS system at CH318.00 – CH 363.50 4) Street lighting duct installation works at Portion IV near Ocean Shores EVA 5) Backfilling of P2A retaining wall 6) ELS works for CH318 – CH363.50 7) Construction of manhole for 2100 pipe (upper part) 8) Construction of irrigation pipe at Portion IV adjacent to Ocean Shores EVA 9) Construction of pillow box and ducting system at Portion IV adjacent to Ocean Shores EVA 10) Construction of utility trough at road P2 (land section) 11) CCTV works for completed 2100 pipe 12) Site formation at existing land 13) Surcharging at surcharge Area 1b1, 1b2, 2a1 14) Backfilling of surcharge Area 2a2 15) Reclamation works at Portion IX 16) Reinstatement of seawall at Portion VII 17) Pre-drilling at P2 CH105 – CH264 18) Pre-boring at P2 H-pile CH105 – CH305 19) ELS at P2 CH105 – CH318 (Pre-boring for s/p installation and interlock pipe pile installation)		(A) / (B) / (C) / (D) / (E) / (G) / (I)

Contract No. and Project Title	Site Activities (May 2019)	Key Environmental Issues *
NE/2015/03 - Tseung Kwan O – Lam Tin Tunnel – Northern Footbridge	1) Installation of Skylight glazing on Main Deck 2) Modification work of temporary platform on Main Deck	(A) / (B) / (C) / (D) / (E)
NE/2017/01 – Tseung Kwan O Interchange and Associated Works	1) Installation of Skylight glazing on Main Deck 2) Modification work of temporary platform on Main Deck 3) Installation of Precast Pile Cap Shell 4) Pre-drilling 5) Bored piling 6) Dismantling Works for Temporary Working Platform 7) Construction of Temporary Working Platform 8) Construction of Pile Cap 9) Construction of Pier	(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) Bored Piles 5) Construction of Temporary carriageway 6) Modification of traffic Island 7) Predrilling 8) Construction of Temporary cycle track 9) Construction of drainage and watermain	(A) / (B) / (E) / (F) / (G)
NE/2017/06 – Tseung Kwan O – Lam Tin Tunnel – Traffic Control and Surveillance System(TCSS) and Associated Works	1) Erection of Contractor's site accommodation and project signboard at Po Yap Road, Tseung Kwan O	(A) / (B) / (C) / (D) / (E) / (F) / (G) / (H)

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 30th Environmental Monitoring and Audit (EM&A) Report which presents the EM&A works undertaken during the period in April 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 Eight (8) Action Level exceedances were recorded due to the documented complaints received in this reporting month. Nine (9) Limit Level exceedances were recorded during night-time in the reporting month. They were considered due to road traffic near the Eastern Cross Harbour Tunnel Toll Plaza, therefore non-Project related.
- 14.5 Zero (0) Limit Level exceedances was recorded for daytime construction noise in the reporting month.

Water Quality Monitoring

- 14.6 No exceedance of groundwater quality monitoring was recorded in the reporting month.
- 14.7 Thirty (30) Action Level and two-hundred and thirty-five (235) 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 L**.

Complaint, Prosecution and Notification of Summons

14.14 Thirteen (13) 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 the 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 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.

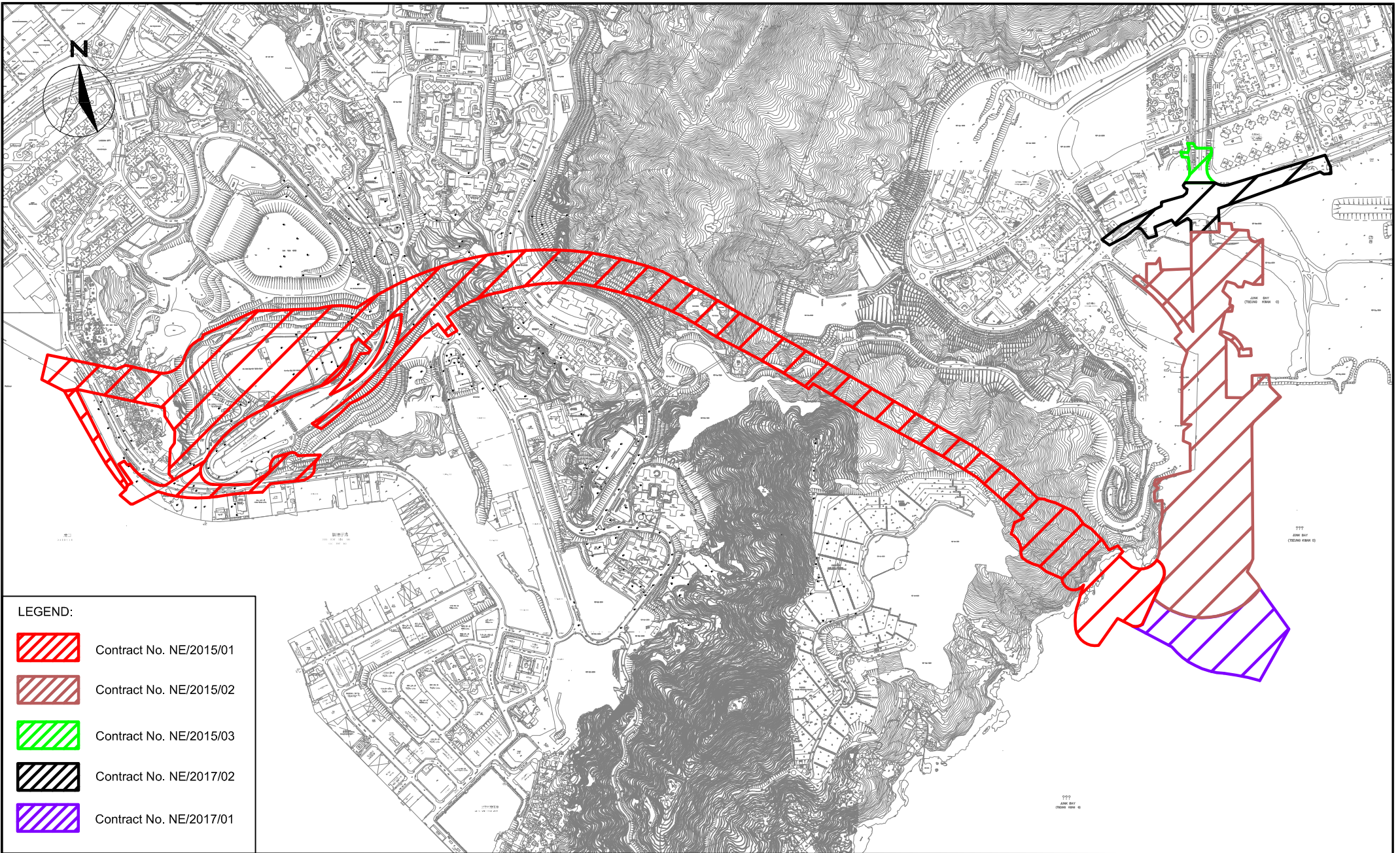
Waste/Chemical Management

- 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



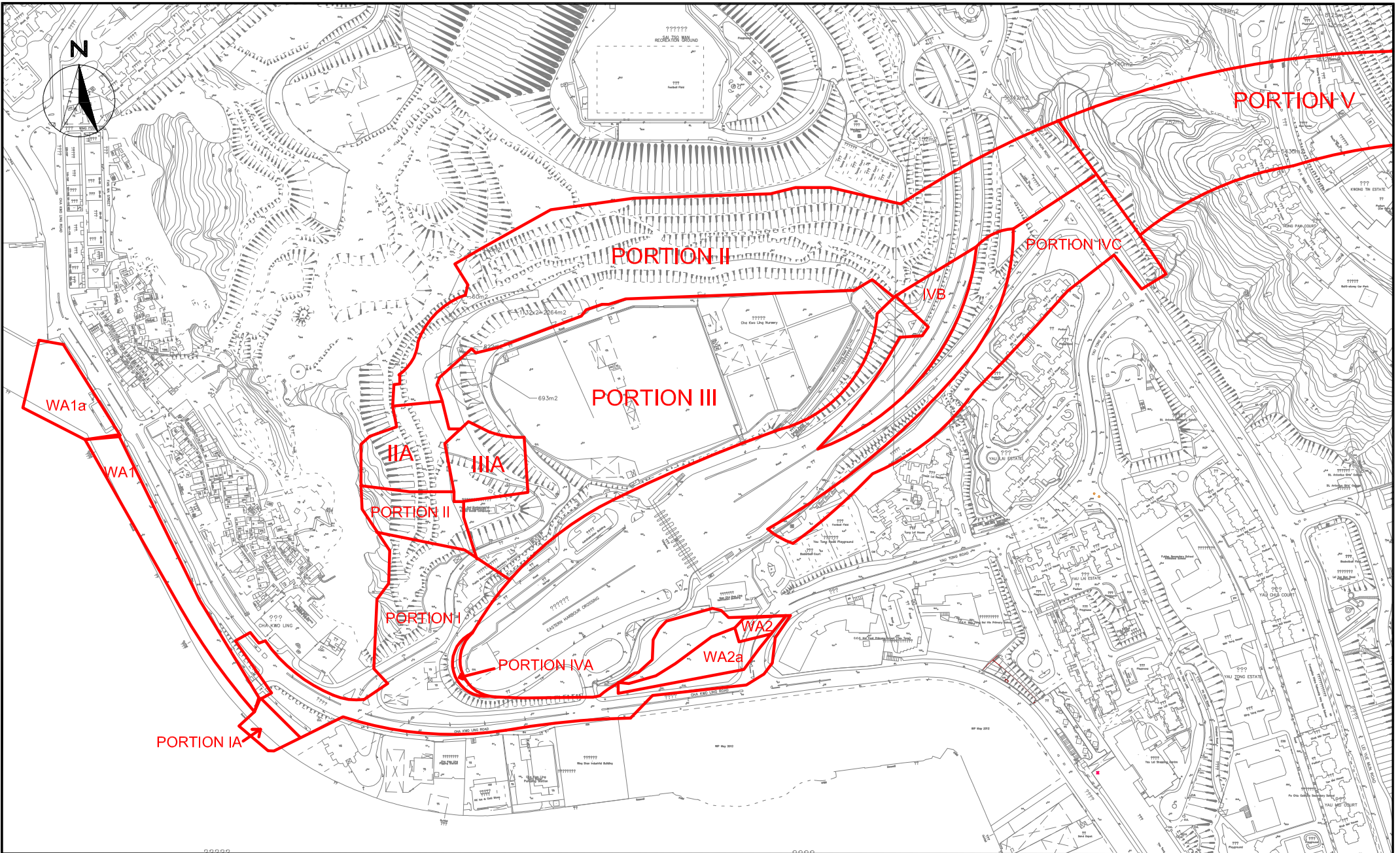
LEGEND:

	Contract No. NE/2015/01
	Contract No. NE/2015/02
	Contract No. NE/2015/03
	Contract No. NE/2017/02
	Contract No. NE/2017/01

CINOTECH
Cinotech Consultants Limited

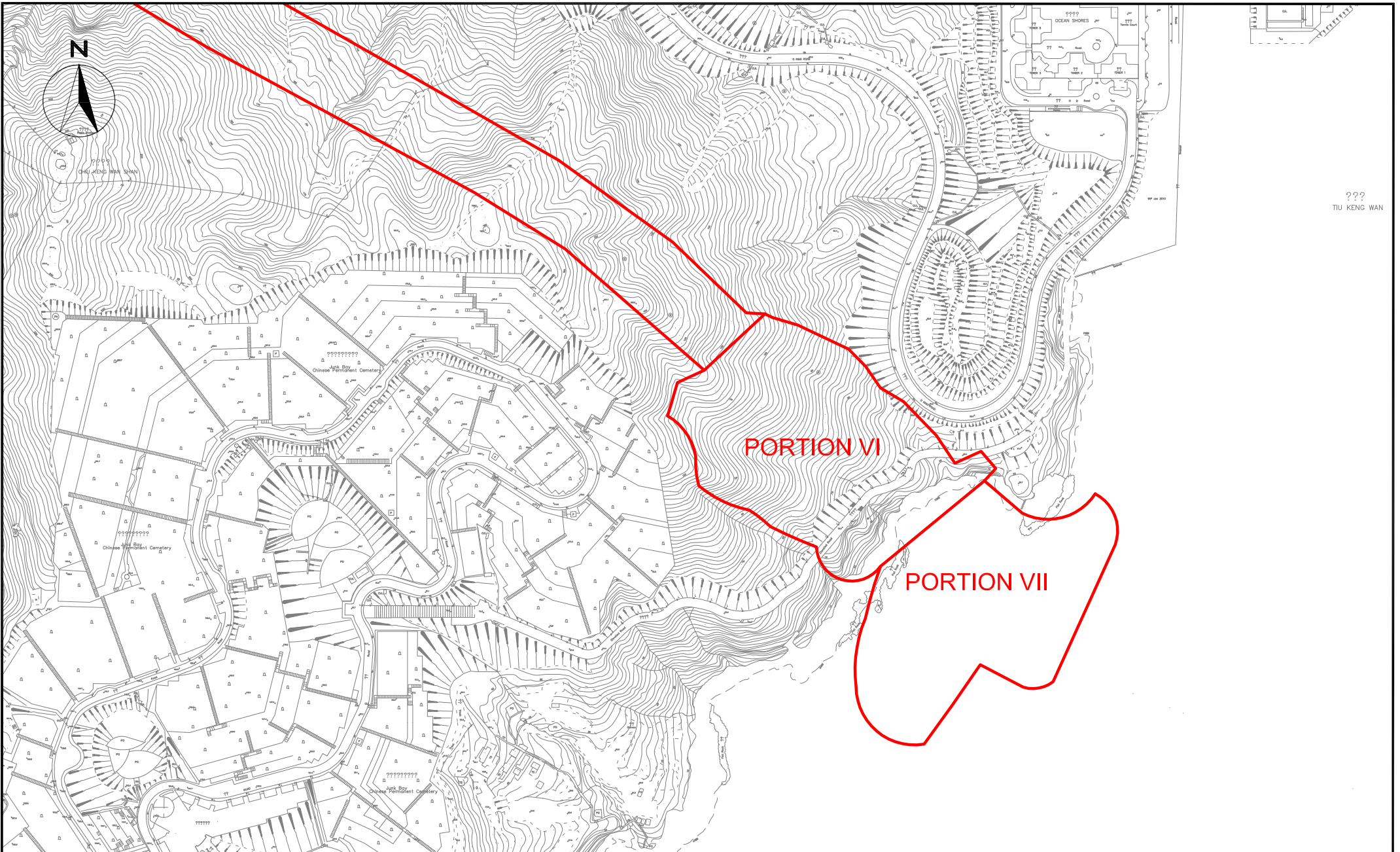
Agreement No. CE/59/2015 (EP)
Environmental Team for Tseung Kwan O - Lam Tin Tunnel
- Design and Construction
Site Layout Plan

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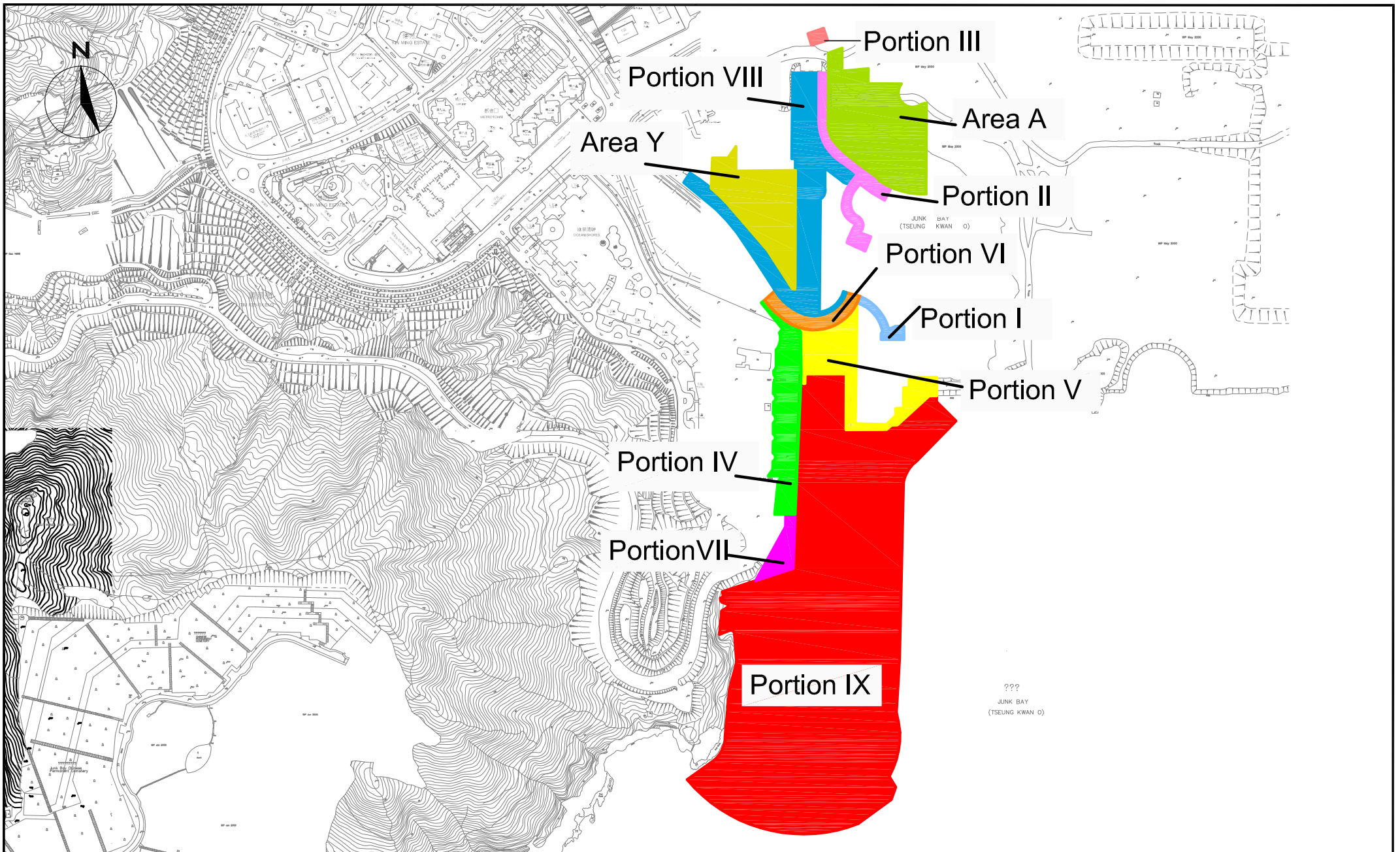


Agreement No. CE/59/2015 (EP)
 Environmental Team for Tseung Kwan O - Lam Tin Tunnel
 - Design and Construction
 Site Portions under Works Contract No. NE/2015/01 (Lam, Tin Side)

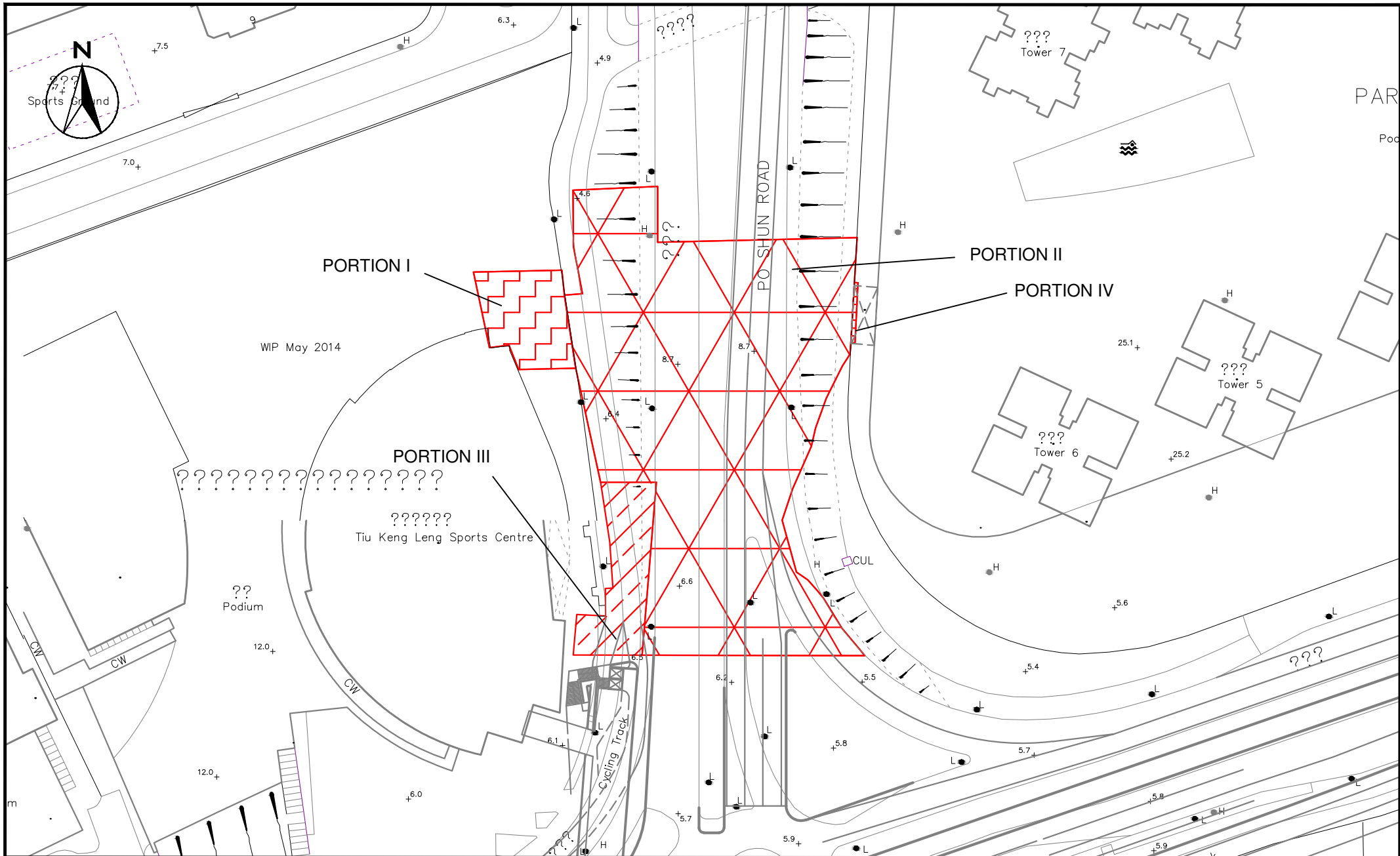
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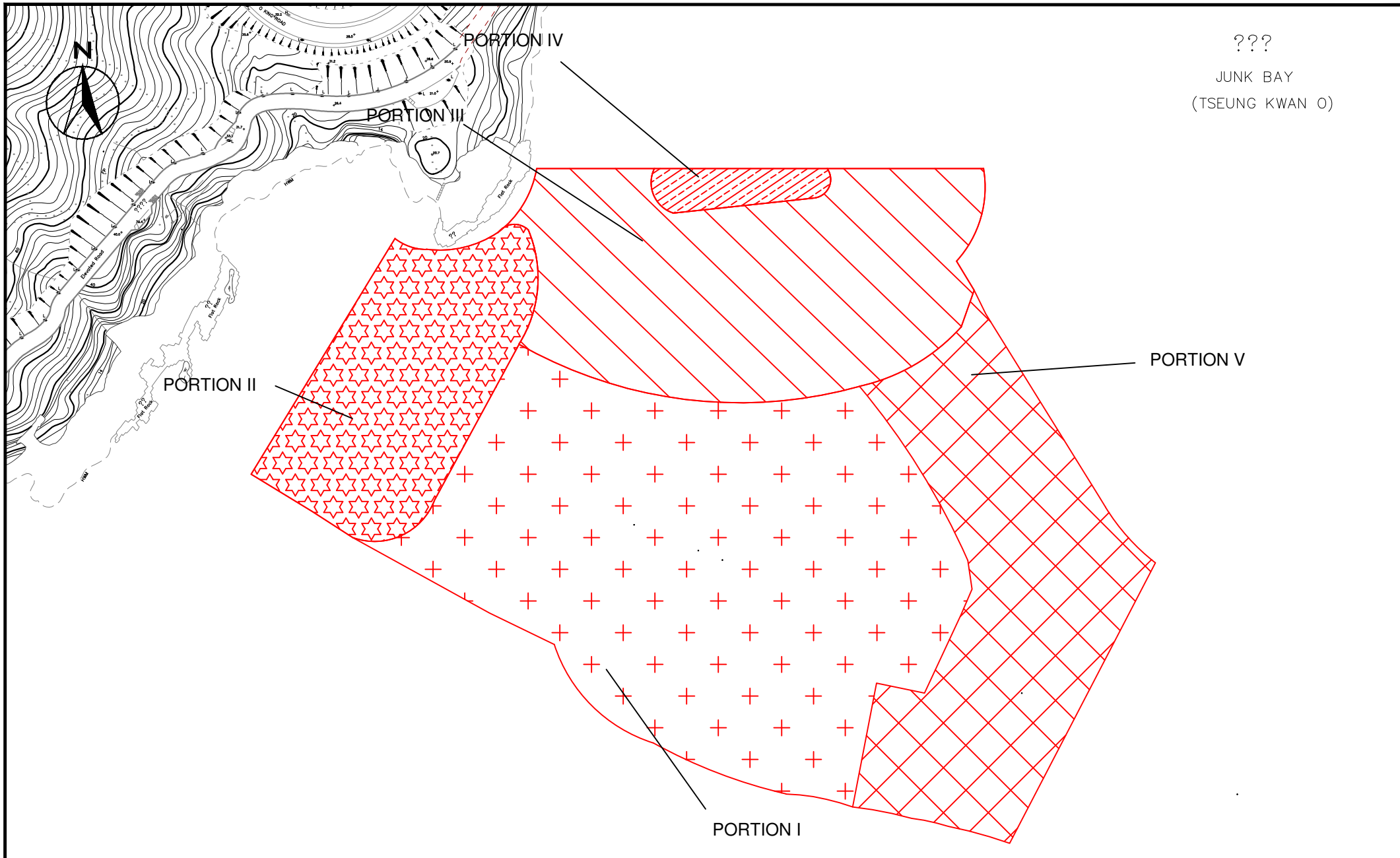
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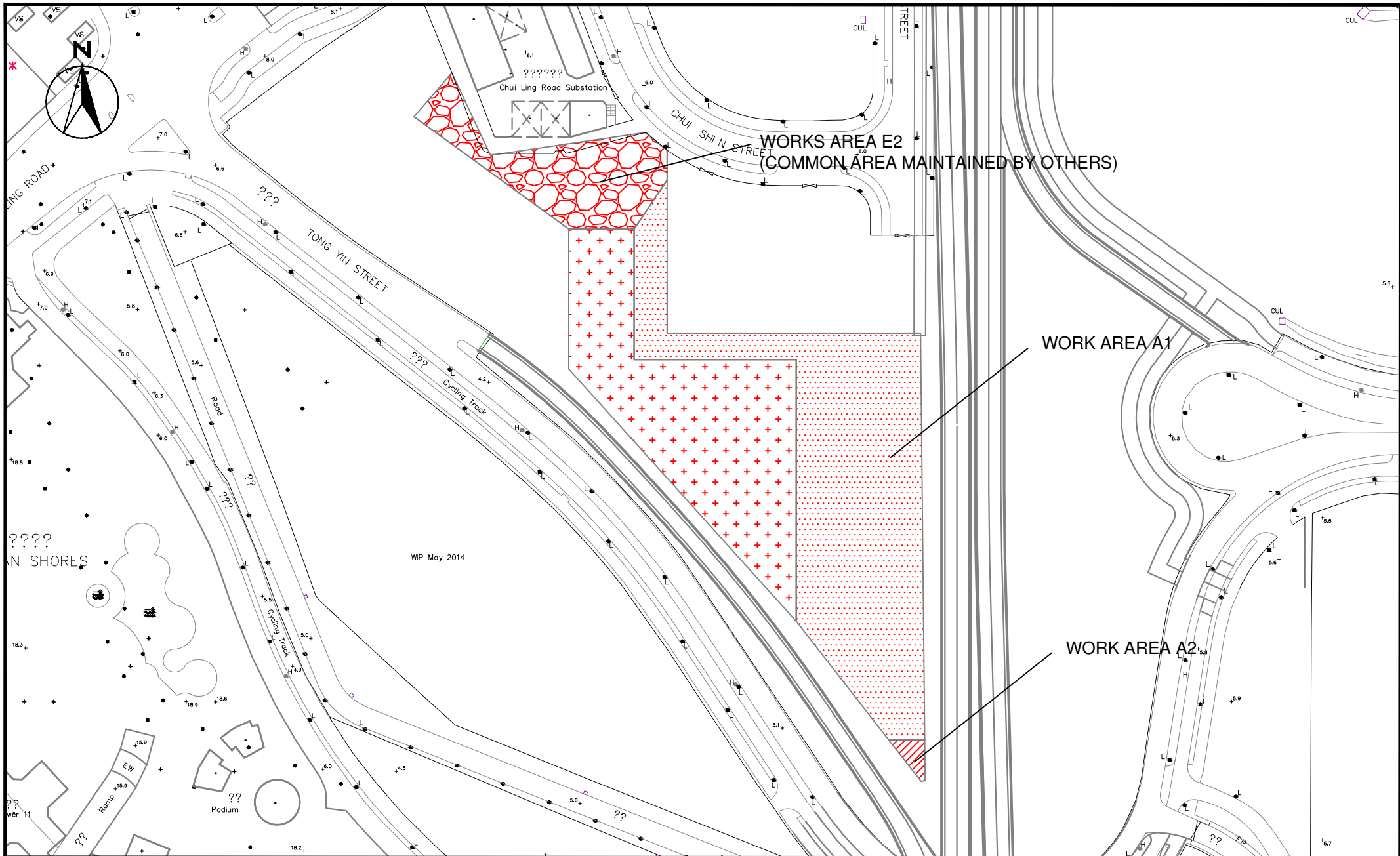
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JUNK BAY
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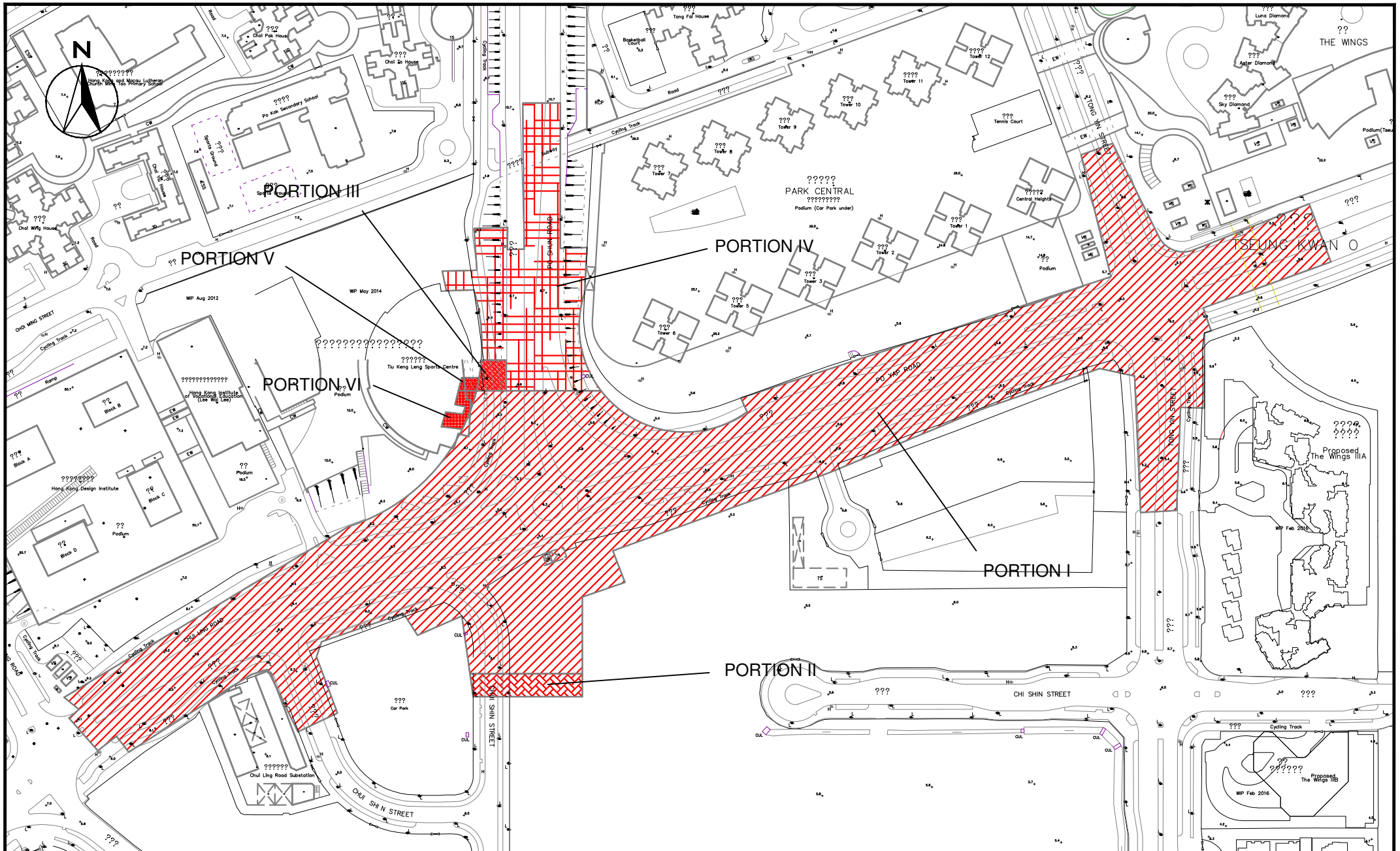


Agreement No. CE/59/2015 (EP)
 Environmental Team for Tseung Kwan O - Lam Tin Tunnel
 - Design and Construction
 Site Portions under Work Contract No. NE/2017/01

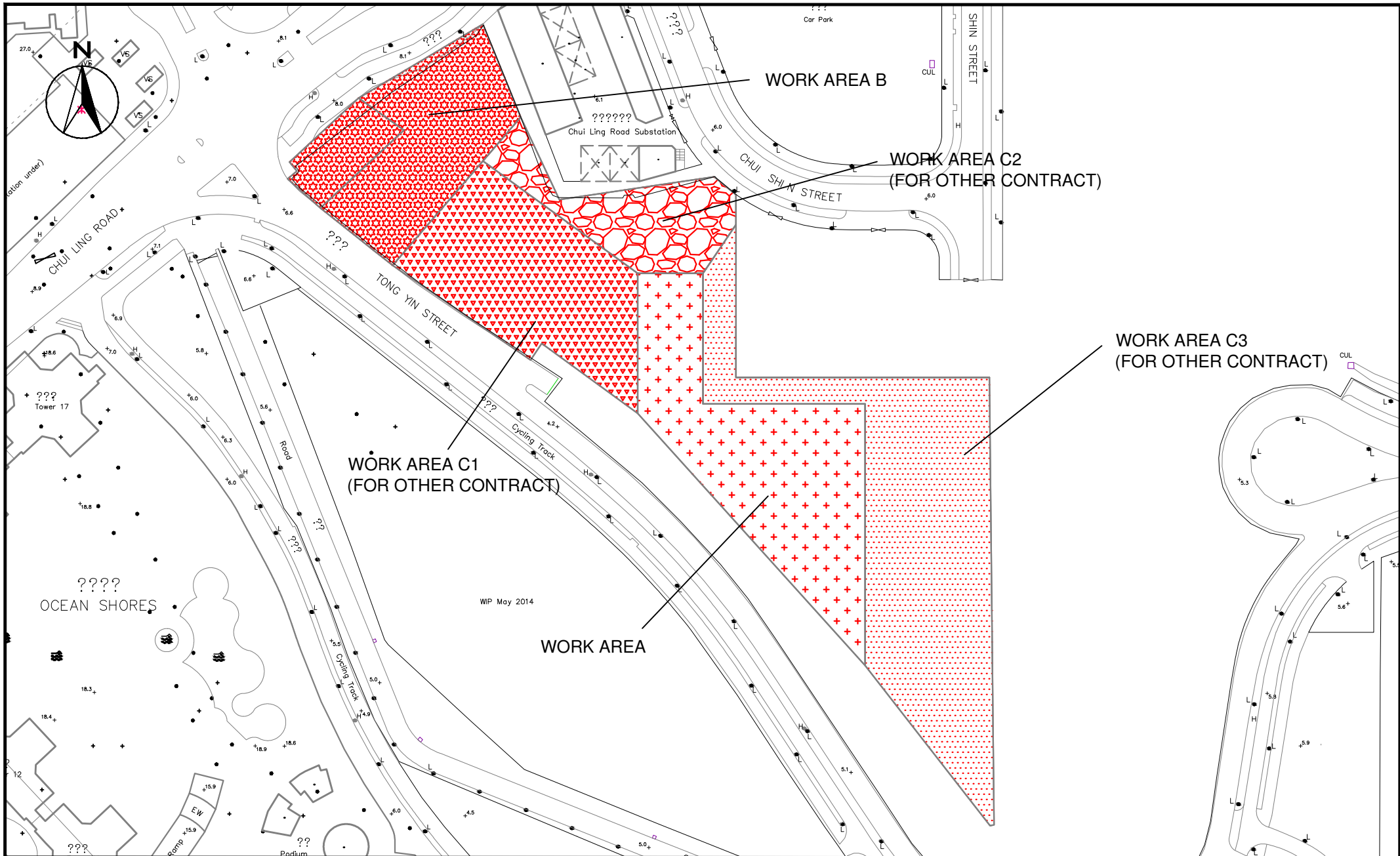
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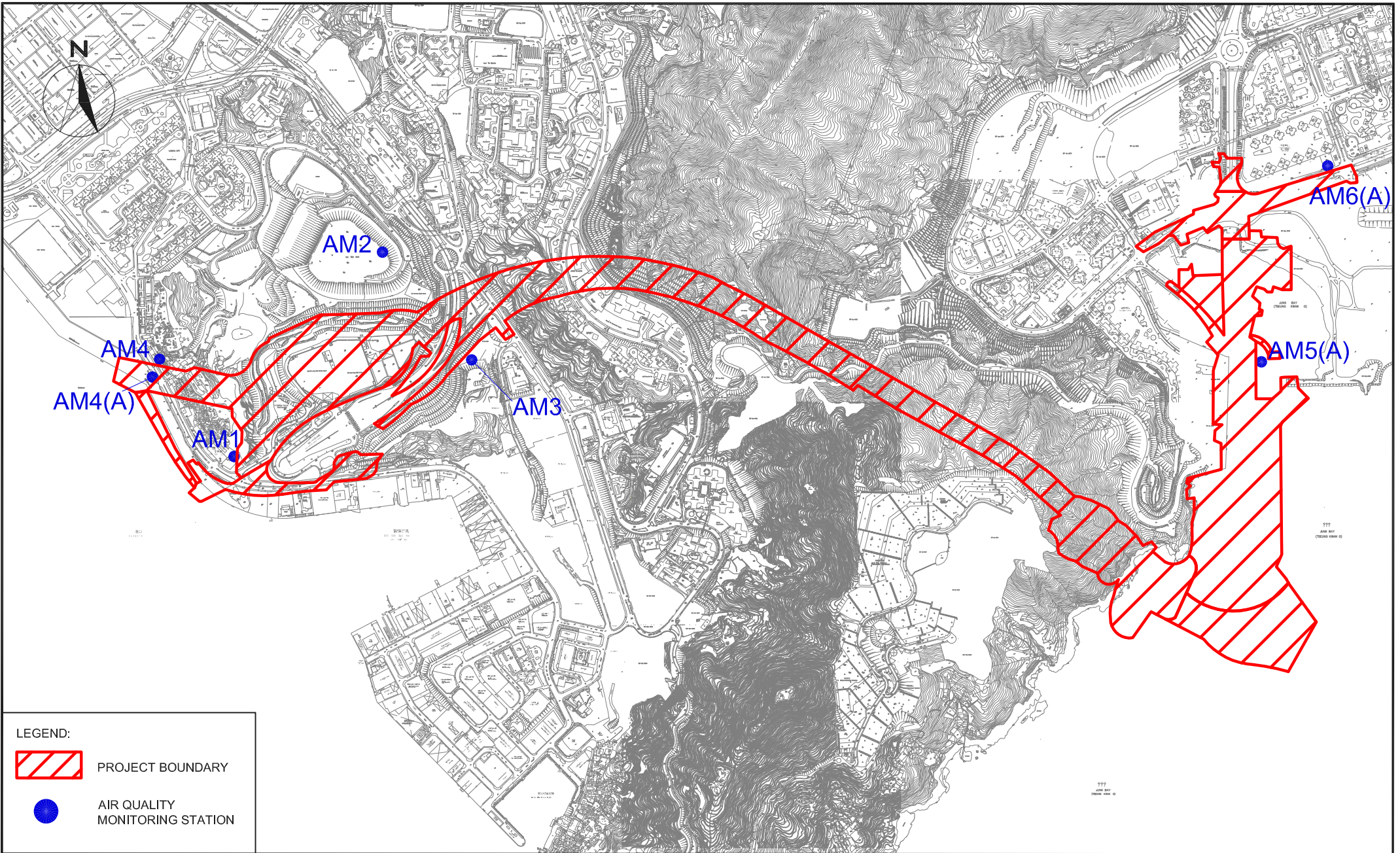
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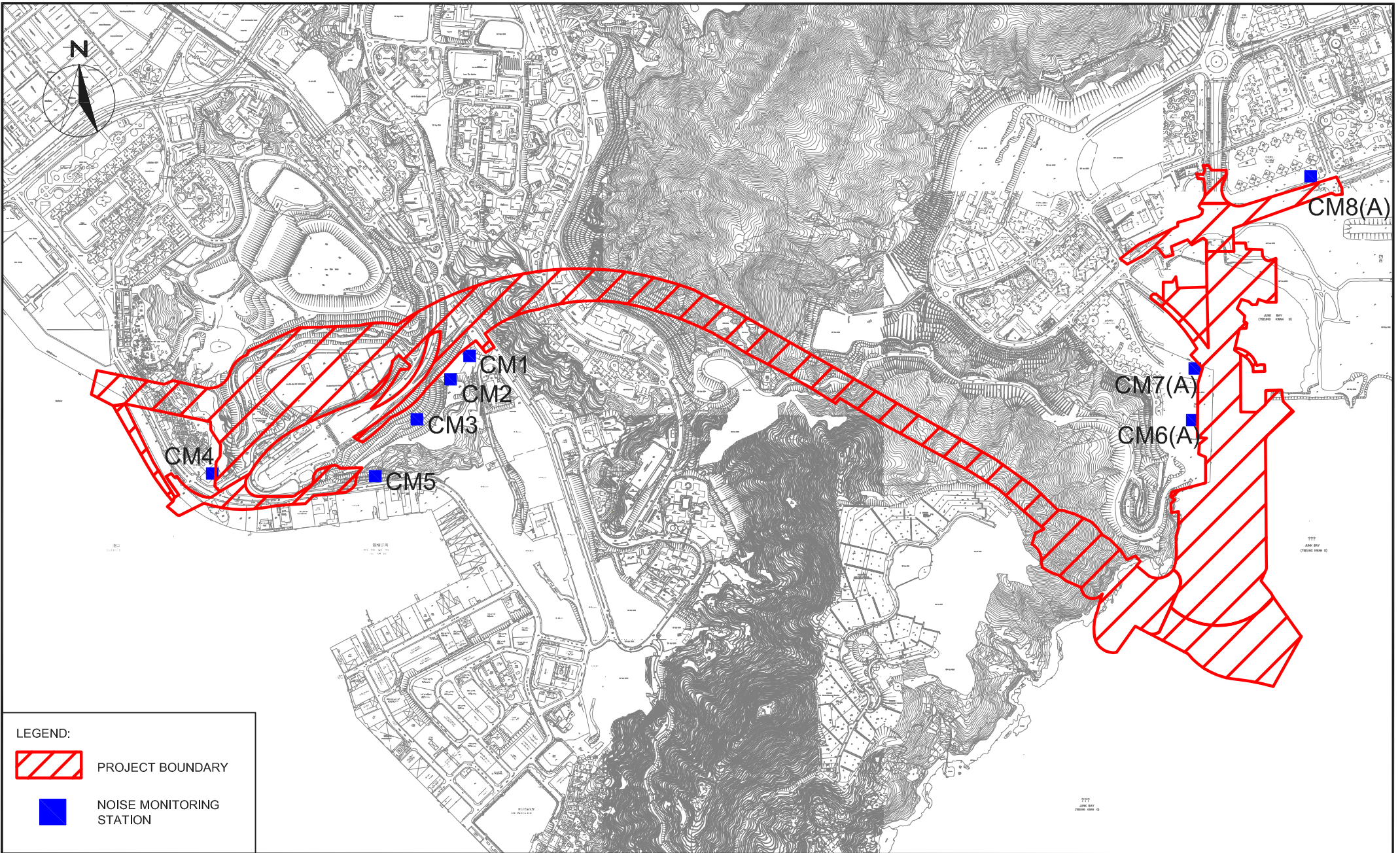


PROJECT BOUNDARY





AIR QUALITY MONITORING STATION

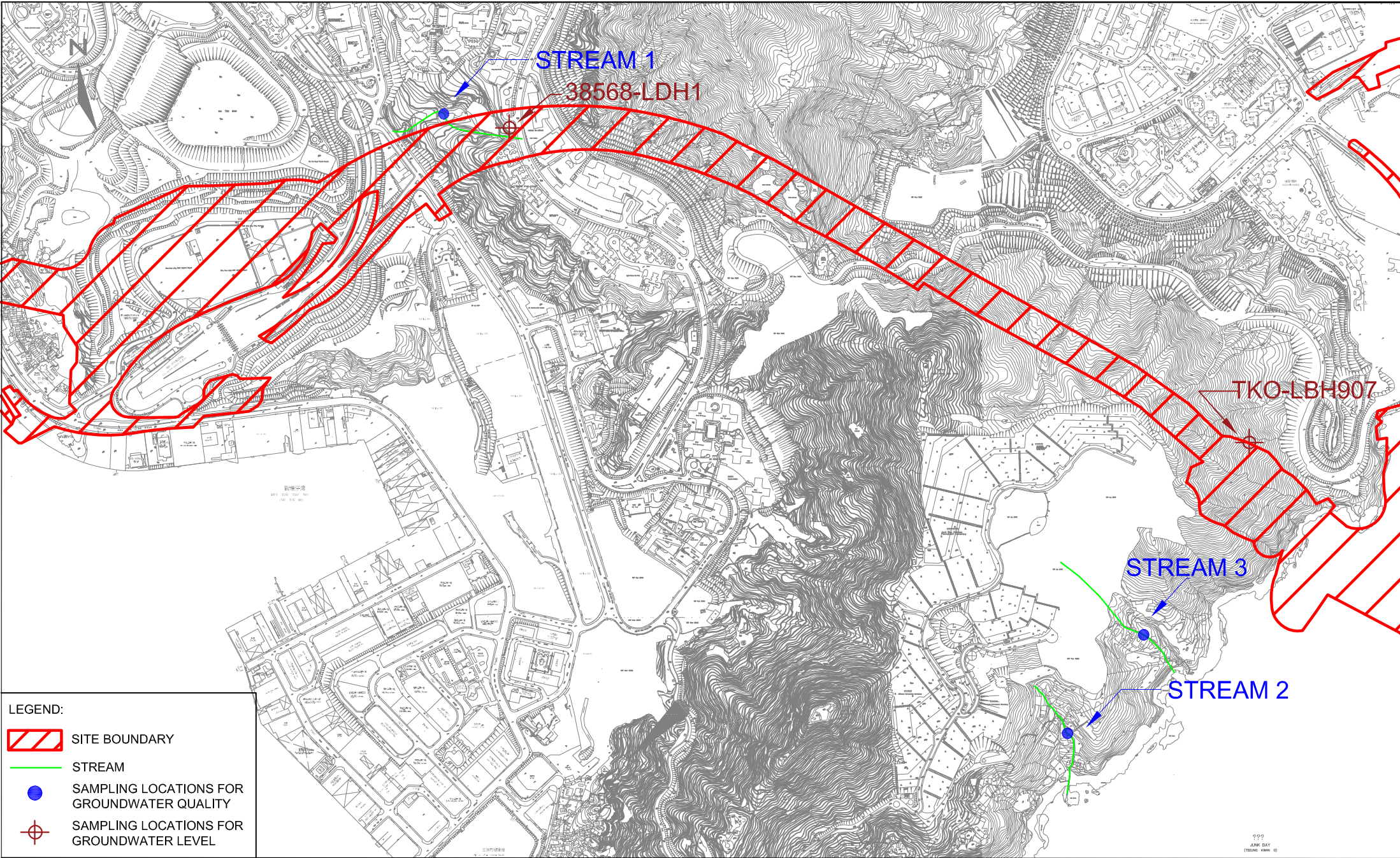
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LEGEND:

-  PROJECT BOUNDARY
-  NOISE MONITORING STATION

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CHECK	JF	DRAWN	JW	
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LEGEND:

-  SITE BOUNDARY
-  STREAM
-  SAMPLING LOCATIONS FOR GROUNDWATER QUALITY
-  SAMPLING LOCATIONS FOR GROUNDWATER LEVEL



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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JOB No.	MA16034	FIGURE NO.	4	REV
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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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PROJECT NO.	MA16034	FIGURE NO.	5	REV —

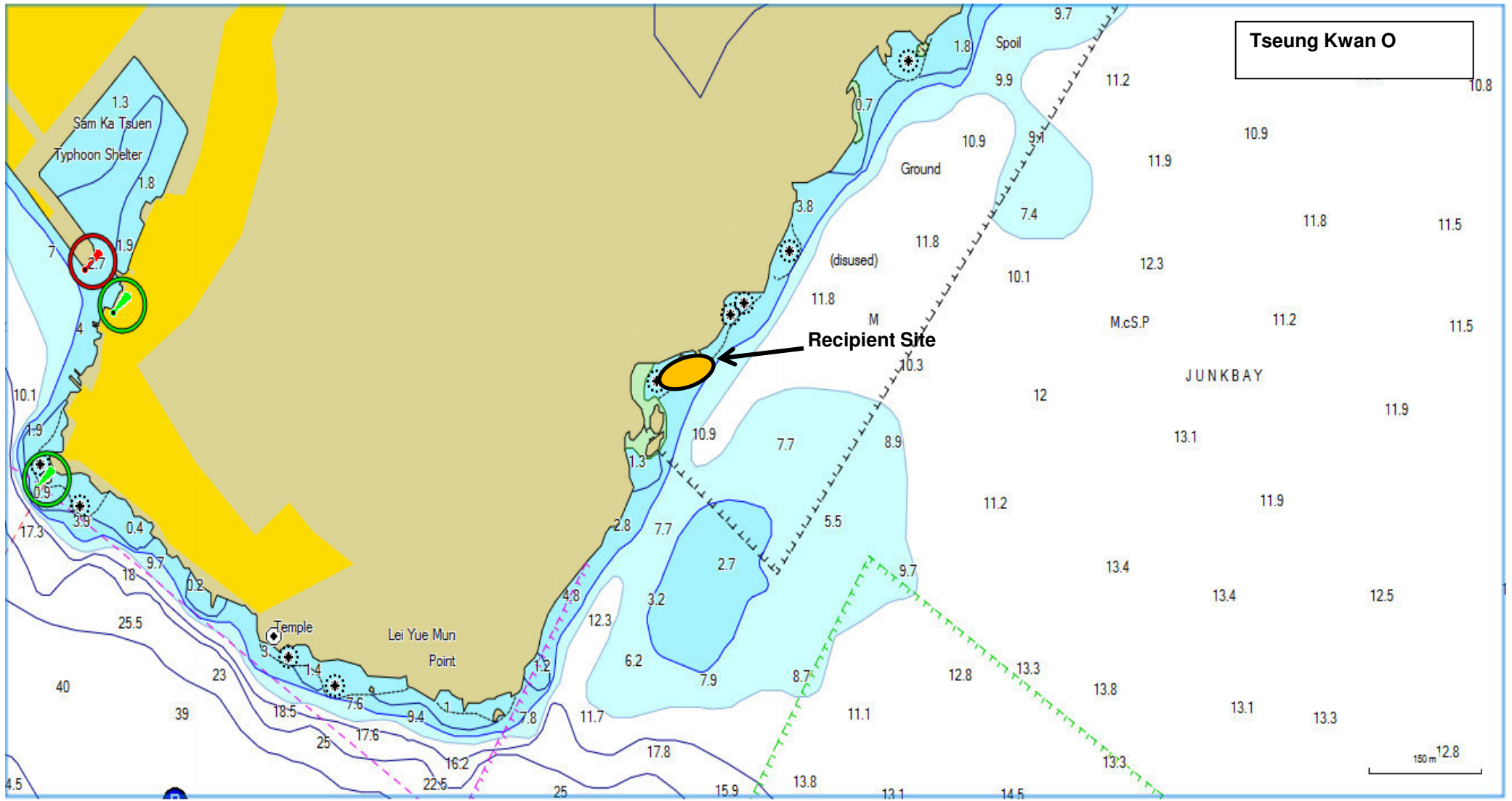


Title Agreement No. CE/59/2015 (EP)
 Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction
 Locations of Landfill Gas Monitoring

Scale N.T.S
 Date Dec-16

Project No. MA16034
 Figure 6



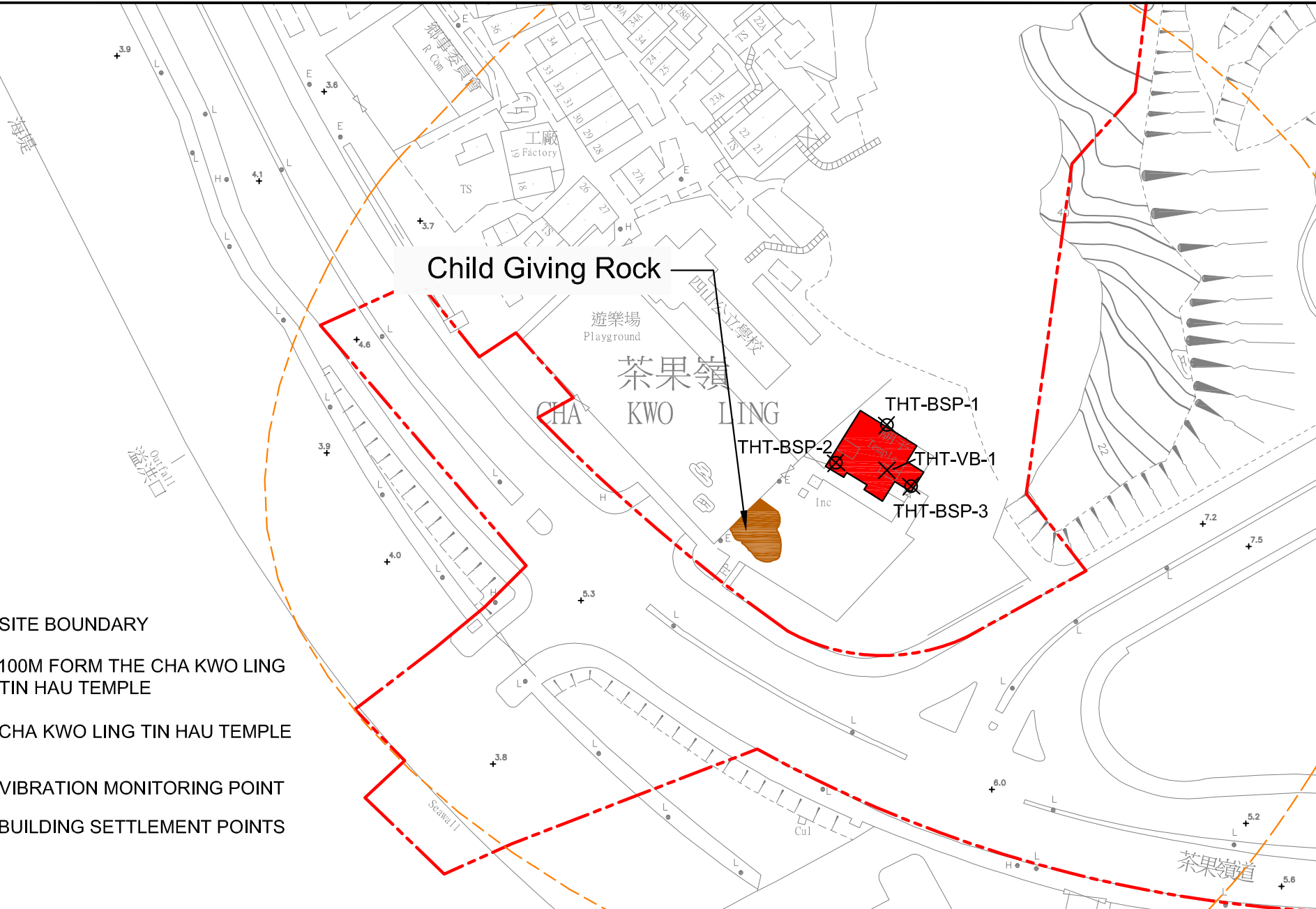
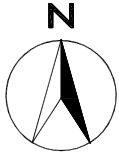


Title Agreement No. CE/59/2015 (EP)
 Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction
 Location of Post-translocation Coral Monitoring

Scale N.T.S
 Date Mar-17

Project No. MA16034
 Figure 7

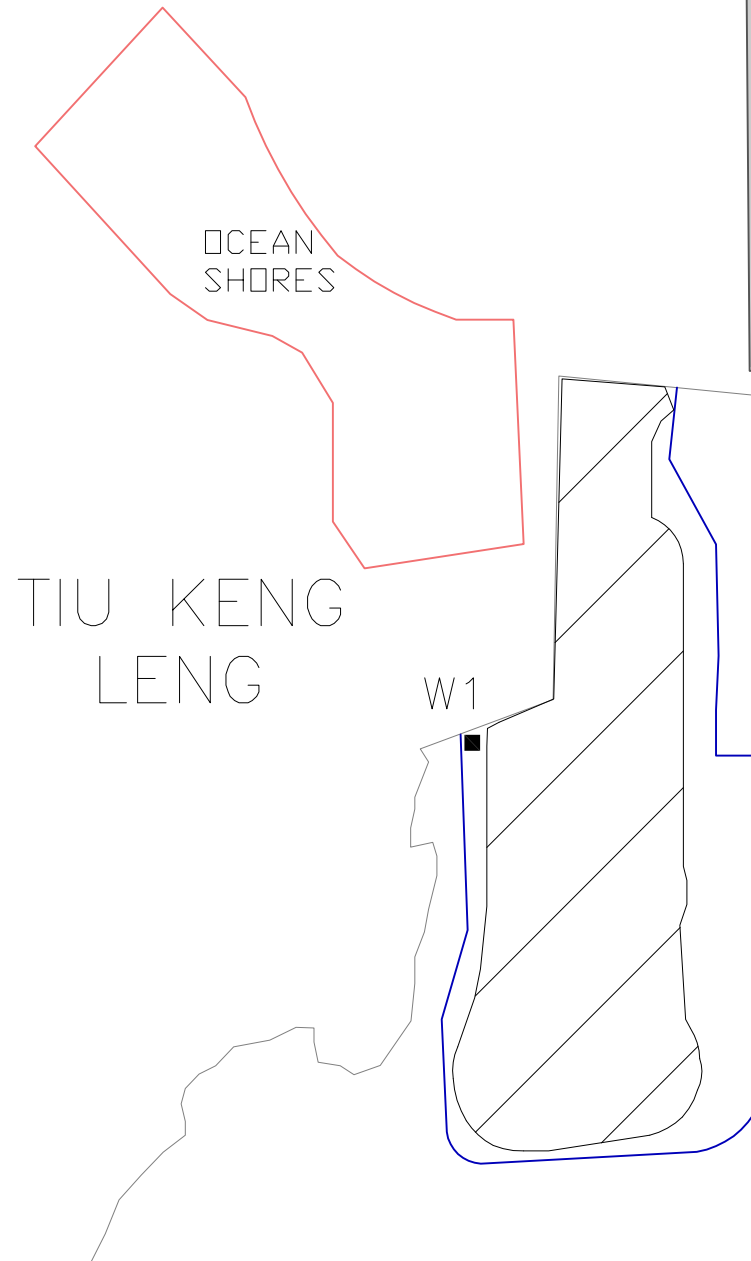
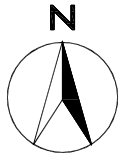




LEGEND

- SITE BOUNDARY
- 100M FORM THE CHA KWO LING TIN HAU TEMPLE
- CHA KWO LING TIN HAU TEMPLE
- × VIBRATION MONITORING POINT
- ⊗ BUILDING SETTLEMENT POINTS

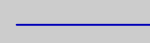
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LEGEND



IMPACT STATIONS



LOCATION OF TEMPORARY MARINE EMBAYMENT BY STEEL COFFERDAM



RECLAMATION FOOTPRINT

CURRENT SHORELINE

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, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
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, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
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 (BOD₅), 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

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

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	<u>4.8 mg/L</u> ⁽⁴⁾	<u>4 mg/L</u> ⁽³⁾
	Bottom	<u>2.4 mg/L</u> ⁽⁴⁾	<u>2 mg/L</u> ⁽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**

Certificate of Calibration

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


Description: Handheld Particle Counter Date of Calibration 13-Feb-19
 Manufacturer: Hal Technology Validity of Calibration Record 12-Apr-19
 Model No.: Hal -HPC301
 Serial No.: 3011701018
 Equipment No.: A-27-05
 High Volume Sampler No.: A-01-03
 Tisch Calibration Orifice No.: 3607


Calibration of 1 hr TSP		
Calibration Point	Laser Dust Monitor	HVS
	Mass Concentration ($\mu\text{g}/\text{m}^3$) X-axis	Mass concentration ($\mu\text{g}/\text{m}^3$) Y-axis
1	134	149.3
2	112	121.9
3	108	119.4
Average	118	130
By Linear Regression of Y on X Slope , mw = <u>1.1821</u> Intercept, bw = <u>-9.2929</u> Correlation coefficient* = <u>0.9977</u>		
Set Correlation Factor		
Particulate Concentration by High Volume Sampler ($\mu\text{g}/\text{m}^3$)	130	
Particulate Concentration by Dust Meter ($\mu\text{g}/\text{m}^3$)	118	
Measuring time, (min)	60	
Set Correlation Factor , SCF		
SCF = [K=High Volume Sampler / Dust Meter, ($\mu\text{g}/\text{m}^3$)]		<u>1.10</u>

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

Certificate of Calibration

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

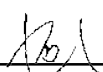
Description: Handheld Particle Counter Date of Calibration 11-Apr-19
 Manufacturer: Hal Technology Validity of Calibration Record 10-Jun-19
 Model No.: Hal -HPC301
 Serial No.: 3011701018
 Equipment No.: A-27-05
 High Volume Sampler No.: A-01-03
 Tisch Calibration Orifice No.: 3607

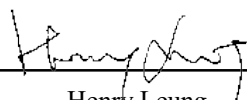
Calibration of 1 hr TSP		
Calibration Point	Laser Dust Monitor	HVS
	Mass Concentration ($\mu\text{g}/\text{m}^3$) X-axis	Mass concentration ($\mu\text{g}/\text{m}^3$) Y-axis
1	98.4	100.4
2	94.7	96.2
3	87.5	90.4
Average	93.5	95.7
By Linear Regression of Y on X Slope , mw = <u>0.9021</u> Intercept, bw = <u>11.2868</u> Correlation coefficient* = <u>0.9958</u>		
Set Correlation Factor		
Particulate Concentration by High Volume Sampler ($\mu\text{g}/\text{m}^3$)	95.7	
Particulate Concentration by Dust Meter ($\mu\text{g}/\text{m}^3$)	93.5	
Measuring time, (min)	60	
Set Correlation Factor , SCF		
SCF = [K=High Volume Sampler / Dust Meter, ($\mu\text{g}/\text{m}^3$)]		<u>1.02</u>

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

Certificate of Calibration

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


Description: Handheld Particle Counter Date of Calibration 13-Feb-19
 Manufacturer: Hal Technology Validity of Calibration Record 12-Apr-19
 Model No.: Hal -HPC301
 Serial No.: 3011701012
 Equipment No.: A-27-07
 High Volume Sampler No.: A-01-03
 Tisch Calibration Orifice No.: 3607


Calibration of 1 hr TSP		
Calibration Point	Laser Dust Monitor	HVS
	Mass Concentration ($\mu\text{g}/\text{m}^3$) X-axis	Mass concentration ($\mu\text{g}/\text{m}^3$) Y-axis
1	140	149.3
2	113	121.9
3	110	119.4
Average	121	130
By Linear Regression of Y on X Slope , mw = <u>1.0038</u> Intercept, bw = <u>8.7346</u> Correlation coefficient* = <u>0.9999</u>		
Set Correlation Factor		
Particulate Concentration by High Volume Sampler ($\mu\text{g}/\text{m}^3$)	130	
Particulate Concentration by Dust Meter ($\mu\text{g}/\text{m}^3$)	121	
Measureing time, (min)	60	
Set Correlation Factor , SCF		
SCF = [K=High Volume Sampler / Dust Meter, ($\mu\text{g}/\text{m}^3$)]		<u>1.08</u>

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

TEST REPORT

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

Test Report No.:	30523
Date of Issue:	2018-12-16
Date Received:	2018-12-14
Date Tested:	2018-12-14
Date Completed:	2018-12-16
Next Due Date:	2019-02-15

ATTN: Mr. W. K. Tang

Page: 1 of 1

Certificate of Calibration

Item for Calibration:

Description : Handheld Particle Counter
 Manufacturer : Hal Technology
 Model No. : Hal-HPC301
 Serial No. : 3011701012
 Flow rate : 0.1 cfm
 Zero Count Test : 0 count per 5 minutes
 Equipment No. : A-27-07

Test Conditions:

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

Test Specifications & Methodology:

1. Instruction and Operation Manual High Volume Sampler, Andersen Samplers, Inc.
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.

Results:

Correlation Factor (CF)	1.066
-------------------------	-------

PREPARED AND CHECKED BY:

For and On Behalf of **WELLAB Ltd.**


PATRICK TSE
 Laboratory Manager

Certificate 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 26-Feb-19
 Manufacturer: Sibata Scientific Technology LTD. Validity of Calibration Record 25-Apr-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

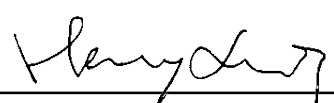
Calibration of 1 hr TSP			
Calibration Point	Laser Dust Monitor		HVS
	Total Count	Count / Minute X-axis	Mass concentration (µg/m ³) Y-axis
1	1887	31.45	87.1
2	1970	32.83	89.1
3	2056	34.27	91.5
Average		32.85	89.23
<p>By Linear Regression of Y on X</p> <p>Slope, mw = <u>1.5611</u> Intercept, bw = <u>37.9527</u></p> <p>Correlation coefficient* = <u>0.9992</u></p> <p>Set Correlation Factor, SCF</p> <p>SCF = [K=High Volume Sampler / Dust Meter, (µ g/m³)] <u>0.0027</u></p>			

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

Certificate 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 25-Apr-19
 Manufacturer: Sibata Scientific Technology LTD. Validity of Calibration Record 24-Jun-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

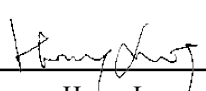
Calibration of 1 hr TSP			
Calibration Point	Laser Dust Monitor		HVS
	Total Count	Count / Minute X-axis	Mass concentration (µg/m ³) Y-axis
1	3189.0	53.2	58.7
2	3510.1	58.5	80.9
3	3660.5	61.0	89.8
Average		57.55	76.47
<p>By Linear Regression of Y on X</p> <p>Slope, mw = <u>3.9875</u> Intercept, bw = <u>-153.0315</u></p> <p>Correlation coefficient* = <u>0.9994</u></p> <p>Set Correlation Factor, SCF</p> <p>SCF = [K=High Volume Sampler / Dust Meter, (µ g/m³)] <u>1.3</u></p>			

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

Certificate of Calibration

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


Description: Handheld Particle Counter Date of Calibration 26-Feb-19
 Manufacturer: Hal Technology Validity of Calibration Record 25-Apr-19
 Model No.: Hal -HPC300
 Serial No.: 30117011019
 Equipment No.: SA-01-03
 High Volume Sampler No.: A-01-03
 Tisch Calibration Orifice No.: 3607

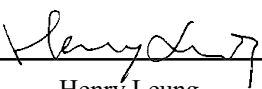
Calibration of 1 hr TSP		
Calibration Point	Laser Dust Monitor	HVS
	Mass Concentration ($\mu\text{g}/\text{m}^3$) X-axis	Mass concentration ($\mu\text{g}/\text{m}^3$) Y-axis
1	37.4	87.1
2	43.2	89.1
3	51.3	91.5
Average	44.0	89.2
By Linear Regression of Y on X Slope , mw = <u>0.3153</u> Intercept, bw = <u>75.3725</u> Correlation coefficient* = <u>0.9991</u>		
Set Correlation Factor		
Particulate Concentration by High Volume Sampler ($\mu\text{g}/\text{m}^3$)	89.2	
Particulate Concentration by Dust Meter ($\mu\text{g}/\text{m}^3$)	44.0	
Measuring time, (min)	60	
Set Correlation Factor , SCF		
SCF = [K=High Volume Sampler / Dust Meter, ($\mu\text{g}/\text{m}^3$)]	<u>2.03</u>	

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

Certificate of Calibration

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


Description: Handheld Particle Counter Date of Calibration 25-Apr-19
 Manufacturer: Hal Technology Validity of Calibration Record 24-Jun-19
 Model No.: Hal -HPC300
 Serial No.: 30117011019
 Equipment No.: SA-01-03
 High Volume Sampler No.: A-01-03
 Tisch Calibration Orifice No.: 3607

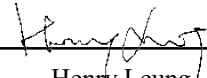
Calibration of 1 hr TSP		
Calibration Point	Laser Dust Monitor	HVS
	Mass Concentration ($\mu\text{g}/\text{m}^3$) X-axis	Mass concentration ($\mu\text{g}/\text{m}^3$) Y-axis
1	27.6	58.7
2	37.8	80.9
3	43.6	89.8
Average	36.3	76.5
By Linear Regression of Y on X Slope , mw = <u>1.9703</u> Intercept, bw = <u>4.8798</u> Correlation coefficient* = <u>0.9964</u>		
Set Correlation Factor		
Particulate Concentration by High Volume Sampler ($\mu\text{g}/\text{m}^3$)	76.5	
Particulate Concentration by Dust Meter ($\mu\text{g}/\text{m}^3$)	36.3	
Measuring time, (min)	60	
Set Correlation Factor , SCF		
SCF = [K=High Volume Sampler / Dust Meter, ($\mu\text{g}/\text{m}^3$)]		<u>2.10</u>

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

Certificate of Calibration

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

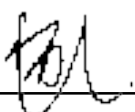
Description: Digital Dust Indicator Date of Calibration 13-Feb-19
 Manufacturer: Sibata Scientific Technology LTD. Validity of Calibration Record 12-Apr-19
 Model No.: LD-5R
 Serial No.: 8Y2374
 Equipment No.: SA-01-04 Sensitivity 0.001 mg/m3
 High Volume Sampler No.: A-01-03 Before Sensitivity Adjustment 652
 Tisch Calibration Orifice No.: 3607 After Sensitivity Adjustment 652

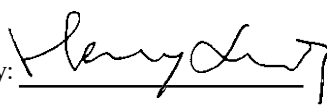
Calibration of 1 hr TSP		
Calibration Point	Laser Dust Monitor	HVS
	Mass Concentration ($\mu\text{g}/\text{m}^3$) X-axis	Mass concentration ($\mu\text{g}/\text{m}^3$) Y-axis
1	74	149.3
2	60	121.9
3	58	119.4
Average	64	130
By Linear Regression of Y on X Slope , mw = <u>1.9013</u> Intercept, bw = <u>8.5158</u> Correlation coefficient* = <u>0.9992</u>		
Set Correlation Factor		
Particulate Concentration by High Volume Sampler ($\mu\text{g}/\text{m}^3$)	130	
Particulate Concentration by Dust Meter ($\mu\text{g}/\text{m}^3$)	64	
Measuring time, (min)	60	
Set Correlation Factor , SCF		
SCF = [K=High Volume Sampler / Dust Meter, ($\mu\text{g}/\text{m}^3$)]		<u>2.0</u>

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

Certificate 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 11-Apr-19
 Manufacturer: Sibata Scientific Technology LTD. Validity of Calibration Record 10-Jun-19
 Model No.: LD-5R
 Serial No.: 8Y2374
 Equipment No.: SA-01-04 Sensitivity 0.001 mg/m3
 High Volume Sampler No.: A-01-03 Before Sensitivity Adjustment 652
 Tisch Calibration Orifice No.: 3607 After Sensitivity Adjustment 652

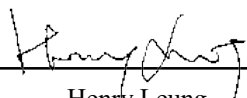
Calibration of 1 hr TSP		
Calibration Point	Laser Dust Monitor	HVS
	Mass Concentration ($\mu\text{g}/\text{m}^3$) X-axis	Mass concentration ($\mu\text{g}/\text{m}^3$) Y-axis
1	68	100.4
2	65	96.2
3	60	90.4
Average	64.3	95.7
By Linear Regression of Y on X Slope , mw = <u>1.2408</u> Intercept, bw = <u>15.8408</u> Correlation coefficient* = <u>0.9987</u>		
Set Correlation Factor		
Particulate Concentration by High Volume Sampler ($\mu\text{g}/\text{m}^3$)		96
Particulate Concentration by Dust Meter ($\mu\text{g}/\text{m}^3$)		64
Measuring time, (min)		60
Set Correlation Factor , SCF SCF = [K=High Volume Sampler / Dust Meter, ($\mu\text{g}/\text{m}^3$)] <u>1.5</u>		

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

Certificate 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 13-Feb-19
 Manufacturer: Sibata Scientific Technology LTD. Validity of Calibration Record 12-Apr-19
 Model No.: LD-5R
 Serial No.: 8Y2373
 Equipment No.: SA-01-05 Sensitivity 0.001 mg/m3
 High Volume Sampler No.: A-01-03 Before Sensitivity Adjustment 657
 Tisch Calibration Orifice No.: 3607 After Sensitivity Adjustment 657

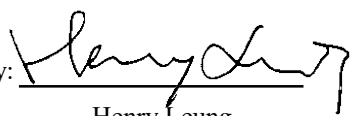
Calibration of 1 hr TSP		
Calibration Point	Laser Dust Monitor	HVS
	Mass Concentration ($\mu\text{g}/\text{m}^3$) X-axis	Mass concentration ($\mu\text{g}/\text{m}^3$) Y-axis
1	74	149.3
2	62	121.9
3	60	119.4
Average	65	130
By Linear Regression of Y on X Slope , mw = <u>2.1872</u> Intercept, bw = <u>-12.6977</u> Correlation coefficient* = <u>0.9984</u>		
Set Correlation Factor		
Particulate Concentration by High Volume Sampler ($\mu\text{g}/\text{m}^3$)	130	
Particulate Concentration by Dust Meter ($\mu\text{g}/\text{m}^3$)	65	
Measuring time, (min)	60	
Set Correlation Factor , SCF		
SCF = [K=High Volume Sampler / Dust Meter, ($\mu\text{g}/\text{m}^3$)]	<u>2.0</u>	

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

Certificate of Calibration

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

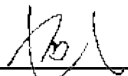
Description: Digital Dust Indicator Date of Calibration 11-Apr-19
 Manufacturer: Sibata Scientific Technology LTD. Validity of Calibration Record 10-Jun-19
 Model No.: LD-5R
 Serial No.: 8Y2373
 Equipment No.: SA-01-05 Sensitivity 0.001 mg/m3
 High Volume Sampler No.: A-01-03 Before Sensitivity Adjustment 657
 Tisch Calibration Orifice No.: 3607 After Sensitivity Adjustment 657

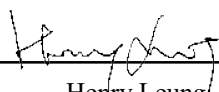
Calibration of 1 hr TSP		
Calibration Point	Laser Dust Monitor	HVS
	Mass Concentration ($\mu\text{g}/\text{m}^3$) X-axis	Mass concentration ($\mu\text{g}/\text{m}^3$) Y-axis
1	67	100.4
2	64	96.2
3	58	90.4
Average	63	96
By Linear Regression of Y on X Slope , mw = <u>1.0905</u> Intercept, bw = <u>26.9667</u> Correlation coefficient* = <u>0.9952</u>		
Set Correlation Factor		
Particulate Concentration by High Volume Sampler ($\mu\text{g}/\text{m}^3$)		96
Particulate Concentration by Dust Meter ($\mu\text{g}/\text{m}^3$)		63
Measuring time, (min)		60
Set Correlation Factor , SCF SCF = [K=High Volume Sampler / Dust Meter, ($\mu\text{g}/\text{m}^3$)] <u>1.5</u>		

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

High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET



File No. MA16034/05/0016

Project No. AM1 - Tin Hau Temple
 Date: 19-Feb-19 Next Due Date: 18-Apr-19 Operator: SK
 Equipment No.: A-01-05 Model No.: GS2310 Serial No. 10599

Ambient Condition			
Temperature, Ta (K)	291.8	Pressure, Pa (mmHg)	764.9

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

Calibration of TSP Sampler					
Calibration Point	Orifice			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	12.8	3.63	62.10	8.1	2.89
2	9.2	3.08	52.71	5.8	2.44
3	7.8	2.83	48.57	4.9	2.24
4	4.9	2.24	38.58	3.3	1.84
5	2.8	1.70	29.26	2.1	1.47

By Linear Regression of Y on X

Slope, mw = 0.0429 Intercept, bw = 0.1934
 Correlation coefficient* = 0.9990

*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 = $(mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ 4.04

Remarks: _____

Conducted by: SK Wong Signature:  Date: 19 Feb 2019

Checked by: Henry Leung Signature:  Date: 19 Feb 2019

High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET



File No. MA16034/08/0016

Project No. AM2 - Sai Tso Wan Recreation Ground
 Date: 19-Feb-19 Next Due Date: 18-Apr-19 Operator: SK
 Equipment No.: A-01-08 Model No.: GS2310 Serial No. 1287

Ambient Condition			
Temperature, Ta (K)	<u>291.8</u>	Pressure, Pa (mmHg)	<u>764.9</u>

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

Calibration of TSP Sampler					
Calibration Point	Orifice			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	<u>12.9</u>	3.64	62.34	<u>8.1</u>	2.89
2	<u>9.5</u>	3.12	53.55	<u>6.1</u>	2.50
3	<u>8.0</u>	2.87	49.18	<u>5.1</u>	2.29
4	<u>4.9</u>	2.24	38.58	<u>3.1</u>	1.79
5	<u>3.0</u>	1.76	30.28	<u>2.1</u>	1.47

By Linear Regression of Y on X

Slope, mw = 0.0448 Intercept, bw = 0.0886
 Correlation coefficient* = 0.9993

*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 = $(mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ 3.96

Remarks: _____

Conducted by: SK Wong Signature:  Date: 19 Feb 2019

Checked by: Henry Leung Signature:  Date: 19 Feb 2019

High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET



File No. MA16034/03/0016

Project No. AM3 - Yau Lai Estate, Bik Lai House
 Date: 19-Feb-19 Next Due Date: 18-Apr-19 Operator: SK
 Equipment No.: A-01-03 Model No.: GS2310 Serial No. 10379

Ambient Condition			
Temperature, Ta (K)	291.8	Pressure, Pa (mmHg)	764.9

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

Calibration of TSP Sampler					
Calibration Point	Orifice			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	12.6	3.60	61.61	8.0	2.87
2	9.5	3.12	53.55	6.2	2.52
3	7.9	2.85	48.87	4.9	2.24
4	5.1	2.29	39.35	3.2	1.81
5	3.0	1.76	30.28	2.0	1.43

By Linear Regression of Y on X

Slope, mw = 0.0463 Intercept, bw = 0.0113
 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

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

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

Remarks: _____

Conducted by: SK Wong Signature:  Date: 19 Feb 2019

Checked by: Henry Leung Signature:  Date: 19 Feb 2019

High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET



File No. MA16034/54/0016

Project No. AM4(A) - Cha Kwo Ling Public Cargo Working Area Administrative Office
 Date: 19-Feb-19 Next Due Date: 18-Apr-19 Operator: SK
 Equipment No.: A-01-54 Model No.: TE-5170 Serial No. 1536

Ambient Condition			
Temperature, Ta (K)	<u>291.8</u>	Pressure, Pa (mmHg)	<u>764.9</u>

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

Calibration of TSP Sampler					
Calibration Point	Orifice			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	<u>13.0</u>	3.66	62.58	<u>8.5</u>	2.96
2	<u>9.8</u>	3.17	54.39	<u>6.5</u>	2.58
3	<u>7.9</u>	2.85	48.87	<u>5.3</u>	2.33
4	<u>5.3</u>	2.33	40.11	<u>3.4</u>	1.87
5	<u>3.2</u>	1.81	31.26	<u>2.2</u>	1.50

By Linear Regression of Y on X

Slope, mw = 0.0470 Intercept, bw = 0.0179
 Correlation coefficient* = 0.9993

*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 = $(mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ 4.05

Remarks: _____

Conducted by: SK Wong Signature:  Date: 19 Feb 2019
 Checked by: Henry Leung Signature:  Date: 19 Feb 2019

High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET



File No. MA16034/37/0016

Project No. AM5(A) - Tseung Kwan O DSD Desilting Compound
 Date: 19-Feb-19 Next Due Date: 18-Apr-19 Operator: SK
 Equipment No.: A-01-37 Model No.: GS2310 Serial No. 1704

Ambient Condition			
Temperature, Ta (K)	291.8	Pressure, Pa (mmHg)	764.9

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

Calibration of TSP Sampler					
Calibration Point	Orifice			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	13.5	3.73	63.76	8.6	2.97
2	10.1	3.22	55.21	6.6	2.60
3	8.1	2.89	49.48	5.3	2.33
4	5.5	2.38	40.85	3.5	1.90
5	3.4	1.87	32.20	2.4	1.57

By Linear Regression of Y on X

Slope, mw = 0.0453 Intercept, bw = 0.0885
 Correlation coefficient* = 0.9990

*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 = $(mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ 4.03

Remarks: _____

Conducted by: SK Wong Signature: Date: 19 Feb 2019

Checked by: Henry Leung Signature: Date: 19 Feb 2019

High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET



File No. MA16034/07/0016

Project No. AM6 - Park Central
 Date: 20-Mar-19 Next Due Date: 18-May-19 Operator: SK
 Equipment No.: A-01-07 Model No.: GS2310 Serial No. 10592

Ambient Condition			
Temperature, Ta (K)	<u>296.2</u>	Pressure, Pa (mmHg)	<u>759.2</u>

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

Calibration of TSP Sampler					
Calibration Point	Orifice			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	<u>10.9</u>	3.31	56.70	<u>6.4</u>	2.54
2	<u>8.6</u>	2.94	50.41	<u>5.3</u>	2.31
3	<u>6.8</u>	2.61	44.87	<u>4.1</u>	2.03
4	<u>4.4</u>	2.10	36.18	<u>2.6</u>	1.62
5	<u>2.9</u>	1.71	29.45	<u>1.7</u>	1.31

By Linear Regression of Y on X

Slope, mw = 0.0459 Intercept, bw = -0.0374
 Correlation coefficient* = 0.9990

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation


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

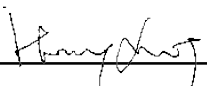
From the Regression Equation, the "Y" value according to

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

Therefore, Set Point; W = $(mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ 3.73

Remarks: _____

Conducted by: SK Wong Signature:  Date: 20 March 2019

Checked by: Henry Leung Signature:  Date: 20 March 2019

High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET



File No. MA16034/05/0017

Project No. AM1 - Tin Hau Temple
 Date: 18-Apr-19 Next Due Date: 17-Jun-19 Operator: SK
 Equipment No.: A-01-05 Model No.: GS2310 Serial No. 10599

Ambient Condition			
Temperature, Ta (K)	<u>297</u>	Pressure, Pa (mmHg)	<u>757.6</u>

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

Calibration of TSP Sampler					
Calibration Point	Orifice			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	<u>12.9</u>	3.59	61.50	<u>8.1</u>	2.85
2	<u>9.2</u>	3.03	52.00	<u>5.8</u>	2.41
3	<u>7.7</u>	2.78	47.61	<u>4.9</u>	2.21
4	<u>5.0</u>	2.24	38.44	<u>3.2</u>	1.79
5	<u>2.8</u>	1.67	28.87	<u>2.0</u>	1.41

By Linear Regression of Y on X

Slope, mw = 0.0441 Intercept, bw = 0.1183
 Correlation coefficient* = 0.9994

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

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

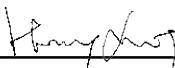
From the Regression Equation, the "Y" value according to

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

Therefore, Set Point; W = $(mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ 4.06

Remarks: _____

Conducted by: SK Wong Signature:  Date: 18 April 2019

Checked by: Henry Leung Signature:  Date: 18 April 2019

High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET



File No. MA16034/08/0017

Project No. AM2 - Sai Tso Wan Recreation Ground
 Date: 18-Apr-19 Next Due Date: 17-Jun-19 Operator: SK
 Equipment No.: A-01-08 Model No.: GS2310 Serial No. 1287

Ambient Condition			
Temperature, Ta (K)	<u>297</u>	Pressure, Pa (mmHg)	<u>757.6</u>

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

Calibration of TSP Sampler					
Calibration Point	Orifice			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	<u>12.8</u>	3.58	61.26	<u>8.2</u>	2.86
2	<u>9.5</u>	3.08	52.84	<u>6.0</u>	2.45
3	<u>8.0</u>	2.83	48.52	<u>5.1</u>	2.26
4	<u>4.8</u>	2.19	37.68	<u>3.1</u>	1.76
5	<u>2.9</u>	1.70	29.38	<u>2.0</u>	1.41

By Linear Regression of Y on X

Slope, mw = 0.0454 Intercept, bw = 0.0634
 Correlation coefficient* = 0.9996

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

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

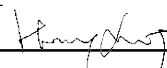
From the Regression Equation, the "Y" value according to

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

Therefore, Set Point; W = $(mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ 4.06

Remarks: _____

Conducted by: SK Wong Signature:  Date: 18 April 2019

Checked by: Henry Leung Signature:  Date: 18 April 2019

High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET



File No. MA16034/03/0017

Project No. AM3 - Yau Lai Estate, Bik Lai House
 Date: 18-Apr-19 Next Due Date: 17-Jun-19 Operator: SK
 Equipment No.: A-01-03 Model No.: GS2310 Serial No. 10379

Ambient Condition			
Temperature, Ta (K)	<u>297</u>	Pressure, Pa (mmHg)	<u>757.6</u>

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

Calibration of TSP Sampler					
Calibration Point	Orifice			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	<u>12.7</u>	3.56	61.03	<u>8.0</u>	2.83
2	<u>9.5</u>	3.08	52.84	<u>6.2</u>	2.49
3	<u>7.9</u>	2.81	48.22	<u>5.0</u>	2.24
4	<u>5.2</u>	2.28	39.20	<u>3.3</u>	1.82
5	<u>2.9</u>	1.70	29.38	<u>2.0</u>	1.41

By Linear Regression of Y on X

Slope, mw = 0.0453 Intercept, bw = 0.0653
 Correlation coefficient* = 0.9992

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

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

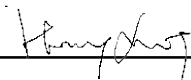
From the Regression Equation, the "Y" value according to

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

Therefore, Set Point; W = $(mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ 4.06

Remarks: _____

Conducted by: SK Wong Signature:  Date: 18 April 2019

Checked by: Henry Leung Signature:  Date: 18 April 2019

High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET



File No. MA16034/54/0017

Project No. AM4(A) - Cha Kwo Ling Public Cargo Working Area Administrative Office
 Date: 18-Apr-19 Next Due Date: 17-Jun-19 Operator: SK
 Equipment No.: A-01-54 Model No.: TE-5170 Serial No. 1536

Ambient Condition			
Temperature, Ta (K)	<u>297</u>	Pressure, Pa (mmHg)	<u>757.6</u>

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

Calibration of TSP Sampler					
Calibration Point	Orifice			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	<u>12.9</u>	3.59	61.50	<u>8.5</u>	2.92
2	<u>9.8</u>	3.13	53.66	<u>6.4</u>	2.53
3	<u>7.8</u>	2.79	47.91	<u>5.3</u>	2.30
4	<u>5.2</u>	2.28	39.20	<u>3.4</u>	1.84
5	<u>3.2</u>	1.79	30.84	<u>2.1</u>	1.45

By Linear Regression of Y on X

Slope, mw = 0.0478 Intercept, bw = -0.0222
 Correlation coefficient* = 0.9995

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation


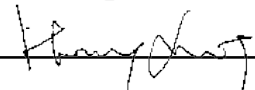
From the TSP Field Calibration Curve, take Qstd = 43 CFM

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 = $(mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ 4.14

Remarks: _____

Conducted by: SK Wong Signature:  Date: 18 April 2019
 Checked by: Henry Leung Signature:  Date: 18 April 2019

High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET



File No. MA16034/37/0017

Project No. AM5(A) - Tseung Kwan O DSD Desilting Compound
 Date: 18-Apr-19 Next Due Date: 17-Jun-19 Operator: SK
 Equipment No.: A-01-37 Model No.: GS2310 Serial No. 1704

Ambient Condition			
Temperature, Ta (K)	<u>297</u>	Pressure, Pa (mmHg)	<u>757.6</u>

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

Calibration of TSP Sampler					
Calibration Point	Orifice			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	<u>13.4</u>	3.66	62.67	<u>8.5</u>	2.92
2	<u>10.1</u>	3.18	54.47	<u>6.5</u>	2.55
3	<u>8.1</u>	2.85	48.82	<u>5.2</u>	2.28
4	<u>5.4</u>	2.32	39.94	<u>3.5</u>	1.87
5	<u>3.3</u>	1.82	31.31	<u>2.3</u>	1.52

By Linear Regression of Y on X

Slope, mw = 0.0450 Intercept, bw = 0.0943
 Correlation coefficient* = 0.9997

*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 = $(mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ 4.11

Remarks: _____

Conducted by: SK Wong Signature: _____ Date: 18 April 2019

Checked by: Henry Leung Signature: _____ Date: 18 April 2019



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)	$\sqrt{\Delta H \left(\frac{Ta}{Pa} \right)}$ (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= $\Delta Vol \left(\frac{Pa - \Delta P}{Pstd} \right) \left(\frac{Tstd}{Ta} \right)$	Va= $\Delta Vol \left(\frac{Pa - \Delta P}{Pa} \right)$
Qstd= $Vstd / \Delta Time$	Qa= $Va / \Delta Time$
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= $1/m \left(\left(\sqrt{\Delta H \left(\frac{Ta}{Pa} \right)} \right) - b \right)$

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

TEST REPORT

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

Test Report No.:	30760
Date of Issue:	2019-02-23
Date Received:	2019-02-22
Date Tested:	2019-02-22
Date Completed:	2019-02-23
Next Due Date:	2019-08-22

ATTN: Mr. W.K. Tang

Page: 1 of 2

Certificate of Calibration

Item for calibration:

Description	: Weather Monitor II
Manufacturer	: Davis Instruments
Model No.	: 7440
Serial No.	: MC01010A44

Test conditions:

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

Test Specifications:

1. Performance check of anemometer
2. Performance check of wind direction sensor

Methodology:

In-house method with reference anemometer (RS232 Integral Vane Digital Anemometer)

PREPARED AND CHECKED BY:

For and On Behalf of **WELLAB Ltd.**



PATRICK TSE
Laboratory Manager

TEST REPORT

Test Report No.:	30760
Date of Issue:	2019-02-23
Date Received:	2019-02-22
Date Tested:	2019-02-22
Date Completed:	2019-02-23
Next Due Date:	2019-08-22
Page:	2 of 2

Results:

1. Performance check of anemometer

Air Velocity, m/s		Difference D (m/s)
Instrument Reading (V1)	Reference Value (V1)	D = V1 - V2
2.00	1.95	0.05

2. Performance check of wind direction sensor

Wind Direction (°)		Difference D (°)
Instrument Reading (W1)	Reference Value (W2)	D = W1 - W2
0	0	0
45	45	0
90	90	0
135.5	135	0.5
180	180	0
225	225	0
270.5	270	0.5
315	315	0
360	360	0

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

TEST REPORT

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

Test Report No.:	30289
Date of Issue:	2018-11-04
Date Received:	2018-11-03
Date Tested:	2018-11-03
Date Completed:	2018-11-04
Next Due Date:	2019-11-03

ATTN: Mr. W.K. Tang

Page: 1 of 1

Item for calibration:

Description	: Acoustical Calibrator
Manufacturer	: Brüel & Kjær
Model No.	: 4231
Serial No.	: 2326353
Equipment No.	: N-02-01

Test conditions:

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

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 dB SPL	94.0	94.0 ± 0.1 dB
At 114 dB SPL	114.0	114.0 ± 0.1 dB

PREPARED AND CHECKED BY:

For and On Behalf of **WELLAB Ltd.**



PATRICK TSE
Laboratory Manager

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 Temperature : 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
Laboratory Manager

TEST REPORT

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

Test Report No.:	29501
Date of Issue:	2018-08-27
Date Received:	2018-08-24
Date Tested:	2018-08-24
Date Completed:	2018-08-27
Next Due Date:	2019-08-26

ATTN: Mr. W.K. Tang

Page: 1 of 1

Certificate of Calibration

Item for calibration:

Description	: 'SVANTEK' Integrating Sound Level Meter
Manufacturer	: SVANTEK
Model No.	: SVAN 957
Serial No.	: 21455
Microphone No.	: 43730
Equipment No.	: N-08-07

Test conditions:

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

Test Specifications:

Performance checking at 94 and 114 dB

Methodology:

In-house method, according to manufacturer instruction manual

Results:

Reference Set Point, dB	Instrument Readings, dB
94	94.0
114	114.0

PREPARED AND CHECKED BY:

For and On Behalf of **WELLAB Ltd.**



PATRICK TSE

Laboratory Manager

TEST REPORT

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

Test Report No.:	30293
Date of Issue:	2018-11-24
Date Received:	2018-11-23
Date Tested:	2018-11-23
Date Completed:	2018-11-24
Next Due Date:	2019-11-23

ATTN: Mr. W.K. Tang

Page: 1 of 1

Certificate of Calibration

Item for calibration:

Description	: 'SVANTEK' Integrating Sound Level Meter
Manufacturer	: SVANTEK
Model No.	: SVAN 957
Serial No.	: 23852
Microphone No.	: 43690
Equipment No.	: N-08-11

Test conditions:

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

Test Specifications:

Performance checking at 94 and 114 dB

Methodology:

In-house method, according to manufacturer instruction manual

Results:

Reference Set Point, dB	Instrument Readings, dB
94	94.0
114	114.0

PREPARED AND CHECKED BY:

For and On Behalf of **WELLAB Ltd.**


PATRICK TSE
Laboratory Manager

TEST REPORT

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

Test Report No.:	30294
Date of Issue:	2018-11-24
Date Received:	2018-11-23
Date Tested:	2018-11-23
Date Completed:	2018-11-24
Next Due Date:	2019-11-23

ATTN: Mr. W.K. Tang

Page: 1 of 1

Certificate of Calibration

Item for calibration:

Description	: 'SVANTEK' Integrating Sound Level Meter
Manufacturer	: SVANTEK
Model No.	: SVAN 957
Serial No.	: 23851
Equipment No.	: N-08-12

Test conditions:

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

Test Specifications:

Performance checking at 94 and 114 dB

Methodology:

In-house method, according to manufacturer instruction manual

Results:

Reference Set Point, dB	Instrument Readings, dB
94	94.0
114	114.0

PREPARED AND CHECKED BY:

For and On Behalf of **WELLAB Ltd.**



PATRICK TSE
Laboratory Manager

TEST REPORT

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

Test Report No.:	29817A
Date of Issue:	2018-09-29
Date Received:	2018-09-28
Date Tested:	2018-09-28
Date Completed:	2018-09-29
Next Due Date:	2019-09-28

ATTN: Mr. W.K. Tang

Page: 1 of 1

Item for calibration:

Description	: Acoustical Calibrator
Manufacturer	: SVANTEK
Model No.	: SV30A
Serial No.	: 10965
Equipment No.	: N-09-02

Test conditions:

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

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 dB SPL	94.0	94.0 ± 0.1 dB
At 114 dB SPL	114.0	114.0 ± 0.1 dB

PREPARED AND CHECKED BY:

For and On Behalf of **WELLAB Ltd.**


PATRICK TSE
Laboratory Manager

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 Temperature	: 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
Laboratory Manager

TEST REPORT

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

Test Report No.:	C/N/171213/2
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.	: 27190
Microphone No.	: 167465
Equipment No.	: SN-01-02

Test conditions:

Room Temperature	: 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
Laboratory Manager

TEST REPORT

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

Test Report No.:	30967
Date of Issue:	2019-03-04
Date Received:	2019-03-04
Date Tested:	2019-03-04
Date Completed:	2019-03-04

ATTN: **Miss Mei Ling Tang**

Page: 1 of 2

Certificate of Calibration

Item for calibration:

YSI EXO1 Multiparameter Sondes	Equipment No.:	SW-08-06
Manufacturer:	YSI Incorporated, a Xylem brand	
Description:	Model No.	Serial No.
- EXO1 Sonde, 100 meter Depth, 4 Sensor ports	599501-02	16J100680
- EXO Optical DO Sensor, Ti	599100-01	16H102985
- EXO conductivity/Temperature Sensor, Ti	599870	16G102307
- EXO Turbidity Sensor, Ti	599101-01	16H102463
- EXO pH Sensor Assembly, Guarded, Ti	599701	16H102985

Test conditions:

Room Temperature : 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

PREPARED AND CHECKED BY:

For and On Behalf of **WELLAB Ltd.**



PATRICK TSE
General Manager

TEST REPORT

Test Report No.:	30967
Date of Issue:	2019-03-04
Date Received:	2019-03-04
Date Tested:	2019-03-04
Date Completed:	2019-03-04

Page: 2 of 2

Certificate of Calibration

Results:

Conductivity performance checking

	Instrument Readings ($\mu\text{S}/\text{cm}$)	Acceptance Criteria	Comment
KCl stock solution (12890 $\mu\text{S}/\text{cm}$)	13000	12246-13534	Pass

Temperature performance checking

Reference thermometer- E431 Readings ($^{\circ}\text{C}$)	Instrument Readings ($^{\circ}\text{C}$)	Correction ($^{\circ}\text{C}$)	Comment
20.0	20.001	-0.002	N/A

pH performance checking

	Instrument Readings (pH unit)	Acceptance Criteria	Comment
pH QC buffer 4.00	4.00	4.00 ± 0.10	Pass
pH QC buffer 6.86	6.84	6.86 ± 0.10	Pass
pH QC buffer 9.18	9.20	9.18 ± 0.10	Pass

D.O. performance checking

	Instrument Readings (mg/L)	Acceptance Criteria	Comment
Zero DO solution	0.07	<0.1mg/L	Pass

Winkler Titration value (mg/L)	Instrument Readings (mg/L)	Acceptance Criteria	Comment
8.00	8.01	Difference between Titration value and instrument reading <0.2mg/L	Pass

Turbidity performance checking

Turbidity stock solution	Instrument Readings (NTU)	Acceptance Criteria	Comment
10 NTU	10.01	9.0-11.0	Pass
50 NTU	50.09	45.0-55.0	Pass
100 NTU	100.2	90.0-110.0	Pass

Depth performance checking

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

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

TEST REPORT

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

Test Report No.:	30967A
Date of Issue:	2019-03-04
Date Received:	2019-03-04
Date Tested:	2019-03-04
Date Completed:	2019-03-04

ATTN: Miss Mei Ling Tang

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 Turbidity Sensor, Ti	599101-01	17A104098
- EXO pH Sensor Assembly, Guarded, Ti	599701	16J101280

Test conditions:

Room Temperature : 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

PREPARED AND CHECKED BY:

For and On Behalf of **WELLAB Ltd.**



PATRICK TSE
General Manager

TEST REPORT

Test Report No.:	30967A
Date of Issue:	2019-03-04
Date Received:	2019-03-04
Date Tested:	2019-03-04
Date Completed:	2019-03-04

Page: 2 of 2

Certificate of Calibration

Results:

Conductivity performance checking

	Instrument Readings ($\mu\text{S}/\text{cm}$)	Acceptance Criteria	Comment
KCl stock solution (12890 $\mu\text{S}/\text{cm}$)	13000	12246-13534	Pass

Temperature performance checking

Reference thermometer- E431 Readings ($^{\circ}\text{C}$)	Instrument Readings ($^{\circ}\text{C}$)	Correction ($^{\circ}\text{C}$)	Comment
20.0	20.002	-0.002	N/A

pH performance checking

	Instrument Readings (pH unit)	Acceptance Criteria	Comment
pH QC buffer 4.00	4.00	4.00 ± 0.10	Pass
pH QC buffer 6.86	6.87	6.86 ± 0.10	Pass
pH QC buffer 9.18	9.12	9.18 ± 0.10	Pass

D.O. performance checking

	Instrument Readings (mg/L)	Acceptance Criteria	Comment
Zero DO solution	0.08	$<0.1\text{mg}/\text{L}$	Pass

Winkler Titration value (mg/L)	Instrument Readings (mg/L)	Acceptance Criteria	Comment
8.00	7.89	Difference between Titration value and instrument reading $<0.2\text{mg}/\text{L}$	Pass

Turbidity performance checking

Turbidity stock solution	Instrument Readings (NTU)	Acceptance Criteria	Comment
10 NTU	10.07	9.0-11.0	Pass
50 NTU	49.95	45.0-55.0	Pass
100 NTU	100.2	90.0-110.0	Pass

Depth performance checking

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

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



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:

Calibrated By: T. Skal

JIM HOFFMAN
QUALITY ENGINEER

Leica Geosystems Calibration Certificate Blue

Calibration Certificate Blue without measurement values issued by Authorised Service Centre

Product	LS15 0.3mm Digital Level with Auto Focus	Certificate No.	701141-14092018
Article No.	804549	Inspection Date	14.09.2018
Serial No.	701141	Order No.	501195285
Equipment No.	7434370	PO No.	PO
Issued by	Authorised Service Centre Leica Geosystems Ltd. Kowloon, Hong Kong Hongkong	Ordered by	LEIGHTON - CHINA STATE J.V. HONG KONG Hongkong
		Customer	LEIGHTON - CHINA STATE J.V. HONG KONG Hongkong

Compliance

The Calibration Certificate Blue without measurement values issued by Authorised Service Centre corresponds to the Producer Inspection Certificate O in accordance with DIN 55 350 Part 18-4.2.1.

Certificate

We hereby certify that the product described has been tested and complies with the specifications of the product. The test equipment used is traceable to national standards or to recognized procedures. This is established by our Quality Management System, audited and certified to ISO 9001.



Leica Geosystems Ltd.

14.09.2018




Stella Kam
Operations Manager


Jacky Ng
Service Manager

Certificate No. 701141-14092018
Article No. 5003367

This Certificate may not be reproduced other than in full except with prior written approval of the issuing authority.

Leica Geosystems AG
Heinrich-Wild-Strasse
9435 Heerbrugg
Switzerland
Telephone +41 71 / 727 31 31
www.leica-geosystems.com



Calibration Certificate

Certificate No. : CSA85446

Page : 2 of 2

Calibration Results (Unit in: mm)

1. Maximum Flatness (Fixed jaw face and Sliding jaw face)
Error : 0.02
2. Squareness of the Face of Fixed Jaw Check (external)
Error : 0.02
3. Parallelism of the Face (external)
Error : 0.01
4. Zero Check : 0.00
5. Scale Accuracy

	Applied Value	UUT Reading	Correction	Expanded Uncertainty	Coverage Factor
External Measurement Jaw	5.12	5.12	0.00	0.02	2.0
	10.24	10.23	0.01		
	15.36	15.34	0.02		
	21.50	21.49	0.01		
	25.00	25.00	0.00		
	50.00	50.00	0.00		
	75.00	75.00	0.00		
	100.00	100.00	0.00		
	125.00	125.00	0.00		
Internal Measurement Jaw	150.00	149.99	0.01		
	25.00	25.00	0.00		
	150.00	150.00	0.00		

- Note :
- Correction = Applied Value - UUT Reading
 - Uncertainty quoted are based on 95 % confidence level.
 - UUT reading are mean of three measurements.
 - Result of scale accuracy measured on UUT tip.

*** End of certificate ***



CERTIFICATE OF CALIBRATION

Calibration Date: 13 September, 2018

Model: iCivil-1011 Tiltmeter
Serial No. : HK110118
Method Used: By direct measurement

Laboratory Conditions:

Ambient Temperature: (27±2)°C
Relative Humidity: (50 ±20)%

Test Reference	Model	Equipment ID
Dual-Axis Digital Angle Protractor	TLL-90S	EPC001

Calibration Result

X-Axis Measurement

Applied Angle (degree)	UUT Reading (degree)	Error (degree)
10.028	10.018	-0.01
5.006	4.992	-0.014
1.027	1.018	-0.009
0.001	0.004	0.003
-1.020	-1.011	0.009
-5.069	-5.066	0.003
-9.995	-10.001	-0.006

Remarks:

1. The above calibration data applies only to the instrument described above.

Checked By: Leung Man Hin

Date: 13 September, 2018

*** End of Report***



CERTIFICATE OF CALIBRATION

Calibration Date: 10 September, 2018

Model: iCivil-1011 Tiltmeter
Serial No. : HK110120
Method Used: By direct measurement

Laboratory Conditions:

Ambient Temperature: (27±2)°C
Relative Humidity: (50 ±20)%

Test Reference	Model	Equipment ID
Dual-Axis Digital Angle Protractor	TLL-90S	EPC001

Calibration Result

X-Axis Measurement

Applied Angle (degree)	UUT Reading (degree)	Error (degree)
10.024	10.013	-0.011
5.009	5.003	-0.006
1.014	1.016	0.002
0.003	0.007	0.004
-1.018	-1.011	0.007
-5.004	-4.974	0.03
-10.008	-9.958	0.05

Remarks:

1. The above calibration data applies only to the instrument described above.

Checked By: Leung Man Hin

Date: 10 September, 2018

*** End of Report***

CALIBRATION CERTIFICATE

Calibration Item: TRIAXIAL GEOPHONE (Calibration with main unit BE15892)
Part Number: 714A9701
Serial No.: BG14849
Calibration Date: 9 April 2018
Next Calibration Date: 9 April 2019
Method Used: In-house Method B3-001
In-house Testing Procedure No.: B3-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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: _____



(Wong, Keefe Solomon)

Date: 9 April 2018

CALIBRATION CERTIFICATE

Calibration Item: Minimate Plus Unit (Calibration with Geophone
BG14849)
Model No.: 716A0403
Serial No.: BE15892
Calibration Date: 9 April 2018
Next Calibration Date: 9 April 2019
Method Used: In-house Method B3-001
In-house Testing Procedure No.: B3-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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: _____



(Wong, Keefe Solomon)

Date: 9 April 2018

CALIBRATION CERTIFICATE

Calibration Item: TRIAXIAL GEOPHONE (Calibration with main unit BE17906)

Part Number: 714A9701

Serial No.: BG14853

Calibration Date: 9 April 2018

Next Calibration Date: 9 April 2019

Method Used: In-house Method B3-001

In-house Testing Procedure No.: B3-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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: 9 April 2018

CALIBRATION CERTIFICATE

Calibration Item: Minimate Plus Unit (Calibration with Geophone
BG14853)
Model No.: 716A0403
Serial No.: BE17906
Calibration Date: 9 April 2018
Next Calibration Date: 9 April 2019
Method Used: In-house Method B3-001
In-house Testing Procedure No.: B3-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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: 9 April 2018

CALIBRATION CERTIFICATE

Calibration Item: Minimate Plus Unit (Calibration with Geophone
BG14852)
Model No.: 716A0403
Serial No.: BE15890
Calibration Date: 9 April 2018
Next Calibration Date: 9 April 2019
Method Used: In-house Method B3-001
In-house Testing Procedure No.: B3-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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: _____

(Wong, Keefe Solomon)

Date: 9 April 2018

CALIBRATION CERTIFICATE

Calibration Item: TRIAXIAL GEOPHONE (Calibration with main unit BE15890)
Part Number: 714A9701
Serial No.: BG14852
Calibration Date: 9 April 2018
Next Calibration Date: 9 April 2019
Method Used: In-house Method B3-001
In-house Testing Procedure No.: B3-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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: _____


(Wong, Keefe Solomon)

Date: 9 April 2018

CALIBRATION CERTIFICATE

Calibration Item: TRIAXIAL GEOPHONE (Calibration with main unit BE16223)
Part Number: 714A9701
Serial No.: BG16955
Calibration Date: 9 April 2018
Next Calibration Date: 9 April 2019
Method Used: In-house Method B3-001
In-house Testing Procedure No.: B3-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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: 9 April 2018

CALIBRATION CERTIFICATE


Calibration Item: Minimate Plus Unit (Calibration with Geophone
BG16955)
Model No.: 716A0403
Serial No.: BE16223
Calibration Date: 9 April 2018
Next Calibration Date: 9 April 2019
Method Used: In-house Method B3-001
In-house Testing Procedure No.: B3-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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: _____


(Wong, Keefe Solomon)

Date: 9 April 2018

CALIBRATION CERTIFICATE

Calibration Item: TRIAXIAL GEOPHONE (Calibration with main unit BE17504)
Part Number: 714A9701
Serial No.: BG20672
Calibration Date: 10 April 2018
Next Calibration Date: 10 April 2019
Method Used: In-house Method B3-001
In-house Testing Procedure No.: B3-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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: _____



(Wong, Keefe Solomon)

Date: 10 April 2018

CALIBRATION CERTIFICATE

Calibration Item: Minimate Plus Unit (Calibration with Geophone
BG20672)
Model No.: 716A0403
Serial No.: BE17504
Calibration Date: 10 April 2018
Next Calibration Date: 10 April 2019
Method Used: In-house Method B3-001
In-house Testing Procedure No.: B3-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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: _____


(Wong, Keefe Solomon)

Date: 10 April 2018

CALIBRATION CERTIFICATE

Calibration Item: TRIAXIAL GEOPHONE (Calibration with main unit BE17902)
Part Number: 714A9701
Serial No.: BG20674
Calibration Date: 10 April 2018
Next Calibration Date: 10 April 2019
Method Used: In-house Method B3-001
In-house Testing Procedure No.: B3-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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: 10 April 2018

CALIBRATION CERTIFICATE

Calibration Item: Minimate Plus Unit (Calibration with Geophone
BG20674)
Model No.: 716A0403
Serial No.: BE17902
Calibration Date: 10 April 2018
Next Calibration Date: 10 April 2019
Method Used: In-house Method B3-001
In-house Testing Procedure No.: B3-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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: 10 April 2018

CALIBRATION CERTIFICATE

Calibration Item: TRIAXIAL GEOPHONE (Calibration with main unit BE17905)
Part Number: 714A9701
Serial No.: BG16514
Calibration Date: 9 April 2018
Next Calibration Date: 9 April 2019
Method Used: In-house Method B3-001
In-house Testing Procedure No.: B3-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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: 9 April 2018

CALIBRATION CERTIFICATE

Calibration Item: Minimate Plus Unit (Calibration with Geophone
BG16514)
Model No.: 716A0403
Serial No.: BE17905
Calibration Date: 9 April 2018
Next Calibration Date: 9 April 2019
Method Used: In-house Method B3-001
In-house Testing Procedure No.: B3-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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: _____


(Wong, Keefe Solomon)

Date: 9 April 2018

CALIBRATION CERTIFICATE

Calibration Item: Minimate Plus Unit (Calibration with Geophone
BG20673)
Model No.: 716A0403
Serial No.: BE13849
Calibration Date: 10 April 2018
Next Calibration Date: 10 April 2019
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: _____


(Wong, Keefe Solomon)

Date: 10 April 2018

CALIBRATION CERTIFICATE

Calibration Item: TRIAXIAL GEOPHONE (Calibration with main unit BE13849)
Part Number: 714A9701
Serial No.: BG20673
Calibration Date: 10 April 2018
Next Calibration Date: 10 April 2019
Method Used: In-house Method B3-001
In-house Testing Procedure No.: B3-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
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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: 10 April 2018

CALIBRATION CERTIFICATE

Calibration Item: TRIAXIAL GEOPHONE (Calibration with main unit BE13853)
Part Number: 714A9701
Serial No.: BG16512
Calibration Date: 11 April 2018
Next Calibration Date: 11 April 2019
Method Used: In-house Method B3-001
In-house Testing Procedure No.: B3-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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: 11 April 2018

CALIBRATION CERTIFICATE

Calibration Item: Minimate Plus Unit (Calibration with Geophone
BG16512)
Model No.: 716A0403
Serial No.: BE13853
Calibration Date: 11 April 2018
Next Calibration Date: 11 April 2019
Method Used: In-house Method B3-001
In-house Testing Procedure No.: B3-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
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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: 11 April 2018

CALIBRATION CERTIFICATE

Calibration Item: TRIAXIAL GEOPHONE (Calibration with main unit BE17506)
Part Number: 714A9701
Serial No.: BG16959
Calibration Date: 9 April 2018
Next Calibration Date: 9 April 2019
Method Used: In-house Method B3-001
In-house Testing Procedure No.: B3-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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: _____


(Wong, Keefe Solomon)

Date: 9 April 2018

CALIBRATION CERTIFICATE

Calibration Item: Minimate Plus Unit (Calibration with Geophone
BG16959)
Model No.: 716A0403
Serial No.: BE17506
Calibration Date: 9 April 2018
Next Calibration Date: 9 April 2019
Method Used: In-house Method B3-001
In-house Testing Procedure No.: B3-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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: _____


(Wong, Keefe Solomon)

Date: 9 April 2018

CALIBRATION CERTIFICATE

Calibration Item: TRIAXIAL GEOPHONE (Calibration with main unit BE17904)
Part Number: 714A9701
Serial No.: BG14847
Calibration Date: 9 April 2018
Next Calibration Date: 9 April 2019
Method Used: In-house Method B3-001
In-house Testing Procedure No.: B3-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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: 9 April 2018

CALIBRATION CERTIFICATE

Calibration Item: Minimate Plus Unit (Calibration with Geophone
BG14847)
Model No.: 716A0403
Serial No.: BE17904
Calibration Date: 9 April 2018
Next Calibration Date: 9 April 2019
Method Used: In-house Method B3-001
In-house Testing Procedure No.: B3-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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: _____


(Wong, Keefe Solomon)

Date: 9 April 2018

CALIBRATION CERTIFICATE


Calibration Item: Minimate Plus Unit (Calibration with Geophone
BG17240)
Model No.: 716A0403
Serial No.: BE20015
Calibration Date: 10 May 2018
Next Calibration Date: 10 May 2019
Method Used: In-house Method B3-001
In-house Testing Procedure No.: B3-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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: 10 May 2018

CALIBRATION CERTIFICATE

Calibration Item: TRIAXIAL GEOPHONE (Calibration with main unit BE20015)
Part Number: 714A9701
Serial No.: BG17240
Calibration Date: 10 May 2018
Next Calibration Date: 10 May 2019
Method Used: In-house Method B3-001
In-house Testing Procedure No.: B3-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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: 10 May 2018

CALIBRATION CERTIFICATE

Calibration Item: Minimate Plus Unit (Calibration with Geophone

BG19189)

Model No.: 716A0403
Serial No.: BE21658
Calibration Date: 10 May 2018
Next Calibration Date: 10 May 2019
Method Used: In-house Method B3-001
In-house Testing Procedure No.: B3-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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: 10 May 2018

CALIBRATION CERTIFICATE

Calibration Item: TRIAXIAL GEOPHONE (Calibration with main unit BE21658)

Part Number: 714A9701
Serial No.: BG19189
Calibration Date: 10 May 2018
Next Calibration Date: 10 May 2019
Method Used: In-house Method B3-001
In-house Testing Procedure No.: B3-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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: 10 May 2018

CALIBRATION CERTIFICATE

Calibration Item: TRIAXIAL GEOPHONE (Calibration with main unit UM12902)
Part Number: 721A2901
Serial No.: UM12902
Calibration Date: 14 May 2018
Next Calibration Date: 14 May 2019
Method Used: In-house Method MM-001
In-house Testing Procedure No.: MM-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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: _____


(Wong, Keefe Solomon)

Date: 14 May 2018

CALIBRATION CERTIFICATE

Calibration Item: Micromate Unit (Calibration with Geophone
UM12902)
Model No.: 721A2501
Serial No.: UM12902
Calibration Date: 14 May 2018
Next Calibration Date: 14 May 2019
Method Used: In-house Method MM-001
In-house Testing Procedure No.: MM-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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: _____


(Wong, Keefe Solomon)

Date: 14 May 2018

CALIBRATION CERTIFICATE

Calibration Item: Micromate Unit (Calibration with Geophone
UM12904)
Model No.: 721A2501
Serial No.: UM12904
Calibration Date: 14 May 2018
Next Calibration Date: 14 May 2019
Method Used: In-house Method MM-001
In-house Testing Procedure No.: MM-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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: _____

(Leung Man Hin, Eric)

Date: 14 May 2018

CALIBRATION CERTIFICATE

Calibration Item: TRIAXIAL GEOPHONE (Calibration with main unit UM12904)
Part Number: 721A2901
Serial No.: UM12904
Calibration Date: 14 May 2018
Next Calibration Date: 14 May 2019
Method Used: In-house Method MM-001
In-house Testing Procedure No.: MM-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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: _____


(Leung Man Hin, Eric)

Date: 14 May 2018

CALIBRATION CERTIFICATE

Calibration Item: TRIAXIAL GEOPHONE (Calibration with main unit UM12905)
Part Number: 721A2901
Serial No.: UM12905
Calibration Date: 14 May 2018
Next Calibration Date: 14 May 2019
Method Used: In-house Method MM-001
In-house Testing Procedure No.: MM-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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: _____

(Wong, Keefe Solomon)

Date: 14 May 2018

CALIBRATION CERTIFICATE

Calibration Item: Micromate Unit (Calibration with Geophone
UM12905)
Model No.: 721A2501
Serial No.: UM12905
Calibration Date: 14 May 2018
Next Calibration Date: 14 May 2019
Method Used: In-house Method MM-001
In-house Testing Procedure No.: MM-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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: _____


(Wong, Keefe Solomon)

Date: 14 May 2018

CALIBRATION CERTIFICATE

Calibration Item: TRIAXIAL GEOPHONE (Calibration with main unit UM12906)
Part Number: 721A2901
Serial No.: UM12906
Calibration Date: 14 May 2018
Next Calibration Date: 14 May 2019
Method Used: In-house Method MM-001
In-house Testing Procedure No.: MM-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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: 14 May 2018

CALIBRATION CERTIFICATE

Calibration Item: Micromate Unit (Calibration with Geophone
UM12906)
Model No.: 721A2501
Serial No.: UM12906
Calibration Date: 14 May 2018
Next Calibration Date: 14 May 2019
Method Used: In-house Method MM-001
In-house Testing Procedure No.: MM-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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: 14 May 2018

CALIBRATION CERTIFICATE

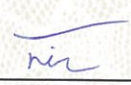
Calibration Item: Micromate Unit (Calibration with Geophone
UM12907)
Model No.: 721A2501
Serial No.: UM12907
Calibration Date: 14 May 2018
Next Calibration Date: 14 May 2019
Method Used: In-house Method MM-001
In-house Testing Procedure No.: MM-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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: 14 May 2018

CALIBRATION CERTIFICATE

Calibration Item: TRIAXIAL GEOPHONE (Calibration with main unit UM12907)

Part Number: 721A2901

Serial No.: UM12907

Calibration Date: 14 May 2018

Next Calibration Date: 14 May 2019

Method Used: In-house Method MM-001

In-house Testing Procedure No.: MM-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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: 14 May 2018

CALIBRATION CERTIFICATE

Calibration Item: TRIAXIAL GEOPHONE (Calibration with main unit UM12928)
Part Number: 721A2901
Serial No.: UM12928
Calibration Date: 14 May 2018
Next Calibration Date: 14 May 2019
Method Used: In-house Method MM-001
In-house Testing Procedure No.: MM-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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: _____



(Wong, Keefe Solomon)

Date: 14 May 2018

CALIBRATION CERTIFICATE

Calibration Item: Micromate Unit (Calibration with Geophone
UM12928)
Model No.: 721A2501
Serial No.: UM12928
Calibration Date: 14 May 2018
Next Calibration Date: 14 May 2019
Method Used: In-house Method MM-001
In-house Testing Procedure No.: MM-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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: _____



(Wong, Keefe Solomon)

Date: 14 May 2018

CALIBRATION CERTIFICATE

Calibration Item: Micromate Unit (Calibration with Geophone
UM12929)
Model No.: 721A2501
Serial No.: UM12929
Calibration Date: 14 May 2018
Next Calibration Date: 14 May 2019
Method Used: In-house Method MM-001
In-house Testing Procedure No.: MM-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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: 14 May 2018

CALIBRATION CERTIFICATE

Calibration Item: TRIAXIAL GEOPHONE (Calibration with main unit UM12929)
Part Number: 721A2901
Serial No.: UM12929
Calibration Date: 14 May 2018
Next Calibration Date: 14 May 2019
Method Used: In-house Method MM-001
In-house Testing Procedure No.: MM-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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: 14 May 2018

CALIBRATION CERTIFICATE

Calibration Item: Micromate Unit (Calibration with Geophone
UM13698)
Model No.: 721A2501
Serial No.: UM13698
Calibration Date: 14 May 2018
Next Calibration Date: 14 May 2019
Method Used: In-house Method MM-001
In-house Testing Procedure No.: MM-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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: 14 May 2018

CALIBRATION CERTIFICATE

Calibration Item: TRIAXIAL GEOPHONE (Calibration with main unit UM13698)
Part Number: 721A2901
Serial No.: UM13698
Calibration Date: 14 May 2018
Next Calibration Date: 14 May 2019
Method Used: In-house Method MM-001
In-house Testing Procedure No.: MM-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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: 14 May 2018

CALIBRATION CERTIFICATE

Calibration Item: TRIAXIAL GEOPHONE (Calibration with main unit UM13701)
Part Number: 721A2901
Serial No.: UM13701
Calibration Date: 14 May 2018
Next Calibration Date: 14 May 2019
Method Used: In-house Method MM-001
In-house Testing Procedure No.: MM-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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: 14 May 2018

CALIBRATION CERTIFICATE

Calibration Item: Micromate Unit (Calibration with Geophone
UM13701)
Model No.: 721A2501
Serial No.: UM13701
Calibration Date: 14 May 2018
Next Calibration Date: 14 May 2019
Method Used: In-house Method MM-001
In-house Testing Procedure No.: MM-001

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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: _____

(Wong, Keefe Solomon)

Date: 14 May 2018

Calibration Certificate

Part Number: 721A2501
Description: Micromate ISEE Base Unit

Serial Number: UM13695
Calibration Date: MAY 04 2018
Calibration Equipment: 714J7403

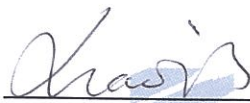
Instantel certifies that the above product was calibrated in accordance with the applicable Instantel procedures. These procedures are part of a quality system that is designed to assure that the product listed above meets or exceeds Instantel specifications.

Instantel further certifies that the measurement instruments used during the calibration of this product are traceable to the National Institute of Standards and Technology; or National Research Council of Canada. Evidence of traceability is on file at Instantel and is available upon request.

The environment in which this product was calibrated is maintained within the operating specifications of the instrument.

Please note that the sensor check function is intended to check that the sensors are connected to the unit, installed in the proper orientation and sufficiently level to operate properly. This function should not be confused with a formal calibration, which requires the sensors be checked against a reference that is traceable to a known standard. Instantel recommends that products be returned to Instantel or an authorized service and calibration facility for annual calibration.

Calibrated By:



Xiaoming Yang

 **Instantel**[®]

Instantel

Calibration Certificate

Part Number: 721A2501
Description: Micromate ISEE Base Unit

Serial Number: UM13696
Calibration Date: MAY 04 2018
Calibration Equipment: 714J7403

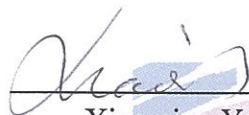
Instantel certifies that the above product was calibrated in accordance with the applicable Instantel procedures. These procedures are part of a quality system that is designed to assure that the product listed above meets or exceeds Instantel specifications.

Instantel further certifies that the measurement instruments used during the calibration of this product are traceable to the National Institute of Standards and Technology; or National Research Council of Canada. Evidence of traceability is on file at Instantel and is available upon request.

The environment in which this product was calibrated is maintained within the operating specifications of the instrument.

Please note that the sensor check function is intended to check that the sensors are connected to the unit, installed in the proper orientation and sufficiently level to operate properly. This function should not be confused with a formal calibration, which requires the sensors be checked against a reference that is traceable to a known standard. Instantel recommends that products be returned to Instantel or an authorized service and calibration facility for annual calibration.

Calibrated By:


Xiaoming Yang

 **Instantel**

Calibration Certificate

Part Number: 721A2501
Description: Micromate ISEE Base Unit

Serial Number: UM13699
Calibration Date: MAY 04 2018
Calibration Equipment: 714J7403

Instantel certifies that the above product was calibrated in accordance with the applicable Instantel procedures. These procedures are part of a quality system that is designed to assure that the product listed above meets or exceeds Instantel specifications.

Instantel further certifies that the measurement instruments used during the calibration of this product are traceable to the National Institute of Standards and Technology; or National Research Council of Canada. Evidence of traceability is on file at Instantel and is available upon request.

The environment in which this product was calibrated is maintained within the operating specifications of the instrument.

Please note that the sensor check function is intended to check that the sensors are connected to the unit, installed in the proper orientation and sufficiently level to operate properly. This function should not be confused with a formal calibration, which requires the sensors be checked against a reference that is traceable to a known standard. Instantel recommends that products be returned to Instantel or an authorized service and calibration facility for annual calibration.

Calibrated By:



Xiaoming Yang

 **Instantel**[®]

Calibration Certificate

Part Number: 721A2501
Description: Micromate ISEE Base Unit

Serial Number: UM13702
Calibration Date: MAY 04 2018
Calibration Equipment: 714J7403


Instantel certifies that the above product was calibrated in accordance with the applicable Instantel procedures. These procedures are part of a quality system that is designed to assure that the product listed above meets or exceeds Instantel specifications.

Instantel further certifies that the measurement instruments used during the calibration of this product are traceable to the National Institute of Standards and Technology; or National Research Council of Canada. Evidence of traceability is on file at Instantel and is available upon request.

The environment in which this product was calibrated is maintained within the operating specifications of the instrument.

Please note that the sensor check function is intended to check that the sensors are connected to the unit, installed in the proper orientation and sufficiently level to operate properly. This function should not be confused with a formal calibration, which requires the sensors be checked against a reference that is traceable to a known standard. Instantel recommends that products be returned to Instantel or an authorized service and calibration facility for annual calibration.

Calibrated By:


Xiaoming Yang

 **Instantel**[®]

Calibration Certificate

Part Number: 721A2501
Description: Micromate ISEE Base Unit

Serial Number: UM13703
Calibration Date: MAY 04 2018
Calibration Equipment: 714J7403

Instantel certifies that the above product was calibrated in accordance with the applicable Instantel procedures. These procedures are part of a quality system that is designed to assure that the product listed above meets or exceeds Instantel specifications.

Instantel further certifies that the measurement instruments used during the calibration of this product are traceable to the National Institute of Standards and Technology; or National Research Council of Canada. Evidence of traceability is on file at Instantel and is available upon request.

The environment in which this product was calibrated is maintained within the operating specifications of the instrument.

Please note that the sensor check function is intended to check that the sensors are connected to the unit, installed in the proper orientation and sufficiently level to operate properly. This function should not be confused with a formal calibration, which requires the sensors be checked against a reference that is traceable to a known standard. Instantel recommends that products be returned to Instantel or an authorized service and calibration facility for annual calibration.

Calibrated By: _____

Xiaoming Yang

 **Instantel**[®]

Calibration Certificate

Part Number: 721A2501
Description: Micromate ISEE Base Unit

Serial Number: UM13704
Calibration Date: MAY 04 2018
Calibration Equipment: 714J7403

Instantel certifies that the above product was calibrated in accordance with the applicable Instantel procedures. These procedures are part of a quality system that is designed to assure that the product listed above meets or exceeds Instantel specifications.

Instantel further certifies that the measurement instruments used during the calibration of this product are traceable to the National Institute of Standards and Technology; or National Research Council of Canada. Evidence of traceability is on file at Instantel and is available upon request.

The environment in which this product was calibrated is maintained within the operating specifications of the instrument.

Please note that the sensor check function is intended to check that the sensors are connected to the unit, installed in the proper orientation and sufficiently level to operate properly. This function should not be confused with a formal calibration, which requires the sensors be checked against a reference that is traceable to a known standard. Instantel recommends that products be returned to Instantel or an authorized service and calibration facility for annual calibration.

Calibrated By:



Xiaoming Yang



Instantel

Calibration Certificate

Part Number: 721A2501
Description: Micromate ISEE Base Unit

Serial Number: UM13708
Calibration Date: MAY 04 2018
Calibration Equipment: 714J7403


Instantel certifies that the above product was calibrated in accordance with the applicable Instantel procedures. These procedures are part of a quality system that is designed to assure that the product listed above meets or exceeds Instantel specifications.

Instantel further certifies that the measurement instruments used during the calibration of this product are traceable to the National Institute of Standards and Technology; or National Research Council of Canada. Evidence of traceability is on file at Instantel and is available upon request.

The environment in which this product was calibrated is maintained within the operating specifications of the instrument.

Please note that the sensor check function is intended to check that the sensors are connected to the unit, installed in the proper orientation and sufficiently level to operate properly. This function should not be confused with a formal calibration, which requires the sensors be checked against a reference that is traceable to a known standard. Instantel recommends that products be returned to Instantel or an authorized service and calibration facility for annual calibration.

Calibrated By:


Xiaoming Yang

 **Instantel**

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

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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
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

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
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

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Agilent Multimeter*	34410A	MY47011119
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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
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

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHz*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
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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

<u>Test References</u>	<u>Model</u>	<u>Serial No.</u>
Blastmate III	714A0801	BA15521
ISEE Triaxial Geophone	714A9701	BG14463
GLOBAL SPECIALISTS 3MHZ*	2030	256812
Stanford Spectrum Analyzer	SR760	41550
Aglient Multimeter*	34410A	MY47011119
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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



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:

Calibrated By: T. Skal

JIM HOFFMAN
QUALITY ENGINEER

APPENDIX C
WEATHER INFORMATION

**APPENDIX C –
WEATHER CONDITIONS DURING THE MONITORING PERIOD**

I. Mean Wind Speed and Wind Direction

Date	Mean Air Temperature (°C)	Mean Relative Humidity (%)	Precipitation (mm)
1 April 2019	20.3	81	Trace
2 April 2019	20.7	76	Trace
3 April 2019	22.8	80	Trace
4 April 2019	21.7	83	Trace
5 April 2019	24.0	76	0.0
6 April 2019	25.1	79	0.0
7 April 2019	25.7	80	0.0
8 April 2019	26.7	80	0.0
9 April 2019	26.6	81	0.0
10 April 2019	27.1	80	0.0
11 April 2019	27.3	81	0.7
12 April 2019	22.3	89	6.1
13 April 2019	21.2	92	3.8
14 April 2019	22.7	90	10.4
15 April 2019	22.1	85	1.1
16 April 2019	21.2	91	9.2
17 April 2019	23.5	85	0.0
18 April 2019	24.0	90	6.7
19 April 2019	23.7	93	75.8
20 April 2019	23.3	95	43.6

**APPENDIX C –
WEATHER CONDITIONS DURING THE MONITORING PERIOD**

I. Mean Wind Speed and Wind Direction

Date	Mean Air Temperature (°C)	Mean Relative Humidity (%)	Precipitation (mm)
21 April 2019	26.2	88	0.3
22 April 2019	27.5	84	0.0
23 April 2019	28.0	81	0.0
24 April 2019	28.0	78	0.0
25 April 2019	28.5	77	0.0
26 April 2019	28.4	81	0.9
27 April 2019	24.9	86	16.3
28 April 2019	24.3	89	6.1
29 April 2019	26.4	86	0.0
30 April 2019	26.7	82	7.5

* The above information was extracted from the daily weather summary by Hong Kong Observatory.

** Trace means rainfall less than 0.05 mm

**APPENDIX C –
WEATHER CONDITIONS DURING THE MONITORING PERIOD**

I. Mean Wind Speed and Wind Direction

Date	Time	Wind Speed m-s	Direction	Date	Time	Wind Speed m-s	Direction
1-Apr-19	00:00	0.9	ENE	2-Apr-19	12:00	0.9	E
1-Apr-19	01:00	0.9	E	2-Apr-19	13:00	1.3	ENE
1-Apr-19	02:00	0.9	E	2-Apr-19	14:00	0.9	ENE
1-Apr-19	03:00	0.4	ENE	2-Apr-19	15:00	0.9	ENE
1-Apr-19	04:00	1.8	E	2-Apr-19	16:00	0.4	E
1-Apr-19	05:00	1.8	W	2-Apr-19	17:00	0.4	E
1-Apr-19	06:00	2.2	E	2-Apr-19	18:00	0	ENE
1-Apr-19	07:00	1.8	WNW	2-Apr-19	19:00	0	E
1-Apr-19	08:00	2.2	W	2-Apr-19	20:00	0	ENE
1-Apr-19	09:00	2.2	WSW	2-Apr-19	21:00	0	E
1-Apr-19	10:00	2.2	W	2-Apr-19	22:00	0	NE
1-Apr-19	11:00	1.8	WSW	2-Apr-19	23:00	0.4	E
1-Apr-19	12:00	2.2	W	3-Apr-19	00:00	0	E
1-Apr-19	13:00	1.8	WSW	3-Apr-19	01:00	0.4	ENE
1-Apr-19	14:00	0.9	E	3-Apr-19	02:00	0.4	ENE
1-Apr-19	15:00	0.4	ENE	3-Apr-19	03:00	0.4	ENE
1-Apr-19	16:00	0	E	3-Apr-19	04:00	0.4	ENE
1-Apr-19	17:00	0.4	ENE	3-Apr-19	05:00	0.4	E
1-Apr-19	18:00	0	ENE	3-Apr-19	06:00	0	E
1-Apr-19	19:00	0	ENE	3-Apr-19	07:00	0	E
1-Apr-19	20:00	0.4	E	3-Apr-19	08:00	0	ENE
1-Apr-19	21:00	0.4	W	3-Apr-19	09:00	0.4	ENE
1-Apr-19	22:00	0.4	WNW	3-Apr-19	10:00	0	ENE
1-Apr-19	23:00	0.9	E	3-Apr-19	11:00	0	ENE
2-Apr-19	00:00	0.9	ENE	3-Apr-19	12:00	0	ENE
2-Apr-19	01:00	0.9	E	3-Apr-19	13:00	0	ENE
2-Apr-19	02:00	0.9	E	3-Apr-19	14:00	0	ENE
2-Apr-19	03:00	0.4	ENE	3-Apr-19	15:00	0	E
2-Apr-19	04:00	1.8	E	3-Apr-19	16:00	0	E
2-Apr-19	05:00	1.8	W	3-Apr-19	17:00	0	ENE
2-Apr-19	06:00	2.2	E	3-Apr-19	18:00	0	ENE
2-Apr-19	07:00	1.8	WNW	3-Apr-19	19:00	0	E
2-Apr-19	08:00	2.2	W	3-Apr-19	20:00	0	E
2-Apr-19	09:00	2.2	WSW	3-Apr-19	21:00	0	ENE
2-Apr-19	10:00	2.2	W	3-Apr-19	22:00	0	E
2-Apr-19	11:00	1.8	WSW	3-Apr-19	23:00	0	E

**APPENDIX C –
WEATHER CONDITIONS DURING THE MONITORING PERIOD**

I. Mean Wind Speed and Wind Direction

Date	Time	Wind Speed m-s	Direction	Date	Time	Wind Speed m-s	Direction
4-Apr-19	00:00	0.4	ENE	5-Apr-19	12:00	0.4	W
4-Apr-19	01:00	0	ENE	5-Apr-19	13:00	0.4	WNW
4-Apr-19	02:00	0	E	5-Apr-19	14:00	0.9	WNW
4-Apr-19	03:00	0.4	ENE	5-Apr-19	15:00	0.4	WNW
4-Apr-19	04:00	1.3	E	5-Apr-19	16:00	0.4	WSW
4-Apr-19	05:00	0.9	E	5-Apr-19	17:00	0.4	WSW
4-Apr-19	06:00	0.4	ENE	5-Apr-19	18:00	0.9	W
4-Apr-19	07:00	0.9	ENE	5-Apr-19	19:00	2.2	WNW
4-Apr-19	08:00	0.9	E	5-Apr-19	20:00	0	WNW
4-Apr-19	09:00	0.9	E	5-Apr-19	21:00	0	W
4-Apr-19	10:00	0.9	ENE	5-Apr-19	22:00	0	W
4-Apr-19	11:00	1.3	E	5-Apr-19	23:00	0.4	WNW
4-Apr-19	12:00	0.9	ENE	6-Apr-19	00:00	0	WNW
4-Apr-19	13:00	0.4	ENE	6-Apr-19	01:00	0	WNW
4-Apr-19	14:00	0.9	E	6-Apr-19	02:00	0	WNW
4-Apr-19	15:00	0.4	E	6-Apr-19	03:00	0	WNW
4-Apr-19	16:00	0.4	E	6-Apr-19	04:00	0	WNW
4-Apr-19	17:00	0	ENE	6-Apr-19	05:00	0	WNW
4-Apr-19	18:00	0	E	6-Apr-19	06:00	0	WNW
4-Apr-19	19:00	0	E	6-Apr-19	07:00	0	WNW
4-Apr-19	20:00	0	ENE	6-Apr-19	08:00	0	WNW
4-Apr-19	21:00	0	ESE	6-Apr-19	09:00	0	---
4-Apr-19	22:00	0	ESE	6-Apr-19	10:00	0	W
4-Apr-19	23:00	0	E	6-Apr-19	11:00	0	W
5-Apr-19	00:00	0	E	6-Apr-19	12:00	0	W
5-Apr-19	01:00	0	E	6-Apr-19	13:00	0	WSW
5-Apr-19	02:00	0	ENE	6-Apr-19	14:00	0	W
5-Apr-19	03:00	0	ENE	6-Apr-19	15:00	0.4	W
5-Apr-19	04:00	0	E	6-Apr-19	16:00	0.4	W
5-Apr-19	05:00	0	E	6-Apr-19	17:00	0.9	SW
5-Apr-19	06:00	0	E	6-Apr-19	18:00	1.3	SW
5-Apr-19	07:00	0	E	6-Apr-19	19:00	0.4	WSW
5-Apr-19	08:00	0	E	6-Apr-19	20:00	0.4	WSW
5-Apr-19	09:00	0	E	6-Apr-19	21:00	0	WSW
5-Apr-19	10:00	0	E	6-Apr-19	22:00	0	SW
5-Apr-19	11:00	0	SW	6-Apr-19	23:00	0.4	SW

**APPENDIX C –
WEATHER CONDITIONS DURING THE MONITORING PERIOD**

I. Mean Wind Speed and Wind Direction

Date	Time	Wind Speed m-s	Direction	Date	Time	Wind Speed m-s	Direction
7-Apr-19	00:00	0.4	SW	8-Apr-19	12:00	0	SW
7-Apr-19	01:00	0.4	SW	8-Apr-19	13:00	0	WSW
7-Apr-19	02:00	0	SW	8-Apr-19	14:00	0	SW
7-Apr-19	03:00	0	SW	8-Apr-19	15:00	0	WSW
7-Apr-19	04:00	0.4	WSW	8-Apr-19	16:00	0	SW
7-Apr-19	05:00	0	WSW	8-Apr-19	17:00	0	SSE
7-Apr-19	06:00	0	W	8-Apr-19	18:00	0	SSE
7-Apr-19	07:00	0	W	8-Apr-19	19:00	0	WSW
7-Apr-19	08:00	0	SW	8-Apr-19	20:00	0	S
7-Apr-19	09:00	0	SW	8-Apr-19	21:00	0	SSE
7-Apr-19	10:00	0	SW	8-Apr-19	22:00	0	SSE
7-Apr-19	11:00	0	SSW	8-Apr-19	23:00	0	SE
7-Apr-19	12:00	0.4	WNW	9-Apr-19	00:00	0	ESE
7-Apr-19	13:00	0.9	WNW	9-Apr-19	01:00	0	E
7-Apr-19	14:00	0.9	W	9-Apr-19	02:00	0	E
7-Apr-19	15:00	1.3	WNW	9-Apr-19	03:00	0	ESE
7-Apr-19	16:00	0.9	WSW	9-Apr-19	04:00	0	ESE
7-Apr-19	17:00	0.4	WSW	9-Apr-19	05:00	0	SE
7-Apr-19	18:00	0.4	SW	9-Apr-19	06:00	0	SE
7-Apr-19	19:00	0.4	SW	9-Apr-19	07:00	0	---
7-Apr-19	20:00	0.4	SW	9-Apr-19	08:00	0	---
7-Apr-19	21:00	0	SW	9-Apr-19	09:00	0	SE
7-Apr-19	22:00	0	SW	9-Apr-19	10:00	0	SE
7-Apr-19	23:00	0	SW	9-Apr-19	11:00	0	SSE
8-Apr-19	00:00	0	SSW	9-Apr-19	12:00	0	SSE
8-Apr-19	01:00	0	SW	9-Apr-19	13:00	0	SSE
8-Apr-19	02:00	0	SW	9-Apr-19	14:00	0	SSE
8-Apr-19	03:00	0.4	SW	9-Apr-19	15:00	0	WSW
8-Apr-19	04:00	0	SW	9-Apr-19	16:00	0	WSW
8-Apr-19	05:00	0	SW	9-Apr-19	17:00	0	WSW
8-Apr-19	06:00	0	SW	9-Apr-19	18:00	0	WSW
8-Apr-19	07:00	0	SW	9-Apr-19	19:00	0	SSE
8-Apr-19	08:00	0	SSE	9-Apr-19	20:00	0	SSE
8-Apr-19	09:00	0	S	9-Apr-19	21:00	0	SSE
8-Apr-19	10:00	0	SSW	9-Apr-19	22:00	0	SSE
8-Apr-19	11:00	0	SSW	9-Apr-19	23:00	0	SSE

**APPENDIX C –
WEATHER CONDITIONS DURING THE MONITORING PERIOD**

I. Mean Wind Speed and Wind Direction

Date	Time	Wind Speed m-s	Direction	Date	Time	Wind Speed m-s	Direction
10-Apr-19	00:00	0	SSE	11-Apr-19	12:00	0	SE
10-Apr-19	01:00	0	SSE	11-Apr-19	13:00	0	ESE
10-Apr-19	02:00	0	SSW	11-Apr-19	14:00	0	SE
10-Apr-19	03:00	0	SW	11-Apr-19	15:00	0	E
10-Apr-19	04:00	0	WSW	11-Apr-19	16:00	0	E
10-Apr-19	05:00	0	S	11-Apr-19	17:00	0	E
10-Apr-19	06:00	0	S	11-Apr-19	18:00	0.4	E
10-Apr-19	07:00	0	SSE	11-Apr-19	19:00	0.4	E
10-Apr-19	08:00	0	WSW	11-Apr-19	20:00	0.4	ENE
10-Apr-19	09:00	0	SW	11-Apr-19	21:00	0.4	E
10-Apr-19	10:00	0	WSW	11-Apr-19	22:00	0.4	ENE
10-Apr-19	11:00	0	W	11-Apr-19	23:00	0.4	ENE
10-Apr-19	12:00	0	W	12-Apr-19	00:00	0.9	ENE
10-Apr-19	13:00	0	WSW	12-Apr-19	01:00	0.4	E
10-Apr-19	14:00	0	WSW	12-Apr-19	02:00	0	ENE
10-Apr-19	15:00	0.4	SW	12-Apr-19	03:00	0	E
10-Apr-19	16:00	0.9	SW	12-Apr-19	04:00	0	E
10-Apr-19	17:00	0.9	SW	12-Apr-19	05:00	0.4	E
10-Apr-19	18:00	0	SW	12-Apr-19	06:00	0.4	E
10-Apr-19	19:00	0	SW	12-Apr-19	07:00	0.4	E
10-Apr-19	20:00	0	SW	12-Apr-19	08:00	0.4	E
10-Apr-19	21:00	0	SW	12-Apr-19	09:00	0.4	ENE
10-Apr-19	22:00	0.4	SW	12-Apr-19	10:00	0.9	ENE
10-Apr-19	23:00	0.4	SW	12-Apr-19	11:00	0.4	ENE
11-Apr-19	00:00	0	SW	12-Apr-19	12:00	0	SE
11-Apr-19	01:00	0	SW	12-Apr-19	13:00	0	ESE
11-Apr-19	02:00	0	SW	12-Apr-19	14:00	0	SE
11-Apr-19	03:00	0	SW	12-Apr-19	15:00	0	E
11-Apr-19	04:00	0	SW	12-Apr-19	16:00	0	E
11-Apr-19	05:00	0	SW	12-Apr-19	17:00	0	E
11-Apr-19	06:00	0	SW	12-Apr-19	18:00	0.4	E
11-Apr-19	07:00	0	SW	12-Apr-19	19:00	0.4	E
11-Apr-19	08:00	0	SSE	12-Apr-19	20:00	0.4	ENE
11-Apr-19	09:00	0	SSE	12-Apr-19	21:00	0.4	E
11-Apr-19	10:00	0	S	12-Apr-19	22:00	0.4	ENE
11-Apr-19	11:00	0	S	12-Apr-19	23:00	0.4	ENE

**APPENDIX C –
WEATHER CONDITIONS DURING THE MONITORING PERIOD**

I. Mean Wind Speed and Wind Direction

Date	Time	Wind Speed m-s	Direction	Date	Time	Wind Speed m-s	Direction
13-Apr-19	00:00	0.4	ENE	14-Apr-19	12:00	0.4	ENE
13-Apr-19	01:00	0.4	E	14-Apr-19	13:00	0.4	ENE
13-Apr-19	02:00	0.9	ENE	14-Apr-19	14:00	0	ENE
13-Apr-19	03:00	0.9	ENE	14-Apr-19	15:00	0	E
13-Apr-19	04:00	0.4	ENE	14-Apr-19	16:00	0.4	E
13-Apr-19	05:00	0.9	ENE	14-Apr-19	17:00	0.4	E
13-Apr-19	06:00	1.3	E	14-Apr-19	18:00	0.9	E
13-Apr-19	07:00	1.8	SW	14-Apr-19	19:00	0.4	E
13-Apr-19	08:00	1.3	E	14-Apr-19	20:00	0.9	E
13-Apr-19	09:00	1.3	E	14-Apr-19	21:00	0.4	ENE
13-Apr-19	10:00	1.8	W	14-Apr-19	22:00	0.9	E
13-Apr-19	11:00	1.8	E	14-Apr-19	23:00	0.9	WSW
13-Apr-19	12:00	1.8	E	15-Apr-19	00:00	0.4	E
13-Apr-19	13:00	1.3	E	15-Apr-19	01:00	0.4	ENE
13-Apr-19	14:00	0.9	E	15-Apr-19	02:00	0.4	ENE
13-Apr-19	15:00	0.9	SE	15-Apr-19	03:00	0.4	ENE
13-Apr-19	16:00	0.9	E	15-Apr-19	04:00	0	ENE
13-Apr-19	17:00	1.3	E	15-Apr-19	05:00	0.4	ENE
13-Apr-19	18:00	0.9	E	15-Apr-19	06:00	0.4	E
13-Apr-19	19:00	0.9	E	15-Apr-19	07:00	1.3	ENE
13-Apr-19	20:00	0.9	E	15-Apr-19	08:00	0.9	E
13-Apr-19	21:00	0.9	ENE	15-Apr-19	09:00	0.9	E
13-Apr-19	22:00	0.9	ENE	15-Apr-19	10:00	0	ENE
13-Apr-19	23:00	0.9	E	15-Apr-19	11:00	0.4	E
14-Apr-19	00:00	1.8	ENE	15-Apr-19	12:00	0.4	ESE
14-Apr-19	01:00	0.9	E	15-Apr-19	13:00	0.9	E
14-Apr-19	02:00	0	ENE	15-Apr-19	14:00	0.9	E
14-Apr-19	03:00	0.4	E	15-Apr-19	15:00	0.9	E
14-Apr-19	04:00	0.4	E	15-Apr-19	16:00	1.3	E
14-Apr-19	05:00	0.4	SE	15-Apr-19	17:00	1.8	ESE
14-Apr-19	06:00	0.4	E	15-Apr-19	18:00	0.9	E
14-Apr-19	07:00	0	E	15-Apr-19	19:00	0.9	E
14-Apr-19	08:00	0.4	E	15-Apr-19	20:00	0.9	E
14-Apr-19	09:00	0	E	15-Apr-19	21:00	1.3	E
14-Apr-19	10:00	0.4	E	15-Apr-19	22:00	1.8	E
14-Apr-19	11:00	0.4	E	15-Apr-19	23:00	1.8	E

**APPENDIX C –
WEATHER CONDITIONS DURING THE MONITORING PERIOD**

I. Mean Wind Speed and Wind Direction

Date	Time	Wind Speed m-s	Direction	Date	Time	Wind Speed m-s	Direction
Apr-16-19	0:00	1.3	ENE	Apr-17-19	12:00	0	S
Apr-16-19	1:00	0.9	E	Apr-17-19	13:00	0.4	SE
Apr-16-19	2:00	0.9	ENE	Apr-17-19	14:00	0	---
Apr-16-19	3:00	0.9	E	Apr-17-19	15:00	0	---
Apr-16-19	4:00	0.4	E	Apr-17-19	16:00	0	ESE
Apr-16-19	5:00	0.4	E	Apr-17-19	17:00	2.7	ENE
Apr-16-19	6:00	0.4	ENE	Apr-17-19	18:00	1.3	ENE
Apr-16-19	7:00	0	W	Apr-17-19	19:00	2.2	ENE
Apr-16-19	8:00	0.4	ENE	Apr-17-19	20:00	0.4	NNE
Apr-16-19	9:00	1.8	ENE	Apr-17-19	21:00	0.9	ENE
Apr-16-19	10:00	0.9	NNE	Apr-17-19	22:00	0.4	NNE
Apr-16-19	11:00	0.4	NE	Apr-17-19	23:00	1.3	ENE
Apr-16-19	12:00	1.3	SSW	Apr-18-19	0:00	0.4	NNE
Apr-16-19	13:00	1.3	S	Apr-18-19	1:00	0.9	ENE
Apr-16-19	14:00	0.9	ENE	Apr-18-19	2:00	0.4	NNE
Apr-16-19	15:00	0.4	ESE	Apr-18-19	3:00	0.9	NE
Apr-16-19	16:00	0.9	NE	Apr-18-19	4:00	0.9	NNE
Apr-16-19	17:00	1.8	ENE	Apr-18-19	5:00	0.9	NNE
Apr-16-19	18:00	0.9	S	Apr-18-19	6:00	0.9	NNE
Apr-16-19	19:00	1.8	ENE	Apr-18-19	7:00	0.9	ENE
Apr-16-19	20:00	2.7	ENE	Apr-18-19	8:00	0.9	NE
Apr-16-19	21:00	2.2	ENE	Apr-18-19	9:00	1.3	ENE
Apr-16-19	22:00	0.9	NE	Apr-18-19	10:00	1.3	ENE
Apr-16-19	23:00	0.4	SSE	Apr-18-19	11:00	0.9	NE
Apr-17-19	0:00	0.9	ENE	Apr-18-19	12:00	0.9	NNE
Apr-17-19	1:00	0.9	ENE	Apr-18-19	13:00	0.4	ENE
Apr-17-19	2:00	0.4	ESE	Apr-18-19	14:00	0.4	ENE
Apr-17-19	3:00	1.3	ENE	Apr-18-19	15:00	0.9	ENE
Apr-17-19	4:00	0.9	NE	Apr-18-19	16:00	0.4	ESE
Apr-17-19	5:00	1.3	ENE	Apr-18-19	17:00	0.9	E
Apr-17-19	6:00	1.3	ENE	Apr-18-19	18:00	0.9	ENE
Apr-17-19	7:00	1.3	ENE	Apr-18-19	19:00	0.4	NE
Apr-17-19	8:00	0.4	ENE	Apr-18-19	20:00	0.9	ENE
Apr-17-19	9:00	0	ENE	Apr-18-19	21:00	0	ENE
Apr-17-19	10:00	0	ENE	Apr-18-19	22:00	0.4	ENE
Apr-17-19	11:00	0.4	S	Apr-18-19	23:00	1.3	ENE

**APPENDIX C –
WEATHER CONDITIONS DURING THE MONITORING PERIOD**

I. Mean Wind Speed and Wind Direction

Date	Time	Wind Speed m-s	Direction	Date	Time	Wind Speed m-s	Direction
Apr-19-19	0:00	1.3	ENE	Apr-20-19	12:00	1.8	ENE
Apr-19-19	1:00	1.3	ENE	Apr-20-19	13:00	2.2	ENE
Apr-19-19	2:00	1.8	S	Apr-20-19	14:00	3.1	ENE
Apr-19-19	3:00	1.3	ENE	Apr-20-19	15:00	3.1	ENE
Apr-19-19	4:00	1.3	ENE	Apr-20-19	16:00	2.2	ENE
Apr-19-19	5:00	0.9	ENE	Apr-20-19	17:00	2.2	ENE
Apr-19-19	6:00	0.9	ENE	Apr-20-19	18:00	2.2	ENE
Apr-19-19	7:00	0.9	SE	Apr-20-19	19:00	1.3	ENE
Apr-19-19	8:00	0.9	ENE	Apr-20-19	20:00	1.3	ENE
Apr-19-19	9:00	0.9	ENE	Apr-20-19	21:00	1.3	NNE
Apr-19-19	10:00	1.8	ENE	Apr-20-19	22:00	0.9	NE
Apr-19-19	11:00	1.8	ENE	Apr-20-19	23:00	0.9	ENE
Apr-19-19	12:00	3.1	ENE	Apr-21-19	0:00	0.9	ENE
Apr-19-19	13:00	2.7	ENE	Apr-21-19	1:00	0.9	SE
Apr-19-19	14:00	2.2	ENE	Apr-21-19	2:00	1.3	NE
Apr-19-19	15:00	1.3	ENE	Apr-21-19	3:00	0.4	ENE
Apr-19-19	16:00	0.9	NE	Apr-21-19	4:00	0.4	ENE
Apr-19-19	17:00	0.9	NNE	Apr-21-19	5:00	0.4	ENE
Apr-19-19	18:00	0	E	Apr-21-19	6:00	0	NNE
Apr-19-19	19:00	0.4	SE	Apr-21-19	7:00	0.4	ENE
Apr-19-19	20:00	1.3	E	Apr-21-19	8:00	0.4	ENE
Apr-19-19	21:00	0.9	SSE	Apr-21-19	9:00	0.9	SW
Apr-19-19	22:00	1.3	SSE	Apr-21-19	10:00	1.8	ENE
Apr-19-19	23:00	0.9	S	Apr-21-19	11:00	2.2	ENE
Apr-20-19	0:00	0.9	SSE	Apr-21-19	12:00	1.8	ENE
Apr-20-19	1:00	0.4	ESE	Apr-21-19	13:00	2.7	ENE
Apr-20-19	2:00	0.4	E	Apr-21-19	14:00	3.6	ENE
Apr-20-19	3:00	2.7	SSW	Apr-21-19	15:00	4	ENE
Apr-20-19	4:00	0.9	NNE	Apr-21-19	16:00	2.7	ENE
Apr-20-19	5:00	1.3	NNE	Apr-21-19	17:00	1.8	ENE
Apr-20-19	6:00	0.9	ENE	Apr-21-19	18:00	1.8	ENE
Apr-20-19	7:00	1.3	ENE	Apr-21-19	19:00	1.3	ENE
Apr-20-19	8:00	0.9	SSW	Apr-21-19	20:00	2.2	ENE
Apr-20-19	9:00	0.9	SW	Apr-21-19	21:00	1.3	ENE
Apr-20-19	10:00	0.4	ESE	Apr-21-19	22:00	1.8	ENE
Apr-20-19	11:00	0.9	ENE	Apr-21-19	23:00	1.3	ENE

**APPENDIX C –
WEATHER CONDITIONS DURING THE MONITORING PERIOD**

I. Mean Wind Speed and Wind Direction

Date	Time	Wind Speed m-s	Direction	Date	Time	Wind Speed m-s	Direction
Apr-22-19	0:00	1.3	ENE	Apr-23-19	12:00	1.3	E
Apr-22-19	1:00	0.9	ENE	Apr-23-19	13:00	1.3	E
Apr-22-19	2:00	0.4	NNE	Apr-23-19	14:00	1.8	SW
Apr-22-19	3:00	0.4	NNE	Apr-23-19	15:00	0.9	E
Apr-22-19	4:00	0.4	NNE	Apr-23-19	16:00	1.3	SE
Apr-22-19	5:00	0.4	NNE	Apr-23-19	17:00	1.3	ENE
Apr-22-19	6:00	0	NNE	Apr-23-19	18:00	1.3	ENE
Apr-22-19	7:00	0.4	ENE	Apr-23-19	19:00	1.3	SW
Apr-22-19	8:00	0.4	NNE	Apr-23-19	20:00	1.8	ENE
Apr-22-19	9:00	0.4	SW	Apr-23-19	21:00	1.8	ENE
Apr-22-19	10:00	0.4	ESE	Apr-23-19	22:00	1.8	ENE
Apr-22-19	11:00	1.3	SW	Apr-23-19	23:00	1.8	ENE
Apr-22-19	12:00	1.3	ESE	Apr-24-19	0:00	1.3	ENE
Apr-22-19	13:00	1.3	ESE	Apr-24-19	1:00	1.3	ENE
Apr-22-19	14:00	1.3	ENE	Apr-24-19	2:00	1.8	ENE
Apr-22-19	15:00	1.8	SW	Apr-24-19	3:00	1.3	ENE
Apr-22-19	16:00	0.9	SSW	Apr-24-19	4:00	1.8	SW
Apr-22-19	17:00	1.3	SW	Apr-24-19	5:00	0.9	SW
Apr-22-19	18:00	0.9	E	Apr-24-19	6:00	0.4	ESE
Apr-22-19	19:00	1.8	SW	Apr-24-19	7:00	0.9	SW
Apr-22-19	20:00	2.2	SW	Apr-24-19	8:00	2.2	ENE
Apr-22-19	21:00	1.3	ENE	Apr-24-19	9:00	1.3	SW
Apr-22-19	22:00	0.9	ENE	Apr-24-19	10:00	0.9	SW
Apr-22-19	23:00	1.3	ENE	Apr-24-19	11:00	1.3	ESE
Apr-23-19	0:00	1.8	ENE	Apr-24-19	12:00	1.8	ENE
Apr-23-19	1:00	0.4	NE	Apr-24-19	13:00	1.8	SE
Apr-23-19	2:00	0.9	NE	Apr-24-19	14:00	1.3	ENE
Apr-23-19	3:00	1.3	SW	Apr-24-19	15:00	1.3	SW
Apr-23-19	4:00	0.4	SW	Apr-24-19	16:00	1.3	ESE
Apr-23-19	5:00	0.4	SW	Apr-24-19	17:00	1.3	SW
Apr-23-19	6:00	0.4	ENE	Apr-24-19	18:00	2.2	SW
Apr-23-19	7:00	0.9	NE	Apr-24-19	19:00	1.8	SW
Apr-23-19	8:00	1.3	SW	Apr-24-19	20:00	2.2	SW
Apr-23-19	9:00	0.9	SW	Apr-24-19	21:00	1.3	SW
Apr-23-19	10:00	1.3	SW	Apr-24-19	22:00	1.8	SW
Apr-23-19	11:00	1.3	SW	Apr-24-19	23:00	1.8	SW

**APPENDIX C –
WEATHER CONDITIONS DURING THE MONITORING PERIOD**

I. Mean Wind Speed and Wind Direction

Date	Time	Wind Speed m-s	Direction	Date	Time	Wind Speed m-s	Direction
Apr-25-19	0:00	1.3	SW	Apr-26-19	12:00	1.8	NNE
Apr-25-19	1:00	1.3	SW	Apr-26-19	13:00	1.8	NNE
Apr-25-19	2:00	1.3	SW	Apr-26-19	14:00	1.3	NNE
Apr-25-19	3:00	1.3	SW	Apr-26-19	15:00	1.8	NNE
Apr-25-19	4:00	1.3	SW	Apr-26-19	16:00	1.8	NNE
Apr-25-19	5:00	1.8	SW	Apr-26-19	17:00	1.3	SW
Apr-25-19	6:00	1.3	SW	Apr-26-19	18:00	1.8	SW
Apr-25-19	7:00	1.3	SW	Apr-26-19	19:00	1.8	ENE
Apr-25-19	8:00	0.4	ENE	Apr-26-19	20:00	1.3	NNE
Apr-25-19	9:00	0.4	WSW	Apr-26-19	21:00	1.8	NNE
Apr-25-19	10:00	1.3	ENE	Apr-26-19	22:00	1.3	NNE
Apr-25-19	11:00	0.4	S	Apr-26-19	23:00	0.9	NE
Apr-25-19	12:00	1.8	SW	Apr-27-19	0:00	1.8	NE
Apr-25-19	13:00	2.2	ENE	Apr-27-19	1:00	0.9	NE
Apr-25-19	14:00	1.8	SW	Apr-27-19	2:00	0.9	NNE
Apr-25-19	15:00	2.2	SW	Apr-27-19	3:00	0.9	ENE
Apr-25-19	16:00	3.6	ENE	Apr-27-19	4:00	1.3	NE
Apr-25-19	17:00	3.1	ENE	Apr-27-19	5:00	0.9	NNE
Apr-25-19	18:00	1.8	ENE	Apr-27-19	6:00	0.9	NE
Apr-25-19	19:00	2.2	ENE	Apr-27-19	7:00	0.9	ESE
Apr-25-19	20:00	3.6	ENE	Apr-27-19	8:00	1.3	ENE
Apr-25-19	21:00	0.9	NE	Apr-27-19	9:00	0.9	ENE
Apr-25-19	22:00	1.3	NNE	Apr-27-19	10:00	0.9	ENE
Apr-25-19	23:00	1.3	NE	Apr-27-19	11:00	1.8	NE
Apr-26-19	0:00	1.3	NNE	Apr-27-19	12:00	1.8	NE
Apr-26-19	1:00	1.3	NE	Apr-27-19	13:00	2.2	NNE
Apr-26-19	2:00	0.9	S	Apr-27-19	14:00	1.3	NNE
Apr-26-19	3:00	1.8	NE	Apr-27-19	15:00	1.3	NE
Apr-26-19	4:00	2.2	NNE	Apr-27-19	16:00	0.4	E
Apr-26-19	5:00	1.8	NE	Apr-27-19	17:00	1.8	SW
Apr-26-19	6:00	1.3	NE	Apr-27-19	18:00	0.9	ENE
Apr-26-19	7:00	1.8	NNE	Apr-27-19	19:00	1.8	ENE
Apr-26-19	8:00	1.3	ENE	Apr-27-19	20:00	1.3	NNE
Apr-26-19	9:00	0.9	NNE	Apr-27-19	21:00	1.8	NNE
Apr-26-19	10:00	1.3	NE	Apr-27-19	22:00	1.3	NNE
Apr-26-19	11:00	1.3	NNE	Apr-27-19	23:00	0.9	NE

**APPENDIX C –
WEATHER CONDITIONS DURING THE MONITORING PERIOD**

I. Mean Wind Speed and Wind Direction

Date	Time	Wind Speed m-s	Direction	Date	Time	Wind Speed m-s	Direction
Apr-28-19	0:00	0.9	NE	Apr-29-19	12:00	1.8	ENE
Apr-28-19	1:00	0.9	NNE	Apr-29-19	13:00	4	ENE
Apr-28-19	2:00	0.9	ENE	Apr-29-19	14:00	5.4	ENE
Apr-28-19	3:00	1.3	NE	Apr-29-19	15:00	4	ENE
Apr-28-19	4:00	0.9	NNE	Apr-29-19	16:00	4.5	ENE
Apr-28-19	5:00	0.9	NE	Apr-29-19	17:00	4	ENE
Apr-28-19	6:00	0.9	ESE	Apr-29-19	18:00	4	ENE
Apr-28-19	7:00	1.3	ENE	Apr-29-19	19:00	3.1	ENE
Apr-28-19	8:00	0.9	ENE	Apr-29-19	20:00	1.8	ENE
Apr-28-19	9:00	1.3	NNE	Apr-29-19	21:00	2.2	ENE
Apr-28-19	10:00	1.3	NE	Apr-29-19	22:00	2.2	ENE
Apr-28-19	11:00	2.2	ENE	Apr-29-19	23:00	1.8	ENE
Apr-28-19	12:00	2.7	ENE	Apr-30-19	0:00	2.2	ENE
Apr-28-19	13:00	2.7	ENE	Apr-30-19	1:00	1.3	ENE
Apr-28-19	14:00	2.7	ENE	Apr-30-19	2:00	1.3	ENE
Apr-28-19	15:00	2.2	ENE	Apr-30-19	3:00	0.9	ENE
Apr-28-19	16:00	1.3	NNE	Apr-30-19	4:00	0.9	NE
Apr-28-19	17:00	0.9	NNE	Apr-30-19	5:00	0.9	ENE
Apr-28-19	18:00	0.9	NNE	Apr-30-19	6:00	1.3	ENE
Apr-28-19	19:00	0.9	NNE	Apr-30-19	7:00	0.9	ENE
Apr-28-19	20:00	0.9	NE	Apr-30-19	8:00	1.3	ENE
Apr-28-19	21:00	0.4	NE	Apr-30-19	9:00	2.7	ENE
Apr-28-19	22:00	0.4	NNE	Apr-30-19	10:00	2.2	ENE
Apr-28-19	23:00	0.4	ENE	Apr-30-19	11:00	2.7	ENE
Apr-29-19	0:00	0.4	NE	Apr-30-19	12:00	1.8	ENE
Apr-29-19	1:00	0.9	ENE	Apr-30-19	13:00	1.8	ENE
Apr-29-19	2:00	0.9	ENE	Apr-30-19	14:00	1.8	SW
Apr-29-19	3:00	0.9	ENE	Apr-30-19	15:00	2.2	SW
Apr-29-19	4:00	0.4	NE	Apr-30-19	16:00	0.9	SW
Apr-29-19	5:00	0.4	NE	Apr-30-19	17:00	1.3	SW
Apr-29-19	6:00	0.4	N	Apr-30-19	18:00	0.9	SW
Apr-29-19	7:00	0.9	NNE	Apr-30-19	19:00	0.9	SW
Apr-29-19	8:00	0.9	NE	Apr-30-19	20:00	0.9	SW
Apr-29-19	9:00	2.2	ENE	Apr-30-19	21:00	0.4	SW
Apr-29-19	10:00	1.3	ENE	Apr-30-19	22:00	0.4	SW
Apr-29-19	11:00	0.9	NE	Apr-30-19	23:00	0.4	SW

**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 (April 2019)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1-Apr	2-Apr	3-Apr	4-Apr	5-Apr	6-Apr
			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 (19:00-20:00)] [CM6(A)] Noise [Evening time (19:00-23:00)] [CM1, CM2, CM3] Noise [Night-time (23:00-07:00)] [CM1, CM2, CM3]		
7-Apr	8-Apr	9-Apr	10-Apr	11-Apr	12-Apr	13-Apr
		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 (19:00-20:00)] [CM6(A)]		Noise [Evening time (19:00-23:00)] [CM1, CM2, CM3] Noise [Night-time (23:00-07:00)] [CM1, CM2, CM3]	
14-Apr	15-Apr	16-Apr	17-Apr	18-Apr	19-Apr	20-Apr
	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 (19:00-20:00)] [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
21-Apr	22-Apr	23-Apr	24-Apr	25-Apr	26-Apr	27-Apr
		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 (19:00-20:00)] [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	
28-Apr	29-Apr	30-Apr				
	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 (19:00-20:00)] [CM6(A)]					

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

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

Note (1) For 1-hour TSP monitoring; (2) For 24-hour TSP monitoring

Agreement No. CE/59/2015 (EP)
Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction
Impact Water Quality Monitoring Schedule (April 2019)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1-Apr	2-Apr	3-Apr	4-Apr	5-Apr	6-Apr
	Mid-Ebb 10:48 Mid-Flood 15:45		Mid-Ebb 11:48 Mid-Flood 17:18			Mid-Flood 8:00 Mid-Ebb 13:10
7-Apr	8-Apr	9-Apr	10-Apr	11-Apr	12-Apr	13-Apr
	Mid-Flood 7:54 Mid-Ebb 14:47		Mid-Flood 8:42 Mid-Ebb 15:31		Mid-Flood 9:22 Mid-Ebb 17:11	
14-Apr	15-Apr	16-Apr	17-Apr	18-Apr	19-Apr	20-Apr
	Mid-Ebb 9:23 Mid-Flood 14:31		Mid-Ebb 11:00 Mid-Flood 16:49			
21-Apr	22-Apr	23-Apr	24-Apr	25-Apr	26-Apr	27-Apr
		Mid-Flood 08:19 Mid-Ebb 14:56		Mid-Flood 09:11 Mid-Ebb 16:40		Mid-Flood N/A Mid-Ebb 18:53
28-Apr	29-Apr	30-Apr				
	Mid-Ebb 9:33 Mid-Flood 14:01					

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
Impact Water Quality Monitoring Schedule in Temporary Marine Embayment (April 2019)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1-Apr	2-Apr	3-Apr	4-Apr	5-Apr	6-Apr
	Mid-Ebb 10:48 Mid-Flood 15:45					
7-Apr	8-Apr	9-Apr	10-Apr	11-Apr	12-Apr	13-Apr
	Mid-Flood 7:54 Mid-Ebb 14:47					
14-Apr	15-Apr	16-Apr	17-Apr	18-Apr	19-Apr	20-Apr
	Mid-Ebb 9:23 Mid-Flood 14:31					
21-Apr	22-Apr	23-Apr	24-Apr	25-Apr	26-Apr	27-Apr
		Mid-Flood 08:19 Mid-Ebb 14:56				
28-Apr	29-Apr	30-Apr				
	Mid-Ebb 9:33 Mid-Flood 14:01					

Monitoring Station:
W1

Agreement No. CE/59/2015 (EP)
Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction
Impact Groundwater Quality Monitoring Schedule (April 2019)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1-Apr	2-Apr	3-Apr	4-Apr	5-Apr	6-Apr
7-Apr	8-Apr	9-Apr	10-Apr	11-Apr	12-Apr	13-Apr
			Groundwater Quality Monitoring			
14-Apr	15-Apr	16-Apr	17-Apr	18-Apr	19-Apr	20-Apr
	Groundwater Quality Monitoring					
21-Apr	22-Apr	23-Apr	24-Apr	25-Apr	26-Apr	27-Apr
28-Apr	29-Apr	30-Apr				

Monitoring Location:
Stream 1, Stream 2, Stream 3

**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 ($\mu\text{g}/\text{m}^3$)
4-Apr-19	9:00	Fine	107.8
4-Apr-19	10:00	Fine	117.7
4-Apr-19	11:00	Fine	127.6
10-Apr-19	9:00	Sunny	100.0
10-Apr-19	10:00	Sunny	106.0
10-Apr-19	11:00	Sunny	108.0
16-Apr-19	9:00	Cloudy	100.0
16-Apr-19	10:00	Cloudy	107.0
16-Apr-19	11:00	Cloudy	107.0
23-Apr-19	9:00	Sunny	100.0
23-Apr-19	10:00	Sunny	106.0
23-Apr-19	11:00	Sunny	108.0
29-Apr-19	9:00	Sunny	117.0
29-Apr-19	10:00	Sunny	120.0
29-Apr-19	11:00	Sunny	124.5
		Average	110.4
		Maximum	127.6
		Minimum	100.0

Location AM2 - Sai Tso Wan Recreation Ground			
Date	Time	Weather	Particulate Concentration ($\mu\text{g}/\text{m}^3$)
4-Apr-19	9:00	Fine	77.8
4-Apr-19	10:00	Fine	84.2
4-Apr-19	11:00	Fine	88.6
10-Apr-19	9:00	Sunny	98.0
10-Apr-19	10:00	Sunny	94.0
10-Apr-19	11:00	Sunny	100.0
16-Apr-19	9:00	Cloudy	78.0
16-Apr-19	10:00	Cloudy	85.5
16-Apr-19	11:00	Cloudy	87.0
23-Apr-19	10:00	Sunny	95.4
23-Apr-19	11:00	Sunny	99.5
23-Apr-19	13:00	Sunny	103.5
29-Apr-19	9:00	Sunny	98.7
29-Apr-19	10:00	Sunny	104.2
29-Apr-19	11:00	Sunny	100.0
		Average	93.0
		Maximum	104.2
		Minimum	77.8

Appendix E - 1-hour TSP Monitoring Results

Location AM3 - Yau Lai Estate Bik Lai House			
Date	Time	Weather	Particulate Concentration ($\mu\text{g}/\text{m}^3$)
4-Apr-19	9:00	Sunny	158.0
4-Apr-19	10:00	Sunny	162.0
4-Apr-19	11:00	Sunny	152.0
10-Apr-19	13:00	Sunny	132.0
10-Apr-19	14:00	Sunny	140.0
10-Apr-19	15:00	Sunny	138.0
16-Apr-19	13:00	Cloudy	90.0
16-Apr-19	14:00	Cloudy	87.0
16-Apr-19	15:00	Cloudy	86.0
23-Apr-19	13:00	Sunny	76.0
23-Apr-19	14:00	Sunny	83.0
23-Apr-19	15:00	Sunny	83.0
29-Apr-19	13:00	Sunny	84.0
29-Apr-19	14:00	Sunny	90.0
29-Apr-19	15:00	Sunny	96.0
Average			110.5
Maximum			162.0
Minimum			76.0

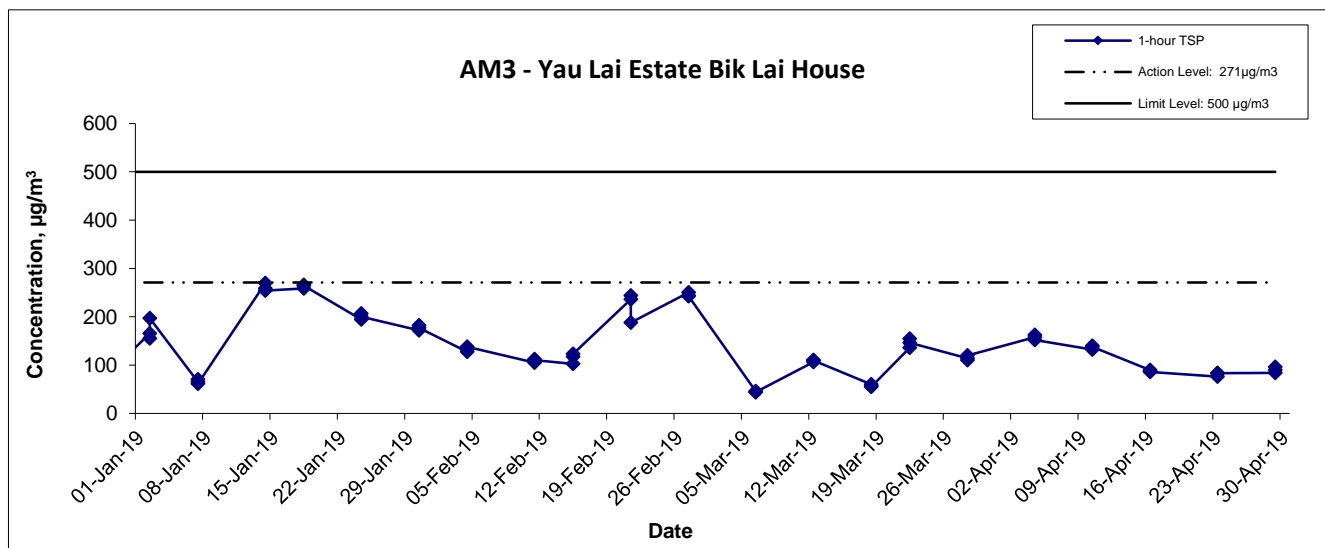
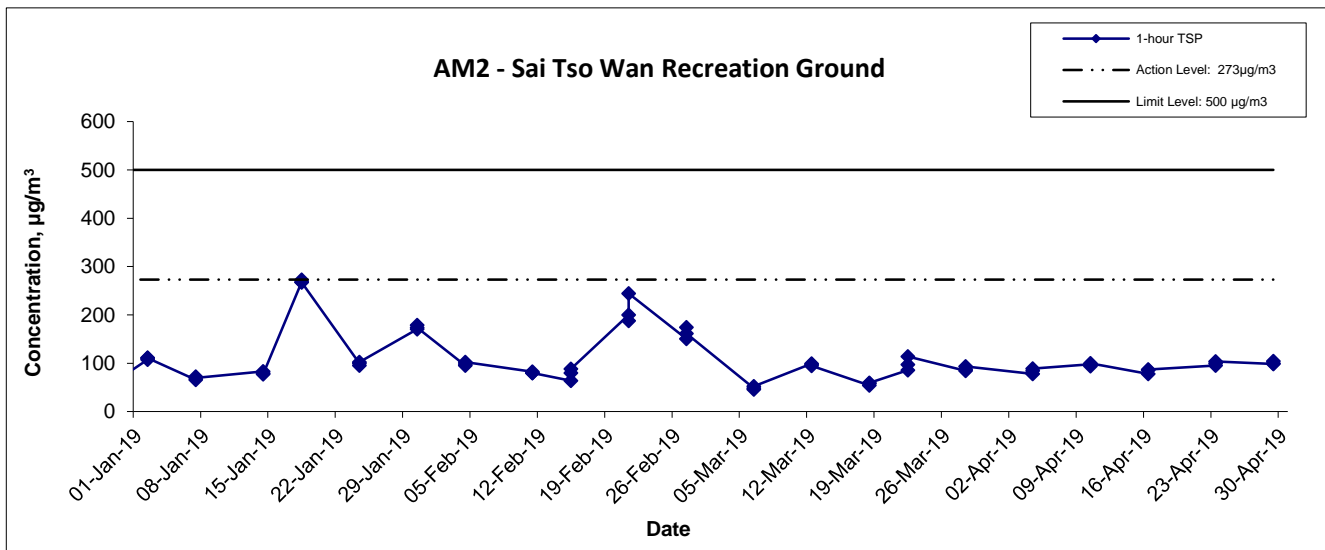
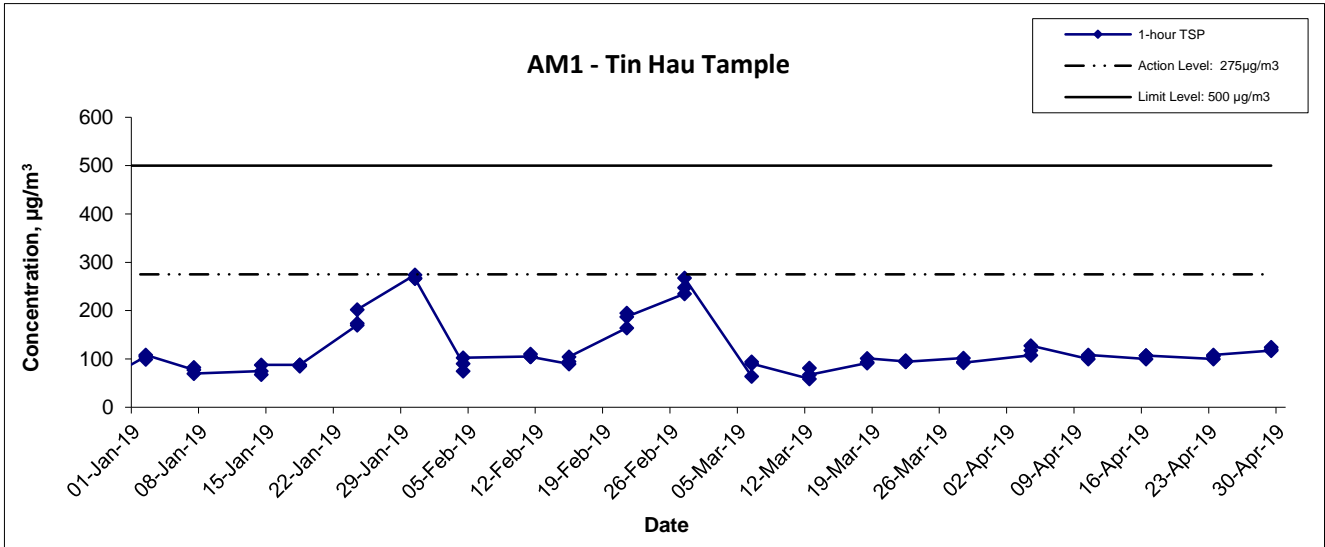
Location AM4 - Sitting-out Area at Cha Kwo Ling Village			
Date	Time	Weather	Particulate Concentration ($\mu\text{g}/\text{m}^3$)
4-Apr-19	13:00	Sunny	133.1
4-Apr-19	14:00	Sunny	119.9
4-Apr-19	15:00	Sunny	128.7
10-Apr-19	16:00	Sunny	90.0
10-Apr-19	17:00	Sunny	94.0
10-Apr-19	18:00	Sunny	86.0
16-Apr-19	16:00	Cloudy	90.0
16-Apr-19	17:00	Cloudy	91.0
16-Apr-19	18:00	Cloudy	92.0
23-Apr-19	16:00	Sunny	57.0
23-Apr-19	17:00	Sunny	63.0
23-Apr-19	18:00	Sunny	61.0
29-Apr-19	16:00	Sunny	60.0
29-Apr-19	17:00	Sunny	57.0
29-Apr-19	18:00	Sunny	69.0
Average			86.1
Maximum			133.1
Minimum			57.0

Appendix E - 1-hour TSP Monitoring Results

Location AM5(A) - Tseung Kwan O DSD Desilting Compound			
Date	Time	Weather	Particulate Concentration ($\mu\text{g}/\text{m}^3$)
4-Apr-19	14:00	Fine	46.0
4-Apr-19	15:00	Fine	52.0
4-Apr-19	16:00	Fine	56.0
10-Apr-19	13:00	Sunny	100.0
10-Apr-19	14:00	Sunny	96.0
10-Apr-19	15:00	Sunny	104.0
16-Apr-19	13:00	Cloudy	90.0
16-Apr-19	14:00	Cloudy	87.0
16-Apr-19	15:00	Cloudy	94.5
23-Apr-19	14:00	Sunny	101.5
23-Apr-19	15:00	Sunny	99.5
23-Apr-19	16:00	Sunny	91.4
29-Apr-19	16:00	Sunny	103.5
29-Apr-19	17:00	Sunny	107.8
29-Apr-19	18:00	Sunny	106.8
		Average	89.1
		Maximum	107.8
		Minimum	46.0

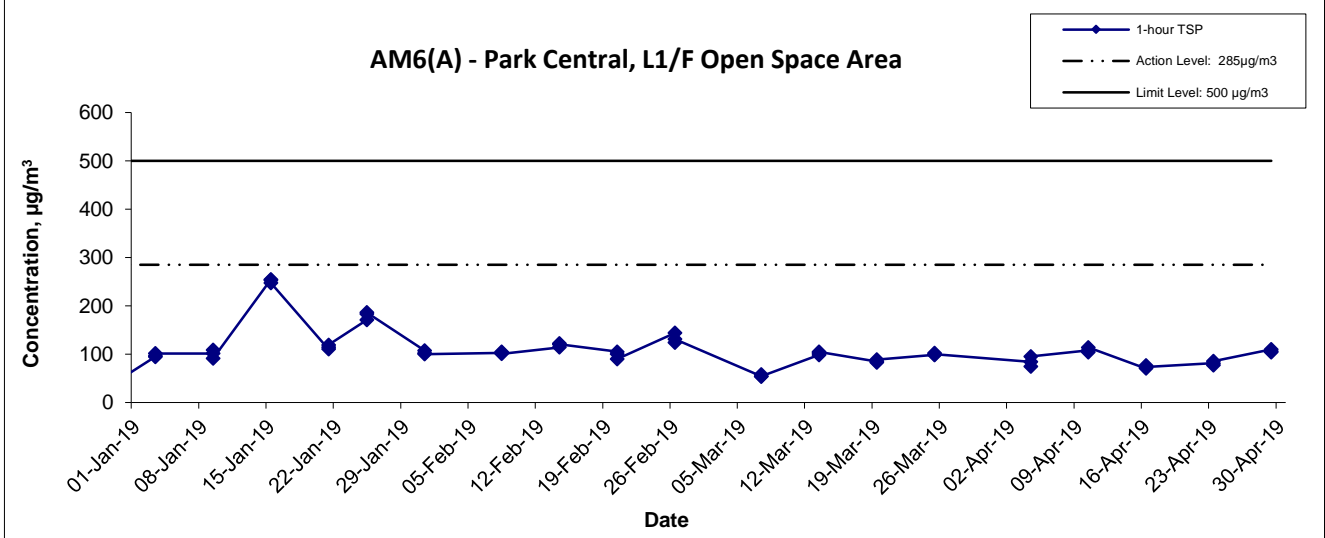
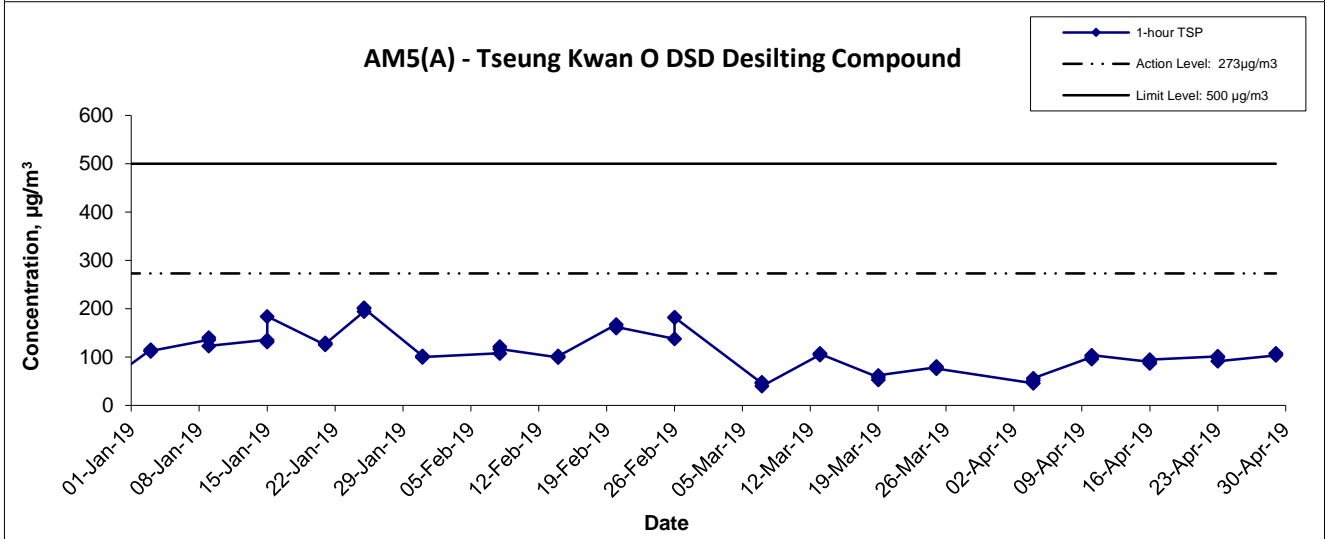
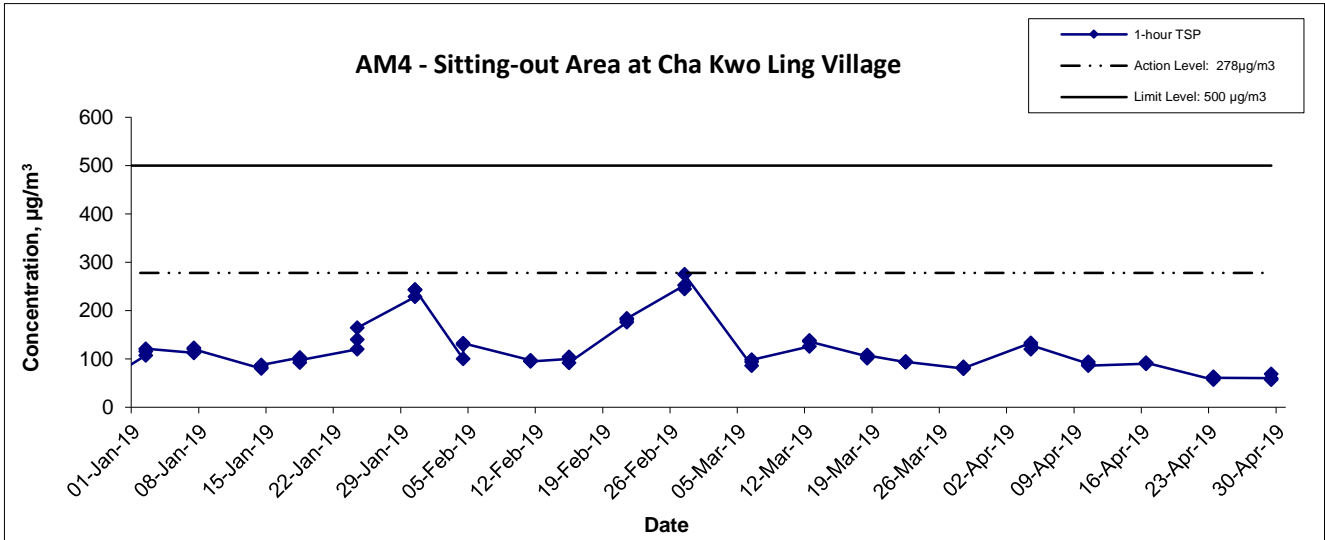
Location AM6(A) - Park Central, L1/F Open Space Area			
Date	Time	Weather	Particulate Concentration ($\mu\text{g}/\text{m}^3$)
4-Apr-19	15:00	Fine	84.2
4-Apr-19	16:00	Fine	74.5
4-Apr-19	17:00	Fine	95.0
10-Apr-19	16:00	Sunny	108.0
10-Apr-19	17:00	Sunny	104.0
10-Apr-19	18:00	Sunny	114.0
16-Apr-19	16:00	Cloudy	70.5
16-Apr-19	17:00	Cloudy	76.5
16-Apr-19	18:00	Cloudy	73.5
23-Apr-19	7:00	Sunny	81.2
23-Apr-19	8:00	Sunny	77.1
23-Apr-19	9:00	Sunny	85.3
29-Apr-19	13:00	Sunny	110.1
29-Apr-19	14:00	Sunny	104.1
29-Apr-19	15:00	Sunny	105.9
		Average	90.9
		Maximum	114.0
		Minimum	70.5

1-hr TSP Concentration Levels



Title 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	Project No. MA16034	
	Date Apr-19	Appendix E	

1-hr TSP Concentration Levels



Title 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	Project No. MA16034	
	Date Apr-19	Appendix E	

**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 Condition	Air Temp. (K)	Atmospheric Pressure, Pa (mmHg)	Filter Weight (g)		Particulate Weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m ³ /min.)		Av. flow (m ³ /min)	Total vol. (m ³)	Conc. (µg/m ³)
				Initial	Final		Initial	Final		Initial	Final			
3-Apr-19	Sunny	295.3	762.9	3.4863	3.5517	0.0654	5100.4	5124.4	24.0	1.21	1.21	1.21	1738.1	37.6
9-Apr-19	Sunny	299.9	758.5	2.9569	3.0995	0.1426	5124.4	5148.4	24.0	1.19	1.19	1.19	1717.8	83.0
15-Apr-19	Sunny	294.7	761.2	3.4804	3.6268	0.1464	5148.4	5172.4	24.0	1.21	1.21	1.21	1737.9	84.2
20-Apr-19	Sunny	297.8	756.7	3.4916	3.5429	0.0513	5196.4	5220.4	24.0	1.31	1.30	1.30	1877.9	27.3
26-Apr-19	Sunny	299.7	759.7	3.5312	3.6190	0.0878	5220.4	5244.4	24.0	1.30	1.31	1.30	1874.7	46.8
													Min	27.3
													Max	84.2
													Average	55.8

Location AM2 - Sai Tso Wan Recreation Ground

Start Date	Weather Condition	Air Temp. (K)	Atmospheric Pressure, Pa (mmHg)	Filter Weight (g)		Particulate Weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m ³ /min.)		Av. flow (m ³ /min)	Total vol. (m ³)	Conc. (µg/m ³)
				Initial	Final		Initial	Final		Initial	Final			
3-Apr-19	Sunny	295.3	762.9	2.9671	3.1036	0.1365	26005.2	26029.2	24.0	1.21	1.21	1.21	1741.4	78.4
9-Apr-19	Sunny	299.9	758.5	2.9762	3.0793	0.1031	26029.2	26053.2	24.0	1.20	1.20	1.20	1722.2	59.9
15-Apr-19	Sunny	294.7	761.2	3.5232	3.6064	0.0832	26059.8	26083.8	24.0	1.21	1.21	1.21	1741.2	47.8
20-Apr-19	Sunny	297.8	756.7	3.4908	3.5480	0.0572	26083.8	26107.8	24.0	1.22	1.21	1.21	1748.6	32.7
26-Apr-19	Sunny	299.7	759.7	3.4847	3.5836	0.0989	26107.8	26131.8	24.0	1.21	1.22	1.21	1746.4	56.6
													Min	32.7
													Max	78.4
													Average	55.1

Location AM3 - Yau Lai Estate, Bik Lai House

Start Date	Weather Condition	Air Temp. (K)	Atmospheric Pressure, Pa (mmHg)	Filter Weight (g)		Particulate Weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m ³ /min.)		Av. flow (m ³ /min)	Total vol. (m ³)	Conc. (µg/m ³)
				Initial	Final		Initial	Final		Initial	Final			
3-Apr-19	Sunny	295.3	762.9	2.9856	3.1343	0.1487	243.3	267.3	24.0	1.21	1.21	1.21	1741.8	85.4
9-Apr-19	Sunny	299.9	758.5	2.9625	3.0493	0.0868	267.3	291.3	24.0	1.20	1.20	1.20	1723.4	50.4
15-Apr-19	Sunny	294.7	761.2	3.4749	3.6872	0.2123	291.3	315.3	24.0	1.21	1.21	1.21	1741.7	121.9
20-Apr-19	Sunny	297.8	756.7	3.4988	3.5736	0.0748	315.3	339.3	24.0	1.22	1.21	1.22	1750.7	42.7
26-Apr-19	Sunny	299.7	759.7	3.4268	3.5355	0.1087	339.3	363.3	24.0	1.21	1.22	1.21	1748.6	62.2
													Min	42.7
													Max	121.9
													Average	72.5

Appendix F - 24-hour TSP Monitoring Results

Location AM4(A) - Cha Kwo Ling Public Cargo Working Area Administrative Office

Start Date	Weather Condition	Air Temp. (K)	Atmospheric Pressure, Pa (mmHg)	Filter Weight (g)		Particulate Weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m ³ /min.)		Av. flow (m ³ /min)	Total vol. (m ³)	Conc. (µg/m ³)
				Initial	Final		Initial	Final		Initial	Final			
3-Apr-19	Sunny	295.3	762.9	2.9484	3.1340	0.1856	11252.0	11276.0	24.0	1.21	1.21	1.21	1740.8	106.6
9-Apr-19	Sunny	299.9	758.5	2.9870	3.1077	0.1207	11156.0	11180.0	24.0	1.20	1.20	1.20	1722.3	70.1
15-Apr-19	Sunny	294.7	761.2	3.5455	3.7946	0.2491	11300.0	11324.0	24.0	1.21	1.21	1.21	1740.6	143.1
20-Apr-19	Sunny	297.8	756.7	3.4991	3.6171	0.1180	11324.0	11348.0	24.0	1.22	1.21	1.22	1750.6	67.4
26-Apr-19	Sunny	299.7	759.7	3.5352	3.7619	0.2267	11348.0	11372.0	24.0	1.21	1.22	1.21	1748.5	129.7
													Min	67.4
													Max	143.1
													Average	103.4

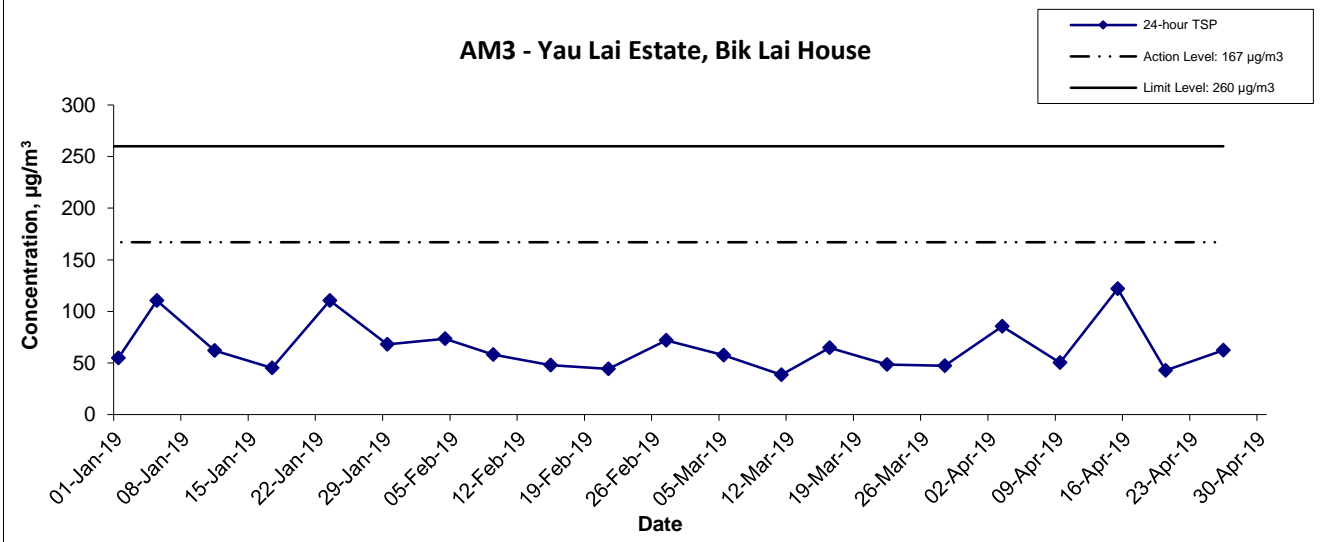
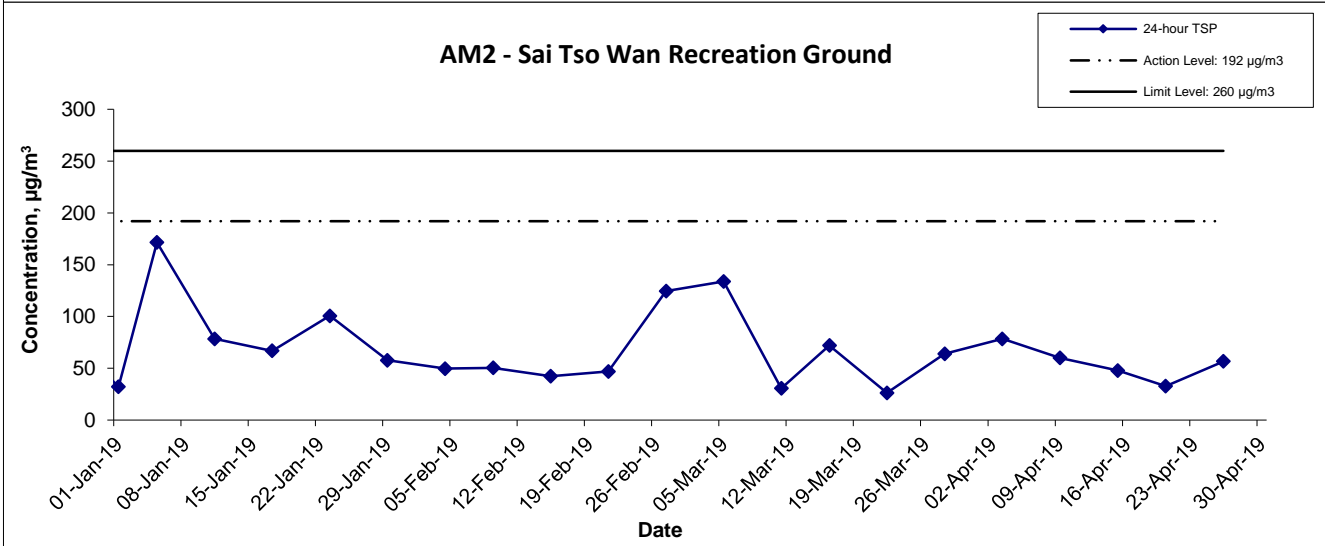
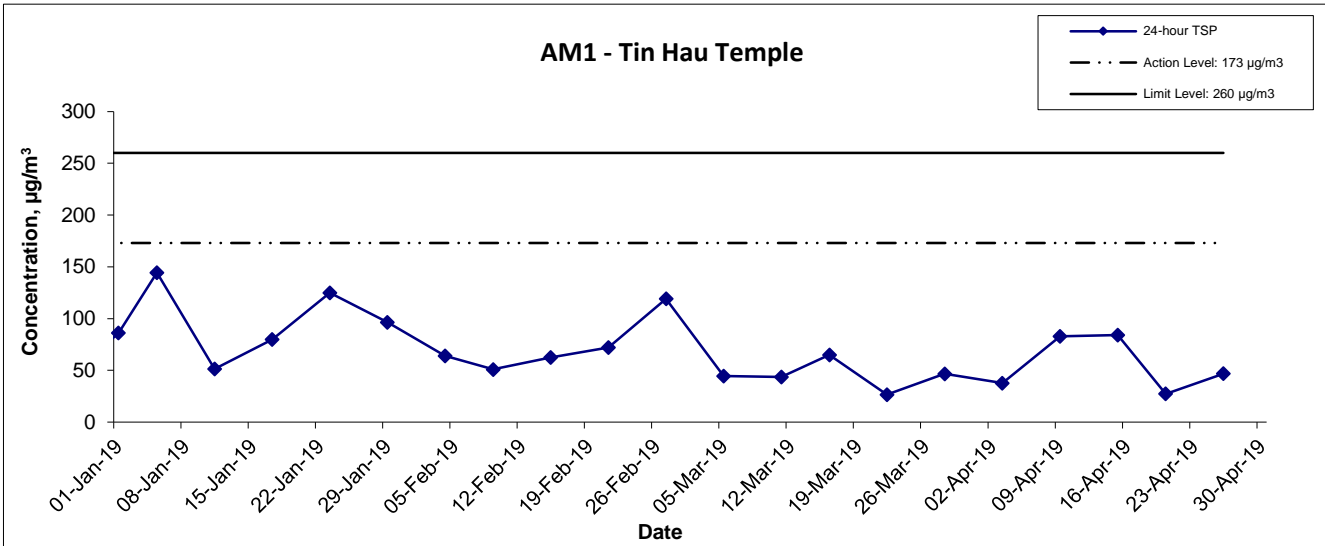
Location AM5(A) - Tseung Kwan O DSD Desilting Compound

Start Date	Weather Condition	Air Temp. (K)	Atmospheric Pressure, Pa (mmHg)	Filter Weight (g)		Particulate Weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m ³ /min.)		Av. flow (m ³ /min)	Total vol. (m ³)	Conc. (µg/m ³)
				Initial	Final		Initial	Final		Initial	Final			
3-Apr-19	Sunny	295.3	762.9	2.9804	3.1211	0.1407	27741.9	27765.9	24.0	1.21	1.21	1.21	1738.1	80.9
9-Apr-19	Sunny	299.9	758.5	2.9860	3.0837	0.0977	27765.9	27789.9	24.0	1.19	1.19	1.19	1719.0	56.8
15-Apr-19	Sunny	294.7	761.2	3.5110	3.5988	0.0878	27797.3	27821.3	24.0	1.21	1.21	1.21	1737.9	50.5
20-Apr-19	Sunny	297.8	756.7	3.4389	3.5080	0.0691	27821.3	27845.3	24.0	1.22	1.21	1.21	1747.3	39.5
26-Apr-19	Sunny	299.7	759.7	3.5194	3.6877	0.1683	27845.3	27869.3	24.0	1.21	1.22	1.21	1745.1	96.4
													Min	39.5
													Max	96.4
													Average	64.9

Location AM6(A) - Park Central, L1/F Open Space Area

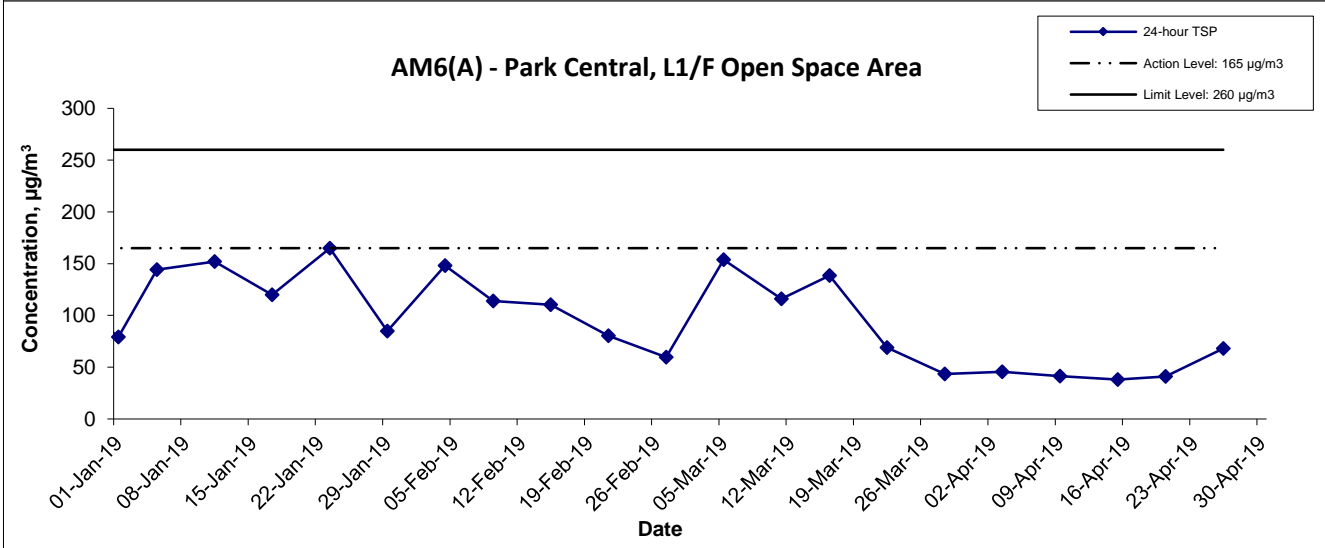
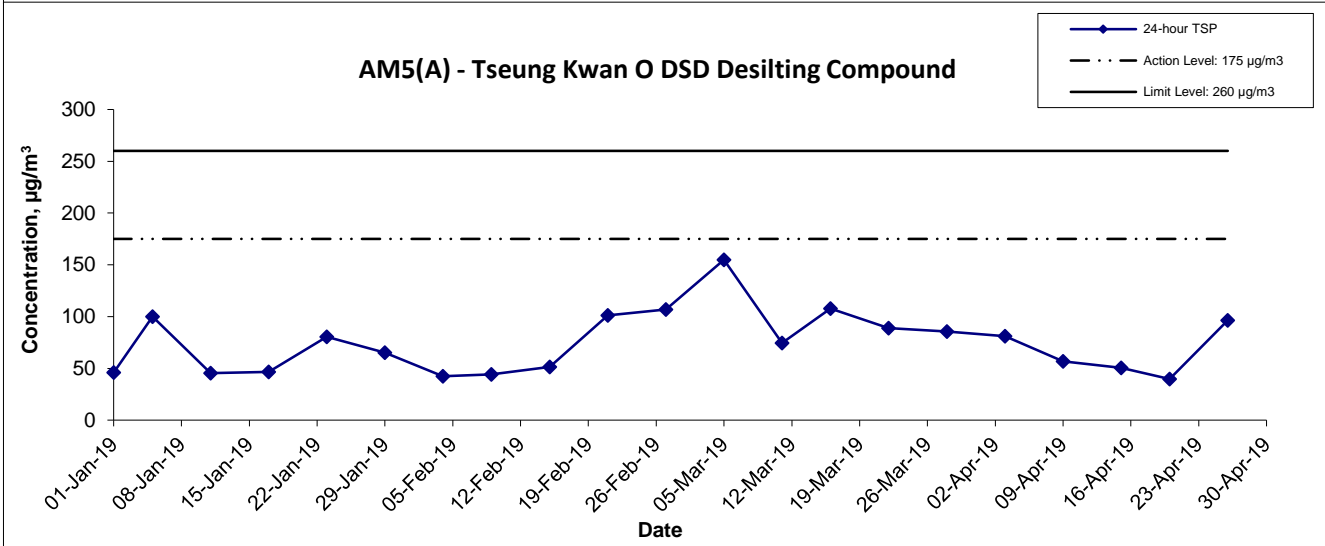
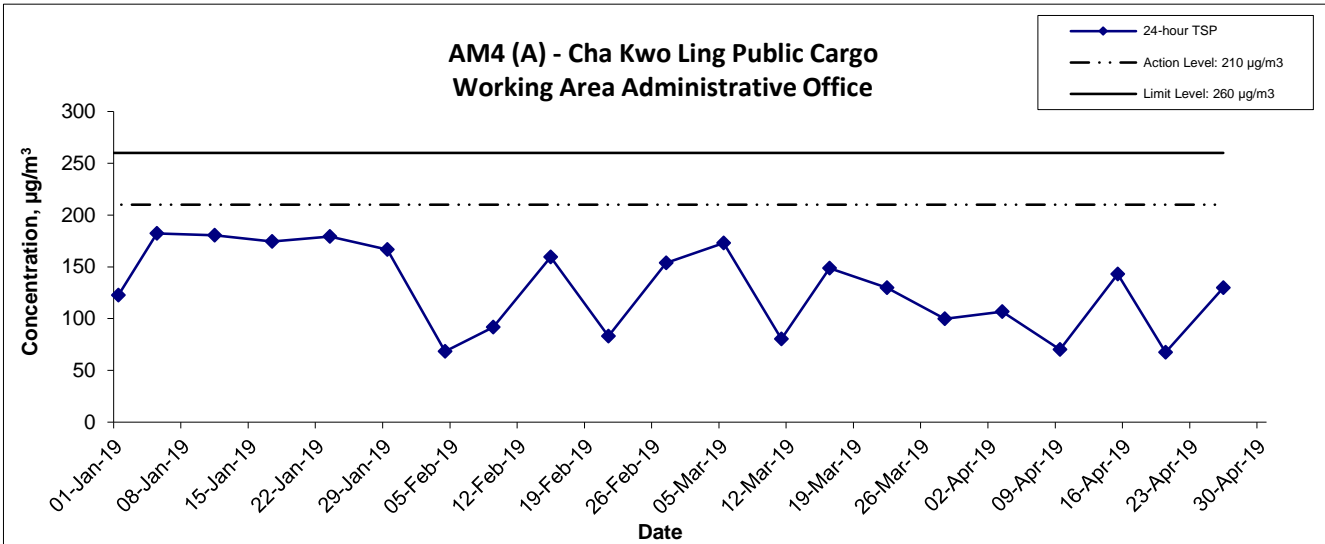
Start Date	Weather Condition	Air Temp. (K)	Atmospheric Pressure, Pa (mmHg)	Filter Weight (g)		Particulate Weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m ³ /min.)		Av. flow (m ³ /min)	Total vol. (m ³)	Conc. (µg/m ³)
				Initial	Final		Initial	Final		Initial	Final			
3-Apr-19	Sunny	295.3	762.9	3.4921	3.5708	0.0787	337.0	361.0	24.0	1.19	1.20	1.20	1721.3	45.7
9-Apr-19	Sunny	299.9	758.5	3.5285	3.5991	0.0706	361.0	385.0	24.0	1.18	1.18	1.18	1702.5	41.5
15-Apr-19	Sunny	294.7	761.2	3.4405	3.5058	0.0653	393.6	417.6	24.0	1.19	1.20	1.20	1721.1	37.9
20-Apr-19	Sunny	297.8	756.7	3.4788	3.5487	0.0699	417.6	441.6	24.0	1.19	1.18	1.19	1706.6	41.0
26-Apr-19	Sunny	299.7	759.7	3.4454	3.5612	0.1158	441.6	465.6	24.0	1.18	1.19	1.18	1704.5	67.9
													Min	37.9
													Max	67.9
													Average	46.8

24-hr TSP Concentration Levels



Title	Agreement No. CE/59/2015 (EP)	Scale	Project No.	CINOTECH
	Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction	N.T.S	MA16034	
Graphical Presentation of 24-hour TSP Monitoring Results		Date	Appendix	
		Apr-19	F	

24-hr TSP Concentration Levels



Title	Agreement No. CE/59/2015 (EP)		Scale	N.T.S	Project No.	MA16034	CINOTECH	
	Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction			Date		Apr-19		Appendix
Graphical Presentation of 24-hour TSP Monitoring Results								

**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}
4-Apr-19	9:45	Sunny	71.2	75.0	68.7	65.5	70
10-Apr-19	16:45	Sunny	71.6	73.2	69.5		70
16-Apr-19	14:40	Cloudy	64.7	66.5	62.4		65 Measured ≤ Baseline
23-Apr-19	15:10	Sunny	74.6	75.9	73.0		74
29-Apr-19	13:00	Sunny	74.0	76.8	68.0		73

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}
4-Apr-19	10:20	Sunny	71.8	74.9	69.2	63.6	71
10-Apr-19	16:05	Sunny	72.8	74.4	70.8		72
16-Apr-19	14:00	Cloudy	64.6	67.3	61.1		58
23-Apr-19	14:20	Sunny	74.7	75.9	73.1		74
29-Apr-19	13:30	Sunny	74.9	76.5	72.5		75

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}
4-Apr-19	10:55	Sunny	73.4	75.2	71.0	65.6	73
10-Apr-19	15:15	Sunny	71.3	72.8	69.4		70
16-Apr-19	14:45	Cloudy	65.3	66.9	62.9		65 Measured ≤ Baseline
23-Apr-19	16:27	Sunny	74.5	75.8	73.0		74
29-Apr-19	16:30	Sunny	72.6	74.4	70.3		72

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}
4-Apr-19	9:00	Sunny	58.9	62.4	50.3	62.0	59 Measured ≤ Baseline
10-Apr-19	14:30	Sunny	59.1	62.2	53.5		59 Measured ≤ Baseline
16-Apr-19	17:15	Cloudy	54.0	55.5	48.1		54 Measured ≤ Baseline
23-Apr-19	11:25	Sunny	62.2	64.9	55.3		49
29-Apr-19	15:30	Sunny	59.8	62.4	54.1		60 Measured ≤ Baseline

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}
4-Apr-19	11:30	Sunny	69.9	73.1	65.3	68.2	65
10-Apr-19	13:00	Sunny	69.8	72.1	64.9		65
16-Apr-19	16:30	Cloudy	60.3	62.5	56.4		60 Measured ≤ Baseline
23-Apr-19	16:55	Sunny	71.3	73.0	67.5		68
29-Apr-19	14:15	Sunny	63.2	64.8	60.9		63 Measured ≤ Baseline

Appendix G - Noise Monitoring Results

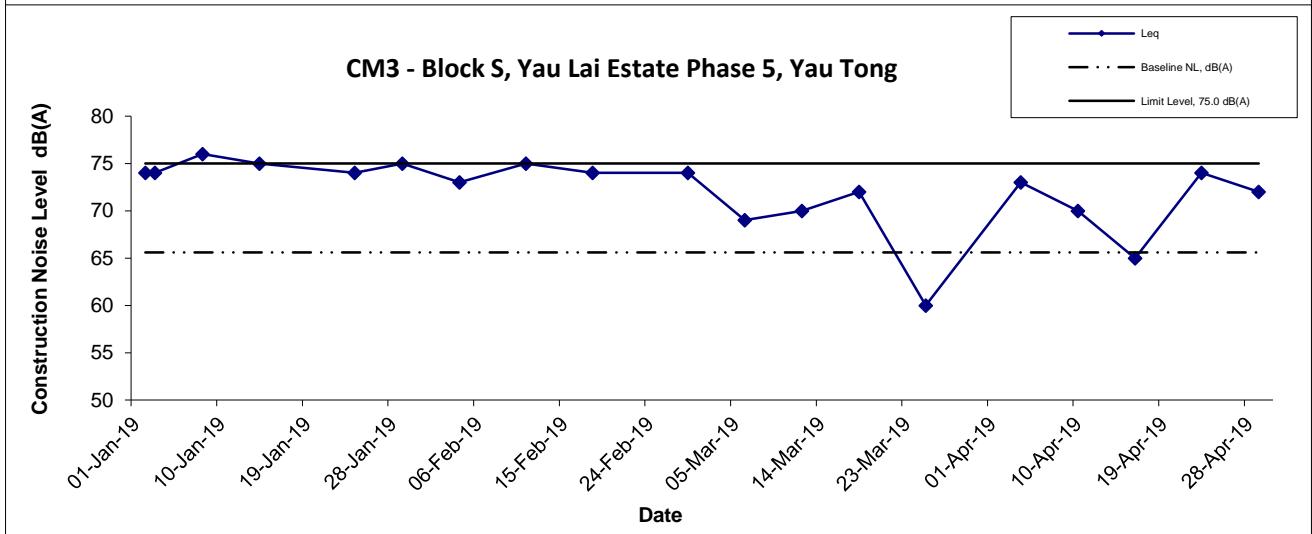
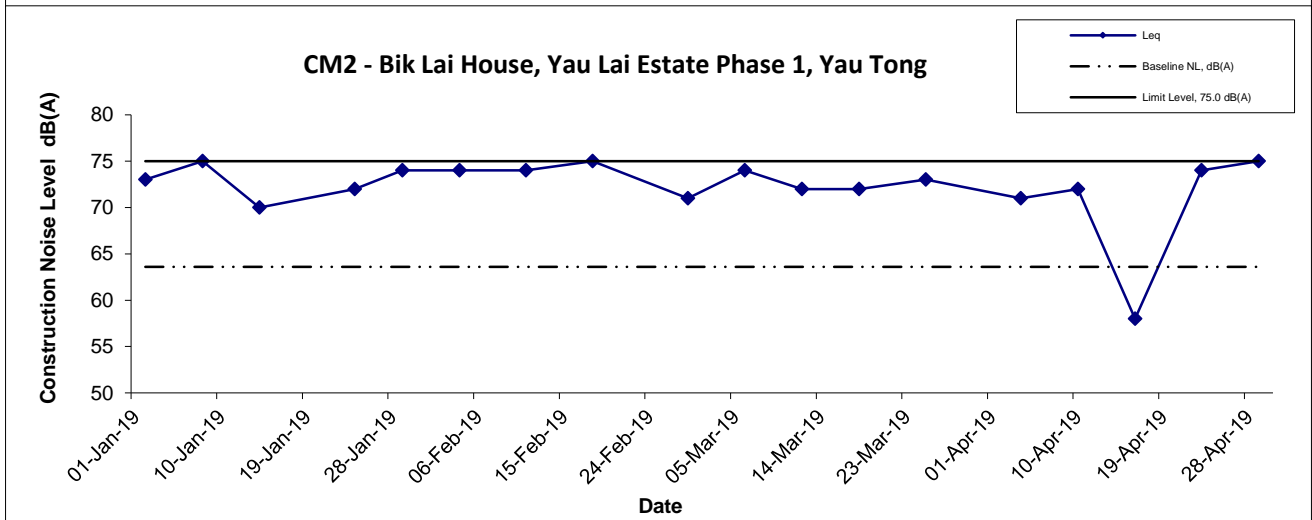
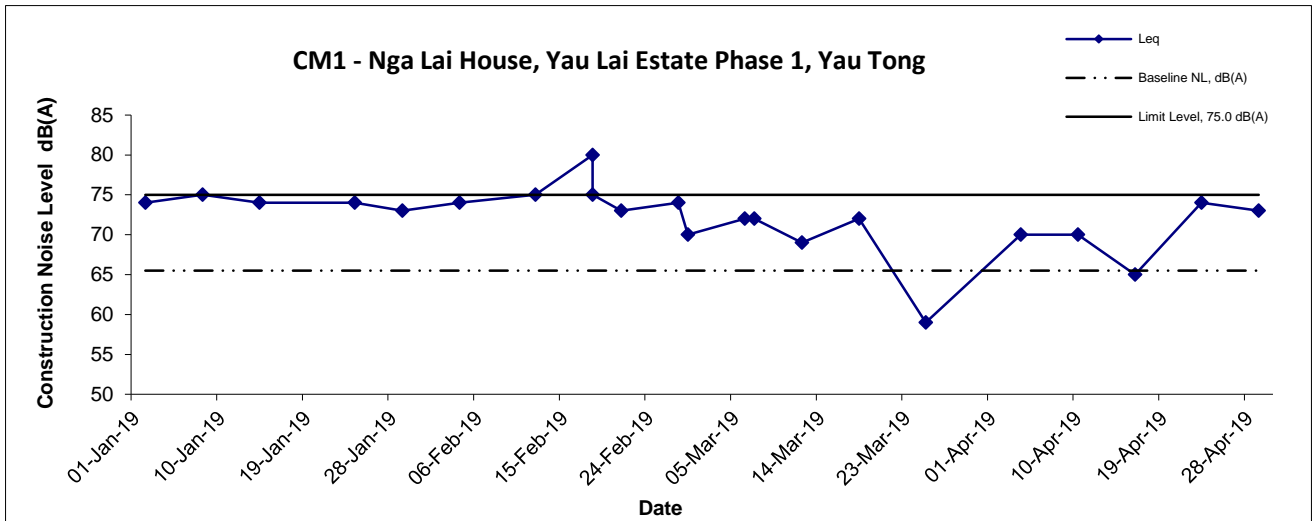
(0700-1900 hrs on Normal Weekdays)

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}
4-Apr-19	13:30	Sunny	63.2	67.9	59.4	61.9	57
10-Apr-19	9:30	Sunny	65.6	69.4	53.7		63
16-Apr-19	13:00	Cloudy	66.7	69.5	63.4		65
23-Apr-19	15:10	Sunny	67.1	70.0	64.2		66
29-Apr-19	13:00	Sunny	68.2	70.5	65.9		67

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}
4-Apr-19	14:30	Sunny	66.3	67.8	59.8	58.3	66
10-Apr-19	10:30	Sunny	60.2	62.5	55.7		56
16-Apr-19	14:00	Cloudy	65.7	67.5	61.8		65
23-Apr-19	16:05	Sunny	66.7	69.7	63.0		66
29-Apr-19	14:00	Sunny	67.2	69.9	64.6		67

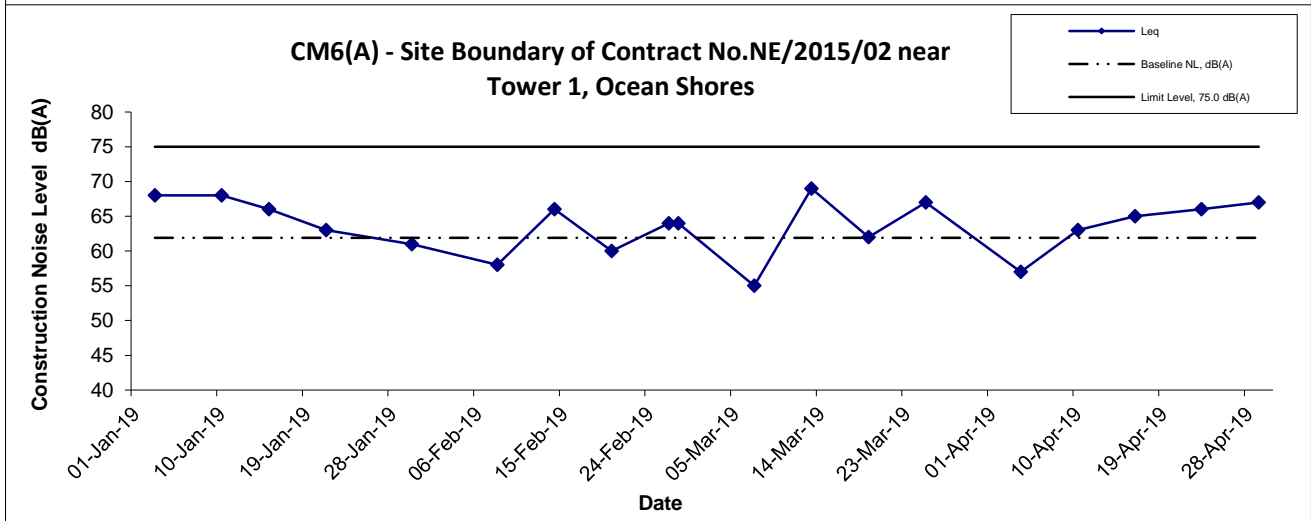
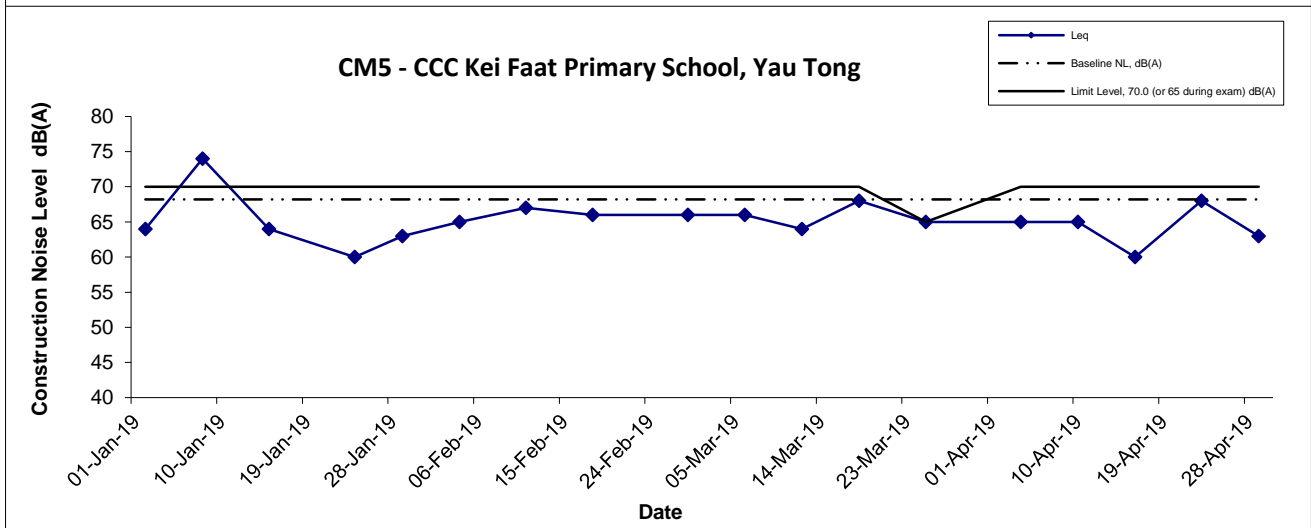
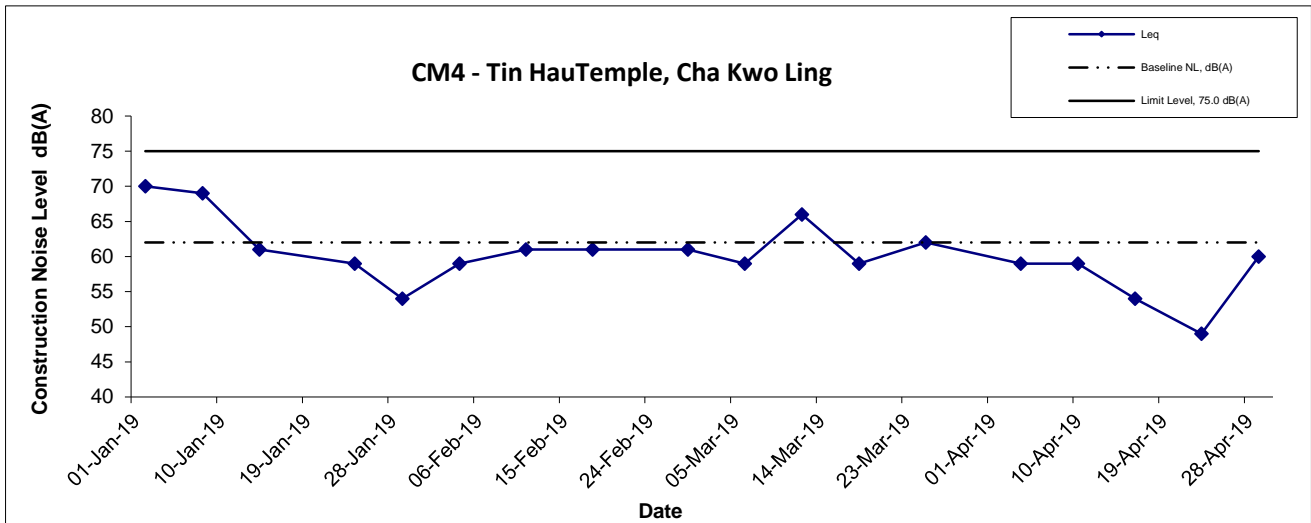
Location CM8(A) - Park Central, L1/F Open Space Area							
Date	Time	Weather	Unit: dB (A) (30-min)				
			Measured Noise Level			Baseline Level	Construction Noise Level
			L _{eq}	L ₁₀	L ₉₀	L _{eq}	L _{eq}
4-Apr-19	15:30	Sunny	62.7	64.4	56.4	69.1	63 Measured ≤ Baseline
10-Apr-19	11:30	Sunny	68.2	70.6	65.3		68 Measured ≤ Baseline
16-Apr-19	16:30	Cloudy	64.8	67.9	60.7		65 Measured ≤ Baseline
23-Apr-19	14:10	Sunny	68.5	70.7	66.2		69 Measured ≤ Baseline
29-Apr-19	16:00	Sunny	69.4	72.1	66.5		58

Noise Levels



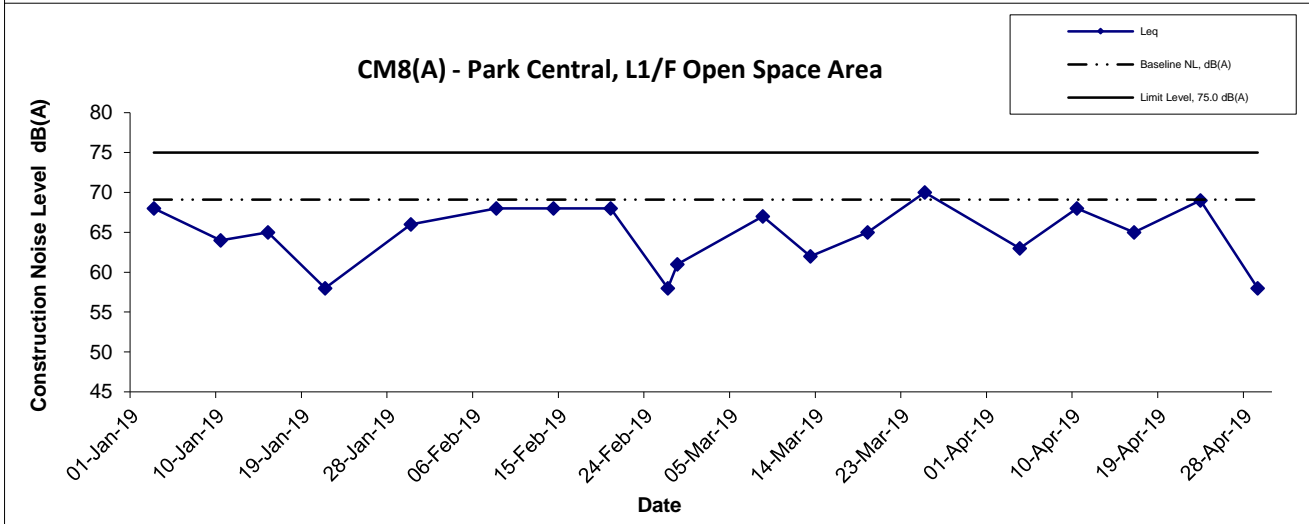
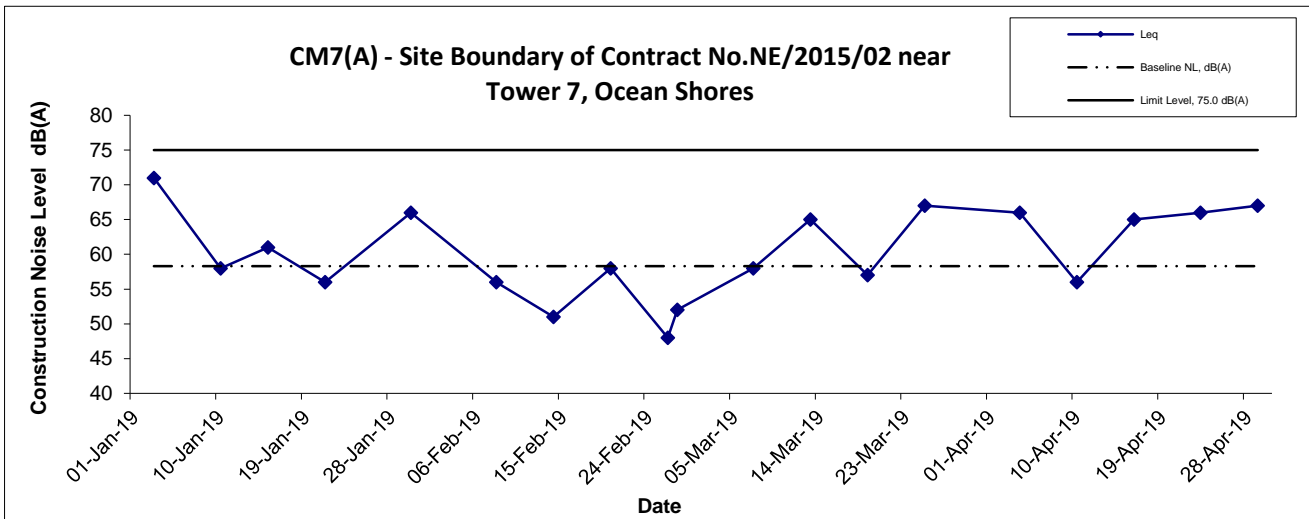
Title Agreement No. CE/59/2015 (EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Graphical Presentation of Construction Noise Monitoring Results	Scale	Project	CINOTECH
	N.T.S	No. MA16034	
	Date Apr 19	Appendix G	

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	Project	CINOTECH
	N.T.S	No. MA16034	
	Date	Appendix	
	Apr 19	G	

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	Project	CINOTECH
	N.T.S	No. MA16034	
	Date	Appendix	
	Apr 19	G	

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)				Average L _{eq}	Baseline Level L _{eq}	Construction Noise Level L _{eq}
			L _{eq}	L ₁₀	L ₉₀				
4-Apr-19	20:30	Sunny	70.4	72.0	68.2	70.4	64.4		
	20:35		70.3	71.8	67.7				
	20:40		70.5	71.9	68.4				
12-Apr-19	22:00	Rainy	71.3	73.1	68.3	71.2			
	22:05		71.2	72.8	68.2				
	22:10		71.0	72.5	67.8				
18-Apr-19	19:30	Cloudy	67.7	69.5	65.3	67.5			
	19:35		67.4	68.9	65.6				
	19:40		67.4	69.3	65.4				
26-Apr-19	22:00	Sunny	64.6	66.6	62.5	64.6			
	22:05		64.8	66.4	63.1				
	22:10		64.5	65.8	62.5				

Location CM2 - Bik Lai House, Yau Lai Estate Phase 1, Yau Tong									
Date	Time	Weather	dB (A) (5-min)				Average L _{eq}	Baseline Level L _{eq}	Construction Noise Level L _{eq}
			L _{eq}	L ₁₀	L ₉₀				
4-Apr-19	21:00	Sunny	67.6	68.9	66.4	67.8	62.2		
	21:05		67.9	69.2	66.3				
	21:10		67.9	69.6	65.4				
12-Apr-19	22:30	Rainy	68.7	69.9	66.5	68.6			
	22:35		68.6	70.2	66.6				
	22:40		68.6	71.3	67.0				
18-Apr-19	20:00	Cloudy	67.4	69.0	65.6	67.3			
	20:05		67.0	68.9	65.7				
	20:10		67.6	68.6	65.5				
26-Apr-19	21:30	Sunny	63.3	65.2	61.1	63.1			
	21:35		62.6	64.1	61.0				
	21:40		63.4	65.1	61.2				

Location CM3 - Block S, Yau Lai Estate Phase 5, Yau Tong									
Date	Time	Weather	dB (A) (5-min)				Average L _{eq}	Baseline Level L _{eq}	Construction Noise Level L _{eq}
			L _{eq}	L ₁₀	L ₉₀				
4-Apr-19	21:30	Sunny	61.7	62.8	60.3	61.8	64.7		
	21:35		61.9	62.9	60.3				
	21:40		61.9	63.4	60.1				
12-Apr-19	21:30	Rainy	63.2	64.7	61.3	63.7			
	21:35		64.0	65.3	61.2				
	21:40		63.8	65.0	62.0				
18-Apr-19	20:20	Cloudy	66.8	68.7	64.3	66.6			
	20:25		66.6	69.0	64.5				
	20:30		66.3	68.8	64.4				
26-Apr-19	22:30	Sunny	63.5	64.9	59.8	62.6			
	22:35		62.4	63.6	60.3				
	22:40		61.8	63.5	60.0				

Location CM6(A) - Site Boundary of Contract No. NE/2015/02 near Tower 1, Ocean Shores									
Date	Time	Weather	dB (A) (5-min)				Average L _{eq}	Baseline Level L _{eq}	Construction Noise Level L _{eq}
			L _{eq}	L ₁₀	L ₉₀				
4-Apr-19	19:00	Cloudy	55.2	57.8	51.1	54.0	60.2		
	19:05		53.8	56.6	49.4				
	19:10		52.8	54.5	49.8				
10-Apr-19	19:00	Sunny	66.8	70.3	63.4	66.4			
	19:05		66.5	70.2	63.2				
	19:10		65.7	69.8	63.0				
16-Apr-19	19:00	Cloudy	63.6	66.7	60.2	63.6			
	19:05		63.7	66.7	60.3				
	19:10		63.5	67.1	60.5				
23-Apr-19	19:00	Cloudy	64.5	67.4	61.3	64.6			
	19:05		64.6	67.6	61.3				
	19:10		64.8	68.1	61.4				
29-Apr-19	19:00	Sunny	63.2	66.7	60.2	65.0			
	19:05		64.5	67.1	61.6				
	19:10		66.7	69.3	63.2				

Appendix G - Noise Monitoring Results

(Restricted Hours - 2300-0700 on all days)

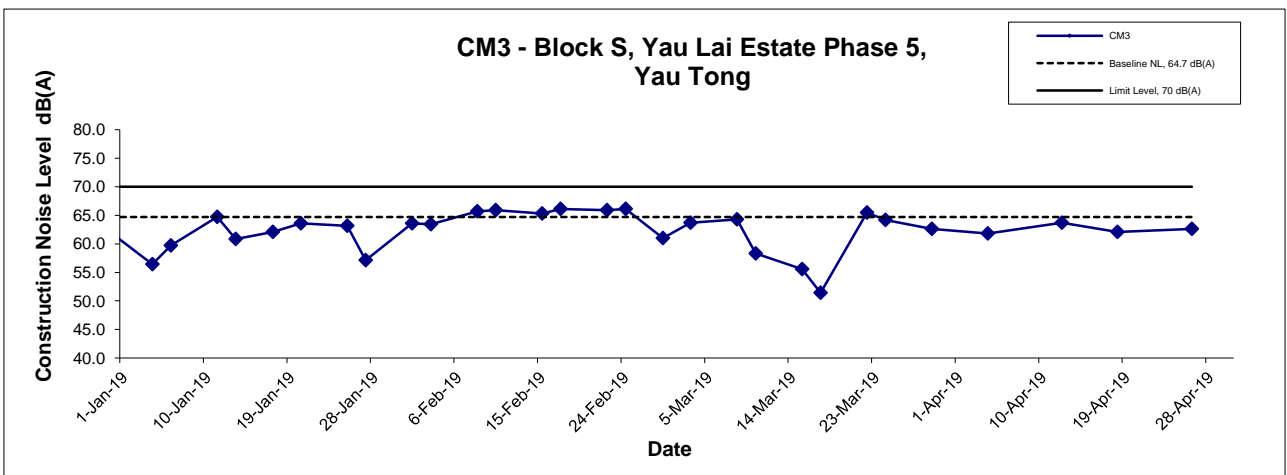
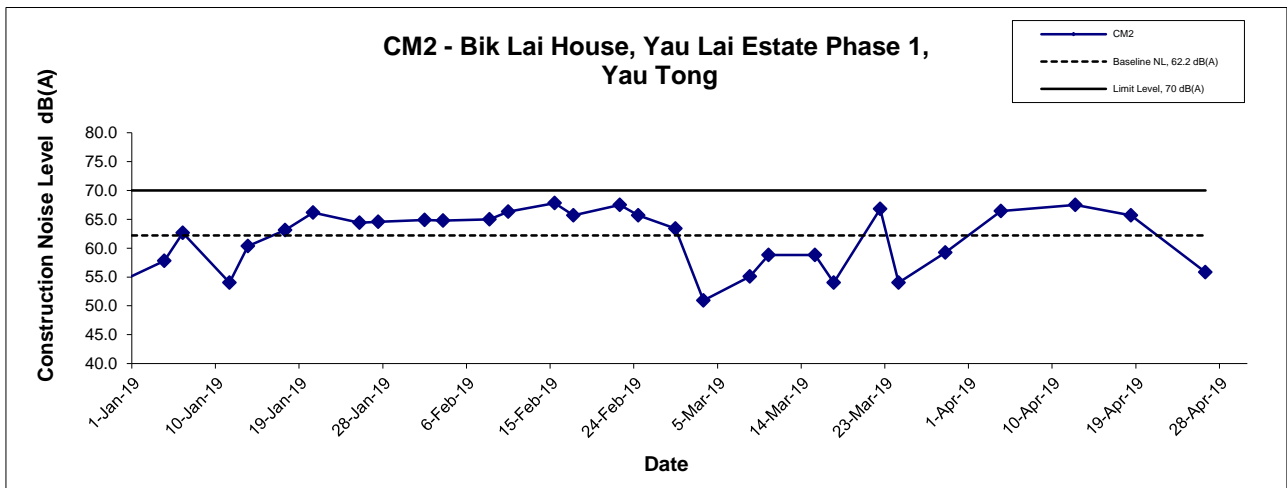
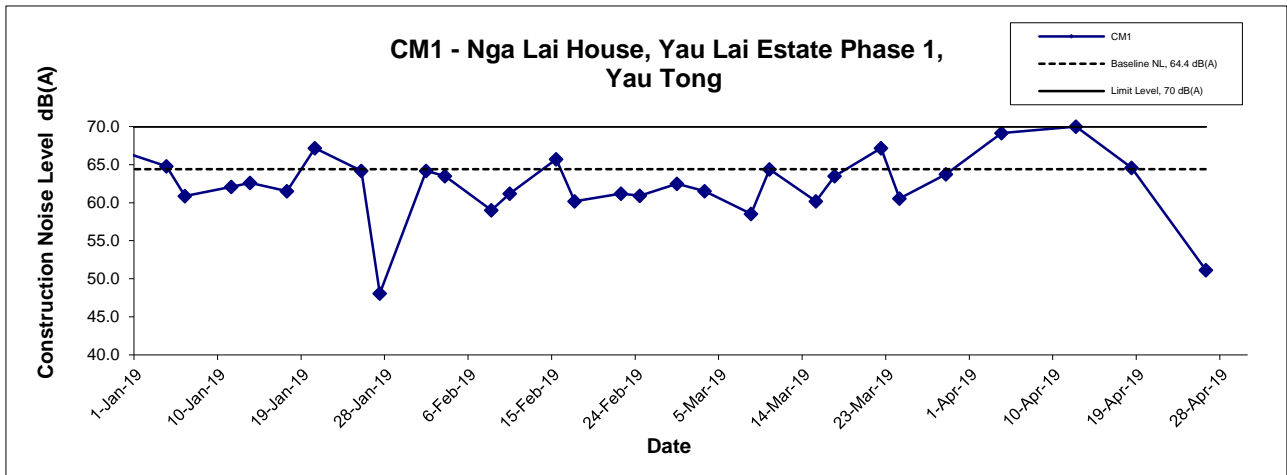
Location CM1 - Nga Lai House, Yau Lai Estate Phase 1, Yau Tong								
Date	Time	Weather	dB (A) (5-min)				Baseline Level L _{eq}	Construction Noise Level L _{eq}
			L _{eq}	L ₁₀	L ₉₀	Average L _{eq}		
4-Apr-19	23:00	Sunny	65.2	67.1	62.9	65.3	63.7	60
	23:05		65.4	67.2	62.8			
	23:10		65.3	67.2	63.0			
12-Apr-19	23:31	Rainy	70.7	72.0	67.8	69.6	62.8	69
	23:36		68.3	70.8	67.1			
	23:41		69.5	71.1	67.3			
18-Apr-19	23:00	Cloudy	64.5	66.3	60.7	64.4	63.7	56
	23:05		64.4	66.0	60.2			
	23:10		64.4	65.9	60.4			
26-Apr-19	23:35	Sunny	65.2	66.7	61.7	64.6	62.8	60
	23:40		64.3	66.4	61.5			
	23:45		64.2	66.7	60.2			

Location CM2 - Bik Lai House, Yau Lai Estate Phase 1, Yau Tong								
Date	Time	Weather	dB (A) (5-min)				Baseline Level L _{eq}	Construction Noise Level L _{eq}
			L _{eq}	L ₁₀	L ₉₀	Average L _{eq}		
4-Apr-19	23:20	Sunny	61.7	63.5	59.7	61.4	61.2	48
	23:25		61.2	63.4	59.8			
	23:30		61.4	63.2	59.8			
12-Apr-19	23:00	Rainy	68.5	69.7	66.3	68.5	61.6	68
	23:05		68.4	70.1	66.4			
	23:10		68.5	70.0	66.3			
18-Apr-19	23:20	Cloudy	64.4	66.4	59.9	64.2	61.2	61
	23:25		64.0	66.0	60.3			
	23:30		64.3	66.1	60.3			
26-Apr-19	23:58	Sunny	62.2	63.7	60.2	61.8	60.8	55
	0:03		61.9	63.5	59.8			
	0:08		61.4	63.0	60.0			

Location CM3 - Block S, Yau Lai Estate Phase 5, Yau Tong								
Date	Time	Weather	dB (A) (5-min)				Baseline Level L _{eq}	Construction Noise Level L _{eq}
			L _{eq}	L ₁₀	L ₉₀	Average L _{eq}		
4-Apr-19	23:40	Sunny	63.8	65.9	61.2	63.8	62.9	57
	23:45		63.7	65.7	61.3			
	23:50		63.9	65.8	61.5			
12-Apr-19	0:00	Rainy	63.1	64.5	61.1	63.6	61.8	59
	0:10		63.9	65.2	61.1			
	0:15		63.7	65.4	61.5			
18-Apr-19	23:50	Cloudy	63.9	65.9	60.1	63.7	62.4	58
	23:55		63.7	66.0	60.3			
	0:00		63.6	65.8	60.3			
26-Apr-19	23:05	Sunny	63.8	65.1	60.5	62.8	64.0	63 Measured ≤ Baseline
	23:10		62.5	63.8	60.5			
	23:15		62.0	63.5	60.1			

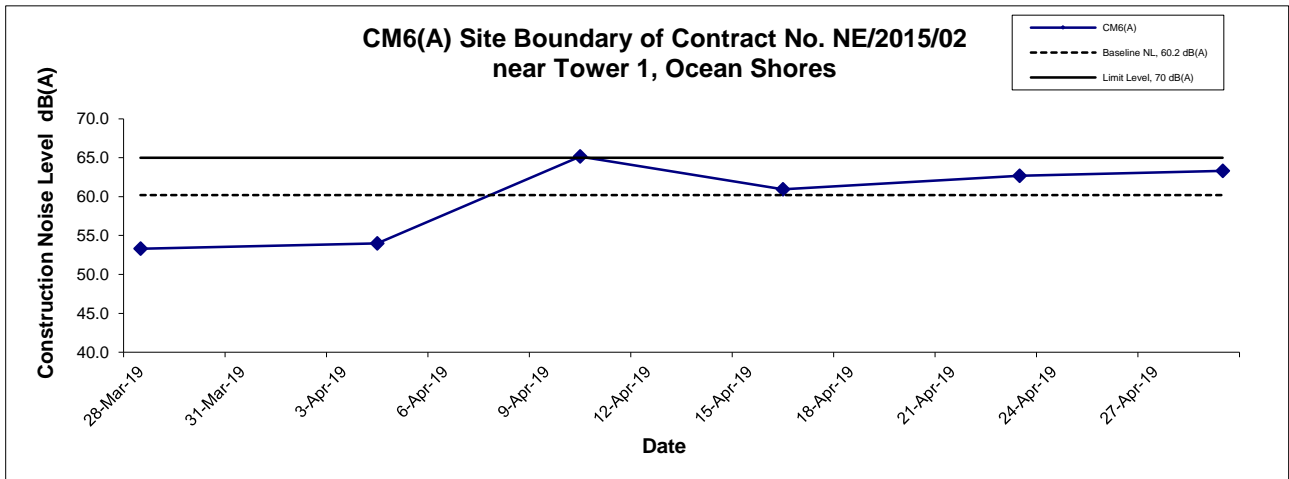
Remark: The exceedances of night time noise limit level (55dB(A)) were not due to the Project but the road traffic near Eastern Harbour Crossing tunnel.

Noise Levels
(Restricted Hours - 07:00 - 23:00 holidays & 19:00 - 23:00 on all other days)



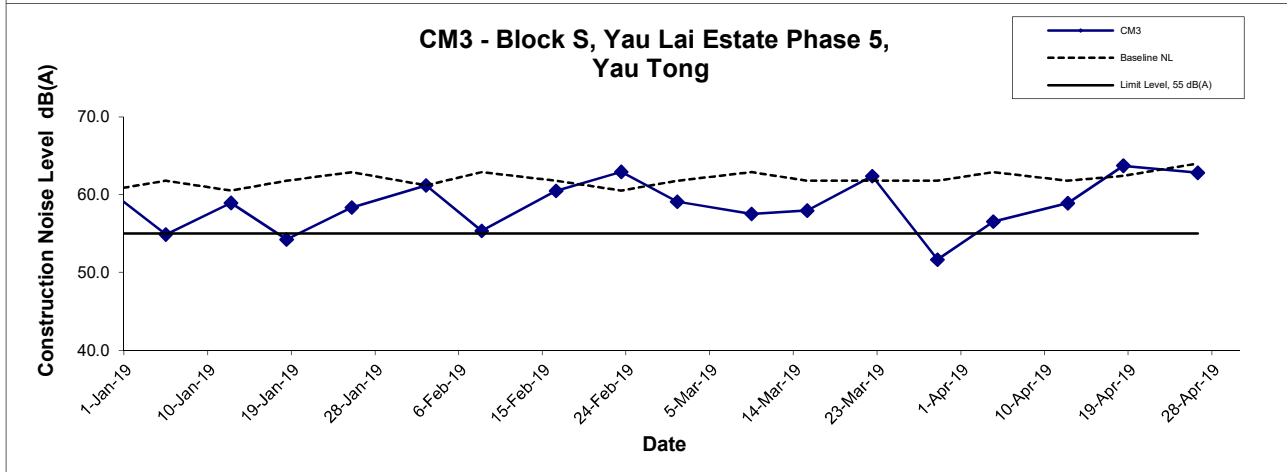
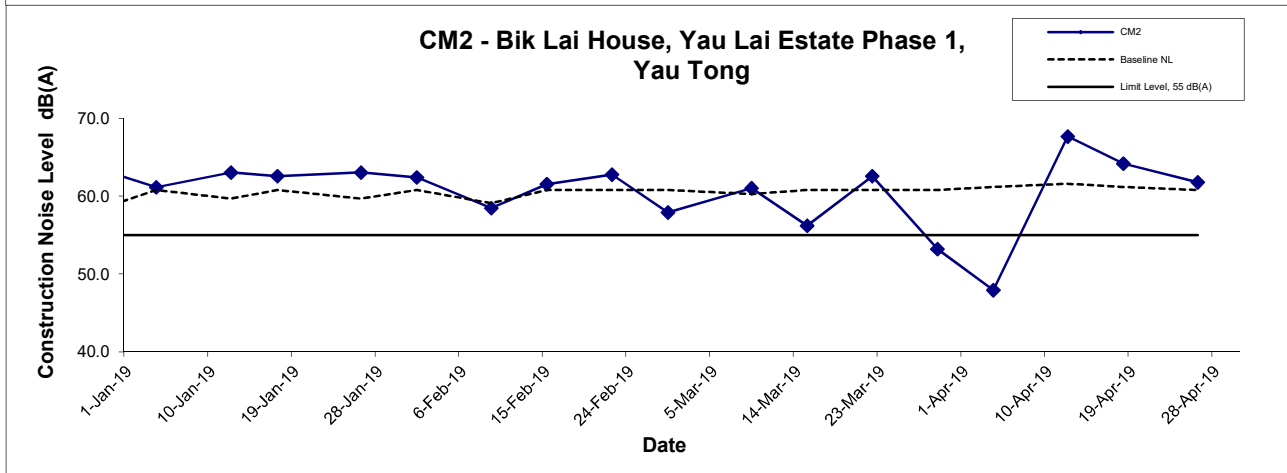
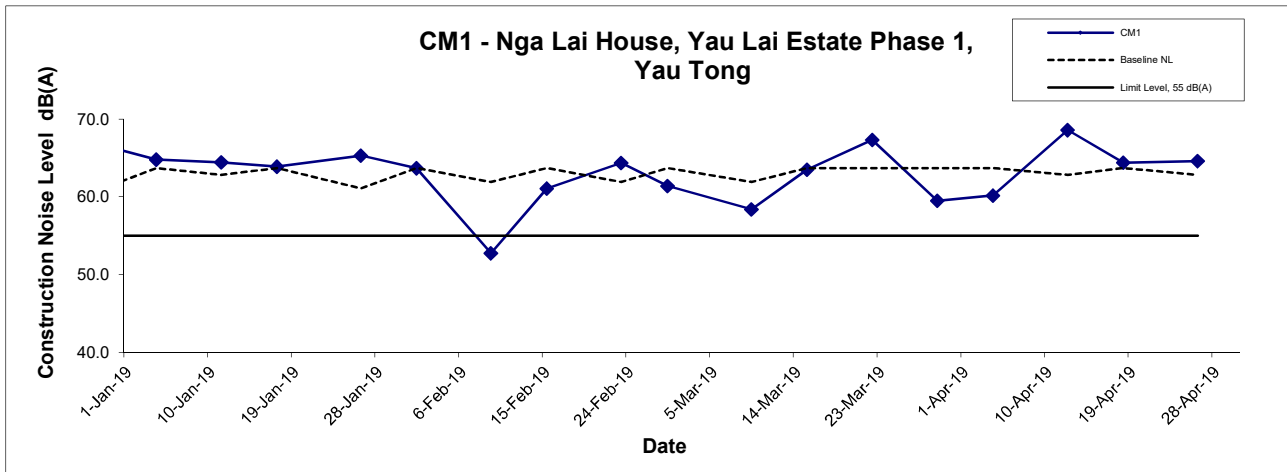
Title Agreement No. CE/59/2015 (EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Graphical Presentation of Restricted Noise Monitoring Results	Scale N.T.S	Project No. MA16034	CINOTECH
	Date Apr 19	Appendix G	

Noise Levels
(Restricted Hours - 07:00 - 23:00 holidays & 19:00 - 23:00 on all other days)



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	
	Date Apr 19	Appendix G	

Noise Levels (Restricted Hours - 2300-0700 on all days)



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	Apr 19	Appendix	G	

**APPENDIX H
GROUNDWATER QUALITY
MONITORING RESULTS AND
GRAPHICAL PRESENTATIONS**

Agreement No. CE/59/2015 (EP)**Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction****Groundwater Quality Monitoring Results at Stream 1**

Date	Weather Condition	Sampling Time	Depth (m)	Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)		Turbidity(NTU)	
				Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average
10-Apr-19	Fine	13:00	Surface	26.4	26.4	8.0	8.0	1.1	1.1	100.9	100.9	8.5	8.5	1.9	1.8
				26.4		8.0		1.1		100.9		8.5		1.8	
15-Apr-19	Fine	14:30	Surface	24.7	24.7	7.7	7.7	1.1	1.1	100.9	101.0	8.7	8.7	0.9	0.9
				24.8		7.8		1.1		101.0		8.7		0.9	

Groundwater Quality Monitoring Results at Stream 2

Date	Weather Condition	Sampling Time	Depth (m)	Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)		Turbidity(NTU)	
				Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average
10-Apr-19	Fine	13:30	Surface	25.5	25.6	8.0	8.0	0.2	0.2	98.6	97.0	7.8	7.8	1.5	1.5
				25.6		8.0		0.2		95.4		7.8		1.5	
15-Apr-19	Fine	14:45	Surface	23.7	23.7	8.1	8.1	0.2	0.2	99.5	99.7	7.9	8.0	0.8	0.8
				23.7		8.2		0.2		99.9		8.0		0.8	

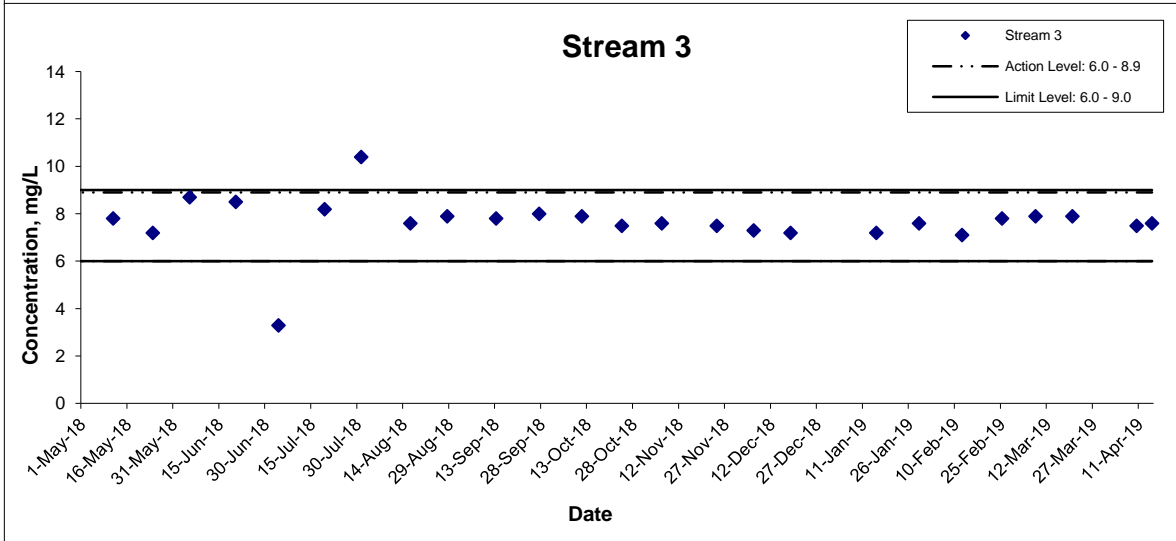
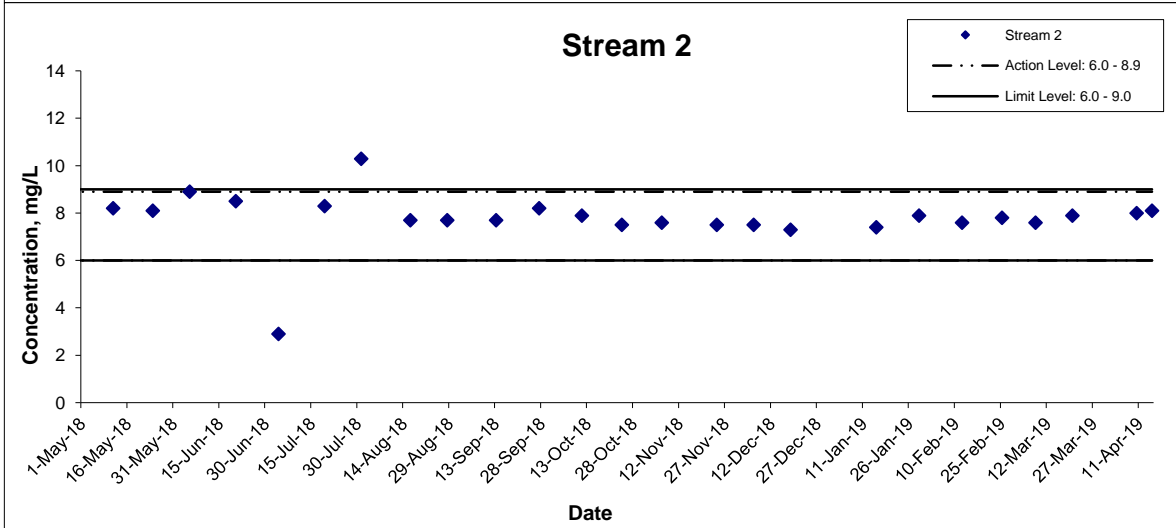
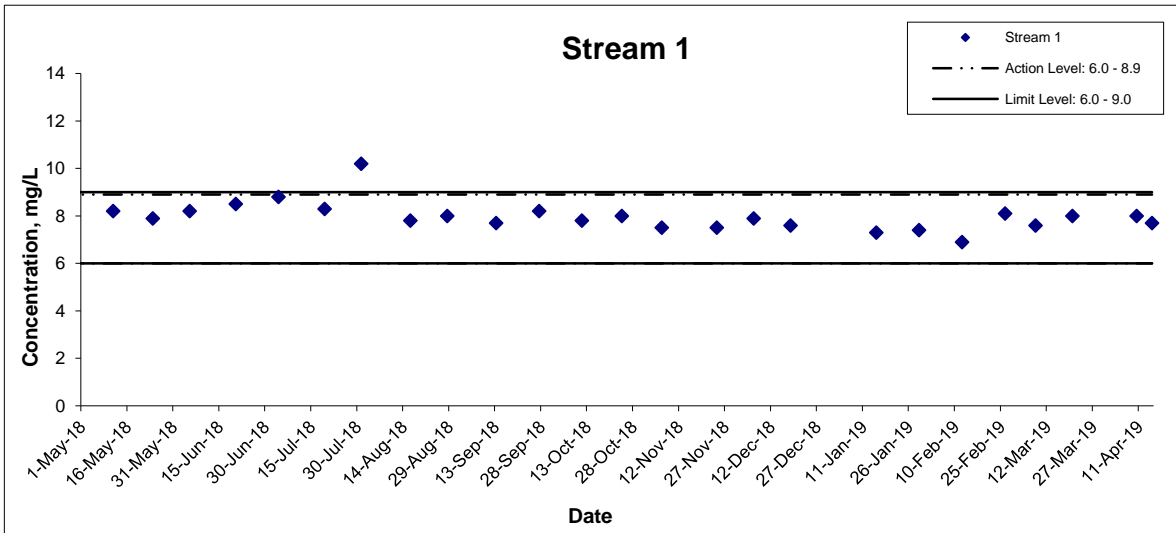
Groundwater Quality Monitoring Results at Stream 3

Date	Weather Condition	Sampling Time	Depth (m)	Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)		Turbidity(NTU)	
				Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average
10-Apr-19	Fine	13:40	Surface	26.7	26.7	7.5	7.5	0.1	0.1	93.1	93.2	7.6	7.7	0.7	0.7
				26.7		7.5		0.1		93.3		7.7		0.6	
15-Apr-19	Fine	14:55	Surface	24.3	24.4	7.6	7.6	0.1	0.1	100.9	101.7	8.1	8.4	0.5	0.5
				24.4		7.6		0.1		102.5		8.7		0.5	

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

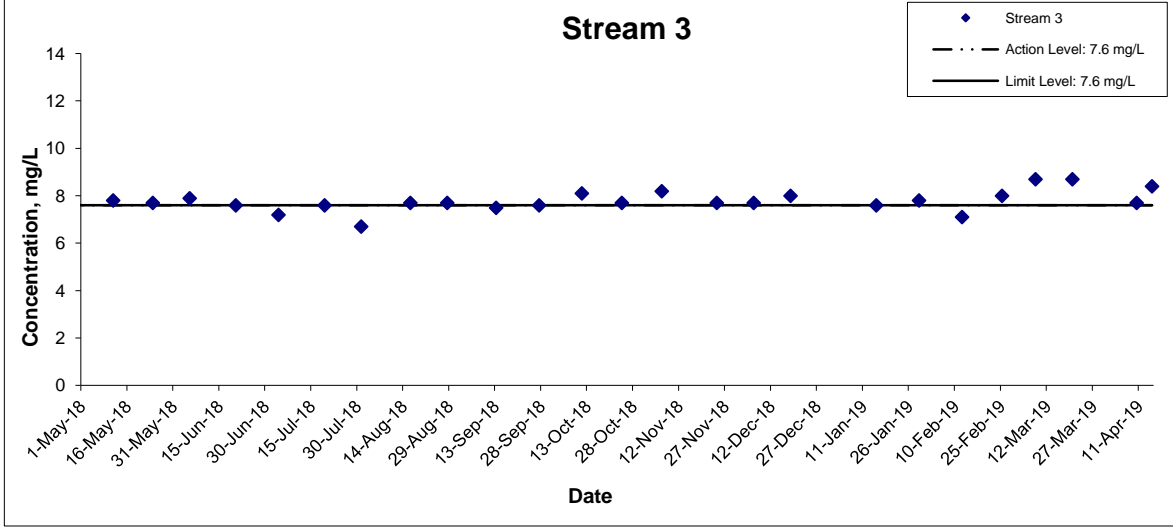
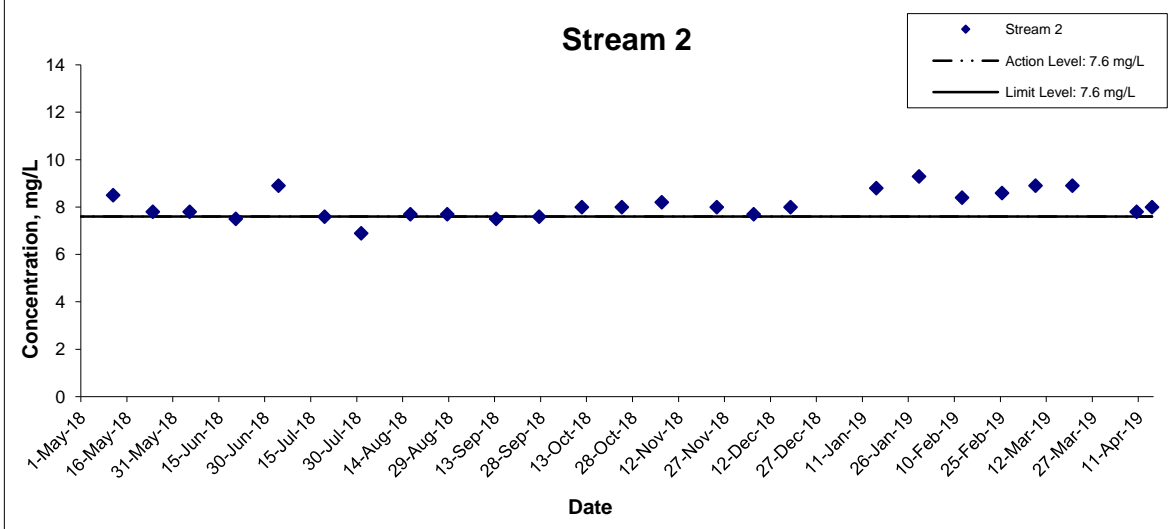
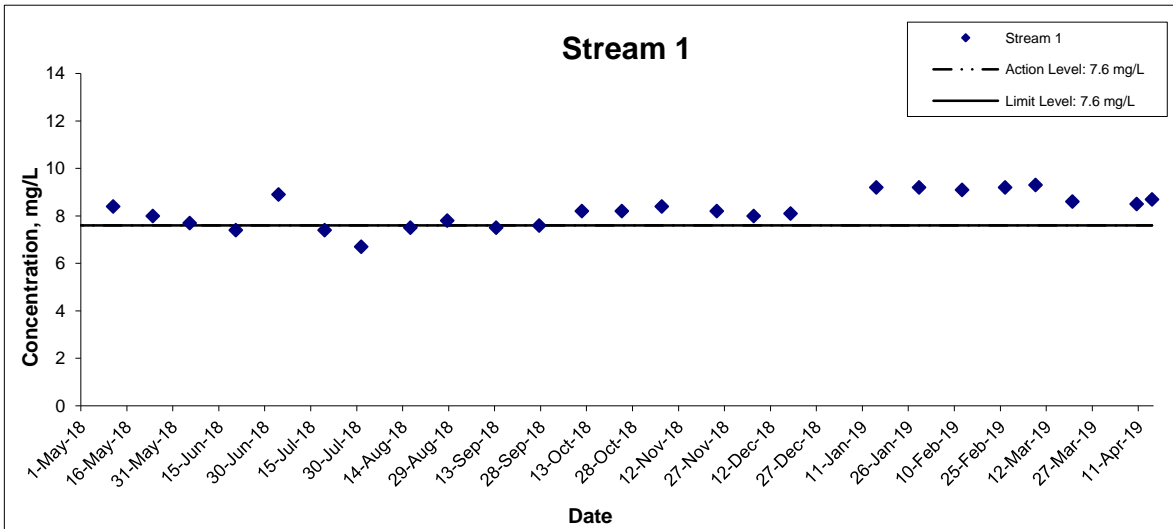
Date	Location	Parameters (unit)								
		pH	Dissolved Oxygen (mg/L)	Turbidity (NTU)	SS (mg/L)	BOD ₅ (mg O ₂ /L)	TOC (mg-TOC/L)	Total Nitrogen (mg/L)	NH ₃ -N (mg NH ₃ -N/L)	Total Phosphorus (mg-P/L)
10 Apr 2019	Stream 1	8.0	8.5	1.8	<2	2	4	1.0	0.04	0.03
	Stream 2	8.0	7.8	1.5	2	<2	3	1	0.05	0.02
	Stream 3	7.5	7.7	0.7	<2	<2	2	1.4	0.01	0.01
15 Apr 2019	Stream 1	7.7	8.7	0.9	<2	<2	5	1	0.04	0.03
	Stream 2	8.1	8.0	0.8	<2	<2	5	1	0.03	0.03
	Stream 3	7.6	8.4	0.5	<2	<2	5	1	0.04	0.03

pH



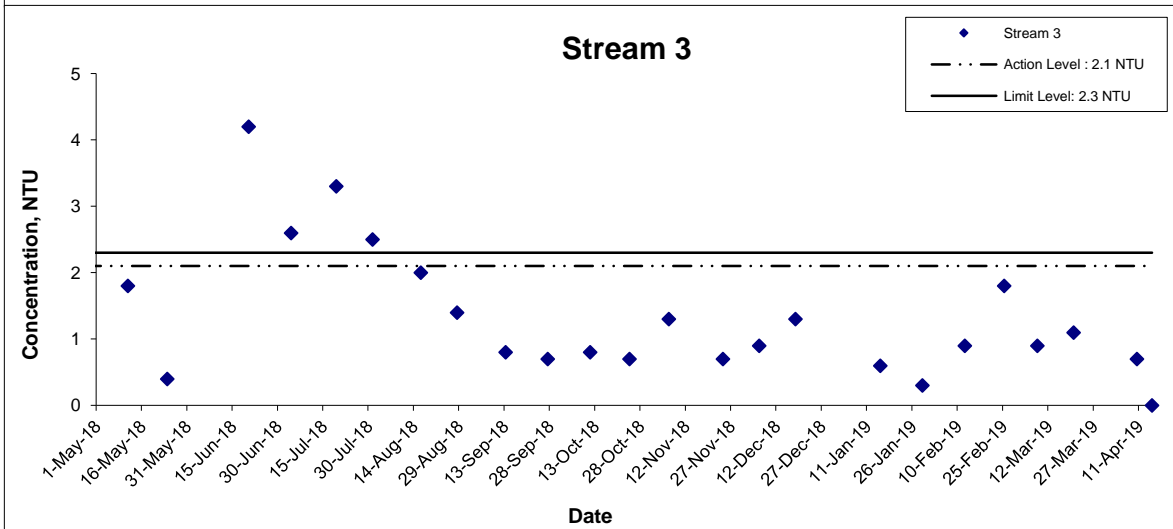
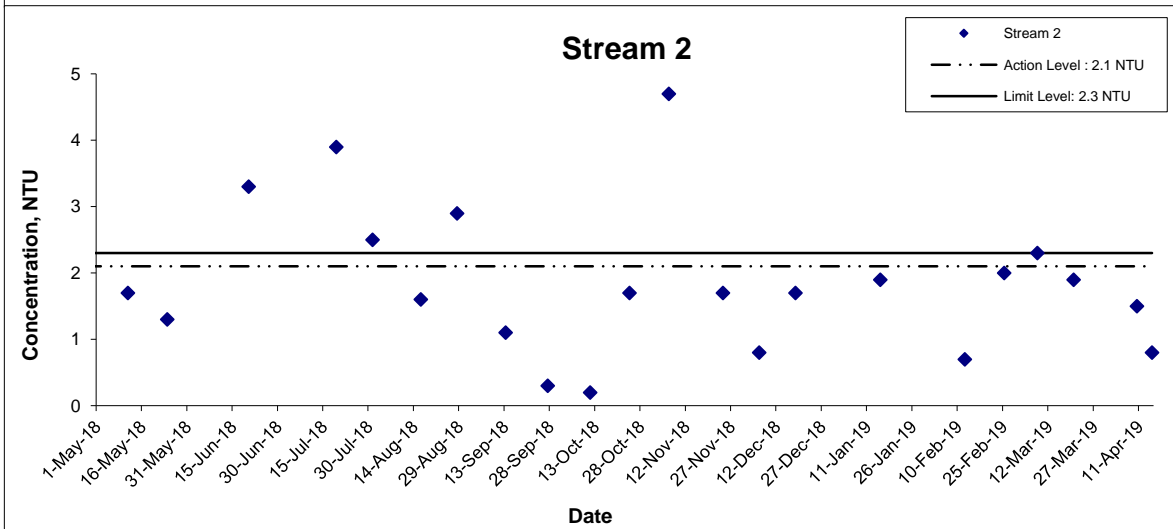
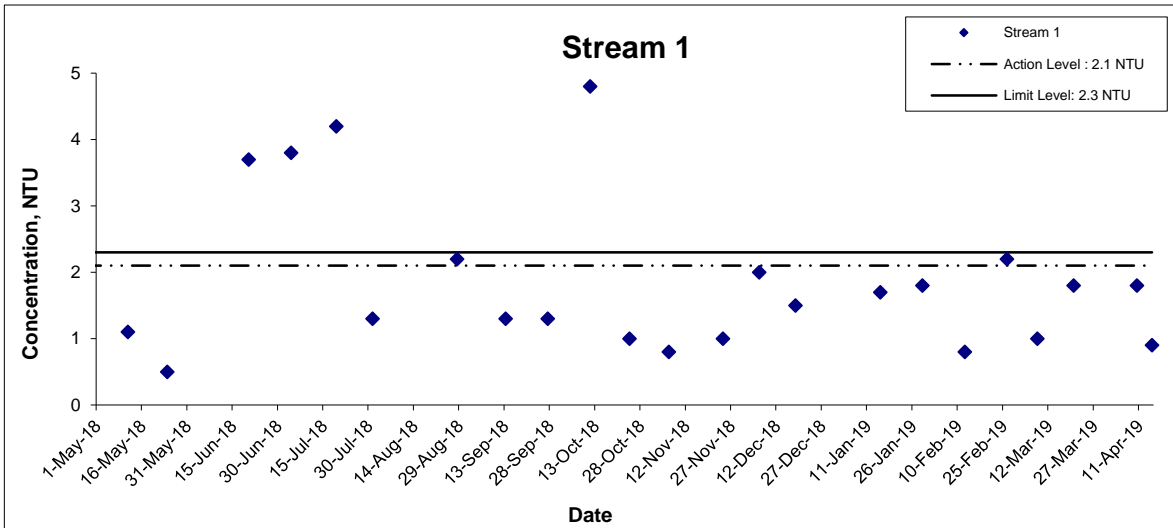
Title Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction Graphical Presentation of Groundwater Quality Monitoring Result	Scale N.T.S	Project No. MA16034	
	Date Apr 19	Appendix H	

Dissolved Oxygen



Title Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction Graphical Presentation of Groundwater Quality Monitoring Result	Scale N.T.S	Project No. MA16034	
	Date Apr 19	Appendix H	

Turbidity



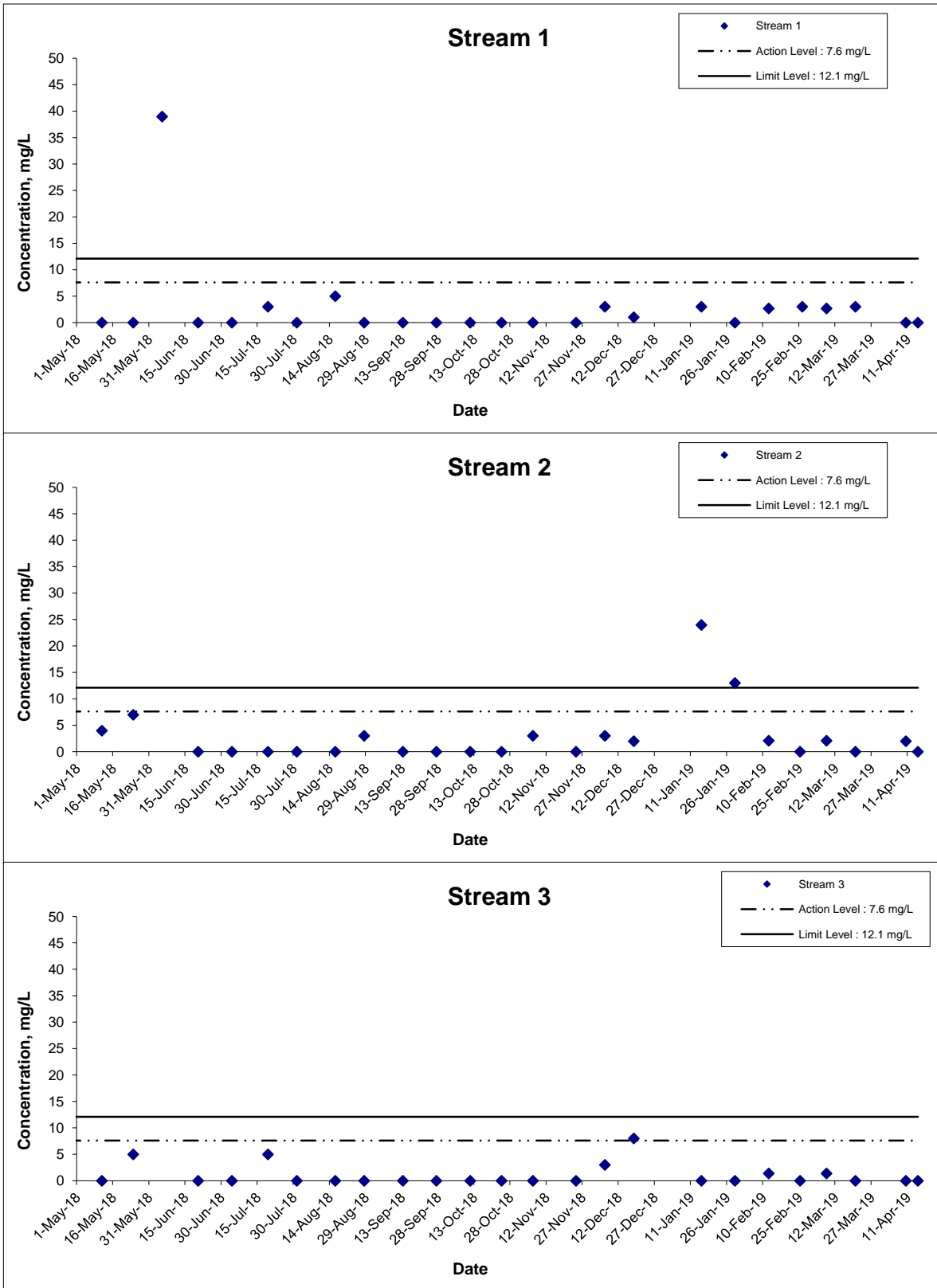
Title Agreement No. CE 59/2015(EP)
 Environmental Team for Tseung Kwan O - Lam Tin Tunnel
 Design and Construction
 Graphical Presentation of Groundwater Quality
 Monitoring Result

Scale N.T.S
 Date Apr 19

Project No. MA16034
 Appendix H



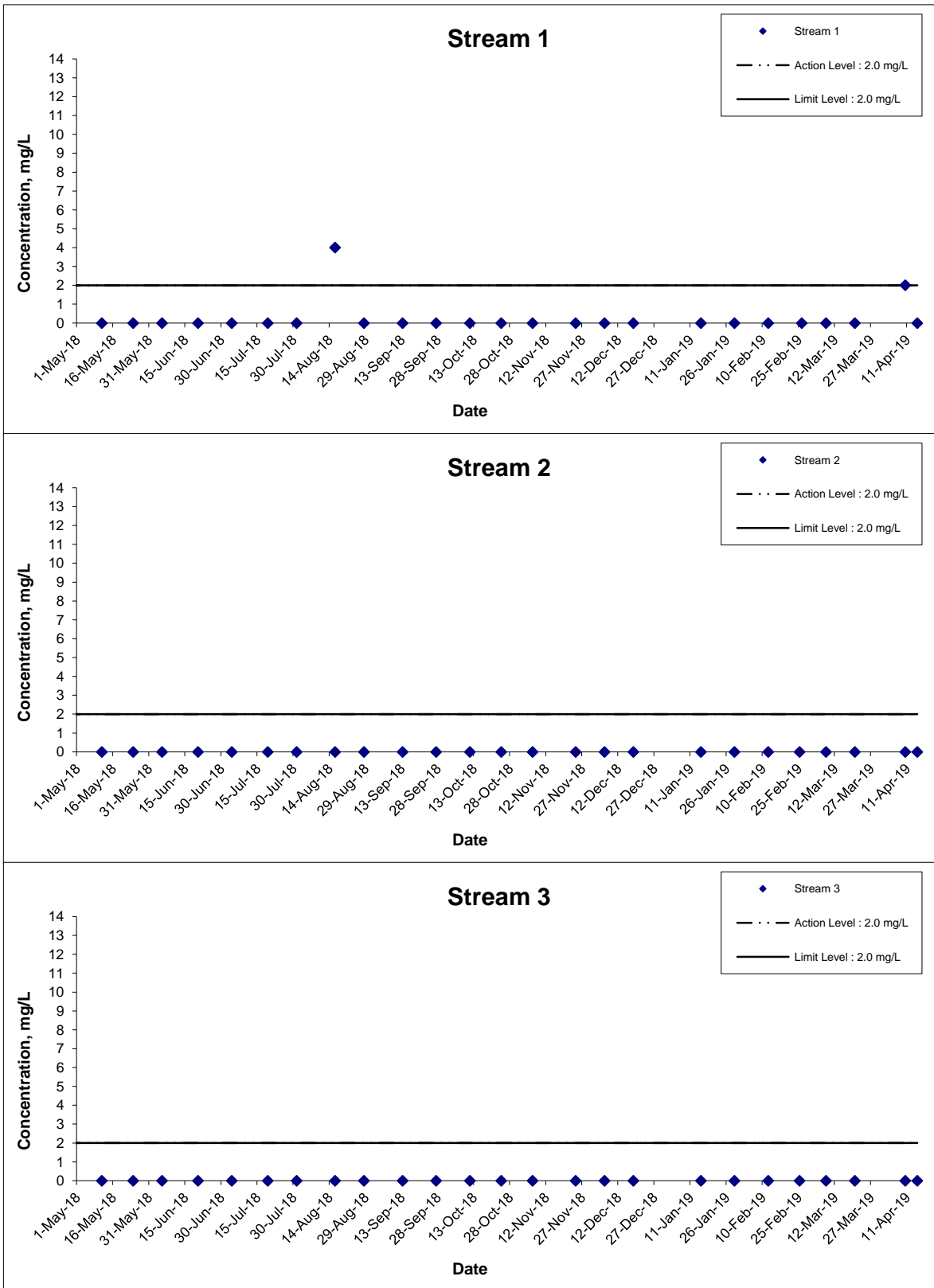
Suspended Solids



Remarks: The graphical point at zero concentration is presented as <2.5 mg/L

Title Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction Graphical Presentation of Groundwater Quality Monitoring Result	Scale N.T.S	Project No. MA16034	
	Date Apr 19	Appendix H	

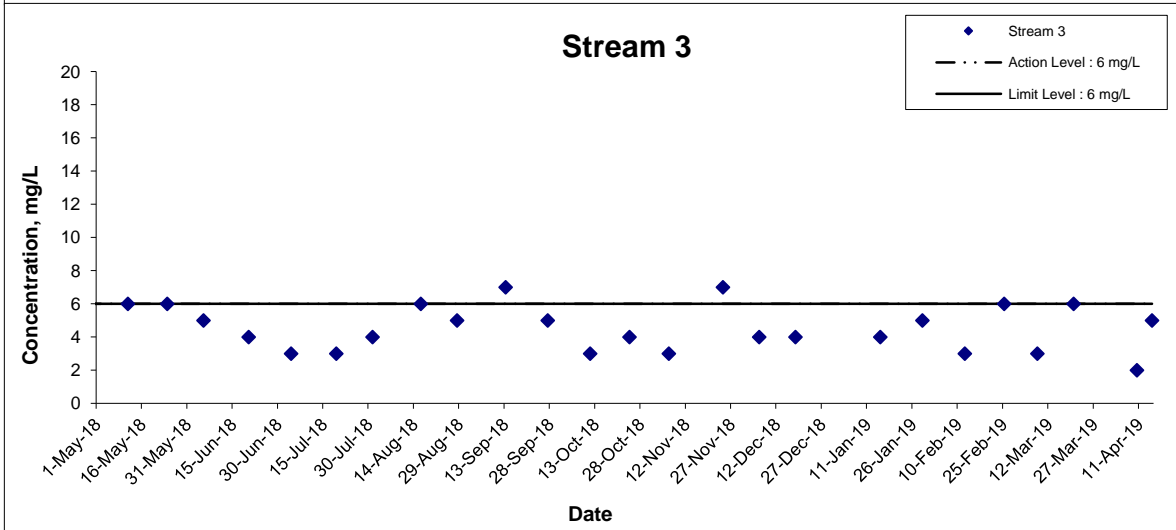
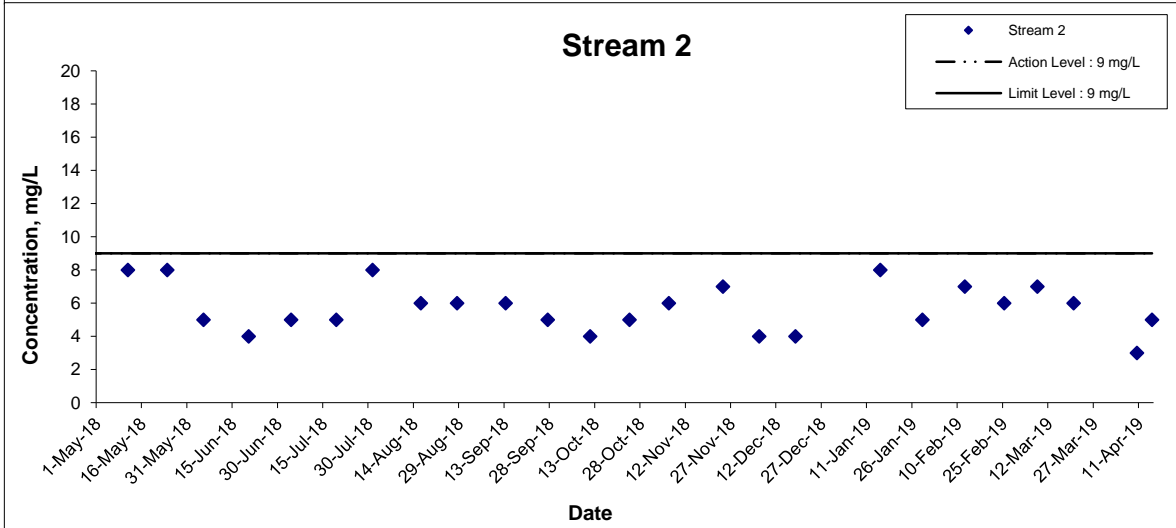
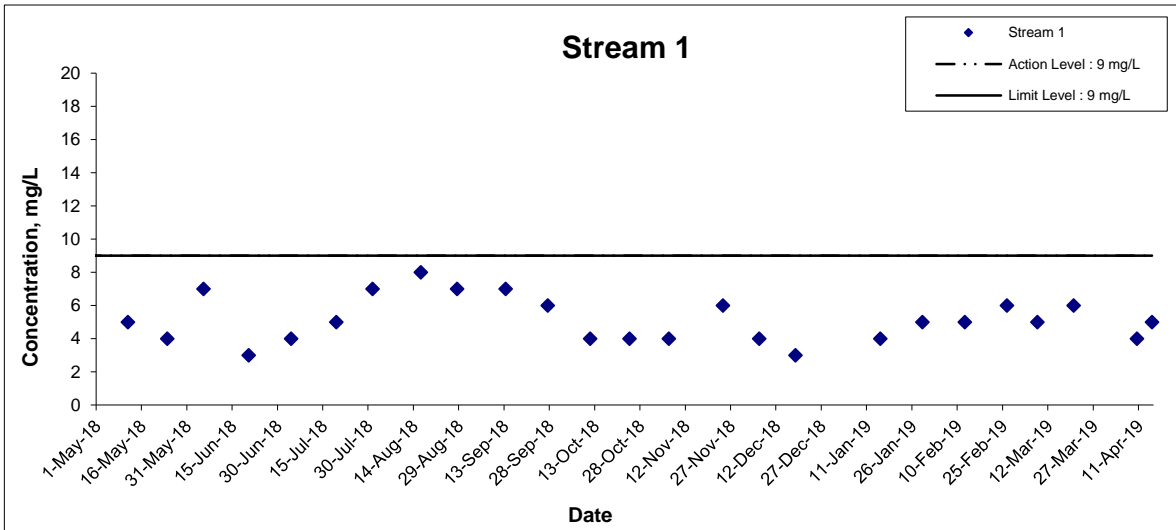
5-day Biochemical Oxygen Demand (BOD₅)



Remarks: The graphical point at zero concentration is presented as <2 mg/L

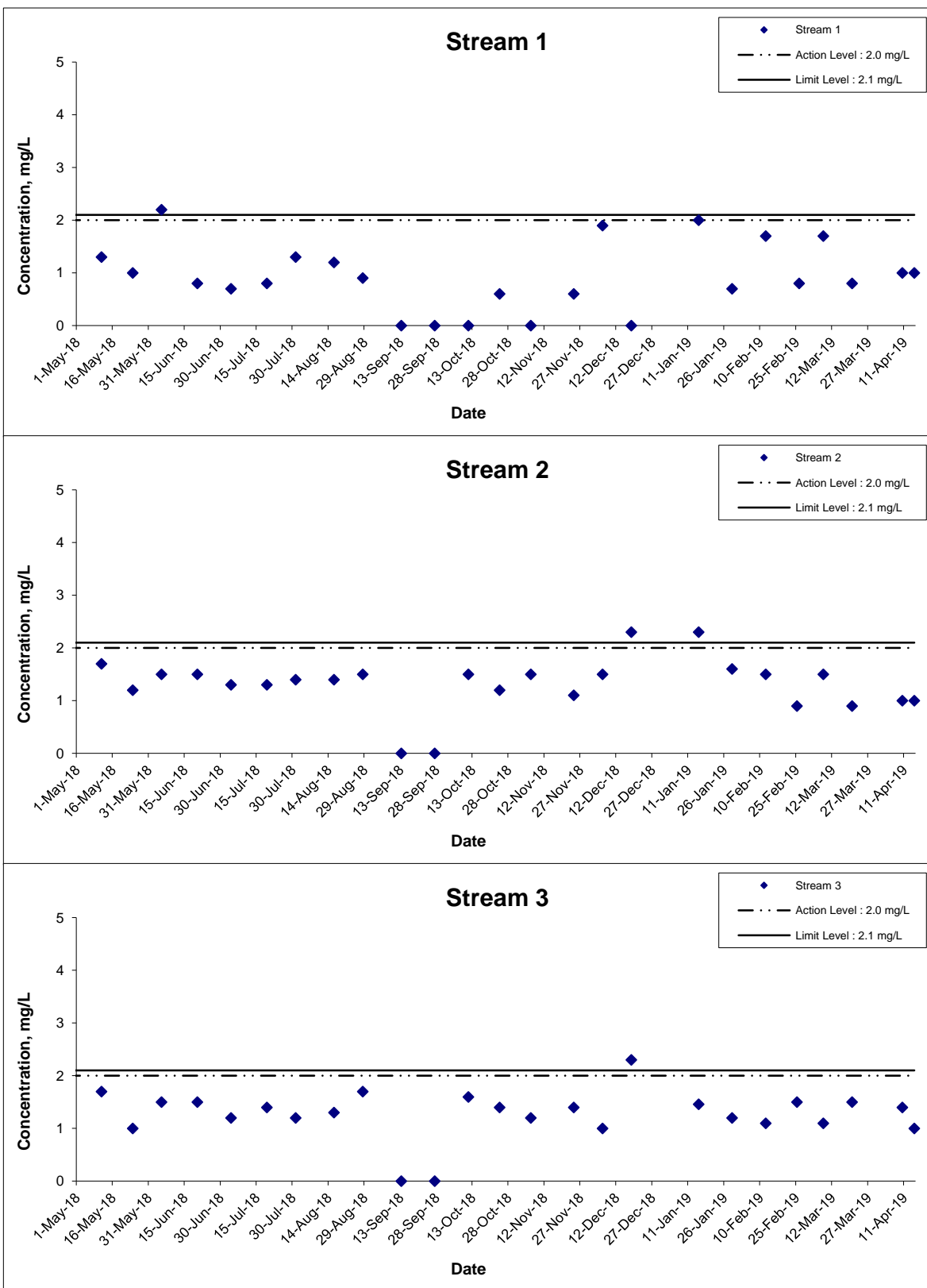
Title Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction Graphical Presentation of Groundwater Quality Monitoring Result	Scale N.T.S	Project No. MA16034	
	Date Apr 19	Appendix H	

Total Organic Carbon (TOC)



Title Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction Graphical Presentation of Groundwater Quality Monitoring Result	Scale N.T.S	Project No. MA16034	
	Date Apr 19	Appendix H	

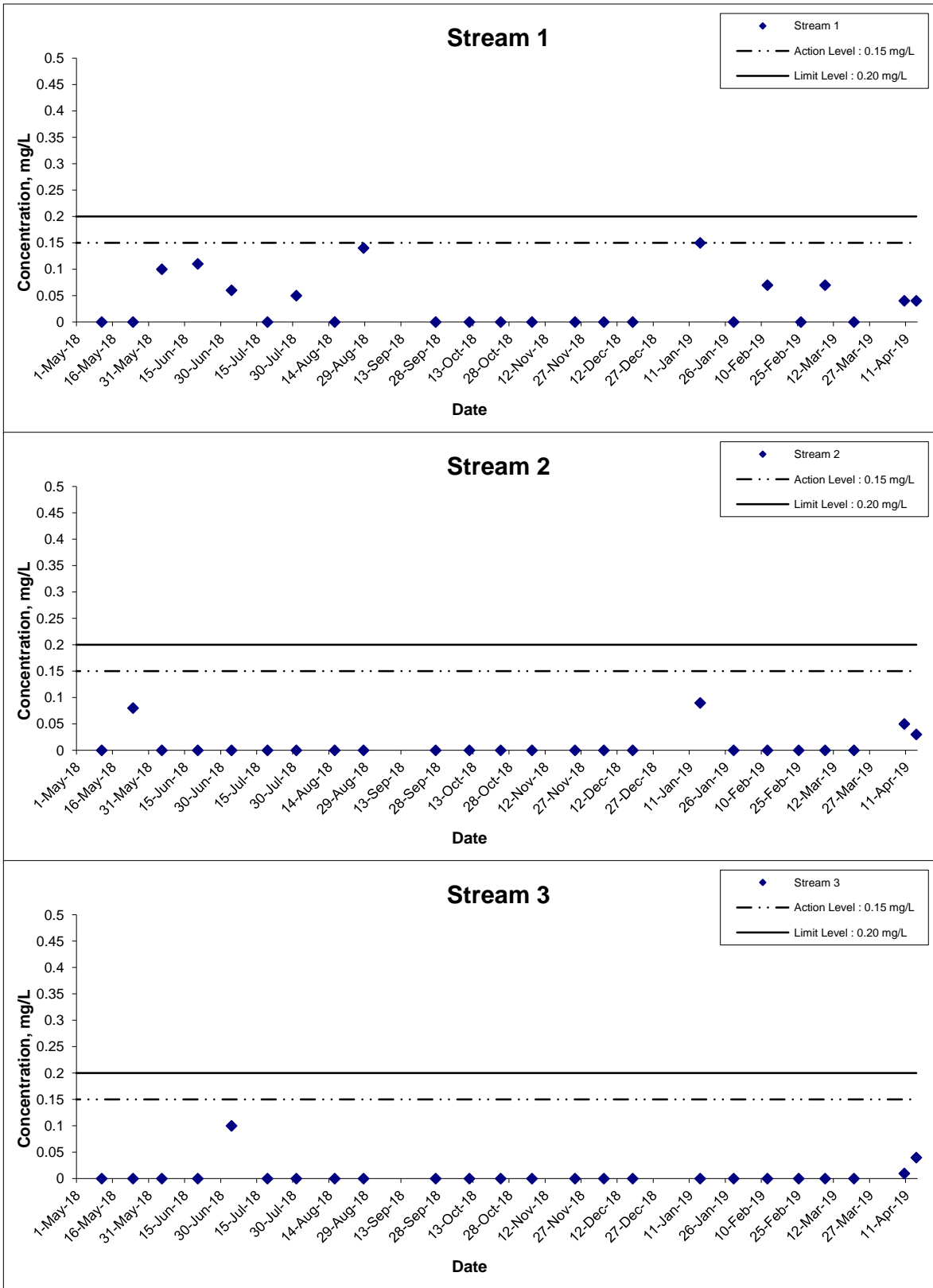
Total Nitrogen



Remarks: The graphical point at zero concentration is presented as <0.6 mg/L

Title Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction Graphical Presentation of Groundwater Quality Monitoring Result	Scale N.T.S	Project No. MA16034	
	Date Apr 19	Appendix H	

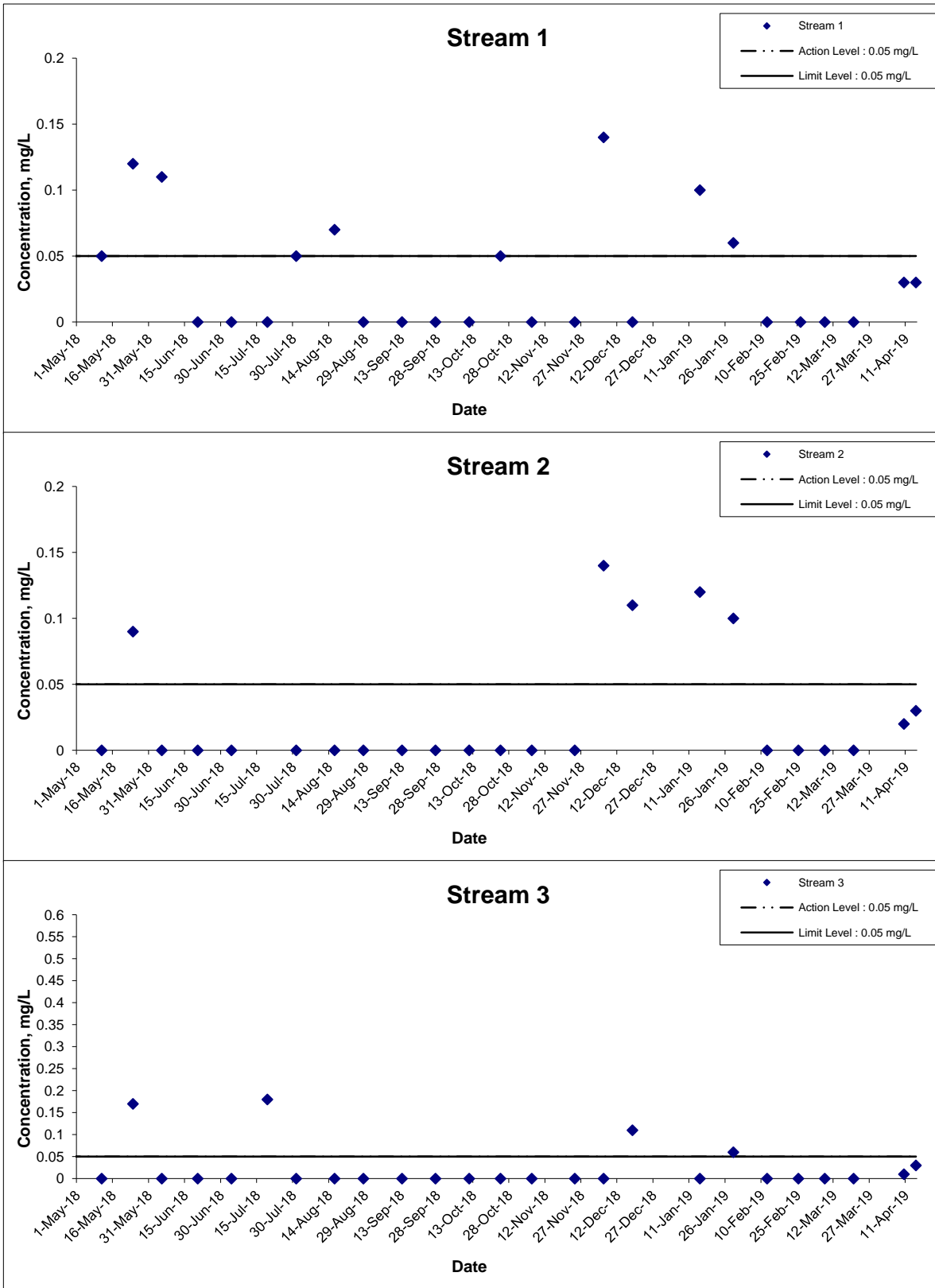
Ammonia-Nitrogen



Remarks: The graphical point at zero concentration is presented as <0.05 mg/L

Title Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction Graphical Presentation of Groundwater Quality Monitoring Result	Scale N.T.S	Project No. MA16034	
	Date Apr 19	Appendix H	

Total Phosphate



Remarks: The graphical point at zero concentration is presented as <0.05 mg/L

Title Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction Graphical Presentation of Groundwater Quality Monitoring Result	Scale N.T.S	Project No. MA16034	
	Date Apr 19	Appendix H	

**APPENDIX I
MARINE WATER QUALITY
MONITORING RESULTS AND
GRAPHICAL PRESENTATIONS**

Appendix I - Action and Limit Levels for Marine Water Quality on 1 April 2019 (Mid-Ebb Tide)

Parameter (unit)	Depth	Action Level	Limit Level
DO in mg/L (See Note 1 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Depth Average	<u>4.9 mg/L</u>	<u>4.6 mg/L</u>
	Bottom	<u>4.2 mg/L</u>	<u>3.6 mg/L</u>
	<u>Station M6</u>		
	Intake Level	<u>5.0 mg/L</u>	<u>4.7 mg/L</u>
Turbidity in NTU (See Note 2 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>19.3 NTU</u>	<u>22.2 NTU</u>
		or 120% of upstream control station's Turbidity at the same tide of the same day <u>C2: 1.6 NTU</u>	or 130% of upstream control station's Turbidity at the same tide of the same day <u>C2: 1.8 NTU</u>
	<u>Station M6</u>		
	Intake Level	<u>19.0 NTU</u>	<u>19.4 NTU</u>
SS in mg/L (See Note 2 and 4)	<u>Stations G1-G4</u>		
	Surface	<u>6.0 mg/L</u>	<u>6.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>C2: 4.0 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>C2: 4.4 mg/L</u>
	<u>Stations M1-M5</u>		
	Surface	<u>6.2 mg/L</u>	<u>7.4 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>C2: 4.0 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>C2: 4.4 mg/L</u>
	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>6.9 mg/L</u>	<u>7.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>C2: 9.8 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>C2: 10.7 mg/L</u>
	<u>Station M6</u>		
Intake Level	<u>8.3 mg/L</u>	<u>8.6 mg/L</u>	

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 01 April 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	10:58	Surface	1.1	22.2 22.2	22.2	8.4 8.4	8.4	35.5 35.5	35.5	99.0 98.6	98.8	7.0 7.0	7.0	7.0	7.0	1.1 1.3	1.2	1.6	5.5 5.5	5.5	7.3
				Middle	9.0	22.2 22.2	22.2	8.4 8.4	8.4	35.5 35.5	35.5	98.2 98.3	98.3	7.0 7.0	7.0	1.1 1.0		1.0	8.2 8.1		8.2		
				Bottom	17.1	22.1 22.1	22.1	8.4 8.4	8.4	35.5 35.5	35.5	97.4 96.7	97.1	6.9 6.9	6.9	2.4 2.9		2.6	8.0 8.3		8.2		
C2	Cloudy	Moderate	10:04	Surface	1.0	22.2 22.2	22.2	8.3 8.3	8.3	35.4 35.4	35.4	95.4 95.3	95.4	6.8 6.8	6.8	6.7	1.3 1.5	1.4	1.4	3.4 3.3	3.4	5.2	
				Middle	15.9	22.2 22.2	22.2	8.3 8.3	8.3	35.4 35.4	35.4	94.7 94.7	94.7	6.7 6.7	6.7		1.4 1.4	1.4		4.1 4.2	4.2		
				Bottom	32.1	22.2 22.2	22.2	8.3 8.3	8.3	35.4 35.4	35.4	94.7 94.7	94.7	6.7 6.7	6.7		1.4 1.3	1.4		8.2 8.2	8.2		
G1	Cloudy	Moderate	10:30	Surface	1.0	22.0 22.1	22.1	8.3 8.3	8.3	35.2 35.2	35.2	96.1 94.0	95.1	6.9 6.7	6.8	6.8	1.7 1.6	1.6	1.6	8.2 8.5	8.4	5.2	
				Middle	4.0	22.1 22.1	22.1	8.3 8.3	8.3	35.4 35.4	35.4	94.9 94.7	94.8	6.7 6.7	6.7		1.7 1.5	1.6		4.0 3.9	4.0		
				Bottom	7.0	22.2 22.2	22.2	8.3 8.3	8.3	35.5 35.5	35.5	95.6 95.4	95.5	6.8 6.8	6.8		1.8 1.5	1.7		3.4 3.4	3.4		
G2	Cloudy	Moderate	10:21	Surface	1.0	22.1 22.1	22.1	8.3 8.3	8.3	35.4 35.4	35.4	97.5 96.2	96.9	6.9 6.8	6.9	6.9	1.0 0.8	0.9	0.9	7.9 8.1	8.0	9.3	
				Middle	5.0	22.1 22.1	22.1	8.3 8.3	8.3	35.4 35.4	35.4	96.5 96.0	96.3	6.8 6.8	6.8		0.8 0.7	0.7		8.6 8.7	8.7		
				Bottom	9.0	22.2 22.2	22.2	8.3 8.3	8.3	35.5 35.5	35.5	96.0 95.8	95.9	6.8 6.8	6.8		1.3 1.1	1.2		11.1 11.1	11.1		
G3	Cloudy	Moderate	10:34	Surface	1.0	22.1 22.1	22.1	8.3 8.3	8.3	35.1 34.8	35.0	92.0 91.9	92.0	6.5 6.6	6.5	6.6	3.2 3.6	3.4	2.6	5.4 5.6	5.5	7.3	
				Middle	4.0	22.2 22.2	22.2	8.3 8.3	8.3	35.3 35.3	35.3	92.7 92.5	92.6	6.6 6.6	6.6		2.7 2.6	2.7		5.9 5.9	5.9		
				Bottom	7.0	22.2 22.1	22.2	8.3 8.3	8.3	35.4 35.4	35.4	93.7 93.4	93.6	6.7 6.6	6.6		1.9 1.8	1.8		10.6 10.5	10.6		
G4	Cloudy	Moderate	10:45	Surface	1.1	22.1 22.1	22.1	8.3 8.3	8.3	35.4 35.4	35.4	94.4 93.1	93.8	6.7 6.6	6.7	6.6	1.9 2.0	1.9	2.1	6.8 6.9	6.9	9.1	
				Middle	4.0	22.1 22.1	22.1	8.3 8.3	8.3	35.4 35.4	35.4	93.1 93.2	93.2	6.6 6.6	6.6		2.4 2.0	2.2		6.1 6.0	6.1		
				Bottom	7.0	22.2 22.2	22.2	8.3 8.3	8.3	35.5 35.5	35.5	95.5 94.9	95.1	6.8 6.7	6.7		2.3 2.3	2.3		14.4 14.4	14.4		
M1	Cloudy	Moderate	10:26	Surface	1.0	22.1 22.1	22.1	8.3 8.3	8.3	35.4 35.4	35.4	96.4 93.9	95.2	6.9 6.7	6.8	6.7	1.8 1.9	1.9	1.9	6.4 6.5	6.5	8.1	
				Middle	3.0	22.2 22.2	22.2	8.3 8.3	8.3	35.4 35.4	35.4	94.6 93.9	94.3	6.7 6.7	6.7		1.8 1.8	1.8		4.8 4.7	4.8		
				Bottom	5.0	22.2 22.2	22.2	8.3 8.3	8.3	35.5 35.4	35.4	94.7 94.4	94.6	6.7 6.7	6.7		1.9 1.8	1.9		13.1 13.0	13.1		
M2	Cloudy	Moderate	10:17	Surface	1.1	22.1 22.1	22.1	8.3 8.3	8.3	35.4 35.4	35.4	97.4 96.5	97.0	6.9 6.9	6.9	6.9	0.8 0.9	0.9	1.1	4.6 4.6	4.6	4.8	
				Middle	6.1	22.1 22.2	22.1	8.3 8.3	8.3	35.4 35.5	35.5	97.1 96.6	96.9	6.9 6.9	6.9		1.0 1.2	1.1		5.8 5.9	5.9		
				Bottom	11.0	22.2 22.2	22.2	8.3 8.3	8.3	35.5 35.5	35.5	96.6 96.4	96.5	6.9 6.8	6.8		1.5 1.5	1.5		3.8 3.8	3.8		
M3	Cloudy	Moderate	10:41	Surface	1.1	22.2 22.1	22.1	8.3 8.3	8.3	35.2 35.2	35.2	92.7 92.0	92.4	6.6 6.5	6.6	6.6	2.4 2.6	2.5	2.4	5.4 5.2	5.3	6.9	
				Middle	4.0	22.1 22.1	22.1	8.3 8.3	8.3	35.3 35.3	35.3	92.7 92.5	92.6	6.6 6.6	6.6		2.4 2.6	2.5		9.9 10.0	10.0		
				Bottom	7.0	22.1 22.1	22.1	8.3 8.3	8.3	35.4 35.3	35.3	92.9 92.6	92.8	6.6 6.6	6.6		2.2 2.5	2.3		5.5 5.3	5.4		
M4	Cloudy	Moderate	10:12	Surface	1.0	22.2 22.2	22.2	8.3 8.3	8.3	35.5 35.5	35.5	97.3 95.9	96.6	6.9 6.8	6.9	6.8	1.1 1.1	1.1	1.1	6.6 6.6	6.6	4.5	
				Middle	5.0	22.2 22.2	22.2	8.3 8.3	8.3	35.5 35.5	35.5	95.8 95.7	95.8	6.8 6.8	6.8		1.2 1.2	1.2		3.7 3.8	3.8		
				Bottom	9.0	22.2 22.2	22.2	8.3 8.3	8.3	35.5 35.5	35.5	96.4 96.3	96.4	6.8 6.8	6.8		1.0 1.2	1.1		3.0 3.0	3.0		
M5	Cloudy	Moderate	10:53	Surface	1.0	22.2 22.2	22.2	8.3 8.3	8.3	35.5 35.5	35.5	97.1 95.3	96.2	6.9 6.8	6.8	6.8	1.7 1.7	1.7	1.8	8.1 8.1	8.1	9.0	
				Middle	6.0	22.2 22.2	22.2	8.3 8.3	8.3	35.5 35.5	35.5	95.5 95.2	95.4	6.8 6.8	6.8		1.8 1.7	1.7		6.5 6.4	6.5		
				Bottom	11.0	22.2 22.2	22.2	8.3 8.3	8.3	35.5 35.5	35.5	95.8 95.5	95.7	6.8 6.8	6.8		2.0 1.9	1.9		12.0 12.6	12.3		
M6	Cloudy	Moderate	10:49	Surface	-	-	-	-	-	-	-	-	-	-	-	6.6	-	-	2.0	-	-	6.9	
				Middle	2.1	22.2 22.2	22.2	8.3 8.3	8.3	35.5 35.5	35.5	93.9 93.2	93.6	6.7 6.6	6.6		2.1 1.9	2.0		6.9 6.9	6.9		
				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 1 April 2019 (Mid-Flood Tide)

Parameter (unit)	Depth	Action Level	Limit Level
DO in mg/L (See Note 1 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Depth Average	<u>4.9 mg/L</u>	<u>4.6 mg/L</u>
	Bottom	<u>4.2 mg/L</u>	<u>3.6 mg/L</u>
	<u>Station M6</u>		
	Intake Level	<u>5.0 mg/L</u>	<u>4.7 mg/L</u>
Turbidity in NTU (See Note 2 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>19.3 NTU</u>	<u>22.2 NTU</u>
		or 120% of upstream control station's Turbidity at the same tide of the same day <u>CI: 3.0 NTU</u>	or 130% of upstream control station's Turbidity at the same tide of the same day <u>CI: 3.3 NTU</u>
	<u>Station M6</u>		
	Intake Level	<u>19.0 NTU</u>	<u>19.4 NTU</u>
SS in mg/L (See Note 2 and 4)	<u>Stations G1-G4</u>		
	Surface	<u>6.0 mg/L</u>	<u>6.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>CI: 11.3 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>CI: 12.3 mg/L</u>
	<u>Stations M1-M5</u>		
	Surface	<u>6.2 mg/L</u>	<u>7.4 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>CI: 11.3 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>CI: 12.3 mg/L</u>
	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>6.9 mg/L</u>	<u>7.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>CI: 9.2 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>CI: 9.9 mg/L</u>
	<u>Station M6</u>		
Intake Level	<u>8.3 mg/L</u>	<u>8.6 mg/L</u>	

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 01 April 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	15:26	Surface	1.1	22.1 22.2	22.1	8.4 8.4	8.4	35.5 35.5	35.5	98.7 98.2	98.5	7.0 7.0	7.0	7.0	7.0	1.2	1.0	1.0	9.5 9.4	9.5	8.6	
				Middle	9.0	22.2 22.2	22.2	8.4 8.4	8.4	35.5 35.5	35.5	97.3 97.8	97.6	6.9 6.9	6.9	6.9	6.9	6.9	1.0	0.9	1.0	8.5 8.7		8.6
				Bottom	17.0	22.2 22.2	22.2	8.4 8.4	8.4	35.5 35.5	35.5	96.7 96.6	96.7	6.9 6.9	6.9	6.9	6.9	6.9	2.4 2.7	2.5	2.5	7.6 7.7		7.7
C2	Cloudy	Moderate	14:36	Surface	1.0	22.2 22.2	22.2	8.3 8.3	8.3	35.4 35.4	35.4	96.1 94.8	95.5	6.8 6.7	6.8	6.8	6.8	1.0	0.9	1.0	6.2 6.1	6.2	12.4	
				Middle	16.0	22.2 22.2	22.2	8.3 8.3	8.3	35.5 35.5	35.5	95.3 95.2	95.3	6.8 6.8	6.8	6.8	6.8	1.1	1.1	1.1	23.5 23.1	23.3		
				Bottom	32.0	22.2 22.2	22.2	8.3 8.3	8.3	35.5 35.5	35.5	95.8 95.6	95.7	6.8 6.8	6.8	6.8	6.8	1.0	1.2	1.1	7.5 7.7	7.6		
G1	Cloudy	Moderate	15:00	Surface	1.0	22.1 22.1	22.1	8.3 8.3	8.3	35.4 35.4	35.4	95.5 94.9	95.2	6.8 6.7	6.8	6.8	6.7	1.5	1.3	1.4	15.0 15.4	15.2	10.6	
				Middle	4.0	22.1 22.1	22.1	8.3 8.3	8.3	35.4 35.4	35.4	95.0 94.7	94.9	6.8 6.7	6.7	6.7	6.7	1.5	1.4	1.4	11.9 11.8	11.9		
				Bottom	7.0	22.1 22.1	22.1	8.3 8.3	8.3	35.4 35.4	35.4	95.0 94.6	94.8	6.8 6.7	6.7	6.7	6.7	1.3	1.3	1.3	4.8 4.7	4.8		
G2	Cloudy	Moderate	14:51	Surface	1.1	22.1 22.1	22.1	8.3 8.4	8.3	35.4 35.4	35.4	97.6 96.2	96.9	6.9 6.8	6.9	6.9	6.9	0.5	0.4	0.5	7.7 7.6	7.7	7.3	
				Middle	5.0	22.1 22.1	22.1	8.4 8.4	8.4	35.4 35.4	35.4	96.5 96.2	96.4	6.9 6.8	6.8	6.8	6.8	0.8	0.8	0.8	3.0 3.0	3.0		
				Bottom	9.0	22.1 22.1	22.1	8.4 8.4	8.4	35.4 35.5	35.4	96.2 96.0	96.1	6.8 6.8	6.8	6.8	6.8	0.7	0.8	0.7	11.1 11.2	11.2		
G3	Cloudy	Moderate	15:05	Surface	1.0	22.1 22.1	22.1	8.3 8.3	8.3	35.1 35.1	35.1	94.0 94.0	94.0	6.7 6.7	6.7	6.7	6.7	1.4	1.8	1.6	9.5 10.0	9.8	10.8	
				Middle	4.0	22.1 22.1	22.1	8.3 8.3	8.3	35.2 35.3	35.3	94.2 94.2	94.2	6.7 6.7	6.7	6.7	6.7	0.9	1.2	1.0	12.7 12.6	12.7		
				Bottom	7.0	22.1 22.1	22.1	8.3 8.3	8.3	35.4 35.4	35.4	94.4 94.3	94.4	6.7 6.7	6.7	6.7	6.7	1.5	1.8	1.7	9.9 9.9	9.9		
G4	Cloudy	Moderate	15:12	Surface	1.0	22.2 22.2	22.2	8.3 8.3	8.3	35.4 35.4	35.4	93.2 93.3	93.3	6.6 6.6	6.6	6.6	6.6	1.9	1.7	1.8	6.4 6.2	6.3	6.1	
				Middle	4.0	22.2 22.2	22.2	8.3 8.3	8.3	35.4 35.4	35.4	93.5 93.7	93.6	6.6 6.7	6.6	6.6	6.6	1.8	1.6	1.7	6.2 6.2	6.2		
				Bottom	7.0	22.2 22.2	22.2	8.3 8.3	8.3	35.5 35.5	35.5	95.2 94.7	95.0	6.8 6.7	6.7	6.7	6.7	2.0	1.8	1.9	5.8 6.0	5.9		
M1	Cloudy	Moderate	14:56	Surface	1.0	22.1 22.2	22.1	8.3 8.3	8.3	35.4 35.4	35.4	96.4 94.4	95.4	6.9 6.7	6.8	6.8	6.7	1.8	1.9	1.9	10.6 10.4	10.5	11.8	
				Middle	3.0	22.1 22.2	22.1	8.3 8.3	8.3	35.4 35.4	35.4	94.8 94.3	94.6	6.7 6.7	6.7	6.7	6.7	1.2	1.4	1.3	13.5 13.6	13.6		
				Bottom	5.0	22.1 22.1	22.1	8.3 8.3	8.3	35.4 35.4	35.4	94.3 94.2	94.3	6.7 6.7	6.7	6.7	6.7	0.7	0.9	0.8	11.2 11.2	11.2		
M2	Cloudy	Moderate	14:47	Surface	1.0	22.1 22.1	22.1	8.3 8.4	8.3	35.4 35.4	35.4	98.4 97.8	98.1	7.0 7.0	7.0	7.0	7.0	1.0	0.9	1.0	15.1 15.2	15.2	9.5	
				Middle	6.0	22.1 22.1	22.1	8.3 8.4	8.3	35.4 35.4	35.4	97.8 97.7	97.8	7.0 6.9	6.9	6.9	6.9	0.8	1.0	0.9	6.2 6.2	6.2		
				Bottom	11.0	22.2 22.2	22.2	8.3 8.4	8.4	35.5 35.5	35.5	97.9 97.8	97.9	6.9 6.9	6.9	6.9	6.9	1.1	0.9	1.0	7.2 7.2	7.2		
M3	Cloudy	Moderate	15:08	Surface	1.0	22.2 22.2	22.2	8.3 8.3	8.3	35.1 35.2	35.2	94.6 92.9	93.8	6.7 6.6	6.7	6.7	6.7	2.4	2.5	2.5	6.3 6.4	6.4	9.4	
				Middle	4.0	22.2 22.2	22.2	8.3 8.3	8.3	35.3 35.4	35.3	93.7 93.8	93.8	6.7 6.7	6.7	6.7	6.7	1.8	1.4	1.6	8.4 8.5	8.5		
				Bottom	7.0	22.1 22.1	22.1	8.3 8.3	8.3	35.4 35.4	35.4	94.2 94.3	94.3	6.7 6.7	6.7	6.7	6.7	1.5	1.5	1.5	13.5 13.0	13.3		
M4	Cloudy	Moderate	14:42	Surface	1.0	22.2 22.2	22.2	8.3 8.3	8.3	35.5 35.5	35.5	97.6 96.9	97.3	6.9 6.9	6.9	6.9	6.9	1.0	1.1	1.0	6.8 7.0	6.9	6.3	
				Middle	5.0	22.2 22.2	22.2	8.3 8.3	8.3	35.5 35.5	35.5	97.1 96.8	97.0	6.9 6.9	6.9	6.9	6.9	1.1	0.9	1.0	2.2 2.2	2.2		
				Bottom	9.0	22.2 22.2	22.2	8.3 8.3	8.3	35.5 35.5	35.5	96.9 96.8	96.9	6.9 6.9	6.9	6.9	6.9	1.2	1.0	1.1	10.0 9.7	9.9		
M5	Cloudy	Moderate	15:21	Surface	1.0	22.2 22.2	22.2	8.3 8.4	8.3	35.5 35.5	35.5	97.4 97.3	97.4	6.9 6.9	6.9	6.9	6.9	1.2	1.2	1.2	9.3 9.7	9.5	8.5	
				Middle	6.0	22.2 22.2	22.2	8.4 8.4	8.4	35.5 35.5	35.5	97.3 97.1	97.2	6.9 6.9	6.9	6.9	6.9	1.3	1.1	1.2	9.0 9.0	9.0		
				Bottom	11.0	22.2 22.2	22.2	8.4 8.4	8.4	35.5 35.5	35.5	97.1 97.0	97.1	6.9 6.9	6.9	6.9	6.9	1.7	1.5	1.6	7.0 7.0	7.0		
M6	Cloudy	Moderate	15:16	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16.6	
				Middle	2.0	22.3 22.3	22.3	8.3 8.3	8.3	35.5 35.5	35.5	94.9 95.0	95.0	6.7 6.7	6.7	6.7	6.7	1.7 1.5	1.6	1.6	16.2 16.9	16.6		
				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 3 April 2019 (Mid-Ebb Tide)

Parameter (unit)	Depth	Action Level	Limit Level
DO in mg/L (See Note 1 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Depth Average	<u>4.9 mg/L</u>	<u>4.6 mg/L</u>
	Bottom	<u>4.2 mg/L</u>	<u>3.6 mg/L</u>
	<u>Station M6</u>		
	Intake Level	<u>5.0 mg/L</u>	<u>4.7 mg/L</u>
Turbidity in NTU (See Note 2 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>19.3 NTU</u>	<u>22.2 NTU</u>
		or 120% of upstream control station's Turbidity at the same tide of the same day <u>C2: 4.3 NTU</u>	or 130% of upstream control station's Turbidity at the same tide of the same day <u>C2: 4.7 NTU</u>
	<u>Station M6</u>		
	Intake Level	<u>19.0 NTU</u>	<u>19.4 NTU</u>
SS in mg/L (See Note 2 and 4)	<u>Stations G1-G4</u>		
	Surface	<u>6.0 mg/L</u>	<u>6.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>C2: 11.6 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>C2: 12.6 mg/L</u>
	<u>Stations M1-M5</u>		
	Surface	<u>6.2 mg/L</u>	<u>7.4 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>C2: 11.6 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>C2: 12.6 mg/L</u>
	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>6.9 mg/L</u>	<u>7.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>C2: 13.4 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>C2: 14.6 mg/L</u>
	<u>Station M6</u>		
Intake Level	<u>8.3 mg/L</u>	<u>8.6 mg/L</u>	

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 03 April 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	12:42	Surface	1.1	22.2 22.1	22.1	8.3 8.3	8.3	35.4 35.5	35.4	96.7 96.4	96.6	6.9 6.8	6.9	6.8	1.5 1.4	1.5	1.3	4.5 4.6	4.6	6.6	
				Middle	9.1	22.1 22.1	22.1	8.3 8.3	8.3	35.5 35.5	35.5	96.1 96.1	96.1	6.8 6.8	6.8		6.8	1.0 1.0		1.0	6.6 6.6		6.6
				Bottom	17.3	21.9 22.1	22.0	8.4 8.3	8.3	35.5 35.5	35.5	95.8 96.0	95.9	6.8 6.8	6.8		6.8	1.4 1.4		1.4	8.6 8.6		8.6
C2	Sunny	Moderate	11:56	Surface	1.1	22.1 22.1	22.1	8.2 8.3	8.3	35.4 35.4	35.4	94.5 94.4	94.5	6.7 6.7	6.7	6.7	2.2 2.2	2.2	2.8	9.5 9.9	9.7	10.1	
				Middle	16.0	22.0 22.0	22.0	8.3 8.3	8.3	35.4 35.4	35.4	93.4 93.5	93.5	6.7 6.7	6.7		2.6 2.6	2.6		9.2 9.5	9.4		
				Bottom	31.0	22.0 22.0	22.0	8.3 8.3	8.3	35.4 35.4	35.4	93.3 92.9	93.1	6.6 6.6	6.6		6.6	3.6 3.6		3.6	11.0 11.4		11.2
G1	Sunny	Moderate	12:21	Surface	1.1	22.2 22.1	22.1	8.3 8.3	8.3	35.4 35.4	35.4	96.9 95.2	96.1	6.9 6.8	6.8	6.8	1.3 1.3	1.3	1.3	10.5 10.3	10.4	11.6	
				Middle	4.3	22.1 22.1	22.1	8.3 8.3	8.3	35.4 35.4	35.4	95.9 95.4	95.7	6.8 6.8	6.8		6.8	1.3 1.3		1.3	15.3 15.5		15.4
				Bottom	7.1	22.0 22.0	22.0	8.3 8.3	8.3	35.4 35.4	35.4	95.1 94.9	95.0	6.8 6.8	6.8		6.8	1.4 1.4		1.4	9.1 9.0		9.1
G2	Sunny	Moderate	12:13	Surface	1.1	22.1 22.1	22.1	8.3 8.3	8.3	35.4 35.4	35.4	97.8 95.1	96.5	6.9 6.8	6.8	6.8	2.0 2.0	2.0	1.8	10.1 10.4	10.3	6.7	
				Middle	5.2	22.1 22.1	22.1	8.3 8.3	8.3	35.4 35.4	35.4	95.5 95.5	95.5	6.8 6.8	6.8		6.8	1.8 1.8		1.8	5.8 6.1		6.0
				Bottom	9.0	22.0 22.0	22.0	8.3 8.3	8.3	35.5 35.5	35.5	94.8 94.7	94.8	6.8 6.7	6.8		6.7	1.7 1.7		1.7	3.7 3.8		3.8
G3	Sunny	Moderate	12:24	Surface	1.0	22.3 22.3	22.3	8.3 8.3	8.3	35.2 35.2	35.2	96.4 95.0	95.7	6.8 6.7	6.8	6.8	1.6 1.6	1.6	1.4	3.7 3.8	3.8	4.6	
				Middle	4.0	22.1 22.2	22.1	8.3 8.3	8.3	35.4 35.4	35.4	94.9 94.5	94.7	6.7 6.7	6.7		6.7	1.0 1.0		1.0	5.3 5.4		5.4
				Bottom	7.1	22.1 22.0	22.0	8.3 8.3	8.3	35.4 35.5	35.5	94.8 94.4	94.6	6.7 6.7	6.7		6.7	1.6 1.5		1.6	4.6 4.6		4.6
G4	Sunny	Moderate	12:30	Surface	1.0	22.1 22.2	22.1	8.3 8.3	8.3	35.6 35.4	35.5	96.3 94.2	95.3	6.9 6.7	6.8	6.7	2.0 2.1	2.0	2.2	5.6 5.6	5.6	14.3	
				Middle	4.1	22.0 22.2	22.1	8.3 8.3	8.3	35.4 35.4	35.4	94.0 93.9	94.0	6.7 6.7	6.7		6.7	2.1 2.0		2.1	13.8 14.0		13.9
				Bottom	7.1	22.0 22.0	22.0	8.3 8.3	8.3	35.5 35.5	35.5	93.9 93.4	93.7	6.7 6.6	6.7		6.7	2.7 2.6		2.6	23.4 23.2		23.3
M1	Sunny	Moderate	12:17	Surface	1.0	22.1 22.1	22.1	8.3 8.3	8.3	35.4 35.4	35.4	95.2 94.0	94.6	6.8 6.7	6.7	6.7	2.2 2.2	2.2	2.2	7.2 6.9	7.1	10.1	
				Middle	3.1	22.1 22.1	22.1	8.3 8.3	8.3	35.4 35.4	35.4	94.4 93.8	94.1	6.7 6.7	6.7		6.7	2.2 2.2		2.2	11.1 11.2		11.2
				Bottom	5.2	22.1 22.1	22.1	8.3 8.3	8.3	35.4 35.4	35.4	94.1 93.8	94.0	6.7 6.7	6.7		6.7	2.2 2.3		2.3	12.2 12.1		12.2
M2	Sunny	Moderate	12:09	Surface	1.0	22.1 22.1	22.1	8.3 8.3	8.3	35.4 35.4	35.4	96.1 95.8	96.0	6.8 6.8	6.8	6.8	1.4 1.4	1.4	1.6	7.3 7.4	7.4	7.6	
				Middle	5.7	22.1 22.1	22.1	8.3 8.3	8.3	35.4 35.5	35.4	95.9 95.6	95.8	6.8 6.8	6.8		6.8	1.5 1.5		1.5	4.4 4.5		4.5
				Bottom	11.0	22.0 22.0	22.0	8.3 8.3	8.3	35.5 35.5	35.5	95.4 95.3	95.4	6.8 6.8	6.8		6.8	1.9 1.9		1.9	10.9 11.0		11.0
M3	Sunny	Moderate	12:26	Surface	1.0	22.1 22.2	22.2	8.3 8.3	8.3	34.4 35.1	34.8	93.7 94.1	93.9	6.7 6.7	6.7	6.7	1.2 1.2	1.2	1.1	15.5 15.3	15.4	10.5	
				Middle	4.0	22.1 22.2	22.1	8.3 8.3	8.3	35.4 35.1	35.3	94.6 93.9	94.3	6.7 6.7	6.7		6.7	1.0 1.0		1.0	8.8 8.6		8.7
				Bottom	7.1	22.1 22.1	22.1	8.3 8.3	8.3	35.4 35.4	35.4	94.6 94.1	94.4	6.7 6.7	6.7		6.7	1.0 1.0		1.0	7.4 7.3		7.4
M4	Sunny	Moderate	12:05	Surface	1.0	22.0 22.0	22.0	8.3 8.3	8.3	35.4 35.4	35.4	95.1 94.3	94.7	6.8 6.7	6.7	6.7	2.2 2.2	2.2	2.0	6.9 7.2	7.1	8.5	
				Middle	5.0	22.0 22.0	22.0	8.3 8.3	8.3	35.4 35.4	35.4	94.2 94.2	94.2	6.7 6.7	6.7		6.7	2.2 2.2		2.2	5.4 5.6		5.5
				Bottom	9.0	22.0 22.0	22.0	8.3 8.3	8.3	35.4 35.4	35.4	94.2 94.1	94.2	6.7 6.7	6.7		6.7	1.7 1.7		1.7	12.6 13.1		12.9
M5	Sunny	Moderate	12:38	Surface	1.1	22.2 22.1	22.2	8.3 8.3	8.3	35.4 35.4	35.4	96.1 94.3	95.2	6.8 6.7	6.8	6.7	2.2 2.2	2.2	2.3	5.8 6.1	6.0	12.8	
				Middle	6.0	22.0 22.0	22.0	8.3 8.3	8.3	35.4 35.4	35.4	93.9 93.8	93.9	6.7 6.7	6.7		6.7	2.4 2.5		2.5	17.7 17.8		17.8
				Bottom	11.0	22.0 22.0	22.0	8.3 8.3	8.3	35.4 35.4	35.4	93.9 93.8	93.9	6.7 6.7	6.7		6.7	2.4 2.4		2.4	14.3 14.9		14.6
M6	Sunny	Moderate	12:34	Surface	-	-	-	-	-	-	-	-	-	-	6.8	-	-	1.5	-	-	6.5		
				Middle	2.1	22.1 22.1	22.1	8.3 8.3	8.3	35.4 35.4	35.4	96.8 95.8	96.3	6.9 6.8		6.8	6.8		1.4 1.5	1.5		6.4 6.6	6.5
				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 3 April 2019 (Mid-Flood Tide)

Parameter (unit)	Depth	Action Level	Limit Level
DO in mg/L (See Note 1 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Depth Average	<u>4.9 mg/L</u>	<u>4.6 mg/L</u>
	Bottom	<u>4.2 mg/L</u>	<u>3.6 mg/L</u>
	<u>Station M6</u>		
	Intake Level	<u>5.0 mg/L</u>	<u>4.7 mg/L</u>
Turbidity in NTU (See Note 2 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>19.3 NTU</u>	<u>22.2 NTU</u>
		or 120% of upstream control station's Turbidity at the same tide of the same day <u>CI: 2.5 NTU</u>	or 130% of upstream control station's Turbidity at the same tide of the same day <u>CI: 2.7 NTU</u>
	<u>Station M6</u>		
	Intake Level	<u>19.0 NTU</u>	<u>19.4 NTU</u>
SS in mg/L (See Note 2 and 4)	<u>Stations G1-G4</u>		
	Surface	<u>6.0 mg/L</u>	<u>6.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>CI: 7.8 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>CI: 8.5 mg/L</u>
	<u>Stations M1-M5</u>		
	Surface	<u>6.2 mg/L</u>	<u>7.4 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>CI: 7.8 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>CI: 8.5 mg/L</u>
	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>6.9 mg/L</u>	<u>7.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>CI: 7.5 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>CI: 8.1 mg/L</u>
	<u>Station M6</u>		
Intake Level	<u>8.3 mg/L</u>	<u>8.6 mg/L</u>	

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 03 April 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	16:55	Surface	1.0	22.1 22.1	22.1	8.3 8.4	8.3	35.4 35.4	35.4	98.5 95.8	97.2	7.0 6.8	6.9	6.8	1.6 1.6	1.6	1.8	6.6 6.4	6.5	6.1
				Middle	9.0	22.0 22.0	22.0	8.3 8.3	8.3	35.5 35.5	35.5	95.4 95.1	95.3	6.8 6.8	6.8		1.7 1.7	1.7		5.6 5.7	5.7	
				Bottom	17.1	21.9 21.9	21.9	8.4 8.4	8.4	35.5 35.5	35.5	95.6 95.4	95.5	6.8 6.8	6.8		2.1 2.1	2.1		6.2 6.3	6.3	
C2	Sunny	Moderate	16:08	Surface	1.1	22.1 22.1	22.1	8.3 8.3	8.3	35.4 35.4	35.4	94.7 94.0	94.4	6.7 6.7	6.7	6.7	1.8 1.9	1.9	2.8	7.8 7.8	7.8	9.7
				Middle	16.1	22.1 22.1	22.1	8.3 8.3	8.3	35.4 35.4	35.4	93.2 93.3	93.3	6.6 6.6	6.6		3.4 3.4	3.4		10.7 10.8	10.8	
				Bottom	31.0	22.0 22.1	22.0	8.3 8.3	8.3	35.5 35.4	35.4	93.7 93.6	93.7	6.7 6.7	6.7		3.1 3.1	3.1		10.6 10.3	10.5	
G1	Sunny	Moderate	16:33	Surface	1.1	22.4 22.2	22.3	8.3 8.3	8.3	35.0 35.4	35.2	97.1 93.9	95.5	6.9 6.7	6.8	6.8	1.5 1.6	1.5	2.3	13.6 13.1	13.4	16.3
				Middle	4.0	22.3 22.2	22.3	8.3 8.3	8.3	35.2 35.4	35.3	96.0 94.6	95.3	6.8 6.7	6.8		2.1 2.0	2.1		27.2 27.4	27.3	
				Bottom	7.0	22.1 22.1	22.1	8.3 8.3	8.3	35.5 35.4	35.5	94.1 94.1	94.1	6.7 6.7	6.7		3.2 3.2	3.2		8.1 8.3	8.2	
G2	Sunny	Moderate	16:24	Surface	1.1	22.4 22.3	22.4	8.3 8.3	8.3	35.3 35.4	35.4	98.5 96.6	97.6	7.0 6.8	6.9	6.9	1.4 1.4	1.4	1.4	5.9 5.9	5.9	9.3
				Middle	5.3	22.4 22.4	22.4	8.3 8.3	8.3	35.4 35.4	35.4	96.6 96.7	96.7	6.8 6.8	6.8		1.4 1.5	1.4		13.4 13.5	13.5	
				Bottom	9.2	22.2 22.2	22.2	8.3 8.3	8.3	35.4 35.4	35.4	96.2 96.1	96.2	6.8 6.8	6.8		1.3 1.3	1.3		8.3 8.5	8.4	
G3	Sunny	Moderate	16:37	Surface	1.1	22.4 22.4	22.4	8.3 8.3	8.3	35.2 34.7	35.0	99.1 94.9	97.0	7.0 6.7	6.9	6.8	1.6 1.6	1.6	1.7	18.1 18.4	18.3	12.5
				Middle	4.1	22.1 22.2	22.1	8.3 8.3	8.3	35.4 35.4	35.4	94.9 94.2	94.6	6.7 6.7	6.7		1.7 1.7	1.7		9.0 9.1	9.1	
				Bottom	7.0	22.1 22.1	22.1	8.3 8.3	8.3	35.5 35.5	35.5	94.3 94.2	94.3	6.7 6.7	6.7		2.0 1.9	1.9		10.1 10.2	10.2	
G4	Sunny	Moderate	16:42	Surface	1.0	22.3 22.4	22.4	8.3 8.3	8.3	35.4 35.4	35.4	97.5 96.3	96.9	6.9 6.8	6.9	6.8	1.4 1.5	1.4	1.5	13.3 13.6	13.5	8.3
				Middle	4.0	22.1 22.1	22.1	8.3 8.3	8.3	35.4 35.4	35.4	96.1 95.7	95.9	6.8 6.8	6.8		1.5 1.5	1.5		5.6 5.6	5.6	
				Bottom	7.0	22.1 22.0	22.1	8.3 8.3	8.3	35.4 35.5	35.4	96.0 95.0	95.5	6.8 6.8	6.8		1.5 1.5	1.5		5.9 5.9	5.9	
M1	Sunny	Moderate	16:28	Surface	1.0	22.0 22.1	22.1	8.3 8.3	8.3	35.5 35.3	35.4	95.5 93.4	94.5	6.8 6.6	6.7	6.7	2.3 2.3	2.3	2.4	9.2 9.1	9.2	8.8
				Middle	3.0	22.1 22.2	22.1	8.3 8.3	8.3	35.4 35.3	35.3	94.1 93.5	93.8	6.7 6.6	6.7		2.3 2.3	2.3		7.8 7.6	7.7	
				Bottom	5.0	22.0 22.0	22.0	8.3 8.3	8.3	35.4 35.4	35.4	93.2 93.1	93.2	6.6 6.6	6.6		2.8 2.8	2.8		9.6 9.4	9.5	
M2	Sunny	Moderate	16:20	Surface	1.0	22.4 22.3	22.3	8.3 8.3	8.3	35.4 35.4	35.4	98.5 96.9	97.7	7.0 6.9	6.9	6.9	1.4 1.4	1.4	1.4	10.5 10.5	10.5	7.6
				Middle	6.0	22.3 22.2	22.3	8.3 8.3	8.3	35.4 35.4	35.4	97.3 96.7	97.0	6.9 6.9	6.9		1.3 1.3	1.3		6.0 5.8	5.9	
				Bottom	11.1	22.1 22.1	22.1	8.3 8.3	8.3	35.5 35.4	35.4	96.4 96.3	96.4	6.9 6.8	6.8		1.6 1.6	1.6		6.4 6.5	6.5	
M3	Sunny	Moderate	16:39	Surface	1.0	22.0 22.1	22.1	8.3 8.3	8.3	35.5 35.4	35.4	98.5 93.9	96.2	7.0 6.7	6.8	6.8	1.9 1.9	1.9	1.8	5.7 5.5	5.6	7.4
				Middle	4.0	22.1 22.1	22.1	8.3 8.3	8.3	35.5 35.4	35.4	95.0 94.6	94.8	6.8 6.7	6.7		1.7 1.8	1.8		5.6 5.6	5.6	
				Bottom	7.0	22.1 22.1	22.1	8.3 8.3	8.3	35.5 35.5	35.5	93.6 94.4	94.0	6.7 6.7	6.7		1.9 1.9	1.9		11.2 10.8	11.0	
M4	Sunny	Moderate	16:16	Surface	1.0	22.2 22.2	22.2	8.3 8.3	8.3	35.4 35.4	35.4	98.9 96.5	97.7	7.0 6.8	6.9	6.9	1.6 1.5	1.5	1.5	12.0 12.6	12.3	10.7
				Middle	5.0	22.2 22.2	22.2	8.3 8.3	8.3	35.4 35.4	35.4	96.8 96.4	96.6	6.9 6.8	6.8		1.5 1.5	1.5		8.5 8.5	8.5	
				Bottom	9.1	22.2 22.2	22.2	8.3 8.3	8.3	35.4 35.4	35.4	96.6 96.2	96.4	6.9 6.8	6.8		1.4 1.4	1.4		11.1 11.2	11.2	
M5	Sunny	Moderate	16:51	Surface	1.0	22.1 22.1	22.1	8.3 8.3	8.3	35.4 35.4	35.4	96.7 96.3	96.5	6.9 6.8	6.9	6.8	1.5 1.5	1.5	1.8	6.7 6.7	6.7	5.8
				Middle	5.9	22.1 22.1	22.1	8.3 8.3	8.3	35.4 35.4	35.4	96.0 96.0	96.0	6.8 6.8	6.8		1.6 1.6	1.6		3.8 3.9	3.9	
				Bottom	11.1	22.1 22.1	22.1	8.3 8.3	8.3	35.5 35.4	35.4	95.8 95.7	95.8	6.8 6.8	6.8		2.2 2.2	2.2		6.9 6.9	6.9	
M6	Sunny	Moderate	16:45	Surface	-	-	-	-	-	-	-	-	-	-	-	6.8	-	-	1.7	-	-	11.5
				Middle	2.1	22.1 22.1	22.1	8.3 8.3	8.3	35.4 35.4	35.4	96.4 95.6	96.0	6.9 6.8	6.8		1.6 1.7	1.7		11.4 11.5	11.5	
				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 April 2019 (Mid-Ebb Tide)

Parameter (unit)	Depth	Action Level	Limit Level
DO in mg/L (See Note 1 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Depth Average	<u>4.9 mg/L</u>	<u>4.6 mg/L</u>
	Bottom	<u>4.2 mg/L</u>	<u>3.6 mg/L</u>
	<u>Station M6</u>		
	Intake Level	<u>5.0 mg/L</u>	<u>4.7 mg/L</u>
Turbidity in NTU (See Note 2 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>19.3 NTU</u>	<u>22.2 NTU</u>
		or 120% of upstream control station's Turbidity at the same tide of the same day <u>C2: 2.0 NTU</u>	or 130% of upstream control station's Turbidity at the same tide of the same day <u>C2: 2.2 NTU</u>
	<u>Station M6</u>		
	Intake Level	<u>19.0 NTU</u>	<u>19.4 NTU</u>
SS in mg/L (See Note 2 and 4)	<u>Stations G1-G4</u>		
	Surface	<u>6.0 mg/L</u>	<u>6.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>C2: 15.0 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>C2: 16.3 mg/L</u>
	<u>Stations M1-M5</u>		
	Surface	<u>6.2 mg/L</u>	<u>7.4 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>C2: 15.0 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>C2: 16.3 mg/L</u>
	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>6.9 mg/L</u>	<u>7.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>C2: 17.8 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>C2: 19.3 mg/L</u>
	<u>Station M6</u>		
Intake Level	<u>8.3 mg/L</u>	<u>8.6 mg/L</u>	

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 April 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	13:06	Surface	1.0	22.4 22.4	22.4	8.3 8.3	8.3	35.2 35.2	35.2	93.1 93.2	93.2	6.6 6.6	6.6	6.6	6.6	1.4 1.5	1.5	1.4	26.3 26.2	26.3	14.6
				Middle	9.0	22.3 22.3	22.3	8.3 8.3	8.3	35.3 35.3	35.3	92.8 92.8	92.8	6.6 6.6	6.6	6.6		1.4 1.4	1.4		6.6 6.6	6.6	
				Bottom	17.0	22.3 22.3	22.3	8.3 8.3	8.3	35.3 35.3	35.3	92.9 92.8	92.9	6.6 6.6	6.6	6.6		1.2 1.3	1.3		11.0 10.8	10.9	
C2	Sunny	Moderate	11:57	Surface	1.0	22.5 22.5	22.5	8.8 8.2	8.5	35.1 35.1	35.1	91.4 92.0	91.7	6.5 6.5	6.5	6.5	6.5	0.8 1.0	0.9	1.3	12.1 12.9	12.5	12.5
				Middle	16.0	22.4 22.3	22.4	8.3 8.2	8.3	35.2 35.2	35.2	91.2 91.2	91.2	6.5 6.5	6.5	6.5		1.1 1.4	1.2		10.0 10.5	10.3	
				Bottom	32.0	22.3 22.3	22.3	8.3 8.2	8.3	35.2 35.2	35.2	91.3 91.5	91.4	6.5 6.5	6.5	6.5		1.6 1.8	1.7		14.9 14.8	14.9	
G1	Sunny	Moderate	12:29	Surface	1.0	22.8 22.7	22.8	8.3 8.3	8.3	35.3 35.2	35.2	95.2 95.2	95.2	6.7 6.7	6.7	6.7	6.7	0.7 0.7	0.7	1.3	16.0 16.3	16.2	14.9
				Middle	4.0	22.6 22.5	22.5	8.3 8.3	8.3	35.3 35.3	35.3	94.8 94.8	94.8	6.7 6.7	6.7	6.7		0.8 0.8	0.8		16.4 16.6	16.5	
				Bottom	7.0	22.3 22.3	22.3	8.3 8.3	8.3	35.3 35.3	35.3	92.8 93.2	93.0	6.6 6.6	6.6	6.6		2.3 2.4	2.4		11.7 12.4	12.1	
G2	Sunny	Moderate	12:18	Surface	1.1	22.7 22.6	22.6	8.3 8.3	8.3	35.2 35.2	35.2	95.9 95.2	95.3	6.7 6.7	6.7	6.7	6.7	0.9 1.0	0.9	1.0	10.5 11.4	11.0	23.6
				Middle	5.1	22.3 22.3	22.3	8.3 8.3	8.3	35.3 35.3	35.3	94.2 94.5	94.4	6.7 6.7	6.7	6.7		1.1 1.1	1.1		20.8 19.9	20.4	
				Bottom	9.0	22.2 22.2	22.2	8.3 8.3	8.3	35.3 35.3	35.3	94.6 94.7	94.7	6.7 6.7	6.7	6.7		1.0 1.1	1.0		39.6 39.1	39.4	
G3	Sunny	Moderate	12:35	Surface	1.0	23.2 23.1	23.1	8.3 8.3	8.3	35.1 35.0	35.0	96.6 96.4	96.5	6.8 6.8	6.8	6.8	6.8	0.6 0.7	0.7	0.9	5.9 5.5	5.7	11.2
				Middle	4.0	22.6 22.7	22.7	8.3 8.3	8.3	35.3 35.3	35.3	96.1 96.1	96.1	6.8 6.8	6.8	6.8		0.9 0.9	0.9		19.7 19.6	19.7	
				Bottom	7.0	22.5 22.5	22.5	8.3 8.3	8.3	35.3 35.3	35.3	95.3 94.7	95.0	6.7 6.7	6.7	6.7		1.0 1.1	1.1		8.6 7.8	8.2	
G4	Sunny	Moderate	12:46	Surface	1.1	23.2 23.2	23.2	8.3 8.3	8.3	35.1 35.1	35.1	97.4 97.2	97.3	6.8 6.8	6.8	6.8	6.8	0.6 0.6	0.7	0.8	20.9 20.7	20.8	12.1
				Middle	4.0	22.8 22.9	22.8	8.3 8.3	8.3	35.2 35.2	35.2	95.9 96.3	96.1	6.7 6.8	6.8	6.8		0.7 0.8	0.8		6.3 5.9	6.1	
				Bottom	7.0	22.7 22.6	22.6	8.3 8.3	8.3	35.2 35.2	35.2	95.6 95.4	95.5	6.7 6.7	6.7	6.7		0.8 0.9	0.8		9.6 9.3	9.5	
M1	Sunny	Moderate	12:25	Surface	1.1	22.7 22.9	22.8	8.3 8.3	8.3	35.2 35.2	35.2	94.0 93.9	94.0	6.6 6.6	6.6	6.6	6.6	2.0 1.6	1.8	2.1	18.3 18.3	18.3	14.0
				Middle	3.1	22.8 22.8	22.8	8.3 8.3	8.3	35.2 35.2	35.2	93.8 93.6	93.7	6.6 6.6	6.6	6.6		1.9 1.8	1.8		12.5 12.7	12.6	
				Bottom	5.0	22.5 22.5	22.5	8.3 8.3	8.3	35.3 35.3	35.3	92.8 92.5	92.7	6.6 6.5	6.5	6.5		2.8 2.9	2.8		11.4 11.0	11.2	
M2	Sunny	Moderate	12:12	Surface	1.1	22.6 22.6	22.6	8.3 8.3	8.3	35.3 35.3	35.3	94.9 95.2	95.1	6.7 6.7	6.7	6.7	6.7	1.2 1.3	1.2	1.2	12.3 12.1	12.2	12.3
				Middle	6.0	22.3 22.3	22.3	8.3 8.3	8.3	35.3 35.3	35.3	94.4 94.5	94.5	6.7 6.7	6.7	6.7		1.2 1.2	1.2		11.7 11.8	11.8	
				Bottom	11.0	22.1 22.1	22.1	8.3 8.3	8.3	35.4 35.4	35.4	94.5 94.7	94.6	6.7 6.7	6.7	6.7		1.2 1.3	1.3		13.0 13.0	13.0	
M3	Sunny	Moderate	12:41	Surface	1.0	23.2 22.9	23.0	8.3 8.3	8.3	35.0 35.1	35.1	95.9 96.7	96.3	6.7 6.8	6.7	6.7	6.8	0.4 0.5	0.5	0.6	24.3 25.0	24.7	24.7
				Middle	4.0	22.6 22.7	22.7	8.3 8.3	8.3	35.2 35.2	35.2	95.9 96.4	96.2	6.8 6.8	6.8	6.8		0.7 0.6	0.6		18.4 17.9	18.2	
				Bottom	7.0	22.6 22.6	22.6	8.3 8.3	8.3	35.3 35.3	35.3	95.6 95.9	95.8	6.7 6.8	6.8	6.8		0.7 0.6	0.6		31.3 31.4	31.4	
M4	Sunny	Moderate	12:05	Surface	1.1	22.3 22.3	22.3	8.3 8.3	8.3	35.3 35.3	35.3	93.1 93.2	93.2	6.6 6.6	6.6	6.6	6.6	1.7 1.4	1.6	1.5	38.2 38.3	38.3	21.8
				Middle	5.0	22.1 22.2	22.2	8.3 8.3	8.3	35.3 35.3	35.3	93.6 93.1	93.4	6.7 6.6	6.6	6.6		1.5 1.4	1.4		12.0 11.6	11.8	
				Bottom	9.1	22.1 22.1	22.1	8.3 8.3	8.3	35.4 35.4	35.4	93.7 93.7	93.7	6.7 6.7	6.7	6.7		1.4 1.8	1.6		15.3 15.4	15.4	
M5	Sunny	Moderate	12:59	Surface	1.0	22.7 22.7	22.7	8.3 8.3	8.3	35.2 35.2	35.2	94.6 93.8	94.2	6.7 6.6	6.6	6.6	6.6	0.9 1.1	1.0	1.7	23.6 23.3	23.5	23.2
				Middle	6.0	22.2 22.3	22.2	8.3 8.3	8.3	35.3 35.3	35.3	93.3 93.4	93.4	6.6 6.6	6.6	6.6		1.4 1.5	1.5		29.5 29.6	29.6	
				Bottom	11.0	22.1 22.1	22.1	8.4 8.4	8.4	35.4 35.4	35.4	94.9 94.8	94.9	6.8 6.7	6.7	6.7		2.8 2.5	2.7		16.0 16.9	16.5	
M6	Sunny	Moderate	12:53	Surface	-	-	-	-	-	-	-	-	-	-	-	6.7	-	-	0.8	-	-	23.2	
				Middle	2.1	22.6 22.8	22.7	8.3 8.3	8.3	35.2 35.2	35.2	94.7 95.3	95.0	6.7 6.7	6.7		6.7	0.8 0.7		0.8	22.9 23.4		23.2
				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 6 April 2019 (Mid-Flood Tide)

Parameter (unit)	Depth	Action Level	Limit Level
DO in mg/L (See Note 1 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Depth Average	<u>4.9 mg/L</u>	<u>4.6 mg/L</u>
	Bottom	<u>4.2 mg/L</u>	<u>3.6 mg/L</u>
	<u>Station M6</u>		
	Intake Level	<u>5.0 mg/L</u>	<u>4.7 mg/L</u>
Turbidity in NTU (See Note 2 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>19.3 NTU</u>	<u>22.2 NTU</u>
		or 120% of upstream control station's Turbidity at the same tide of the same day <u>CI: 3.3 NTU</u>	or 130% of upstream control station's Turbidity at the same tide of the same day <u>CI: 3.6 NTU</u>
	<u>Station M6</u>		
	Intake Level	<u>19.0 NTU</u>	<u>19.4 NTU</u>
SS in mg/L (See Note 2 and 4)	<u>Stations G1-G4</u>		
	Surface	<u>6.0 mg/L</u>	<u>6.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>CI: 21.3 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>CI: 23.1 mg/L</u>
	<u>Stations M1-M5</u>		
	Surface	<u>6.2 mg/L</u>	<u>7.4 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>CI: 21.3 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>CI: 23.1 mg/L</u>
	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>6.9 mg/L</u>	<u>7.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>CI: 11.9 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>CI: 12.9 mg/L</u>
	<u>Station M6</u>		
Intake Level	<u>8.3 mg/L</u>	<u>8.6 mg/L</u>	

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 April 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	09:25	Surface	1.0	22.5 22.4	22.4	8.3 8.3	8.3	35.1 35.2	35.2	93.3 92.3	92.8	6.6 6.5	6.6	6.6	1.0	1.0	1.7	1.0	1.0	17.5 18.0	17.8	12.6
				Middle	9.0	22.1 22.1	22.1	8.3 8.3	8.3	35.3 35.3	35.3	94.0 94.0	94.0	6.7 6.7	6.7		6.7	1.3 1.3		1.3	1.3	10.1 9.8	10.0	
				Bottom	17.1	21.8 21.8	21.8	8.4 8.4	8.4	35.5 35.5	35.5	95.5 95.7	95.6	6.8 6.8	6.8		6.8	2.9 2.6		2.8	2.8	10.1 9.8	10.0	
C2	Sunny	Moderate	08:22	Surface	1.0	22.4 22.3	22.3	8.0 8.3	8.2	35.2 35.2	35.2	92.4 91.3	91.9	6.5 6.5	6.5	6.5	1.0	1.0	1.1	1.0	1.0	10.6 10.5	10.6	7.1
				Middle	16.0	22.3 22.3	22.3	8.3 8.3	8.3	35.2 35.2	35.2	90.7 90.9	90.8	6.4 6.4	6.4		6.4	1.0 1.0		1.0	1.0	6.2 6.3	6.3	
				Bottom	32.1	22.3 22.3	22.3	8.3 8.3	8.3	35.2 35.2	35.2	91.0 90.9	91.0	6.5 6.5	6.5		6.5	1.4 1.3		1.4	1.4	4.3 4.4	4.4	
G1	Sunny	Moderate	08:54	Surface	1.0	22.6 22.6	22.6	8.3 8.3	8.3	35.1 35.0	35.0	93.8 93.3	93.6	6.6 6.6	6.6	6.6	0.8	0.8	0.9	0.8	0.8	17.3 17.6	17.5	29.3
				Middle	4.0	22.5 22.5	22.5	8.3 8.3	8.3	35.3 35.3	35.3	93.6 93.2	93.4	6.6 6.6	6.6		6.6	0.9 0.9		0.9	0.9	62.4 62.5	62.5	
				Bottom	7.0	22.4 22.3	22.4	8.3 8.3	8.3	35.3 35.3	35.3	93.7 93.4	93.6	6.6 6.6	6.6		6.6	1.0 1.2		1.1	1.1	8.0 8.2	8.1	
G2	Sunny	Moderate	08:42	Surface	1.0	22.4 22.3	22.4	8.3 8.3	8.3	35.1 35.2	35.1	93.6 91.6	92.6	6.6 6.5	6.6	6.5	1.0	1.0	1.1	1.0	1.0	8.9 8.6	8.8	17.5
				Middle	5.0	22.3 22.3	22.3	8.3 8.3	8.3	35.2 35.2	35.2	91.5 91.3	91.4	6.5 6.5	6.5		6.5	1.2 1.2		1.2	1.2	22.5 23.1	22.8	
				Bottom	9.0	22.3 22.3	22.3	8.3 8.3	8.3	35.2 35.2	35.2	91.3 91.2	91.3	6.5 6.5	6.5		6.5	1.0 1.1		1.1	1.1	20.8 20.8	20.8	
G3	Sunny	Moderate	08:57	Surface	1.0	22.5 22.5	22.5	8.3 8.3	8.3	35.2 35.2	35.2	94.7 93.9	94.3	6.7 6.6	6.7	6.7	0.9	0.9	0.9	0.9	0.9	20.3 20.6	20.5	20.7
				Middle	4.0	22.4 22.4	22.4	8.3 8.3	8.3	35.3 35.3	35.3	94.1 93.7	93.9	6.7 6.6	6.6		6.6	1.0 1.0		1.0	1.0	27.9 27.7	27.8	
				Bottom	7.0	22.3 22.4	22.3	8.3 8.3	8.3	35.3 35.3	35.3	94.3 93.8	94.1	6.7 6.6	6.7		6.7	1.0 1.0		1.0	1.0	13.9 13.9	13.9	
G4	Sunny	Moderate	09:06	Surface	1.0	22.6 22.6	22.7	8.3 8.3	8.3	35.2 35.0	35.1	91.3 89.9	90.6	6.4 6.3	6.4	6.5	0.4	0.4	1.1	0.4	0.4	8.1 8.3	8.2	12.5
				Middle	4.0	22.4 22.4	22.4	8.3 8.3	8.3	35.3 35.3	35.3	92.5 92.5	92.5	6.5 6.5	6.5		6.5	0.6 0.6		0.6	0.6	17.6 17.1	17.4	
				Bottom	7.0	22.3 22.3	22.3	8.3 8.3	8.3	35.3 35.3	35.3	87.9 86.9	87.4	6.2 6.2	6.2		6.2	2.0 2.4		2.2	2.2	12.2 11.5	11.9	
M1	Sunny	Moderate	08:49	Surface	1.0	22.7 22.7	22.7	8.3 8.3	8.3	35.1 35.1	35.1	92.9 91.1	92.0	6.6 6.4	6.5	6.5	0.8	0.8	0.8	0.8	0.8	12.0 12.5	12.3	12.5
				Middle	3.0	22.6 22.6	22.6	8.3 8.3	8.3	35.2 35.2	35.2	91.8 91.1	91.5	6.5 6.4	6.4		6.4	0.8 0.8		0.8	0.8	13.0 12.6	12.8	
				Bottom	5.0	22.5 22.5	22.5	8.3 8.3	8.3	35.3 35.3	35.3	91.5 91.2	91.4	6.5 6.4	6.5		6.5	0.8 0.9		0.9	0.9	11.9 12.7	12.3	
M2	Sunny	Moderate	08:38	Surface	1.0	22.4 22.4	22.4	8.3 8.3	8.3	35.2 35.2	35.2	93.1 92.0	92.6	6.6 6.5	6.6	6.5	1.0	1.0	1.8	1.0	1.0	6.5 6.8	6.7	7.4
				Middle	6.0	22.2 22.3	22.2	8.3 8.3	8.3	35.3 35.3	35.3	91.3 91.4	91.4	6.5 6.5	6.5		6.5	1.8 1.6		1.7	1.7	6.0 6.2	6.1	
				Bottom	11.0	22.1 22.1	22.1	8.3 8.3	8.3	35.4 35.4	35.4	92.1 92.5	92.3	6.5 6.6	6.6		6.6	2.4 2.8		2.6	2.6	9.7 9.1	9.4	
M3	Sunny	Moderate	09:01	Surface	1.1	22.6 22.6	22.6	8.3 8.3	8.3	35.2 35.1	35.2	94.9 94.6	94.8	6.7 6.7	6.7	6.7	0.9	0.8	0.9	0.8	0.8	9.9 9.4	9.7	6.1
				Middle	4.0	22.5 22.5	22.5	8.3 8.3	8.3	35.3 35.3	35.3	94.3 94.3	94.3	6.7 6.7	6.7		6.7	0.9 0.9		0.9	0.9	5.6 5.1	5.4	
				Bottom	7.0	22.4 22.4	22.4	8.3 8.3	8.3	35.3 35.3	35.3	95.8 95.2	95.5	6.8 6.7	6.8		6.8	0.9 0.9		0.9	0.9	3.2 3.4	3.3	
M4	Sunny	Moderate	08:32	Surface	1.0	22.3 22.3	22.3	8.3 8.3	8.3	35.3 35.3	35.3	92.4 92.1	92.3	6.6 6.5	6.5	6.6	1.8	1.8	2.6	1.8	1.8	3.8 3.4	3.6	15.4
				Middle	5.0	22.1 22.1	22.1	8.3 8.3	8.3	35.4 35.3	35.3	93.3 92.7	93.0	6.6 6.6	6.6		6.6	2.4 1.9		2.1	2.1	9.8 9.7	9.8	
				Bottom	9.0	22.1 22.1	22.1	8.3 8.3	8.3	35.4 35.4	35.4	93.7 93.3	93.5	6.7 6.6	6.6		6.6	3.6 3.9		3.8	3.8	32.8 33.1	33.0	
M5	Sunny	Moderate	09:19	Surface	1.0	22.4 22.4	22.4	8.3 8.3	8.3	35.1 35.1	35.1	91.4 90.7	91.1	6.5 6.4	6.4	6.5	1.1	1.1	2.2	1.1	1.1	10.9 10.2	10.6	11.7
				Middle	6.0	22.1 22.1	22.1	8.3 8.3	8.3	35.4 35.4	35.4	93.1 92.0	92.6	6.6 6.5	6.6		6.6	2.0 2.3		2.2	2.2	15.6 15.3	15.5	
				Bottom	11.1	22.0 22.0	22.0	8.3 8.4	8.3	35.4 35.4	35.4	94.0 94.4	94.2	6.7 6.7	6.7		6.7	3.0 3.6		3.3	3.3	9.5 8.8	9.2	
M6	Sunny	Moderate	09:12	Surface	-	-	-	-	-	-	-	-	-	-	-	6.6	-	-	1.0	-	-	-	-	11.4
				Middle	2.0	22.5 22.5	22.5	8.3 8.3	8.3	35.2 35.2	35.2	93.2 92.3	92.8	6.6 6.5	6.6		6.6	1.0 1.0		1.0	1.0	11.4 11.4	11.4	
				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 8 April 2019 (Mid-Ebb Tide)

Parameter (unit)	Depth	Action Level	Limit Level
DO in mg/L (See Note 1 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Depth Average	<u>4.9 mg/L</u>	<u>4.6 mg/L</u>
	Bottom	<u>4.2 mg/L</u>	<u>3.6 mg/L</u>
	<u>Station M6</u>		
	Intake Level	<u>5.0 mg/L</u>	<u>4.7 mg/L</u>
Turbidity in NTU (See Note 2 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>19.3 NTU</u>	<u>22.2 NTU</u>
		or 120% of upstream control station's Turbidity at the same tide of the same day <u>C2: 1.8 NTU</u>	or 130% of upstream control station's Turbidity at the same tide of the same day <u>C2: 1.9 NTU</u>
	<u>Station M6</u>		
	Intake Level	<u>19.0 NTU</u>	<u>19.4 NTU</u>
SS in mg/L (See Note 2 and 4)	<u>Stations G1-G4</u>		
	Surface	<u>6.0 mg/L</u>	<u>6.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>C2: 10.0 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>C2: 10.8 mg/L</u>
	<u>Stations M1-M5</u>		
	Surface	<u>6.2 mg/L</u>	<u>7.4 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>C2: 10.0 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>C2: 10.8 mg/L</u>
	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>6.9 mg/L</u>	<u>7.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>C2: 8.5 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>C2: 9.2 mg/L</u>
	<u>Station M6</u>		
Intake Level	<u>8.3 mg/L</u>	<u>8.6 mg/L</u>	

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 08 April 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	14:32	Surface	1.1	22.8 22.8	22.8	8.3 8.3	8.3	35.0 35.0	35.0	93.6 93.5	93.6	6.6 6.6	6.6	6.6	0.8 0.7	0.7	0.9	12.4 12.2	12.3	16.1
				Middle	9.0	22.3 22.3	22.3	8.3 8.3	8.3	35.3 35.4	35.3	92.2 92.3	92.3	6.5 6.5	6.5		1.0 1.0	1.0		27.9 27.7	27.8	
				Bottom	16.9	22.3 22.3	22.3	8.3 8.3	8.3	35.4 35.4	35.4	92.4 92.4	92.4	6.5 6.5	6.5		1.0 1.0	1.0		8.0 8.3	8.2	
C2	Sunny	Calm	14:26	Surface	1.0	23.1 23.1	23.1	8.8 8.2	8.5	34.6 34.6	34.6	94.2 94.2	94.2	6.6 6.6	6.6	6.5	0.6 0.7	0.6	1.2	8.2 8.4	8.3	12.0
				Middle	16.0	22.3 22.4	22.4	8.3 8.2	8.3	35.3 35.3	35.3	91.1 91.1	91.1	6.5 6.5	6.5		1.4 1.4	1.4		20.8 20.2	20.5	
				Bottom	31.1	22.3 22.3	22.3	8.3 8.3	8.3	35.4 35.3	35.4	90.8 91.2	91.0	6.4 6.5	6.4		1.5 1.5	1.5		7.0 7.2	7.1	
G1	Sunny	Calm	13:45	Surface	1.0	23.5 23.4	23.4	8.3 8.3	8.3	35.0 35.0	35.0	101.5 101.4	101.5	7.1 7.1	7.1	7.0	0.3 0.3	0.3	0.6	30.4 30.4	30.4	31.4
				Middle	4.0	23.2 23.2	23.2	8.3 8.3	8.3	35.1 35.1	35.1	100.4 100.0	100.2	7.0 7.0	7.0		0.4 0.4	0.4		45.6 45.9	45.8	
				Bottom	6.9	22.4 22.4	22.4	8.3 8.3	8.3	35.4 35.4	35.4	93.3 93.2	93.3	6.6 6.6	6.6		1.1 1.1	1.1		17.8 18.5	18.2	
G2	Sunny	Calm	13:32	Surface	1.1	22.8 22.8	22.8	8.3 8.3	8.3	35.3 35.3	35.3	98.8 98.9	98.9	6.9 6.9	6.9	6.9	0.4 0.4	0.4	0.5	11.8 12.2	12.0	12.4
				Middle	5.0	22.6 22.6	22.6	8.3 8.3	8.3	35.3 35.3	35.3	97.7 97.6	97.7	6.9 6.9	6.9		0.5 0.5	0.5		14.0 13.6	13.8	
				Bottom	8.9	22.3 22.3	22.3	8.3 8.3	8.3	35.4 35.4	35.4	96.0 95.6	95.8	6.8 6.8	6.8		0.7 0.7	0.7		11.1 11.8	11.5	
G3	Sunny	Calm	13:49	Surface	1.0	23.4 23.4	23.4	8.3 8.3	8.3	34.9 34.9	34.9	100.1 100.0	100.1	7.0 7.0	7.0	6.9	0.4 0.4	0.4	0.7	9.3 8.6	9.0	7.1
				Middle	4.0	23.1 22.8	22.9	8.3 8.3	8.3	35.1 35.2	35.2	98.9 98.8	98.9	6.9 6.9	6.9		0.5 0.5	0.5		7.8 7.8	8.0	
				Bottom	7.0	22.3 22.2	22.2	8.3 8.3	8.3	35.5 35.5	35.5	94.4 94.2	94.3	6.7 6.7	6.7		1.2 1.2	1.2		4.2 4.5	4.4	
G4	Sunny	Calm	14:11	Surface	1.0	23.3 23.2	23.3	8.3 8.3	8.3	35.0 35.0	35.0	100.8 100.7	100.8	7.0 7.0	7.0	7.0	0.4 0.4	0.4	0.5	10.0 9.9	10.0	13.5
				Middle	4.0	22.8 22.6	22.8	8.3 8.3	8.3	35.2 35.2	35.2	99.4 98.8	99.1	7.0 7.0	7.0		0.7 0.7	0.7		17.2 16.7	17.0	
				Bottom	7.1	22.3 22.2	22.3	8.3 8.3	8.3	35.5 35.5	35.5	96.1 95.8	96.0	6.8 6.8	6.8		0.5 0.5	0.5		13.9 13.3	13.6	
M1	Sunny	Calm	13:38	Surface	1.0	23.4 23.4	23.4	8.3 8.3	8.3	35.1 35.1	35.1	98.6 98.7	98.7	6.9 6.9	6.9	6.8	0.7 0.7	0.7	0.8	8.3 9.2	8.8	8.8
				Middle	3.1	23.4 23.4	23.4	8.3 8.3	8.3	35.1 35.1	35.1	98.3 98.2	98.3	6.8 6.8	6.8		0.7 0.7	0.7		5.7 5.9	5.8	
				Bottom	5.0	23.2 23.2	23.2	8.3 8.3	8.3	35.2 35.2	35.2	97.5 97.6	97.6	6.8 6.8	6.8		0.9 0.9	0.9		11.9 12.0	12.0	
M2	Sunny	Calm	13:25	Surface	1.1	22.6 22.6	22.6	8.3 8.3	8.3	35.3 35.3	35.3	95.2 95.0	95.1	6.7 6.7	6.7	6.7	0.6 0.7	0.6	0.7	13.0 13.1	13.1	7.8
				Middle	6.1	22.5 22.5	22.5	8.3 8.3	8.3	35.3 35.3	35.3	94.7 94.6	94.7	6.7 6.7	6.7		0.7 0.7	0.7		5.5 5.9	5.7	
				Bottom	11.0	22.4 22.3	22.3	8.3 8.3	8.3	35.4 35.4	35.4	94.5 94.4	94.5	6.7 6.7	6.7		0.7 0.7	0.7		4.6 4.4	4.5	
M3	Sunny	Calm	14:05	Surface	1.0	23.8 23.7	23.7	8.3 8.3	8.3	34.5 34.6	34.6	99.7 99.8	99.8	6.9 6.9	6.9	6.9	0.3 0.4	0.3	0.8	4.7 4.7	4.7	13.3
				Middle	3.9	23.0 22.9	23.0	8.3 8.3	8.3	35.1 35.2	35.1	98.1 97.7	97.9	6.9 6.9	6.9		0.6 0.6	0.6		23.3 23.0	23.2	
				Bottom	7.0	22.4 22.3	22.3	8.3 8.3	8.3	35.5 35.5	35.5	92.9 93.0	93.0	6.6 6.6	6.6		1.5 1.4	1.5		12.4 11.6	12.0	
M4	Sunny	Calm	13:17	Surface	1.0	22.4 22.4	22.4	8.3 8.3	8.3	35.3 35.3	35.3	93.5 93.4	93.5	6.6 6.6	6.6	6.6	0.9 0.9	0.9	1.0	8.4 8.2	8.3	13.1
				Middle	5.0	22.2 22.2	22.2	8.3 8.3	8.3	35.4 35.4	35.4	93.4 93.5	93.5	6.6 6.6	6.6		0.9 0.9	0.9		18.6 17.7	18.2	
				Bottom	8.9	22.2 22.2	22.2	8.3 8.3	8.3	35.4 35.4	35.4	93.0 93.0	93.0	6.6 6.6	6.6		1.2 1.3	1.2		12.8 12.9	12.9	
M5	Sunny	Calm	14:19	Surface	1.1	23.0 23.0	23.0	8.3 8.3	8.3	35.1 35.1	35.1	100.1 100.2	100.2	7.0 7.0	7.0	7.0	0.3 0.3	0.3	0.3	20.0 20.2	20.1	14.0
				Middle	6.0	22.7 22.6	22.7	8.3 8.3	8.3	35.2 35.2	35.2	98.5 98.2	98.4	6.9 6.9	6.9		0.3 0.3	0.3		10.3 11.0	10.7	
				Bottom	11.0	22.6 22.6	22.6	8.4 8.4	8.4	35.3 35.3	35.3	96.8 96.7	96.8	6.8 6.8	6.8		0.4 0.4	0.4		11.1 11.2	11.2	
M6	Sunny	Calm	14:16	Surface	-	-	-	-	-	-	-	-	-	-	6.6	-	-	0.5	-	-	9.3	
				Middle	2.0	22.3 22.3	22.3	8.3 8.3	8.3	35.5 35.5	35.5	93.8 93.6	93.7	6.6 6.6		6.6	0.5 0.5		0.5	9.5 9.1		9.3
				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 8 April 2019 (Mid-Flood Tide)

Parameter (unit)	Depth	Action Level	Limit Level
DO in mg/L (See Note 1 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Depth Average	<u>4.9 mg/L</u>	<u>4.6 mg/L</u>
	Bottom	<u>4.2 mg/L</u>	<u>3.6 mg/L</u>
	<u>Station M6</u>		
	Intake Level	<u>5.0 mg/L</u>	<u>4.7 mg/L</u>
Turbidity in NTU (See Note 2 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>19.3 NTU</u>	<u>22.2 NTU</u>
		or 120% of upstream control station's Turbidity at the same tide of the same day <u>CI: 1.3 NTU</u>	or 130% of upstream control station's Turbidity at the same tide of the same day <u>CI: 1.4 NTU</u>
	<u>Station M6</u>		
	Intake Level	<u>19.0 NTU</u>	<u>19.4 NTU</u>
SS in mg/L (See Note 2 and 4)	<u>Stations G1-G4</u>		
	Surface	<u>6.0 mg/L</u>	<u>6.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>CI: 14.4 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>CI: 15.6 mg/L</u>
	<u>Stations M1-M5</u>		
	Surface	<u>6.2 mg/L</u>	<u>7.4 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>CI: 14.4 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>CI: 15.6 mg/L</u>
	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>6.9 mg/L</u>	<u>7.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>CI: 21.0 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>CI: 22.8 mg/L</u>
	<u>Station M6</u>		
Intake Level	<u>8.3 mg/L</u>	<u>8.6 mg/L</u>	

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 08 April 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	09:07	Surface	1.0	22.9 22.9	8.3 8.3	8.3	35.0 35.0	35.0	93.7 93.7	93.7	6.6 6.6	6.6	6.6	0.7 0.7	0.7	0.9	12.1 11.9	12.0	12.6
				Middle	8.9	22.3 22.3	8.4 8.4	8.4	35.4 35.4	35.4	92.5 92.5	92.5	6.6 6.6	6.6		1.0 1.0	1.0		17.1 17.9	17.5	
				Bottom	17.0	22.3 22.3	8.4 8.4	8.4	35.4 35.4	35.4	92.6 92.6	92.6	6.6 6.6	6.6		1.1 1.1	1.1		18.7 18.5	18.6	
C2	Sunny	Calm	09:03	Surface	1.1	23.2 23.2	8.2 8.3	8.3	34.6 34.6	34.6	95.1 94.7	94.9	6.7 6.6	6.6	6.5	0.6 0.6	0.6	1.1	11.0 11.0	11.0	16.2
				Middle	16.0	22.5 22.5	8.3 8.3	8.3	35.1 35.2	35.1	90.3 90.3	90.3	6.4 6.4	6.4		1.3 1.2	1.2		19.0 19.1	19.1	
				Bottom	31.0	22.3 22.3	8.3 8.3	8.3	35.4 35.4	35.4	90.5 90.6	90.6	6.4 6.4	6.4		1.6 1.6	1.6		18.7 18.5	18.6	
G1	Sunny	Calm	08:27	Surface	1.0	23.5 23.5	8.3 8.3	8.3	35.0 35.0	35.0	101.4 101.4	101.4	7.1 7.1	7.1	7.0	0.5 0.5	0.5	0.6	16.5 16.5	16.5	13.3
				Middle	4.1	23.2 23.2	8.3 8.3	8.3	35.1 35.1	35.1	100.3 99.8	100.1	7.0 7.0	7.0		0.4 0.4	0.5		12.7 12.7	12.7	
				Bottom	6.9	22.6 22.6	8.3 8.3	8.3	35.3 35.4	35.3	93.5 93.3	93.4	6.6 6.6	6.6		0.9 1.0	0.9		10.3 11.0	10.7	
G2	Sunny	Calm	08:16	Surface	1.0	22.9 22.8	8.3 8.3	8.3	35.2 35.3	35.2	98.4 98.5	98.5	6.9 6.9	6.9	6.9	0.4 0.4	0.4	0.5	6.7 6.6	6.7	9.4
				Middle	5.1	22.4 22.4	8.3 8.3	8.3	35.3 35.3	35.3	96.5 96.4	96.5	6.8 6.8	6.8		0.5 0.5	0.5		16.1 16.2	16.2	
				Bottom	9.0	22.3 22.3	8.3 8.3	8.3	35.4 35.4	35.4	95.3 95.1	95.2	6.8 6.7	6.7		0.6 0.6	0.6		5.7 5.2	5.5	
G3	Sunny	Calm	08:32	Surface	1.0	23.5 23.4	8.3 8.3	8.3	34.9 34.9	34.9	100.3 100.2	100.3	7.0 7.0	7.0	7.0	0.6 0.5	0.5	0.6	10.3 10.3	10.3	12.3
				Middle	4.0	23.2 23.1	8.3 8.3	8.3	35.1 35.1	35.1	99.3 99.0	99.2	6.9 6.9	6.9		0.5 0.5	0.5		13.2 13.5	13.4	
				Bottom	7.0	22.5 22.5	8.3 8.3	8.3	35.4 35.4	35.4	96.0 95.3	95.7	6.8 6.7	6.8		0.9 0.9	0.9		13.3 13.3	13.3	
G4	Sunny	Calm	08:49	Surface	1.0	23.4 23.4	8.3 8.3	8.3	35.0 35.0	35.0	101.4 101.4	101.4	7.1 7.1	7.1	7.0	0.4 0.4	0.4	0.8	20.0 20.3	20.2	17.0
				Middle	4.0	22.6 22.6	8.3 8.3	8.3	35.3 35.3	35.3	98.0 97.7	97.9	6.9 6.9	6.9		0.8 0.8	0.8		22.1 22.6	22.4	
				Bottom	7.0	22.2 22.2	8.3 8.3	8.3	35.5 35.6	35.5	95.7 95.6	95.7	6.8 6.8	6.8		1.2 1.3	1.2		8.4 8.5	8.5	
M1	Sunny	Calm	08:20	Surface	1.1	23.4 23.4	8.3 8.3	8.3	35.0 35.0	35.0	98.4 98.4	98.4	6.9 6.9	6.9	6.8	0.8 0.7	0.8	0.8	24.1 24.2	24.2	17.3
				Middle	3.0	23.3 23.3	8.3 8.3	8.3	35.1 35.1	35.1	98.1 98.1	98.1	6.8 6.8	6.8		0.8 0.8	0.8		5.7 6.1	5.9	
				Bottom	5.0	23.1 23.1	8.3 8.3	8.3	35.2 35.2	35.2	96.7 96.6	96.7	6.8 6.8	6.8		0.8 0.8	0.8		21.8 22.1	22.0	
M2	Sunny	Calm	08:10	Surface	1.0	22.6 22.6	8.3 8.3	8.3	35.3 35.3	35.3	95.0 94.9	95.0	6.7 6.7	6.7	6.7	3.9 3.8	3.8	1.8	18.0 17.2	17.6	11.4
				Middle	6.1	22.4 22.4	8.3 8.3	8.3	35.4 35.4	35.4	94.4 94.3	94.4	6.7 6.7	6.7		1.0 1.0	1.0		8.7 8.8	8.8	
				Bottom	11.0	22.3 22.3	8.3 8.3	8.3	35.4 35.4	35.4	94.3 94.3	94.3	6.7 6.7	6.7		0.7 0.7	0.7		8.0 7.8	7.9	
M3	Sunny	Calm	08:45	Surface	1.0	23.7 23.7	8.3 8.3	8.3	34.6 34.6	34.6	100.5 100.5	100.5	7.0 7.0	7.0	6.9	0.5 0.5	0.5	0.9	8.9 9.4	9.2	7.7
				Middle	4.1	22.8 22.8	8.3 8.3	8.3	35.3 35.3	35.3	97.3 97.4	97.4	6.8 6.8	6.8		1.0 1.0	1.0		6.8 7.3	7.1	
				Bottom	7.0	22.3 22.3	8.3 8.3	8.3	35.5 35.5	35.5	93.4 93.5	93.5	6.6 6.6	6.6		1.3 1.3	1.3		6.8 6.7	6.8	
M4	Sunny	Calm	08:00	Surface	1.1	22.4 22.4	8.3 8.3	8.3	35.2 35.2	35.2	93.6 93.6	93.6	6.6 6.6	6.6	6.6	0.9 0.9	0.9	1.0	21.9 22.1	22.0	9.2
				Middle	5.0	22.2 22.2	8.3 8.3	8.3	35.4 35.4	35.4	93.3 93.3	93.3	6.6 6.6	6.6		1.0 1.0	1.0		3.0 3.0	3.0	
				Bottom	9.0	22.2 22.2	8.3 8.3	8.3	35.4 35.4	35.4	92.9 92.9	92.9	6.6 6.6	6.6		1.3 1.3	1.3		2.6 2.8	2.7	
M5	Sunny	Calm	08:55	Surface	1.0	23.0 23.0	8.3 8.3	8.3	35.1 35.1	35.1	99.8 99.6	99.7	7.0 7.0	7.0	6.9	0.4 0.4	0.4	0.4	17.9 17.9	17.9	15.5
				Middle	6.1	22.6 22.6	8.3 8.3	8.3	35.2 35.2	35.2	97.8 97.7	97.8	6.9 6.9	6.9		0.3 0.3	0.3		18.2 18.1	18.2	
				Bottom	11.0	22.6 22.6	8.4 8.4	8.4	35.3 35.3	35.3	96.6 96.6	96.6	6.8 6.8	6.8		0.4 0.4	0.4		10.0 10.6	10.3	
M6	Sunny	Calm	08:54	Surface	-	-	-	-	-	-	-	-	-	-	6.9	-	-	0.7	-	-	9.4
				Middle	2.1	22.9 22.9	8.3 8.3	8.3	35.2 35.2	35.2	97.6 97.6	97.6	6.9 6.9	6.9		0.7 0.6	0.7		9.5 9.3	9.4	
				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 10 April 2019 (Mid-Ebb Tide)

Parameter (unit)	Depth	Action Level	Limit Level
DO in mg/L (See Note 1 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Depth Average	<u>4.9 mg/L</u>	<u>4.6 mg/L</u>
	Bottom	<u>4.2 mg/L</u>	<u>3.6 mg/L</u>
	<u>Station M6</u>		
	Intake Level	<u>5.0 mg/L</u>	<u>4.7 mg/L</u>
Turbidity in NTU (See Note 2 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>19.3 NTU</u>	<u>22.2 NTU</u>
		or 120% of upstream control station's Turbidity at the same tide of the same day <u>C2: 3.6 NTU</u>	or 130% of upstream control station's Turbidity at the same tide of the same day <u>C2: 3.9 NTU</u>
	<u>Station M6</u>		
	Intake Level	<u>19.0 NTU</u>	<u>19.4 NTU</u>
SS in mg/L (See Note 2 and 4)	<u>Stations G1-G4</u>		
	Surface	<u>6.0 mg/L</u>	<u>6.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>C2: 15.5 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>C2: 16.8 mg/L</u>
	<u>Stations M1-M5</u>		
	Surface	<u>6.2 mg/L</u>	<u>7.4 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>C2: 15.5 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>C2: 16.8 mg/L</u>
	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>6.9 mg/L</u>	<u>7.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>C2: 0.0 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>C2: 0.0 mg/L</u>
	<u>Station M6</u>		
Intake Level	<u>8.3 mg/L</u>	<u>8.6 mg/L</u>	

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 10 April 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	15:35	Surface	1.1	23.6 23.6	23.6	8.3 8.3	8.3	34.0 34.0	34.0	101.0 101.0	101.0	7.1 7.1	7.1	6.9	0.6 0.6	0.6	0.9	12.0 12.4	12.2	10.5
				Middle	9.0	22.6 22.6	22.6	8.3 8.3	8.3	35.1 35.1	35.1	95.7 95.7	95.7	6.8 6.8	6.8	1.1 1.1	1.1	9.7 9.6		9.7		
				Bottom	17.1	22.4 22.4	22.4	8.3 8.3	8.3	35.3 35.3	35.3	95.3 95.4	95.4	6.7 6.7	6.7	1.2 1.1	1.2	9.8 9.5		9.7		
C2	Sunny	Moderate	15:53	Surface	1.0	23.8 23.8	23.8	8.4 8.3	8.3	33.7 33.7	33.7	100.8 101.0	100.9	7.0 7.0	7.0	7.0	1.0 1.0	1.0	1.7	12.8 13.1	13.0	9.1
				Middle	16.0	23.8 23.8	23.8	8.3 8.3	8.3	33.7 33.7	33.7	100.9 101.0	101.0	7.0 7.0	7.0	1.0 1.0	1.0	7.7 7.9		7.8		
				Bottom	31.1	23.8 23.8	23.8	8.3 8.3	8.3	33.7 33.7	33.7	100.8 100.9	100.9	7.0 7.0	7.0	3.1 3.0	3.0	6.3 6.5		6.4		
G1	Sunny	Moderate	15:11	Surface	1.1	23.7 23.7	23.7	8.3 8.3	8.3	34.6 34.6	34.6	107.7 107.7	107.7	7.5 7.5	7.5	7.4	0.5 0.5	0.5	0.8	19.8 20.0	19.9	13.7
				Middle	4.0	23.0 23.0	23.0	8.3 8.3	8.3	34.9 34.9	34.9	103.3 103.3	103.3	7.2 7.3	7.2	0.8 0.8	0.8	4.4 4.5		4.5		
				Bottom	7.0	22.8 22.5	22.7	8.3 8.3	8.3	35.1 35.3	35.2	102.1 100.5	101.3	7.2 7.1	7.1	1.2 1.3	1.2	16.8 16.6		16.7		
G2	Sunny	Moderate	15:03	Surface	1.0	23.7 23.7	23.7	8.3 8.3	8.3	34.6 34.6	34.6	107.3 107.4	107.4	7.5 7.5	7.5	7.4	0.6 0.6	0.6	0.6	8.7 8.6	8.7	8.5
				Middle	5.0	23.2 23.0	23.1	8.3 8.3	8.3	34.8 34.8	34.8	105.5 104.9	105.2	7.4 7.4	7.4	0.6 0.6	0.6	8.6 8.4		8.5		
				Bottom	9.0	22.5 22.4	22.4	8.3 8.3	8.3	35.3 35.3	35.3	100.3 100.2	100.3	7.1 7.1	7.1	0.7 0.7	0.7	8.4 8.2		8.3		
G3	Sunny	Moderate	15:13	Surface	1.1	23.7 23.6	23.6	8.3 8.3	8.3	34.6 34.7	34.6	105.8 105.8	105.8	7.3 7.4	7.3	7.3	0.7 0.7	0.7	1.0	10.9 11.3	11.1	7.0
				Middle	4.1	23.2 23.0	23.1	8.3 8.3	8.3	34.9 34.9	34.9	103.5 101.9	102.7	7.2 7.1	7.2	1.0 1.1	1.1	5.2 5.4		5.3		
				Bottom	7.1	22.6 22.5	22.5	8.3 8.3	8.3	35.2 35.3	35.2	99.5 99.0	99.3	7.0 7.0	7.0	1.1 1.4	1.4	4.5 4.6		4.6		
G4	Sunny	Moderate	15:20	Surface	1.0	23.7 23.7	23.7	8.3 8.3	8.3	34.6 34.6	34.6	106.6 106.7	106.7	7.4 7.4	7.4	7.3	0.5 0.5	0.5	0.7	11.4 11.5	11.5	6.7
				Middle	4.1	23.4 22.8	23.1	8.3 8.3	8.3	34.7 35.0	34.9	102.5 102.1	102.3	7.2 7.2	7.2	0.7 0.8	0.8	3.9 4.0		4.0		
				Bottom	7.0	22.7 22.6	22.6	8.3 8.3	8.3	35.1 35.2	35.1	101.8 101.7	101.8	7.2 7.2	7.2	0.7 0.7	0.7	4.6 4.7		4.7		
M1	Sunny	Moderate	15:08	Surface	1.0	23.6 23.6	23.6	8.3 8.3	8.3	34.8 34.8	34.8	102.7 102.7	102.7	7.1 7.1	7.1	7.2	2.3 2.3	2.3	2.1	9.6 9.5	9.6	16.7
				Middle	3.0	23.5 23.5	23.5	8.3 8.3	8.3	34.8 34.8	34.8	102.9 102.9	102.9	7.2 7.2	7.2	2.1 2.1	2.1	11.8 12.0		11.9		
				Bottom	5.0	23.4 23.4	23.4	8.3 8.3	8.3	34.8 34.8	34.8	102.4 102.0	102.2	7.1 7.1	7.1	2.0 1.9	1.9	28.3 28.6		28.6		
M2	Sunny	Moderate	15:00	Surface	1.1	23.4 23.4	23.4	8.3 8.3	8.3	34.8 34.8	34.8	104.2 104.3	104.3	7.3 7.3	7.3	7.2	0.6 0.6	0.6	0.9	16.4 16.8	16.6	13.8
				Middle	6.0	22.6 22.5	22.6	8.3 8.3	8.3	35.2 35.2	35.2	100.5 100.0	100.3	7.1 7.1	7.1	0.9 1.0	1.0	13.4 13.6		13.5		
				Bottom	11.1	22.4 22.3	22.3	8.3 8.3	8.3	35.4 35.4	35.4	98.6 98.1	98.4	7.0 6.9	7.0	1.2 1.3	1.3	11.4 11.1		11.3		
M3	Sunny	Moderate	15:16	Surface	1.1	23.7 23.8	23.7	8.3 8.3	8.3	34.3 34.3	34.3	96.9 98.0	97.5	6.7 6.8	6.8	6.9	0.6 0.6	0.6	1.2	11.8 11.8	11.8	7.3
				Middle	4.0	22.8 22.8	22.8	8.3 8.3	8.3	35.1 35.1	35.1	98.3 98.9	98.6	6.9 7.0	6.9	1.2 1.3	1.3	9.2 9.5		9.4		
				Bottom	7.0	22.5 22.4	22.5	8.3 8.3	8.3	35.2 35.3	35.3	98.2 97.9	98.1	6.9 6.9	6.9	1.7 1.8	1.8	0.7 0.7		0.7		
M4	Sunny	Moderate	14:56	Surface	1.0	23.3 23.3	23.3	8.4 8.4	8.4	34.9 34.9	34.9	103.0 103.1	103.1	7.2 7.2	7.2	7.2	0.2 0.2	0.2	0.5	6.1 6.0	6.1	9.5
				Middle	5.1	23.0 23.0	23.0	8.3 8.3	8.3	35.0 35.0	35.0	102.4 102.4	102.4	7.2 7.2	7.2	0.6 0.6	0.6	7.9 7.8		7.9		
				Bottom	9.0	22.6 22.6	22.6	8.3 8.3	8.3	35.2 35.2	35.2	100.1 100.1	100.1	7.1 7.1	7.1	0.7 0.7	0.7	14.3 14.6		14.5		
M5	Sunny	Moderate	15:30	Surface	1.0	23.2 23.2	23.2	8.3 8.3	8.3	34.7 34.7	34.7	99.6 99.6	99.6	7.0 7.0	7.0	7.0	0.6 0.6	0.6	0.8	4.2 4.3	4.3	7.9
				Middle	6.1	23.1 23.1	23.1	8.3 8.3	8.3	34.7 34.7	34.7	99.7 99.8	99.8	7.0 7.0	7.0	0.8 0.8	0.8	3.9 3.9		3.9		
				Bottom	11.1	23.1 23.1	23.1	8.3 8.3	8.3	34.7 34.7	34.7	99.9 99.9	99.9	7.0 7.0	7.0	0.9 0.8	0.8	15.9 15.3		15.6		
M6	Sunny	Moderate	15:23	Surface	-	-	-	-	-	-	-	-	-	-	-	7.2	-	-	0.8	-	-	17.3
				Middle	2.1	23.5 23.5	23.5	8.3 8.3	8.3	34.7 34.7	34.7	103.7 103.8	103.8	7.2 7.2	7.2	0.8 0.8	0.8	16.9 17.6		17.3		
				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 10 April 2019 (Mid-Flood Tide)

Parameter (unit)	Depth	Action Level	Limit Level
DO in mg/L (See Note 1 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Depth Average	<u>4.9 mg/L</u>	<u>4.6 mg/L</u>
	Bottom	<u>4.2 mg/L</u>	<u>3.6 mg/L</u>
	<u>Station M6</u>		
	Intake Level	<u>5.0 mg/L</u>	<u>4.7 mg/L</u>
Turbidity in NTU (See Note 2 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>19.3 NTU</u>	<u>22.2 NTU</u>
		or 120% of upstream control station's Turbidity at the same tide of the same day <u>CI: 2.1 NTU</u>	or 130% of upstream control station's Turbidity at the same tide of the same day <u>CI: 2.3 NTU</u>
	<u>Station M6</u>		
	Intake Level	<u>19.0 NTU</u>	<u>19.4 NTU</u>
SS in mg/L (See Note 2 and 4)	<u>Stations G1-G4</u>		
	Surface	<u>6.0 mg/L</u>	<u>6.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>CI: 8.1 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>CI: 8.8 mg/L</u>
	<u>Stations M1-M5</u>		
	Surface	<u>6.2 mg/L</u>	<u>7.4 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>CI: 8.1 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>CI: 8.8 mg/L</u>
	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>6.9 mg/L</u>	<u>7.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>CI: 5.2 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>CI: 5.7 mg/L</u>
	<u>Station M6</u>		
Intake Level	<u>8.3 mg/L</u>	<u>8.6 mg/L</u>	

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 10 April 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	10:22	Surface	1.0	23.1 23.0	23.0	8.3 8.4	8.3	34.5 34.5	34.5	97.0 97.8	97.4	6.8 6.8	6.8	6.9	0.8 0.8	0.8	1.1	6.6 6.9	6.8	5.4
				Middle	9.0	22.6 22.6	22.6	8.4 8.4	8.4	35.1 35.1	35.1	97.2 97.6	97.4	6.9 6.9	6.9		0.7 0.7	0.7		5.3 5.1	5.2	
				Bottom	16.9	22.2 22.2	22.2	8.4 8.4	8.4	35.6 35.6	35.6	95.3 95.3	95.3	6.8 6.8	6.8		1.8 1.7	1.8		4.4 4.3	4.4	
C2	Sunny	Moderate	09:18	Surface	1.0	23.1 23.1	23.1	8.2 8.3	8.3	34.4 34.5	34.4	93.9 95.6	94.8	6.6 6.7	6.7	6.6	0.6 0.7	0.7	1.6	2.2 2.3	2.3	11.3
				Middle	16.0	22.7 22.7	22.7	8.3 8.3	8.3	34.8 34.8	34.8	93.5 93.8	93.7	6.6 6.6	6.6		0.7 0.7	0.7		21.8 22.2	22.0	
				Bottom	31.1	22.3 22.3	22.3	8.3 8.3	8.3	35.4 35.4	35.4	94.2 94.2	94.2	6.7 6.7	6.7		3.5 3.4	3.4		9.7 9.8	9.8	
G1	Sunny	Moderate	09:52	Surface	1.1	23.5 23.3	23.4	8.3 8.3	8.3	34.3 34.4	34.3	97.9 98.0	98.0	6.8 6.9	6.8	6.8	0.4 0.4	0.4	0.5	12.8 13.4	13.1	9.5
				Middle	4.0	23.1 23.1	23.1	8.3 8.3	8.3	34.6 34.6	34.6	97.0 97.4	97.2	6.8 6.8	6.8		0.5 0.5	0.5		6.3 6.4	6.4	
				Bottom	7.0	22.9 22.9	22.9	8.3 8.3	8.3	34.8 34.7	34.7	95.6 96.1	95.9	6.7 6.8	6.7		0.6 0.7	0.7		8.9 8.9	8.9	
G2	Sunny	Moderate	09:40	Surface	1.0	23.1 23.0	23.0	8.3 8.3	8.3	34.6 34.6	34.6	97.4 96.9	97.2	6.8 6.8	6.8	6.8	0.7 0.8	0.8	0.9	8.1 8.2	8.2	5.9
				Middle	5.0	22.6 22.7	22.6	8.3 8.3	8.3	35.1 34.9	35.0	95.2 95.6	95.4	6.7 6.7	6.7		0.7 0.8	0.7		5.9 5.8	5.9	
				Bottom	9.0	22.3 22.4	22.3	8.4 8.4	8.4	35.3 35.3	35.3	95.3 95.5	95.4	6.7 6.8	6.8		1.2 1.1	1.1		3.8 3.8	3.8	
G3	Sunny	Moderate	09:56	Surface	1.0	23.3 23.3	23.3	8.3 8.3	8.3	34.4 34.4	34.4	97.7 97.9	97.8	6.8 6.9	6.8	6.8	0.8 0.9	0.9	0.9	5.7 5.8	5.8	8.3
				Middle	4.0	23.2 23.3	23.2	8.3 8.3	8.3	34.7 34.5	34.6	97.7 97.8	97.8	6.8 6.8	6.8		1.0 0.9	1.0		7.0 6.8	6.9	
				Bottom	7.0	23.0 23.0	23.0	8.3 8.3	8.3	34.7 34.7	34.7	96.5 96.6	96.6	6.8 6.8	6.8		0.9 0.9	0.9		12.3 12.1	12.2	
G4	Sunny	Moderate	10:04	Surface	1.0	23.3 23.2	23.2	8.3 8.3	8.3	34.4 34.4	34.4	97.1 96.9	97.0	6.8 6.8	6.8	6.8	0.3 0.3	0.3	0.4	8.5 8.9	8.7	12.5
				Middle	4.0	23.1 23.1	23.1	8.3 8.3	8.3	34.6 34.6	34.6	96.5 96.4	96.5	6.8 6.8	6.8		0.4 0.4	0.4		14.5 14.4	14.5	
				Bottom	7.0	23.0 23.0	23.0	8.3 8.3	8.3	34.7 34.7	34.7	96.2 96.5	96.4	6.8 6.8	6.8		0.5 0.5	0.5		14.6 14.1	14.4	
M1	Sunny	Moderate	09:47	Surface	1.0	23.2 23.2	23.2	8.3 8.3	8.3	34.6 34.6	34.6	97.2 96.5	96.9	6.8 6.8	6.8	6.8	0.8 0.8	0.8	0.8	8.1 8.3	8.2	6.3
				Middle	3.0	23.2 23.2	23.2	8.3 8.3	8.3	34.7 34.7	34.7	96.6 96.2	96.4	6.8 6.7	6.7		0.7 0.7	0.7		5.2 5.0	5.1	
				Bottom	5.0	23.2 23.1	23.2	8.3 8.3	8.3	34.7 34.8	34.7	95.8 95.3	95.6	6.7 6.7	6.7		0.9 1.1	1.0		5.4 5.5	5.5	
M2	Sunny	Moderate	09:35	Surface	1.1	23.1 23.1	23.1	8.3 8.3	8.3	34.6 34.7	34.6	98.1 97.4	97.8	6.9 6.8	6.9	6.8	0.7 0.8	0.8	1.2	12.2 12.4	12.3	16.1
				Middle	6.0	22.4 22.5	22.5	8.4 8.4	8.4	35.2 35.2	35.2	95.1 95.1	95.1	6.7 6.7	6.7		0.9 1.0	0.9		9.2 9.2	9.2	
				Bottom	11.0	22.2 22.2	22.2	8.4 8.4	8.4	35.5 35.5	35.5	95.3 95.1	95.2	6.8 6.7	6.8		1.8 1.8	1.8		26.3 27.4	26.9	
M3	Sunny	Moderate	10:00	Surface	1.0	23.3 23.3	23.3	8.3 8.3	8.3	34.4 34.4	34.4	98.0 97.9	98.0	6.9 6.9	6.9	6.8	0.8 0.9	0.8	1.0	4.3 4.4	4.4	6.6
				Middle	4.0	23.2 23.2	23.2	8.3 8.3	8.3	34.6 34.7	34.6	97.6 97.1	97.4	6.8 6.8	6.8		1.0 1.0	1.0		10.4 10.3	10.4	
				Bottom	7.0	23.1 23.0	23.1	8.3 8.3	8.3	34.9 34.9	34.9	95.7 95.7	95.7	6.7 6.7	6.7		1.1 1.0	1.0		4.8 5.1	5.0	
M4	Sunny	Moderate	09:28	Surface	1.0	22.9 23.0	23.0	8.3 8.3	8.3	34.8 34.7	34.7	96.3 97.6	97.0	6.8 6.9	6.8	6.8	0.8 0.8	0.8	1.0	9.0 8.7	8.9	10.3
				Middle	5.0	22.3 22.8	22.5	8.3 8.3	8.3	35.4 34.9	35.1	95.2 96.3	95.8	6.8 6.8	6.8		1.2 1.0	1.1		10.1 10.3	10.2	
				Bottom	9.0	22.5 22.3	22.4	8.3 8.4	8.3	35.2 35.4	35.3	95.4 95.0	95.2	6.7 6.7	6.7		1.1 1.2	1.2		11.8 12.1	12.0	
M5	Sunny	Moderate	10:16	Surface	1.0	23.2 23.2	23.2	8.3 8.3	8.3	34.4 34.4	34.4	97.2 97.3	97.3	6.8 6.8	6.8	6.8	0.2 0.3	0.3	0.6	4.8 4.7	4.8	7.2
				Middle	6.1	23.0 23.1	23.1	8.3 8.3	8.3	34.7 34.7	34.7	97.3 97.5	97.4	6.8 6.8	6.8		0.2 0.3	0.3		4.9 4.9	4.9	
				Bottom	11.0	22.2 22.4	22.3	8.4 8.4	8.4	35.5 35.3	35.4	95.2 95.8	95.5	6.8 6.8	6.8		1.4 1.3	1.4		11.7 12.0	11.9	
M6	Sunny	Moderate	10:10	Surface	-	-	-	-	-	-	-	-	-	-	6.8	-	-	0.5	-	-	6.3	
				Middle	2.0	23.1 23.0	23.0	8.3 8.3	8.3	34.6 34.6	34.6	97.2 97.2	97.2	6.8 6.8		6.8	0.6 0.5		0.5	6.2 6.3		6.3
				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 12 April 2019 (Mid-Ebb Tide)

Parameter (unit)	Depth	Action Level	Limit Level
DO in mg/L (See Note 1 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Depth Average	<u>4.9 mg/L</u>	<u>4.6 mg/L</u>
	Bottom	<u>4.2 mg/L</u>	<u>3.6 mg/L</u>
	<u>Station M6</u>		
	Intake Level	<u>5.0 mg/L</u>	<u>4.7 mg/L</u>
Turbidity in NTU (See Note 2 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>19.3 NTU</u>	<u>22.2 NTU</u>
		or 120% of upstream control station's Turbidity at the same tide of the same day <u>C2: 2.2 NTU</u>	or 130% of upstream control station's Turbidity at the same tide of the same day <u>C2: 2.4 NTU</u>
	<u>Station M6</u>		
	Intake Level	<u>19.0 NTU</u>	<u>19.4 NTU</u>
SS in mg/L (See Note 2 and 4)	<u>Stations G1-G4</u>		
	Surface	<u>6.0 mg/L</u>	<u>6.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>C2: 8.6 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>C2: 9.3 mg/L</u>
	<u>Stations M1-M5</u>		
	Surface	<u>6.2 mg/L</u>	<u>7.4 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>C2: 8.6 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>C2: 9.3 mg/L</u>
	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>6.9 mg/L</u>	<u>7.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>C2: 7.0 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>C2: 7.5 mg/L</u>
	<u>Station M6</u>		
Intake Level	<u>8.3 mg/L</u>	<u>8.6 mg/L</u>	

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 April 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	Rainy	Calm	17:18	Surface	1.0	23.0 23.0	23.0	8.5 8.4	8.4	34.6 34.7	34.7	106.9 107.3	107.1	7.5 7.5	7.5	7.4	1.9 1.7	1.8	1.7	6.6 5.9	6.3	5.4
				Middle	9.1	22.8 22.8	22.8	8.4 8.4	8.4	35.0 35.0	35.0	102.2 102.1	102.2	7.2 7.2	7.2		1.7 1.7	1.7		6.2 5.3	5.8	
				Bottom	17.0	22.8 22.8	22.8	8.4 8.4	8.4	35.0 35.0	35.0	101.2 100.9	101.1	7.1 7.1	7.1		1.7 1.7	1.7		4.0 4.1	4.1	
C2	Rainy	Calm	16:13	Surface	1.0	23.0 23.0	23.0	8.2 8.4	8.3	34.6 34.7	34.6	105.1 106.7	105.9	7.4 7.5	7.4	7.1	1.6 1.5	1.6	1.8	6.9 7.4	7.2	7.5
				Middle	16.5	22.6 22.6	22.6	8.3 8.4	8.4	35.4 35.2	35.3	94.6 96.6	95.6	6.7 6.8	6.7		1.8 1.8	1.8		8.9 9.9	9.4	
				Bottom	32.0	22.5 22.6	22.6	8.3 8.4	8.4	35.4 35.4	35.4	94.4 96.1	95.3	6.7 6.8	6.7		1.9 1.8	1.9		5.4 6.2	5.8	
G1	Rainy	Calm	16:45	Surface	1.0	22.7 22.8	22.7	8.4 8.4	8.4	33.9 34.3	34.1	100.3 97.8	99.1	7.1 6.9	7.0	7.0	2.6 2.6	2.6	3.0	21.6 21.3	21.5	10.9
				Middle	4.0	22.8 22.8	22.8	8.4 8.4	8.4	34.9 34.7	34.8	98.1 98.7	98.4	6.9 7.0	6.9		3.9 3.3	3.6		7.0 7.2	7.1	
				Bottom	7.1	22.7 22.7	22.7	8.4 8.4	8.4	35.2 35.1	35.2	95.7 95.9	95.8	6.7 6.8	6.7		2.7 3.0	2.9		4.3 4.2	4.3	
G2	Rainy	Calm	16:35	Surface	1.0	22.9 22.9	22.9	8.4 8.4	8.4	34.5 34.5	34.5	103.8 103.9	103.9	7.3 7.3	7.3	7.3	1.7 1.7	1.7	1.7	5.4 5.4	5.4	6.6
				Middle	5.1	22.9 22.9	22.9	8.4 8.4	8.4	34.6 34.6	34.6	104.5 104.1	104.3	7.4 7.3	7.3		1.6 1.7	1.7		10.4 9.9	10.2	
				Bottom	9.0	22.8 22.8	22.8	8.4 8.4	8.4	34.8 34.8	34.8	98.2 98.1	98.2	6.9 6.9	6.9		1.9 1.9	1.9		4.3 4.4	4.4	
G3	Rainy	Calm	16:50	Surface	1.1	22.7 22.7	22.7	8.4 8.4	8.4	34.5 34.8	34.6	97.9 94.2	96.1	6.9 6.6	6.8	6.8	2.3 2.3	2.3	2.3	5.5 6.0	5.8	4.0
				Middle	4.2	22.7 22.8	22.8	8.4 8.4	8.4	35.0 34.6	34.8	95.8 95.1	95.5	6.8 6.7	6.7		2.3 2.4	2.4		3.7 3.4	3.6	
				Bottom	7.0	22.6 22.7	22.6	8.4 8.4	8.4	35.3 35.2	35.2	93.7 94.0	93.9	6.6 6.6	6.6		2.3 2.4	2.4		2.8 2.5	2.7	
G4	Rainy	Calm	16:58	Surface	1.0	22.7 22.7	22.7	8.4 8.4	8.4	34.8 34.8	34.8	97.7 95.6	96.7	6.9 6.8	6.8	6.8	2.1 2.1	2.1	2.1	3.6 3.7	3.7	5.4
				Middle	4.0	22.7 22.7	22.7	8.4 8.4	8.4	35.0 35.1	35.1	95.4 95.0	95.2	6.7 6.7	6.7		2.0 2.0	2.0		3.4 3.3	3.4	
				Bottom	7.1	22.6 22.6	22.6	8.4 8.4	8.4	35.2 35.2	35.2	94.9 94.5	94.7	6.7 6.7	6.7		2.3 2.2	2.2		9.1 9.1	9.1	
M1	Rainy	Calm	16:40	Surface	1.1	22.9 22.9	22.9	8.4 8.4	8.4	34.6 34.6	34.6	103.3 102.6	103.0	7.3 7.2	7.3	7.3	1.7 1.7	1.7	1.7	1.1 0.6	0.9	2.9
				Middle	3.0	22.9 22.9	22.9	8.4 8.4	8.4	34.6 34.6	34.6	103.4 103.1	103.3	7.3 7.3	7.3		1.8 1.8	1.7		4.0 4.1	4.1	
				Bottom	5.0	22.9 22.9	22.9	8.4 8.4	8.4	34.6 34.6	34.6	103.4 103.0	103.2	7.3 7.3	7.3		1.7 1.8	1.7		3.7 4.1	3.9	
M2	Rainy	Calm	16:30	Surface	1.1	22.9 22.9	22.9	8.4 8.4	8.4	34.5 34.5	34.5	108.0 106.8	107.4	7.6 7.5	7.6	7.5	1.8 1.7	1.7	1.7	3.0 2.8	2.9	4.4
				Middle	5.3	22.9 22.9	22.9	8.4 8.4	8.4	34.6 34.5	34.6	103.1 106.8	105.0	7.3 7.5	7.4		1.8 1.6	1.7		5.5 6.0	5.8	
				Bottom	9.5	22.9 22.9	22.9	8.4 8.4	8.4	34.7 34.6	34.6	102.5 105.1	103.8	7.2 7.4	7.3		1.8 1.6	1.7		4.1 4.8	4.5	
M3	Rainy	Calm	16:54	Surface	1.1	22.7 22.7	22.7	8.4 8.4	8.4	34.6 35.0	34.8	98.1 95.8	97.0	6.9 6.8	6.8	6.9	2.2 2.3	2.2	2.2	9.4 9.2	9.3	6.5
				Middle	4.0	22.7 22.7	22.7	8.4 8.4	8.4	34.7 34.9	34.8	97.8 97.6	97.7	6.9 6.9	6.9		2.1 1.9	2.0		5.6 5.2	5.4	
				Bottom	7.2	22.6 22.7	22.6	8.4 8.4	8.4	35.3 35.1	35.2	95.9 96.9	96.4	6.8 6.8	6.8		2.4 2.3	2.3		4.6 4.8	4.7	
M4	Rainy	Calm	16:23	Surface	1.0	23.0 23.0	23.0	8.5 8.4	8.4	34.5 34.5	34.5	106.1 106.8	106.5	7.5 7.5	7.5	7.5	1.4 1.4	1.4	2.6	2.8 3.1	3.0	6.2
				Middle	5.1	23.0 23.0	23.0	8.5 8.5	8.5	34.7 34.6	34.6	106.9 107.1	107.0	7.5 7.5	7.5		1.6 1.6	1.6		4.8 4.7	4.8	
				Bottom	9.1	22.9 22.9	22.9	8.4 8.4	8.4	34.7 34.7	34.7	100.3 103.4	101.9	7.1 7.3	7.2		5.0 4.8	4.9		11.1 10.9	11.0	
M5	Rainy	Calm	17:13	Surface	1.0	22.8 22.9	22.8	8.4 8.4	8.4	34.6 34.9	34.7	104.0 103.3	103.7	7.3 7.3	7.3	7.3	1.8 1.8	1.8	1.8	13.7 14.0	13.9	7.2
				Middle	4.0	22.9 22.9	22.9	8.4 8.4	8.4	34.8 34.8	34.8	103.8 103.7	103.8	7.3 7.3	7.3		1.8 1.7	1.7		5.5 5.2	5.4	
				Bottom	7.0	22.8 22.9	22.8	8.4 8.4	8.4	34.9 34.9	34.9	103.4 103.4	103.4	7.3 7.3	7.3		1.8 1.7	1.7		2.8 1.8	2.3	
M6	Rainy	Calm	17:03	Surface	-	-	-	-	-	-	-	-	-	-	-	7.4	-	-	1.8	-	-	4.1
				Middle	2.3	22.7 22.8	22.7	8.4 8.4	8.4	34.5 34.8	34.7	103.5 104.7	104.1	7.3 7.4	7.4		1.8 1.8	1.8		4.1 4.0	4.1	
				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 12 April 2019 (Mid-Flood Tide)

Parameter (unit)	Depth	Action Level	Limit Level
DO in mg/L (See Note 1 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Depth Average	<u>4.9 mg/L</u>	<u>4.6 mg/L</u>
	Bottom	<u>4.2 mg/L</u>	<u>3.6 mg/L</u>
	<u>Station M6</u>		
	Intake Level	<u>5.0 mg/L</u>	<u>4.7 mg/L</u>
Turbidity in NTU (See Note 2 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>19.3 NTU</u>	<u>22.2 NTU</u>
		or 120% of upstream control station's Turbidity at the same tide of the same day <u>CI: 2.6 NTU</u>	or 130% of upstream control station's Turbidity at the same tide of the same day <u>CI: 2.8 NTU</u>
	<u>Station M6</u>		
	Intake Level	<u>19.0 NTU</u>	<u>19.4 NTU</u>
SS in mg/L (See Note 2 and 4)	<u>Stations G1-G4</u>		
	Surface	<u>6.0 mg/L</u>	<u>6.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>CI: 4.5 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>CI: 4.9 mg/L</u>
	<u>Stations M1-M5</u>		
	Surface	<u>6.2 mg/L</u>	<u>7.4 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>CI: 4.5 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>CI: 4.9 mg/L</u>
	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>6.9 mg/L</u>	<u>7.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>CI: 7.1 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>CI: 7.7 mg/L</u>
	<u>Station M6</u>		
Intake Level	<u>8.3 mg/L</u>	<u>8.6 mg/L</u>	

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 April 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	Rainy	Calm	11:01	Surface	1.0	22.9 22.9	22.9	8.4 8.4	8.4	34.6 34.6	34.6	99.8 99.8	99.8	7.0 7.0	7.0	7.0	7.0	1.9 1.9	1.9	2.0	3.8 3.7	3.8	5.9
				Middle	9.0	23.0 23.0	23.0	8.4 8.4	8.4	34.7 34.7	34.7	99.4 99.5	99.5	7.0 7.0	7.0	7.0		1.9 1.9	1.9		7.5 8.3	7.9	
				Bottom	17.1	22.7 22.6	22.6	8.4 8.4	8.4	35.2 35.4	35.3	94.5 94.4	94.5	6.7 6.7	6.7	6.7		2.1 2.2	2.2		6.0 5.9	6.0	
C2	Rainy	Calm	10:06	Surface	1.1	23.0 23.0	23.0	8.2 8.2	8.2	34.5 34.5	34.5	99.2 99.2	99.2	7.0 7.0	7.0	7.0	1.2 1.2	1.2	1.1	12.4 12.3	12.4	6.8	
				Middle	16.0	23.0 23.0	23.0	8.2 8.2	8.2	34.5 34.5	34.5	99.0 99.0	99.0	7.0 7.0	7.0		1.0 1.0	1.0		5.6 4.8	5.2		
				Bottom	31.1	23.0 23.0	23.0	8.2 8.2	8.2	34.5 34.5	34.5	98.8 98.8	98.8	7.0 6.9	6.9		6.9	1.1 1.1		1.1	3.2 2.5		2.9
G1	Rainy	Calm	10:36	Surface	1.0	23.0 23.0	23.0	8.3 8.3	8.3	34.6 34.6	34.6	99.5 99.3	99.4	7.0 7.0	7.0	7.0	1.2 1.2	1.2	1.2	3.7 3.5	3.6	6.1	
				Middle	4.0	22.9 22.9	22.9	8.3 8.3	8.3	34.8 34.7	34.8	98.1 98.7	98.4	6.9 6.9	6.9		1.2 1.2	1.2		6.8 6.2	6.5		
				Bottom	7.1	22.8 22.6	22.7	8.4 8.4	8.4	35.0 35.2	35.1	96.8 95.8	96.3	6.8 6.8	6.8		6.8	1.2 1.2		1.2	8.1 8.4		8.3
G2	Rainy	Calm	10:23	Surface	1.1	23.0 23.0	23.0	8.3 8.3	8.3	34.5 34.5	34.5	99.1 99.1	99.1	7.0 7.0	7.0	6.9	1.0 1.0	1.0	1.1	4.0 4.1	4.1	3.5	
				Middle	5.0	22.7 22.8	22.8	8.3 8.3	8.3	35.0 34.9	34.9	97.5 98.3	97.9	6.9 6.9	6.9		1.0 1.0	1.0		3.3 3.1	3.2		
				Bottom	9.3	22.5 22.5	22.5	8.4 8.4	8.4	35.5 35.5	35.5	95.2 94.6	94.9	6.7 6.7	6.7		6.7	1.3 1.2		1.2	3.5 2.7		3.1
G3	Rainy	Calm	10:37	Surface	1.1	23.0 23.0	23.0	8.4 8.4	8.4	34.6 34.6	34.6	99.0 99.1	99.1	7.0 7.0	7.0	6.9	1.1 1.1	1.1	1.2	5.4 5.3	5.4	5.8	
				Middle	4.1	22.9 22.9	22.9	8.4 8.4	8.4	34.8 34.8	34.8	98.1 97.6	97.9	6.9 6.9	6.9		1.1 1.1	1.1		5.3 5.2	5.3		
				Bottom	7.0	22.6 22.6	22.6	8.4 8.4	8.4	35.2 35.3	35.3	95.3 94.8	95.1	6.7 6.7	6.7		6.7	1.3 1.3		1.3	7.1 6.2		6.7
G4	Rainy	Calm	10:44	Surface	1.0	23.0 23.0	23.0	8.4 8.4	8.4	34.7 34.7	34.7	99.3 97.8	98.6	7.0 6.9	6.9	6.9	1.1 1.2	1.2	1.2	6.2 6.2	6.4	5.9	
				Middle	4.1	22.9 22.8	22.8	8.4 8.4	8.4	34.8 35.0	34.9	98.1 96.2	97.2	6.9 6.8	6.8		1.3 1.2	1.2		4.7 5.5	5.1		
				Bottom	7.0	22.7 22.7	22.7	8.4 8.4	8.4	35.2 35.1	35.1	95.1 95.4	95.3	6.7 6.7	6.7		6.7	1.2 1.2		1.2	6.2 6.2		6.2
M1	Rainy	Calm	10:29	Surface	1.1	23.0 23.0	23.0	8.3 8.3	8.3	34.6 34.7	34.7	96.5 94.7	95.6	6.8 6.7	6.7	6.7	1.5 1.5	1.5	1.5	4.5 4.3	4.4	6.0	
				Middle	3.0	23.0 23.0	23.0	8.3 8.3	8.3	34.7 34.7	34.7	95.6 94.7	95.2	6.7 6.7	6.7		1.4 1.5	1.5		9.7 9.6	9.7		
				Bottom	5.0	22.7 22.9	22.8	8.3 8.3	8.3	35.1 34.8	35.0	94.4 94.3	94.4	6.7 6.6	6.6		6.6	1.5 1.3		1.4	4.0 4.1		4.1
M2	Rainy	Calm	10:19	Surface	1.0	23.0 23.0	23.0	8.3 8.3	8.3	34.5 34.5	34.5	99.4 99.4	99.4	7.0 7.0	7.0	6.9	0.7 0.6	0.6	1.0	7.1 6.7	6.9	5.3	
				Middle	5.6	22.6 22.8	22.7	8.3 8.3	8.3	35.4 35.0	35.2	95.9 97.9	96.9	6.8 6.9	6.8		1.1 1.0	1.0		4.0 4.0	4.0		
				Bottom	10.0	22.5 22.5	22.5	8.4 8.4	8.4	35.5 35.5	35.5	94.9 94.3	94.6	6.7 6.7	6.7		6.7	1.3 1.4		1.4	4.8 4.9		4.9
M3	Rainy	Calm	10:40	Surface	1.0	23.0 23.0	23.0	8.4 8.4	8.4	34.5 34.5	34.5	98.5 98.8	98.7	6.9 6.9	6.9	6.9	1.2 1.1	1.1	1.1	2.8 2.9	2.9	3.1	
				Middle	4.2	22.9 23.0	22.9	8.4 8.4	8.4	34.8 34.7	34.8	97.5 98.2	97.9	6.9 6.9	6.9		1.1 1.1	1.1		1.8 1.9	1.9		
				Bottom	7.1	22.8 22.7	22.7	8.4 8.4	8.4	35.0 35.2	35.1	96.6 96.0	96.3	6.8 6.8	6.8		6.8	1.1 1.1		1.1	5.2 4.2		4.7
M4	Rainy	Calm	10:17	Surface	1.1	23.0 23.0	23.0	8.3 8.3	8.3	34.5 34.5	34.5	99.8 99.3	99.6	7.0 7.0	7.0	6.9	1.1 1.1	1.1	1.1	5.6 5.8	5.7	6.0	
				Middle	5.0	22.6 22.8	22.7	8.3 8.3	8.3	35.2 35.0	35.1	96.9 97.8	97.4	6.8 6.9	6.9		1.1 1.1	1.1		3.8 4.0	3.9		
				Bottom	9.0	22.5 22.5	22.5	8.3 8.3	8.3	35.5 35.5	35.5	94.6 94.7	94.7	6.7 6.7	6.7		6.7	1.2 1.1		1.2	8.8 7.9		8.4
M5	Rainy	Calm	10:46	Surface	1.2	23.0 23.0	23.0	8.4 8.4	8.4	34.7 34.7	34.7	98.0 98.1	98.1	6.9 6.9	6.9	6.9	1.1 1.1	1.1	1.8	11.6 11.5	11.6	10.5	
				Middle	6.0	22.8 22.9	22.9	8.4 8.4	8.4	35.0 34.9	34.9	96.7 97.4	97.1	6.8 6.9	6.8		1.4 1.3	1.4		19.4 19.4	19.4		
				Bottom	11.1	22.7 22.6	22.7	8.4 8.4	8.4	35.1 35.2	35.2	94.4 94.0	94.2	6.7 6.6	6.6		6.6	2.9 3.0		2.9	0.8 0.4		0.6
M6	Rainy	Calm	10:46	Surface	-	-	-	-	-	-	-	-	-	-	-	6.8	-	-	0.8	-	-	3.8	
				Middle	2.1	22.9 22.9	22.9	8.4 8.4	8.4	34.8 34.8	34.8	96.8 97.1	97.0	6.8 6.8	6.8		0.8 0.8	0.8		3.5 4.1	3.8		
				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 15 April 2019 (Mid-Ebb Tide)

Parameter (unit)	Depth	Action Level	Limit Level
DO in mg/L (See Note 1 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Depth Average	<u>4.9 mg/L</u>	<u>4.6 mg/L</u>
	Bottom	<u>4.2 mg/L</u>	<u>3.6 mg/L</u>
	<u>Station M6</u>		
	Intake Level	<u>5.0 mg/L</u>	<u>4.7 mg/L</u>
Turbidity in NTU (See Note 2 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>19.3 NTU</u>	<u>22.2 NTU</u>
		or 120% of upstream control station's Turbidity at the same tide of the same day <u>C2: 2.4 NTU</u>	or 130% of upstream control station's Turbidity at the same tide of the same day <u>C2: 2.6 NTU</u>
	<u>Station M6</u>		
	Intake Level	<u>19.0 NTU</u>	<u>19.4 NTU</u>
SS in mg/L (See Note 2 and 4)	<u>Stations G1-G4</u>		
	Surface	<u>6.0 mg/L</u>	<u>6.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>C2: 2.1 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>C2: 2.3 mg/L</u>
	<u>Stations M1-M5</u>		
	Surface	<u>6.2 mg/L</u>	<u>7.4 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>C2: 2.1 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>C2: 2.3 mg/L</u>
	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>6.9 mg/L</u>	<u>7.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>C2: 7.0 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>C2: 7.5 mg/L</u>
	<u>Station M6</u>		
Intake Level	<u>8.3 mg/L</u>	<u>8.6 mg/L</u>	

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 15 April 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	10:49	Surface	1.0	22.9 23.0	22.9	8.4 8.4	8.4	34.7 34.7	34.7	96.3 95.7	96.0	6.8 6.7	6.8	6.7	1.1 1.1	1.0	1.1	4.6 4.7	4.7	5.4
				Middle	9.1	23.0 23.0	23.0	8.4 8.4	8.4	34.7 34.7	34.7	95.5 95.6	95.6	6.7 6.7	6.7		1.1 1.0	1.1		8.6 8.7	8.7	
				Bottom	16.9	23.1 23.1	23.1	8.4 8.4	8.4	35.2 35.1	35.1	95.9 95.6	95.8	6.7 6.7	6.7		1.4 1.2	1.3		3.3 2.7	3.0	
C2	Cloudy	Moderate	10:56	Surface	1.0	22.9 23.0	23.0	8.4 8.4	8.4	34.7 34.7	34.7	96.3 95.5	96.6	6.9 6.7	6.8	6.7	1.3 1.2	1.3	1.6	1.9 1.6	1.8	6.6
				Middle	16.0	23.0 23.0	23.0	8.4 8.4	8.4	34.7 34.7	34.7	95.3 94.9	95.1	6.7 6.7	6.7		1.5 1.4	1.5		12.3 12.3	12.3	
				Bottom	31.0	23.1 23.1	23.1	8.4 8.4	8.4	35.1 35.1	35.1	95.4 95.2	95.3	6.7 6.7	6.7		2.0 2.0	2.0		6.2 5.4	5.8	
G1	Cloudy	Moderate	10:01	Surface	1.0	22.9 23.0	22.9	8.4 8.4	8.4	34.4 34.6	34.5	96.8 94.3	95.6	6.8 6.6	6.7	6.7	1.3 1.5	1.4	1.7	3.5 3.5	3.5	3.5
				Middle	4.0	23.0 23.0	23.0	8.4 8.4	8.4	34.7 34.5	34.6	94.5 94.3	94.4	6.6 6.6	6.6		1.9 1.7	1.8		4.5 4.5	4.5	
				Bottom	7.1	23.0 23.0	23.0	8.4 8.4	8.4	34.7 34.7	34.7	94.4 94.2	94.3	6.6 6.6	6.6		2.0 1.9	1.9		2.2 3.0	2.6	
G2	Cloudy	Moderate	09:47	Surface	1.0	22.9 23.0	22.9	8.4 8.4	8.4	34.6 34.6	34.6	95.2 94.5	94.9	6.7 6.7	6.7	6.7	1.6 1.6	1.6	1.6	2.1 2.5	2.3	2.8
				Middle	5.0	23.0 23.0	23.0	8.4 8.4	8.4	34.6 34.6	34.6	94.6 94.3	94.5	6.7 6.6	6.6		1.6 1.6	1.6		2.8 2.7	2.8	
				Bottom	9.0	23.0 23.0	23.0	8.4 8.4	8.4	34.7 34.8	34.8	94.9 94.9	94.9	6.7 6.7	6.7		1.5 1.6	1.5		3.1 3.8	3.5	
G3	Cloudy	Moderate	10:05	Surface	1.0	22.9 23.0	23.0	8.4 8.4	8.4	34.6 34.6	34.6	95.0 94.2	94.6	6.7 6.6	6.7	6.7	1.4 1.2	1.3	1.2	6.5 6.9	6.7	4.7
				Middle	4.0	23.0 23.0	23.0	8.4 8.4	8.4	34.6 34.6	34.6	94.4 94.8	94.6	6.6 6.7	6.7		1.2 1.1	1.1		5.9 5.4	5.7	
				Bottom	7.0	23.0 23.0	23.0	8.4 8.4	8.4	34.6 34.6	34.6	93.8 93.9	93.9	6.6 6.6	6.6		1.2 1.2	1.2		1.5 1.7	1.6	
G4	Cloudy	Moderate	10:22	Surface	1.0	22.9 23.0	22.9	8.4 8.4	8.4	34.6 34.6	34.6	94.2 92.7	93.6	6.6 6.5	6.6	6.6	1.2 1.1	1.1	1.5	1.8 2.3	2.1	5.0
				Middle	4.0	23.0 23.0	23.0	8.4 8.4	8.4	34.6 34.6	34.6	93.7 93.3	93.5	6.6 6.6	6.6		1.0 1.0	1.0		3.3 3.0	3.2	
				Bottom	7.0	23.0 23.0	23.0	8.4 8.4	8.4	34.7 34.7	34.7	92.6 90.7	91.7	6.5 6.4	6.4		2.2 2.6	2.4		9.9 9.5	9.7	
M1	Cloudy	Moderate	09:55	Surface	1.0	22.9 23.0	22.9	8.4 8.4	8.4	34.6 34.7	34.6	95.2 92.7	94.0	6.7 6.5	6.6	6.6	1.6 1.7	1.7	1.7	4.2 4.5	4.4	4.4
				Middle	3.0	22.9 23.0	22.9	8.4 8.4	8.4	34.6 34.6	34.6	93.1 91.6	92.4	6.6 6.4	6.5		1.6 1.5	1.6		3.8 3.6	3.7	
				Bottom	5.0	23.0 23.0	23.0	8.4 8.4	8.4	34.7 34.7	34.7	92.9 92.2	92.6	6.5 6.5	6.5		1.9 2.0	2.0		4.6 5.7	5.2	
M2	Cloudy	Moderate	09:41	Surface	1.0	22.9 23.0	22.9	8.4 8.4	8.4	34.6 34.6	34.6	95.1 94.4	94.8	6.7 6.6	6.7	6.7	1.4 1.3	1.3	1.5	15.7 14.9	15.3	8.4
				Middle	6.0	23.0 23.0	23.0	8.4 8.4	8.4	34.7 34.7	34.7	94.7 94.4	94.6	6.7 6.6	6.6		1.2 1.3	1.3		6.5 6.8	6.7	
				Bottom	11.0	23.0 23.0	23.0	8.4 8.4	8.4	34.8 34.7	34.8	94.2 94.2	94.2	6.6 6.6	6.6		2.0 1.7	1.9		3.5 3.2	3.4	
M3	Cloudy	Moderate	10:15	Surface	1.0	23.0 23.0	23.0	8.4 8.4	8.4	34.4 34.4	34.4	94.2 93.4	93.8	6.6 6.6	6.6	6.6	1.2 1.3	1.2	1.2	1.6 2.1	1.9	3.3
				Middle	4.0	23.0 23.0	23.0	8.4 8.4	8.4	34.5 34.6	34.5	93.3 93.0	93.2	6.6 6.5	6.6		1.1 1.2	1.2		4.7 4.8	4.8	
				Bottom	7.0	23.0 23.0	23.0	8.4 8.4	8.4	34.7 34.7	34.7	91.1 91.7	91.4	6.4 6.4	6.4		1.0 1.2	1.1		3.4 3.0	3.2	
M4	Cloudy	Moderate	09:35	Surface	1.0	22.9 23.0	22.9	8.2 8.3	8.3	34.6 34.6	34.6	96.1 94.8	95.5	6.8 6.7	6.7	6.7	1.3 1.1	1.2	1.0	2.7 2.9	2.8	4.3
				Middle	5.0	23.0 23.0	23.0	8.3 8.4	8.3	34.7 34.6	34.7	95.1 94.8	95.0	6.7 6.7	6.7		0.9 1.0	1.0		3.5 3.9	3.7	
				Bottom	8.9	23.0 23.0	23.0	8.3 8.4	8.3	34.8 34.8	34.8	94.9 94.8	94.9	6.7 6.7	6.7		1.1 0.9	1.0		6.2 6.5	6.4	
M5	Cloudy	Moderate	10:40	Surface	1.0	22.9 23.0	23.0	8.4 8.4	8.4	34.7 34.7	34.7	97.5 95.0	96.3	6.9 6.7	6.8	6.7	1.3 1.1	1.2	1.3	10.6 10.4	10.5	5.3
				Middle	5.9	23.1 23.1	23.1	8.4 8.4	8.4	34.9 34.9	34.9	95.6 95.1	95.4	6.7 6.7	6.7		1.5 1.3	1.4		3.4 3.5	3.5	
				Bottom	11.0	23.1 23.1	23.1	8.4 8.4	8.4	35.1 35.2	35.1	95.8 96.3	96.1	6.7 6.7	6.7		1.5 1.2	1.4		2.1 1.9	2.0	
M6	Cloudy	Moderate	10:30	Surface	-	-	-	-	-	-	-	-	-	-	-	6.4	-	-	3.4	-	-	8.0
				Middle	2.0	23.0 23.0	23.0	8.4 8.4	8.4	34.7 34.7	34.7	91.6 90.8	91.2	6.4 6.4	6.4		3.4 3.5	3.4		7.9 8.0	8.0	
				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 15 April 2019 (Mid-Flood Tide)

Parameter (unit)	Depth	Action Level	Limit Level
DO in mg/L (See Note 1 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Depth Average	<u>4.9 mg/L</u>	<u>4.6 mg/L</u>
	Bottom	<u>4.2 mg/L</u>	<u>3.6 mg/L</u>
	<u>Station M6</u>		
	Intake Level	<u>5.0 mg/L</u>	<u>4.7 mg/L</u>
Turbidity in NTU (See Note 2 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>19.3 NTU</u>	<u>22.2 NTU</u>
		or 120% of upstream control station's Turbidity at the same tide of the same day <u>CI: 2.1 NTU</u>	or 130% of upstream control station's Turbidity at the same tide of the same day <u>CI: 2.3 NTU</u>
	<u>Station M6</u>		
	Intake Level	<u>19.0 NTU</u>	<u>19.4 NTU</u>
SS in mg/L (See Note 2 and 4)	<u>Stations G1-G4</u>		
	Surface	<u>6.0 mg/L</u>	<u>6.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>CI: 5.8 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>CI: 6.2 mg/L</u>
	<u>Stations M1-M5</u>		
	Surface	<u>6.2 mg/L</u>	<u>7.4 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>CI: 5.8 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>CI: 6.2 mg/L</u>
	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>6.9 mg/L</u>	<u>7.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>CI: 5.1 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>CI: 5.5 mg/L</u>
	<u>Station M6</u>		
Intake Level	<u>8.3 mg/L</u>	<u>8.6 mg/L</u>	

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 15 April 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	14:11	Surface	1.0	23.0 23.1	23.0	8.5 8.5	8.5	35.0 35.0	35.0	98.9 97.7	98.3	6.9 6.8	6.9	6.9	0.9 0.8	0.9	1.1	4.8 4.8	4.8	4.3
				Middle	9.0	23.1 23.1	23.1	8.5 8.5	8.5	35.0 35.0	35.0	97.9 97.7	97.8	6.9 6.8	6.9		0.6 0.6	0.6		3.7 4.0	3.9	
				Bottom	17.0	23.1 23.1	23.1	8.5 8.5	8.5	35.2 35.2	35.2	96.6 96.1	96.4	6.8 6.7	6.7		1.5 2.0	1.7		4.3 4.2	4.3	
C2	Cloudy	Moderate	14:20	Surface	1.0	23.0 23.0	23.0	8.4 8.4	8.4	34.8 34.8	34.8	96.5 95.8	96.2	6.8 6.7	6.8	6.7	1.0 1.0	1.0	1.0	4.0 3.5	3.8	5.1
				Middle	16.0	23.0 23.0	23.0	8.4 8.4	8.4	34.8 34.8	34.8	95.6 95.5	95.6	6.7 6.7	6.7		0.7 0.9	0.8		4.7 5.3	5.0	
				Bottom	31.0	23.0 23.1	23.0	8.4 8.4	8.4	34.8 35.2	35.0	95.7 96.5	96.1	6.7 6.8	6.7		1.0 1.2	1.1		6.7 6.1	6.4	
G1	Cloudy	Moderate	13:37	Surface	1.0	23.0 23.0	23.0	8.4 8.4	8.4	34.5 34.6	34.5	94.8 94.8	94.8	6.7 6.7	6.7	6.7	1.3 1.5	1.4	1.2	6.2 6.8	6.5	7.6
				Middle	4.0	23.0 23.0	23.0	8.4 8.4	8.4	34.6 34.6	34.6	94.8 94.7	94.8	6.7 6.7	6.7		1.2 1.4	1.3		10.9 10.7	10.8	
				Bottom	7.0	23.0 23.0	23.0	8.4 8.4	8.4	34.7 34.7	34.7	94.7 94.6	94.7	6.7 6.6	6.6		0.9 1.0	1.0		5.6 5.3	5.5	
G2	Cloudy	Moderate	13:25	Surface	1.0	22.9 23.0	23.0	8.4 8.4	8.4	34.7 34.7	34.7	96.1 95.3	95.7	6.7 6.7	6.7	6.7	0.9 0.9	0.9	1.0	2.3 2.2	2.3	5.0
				Middle	5.0	23.0 23.0	23.0	8.4 8.4	8.4	34.7 34.7	34.7	95.8 95.4	95.6	6.7 6.7	6.7		0.9 0.9	0.9		2.4 2.0	2.2	
				Bottom	9.0	23.0 23.0	23.0	8.4 8.4	8.4	34.8 34.7	34.7	94.5 95.1	94.8	6.6 6.7	6.7		1.1 1.0	1.1		10.8 10.5	10.7	
G3	Cloudy	Moderate	13:41	Surface	1.0	23.0 23.0	23.0	8.4 8.4	8.4	34.6 34.6	34.6	95.6 94.5	95.1	6.7 6.6	6.7	6.7	1.3 1.3	1.3	1.5	8.8 9.4	9.1	6.4
				Middle	3.9	23.0 23.0	23.0	8.4 8.4	8.4	34.6 34.6	34.6	94.9 94.5	94.7	6.7 6.6	6.7		1.3 1.3	1.3		6.1 6.4	6.3	
				Bottom	7.0	23.0 23.0	23.0	8.4 8.4	8.4	34.7 34.7	34.7	94.5 94.2	94.4	6.6 6.6	6.6		1.8 1.8	1.8		3.9 3.9	3.9	
G4	Cloudy	Moderate	13:49	Surface	1.0	23.0 23.0	23.0	8.4 8.4	8.4	34.6 34.6	34.6	93.9 91.5	92.7	6.6 6.4	6.5	6.5	1.7 1.6	1.6	1.7	3.3 2.5	2.9	4.4
				Middle	4.0	23.0 23.0	23.0	8.4 8.4	8.4	34.7 34.7	34.7	92.4 91.5	92.0	6.5 6.4	6.5		1.6 1.5	1.6		5.0 5.0	5.0	
				Bottom	7.0	23.1 23.0	23.1	8.4 8.4	8.4	34.9 34.8	34.8	93.3 92.2	92.8	6.5 6.5	6.5		2.2 1.9	2.1		5.2 5.5	5.4	
M1	Cloudy	Moderate	13:31	Surface	1.0	22.9 23.0	22.9	8.4 8.4	8.4	34.4 34.7	34.6	95.8 92.6	94.2	6.8 6.5	6.6	6.6	2.0 1.7	1.9	1.8	6.5 6.5	6.5	6.6
				Middle	3.0	22.9 23.0	23.0	8.4 8.4	8.4	34.6 34.6	34.6	93.6 92.5	93.1	6.6 6.5	6.5		1.9 1.6	1.7		9.0 9.2	9.1	
				Bottom	5.0	23.0 23.0	23.0	8.4 8.4	8.4	34.7 34.7	34.7	92.7 92.5	92.6	6.5 6.5	6.5		1.9 1.7	1.8		4.5 3.9	4.2	
M2	Cloudy	Moderate	13:20	Surface	1.0	22.9 23.0	22.9	8.4 8.4	8.4	34.7 34.7	34.7	97.9 96.1	97.0	6.9 6.8	6.8	6.8	1.1 0.9	1.0	1.3	2.2 2.0	2.1	2.8
				Middle	6.0	23.0 23.0	23.0	8.4 8.4	8.4	34.7 34.7	34.7	96.5 95.7	96.1	6.8 6.7	6.8		1.0 0.9	0.9		3.3 3.4	3.4	
				Bottom	11.0	23.0 23.0	23.0	8.4 8.4	8.4	34.8 34.8	34.8	95.1 93.5	94.3	6.7 6.6	6.6		1.9 2.3	2.1		2.7 3.3	3.0	
M3	Cloudy	Moderate	13:44	Surface	1.0	23.0 23.0	23.0	8.4 8.4	8.4	34.6 34.6	34.6	95.8 93.9	94.9	6.7 6.6	6.7	6.6	1.4 1.1	1.2	1.4	4.3 5.1	4.7	4.5
				Middle	4.0	23.0 23.0	23.0	8.4 8.4	8.4	34.7 34.7	34.7	94.2 94.0	94.1	6.6 6.6	6.6		1.1 0.9	1.0		3.7 4.0	3.9	
				Bottom	7.0	23.0 23.0	23.0	8.4 8.4	8.4	34.8 34.8	34.8	93.9 93.7	93.8	6.6 6.6	6.6		1.9 2.3	2.1		5.1 4.9	5.0	
M4	Cloudy	Moderate	13:12	Surface	1.0	23.0 22.9	23.0	8.4 8.4	8.4	34.7 34.7	34.7	96.0 95.9	96.0	6.8 6.7	6.7	6.7	0.9 1.0	0.9	1.1	8.4 8.7	8.6	5.3
				Middle	5.0	23.0 23.0	23.0	8.4 8.4	8.4	34.7 34.7	34.7	95.6 95.9	95.8	6.7 6.7	6.7		1.0 1.2	1.1		3.3 3.0	3.2	
				Bottom	9.0	23.0 23.0	23.0	8.4 8.4	8.4	34.7 34.7	34.7	95.2 95.4	95.3	6.7 6.7	6.7		1.3 1.3	1.3		4.2 4.2	4.2	
M5	Cloudy	Moderate	14:04	Surface	1.0	23.0 23.0	23.0	8.4 8.4	8.4	34.8 34.8	34.8	97.7 96.1	96.9	6.9 6.7	6.8	6.8	1.1 1.3	1.2	1.2	6.6 7.0	6.8	5.3
				Middle	6.0	23.0 23.0	23.0	8.4 8.4	8.4	34.9 34.8	34.8	96.6 96.3	96.5	6.8 6.8	6.8		1.0 1.1	1.0		5.3 5.9	5.6	
				Bottom	10.9	23.1 23.1	23.1	8.4 8.4	8.4	35.1 35.1	35.1	96.6 96.5	96.6	6.8 6.8	6.8		1.6 1.3	1.4		3.6 3.5	3.6	
M6	Cloudy	Moderate	13:54	Surface	-	-	-	-	-	-	-	-	-	-	6.7	-	-	2.5	-	-	4.3	
				Middle	2.0	23.0 23.1	23.1	8.4 8.4	8.4	34.8 34.8	34.8	95.5 95.1	95.3	6.7 6.7		6.7	2.5 2.4		2.5	4.6 4.0		4.3
				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 17 April 2019 (Mid-Ebb Tide)

Parameter (unit)	Depth	Action Level	Limit Level
DO in mg/L (See Note 1 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Depth Average	<u>4.9 mg/L</u>	<u>4.6 mg/L</u>
	Bottom	<u>4.2 mg/L</u>	<u>3.6 mg/L</u>
	<u>Station M6</u>		
	Intake Level	<u>5.0 mg/L</u>	<u>4.7 mg/L</u>
Turbidity in NTU (See Note 2 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>19.3 NTU</u>	<u>22.2 NTU</u>
		or 120% of upstream control station's Turbidity at the same tide of the same day <u>C2: 4.8 NTU</u>	or 130% of upstream control station's Turbidity at the same tide of the same day <u>C2: 5.2 NTU</u>
	<u>Station M6</u>		
	Intake Level	<u>19.0 NTU</u>	<u>19.4 NTU</u>
SS in mg/L (See Note 2 and 4)	<u>Stations G1-G4</u>		
	Surface	<u>6.0 mg/L</u>	<u>6.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>C2: 10.3 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>C2: 11.2 mg/L</u>
	<u>Stations M1-M5</u>		
	Surface	<u>6.2 mg/L</u>	<u>7.4 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>C2: 10.3 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>C2: 11.2 mg/L</u>
	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>6.9 mg/L</u>	<u>7.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>C2: 4.3 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>C2: 4.7 mg/L</u>
	<u>Station M6</u>		
Intake Level	<u>8.3 mg/L</u>	<u>8.6 mg/L</u>	

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 17 April 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	11:20	Surface	1.0	23.2 23.2	23.2	8.4 8.4	8.4	34.7 34.7	34.7	92.9 92.9	92.9	6.5 6.5	6.5	6.5	6.5	1.5 1.5	1.5	2.0	5.6 4.7	5.2	4.9
				Middle	9.1	22.8 22.8	22.8	8.4 8.4	8.4	35.0 35.0	35.0	92.8 92.8	92.8	6.5 6.5	6.5	2.1 2.1		2.1	4.8 5.1		5.0		
				Bottom	17.1	22.8 22.8	22.8	8.4 8.4	8.4	35.0 35.0	35.0	93.0 93.0	93.0	6.5 6.5	6.5	2.5 2.5		2.5	4.6 4.6		4.6		
C2	Sunny	Moderate	10:15	Surface	1.1	23.0 23.0	23.0	8.3 8.3	8.3	34.5 34.5	34.5	91.4 91.4	91.4	6.4 6.4	6.4	6.4	1.7 1.7	1.7	2.7	8.7 8.5	8.6	5.2	
				Middle	15.9	22.9 22.9	22.9	8.3 8.3	8.3	34.9 34.9	34.9	91.2 91.2	91.2	6.4 6.4	6.4		2.4 2.4	2.4		3.2 3.6	3.4		
				Bottom	31.1	22.8 22.8	22.8	8.3 8.3	8.3	34.9 34.9	34.9	91.1 91.2	91.2	6.4 6.4	6.4		4.0 4.1	4.0		3.4 3.8	3.6		
G1	Sunny	Moderate	10:43	Surface	1.1	23.3 23.2	23.2	8.4 8.4	8.4	34.7 34.8	34.7	93.6 92.7	93.2	6.5 6.5	6.5	6.5	1.4 1.5	1.4	1.6	3.1 3.2	3.2	3.3	
				Middle	4.1	23.0 23.1	23.0	8.4 8.4	8.4	34.9 34.8	34.8	92.2 92.2	92.2	6.5 6.5	6.5		1.5 1.5	1.5		4.0 3.9	4.0		
				Bottom	7.1	22.9 22.9	22.9	8.4 8.4	8.4	35.0 35.0	35.0	92.2 91.8	92.0	6.5 6.4	6.5		1.8 1.8	1.8		3.3 2.5	2.9		
G2	Sunny	Moderate	10:32	Surface	1.1	23.5 23.6	23.6	8.4 8.4	8.4	34.8 34.7	34.7	94.8 94.5	94.7	6.6 6.6	6.6	6.6	1.4 1.4	1.4	2.0	5.7 5.7	5.7	6.3	
				Middle	5.1	22.9 23.2	23.0	8.4 8.4	8.4	35.1 34.9	35.0	93.2 93.2	93.2	6.5 6.5	6.5		1.9 1.9	1.9		8.1 7.7	7.9		
				Bottom	9.0	22.8 22.7	22.8	8.4 8.4	8.4	35.1 35.2	35.1	93.4 93.5	93.5	6.6 6.6	6.6		2.7 2.9	2.8		5.4 5.4	5.4		
G3	Sunny	Moderate	10:47	Surface	1.0	23.2 23.1	23.1	8.4 8.4	8.4	34.6 34.7	34.7	91.7 91.6	91.7	6.4 6.4	6.4	6.4	1.7 1.8	1.8	2.0	4.3 4.9	4.6	5.0	
				Middle	4.0	23.0 23.0	23.0	8.4 8.4	8.4	34.8 34.9	34.9	91.5 91.3	91.4	6.4 6.4	6.4		2.0 2.0	2.0		6.5 7.0	6.8		
				Bottom	7.0	22.9 22.9	22.9	8.4 8.4	8.4	35.0 35.0	35.0	91.4 92.1	91.8	6.4 6.5	6.4		2.3 2.2	2.2		3.9 3.6	3.8		
G4	Sunny	Moderate	10:57	Surface	1.1	23.6 23.6	23.6	8.4 8.4	8.4	34.6 34.6	34.6	93.1 93.0	93.1	6.5 6.5	6.5	6.4	1.1 1.1	1.1	2.3	3.7 3.2	3.5	3.2	
				Middle	4.0	23.1 23.1	23.1	8.4 8.4	8.4	35.0 35.0	35.0	90.0 90.1	90.1	6.3 6.3	6.3		2.8 2.8	2.8		3.5 2.9	3.2		
				Bottom	7.0	22.9 22.9	22.9	8.4 8.4	8.4	35.1 35.1	35.1	91.9 92.1	92.0	6.5 6.5	6.5		3.0 3.1	3.1		3.0 2.8	2.9		
M1	Sunny	Moderate	10:38	Surface	1.0	23.1 23.1	23.1	8.4 8.4	8.4	34.9 34.9	34.9	91.2 91.4	91.3	6.4 6.4	6.4	6.4	2.3 2.3	2.3	2.4	2.9 2.4	2.7	4.2	
				Middle	3.0	23.1 23.1	23.1	8.4 8.4	8.4	34.9 34.9	34.9	91.4 91.4	91.4	6.4 6.4	6.4		2.5 2.5	2.5		3.2 2.6	2.9		
				Bottom	5.0	22.9 22.9	22.9	8.4 8.4	8.4	35.0 35.0	35.0	91.1 91.1	91.1	6.4 6.4	6.4		2.4 2.3	2.4		7.0 6.9	7.0		
M2	Sunny	Moderate	10:28	Surface	1.1	23.3 23.3	23.3	8.4 8.4	8.4	34.9 34.9	34.9	95.2 94.9	95.1	6.6 6.6	6.6	6.6	1.1 1.0	1.1	1.6	3.7 3.9	3.8	4.1	
				Middle	6.0	22.9 23.0	22.9	8.4 8.4	8.4	35.0 35.0	35.0	93.7 93.9	93.8	6.6 6.6	6.6		1.7 1.6	1.6		2.6 3.1	2.9		
				Bottom	11.0	22.8 22.8	22.8	8.4 8.4	8.4	35.1 35.1	35.1	93.1 93.1	93.1	6.6 6.6	6.6		2.0 1.9	2.0		5.6 5.7	5.7		
M3	Sunny	Moderate	10:52	Surface	1.0	23.2 23.2	23.2	8.4 8.4	8.4	34.7 34.7	34.7	91.0 91.0	91.0	6.4 6.4	6.4	6.4	1.5 1.5	1.5	2.4	7.8 7.9	7.9	7.8	
				Middle	3.9	23.0 23.0	23.0	8.4 8.4	8.4	34.9 34.9	34.9	91.5 91.5	91.5	6.4 6.4	6.4		2.3 2.2	2.3		10.7 9.8	10.3		
				Bottom	7.0	23.0 23.0	23.0	8.4 8.4	8.4	35.0 35.1	35.0	90.6 90.4	90.5	6.4 6.3	6.3		3.3 3.5	3.4		5.1 5.4	5.3		
M4	Sunny	Moderate	10:22	Surface	1.0	23.1 23.0	23.1	8.4 8.4	8.4	35.0 35.0	35.0	94.3 94.2	94.3	6.6 6.6	6.6	6.6	1.3 1.7	1.5	2.1	6.2 6.5	6.4	5.3	
				Middle	5.0	22.8 22.9	22.8	8.4 8.4	8.4	35.1 35.1	35.1	94.0 93.8	93.9	6.6 6.6	6.6		2.1 2.0	2.0		4.6 3.9	4.3		
				Bottom	9.0	22.8 22.8	22.8	8.4 8.4	8.4	35.1 35.1	35.1	93.5 93.5	93.5	6.6 6.6	6.6		2.7 2.8	2.7		5.3 5.0	5.2		
M5	Sunny	Moderate	11:12	Surface	1.0	23.2 23.2	23.2	8.4 8.4	8.4	34.8 34.8	34.8	93.8 93.8	93.8	6.6 6.6	6.6	6.5	1.1 1.2	1.1	2.0	7.8 7.7	7.8	6.5	
				Middle	5.5	23.0 23.0	23.0	8.5 8.4	8.4	35.0 35.0	35.0	92.9 93.0	93.0	6.5 6.5	6.5		1.8 1.7	1.8		8.2 8.7	8.5		
				Bottom	10.0	22.8 22.8	22.8	8.4 8.4	8.4	35.1 35.1	35.1	92.5 92.4	92.5	6.5 6.5	6.5		2.9 3.1	3.0		3.6 3.1	3.4		
M6	Sunny	Moderate	11:02	Surface	-	-	-	-	-	-	-	-	-	-	-	6.5	-	-	1.7	-	-	4.5	
				Middle	2.1	23.2 23.2	23.2	8.4 8.4	8.4	34.8 34.8	34.8	93.3 93.2	93.3	6.5 6.5	6.5		1.7 1.7	1.7		4.3 4.6	4.5		
				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 17 April 2019 (Mid-Flood Tide)

Parameter (unit)	Depth	Action Level	Limit Level
DO in mg/L (See Note 1 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Depth Average	<u>4.9 mg/L</u>	<u>4.6 mg/L</u>
	Bottom	<u>4.2 mg/L</u>	<u>3.6 mg/L</u>
	<u>Station M6</u>		
	Intake Level	<u>5.0 mg/L</u>	<u>4.7 mg/L</u>
Turbidity in NTU (See Note 2 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>19.3 NTU</u>	<u>22.2 NTU</u>
		or 120% of upstream control station's Turbidity at the same tide of the same day <u>CI: 3.5 NTU</u>	or 130% of upstream control station's Turbidity at the same tide of the same day <u>CI: 3.7 NTU</u>
	<u>Station M6</u>		
	Intake Level	<u>19.0 NTU</u>	<u>19.4 NTU</u>
SS in mg/L (See Note 2 and 4)	<u>Stations G1-G4</u>		
	Surface	<u>6.0 mg/L</u>	<u>6.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>CI: 4.7 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>CI: 5.1 mg/L</u>
	<u>Stations M1-M5</u>		
	Surface	<u>6.2 mg/L</u>	<u>7.4 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>CI: 4.7 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>CI: 5.1 mg/L</u>
	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>6.9 mg/L</u>	<u>7.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>CI: 4.7 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>CI: 5.1 mg/L</u>
	<u>Station M6</u>		
Intake Level	<u>8.3 mg/L</u>	<u>8.6 mg/L</u>	

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 17 April 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	16:30	Surface	1.0	23.1 23.1	23.1	8.4 8.4	8.4	34.8 34.8	34.8	93.0 93.0	93.0	6.5 6.5	6.5	6.5	6.5	1.3 1.3	1.3	1.8	3.9 4.0	4.0	3.6
				Middle	9.0	22.9 23.0	23.0	8.4 8.4	8.4	34.9 34.9	34.9	92.7 92.7	92.7	6.5 6.5	6.5	6.5		1.3 1.3	1.3		2.6 3.2	2.9	
				Bottom	17.0	22.7 22.7	22.7	8.4 8.4	8.4	35.2 35.2	35.2	93.8 93.9	93.9	6.6 6.6	6.6	6.6		2.9 2.9	2.9		3.8 3.9	3.9	
C2	Sunny	Moderate	15:28	Surface	1.1	23.2 23.2	23.2	8.4 8.4	8.4	34.5 34.5	34.5	90.6 90.6	90.6	6.4 6.4	6.4	6.4	6.4	1.0 1.0	1.0	1.7	2.6 1.7	2.2	3.5
				Middle	16.1	22.9 22.9	22.9	8.4 8.4	8.4	34.9 34.9	34.9	91.2 91.1	91.2	6.4 6.4	6.4	6.4		1.6 1.6	1.6		2.9 2.6	2.8	
				Bottom	31.0	22.8 22.8	22.8	8.4 8.4	8.4	35.1 35.1	35.1	92.7 92.8	92.8	6.5 6.5	6.5	6.5		2.6 2.5	2.5		5.9 5.5	5.7	
G1	Sunny	Moderate	15:57	Surface	1.0	23.5 23.5	23.5	8.4 8.4	8.4	34.8 34.8	34.8	95.0 95.0	95.0	6.6 6.6	6.6	6.6	6.6	1.2 1.2	1.2	1.4	3.1 3.0	3.1	5.9
				Middle	4.1	23.3 23.3	23.3	8.4 8.4	8.4	34.8 34.8	34.8	94.4 94.5	94.5	6.6 6.6	6.6	6.6		1.2 1.2	1.2		11.6 11.5	11.6	
				Bottom	7.0	23.0 23.0	23.0	8.4 8.4	8.4	35.0 35.0	35.0	93.8 93.8	93.8	6.6 6.6	6.6	6.6		1.8 1.8	1.8		3.1 3.0	3.1	
G2	Sunny	Moderate	15:45	Surface	1.1	23.6 23.6	23.6	8.4 8.4	8.4	34.8 34.8	34.8	95.7 95.7	95.7	6.6 6.6	6.6	6.6	6.6	1.0 1.1	1.0	1.2	2.5 2.9	2.7	5.5
				Middle	5.1	23.4 23.4	23.4	8.4 8.4	8.4	34.8 34.8	34.8	94.8 95.0	94.9	6.6 6.6	6.6	6.6		1.1 1.0	1.0		3.9 3.7	3.8	
				Bottom	9.0	22.8 22.8	22.8	8.4 8.4	8.4	35.1 35.1	35.1	93.3 93.4	93.4	6.6 6.6	6.6	6.6		1.6 1.6	1.6		9.9 10.1	10.0	
G3	Sunny	Moderate	16:00	Surface	1.1	23.6 23.6	23.6	8.4 8.4	8.4	34.8 34.8	34.8	96.5 96.2	96.4	6.7 6.7	6.7	6.7	6.6	1.1 1.1	1.1	1.5	3.1 3.1	3.1	3.7
				Middle	4.0	23.3 23.3	23.3	8.4 8.4	8.4	34.8 34.8	34.8	94.2 94.3	94.3	6.6 6.6	6.6	6.6		1.4 1.4	1.4		3.5 2.9	3.2	
				Bottom	7.1	23.0 23.0	23.0	8.4 8.4	8.4	35.0 35.0	35.0	92.0 92.0	92.0	6.5 6.5	6.5	6.5		2.1 2.0	2.0		4.7 4.8	4.8	
G4	Sunny	Moderate	16:08	Surface	1.0	23.8 23.8	23.8	8.4 8.4	8.4	34.7 34.7	34.7	95.0 94.9	95.0	6.6 6.6	6.6	6.6	6.6	1.3 1.2	1.2	2.0	5.2 4.8	5.0	4.0
				Middle	4.1	23.6 23.6	23.6	8.4 8.4	8.4	34.7 34.7	34.7	94.1 94.2	94.2	6.5 6.5	6.5	6.5		1.2 1.2	1.2		3.7 3.2	3.5	
				Bottom	7.0	23.1 23.1	23.1	8.4 8.4	8.4	35.0 35.0	35.0	91.6 91.5	91.6	6.4 6.4	6.4	6.4		3.6 3.8	3.7		3.4 3.8	3.6	
M1	Sunny	Moderate	15:51	Surface	1.1	23.8 23.6	23.7	8.4 8.4	8.4	34.7 34.8	34.8	96.0 93.8	94.9	6.6 6.5	6.6	6.6	6.6	1.0 1.1	1.1	1.3	4.2 4.2	4.2	3.1
				Middle	3.0	23.6 23.5	23.6	8.4 8.4	8.4	34.8 34.8	34.8	94.4 93.4	93.9	6.6 6.5	6.5	6.5		1.3 1.3	1.3		2.6 2.7	2.7	
				Bottom	5.0	23.4 23.3	23.4	8.4 8.4	8.4	34.8 34.8	34.8	92.9 92.0	92.5	6.5 6.4	6.4	6.4		1.5 1.6	1.5		2.6 2.4	2.5	
M2	Sunny	Moderate	15:41	Surface	1.1	23.4 23.4	23.4	8.4 8.4	8.4	34.8 34.8	34.8	95.8 95.7	95.8	6.7 6.7	6.7	6.7	6.6	0.7 0.7	0.7	1.0	4.1 3.7	3.9	3.9
				Middle	6.0	23.3 23.3	23.3	8.4 8.4	8.4	34.8 34.8	34.8	94.3 94.3	94.3	6.6 6.6	6.6	6.6		0.7 0.7	0.7		5.2 5.2	5.2	
				Bottom	11.0	22.8 22.8	22.8	8.4 8.4	8.4	35.1 35.1	35.1	93.6 93.6	93.6	6.6 6.6	6.6	6.6		1.7 1.7	1.7		2.5 2.5	2.5	
M3	Sunny	Moderate	16:03	Surface	1.0	23.5 23.5	23.5	8.4 8.4	8.4	34.5 34.5	34.5	97.0 96.7	96.9	6.8 6.7	6.8	6.8	6.7	1.1 1.1	1.1	1.3	2.9 2.9	2.9	3.8
				Middle	4.0	23.4 23.5	23.5	8.4 8.4	8.4	34.8 34.8	34.8	94.5 94.5	94.5	6.6 6.6	6.6	6.6		1.1 1.1	1.1		2.7 3.4	3.1	
				Bottom	7.0	23.2 23.2	23.2	8.4 8.4	8.4	34.8 34.9	34.8	93.2 93.0	93.1	6.5 6.5	6.5	6.5		1.7 1.7	1.7		5.6 5.4	5.5	
M4	Sunny	Moderate	15:34	Surface	1.0	23.3 23.4	23.3	8.4 8.4	8.4	34.8 34.8	34.8	95.6 95.2	95.4	6.7 6.6	6.7	6.7	6.6	1.0 1.0	1.0	1.5	4.4 4.5	4.5	3.6
				Middle	5.0	23.0 23.1	23.1	8.4 8.4	8.4	35.0 34.9	35.0	94.4 94.5	94.5	6.6 6.6	6.6	6.6		0.5 0.6	0.6		3.0 3.3	3.2	
				Bottom	9.0	23.0 23.1	23.0	8.4 8.4	8.4	35.0 35.0	35.0	94.2 94.4	94.3	6.6 6.6	6.6	6.6		2.9 3.1	3.0		3.5 2.8	3.2	
M5	Sunny	Moderate	16:23	Surface	1.1	23.2 23.2	23.2	8.4 8.4	8.4	34.7 34.7	34.7	93.7 93.6	93.7	6.6 6.6	6.6	6.6	6.5	1.5 1.4	1.4	2.0	3.3 4.2	3.8	4.5
				Middle	6.0	23.1 23.0	23.0	8.4 8.4	8.4	34.7 34.8	34.7	92.3 92.2	92.3	6.5 6.5	6.5	6.5		1.9 2.0	2.0		4.5 3.6	4.1	
				Bottom	11.0	23.0 23.0	23.0	8.4 8.4	8.4	34.8 34.8	34.8	92.0 92.1	92.1	6.5 6.5	6.5	6.5		2.6 2.8	2.7		5.9 5.3	5.6	
M6	Sunny	Moderate	16:13	Surface	-	-	-	-	-	-	-	-	-	-	-	6.6	-	-	1.3	-	-	11.8	
				Middle	2.0	23.4 23.4	23.4	8.4 8.4	8.4	34.8 34.8	34.8	94.8 94.8	94.8	6.6 6.6	6.6		6.6	1.3 1.3		1.3	11.5 12.0		11.8
				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 23 April 2019 (Mid-Ebb Tide)

Parameter (unit)	Depth	Action Level	Limit Level
DO in mg/L (See Note 1 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Depth Average	<u>4.9 mg/L</u>	<u>4.6 mg/L</u>
	Bottom	<u>4.2 mg/L</u>	<u>3.6 mg/L</u>
	<u>Station M6</u>		
	Intake Level	<u>5.0 mg/L</u>	<u>4.7 mg/L</u>
Turbidity in NTU (See Note 2 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>19.3 NTU</u>	<u>22.2 NTU</u>
		or 120% of upstream control station's Turbidity at the same tide of the same day <u>C2: 3.7 NTU</u>	or 130% of upstream control station's Turbidity at the same tide of the same day <u>C2: 4.0 NTU</u>
	<u>Station M6</u>		
	Intake Level	<u>19.0 NTU</u>	<u>19.4 NTU</u>
SS in mg/L (See Note 2 and 4)	<u>Stations G1-G4</u>		
	Surface	<u>6.0 mg/L</u>	<u>6.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>C2: 7.3 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>C2: 7.9 mg/L</u>
	<u>Stations M1-M5</u>		
	Surface	<u>6.2 mg/L</u>	<u>7.4 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>C2: 7.3 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>C2: 7.9 mg/L</u>
	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>6.9 mg/L</u>	<u>7.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>C2: 6.0 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>C2: 6.5 mg/L</u>
	<u>Station M6</u>		
Intake Level	<u>8.3 mg/L</u>	<u>8.6 mg/L</u>	

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 April 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	15:12	Surface	1.1	24.0 24.0	24.0	8.4 8.4	8.4	33.2 33.2	33.2	91.4 91.2	91.3	6.4 6.4	6.4	6.3	1.4 1.4	1.4	2.9	5.2 5.0	5.1	5.5
				Middle	9.1	23.3 23.3	23.3	8.4 8.4	8.4	34.5 34.5	34.5	90.5 90.6	90.6	6.3 6.3	6.3		3.5 3.5	3.5		6.0 7.1	7.0	
				Bottom	17.0	23.3 23.3	23.3	8.4 8.4	8.4	34.5 34.5	34.5	90.6 90.6	90.6	6.3 6.3	6.3		3.7 3.7	3.7		4.4 4.5	4.5	
C2	Sunny	Moderate	15:25	Surface	1.1	24.1 24.1	24.1	8.3 8.3	8.3	32.9 32.9	32.9	89.9 89.3	89.6	6.3 6.2	6.2	6.2	2.3 2.2	2.2	2.8	6.0 6.1	6.1	5.2
				Middle	16.0	23.4 23.4	23.4	8.4 8.4	8.4	34.2 34.2	34.2	88.5 88.7	88.6	6.2 6.2	6.2		3.0 3.0	3.0		4.4 4.7	4.6	
				Bottom	31.0	23.3 23.3	23.3	8.4 8.4	8.4	34.4 34.4	34.4	90.1 90.2	90.2	6.3 6.3	6.3		3.0 3.1	3.1		4.9 5.1	5.0	
G1	Sunny	Moderate	14:33	Surface	1.0	24.2 24.1	24.2	8.4 8.4	8.4	33.9 33.9	33.9	94.5 94.4	94.5	6.5 6.5	6.5	6.5	2.4 2.4	2.4	2.1	2.2 2.2	2.2	2.9
				Middle	4.1	23.7 23.7	23.7	8.4 8.4	8.4	34.1 34.1	34.1	92.3 92.3	92.3	6.4 6.4	6.4		1.9 1.9	1.9		2.3 2.3	2.3	
				Bottom	7.1	23.6 23.6	23.6	8.4 8.4	8.4	34.3 34.3	34.3	91.8 91.8	91.8	6.4 6.4	6.4		2.1 2.1	2.1		4.2 4.2	4.2	
G2	Sunny	Moderate	14:22	Surface	1.0	24.1 24.1	24.1	8.4 8.4	8.4	34.1 34.1	34.1	95.4 95.4	95.4	6.6 6.6	6.6	6.6	1.2 1.1	1.2	1.3	5.1 5.1	5.1	4.0
				Middle	5.0	23.6 23.4	23.5	8.4 8.4	8.4	34.3 34.4	34.3	93.9 93.5	93.7	6.5 6.5	6.5		1.1 1.1	1.1		3.7 3.8	3.8	
				Bottom	9.0	23.2 23.2	23.2	8.4 8.4	8.4	34.7 34.7	34.7	92.9 92.9	92.9	6.5 6.5	6.5		1.6 1.7	1.7		3.3 3.2	3.3	
G3	Sunny	Moderate	14:37	Surface	1.1	24.3 24.3	24.3	8.4 8.4	8.4	33.9 33.9	33.9	94.9 94.9	94.9	6.6 6.6	6.6	6.5	1.3 1.3	1.3	1.8	4.0 4.2	4.1	4.7
				Middle	4.0	23.6 23.5	23.6	8.4 8.4	8.4	34.3 34.4	34.3	92.0 91.5	91.8	6.4 6.4	6.4		2.0 2.0	1.9		9.4 9.5	9.5	
				Bottom	7.0	23.3 23.3	23.3	8.5 8.5	8.5	34.6 34.6	34.6	91.5 91.5	91.5	6.4 6.4	6.4		2.2 2.2	2.2		0.6 0.6	0.6	
G4	Sunny	Moderate	14:44	Surface	1.0	24.5 24.5	24.5	8.4 8.4	8.4	33.8 33.8	33.8	96.1 96.0	96.1	6.6 6.6	6.6	6.5	1.3 1.3	1.3	1.2	4.6 4.6	4.6	4.9
				Middle	4.0	24.2 24.2	24.2	8.4 8.4	8.4	33.9 33.9	33.9	93.7 93.7	93.7	6.5 6.5	6.5		0.8 0.8	0.8		4.8 4.8	4.8	
				Bottom	7.0	23.3 23.3	23.3	8.5 8.5	8.5	34.5 34.6	34.5	91.6 91.8	91.7	6.4 6.4	6.4		1.4 1.3	1.3		5.5 5.3	5.4	
M1	Sunny	Moderate	14:27	Surface	1.1	24.0 24.0	24.0	8.4 8.4	8.4	34.0 34.0	34.0	93.5 93.3	93.4	6.5 6.5	6.5	6.4	1.5 1.5	1.5	2.7	3.2 3.2	3.2	5.9
				Middle	3.1	24.0 24.0	24.0	8.4 8.4	8.4	34.0 34.1	34.0	92.7 92.7	92.7	6.4 6.4	6.4		1.5 1.5	1.5		7.3 7.4	7.4	
				Bottom	5.1	23.7 23.6	23.6	8.4 8.4	8.4	34.2 34.3	34.2	91.4 91.1	91.3	6.4 6.4	6.4		5.0 5.1	5.0		6.9 7.3	7.1	
M2	Sunny	Moderate	14:18	Surface	1.1	23.6 23.6	23.6	8.4 8.4	8.4	34.3 34.3	34.3	94.5 94.5	94.5	6.6 6.6	6.6	6.5	1.1 1.1	1.1	1.8	3.2 3.1	3.2	4.6
				Middle	6.0	23.2 23.2	23.2	8.4 8.4	8.4	34.7 34.7	34.7	92.8 92.8	92.8	6.5 6.5	6.5		1.7 1.7	1.7		3.1 3.1	3.1	
				Bottom	11.0	23.2 23.1	23.1	8.4 8.4	8.4	34.9 34.9	34.9	92.2 92.2	92.2	6.5 6.5	6.5		2.6 2.9	2.7		7.4 7.4	7.4	
M3	Sunny	Moderate	14:40	Surface	1.1	24.2 24.2	24.2	8.4 8.4	8.4	33.6 33.6	33.6	93.4 93.3	93.4	6.5 6.5	6.5	6.4	0.4 0.5	0.4	1.2	8.4 8.3	8.4	4.6
				Middle	4.0	23.5 23.5	23.5	8.5 8.5	8.5	34.3 34.3	34.3	90.0 89.9	90.0	6.3 6.3	6.3		1.5 1.6	1.5		2.8 3.0	2.9	
				Bottom	7.1	23.2 23.2	23.2	8.5 8.5	8.5	34.7 34.7	34.7	90.8 90.8	90.8	6.4 6.4	6.4		1.6 1.6	1.6		2.6 2.7	2.7	
M4	Sunny	Moderate	14:14	Surface	1.0	23.7 23.7	23.7	8.7 8.7	8.7	34.1 34.1	34.1	92.6 92.4	92.5	6.5 6.4	6.4	6.4	2.3 2.3	2.3	2.3	5.9 5.9	5.9	5.6
				Middle	5.1	23.5 23.5	23.5	8.7 8.7	8.7	34.2 34.2	34.2	91.1 91.2	91.2	6.4 6.4	6.4		2.4 2.4	2.4		4.9 4.8	4.9	
				Bottom	9.1	23.3 23.3	23.3	8.5 8.5	8.5	34.6 34.7	34.6	92.5 92.5	92.5	6.5 6.5	6.5		2.3 2.3	2.3		6.1 6.0	6.1	
M5	Sunny	Moderate	15:00	Surface	1.1	23.8 23.8	23.8	8.4 8.4	8.4	34.2 34.2	34.2	94.6 94.5	94.6	6.6 6.6	6.6	6.5	1.1 1.1	1.1	3.1	4.2 4.2	4.2	3.7
				Middle	6.0	23.5 23.5	23.5	8.4 8.4	8.4	34.2 34.2	34.2	92.2 92.2	92.2	6.4 6.4	6.4		1.6 1.8	1.7		2.9 2.8	2.9	
				Bottom	11.1	23.2 23.2	23.2	8.4 8.4	8.4	34.6 34.7	34.6	90.9 90.7	90.8	6.4 6.4	6.4		6.2 6.4	6.3		4.0 4.1	4.1	
M6	Sunny	Moderate	14:49	Surface	-	-	-	-	-	-	-	-	-	-	-	6.6	-	-	1.1	-	-	4.6
				Middle	2.1	24.5 24.4	24.4	8.4 8.4	8.4	33.7 33.8	33.7	95.8 95.3	95.6	6.6 6.6	6.6		1.1 1.1	1.1		4.6 4.6	4.6	
				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 23 April 2019 (Mid-Flood Tide)

Parameter (unit)	Depth	Action Level	Limit Level
DO in mg/L (See Note 1 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Depth Average	<u>4.9 mg/L</u>	<u>4.6 mg/L</u>
	Bottom	<u>4.2 mg/L</u>	<u>3.6 mg/L</u>
	<u>Station M6</u>		
	Intake Level	<u>5.0 mg/L</u>	<u>4.7 mg/L</u>
Turbidity in NTU (See Note 2 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>19.3 NTU</u>	<u>22.2 NTU</u>
		or 120% of upstream control station's Turbidity at the same tide of the same day <u>CI: 2.8 NTU</u>	or 130% of upstream control station's Turbidity at the same tide of the same day <u>CI: 3.0 NTU</u>
	<u>Station M6</u>		
	Intake Level	<u>19.0 NTU</u>	<u>19.4 NTU</u>
SS in mg/L (See Note 2 and 4)	<u>Stations G1-G4</u>		
	Surface	<u>6.0 mg/L</u>	<u>6.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>CI: 2.0 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>CI: 2.1 mg/L</u>
	<u>Stations M1-M5</u>		
	Surface	<u>6.2 mg/L</u>	<u>7.4 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>CI: 2.0 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>CI: 2.1 mg/L</u>
	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>6.9 mg/L</u>	<u>7.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>CI: 2.1 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>CI: 2.3 mg/L</u>
	<u>Station M6</u>		
Intake Level	<u>8.3 mg/L</u>	<u>8.6 mg/L</u>	

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 April 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	09:35	Surface	1.1	23.9 23.8	23.9 8.3	8.3 8.4	8.3	33.6 33.7	33.7	92.9 92.7	92.8	6.5 6.5	6.5	6.4	1.3 1.3	1.3	1.7	1.6 1.7	1.7	2.5
				Middle	9.0	23.5 23.5	23.5 8.4	8.4 8.4	8.4	34.0 34.0	34.0	91.8 91.8	91.8	6.4 6.4	6.4		1.4 1.4	1.4		4.0 3.9	4.0	
				Bottom	17.1	23.1 23.1	23.1 8.4	8.4 8.4	8.4	35.1 35.1	35.1	93.3 93.3	93.3	6.5 6.5	6.5		2.3 2.3	2.3		1.8 1.7	1.8	
C2	Sunny	Moderate	09:45	Surface	1.0	23.7 23.7	23.7 8.4	8.4 8.4	8.4	33.9 33.9	33.9	93.4 93.3	93.4	6.5 6.5	6.5	6.5	1.3 1.3	1.3	2.1	2.3 2.3	2.3	2.3
				Middle	16.0	23.1 23.1	23.1 8.4	8.4 8.4	8.4	34.9 35.0	34.9	91.5 91.6	91.6	6.4 6.4	6.4		2.3 2.3	2.3		2.3 2.4	2.4	
				Bottom	31.0	23.0 23.0	23.0 8.4	8.4 8.4	8.4	35.1 35.1	35.1	92.4 92.5	92.5	6.5 6.5	6.5		2.8 2.8	2.8		2.3 2.3	2.3	
G1	Sunny	Moderate	08:41	Surface	1.0	23.7 23.8	23.8 8.3	8.3 8.3	8.3	33.8 33.8	33.8	93.3 93.0	93.2	6.5 6.5	6.5	6.4	1.5 1.4	1.4	2.2	2.6 3.5	2.7	3.3
				Middle	4.1	23.7 23.7	23.7 8.4	8.4 8.4	8.4	33.8 33.8	33.8	90.6 90.6	90.6	6.3 6.3	6.3		1.6 1.6	1.6		3.5 3.5	3.5	
				Bottom	7.1	23.2 23.2	23.2 8.4	8.4 8.4	8.4	34.6 34.6	34.6	91.0 91.0	91.0	6.4 6.4	6.4		3.5 3.5	3.5		3.6 3.7	3.7	
G2	Sunny	Moderate	08:26	Surface	1.0	23.8 23.8	23.8 8.4	8.4 8.4	8.4	33.8 33.8	33.8	92.1 92.0	92.1	6.4 6.4	6.4	6.4	1.3 1.3	1.3	2.0	2.9 3.0	3.0	2.6
				Middle	5.0	23.3 23.2	23.3 8.4	8.4 8.4	8.4	34.4 34.5	34.4	91.1 91.3	91.2	6.4 6.4	6.4		1.9 1.9	1.9		2.0 2.0	2.0	
				Bottom	9.1	23.2 23.2	23.2 8.5	8.5 8.5	8.5	34.9 34.9	34.9	92.8 93.0	92.9	6.5 6.5	6.5		2.8 2.9	2.9		2.8 2.9	2.9	
G3	Sunny	Moderate	08:50	Surface	1.1	23.8 23.8	23.8 8.3	8.3 8.3	8.3	33.7 33.7	33.7	91.0 90.8	90.9	6.3 6.3	6.3	6.3	1.3 1.3	1.3	1.9	3.0 3.1	3.1	3.7
				Middle	4.0	23.5 23.5	23.5 8.4	8.4 8.4	8.4	34.0 34.0	34.0	90.2 90.2	90.2	6.3 6.3	6.3		1.5 1.5	1.5		3.2 3.1	3.2	
				Bottom	7.1	23.4 23.3	23.3 8.4	8.4 8.4	8.4	34.2 34.5	34.3	90.1 90.3	90.2	6.3 6.3	6.3		3.0 2.9	3.0		4.7 4.8	4.8	
G4	Sunny	Moderate	09:10	Surface	1.1	24.1 24.1	24.1 8.3	8.3 8.3	8.3	33.3 33.3	33.3	93.6 93.5	93.6	6.5 6.5	6.5	6.4	2.5 2.7	2.6	2.4	6.3 6.5	6.4	5.2
				Middle	4.0	23.5 23.5	23.5 8.4	8.4 8.4	8.4	34.0 34.0	34.0	90.1 90.1	90.1	6.3 6.3	6.3		1.3 1.3	1.3		4.6 4.8	4.7	
				Bottom	7.1	23.2 23.1	23.1 8.4	8.4 8.4	8.4	34.7 34.7	34.7	90.2 90.8	90.5	6.3 6.4	6.3		3.1 3.3	3.2		4.5 4.6	4.6	
M1	Sunny	Moderate	08:33	Surface	1.1	23.8 23.7	23.8 8.4	8.4 8.4	8.4	33.9 33.9	33.9	91.4 91.1	91.3	6.4 6.3	6.4	6.3	1.7 1.7	1.7	2.8	4.8 4.6	4.7	8.3
				Middle	3.0	23.2 23.2	23.2 8.4	8.4 8.4	8.4	34.5 34.5	34.5	89.8 89.9	89.9	6.3 6.3	6.3		2.5 2.4	2.4		9.9 10.2	10.1	
				Bottom	5.0	23.1 23.1	23.1 8.4	8.4 8.4	8.4	34.8 34.8	34.8	90.8 90.8	90.8	6.4 6.4	6.4		4.2 4.2	4.2		10.0 10.2	10.1	
M2	Sunny	Moderate	08:20	Surface	1.0	23.5 23.5	23.5 8.4	8.4 8.4	8.4	34.3 34.3	34.3	93.9 93.5	93.7	6.6 6.5	6.5	6.5	1.4 1.5	1.4	2.0	4.6 4.6	4.6	4.3
				Middle	6.0	23.3 23.3	23.3 8.4	8.4 8.4	8.4	34.4 34.4	34.4	92.6 92.6	92.6	6.5 6.5	6.5		1.4 1.3	1.4		3.4 3.6	3.5	
				Bottom	11.0	23.2 23.1	23.2 8.5	8.5 8.5	8.5	34.9 34.9	34.9	93.1 93.3	93.2	6.5 6.5	6.5		3.0 3.2	3.1		4.9 4.8	4.9	
M3	Sunny	Moderate	09:00	Surface	1.1	23.7 23.7	23.7 8.3	8.3 8.3	8.3	33.9 33.9	33.9	89.3 89.4	89.4	6.2 6.2	6.2	6.2	1.3 1.4	1.4	2.2	2.9 2.9	2.9	2.8
				Middle	4.1	23.4 23.4	23.4 8.3	8.3 8.3	8.3	34.2 34.2	34.2	87.6 87.5	87.6	6.1 6.1	6.1		2.3 2.4	2.4		1.9 1.8	1.9	
				Bottom	7.0	23.3 23.3	23.3 8.4	8.4 8.4	8.4	34.4 34.4	34.4	87.6 88.0	87.8	6.1 6.2	6.1		2.9 3.0	2.9		3.6 3.7	3.7	
M4	Sunny	Moderate	08:13	Surface	1.1	23.5 23.5	23.5 8.7	8.6 8.6	8.6	34.2 34.2	34.2	93.7 92.8	93.3	6.5 6.5	6.5	6.5	1.2 1.3	1.3	1.5	3.4 3.3	3.4	2.8
				Middle	5.1	23.4 23.4	23.4 8.8	8.5 8.5	8.6	34.3 34.3	34.3	92.4 92.3	92.4	6.5 6.5	6.5		1.4 1.5	1.4		2.4 2.4	2.4	
				Bottom	9.0	23.3 23.3	23.3 8.8	8.5 8.5	8.7	34.6 34.6	34.6	92.6 92.5	92.6	6.5 6.5	6.5		1.9 2.0	1.9		2.6 2.6	2.6	
M5	Sunny	Moderate	09:25	Surface	1.1	23.8 23.8	23.8 8.4	8.4 8.4	8.4	33.7 33.7	33.7	92.4 92.4	92.4	6.4 6.4	6.4	6.4	1.3 1.3	1.3	2.9	5.2 5.1	5.2	4.9
				Middle	6.0	23.4 23.4	23.4 8.4	8.4 8.4	8.4	34.2 34.2	34.2	91.1 91.1	91.1	6.4 6.4	6.4		1.8 1.8	1.8		6.8 6.8	6.8	
				Bottom	11.0	23.1 23.1	23.1 8.4	8.4 8.4	8.4	35.0 35.0	35.0	92.1 92.2	92.2	6.4 6.5	6.4		5.7 5.8	5.8		2.8 2.9	2.9	
M6	Sunny	Moderate	09:18	Surface	-	-	-	-	-	-	-	-	-	-	6.2	-	-	2.7	-	-	2.9	
				Middle	2.0	23.5 23.4	23.4 8.3	8.3 8.3	8.3	34.1 34.1	34.1	88.9 88.9	88.9	6.2 6.2		6.2	2.7 2.8		2.7	2.9 2.9		2.9
				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 25 April 2019 (Mid-Ebb Tide)

Parameter (unit)	Depth	Action Level	Limit Level
DO in mg/L (See Note 1 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Depth Average	<u>4.9 mg/L</u>	<u>4.6 mg/L</u>
	Bottom	<u>4.2 mg/L</u>	<u>3.6 mg/L</u>
	<u>Station M6</u>		
	Intake Level	<u>5.0 mg/L</u>	<u>4.7 mg/L</u>
Turbidity in NTU (See Note 2 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>19.3 NTU</u>	<u>22.2 NTU</u>
		or 120% of upstream control station's Turbidity at the same tide of the same day <u>C2: 2.7 NTU</u>	or 130% of upstream control station's Turbidity at the same tide of the same day <u>C2: 3.0 NTU</u>
	<u>Station M6</u>		
	Intake Level	<u>19.0 NTU</u>	<u>19.4 NTU</u>
SS in mg/L (See Note 2 and 4)	<u>Stations G1-G4</u>		
	Surface	<u>6.0 mg/L</u>	<u>6.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>C2: 18.7 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>C2: 20.3 mg/L</u>
	<u>Stations M1-M5</u>		
	Surface	<u>6.2 mg/L</u>	<u>7.4 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>C2: 18.7 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>C2: 20.3 mg/L</u>
	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>6.9 mg/L</u>	<u>7.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>C2: 7.4 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>C2: 8.0 mg/L</u>
	<u>Station M6</u>		
Intake Level	<u>8.3 mg/L</u>	<u>8.6 mg/L</u>	

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 25 April 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	16:17	Surface	1.1	24.1 24.1	24.1	8.4 8.4	8.4	33.7 33.7	33.7	91.8 91.7	91.8	6.4 6.4	6.4	6.3	1.7 1.8	1.8	2.1	5.8 6.1	6.0	6.2
				Middle	9.1	23.7 23.7	23.7	8.4 8.4	8.4	34.7 34.7	34.7	89.9 89.9	89.9	6.2 6.2	6.2		2.3 2.5	2.4		7.3 7.6	7.5	
				Bottom	17.1	23.7 23.7	23.7	8.4 8.4	8.4	34.7 34.7	34.7	90.0 89.9	90.0	6.3 6.2	6.2		2.2 2.2	2.2		5.1 5.1	5.1	
C2	Sunny	Moderate	15:15	Surface	1.1	24.9 24.9	24.9	9.5 8.7	9.1	32.3 32.3	32.3	95.1 94.3	94.7	6.6 6.5	6.5	6.5	1.4 1.3	1.3	1.7	15.8 15.4	15.6	9.3
				Middle	16.0	24.4 24.3	24.4	9.2 8.6	8.9	33.0 33.2	33.1	93.1 91.6	92.4	6.4 6.3	6.4		1.3 1.5	1.4		6.3 6.1	6.2	
				Bottom	31.0	23.8 23.6	23.7	9.1 8.6	8.8	34.3 34.7	34.5	90.3 89.3	89.8	6.3 6.2	6.2		2.3 2.2	2.3		6.2 6.1	6.2	
G1	Sunny	Moderate	15:43	Surface	1.1	24.8 24.9	24.8	8.4 8.5	8.4	33.9 33.9	33.9	100.1 101.3	100.7	6.8 6.9	6.9	6.9	1.7 1.6	1.6	2.2	9.3 9.4	9.4	8.5
				Middle	4.0	24.6 24.8	24.7	8.5 8.5	8.5	34.1 33.9	34.0	98.3 100.9	99.6	6.7 6.9	6.8		2.3 2.4	2.3		8.4 8.4	8.4	
				Bottom	7.1	24.3 24.4	24.3	8.5 8.4	8.4	34.2 34.2	34.2	92.8 92.6	92.7	6.4 6.4	6.4		2.6 2.6	2.6		7.8 8.0	7.9	
G2	Sunny	Moderate	15:30	Surface	1.0	24.6 24.0	24.7	8.4 8.4	8.4	34.0 33.9	33.9	98.4 100.9	99.7	6.8 6.9	6.8	6.7	1.0 1.0	1.0	1.5	5.1 5.2	5.2	6.7
				Middle	5.0	24.0 24.3	24.1	8.4 8.4	8.4	34.4 34.2	34.3	95.1 93.4	94.3	6.6 6.4	6.5		1.7 1.5	1.6		8.7 9.2	9.0	
				Bottom	9.0	23.5 23.6	23.5	8.4 8.4	8.4	35.1 35.0	35.0	90.1 91.4	90.8	6.3 6.4	6.3		1.8 1.9	1.8		6.2 6.0	6.1	
G3	Sunny	Moderate	15:46	Surface	1.1	25.0 25.0	25.0	8.4 8.4	8.4	33.8 33.7	33.8	100.6 101.4	101.0	6.9 6.9	6.9	6.9	1.5 1.5	1.5	2.1	8.0 7.7	7.9	7.4
				Middle	4.0	24.7 24.8	24.7	8.4 8.4	8.4	34.0 33.9	34.0	99.7 100.4	100.1	6.8 6.9	6.8		1.9 1.8	1.9		4.6 4.9	4.8	
				Bottom	7.1	23.5 24.0	23.8	8.4 8.4	8.4	34.9 34.5	34.7	90.7 90.9	90.8	6.3 6.3	6.3		3.1 2.9	3.0		9.7 9.7	9.7	
G4	Sunny	Moderate	15:54	Surface	1.1	25.5 25.3	25.4	8.5 8.4	8.4	33.1 33.3	33.2	111.5 110.6	111.1	7.6 7.5	7.5	7.4	1.9 2.1	2.0	2.8	9.6 9.8	9.7	10.4
				Middle	4.0	25.1 25.0	25.0	8.5 8.4	8.4	33.7 33.8	33.7	106.3 104.0	105.2	7.2 7.1	7.2		1.3 1.1	1.2		11.0 11.3	11.2	
				Bottom	7.1	23.5 23.5	23.5	8.4 8.4	8.4	34.9 34.9	34.9	91.9 91.5	91.7	6.4 6.4	6.4		5.7 4.7	5.2		10.0 10.5	10.3	
M1	Moderate	Moderate	15:37	Surface	1.1	25.0 25.1	25.0	8.4 8.4	8.4	33.8 33.8	33.8	100.3 101.0	100.7	6.8 6.9	6.9	6.9	1.3 1.3	1.3	1.7	8.2 8.4	8.3	6.6
				Middle	3.1	24.9 25.0	25.0	8.4 8.4	8.4	33.8 33.8	33.8	100.0 100.7	100.4	6.8 6.9	6.9		1.4 1.4	1.4		5.2 5.3	5.3	
				Bottom	5.0	24.5 24.5	24.5	8.4 8.4	8.4	34.2 34.2	34.2	94.3 94.3	94.3	6.5 6.5	6.5		2.4 2.6	2.5		6.3 6.0	6.2	
M2	Sunny	Moderate	15:26	Surface	1.0	24.4 24.5	24.5	8.4 8.4	8.4	34.1 34.0	34.1	96.0 96.8	96.4	6.6 6.6	6.6	6.5	1.1 1.1	1.1	1.6	3.8 3.7	3.8	4.0
				Middle	6.0	23.6 23.7	23.7	8.4 8.4	8.4	35.0 34.8	34.9	91.0 91.3	91.2	6.3 6.3	6.3		1.3 1.4	1.3		4.9 5.0	5.0	
				Bottom	11.1	23.5 23.5	23.5	8.4 8.4	8.4	35.3 35.3	35.3	90.1 90.1	90.1	6.3 6.3	6.3		2.5 2.2	2.3		3.3 3.4	3.4	
M3	Sunny	Moderate	15:50	Surface	1.1	25.3 25.0	25.2	8.4 8.4	8.4	33.4 33.5	33.4	103.7 103.5	103.6	7.1 7.1	7.1	7.0	1.3 1.4	1.4	1.7	10.4 10.3	10.4	8.4
				Middle	4.0	25.0 24.7	24.9	8.4 8.4	8.4	33.6 33.8	33.7	103.3 98.6	101.0	7.1 6.8	6.9		1.3 1.3	1.3		9.1 9.2	9.2	
				Bottom	7.1	24.0 24.3	24.2	8.4 8.4	8.4	34.5 34.2	34.4	94.2 92.8	93.5	6.5 6.4	6.5		2.4 2.3	2.4		5.6 5.7	5.7	
M4	Sunny	Moderate	15:21	Surface	1.1	24.5 24.5	24.5	8.4 8.4	8.4	33.6 33.7	33.6	94.2 94.8	94.5	6.5 6.5	6.5	6.5	1.6 1.8	1.7	1.8	5.9 6.0	6.0	6.5
				Middle	5.0	24.4 24.4	24.4	8.4 8.4	8.4	34.0 33.9	34.0	95.4 95.1	95.3	6.6 6.6	6.6		1.7 1.7	1.7		6.4 6.4	6.4	
				Bottom	9.1	23.8 23.9	23.8	8.4 8.5	8.4	34.8 34.7	34.7	91.9 90.7	91.3	6.4 6.3	6.3		2.1 2.1	2.1		7.2 7.2	7.2	
M5	Sunny	Moderate	16:09	Surface	1.1	24.6 24.6	24.6	8.4 8.4	8.4	33.5 33.5	33.5	96.8 96.9	96.9	6.7 6.7	6.7	6.7	1.4 1.7	1.5	1.5	16.7 16.9	16.8	12.8
				Middle	6.0	24.5 24.5	24.5	8.4 8.4	8.4	33.5 33.5	33.5	96.0 96.5	96.3	6.6 6.7	6.6		1.4 1.4	1.4		11.8 11.8	11.8	
				Bottom	11.0	24.5 24.4	24.4	8.4 8.4	8.4	33.5 33.6	33.5	95.4 95.8	95.6	6.6 6.6	6.6		1.5 1.7	1.6		9.7 9.7	9.7	
M6	Sunny	Moderate	15:59	Surface	-	-	-	-	-	-	-	-	-	-	-	7.6	-	-	1.2	-	-	4.6
				Middle	2.1	25.8 25.4	25.6	8.5 8.5	8.5	33.0 33.3	33.2	114.6 110.4	112.5	7.8 7.5	7.6		1.2 1.3	1.2		4.5 4.7	4.6	
				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 25 April 2019 (Mid-Flood Tide)

Parameter (unit)	Depth	Action Level	Limit Level
DO in mg/L (See Note 1 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Depth Average	<u>4.9 mg/L</u>	<u>4.6 mg/L</u>
	Bottom	<u>4.2 mg/L</u>	<u>3.6 mg/L</u>
	<u>Station M6</u>		
	Intake Level	<u>5.0 mg/L</u>	<u>4.7 mg/L</u>
Turbidity in NTU (See Note 2 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>19.3 NTU</u>	<u>22.2 NTU</u>
		or 120% of upstream control station's Turbidity at the same tide of the same day <u>CI: 2.1 NTU</u>	or 130% of upstream control station's Turbidity at the same tide of the same day <u>CI: 2.2 NTU</u>
	<u>Station M6</u>		
	Intake Level	<u>19.0 NTU</u>	<u>19.4 NTU</u>
SS in mg/L (See Note 2 and 4)	<u>Stations G1-G4</u>		
	Surface	<u>6.0 mg/L</u>	<u>6.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>CI: 6.1 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>CI: 6.6 mg/L</u>
	<u>Stations M1-M5</u>		
	Surface	<u>6.2 mg/L</u>	<u>7.4 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>CI: 6.1 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>CI: 6.6 mg/L</u>
	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>6.9 mg/L</u>	<u>7.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>CI: 9.4 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>CI: 10.2 mg/L</u>
	<u>Station M6</u>		
Intake Level	<u>8.3 mg/L</u>	<u>8.6 mg/L</u>	

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 25 April 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	10:19	Surface	1.1	24.2 24.3	24.2	8.4 8.4	8.4	33.6 33.5	33.5	93.9 94.2	94.1	6.5 6.5	6.5	6.5	1.3 1.2	1.3	1.4	5.2 5.0	5.1	5.6
				Middle	9.1	23.6 23.6	23.6	8.4 8.4	8.4	34.7 34.7	34.7	92.7 93.0	92.9	6.4 6.5	6.5		1.1 1.1	1.1		3.7 3.8	3.8	
				Bottom	17.0	23.5 23.5	23.5	8.4 8.4	8.4	35.4 35.4	35.4	93.2 93.2	93.2	6.5 6.5	6.5		1.6 1.8	1.7		8.0 7.7	7.9	
C2	Sunny	Moderate	09:13	Surface	1.0	24.3 24.2	24.3	8.5 8.4	8.4	33.4 33.6	33.5	95.0 95.3	95.2	6.6 6.6	6.6	6.6	1.3 1.3	1.3	1.3	6.7 6.7	6.7	7.6
				Middle	16.0	24.2 24.2	24.2	8.6 8.4	8.5	33.7 33.7	33.7	95.4 95.4	95.4	6.6 6.6	6.6		1.2 1.2	1.2		5.1 5.1	5.1	
				Bottom	31.1	23.8 23.8	23.8	8.5 8.4	8.5	34.3 34.2	34.2	93.4 93.5	93.5	6.5 6.5	6.5		1.4 1.3	1.3		10.9 10.8	10.9	
G1	Sunny	Moderate	09:44	Surface	1.1	24.6 24.6	24.6	8.4 8.4	8.4	33.6 33.5	33.5	100.2 99.7	100.0	6.9 6.9	6.9	6.7	1.4 1.3	1.4	1.5	4.8 5.0	4.9	7.5
				Middle	4.0	24.2 24.1	24.2	8.4 8.4	8.4	33.7 33.9	33.8	94.4 95.6	95.0	6.5 6.6	6.6		1.3 1.4	1.3		11.8 11.8	11.8	
				Bottom	7.0	23.5 23.5	23.5	8.4 8.4	8.4	34.8 34.7	34.7	91.1 91.0	91.1	6.3 6.3	6.3		1.9 1.9	1.9		5.7 5.8	5.8	
G2	Sunny	Moderate	09:31	Surface	1.1	24.5 24.5	24.5	8.4 8.4	8.4	33.5 33.5	33.5	98.2 97.8	98.0	6.8 6.7	6.7	6.6	1.2 1.2	1.2	1.9	6.2 6.5	6.4	4.7
				Middle	5.1	23.6 23.6	23.6	8.4 8.4	8.4	34.7 34.6	34.7	92.0 91.9	92.0	6.4 6.4	6.4		1.3 1.4	1.4		3.1 3.1	3.1	
				Bottom	9.0	23.4 23.4	23.4	8.4 8.4	8.4	35.2 35.1	35.1	91.0 91.5	91.3	6.3 6.4	6.3		3.0 3.1	3.0		4.5 4.6	4.6	
G3	Sunny	Moderate	09:47	Surface	1.1	24.5 24.5	24.5	8.4 8.4	8.4	33.5 33.5	33.5	98.7 99.4	99.1	6.8 6.9	6.8	6.7	1.4 1.4	1.4	1.5	9.7 9.7	9.7	6.4
				Middle	4.1	24.0 24.2	24.1	8.4 8.4	8.4	34.1 33.7	33.9	93.5 94.7	94.1	6.5 6.5	6.5		1.2 1.3	1.3		5.3 5.4	5.4	
				Bottom	7.1	23.6 23.6	23.6	8.4 8.4	8.4	34.6 34.6	34.6	90.5 91.2	90.9	6.3 6.3	6.3		1.9 1.7	1.8		4.1 4.1	4.1	
G4	Sunny	Moderate	09:57	Surface	1.0	24.7 24.7	24.7	8.4 8.4	8.4	33.1 33.1	33.1	102.1 101.4	101.8	7.0 7.0	7.0	6.8	1.3 1.3	1.3	1.8	8.2 8.4	8.3	8.2
				Middle	4.0	24.0 24.3	24.2	8.4 8.4	8.4	33.9 33.6	33.7	95.0 95.2	95.1	6.6 6.6	6.6		1.5 1.5	1.5		7.9 8.1	8.0	
				Bottom	7.0	23.9 23.9	23.9	8.4 8.4	8.4	34.1 34.1	34.1	92.6 93.4	93.1	6.4 6.5	6.5		2.6 2.4	2.5		8.2 8.3	8.3	
M1	Sunny	Moderate	09:37	Surface	1.1	24.7 24.0	24.4	8.3 8.4	8.4	33.5 34.1	33.8	96.7 90.5	93.6	6.6 6.3	6.5	6.3	1.1 1.0	1.0	1.9	5.7 5.9	5.8	5.5
				Middle	3.1	24.6 23.7	24.1	8.3 8.4	8.4	33.6 34.4	34.0	92.0 88.4	90.2	6.3 6.1	6.2		1.3 1.4	1.3		4.7 4.9	4.8	
				Bottom	5.0	23.6 23.6	23.6	8.4 8.4	8.4	34.6 34.6	34.6	88.2 88.1	88.2	6.1 6.1	6.1		3.5 3.3	3.4		5.9 6.1	6.0	
M2	Sunny	Moderate	09:27	Surface	1.1	24.5 24.4	24.5	8.4 8.4	8.4	33.6 33.6	33.6	98.1 97.2	97.7	6.8 6.7	6.7	6.6	1.3 1.2	1.2	1.9	5.7 5.8	5.8	4.3
				Middle	6.1	23.6 23.7	23.6	8.4 8.4	8.4	34.8 34.4	34.6	91.9 92.0	92.0	6.4 6.4	6.4		1.7 1.6	1.7		4.1 4.2	4.2	
				Bottom	11.1	23.4 23.4	23.4	8.4 8.4	8.4	35.3 35.2	35.2	91.6 91.7	91.7	6.4 6.4	6.4		2.8 3.0	2.9		3.1 3.1	3.1	
M3	Sunny	Moderate	09:51	Surface	1.0	24.6 24.6	24.6	8.3 8.4	8.3	33.1 33.2	33.1	100.4 99.7	100.1	6.9 6.9	6.9	6.7	1.3 1.0	1.1	1.2	7.5 7.3	7.4	6.6
				Middle	4.0	24.1 24.3	24.2	8.3 8.4	8.3	34.0 33.7	33.9	93.6 94.1	93.9	6.5 6.5	6.5		1.2 1.3	1.2		8.0 8.0	8.0	
				Bottom	7.1	23.7 23.9	23.8	8.4 8.4	8.4	34.3 34.2	34.3	91.0 92.6	91.8	6.3 6.4	6.4		1.3 1.2	1.2		4.4 4.3	4.4	
M4	Sunny	Moderate	09:21	Surface	1.0	24.1 24.1	24.1	8.5 8.5	8.5	33.9 33.9	33.9	95.0 94.7	94.9	6.6 6.6	6.6	6.5	1.6 1.6	1.6	2.3	12.3 12.3	12.3	7.9
				Middle	5.1	23.5 23.6	23.5	8.5 8.5	8.5	35.2 34.9	35.0	92.4 92.9	92.7	6.4 6.5	6.4		2.6 2.3	2.5		6.2 6.4	6.3	
				Bottom	9.1	23.4 23.4	23.4	8.6 8.5	8.6	35.4 35.3	35.3	91.5 92.0	91.8	6.4 6.4	6.4		3.0 2.7	2.9		5.2 5.2	5.2	
M5	Sunny	Moderate	10:11	Surface	1.0	24.6 24.5	24.6	8.4 8.4	8.4	33.4 33.4	33.4	95.9 95.1	95.5	6.6 6.6	6.6	6.5	1.3 1.2	1.2	1.4	6.3 6.1	6.2	7.4
				Middle	6.1	23.9 23.9	23.9	8.4 8.4	8.4	34.1 34.1	34.1	93.2 92.7	93.0	6.5 6.4	6.4		1.3 1.3	1.3		8.9 8.9	8.9	
				Bottom	11.1	23.6 23.6	23.6	8.5 8.4	8.5	34.9 34.8	34.9	92.2 91.9	92.1	6.4 6.4	6.4		1.5 1.9	1.7		7.1 7.1	7.1	
M6	Sunny	Moderate	10:02	Surface	-	-	-	-	-	-	-	-	-	-	-	7.0	-	-	1.0	-	-	5.8
				Middle	2.0	24.8 24.8	24.8	8.4 8.4	8.4	33.2 33.2	33.2	101.6 101.6	101.6	7.0 7.0	7.0		1.1 1.0	1.0		5.8 5.7	5.8	
				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 27 April 2019 (Mid-Ebb Tide)

Parameter (unit)	Depth	Action Level	Limit Level
DO in mg/L (See Note 1 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Depth Average	<u>4.9 mg/L</u>	<u>4.6 mg/L</u>
	Bottom	<u>4.2 mg/L</u>	<u>3.6 mg/L</u>
	<u>Station M6</u>		
	Intake Level	<u>5.0 mg/L</u>	<u>4.7 mg/L</u>
Turbidity in NTU (See Note 2 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>19.3 NTU</u>	<u>22.2 NTU</u>
		or 120% of upstream control station's Turbidity at the same tide of the same day <u>C2: 1.0 NTU</u>	or 130% of upstream control station's Turbidity at the same tide of the same day <u>C2: 1.1 NTU</u>
	<u>Station M6</u>		
	Intake Level	<u>19.0 NTU</u>	<u>19.4 NTU</u>
SS in mg/L (See Note 2 and 4)	<u>Stations G1-G4</u>		
	Surface	<u>6.0 mg/L</u>	<u>6.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>C2: 7.5 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>C2: 8.1 mg/L</u>
	<u>Stations M1-M5</u>		
	Surface	<u>6.2 mg/L</u>	<u>7.4 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>C2: 7.5 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>C2: 8.1 mg/L</u>
	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>6.9 mg/L</u>	<u>7.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>C2: 1.7 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>C2: 1.9 mg/L</u>
	<u>Station M6</u>		
Intake Level	<u>8.3 mg/L</u>	<u>8.6 mg/L</u>	

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 27 April 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	Rainy	Moderate	19:06	Surface	1.1	25.0 25.0	25.0	8.7 8.7	8.7	32.3 32.3	32.3	117.0 117.0	117.0	8.1 8.1	8.1	8.1	0.7 0.7	0.7	0.7	2.3 2.3	2.3	3.4
				Middle	9.1	25.0 25.0	25.0	8.7 8.7	8.7	32.3 32.3	32.3	117.0 117.0	117.0	8.1 8.1	8.1		0.8 0.8	0.8		2.9 2.9	2.9	
				Bottom	17.0	25.0 25.0	25.0	8.7 8.7	8.7	32.3 32.3	32.3	117.0 116.9	117.0	8.1 8.0	8.0		0.7 0.6	0.6		4.8 4.9	4.9	
C2	Rainy	Moderate	17:37	Surface	1.1	25.0 25.0	25.0	8.9 9.2	9.0	32.1 32.2	32.2	117.1 117.8	117.5	8.1 8.1	8.1	8.1	0.6 0.6	0.6	0.8	6.3 6.2	6.3	3.0
				Middle	16.1	25.0 25.0	25.0	9.0 9.4	9.2	32.2 32.2	32.2	117.8 117.8	117.8	8.1 8.1	8.1		0.9 0.8	0.8		1.4 1.4	1.4	
				Bottom	31.1	25.0 25.0	25.0	9.2 9.4	9.3	32.3 32.3	32.3	117.6 117.8	117.7	8.1 8.1	8.1		0.8 0.8	0.8		1.5 1.4	1.5	
G1	Rainy	Moderate	18:16	Surface	1.0	25.0 25.0	25.0	8.7 8.7	8.7	32.2 32.2	32.2	117.9 117.9	117.9	8.1 8.1	8.1	8.1	0.7 0.7	0.7	0.5	2.1 2.1	2.1	1.9
				Middle	4.0	25.0 25.0	25.0	8.7 8.7	8.7	32.2 32.2	32.2	117.8 117.8	117.8	8.1 8.1	8.1		0.5 0.5	0.5		1.7 1.8	1.8	
				Bottom	7.1	25.0 25.0	25.0	8.7 8.7	8.7	32.3 32.2	32.2	117.8 117.7	117.8	8.1 8.1	8.1		0.4 0.3	0.4		1.8 1.8	1.8	
G2	Rainy	Moderate	17:59	Surface	1.1	25.0 25.0	25.0	8.9 8.9	8.9	32.2 32.2	32.2	118.1 118.0	118.1	8.1 8.1	8.1	8.1	0.9 0.9	0.9	0.6	3.5 3.5	3.5	5.9
				Middle	5.1	25.0 25.0	25.0	8.9 8.8	8.9	32.2 32.2	32.2	118.0 118.0	118.0	8.1 8.1	8.1		0.7 0.7	0.7		9.0 8.6	8.8	
				Bottom	9.1	25.0 25.0	25.0	8.9 8.8	8.9	32.3 32.3	32.3	118.0 117.9	118.0	8.1 8.1	8.1		0.3 0.3	0.3		5.3 5.2	5.3	
G3	Rainy	Moderate	18:25	Surface	1.1	25.0 25.0	25.0	8.7 8.8	8.8	32.2 32.2	32.2	117.8 117.7	117.8	8.1 8.1	8.1	8.1	0.8 0.8	0.8	0.9	2.3 2.3	2.3	2.4
				Middle	4.0	25.0 25.0	25.0	8.8 8.8	8.8	32.2 32.2	32.2	117.8 117.7	117.8	8.1 8.1	8.1		0.9 0.9	0.9		3.3 3.3	3.3	
				Bottom	7.1	25.0 25.0	25.0	8.8 8.8	8.8	32.2 32.2	32.2	117.7 117.6	117.7	8.1 8.1	8.1		0.9 0.9	0.9		1.7 1.7	1.7	
G4	Rainy	Moderate	18:39	Surface	1.0	25.0 25.0	25.0	8.8 8.7	8.7	32.3 32.3	32.3	117.5 117.2	117.4	8.1 8.1	8.1	8.1	0.9 0.9	0.9	0.9	3.3 3.4	3.4	2.2
				Middle	4.1	25.0 25.0	25.0	8.7 8.7	8.7	32.3 32.3	32.3	117.4 117.3	117.4	8.1 8.1	8.1		0.9 0.8	0.9		1.7 1.7	1.7	
				Bottom	7.1	25.0 25.0	25.0	8.7 8.7	8.7	32.3 32.3	32.3	117.1 117.0	117.1	8.1 8.1	8.1		0.9 0.9	0.9		1.4 1.4	1.4	
M1	Rainy	Moderate	18:07	Surface	1.1	25.0 25.0	25.0	8.8 8.8	8.8	32.2 32.2	32.2	117.9 117.9	117.9	8.1 8.1	8.1	8.1	0.9 0.8	0.8	0.7	2.2 2.2	2.2	2.4
				Middle	3.0	25.0 25.0	25.0	8.8 8.8	8.8	32.2 32.2	32.2	117.9 117.9	117.9	8.1 8.1	8.1		0.7 0.6	0.7		2.9 3.0	3.0	
				Bottom	5.0	25.0 25.0	25.0	8.8 8.8	8.8	32.3 32.3	32.3	117.8 117.9	117.9	8.1 8.1	8.1		0.6 0.6	0.6		1.9 1.9	1.9	
M2	Rainy	Moderate	17:54	Surface	1.0	25.0 25.0	25.0	9.2 9.0	9.1	32.2 32.2	32.2	118.0 118.0	118.0	8.1 8.1	8.1	8.1	0.8 1.0	0.9	0.8	2.4 2.4	2.4	2.2
				Middle	6.0	25.0 25.0	25.0	9.1 9.0	9.1	32.2 32.2	32.2	118.0 118.0	118.0	8.1 8.1	8.1		0.7 0.6	0.7		1.5 1.4	1.5	
				Bottom	11.1	25.0 25.0	25.0	9.1 9.0	9.0	32.3 32.3	32.3	118.0 118.0	118.0	8.1 8.1	8.1		0.9 0.9	0.9		2.8 2.7	2.8	
M3	Rainy	Moderate	18:30	Surface	1.0	25.0 25.0	25.0	8.8 8.8	8.8	32.2 32.2	32.2	117.5 117.5	117.5	8.1 8.1	8.1	8.1	0.9 0.8	0.8	0.8	5.0 5.0	5.0	3.6
				Middle	4.0	25.0 25.0	25.0	8.8 8.8	8.8	32.2 32.2	32.2	117.6 117.5	117.6	8.1 8.1	8.1		0.8 0.8	0.8		2.3 2.2	2.3	
				Bottom	7.0	25.0 25.0	25.0	8.8 8.8	8.8	32.3 32.3	32.3	117.5 117.3	117.4	8.1 8.1	8.1		0.8 0.8	0.8		3.7 3.6	3.7	
M4	Rainy	Moderate	17:45	Surface	1.1	25.0 25.0	25.0	9.5 9.3	9.4	32.2 32.2	32.2	117.8 118.0	117.9	8.1 8.1	8.1	8.1	0.6 0.6	0.6	0.5	4.1 4.2	4.2	5.0
				Middle	5.0	25.0 25.0	25.0	9.5 9.3	9.4	32.2 32.2	32.2	117.9 118.0	118.0	8.1 8.1	8.1		0.4 0.4	0.4		8.8 8.9	8.9	
				Bottom	9.0	25.0 25.0	25.0	9.4 9.3	9.3	32.3 32.3	32.3	117.9 118.0	118.0	8.1 8.1	8.1		0.5 0.5	0.5		1.9 1.9	1.9	
M5	Rainy	Moderate	18:56	Surface	1.0	25.0 25.0	25.0	8.7 8.7	8.7	32.3 32.3	32.3	117.3 117.0	117.2	8.1 8.1	8.1	8.1	0.9 0.9	0.9	0.9	4.1 4.2	4.2	2.6
				Middle	6.0	25.0 25.0	25.0	8.7 8.7	8.7	32.3 32.3	32.3	117.2 117.1	117.2	8.1 8.1	8.1		0.9 0.9	0.9		1.9 2.0	2.0	
				Bottom	11.1	25.0 25.0	25.0	8.7 8.7	8.7	32.3 32.3	32.3	116.9 117.0	117.0	8.1 8.1	8.1		0.9 0.9	0.9		1.6 1.6	1.6	
M6	Rainy	Moderate	18:46	Surface	-	-	-	-	-	-	-	-	-	-	8.1	-	-	0.9	-	-	1.5	
				Middle	2.1	25.0 25.0	25.0	8.7 8.7	8.7	32.3 32.3	32.3	117.0 117.0	117.0	8.1 8.1		8.1	0.8 0.9		0.9	1.5 1.5		1.5
				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 29 April 2019 (Mid-Ebb Tide)

Parameter (unit)	Depth	Action Level	Limit Level
DO in mg/L (See Note 1 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Depth Average	<u>4.9 mg/L</u>	<u>4.6 mg/L</u>
	Bottom	<u>4.2 mg/L</u>	<u>3.6 mg/L</u>
	<u>Station M6</u>		
	Intake Level	<u>5.0 mg/L</u>	<u>4.7 mg/L</u>
Turbidity in NTU (See Note 2 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>19.3 NTU</u>	<u>22.2 NTU</u>
		or 120% of upstream control station's Turbidity at the same tide of the same day <u>C2: 4.1 NTU</u>	or 130% of upstream control station's Turbidity at the same tide of the same day <u>C2: 4.5 NTU</u>
	<u>Station M6</u>		
	Intake Level	<u>19.0 NTU</u>	<u>19.4 NTU</u>
SS in mg/L (See Note 2 and 4)	<u>Stations G1-G4</u>		
	Surface	<u>6.0 mg/L</u>	<u>6.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>C2: 3.8 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>C2: 4.1 mg/L</u>
	<u>Stations M1-M5</u>		
	Surface	<u>6.2 mg/L</u>	<u>7.4 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>C2: 3.8 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>C2: 4.1 mg/L</u>
	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>6.9 mg/L</u>	<u>7.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>C2: 4.7 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>C2: 5.1 mg/L</u>
	<u>Station M6</u>		
Intake Level	<u>8.3 mg/L</u>	<u>8.6 mg/L</u>	

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 29 April 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	10:19	Surface	1.0	25.0 25.0	25.0	9.0 9.0	9.0	32.9 32.9	32.9	103.8 103.9	103.9	7.1 7.1	7.1	7.0	1.8 1.8	1.8	2.1	9.2 9.4	9.3	6.8
				Middle	9.0	24.8 24.7	24.7	8.8 8.8	8.8	33.4 33.5	33.5	101.6 100.1	100.9	7.0 6.9	6.9	7.0	0.8 0.8	0.8		8.6 8.9	8.8	
				Bottom	16.9	24.3 24.3	24.3	8.7 8.7	8.7	34.2 34.2	34.2	90.9 90.8	90.9	6.3 6.3	6.3	6.3	3.8 3.8	3.8		2.5 2.4	2.5	
C2	Fine	Calm	09:14	Surface	1.1	24.8 24.8	24.8	8.7 8.7	8.7	32.9 32.9	32.9	102.0 102.1	102.1	7.0 7.0	7.0	6.7	0.4 0.4	0.4	2.0	3.2 3.1	3.2	3.4
				Middle	16.0	24.3 24.3	24.3	8.7 8.7	8.7	33.9 33.9	33.9	92.3 91.9	92.1	6.4 6.3	6.4	6.7	2.2 2.3	2.3		3.1 3.0	3.1	
				Bottom	31.1	24.1 24.1	24.1	8.7 8.6	8.6	34.2 34.2	34.2	87.3 87.3	87.3	6.0 6.0	6.0	6.0	3.4 3.5	3.5		3.9 4.0	4.0	
G1	Fine	Calm	09:42	Surface	1.0	24.9 24.9	24.9	8.6 8.6	8.6	32.6 32.6	32.6	102.7 103.2	103.0	7.1 7.1	7.1	7.1	1.1 1.1	1.1	0.9	9.4 9.2	9.3	7.9
				Middle	4.0	24.9 24.9	24.9	8.6 8.6	8.6	32.8 32.8	32.8	104.2 104.1	104.2	7.2 7.2	7.2	7.2	0.7 0.8	0.7		5.5 5.6	5.6	
				Bottom	6.9	24.6 24.6	24.6	8.6 8.6	8.6	33.2 33.2	33.2	99.5 99.5	99.5	6.9 6.9	6.9	6.9	0.7 0.7	0.7		8.9 8.9	8.9	
G2	Fine	Calm	09:31	Surface	1.1	25.0 24.9	24.9	8.6 8.6	8.6	32.7 32.7	32.7	105.4 105.4	105.4	7.2 7.2	7.2	7.2	1.1 1.1	1.1	0.8	3.0 3.1	3.1	5.7
				Middle	5.0	24.8 24.8	24.8	8.6 8.6	8.6	32.8 32.8	32.8	104.1 104.0	104.1	7.2 7.2	7.2	7.2	0.7 0.6	0.6		7.3 7.7	7.5	
				Bottom	9.0	24.6 24.6	24.6	8.6 8.6	8.6	33.2 33.2	33.2	100.5 100.1	100.3	6.9 6.9	6.9	6.9	0.7 0.8	0.7		6.5 6.8	6.7	
G3	Fine	Calm	09:46	Surface	1.0	25.2 25.1	25.2	8.7 8.7	8.7	32.4 32.4	32.4	102.4 102.6	102.5	7.0 7.0	7.0	7.0	1.1 1.1	1.1	1.3	5.9 5.8	5.9	4.0
				Middle	4.0	24.8 24.8	24.8	8.6 8.6	8.6	32.9 32.9	32.9	101.6 101.2	101.4	7.0 7.0	7.0	7.0	1.4 1.4	1.4		3.1 3.2	3.2	
				Bottom	7.0	24.7 24.6	24.7	8.6 8.6	8.6	33.0 33.3	33.1	99.4 96.8	98.1	6.8 6.7	6.8	6.8	1.3 1.3	1.3		2.9 2.8	2.9	
G4	Fine	Calm	09:56	Surface	1.1	25.0 25.0	25.0	8.6 8.6	8.6	32.6 32.6	32.6	104.6 104.6	104.6	7.2 7.2	7.2	7.1	1.5 1.5	1.5	1.7	2.6 2.7	2.7	4.7
				Middle	4.0	24.8 24.8	24.8	8.6 8.6	8.6	32.9 32.9	32.9	103.2 103.1	103.1	7.1 7.1	7.1	7.1	1.6 1.6	1.6		8.4 8.1	8.3	
				Bottom	7.0	24.7 24.7	24.7	8.6 8.6	8.6	33.2 33.2	33.2	100.9 100.5	100.7	6.9 6.9	6.9	6.9	1.9 1.9	1.9		3.1 3.1	3.1	
M1	Fine	Calm	09:37	Surface	1.0	24.9 24.9	24.9	8.6 8.6	8.6	32.7 32.7	32.7	98.9 98.9	98.9	6.8 6.8	6.8	6.8	0.5 0.5	0.5	0.6	2.5 2.4	2.5	3.9
				Middle	3.0	24.9 24.9	24.9	8.6 8.6	8.6	32.7 32.7	32.7	98.6 98.7	98.7	6.8 6.8	6.8	6.8	0.5 0.5	0.5		4.2 4.2	4.2	
				Bottom	5.0	24.8 24.7	24.7	8.6 8.6	8.6	32.9 32.9	32.9	98.9 98.8	98.9	6.8 6.8	6.8	6.8	0.9 1.0	0.9		5.0 4.9	5.0	
M2	Fine	Calm	09:27	Surface	1.1	25.0 25.0	25.0	8.6 8.6	8.6	32.7 32.7	32.7	105.4 105.4	105.4	7.2 7.2	7.2	7.2	1.3 1.4	1.4	1.2	1.8 1.7	1.8	3.7
				Middle	6.0	24.8 24.8	24.8	8.6 8.6	8.6	32.9 32.9	32.9	103.6 103.4	103.5	7.1 7.1	7.1	7.1	1.0 1.0	1.0		1.8 1.8	1.8	
				Bottom	11.0	24.6 24.6	24.6	8.6 8.6	8.6	33.2 33.2	33.2	100.6 100.0	100.3	6.9 6.9	6.9	6.9	1.3 1.3	1.3		7.4 7.5	7.5	
M3	Fine	Calm	09:51	Surface	1.0	24.8 24.8	24.8	8.6 8.6	8.6	32.6 32.6	32.6	101.9 102.0	102.0	7.0 7.0	7.0	7.0	2.0 2.0	2.0	2.0	8.8 8.5	8.7	5.6
				Middle	4.0	24.8 24.7	24.8	8.6 8.6	8.6	32.8 32.9	32.9	101.1 100.4	100.8	7.0 6.9	6.9	6.9	1.8 1.9	1.8		4.4 4.5	4.5	
				Bottom	7.0	24.7 24.7	24.7	8.6 8.6	8.6	33.0 33.0	33.0	99.2 98.7	99.0	6.8 6.8	6.8	6.8	2.2 2.3	2.3		3.8 3.7	3.8	
M4	Fine	Calm	09:21	Surface	1.0	24.9 24.9	24.9	8.6 8.6	8.6	32.8 32.8	32.8	104.3 104.3	104.3	7.2 7.2	7.2	7.1	0.8 0.8	0.8	0.7	2.3 2.4	2.4	3.5
				Middle	5.0	24.8 24.8	24.8	8.6 8.6	8.6	32.9 32.9	32.9	103.0 102.9	103.0	7.1 7.1	7.1	7.1	0.8 0.7	0.7		2.2 2.2	2.2	
				Bottom	9.0	24.6 24.6	24.6	8.6 8.6	8.6	33.2 33.2	33.2	99.8 99.4	99.6	6.9 6.9	6.9	6.9	0.5 0.5	0.5		6.0 6.0	6.0	
M5	Fine	Calm	10:10	Surface	1.1	25.0 25.0	25.0	8.6 8.6	8.6	32.8 32.8	32.8	104.4 104.5	104.5	7.2 7.2	7.2	7.1	1.6 1.6	1.6	2.4	2.0 2.0	2.0	3.0
				Middle	6.0	24.8 24.8	24.8	8.6 8.6	8.6	32.9 32.9	32.9	102.1 102.2	102.2	7.0 7.0	7.0	7.0	1.7 1.7	1.7		3.3 3.3	3.3	
				Bottom	11.0	24.6 24.6	24.6	8.6 8.6	8.6	33.2 33.3	33.3	96.0 95.7	95.9	6.6 6.6	6.6	6.6	3.8 3.8	3.8		3.8 3.8	3.8	
M6	Fine	Calm	10:01	Surface	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.4	-	-	9.3
				Middle	2.0	24.9 24.9	24.9	8.6 8.6	8.6	32.8 32.8	32.8	101.0 100.9	101.0	6.9 6.9	6.9	6.9	2.4 2.4	2.4		9.4 9.2	9.3	
				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 29 April 2019 (Mid-Flood Tide)

<u>Parameter (unit)</u>	<u>Depth</u>	<u>Action Level</u>	<u>Limit Level</u>
DO in mg/L (See Note 1 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Depth Average	<u>4.9 mg/L</u>	<u>4.6 mg/L</u>
	Bottom	<u>4.2 mg/L</u>	<u>3.6 mg/L</u>
	<u>Station M6</u>		
	Intake Level	<u>5.0 mg/L</u>	<u>4.7 mg/L</u>
Turbidity in NTU (See Note 2 and 4)	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>19.3 NTU</u>	<u>22.2 NTU</u>
		or 120% of upstream control station's Turbidity at the same tide of the same day <u>CI: 5.0 NTU</u>	or 130% of upstream control station's Turbidity at the same tide of the same day <u>CI: 5.4 NTU</u>
	<u>Station M6</u>		
	Intake Level	<u>19.0 NTU</u>	<u>19.4 NTU</u>
SS in mg/L (See Note 2 and 4)	<u>Stations G1-G4</u>		
	Surface	<u>6.0 mg/L</u>	<u>6.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>CI: 1.4 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>CI: 1.5 mg/L</u>
	<u>Stations M1-M5</u>		
	Surface	<u>6.2 mg/L</u>	<u>7.4 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>CI: 1.4 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>CI: 1.5 mg/L</u>
	<u>Stations G1-G4, M1-M5</u>		
	Bottom	<u>6.9 mg/L</u>	<u>7.9 mg/L</u>
		or 120% of upstream control station's SS at the same tide of the same day <u>CI: 6.1 mg/L</u>	or 130% of upstream control station's SS at the same tide of the same day <u>CI: 6.6 mg/L</u>
	<u>Station M6</u>		
Intake Level	<u>8.3 mg/L</u>	<u>8.6 mg/L</u>	

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.

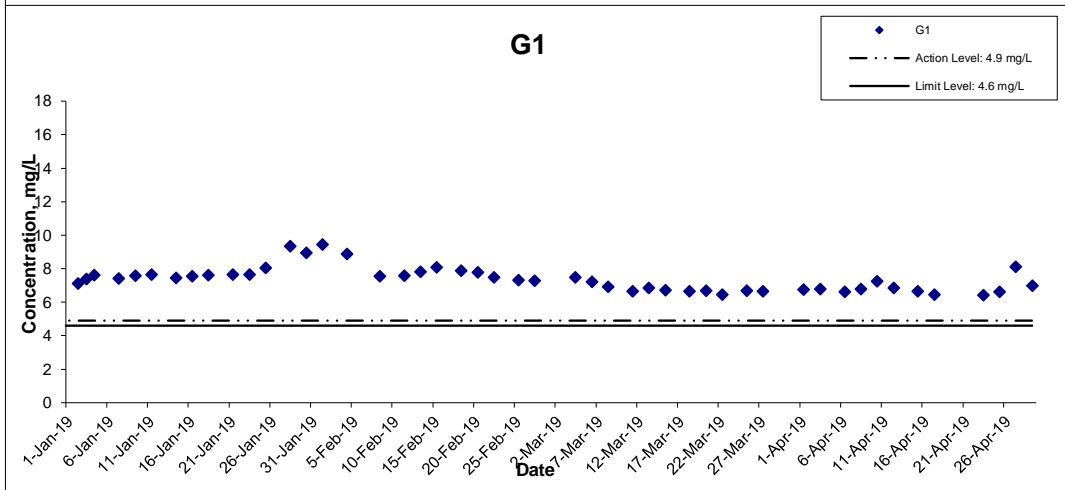
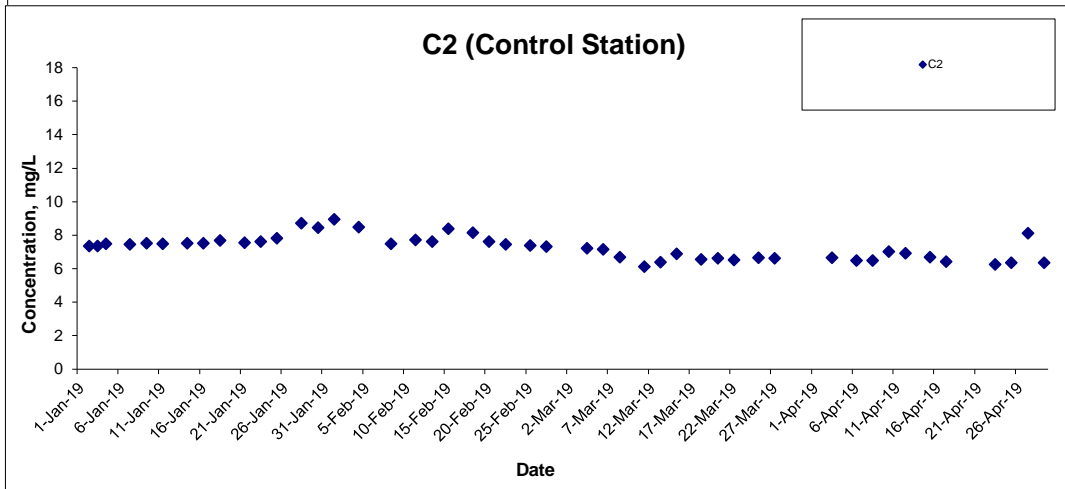
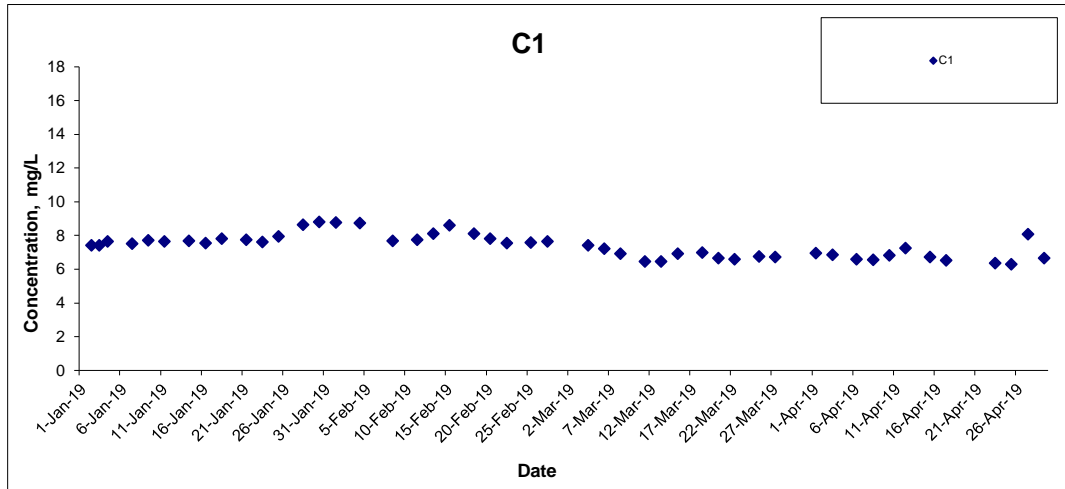
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 Water Quality Monitoring Results on 29 April 2019

(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	13:32	Surface	1.0	24.9 24.9	24.9	8.7 8.7	8.7	32.9 32.9	32.9	103.4 103.4	103.4	7.1 7.1	7.1	7.1	7.1	0.5 0.5	0.5	1.9	1.1 1.2	1.2	2.8
				Middle	9.0	24.8 24.8	24.8	8.7 8.7	8.7	33.0 33.0	33.0	103.1 102.7	102.9	7.1 7.1	7.1	7.1		1.1	1.1		2.1 2.1	2.1	
				Bottom	17.0	24.3 24.3	24.3	8.6 8.6	8.6	34.2 34.2	34.2	90.4 90.4	90.4	6.2 6.2	6.2	6.2		4.2 4.2	4.2		5.1 5.1	5.1	
C2	Fine	Calm	12:31	Surface	1.0	24.8 24.8	24.8	8.7 8.7	8.7	32.9 32.9	32.9	102.1 102.2	102.2	7.0 7.0	7.0	7.0	6.7	1.5 1.4	1.4	2.2	11.0 11.0	11.0	7.8
				Middle	16.1	24.3 24.2	24.2	8.6 8.6	8.6	34.0 34.0	34.0	91.9 91.7	91.8	6.3 6.3	6.3	6.3		2.2 2.2	2.2		6.0 5.9	6.0	
				Bottom	31.1	24.2 24.2	24.2	8.6 8.6	8.6	34.1 34.1	34.1	88.4 88.4	88.4	6.1 6.1	6.1	6.1		2.9 2.9	2.9		6.2 6.5	6.4	
G1	Fine	Calm	13:00	Surface	1.0	24.9 24.9	24.9	8.6 8.6	8.6	32.6 32.6	32.6	104.5 104.5	104.5	7.2 7.2	7.2	7.2	7.2	0.4 0.4	0.4	0.4	5.1 5.2	5.2	9.0
				Middle	4.0	24.9 24.8	24.8	8.6 8.6	8.6	32.8 32.8	32.8	104.2 104.1	104.2	7.2 7.2	7.2	7.2		0.3 0.3	0.3		10.2 10.3	10.3	
				Bottom	7.1	24.7 24.7	24.7	8.6 8.6	8.6	33.0 33.1	33.1	102.6 102.2	102.4	7.1 7.0	7.0	7.0		0.4 0.4	0.4		11.7 11.5	11.6	
G2	Fine	Calm	12:48	Surface	1.0	24.9 24.9	24.9	8.6 8.6	8.6	32.7 32.7	32.7	105.4 105.5	105.5	7.2 7.3	7.2	7.2	7.2	0.3 0.3	0.3	0.4	6.7 6.7	6.7	11.6
				Middle	5.0	24.9 24.9	24.9	8.6 8.6	8.6	32.7 32.7	32.7	105.3 105.1	105.2	7.2 7.2	7.2	7.2		0.4 0.4	0.4		12.0 12.1	12.1	
				Bottom	9.1	24.7 24.7	24.7	8.6 8.6	8.6	33.0 33.0	33.0	103.0 102.8	102.9	7.1 7.1	7.1	7.1		0.7 0.6	0.6		16.1 16.1	16.1	
G3	Fine	Calm	13:03	Surface	1.1	25.0 25.0	25.0	8.6 8.6	8.6	31.8 31.9	31.9	102.4 102.7	102.6	7.1 7.1	7.1	7.1	7.1	0.8 0.8	0.8	1.5	7.4 7.3	7.4	6.4
				Middle	4.0	24.8 24.8	24.8	8.6 8.6	8.6	32.8 32.8	32.8	102.9 102.9	102.9	7.1 7.1	7.1	7.1		1.1 1.1	1.1		4.2 4.1	4.2	
				Bottom	7.0	24.6 24.6	24.6	8.6 8.6	8.6	33.3 33.3	33.3	96.7 96.7	96.7	6.7 6.7	6.7	6.7		2.6 2.7	2.7		8.0 7.6	7.8	
G4	Fine	Calm	13:11	Surface	1.0	25.0 25.0	25.0	8.6 8.6	8.6	32.6 32.6	32.6	105.4 105.4	105.4	7.2 7.2	7.2	7.2	7.2	0.8 0.8	0.8	1.4	11.3 11.0	11.2	9.3
				Middle	4.0	24.8 24.8	24.8	8.6 8.6	8.6	32.8 32.9	32.9	103.3 102.9	103.1	7.1 7.1	7.1	7.1		1.5 1.6	1.5		6.8 6.9	6.9	
				Bottom	6.9	24.7 24.7	24.7	8.6 8.6	8.6	33.1 33.2	33.2	101.3 100.9	101.1	7.0 6.9	7.0	7.0		1.7 1.8	1.8		10.1 9.7	9.9	
M1	Fine	Calm	12:54	Surface	1.0	24.9 24.9	24.9	8.6 8.6	8.6	32.7 32.7	32.7	98.5 98.5	98.5	6.8 6.8	6.8	6.8	6.8	0.8 0.8	0.8	0.8	4.8 4.8	4.8	6.1
				Middle	3.0	24.9 24.8	24.9	8.6 8.6	8.6	32.7 32.8	32.7	98.2 98.5	98.4	6.8 6.8	6.8	6.8		0.6 0.6	0.6		5.8 5.9	5.9	
				Bottom	5.1	24.7 24.7	24.7	8.6 8.6	8.6	32.9 32.9	32.9	98.8 98.7	98.8	6.8 6.8	6.8	6.8		1.0 1.0	1.0		7.5 7.8	7.7	
M2	Fine	Calm	12:44	Surface	1.0	25.0 25.0	25.0	8.6 8.6	8.6	32.7 32.7	32.7	105.7 105.7	105.7	7.3 7.3	7.3	7.3	7.2	0.4 0.4	0.4	0.8	3.1 3.1	3.1	4.0
				Middle	6.0	24.8 24.8	24.8	8.6 8.6	8.6	32.8 32.8	32.8	103.7 103.6	103.7	7.1 7.1	7.1	7.1		0.9 0.9	0.9		5.6 5.8	5.7	
				Bottom	11.0	24.7 24.7	24.7	8.6 8.6	8.6	32.9 33.0	33.0	102.3 102.0	102.2	7.0 7.0	7.0	7.0		1.2 1.2	1.2		3.3 3.3	3.3	
M3	Fine	Calm	13:06	Surface	0.9	24.8 24.8	24.8	8.6 8.6	8.6	32.7 32.7	32.7	102.0 102.0	102.0	7.0 7.0	7.0	7.0	7.0	1.4 1.4	1.4	1.8	1.6 1.6	1.6	5.9
				Middle	4.0	24.8 24.8	24.8	8.6 8.6	8.6	32.9 32.9	32.9	100.6 100.5	100.6	6.9 6.9	6.9	6.9		1.7 1.7	1.7		8.5 8.9	8.7	
				Bottom	6.9	24.7 24.7	24.7	8.6 8.6	8.6	33.1 33.1	33.1	98.6 98.3	98.5	6.8 6.8	6.8	6.8		2.3 2.4	2.3		7.2 7.3	7.3	
M4	Fine	Calm	12:37	Surface	1.0	24.9 24.9	24.9	8.6 8.6	8.6	32.8 32.8	32.8	103.5 103.6	103.6	7.1 7.1	7.1	7.1	7.1	0.8 0.7	0.7	0.7	6.0 5.9	6.0	3.6
				Middle	5.0	24.8 24.8	24.8	8.6 8.6	8.6	32.9 32.9	32.9	103.2 103.2	103.2	7.1 7.1	7.1	7.1		0.7 0.7	0.7		2.6 2.5	2.6	
				Bottom	9.0	24.6 24.6	24.6	8.6 8.6	8.6	33.2 33.2	33.2	99.5 99.3	99.4	6.9 6.9	6.9	6.9		0.9 0.8	0.8		2.3 2.2	2.3	
M5	Fine	Calm	13:26	Surface	1.0	24.9 24.9	24.9	8.6 8.6	8.6	32.8 32.8	32.8	104.3 104.4	104.4	7.2 7.2	7.2	7.2	7.2	0.6 0.6	0.6	2.1	2.5 2.5	2.5	3.3
				Middle	6.0	24.8 24.8	24.8	8.6 8.6	8.6	32.8 32.8	32.8	104.3 104.1	104.2	7.2 7.2	7.2	7.2		0.7 0.7	0.7		2.8 2.8	2.8	
				Bottom	11.0	24.5 24.5	24.5	8.6 8.6	8.6	33.5 33.5	33.5	95.2 95.0	95.1	6.6 6.6	6.6	6.6		4.9 4.8	4.9		4.5 4.4	4.5	
M6	Fine	Calm	13:16	Surface	-	-	-	-	-	-	-	-	-	-	-	-	6.9	-	-	2.4	-	-	4.4
				Middle	2.0	24.9 24.9	24.9	8.6 8.6	8.6	32.8 32.8	32.8	101.0 101.0	101.0	6.9 6.9	6.9	6.9		2.4 2.4	2.4		4.4 4.4	4.4	
				Bottom	-	-	-	-	-	-	-	-	-	-	-	-		-	-		-	-	

Remarks: *DA: Depth-Averaged
 **Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

Dissolved Oxygen (Depth-averaged) at Mid-Ebb Tide



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Graphical Presentation of Water Quality Monitoring Results

Scale N.T.S

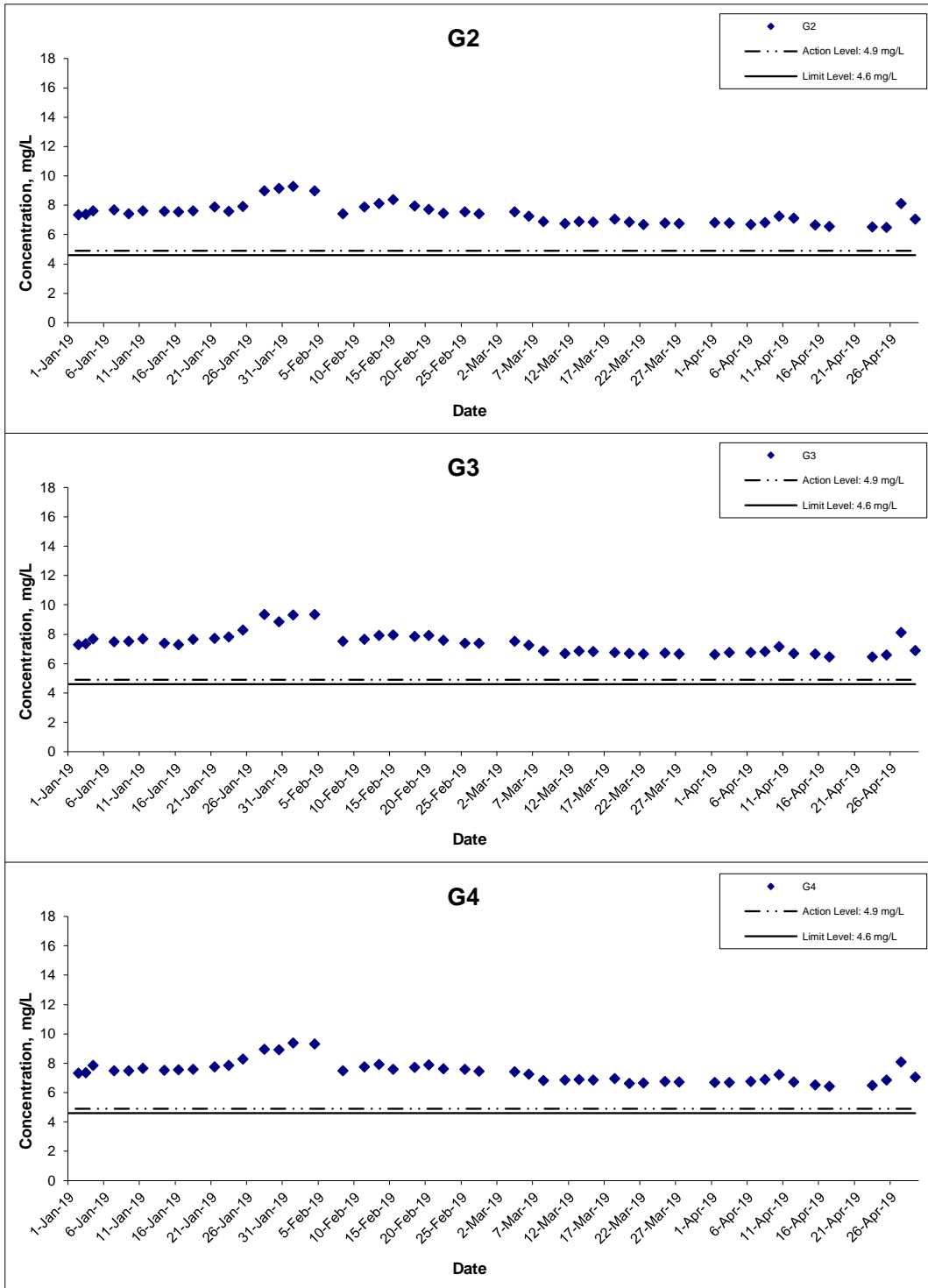
Date Apr 19

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Appendix I



Dissolved Oxygen (Depth-averaged) at Mid-Ebb Tide



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Results

Scale N.T.S

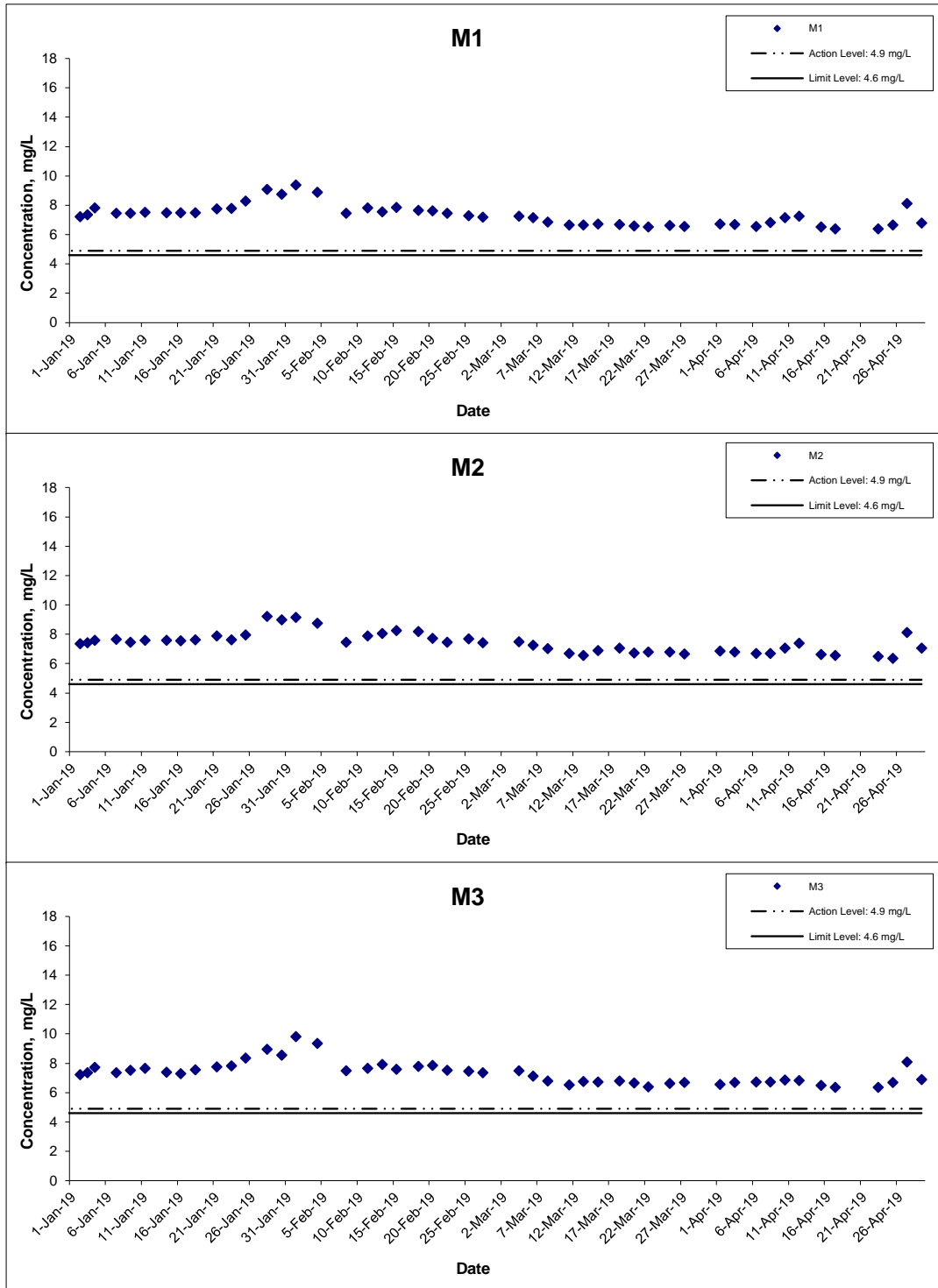
Date Apr 19

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Appendix I



Dissolved Oxygen (Depth-averaged) at Mid-Ebb Tide



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Results

Scale N.T.S

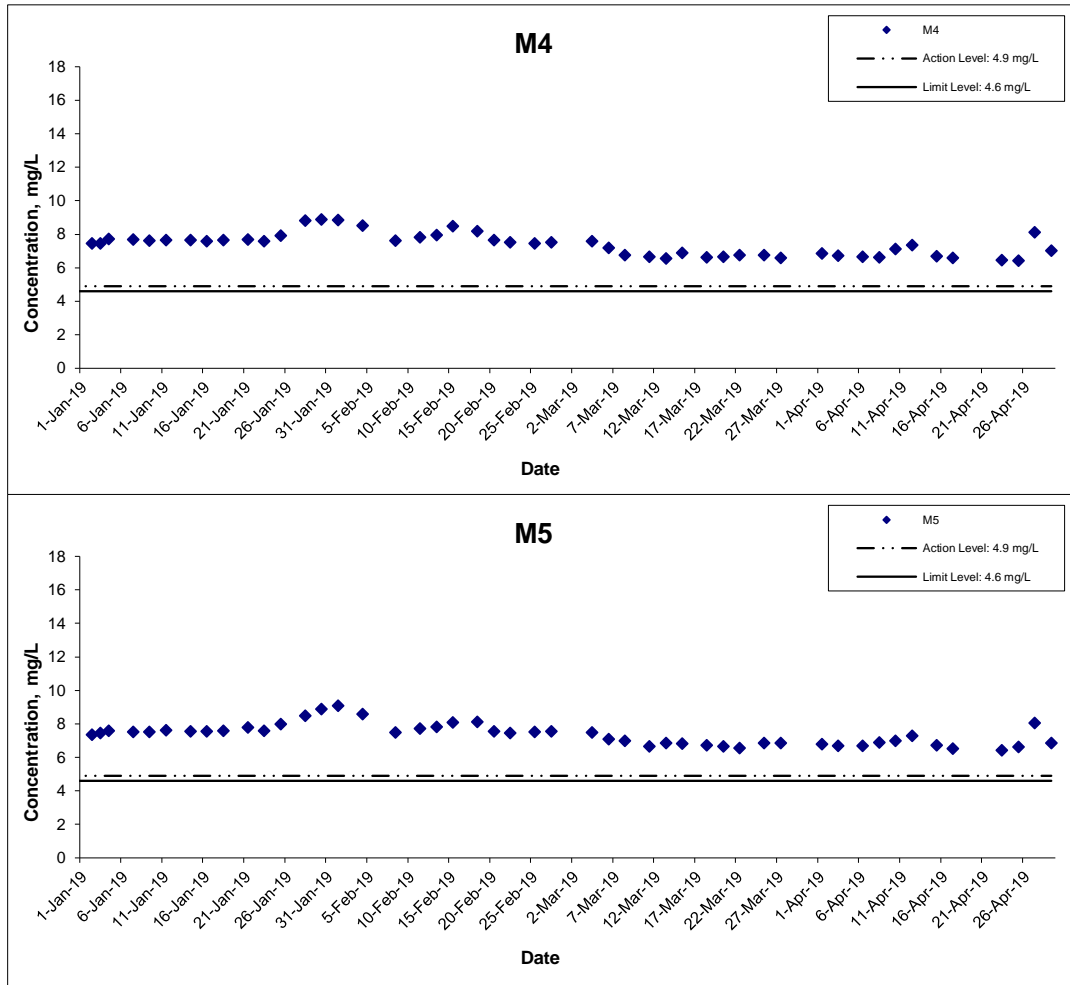
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Appendix I



Dissolved Oxygen (Depth-averaged) at Mid-Ebb Tide



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Graphical Presentation of Water Quality Monitoring Results

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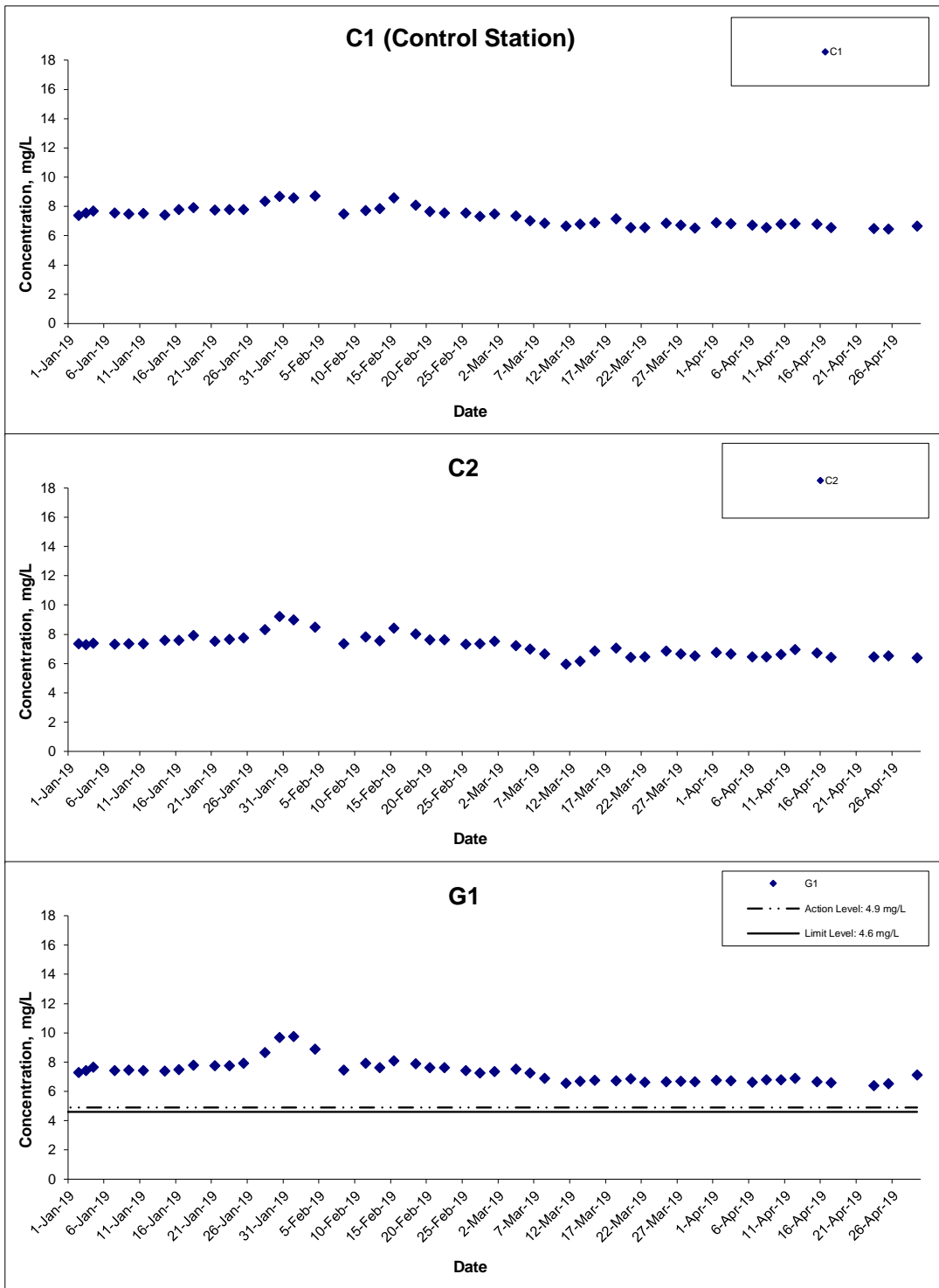
Date Apr 19

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Appendix I



Dissolved Oxygen (Depth-averaged) at Mid-Flood Tide



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Graphical Presentation of Water Quality Monitoring Results

Scale N.T.S

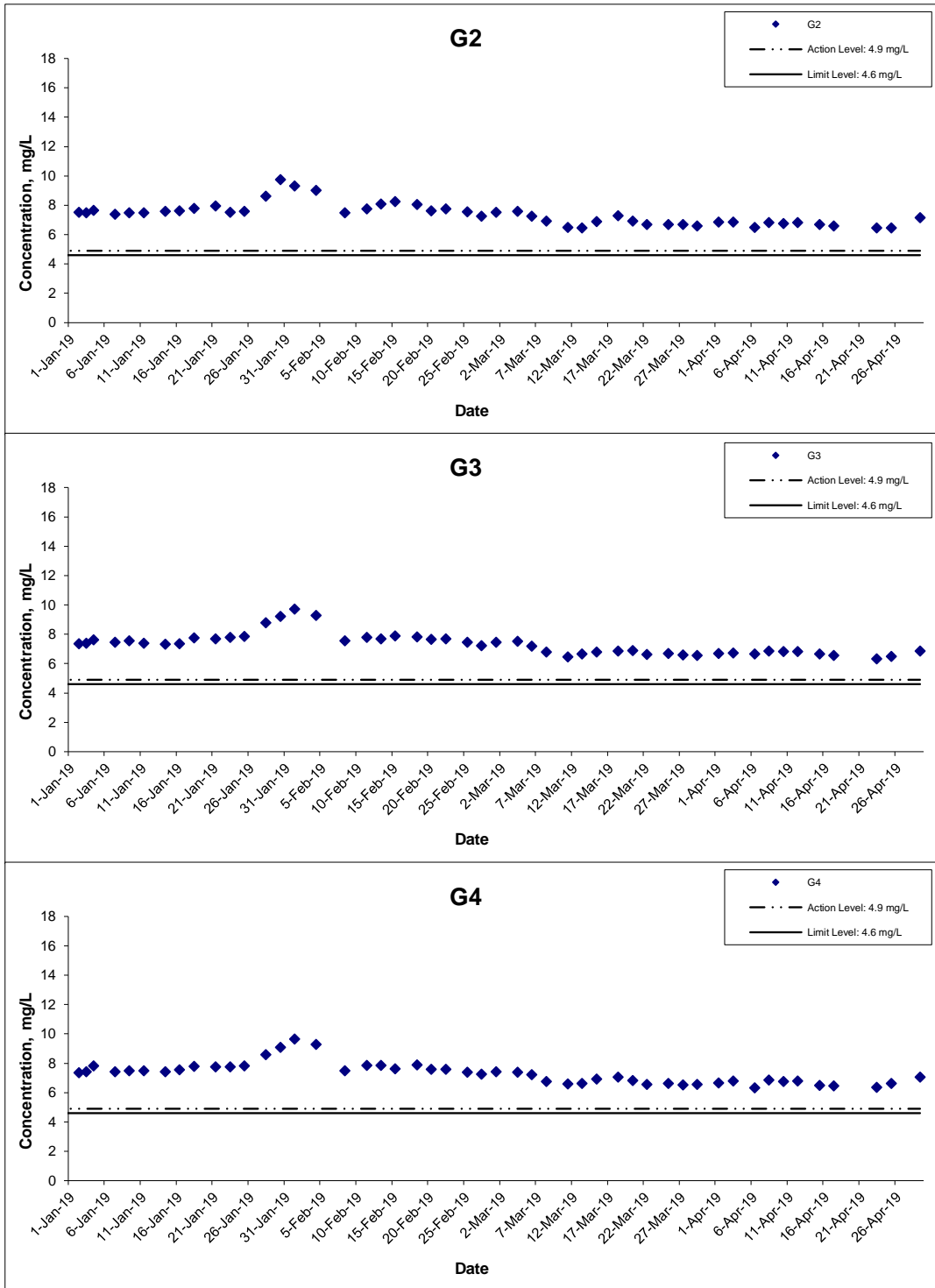
Date Apr 19

Project No. MA16034

Appendix I



Dissolved Oxygen (Depth-averaged) 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

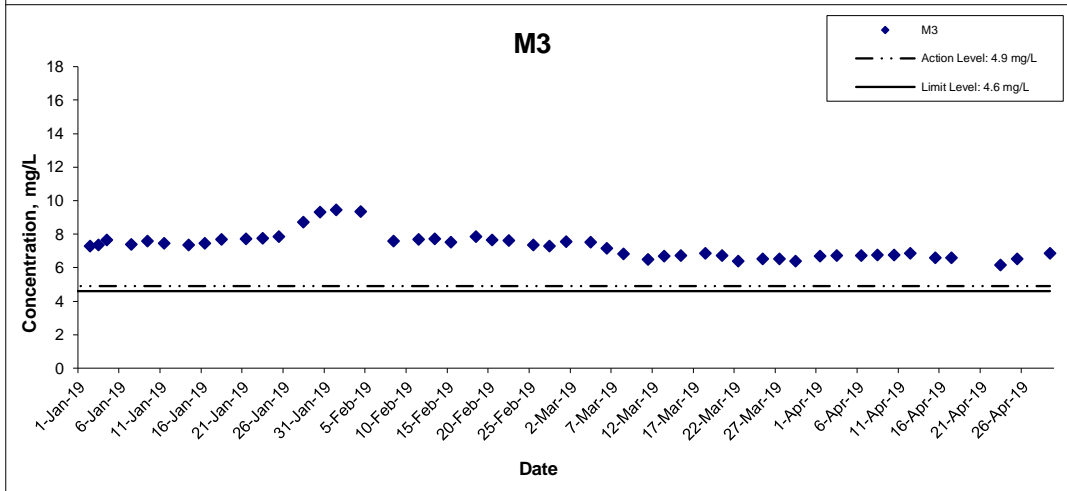
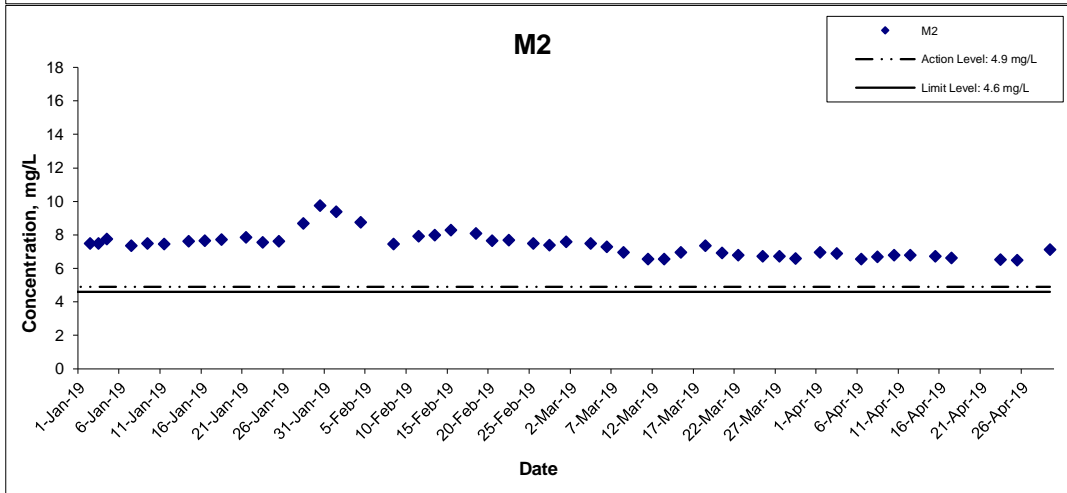
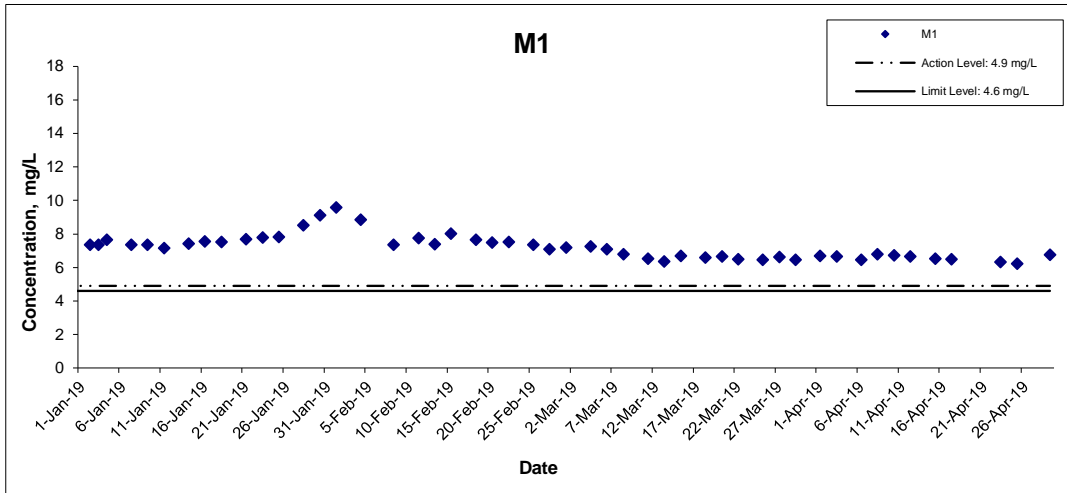
Date Apr 19

Project No. MA16034

Appendix I



Dissolved Oxygen (Depth-averaged) 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

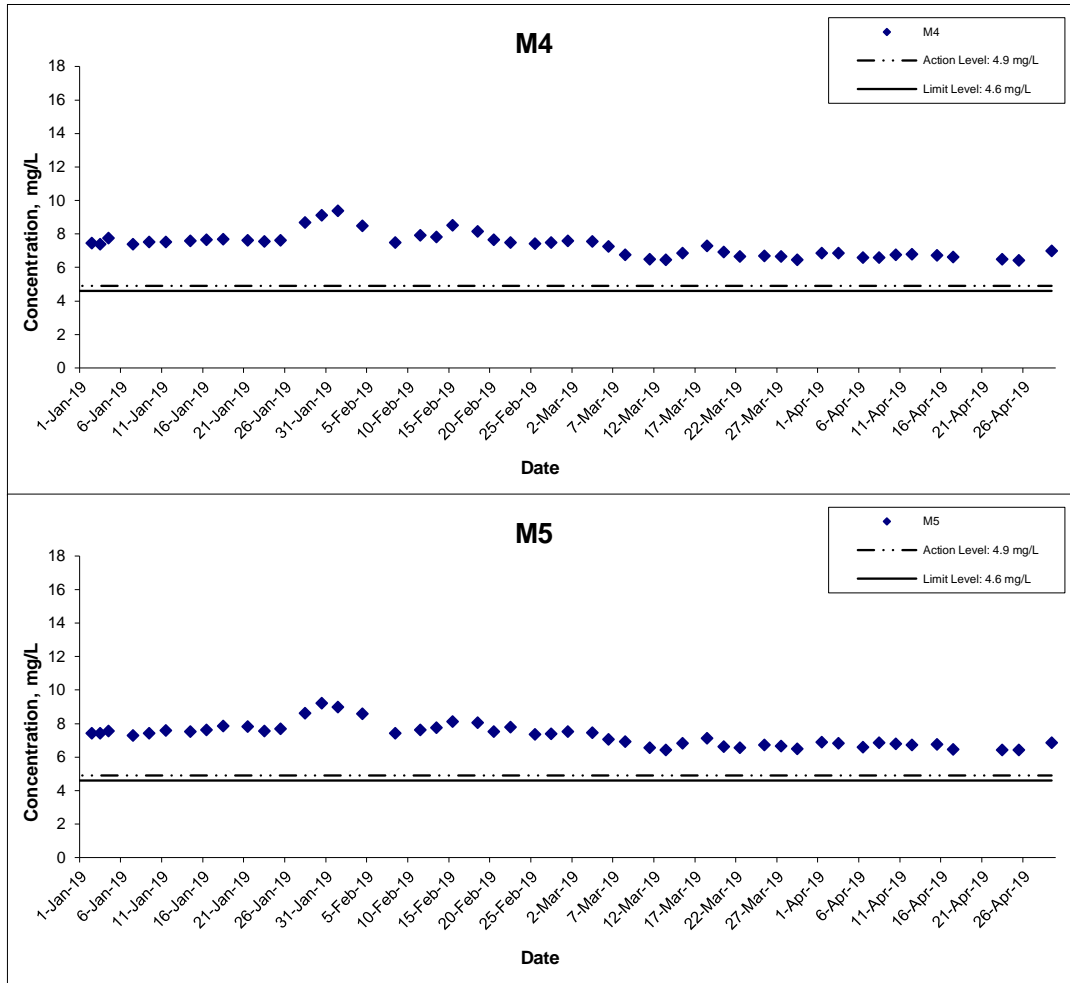
Date Apr 19

Project No. MA16034

Appendix I



Dissolved Oxygen (Depth-averaged) 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

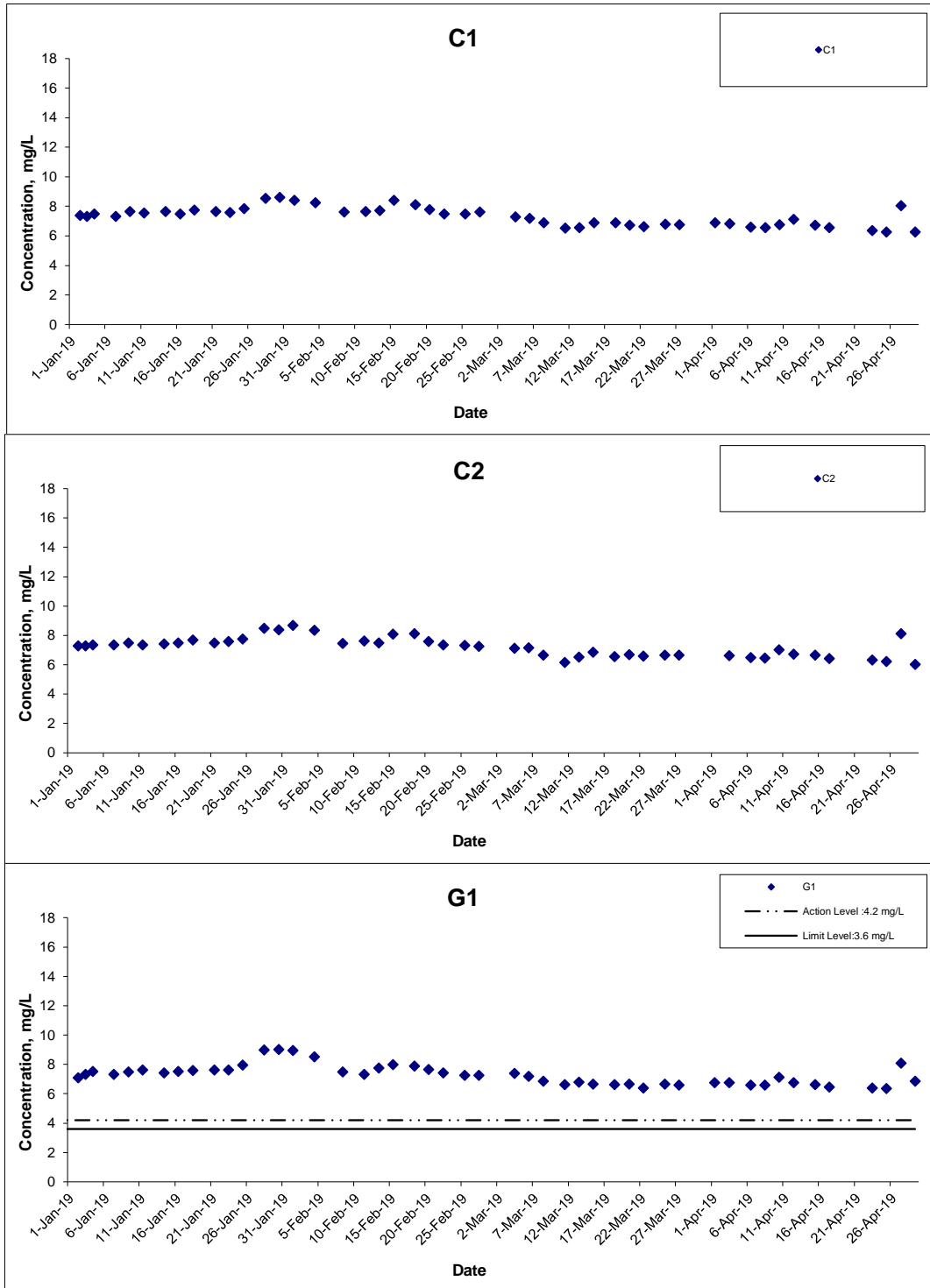
Date Apr 19

Project No. MA16034

Appendix I



Dissolved Oxygen (Bottom) at Mid-Ebb Tide



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

Graphical Presentation of Water Quality Monitoring Results

Scale N.T.S

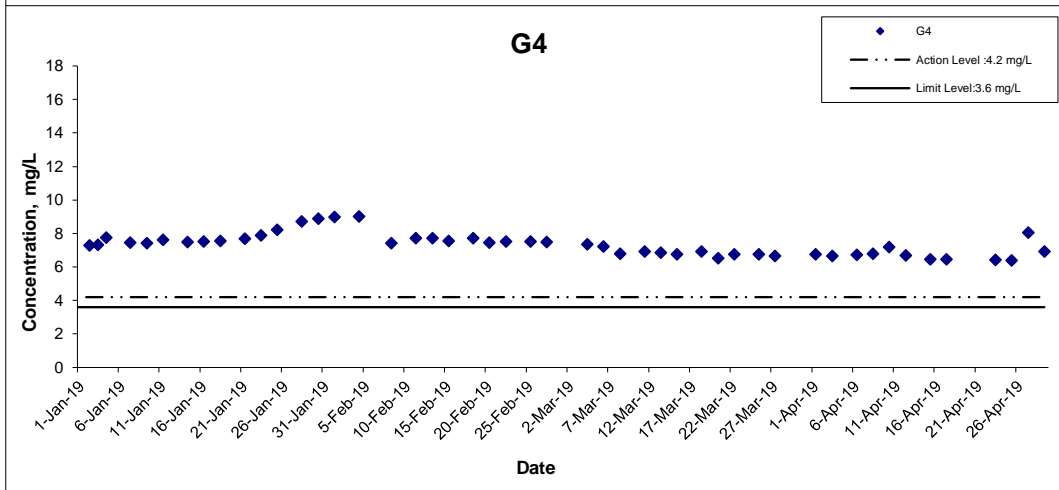
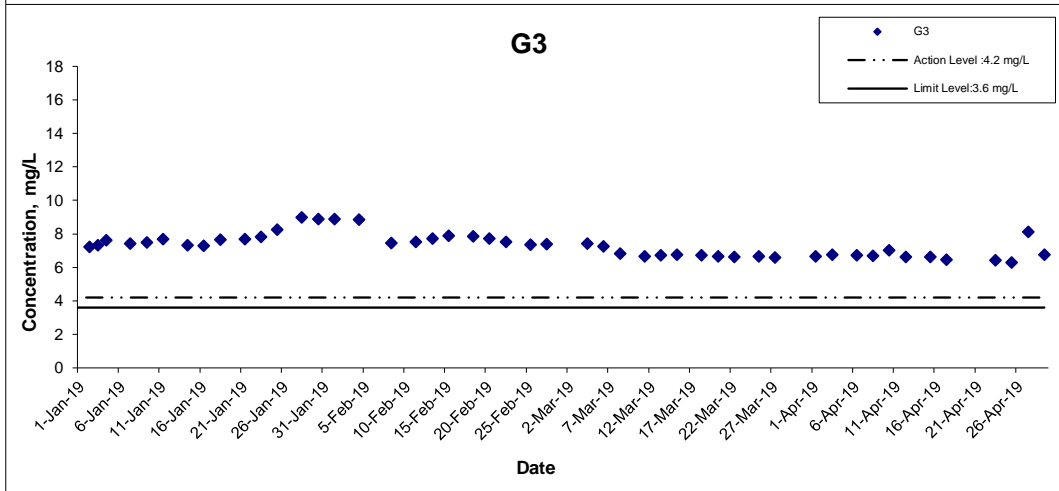
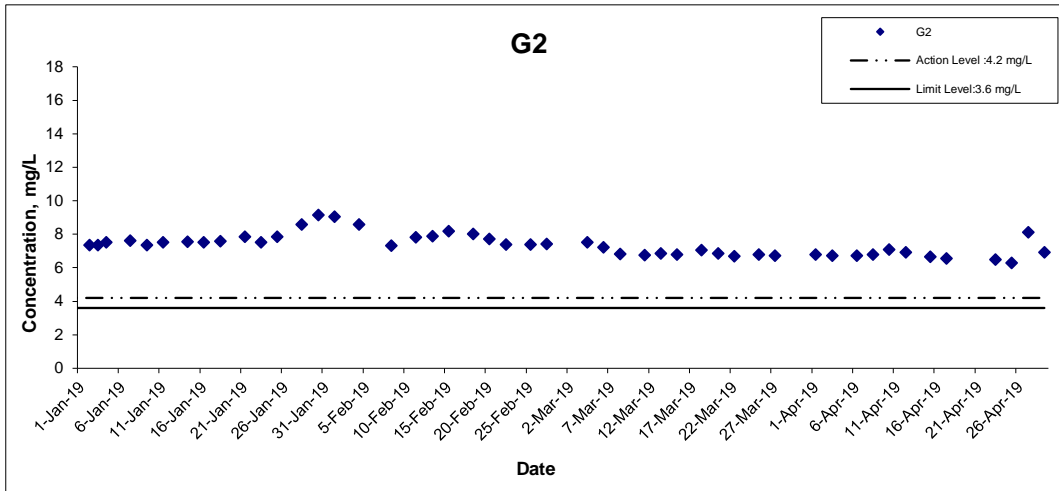
Date Apr 19

Project No. MA16034

Appendix I



Dissolved Oxygen (Bottom) at Mid-Ebb Tide



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

Graphical Presentation of Water Quality Monitoring Results

Scale N.T.S

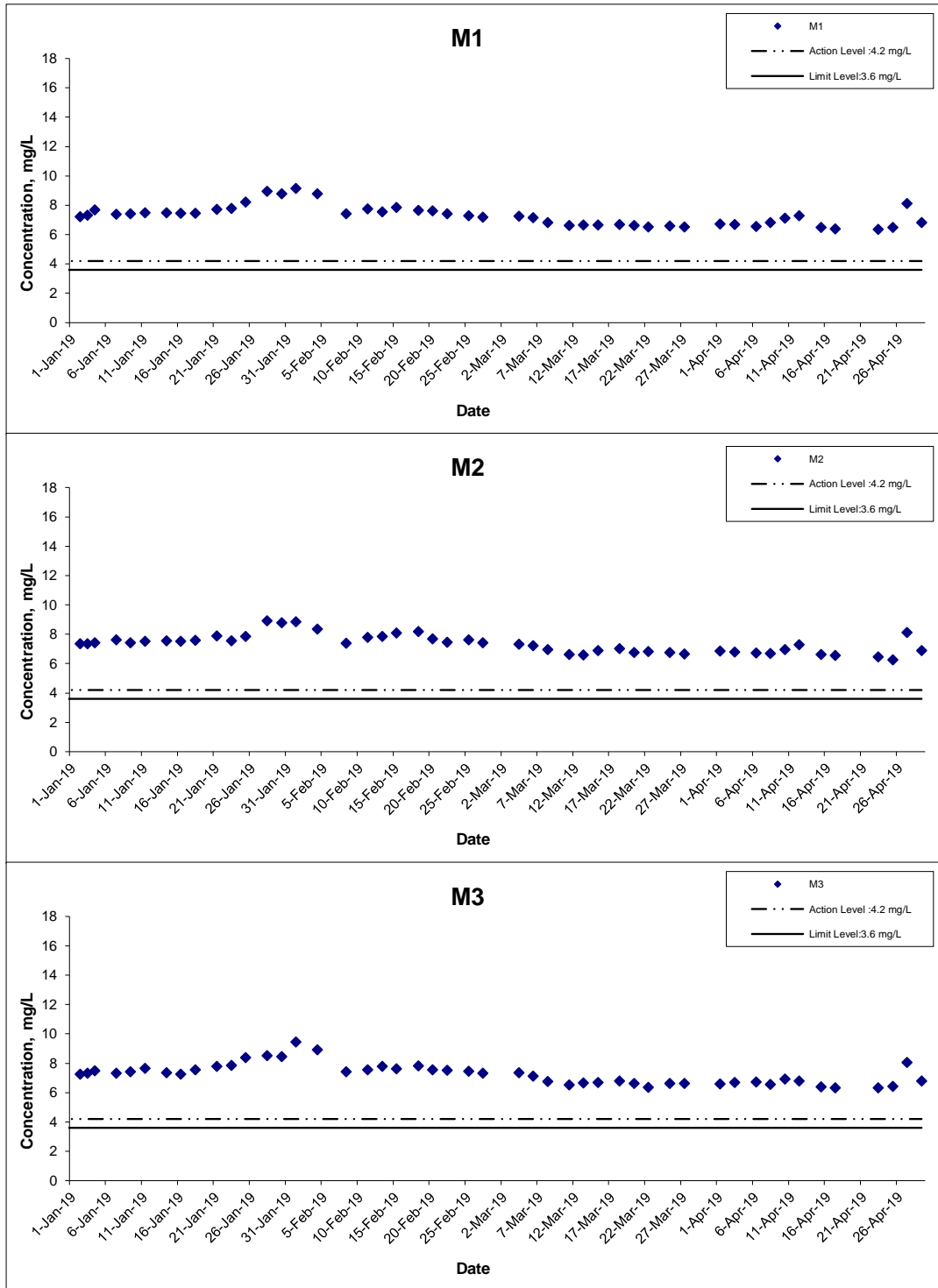
Date Apr 19

Project No. MA16034

Appendix I



Dissolved Oxygen (Bottom) 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

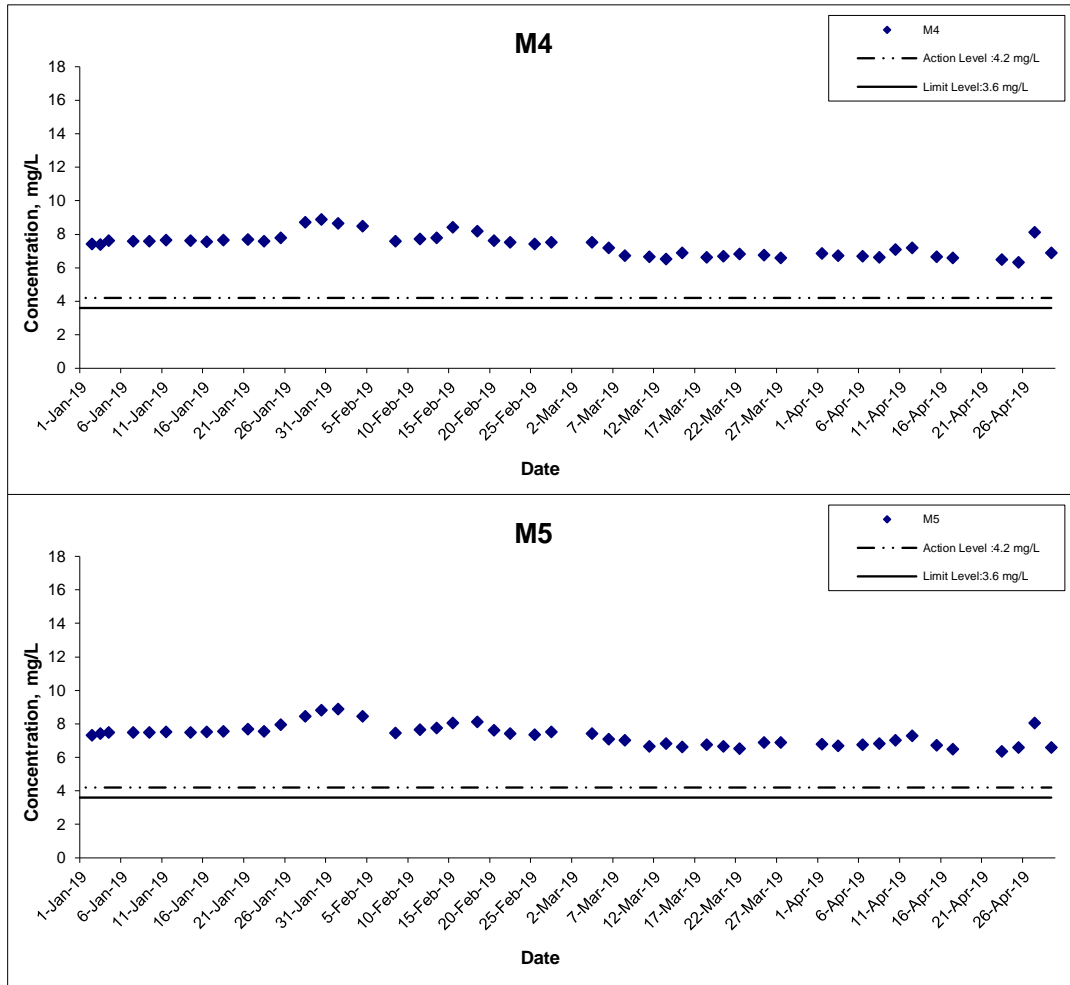
Date Apr 19

Project No. MA16034

Appendix I



Dissolved Oxygen (Bottom) 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

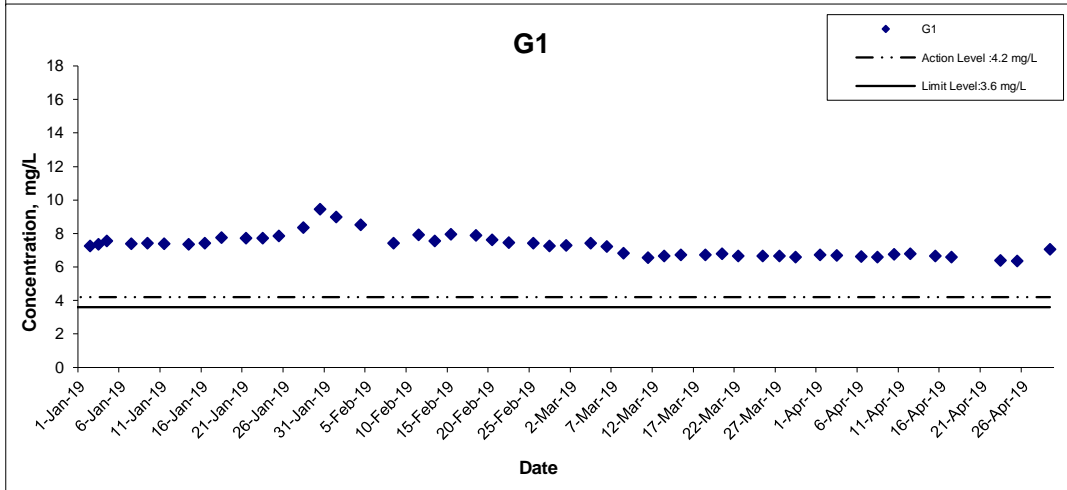
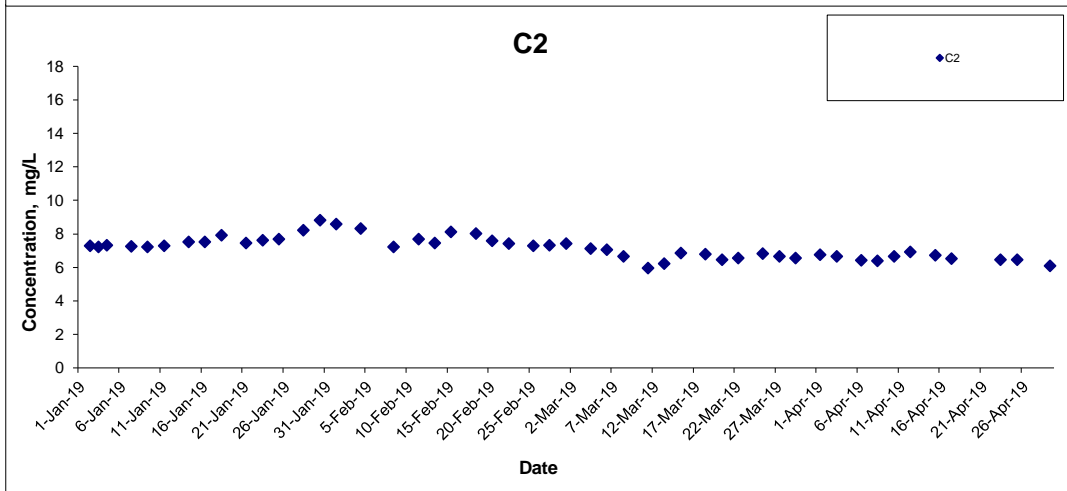
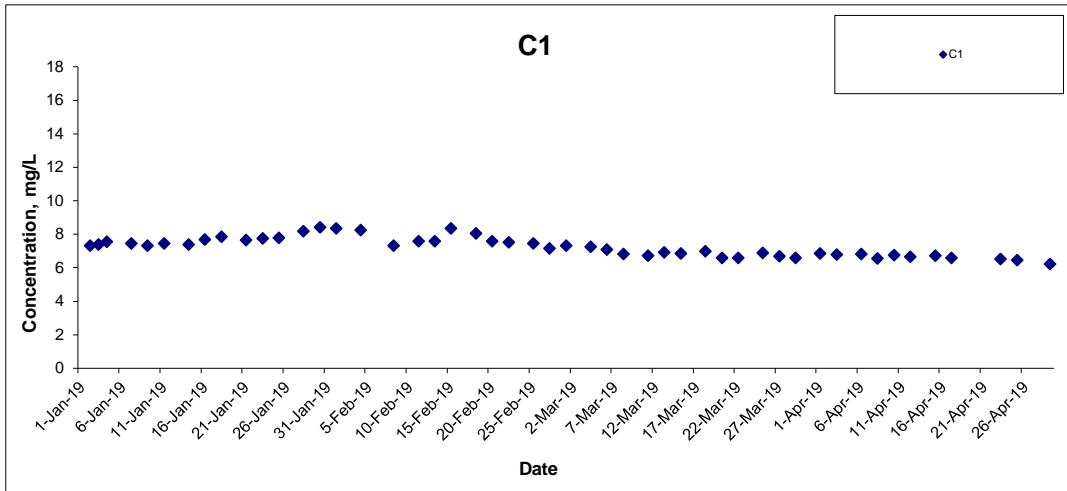
Date Apr 19

Project No. MA16034

Appendix I



Dissolved Oxygen (Bottom) at Mid-Flood Tide



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

Graphical Presentation of Water Quality Monitoring Results

Scale N.T.S

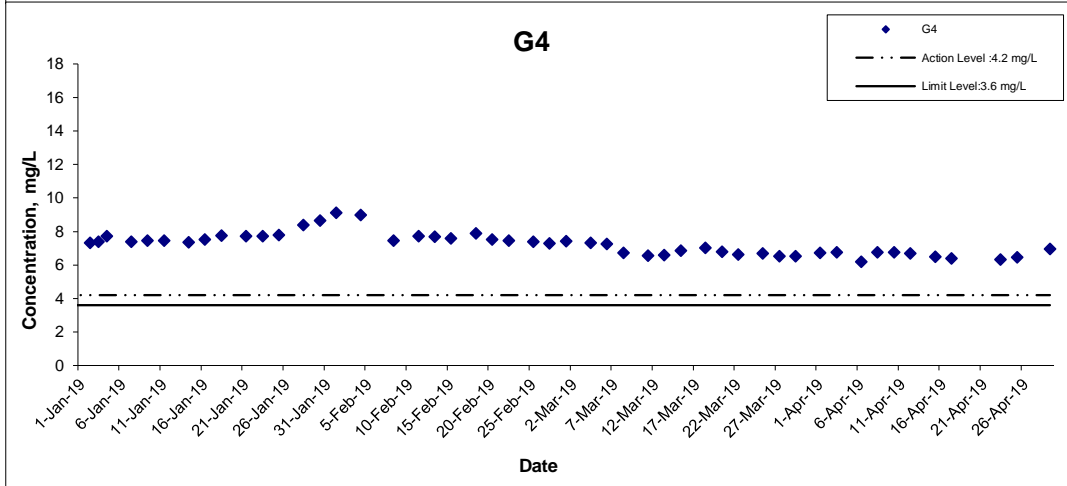
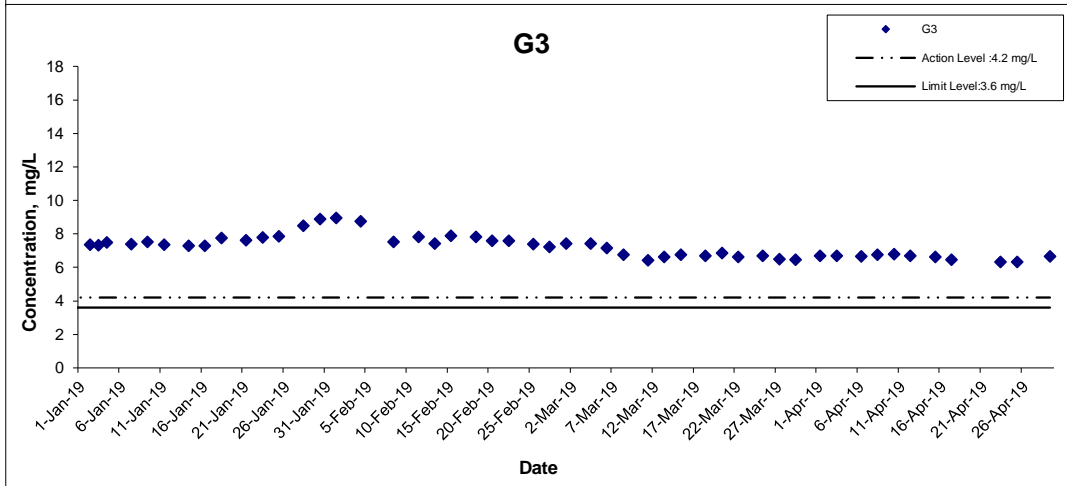
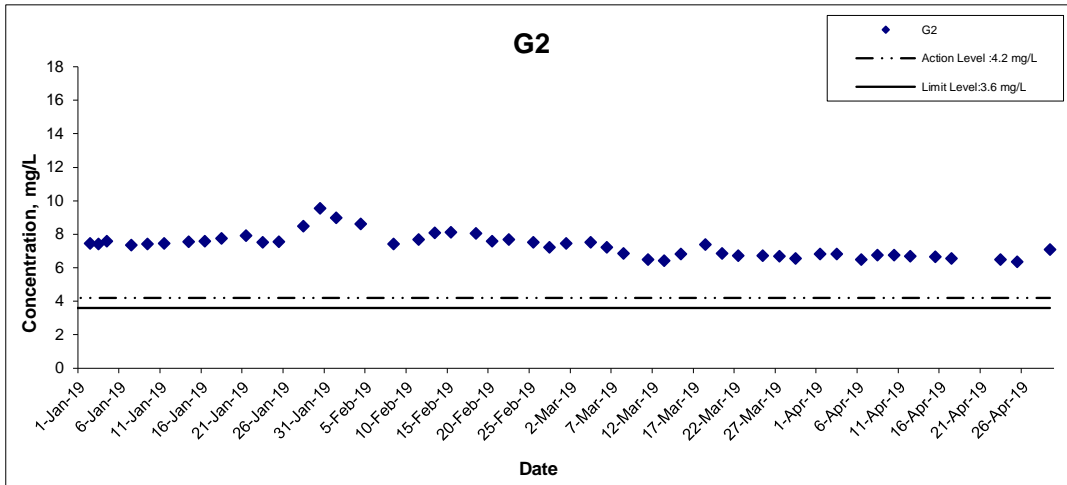
Date Apr 19

Project No. MA16034

Appendix I



Dissolved Oxygen (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

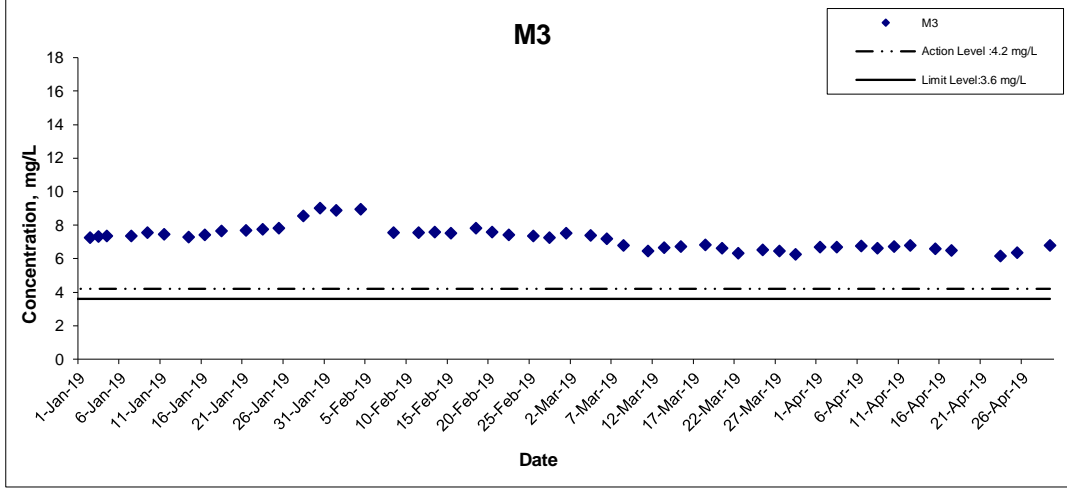
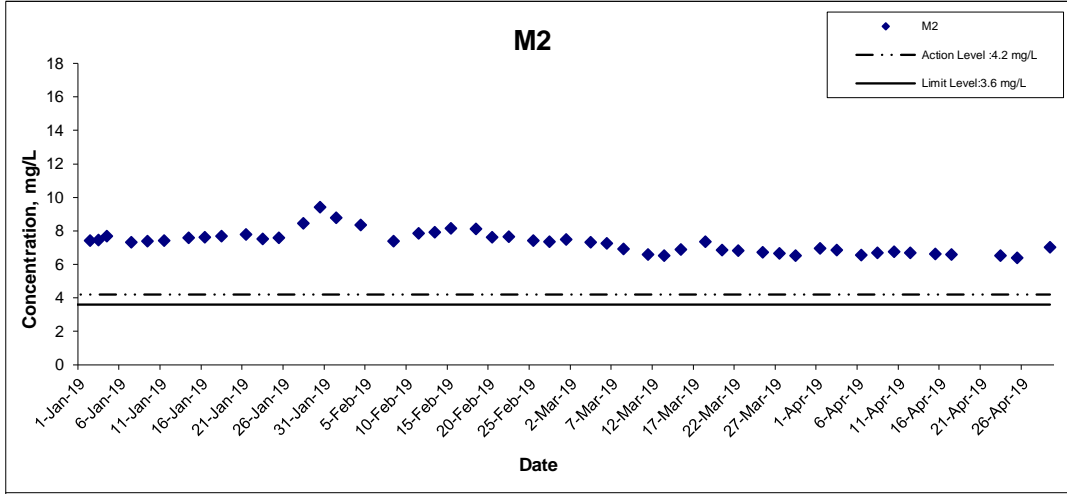
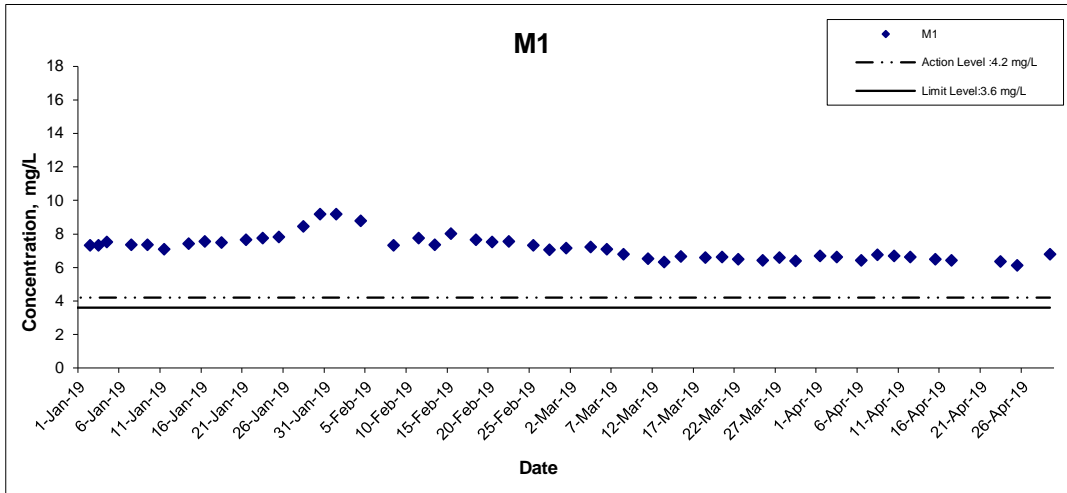
Date Apr 19

Project No. MA16034

Appendix I



Dissolved Oxygen (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

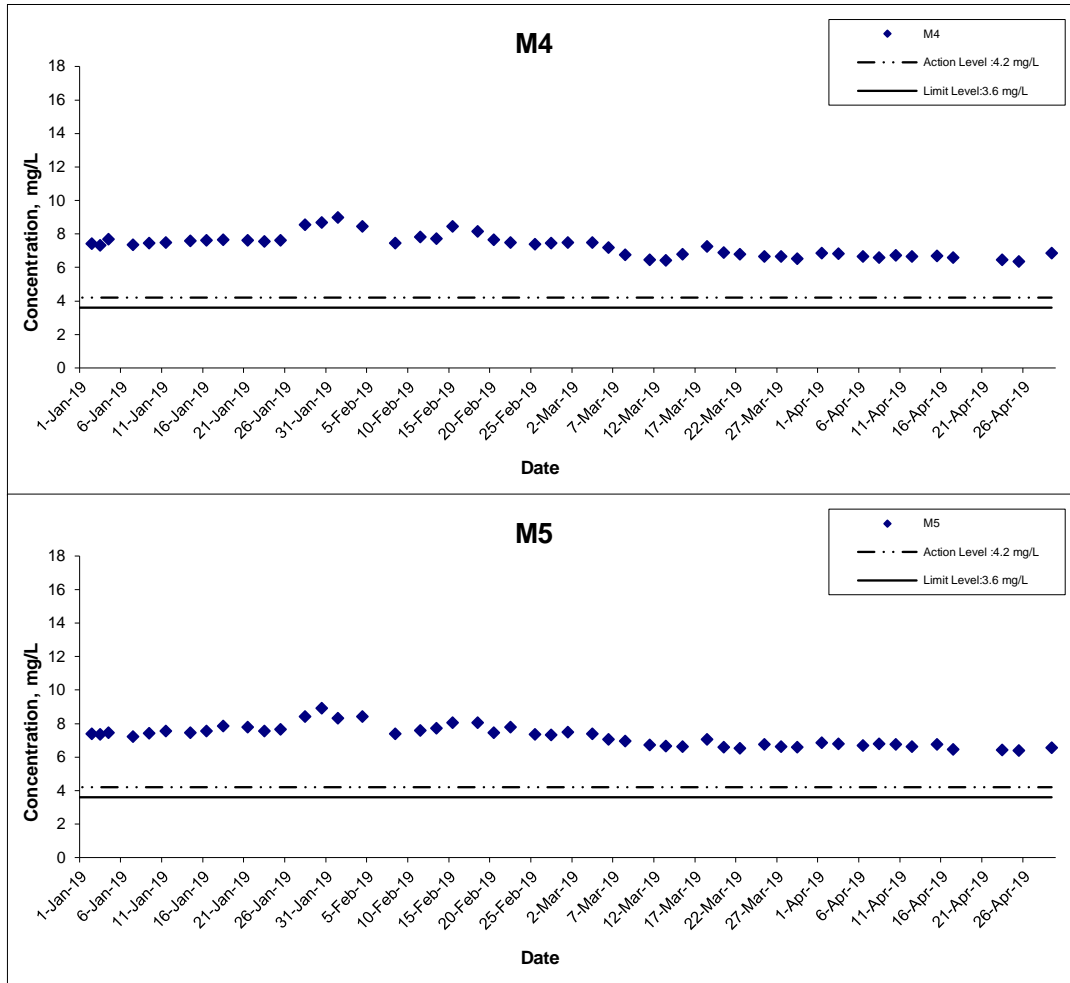
Date Apr 19

Project No. MA16034

Appendix I



Dissolved Oxygen (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

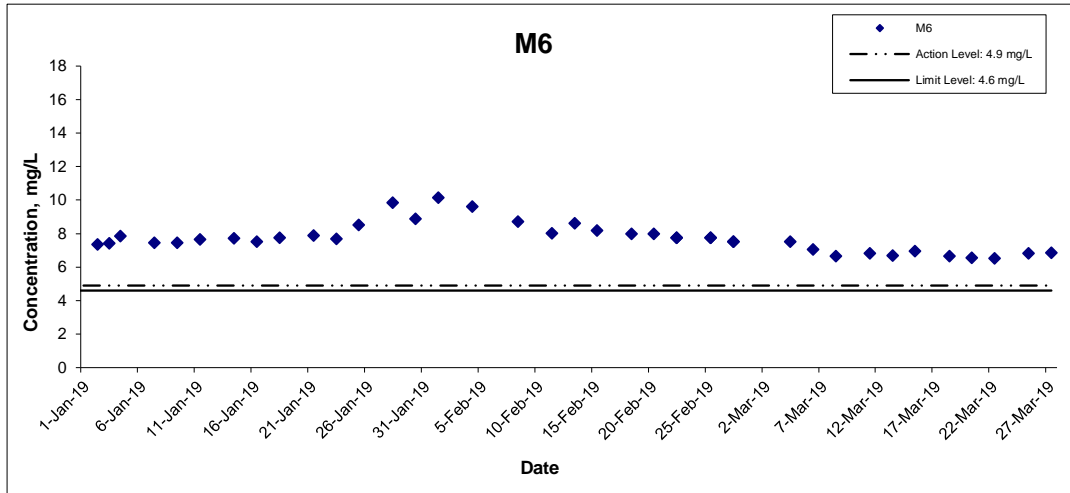
Date Apr 19

Project No. MA16034

Appendix I



Dissolved Oxygen (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

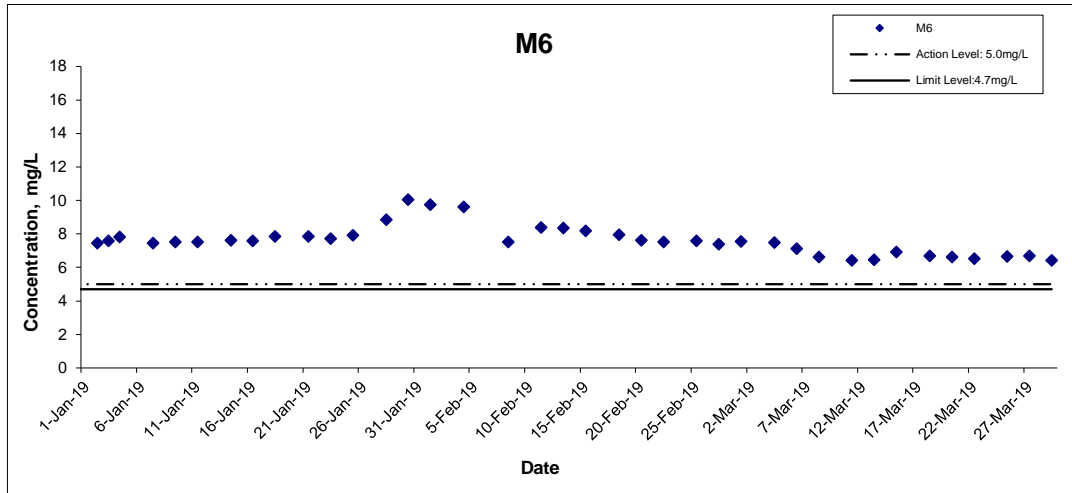
Date Apr 19

Project No. MA16034

Appendix I



Dissolved Oxygen (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

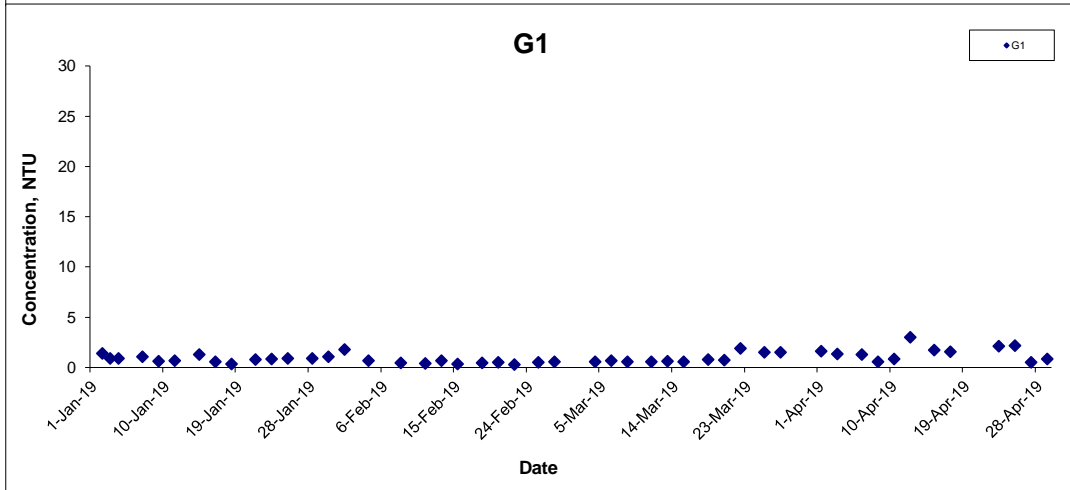
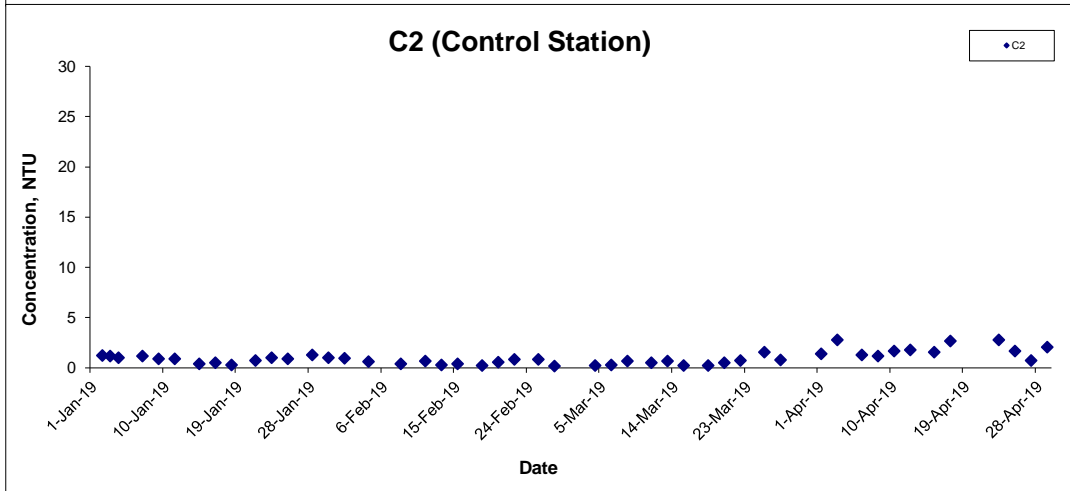
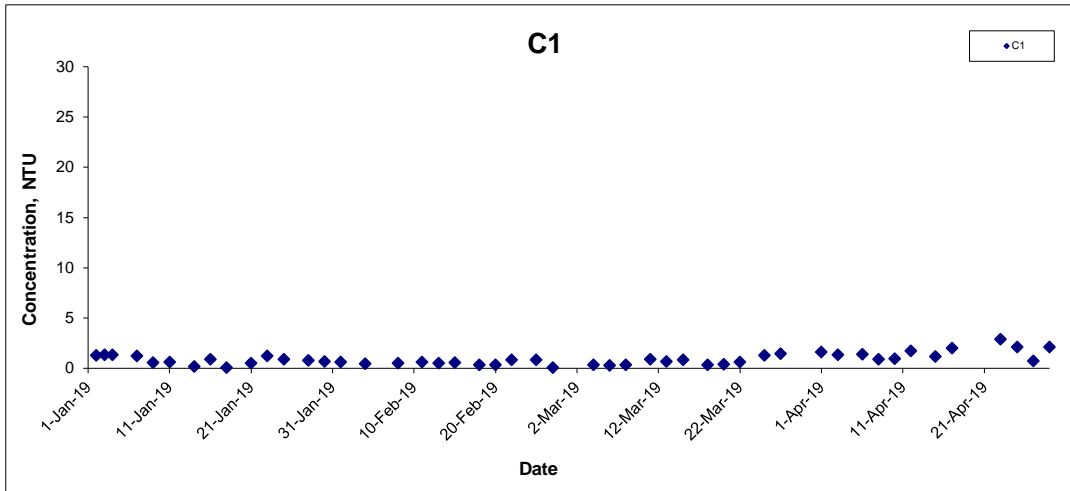
Date Apr 19

Project No. MA16034

Appendix I



Turbidity (Depth-averaged) 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

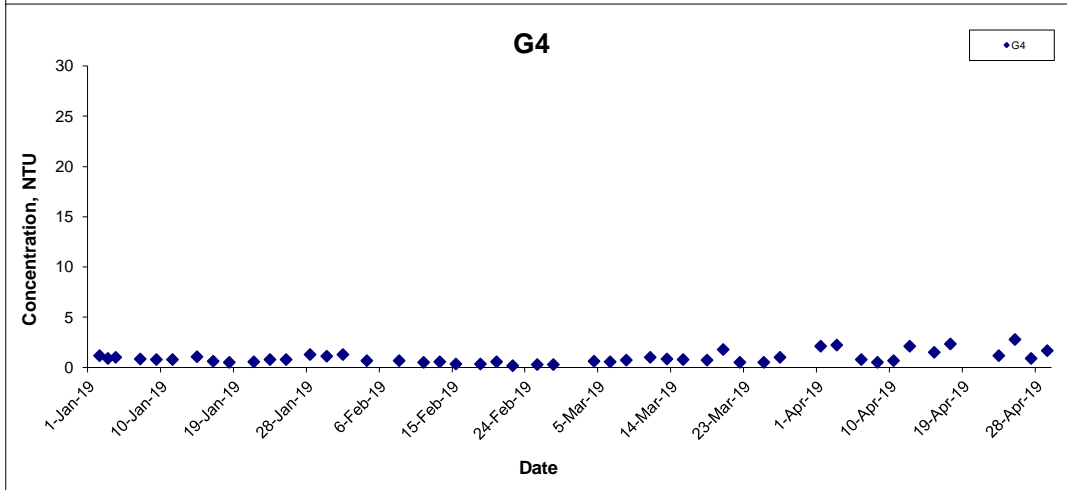
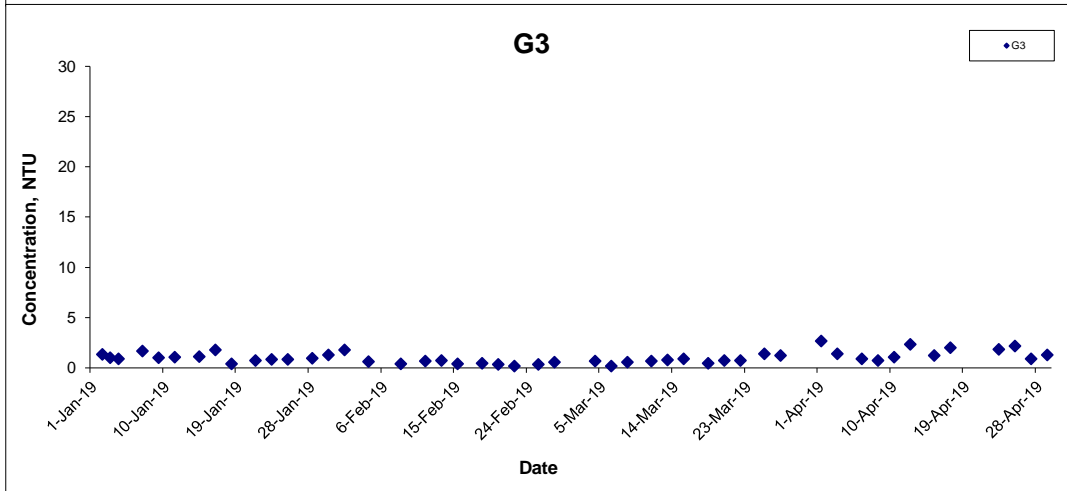
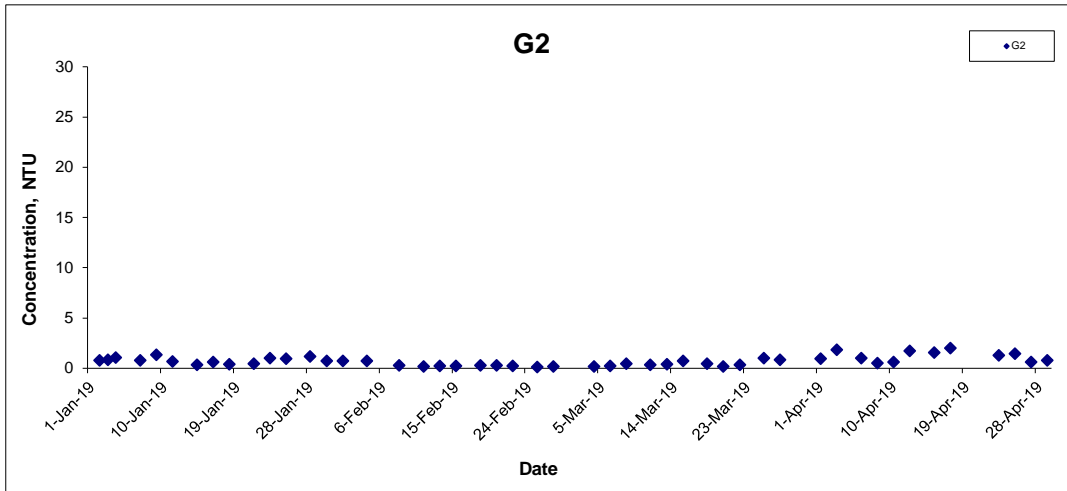
Date Apr 19

Project No. MA16034

Appendix I



Turbidity (Depth-averaged) 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

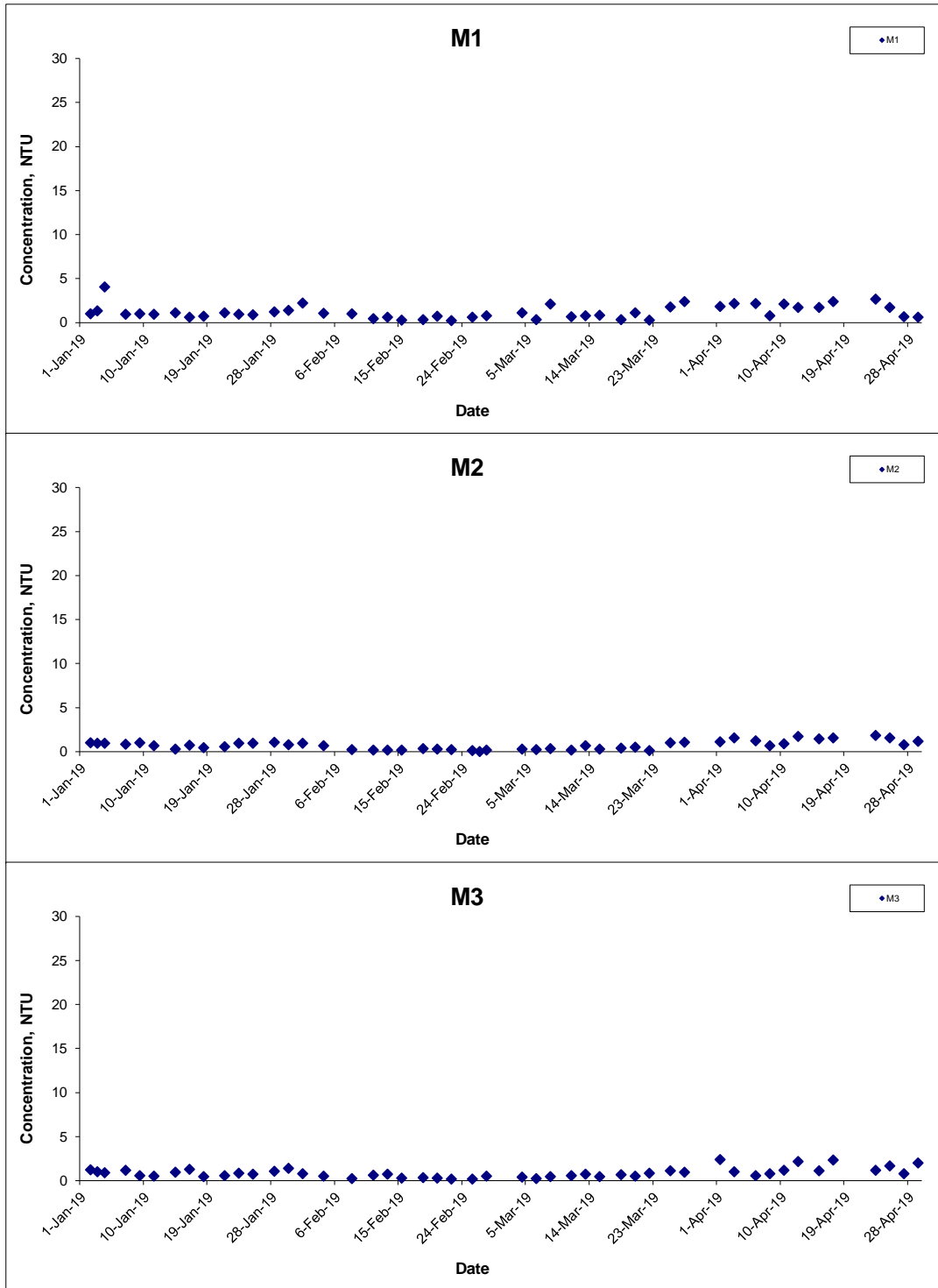
Date Apr 19

Project No. MA16034

Appendix I



Turbidity (Depth-averaged) 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

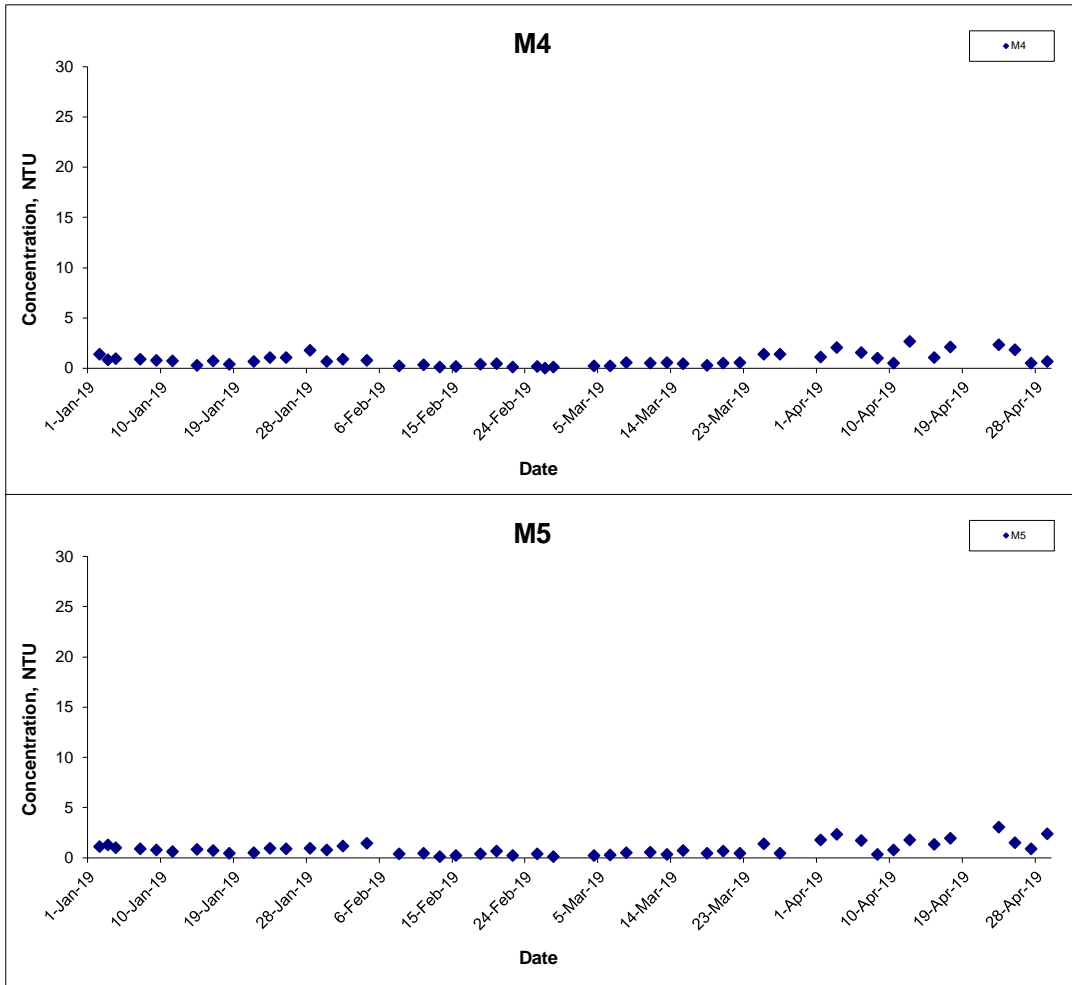
Date Apr 19

Project No. MA16034

Appendix I

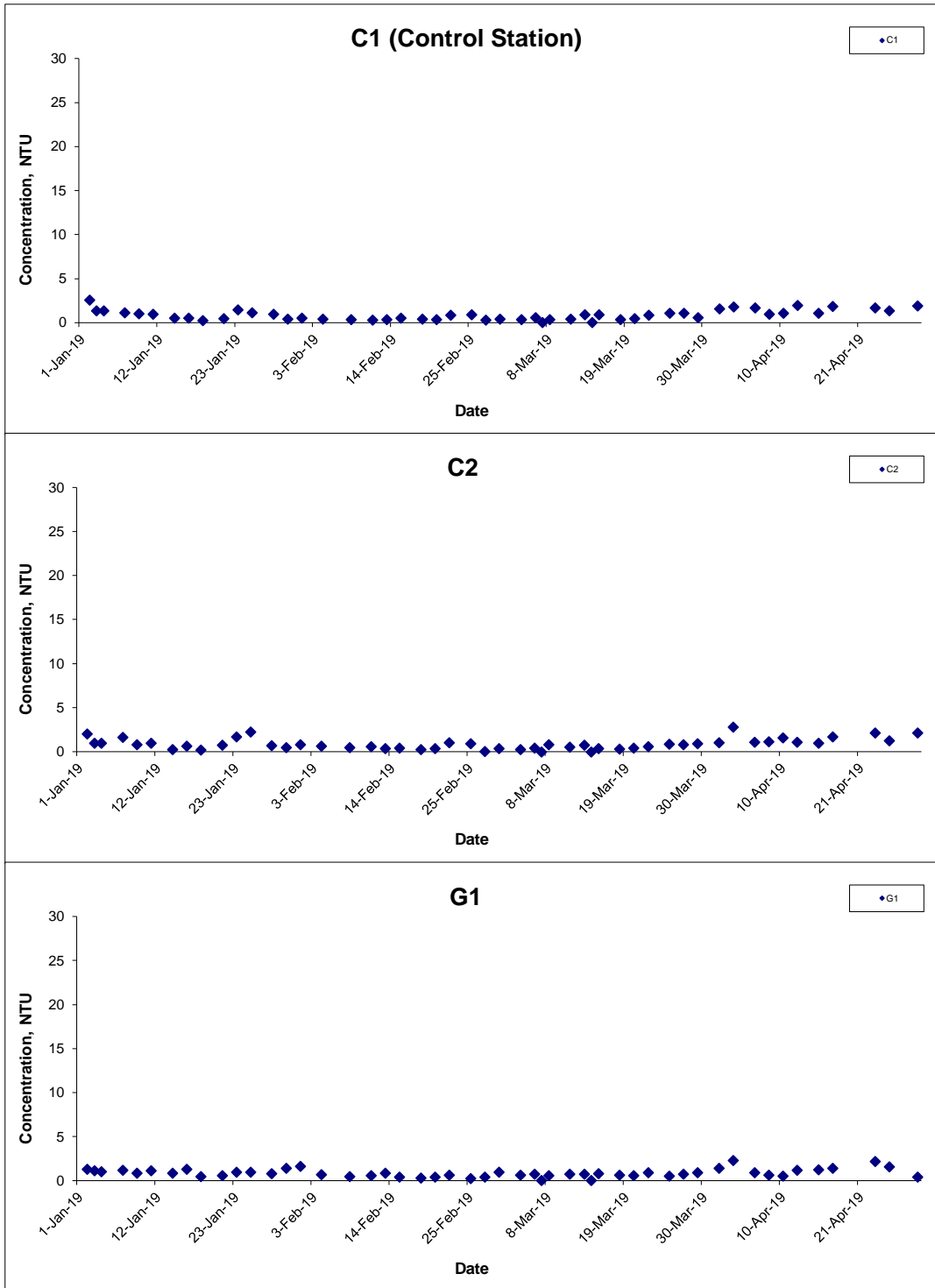


Turbidity (Depth-averaged) at Mid-Ebb Tide



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	Project No. MA16034	
	Date Apr 19	Appendix I	

Turbidity (Depth-averaged) 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

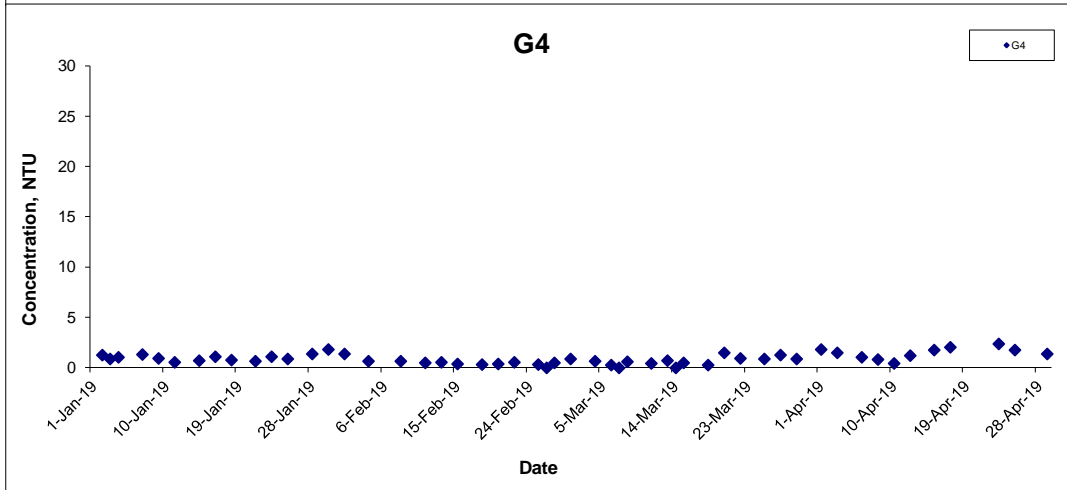
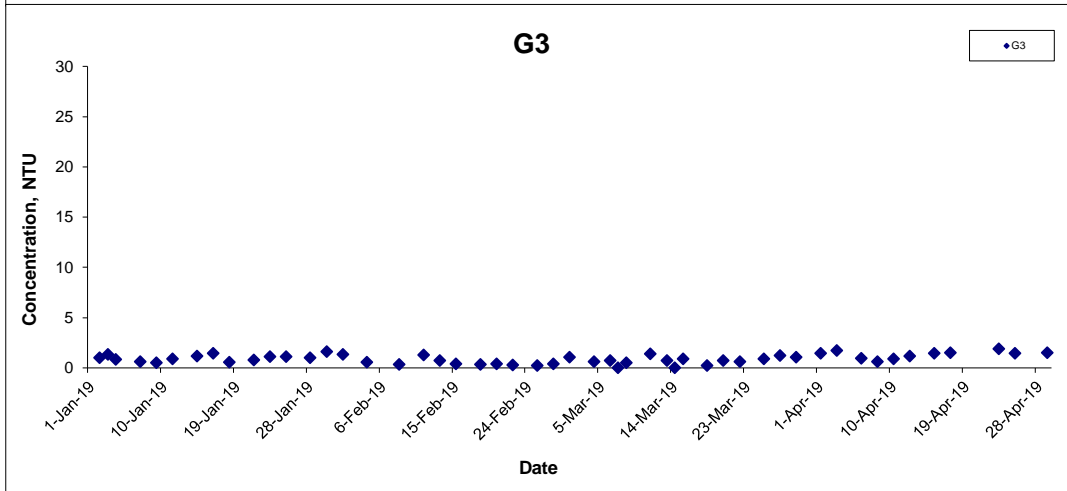
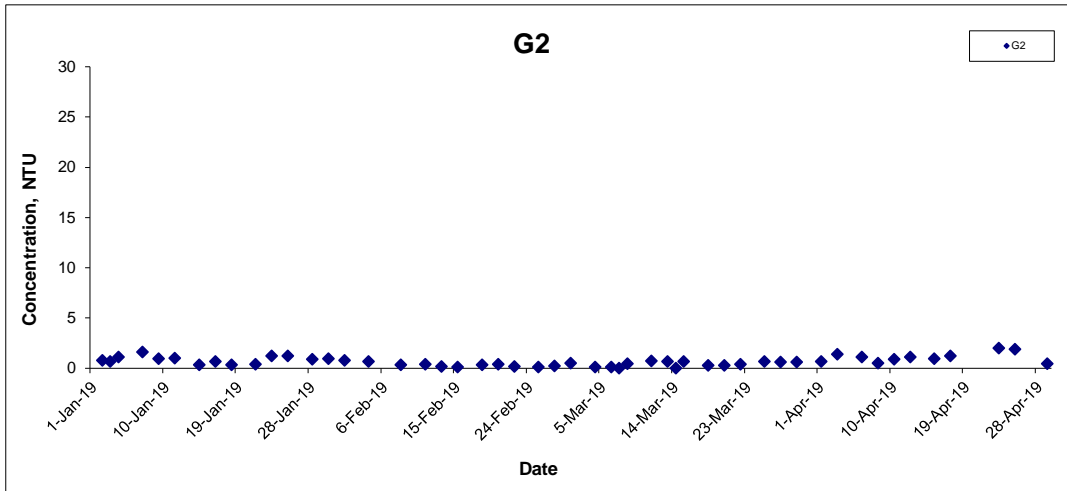
Date Apr 19

Project No. MA16034

Appendix I



Turbidity (Depth-averaged) 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

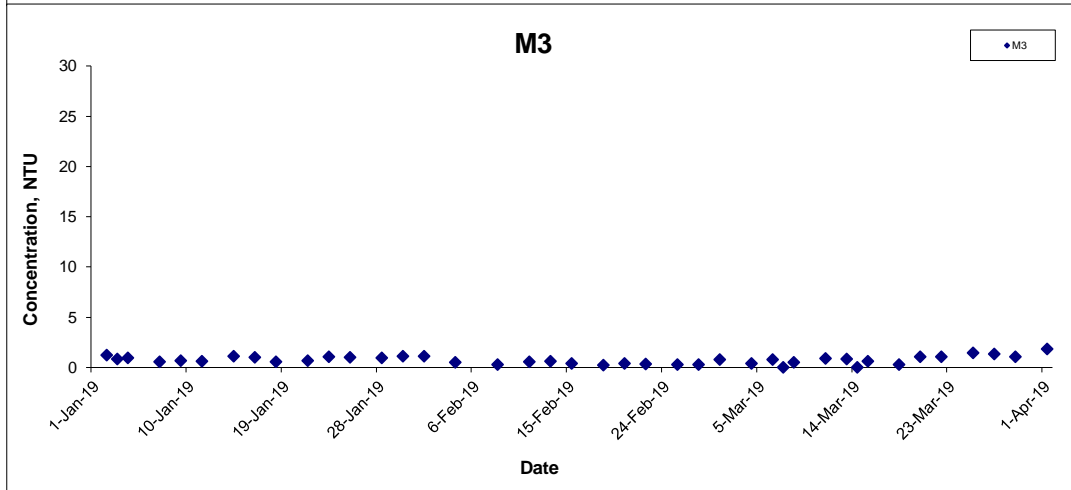
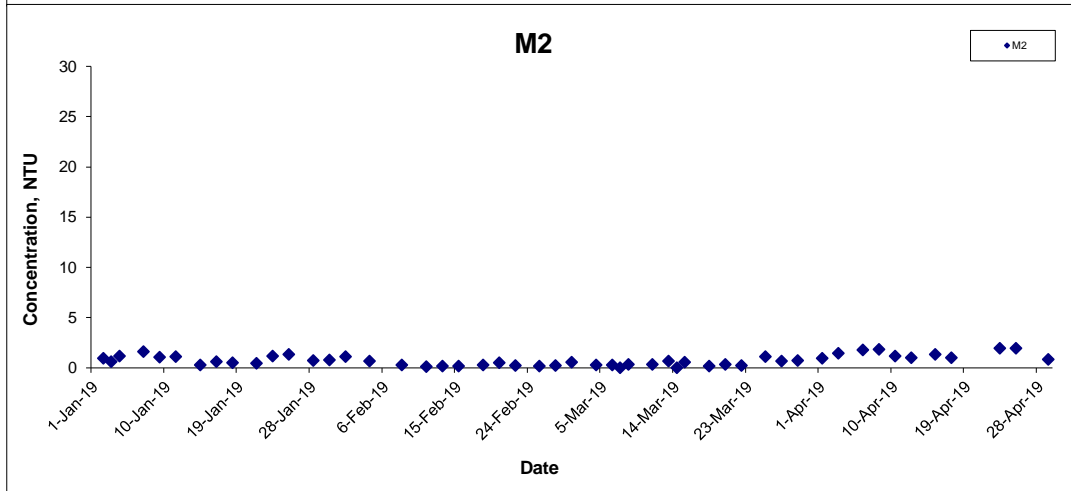
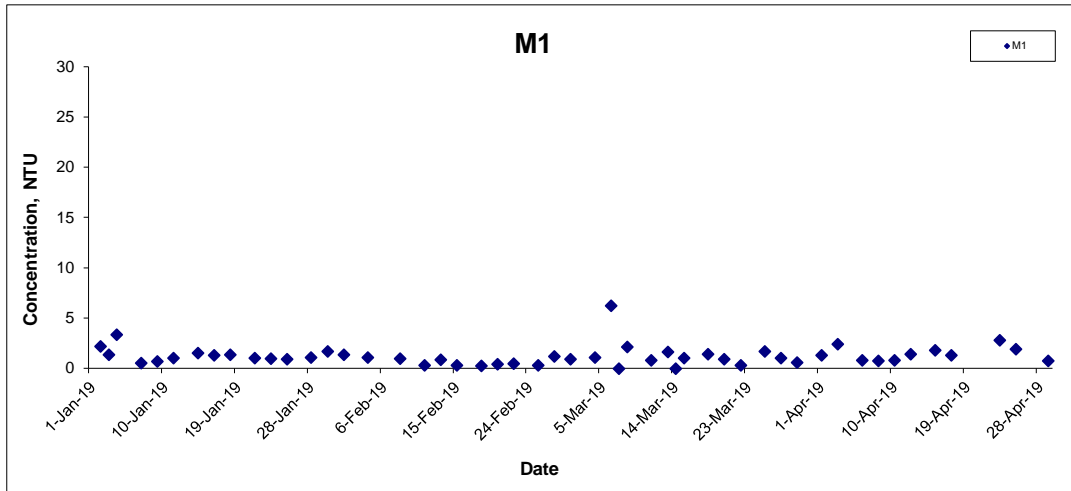
Date Apr 19

Project No. MA16034

Appendix I



Turbidity (Depth-averaged) 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

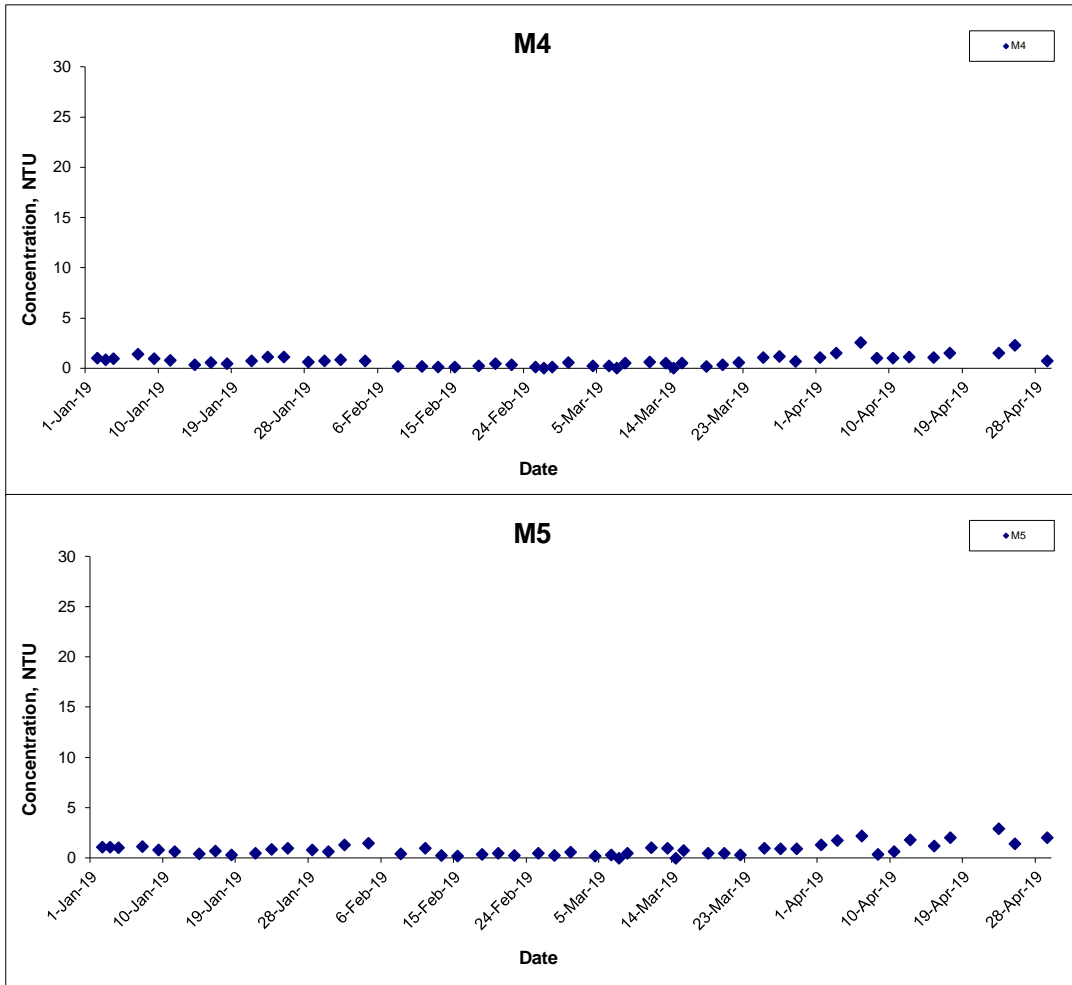
Date Apr 19

Project No. MA16034

Appendix I

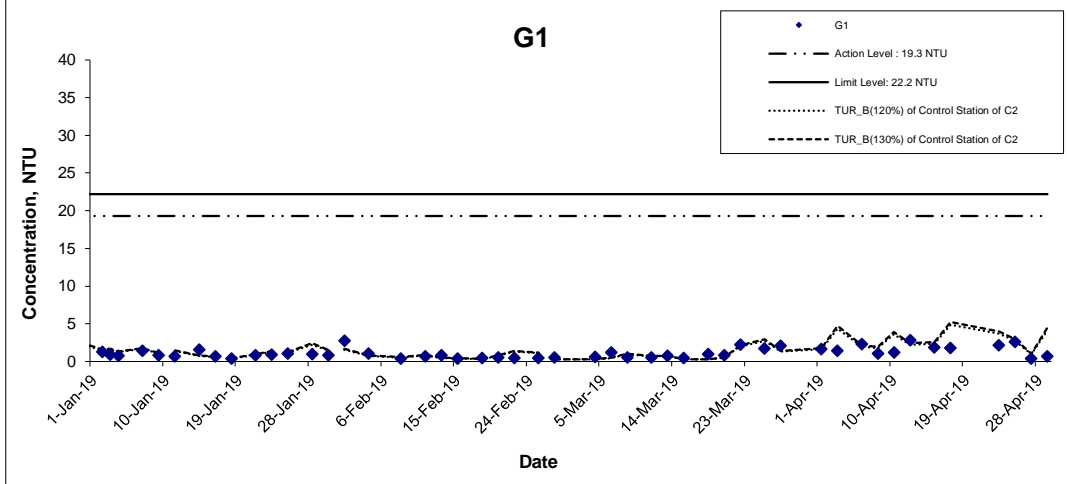
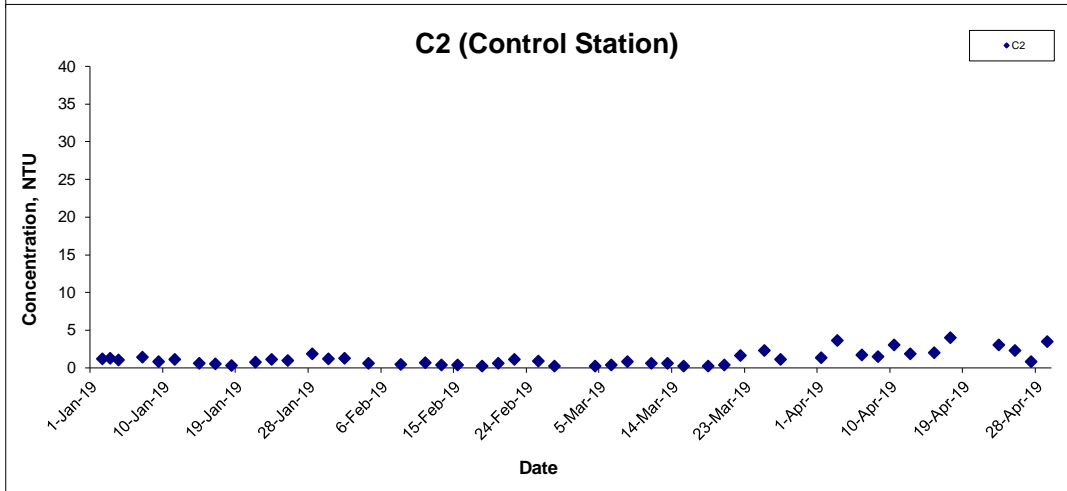
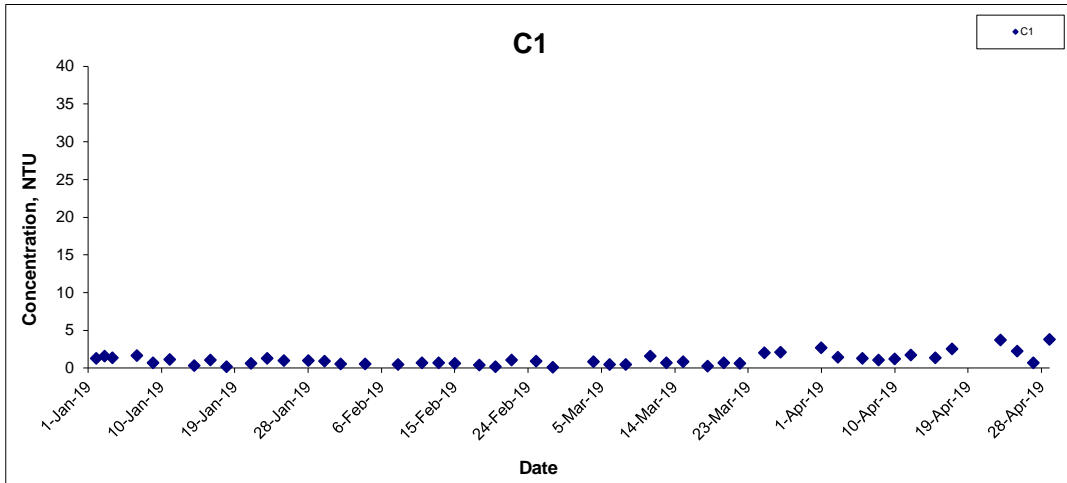


Turbidity (Depth-averaged) at Mid-Flood Tide



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	
	Date Apr 19	Appendix I	

Turbidity (Bottom) at Mid-Ebb Tide



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

Graphical Presentation of Water Quality Monitoring Results

Scale N.T.S

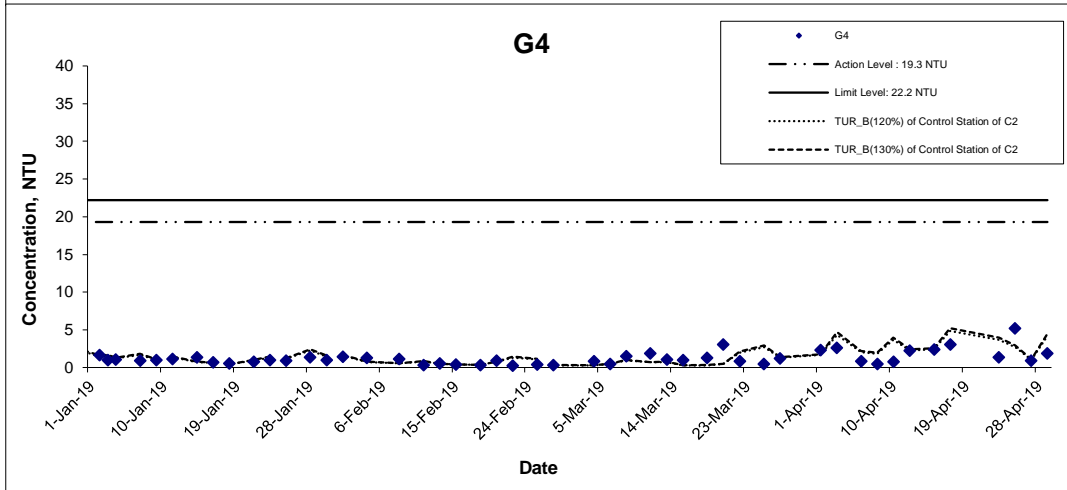
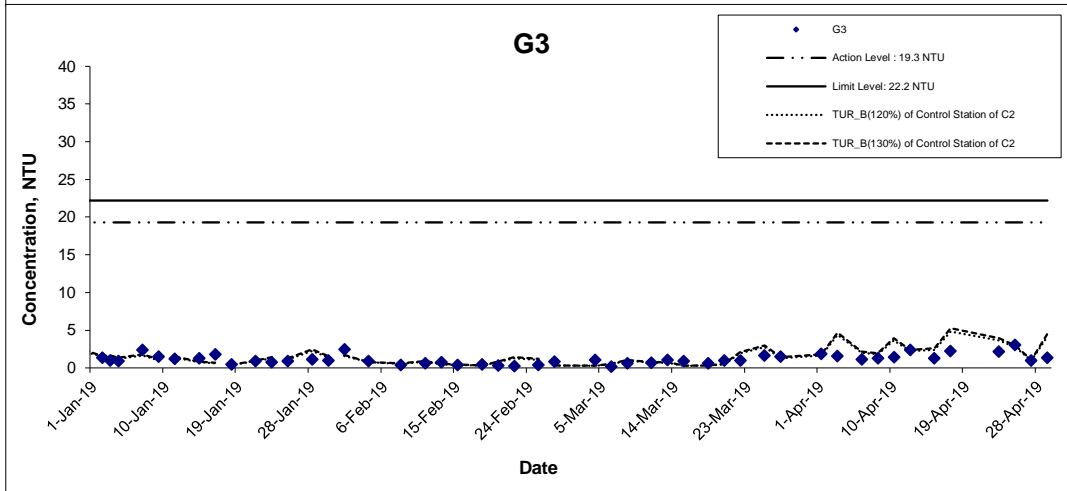
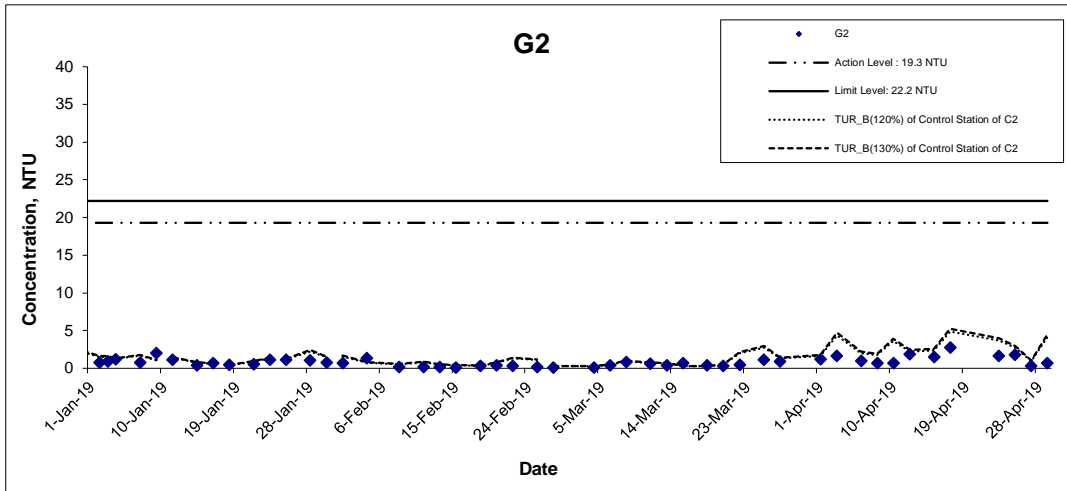
Date Mar 19

Project No. MA16034

Appendix I



Turbidity (Bottom) 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

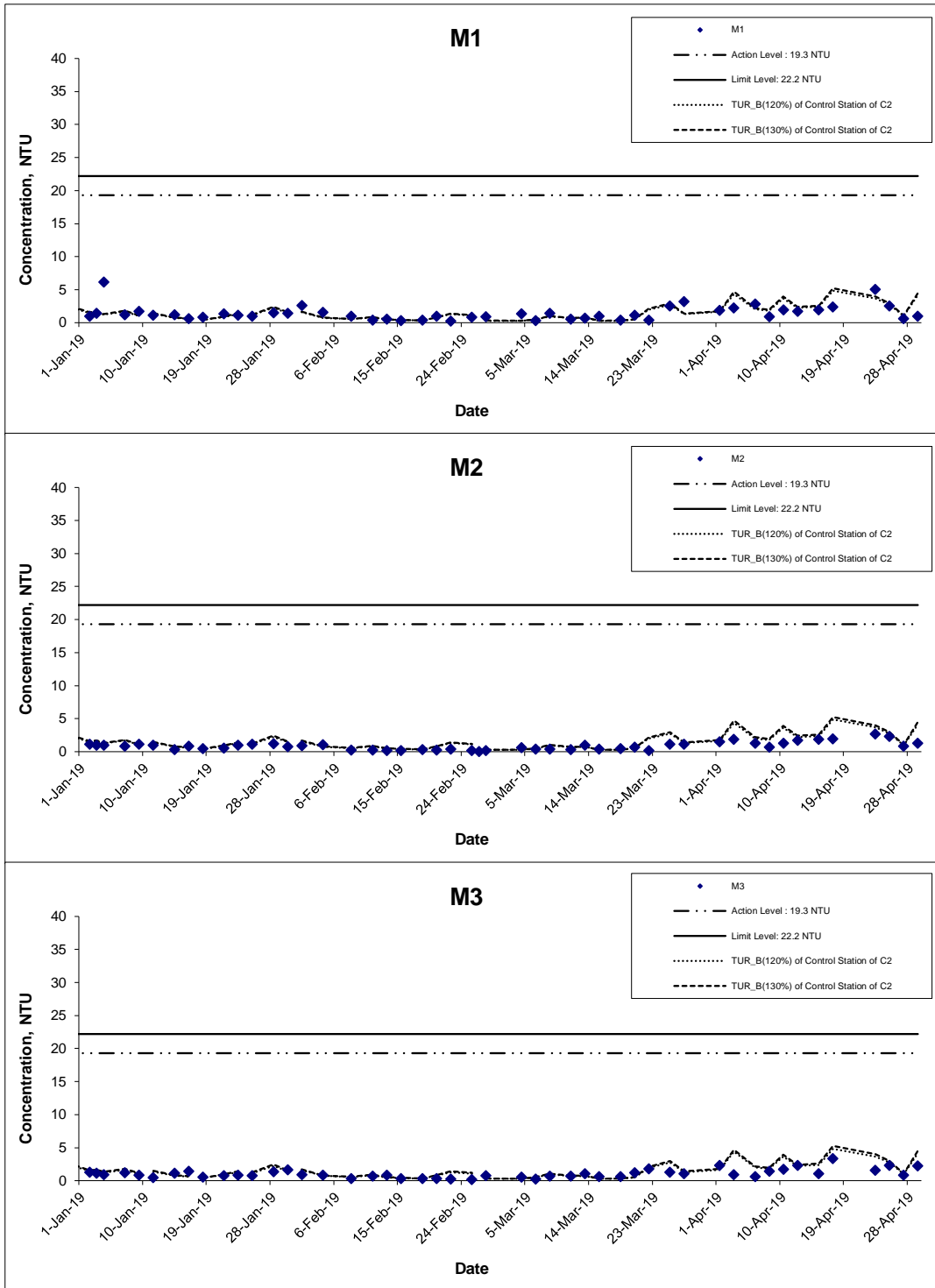
Date Mar 19

Project No. MA16034

Appendix I



Turbidity (Bottom) 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

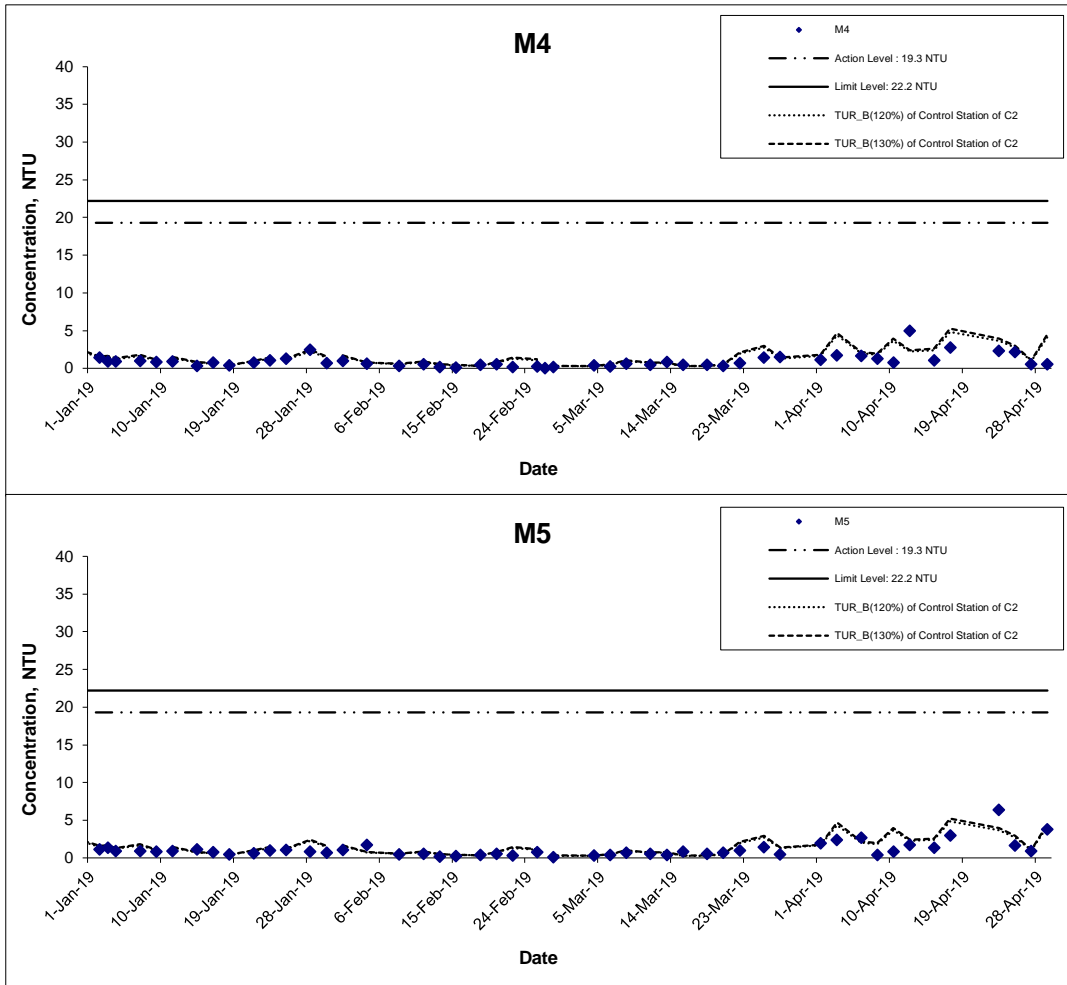
Date Mar 19

Project No. MA16034

Appendix I



Turbidity (Bottom) 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

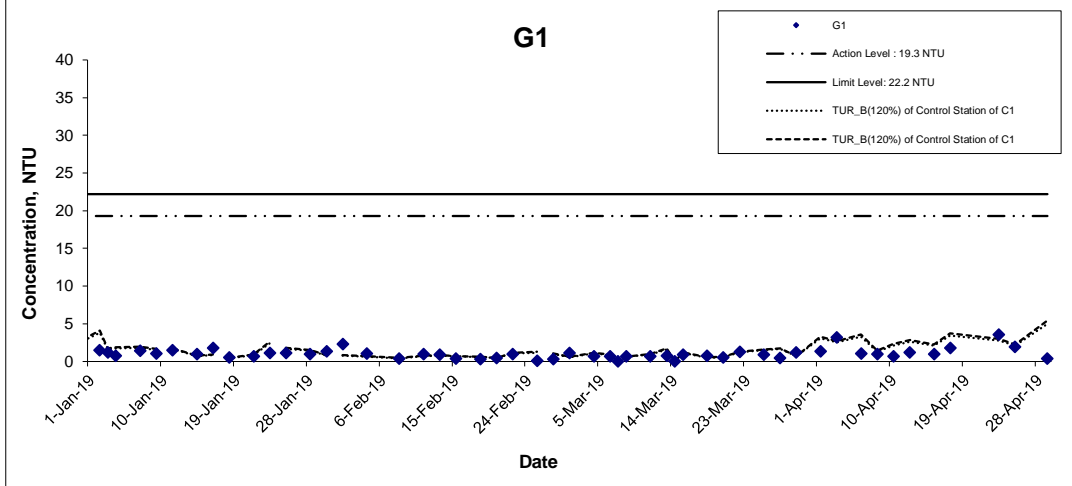
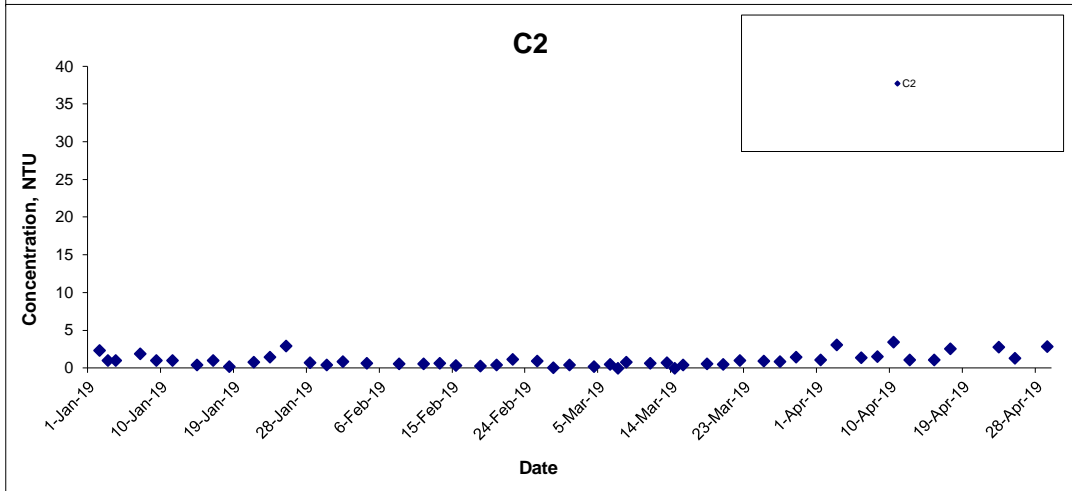
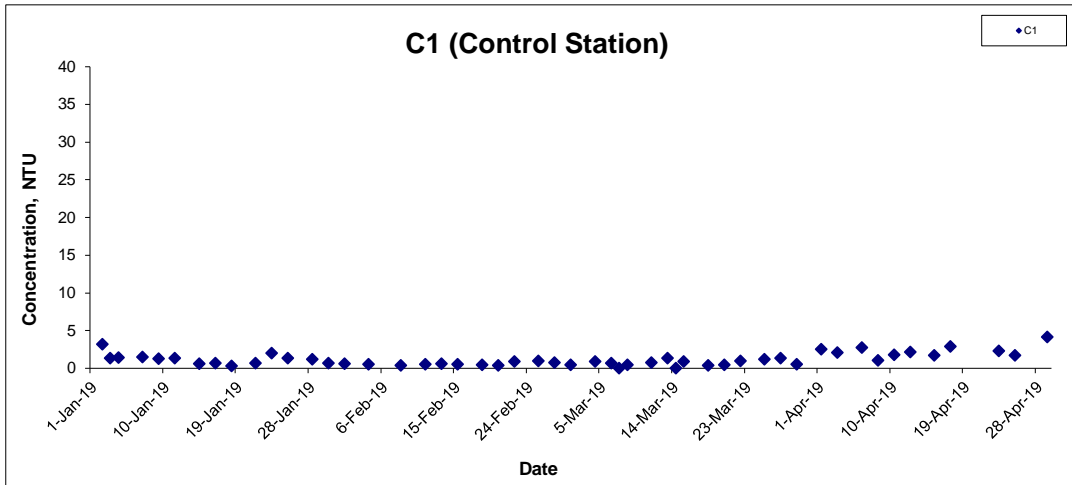
Date Mar 19

Project No. MA16034

Appendix I



Turbidity (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

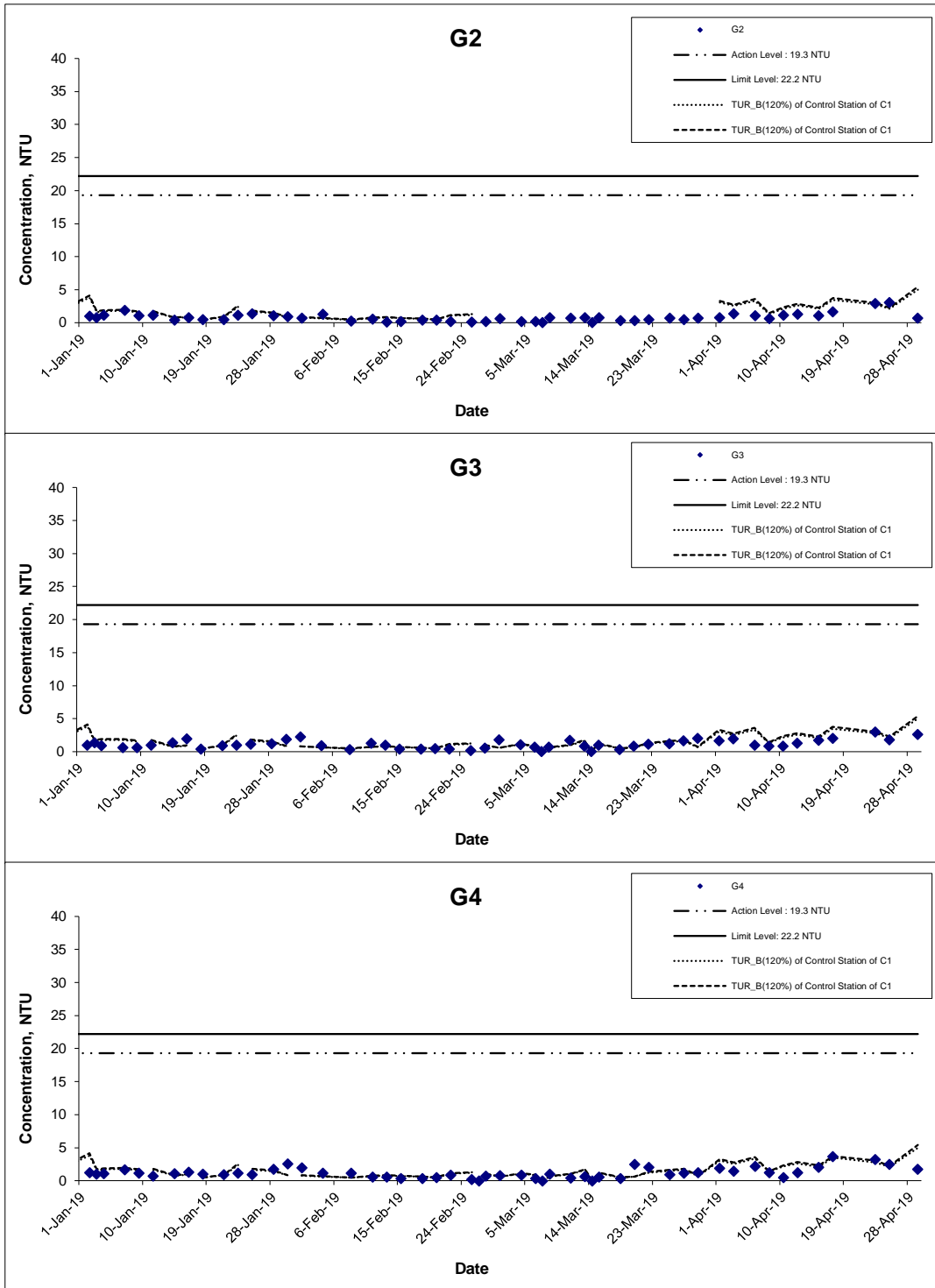
Date Mar 19

Project No. MA16034

Appendix I



Turbidity (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

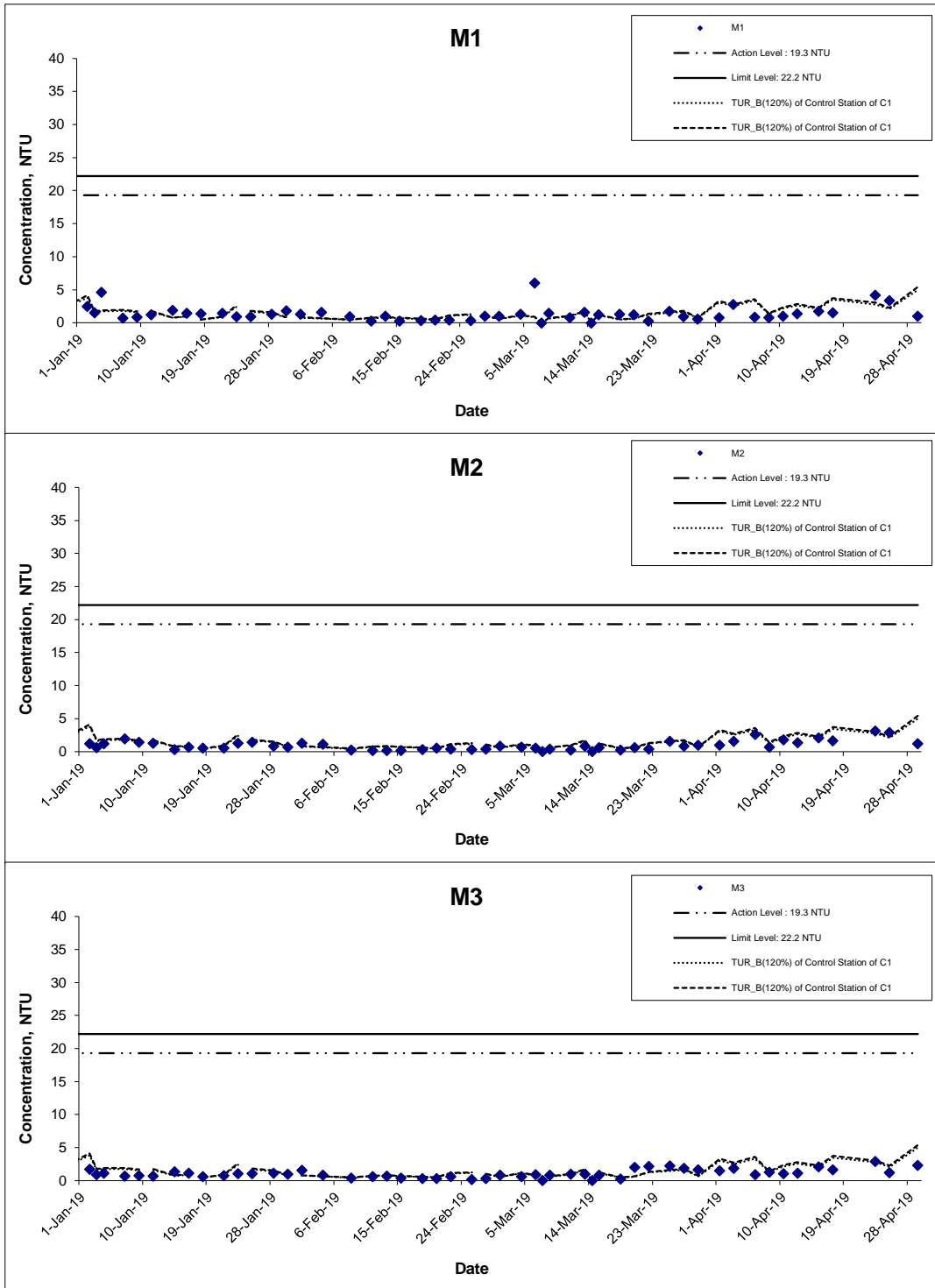
Date Mar 19

Project No. MA16034

Appendix I



Turbidity (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

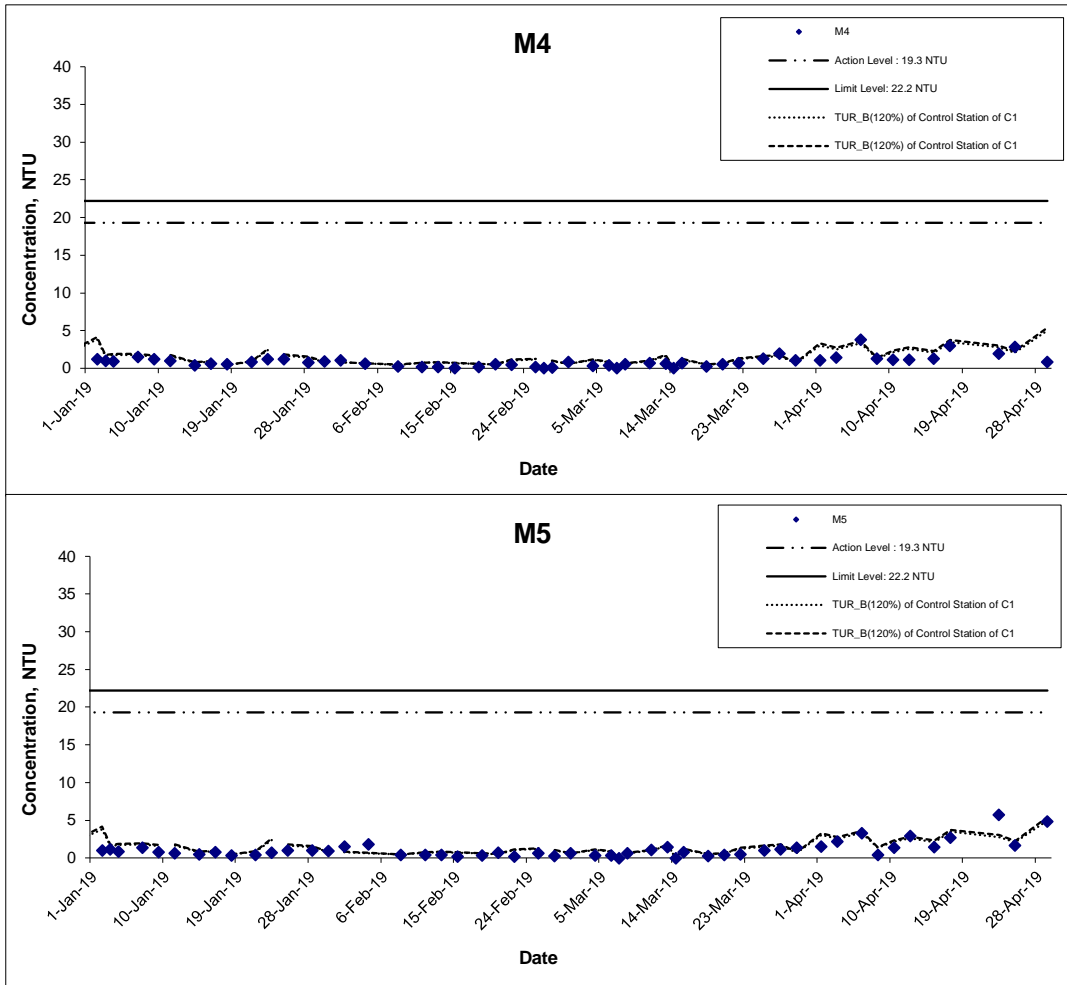
Date Mar 19

Project No. MA16034

Appendix I



Turbidity (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

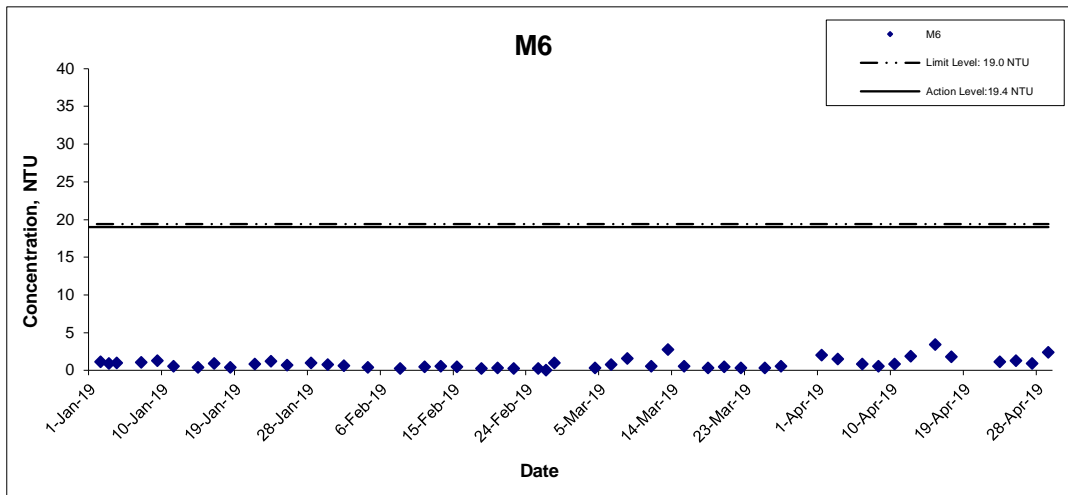
Date Mar 19

Project No. MA16034

Appendix I



Turbidity (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

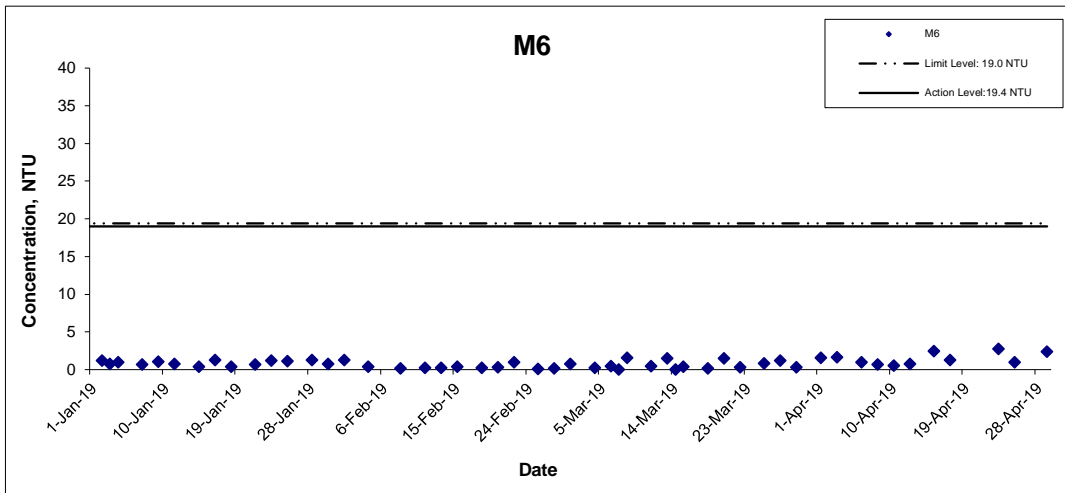
Date Mar 19

Project No. MA16034

Appendix I

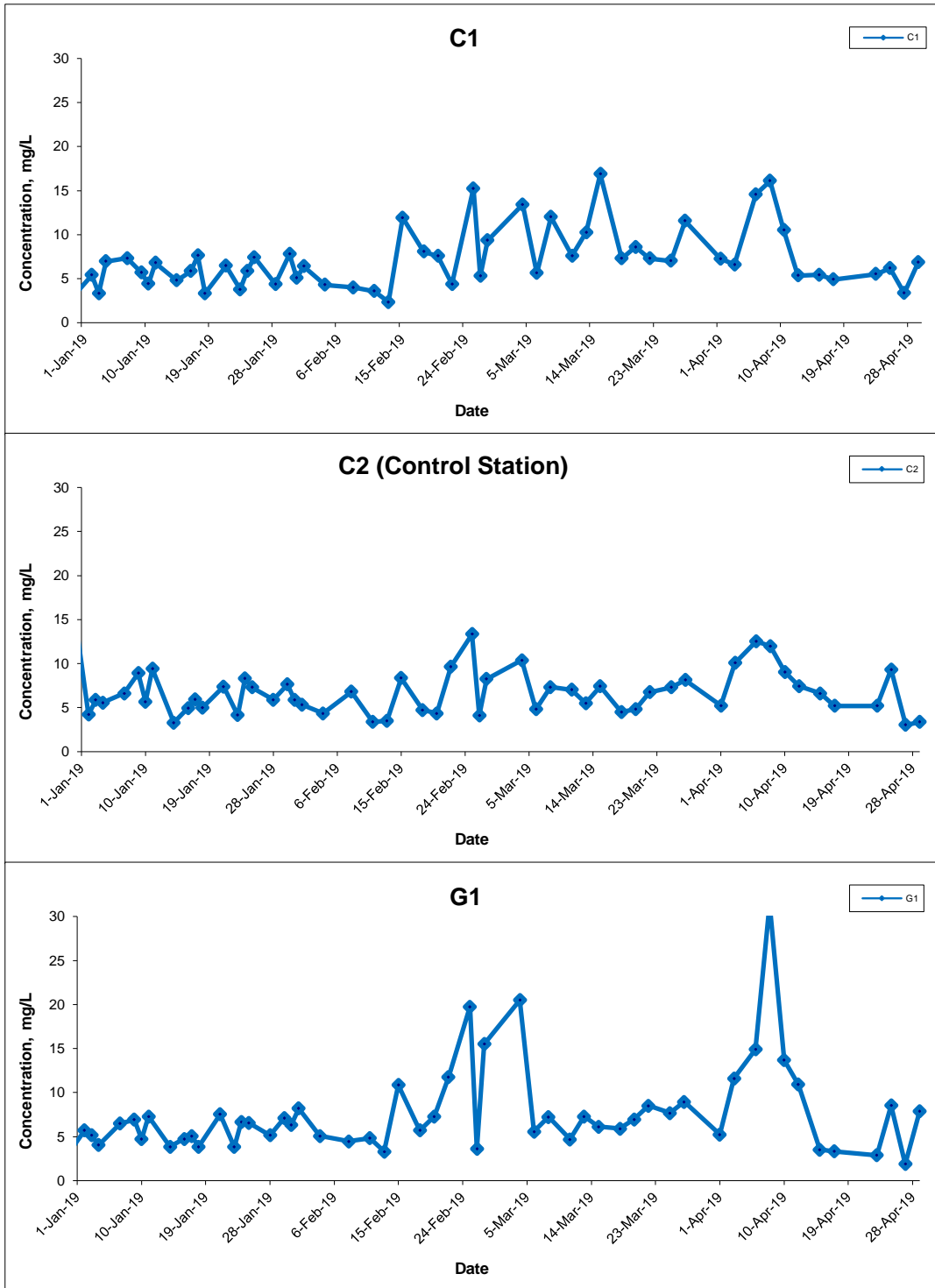


Turbidity (Intake Level of WSD Salt Water Intake) at Mid-Flood Tide



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	Project No. MA16034	
	Date Mar 19	Appendix I	

Suspended Solids (Depth-averaged) 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

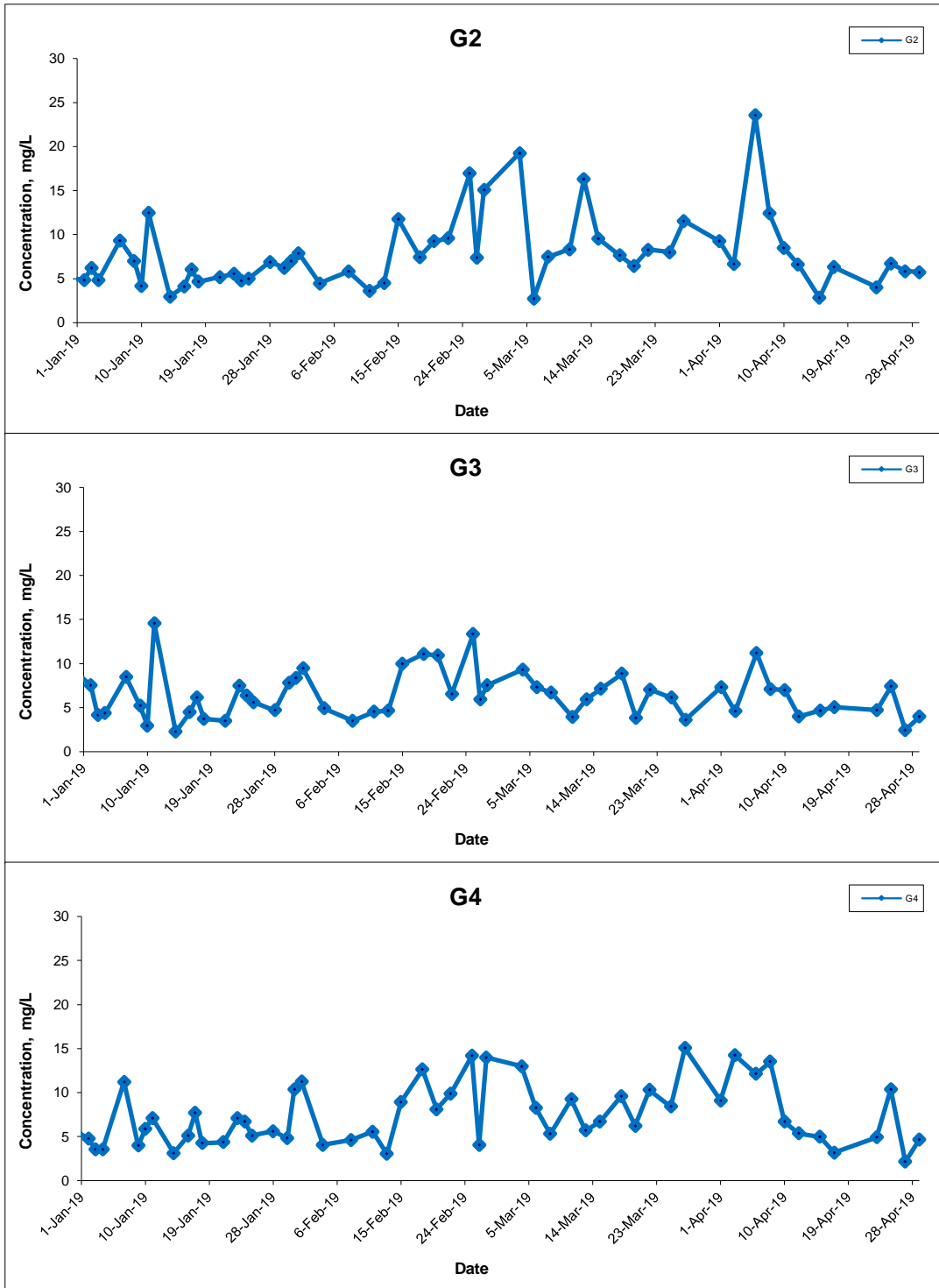
Date Mar 19

Project No. MA16034

Appendix I



Suspended Solids (Depth-averaged) 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

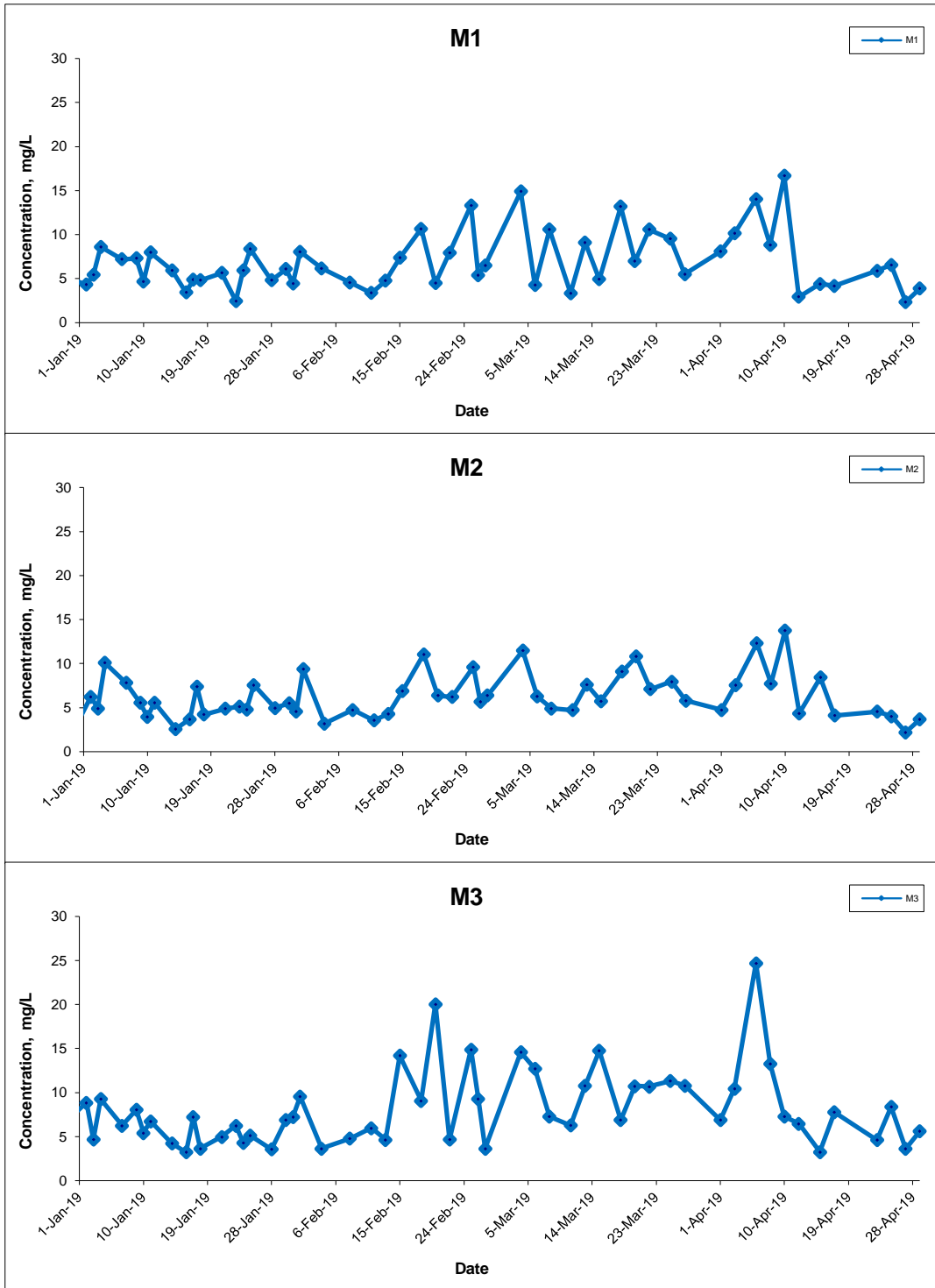
Date Mar 19

Project No. MA16034

Appendix I



Suspended Solids (Depth-averaged) 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

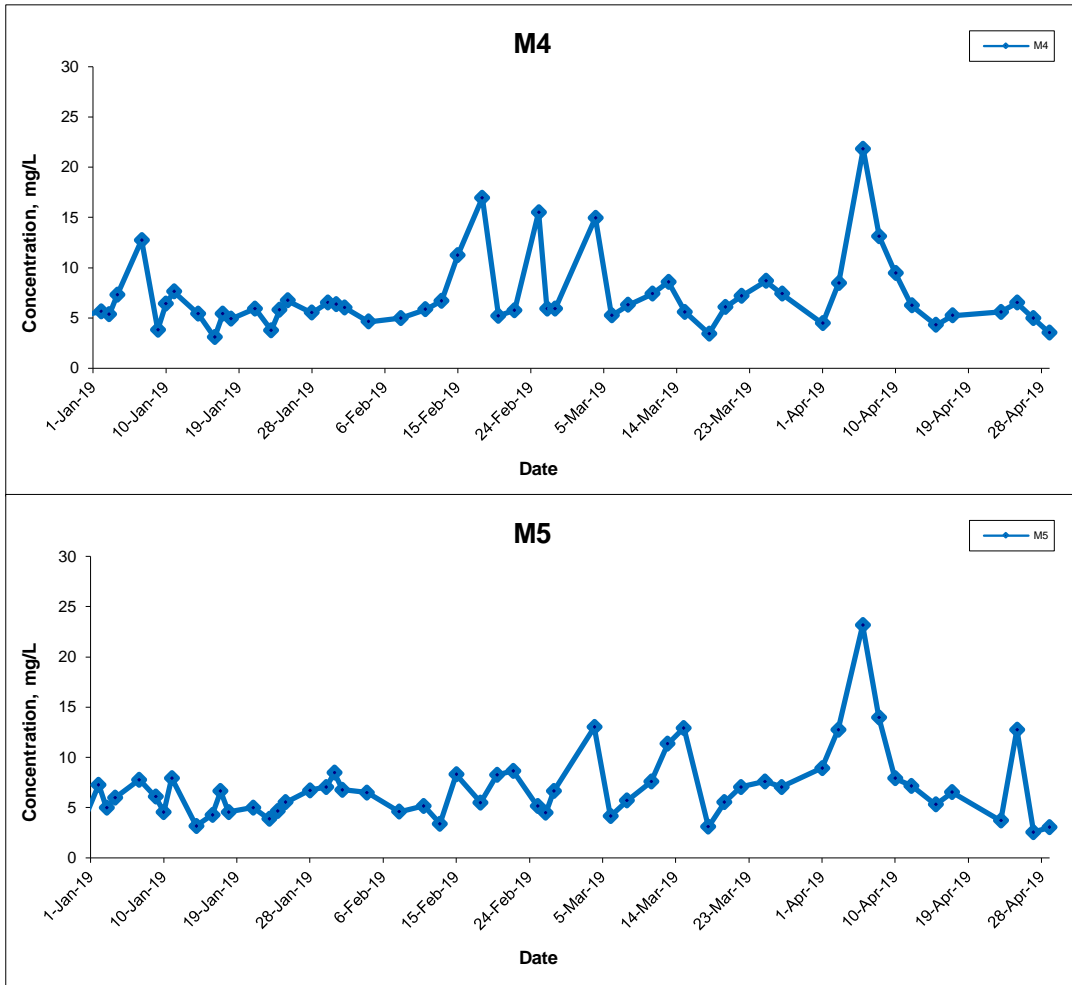
Date Mar 19

Project No. MA16034

Appendix I



Suspended Solids (Depth-averaged) 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

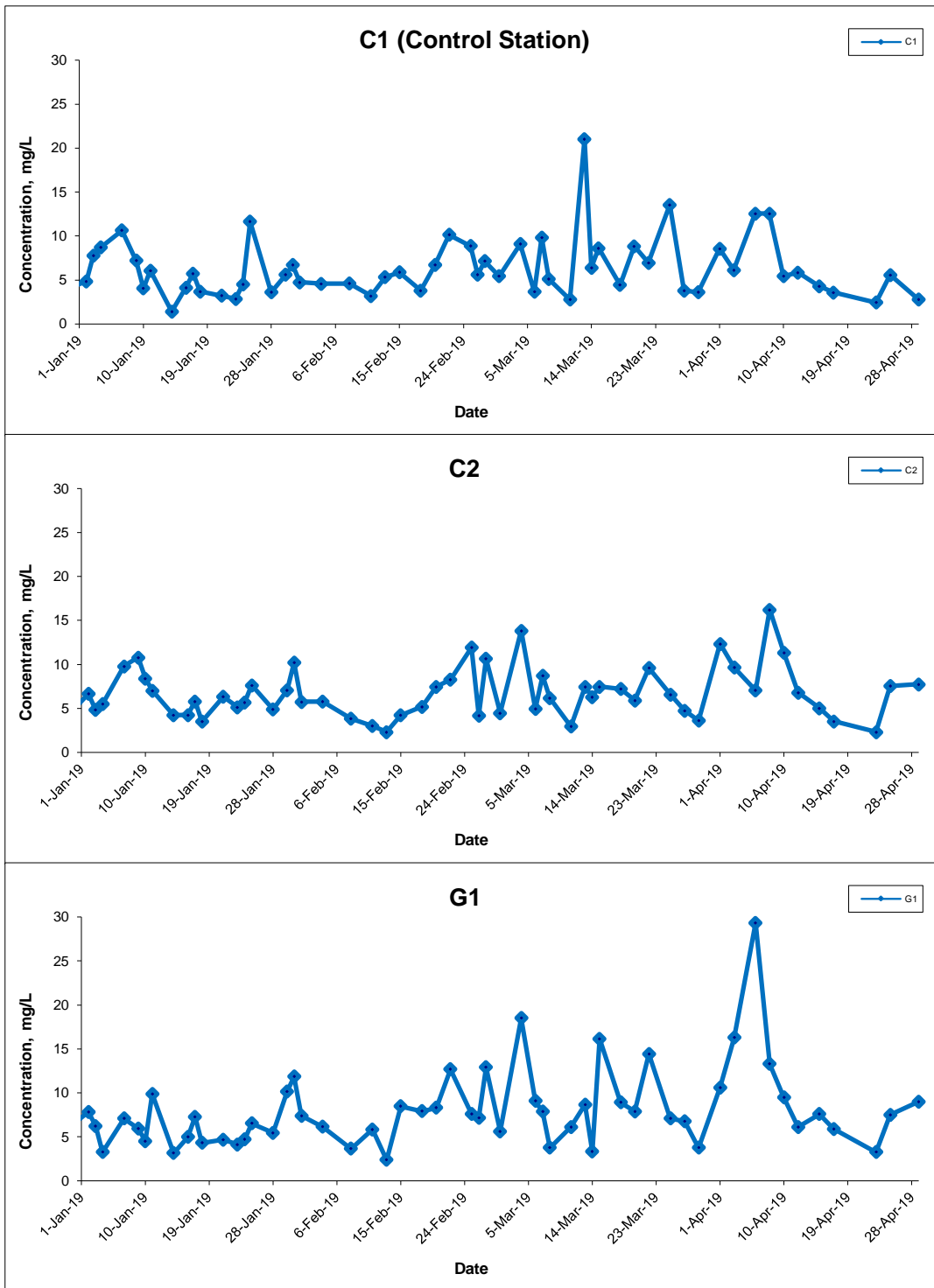
Date Mar 19

Project No. MA16034

Appendix I



Suspended Solids (Depth-averaged) 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

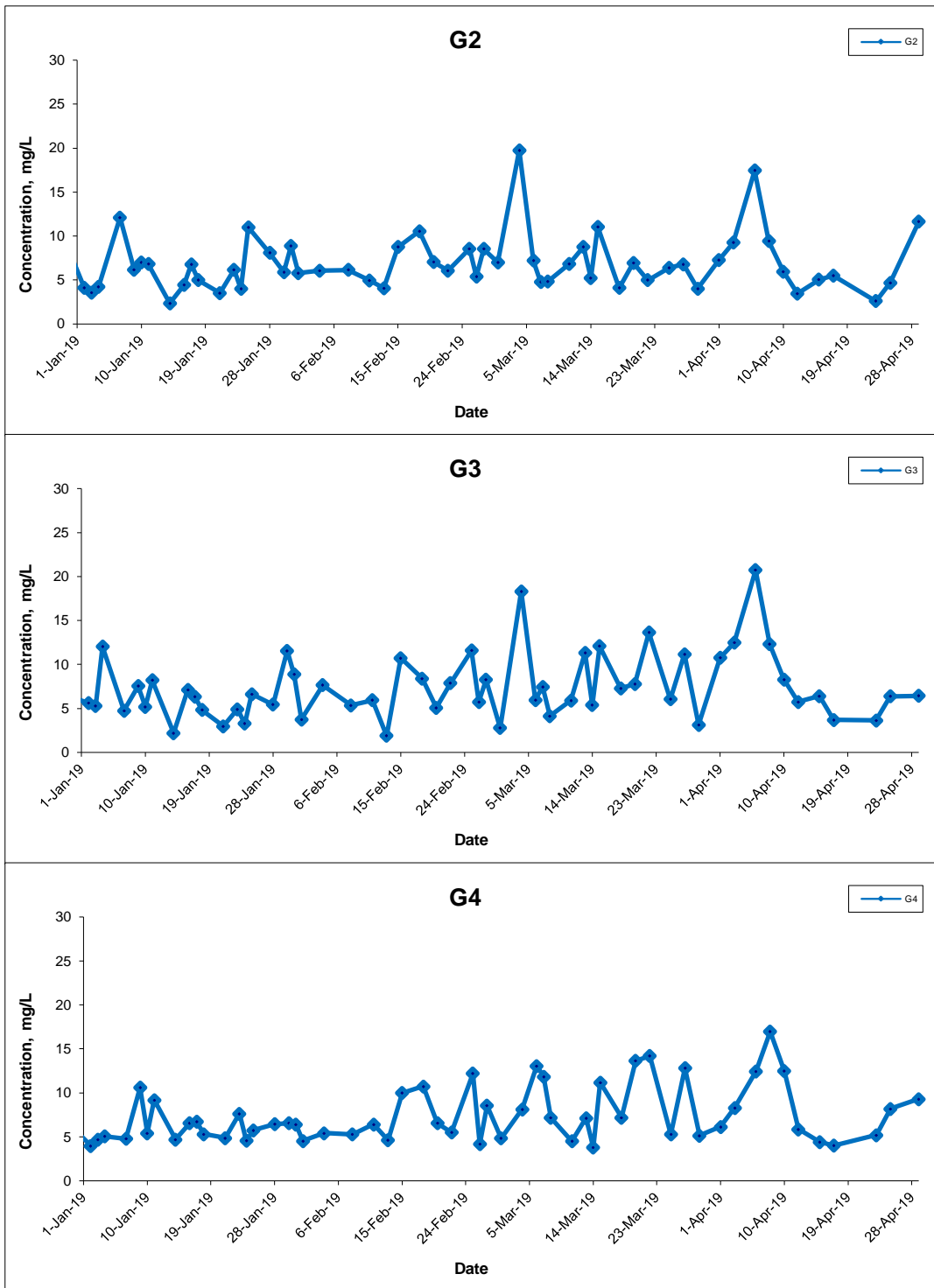
Date Mar 19

Project No. MA16034

Appendix I



Suspended Solids (Depth-averaged) 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

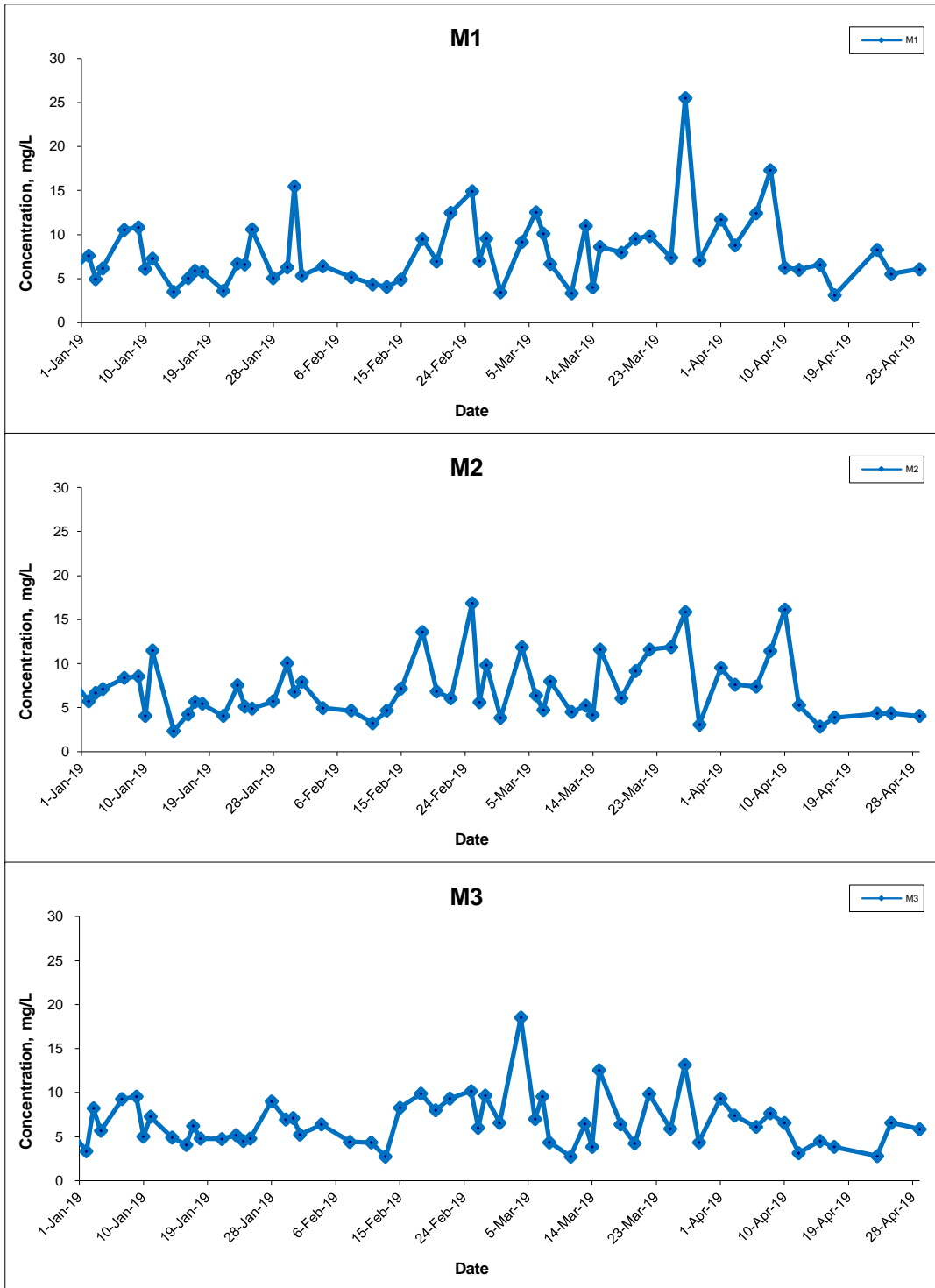
Date Mar 19

Project No. MA16034

Appendix I



Suspended Solids (Depth-averaged) 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

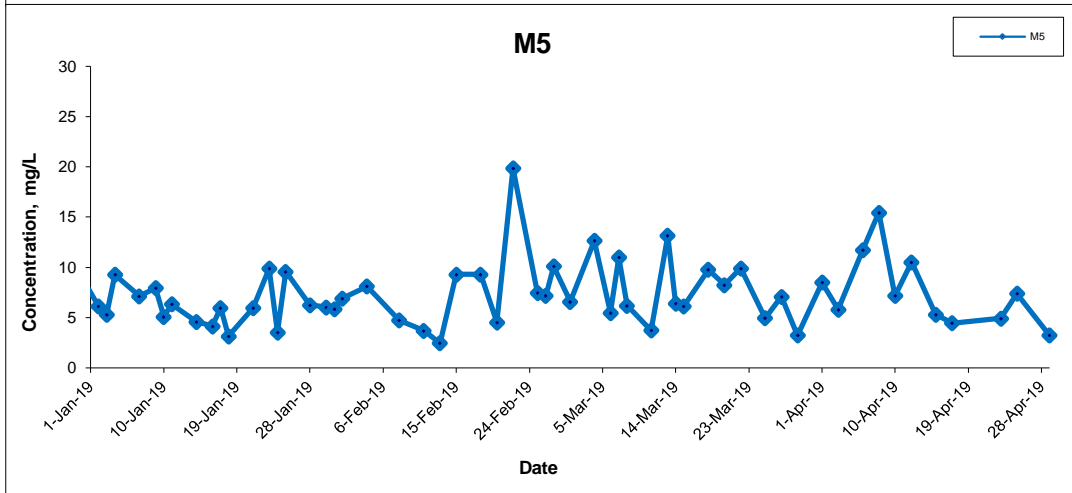
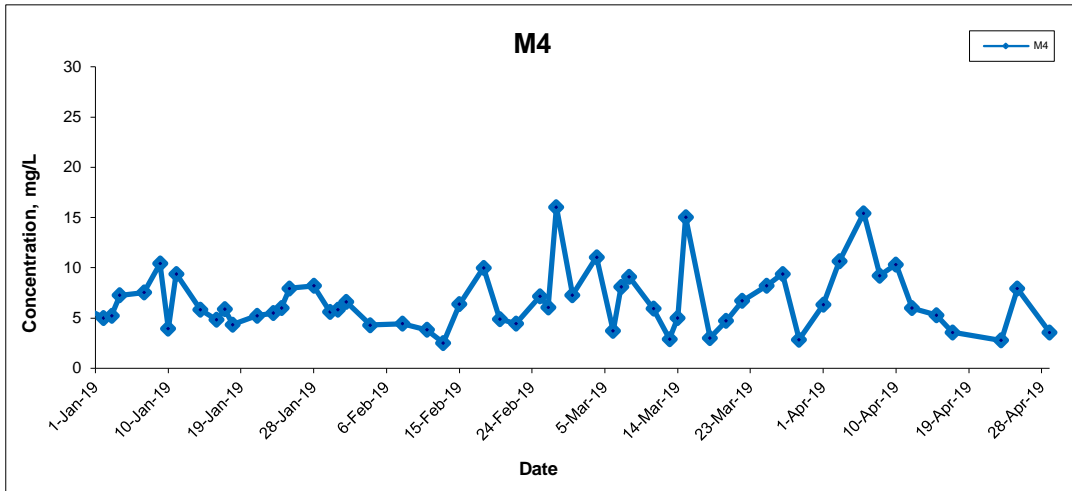
Date Mar 19

Project No. MA16034

Appendix I



Suspended Solids (Depth-averaged) 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

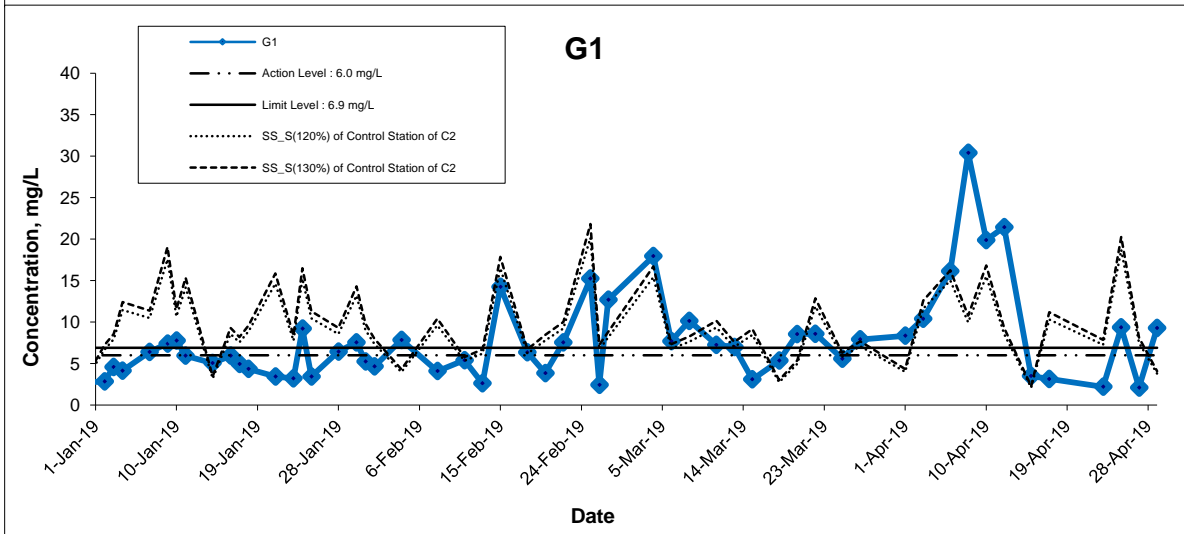
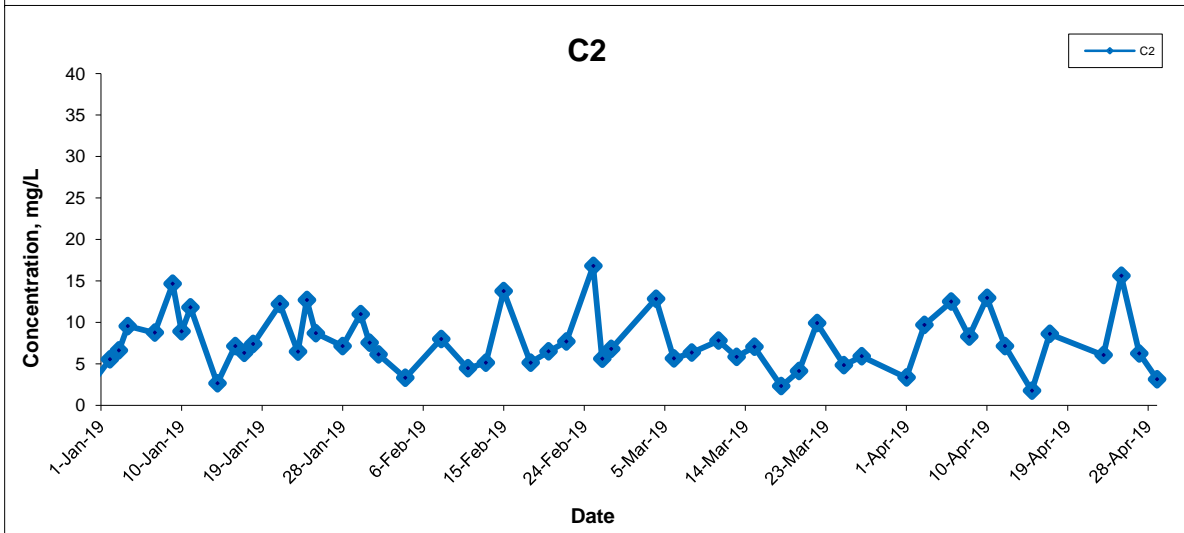
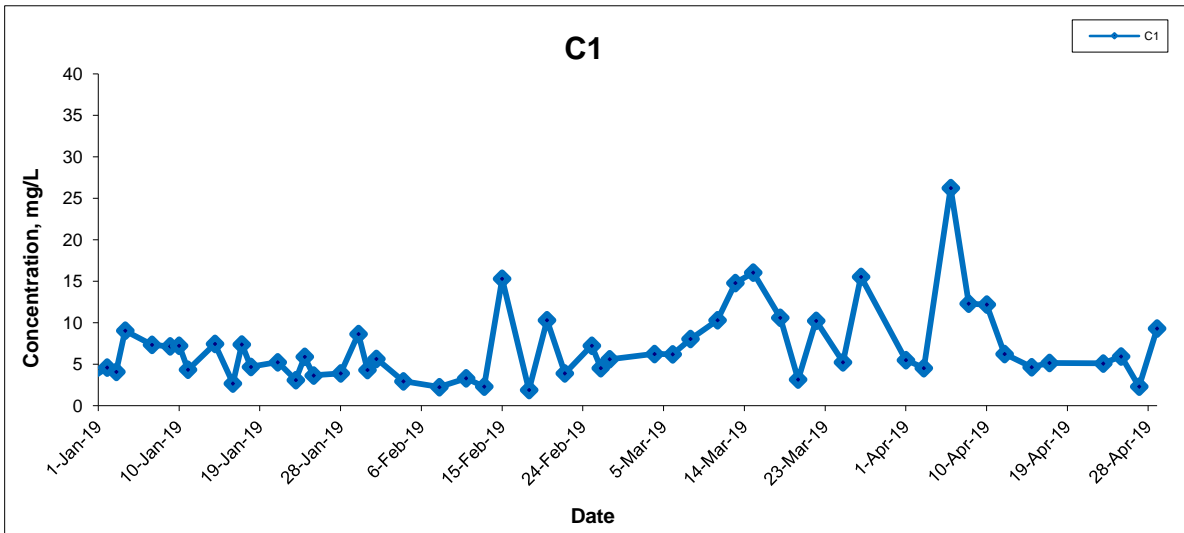
Date Mar 19

Project No. MA16034

Appendix I



Suspended Solids (Surface) 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

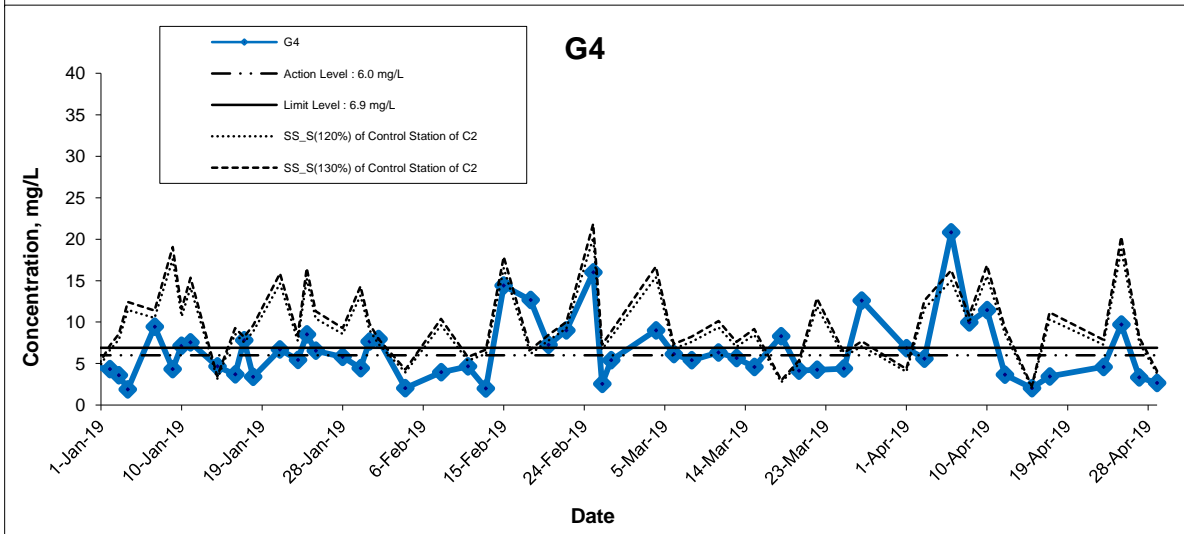
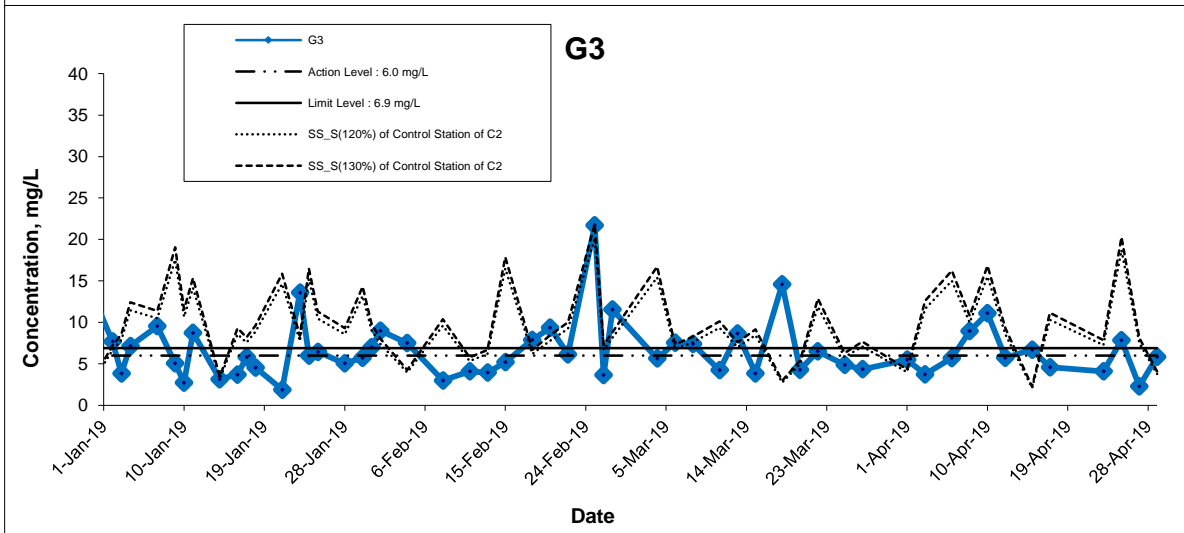
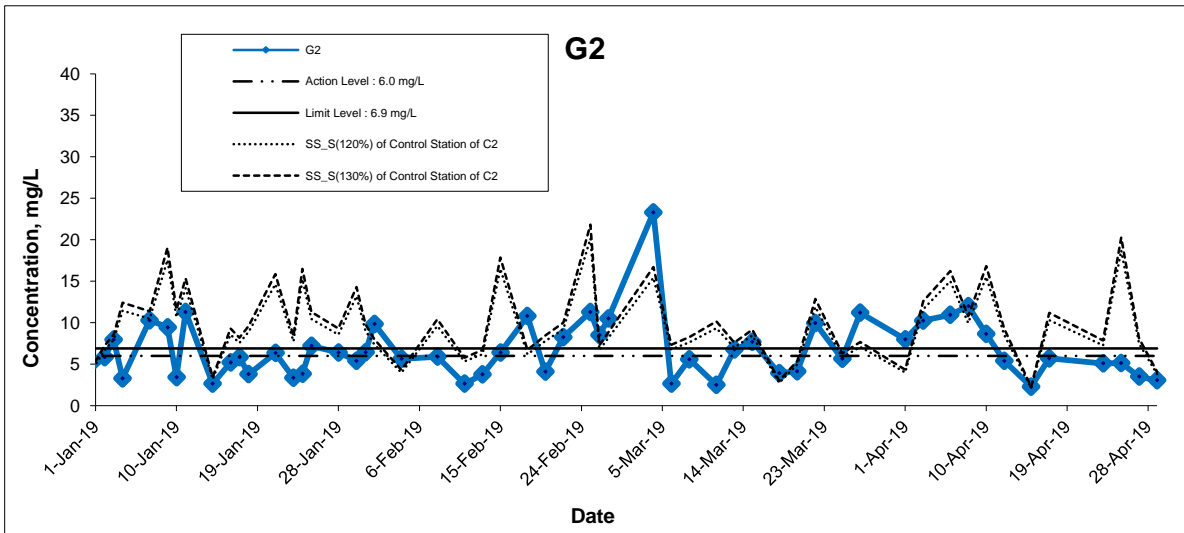
Date Mar 19

Project No. MA16034

Appendix I



Suspended Solids (Surface) 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

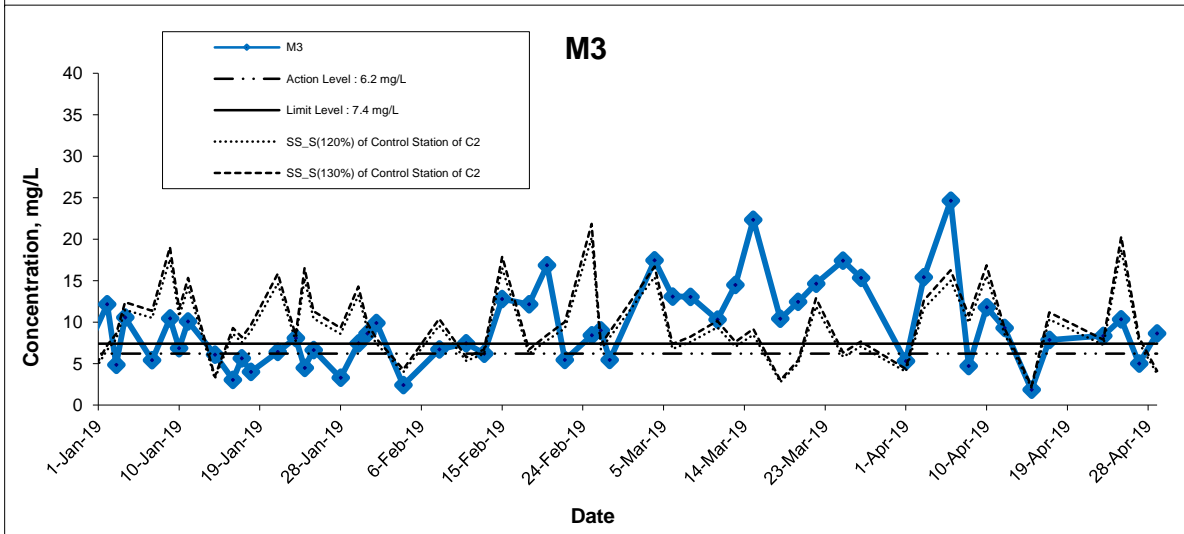
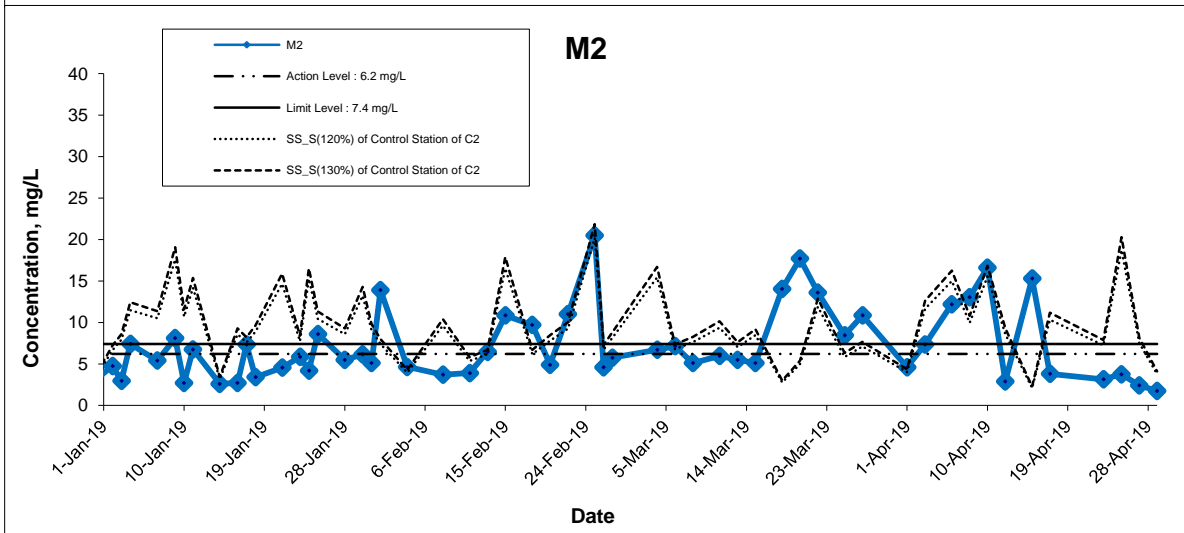
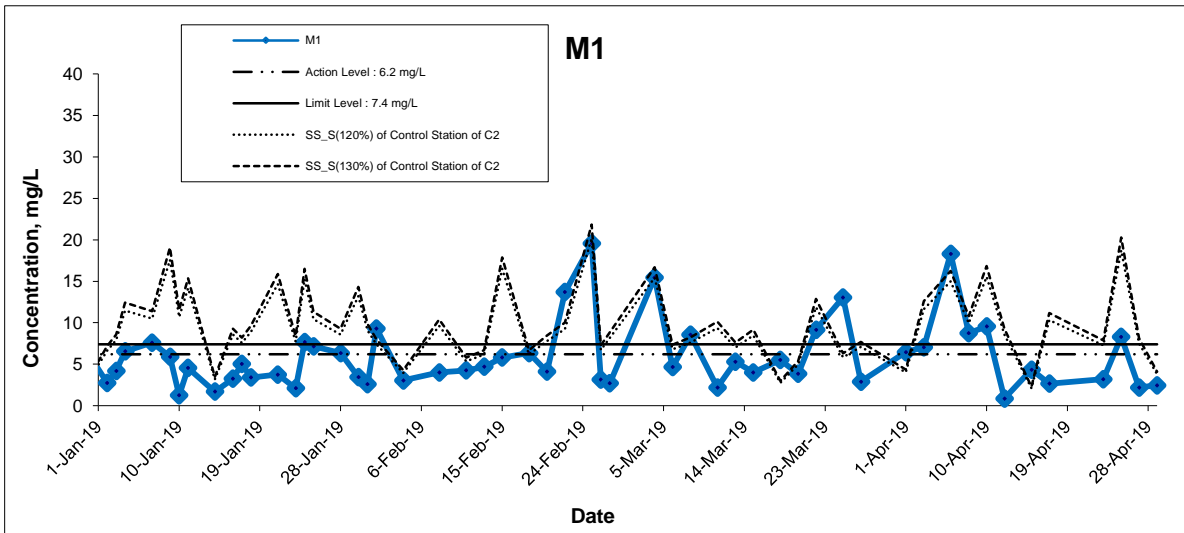
Date Mar 19

Project No. MA16034

Appendix I

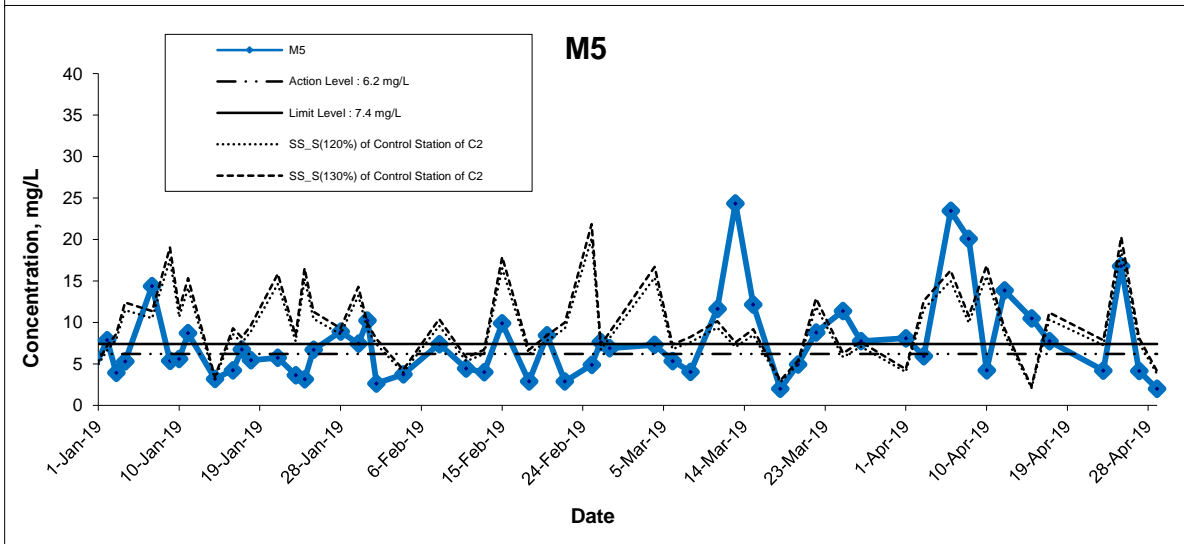
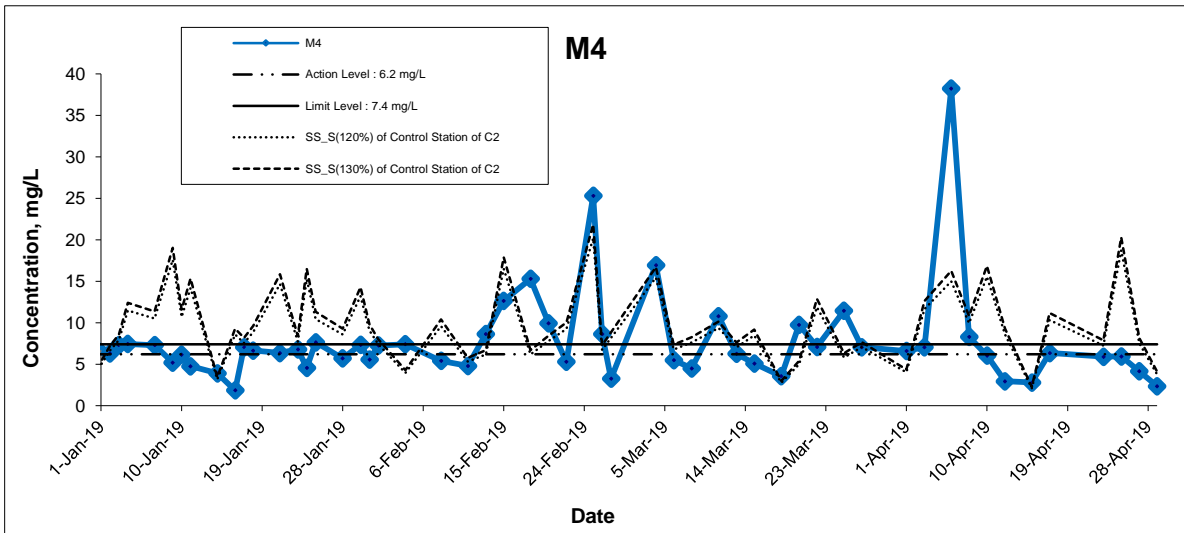


Suspended Solids (Surface) at Mid-Ebb Tide



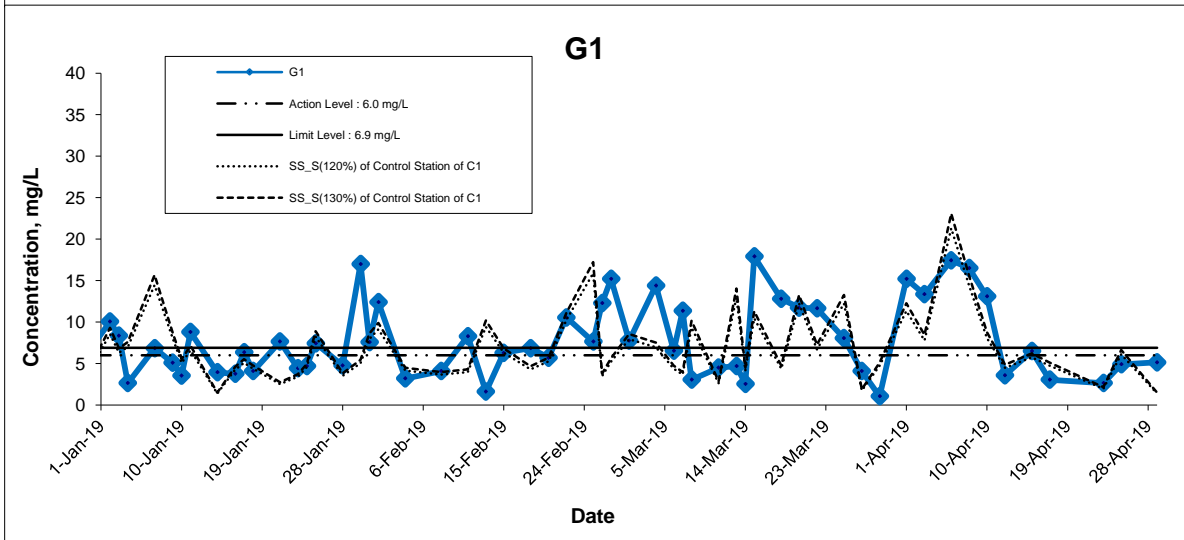
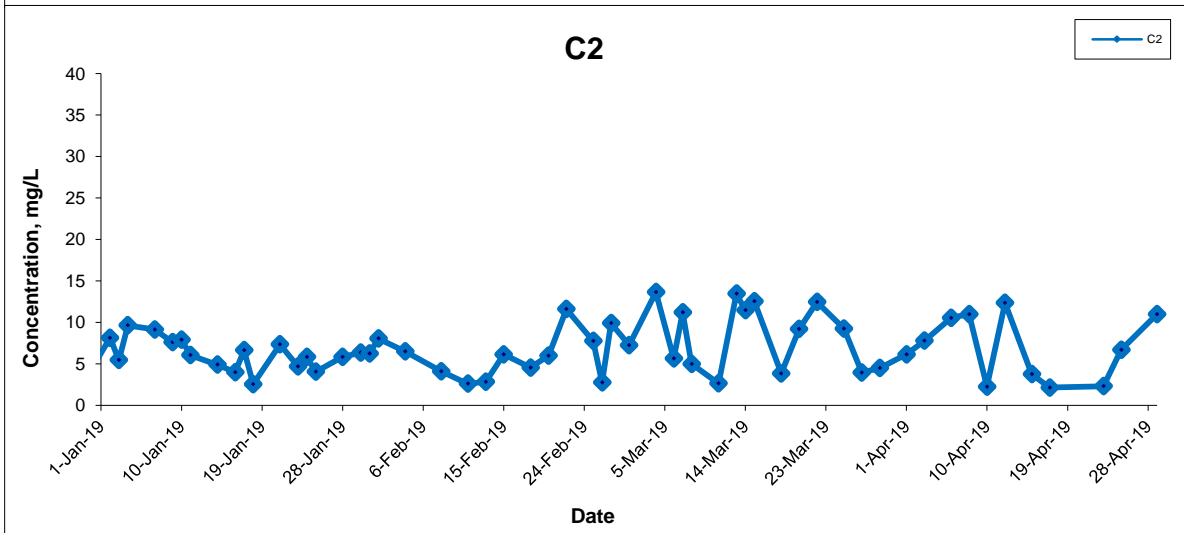
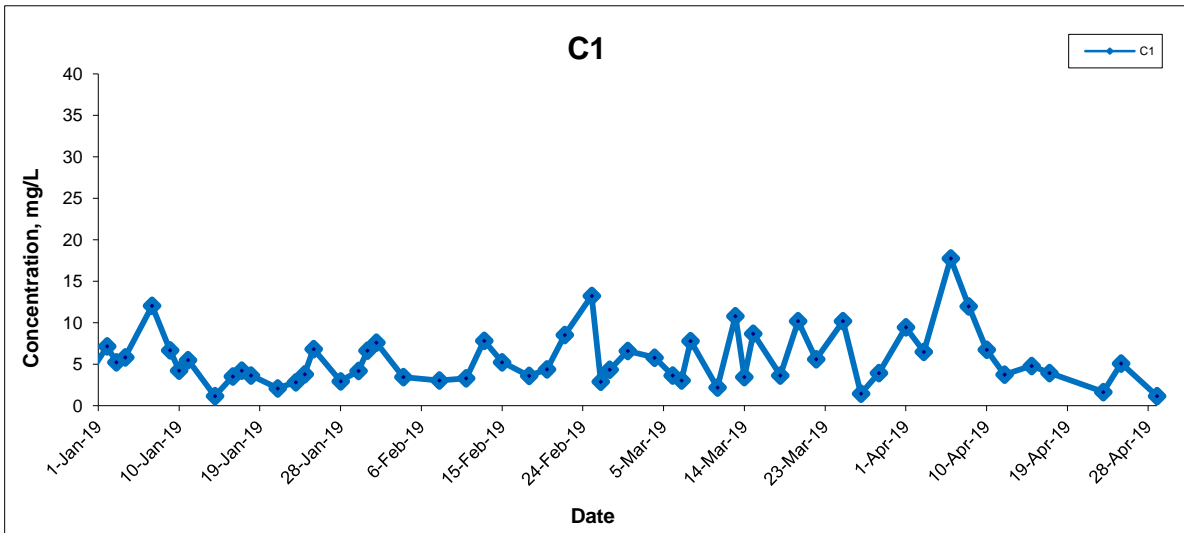
Title Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA16034	CINOTECH
	Date Mar 19	Appendix I	

Suspended Solids (Surface) 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	Project No. MA16034	
	Date Mar 19	Appendix I	

Suspended Solids (Surface) 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

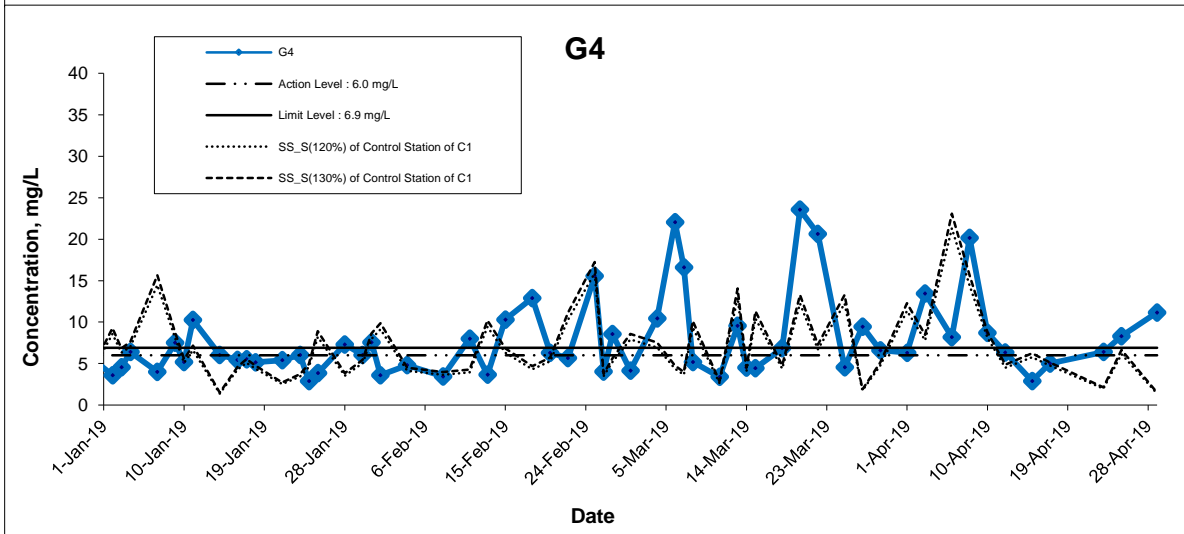
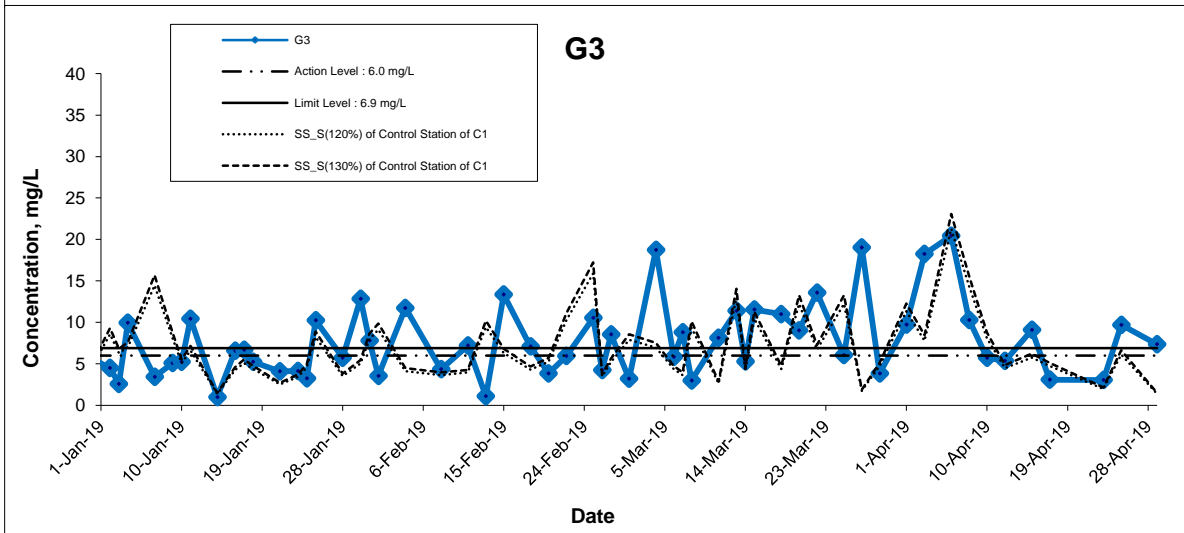
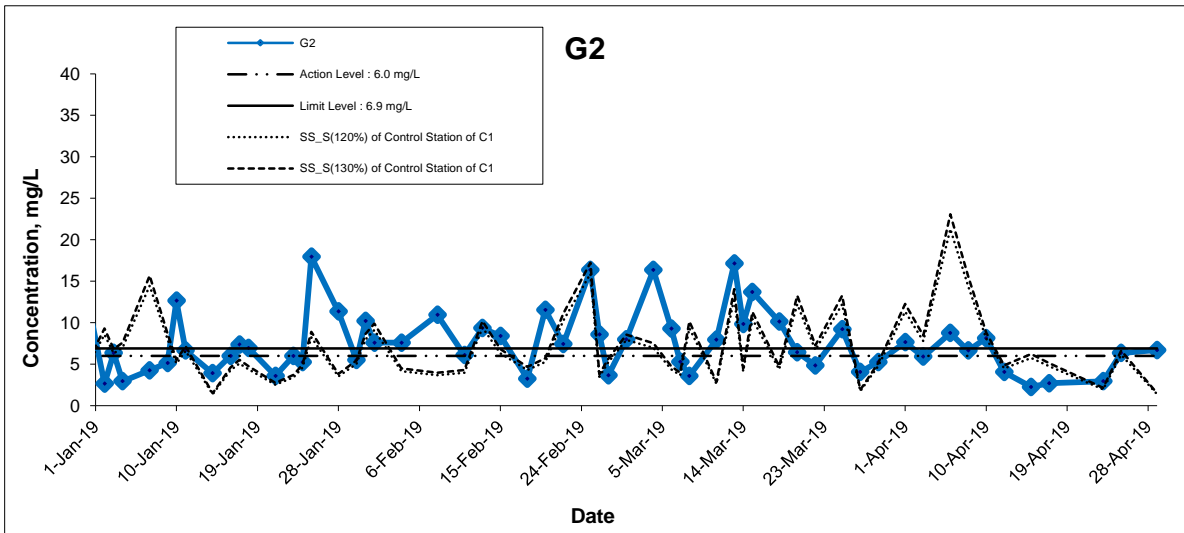
Date Mar 19

Project No. MA16034

Appendix I



Suspended Solids (Surface) 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

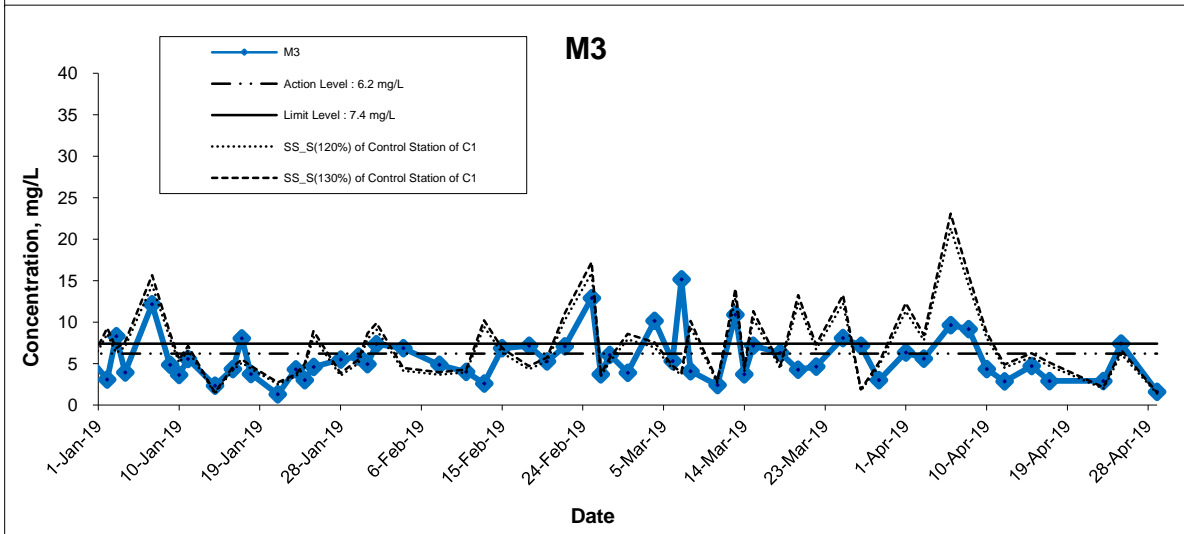
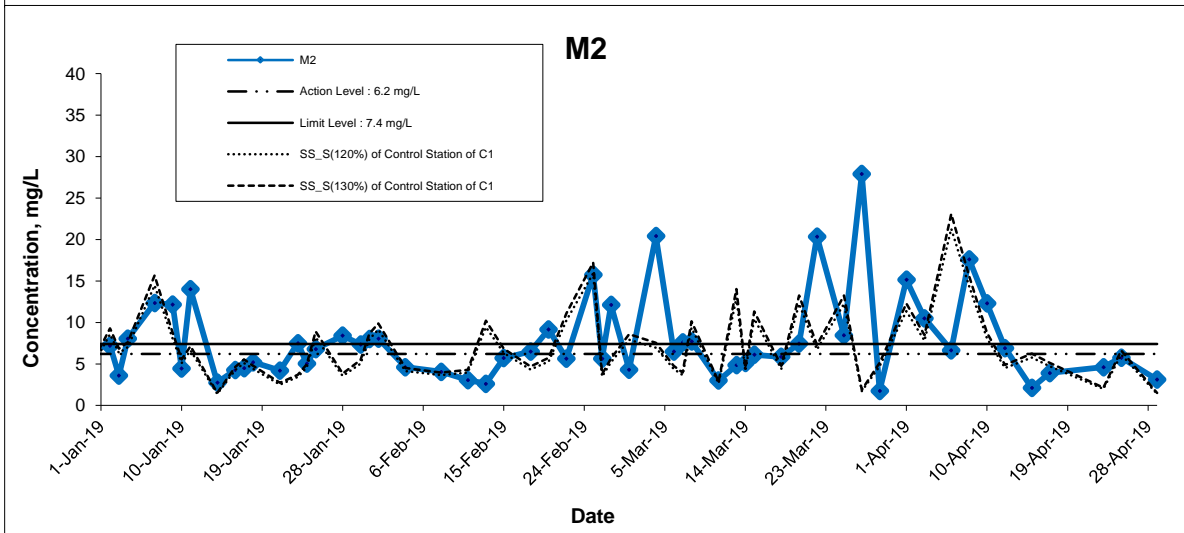
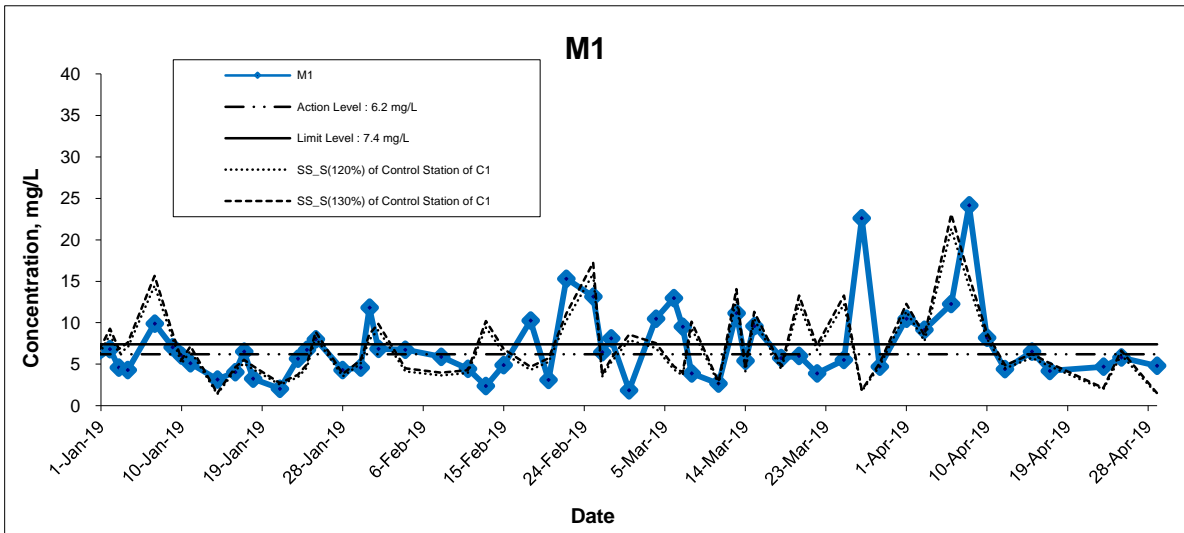
Date Mar 19

Project No. MA16034

Appendix I



Suspended Solids (Surface) 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

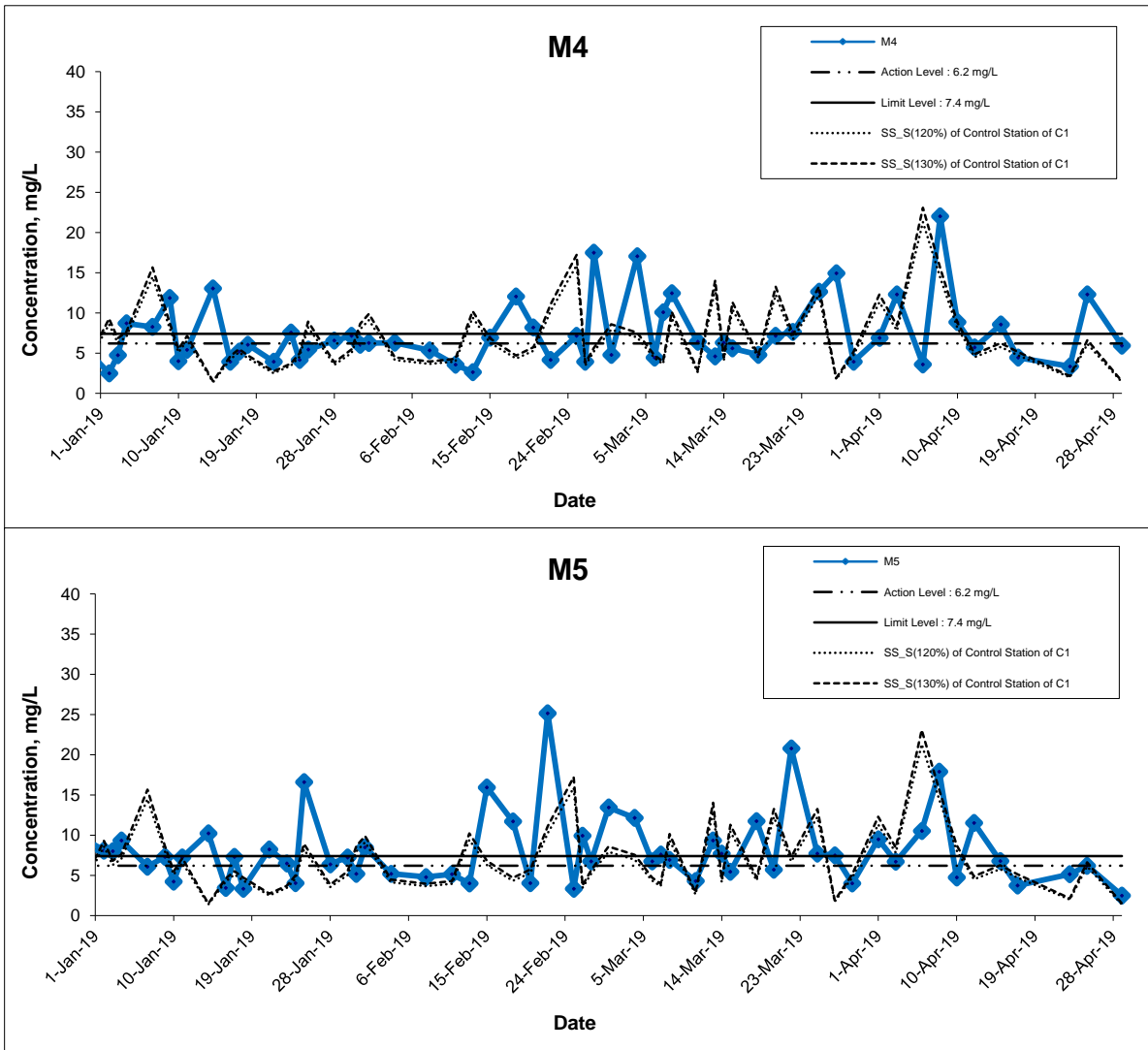
Date Mar 19

Project No. MA16034

Appendix I



Suspended Solids (Surface) 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

Mar 19

Project No.

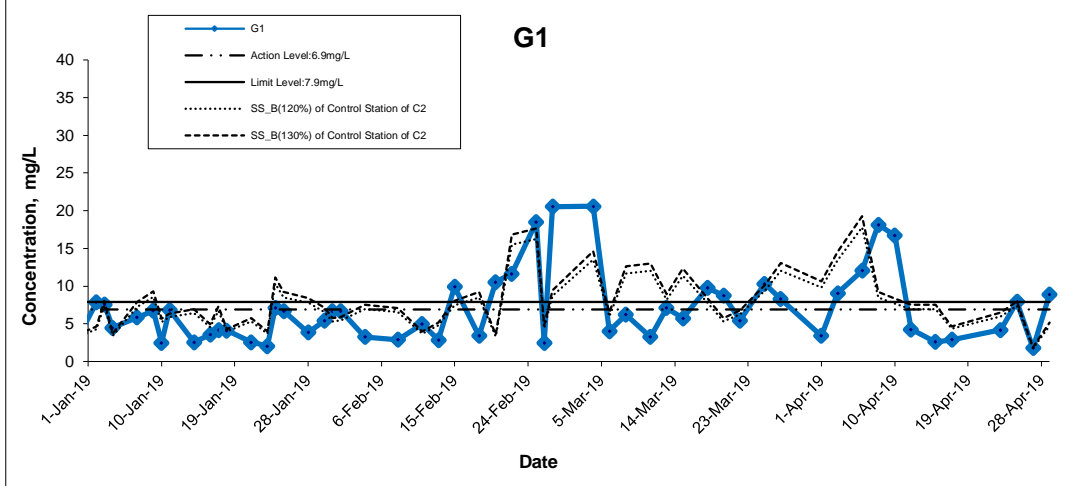
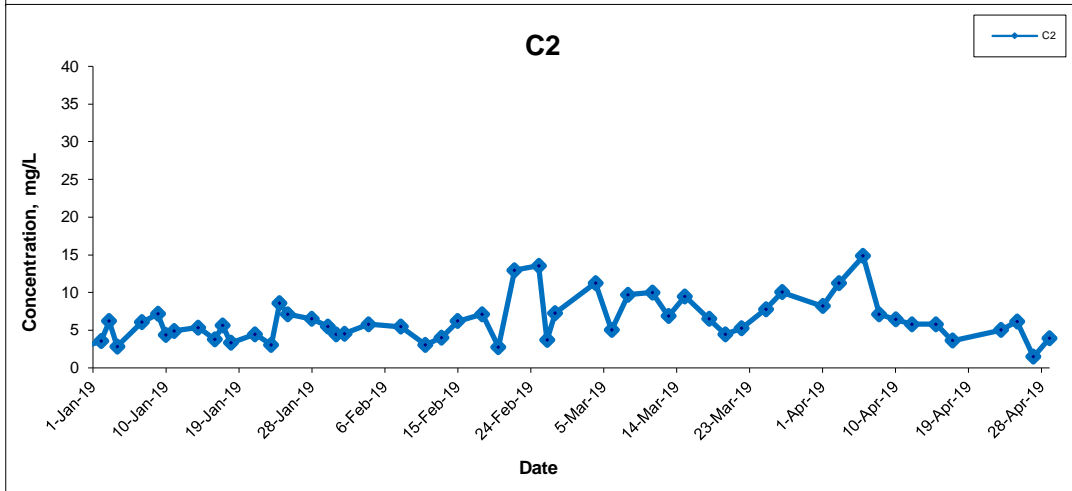
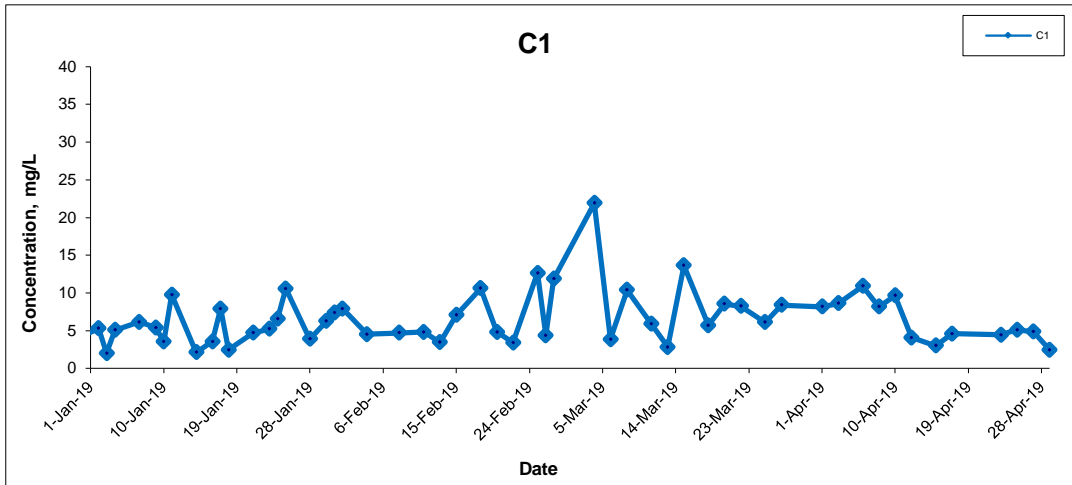
MA16034

Appendix

I

CINOTECH

Suspended Solids (Bottom) at Mid-Ebb Tide



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

Graphical Presentation of Water Quality Monitoring Results

Scale N.T.S

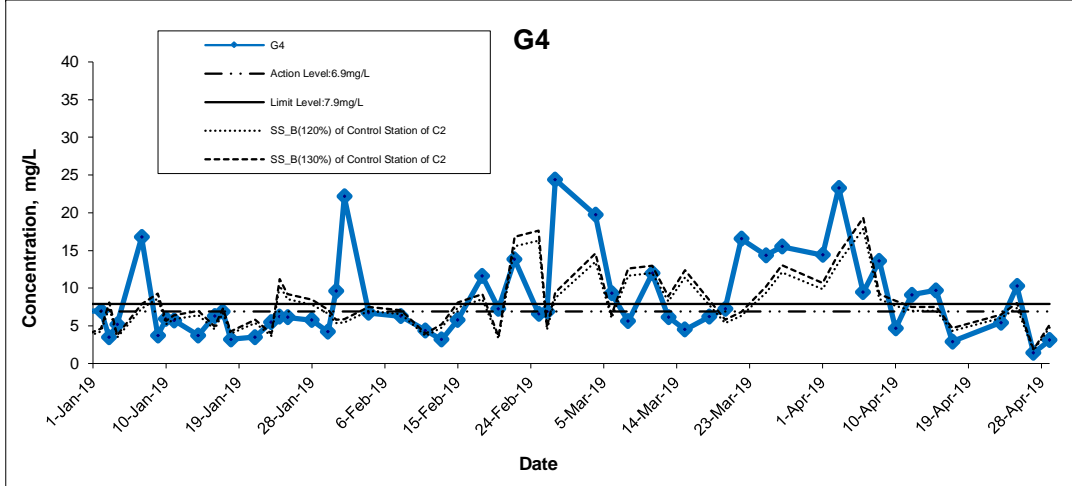
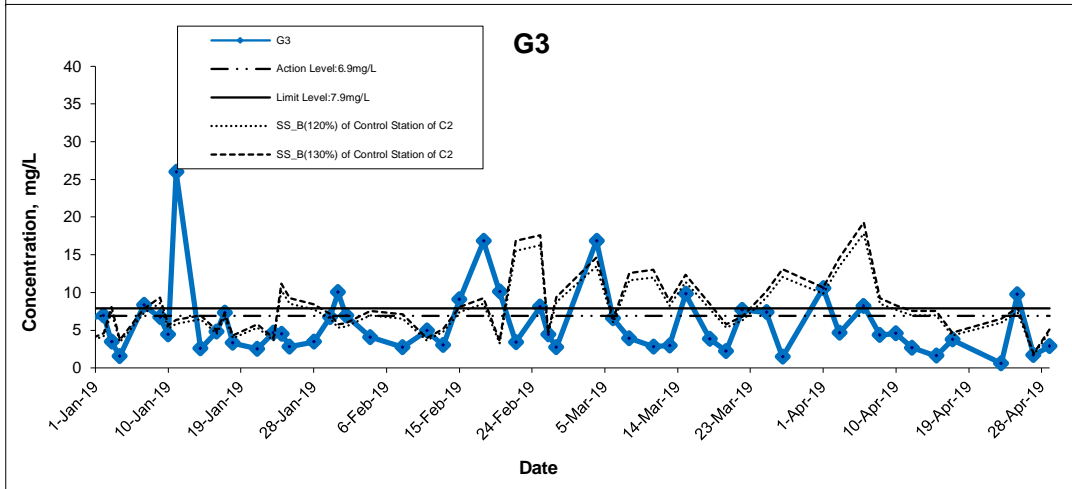
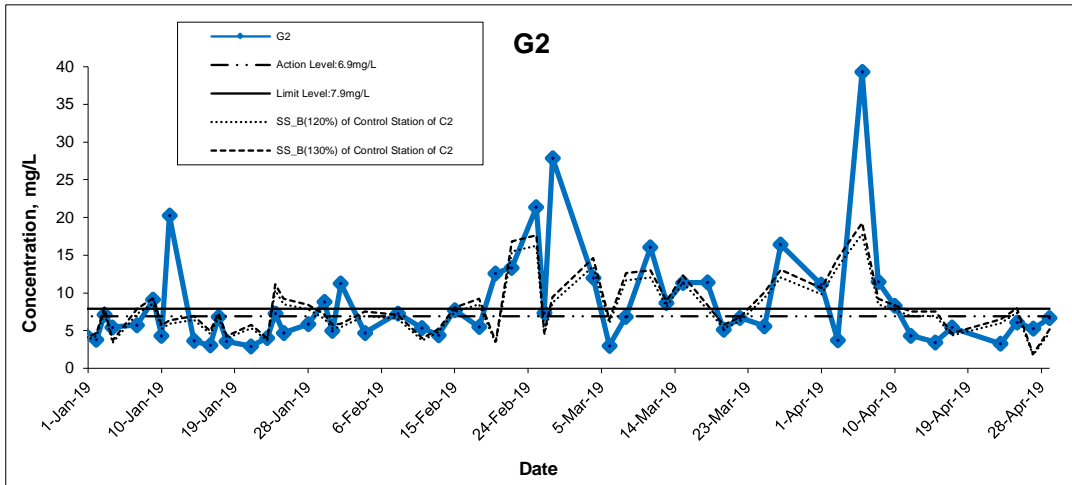
Date Mar 19

Project No. MA16034

Appendix I



Suspended Solids (Bottom) at Mid-Ebb Tide



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

Graphical Presentation of Water Quality Monitoring Results

Scale N.T.S

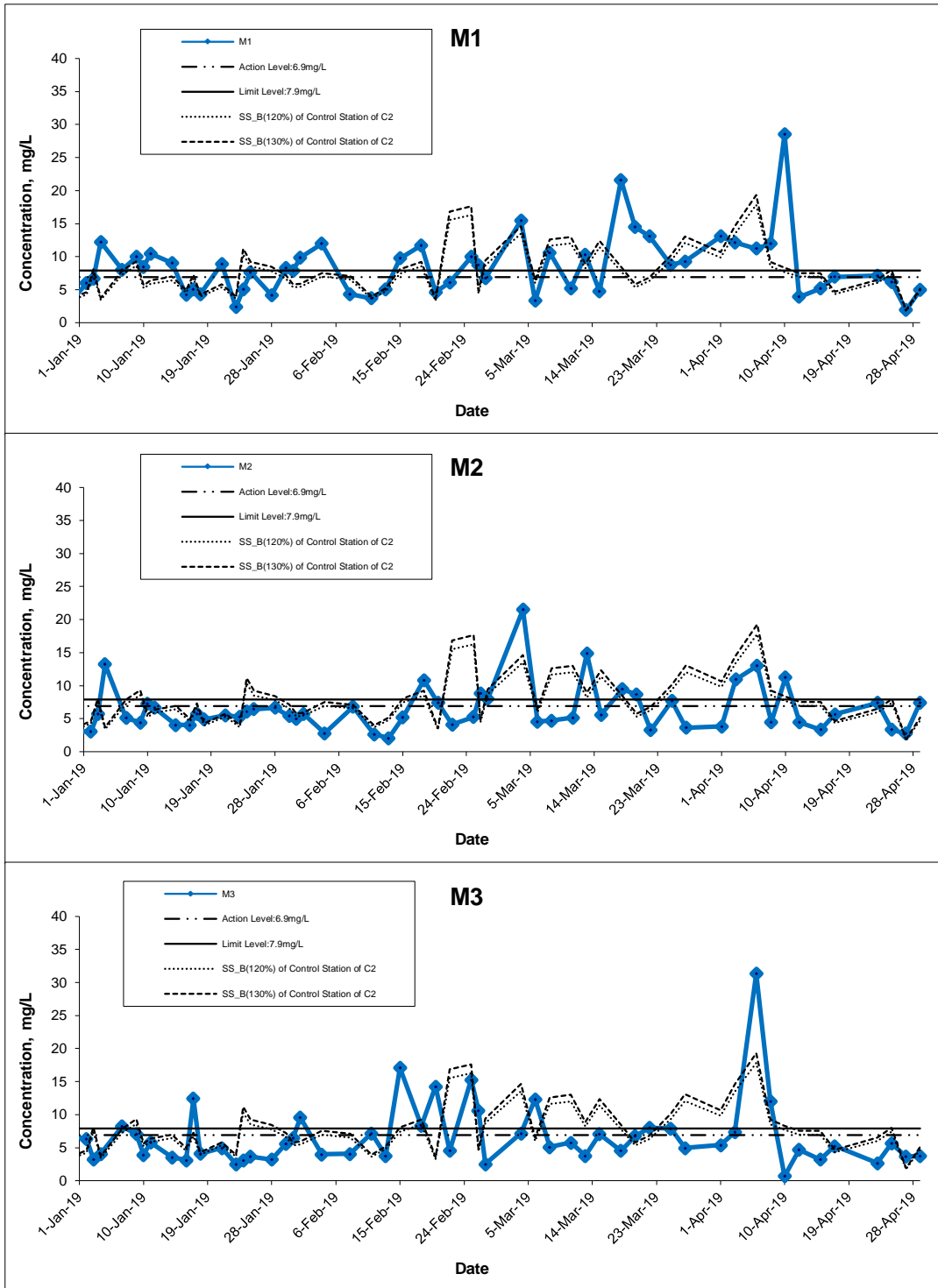
Date Mar 19

Project No. MA16034

Appendix I



Suspended Solids (Bottom) 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

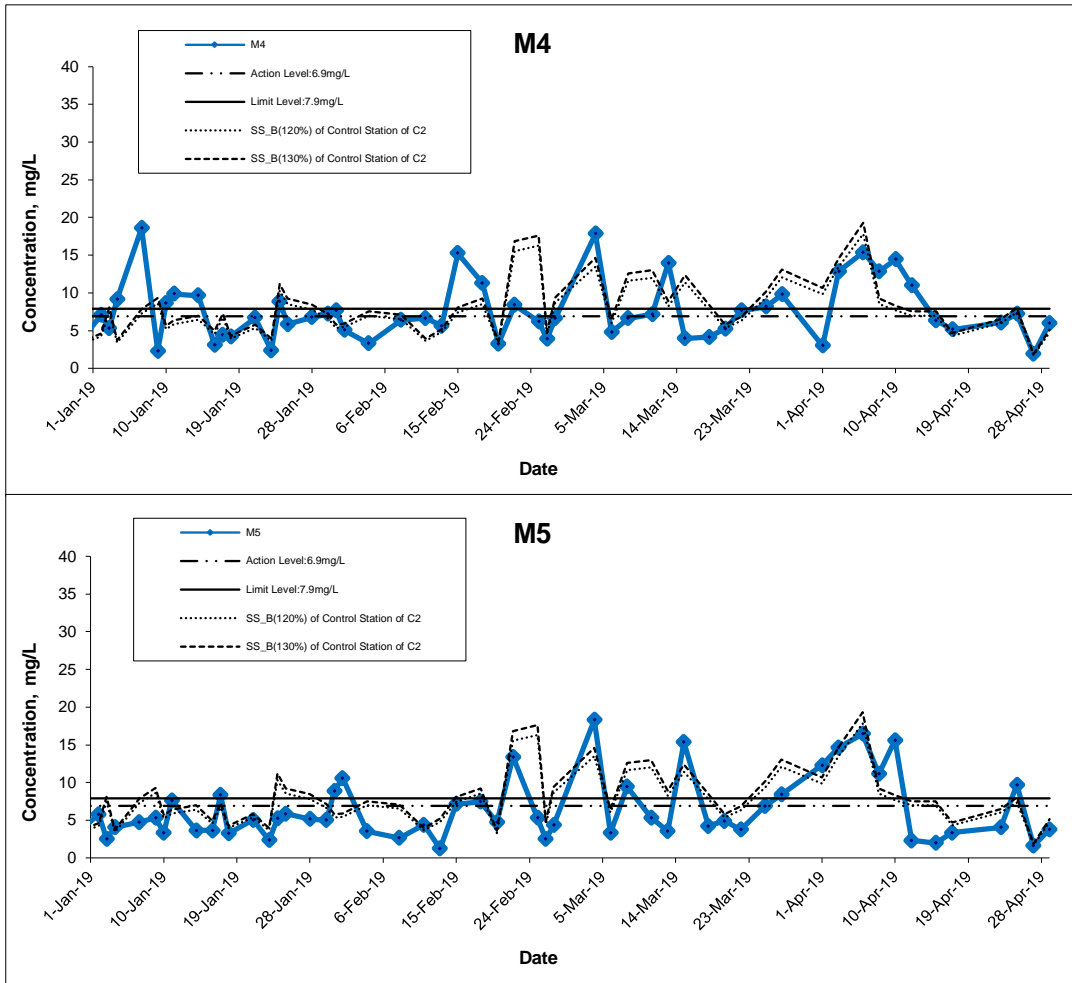
Date Mar 19

Project No. MA16034

Appendix I



Suspended Solids (Bottom) 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

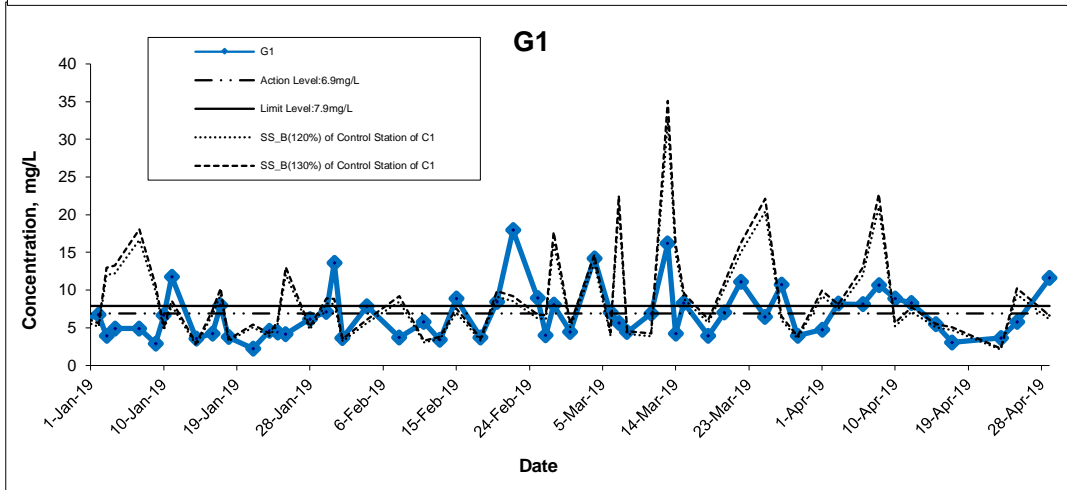
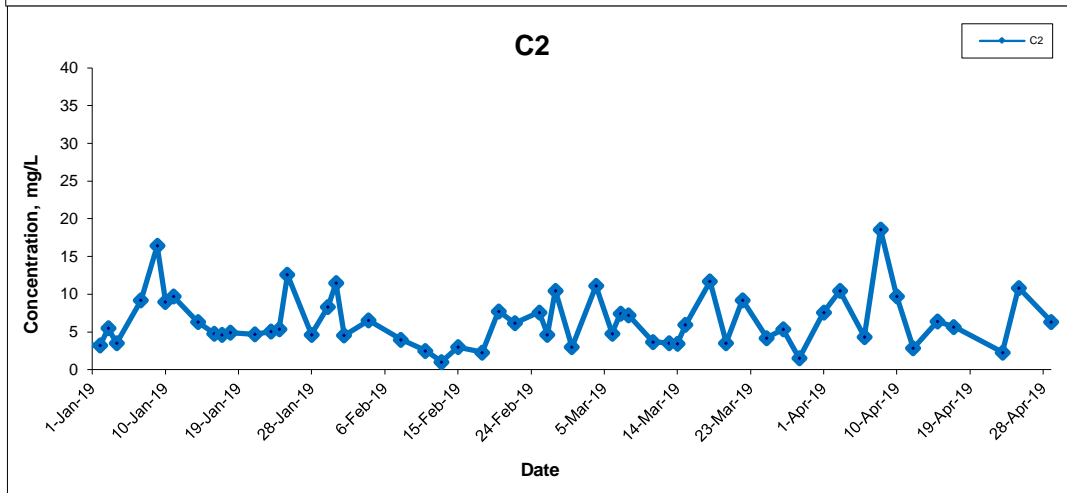
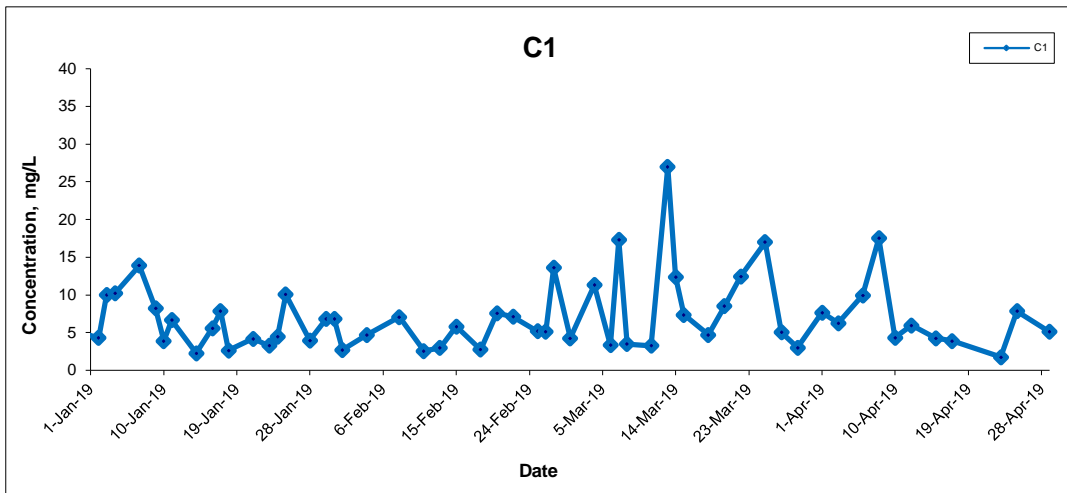
Date Mar 19

Project No. MA16034

Appendix I



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

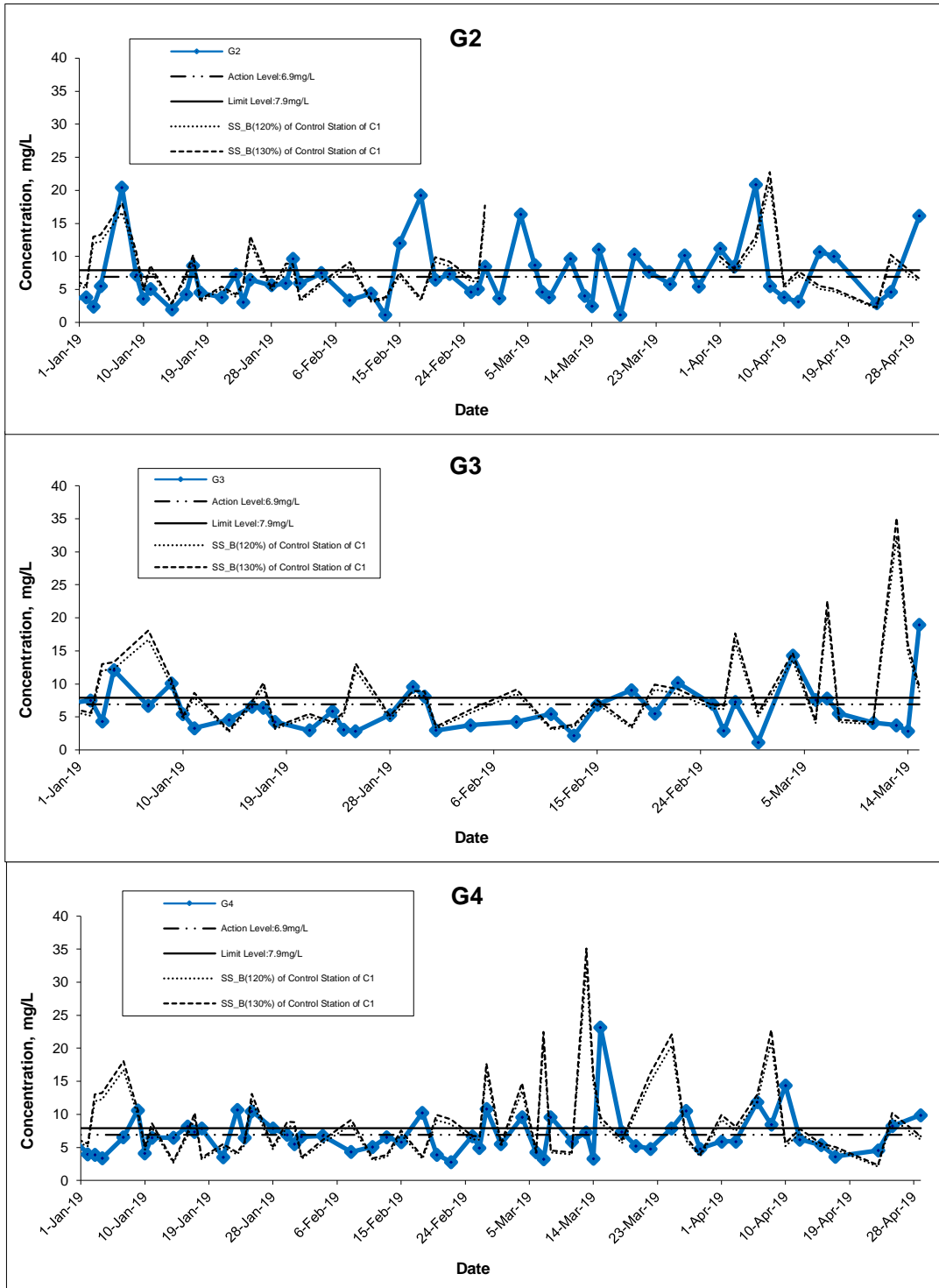
Date Mar 19

Project No. MA16034

Appendix I



Suspended Solids (Bottom) at Mid-Flood Tide



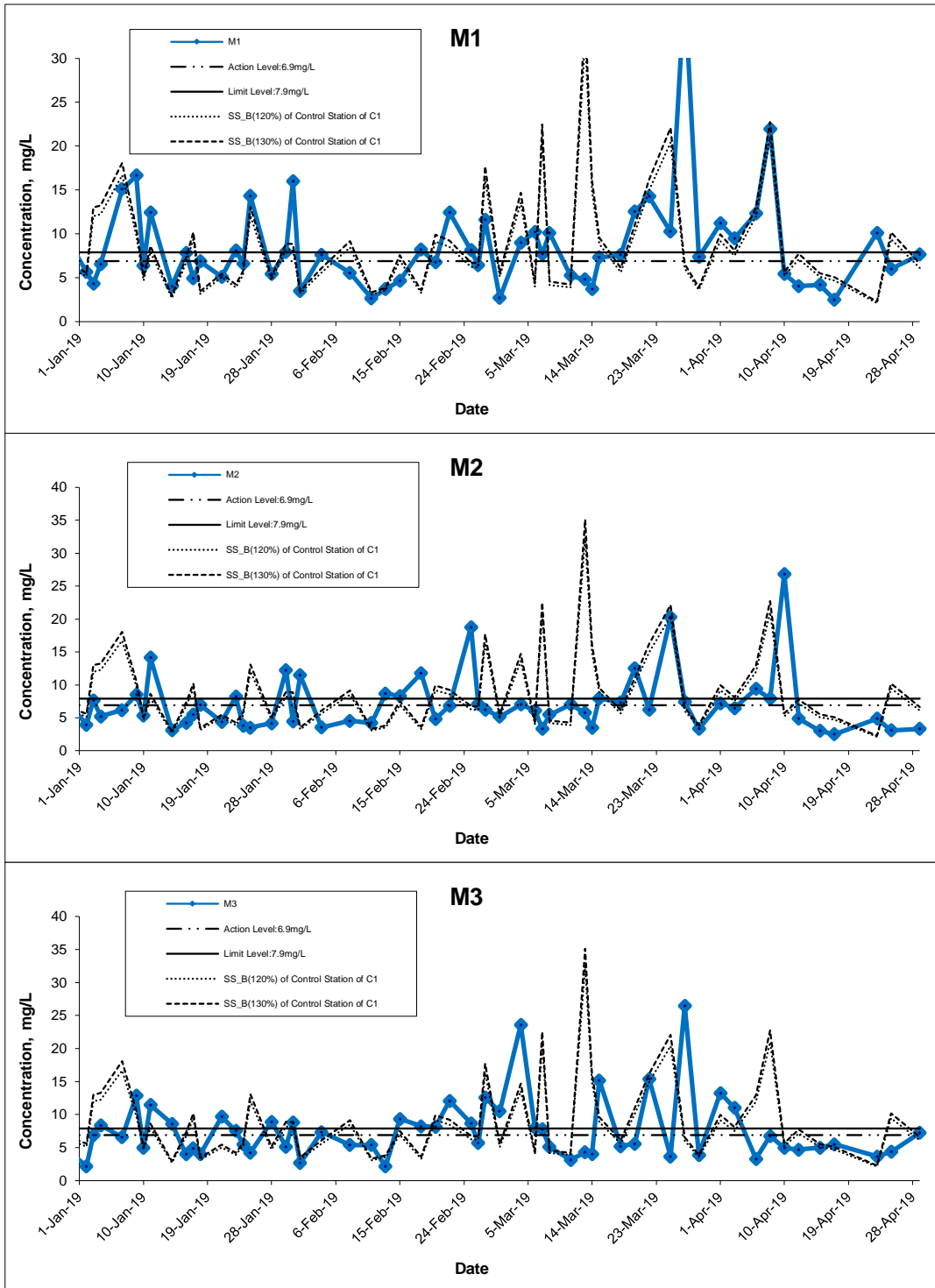
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 Graphical Presentation of Water Quality Monitoring Results

Scale N.T.S
 Date Mar 19

Project No. MA16034
 Appendix I



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

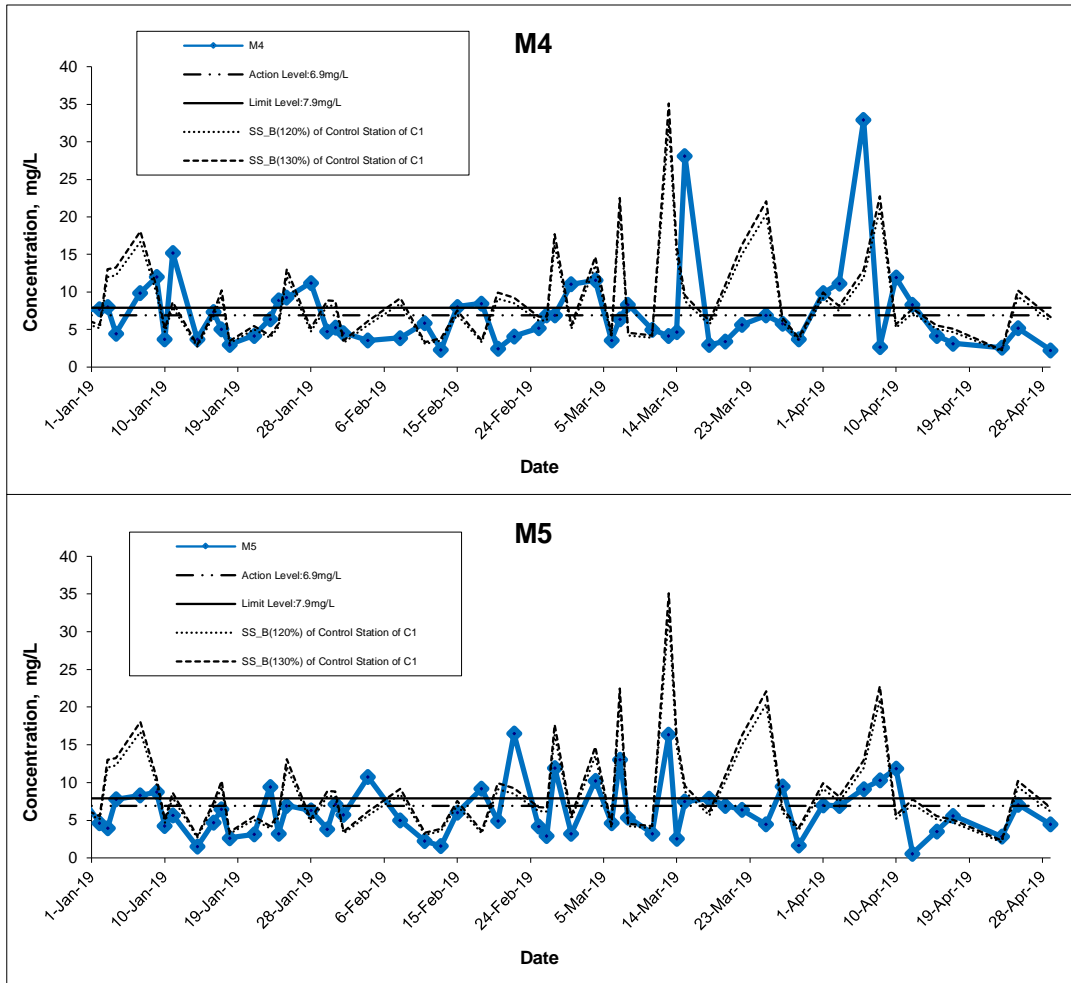
Date Mar 19

Project No. MA16034

Appendix I



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

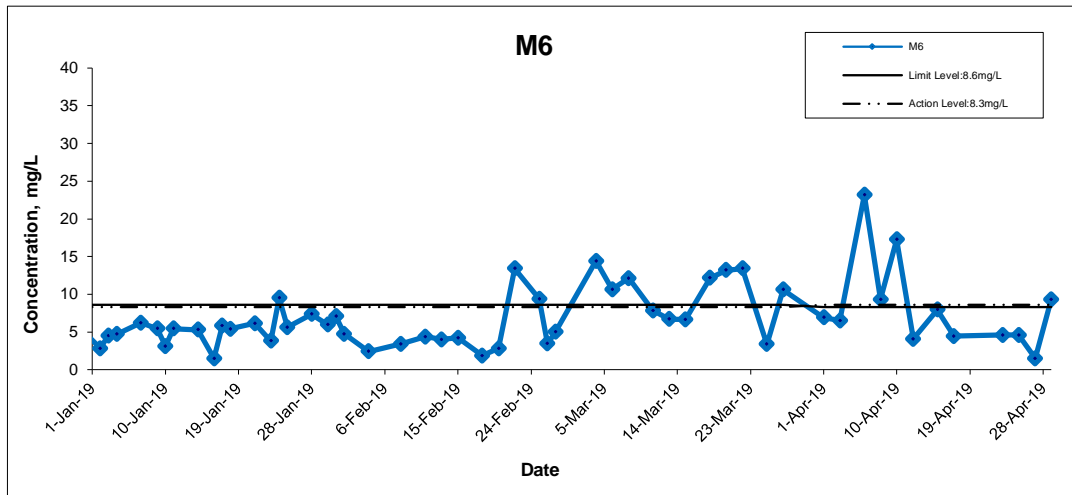
Date Mar 19

Project No. MA16034

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

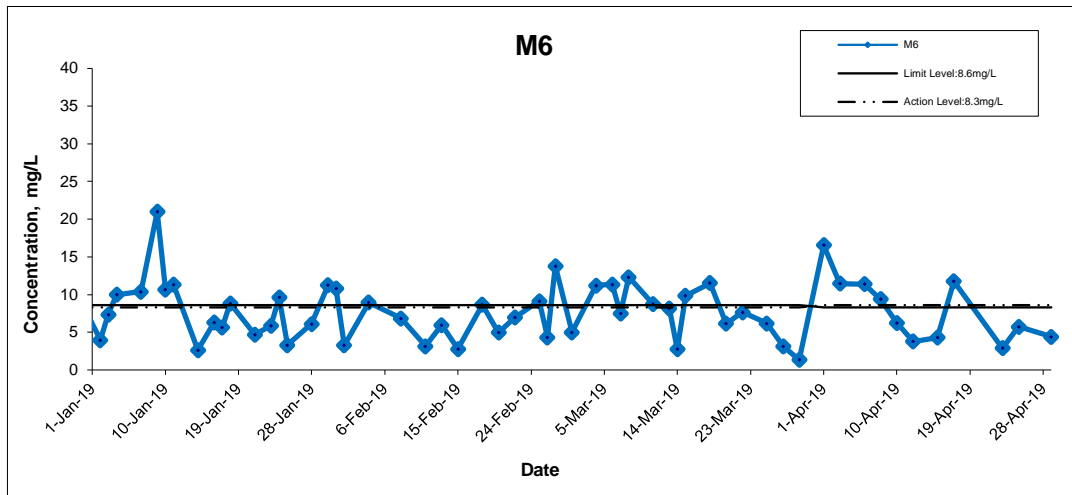
Date Apr 19

Project No. MA16034

Appendix I



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 Apr 19

Project No. MA16034

Appendix I



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)		DA*	
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average		
1-Apr-19	Cloudy	Moderate	10:38	Surface	1.0	22.1 22.1	22.1	8.3 8.3	8.3	35.1 35.1	35.1	88.0 88.0	88.0	6.3 6.3	6.3	6.3	
				Middle	-	-	-	-	-	-	-	-	-	-	-		-
				Bottom	3.0	22.1 22.1	22.1	8.3 8.3	8.3	35.2 35.2	35.2	87.5 87.4	87.5	6.2 6.2	6.2		6.2
8-Apr-19	Sunny	Calm	13:53	Surface	1.1	23.2 23.3	23.3	8.3 8.3	8.3	35.2 35.2	35.2	99.6 99.5	99.6	7.0 6.9	6.9	6.9	
				Middle	-	-	-	-	-	-	-	-	-	-	-		
				Bottom	3.0	23.3 23.2	23.2	8.3 8.3	8.3	35.1 35.3	35.2	99.3 98.7	99.0	6.9 6.9	6.9		6.9
15-Apr-19	Cloudy	Moderate	10:11	Surface	1.0	22.9 22.9	22.9	8.4 8.4	8.4	34.4 34.5	34.4	92.0 89.7	90.9	6.5 6.3	6.4	6.4	
				Middle	-	-	-	-	-	-	-	-	-	-	-		
				Bottom	3.0	22.9 22.9	22.9	8.4 8.4	8.4	34.5 34.5	34.5	89.8 89.4	89.6	6.3 6.3	6.3		6.3
23-Apr-19	Sunny	Moderate	14:39	Surface	1.1	24.0 24.1	24.0	8.3 8.3	8.3	33.3 33.3	33.3	92.2 92.1	92.2	6.4 6.4	6.4	6.4	
				Middle	-	-	-	-	-	-	-	-	-	-	-		
				Bottom	3.4	24.2 23.9	24.0	8.3 8.3	8.3	33.2 33.6	33.4	87.9 87.5	87.7	6.1 6.1	6.1		6.1
29-Apr-19	Fine	Calm	9:53	Surface	1.0	24.9 24.9	24.9	8.6 8.6	8.6	32.5 32.5	32.5	106.3 106.2	92.2	7.3 7.3	7.3	7.3	
				Middle	-	-	-	-	-	-	-	-	-	-	-		
				Bottom	3.0	24.9 24.9	24.9	8.6 8.6	8.6	32.6 32.6	32.6	105.7 105.0	105.4	7.3 7.2	7.3		7.3

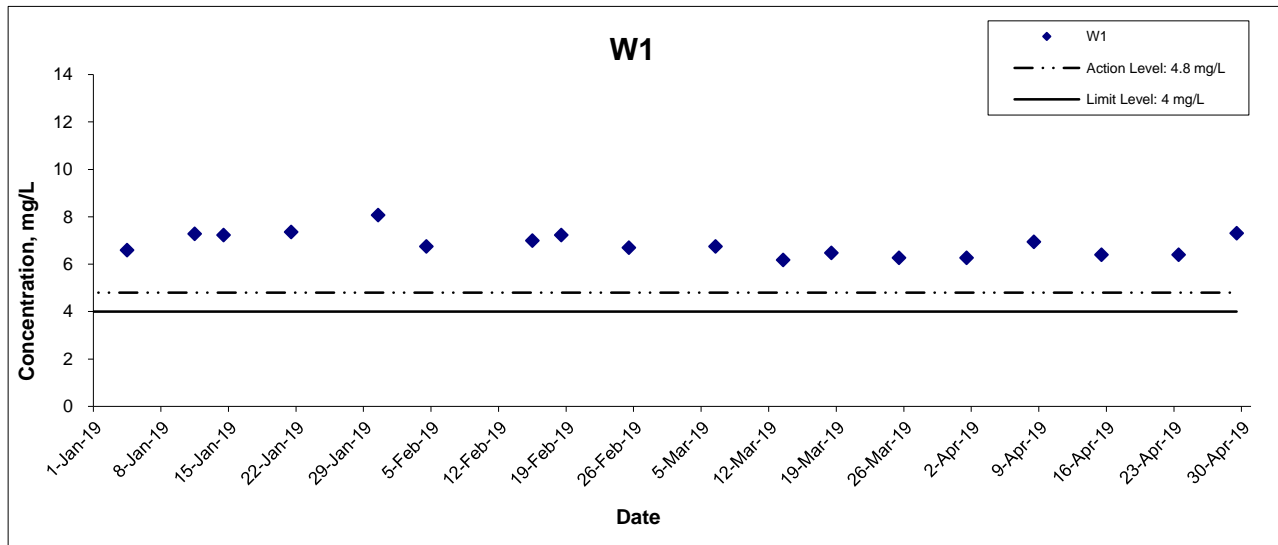
Water Quality Monitoring Results at W1 - Mid-Flood Tide

Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)		DA*
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	
1-Apr-19	Cloudy	Moderate	14:39	Surface	1.1	22.1 22.1	22.1	8.3 8.3	8.3	35.1 35.1	35.1	87.4 87.4	87.4	6.2 6.2	6.2	6.2
				Middle	-	-	-	-	-	-	-	-	-	-	-	
				Bottom	3.1	22.1 22.1	22.1	8.3 8.3	8.3	35.2 35.2	35.2	86.9 86.9	86.9	6.2 6.2	6.2	
8-Apr-19	Sunny	Calm	8:35	Surface	1.1	23.4 23.3	23.4	8.3 8.3	8.3	35.1 35.1	35.1	98.1 98.2	98.2	6.8 6.8	6.8	6.8
				Middle	-	-	-	-	-	-	-	-	-	-	-	
				Bottom	3.0	23.2 23.2	23.2	8.3 8.3	8.3	35.3 35.3	35.3	99.7 99.7	99.7	7.0 7.0	7.0	
15-Apr-19	Cloudy	Moderate	13:43	Surface	1.0	23.0 23.0	23.0	8.4 8.4	8.4	34.6 34.5	34.6	92.6 90.4	91.5	6.4 6.4	6.4	6.4
				Middle	-	-	-	-	-	-	-	-	-	-	-	
				Bottom	3.0	23.0 22.1	22.5	8.4 8.4	8.4	34.6 34.5	34.6	90.1 90.2	90.2	6.4 6.3	6.4	
23-Apr-19	Sunny	Moderate	8:55	Surface	1.0	24.2 24.2	24.2	8.3 8.3	8.3	33.2 33.2	33.2	92.9 92.8	92.9	6.4 6.4	6.4	6.4
				Middle	-	-	-	-	-	-	-	-	-	-	-	
				Bottom	3.4	24.2 24.0	24.1	8.3 8.3	8.3	33.1 33.4	33.2	88.1 87.6	87.9	6.1 6.1	6.1	
29-Apr-19	Fine	Calm	13:08	Surface	1.1	24.9 24.9	24.9	8.6 8.6	8.6	32.5 32.5	32.5	105.3 105.2	105.3	7.2 7.2	7.2	7.2
				Middle	-	-	-	-	-	-	-	-	-	-	-	
				Bottom	3.0	24.9 24.9	24.9	8.6 8.6	8.6	32.6 32.6	32.6	104.0 103.1	103.6	7.2 7.1	7.1	

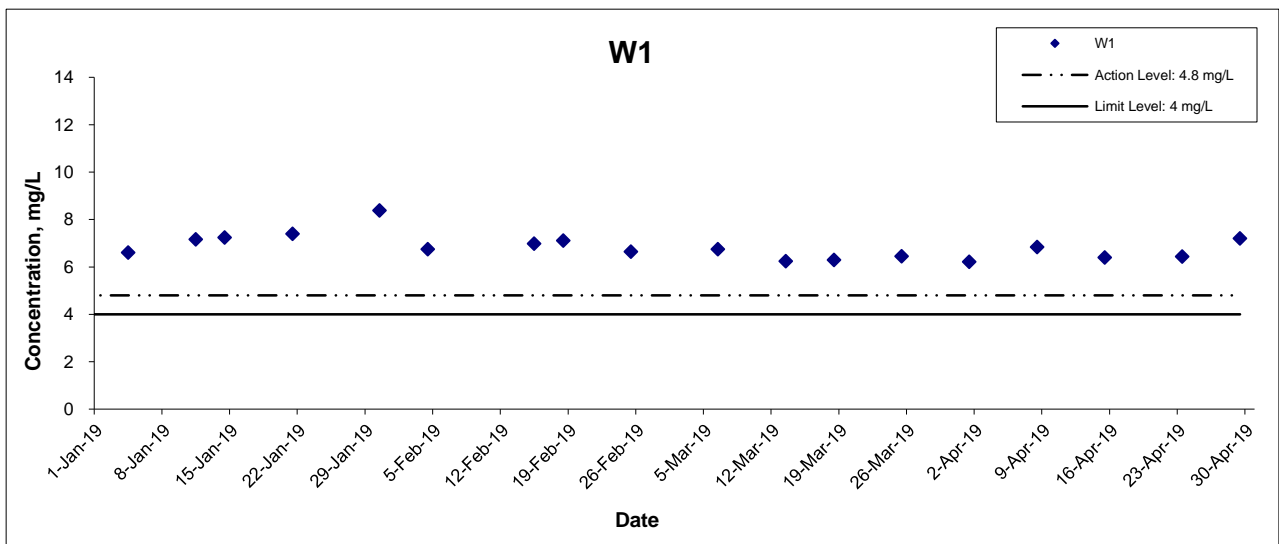
Remarks: *DA: Depth-Averaged

**Calm: Small or no wave; Moderate: Between calm and rough; Rough : White capped or rougher.

Dissolved Oxygen (Depth-Averaged) at Mid-Ebb Tide



Dissolved Oxygen (Depth-Averaged) 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 Additional Water Quality Monitoring Results

Scale N.T.S

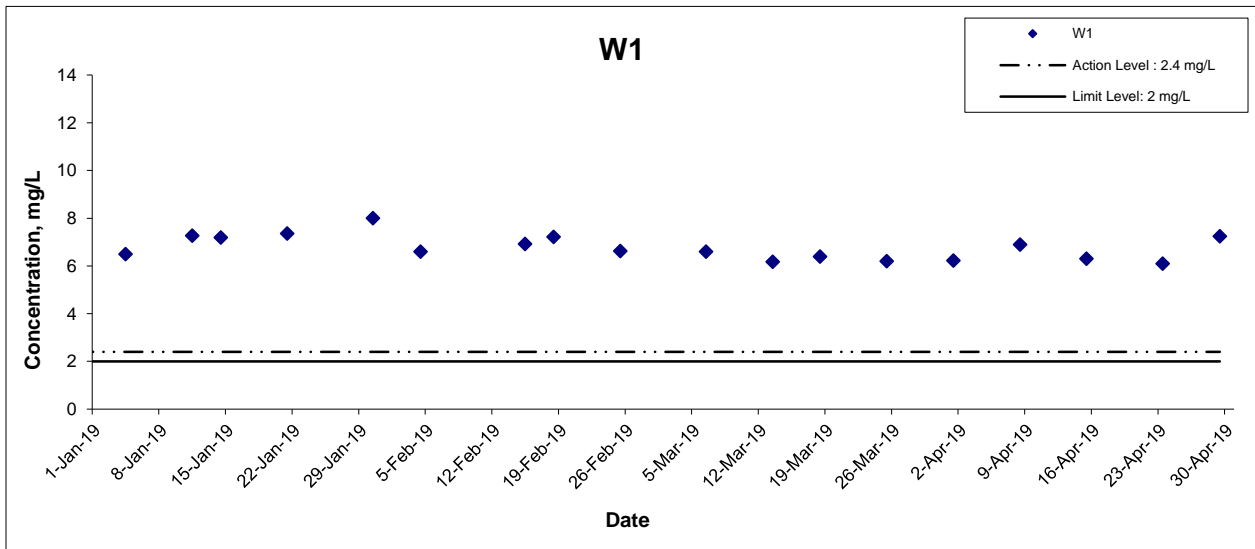
Date Apr-19

Project No. MA16034

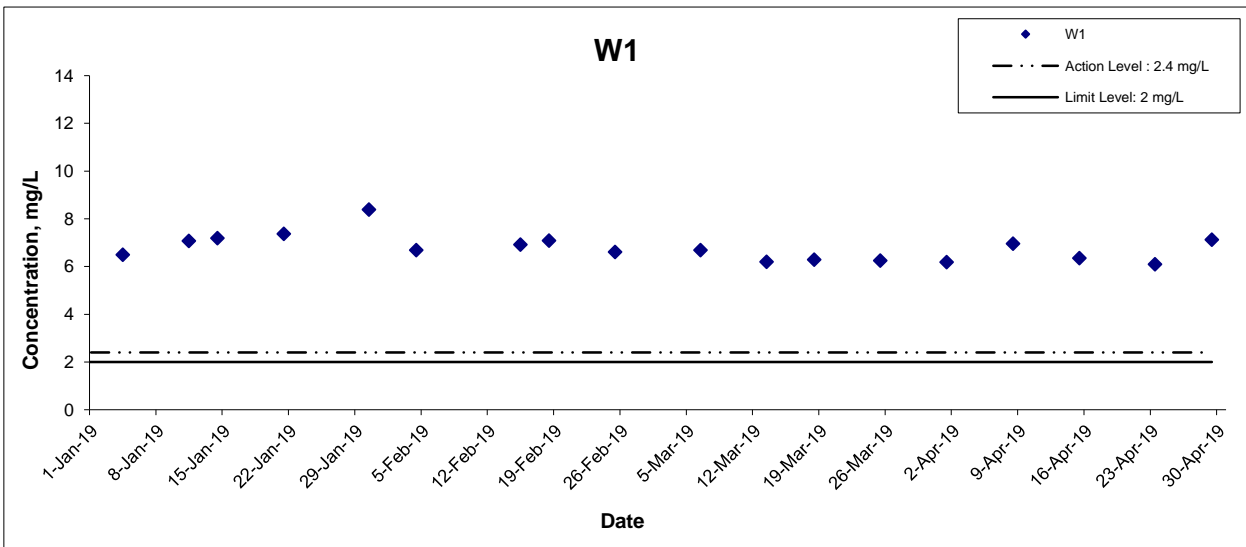
Appendix I



Dissolved Oxygen (Bottom) at Mid-Ebb Tide



Dissolved Oxygen (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 Additional Water Quality Monitoring Results

Scale N.T.S

Date Apr-19

Project No. MA16034

Appendix I



**APPENDIX J
QUALITY CONTROL REPORTS FOR
LABORATORY ANALYSIS**



CERTIFICATE OF ANALYSIS

Client	: CINOTECH CONSULTANTS LIMITED	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 5
Contact	: HENRY LEUNG	Contact	: Richard Fung	Work Order	: HK1915387
Address	: RM 1710, TECHNOLOGY PARK, 18 ON LAI STREET, SHATIN, N.T. HONG KONG HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: henry.leung@cinotech.com.hk	E-mail	: richard.fung@alsglobal.com		
Telephone	: +852 2151 2083	Telephone	: +852 2610 1044	Date Samples Received	: 10-Apr-2019
Facsimile	: +852 3107 1388	Facsimile	: +852 2610 2021	Issue Date	: 23-Apr-2019
Project	: ---			No. of samples received	: 3
Order number	:	Quote number	: HKE/1722a/2019	No. of samples analysed	: 3
C-O-C number	: ---				
Site	: ---				

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This document has been signed by those names that appear on this report and are the authorised signatories.

<i>Signatories</i>	<i>Position</i>	<i>Authorised results for</i>
		
Fung Lim Chee, Richard	General Manager	Inorganics



General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 10-Apr-2019 to 23-Apr-2019.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific Comments for Work Order: HK1915387

Sample(s) were received in chilled condition.

Water sample(s) analysed and reported on as received basis.



Analytical Results

Sub-Matrix: GROUNDWATER				Client sample ID	Stream 1	Stream 2	Stream 3	---	---
				Client sampling date / time	10-Apr-2019	10-Apr-2019	10-Apr-2019	----	----
Compound	CAS Number	LOR	Unit	HK1915387-001	HK1915387-002	HK1915387-003	-----	-----	
EA/ED: Physical and Aggregate Properties									
EA025: Suspended Solids (SS)	----	2	mg/L	<2	2	<2	---	---	
ED/EK: Inorganic Nonmetallic Parameters									
EK055K: Ammonia as N	7664-41-7	0.01	mg/L	0.04	0.05	0.01	---	---	
EK062P: Total Nitrogen as N	----	0.1	mg/L	1.0	1.0	1.4	---	---	
EK067P: Total Phosphorus as P	----	0.01	mg/L	0.03	0.02	0.01	---	---	
EP: Aggregate Organics									
EP005: Total Organic Carbon	----	1	mg/L	4	3	2	---	---	
EP030: Biochemical Oxygen Demand	----	2	mg/L	2	<2	<2	---	---	



Laboratory Duplicate (DUP) Report

Matrix: WATER				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 2296511)								
HK1915305-003	Anonymous	EA025: Suspended Solids (SS)	----	2	mg/L	<2	<2	0.00
HK1915346-003	Anonymous	EA025: Suspended Solids (SS)	----	2	mg/L	5	6	28.4
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 2294726)								
HK1915374-004	Anonymous	EK062P: Total Nitrogen as N	----	0.1	mg/L	3.9	4.4	12.4
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 2294727)								
HK1915374-004	Anonymous	EK067P: Total Phosphorus as P	----	0.01	mg/L	3.13	3.12	0.00
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 2299167)								
HK1915387-001	Stream 1	EK055K: Ammonia as N	7664-41-7	0.01	mg/L	0.04	0.03	0.00
EP: Aggregate Organics (QC Lot: 2310482)								
HK1915912-007	Anonymous	EP005: Total Organic Carbon	----	1	mg/L	<5	<5	0.00

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: WATER		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits(%)		RPD (%)	
						LCS	DCS	Low	High	Value	Control Limit
EA/ED: Physical and Aggregate Properties (QC Lot: 2296511)											
EA025: Suspended Solids (SS)	----	2	mg/L	<2	10 mg/L	93.0	----	81	120	----	----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 2294726)											
EK062P: Total Nitrogen as N	----	0.1	mg/L	<0.1	0.5 mg/L	107	----	92	116	----	----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 2294727)											
EK067P: Total Phosphorus as P	----	0.01	mg/L	<0.01	0.5 mg/L	98.4	----	90	104	----	----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 2299167)											
EK055K: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	94.6	----	88	109	----	----
EP: Aggregate Organics (QC Lot: 2291559)											
EP030: Biochemical Oxygen Demand	----	----	mg/L	----	198 mg/L	101	----	84	119	----	----
EP: Aggregate Organics (QC Lot: 2310482)											
EP005: Total Organic Carbon	----	1	mg/L	<1	5 mg/L	105	----	87	114	----	----
				<1	100 mg/L	101	----	88	109	----	----



Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

Matrix: WATER

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
					MS	MSD	Low	High	Value	Control Limit
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 2294726)										
HK1915374-004	Anonymous	EK062P: Total Nitrogen as N	----	5 mg/L	103	----	75	125	----	----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 2294727)										
HK1915374-004	Anonymous	EK067P: Total Phosphorus as P	----	0.5 mg/L	# Not Determined	----	75	125	----	----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 2299167)										
HK1915387-001	Stream 1	EK055K: Ammonia as N	7664-41-7	0.5 mg/L	106	----	75	125	----	----
EP: Aggregate Organics (QC Lot: 2310482)										
HK1915912-007	Anonymous	EP005: Total Organic Carbon	----	5 mg/L	95.7	----	75	125	----	----



CERTIFICATE OF ANALYSIS

Client	: CINOTECH CONSULTANTS LIMITED	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 5
Contact	: HENRY LEUNG	Contact	: Richard Fung	Work Order	: HK1916123
Address	: RM 1710, TECHNOLOGY PARK, 18 ON LAI STREET, SHATIN, N.T. HONG KONG HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: henry.leung@cinotech.com.hk	E-mail	: richard.fung@alsglobal.com		
Telephone	: +852 2151 2083	Telephone	: +852 2610 1044		
Facsimile	: +852 3107 1388	Facsimile	: +852 2610 2021		
Project	: CEDD TSEUNG KWAN O-LAM TIN TUNNEL			Date Samples Received	: 15-Apr-2019
Order number	:	Quote number	: HKE/1722a/2019	Issue Date	: 25-Apr-2019
C-O-C number	: ---			No. of samples received	: 3
Site	: ---			No. of samples analysed	: 3

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<i>Signatories</i>	<i>Position</i>	<i>Authorised results for</i>
		
Fung Lim Chee, Richard	General Manager	Inorganics



General Comments

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Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific Comments for Work Order: HK1916123

Sample(s) were received in chilled condition.

Water sample(s) analysed and reported on as received basis.



Analytical Results

Sub-Matrix: GROUNDWATER

Client sample ID

Client sampling date / time

				Stream1	Stream2	Stream3	---	---
				15-Apr-2019	15-Apr-2019	15-Apr-2019	----	----
Compound	CAS Number	LOR	Unit	HK1916123-001	HK1916123-002	HK1916123-003	-----	-----
EA/ED: Physical and Aggregate Properties								
EA025: Suspended Solids (SS)	----	2	mg/L	<2	<2	<2	---	---
ED/EK: Inorganic Nonmetallic Parameters								
EK055K: Ammonia as N	7664-41-7	0.01	mg/L	0.04	0.03	0.04	---	---
EK062P: Total Nitrogen as N	----	0.1	mg/L	1.0	1.0	1.0	---	---
EK067P: Total Phosphorus as P	----	0.01	mg/L	0.03	0.03	0.03	---	---
EP: Aggregate Organics								
EP005: Total Organic Carbon	----	1	mg/L	5	5	5	---	---
EP030: Biochemical Oxygen Demand	----	2	mg/L	<2	<2	<2	---	---



Laboratory Duplicate (DUP) Report

Matrix: WATER				Laboratory Duplicate (DUP) Report				
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 2304843)								
HK1916058-001	Anonymous	EA025: Suspended Solids (SS)	----	2	mg/L	32	33	0.00
HK1916123-003	Stream3	EA025: Suspended Solids (SS)	----	2	mg/L	<2	<2	0.00
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 2299168)								
HK1916123-001	Stream1	EK055K: Ammonia as N	7664-41-7	0.01	mg/L	0.04	0.03	0.00
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 2303117)								
HK1915892-004	Anonymous	EK062P: Total Nitrogen as N	----	0.1	mg/L	4.8	4.7	0.00
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 2303118)								
HK1915892-004	Anonymous	EK067P: Total Phosphorus as P	----	0.01	mg/L	2.92	2.92	0.00
EP: Aggregate Organics (QC Lot: 2313404)								
HK1915920-026	Anonymous	EP005: Total Organic Carbon	----	1	mg/L	7	9	18.8

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: WATER		Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits(%)		RPD (%)	
						LCS	DCS	Low	High	Value	Control Limit
EA/ED: Physical and Aggregate Properties (QC Lot: 2304843)											
EA025: Suspended Solids (SS)	----	2	mg/L	<2	10 mg/L	96.5	----	81	120	----	----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 2299168)											
EK055K: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	96.1	----	88	109	----	----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 2303117)											
EK062P: Total Nitrogen as N	----	0.1	mg/L	<0.1	0.5 mg/L	105	----	92	116	----	----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 2303118)											
EK067P: Total Phosphorus as P	----	0.01	mg/L	<0.01	0.5 mg/L	96.6	----	90	104	----	----
EP: Aggregate Organics (QC Lot: 2298072)											
EP030: Biochemical Oxygen Demand	----	----	mg/L	----	198 mg/L	105	----	84	119	----	----
EP: Aggregate Organics (QC Lot: 2313404)											
EP005: Total Organic Carbon	----	1	mg/L	<1	5 mg/L	105	----	87	114	----	----
				<1	100 mg/L	94.6	----	88	109	----	----



Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

Matrix: WATER

					Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
					MS	MSD	Low	High	Value	Control Limit
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 2299168)										
HK1916123-001	Stream1	EK055K: Ammonia as N	7664-41-7	0.5 mg/L	95.2	----	75	125	----	----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 2303117)										
HK1915892-004	Anonymous	EK062P: Total Nitrogen as N	----	5 mg/L	110	----	75	125	----	----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 2303118)										
HK1915892-004	Anonymous	EK067P: Total Phosphorus as P	----	5 mg/L	93.8	----	75	125	----	----
EP: Aggregate Organics (QC Lot: 2313404)										
HK1915920-026	Anonymous	EP005: Total Organic Carbon	----	25 mg/L	79.5	----	75	125	----	----

**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: April 2019

(A) Exceedance Report for Air Quality
 (NIL in the reporting month)

(B) Exceedance Report for Construction Noise

Action Level for Construction Noise

Eight (8) Action Level exceedances were recorded due to the documented complaints received in this reporting month.

Limit Level for Construction Noise

No Limit Level exceedance for daytime construction noise monitoring was recorded in the reporting month.

Nine (9) Limit Level exceedances for nighttime construction noise monitoring were recorded in the reporting month. The night time limit level exceedances were considered non-Project related as detailed in relevant notification of exceedance.

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
04 April 2019	CM1	65.3	63.7	<u>60</u>	55
12 April 2019		69.6	62.8	<u>69</u>	
18 April 2019		64.4	63.7	<u>56</u>	
26 April 2019		64.6	62.8	<u>60</u>	
12 April 2019	CM2	68.5	61.6	<u>68</u>	
18 April 2019		64.2	61.2	<u>61</u>	
22 March 2019		64.8	60.8	<u>63</u>	
04 April 2019	CM3	63.8	62.9	<u>57</u>	
12 April 2019		63.6	61.8	<u>59</u>	
18 April 2019		63.7	62.4	<u>58</u>	

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

Thirty (30) Action Level and two hundred and thirty-five (235) Limit Level exceedances in marine water quality monitoring. Refer to the attached notifications for details. The reasons are under investigation.

No Action Level and Limit Level exceedances in groundwater quality monitoring

(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. 190404_noise (CM1-CM2) **Exceedance Level:** Limit

Time of Measurement: 23:00-23:55

Date of Noise Monitoring: 4 April 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	65.3	63.7	<u>60</u>	When one documented complaint is received.	55	Limit
CM3	Block S, Yau Lai Estate Phase 5, Yau Tong	23:40-23:55	63.8	62.9	<u>57</u>			

Field Observation(s) and Conclusion

(a) Statement of exceedance(s) Construction noise measured at CM1 & CM2 exceeded the construction noise (night time) limit level.
(b) Cause of exceedance(s) The exceedance was not considered related to the Project works: <ul style="list-style-type: none"> According to our field observation, road traffic noise was identified as the dominant noise source. No noticeable noise from blasting / associated works was identified. No major construction activity was observed in Lam Tin Interchange during monitoring.

Part B – Conclusion: The exceedances of night time noise limit level were not due to the Project. Only blasting associated works inside the tunnel were being conducted with blast door closed, thus, noise generated within the tunnel should not be associated with the exceedance.

Part C – Recommendation: No further action is required.

ETL Signature: 

Date: 8 April, 2019

Agreement No. CE 59/2015 (EP) Environmental Team for Tseung Kwan O – Lam Tin Tunnel
 - Notification of Exceedances

NOE No. 190412_noise (CM1-CM3) Exceedance Level: Limit

Time of Measurement: 23:00-00:15

Date of Noise Monitoring: 12 April 2019 – 13 April 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	69.6	62.8	<u>69</u>	When one documented complaint is received.	55	Limit
CM2	Bik Lai House, Yau Lai Estate Phase 1, Yau Tong	23:00-23:15	68.5	61.6	<u>68</u>			
CM3	Block S, Yau Lai Estate Phase 5, Yau Tong	00:00-00:15	63.6	61.8	<u>59</u>			

Field Observation(s) and Conclusion

(a) Statement of exceedance(s) Construction noise measured at CM1, CM2 & CM3 exceeded the construction noise (night time) limit level.
(b) Cause of exceedance(s) The exceedance was not considered related to the Project works: <ul style="list-style-type: none"> According to our field observation, road traffic noise was identified as the dominant noise source. No noticeable noise from blasting / associated works was identified. No major construction activity was observed in Lam Tin Interchange during monitoring.

Part B – Conclusion: The exceedances of night time noise limit level were not due to the Project. Only blasting associated works inside the tunnel were being conducted with blast door closed, thus, noise generated within the tunnel should not be associated with the exceedance.

Part C – Recommendation: No further action is required.



ETL Signature: _____ Date: 15 April 2019

Agreement No. CE 59/2015 (EP) Environmental Team for Tseung Kwan O – Lam Tin Tunnel
 - Notification of Exceedances

NOE No. 190418_noise (CM1-CM3) Exceedance Level: Limit

Time of Measurement: 23:00-00:05

Date of Noise Monitoring: 18 April 2019 – 19 April 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	64.4	63.7	<u>56</u>	When one documented complaint is received.	55	Limit
CM2	Bik Lai House, Yau Lai Estate Phase 1, Yau Tong	23:20-23:35	64.2	61.2	<u>61</u>			
CM3	Block S, Yau Lai Estate Phase 5, Yau Tong	23:50-00:05	63.7	62.4	<u>58</u>			

Field Observation(s) and Conclusion

(a) Statement of exceedance(s) Construction noise measured at CM1, CM2 & CM3 exceeded the construction noise (night time) limit level.
(b) Cause of exceedance(s) The exceedance was not considered related to the Project works: <ul style="list-style-type: none"> According to our field observation, road traffic noise was identified as the dominant noise source. No noticeable noise from blasting / associated works was identified. No major construction activity was observed in Lam Tin Interchange during monitoring.

Part B – Conclusion: The exceedances of night time noise limit level were not due to the Project. Only blasting associated works inside the tunnel were being conducted with blast door closed, thus, noise generated within the tunnel should not be associated with the exceedance.

Part C – Recommendation: No further action is required.



ETL Signature:
 MA16034\NOE\NOE_Noise190418(CM1-3)

Date: 22 April, 2019

**Agreement No. CE 59/2015 (EP) Environmental Team for Tseung Kwan O – Lam Tin Tunnel
- Notification of Exceedances**

NOE No. 190426_noise (CM1) Exceedance Level: Limit

Time of Measurement: 23:35-23:50

Date of Noise Monitoring: 26 April 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	23:35-23:50	64.6	62.8	<u>60</u>	When one documented complaint is received.	55	Limit

Field Observation(s) and Conclusion

(a) Statement of exceedance(s)

Construction noise measured at CM1 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 blasting / associated works was identified.
- No major construction activity was observed in Lam Tin Interchange during monitoring.

Part B – Conclusion: The exceedances of night time noise limit level were not due to the Project. Only blasting associated works inside the tunnel were being conducted with blast door closed, thus, noise generated within the tunnel should not be associated with the exceedance.

Part C – Recommendation: No further action is required.

ETL Signature: 

Date: 29 April, 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: 01 April 2019

Part A – Exceedance Summary Tables

Table I: 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	1.4	G1	10:30	1.6	1.8	<u>1.7</u>
						G3	10:34			<u>1.8</u>
						G4	10:45			<u>2.3</u>
						M1	10:26			<u>1.9</u>
						M3	10:41			<u>2.3</u>
						M5	10:53			<u>1.9</u>

Contract No. CE 59/2015 (EP)

Environmental Team for Tseung Kwan O – Lam Tin Tunnel

Design and Construction

- Notification of Environmental Quality Limit Exceedances

Table II: 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	3.4	G1	10:30	6.0	6.9	4.0	4.4	<u>8.4</u>
				G2	10:21					<u>8.0</u>
				G3	10:34					<u>5.5</u>
				G4	10:45					<u>6.9</u>
				M1	10:26					<u>6.5</u>
		M2	10:17	<u>4.6</u>						
		M3	10:41	6.2	7.4	<u>5.3</u>				
		M4	10:12			<u>6.6</u>				
		M5	10:53			<u>8.1</u>				
		Bottom	8.2			G2	10:21	6.9	7.9	9.8
G3	10:34					<u>10.6</u>				
G4	10:45			<u>14.4</u>						
M1	10:26			<u>13.1</u>						
M5	10:53			<u>12.3</u>						

Contract No. CE 59/2015 (EP)

Environmental Team for Tseung Kwan O – Lam Tin Tunnel

Design and Construction

- Notification of Environmental Quality Limit Exceedances

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	9.5	G1	15:00	6.0	6.9	11.3	12.3	<u>15.2</u>
				G2	14:51					<u>7.7</u>
				G3	15:05					<u>9.8</u>
				G4	15:12					<u>6.3</u>
				M1	14:56	6.2	7.4			<u>10.5</u>
				M2	14:47					<u>15.2</u>
				M3	15:08					<u>6.4</u>
				M4	14:42					<u>6.9</u>
		M5	15:21	<u>9.5</u>						
		Intake	n.a.	M6	15:16	8.3	8.6	n.a.	n.a.	<u>16.6</u>
		Bottom	7.7	G2	14:51	6.9	7.9	9.2	9.9	<u>11.2</u>
				G3	15:05					<u>9.9</u>
				M1	14:56					<u>11.2</u>
				M2	14:47					<u>7.2</u>
				M3	15:08					<u>13.3</u>
M4	14:42			<u>9.9</u>						
M5	15:21			<u>7.0</u>						

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: 03 April 2019

Part A – Exceedance Summary Tables

Table I: 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	2.1	G1	16:33	2.5	2.7	<u>3.2</u>
						M1	16:28			<u>2.8</u>

Contract No. CE 59/2015 (EP)

Environmental Team for Tseung Kwan O – Lam Tin Tunnel

Design and Construction

- Notification of Environmental Quality Limit Exceedances

Table II: 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	9.7	G1	12:21	6.0	6.9	11.6	12.6	<u>10.4</u>
				G2	12:13					<u>10.3</u>
				M1	12:17	6.2	7.4			<u>7.1</u>
				M2	12:09					<u>7.4</u>
				M3	12:26					<u>15.4</u>
				M4	12:05					<u>7.1</u>
		Bottom	11.2	G1	12:21	6.9	7.9	13.4	14.6	<u>9.1</u>
				G4	12:30					<u>23.3</u>
				M1	12:17					<u>12.2</u>
				M2	12:09					<u>11.0</u>
				M3	12:26					<u>7.4</u>
				M4	12:05					<u>12.9</u>
		M5	12:38					<u>14.6</u>		

Contract No. CE 59/2015 (EP)

Environmental Team for Tseung Kwan O – Lam Tin Tunnel

Design and Construction

- Notification of Environmental Quality Limit Exceedances

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	6.5	G1	16:33	6.0	6.9	7.8	8.5	<u>13.4</u>
				G3	16:37					<u>18.3</u>
				G4	16:42					<u>13.5</u>
				M1	16:28	6.2	7.4			<u>9.2</u>
				M2	16:20					<u>10.5</u>
				M4	16:16					<u>12.3</u>
				M5	16:51					<u>6.7</u>
		Intake	n.a.	M6	16:45	8.3	8.6	n.a.	n.a.	<u>11.5</u>
		Bottom	6.3	G1	16:33	6.9	7.9	7.5	8.1	<u>8.2</u>
				G2	16:24					<u>8.4</u>
				G3	16:37					<u>10.2</u>
				M1	16:28					<u>9.5</u>
				M3	16:39					<u>11.0</u>
				M4	16:16					<u>11.2</u>

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: 06 April 2019

Part A – Exceedance Summary Tables

Table I: 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	G1	12:29	2.0	2.2	<u>2.4</u>
						M1	12:25			<u>2.8</u>
						M5	12:59			<u>2.7</u>
			Mid-flood	C1	2.8	M4	08:32	3.3	3.6	<u>3.8</u>

Contract No. CE 59/2015 (EP)

Environmental Team for Tseung Kwan O – Lam Tin Tunnel

Design and Construction

- Notification of Environmental Quality Limit Exceedances

Table II: 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	12.5	G1	12:29	6.0	6.9	15.0	16.3	<u>16.2</u>
				G2	12:18					<u>11.0</u>
				G4	12:46					<u>20.8</u>
				M1	12:25	6.2	7.4			<u>18.3</u>
				M2	12:12					<u>12.2</u>
				M3	12:41					<u>24.7</u>
				M4	12:05					<u>38.3</u>
				M5	12:59					<u>23.5</u>
		Intake	12:53	8.3	8.6	n.a.	n.a.	<u>23.2</u>		
		Bottom	14.9	G1	12:29	6.9	7.9	17.8	19.3	<u>12.1</u>
				G2	12:18					<u>39.4</u>
				G3	12:35					<u>8.2</u>
				G4	12:46					<u>9.5</u>
				M1	12:25					<u>11.2</u>
				M2	12:12					<u>13.0</u>
				M3	12:41					<u>31.4</u>
M4	12:05			<u>15.4</u>						
M5	12:59	<u>16.5</u>								

Contract No. CE 59/2015 (EP)

Environmental Team for Tseung Kwan O – Lam Tin Tunnel

Design and Construction

- Notification of Environmental Quality Limit Exceedances

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	17.8	G1	8:54	6.0	6.9	21.3	23.1	<u>17.5</u>
				G2	8:42					<u>8.8</u>
				G3	8:57					<u>20.5</u>
				G4	9:06					<u>8.2</u>
				M1	8:49	6.2	7.4			<u>12.3</u>
				M2	8:38					<u>6.7</u>
				M3	9:01					<u>9.7</u>
		M5	9:19	<u>10.6</u>						
		Intake	n.a.	M6	09:12	8.3	8.6	n.a.	n.a.	<u>11.4</u>
		Bottom	10.0	G1	08:54	6.9	7.9	11.9	12.9	<u>8.1</u>
				G2	08:42					<u>20.8</u>
				G3	08:57					<u>13.9</u>
				G4	09:06					<u>11.9</u>
				M1	08:49					<u>12.3</u>
				M2	08:38					<u>9.4</u>
				M4	08:32					<u>33.0</u>
		M5	09:19	<u>9.2</u>						

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: 08 April 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	8.3	G1	13:45	6.0	6.9	10.0	10.8	<u>30.4</u>
				G2	13:32					<u>12.0</u>
				G3	13:49					<u>9.0</u>
				G4	14:11					<u>10.0</u>
				M1	13:38	6.2	7.4			<u>8.8</u>
				M2	13:25					<u>13.1</u>
				M4	13:17					<u>8.3</u>
				M5	14:19					<u>20.1</u>
		Intake	n.a.	M6	14:16	8.3	8.6	n.a.	n.a.	<u>9.3</u>
		Bottom	7.1	G1	13:45	6.9	7.9	8.5	9.2	<u>18.2</u>
				G2	13:32					<u>11.5</u>
				G4	14:11					<u>13.6</u>
				M1	13:38					<u>12.0</u>
				M3	14:05					<u>12.0</u>
				M4	13:17					<u>12.9</u>
M5	14:19			<u>11.2</u>						

Contract No. CE 59/2015 (EP)

Environmental Team for Tseung Kwan O – Lam Tin Tunnel

Design and Construction

- Notification of Environmental Quality Limit Exceedances

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	12.0	G1	8:27	6.0	6.9	14.4	15.6	<u>16.5</u>
				G2	8:16					6.7
				G3	8:32					<u>10.3</u>
				G4	8:49					<u>20.2</u>
				M1	8:20	6.2	7.4			<u>24.2</u>
				M2	8:10					<u>17.6</u>
				M3	8:45					<u>9.2</u>
				M4	8:00					<u>22.0</u>
		M5	8:55	<u>17.9</u>						
		Intake	08:54	n.a.	8.3	8.6	n.a.	n.a.	<u>9.4</u>	
		Bottom	17.5	G1	08:27	6.9	7.9	21.0	22.8	<u>10.7</u>
				G2	08:16					<u>5.5</u>
				G3	08:32					<u>13.3</u>
				G4	08:49					<u>8.5</u>
				M1	08:20					<u>22.0</u>
M2	08:10			7.9						
M5	08:55			<u>10.3</u>						

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: 10 April 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	13.0	G1	15:11	6.0	6.9	15.5	16.8	<u>19.9</u>
				G2	15:03					<u>8.7</u>
				G3	15:13					<u>11.1</u>
				G4	15:20	<u>11.5</u>				
				M1	15:08	6.2	7.4			<u>9.6</u>
				M2	15:00					<u>16.6</u>
		M3	15:16	<u>11.8</u>						
		Intake	n.a.	M6	15:23	8.3	8.6	n.a.	n.a.	<u>17.3</u>
		Bottom	6.4	G1	15:11	6.9	7.9	7.7	8.3	<u>16.7</u>
				G2	15:03					<u>8.3</u>
				M1	15:08					<u>28.6</u>
				M2	15:00					<u>11.3</u>
				M4	14:56					<u>14.5</u>
				M5	15:30					<u>15.6</u>

Contract No. CE 59/2015 (EP)

Environmental Team for Tseung Kwan O – Lam Tin Tunnel

Design and Construction

- Notification of Environmental Quality Limit Exceedances

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	6.8	G1	9:52	6.0	6.9	8.1	8.8	<u>13.1</u>
				G2	9:40					<u>8.2</u>
				G4	10:04					<u>8.7</u>
				M1	9:47	6.2	7.4			<u>8.2</u>
				M2	9:35					<u>12.3</u>
				M4	9:28					<u>8.9</u>
		Bottom	4.4	G1	09:52	6.9	7.9	5.2	5.7	<u>8.9</u>
				G3	09:56					<u>12.2</u>
				G4	10:04					<u>14.4</u>
				M1	09:47					<u>5.5</u>
				M2	09:35					<u>26.9</u>
				M4	09:28					<u>12.0</u>
				M5	10:16					<u>11.9</u>

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: 12 April 2019

Part A – Exceedance Summary Tables

Table I: 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	1.9	G1	16:45	2.2	2.4	<u>2.9</u>
						G3	16:50			2.4
						G4	16:58			2.2
						M3	16:54			2.3
						M4	16:23			<u>4.9</u>
			Mid-flood	C1	2.2	M5	10:46	2.6	2.9	2.9

Contract No. CE 59/2015 (EP)

Environmental Team for Tseung Kwan O – Lam Tin Tunnel

Design and Construction

- Notification of Environmental Quality Limit Exceedances

Table II: 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	7.2	G1	16:45	6.0	6.9	8.6	9.3	<u>21.5</u>
				M3	16:54	6.2	7.4			<u>9.3</u>
				M5	17:13					<u>13.9</u>
		Bottom	5.8	G4	16:58	6.9	7.9	7.0	7.5	<u>9.1</u>
				M4	16:23					<u>11.0</u>

Contract No. CE 59/2015 (EP)

Environmental Team for Tseung Kwan O – Lam Tin Tunnel

Design and Construction

- Notification of Environmental Quality Limit Exceedances

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	3.8	G3	10:37	6.0	6.9	4.5	4.9	<u>5.4</u>
				G4	10:44					<u>6.4</u>
				M2	10:19	6.2	7.4			<u>6.9</u>
				M4	10:17					<u>5.7</u>
				M5	10:46					<u>11.6</u>
		Bottom	6.0	G1	10:36	6.9	7.9	7.1	7.7	<u>8.3</u>
				M4	10:17					<u>8.4</u>

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: 15 April 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	1.8	G1	10:01	6.0	6.9	2.1	2.3	<u>3.5</u>
				G2	09:47					<u>2.3</u>
				G3	10:05					<u>6.7</u>
				M1	09:55	6.2	7.4			<u>4.4</u>
				M2	09:41					<u>15.3</u>
				M4	10:35					<u>2.8</u>
				M5	10:40					<u>10.5</u>
		Bottom		5.8	G4	10:22	6.9	7.9	7.0	7.5

Contract No. CE 59/2015 (EP)

Environmental Team for Tseung Kwan O – Lam Tin Tunnel

Design and Construction

- Notification of Environmental Quality Limit Exceedances

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	4.8	G1	13:37	6.0	6.9	5.8	6.2	<u>6.5</u>
				G3	13:41					<u>9.1</u>
				M1	13:31	6.2	7.4			<u>6.5</u>
				M4	13:12					<u>8.6</u>
				M5	14:04					<u>6.8</u>
		Bottom	4.3	G1	13:37	6.9	7.9	5.1	5.5	5.5
				G2	13:25					<u>10.7</u>
				G4	13:49					5.4

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: 17 April 2019

Part A – Exceedance Summary Tables

Table I: 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	2.9	G4	16:08	3.4	3.7	3.7

Contract No. CE 59/2015 (EP)

Environmental Team for Tseung Kwan O – Lam Tin Tunnel

Design and Construction

- Notification of Environmental Quality Limit Exceedances

Table II: 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	8.6	M3	10:52	6.2	7.4	10.3	11.2	<u>7.9</u>
				M4	10:22					<u>6.4</u>
				M5	11:12					<u>7.8</u>
		Bottom	5.8	G2	10:32	6.9	7.9	7.0	7.5	<u>5.4</u>
				M1	10:38					<u>7.0</u>
				M2	10:28					<u>5.7</u>
				M3	10:52					<u>5.3</u>
				M4	10:22					<u>5.2</u>

Contract No. CE 59/2015 (EP)

Environmental Team for Tseung Kwan O – Lam Tin Tunnel

Design and Construction

- Notification of Environmental Quality Limit Exceedances

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	4.0	G4	16:08	6.0	6.9	4.7	5.1	<i>5.0</i>
		Intake	n.a.	M6	16:13	8.3	8.6	n.a.	n.a.	<i><u>11.8</u></i>
		Bottom	3.9	G2	15:45	6.9	7.9	4.7	5.1	<i><u>10.0</u></i>
				G3	16:00					<i>4.8</i>
				M3	16:03					<i><u>5.5</u></i>
				M5	16:23					<i><u>5.6</u></i>

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: 23 April 2019

Part A – Exceedance Summary Tables

Table I: 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	3.1	M1	14:27	3.7	4.0	<u>5.0</u>	
						M5	15:00			<u>6.3</u>	
			Mid-flood	C1	2.3		G1	8:41	2.7	3.0	<u>3.5</u>
							G2	8:26			<u>2.9</u>
							G3	8:50			<u>3.0</u>
							G4	9:10			<u>3.2</u>
							M1	8:33			<u>4.2</u>
							M2	8:20			<u>3.1</u>
							M3	9:00			<u>2.9</u>
							M5	9:25			<u>5.8</u>

Contract No. CE 59/2015 (EP)

Environmental Team for Tseung Kwan O – Lam Tin Tunnel

Design and Construction

- Notification of Environmental Quality Limit Exceedances

Table II: 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	6.1	M3	14:40	6.2	7.4	7.3	7.9	<u>8.4</u>
		Bottom	5.0	M1	14:27	6.9	7.9	6.0	6.5	<u>7.1</u>
				M2	14:18					<u>7.4</u>
				M4	14:14					<u>6.1</u>

Contract No. CE 59/2015 (EP)

Environmental Team for Tseung Kwan O – Lam Tin Tunnel

Design and Construction

- Notification of Environmental Quality Limit Exceedances

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	1.7	G1	8:41	6.0	6.9	2.0	2.1	<u>2.7</u>
				G2	8:26					<u>3.0</u>
				G3	8:50					<u>3.1</u>
				G4	9:10					<u>6.4</u>
				M1	8:33	6.2	7.4			<u>4.7</u>
				M2	8:20					<u>4.6</u>
				M3	9:00					<u>2.9</u>
				M4	8:13					<u>3.4</u>
		M5	9:25	<u>5.2</u>						
		Bottom	1.8	G1	08:41	6.9	7.9	2.1	2.3	<u>3.7</u>
				G2	08:26					<u>2.9</u>
				G3	08:50					<u>4.8</u>
				G4	09:10					<u>4.6</u>
				M1	08:33					<u>10.1</u>
				M2	08:20					<u>4.9</u>
				M3	09:00					<u>3.7</u>
M4	08:13			<u>2.6</u>						
M5	09:25	<u>2.9</u>								

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: 25 April 2019

Part A – Exceedance Summary Tables

Table I: 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	G3	15:46	2.7	3.0	<u>3.0</u>
						G4	15:54			<u>5.2</u>
			Mid-flood	C1	1.7	G2	09:31	2.0	2.2	<u>3.0</u>
						G4	09:57			<u>2.5</u>
						M1	09:37			<u>3.4</u>
						M2	09:27			<u>2.9</u>
						M4	09:21			<u>2.9</u>

Contract No. CE 59/2015 (EP)

Environmental Team for Tseung Kwan O – Lam Tin Tunnel

Design and Construction

- Notification of Environmental Quality Limit Exceedances

Table II: 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	15.6	G1	15:43	6.0	6.9	18.7	20.3	<u>9.4</u>
				G3	15:46					<u>7.9</u>
				G4	15:54					<u>9.7</u>
				M1	15:37	6.2	7.4			<u>8.3</u>
				M3	15:50					<u>10.4</u>
		M5	16:09	<u>16.8</u>						
		Bottom	6.2	G1	15:43	6.9	7.9	7.4	8.0	<u>7.9</u>
				G3	15:46					<u>9.7</u>
				G4	15:54					<u>10.3</u>
				M4	15:21					<u>7.2</u>
M5	16:09			<u>9.7</u>						

Contract No. CE 59/2015 (EP)

Environmental Team for Tseung Kwan O – Lam Tin Tunnel

Design and Construction

- Notification of Environmental Quality Limit Exceedances

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	5.1	G2	09:31	6.0	6.9	6.1	6.6	<i>6.4</i>
				G3	09:47					<i><u>9.7</u></i>
				G4	09:57					<i><u>8.3</u></i>
				M3	09:51	<i><u>7.4</u></i>				
				M4	09:21	<i><u>12.3</u></i>				
		M5	10:11	<i>6.2</i>						
		Bottom	7.9	G4	09:57	6.9	7.9	9.4	10.2	<i><u>8.3</u></i>
				M5	10:11					<i><u>7.1</u></i>

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 April 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)
M-Ebb	C2	Bottom	1.5	G1	18:16	6.9	7.9	1.7	1.9	<i>1.8</i>
				G2	17:59					<u>5.3</u>
				M1	18:07					<i>1.9</i>
				M2	17:54					<u>2.8</u>
				M3	18:30					<u>3.7</u>
				M4	17:45					<i>1.9</i>

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: 29 April 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	3.2	G1	09:42	6.0	6.9	3.8	4.1	<u>9.3</u>
				G3	09:46					<u>5.9</u>
				M3	09:51					<u>8.7</u>
		Intake	n.a.	M6	10:01	8.3	8.6	n.a.	n.a.	<u>9.3</u>
		Bottom	4.0	G1	09:42	6.9	7.9	4.7	5.1	<u>8.9</u>
				G2	09:31					<u>6.7</u>
				M1	09:37					<u>5.0</u>
				M2	09:27					<u>6.0</u>
				M4	09:21					<u>9.3</u>

Contract No. CE 59/2015 (EP)

Environmental Team for Tseung Kwan O – Lam Tin Tunnel

Design and Construction

- Notification of Environmental Quality Limit Exceedances

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	1.2	G1	13:00	6.0	6.9	1.4	1.5	<u>5.2</u>
				G2	12:48					<u>6.7</u>
				G3	13:03					<u>7.4</u>
				G4	13:11					<u>11.2</u>
				M1	12:54	6.2	7.4			<u>4.8</u>
				M2	12:44					<u>3.1</u>
				M3	13:06					<u>1.6</u>
				M4	12:37					<u>6.0</u>
		M5	13:26	<u>2.5</u>						
		Bottom	5.1	G1	13:00	6.9	7.9	6.1	6.6	<u>11.6</u>
				G2	12:48					<u>16.1</u>
				G3	13:03					<u>7.8</u>
				G4	13:11					<u>9.9</u>
				M1	12:54					<u>7.7</u>
M3	13:06			<u>7.3</u>						

Note: ***Bold Italic*** means Action Level exceedance
Bold Italic with underline means Limit Level exceedance

**APPENDIX L
SITE AUDIT SUMMARY**

Agreement No. CE 59/2015 (EP)
Environmental Team for Tseung Kwan O - Lam Tin Tunnel – Design and Construction
Monthly EM&A Report

Appendix L - Site Audit Summary (April 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			
At Tseung Kwan O side, oil stain and mud were found on the road to the barge point. They have to be cleaned to prevent pollutant runoff to the sea.	10 April 2019	✓	Item was rectified on 24 April 2019.
There was rubbish found at the sea near a Platform and it later was cleared by Contractor. Still, rubbish was being thrown from the platform. Contractor is reminded to prevent dumping rubbish into the sea.	24 April 2019	✓	Item was rectified on 30 April 2019.
Silt curtains at the right side of shores in Portion VII were floating.	30 April 2019	#	Follow up action will be reported in the next reporting month.
Ecology			
--	--	--	--
Noise			
Noise barrier(s) in Portion II were placed without facing the direction of NSRs (Yau Lai Estate) when breaking. Contractor is reminded to minimize noise effects to nearby residents.	3 April 2019	✓	Item was rectified on 17 April 2019.
A breaker was found with a broken piece of noise absorption material. Contractor is reminded to wrap complete noise absorption materials to each breaker.	24 April 2019	✓	Item was rectified on 30 April 2019.
A noise barrier of a driller was found in the incorrect direction of NSRs. Contractor is reminded to set noise barrier(s) in a correct position.	30 April 2019	#	Follow up action will be reported in the next reporting month.
Landscape and Visual			
--	--	--	--
Air Quality			
Cement bags in Portion IVC need to be covered to prevent dust emission.	27 February 2019	✓	Item was rectified on 24 April 2019.
In Portion III, dust was emitted during unloading by trucks. Contractor is reminded to provide water sprays to reduce dust emission.	17 April 2019	✓	Item was rectified on 30 April 2019.
Dust was emitted from a breaker without sufficient water sprays. Contractor is reminded to provide steady and continuous water sprays at all times during breaking.	30 April 2019	#	Follow up action will be reported in the next reporting month.
Waste / Chemical Management			
General refuse accumulation was observed nearby the entrance of Portion II. Accumulation of construction wastes, general refuses and tree branches were found in Portion II.	20 March 2019	✓	Item was rectified on 30 April 2019.
A chemical waste tank was found without a drip tray. It is required to prevent chemical leakage.	27 March 2019	✓	Item was rectified on 17 April 2019.
General refuse and construction waste was found. Regular clean-up is needed.	27 March 2019	✓	Item was rectified on 17 April 2019.
At Tseung Kwan O side, oil stain and mud were found on the road to the barge point. They have to be cleaned to prevent pollutant runoff to the sea.	10 April 2019	✓	Item was rectified on 24 April 2019.
At Tseung Kwan O side, a drip tray was found with	10 April 2019	✓	Item was rectified on 17 April

Agreement No. CE 59/2015 (EP)
Environmental Team for Tseung Kwan O - Lam Tin Tunnel – Design and Construction
Monthly EM&A Report

Appendix L - Site Audit Summary (April 2019)

Items	Date	Status*	Follow up Action
water and oil/grease stain. It is reminded to clean it up to prevent chemical leakage.			2019.
A chemical tank was found without a drip tray in Portion II.	30 April 2019	#	Follow up action will be reported in the next reporting month.
<i>Impact on Cultural Heritage</i>			
--	--	--	--
<i>Permits / Licenses</i>			
--	--	--	--

- ✓ 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 improved by the contractor

Agreement No. CE 59/2015 (EP)
Environmental Team for Tseung Kwan O - Lam Tin Tunnel – Design and Construction
Monthly EM&A Report

Appendix L - Site Audit Summary (April 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			
Stagnant water are found at Portion V.	18 April 2019	✓	Improved/rectified on 25 April 2019
Noise			
Noise emission from the excavator, need to apply with lubricant.	25 April 2019	#	Follow up action will be reported in the next reporting month.
Landscape and Visual			
--	--	--	--
Air Quality			
Sand piles need to be covered to prevent dust emission by wind erosion.	11 April 2019	✓	Improved/rectified on 18 April 2019
Smoke emission from the duct during operation of the Roller.	25 April 2019	#	Follow up action will be reported in the next reporting month.
Waste / Chemical Management			
The contractor need to clean the rubbish tank in the site office area	18 April 2019	✓	Improved/rectified on 25 April 2019
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

Agreement No. CE 59/2015 (EP)
Environmental Team for Tseung Kwan O - Lam Tin Tunnel – Design and Construction
Monthly EM&A Report

Appendix L - Site Audit Summary (April 2019)

Contract No. NE/2015/03

Tseung Kwan O - Lam Tin Tunnel - Northern Footbridge

Items	Date	Status*	Follow up Action
<i>Water Quality</i>			
The generator drip tray had accumulated some water after raining.	11 April 2019	✓	Improved/rectified on 18 April 2019
<i>Noise</i>			
--	--	--	--
<i>Landscape and Visual</i>			
--	--	--	--
<i>Air Quality</i>			
--	--	--	--
<i>Waste / Chemical Management</i>			
--			
<i>Impact on Cultural Heritage</i>			
--	--	--	--
<i>Permits / Licenses</i>			
--	--	--	--

- ✓ 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

Agreement No. CE 59/2015 (EP)
Environmental Team for Tseung Kwan O - Lam Tin Tunnel – Design and Construction
Monthly EM&A Report

Appendix L - Site Audit Summary (April 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			
A hole is found on the silt curtains. Silt curtains should be in good condition deployed around the platform.	2 April 2019	✓	Improved/rectified on 9 April 2019.
Oil stain was observed on the barge (三 航 駁 205) and the surface of marine. Oil leakage should be avoided.	16 April 2019	✓	Improved/rectified on 23 April 2019.
Noise			
--	--	--	--
Landscape and Visual			
--	--	--	--
Air Quality			
--	--	--	--
Waste / Chemical Management			
Oil is observed on the barge. Oil leakage from the equipment should be avoided.	2 April 2019	✓	Improved/rectified on 9 April 2019.
Oil stain was observed on the barge (三 航 駁 205) and the surface of marine. Oil leakage should be avoided.	16 April 2019	✓	Improved/rectified on 23 April 2019.
Drip tray should be well-maintained to avoid oil leakage.	30 April 2019	#	Follow up action will be reported in the next reporting month.
General refuse should be disposed regularly.	30 April 2019	#	Follow up action will be reported in the next reporting month.
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

Agreement No. CE 59/2015 (EP)
Environmental Team for Tseung Kwan O - Lam Tin Tunnel – Design and Construction
Monthly EM&A Report

Appendix L - Site Audit Summary (April 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			
the manholes need to seal to prevent construction site runoffs to Public Drainage System.	4 April 2019	✓	Improved/rectified on 11 April 2019
Noise			
--	--	--	--
Landscape and Visual			
--	--	--	--
Air Quality			
The contractor need to provide frequent water spraying / coverings to reduce dust emission	25 April 2019	#	Follow up action will be reported in the next reporting month.
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	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method. 	<ol style="list-style-type: none"> 1. Notify Contractor. 	<ol style="list-style-type: none"> 1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
Action level being exceeded by two or more consecutive sampling	<ol style="list-style-type: none"> 1. Identify source; 2. Inform IEC and ER; 3. Advise the ER on the effectiveness of the proposed remedial measures; 4. Repeat measurements to confirm findings; 5. Increase monitoring frequency to daily; 6. Discuss with IEC and Contractor on remedial actions required; 7. If exceedance continues, arrange meeting with IEC and ER; 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ET on the effectiveness of the proposed remedial measures; 5. Supervise Implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented. 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 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	<ol style="list-style-type: none"> 1. Notify IEC, ER, Contractor and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily; 	<ol style="list-style-type: none"> 1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 	<ol style="list-style-type: none"> 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; 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 1. Review the analysed results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; 3. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures are properly implemented. 	<ol style="list-style-type: none"> 1. Submit noise mitigation proposals to IEC; 2. Implement noise mitigation proposals.
Limit Level	<ol style="list-style-type: none"> 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; 	<ol style="list-style-type: none"> 1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractors remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
	<p>7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results;</p> <p>8. If exceedance stops, cease additional monitoring.</p>			

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)	<ul style="list-style-type: none"> 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 <i>in-situ</i> 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. 	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> Discuss with IEC on the proposed mitigation measures; Make agreement on the mitigation proposal. 	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Identify the source(s) of impact by comparing the results with those collected at the control stations as appropriate; 	<ul style="list-style-type: none"> Discuss with ET and Contractor on the mitigation measures; 	<ul style="list-style-type: none"> Discuss with IEC on the proposed mitigation measures; Make agreement on the mitigation proposal; 	<ul style="list-style-type: none"> 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)	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Review proposal on mitigation measures submitted by Contractor and advise the ER accordingly; • Assess the effectiveness of the implemented mitigation measures. 	<ul style="list-style-type: none"> • Assess the effectiveness of the implemented mitigation measures. 	<ul style="list-style-type: none"> • 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)	<ul style="list-style-type: none"> • Identify the source(s) of impact by comparing the results with those collected at the control stations as appropriate; 	<ul style="list-style-type: none"> • Discuss with ET and Contractor on the mitigation measures; • Review proposal on mitigation measures submitted by Contractor and advise the ER accordingly; 	<ul style="list-style-type: none"> • Discuss with IEC, ET and Contractor on the proposed mitigation measures; • Request Contractor to critically review the working methods; 	<ul style="list-style-type: none"> • Inform the ER and confirm notification of the non-compliance in writing; • Rectify unacceptable practice;

Event	Action			
	ET	IEC	ER	CONTRACTOR
	<ul style="list-style-type: none"> • If exceedance is found to be caused by the reclamation activities, repeat <i>in-situ</i> 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. 	<ul style="list-style-type: none"> • Assess the effectiveness of the implemented mitigation measures. 	<ul style="list-style-type: none"> • Make agreement on the mitigation measures to be implemented; • Assess the effectiveness of the implemented mitigation measures. 	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Identify the source(s) of impact by comparing the results with those collected at the control stations as appropriate; 	<ul style="list-style-type: none"> • Discuss with ET and Contractor on the mitigation measures; • Review proposal on mitigation measures submitted by Contractor and advise the ER accordingly; 	<ul style="list-style-type: none"> • Discuss with IC(E), ET and Contractor on the proposed mitigation measures; • Request Contractor to critically review the working methods; 	<ul style="list-style-type: none"> • 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)	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Assess the effectiveness of the implemented mitigation measures. 	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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%	<ul style="list-style-type: none"> • Ventilate to restore oxygen to >19%
	<18%	<ul style="list-style-type: none"> • Stop works • Evacuate personnel/prohibit entry • Increase ventilation to restore oxygen to >19%
Methane	>10% LEL (i.e. > 0.5% by volume)	<ul style="list-style-type: none"> • Prohibit hot works • Ventilate to restore methane to <10% LEL
	>20% LEL (i.e. > 1% by volume)	<ul style="list-style-type: none"> • Stop works • Evacuate personnel / prohibit entry • Increase ventilation to restore methane to <10% LEL
Carbon Dioxide	>0.5%	<ul style="list-style-type: none"> • Ventilate to restore carbon dioxide to < 0.5%
	>1.5%	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> ● 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	<ul style="list-style-type: none"> ● 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	<ul style="list-style-type: none">● 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.
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**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
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,	To minimize the dust impact	Contractor#	All Construction Work Sites	Construction phase	APCO and Air Pollution Control (Construction Dust) Regulation	* (1) (2) # (1) ^

	<p>watering shall be applied to aggregate fines.</p> <ul style="list-style-type: none"> - 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. 						<p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p>
/	<p>Emission from Vehicles and Plants</p> <ul style="list-style-type: none"> • 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 	<p>Reduce air pollution emission from construction vehicles and</p>	<p>Contractor</p>	<p>All construction sites</p>	<p>Construction stage</p>	<p>• APCO</p>	<p>^</p> <p>^</p> <p>^</p>

	ultra low sulphur diesel fuel (ULSD)	plants					
/	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	*(3) (4) # (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.	To minimize construction noise impact arising from the Project at the affected NSRs	Project Proponent	Work sites	Construction Period	EIAO-TM, NCO	^ ^ ^

	<ul style="list-style-type: none"> - 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. 						^ ^ ^
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	Control potential impacts from filling activities	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO	N/A

	access.						
Silt Curtain Deployment Plan	<ul style="list-style-type: none"> - 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 works	Contractor	NE/2015/01	Construction stage	EIAO	# (3)
S5.8.3	<p>Other good site practices should be undertaken during filling operations include:</p> <ul style="list-style-type: none"> - 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)	<p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>* (6) (7)</p>

	<p>grounds; and</p> <ul style="list-style-type: none"> - 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	<p>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.</p>	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	<p>To minimize water quality impact arising from the dredging and filling works for Reclamation for Road P2, the following mitigation measures shall be implemented:</p> <ul style="list-style-type: none"> - 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

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	^
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	^
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	^
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	Control potential impacts from construction site	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A

	periods of heavy rain.	runoff and land-based construction					
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 particularly following rain storms. The	Control potential impacts from construction site runoff and land-	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^

	temporarily diverted drainage should be reinstated to its original condition when the construction work has finished or the temporary diversion is no longer required.	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/	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

	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.						
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	Control potential impacts from construction site runoff and land-based	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^

	should be paved with backfill to reduce vehicle tracking of soil and to prevent site runoff from entering public road drains.	construction					
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-based construction	CEDD's Contractors	Work site	Design Stage and Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A

**App N1 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES
2019**

April 2019

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	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^

		runoff and land-based construction					
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	<p>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:</p> <ul style="list-style-type: none"> - 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	<p>Measures to Minimize Disturbance</p> <ul style="list-style-type: none"> - 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	<p>Standard Good Site Practice</p> <ul style="list-style-type: none"> - Placement of equipment or stockpile in designated works areas and access 	Reduce disturbance to	Contractor	Land-based works are	Construction Phase	N/A	^

	<p>routes selected on existing disturbed land to minimise disturbance to natural habitats.</p> <ul style="list-style-type: none"> - 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. 	surrounding habitats					<p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p>
S6.8.6	<p>Measure to Minimize Groundwater Inflow</p> <ul style="list-style-type: none"> - 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	<p>N/A</p> <p>N/A</p>
S6.8.8	<p>Measure to Minimize Impact on Corals</p> <p><u>Coral translocation</u></p> <ul style="list-style-type: none"> - It is recommended to translocate the affected coral colonies, except the locally common <i>Oulastrea crispata</i>, 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 	Minimize loss of coral	Design team, contractor, project operator	Within reclamation areas and pier footprint	Prior construction	N/A	<p>^</p> <p>^</p> <p>^</p>

	<p>coral recipient site, monitoring methodology for posttranslocation should be prepared during the detailed design stage.</p> <ul style="list-style-type: none"> - 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. <p><u>Post translocation Monitoring</u></p> <ul style="list-style-type: none"> - 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	<p>Measure to Control Water Quality Impact</p>	Control water	Design	Marine and	Construction	WQO	
S6.8.10	<ul style="list-style-type: none"> - 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. 	<p>quality impact, especially on suspended solid level; minimize the contamination of wastewater discharge, accidental chemical spillage and construction site runoff to the receiving water</p>	<p>Team, contractor</p>	<p>landbased works area</p>	<p>phase</p>		<p>N/A</p> <p>^</p> <p>^</p> <p>^</p>

		bodies					
S6.8.11	<p>Compensation for Vegetation Loss</p> <ul style="list-style-type: none"> - 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	<p>Measure to Control Water Quality Impact</p> <ul style="list-style-type: none"> - 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	<p>Good Site Practices and Waste Reduction Measures</p> <ul style="list-style-type: none"> - 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 	To reduce waste management impacts	Contractor	All work sites	Construction Phase	Waste Disposal Ordinance (Cap. 354) Land (Miscellaneous Provisions) Ordinance (Cap. 28)	^ ^ * (8) (9) ^

	<p>containers; and</p> <ul style="list-style-type: none"> - Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors. 						^
S8.6.4	<p>Good Site Practices and Waste Reduction Measures (con't)</p> <ul style="list-style-type: none"> - 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	<p>Waste Disposal Ordinance (Cap. 354)</p> <p>Land (Miscellaneous Provisions) Ordinance (Cap. 28)</p>	<p>^</p> <p>^</p> <p>^</p> <p>^</p>
S8.6.5	<p>Good Site Practices and Waste Reduction Measures (con't)</p> <p>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.</p> <p>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.</p>	To achieve waste reduction	Contractor	All work sites	Construction Phase	ETWB TCW No. 19/2005	^

S8.6.6	<p>Good Site Practices and Waste Reduction Measures (con't)</p> <ul style="list-style-type: none"> - 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	<p>Storage, Collection and Transportation of Waste</p> <p>Should any temporary storage or stockpiling of waste is required, recommendations to minimize the impacts include:</p> <ul style="list-style-type: none"> - 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 Manage ment Plan	<p>Storage, Collection and Transportation of Waste (con't)</p> <ul style="list-style-type: none"> - 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	<p>Storage, Collection and Transportation of Waste (con't)</p> <ul style="list-style-type: none"> - Implementation of trip ticket system with reference to DEVB TC(W) No. 6/2010, 	To minimize potential	Contractor	All work sites	Construction Phase	DEVB TCW No. 6/2010	^

Management Plan	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.	adverse environmental impacts arising from waste collection and disposal					
S8.6.11 - S8.6.13/ Waste Management Plan	<p>Sorting of C&D Materials</p> <ul style="list-style-type: none"> - 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	<p>DEVB TCW No. 6/2010</p> <p>ETWB TCW No. 33/2002</p> <p>ETWB TCW No. 19/2005</p>	<p>^</p> <p>^</p> <p>^</p>
S8.6.17 – S8.6.20	<p>Sediments (con't)</p> <ul style="list-style-type: none"> - 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 	To determine the best handling and treatment of sediment	Contractor	All works areas with sediments concern	Construction Phase		<p>^</p> <p>^</p> <p>^</p>

	<p>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.</p> <ul style="list-style-type: none"> - 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. 						<p>N/A</p> <p>N/A</p>
<p>S8.6.26/ Waste Manage ment Plan</p>	<p>Chemical Wastes.</p> <ul style="list-style-type: none"> - 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 	<p>To ensure proper management of chemical waste</p>	<p>Contractor</p>	<p>All works sites</p>	<p>Construction Phase</p>	<p>Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes</p> <p>Waste Disposal (Chemical Waste) (General) Regulation</p>	<p>* (10) (11) (12) # (4)</p>

	(Chemical Waste) (General) Regulation.						
S8.6.27/ Waste Manage ment 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 - 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	- 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	To prevent vibration impacts	NE/2015/01	Tin Hau Temple	Construction Phase	Vibration Limits on Heritage Buildings by CEDD; GCHIA;	^ ^ ^

Plan	when AAA Level is reached or exceeded.					AMO.	
Landscaping and Visual Impact (Construction Phase)							
Table 10.8.1/ Landscaping 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/ Landscaping 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/ Landscaping 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 landscaping 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/ Landscaping 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	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	^

**App N1 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES
2019**

April 2019

	Application stage).						
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 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	^

Landscape Mitigation Plan							
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 integration with existing coastline	CEDD (via Contractor)	Temporary reclamation for barging points at TKO and Lam Tin and permanent reclamation for TKO Interchange	Construction planning and reclamation stages	N/A	N/A

				slip roads and Road P2			
Landfill Gas Hazard (Design and Construction Phase)							
S11.5.9	<p>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:</p> <p>Methane 0-100% LEL and 0100% v/v Carbon dioxide 0-100% Oxygen 0-21%</p>	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	<p>Safety Measures</p> <ul style="list-style-type: none"> - 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. 	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	^ ^ ^

	<ul style="list-style-type: none"> - Welding, flame-cutting or other hot works should be confined to open areas at least 15m 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 					<p style="text-align: center;">^</p> <p style="text-align: center;">^</p> <p style="text-align: center;">^</p> <p style="text-align: center;">^</p> <p style="text-align: center;">^</p>	
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	<p>through the pipeline/conduit. All piping /conducting should be capped at the end of each working day.</p> <ul style="list-style-type: none"> - 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. 						<p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p>
<p>S11.5.26</p> <p>-</p>	<p>Monitoring</p> <ul style="list-style-type: none"> ● Routine monitoring should be carried out in all excavations, manholes, 	<p>Protect the workers from</p>	<p>Contractor</p>	<p>Project sites within the</p>	<p>Construction phase</p>	<p>EPD's Landfill Gas Hazard</p>	<p>^</p>

	<p>Landfill Consultation Zone should be minimized by suitable precautionary measures recommended in Chapter 8 of the Landfill Gas Hazard Assessment Guidance Note.</p>	<p>stage within the Sai Tso Wan Protect the workers from landfill gas hazards</p>		<p>within the Sai Tso Wan Landfill Consultation Zone</p>	<p>phase</p>	<p>Hazard Assessment Guidance Note</p>	
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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
<i>Air Quality Impact (Construction Phase)</i>					
* (1)	S3.8.7	<ul style="list-style-type: none"> - 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 applied to aggregate fines. - Open stockpiles shall be avoided or 	NE/2015/01	Construction of Lam Tin Interchange	<ul style="list-style-type: none"> • Cement bags in Portion IVC need to be covered to prevent dust emission.
* (2)			NE/2015/01	Construction of Lam Tin Interchange	<ul style="list-style-type: none"> • In Portion III, dust was emitted during unloading by trucks. Contractor is reminded to provide water sprays to reduce dust emission.
# (1)			NE/2015/01	Construction of Lam Tin Interchange	<ul style="list-style-type: none"> • Dust was emitted from a breaker without sufficient water sprays. Contractor is reminded to provide steady and continuous water sprays at all times during breaking.

		covered. Where possible, prevent placing dusty material storage piles near ASRs.			
Noise Impact (Construction Phase)					
* (3)	Noise Mitigation Plan	Use of Temporary Noise Barriers (i.e Acoustic box, Silent Up, and etc) or Full Enclosure for PME according to the approved Noise Mitigation Plan	NE/2015/01	Construction of Lam Tin Interchange	<ul style="list-style-type: none"> Noise barrier(s) in Portion II were placed without facing the direction of NSRs (Yau Lai Estate) when breaking. Contractor is reminded to minimize noise effects to nearby residents.
* (4)			NE/2015/01	Construction of Lam Tin Interchange	<ul style="list-style-type: none"> A breaker was found with a broken piece of noise absorption material. Contractor is reminded to wrap complete noise absorption materials to each breaker.
# (2)			NE/2015/01	Construction of Lam Tin Interchange	<ul style="list-style-type: none"> A noise barrier of a driller was found in the incorrect direction of NSRs. Contractor is reminded to set noise barrier(s) in a correct position.
Water Quality Impact (Construction Phase)					
# (3)	Silt curtain deployment Plan	<ul style="list-style-type: none"> Silt curtains should be deployed properly to surround the works area. Maintenance of silt curtain should be provided. 	NE/2015/01	Construction of Lam Tin Interchange	<ul style="list-style-type: none"> Silt curtains at the right side of shores in Portion VII were floating.
* (6) (7)	S5.8.3	<ul style="list-style-type: none"> 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 	NE/2015/01	Construction of Lam Tin Interchange	<ul style="list-style-type: none"> At Tseung Kwan O side, oil stain and mud were found on the road to the barge point. They have to be cleaned to prevent pollutant runoff to the sea.
			NE/2015/01	Construction of Lam Tin Interchange	<ul style="list-style-type: none"> There was rubbish found at the sea near a Platform and it later was cleared by Contractor. Still, rubbish was being thrown from the platform. Contractor is reminded to prevent dumping rubbish into the sea.

<i>Waste/ Chemical Management</i>					
* (8) (9)	S8.6.3	- Provision of sufficient waste disposal points and regular collection of waste	NE/2015/01	Construction of Lam Tin Interchange	<ul style="list-style-type: none"> General refuse accumulation was observed nearby the entrance of Portion II. Accumulation of construction wastes, general refuses and tree branches were found in Portion II.
			NE/2015/01	Construction of Lam Tin Interchange	<ul style="list-style-type: none"> General refuse and construction waste was found. Regular clean-up is needed.
* (10) (11)	S8.6.26/ Waste Management Plan	<p>Chemical Wastes.</p> <p>- 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</p>	NE/2015/01	Construction of Lam Tin Interchange	<ul style="list-style-type: none"> A chemical waste tank was found without a drip tray. It is required to prevent chemical leakage.
			NE/2015/01	Construction of Lam Tin Interchange	<ul style="list-style-type: none"> At Tseung Kwan O side, oil stain and mud were found on the road to the barge point. They have to be cleaned to prevent pollutant runoff to the sea.

**App N1 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES
2019**

April 2019

*(12)		<p>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</p>	NE/2015/01	Construction of Lam Tin Interchange	<ul style="list-style-type: none"> At Tseung Kwan O side, a drip tray was found with water and oil/grease stain. It is reminded to clean it up to prevent chemical leakage.
# (4)		<p>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.</p>	NE/2015/01	Construction of Lam Tin Interchange	<ul style="list-style-type: none"> A chemical tank was found without a drip tray in Portion II.

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.	To minimize the dust impact	Contractor	All Construction Work Sites	Construction phase	APCO and Air Pollution Control (Construction Dust) Regulation	* (1) ^ ^

App N2 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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
	<ul style="list-style-type: none"> - 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. - 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 						<p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p>

App N2 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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
	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 low sulphur diesel fuel (ULSD)	Reduce air pollution emission from construction vehicles and plants	Contractor	All construction sites	Construction stage	• APCO	^ # (2) ^
/	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 <i>Supervisor</i> , 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	^ ^ ^

App N2 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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
	<ul style="list-style-type: none"> - 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. 						<p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p>

App N2 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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	<ul style="list-style-type: none"> - 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	<p>Good Site Practice</p> <ul style="list-style-type: none"> - Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction 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	#(3) ^ ^ ^ ^

App N2 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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
	<ul style="list-style-type: none"> - 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. 						<p>^</p> <p>^</p>
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	Control potential	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO	N/A

App N2 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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
	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.	impacts from filling activities					
Silt Curtain Deployment Plan	<ul style="list-style-type: none"> - 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/2015/02	Construction stage	EIAO	^ ^ ^
Sediment Management Plan	<ul style="list-style-type: none"> - 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 	Control potential impacts from Cement s/s process	Contractor	NE/2015/02	Construction stage	EIAO, WPCO	^ ^ ^ ^ ^

App N2 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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
	<p>bodies and tailgates will be sealed to prevent any discharge during transport or wet conditions.</p> <ul style="list-style-type: none"> - 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 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. 						<p>^</p> <p>^</p> <p>^</p> <p>^</p>
S5.8.3	<p>Other good site practices should be undertaken during filling operations include:</p> <ul style="list-style-type: none"> - 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 	Control potential impacts from	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO, Waste Disposal	^

App N2 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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
	<p>sepFarate the construction works from the sea;</p> <ul style="list-style-type: none"> - 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. 	<p>filling activities and marine-based construction</p>				<p>Ordinance (WDO)</p>	<p>^ ^ ^ ^ ^ ^ ^ ^ N/A</p>

App N2 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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
S5.8.4	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	<p>To minimize water quality impact arising from the dredging and filling works for Reclamation for Road P2, the following mitigation measures shall be implemented:</p> <ul style="list-style-type: none"> - 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 ^

App N2 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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
S5.8.5	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	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	^

App N2 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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
	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	* (4)
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	^

App N2 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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					
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	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO S5	^

App N2 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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					
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 runoff 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	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^

App N2 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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					
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	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^

App N2 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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					
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	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^

App N2 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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					
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	Control potential impacts from construction site runoff and land-based	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO, Buildings Ordinance	N/A

App N2 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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
	<p>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.</p>	<p>construction</p>					
S5.8.28	<p>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.</p>	<p>Control potential impacts from construction site runoff and land-based construction</p>	<p>CEDD's Contractors</p>	<p>Work site</p>	<p>Design Stage and Construction Phas</p>	<p>ProPECC PN 1/94, EIAOTM, WPCO</p>	<p>N/A</p>
S5.8.29 - S5.8.31	<p>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.</p>	<p>Control potential impacts from construction site runoff and land-based construction</p>	<p>CEDD's Contractors</p>	<p>Work site</p>	<p>Construction Phase</p>	<p>ProPECC PN 1/94, EIAOTM, WPCO</p>	<p>^</p>

App N2 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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
S5.8.32	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

App N2 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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
S5.8.35	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

App N2 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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
S5.8.38	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

App N2 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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
S5.8.41	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	^

App N2 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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
S5.8.44	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	<p>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:</p> <ul style="list-style-type: none"> - 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 	Control potential impacts from accidental spillage of chemicals	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO, WDO	^ ^

App N2 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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
	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	<p>Measures to Minimize Disturbance</p> <ul style="list-style-type: none"> - 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	<p>Standard Good Site Practice</p> <ul style="list-style-type: none"> - 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 	Reduce disturbance to surrounding habitats	Contractor	Land-based works are	Construction Phase	N/A	^ ^

App N2 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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
	<p>demarcated. The works areas should be reinstated after completion of the works.</p> <ul style="list-style-type: none"> - 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. 						<p>^</p> <p>^</p> <p>^</p> <p>^</p>
S6.8.6	<p>Measure to Minimize Groundwater Inflow</p> <ul style="list-style-type: none"> - 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	<p>N/A</p> <p>N/A</p>
S6.8.8	<p>Measure to Minimize Impact on Corals</p> <p><u>Coral translocation</u></p> <ul style="list-style-type: none"> - It is recommended to translocate the affected coral colonies, except the locally common <i>Oulastrea crispata</i>, 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). 	Minimize loss of coral	Design team, contractor, project operator	Within reclamation areas and pier footprint	Prior construction	N/A	<p>^</p> <p>^</p>

App N2 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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
	<ul style="list-style-type: none"> - 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. <p><u>Post translocation Monitoring</u></p> <ul style="list-style-type: none"> - 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. 						<p>^</p> <p>^</p> <p>^</p> <p>^</p>
<p>S6.8.9</p> <p>S6.8.10</p>	<p>Measure to Control Water Quality Impact</p> <ul style="list-style-type: none"> - 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. 	<p>Control water quality impact, especially on suspended solid level; minimize the</p>	<p>Design Team, contractor</p>	<p>Marine and landbased works area</p>	<p>Construction phase</p>	<p>WQO</p>	<p>N/A</p> <p>^</p> <p>^</p> <p>^</p>

App N2 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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		contamination of wastewater discharge, accidental chemical spillage and construction site runoff to the receiving water bodies					^
S6.8.11	<p>Compensation for Vegetation Loss</p> <ul style="list-style-type: none"> - 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	<p>Measure to Control Water Quality Impact</p> <ul style="list-style-type: none"> - 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	Design Team / Contractor	Marine work area	Construction phase	WQO	^

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		solid level					
Waste Management (Construction Phase)							
S8.6.3	<p>Good Site Practices and Waste Reduction Measures</p> <ul style="list-style-type: none"> - 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	<p>Good Site Practices and Waste Reduction Measures (con't)</p> <ul style="list-style-type: none"> - 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 	To achieve waste reduction	Contractor	All work sites	Construction Phase	Waste Disposal Ordinance (Cap. 354) Land (Miscellaneous Provisions) Ordinance	^ ^ ^

App N2 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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	and avoid unnecessary generation of waste.					(Cap. 28)	
S8.6.5	<p>Good Site Practices and Waste Reduction Measures (con't)</p> <p>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.</p>	To achieve waste reduction	Contractor	All work sites	Construction Phase	ETWB TCW No. 19/2005	^
S8.6.6	<p>Good Site Practices and Waste Reduction Measures (con't)</p> <ul style="list-style-type: none"> - 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	<p>Storage, Collection and Transportation of Waste</p> <p>Should any temporary storage or stockpiling of waste is required, recommendations to minimize the impacts include:</p> <ul style="list-style-type: none"> - 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 	To minimize potential adverse environmental impacts arising from waste storage	Contractor	All work sites	Construction Phase	-	^ ^ ^

App N2 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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	<p>materials from wind-blown or being washed away; and</p> <ul style="list-style-type: none"> - Different locations should be designated to stockpile each material to enhance reuse. 						^
<p>S8.6.8/ Waste Management Plan</p>	<p>Storage, Collection and Transportation of Waste (con't)</p> <ul style="list-style-type: none"> - 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. 	<p>To minimize potential adverse environmental impacts arising from waste collection and disposal</p>	<p>Contractor</p>	<p>All work sites</p>	<p>Construction Phase</p>		<p>^ ^ ^ ^ ^ ^</p>
<p>S8.6.9/ Waste Management Plan</p>	<p>Storage, Collection and Transportation of Waste (con't)</p> <ul style="list-style-type: none"> - 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. 	<p>To minimize potential adverse environmental impacts arising from waste</p>	<p>Contractor</p>	<p>All work sites</p>	<p>Construction Phase</p>	<p>DEVB TCW No. 6/2010</p>	<p>^</p>

App N2 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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		collection and disposal					
S8.6.11 - S8.6.13/ Waste Management Plan	<p>Sorting of C&D Materials</p> <ul style="list-style-type: none"> - 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	<p>Sediments</p> <ul style="list-style-type: none"> - 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 	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

App N2 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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	<p>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.</p> <ul style="list-style-type: none"> - 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	<p>Sediments (con't)</p> <ul style="list-style-type: none"> - 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 	To determine the best handling and treatment of sediment	Contractor	All works areas with sediments concern	Construction Phase		^ ^ ^

App N2 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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	<p>transportation of the sediment, the excavated sediments should be kept wet during excavation/boring and should be properly covered when placed on barges/trucks.</p> <p>Loading of the excavated sediment to the barge should be controlled to avoid splashing and overflowing of the sediment slurry to the surrounding water.</p> <ul style="list-style-type: none"> - 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	<p>Sediments (con't)</p> <ul style="list-style-type: none"> - 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	All works areas with sediments concern	Construction Phase	ETWB TC(W) No. 34/2002 & Dumping at Sea Ordinance	N/A
S8.6.23	<p>Sediments (con't)</p> <ul style="list-style-type: none"> - 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 	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

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	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.						
S8.6.24 - S8.6.28/ Waste Management Plan	<p>Sediments (con't)</p> <ul style="list-style-type: none"> - The excavated sediments is expected to be loaded onto the barge and transported to the designated disposal sites allocated by the MFC. The excavated 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. 	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	^ ^ ^

App N2 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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	<ul style="list-style-type: none"> - 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. 						<p style="text-align: center;">^</p> <p style="text-align: center;">N/A</p> <p style="text-align: center;">N/A</p>
S8.6.26/ Waste Management Plan	<p>Chemical Wastes.</p> <ul style="list-style-type: none"> - 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, 	To ensure proper management of chemical waste	Contractor	All works sites	Construction Phase	Code of Practice on the Packaging, Labelling and Storage of	^

App N2 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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	<p>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.</p>					<p>Chemical Wastes Waste Disposal (Chemical Waste) (General) Regulation</p>	
<p>S8.6.27/ Waste Management Plan</p>	<p>General Refuse</p> <ul style="list-style-type: none"> - 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. 	<p>To ensure proper management of general refuse</p>	<p>Contractor</p>	<p>All works sites</p>	<p>Construction Phase</p>	<p>Public Health and Municipal Services Ordinance (Cap. 132)</p>	<p>* (5)</p>
<p>Impact on Cultural Heritage (Construction Phase)</p>							
<p>S9.6.4</p>	<p>Dust and visual impacts</p> <ul style="list-style-type: none"> - 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. 	<p>To prevent dust and visual impacts</p>	<p>Contractors</p>	<p>Work areas</p>	<p>Construction Phase</p>	<p>EIAO; GCHIA; AMO</p>	<p>^ ^ ^</p>
<p>S9.6.4</p>	<p>Indirect vibration impact</p>	<p>To prevent</p>	<p>Contractors</p>	<p>Work areas</p>	<p>Construction</p>	<p>Vibration Limits</p>	

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	<ul style="list-style-type: none"> - 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	^

App N2 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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
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/	CM7 - Hydroseeding or sheeting of soil stockpiles with visually unobtrusive material	To reduce	CEDD (via	General	Throughout	As per	N/A

App N2 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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		visual intrusion	Contractor)		construction period	Particular Specification	
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/ 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	Throughout construction period	N/A	^

App N2 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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
				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 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

- 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
<i>Air Quality Impact (Construction Phase)</i>					
* (1)	S3.8.7	- Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather.	NE/2015/02	Construction of Road P2	• Sand piles need to be covered to prevent dust emission by wind erosion.
# (2)		- Only well-maintained plant should be operated on-site and plant should be serviced regularly to avoid emission of black smoke.	NE/2015/02	Construction of Road P2	• Smoke emission from the duct during operation of the Roller.
<i>Noise Impact (Construction Phase)</i>					
#(3)	S4.9	- Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction program.	NE/2015/02	Construction of Road P2	• Noise emission from the excavator, need to apply with lubricant.
<i>Water Quality Impact (Construction Phase)</i>					
* (4)	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	NE/2015/02	Construction of Road P2	• Stagnant water are found at Portion V.

App N2 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

		<p>basins or traps and baffles to enhance deposition rates.</p> <p>The design of efficient silt removal facilities should be based on the guidelines in Appendix A1 of ProPECC PN 1/94.</p>			
Waste / Chemical Management					
* (5)	S8.6.27/ Waste Management Plan	<p>General Refuse</p> <ul style="list-style-type: none"> - 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. 	NE/2015/02	Construction of Road P2	<ul style="list-style-type: none"> • The contractor need to clean the rubbish tank in the site office area.

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 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: <ul style="list-style-type: none"> - 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	#(1) ^ ^

App N - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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							
	<p>reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines.</p> <ul style="list-style-type: none"> - 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. 						<p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p>

App N - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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							
	<ul style="list-style-type: none"> - 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 <ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> - 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	^ ^ ^

App N - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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							
	<ul style="list-style-type: none"> - Subject to the odour intensity and instruction by the <i>Supervisor</i>, 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. - 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. 						<p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p>

App N - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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							
	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - 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 <ul style="list-style-type: none"> - Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program 	To minimize construction noise impact	Project Proponent	Work sites	Construction Period	EIAO-TM, NCO	^

App N - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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							
	<ul style="list-style-type: none"> - 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. 	arising from the Project at the 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	^
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	Control potential impacts from	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO	N/A

App N - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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							
	column installation (also including the installation of steel cellular caisson), silt curtain shall be employed around the active stone column installation points.	filling activities					
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
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	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^

App N - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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					
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	^
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 ^

App N - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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							
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	^

App N - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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							
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	*(2)
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.	Control potential impacts from construction site	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^

App N - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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							
	Discharge of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul sewerage system.	runoff and land-based construction					
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
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	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^

App N - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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							
	with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains.						
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 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	^

App N - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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							
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	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	Control potential impacts from construction site	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM,	N/A

App N - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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							
5.18	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.	runoff and land-based construction				WPCO, Buildings Ordinance	
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	Control potential impacts from construction site runoff and land-	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^

App N - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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							
	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.	based 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 runoff 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	Control potential impacts from construction site	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A

App N - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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							
	Memorandum on Effluent Standards.	runoff and land-based construction					
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

App N - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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							
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	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^

App N - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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							
		runoff and land-based construction					
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	^

App N - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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							
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							

App N - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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							
S6.8.4	<p>Measures to Minimize Disturbance</p> <ul style="list-style-type: none"> - 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	<p>Standard Good Site Practice</p> <ul style="list-style-type: none"> - 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	^ ^ ^ ^ ^

App N - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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							
	the nearby watercourses.						
S6.8.6	<p>Measure to Minimize Groundwater Inflow</p> <ul style="list-style-type: none"> - 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	<p>Measure to Minimize Impact on Corals</p> <p><u>Coral translocation</u></p> <ul style="list-style-type: none"> - It is recommended to translocate the affected coral colonies, except the locally common <i>Oulastrea crispata</i>, 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 	Minimize loss of coral	Design team, contractor, project operator	Within reclamation areas and pier footprint	Prior construction	N/A	^ ^ ^ ^

App N - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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							
	<p>prepared during the detailed design stage.</p> <ul style="list-style-type: none"> - 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. <p><u>Post translocation Monitoring</u></p> <ul style="list-style-type: none"> - 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. 						<p>^</p> <p>^</p>
S6.8.9 S6.8.10	<p>Measure to Control Water Quality Impact</p> <ul style="list-style-type: none"> - 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,	Design Team, contractor	Marine and landbased works area	Construction phase	WQO	<p>N/A</p> <p>^</p> <p>^</p> <p>^</p>

App N - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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							
		accidental chemical spillage and construction site runoff to the receiving water bodies					
S6.8.11	<p>Compensation for Vegetation Loss</p> <ul style="list-style-type: none"> - 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	<p>Measure to Control Water Quality Impact</p> <ul style="list-style-type: none"> - 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	^

App N - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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							
Waste Management (Construction Phase)							
S8.6.3	<p>Good Site Practices and Waste Reduction Measures</p> <ul style="list-style-type: none"> - 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	<p>Good Site Practices and Waste Reduction Measures (con't)</p> <ul style="list-style-type: none"> - 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 	To achieve waste reduction	Contractor	All work sites	Construction Phase	Waste Disposal Ordinance (Cap. 354) Land (Miscellaneous Provisions) Ordinance (Cap.	^ ^ ^

App N - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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							
	contamination of construction materials; and - Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste.					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	To minimize potential adverse environmental	Contractor	All work sites	Construction Phase	-	^

App N - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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							
	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.	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	Storage, Collection and Transportation of Waste (con't) - Implementation of trip ticket system with reference to DEVB TC(W) No. 6/2010,	To minimize potential	Contractor	All work sites	Construction Phase	DEVB TCW No. 6/2010	^

App N - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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							
Management Plan	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.	adverse environmental impacts arising from waste collection and disposal					
S8.6.11 - S8.6.13/ Waste Management Plan	<p>Sorting of C&D Materials</p> <ul style="list-style-type: none"> - 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	<p>Sediments</p> <ul style="list-style-type: none"> - 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 	To ensure the sediment to be disposed of in an authorized and least	NE/2015/02, NE/2017/01	All works areas with sediments concern	Construction Phase	RBRG	N/A

App N - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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							
Plan	<p>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.</p> <p>- Despite exceedance of RBRG, onsite reuse of sediment under sample (TKO-EBH501 3-3.95m) 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</p>	impacted way					N/A
S8.6.17 – S8.6.20	<p>Sediments (con't)</p> <p>- Requirements of the Air Pollution Control (Construction Dust) Regulation, where</p>	To determine the best handling	Contractor	All works areas with	Construction Phase		^

App N - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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							
	<p>relevant, shall be adhered to during boring, excavation, transportation and disposal of sediments or cement stabilization of sediment.</p> <ul style="list-style-type: none"> - 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			<p>^</p> <p>^</p> <p>N/A</p>
S8.6.21/ Waste Manage ment Plan	<p>Sediments (con't)</p> <ul style="list-style-type: none"> - 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 	To ensure the sediment to be disposed of in an authorized and least	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

App N - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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							
	sediment, while the permit of marine dumping is required under the Dumping at Sea Ordinance and is the responsibility of the DEP.	impacted way					
S8.6.23	<p>Sediments (con't)</p> <ul style="list-style-type: none"> - 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 Manage ment Plan	<p>Sediments (con't)</p> <ul style="list-style-type: none"> - The excavated sediments is expected to be loaded onto the barge and transported to the designated disposal sites allocated by the MFC. The excavated 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 	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	^ ^

App N - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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							
	<p>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).</p> <ul style="list-style-type: none"> - 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. 					<p>^</p> <p>^</p>	<p>N/A</p>

App N - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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							
	<ul style="list-style-type: none"> - 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
S8.6.26/ Waste Manage ment Plan	<p>Chemical Wastes.</p> <ul style="list-style-type: none"> - 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	<p>General Refuse</p> <ul style="list-style-type: none"> - General refuse should be stored in enclosed bins or compaction units separate 	To ensure proper	Contractor	All works sites	Construction Phase	Public Health and Municipal Services	^

App N - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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							
Management Plan	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.	management of general refuse				Ordinance (Cap. 132)	
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	^

App N - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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							
Mitigation Plan							
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	^

App N - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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							
Table 10.8.1/ Landsca pe 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/ Landsca pe 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/ Landsca pe 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/ Landsca	CM10 - Avoidance of excessive height and bulk of site buildings and structure	Reduction of visual intrusion and integration	CEDD (via Contractor)	Built structures	Design and construction stage	N/A	^

App N - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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							
pe Mitigation Plan		with environment					
Table 10.8.1/ Landsca pe 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 integration with existing coastline	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

App N - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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
<i>Air Quality Impact</i>							
				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

App N - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

Status / Remark	EIA Ref.	Recommended Mitigation Measures	Contract No.	Work Sites	Details of Observation/Reminder
<i>Air Quality (Construction Phase)</i>					
#(1)	S3.8.7	- Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather.	NE/2017/02	Road P2/D4 and Associated Works	The contractor need to provide frequent water spraying / coverings to reduce dust emission
<i>Water Quality (Construction Phase)</i>					
*(2)	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.	NE/2017/02	Road P2/D4 and Associated Works	The manholes need to seal to prevent construction site runoffs to Public Drainage System.

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: <ul style="list-style-type: none"> - 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	^ ^ ^

App N4 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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
	<p>watering shall be applied to aggregate fines.</p> <ul style="list-style-type: none"> - 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 						<p>^</p> <p>^</p> <p>N/A</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p>

App N4 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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 <ul style="list-style-type: none"> • 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	^

App N4 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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	<p>Good Site Practice</p> <ul style="list-style-type: none"> - Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction 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

App N4 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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)							
	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	^

App N4 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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 ^
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	* (1)
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	^

App N4 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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	^
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	^

App N4 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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
		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

App N4 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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
S5.8.18	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	^

App N4 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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
S5.8.21	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	^

App N4 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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
		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

App N4 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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
S5.8.29 - 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 runoff 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

App N4 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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
S5.8.34	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

App N4 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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
		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

App N4 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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
S5.8.41	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	^

App N4 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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
	(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,	^

App N4 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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
Ecological Impact							
S6.8.4	<p>Measures to Minimize Disturbance</p> <ul style="list-style-type: none"> - 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 	<p>Minimize noise, human and traffic disturbance to terrestrial habitat and wildlife; and reduce dust generation</p>	<p>Design Team / Contractor</p>	<p>Land-based works are</p>	<p>Construction Phase</p>	<p>N/A</p>	<p>^ ^ ^</p>
S6.8.5	<p>Standard Good Site Practice</p> <ul style="list-style-type: none"> - 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 	<p>Reduce disturbance to surrounding habitats</p>	<p>Contractor</p>	<p>Land-based works are</p>	<p>Construction Phase</p>	<p>N/A</p>	<p>^ ^ ^ ^ ^</p>

App N4 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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	<p>Measure to Control Water Quality Impact</p> <ul style="list-style-type: none"> - 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	^ ^

App N4 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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
S6.8.11	<p>Compensation for Vegetation Loss</p> <ul style="list-style-type: none"> - 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	<p>Good Site Practices and Waste Reduction Measures</p> <ul style="list-style-type: none"> - 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	<p>Good Site Practices and Waste Reduction Measures (con't)</p> <ul style="list-style-type: none"> - 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)	^

App N4 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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	<p><i>Good Site Practices and Waste Reduction Measures (con't)</i></p> <p>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.</p> <p>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.</p>	To achieve waste reduction	Contractor	All work sites	Construction Phase	ETWB TCW No. 19/2005	^
S8.6.6	<p><i>Good Site Practices and Waste Reduction Measures (con't)</i></p> <p>- C&D materials would be reused in the project and other local concurrent projects as far as possible.</p>	To achieve waste reduction	Contractor	All work sites	Construction Phase	ETWB TCW No. 19/2005	^

App N4 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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
S8.6.7	<p><i>Storage, Collection and Transportation of Waste</i></p> <p>Should any temporary storage or stockpiling of waste is required, recommendations to minimize the impacts include:</p> <ul style="list-style-type: none"> - 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	<p><i>Storage, Collection and Transportation of Waste (con't)</i></p> <ul style="list-style-type: none"> - 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		^ ^ ^ ^ ^ ^

App N4 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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
S8.6.9/ Waste Manage ment Plan	<p>Storage, Collection and Transportation of Waste (con't)</p> <ul style="list-style-type: none"> - 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 Manage ment Plan	<p>Sorting of C&D Materials</p> <ul style="list-style-type: none"> - 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	<p>Sediments (con't)</p> <ul style="list-style-type: none"> - Requirements of the Air Pollution Control (Construction Dust) Regulation, where 	To determine the best handling	Contractor	All works areas with	Construction Phase		^

App N4 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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
	<p>relevant, shall be adhered to during boring, excavation, transportation and disposal of sediments or cement stabilization of sediment.</p> <ul style="list-style-type: none"> - 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	<p>Chemical Wastes.</p> <ul style="list-style-type: none"> - 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	^

App N4 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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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	<p>General Refuse</p> <ul style="list-style-type: none"> - 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	<p>Dust and visual impacts</p> <ul style="list-style-type: none"> - 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	^ ^ ^

App N4 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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	works are less than 100m from the temple.						
<i>Landscape and Visual Impact (Construction Phase)</i>							
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	^

App N4 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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

App N4 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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Plan							
Table 10.8.1/ Landsca pe 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/ Landsca pe 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/ Landsca pe 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	^

App N4 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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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

- 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
Water Quality (Construction Phase)					
* (1)	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.	NE/2015/03	Construction of Northern Footbridge	The generator drip tray had accumulated some water after raining.

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

App N5 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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
	<ul style="list-style-type: none"> - 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. - 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. 						<p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>^</p> <p>N/A</p>

App N5 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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
	<ul style="list-style-type: none"> - 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 <ul style="list-style-type: none"> • 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 Manage ment Plan	<ul style="list-style-type: none"> - 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

App N5 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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
	<ul style="list-style-type: none"> - Subject to the odour intensity and instruction by the <i>Supervisor</i>, 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. - 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. 						<p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>^</p> <p>N/A</p> <p>N/A</p> <p>N/A</p>

App N5 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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
	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - 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	<p>Good Site Practice</p> <ul style="list-style-type: none"> - Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction 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	^ ^

App N5 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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
	<ul style="list-style-type: none"> - 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					<p>^</p> <p>^</p> <p>^</p> <p>^</p>
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

App N5 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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 Deploym ent Plan	<ul style="list-style-type: none"> - 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 works	Contractor	NE/2015/01, NE/2015/02, NE/2017/01	Construction stage	EIAO	^ *(1) ^
Sediment Manage ment Plan	<ul style="list-style-type: none"> - 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

App N5 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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
	<ul style="list-style-type: none"> - 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 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. 						<p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p>

App N5 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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
S5.8.3	<p>Other good site practices should be undertaken during filling operations include:</p> <ul style="list-style-type: none"> - 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)	<p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>^</p> <p>N/A</p> <p>^</p> <p>^</p> <p>* (2)</p>

App N5 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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

App N5 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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

App N5 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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	N/A
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

App N5 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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

App N5 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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
		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

App N5 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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
S5.8.18	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

App N5 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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
S5.8.21	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

App N5 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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
		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

App N5 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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
S5.8.29 - 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 runoff 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

App N5 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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
S5.8.34	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

App N5 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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
		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

App N5 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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
S5.8.41	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	^

App N5 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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
	(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	*(2), *(3), #(4) ^ ^
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,	^

App N5 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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
Ecological Impact							
S6.8.4	<p>Measures to Minimize Disturbance</p> <ul style="list-style-type: none"> - 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	<p>Standard Good Site Practice</p> <ul style="list-style-type: none"> - 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 ^ ^

App N5 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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.						
S6.8.6	<p><i>Measure to Minimize Groundwater Inflow</i></p> <ul style="list-style-type: none"> - 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
S6.8.8	<p><i>Measure to Minimize Impact on Corals</i></p> <p><u>Coral translocation</u></p> <ul style="list-style-type: none"> - It is recommended to translocate the affected coral colonies, except the locally common <i>Oulastrea crispata</i>, 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

App N5 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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
	<p>who is/are approved by AFCD prior to commencement of coral translocation.</p> <p><u>Post translocation Monitoring</u></p> <ul style="list-style-type: none"> - 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. 						<p>N/A</p> <p>N/A</p>
<p>S6.8.9</p> <p>S6.8.10</p>	<p><i>Measure to Control Water Quality Impact</i></p> <ul style="list-style-type: none"> - 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. 	<p>Control water quality impact, especially on suspended solid level; minimize the contamination of wastewater discharge, accidental chemical spillage and construction site runoff to the</p>	<p>Design Team, contractor</p>	<p>Marine and land based works area</p>	<p>Construction phase</p>	<p>WQO</p>	<p>N/A</p> <p>^</p> <p>^</p> <p>N/A</p>

App N5 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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
		receiving water bodies					
S6.8.11	<p>Compensation for Vegetation Loss</p> <ul style="list-style-type: none"> - 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	<p>Measure to Control Water Quality Impact</p> <ul style="list-style-type: none"> - 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	<p>Good Site Practices and Waste Reduction Measures</p> <ul style="list-style-type: none"> - 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; 	To reduce waste management impacts	Contractor	All work sites	Construction Phase	Waste Disposal Ordinance (Cap. 354) Land (Miscellaneous Provisions)	^ ^ ^

App N5 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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
	<ul style="list-style-type: none"> - 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	<p><i>Good Site Practices and Waste Reduction Measures (con't)</i></p> <ul style="list-style-type: none"> - 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	<p><i>Good Site Practices and Waste Reduction Measures (con't)</i></p> <p>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</p>	To achieve waste reduction	Contractor	All work sites	Construction Phase	ETWB TCW No. 19/2005	^

App N5 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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
	<p>areas for segregation and temporary storage of reusable and recyclable materials.</p> <p>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.</p>						
S8.6.6	<p>Good Site Practices and Waste Reduction Measures (con't)</p> <ul style="list-style-type: none"> - 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	<p>Storage, Collection and Transportation of Waste</p> <p>Should any temporary storage or stockpiling of waste is required, recommendations to minimize the impacts include:</p> <ul style="list-style-type: none"> - 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 Manage ment	<p>Storage, Collection and Transportation of Waste (con't)</p> <ul style="list-style-type: none"> - 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		^ ^ ^

App N5 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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	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	<i>Storage, Collection and Transportation of Waste (con't)</i> - 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	<i>Sorting of C&D Materials</i> - 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	^ ^ ^

App N5 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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
	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	<p>Sediments (con't)</p> <ul style="list-style-type: none"> - 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

App N5 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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 Manage ment Plan	<p>Sediments (con't)</p> <ul style="list-style-type: none"> 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	<p>Sediments (con't)</p> <ul style="list-style-type: none"> 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	<p>Sediments (con't)</p> <ul style="list-style-type: none"> The excavated sediments is expected to be loaded onto the barge and transported to the designated disposal sites allocated by the MFC. The excavated 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	^

App N5 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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	<p>options and ETWB TC(W) No. 34/2002.</p> <ul style="list-style-type: none"> - 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					<p>^</p> <p>^</p> <p>^</p>

App N5 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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
	<p>specified by the DEP.</p> <ul style="list-style-type: none"> - 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. 						<p>N/A</p> <p>N/A</p>
S8.6.26/ Waste Management Plan	<p>Chemical Wastes.</p> <ul style="list-style-type: none"> - 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	^

App N5 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

EIA Ref. / EP Submiss ion	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 Manage ment Plan	<p>General Refuse</p> <ul style="list-style-type: none"> - 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)	#(5)
Impact on Cultural Heritage (Construction Phase)							
S9.6.4	<p>Dust and visual impacts</p> <ul style="list-style-type: none"> - 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	<p>Indirect vibration impact</p> <ul style="list-style-type: none"> - 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

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	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - 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
<i>Landscape and Visual Impact (Construction Phase)</i>							
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

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10.8.1/ Landsca pe 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/ Landsca pe 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/ Landsca pe 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/ Landsca pe	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

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Mitigation Plan				landscape deck, TKO			
Table 10.8.1/ Landsca pe 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/ Landsca pe 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/ Landsca pe 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

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EIA Ref. / EP Submiss ion	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

App N5 - IMPLEMENTATION SCHEDULE AND RECOMMENDED MITIGATION MEASURES

April 2019

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

- 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
<i>Water Quality Impact (Construction Phase)</i>					
* (1)	Silt Curtain Deployment Plan	- Maintenance of silt curtain should be provided.	NE/2017/01	Construction of TKO Interchange	<ul style="list-style-type: none"> • A hole is found on the silt curtains. Silt curtains should be in good condition deployed around the platform.
* (2)	S5.8.3	Other good site practices should be undertaken during filling operations include: <ul style="list-style-type: none"> - 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 	NE/2017/01	Construction of TKO Interchange	<ul style="list-style-type: none"> • Oil stain was observed on the barge (三航駁 205) and the surface of marine. Oil leakage should be avoided.

Waste Management (Construction Phase)					
<p>*(2), *(3), #(4)</p>	<p>S5.8.46</p>	<p>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:</p> <ul style="list-style-type: none"> - 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 <p>storage area should be selected at a safe location on site and adequate space should be allocated to the storage area.</p>	<p>NE/2017/01</p>	<p>Construction of TKO Interchange</p>	<ul style="list-style-type: none"> • Oil stain was observed on the barge (三 航 駁 205) and the surface of marine. Oil leakage should be avoided. • Oil is observed on the barge. Oil leakage from the equipment should be avoided. • Drip tray should be well-maintained to avoid oil leakage.
<p>#(5)</p>	<p>S8.6.27/ Waste Manage</p>	<p>General Refuse General refuse should be stored in enclosed bins or compaction units</p>	<p>NE/2017/01</p>	<p>Construction of TKO Interchange</p>	<ul style="list-style-type: none"> • General refuse should be disposed regularly.

	<p>ment Plan</p>	<p>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.</p>			
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**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
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	Under Investigation	On-going
358	30-Apr-19	27-04-2019/ Near cofferdam area	General Public	Noise	The complaint about the noise nuisance during evening time.	Y	Under Investigation	On-going
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	Under Investigation	On-going
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	Under Investigation	On-going
355	17-Apr-19	17-04-2019/ Near cofferdam area	General Public	Noise & Others	The complaint about the noise nuisance and light pollution near cofferdam area during evening-time.	Y	Under Investigation	On-going
354	30-Apr-19	20 Apr 2019 / Cofferdam Area	Resident of Ocean Shore	Others	The construction site near O King	N		On-going

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
		19 Apr 2019 / Cofferdam Area	(Mr. Chan)		Road is operated in holiday during day-time and weekday during night-time.		Under Investigation	
		15 Apr 2019 / Cofferdam Area						
		07 Apr 2019 / Cofferdam Area						
		31 Mar 2019 / Cofferdam Area						
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	Investigation has been completed but yet to be finalised.	On-going
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	Investigation has been completed but yet to be finalised.	On-going
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	Investigation has been completed but yet to be finalised.	On-going

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
350	8-Apr-19	07 Apr 2019 / Cofferdam Area in TKO	-	Air & Others	11:40 The complainant complained the dark smoke generation and the construction works from the cofferdam area in Tiu Keng Leng during holiday.	N	Investigation has been completed but yet to be finalised.	On-going
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	Investigation has been completed but yet to be finalised.	On-going
348	2-Apr-19	02 Apr 2019 / LTT-TKO	-	Others	13:03 The complainant complained the LTT construction site was working during holiday.	N	Investigation has been completed but yet to be inalized.	On-going
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	Investigation has been completed but yet to be finalised.	On-going
346	31-Mar-19	31st March 2019 / Construction of Road P2	District Council	Others	Validity of Construction works on Sunday	N	Investigation has been completed but yet to be finalised.	On-going
345	29-Mar-19	29th March 2019 / Construction of Road D4	Resident of Park Central?	Noise	Breaking noise (Daytime)	Y	Investigation has been completed but yet to be finalised.	On-going

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
344	28-Mar-19	28th March 2019 / Construction of Road P2	District Council	Noise	Noise and black smoke from barges	Y	Investigation has been completed but yet to be finalised.	On-going
343	25-Mar-19	25th March 2019 / Construction of Road D4	Resident of Park Central	Noise	Piling like noise (Daytime)	Y	Investigation has been completed but yet to be finalised.	On-going
342	25-Mar-19	25th March 2019 / Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	Construction noise (Daytime)	Y	Investigation has been completed but yet to be finalised.	On-going
341	24-Mar-19	24th March 2019 / Construction of Lam Tin Interchange	Management Section of Hong Nga Court	Noise	Breaking noise (Daytime)	Y	Investigation has been completed but yet to be finalised.	On-going
340	24-Mar-19	24th March 2019 / Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	Tunneling work noise (Daytime)	Y	Investigation has been completed but yet to be finalised.	On-going
339	21-Mar-19	21st March 2019 / Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	Breaking noise (Daytime)	Y	Investigation has been completed but yet to be finalised.	On-going
338	21-Mar-19	21st March 2019 / Construction of Lam Tin Interchange	Resident of Ocean Shore	Noise	Metal collision like noise (Night time)	Y	Investigation has been completed but yet to be finalised.	On-going

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
337	20-Mar-19	20th March 2019 / Construction of Road D4 and Footbridge between Tiu Keng Leng Sport Centre and Park Central	Resident of Park Central	Noise	Construction of work noise (Evening time)	Y	Investigation has been completed but yet to be finalised.	On-going
336	20-Mar-19	20th March 2019 / Construction of Road D4	Resident of Park Central	Noise & Pest	Construction vehicle noise (Evening time)	Y	Investigation has been completed but yet to be finalised.	On-going
335	19-Mar-19	19th March 2019 / Construction of Road P2/	Resident of Ocean Shore	Noise	Marine works noise (Evening time)	Y	Investigation has been completed but yet to be finalised.	On-going
334	19-Mar-19	19th March 2019 / Construction of Road P2/	District Council	Noise	Marine works noise (Evening time)	Y	Investigation has been completed but yet to be finalised.	On-going
333	19-Mar-19	19th March 2019 / Construction of Road P2/	Resident of Ocean Shore	Noise	Marine works noise (Evening time)	Y	Investigation has been completed but yet to be finalised.	On-going
332	18-Mar-19	18th March 2019 / Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Construction noise (Night time)	Y	Investigation has been completed but yet to be finalised.	On-going
331	18-Mar-19	18th March 2019 / Construction of Lam Tin Interchange	Resident of Hong Pak Court	Noise	Construction noise (Day time and Evening time)	Y	Investigation has been completed but yet to be finalised.	On-going

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
330	17-Mar-19	17th March 2019 / Construction of Lam Tin Interchange	General Public	Noise	Construction noise (Night time)	Y	Investigation has been completed but yet to be finalised.	On-going
329	15-Mar-19	15th March 2019 / Construction of Road D4	Resident of Park Central	Noise & Air	Construction of work noise (Daytime) and odour	Y	Investigation has been completed but yet to be finalised.	On-going
328	14-Mar-19	14th March 2019 / Construction Site of Footbridge between Tiu Keng Leng Sport Centre and Park Central	Resident of Park Central	Noise	Drilling noise (Daytime)	Y	Investigation has been completed but yet to be finalised.	On-going
327	13-Mar-19	13th March 2019 / Construction of Lam Tin Interchange	Resident of Bik Lai House	Noise	Construction noise (Evening time)	Y	Investigation has been completed but yet to be finalised.	On-going
326	13-Mar-19	13th March 2019 / Construction of Road P2	Resident of Ocean Shore	Noise	Construction noise (Daytime)	Y	Investigation has been completed but yet to be finalised.	On-going
325	9-Mar-19	9th March 2019 / Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	Machine and breaking noise (Night time)	Y	Investigation has been completed but yet to be finalised.	On-going

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
324	7-Mar-19	7th March 2019 / Construction of Lam Tin Interchange	Resident of Hong Pak Court	Noise	Breaking noise during day and night	Y	Investigation has been completed but yet to be finalised.	On-going
323	4-Mar-19		Resident of Ocean Shore	Noise	Construction noise (Evening time)	Y	Investigation has been completed but yet to be finalised.	On-going
322	1-Mar-19	4th March 2019 / Construction of Road P2	Resident of Ocean Shore	Noise	Construction noise (Day time)	Y	Investigation has been completed but yet to be finalised.	On-going
321	28-Feb-19	28th February 2019 / Construction of Lam Tin Interchange	Management Section of Yau Lai Estate	Noise	Construction noise (Night time)	Y	Investigation has been completed but yet to be finalised.	On-going
320	22-Feb-19	22nd February 2019 / Construction of Lam Tin Interchange	Resident of Hong Pak Court	Noise	Breaking noise (Day time)	Y	Investigation has been completed but yet to be finalised.	On-going
319	21-Feb-19	21st February 2019 / Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	Breaking noise (Night time)	Y	Investigation has been completed but yet to be finalised.	On-going
318	21-Feb-19	21st February 2019 / Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	Breaking noise (Night time)	Y	Investigation has been completed but yet to be finalised.	On-going

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
317	25-Feb-19	25th February 2019 / Construction of Road P2	Resident in O King Road	Air	Complained about the petroleum smell	N	Investigation has been completed but yet to be finalised.	On-going
316	18-Feb-19	18th February 2019 / Construction of Road P2	Resident in O King Road	Air	Complained about the black smoke and petroleum smell	N	Investigation has been completed but yet to be finalised.	On-going
315	17-Feb-19	17th February 2019 / Construction of Lam Tin Interchange, Road P2 and Tseung Kwan O Interchange	General Public	Noise	Complained about construction noise (Daytime)	Y	Investigation has been completed but yet to be finalised.	On-going
314	17-Feb-19	17th February 2019 / Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Air	Complained about dust	N	Investigation has been completed but yet to be finalised.	On-going
313	17-Feb-19	17th February 2019 / Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	Complained about the explosion noise (Daytime)	Y	Investigation has been completed but yet to be finalised.	On-going
312	16-Feb-19	16th February 2019 / Construction of Lam Tin Interchange	District Council	Noise	Complained about the explosion noise (Daytime)	Y	Investigation has been completed but yet to be finalised.	On-going

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
311	15-Feb-19	15th February 2019 / Construction of Lam Tin Interchange	Public	Noise	Complained about the explosion noise (Daytime)	Y	Investigation has been completed but yet to be finalised.	On-going
310	14-Feb-19	14th February 2019 / Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Complained about the dumping noise (Daytime)	Y	Investigation has been completed but yet to be finalised.	On-going
309	13-Feb-19	13th February 2019 / Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Complaint about construction noise (Night time)	Y	Investigation has been completed but yet to be finalised.	On-going
308	13-Feb-19	13th February 2019 / Construction of Lam Tin Interchange	Management Section of Kwong Tin Estate	Noise	Complaint about construction noise (Night time)	Y	Investigation has been completed but yet to be finalised.	On-going
307	13-Feb-19	13th February 2019 / Construction of Road P2	District Council	Noise	Complained about construction noise (Daytime)	Y	Investigation has been completed but yet to be finalised.	On-going
306	13-Feb-19	13th February 2019 / Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	Complaint about construction noise (Night time)	Y	Investigation has been completed but yet to be finalised.	On-going
305	12-Feb-19	12th February 2019 / Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	Complaint about construction noise (Night time)	Y	Investigation has been completed but yet to be finalised.	On-going

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
304	8-Feb-19	8th February 2019 / Construction of Road P2	Resident of Ocean Shore	Noise	Complained about construction noise (Daytime)	Y	Investigation has been completed but yet to be finalised.	On-going
303	2-Feb-19	2nd February 2019 / Construction of Lam Tin Interchange	Resident of Ping Tin Estate	Noise	Complained about construction noise from the subway (Day & night time)	Y	Investigation has been completed but yet to be finalised.	On-going
302	2-Feb-19	2nd February 2019 / Construction of Lam Tin Interchange	Resident of Hong Pak Court	Noise	Complained about breaking (Day Time)	Y	Investigation has been completed but yet to be finalised.	On-going
301	31th January 2019	31th January 2019 / Construction of Lam Tin Interchange	Management Section of Hong Nga Court	Noise	Complained about construction noise.	Y	Investigation has been completed but yet to be finalised.	On-going
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	Complained about the construction noise from a crane near footbridge between Tiu Keng Leng Sport Centre and Park Central	Y	Investigation has been completed but yet to be finalised.	On-going

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
299	30th January 2019	30th January 2019 / Construction Site of Footbridge between Tiu Keng Leng Sport Centre and Park Central	Resident of Park Central	Noise	Complained about the noise from safety alarm at the site near footbridge between Tiu Keng Leng Sport Centre and Park Central	Y	As confirmed by the engineer, the beeping noise should come from the crane lorry during reversing. This is applied to give an audible warning to nearby pedestrians when the vehicle reverses and it is only a temporary noise source. In order to minimize the disturbance, signalman is used instead.	Closed
298	30th January 2019	30th January 2019 / Construction Site of Footbridge between Tiu Keng Leng Sport Centre and Park Central	Resident of Park Central	Noise & Air Quality	Complained about construction noise & dust.	Y	Investigation has been completed but yet to be finalised.	On-going
297	30th January 2019	30th January 2019 / Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	Complained about the construction noise from loading and unloading.	Y	Investigation has been completed but yet to be finalised.	On-going
296	29th January 2019	29th January 2019 / Construction Site of Footbridge between Tiu Keng Leng Sport Centre and Park Central	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	Refer to Investigation / Mitigation Action for complaint no. 299	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
295	29th January 2019	29th January 2019 / Construction of Road P2	Resident of Ocean Shore	Noise	Complained about the noise from the Steel cable wire for anchoring between barge and pier.	Y	Investigation has been completed but yet to be finalised.	On-going
294	29th January 2019	29th January 2019 / Construction of Road P2	Resident in O King Road	Air Quality	Complained about black smoke emission and odour.	Y	Investigation has been completed but yet to be finalised.	On-going
293 (EPD-K15/RE/0000 3291-19)	29th January 2019	29th January 2019 / Construction of Lam Tin Interchange	Cha Kwo Ling Tsuen	Noise & Air Quality	Complained about construction noise & dust (Day & Nighttime)	Y	Investigation has been completed but yet to be finalised.	On-going
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	Investigation has been completed but yet to be finalised.	On-going
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	Investigation has been completed but yet to be finalised.	On-going
290	29th January 2019	29th January 2019 / Construction of Lam Tin Interchange	District Council	Noise	Complained about the construction noise from Tunnel Works	Y	Investigation has been completed but yet to be finalised.	On-going
289 (EPD-)	24th January 2019	24th January 2019 / Construction of Road P2	Resident of Ocean Shore	Noise	Complained about the construction noise from Tunnel Works	Y	Investigation has been completed but yet to be finalised.	On-going

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
288	18th January 2019	18th January 2019 / Construction of Road P2	Public	Noise	Complained about the construction noise from Tunnel Works	Y	Investigation has been completed but yet to be finalised.	On-going
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	Investigation has been completed but yet to be finalised.	On-going
286	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 near Tiu Keng Leng Sport Centre and Park Central.	N	Investigation has been completed but yet to be finalised.	On-going
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	Investigation has been completed but yet to be finalised.	On-going
284	16th January 2019	16th January 2019 / Construction of Road D4	Resident of Park Central	Noise	Complained about the construction noise from an air blower/fan near Tiu Keng Leng Sport Centre and Park Central.	N	Investigation has been completed but yet to be finalised.	On-going

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File 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 blower/fan near Tiu Keng Leng Sport Centre and Park Central.	N	Investigation has been completed but yet to be finalised.	On-going
282	15th January 2019	15th January 2019 / Construction of Road D4	Resident of Park Central	Noise	Complained about the construction noise from an air blower/fan near Tiu Keng Leng Sport Centre and Park Central.	N	Investigation has been completed but yet to be finalised.	On-going
281	15th January 2019	15th January 2019 / Construction of Road D4	Resident of Park Central	Noise	Complained about the construction noise from an air blower/fan near Tiu Keng Leng Sport Centre	N	Investigation has been completed but yet to be finalised.	On-going
280	14th January 2019	14th January 2019 / Construction of Road D4	Resident of Park Central	Noise	Complained about the construction noise from an air blower/fan near Tiu Keng Leng Sport Centre and Park Central.	N	Investigation has been completed but yet to be finalised.	On-going
279	14th January 2019	14th January 2019 / Construction of Road D4	Resident of Park Central	Noise	Complained about the construction noise from an air blower/fan near Tiu Keng Leng Sport Centre and Park Central.	N	Investigation has been completed but yet to be finalised.	On-going

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
278	12th January 2019	12th 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	Investigation has been completed but yet to be finalised.	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	Investigation has been completed but yet to be finalised.	On-going
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	Investigation has been completed but yet to be finalised.	On-going
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	Investigation has been completed but yet to be finalised.	On-going
274 (EPD-N08/RE/0000 1234-19)	11th January 2019	11th January 2019 / Construction of Road D4	Public	Noise	Complained about the construction noise from a crane near footbridge between Tiu Keng Leng Sport Centre and Park Central	Y	Investigation has been completed but yet to be finalised.	On-going
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	Investigation has been completed but yet to be finalised.	On-going

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 Lam Tin Interchange	Resident of Hong Nga Court	Noise	Complained about the construction noise from Tunnel Works	Y	Investigation has been completed but yet to be finalised.	On-going
271	8th January 2019	8th 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	Investigation has been completed but yet to be finalised.	On-going
270 (EPD-K15/RE/0000 0691-19)	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	Further information is required for investigation	On-going
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	Investigation has been completed but yet to be finalised.	On-going
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	Investigation has been completed but yet to be finalised.	On-going
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 the investigation for complaint no. 266	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: <ul style="list-style-type: none"> • 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
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	Investigation has been completed but yet to be finalised.	On-going
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/stain on the sea surface near the sunken barge at C2 site.	N	Investigation has been completed but yet to be finalised.	On-going
262	30 th December 2018	26 th 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	26 th December 2018	26 th 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	26 th December 2018	26 th 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
259	26 th December 2018	26 th 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	18 th December 2018	18 th December 2018/ Construction of Lam Tin Interchange	Engineering Section of Ocean Shore	Noise	Complained about the construction noise from the marine works.	Y	<p>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.</p> <p><u>Mitigation measures:</u> 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:</p> <ul style="list-style-type: none"> • Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction 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	18 th December 2018	18 th 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	17 th December 2018	15 th December 2018/ Construction of Road P2	Resident of Ocean Shore	Noise	Complained about the construction noise from breaking and piling activities	N	<p>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)</p> <p>The following recommendations were made for the Contractor to enhance the mitigation measures:</p> <ul style="list-style-type: none"> • 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; <p>To ensure all erected noise barriers and sound proofing canvases wrapped on PME are intact and in good condition.</p>	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	16 th December 2018	16 th December 2018/ Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	Complained about the construction noise from Tunnel Works	Y	<ul style="list-style-type: none"> 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	15 th December 2018	15 th 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
252	30 th November 2018	30 th November 2018/ Construction of Road D4	Resident of Park Central	Noise & Air	Complained about the construction noise and dust resuspension in Road D4.	Y	<p>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.</p> <p>Based on the noise and air monitoring results in November 2018, no Limit Level Exceedance was recorded.</p> <p>Mitigation Measures</p> <ul style="list-style-type: none"> 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, <p>Stockpile are covered with impervious material to avoid dust resuspension</p>	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
251	28 th November 2018	27 th November 2018/ Construction of TKO portal	Public	Noise	Complained about the construction noise from the marine works.	Y	The complaint lodged on 25 th November 2018 is considered as non-project related, as no works was conducted on that day. The complaint on 27 th 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	26 th November 2018	26 th 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
249	25 th November 2018	20 th 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	20 th November 2018	20 th 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	20 th November 2018	19 th 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	19 th November 2018	19 th 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

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
245	8 th November 2018	8 th 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
243	8 th November 2018	8 th 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	7 th November 2018	7 th 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	6 th November 2018	6 th 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	6 th November 2018	6 th 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	25 th October 2018	25 th October 2018/ Construction of Road P2	Resident of Ocean Shore	Noise	Complained about daytime construction noise near Ocean Shore.	Y	<p>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)</p> <p>Additional mitigation measures adopted by Contractor upon receipt of complaint:</p> <ul style="list-style-type: none"> ➤ A more effective acoustic barrier was erected that covered the direct line of sight from the entire Ocean Shore during piling works. <p>Existing Mitigation Measures adopted by Contractor</p> <ul style="list-style-type: none"> ➤ 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	23 rd October 2018	23 rd 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
237	18 th October 2018	18 th 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

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
236	18 th October 2018	18 th 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	18 th October 2018	18 th 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	18 th October 2018	18 th 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	15 th October 2018	15 th 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	14 th October 2018	14 th 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	12 th October 2018	12 th 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
230	11 th October 2018	11 th 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	9 th October 2018	9 th 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	9 th October 2018	9 th October 2018/ Lam Tin Interchange	Public	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
227	3 rd October 2018	3 rd 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	<p>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).</p> <p>Mitigation Measures adopted by Contractor</p> <p><u>Noise:</u></p> <ul style="list-style-type: none"> ➤ 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; <p>Powered mechanical equipment (PME) for breaker was equipped with noise barriers at Portion 4C.</p>	Closed
226	28 th September 2018	28 th September 2018/ Construction of Road P2	Resident of Ocean Shores	Noise	Complained about noise nuisance from portion IV	Y	<ul style="list-style-type: none"> ➤ See Investigation / Mitigation Measures for Complaint No. 222 	Closed
225	26 th September 2018	26 th 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	18 th September 2018	18 th 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	13 th September 2018	9 th 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	12 th September 2018	12 th September 2018/ Construction of Road P2	Resident of Ocean Shores	Noise	Complained about the noise nuisance from piling works	Y	<p>Mitigation Measures adopted by the Contractor</p> <ul style="list-style-type: none"> ➤ 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
221	11 th September 2018	9 th September 2018/ Construction of Portion VII on TKO side	Public	Noise	Complained about the noise from broadcasting at barging point	Y	<p>The Contractor had implemented environmental mitigation measures in accordance with the “Implementation Schedule of Proposed Mitigation Measures” of EM&A Manual as follows:</p> <p style="text-align: center;"><u>Noise:</u></p> <p>Walkie-talkie was used instead of broadcasting to reduce the noise nuisance.</p>	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
220	11 th September 2018	26 th September 2018/ Lam Tin Interchange	Public	Noise	Complained about the construction noise	Y	➤ See Investigation / Mitigation Measures for Complaint No. 218	Closed
219	7 th September 2018	7 th September 2018/ Construction of Road P2	Resident of Ocean Shores	Noise	Complained about the noise from sheet piling	Y	<p>Mitigation Measures adopted by the Contractor</p> <ul style="list-style-type: none"> ➤ 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
218	6 th September 2018	6 th September 2018/ Construction in LTI	Public	Noise	Complained about noise nuisance in LTI	Y	<p>The Contractor had implemented environmental mitigation measures in accordance with the “Implementation Schedule of Proposed Mitigation Measures” of EM&A Manual as follows:</p> <p><u>Noise:</u></p> <ul style="list-style-type: none"> ➤ 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
217	5 th September 2018	5 th September 2018/ Construction of Road P2	Public	Air Quality	Complained about dark smoke emission from derrick barges.	N	<p>The Contractors has adopted the following environmental mitigation measures to reduce dark smoke nuisance from construction barges since June for dark smoke complaints:</p> <ul style="list-style-type: none"> ➤ 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	5 th September 2018	5 th 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	5 th September 2018	5 th September 2018/ Construction of Road P2	Public	Water Quality	Complained about the oil leakage within the cofferdam	N	<p>The Contractors had taken measures to clean up and prevent any further oil spillage for marine works in the future:</p> <ul style="list-style-type: none"> ➤ 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. <p>The Contractor had implemented environmental measures in accordance with the “Implementation Schedule of Proposed Mitigation Measures” of EM&A Manual as below:</p> <ul style="list-style-type: none"> ➤ Construction activities should not cause foam, oil, grease, scum, little or other objectionable matter to be present on the water within the site. <p>Standard good-site practice is adopted to prevent any fuels and solvent entering the nearby watercourses.</p>	Closed
214	4 th September 2018	4 th 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	<ul style="list-style-type: none"> ➤ 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
213	31 st August 2018	31 st 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	27 th August 2018	27 th 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	22 nd August 2018	22 nd 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
210	21 st August 2018	21 st 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
209	21 st August 2018	20 th & 21 st 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	<p>The Contractors had implemented environmental mitigation measures to reduce dark smoke nuisance from construction barges to the nearby sensitive receivers as follows:</p> <ul style="list-style-type: none"> ➤ 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
208	20 th August 2018	17 th August/ Construction of Road P2	DC Member	Water Quality	The complainant complained that muddy water was discharged from the construction site.	N	<p>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.</p> <p>Measure Taken by the Contractor</p> <p>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:</p> <ul style="list-style-type: none"> ➤ 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	18 th August 2018	18 th August 2018/ Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Air Quality	The complainant complained about dust nuisance from surface blasting.	N	<p>According to the EM&A Manual of this Project, regular air quality monitoring has been carried out at following Stations.</p> <p>AM2 – Sai Tso Wan Recreation Ground; AM3 Yau Lai Estate, Bik Lai House.</p> <p>No exceedance was recorded in the above station during August.</p> <p>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:</p> <ul style="list-style-type: none"> ➤ 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	13 th August 2018	13 th 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	10 th August 2018	10 th 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	9 th August 2018	9 th 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	<p>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.</p> <p>There was no exceedance recorded in the above station during daytime in August.</p>	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	9 th August 2018	9 th August 2018/ Construction of Lam Tin Interchange	Property Management of Tak Tin Estate	Noise	The complainant complained about the noise nuisance during 8pm	Y	<p>Mitigation Measures and Follow up Actions by Contractor</p> <p>The Contractor had implemented environmental mitigation measures in accordance with the “Implementation Schedule of Proposed Mitigation Measures” of EM&A Manual as follows:</p> <p>Noise:</p> <ul style="list-style-type: none"> ➤ 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 <p>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.</p> <p>There was no exceedance recorded in the above station during daytime in August.</p>	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	1 st August 2018	1 st 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: <ul style="list-style-type: none"> ➤ 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	26 th July 2018	26 th 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: <ul style="list-style-type: none"> ➤ Sandbags barrier was placed along the working area to prevent direct discharge 	Closed
200	26 th July 2018	26 th July 2018 / Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Follow up on 24 th July 2018, the situation has yet been addressed.	Y	See Investigation / Mitigation Measures for Complaint No. 197	Closed
200 199	24 th July 2018	23 rd 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

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
	25 th July 2018	25 th 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
198	21 st July 2018	21 st July 2018 / Construction of Road P2	SKDC member	Noise	The complainant complained about the noise from metal occasionally in the marine works area.	Y	<p>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.</p> <p>The Contractors had implemented environmental mitigation measures to reduce construction nuisance from construction activities to the nearby sensitive receivers as follows:</p> <p><u>Noise:</u></p> <ul style="list-style-type: none"> ➤ 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	21 st July 2018	21 st July 2018 / Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	The complainant complained about the noise nuisance from breaker.	Y	<p>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</p> <p>The Contractor had implemented environmental mitigation measures in accordance with the “Implementation Schedule of Proposed Mitigation Measures” of EM&A Manual as follows:</p> <ul style="list-style-type: none"> ➤ 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
196	20 th 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	<p>The Contractor had implemented environmental mitigation measures in accordance with the “Implementation Schedule of Proposed Mitigation Measures” of EM&A Manual as follows:</p> <ul style="list-style-type: none"> ➤ Blasting cage were surrounded with impervious material during surface blasting ➤ Water spraying was provided at the blasting cage to enhance dust suppression 	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
195	17 th July 2018	16 th 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	12 th July 2018	12 th 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	<p>The Contractor had implemented environmental mitigation measures in accordance with the “Implementation Schedule of Proposed Mitigation Measures” of EM&A Manual as follows:</p> <ul style="list-style-type: none"> ➤ 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	12 th July 2018	12 th 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	<p>According to the information provided and confirmed by the Engineer, loading and unloading of treated sediment was conducted in Work Area A.</p> <p>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</p> <p>The Contractors had implemented environmental mitigation measures to reduce dust nuisance from construction activities to the nearby sensitive receivers as follows:</p> <ul style="list-style-type: none"> ➤ Covered the stockpile of treated marine sediment with tarpaulin sheets 	Closed
192	23 rd July 2018	Not specified/ Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Follow up on the complaint on 27 th June, 2 nd and 3 rd July 2018, the complainant complained that the situation has not yet been addressed.	Y	<p>The Contractor had implemented environmental mitigation measures in accordance with the “Implementation Schedule of Proposed Mitigation Measures” of EM&A Manual as follows:</p> <ul style="list-style-type: none"> ➤ 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
192 191	3 rd July 2018	3 rd July 2018/ Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Follow up on the complaint on 27 th June, 2 nd 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.	Closed
	2 nd July 2018	2 nd July 2018/ Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Follow up on the complaint on 27 th June 2018, the complainant complained that the situation has not yet been addressed.	Y		Closed
	27 th June 2018	26 th and 27 th 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	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	Closed
	25 th June 2018	23 rd 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	➤ Additional water filter tank was adopted on deck level of derrick barges to reduce emission of dark smoke and exhaust smell	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	22 nd June 2018	Not Specific/ Construction of Lam Tin Interchange	Public	Waste Management	The complainant complaint about the housekeeping of the construction site.	N	<p>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.</p> <p>Despite, the Contractor was reminded to follow the relevant mitigation measures related to waste management:</p> <ul style="list-style-type: none"> ➤ 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	20 th June 2018	28 th 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	20 th June 2018	20 th June 2018/ Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	The complainant complained about construction noise starting from 6 am.	Y	<p>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)</p> <p>The Contractor had implemented environmental mitigation measures in accordance with the “Implementation Schedule of Proposed Mitigation Measures” of EM&A Manual as follows:</p> <ul style="list-style-type: none"> ➤ 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	7 th June 2018	7 th 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	<p>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.</p> <p>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.</p> <p>The Contractors had implemented environmental mitigation measures to minimize the air nuisance to the nearby sensitive receivers as follows: <u>Odour Emission from Exhausted Gas:</u></p> <ul style="list-style-type: none"> ➤ Additional water filter tank was adopted on the deck level of derrick barges to reduce emission of dark smoke and exhaust smell 	Closed
186	6 th June 2018	6 th 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
185	6 th June 2018	30 th May and 30 th 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	6 th June 2018	Not specified / Construction of Road P2	SKDC member	Landscape	The complainant complained about excessive tree felling near Ocean Shores.	N	<p>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.</p> <p>The Contractor had taken initiatives to minimize nuisance from construction works to the nearby sensitive receivers as follows:</p> <ul style="list-style-type: none"> ➤ 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	4 th June 2018	4 th 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	<p>The Contractor had implemented environmental mitigation measures in accordance with the “Implementation Schedule of Proposed Mitigation Measures”</p> <ul style="list-style-type: none"> ➤ 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	1 st June 2018	Not specified/ Construction of Lam Tin Interchange	Sin Fat Road Tennis Court	Air Quality	The complainant complained about the dust	N	<p>The Contractor had taken initiatives to minimize nuisance from construction works to the nearby sensitive receivers as follows:</p> <ul style="list-style-type: none"> ➤ 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

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
181	29 th May 2018	Not specified/ Construction of Road P2	Public	Air Quality	The complainant complained about the black smoke emission from the construction vessel.	N	<p>According to the information provided and confirmed by the Engineer, dredging and placing rock fill material were conducted during the time of complaint.</p> <p>The Contractors had implemented environmental mitigation measures to reduce construction nuisance from construction activities to the nearby sensitive receivers as follows: <u>Air Quality:</u></p> <p>As confirmed by the Engineer, the concerned s removed off site for further maintenance; Additional water filter tank was adopted to mission of dark smoke and exhaust.</p> <p>The Engineer and the Environmental Team have reminded the Contractor to properly implement mitigation measures to effectively minimize construction nuisance caused by the construction works to the nearby residents.</p>	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
180	25 th May 2018	24 th May 2018/ Construction of Road P2	SKDC member Mr. Cheung Chin Pang	Odour	The complainant complained about smell of exhaust gas affecting high level residents (60/F and above) of Metrotown Tower 10.	N	<p>According to the information provided and confirmed by the Engineer, modification of temporary marine platform and welding works were conducted during the time of complaint.</p> <p>The Contractors had implemented environmental mitigation measures to reduce construction nuisance from construction activities to the nearby sensitive receivers as follows: <u>Air Quality:</u></p> <p>Additional water filter tank was adopted to mission of dark smoke and exhaust.</p> <p>The Engineer and the Environmental Team have reminded the Contractor to properly implement mitigation measures to effectively minimize construction nuisance caused by the construction works to the nearby residents.</p>	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
179	24 th May 2018	24 th May 2018/ Construction of Northern footbridge, Road P2/D4 and Road P2	Public	Air Quality	The complainant complained construction dust generated from the CEDD construction works site between Tong Yin Street and Tiu Keng Leng Sport Centre (Po Yap Road) as a result of insufficient dust suppression measures	N	<p>According to the information provided and confirmed by the Engineer, construction works including steel bar fixing, scaffolding, trimming formation level, compaction, removal of road marking and handling of treated sediment were conducted during the time of complaint.</p> <p>As shown in the Air Quality Monitoring Results, no Action/ Limit Level Exceedance was recorded at Station AM5(A) and AM6(A) in May 2018. It is considered that no adverse construction dust impact was brought to the nearby sensitive receivers during the construction period of this Project</p> <p>The Contractors had implemented environmental mitigation measures to reduce construction nuisance from construction activities to the nearby sensitive receivers as follows: watering was provided at least 8 times a day; near public access was hard paved; the ground in Work Area A was covered except the operating area</p> <p>The Engineer and the Environmental Team have reminded the Contractor to properly implement mitigation measures to effectively minimize construction nuisance caused by the construction works to the nearby residents.</p>	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
178	23 rd May 2018	22 nd May 2018/ Construction of TKO Portal	Public	N/A	The complainant complained construction works was carried out on 22 May (which was a public holiday) around 1500 hour at the sea area near Ocean shore Block 2.	N	<p>According to the information provided and confirmed by the Engineer, modification of temporary marine platform and welding works were conducted during the time of complaint.</p> <p>One valid Construction Noise Permit (CNP) (No. GE-RE0309-18) was granted to the Contractor (Leighton – China State Joint Venture) (Contract No. NE/2015/01) for the marine construction site near Ocean Shores. According to the CNP, Group O to T of the PME listed in condition 3.a. are allowed to operate during general holiday (including Sunday) from 0900 – 2300 hours.</p> <p>As confirmed by the Engineer, only a group of PME (listed in Group Q) was operated during the time of complaint. No welding machine was operated in Zone A. No derrick barge and flat top barge were operated beyond Zone C.</p> <p>The Contractors had implemented environmental mitigation measures to reduce construction nuisance from construction activities to the nearby sensitive receivers as follows:</p> <p><u>Noise:</u></p> <p>Preinstalled speaker was used on derrick barge to minimize the noise disturbance from on-site communication.</p> <p>The Engineer and the Environmental Team have reminded the Contractor to properly implement mitigation measures to effectively minimize construction nuisance caused by the construction works to the nearby residents.</p>	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
177	22 nd May 2018	Not specified/ Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Air Quality & Noise	The complainant complained about the dust nuisance and construction noise at Lam Tin Interchange	Y	<p>According to the Engineer's Site Diaries, the major construction activities performed in May 2018 included rock breaking, drilling and excavation at Lam Tin Interchange. Construction works for night-time included blasting and excavation.</p> <p>According to the EM&A Manual of this Project, regular air quality monitoring has been carried out at Station AM2 – Sai Tso Wan Recreation Ground and AM3 – Yau Lai Estate, Bik Lai House. Based on the Air Quality Monitoring Results which conducted by ET, no Action or Limit Level Exceedance was recorded at Station AM2 and AM3. It is considered that no adverse air quality impact was brought to the nearby sensitive receivers during the time of complaint.</p> <p>The Contractor had implemented environmental mitigation measures in accordance with the "Implementation Schedule of Proposed Mitigation Measures" of EM&A Manual as follows:</p> <p><u>Air Quality:</u></p> <p>water spraying on unpaved area and haul roads at Lam change</p> <p>Noise:</p> <ul style="list-style-type: none"> ➤ 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 ➤ Erected movable cantilever noise barriers and the breaker head was wrapped with Silent Mat and TMD; ➤ Powered mechanical equipment (PME) for rock breaking were equipped with TMD and SilentMat ➤ Drill rig was covered with Silent Mat and 	Closed
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Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
176	21 st May 2018	21 st May 2018/ Construction of Road P2	Public	Air Quality	The complainant complained about dust/dirt being brought onto Tong Yin Street by the vehicles travelling to and from TKO-LTT construction site, causing dust problem and air nuisance.	N	<p>According to the information confirmed by the Engineer, all dump trucks were covered and wheel washed before leaving the works site on 21 May 2018.</p> <p>As shown in the Air Quality Monitoring Results, no Action/ Limit Level Exceedance was recorded at Station AM5(A) and AM6(A) in May 2018. It is considered that no adverse construction dust impact was brought to the nearby sensitive receivers during the construction period of this Project</p> <p>The Contractors had implemented environmental mitigation measures to minimize the noise nuisance to the nearby noise sensitive receivers as follows: raying was provided at least 8 times a day. ashing truck would be provided once a week to clean the he public street. al notice would be set up to remind the truck driver to wheel-washing properly before leaving site. d staff at the access to check the dump trucks to ensure o truck are properly covered and wheel-washed before site.</p> <p>The Engineer and the Environmental Team have reminded the Contractor to properly implement mitigation measures to effectively minimize construction nuisance caused by the construction works to the nearby residents.</p>	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
175	19 th May 2018	Not specified/ Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	The complainant complained the noise nuisance due to the construction work at Lam Tin Interchange during nighttime.	Y	See Investigation / Mitigation Measures for Complaint No. 160.	Closed
174	19 th May 2018	Not specified/ Construction of Lam Tin Interchange	Resident of Hong Pak Court	Noise	The complainant complained the noise nuisance due to the construction work at Lam Tin Interchange during nighttime.	Y	See Investigation / Mitigation Measures for Complaint No. 160.	Closed
173	16 th May 2018	Not specified/ Construction of Lam Tin Interchange	Resident of Hong Nga Court,	Noise	The complainant complained the noise nuisance due to the construction work at Lam Tin Interchange during night-time.	Y	See Investigation / Mitigation Measures for Complaint No. 160.	Closed
172	15 th May 2018	Not specified/ Construction of Lam Tin Interchange	Resident of Hong Pak Court	Noise	The complainant complained the noise nuisance during night time blasting works at the Lam Tin Interchange.	Y	See Investigation / Mitigation Measures for Complaint No. 165.	Closed
171	15 th May 2018	Not specified/ Construction of Lam Tin Interchange	Resident of Yau Lai Estate, Bik Lai Estate	Noise	The complainant complained the noise nuisance during night time blasting works at the Lam Tin Interchange.	Y	See Investigation / Mitigation Measures for Complaint No. 165.	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
170	15 th May 2018	Not specified/ Construction site near Cha Kwo Ling Tsuen	Anonymous	Noise	The complainant complained the noise nuisance due to the construction work near Cha Kwo Ling Tsuen during night-time.	Y	See Investigation / Mitigation Measures for Complaint No. 165.	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
169	14 th May 2018	Not specified/ Construction of Lam Tin Interchange	Kowloon East District Council Member Mr. Tam Man Ho	Noise	The complainant complained the noise nuisance due to the construction work and night time blasting works at the Lam Tin Interchange.	Y	<p>According to the latest CNMP of this Contract, the subgroups of work activities undertaken near noise sensitive receivers in the reporting period: The construction activities of Lam Tin Interchange (Work site No.101) on 14th of May 2018 possessed of 6 no. of breakers, excavator mounted which were consistent with the quantities of breaker in the Construction Noise Mitigation Plan (Construction Activity Group1.1)</p> <p><u>Noise:</u></p> <p>Installed steel-type blasting door mounted and absorptive lining to absorb construction noise in the</p> <p>Erected movable cantilever noise barriers and er head was wrapped with Silent Mat and TMD;</p> <p>Powered mechanical equipment (PME) for taking were equipped with TMD and SilentMat;</p> <p>As shown by the Noise Monitoring Results conducted by ET, no Limit Level Exceedance was recorded at Station CM1, CM2, CM3 and CM4. The summary of noise monitoring results which conducted by ETL in May 2018 at Station CM1, CM2, CM3 and CM4.</p> <p>The environmental conditions of the site and the control of works will be continuously reviewed and monitored by the Engineer and the Environmental Team.</p>	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
168	14 th May 2018	Not specified/ Construction of Lam Tin Interchange	Resident of Yau Lai Estate, Yung Lai House	Noise	The complainant complained the noise nuisance due to the construction work at Lam Tin Interchange during night-time.	Y	See Investigation / Mitigation Measures for Complaint No. 165.	Closed
167	13 th May 2018	Not specified/ Construction of Lam Tin Interchange	Resident of Hong Nga Court, Chung Pak House	Noise	The complainant complained the noise nuisance due to the construction work on Sunday morning and night time blasting works at the Lam Tin Interchange.	Y	See Investigation / Mitigation Measures for Complaint No. 165.	Closed
166	13 th May 2018	Not specified/ Construction of Lam Tin Interchange	Resident of Hong Pak Court	Noise	The complainant complained the noise nuisance due to the construction work at around 5:00 am and night time blasting works at the Lam Tin Interchange.	Y	See Investigation / Mitigation Measures for Complaint No. 165.	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
165	13 th May 2018	13 th May 2018/ Construction of Lam Tin Interchange	Property Management Office of Hong Nga Court	Noise	The complainant complained the noise nuisance due to the construction work at Lam Tin Interchange on 13 th May 2018 (Sunday morning).	Y	<p>A valid Construction Noise Permit (CNP) (No. GW-RE0278-18) was granted to the Contractor for the construction site at Lam Tin Interchange (location of construction site is shown in Figure 1). According to the conditions in the CNP, only one group among Group A to R of the powered mechanical equipment is allowed to be operated during 0800-2300 hours on general holidays (including Sundays); and 1900-2300 hours on any day not being a general holiday. The number of excavators, dump trucks, craned lorry and breakers that were used on 13th, 14th, 15th & 22nd of May were covered by the CNP.</p> <p>Other good site practices recommended in the “Implementation Schedule of Proposed Mitigation Measures” of EM&A Manual and the Noise Mitigation Plan of this Contract had been implemented by the Contractor, including the following:</p> <ul style="list-style-type: none"> • Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program; • Mobile plant, if any, should be sited as far away from NSRs as possible; • Plants known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs <p>As shown by the Noise Monitoring Results conducted by ET, no Limit Level Exceedance was recorded at Station CM1, CM2, CM3 and CM4. The summary of noise monitoring results which conducted by ETL in May 2018 at Station CM1, CM2, CM3 and CM4.</p>	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
164	12 th May 2018	12 th May 2018/ Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	The complainant complained the noise nuisance during night time blasting works at the Lam Tin Interchange.	Y	See Investigation / Mitigation Measures for Complaint No. 160.	Closed
163	12 th May 2018	Not specified/ Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	The complainant complained the noise nuisance due to the construction work at Lam Tin Interchange.	Y	See Investigation / Mitigation Measures for Complaint No. 160.	Closed
162	11 th May 2018	Not specified/ Construction of Lam Tin Interchange	Resident of Lung Pak House	Noise	The complainant complained the noise nuisance during night time blasting works at the Lam Tin Interchange.	Y	See Investigation / Mitigation Measures for Complaint No. 160.	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	12	0	0

Reporting Month	Number of Complaints in Reporting Month	Number of Summons in Reporting Month	Number of Prosecutions in Reporting Month
December 2018	9	0	0
January 2019	39	0	0
February 2019	20	0	0
March 2019	25	0	0
April 2019	13	0	0
Total	350	1	1

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	KTS2 4138/ 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	KTS2 4138/ 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**



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				
	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	0.333	0.000	0.000	0.088
March	147.872	85.219	0.000	85.219	62.653	0.000	0.000	0.000	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											
June											
Sub-total	472.152	275.356	0.000	309.664	162.487	0.000	0.000	0.754	0.000	2.400	0.431
July											
August											
September											
October											
November											
December											
Total	472.152	275.356	0.000	309.664	162.487	0.000	0.000	0.754	0.000	2.400	0.431

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

Name of Department: Civil Engineering Development Department

Contract No.: NE/2015/01



- 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/m³; soil = 2.0 tonnes/m³
 - (7) excavated: rock = 2.0 tonnes/m³; soil = 1.8 tonnes/m³; broken concrete and bitumen = 2.4 tonnes/m³, soil and rock = 1.9 tonnes/m³
 - (8) C&D Waste = 0.9 tonnes/m³; bentonite slurry = 2.8 tonnes/m³
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	162.89065	0.00000	0.00000	0.00000	2.04236	160.84829	0.00000	0.00000	0.00000	0.00000	0.03052
May											
June											
SUB-TOTAL	277.44879	0.00000	1.82964	0.00000	9.38048	266.23867	159.30000	0.00000	0.00000	4.83000	0.17460
Jul											
Aug											
Sep											
Oct											
Nov											
Dec											
TOTAL	277.44879	0.00000	1.82964	0.00000	9.38048	266.23867	159.30000	0.00000	0.00000	4.83000	0.17460

Note: Conversion to 1000m³ for general refuse is weight in 1000kg multiply by 0.002

Conversion to 1000m³ 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 (in '000m ³)	Broken Concrete (see Note 1) (in '000m ³)	Reused in the Contract (in '000m ³)	Reused in other Projects (in '000m ³)	Disposed as Public Fill (in '000m ³)	Metals (in '000 Kg)	Paper/ cardboard packaging (in '000 Kg)	Plastics (see Note 2) (in '000 Kg)	Chemical Waste (in '000 Kg)	Others, e.g. general refuse (in '000m ³)
		(in '000m ³)						(in '000 Kg)		
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
Sub-total	1.0269	0	0	0	1.0269	0	0	0	0	0.0260
May	0	0	0	0	0	0	0	0	0	0
Jun	0	0	0	0	0	0	0	0	0	0
Jul	0	0	0	0	0	0	0	0	0	0
Aug	0	0	0	0	0	0	0	0	0	0
Sept	0	0	0	0	0	0	0	0	0	0
Oct	0	0	0	0	0	0	0	0	0	0
Nov	0	0	0	0	0	0	0	0	0	0
Dec	0	0	0	0	0	0	0	0	0	0
Total	1.0269	0	0	0	1.0269	0	0	0	0	0.0260

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.



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											
Jun											
Sub-total	0	0	0	0	0	0	0	0	0	0	0.018
Jul											
Aug											
Sep											
Oct											
Nov											
Dec											
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 6m³ of general refuse.
 - (4) The commencement date of the Contract is 9 November 2018. The current reporting period is from 1 April 2019 to 30 April 2019.

Name of Department : CEDD

Contract No. : NE/2015/03

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 (in '000 m ³)	Hard Rock & Large Broken Concrete (in '000 m ³)	Reused in the Contract (in '000 m ³)	Reused in other Projects (in '000 m ³)	Disposed as Public Fill (in '000 m ³)	Imported Fill (in '000 m ³)	Metals (in '000 kg)	Paper/ cardboard packaging (in '000 kg)	Plastics (see Note 3) (in '000 kg)	Chemicals Waste (in '000 kg)	Others, e.g. general refuse (in '000 m ³)
Accumulated From 2018	1.234385	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	0.0125	0	0	0	0.0125	0	0	0	0	0	0
May											
June											
Sub-total											
July											
Aug											
Sept											
Oct											
Nov											
Dec											
Total	0.02012	0	0.17365	0.427405	0.02012	0.03056	0	0	0	0	0.038188

- 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											
Jun											
Sub-total	0.1620	0.0000	0.0000	0.1200	0.0420	0.0000	0.0000	0.0000	0.0000	0.0000	0.0050
Jul											
Aug											
Sep											
Oct											
Nov											
Dec											
Total	0.1620	0.0000	0.0000	0.1200	0.0420	0.0000	0.0000	0.0000	0.0000	0.0000	0.0050

- Notes:
1. Assume the density of soil fill is 2 ton/m³.
 2. Assume the density of rock and broken concrete is 2.5 ton/m³.
 3. Assume the density of mixed rock and soil is 1.9 ton/m³.
 4. Assume the density of slurry and bentonite is 2.8 ton/m³.
 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/m³.
 7. The non-inert C&D wastes are disposed at NENT.

**APPENDIX Q
TENTATIVE CONSTRUCTION
PROGRAMME**

High Level 3 Months Look Ahead Programme

Activities	May-19	Jun-19	Jul-19
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			
Steel Platform for Bridge Construction			
Cavern Excavation			

Activity ID	Activity Name	Calendar	Actual Duration	Original Duration	Remaining Dur	Start	Finish	Total Float	Activity Complete	2019	Mar	Apr	May	Jun
NE/2015/02 Tseung Kwan O - Lam Tin Tunnel-Road P2 (Apr-19) F														
Area Handover Date														
A10660	Area C	P2-Cal.A	0	0	0	30-Jun-19	30-Jun-19	0	0%					
A10700	Area X (Additional Works Area)	P2-Cal.A	0	0	0	30-Jun-19	30-Jun-19	0	0%					
Preliminaries, Submission, Contractor's Design Submission and														
General Submission and Acceptance														
S10240	Prepare/Submit the Weather Protection Scheme	P2-Cal.A	607	30	16	21-Aug-17 A	05-May-19	605	46.67%				Prepare/Submit the Weather Protection Scheme	
Contractor's Design Submission and Acceptance														
Foundation Design														
AIP Submission for Foundation of Road P2 Structure (Reclaimed Section) Zone 2 (S2)														
S11270-06	Review and Accept AIP Submission for Foundation of Road P2 Structure (Reclaimed Section Zone 2)	P2-Cal.A	31	21	16	20-Mar-19 A	05-May-19	-42	23.81%				Review and Accept AIP Submission for Foundation of Road P2 Structure (Reclaimed Section Zone 2)	
DDA Submission for Foundation of Road P2 Structure (Reclaimed Section) Zone 1 C'														
S11360	Prepare and Submit DDA Submission for Foundation of Road P2 Structure (Reclaimed Section Zone 1)	P2-Cal.A	46	21	21	05-Mar-19 A	10-May-19	-81	0%				Prepare and Submit DDA Submission for Foundation of Road P2 Structure (Reclaimed Section Zone 1)	
S11380	Review and Discuss DDA Submission for Foundation of Road P2 Structure (Reclaimed Section Zone 1)	P2-Cal.A	0	21	21	11-May-19	31-May-19	-81	0%				Review and Discuss DDA Submission for Foundation of Road P2 Structure (Reclaimed Section Zone 1)	
S11400	Resubmit DDA Submission for Foundation of Road P2 Structure (Reclaimed Section Zone 1)	P2-Cal.A	0	14	14	01-Jun-19	14-Jun-19	-81	0%				Resubmit DDA Submission for Foundation of Road P2 Structure (Reclaimed Section Zone 1)	
S11410	Review and comment by Hyd	P2-Cal.A	0	14	14	15-Jun-19	28-Jun-19	-81	0%				Review and comment by Hyd	
S11420	Review and Accept DDA Submission for Foundation of Road P2 Structure (Reclaimed Section Zone 1)	P2-Cal.A	0	21	21	29-Jun-19	19-Jul-19	-81	0%				Review and Accept DDA Submission for Foundation of Road P2 Structure (Reclaimed Section Zone 1)	
DDA Submission for Foundation of Road P2 Structure (Reclaimed Section) Zone 2 (S)														
S11426	Resubmit DDA Submission for Foundation of Road P2 Structure (Reclaimed Section Zone 2)	P2-Cal.A	71	14	7	08-Feb-19 A	26-Apr-19	-42	50%				Resubmit DDA Submission for Foundation of Road P2 Structure (Reclaimed Section Zone 2)	
S11428	Review and comment by Hyd	P2-Cal.A	31	14	14	20-Mar-19 A	10-May-19	-42	0%				Review and comment by Hyd	
S11430	Review and Accept DDA Submission for Foundation of Road P2 Structure (Reclaimed Section Zone 2)	P2-Cal.A	17	21	21	03-Apr-19 A	31-May-19	-42	0%				Review and Accept DDA Submission for Foundation of Road P2 Structure (Reclaimed Section Zone 2)	
DDA Submission for Foundation of Road P2 Structure (Reclaimed Section) Zone 3 (P)														
S11438	Review and comment by Hyd	P2-Cal.A	182	14	4	20-Oct-18 A	23-Apr-19	-4	71.43%				Review and comment by Hyd	
E&M Design														
Statutory Approval for E&M Works														
S11570-11	FSD Approval for Underpass GBP	P2-Cal.A	0	0	0	12-Jun-19	12-Jun-19	630	0%					◆ FSD Approval for Underpass GBP
S11570-12	FSD Approval for Plant room GBP	P2-Cal.A	0	0	0	12-Jun-19	12-Jun-19	630	0%					◆ FSD Approval for Plant room GBP
Detail Design for E&M Works (Tunnel and associated)														
MVAC Detail Design														
Plantroom														
S11577	Formal Submission to Supervisor	P2-Cal.A	351	8	11	04-May-18 A	30-Apr-19	658	0%				Formal Submission to Supervisor	
S11578	Accept detail design by the Supervisor	P2-Cal.A	52	7	15	27-Feb-19 A	15-May-19	658	0%				Accept detail design by the Supervisor	
Underpass														
S11630	Formal Submission to Supervisor	P2-Cal.A	357	8	11	28-Apr-18 A	30-Apr-19	666	0%				Formal Submission to Supervisor	
S11640	Accept detail design by the Supervisor	P2-Cal.A	66	7	7	13-Feb-19 A	07-May-19	666	0%				Accept detail design by the Supervisor	
FS Detail Design														
Underpass														
S11649	FSD review GBP	P2-Cal.A	548	28	7	19-Oct-17 A	26-Apr-19	630	75%				FSD review GBP	

- Actual Work
- Remaining Work
- Critical Remaining Work

Program with Progress as of 20-Apr-19

3 Month Rolling Programme
(Data Date : 20 Apr 2019)

Date	Revision	Checked	Approved
20-apr-19			

Activity ID	Activity Name	Calendar	Actual Duration	Original Duration	Remaining Dur	Start	Finish	Total Float	Activity Complete	2019			
										Mar	Apr	May	Jun
S11650-01	2nd review by EMSD	P2-Cal.A	397	15	10	19-Mar-18 A	06-May-19	630	33.33%				2nd review by EMSD
S11651	Accept detail design by the Supervisor	P2-Cal.A	0	7	7	07-May-19	13-May-19	630	0%				Accept detail design by the Supervisor
Plantroom													
S11652-10	FSD review GBP	P2-Cal.A	548	28	7	19-Oct-17 A	26-Apr-19	630	75%				FSD review GBP
S11652-21	2nd review by FSD/EMSD	P2-Cal.A	397	15	10	19-Mar-18 A	06-May-19	630	33.33%				2nd review by FSD/EMSD
S11652-23	Accept detail design by the Supervisor	P2-Cal.A	0	7	7	07-May-19	13-May-19	630	0%				Accept detail design by the Supervisor
Plumbing and Drainage Detail Design													
Underpass													
S11657	1st review by HyD/EMSD	P2-Cal.A	376	15	3	09-Apr-18 A	22-Apr-19	326	80%				1st review by HyD/EMSD
S11657-01	2nd review by HyD/EMSD	P2-Cal.A	0	15	15	23-Apr-19	07-May-19	326	0%				2nd review by HyD/EMSD
S11658	Formal Submission to Supervisor	P2-Cal.A	0	7	7	08-May-19	14-May-19	326	0%				Formal Submission to Supervisor
S11659	Accept detail design by the Supervisor	P2-Cal.A	0	7	7	15-May-19	21-May-19	326	0%				Accept detail design by the Supervisor
Plantroom													
S11660-07	Design Coordination for PD Services	P2-Cal.A	749	60	7	01-Apr-17 A	26-Apr-19	324	88.33%				Design Coordination for PD Services
S11660-09	2nd review by HyD/EMSD	P2-Cal.A	338	15	13	17-May-18 A	09-May-19	324	13.33%				2nd review by HyD/EMSD
S11660-10	Formal Submission to Supervisor	P2-Cal.A	0	7	7	10-May-19	16-May-19	324	0%				Formal Submission to Supervisor
S11660-11	Accept detail design by the Supervisor	P2-Cal.A	0	7	7	17-May-19	23-May-19	324	0%				Accept detail design by the Supervisor
Electrical Detail Design													
Underpass Lighting													
S11660-17	2nd review by EMSD/HyD	P2-Cal.A	288	15	2	06-Jul-18 A	21-Apr-19	668	86.67%				2nd review by EMSD/HyD
S11660-19	Formal Submission to Supervisor	P2-Cal.A	0	7	7	22-Apr-19	28-Apr-19	668	0%				Formal Submission to Supervisor
S11660-20	Accept detail design by the Supervisor	P2-Cal.A	0	7	7	29-Apr-19	05-May-19	668	0%				Accept detail design by the Supervisor
External Road Lighting													
S11660-25	2nd review by EMSD/CLP/ HyD	P2-Cal.A	288	15	5	06-Jul-18 A	24-Apr-19	477	66.67%				2nd review by EMSD/CLP/ HyD
S11660-27	Formal Submission to Supervisor	P2-Cal.A	0	7	7	25-Apr-19	01-May-19	477	0%				Formal Submission to Supervisor
S11660-28	Accept detail design by the Supervisor	P2-Cal.A	0	7	7	02-May-19	08-May-19	477	0%				Accept detail design by the Supervisor
Plantroom													
S11666	2nd review by EMSD/HyD	P2-Cal.A	288	15	5	06-Jul-18 A	24-Apr-19	477	66.67%				2nd review by EMSD/HyD
S11667	Formal Submission to Supervisor	P2-Cal.A	0	7	7	25-Apr-19	01-May-19	477	0%				Formal Submission to Supervisor
S11668	Accept detail design by the Supervisor	P2-Cal.A	0	7	7	02-May-19	08-May-19	477	0%				Accept detail design by the Supervisor
ELV And SCADA Detail Design													
Underpass													
S11669-19	2nd review by EMSD	P2-Cal.A	303	15	5	21-Jun-18 A	24-Apr-19	582	66.67%				2nd review by EMSD
S11669-29	Formal Submission to Supervisor	P2-Cal.A	0	7	7	25-Apr-19	01-May-19	582	0%				Formal Submission to Supervisor
S11669-30	Accept detail design by the Supervisor	P2-Cal.A	0	7	7	02-May-19	08-May-19	582	0%				Accept detail design by the Supervisor
Plantroom													
S11670-19	2nd review by EMSD	P2-Cal.A	303	15	5	21-Jun-18 A	24-Apr-19	582	66.67%				2nd review by EMSD
S11670-29	Formal Submission to Supervisor	P2-Cal.A	0	7	7	25-Apr-19	01-May-19	582	0%				Formal Submission to Supervisor

■ Actual Work ◆ ◆ M
■ Remaining Work
■ Critical Remaining Work

Program with Progress as of 20-Apr-19

3 Month Rolling Programme
(Data Date : 20 Apr 2019)

Page : 2 of 14

Date	Revision	Checked	Approved
20-apr-19			

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										Mar	Apr	May	Jun	
S11670-30	Accept detail design by the Supervisor	P2-Cal.A	0	7	7	02-May-19	08-May-19	582	0%				Accept detail design by the Supervisor	
Design of Architectural Finishes for Internal Walls of U-Trough Structures														
S11675	Prepare and Submit Design of Architectural Finishes for Internal Walls of U-Trough Structures (VE and PC Panel)	P2-Cal.A	217	279	67	15-Sep-18 A	25-Jun-19	59	47.62%				Prepare and Submit Design of Architectural Finishes for Internal Walls of U-Trough Structures (VE and PC Panel)	
S11680	Review and Discuss Design of Architectural Finishes for Internal Walls of U-Trough Structures (VE and PC Panel)	P2-Cal.A	0	21	21	01-May-19	21-May-19	59	0%				Review and Discuss Design of Architectural Finishes for Internal Walls of U-Trough Structures (VE and PC Panel)	
S11700	Resubmit Design of Architectural Finishes for Internal Walls of U-Trough Structures (VE and PC Panel)	P2-Cal.A	0	14	14	22-May-19	04-Jun-19	59	0%				Resubmit Design of Architectural Finishes for Internal Walls of U-Trough Structures (VE and PC Panel)	
S11720	Review and Accept Design of Architectural Finishes for Internal Walls of U-Trough Structures (VE and PC Panel)	P2-Cal.A	0	21	21	05-Jun-19	25-Jun-19	59	0%				Review and Accept Design of Architectural Finishes for Internal Walls of U-Trough Structures (VE and PC Panel)	
Irrigation System														
S11788	Prepare & Submission of Form 542	P2-Cal.A	0	14	14	20-Apr-19	03-May-19	44	0%				Prepare & Submission of Form 542	
S11789	Reviewed by WSD	P2-Cal.A	0	28	28	04-May-19	31-May-19	44	0%				Reviewed by WSD	
S11790	Formal Submission to Supervisor	P2-Cal.A	0	14	14	01-Jun-19	14-Jun-19	44	0%				Formal Submission to Supervisor	
S11800	Review and Accept Submission for Waterpoints and associated elements	P2-Cal.A	0	21	21	15-Jun-19	05-Jul-19	44	0%				Review and Accept Submission for Waterpoints and associated elements	
Contractor Cost Saving Design														
AIP Submission for CSD3(B) of Reclaimed Section (S200 CH821 - P2 CH105)														
S17988	Review and AIP Submission for CSD of Reclaimed Section (S200 CH821 - P2 CH105)	P2-Cal.A	30	28	28	21-Mar-19 A	17-May-19	-26	0%				Review and AIP Submission for CSD of Reclaimed Section (S200 CH821 - P2 CH105)	
S18008	Review and Accept AIP Submission for CSD of Reclaimed Section by HyD (S200 CH821 - P2 CH105)	P2-Cal.A	30	28	28	21-Mar-19 A	17-May-19	-37	0%				Review and Accept AIP Submission for CSD of Reclaimed Section by HyD (S200 CH821 - P2 CH105)	
DDA Submission for CSD3(A) of Reclaimed Section (P2 CH105 - P2 CH305)														
S11975	Prepare and Submit DDA Submission for CSD of Reclaimed Section (P2 CH105 - P2 CH305)	P2-Cal.A	0	21	21	20-Apr-19	10-May-19	-20	0%				Prepare and Submit DDA Submission for CSD of Reclaimed Section (P2 CH105 - P2 CH305)	
S11976	Review and Discuss DDA Submission for CSD of Reclaimed Section (P2 CH105 - P2 CH305)	P2-Cal.A	0	21	21	11-May-19	31-May-19	-20	0%				Review and Discuss DDA Submission for CSD of Reclaimed Section (P2 CH105 - P2 CH305)	
S11977	Resubmit DDA Submission for CSD of Reclaimed Section (P2 CH105 - P2 CH305)	P2-Cal.A	0	14	14	01-Jun-19	14-Jun-19	-20	0%				Resubmit DDA Submission for CSD of Reclaimed Section (P2 CH105 - P2 CH305)	
S11978	Review and Accept DDA Submission for CSD of Reclaimed Section by CEDD (P2 CH105 - P2 CH305)	P2-Cal.A	0	21	21	15-Jun-19	05-Jul-19	-18	0%				Review and Accept DDA Submission for CSD of Reclaimed Section by CEDD (P2 CH105 - P2 CH305)	
S11979	Review and Accept DDA Submission for CSD of Reclaimed Section by HyD (P2 CH105 - P2 CH305)	P2-Cal.A	0	28	28	15-Jun-19	12-Jul-19	-20	0%				Review and Accept DDA Submission for CSD of Reclaimed Section by HyD (P2 CH105 - P2 CH305)	
AIP Submission for CSD3(A) of Reclaimed Section (P2 CH105 - P2 CH305)														
S11974	Review and Accept AIP Submission for CSD of Reclaimed Section by HyD (P2 CH105 - P2 CH305)	P2-Cal.A	182	28	10	20-Oct-18 A	29-Apr-19	-30	64.29%				Review and Accept AIP Submission for CSD of Reclaimed Section by HyD (P2 CH105 - P2 CH305)	
S11973-04	Review and Accept AIP Submission for CSD of Reclaimed Section (P2 CH105 - P2 CH305)	P2-Cal.A	18	21	6	02-Apr-19 A	25-Apr-19	-26	71.43%				Review and Accept AIP Submission for CSD of Reclaimed Section (P2 CH105 - P2 CH305)	
DDA Submission for CSD3(B) of Reclaimed Section (S200 CH821 - P2 CH105)														
S18028	Prepare and Submit DDA Submission for CSD of Reclaimed Section (S200 CH821 - P2 CH105)	P2-Cal.A	0	21	21	07-May-19	27-May-19	-37	0%				Prepare and Submit DDA Submission for CSD of Reclaimed Section (S200 CH821 - P2 CH105)	
S18048	Review and Discuss DDA Submission for CSD of Reclaimed Section (S200 CH821 - P2 CH105)	P2-Cal.A	0	21	21	28-May-19	17-Jun-19	-37	0%				Review and Discuss DDA Submission for CSD of Reclaimed Section (S200 CH821 - P2 CH105)	
S18068	Resubmit DDA Submission for CSD of Reclaimed Section (S200 CH821 - P2 CH105)	P2-Cal.A	0	14	14	18-Jun-19	01-Jul-19	-37	0%				Resubmit DDA Submission for CSD of Reclaimed Section (S200 CH821 - P2 CH105)	
S18088	Review and Accept DDA Submission for CSD of Reclaimed Section by CEDD (S200 CH821 - P2 CH105)	P2-Cal.A	0	21	21	02-Jul-19	22-Jul-19	-35	0%				Review and Accept DDA Submission for CSD of Reclaimed Section by CEDD (S200 CH821 - P2 CH105)	
S18108	Review and Accept DDA Submission for CSD of Reclaimed Section by HyD (S200 CH821 - P2 CH105)	P2-Cal.A	0	28	28	02-Jul-19	29-Jul-19	-37	0%				Review and Accept DDA Submission for CSD of Reclaimed Section by HyD (S200 CH821 - P2 CH105)	
Major Temporary Works Design														
ELS Design for U-Trough A & B within the Reclaimed Section (S200 CH 821 - CH 755)														
S12620	Prepare and Submit ELS Design for U-Trough A & B within the Reclaimed Section (S200 CH 821 - CH 755)	P2-Cal.A	0	18	18	10-Jul-19	27-Jul-19	-81	0%				Prepare and Submit ELS Design for U-Trough A & B within the Reclaimed Section (S200 CH 821 - CH 755)	
Major Construction Works Method Statement														
Removal of Temporary Steel Cofferdam														
S13810	Prepare and Submit Method Statement for Removal of Temporary Steel Cofferdam (type 1)	P2-Cal.A	0	18	18	20-Apr-19	07-May-19	-86	0%				Prepare and Submit Method Statement for Removal of Temporary Steel Cofferdam (type 1)	
S13814	Prepare and Submit Method Statement for Removal of Temporary Steel Cofferdam (type 2)	P2-Cal.A	0	18	18	20-Apr-19	07-May-19	-86	0%				Prepare and Submit Method Statement for Removal of Temporary Steel Cofferdam (type 2)	
S13818-1	Prepare and Submit Method Statement for Removal of Temporary Steel Cofferdam (type 3)	P2-Cal.A	0	18	18	20-Apr-19	07-May-19	-64	0%				Prepare and Submit Method Statement for Removal of Temporary Steel Cofferdam (type 3)	

█ Actual Work ◆ ◆ M
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										Mar	Apr	May	Jun
S13811	Review and Discuss Method Statement for Removal of Temporary Steel Cofferdam (type 1)	P2-Cal.A	0	21	21	08-May-19	28-May-19	-86	0%				Review and Discuss Method Statement for Removal of Temporary Steel Cofferdam (type 1)
S13815	Review and Discuss Method Statement for Removal of Temporary Steel Cofferdam (type 2)	P2-Cal.A	0	21	21	08-May-19	28-May-19	-86	0%				Review and Discuss Method Statement for Removal of Temporary Steel Cofferdam (type 2)
S13818-2	Review and Discuss Method Statement for Removal of Temporary Steel Cofferdam (type 3)	P2-Cal.A	0	21	21	08-May-19	28-May-19	-64	0%				Review and Discuss Method Statement for Removal of Temporary Steel Cofferdam (type 3)
S13812	Resubmit Method Statement for Removal of Temporary Steel Cofferdam (type 1)	P2-Cal.A	0	7	7	29-May-19	04-Jun-19	-86	0%				Resubmit Method Statement for Removal of Temporary Steel Cofferdam (type 1)
S13816	Resubmit Method Statement for Removal of Temporary Steel Cofferdam (type 2)	P2-Cal.A	0	7	7	29-May-19	04-Jun-19	-86	0%				Resubmit Method Statement for Removal of Temporary Steel Cofferdam (type 2)
S13818-3	Resubmit Method Statement for Removal of Temporary Steel Cofferdam (type 3)	P2-Cal.A	0	7	7	29-May-19	04-Jun-19	-64	0%				Resubmit Method Statement for Removal of Temporary Steel Cofferdam (type 3)
S13813	Accept Method Statement for Removal of Temporary Steel Cofferdam (type 1)	P2-Cal.A	0	21	21	05-Jun-19	25-Jun-19	-86	0%				Accept Method Statement for Removal of Temporary Steel Cofferdam (type 1)
S13817	Accept Method Statement for Removal of Temporary Steel Cofferdam (type 2)	P2-Cal.A	0	21	21	05-Jun-19	25-Jun-19	-86	0%				Accept Method Statement for Removal of Temporary Steel Cofferdam (type 2)
S13818-4	Accept Method Statement for Removal of Temporary Steel Cofferdam (type 3)	P2-Cal.A	0	21	21	05-Jun-19	25-Jun-19	-64	0%				Accept Method Statement for Removal of Temporary Steel Cofferdam (type 3)
Removal of Water Gate		P2-Cal.A	0	67	67	08-May-19	13-Jul-19	-26					
S13882	Prepare and Submit Method Statement for Removal of Water Gate	P2-Cal.A	0	18	18	08-May-19	25-May-19	-26	0%				Prepare and Submit Method Statement for Removal of Water Gate
S13884	Review and Discuss Method Statement for Removal of Water Gate	P2-Cal.A	0	21	21	26-May-19	15-Jun-19	-26	0%				Review and Discuss Method Statement for Removal of Water Gate
S13886	Resubmit Method Statement for Removal of Water Gate	P2-Cal.A	0	7	7	16-Jun-19	22-Jun-19	-26	0%				Resubmit Method Statement for Removal of Water Gate
S13888	Accept Method Statement for Removal of Water Gate	P2-Cal.A	0	21	21	23-Jun-19	13-Jul-19	-26	0%				Accept Method Statement for Removal of Water Gate
ELS of Underpass (P2 CH105-318)		P2-Cal.A	68	116	54	11-Feb-19 A	12-Jun-19	25					
S14056	Prepare and Submit Method Statement for Excavation and ELS of Underpass (P2 CH105-318)	P2-Cal.A	68	18	5	11-Feb-19 A	24-Apr-19	25	72.22%				Prepare and Submit Method Statement for Excavation and ELS of Underpass (P2 CH105-318)
S14057	1st Review and Discuss Method Statement for Excavation and ELS of Underpass (P2 CH105-318)	P2-Cal.A	0	21	21	25-Apr-19	15-May-19	25	0%				1st Review and Discuss Method Statement for Excavation and ELS of Underpass (P2 CH105-318)
S14058	Resubmit Method Statement for Excavation and ELS of Underpass (P2 CH105-318)	P2-Cal.A	0	7	7	16-May-19	22-May-19	25	0%				Resubmit Method Statement for Excavation and ELS of Underpass (P2 CH105-318)
S14059	Accept Method Statement for Excavation and ELS of Underpass (P2 CH105-318)	P2-Cal.A	0	21	21	23-May-19	12-Jun-19	25	0%				Accept Method Statement for Excavation and ELS of Underpass (P2 CH105-318)
Construction of U-Troughs structure (P2 CH318-363)		P2-Cal.A	122	182	61	19-Dec-18 A	19-Jun-19	-300					
S14122	Prepare and Submit Method Statement for Construction of U-Troughs Structure (P2 CH318-363)	P2-Cal.A	122	18	5	19-Dec-18 A	24-Apr-19	-300	72.22%				Prepare and Submit Method Statement for Construction of U-Troughs Structure (P2 CH318-363)
S14124	Review and Discuss Method Statement for Construction of U-Troughs Structure (P2 CH318-363)	P2-Cal.A	0	21	21	25-Apr-19	15-May-19	-300	0%				Review and Discuss Method Statement for Construction of U-Troughs Structure (P2 CH318-363)
S14126	Resubmit Method Statement for Construction of U-Troughs Structure (P2 CH318-363)	P2-Cal.A	0	14	14	16-May-19	29-May-19	-300	0%				Resubmit Method Statement for Construction of U-Troughs Structure (P2 CH318-363)
S14128	Accept Method Statement for Construction of U-Troughs Structure (P2 CH318-363)	P2-Cal.A	0	21	21	30-May-19	19-Jun-19	-300	0%				Accept Method Statement for Construction of U-Troughs Structure (P2 CH318-363)
Procurement of Major Material		P2-Cal.A	820	1354	534	20-Jan-17 A	04-Oct-20	630					
Civil/Structural		P2-Cal.A	820	1015	195	20-Jan-17 A	31-Oct-19	419					
S14983	Procurement and Delivery of ELS Walling & Struts Members	P2-Cal.A	820	1015	195	20-Jan-17 A	31-Oct-19	-301	80.79%				Procurement and Delivery of ELS Walling & Struts Members
S14981	Procurement and Delivery of Steel H-Pile	P2-Cal.A	809	800	50	31-Jan-17 A	08-Jun-19	-301	93.75%				Procurement and Delivery of Steel H-Pile
S14987	Cast-in for sign gantry and Road Works	P2-Cal.A	0	120	120	03-Jul-19	30-Oct-19	420	0%				Cast-in for sign gantry and Road Works
E&M		P2-Cal.A	0	485	485	08-Jun-19	04-Oct-20	630					
S15150	Procurement and Delivery of EL Equipment (Incl. SCADA and ELV)	P2-Cal.A	0	450	450	08-Jun-19	30-Aug-20	665	0%				Procurement and Delivery of EL Equipment (Incl. SCADA and ELV)
S15144	Procurement and Delivery of MVAC Plant	P2-Cal.A	0	450	450	15-Jun-19	06-Sep-20	658	0%				Procurement and Delivery of MVAC Plant
S15148	Procurement and Delivery of P/D Equipment	P2-Cal.A	0	450	450	23-Jun-19	14-Sep-20	650	0%				Procurement and Delivery of P/D Equipment
S15146	Procurement and Delivery of FS Equipment	P2-Cal.A	0	450	450	13-Jul-19	04-Oct-20	630	0%				Procurement and Delivery of FS Equipment
Subletting Package		P2-Cal.A	197	223	48	05-Oct-18 A	06-Jun-19	506					
ELS Works (Reclaimed Section)		P2-Cal.A	197	199	24	05-Oct-18 A	13-May-19	206					
S16386	Invitation, Submission and Opening of Tender for Excavation and ELS Works (Reclaimed Section)	P2-Cal.A	197	14	3	05-Oct-18 A	22-Apr-19	206	78.57%				Invitation, Submission and Opening of Tender for Excavation and ELS Works (Reclaimed Section)
S16387	Tender Interview and Recommendation to PM for Excavation and ELS Works (Reclaimed Section)	P2-Cal.A	0	21	21	23-Apr-19	13-May-19	206	0%				Tender Interview and Recommendation to PM for Excavation and ELS Works (Reclaimed Section)

█ Actual Work ◆ ◆ M
█ Remaining Work
█ Critical Remaining Work

Program with Progress as of 20-Apr-19

3 Month Rolling Programme
(Data Date : 20 Apr 2019)

Page : 4 of 14

Date	Revision	Checked	Approved
20-apr-19			

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S16388	Excavation and ELS Works (Reclaimed Section) Award	P2-Cal.A	0	0	0	13-May-19	206	0%					◆ Excavation and ELS Works (Reclaimed Section) Award	
Structural Works for Retaining Wall (Reclaimed Section)														
S16391	Tender Interview and Recommendation to PM for Structural Works for Retaining Wall	P2-Cal.A	178	30	20 24-Oct-18 A	09-May-19	297	33.33%					◆ Tender Interview and Recommendation to PM for Structural Works for Retaining Wall	
S16392	Structural Works for Retaining Wall Award	P2-Cal.A	0	0	0	09-May-19	297	0%					◆ Structural Works for Retaining Wall Award	
Structural Works for U-Trough, Underpass and Abutment														
S16440	Tender Interview and Recommendation to PM for Structural Works for U-Trough, Underpass and Abutment	P2-Cal.A	178	30	20 24-Oct-18 A	09-May-19	346	33.33%					◆ Tender Interview and Recommendation to PM for Structural Works for U-Trough, Underpass and Abutment	
S16460	Structural Works for U-Trough, Underpass and Abutment Award	P2-Cal.A	0	0	0	09-May-19	346	0%					◆ Structural Works for U-Trough, Underpass and Abutment Award	
Installation of Bored Pile														
S16800	Prepare Installation of Bored Pile Tender Document for PM Acceptance	P2-Cal.A	85	7	5 25-Jan-19 A	24-Apr-19	208	28.57%					◆ Prepare Installation of Bored Pile Tender Document for PM Acceptance	
S16820	Invitation, Submission and Opening of Tender for Installation of Bored Pile	P2-Cal.A	0	14	14 25-Apr-19	08-May-19	208	0%					◆ Invitation, Submission and Opening of Tender for Installation of Bored Pile	
S16840	Tender Interview and Recommendation to PM for Installation of Bored Pile	P2-Cal.A	0	21	21 09-May-19	29-May-19	208	0%					◆ Tender Interview and Recommendation to PM for Installation of Bored Pile	
S16860	Installation of Bored Pile Award	P2-Cal.A	0	0	0	29-May-19	208	0%					◆ Installation of Bored Pile Award	
Traffic and Directional Signs														
S17440	Prepare Traffic and Directional Signs Tender Document for PM Acceptance	P2-Cal.A	0	7	7 26-Apr-19	02-May-19	506	0%					◆ Prepare Traffic and Directional Signs Tender Document for PM Acceptance	
S17460	Submission and Opening of Tender for Traffic and Directional Signs	P2-Cal.A	0	14	14 03-May-19	16-May-19	506	0%					◆ Submission and Opening of Tender for Traffic and Directional Signs	
S17480	Tender Interview and Recommendation to PM for Traffic and Directional Signs	P2-Cal.A	0	21	21 17-May-19	06-Jun-19	506	0%					◆ Tender Interview and Recommendation to PM for Traffic and Directional Signs	
S17500	Traffic and Directional Signs Award	P2-Cal.A	0	0	0	06-Jun-19	506	0%					◆ Traffic and Directional Signs Award	
Section 2 of the Works (All Works Within Portion II)														
Roadworks														
LC11808	TTA Implementation (Site Entrance)	P2-Cal.C	7	14	7 11-Apr-19 A	30-Apr-19	102	50%					◆ TTA Implementation (Site Entrance)	
LC11810	Drainage works, ducting and water mains	P2-Cal.C	0	60	60 02-May-19	13-Jul-19	102	0%					◆ Drainage works, ducting and water mains	
LC11860	Installation of kerbs (for F/P and C/T)	P2-Cal.C	0	30	30 15-Jul-19	17-Aug-19	102	0%					◆ Installation of kerbs (for F/P and C/T)	
Section 3 of the Works All Works within Portion IV, V, VI, VII, VIII														
Existing Land Section														
Retaining Wall P2-A CH 500- 650														
Bay 1-2														
LC11947	Backfilling Works RW P2-A Back Side (Bay 1 - 2) (Incl. soil test)	P2-Cal.C	66	35	10 28-Jan-19 A	04-May-19	280	71.43%					◆ Backfilling Works RW P2-A Back Side (Bay 1 - 2) (Incl. soil test)	
Bay 5-15														
LC11988	Backfilling Works RW P2-A Back Side (Bay 5 - 15) (Incl. Soil Test)	P2-Cal.C	209	35	7 07-Aug-18 A	30-Apr-19	143	80%					◆ Backfilling Works RW P2-A Back Side (Bay 5 - 15) (Incl. Soil Test)	
LC11972-1	Construction of CCTV High Mast Footing - Base Slab (PMI 090)	P2-Cal.C	0	10	10 02-May-19	14-May-19	143	0%					◆ Construction of CCTV High Mast Footing - Base Slab (PMI 090)	
LC11972-2	Construction of CCTV High Mast Footing - Column (PMI 090)	P2-Cal.C	0	10	10 15-May-19	25-May-19	143	0%					◆ Construction of CCTV High Mast Footing - Column (PMI 090)	
LC11989	Excavation and Drainage Works (Bay 1 - 15)	P2-Cal.C	0	60	60 27-May-19	06-Aug-19	143	0%					◆ Excavation and Drainage Works (Bay 1 - 15)	
P2 Road														
P2 CH 318 - 363														
ELS P2 CH318-363 & SR2 CH100-110														
LC12958	Excavation to -1.0 ~ -1.6mPD (3810m3)	P2-Cal.C	3	5	2 16-Apr-19 A	24-Apr-19	-246	60%					◆ Excavation to -1.0 ~ -1.6mPD (3810m3)	
LC12959	Installation of 2nd layer strut/water @ -0.6 ~ -1.0mPD	P2-Cal.C	0	15	15 25-Apr-19	14-May-19	-246	0%					◆ Installation of 2nd layer strut/water @ -0.6 ~ -1.0mPD	
LC12961	Excavation to -2.9 ~ -4.6mPD (3810m3)	P2-Cal.C	0	5	5 15-May-19	20-May-19	-246	0%					◆ Excavation to -2.9 ~ -4.6mPD (3810m3)	

█ Actual Work ◆ ◆ M
█ Remaining Work
█ Critical Remaining Work

Program with Progress as of 20-Apr-19

3 Month Rolling Programme
(Data Date : 20 Apr 2019)

Page : 5 of 14

Date	Revision	Checked	Approved
20-apr-19			

Activity ID	Activity Name	Calendar	Actual Duration	Original Duration	Planning Dur	Start	Finish	Total Float	Activity Complete	2019					
										Mar	Apr	May	Jun		
LC12962	Installation of 3rd layer strut/waler @ -1.9 ~ -3.6mPD	P2-Cal.C	0	15	15	21-May-19	06-Jun-19	-246	0%					Installation of 3rd layer strut/waler @ -1.9	
LC12964	Excavation to -5.5 ~ -6.7mPD (6550m3)	P2-Cal.C	0	9	9	08-Jun-19	18-Jun-19	-246	0%					Excavation to -5.5	
Structure P2 CH 318 - 363 & SR2 CH100-110 (U Trough B)															
LC12965	Laying blinding and waterproofing	P2-Cal.C	0	6	6	18-Jun-19	24-Jun-19	-246	0%					Laying bl	
LC12970	Construction of base slab - bay 1 (CH318 - CH332)	P2-Cal.C	0	10	10	25-Jun-19	06-Jul-19	-245	0%						
LC12980	Construction of base slab - bay 2 (CH342 - CH352)	P2-Cal.C	0	10	10	26-Jun-19	08-Jul-19	-246	0%						
LC12975	Construction of base slab - bay 2 (CH332 - CH342)	P2-Cal.C	0	10	10	09-Jul-19	19-Jul-19	-246	0%						
LC12985	Construction of base slab - bay 4 (CH352 - CH363 & SR2 CH100 - CH110)	P2-Cal.C	0	10	10	10-Jul-19	20-Jul-19	-246	0%						
P2 CH 411- 500															
Structure P2 CH 411 - 500 (U Trough A)															
Wall Stem															
LC15250	Construction of Drainage and Manhole (NCE143)	P2-Cal.C	310	60	5	06-Apr-18 A	27-Apr-19	250	91.67%					Construction of Drainage and Manhole (NCE143)	
LC15260	Backfilling of Engineered Fill Material (3430m3) inside U-trough	P2-Cal.C	278	15	5	15-May-18 A	04-May-19	250	66.67%					Backfilling of Engineered Fill Material (3430m3) inside U-trough	
LC15185	Waterproofing of wall stem, backfill & removal of strut/waling at Bay 1 to 3	P2-Cal.C	99	30	1	17-Dec-18 A	23-Apr-19	216	96.67%					Waterproofing of wall stem, backfill & removal of strut/waling at Bay 1 to 3	
LC15230	Construction of wall stem Final Pour at Bay 1	P2-Cal.C	0	13	13	24-Apr-19	09-May-19	216	0%					Construction of wall stem Final Pour at Bay 1	
LC15240	Backfilling and Removal of Sheetpile at the edge	P2-Cal.C	0	30	30	10-May-19	15-Jun-19	216	0%					Backfilling and Removal of	
LC15270	Installation of Precast Concrete Profile Barrier (192m)	P2-Cal.C	0	30	30	17-Jun-19	22-Jul-19	216	0%						
SR2															
Retaining Wall SR2-A & B CH250 - 310															
Retaining Wall SR2-B															
LC16865	Backfilling Works of back side (SR2: A & B - Bay 1)	P2-Cal.C	41	30	12	01-Mar-19 A	07-May-19	238	60%					Backfilling Works of back side (SR2: A & B - Bay 1)	
LC16860	Construction of Drainage and Manhole	P2-Cal.C	0	40	40	23-Apr-19	11-Jun-19	210	0%					Construction of Drainage and Ma	
LC16880	Installation of Precast Concrete Profile Barrier	P2-Cal.C	0	40	40	12-Jun-19	29-Jul-19	210	0%						
SR2 CH170 - 250															
Structure SR2 CH 170 - 250 (U Trough A)															
LC17340	Waterproofing of wall stem, backfill & removal of strut/waling at CH170 - 182.5 (NCE107, 110, 116, 119, 127 & 132)	P2-Cal.C	268	10	5	28-May-18 A	27-Apr-19	226	50%					Waterproofing of wall stem, backfill & removal of strut/waling at CH170 - 182.5 (NCE107, 110, 116, 119, 127 & 132)	
LC17400	Construction of Drainage and Manhole Cover (NCE143)	P2-Cal.C	242	40	10	28-Jun-18 A	10-May-19	226	75%					Construction of Drainage and Manhole Cover (NCE143)	
LC17510	Waterproofing, Backfilling and Remove sheetpile	P2-Cal.C	42	40	40	28-Feb-19 A	17-Jun-19	245	0%					Waterproofing, Backf	
LC17520	Installation of Precast Concrete Profile Barrier	P2-Cal.C	0	40	40	11-May-19	28-Jun-19	226	0%						
LC17395	Construction of wall stem 2nd pour (top level) at CH170 - 182.5	P2-Cal.C	0	9	9	29-Jun-19	10-Jul-19	226	0%						
Portion IV & VII															
Construction of DN2100 stormwater at Portion IV & VII															
Drainage works															
SMH9104-SMH9105															
LC17691-3	Manhole construction and Pipe Laying (SMH9105)	P2-Cal.C	180	16	2	10-Sep-18 A	24-Apr-19	-7	87.5%					Manhole construction and Pipe Laying (SMH9105)	
SMH9105-SMH9106															
LC17692-3	Manhole construction and Pipe Laying (SMH9106)	P2-Cal.C	135	16	9	05-Nov-18 A	03-May-19	15	43.75%					Manhole construction and Pipe Laying (SMH9106)	
SMH9106-SMH9107															

- Actual Work
- Remaining Work
- Critical Remaining Work

Program with Progress as of 20-Apr-19

3 Month Rolling Programme
(Data Date : 20 Apr 2019)

Page : 6 of 14

Date	Revision	Checked	Approved
20-apr-19			

Activity ID	Activity Name	Calendar	Actual Duration	Original Duration	Planning Dur	Start	Finish	Total Float	Activity Complete	2019			
										Mar	Apr	May	Jun
LC17693-3	Manhole construction and Pipe Laying (SMH9107)	P2-Cal.C	80	16	10	11-Jan-19 A	04-May-19	14	37.5%	Manhole construction and Pipe Laying (SMH9107)			
SMH9107-SMH9108			P2-Cal.C	7	24	24	11-Apr-19 A	22-May-19	-2				
LC17696	Manhole construction and Pipe Laying (SMH9108)	P2-Cal.C	7	16	12	11-Apr-19 A	07-May-19	-2	25%	Manhole construction and Pipe Laying (SMH9108)			
LC17698	Inspection & Backfill	P2-Cal.C	0	14	14	06-May-19	22-May-19	-2	0%	Inspection & Backfill			
SMH9108-SMH9109			P2-Cal.C	78	105	38	14-Jan-19 A	08-Jun-19	-16				
LC17701	Bedding And Inspection	P2-Cal.C	78	3	12	14-Jan-19 A	07-May-19	-16	0%	Bedding And Inspection			
LC17702	Manhole construction and Pipe Laying (SMH9109)	P2-Cal.C	7	16	14	11-Apr-19 A	24-May-19	-16	12.5%	Manhole construction and Pipe Laying (SMH9109)			
LC17704	Inspection & Backfill	P2-Cal.C	0	14	14	23-May-19	08-Jun-19	-16	0%	Inspection & Backfill			
SMH9109-SMH9110			P2-Cal.C	42	47	22	28-Feb-19 A	20-May-19	0				
LC17708	Manhole construction and Pipe Laying (SMH9110)	P2-Cal.C	42	16	10	28-Feb-19 A	04-May-19	0	37.5%	Manhole construction and Pipe Laying (SMH9110)			
LC17710	Inspection & Backfill	P2-Cal.C	0	14	14	03-May-19	20-May-19	0	0%	Inspection & Backfill			
SMH9110-Outfall			P2-Cal.C	75	83	23	17-Jan-19 A	21-May-19	-1				
LC17713	Bedding And Inspection	P2-Cal.C	75	3	2	17-Jan-19 A	24-Apr-19	-1	33.33%	Bedding And Inspection			
LC17716	Reinstatement of Seawall and Backfilling Works	P2-Cal.C	40	30	13	02-Mar-19 A	21-May-19	-1	56.67%	Reinstatement of Seawall and Backfilling Works			
LC17715	Lay Dia. 2100 Drainage for Existing Outfalls along Existing Seawall (SMH9110-Outfall) (63m)	P2-Cal.C	0	10	10	24-Apr-19	06-May-19	-1	0%	Lay Dia. 2100 Drainage for Existing Outfalls along Existing Seawall (SMH9110-Outfall) (63m)			
Inspection 2100 Drainage Pipe			P2-Cal.C	0	14	14	10-Jun-19	25-Jun-19	-16				
LC17717	Inspection with DSD and Temporary Diversion from SMH9103 to Outfall	P2-Cal.C	0	14	14	10-Jun-19	25-Jun-19	-16	0%	Inspection			
TKO Town Centre South Reinstatement (PS Cl. 1.45)			P2-Cal.C	0	35	35	02-Jul-19	10-Aug-19	314				
LC17720	TTA application of road works (After handover of Area C)	P2-Cal.C	0	35	35	02-Jul-19*	10-Aug-19	314	0%				
New Reclaimed Section				469	593	149	06-Jan-18 A	15-Sep-19	62				
Marine Works				469	593	149	06-Jan-18 A	15-Sep-19	62				
Initial Works			P2-Cal.C	288	265	60	03-May-18 A	05-Jul-19	-60				
MC10080	Installation of Type 1 Settlement Marker (Type RA/ RB)	P2-Cal.C	288	7	2	03-May-18 A	24-Apr-19	-25	71.43%	Installation of Type 1 Settlement Marker (Type RA/ RB)			
MC10060	Installation of Piezometer/ O Well/ Extensometer (Type RB)	P2-Cal.C	242	7	2	28-Jun-18 A	24-Apr-19	-31	71.43%	Installation of Piezometer/ O Well/ Extensometer (Type RB)			
MC10070	Baseline for Piezometer/ O Well/ Extensometer (Type RB)	P2-Cal.C	239	10	9	03-Jul-18 A	06-May-19	-31	10%	Baseline for Piezometer/ O Well/ Extensometer (Type RB)			
MC10156	Installation of Type 2 Settlement Marker (Type RA)	P2-Cal.C	0	7	7	23-Apr-19	30-Apr-19	-30	0%	Installation of Type 2 Settlement Marker (Type RA)			
MC10170	Installation of Type 2 Settlement Marker (Type RB)	P2-Cal.C	0	7	7	23-Apr-19	30-Apr-19	-30	0%	Installation of Type 2 Settlement Marker (Type RB)			
MC10120	Baseline for Type 1 Settlement Marker (Type RA/ RB)	P2-Cal.C	0	3	3	25-Apr-19	27-Apr-19	-25	0%	Baseline for Type 1 Settlement Marker (Type RA/ RB)			
MC10160	Baseline for Type 2 Settlement Marker (Type RA)	P2-Cal.C	0	3	3	02-May-19	04-May-19	-30	0%	Baseline for Type 2 Settlement Marker (Type RA)			
MC10175	Baseline for Type 2 Settlement Marker (Type RB)	P2-Cal.C	0	3	3	02-May-19	04-May-19	-30	0%	Baseline for Type 2 Settlement Marker (Type RB)			
Steel Cofferdam and Water Gate			P2-Cal.C	0	60	60	23-Apr-19	05-Jul-19	-60				
Steel Cofferdam Installation			P2-Cal.C	0	60	60	23-Apr-19	05-Jul-19	-60				
Reinstatement works			P2-Cal.C	0	60	60	23-Apr-19	05-Jul-19	-60				
Type 1			P2-Cal.C	0	60	60	23-Apr-19	05-Jul-19	-60				
Removal of SP at transition zone			P2-Cal.C	0	60	60	23-Apr-19	05-Jul-19	-60				
MC10304-02	Removal of Underwater S/P	P2-Cal.C	0	60	60	23-Apr-19	05-Jul-19	-60	0%				
Filling of Recycle G400 Rock at Dredged Trench			P2-Cal.C	128	175	31	13-Nov-18 A	30-May-19	-95				
MC11205	Fill Recycle G400 at CH412-442 (19909m3)	P2-Cal.C	128	10	1	13-Nov-18 A	23-Apr-19	-89	90%	Fill Recycle G400 at CH412-442 (19909m3)			

- Actual Work
- Remaining Work
- Critical Remaining Work

Program with Progress as of 20-Apr-19

3 Month Rolling Programme
(Data Date : 20 Apr 2019)

Page : 7 of 14

Date	Revision	Checked	Approved
20-apr-19			

Activity ID	Activity Name	Calendar	Actual Duration	Original Duration	Remaining Dur	Start	Finish	Total Float	Activity Complete	2019				
										Mar	Apr	May	Jun	
MC11245	Fill Recycle G400 at CH442-560 (91060m3) - Stage 2 (East Side)	P2-Cal.C	28	43	13	16-Mar-19 A	08-May-19	-95	69.77%				Fill Recycle G400 at CH442-560 (91060m3) - Stage 2 (East Side)	
MC11228	Fill Recycle G400 after Band Drain Installation (5850m3)	P2-Cal.C	0	6	6	24-May-19	30-May-19	-95	0%				Fill Recycle G400 after Band Drain Installation (5850m3)	
Construction of Seawall Foundation (Dredged Area)														
Laying of Type A Rockfill (Base)														
MC11305	Type A Rockfill CH412-442 (773m3)	P2-Cal.C	34	1	0	09-Mar-19 A	24-Apr-19	-89	100%				Type A Rockfill CH412-442 (773m3)	
MC11295	Type A Rockfill CH362-412 (917m3)	P2-Cal.C	0	1	1	23-Apr-19	23-Apr-19	-91	0%				Type A Rockfill CH362-412 (917m3)	
MC11315	Type A Rockfill CH442-500 (2222m3)	P2-Cal.C	0	2	2	09-May-19	10-May-19	-95	0%				Type A Rockfill CH442-500 (2222m3)	
MC11318	Type A Rockfill after Band Drain at West Side (2000m3)	P2-Cal.C	0	2	2	31-May-19	01-Jun-19	-95	0%				Type A Rockfill after Band Drain at West Side (2000m3)	
Laying of Geotextile Type A (Base)														
MC11405	Geotextile Type A CH442-500 (1567m2)	P2-Cal.C	7	2	1	11-Apr-19 A	11-May-19	-95	50%				Geotextile Type A CH442-500 (1567m2)	
MC11385	Geotextile Type A CH362-412 (952m2)	P2-Cal.C	0	1	1	24-Apr-19	24-Apr-19	-91	0%				Geotextile Type A CH362-412 (952m2)	
MC11395	Geotextile Type A CH412-442 (673m2)	P2-Cal.C	0	1	1	24-Apr-19	24-Apr-19	-89	0%				Geotextile Type A CH412-442 (673m2)	
MC11408	Geotextile Type A after Band Drain at West Side (1400m2)	P2-Cal.C	0	2	2	03-Jun-19	04-Jun-19	-95	0%				Geotextile Type A after Band Drain at West Side (1400m2)	
Laying of Granular Filter (Base)														
MC11455	Granular Filter CH262-312 (1217m3)	P2-Cal.C	73	2	2	19-Jan-19 A	24-Apr-19	-91	0%				Granular Filter CH262-312 (1217m3)	
MC11465	Granular Filter CH312-362 (852m3)	P2-Cal.C	49	1	1	20-Feb-19 A	25-Apr-19	-91	30%				Granular Filter CH312-362 (852m3)	
MC11475	Granular Filter CH362-412 (893m3)	P2-Cal.C	0	1	1	25-Apr-19	26-Apr-19	-91	0%				Granular Filter CH362-412 (893m3)	
MC11485	Granular Filter CH412-442 (743m3)	P2-Cal.C	0	1	1	26-Apr-19	27-Apr-19	-91	0%				Granular Filter CH412-442 (743m3)	
MC11495	Granular Filter CH442-500 (2164m3)	P2-Cal.C	0	1	1	11-May-19	11-May-19	-95	0%				Granular Filter CH442-500 (2164m3)	
MC11498	Granular Filter after Band Drain at West Side (2000m3)	P2-Cal.C	0	2	2	05-Jun-19	06-Jun-19	-95	0%				Granular Filter after Band Drain at West Side (2000m3)	
Laying Geotextile Type A														
MC12065	Geotextile Type A (No-Dredged Area) CH362-412 (2566m2)	P2-Cal.C	210	4	1	06-Aug-18 A	29-Apr-19	-89	75%				Geotextile Type A (No-Dredged Area) CH362-412 (2566m2)	
MC12055	Geotextile Type A (No-Dredged Area) CH312-362 (2606m2)	P2-Cal.C	210	4	1	06-Aug-18 A	27-Apr-19	-89	75%				Geotextile Type A (No-Dredged Area) CH312-362 (2606m2)	
MC12085-1	Geotextile Type A (No-Dredged Area) CH442-530 (2540m2) - Stage 1	P2-Cal.C	6	2	1	12-Apr-19 A	14-May-19	-46	50%				Geotextile Type A (No-Dredged Area) CH442-530 (2540m2) - Stage 1	
MC12075 - 1	Geotextile Type A (No-Dredged Area) CH412-442 (939m2) - Stage 1	P2-Cal.C	0	3	3	27-Apr-19	02-May-19	-91	0%				Geotextile Type A (No-Dredged Area) CH412-442 (939m2) - Stage 1	
MC12075 - 2	Geotextile Type A (No-Dredged Area) CH412-530 (2496m2) - Stage 2	P2-Cal.C	0	2	2	15-May-19	16-May-19	-95	0%				Geotextile Type A (No-Dredged Area) CH412-530 (2496m2) - Stage 2	
Placing Sand Blanket (Non-Dredged Area)														
MC12155-1	Sand Blanket CH442-530 (1248m3) - Stage 1 West	P2-Cal.C	7	5	1	11-Apr-19 A	17-May-19	-78	80%				Sand Blanket CH442-530 (1248m3) - Stage 1 West	
MC12145-1	Sand Blanket CH425-442 (624m3) - Stage 1 West	P2-Cal.C	5	2	1	13-Apr-19 A	03-May-19	-85	50%				Sand Blanket CH425-442 (624m3) - Stage 1 West	
MC12125	Sand Blanket CH325-375 (2467m3)	P2-Cal.C	0	5	5	27-Apr-19	04-May-19	-89	0%				Sand Blanket CH325-375 (2467m3)	
MC12135	Sand Blanket CH375-425 (2465m3)	P2-Cal.C	0	5	5	02-May-19	08-May-19	-91	0%				Sand Blanket CH375-425 (2465m3)	
MC12145-2	Sand Blanket CH425-530 (2496m3) Stage 2 East	P2-Cal.A	0	2	2	17-May-19	18-May-19	-121	0%				Sand Blanket CH425-530 (2496m3) Stage 2 East	
Installation of Band Drain (Non-Dredged Area)														
MC12195	Band Drain CH325-375 (1016nos)	P2-Cal.C	140	7	2	30-Oct-18 A	09-May-19	-91	71.43%				Band Drain CH325-375 (1016nos)	
MC12205	Band Drain CH375-425 (1455nos)	P2-Cal.C	134	10	3	06-Nov-18 A	14-May-19	-91	70%				Band Drain CH375-425 (1455nos)	
MC12185	Band Drain CH275-325 (1133nos)	P2-Cal.C	51	8	2	18-Feb-19 A	26-Apr-19	-82	75%				Band Drain CH275-325 (1133nos)	
MC12225-1	Band Drain CH442-530 (578nos) - Stage 1 West	P2-Cal.C	14	4	7	02-Apr-19 A	06-May-19	-82	0%				Band Drain CH442-530 (578nos) - Stage 1 West	
MC12225-2	Band Drain CH442-530 (434nos) - Stage 2 East	P2-Cal.C	0	2	2	20-May-19	21-May-19	-95	0%				Band Drain CH442-530 (434nos) - Stage 2 East	

- Actual Work
- Remaining Work
- Critical Remaining Work

Program with Progress as of 20-Apr-19

3 Month Rolling Programme
(Data Date : 20 Apr 2019)

Page : 8 of 14

Date	Revision	Checked	Approved
20-apr-19			

Activity ID	Activity Name	Calendar	Actual Duration	Original Duration	Remaining Dur	Start	Finish	Total Float	Activity Complete	2019				
										Mar	Apr	May	Jun	
MC12215-1	Band Drain CH425-442 (198nos) - Stage 1 West	P2-Cal.C	0	2	2	22-May-19	23-May-19	-95	0%				■ Band Drain CH425-442 (198nos) - Stage 1 West	
MC12215-2	Band Drain CH425-442 (496nos) - Stage 2 East	P2-Cal.C	0	2	2	22-May-19	23-May-19	-95	0%				■ Band Drain CH425-442 (496nos) - Stage 2 East	
Filling of Reclamation Fill to Seabed Level														
MC12365	Reclamation Fill CH225-275 (3760m3)	P2-Cal.C	46	5	2	23-Feb-19 A	26-Apr-19	-76	70%				■ Reclamation Fill CH225-275 (3760m3)	
MC12375	Reclamation Fill CH275-325 (4829m3)	P2-Cal.C	0	5	5	26-Apr-19	03-May-19	-76	0%				■ Reclamation Fill CH275-325 (4829m3)	
MC12385	Reclamation Fill CH325-375 (3454m3)	P2-Cal.C	0	4	4	09-May-19	15-May-19	-79	0%				■ Reclamation Fill CH325-375 (3454m3)	
MC12395	Reclamation Fill CH375-398 (2152m3)	P2-Cal.C	0	3	3	15-May-19	18-May-19	-79	0%				■ Reclamation Fill CH375-398 (2152m3)	
MC12405	Reclamation Fill CH398-500 (8036m3)	P2-Cal.C	0	6	6	08-Jun-19	14-Jun-19	-95	0%				■ Reclamation Fill CH398-500 (8036m3)	
Laying of Geotextile Type A on Top of Reclamation Fill														
MC12445	Geotextile Type A CH215-265 (905m2)	P2-Cal.C	50	1	1	19-Feb-19 A	26-Apr-19	-75	50%				■ Geotextile Type A CH215-265 (905m2)	
MC12455	Geotextile Type A CH265-315 (1156m2)	P2-Cal.C	0	1	1	03-May-19	04-May-19	-76	0%				■ Geotextile Type A CH265-315 (1156m2)	
MC12465	Geotextile Type A CH315-365 (1077m2)	P2-Cal.C	0	1	1	15-May-19	16-May-19	-78	0%				■ Geotextile Type A CH315-365 (1077m2)	
MC12475	Geotextile Type A CH365-388 (518m2)	P2-Cal.C	0	1	1	18-May-19	20-May-19	-77	0%				■ Geotextile Type A CH365-388 (518m2)	
MC12485	Geotextile Type A CH388-500 (1946m2)	P2-Cal.C	0	1	1	15-Jun-19	15-Jun-19	-95	0%				■ Geotextile Type A CH388-500 (1946m2)	
Construction of Eastern Seawall Up to +2.5mPD														
Filling of G400 Rock as East Seawall Core (+2.5mPD)														
MC11525	Fill G400 at CH165-215 (5826m3) for Vertical Seawall	P2-Cal.C	74	3	1	18-Jan-19 A	23-Apr-19	-72	66.67%				■ Fill G400 at CH165-215 (5826m3) for Vertical Seawall	
MC11535	Fill G400 at CH215-265 (10232m3)	P2-Cal.C	38	6	5	05-Mar-19 A	16-May-19	-85	16.67%				■ Fill G400 at CH215-265 (10232m3)	
MC11545	Fill G400 at CH265-315 (11705m3)	P2-Cal.C	0	7	7	17-May-19	24-May-19	-85	0%				■ Fill G400 at CH265-315 (11705m3)	
MC11555	Fill G400 at CH315-365 (12252m3)	P2-Cal.C	0	4	4	25-May-19	29-May-19	-85	0%				■ Fill G400 at CH315-365 (12252m3)	
MC11565	Fill G400 at CH365-388 (6115m3)	P2-Cal.C	0	4	4	30-May-19	03-Jun-19	-85	0%				■ Fill G400 at CH365-388 (6115m3)	
MC11575	Fill G400 at CH388-465 (25272m3)	P2-Cal.C	0	7	7	17-Jun-19	24-Jun-19	-95	0%				■ Fill G400 at CH388-465 (25272m3)	
MC11585	Fill G400 at CH465-530 to -4.0mPD (18938m3)	P2-Cal.C	0	7	7	25-Jun-19	03-Jul-19	-95	0%				■ Fill G400 at CH465-530 to -4.0mPD (18938m3)	
MC11595	Fill G400 at CH465-530 to +2.5mPD (13753m3)	P2-Cal.C	0	9	9	04-Jul-19	13-Jul-19	-95	0%				■ Fill G400 at CH465-530 to +2.5mPD (13753m3)	
Laying of Type A Rockfill as East Seawall Core (+2.5mPD)														
MC11625	Type A Rockfill CH165-215 (3059m3) After Vertical Seawall Completion	P2-Cal.C	14	4	1	02-Apr-19 A	23-Apr-19	-58	75%				■ Type A Rockfill CH165-215 (3059m3) After Vertical Seawall Completion	
MC11635	Type A Rockfill CH215-265 (823m3)	P2-Cal.C	0	2	2	17-May-19	18-May-19	-76	0%				■ Type A Rockfill CH215-265 (823m3)	
MC11645	Type A Rockfill CH265-315 (735m3)	P2-Cal.C	0	1	1	25-May-19	25-May-19	-78	0%				■ Type A Rockfill CH265-315 (735m3)	
MC11655	Type A Rockfill CH315-365 (735m3)	P2-Cal.C	0	1	1	30-May-19	30-May-19	-78	0%				■ Type A Rockfill CH315-365 (735m3)	
MC11665	Type A Rockfill CH365-388 (352m3)	P2-Cal.C	0	1	1	04-Jun-19	04-Jun-19	-78	0%				■ Type A Rockfill CH365-388 (352m3)	
MC11675	Type A Rockfill CH388-465 (1595m3)	P2-Cal.C	0	2	2	25-Jun-19	26-Jun-19	-91	0%				■ Type A Rockfill CH388-465 (1595m3)	
MC11685	Type A Rockfill CH465-530 to -4.0mPD (881m3)	P2-Cal.C	0	1	1	04-Jul-19	04-Jul-19	-88	0%				■ Type A Rockfill CH465-530 to -4.0mPD (881m3)	
MC11695	Type A Rockfill CH465-530 to +2.5mPD (881m3)	P2-Cal.C	0	1	1	15-Jul-19	15-Jul-19	-95	0%				■ Type A Rockfill CH465-530 to +2.5mPD (881m3)	
Laying of Geotextile Type A as East Seawall Core (+2.5mPD)														
MC11735	Geotextile Type A CH215-265 (1243m2)	P2-Cal.C	0	1	1	20-May-19	20-May-19	-76	0%				■ Geotextile Type A CH215-265 (1243m2)	
MC11745	Geotextile Type A CH265-315 (1282m2)	P2-Cal.C	0	1	1	27-May-19	27-May-19	-78	0%				■ Geotextile Type A CH265-315 (1282m2)	
MC11755	Geotextile Type A CH315-365 (1308m2)	P2-Cal.C	0	1	1	31-May-19	31-May-19	-78	0%				■ Geotextile Type A CH315-365 (1308m2)	
MC11765	Geotextile Type A CH365-388 (633m2)	P2-Cal.C	0	1	1	05-Jun-19	05-Jun-19	-78	0%				■ Geotextile Type A CH365-388 (633m2)	

■ Actual Work ◆ ◆ M
■ Remaining Work
■ Critical Remaining Work

Program with Progress as of 20-Apr-19

3 Month Rolling Programme
(Data Date : 20 Apr 2019)

Date	Revision	Checked	Approved
20-apr-19			

Activity ID	Activity Name	Calendar	Actual Duration	Original Duration	Remaining Dur	Start	Finish	Total Float	Activity Complete	2019				
										Mar	Apr	May	Jun	
MC11775	Geotextile Type A CH388-465 (2049m2)	P2-Cal.C	0	1	1	27-Jun-19	27-Jun-19	-91	0%					
MC11785	Geotextile Type A CH465-530 to -4.0mPD (903m2)	P2-Cal.C	0	1	1	05-Jul-19	05-Jul-19	-88	0%					
MC11795	Geotextile Type A CH465-530 to +2.5mPD (903m2)	P2-Cal.C	0	1	1	16-Jul-19	16-Jul-19	-95	0%					
Laying of Granular Filter as East Seawall Core (+2.5mPD)														
MC11825	Granular Filter CH165-215 (1112m3)	P2-Cal.C	1	2	1	18-Apr-19 A	23-Apr-19	-55	50%					
MC11835	Granular Filter CH215-265 (877m3)	P2-Cal.C	0	1	1	21-May-19	21-May-19	-76	0%					
MC11845	Granular Filter CH265-315 (904m3)	P2-Cal.C	0	1	1	28-May-19	28-May-19	-78	0%					
MC11855	Granular Filter CH315-365 (923m3)	P2-Cal.C	0	1	1	01-Jun-19	01-Jun-19	-78	0%					
MC11865	Granular Filter CH365-388 (420m3)	P2-Cal.C	0	1	1	06-Jun-19	06-Jun-19	-78	0%					
MC11875	Granular Filter CH388-465 (1929m3)	P2-Cal.C	0	2	2	28-Jun-19	29-Jun-19	-91	0%					
MC11885	Granular Filter CH465-530 to -4.0mPD (1183m3)	P2-Cal.C	0	2	2	06-Jul-19	08-Jul-19	-88	0%					
MC11895	Granular Filter CH465-530 to +2.5mPD (1183m3)	P2-Cal.C	0	2	2	17-Jul-19	18-Jul-19	-95	0%					
Construction of Vertical Seawall														
Construction of Vertical Seawall (Type 2 & 3)														
MC11950	Connection of existing Vertical Seawall - 3 Layer (RFI-151)(PMI-096)	P2-Cal.C	107	3	1	07-Dec-18 A	23-Apr-19	-58	66.67%					
Construction of Western Seawall Up to +1.3mPD														
Filling of G400 Rock as West Seawall Core (+1.3mPD)														
MC12495	Fill G400 CH270-320 (4241m3)	P2-Cal.C	0	2	2	09-May-19	10-May-19	-67	0%					
MC12505	Fill G400 CH320-370 (4679m3)	P2-Cal.C	0	2	2	11-May-19	14-May-19	-65	0%					
MC12515	Fill G400 CH370-420 (5159m3)	P2-Cal.C	0	3	3	15-May-19	17-May-19	-64	0%					
MC12525	Fill G400 CH420-440 (1449m3)	P2-Cal.C	0	1	1	15-Jun-19	15-Jun-19	-82	0%					
Laying of Type A Rockfill as West Seawall Core (+1.3mPD)														
MC12535	Type A Rockfill CH270-320 (511m3)	P2-Cal.C	0	1	1	11-May-19	11-May-19	-67	0%					
MC12545	Type A Rockfill CH320-370 (541m3)	P2-Cal.C	0	1	1	15-May-19	15-May-19	-65	0%					
MC12555	Type A Rockfill CH370-420 (554m3)	P2-Cal.C	0	1	1	18-May-19	18-May-19	-64	0%					
MC12565	Type A Rockfill CH420-440 (160m3)	P2-Cal.C	0	1	1	17-Jun-19	17-Jun-19	-82	0%					
Laying of Geotextile Type A as West Seawall Core (+1.3mPD)														
MC12575	Geotextile Type A CH270-320 (807m2)	P2-Cal.C	0	1	1	14-May-19	14-May-19	-67	0%					
MC12585	Geotextile Type A CH320-370 (541m2)	P2-Cal.C	0	1	1	16-May-19	16-May-19	-65	0%					
MC12595	Geotextile Type A CH370-420 (805m2)	P2-Cal.C	0	1	1	20-May-19	20-May-19	-64	0%					
MC12605	Geotextile Type A CH420-440 (237m2)	P2-Cal.C	0	1	1	18-Jun-19	18-Jun-19	-82	0%					
Laying of Granular Filter as West Seawall Core (+1.3mPD)														
MC12615	Granular Filter CH270-320 (533m3)	P2-Cal.C	0	1	1	15-May-19	15-May-19	-67	0%					
MC12625	Granular Filter CH320-370 (543m3)	P2-Cal.C	0	1	1	17-May-19	17-May-19	-65	0%					
MC12635	Granular Filter CH370-420 (634m3)	P2-Cal.C	0	1	1	21-May-19	21-May-19	-64	0%					
MC12645	Granular Filter CH420-440 (160m3)	P2-Cal.C	0	1	1	19-Jun-19	19-Jun-19	-82	0%					
Filling of Reclamation Fill to -2.0mPD														
MC12665-01	Reclamation Fill to -2.0mPD CH155-215 (2760m3) - West Side	P2-Cal.C	0	4	4	23-Apr-19	26-Apr-19	-58	0%					

- Actual Work
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Program with Progress as of 20-Apr-19

3 Month Rolling Programme
(Data Date : 20 Apr 2019)

Date	Revision	Checked	Approved
20-apr-19			

Activity ID	Activity Name	Calendar	Actual Duration	Original Duration	Remaining Dur	Start	Finish	Total Float	Activity Complete	2019			
										Mar	Apr	May	Jun
MC12665-02	Reclamation Fill to -2.0mPD CH155-215 (2760m3)	P2-Cal.C	0	1	1	27-Apr-19	27-Apr-19	-58	0%				■ Reclamation Fill to -2.0mPD CH155-215 (2760m3)
MC12675	Reclamation Fill to -2.0mPD CH215-255 (4528m3)	P2-Cal.C	0	4	4	22-May-19	25-May-19	-76	0%				■ Reclamation Fill to -2.0mPD CH215-255 (4528m3)
MC12675-01	Reclamation Fill to -2.0mPD CH255-315 (8839m3)	P2-Cal.C	0	4	4	29-May-19	01-Jun-19	-78	0%				■ Reclamation Fill to -2.0mPD CH255-315 (8839m3)
MC12685	Reclamation Fill to -2.0mPD CH315-355 (6284m3)	P2-Cal.C	0	4	4	03-Jun-19	06-Jun-19	-78	0%				■ Reclamation Fill to -2.0mPD CH315-355 (6284m3)
MC12685-01	Reclamation Fill to -2.0mPD CH355-405 (7927m3)	P2-Cal.C	0	4	4	08-Jun-19	12-Jun-19	-78	0%				■ Reclamation Fill to -2.0mPD CH355-405 (7927m3)
MC12695	Reclamation Fill to -2.0mPD CH405-455 (8355m3)	P2-Cal.C	0	4	4	02-Jul-19	05-Jul-19	-91	0%				■ Reclamation Fill to -2.0mPD CH405-455 (8355m3)
MC12695-01	Reclamation Fill to -2.0mPD CH455-500 (5121m3)	P2-Cal.C	0	4	4	19-Jul-19	23-Jul-19	-95	0%				■ Reclamation Fill to -2.0mPD CH455-500 (5121m3)
Filling of Reclamation Fill to -2.0 to +1.3mPD		P2-Cal.C	0	33	33	03-Jun-19	12-Jul-19	-91					
MC12705	Reclamation Fill to +1.3mPD CH260-300 (6115m3)	P2-Cal.C	0	4	4	03-Jun-19	06-Jun-19	-75	0%				■ Reclamation Fill to +1.3mPD CH260-300 (6115m3)
MC12705-01	Reclamation Fill to +1.3mPD CH300-350 (7807m3)	P2-Cal.C	0	4	4	08-Jun-19	12-Jun-19	-78	0%				■ Reclamation Fill to +1.3mPD CH300-350 (7807m3)
MC12715	Reclamation Fill to +1.3mPD CH350-400 (7639m3)	P2-Cal.C	0	4	4	13-Jun-19	17-Jun-19	-78	0%				■ Reclamation Fill to +1.3mPD CH350-400 (7639m3)
MC12725	Reclamation Fill to +1.3mPD CH400-460 (8900m3)	P2-Cal.C	0	5	5	06-Jul-19	11-Jul-19	-91	0%				■ Reclamation Fill to +1.3mPD CH400-460 (8900m3)
Laying Geotextile Type A at West Side		P2-Cal.C	0	29	29	08-Jun-19	12-Jul-19	-91					
MC12735	Geotextile Type A CH260-300 (617m2)	P2-Cal.C	0	1	1	08-Jun-19	08-Jun-19	-75	0%				■ Geotextile Type A CH260-300 (617m2)
MC12735-01	Geotextile Type A CH300-350 (617m2)	P2-Cal.C	0	1	1	13-Jun-19	13-Jun-19	-78	0%				■ Geotextile Type A CH300-350 (617m2)
MC12745	Geotextile Type A CH350-400 (650m2)	P2-Cal.C	0	1	1	18-Jun-19	18-Jun-19	-78	0%				■ Geotextile Type A CH350-400 (650m2)
MC12755	Geotextile Type A CH400-440 (509m2)	P2-Cal.C	0	1	1	12-Jul-19	12-Jul-19	-91	0%				■ Geotextile Type A CH400-440 (509m2)
Construction of Western Seawall Up to +2.5mPD		P2-Cal.C	0	32	32	10-Jun-19	17-Jul-19	-91					
Filling of G400 Rock as West Seawall Core (+2.5mPD)		P2-Cal.C	0	29	29	10-Jun-19	13-Jul-19	-91					
MC12765	Fill G400 CH260-300 (402m3)	P2-Cal.C	0	1	1	10-Jun-19	10-Jun-19	-75	0%				■ Fill G400 CH260-300 (402m3)
MC12765-01	Fill G400 CH300-350 (402m3)	P2-Cal.C	0	1	1	14-Jun-19	14-Jun-19	-78	0%				■ Fill G400 CH300-350 (402m3)
MC12775	Fill G400 CH350-400 (420m3)	P2-Cal.C	0	1	1	19-Jun-19	19-Jun-19	-78	0%				■ Fill G400 CH350-400 (420m3)
MC12785	Fill G400 CH400-440 (127m3)	P2-Cal.C	0	1	1	13-Jul-19	13-Jul-19	-91	0%				■ Fill G400 CH400-440 (127m3)
Laying of Type A Rockfill as West Seawall Core (+2.5mPD)		P2-Cal.C	0	29	29	11-Jun-19	15-Jul-19	-91					
MC12795	Type A Rockfill CH260-300 (152m3)	P2-Cal.C	0	1	1	11-Jun-19	11-Jun-19	-75	0%				■ Type A Rockfill CH260-300 (152m3)
MC12795-01	Type A Rockfill CH300-350 (152m3)	P2-Cal.C	0	1	1	15-Jun-19	15-Jun-19	-78	0%				■ Type A Rockfill CH300-350 (152m3)
MC12805	Type A Rockfill CH350-400 (80m3)	P2-Cal.C	0	1	1	20-Jun-19	20-Jun-19	-78	0%				■ Type A Rockfill CH350-400 (80m3)
MC12815	Type A Rockfill CH400-440 (75m3)	P2-Cal.C	0	1	1	15-Jul-19	15-Jul-19	-91	0%				■ Type A Rockfill CH400-440 (75m3)
Laying of Geotextile Type A as West Seawall Core (+2.5mPD)		P2-Cal.C	0	29	29	12-Jun-19	16-Jul-19	-91					
MC12825	Geotextile Type A CH260-300 (178m2)	P2-Cal.C	0	1	1	12-Jun-19	12-Jun-19	-75	0%				■ Geotextile Type A CH260-300 (178m2)
MC12825-01	Geotextile Type A CH300-350 (178m2)	P2-Cal.C	0	1	1	17-Jun-19	17-Jun-19	-78	0%				■ Geotextile Type A CH300-350 (178m2)
MC12835	Geotextile Type A CH350-400 (375m2)	P2-Cal.C	0	1	1	21-Jun-19	21-Jun-19	-78	0%				■ Geotextile Type A CH350-400 (375m2)
MC12845	Geotextile Type A CH400-440 (188m2)	P2-Cal.C	0	1	1	16-Jul-19	16-Jul-19	-91	0%				■ Geotextile Type A CH400-440 (188m2)
Laying of Granular Filter as West Seawall Core (+2.5mPD)		P2-Cal.C	0	29	29	13-Jun-19	17-Jul-19	-91					
MC12855	Granular Filter CH260-300 (236m3)	P2-Cal.C	0	1	1	13-Jun-19	13-Jun-19	-75	0%				■ Granular Filter CH260-300 (236m3)
MC12855-01	Granular Filter CH300-350 (236m3)	P2-Cal.C	0	1	1	18-Jun-19	18-Jun-19	-78	0%				■ Granular Filter CH300-350 (236m3)
MC12865	Granular Filter CH350-400 (250m3)	P2-Cal.C	0	1	1	22-Jun-19	22-Jun-19	-78	0%				■ Granular Filter CH350-400 (250m3)
MC12875	Granular Filter CH400-440 (417m3)	P2-Cal.C	0	1	1	17-Jul-19	17-Jul-19	-91	0%				■ Granular Filter CH400-440 (417m3)

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3 Month Rolling Programme
(Data Date : 20 Apr 2019)

Date	Revision	Checked	Approved
20-apr-19			

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										Mar	Apr	May	Jun
Filling of Reclamation Fill -2.0 to +2.5mPD													
MC12895	Reclamation Fill to +2.5mPD CH80-150 (11412m3)	P2-Cal.C	65	74	31	29-Jan-19 A	30-May-19	-64	50%				
MC12895-01	Reclamation Fill to +2.5mPD CH150-205 (8538m3)	P2-Cal.C	0	2	2	29-Apr-19	30-Apr-19	-57	0%				
MC12905	Reclamation Fill to +2.5mPD CH205-255 (7553m3)	P2-Cal.C	0	4	4	27-May-19	30-May-19	-64	0%				
Filling of Reclamation Fill to +1.3 to +2.5mPD													
MC12925	Reclamation Fill to +2.5mPD CH255-300 (3384m3)	P2-Cal.C	0	3	3	14-Jun-19	17-Jun-19	-75	0%				
MC12925-01	Reclamation Fill to +2.5mPD CH300-335 (2327m3)	P2-Cal.C	0	2	2	19-Jun-19	20-Jun-19	-78	0%				
MC12935	Reclamation Fill to +2.5mPD CH335-385 (3325m3)	P2-Cal.C	0	2	2	24-Jun-19	25-Jun-19	-78	0%				
MC12945	Reclamation Fill to +2.5mPD CH385-445 (3343m3)	P2-Cal.C	0	2	2	18-Jul-19	19-Jul-19	-91	0%				
Filling of Compacted Fill +2.5 to +3.5 & Temp Fill +3.5 to +5.5mPD													
MC12965-01	Compacted Fill to +5.5mPD CH140-190 (4476m3)	P2-Cal.C	0	1	1	02-May-19	02-May-19	-32	0%				
MC12975	Compacted Fill to +5.5mPD CH190-240 (5033m3)	P2-Cal.C	0	5	5	31-May-19	05-Jun-19	-8	0%				
MC12975-01	Compacted Fill to +5.5mPD CH240-300 (6013m3)	P2-Cal.C	0	6	6	18-Jun-19	24-Jun-19	-17	0%				
MC12985	Compacted Fill to +5.5mPD CH300-330 (5458m3)	P2-Cal.C	0	6	6	25-Jun-19	02-Jul-19	-17	0%				
MC12985-01	Compacted Fill to +5.5mPD CH330-380 (6823m3)	P2-Cal.C	0	8	8	03-Jul-19	11-Jul-19	-17	0%				
Surcharge													
Placing Surcharge													
MC13035-01	Placing Surcharge Area 2a2 (CH135-190) (1939m3)	P2-Cal.C	0	65	65	03-May-19	20-Jul-19	-17					
MC13055	Placing Surcharge Area 2b1 (CH190-235) (2661m3)	P2-Cal.C	0	3	3	06-Jun-19	10-Jun-19	-1	0%				
MC13055-01	Placing Surcharge Area 2b2 (CH235-300) (2661m3)	P2-Cal.C	0	3	3	24-Jun-19	26-Jun-19	-14	0%				
MC13075	Placing Surcharge Area 4 (CH300-380 W) (4584m3)	P2-Cal.C	0	5	5	12-Jul-19	17-Jul-19	-17	0%				
MC13095	Placing Surcharge Area 3 (CH304-363 E) (3043m3)	P2-Cal.C	0	3	3	18-Jul-19	20-Jul-19	-17	0%				
Surcharging													
MC13160	Surcharge Area 1b1 (CH30-75) (3701m3)	P2-Cal.A	46	120	74	05-Mar-19 A	02-Jul-19	-35	38.33%				
MC13161	Surcharge Area 1b2 (CH75-89) (1151m3)	P2-Cal.A	12	120	106	08-Apr-19 A	06-Aug-19	-50	11.67%				
MC13175	Surcharge Area 2a1 (CH89-135) (1173m3)	P2-Cal.A	7	60	43	13-Apr-19 A	07-Jun-19	-5	28.33%				
MC13175-01	Surcharge Area 2a2 (CH135-190) (1939m3)	P2-Cal.A	0	60	60	05-May-19	03-Jul-19	-31	0%				
MC13195	Surcharge Area 2b1 (CH190-235) (2661m3)	P2-Cal.A	0	60	60	11-Jun-19	09-Aug-19	-1	0%				
MC13195-01	Surcharge Area 2b2 (CH235-300) (2661m3)	P2-Cal.A	0	60	60	27-Jun-19	25-Aug-19	-16	0%				
MC13215	Surcharge Area 4 (CH300-380 W) (4584m3)	P2-Cal.A	0	60	60	18-Jul-19	15-Sep-19	-13	0%				
Removal of Surcharge													
MC13295	Removal of Surcharge Area 1a (CH0-30) (2990m3)	P2-Cal.C	0	3	3	23-Apr-19	25-Apr-19	-30	0%				
MC13315	Removal of Surcharge Area 2a1 (CH89-135) (1173m3)	P2-Cal.C	0	2	2	08-Jun-19	10-Jun-19	59	0%				
MC13300	Removal of Surcharge Area 1b1 (CH30-75) (3701m3)	P2-Cal.C	0	4	4	03-Jul-19	06-Jul-19	39	0%				
MC13315-01	Removal Surcharge Area 2a2 (CH135-190) (1939m3)	P2-Cal.C	0	2	2	10-Jul-19	11-Jul-19	35	0%				
Armour Protection													
Laying of Underlayer Armour Rock (West)													
MC13615	Armour CH271-300 (965m3)	P2-Cal.C	0	2	2	21-Jun-19	22-Jun-19	-75	0%				

- Actual Work
- Remaining Work
- Critical Remaining Work

Program with Progress as of 20-Apr-19

3 Month Rolling Programme
(Data Date : 20 Apr 2019)

Date	Revision	Checked	Approved
20-apr-19			

Activity ID	Activity Name	Calendar	Actual Duration	Original Duration	Remaining Dur	Start	Finish	Total Float	Activity Complete	2019				
										Mar	Apr	May	Jun	
MC13635	Armour CH300-375 (2501m3)	P2-Cal.C	0	4	4	26-Jun-19	29-Jun-19	-77	0%					
Laying of Armour Rock (West)														
MC13695	Armour CH271-300 (1833m3)	P2-Cal.C	0	3	3	24-Jun-19	26-Jun-19	-74	0%					
MC13715	Armour CH300-375 (4767m3)	P2-Cal.C	0	7	7	02-Jul-19	09-Jul-19	-77	0%					
Laying of Underlayer Armour Rock (East)														
MC13775	Armour CH71-190 (berm stone 820m3)	P2-Cal.C	0	17	17	02-May-19	22-May-19	-57	0%					
MC13795	Armour CH190-250 (1218m3)	P2-Cal.C	0	2	2	31-May-19	01-Jun-19	-64	0%					
MC13815	Armour CH250-300 (1674m3)	P2-Cal.C	0	3	3	21-Jun-19	24-Jun-19	-78	0%					
MC13835	Armour CH300-375 (2501m3)	P2-Cal.C	0	4	4	26-Jun-19	29-Jun-19	-78	0%					
MC13875	Armour CH440-525 South (8670m3)	P2-Cal.C	0	10	10	15-Jul-19	25-Jul-19	-95	0%					
Laying of Armour Rock (East)														
MC13895	Armour CH190-250 (2310m3)	P2-Cal.C	0	4	4	03-Jun-19	06-Jun-19	-64	0%					
MC13915	Armour CH250-300 (3181m3)	P2-Cal.C	0	5	5	25-Jun-19	29-Jun-19	-78	0%					
MC13935	Armour CH300-375 (4767m3)	P2-Cal.C	0	7	7	02-Jul-19	09-Jul-19	-78	0%					
Full-scale Treatment of Cement S/S of Marine Sediment														
MC14080	Curing, Stockpiling and Filling	P2-Cal.C	380	313	28	06-Jan-18 A	30-May-19	116	91.05%					
MC14085	Removal of Concrete Block Wall	P2-Cal.C	0	70	70	23-Apr-19	17-Jul-19	102	0%					
Modification Works of Existing Seawall														
MC14145	Excavation and Removal of existing seawall	P2-Cal.C	0	15	15	23-Apr-19	10-May-19	3	0%					
MC14165	Excavation down to -0.5mPD	P2-Cal.C	0	20	20	11-May-19	04-Jun-19	3	0%					
MC14185	Installation of Guidance Rail	P2-Cal.C	0	4	4	05-Jun-19	10-Jun-19	3	0%					
MC14205	Installation of Leveling Stone (47nos.)	P2-Cal.C	0	6	6	11-Jun-19	17-Jun-19	3	0%					
MC14225	Installation of Seawall (39nos)	P2-Cal.C	0	5	5	18-Jun-19	22-Jun-19	3	0%					
MC14245	Construction of Mass Concrete Coping	P2-Cal.C	0	10	10	24-Jun-19	05-Jul-19	3	0%					
MC14265	Reinstatement of 1.5m thick rock armour type 5	P2-Cal.C	0	3	3	06-Jul-19	09-Jul-19	3	0%					
MC14285	Reinstatement of 2.3m thick rock armour type 6	P2-Cal.C	0	3	3	10-Jul-19	12-Jul-19	3	0%					
MC14305	Grade 400 Rock fill	P2-Cal.C	0	4	4	13-Jul-19	17-Jul-19	3	0%					
Land Works														
Road P2 Underpass (CH105-CH318)														
Underpass														
Underpass P2 CH 105 - 318														
Ground Investigation (Non Surcharge)														
LC17761-01	Erection of Concrete Block Wall & Demolition of Existing Seawall to +3.5mPD	P2-Cal.C	136	50	18	03-Nov-18 A	15-May-19	-16	65%					
LC17764	Pre-drilling Works (5 nos) PDA05-PDA07a at P2 CH208 - 264 (west side) 13d/nos - Rig x 2	P2-Cal.C	65	13	5	29-Jan-19 A	29-Apr-19	-14	60%					
LC17766	Pre-drilling Works (8 nos) PDA08-PDA11 & PDB10-PDB13 at P2 CH159 - 208) - Rig x 2	P2-Cal.C	0	16	16	26-Apr-19	16-May-19	-19	0%					
LC17767	Pre-drilling Works (11 nos) PDA12-PDA16 & PDB14-PDB19 at P2 CH105 - 159) - Rig x 2	P2-Cal.C	0	20	20	06-May-19	29-May-19	-4	0%					
Foundation (Non Surcharge)														
LC17768	Installation of Socketed H-pile (7 nos) at P2 CH292 to CH305 (north side) - (Rig x 1)	P2-Cal.C	56	28	4	12-Feb-19 A	26-Apr-19	-3	85.71%					

█ Actual Work ◆ ◆ M
█ Remaining Work
█ Critical Remaining Work

Program with Progress as of 20-Apr-19

3 Month Rolling Programme
 (Data Date : 20 Apr 2019)
 Page : 13 of 14

Date	Revision	Checked	Approved
20-apr-19			

Activity ID	Activity Name	Calendar	Actual Duration	Original Duration	Remaining Dur	Start	Finish	Total Float	Activity Complete	2019			
										Mar	Apr	May	Jun
LC17777	Installation of Socket H-pile (13 nos) at P2 CH266-CH305 (middle) install steel H&grouting - 1.5d/no - (Rigx2)	P2-Cal.C	37	10	5	06-Mar-19 A	27-Apr-19	45	50%				
LC17772	Installation of Socketed H-pile (20 nos) at P2 CH208 to CH266 (middle) Drilling to FL - 2d/nos - (Rig x 1)	P2-Cal.C	26	40	19	19-Mar-19 A	21-May-19	-3	52.5%				
LC17778-1	Area 1b1 Install Socket H-pile (12 no) at P2 CH208-CH266 (middle) install steel H & grouting-1.5d/no-(Rig x 2)	P2-Cal.C	26	9	7	19-Mar-19 A	10-Jul-19	-28	22.22%				
LC17778-2	Area 1b2 Install Socket H-pile (8 no) at P2 CH208-CH266 (middle) install steel H & grouting-1.5d/no-(Rig x 2)	P2-Cal.C	26	9	7	19-Mar-19 A	06-Aug-19	-35	22.22%				
LC17769	Installation of Socketed H-pile (10 nos) at P2 CH266 to CH305 (west side) - (Rig x 1)	P2-Cal.C	4	40	38	14-Apr-19 A	08-Jun-19	-12	5%				
LC17771	Installation of Socketed H-pile (10 nos) at P2 CH208 to CH266 (west side) - (Rig x 1)	P2-Cal.C	0	40	40	23-Apr-19	11-Jun-19	-14	0%				
LC17774	Installation of Socketed H-pile (18 nos) at P2 CH160 to CH208 (middle) Drilling to FL - 2d/nos - (Rig x 2)	P2-Cal.C	0	18	18	23-Apr-19	15-May-19	-9	0%				
LC17776	Installation of Socketed H-pile (20 nos) at P2 CH105 to CH160 (middle) Drilling to FL - 2d/nos - (Rig x 2)	P2-Cal.C	0	20	20	16-May-19	08-Jun-19	-9	0%				
LC17773	Installation of Socketed H-pile (13 nos) at P2 CH160 to CH208 (west side) - (Rig x 1)	P2-Cal.C	0	52	52	17-May-19	18-Jul-19	-19	0%				
LC17779	Installation of Socket H-pile (18 nos) at P2 CH160 to CH208 (middle) install steel H & grouting - 1.5d/no - (Rig x 2)	P2-Cal.C	0	14	14	17-May-19	01-Jun-19	-4	0%				
LC17779-01	Installation of Socket H-pile (20 nos) at P2 CH105 to CH160 (middle) install steel H & grouting - 1.5d/no - (Rig x 2)	P2-Cal.C	0	15	15	10-Jun-19	26-Jun-19	-9	0%				
LC17775	Installation of Socketed H-pile (13 nos) at P2 CH105 to CH160 (west side) - (Rig x 2)	P2-Cal.C	0	26	26	12-Jun-19	12-Jul-19	-14	0%				
Ground Investigation (On Top Surcharge)			P2-Cal.C	0	49	49	26-Apr-19	25-Jun-19	-16				
LC17784	Pre-drilling Works (4 nos) PD012-PD015 at P2 CH159 - 208 - (Rig x 2)	P2-Cal.C	0	8	8	26-Apr-19	06-May-19	15	0%				
LC17789	Pre-drilling Works (5 nos) PD016-PD020 at P2 CH105 - 159 - (Rig x 2)	P2-Cal.C	0	12	12	06-May-19	20-May-19	4	0%				
LC17783	Completion of abandoning temp. 1500mm DN	P2-Cal.C	0	0	0		25-Jun-19	-16	0%				
Foundation (On Top Surcharge)			P2-Cal.C	9	62	54	09-Apr-19 A	27-Jul-19	-31				
LC17830	Installation of Socketed H-pile (12 nos) PPW Zone at P2 CH208 to CH264 Drilling to FL - 2d/nos - (Rig x 2)	P2-Cal.C	9	12	9	09-Apr-19 A	16-Jul-19	-33	25%				
LC17823	Installation of Socketed H-pile (9 nos) Except PPW Zone at P2 CH208 to CH264 Drilling to FL - 2d/nos - (Rig x 1)	P2-Cal.C	0	18	18	24-May-19	14-Jun-19	-5	0%				
LC17815	Installation of Socket H-pile (26 nos) at P2 CH105 to CH208 Drilling to FL - 2d/nos - (Rig x 3)	P2-Cal.C	0	18	18	29-Jun-19	20-Jul-19	-29	0%				
LC17825	Installation of Socket H-pile (3 no) Except PPW Zone at P2 CH208 to CH264 1b1 install steel&grout- 1.5d/no - (Rig x 1)	P2-Cal.C	0	6	6	03-Jul-19	09-Jul-19	-19	0%				
LC17820	Installation of Socket H-pile (26 nos) at P2 CH105 to CH208 install steel H & grouting - 1.5d/nos - (Rig x 3)	P2-Cal.C	0	15	15	08-Jul-19	24-Jul-19	-28	0%				
LC17835	Installation of Socketed H-pile (12 nos) PPW Zone at P2 CH208 to CH264 install steel H & grouting - 1.5d/no - (Rig x 2)	P2-Cal.C	0	10	10	17-Jul-19	27-Jul-19	-33	0%				
ELS			P2-Cal.C	0	63	63	23-Apr-19	09-Jul-19	-32				
LC17880	Pre-boring & Installation of sheetpile wall (21m; 54pcs) at P2 CH202 - 223 (Rig x 1)	P2-Cal.C	0	25	25	23-Apr-19	23-May-19	-33	0%				
LC17870	Installation of sheetpile wall (50m; 125pcs) at P2 CH268 - 318 (Rig x 1)	P2-Cal.C	0	58	58	26-Apr-19	06-Jul-19	-30	0%				
LC17850	Pre-boring Works (97m; 180 hole)(east side) at P2 CH105 - 202 (Rig x 2)	P2-Cal.C	0	45	45	06-May-19	28-Jun-19	-32	0%				
LC17860	Installation of sheetpile wall (Bulkhead; 92pcs) at P2 CH105 (Rig x 1)	P2-Cal.C	0	14	14	06-May-19	22-May-19	-32	0%				
LC18000	Installation of sheetpile wall (97m; 243pcs)(east side) at P2 CH105 - 202 (Rig x 1)	P2-Cal.C	0	40	40	22-May-19	09-Jul-19	-32	0%				
LC18005	Installation of pipe pile wall (106nos. @1.5 nos/d) (Rig x 2)	P2-Cal.C	0	35	35	24-May-19	05-Jul-19	-33	0%				
U-Trough A and B			P2-Cal.C	0	60	60	11-Jun-19	20-Aug-19	-1				
"U-Trough A Type 3 and U-Trough B Type 4" from S200 CH821 to P2 CH105			P2-Cal.C	0	60	60	11-Jun-19	20-Aug-19	-1				
Ground Investigation			P2-Cal.C	0	60	60	11-Jun-19	20-Aug-19	-1				
LC20800	Pre-drilling works ("S200 CH905 to P2 CH105")(24 nos)(Area 2b)(3 Rigs)	P2-Cal.C	0	60	60	11-Jun-19	20-Aug-19	-1	0%				
Section 4 of the Works - Preservation and Protection of Existing			P2-Cal.A	828	1563	820	12-Jan-17 A	17-Jul-21	-89				
LC25260	Preservation and Protection of Existing Trees	P2-Cal.A	828	1451	820	12-Jan-17 A	17-Jul-21	-89	43.49%				
LC25280	Nursery Transplanted Trees at the Contractor's holding nursery	P2-Cal.A	722	1177	820	28-Apr-17 A	17-Jul-21	-89	30.33%				

■ Actual Work ◆ ◆ M
■ Remaining Work
■ Critical Remaining Work

Program with Progress as of 20-Apr-19

3 Month Rolling Programme
(Data Date : 20 Apr 2019)

Date	Revision	Checked	Approved
20-apr-19			

NE/2017/02 - Updated Programme (Apr 2019)

C/NCE/PMI	Activity ID	Activity Name	Original Duration	Calendar	Activity % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	Time Risk Allowance	2019				
													Mar	Apr	May	Jun	Jul
NE/2017/02 - Updated Programme (Apr 2019)																	
Contractual Dates																	
Commencement Date			405	C3-7d		0	20-Nov-17 A	30-Nov-17 A	23-Nov-18	23-Nov-18							
K10000	Contract Date		0	C3-7d	100%	0	20-Nov-17 A		23-Nov-18								
K10010	Starting Date		0	C3-7d	100%	0	30-Nov-17 A		23-Nov-18								
Key Dates (contract)																	
K10020	Key Date 1 - Completion of works for the T&C of route-wide lighting, E&M and TCSS		0	C3-7d	0%	0		29-May-20*		29-May-20	0						
K10030	Key Date 2 - Completion of works for the opening of Road P2		0	C3-7d	0%	0		10-Dec-20*		10-Dec-20	0						
Key Dates (planned)																	
K10040	Key Date 1 - Completion of works for the T&C of route-wide lighting, E&M and TCSS (planned)		0	C3-7d	0%	0		04-Sep-20*		29-May-20	-98						
K10050	Key Date 2 - Completion of works for the opening of Road P2 (planned)		0	C3-7d	0%	0		28-Apr-21*		10-Dec-20	-139						
Completion Dates (contract)																	
K10060	Section 1 - All works not covered by other Sections		0	C3-7d	0%	0		13-Aug-20*		13-Aug-20	0						
K10070	Section 2 - Bridgeworks		0	C3-7d	0%	0		10-Dec-20*		10-Dec-20	0						
K10080	Section 3 - Preservation and Protection of Existing Trees		0	C3-7d	0%	0		10-Dec-20*		10-Dec-20	0						
K10090	Section 4 - Landscape Softworks		0	C3-7d	0%	0		10-Dec-20*		10-Dec-20	0						
K10100	Section 5 - Establishment Works		0	C3-7d	0%	0		10-Dec-21*		10-Dec-21	0						
K10110	Section 6 - Community Liaison Centre		0	C3-7d	100%	0	27-Aug-18 A		10-Dec-21								
Completion Dates (planned)																	
K10120	Section 1 - All works not covered by other Sections (planned)		0	C3-7d	0%	0		23-Dec-20*		13-Aug-20	-132						
K10130	Section 2 - Bridgeworks (planned)		0	C3-7d	0%	0		28-Apr-21*		10-Dec-20	-139						
K10140	Section 3 - Preservation and Protection of Existing Trees (planned)		0	C3-7d	0%	0		28-Apr-21*		10-Dec-20	-139						
K10150	Section 4 - Landscape Softworks (planned)		0	C3-7d	0%	0		28-Apr-21*		10-Dec-20	-139						
K10160	Section 5 - Establishment Works (planned)		0	C3-7d	0%	0		28-Apr-22*		10-Dec-21	-139						
K10170	Section 6 - Community Liaison Centre (planned)		0	C3-7d	100%	0	27-Aug-18 A		10-Dec-21								
Access Dates																	
K10180	Portion I		0	C3-6d	100%	0	30-Nov-17 A		10-Dec-21								
K10190	Portion II		0	C3-6d	100%	0	30-Nov-17 A		10-Dec-21								
K10200	Portion III		0	C3-6d	100%	0	17-Nov-17 A		10-Dec-21								
K10210	Portion IV		0	C3-6d	0%	0	21-Sep-19*		21-Sep-19		0						
K10220	Portion V		0	C3-6d	100%	0	30-Nov-17 A		10-Dec-21								
K10230	Portion VI		0	C3-6d	100%	0	30-Nov-17 A		10-Dec-21								
Subcontracting																	
S10000	Proposal on competitive process for selection of suppliers of Plant and Materials, Equipment		21	C3-7d	100%	0	20-Nov-17 A	11-Dec-17 A	28-Jun-19	28-Jun-19							
S10010	Acceptance of proposal on competitive process		21	C3-7d	100%	0	11-Dec-17 A	18-Dec-17 A	28-Jun-19	28-Jun-19							
S10020	Subcontracting procedure		3	C3-6d	100%	0	04-Dec-17 A	06-Dec-17 A	23-Nov-18	23-Nov-18							
S10030	Acceptance of subcontracting procedure		6	C3-7d	100%	0	07-Dec-17 A	12-Dec-17 A	23-Nov-18	23-Nov-18							
Subcontract Packages																	
S10040	SC003 - Community Liaison Centre subcontract		48	C3-6d	100%	0	07-Dec-17 A	21-Feb-18 A	10-Dec-21	10-Dec-21							
S10050	SC004 - Contractor's site office subcontract		48	C3-6d	100%	0	07-Dec-17 A	08-Feb-18 A	13-Aug-20	13-Aug-20							
S10060	SC002 - Pre-construction condition survey subcontract		48	C3-6d	100%	0	07-Dec-17 A	27-Feb-18 A	23-Nov-18	23-Nov-18							
S10070	SC014 - Groundwater monitoring subcontract		48	C3-6d	100%	0	31-May-18 A	09-Aug-18 A	01-Apr-19	01-Apr-19							
S10080	SC005 - Site security system subcontract		48	C3-6d	100%	0	07-Dec-17 A	27-Feb-18 A	13-Aug-20	13-Aug-20							
S10090	SC006 - ICE for temporary works and Contractor's Design works		48	C3-6d	100%	0	07-Dec-17 A	20-Mar-18 A	23-Nov-18	23-Nov-18							
S10100	SC028 - Landscaping subcontract		48	C3-6d	100%	0	07-Dec-17 A	15-Feb-18 A	23-Nov-18	23-Nov-18							
S10110	Traffic consultant (1st stage)		17	C3-6d	100%	0	30-Nov-17 A	08-Dec-17 A	23-Nov-18	23-Nov-18							
S10120	SC008 - Traffic consultant (2nd stage)		48	C3-6d	100%	0	13-Dec-17 A	19-Apr-18 A	02-Mar-19	02-Mar-19							
S10130	SC013 - Road, Drainage, Watermain subcontract		48	C3-6d	100%	0	08-Feb-18 A	03-May-18 A	23-Nov-18	23-Nov-18							
S10150	SC010 - Ground investigation subcontract		48	C3-6d	100%	0	08-Mar-18 A	04-May-18 A	01-Apr-19	01-Apr-19							
S10160	SC018 - Bored pile subcontract		48	C3-6d	100%	0	30-Aug-18 A	04-Jan-19 A	01-Apr-19	01-Apr-19							
S10170	SC019 - Socketted H-pile subcontract		48	C3-6d	100%	0	02-May-18 A	24-Jul-18 A	01-Apr-19	01-Apr-19							
S10180	SC031 - Road lighting system and electrical system for footbridge subcontract		48	C3-6d	100%	0	27-Jul-18 A	14-Nov-18 A	03-May-19	03-May-19							
S10200	SC015 - Flexible surfacing, milling and resurfacing		48	C3-6d	100%	0	05-May-18 A	03-Jul-18 A	08-Apr-19	08-Apr-19							
S10220	SC029 - Irrigation system subcontract		48	C3-6d	0%	48	09-Apr-19	10-Jun-19	24-Jul-19	18-Sep-19	84						
S10230	SC030 - Lift system subcontract		48	C3-6d	100%	0	09-Jul-18 A	11-Sep-18 A	21-Jun-19	21-Jun-19							
S10240	SC022 - Footbridge waterproofing		48	C3-6d	0%	48	09-Apr-19	10-Jun-19	22-Apr-20	18-Jun-20	305						
S10270	SC020 - Footbridge RC works subcontract		48	C3-6d	100%	0	07-Nov-18 A	16-Jan-19 A	30-May-19	30-May-19							
S10280	SC021 - Prestressing, bearing and fabricated movement joint subcontract		45	C3-6d	100%	0	07-Nov-18 A	20-Dec-18 A	06-Nov-19	06-Nov-19							
S10290	SC023 - Footbridge steelwork (canopy & arch), cladding, glazing, sundry metalwork		48	C3-6d	100%	0	06-Dec-18 A	25-Jan-19 A	23-May-19	23-May-19							
General Submissions																	
C10000	Draft Safety Plan (submission)		14	C3-7d	100%	0	20-Nov-17 A	19-Dec-17 A	23-Nov-18	23-Nov-18							
C10010	Safety Plan (submission)		6	C3-6d	100%	0	20-Dec-17 A	06-Jan-18 A	23-Nov-18	23-Nov-18							
C10020	Safety Plan (PM's acceptance)		21	C3-7d	100%	0	07-Jan-18 A	24-Jan-18 A	23-Nov-18	23-Nov-18							
C10030	Environmental Management Plan (prepare & submit)		21	C3-7d	100%	0	20-Nov-17 A	11-Dec-17 A	23-Nov-18	23-Nov-18							
C10040	Environmental Management Plan (review & discuss)		6	C3-7d	100%	0	12-Dec-17 A	11-Jan-18 A	23-Nov-18	23-Nov-18							
C10050	Environmental Management Plan (resubmit)		6	C3-6d	100%	0	12-Jan-18 A	30-Jan-18 A	23-Nov-18	23-Nov-18							
C10060	Environmental Management Plan (PM's acceptance)		21	C3-7d	100%	0	31-Jan-18 A	25-Apr-18 A	23-Nov-18	23-Nov-18							
C10070	Subcontractor Management Plan (submission)		30	C3-7d	100%	0	20-Nov-17 A	20-Dec-17 A	23-Nov-18	23-Nov-18							
C10080	Subcontractor Management Plan (PM's comments)		21	C3-7d	100%	0	21-Dec-17 A	05-Jan-18 A	23-Nov-18	23-Nov-18							
C10090	Subcontractor Management Plan (resubmit)		56	C3-6d	100%	0	06-Jan-18 A	15-Mar-18 A	23-Nov-18	23-Nov-18							
C10100	Subcontractor Management Plan (PM's acceptance)		21	C3-7d	100%	0	16-Mar-18 A	30-Apr-18 A	23-Nov-18	23-Nov-18							
C10110	Noise Mitigation Plan (prepare & submit)		1	C3-6d	100%	0	13-Jan-18 A	15-Feb-18 A	01-Apr-19	01-Apr-19							

- █ Actual Work
- █ Remaining Work
- █ Critical Remaining Work
- ◆ Milestone
- ▬ Summary

NE/2017/02 - Tseung Kwan O - Lam Tin Tunnel
Road P2/D4 and Associated Works
Updated Programme (April 2019)

Date	Revision	Checked	Approved
08-Apr-19	RWP-2019-04 (Data date 8-Apr-19)	TC	

CE/NCE/PMI	Activity ID	Activity Name	Original Duration	Calendar	Activity % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	Time Risk Allowance	2019				
													Mar	Apr	May	Jun	Jul
	C10120	Noise Mitigation Plan (review & comment)	18	C3-6d	100%	0	16-Feb-18 A	26-Mar-18 A	01-Apr-19	01-Apr-19							
	C10121	Noise Mitigation Plan (resubmit)	12	C3-6d	100%	0	27-Mar-18 A	11-Jun-18 A	01-Apr-19	01-Apr-19							
	C10122	Noise Mitigation Plan (review & comment)	12	C3-6d	100%	0	12-Jun-18 A	26-Jun-18 A	01-Apr-19	01-Apr-19							
	C10123	Noise Mitigation Plan (resubmit)	12	C3-6d	100%	0	27-Jun-18 A	11-Sep-18 A	01-Apr-19	01-Apr-19							
	C10124	Noise Mitigation Plan (accept)	21	C3-7d	100%	0	12-Sep-18 A	10-Oct-18 A	01-Apr-19	01-Apr-19							
	C10130	Weather Protection Scheme (prepare & submit)	30	C3-7d	100%	0	30-Nov-17 A	30-Jan-18 A	23-Nov-18	23-Nov-18							
	C10140	Weather Protection Scheme (accept)	21	C3-7d	100%	0	31-Jan-18 A	05-Feb-18 A	23-Nov-18	23-Nov-18							
	C10150	Waste Management Plan (prepare & submit)	18	C3-6d	100%	0	30-Nov-17 A	20-Dec-17 A	23-Nov-18	23-Nov-18							
	C10160	Waste Management Plan (review & discuss)	18	C3-6d	100%	0	21-Dec-17 A	11-Jan-18 A	23-Nov-18	23-Nov-18							
	C10170	Waste Management Plan (resubmit)	12	C3-6d	100%	0	12-Jan-18 A	18-Jan-18 A	23-Nov-18	23-Nov-18							
	C10180	Waste Management Plan (accept)	21	C3-7d	100%	0	19-Jan-18 A	25-Apr-18 A	23-Nov-18	23-Nov-18							
	C10190	Site Traffic Safety Management Plan	42	C3-7d	100%	0	30-Nov-17 A	05-Feb-18 A	23-Nov-18	23-Nov-18							
	C10200	Construction Impact Assessment (prepare & submit - Issue 1)	24	C3-6d	100%	0	12-Dec-17 A	11-Jan-18 A	01-Apr-19	01-Apr-19							
	C10210	Construction Impact Assessment (review & discuss)	12	C3-6d	100%	0	12-Jan-18 A	24-Jan-18 A	01-Apr-19	01-Apr-19							
	C10220	Construction Impact Assessment (resubmit - Issue 2 and 3)	12	C3-6d	100%	0	25-Jan-18 A	13-Apr-18 A	01-Apr-19	01-Apr-19							
	C10230	Construction Impact Assessment (resubmit - Issue 4)	12	C3-6d	100%	0	14-Apr-18 A	29-Jun-18 A	01-Apr-19	01-Apr-19							
	C10231	Construction Impact Assessment (resubmit - Issue 5)	12	C3-6d	100%	0	30-Jun-18 A	29-Aug-18 A	01-Apr-19	01-Apr-19							
	C10232	Construction Impact Assessment (resubmit - Issue 6)	12	C3-7d	100%	0	30-Aug-18 A	16-Oct-18 A	01-Apr-19	01-Apr-19							
	C10233	Construction Impact Assessment (accept)	21	C3-7d	100%	0	17-Oct-18 A	07-Nov-18 A	01-Apr-19	01-Apr-19							
	C10240	Monitoring proposal for Geotechnical Monitoring	30	C3-7d	100%	0	15-Feb-18 A	02-Mar-18 A	01-Apr-19	01-Apr-19							
	C10250	Geotechnical instrumentation programme (prepare & submit)	6	C3-6d	100%	0	08-Feb-18 A	14-Feb-18 A	01-Apr-19	01-Apr-19							
	C10260	Geotechnical instrumentation programme (accept)	21	C3-7d	100%	0	15-Feb-18 A	02-Mar-18 A	01-Apr-19	01-Apr-19							
	C10280	Fall Arrest System (prepare & submit)	18	C3-6d	0%	18	02-Jul-19*	22-Jul-19	13-Jan-20	06-Feb-20	161						
	C10290	Fall Arrest System (review & discuss)	12	C3-6d	0%	12	23-Jul-19	05-Aug-19	06-Feb-20	20-Feb-20	161						
	C10300	Fall Arrest System (resubmit)	12	C3-6d	0%	12	06-Aug-19	19-Aug-19	20-Feb-20	05-Mar-20	161						
	C10310	Fall Arrest System (accept)	21	C3-7d	0%	21	20-Aug-19	09-Sep-19	05-Mar-20	26-Mar-20	198						
	C10320	Bridge waterproofing system (prepare & submit)	18	C3-6d	0%	18	02-Jan-20*	22-Jan-20	19-Jun-20	11-Jul-20	136						
	C10330	Bridge waterproofing system (review & discuss)	12	C3-6d	0%	12	23-Jan-20	08-Feb-20	13-Jul-20	25-Jul-20	136						
	C10340	Bridge waterproofing system (resubmit)	12	C3-6d	0%	12	10-Feb-20	22-Feb-20	27-Jul-20	08-Aug-20	136						
	C10350	Bridge waterproofing system (accept)	21	C3-7d	0%	21	23-Feb-20	14-Mar-20	10-Aug-20	30-Aug-20	169						
	C10360	Particulars of bridge bearings (prepare & submit)	18	C3-6d	33.33%	12	01-Apr-19 A	25-Apr-19	06-Nov-19	20-Nov-19	172						
	C10370	Particulars of bridge bearings (review & discuss)	12	C3-6d	0%	12	26-Apr-19	10-May-19	20-Nov-19	04-Dec-19	172						
	C10380	Particulars of bridge bearings (resubmit)	12	C3-6d	0%	12	11-May-19	25-May-19	04-Dec-19	18-Dec-19	172						
	C10390	Particulars of bridge bearings (accept)	21	C3-7d	0%	21	26-May-19	15-Jun-19	18-Dec-19	08-Jan-20	207						
	C10400	Pillar box arrangement (prepare & submit)	18	C3-6d	0%	18	06-Jan-20*	29-Jan-20	04-Feb-20	24-Feb-20	22						
	C10410	Pillar box arrangement (review & discuss)	12	C3-6d	0%	12	30-Jan-20	12-Feb-20	25-Feb-20	09-Mar-20	22						
	C10420	Pillar box arrangement (resubmit)	12	C3-6d	0%	12	13-Feb-20	26-Feb-20	10-Mar-20	23-Mar-20	22						
	C10430	Pillar box arrangement (accept)	21	C3-7d	0%	21	27-Feb-20	18-Mar-20	24-Mar-20	13-Apr-20	26						
	Temporary Works (TW) Design			516		119	08-Mar-18 A	05-Aug-19	23-Nov-18	04-Oct-19	60						
	C10440	TW for trench excavation (prepare & submit)	12	C3-6d	100%	0	08-Mar-18 A	09-Apr-18 A	23-Nov-18	23-Nov-18							
	C10470	TW for trench excavation (accept)	19	C3-7d	100%	0	10-Apr-18 A	19-Apr-18 A	23-Nov-18	23-Nov-18							
	C10480	TW for socketted H-pile test (prepare & submit)	18	C3-6d	100%	0	30-Nov-18 A	14-Dec-18 A	24-Aug-19	24-Aug-19							
	C10490	TW for socketted H-pile test (review & discuss)	12	C3-6d	100%	0	15-Dec-18 A	31-Dec-18 A	24-Aug-19	24-Aug-19							
	C10500	TW for socketted H-pile test (resubmit)	6	C3-6d	100%	0	02-Jan-19 A	13-Mar-19 A	24-Aug-19	24-Aug-19							
	C10510	TW for socketted H-pile test (accept)	21	C3-7d	100%	0	14-Mar-19 A	08-Apr-19 A	24-Aug-19	24-Aug-19							
	C10520	TW for construction of pile cap (prepare & submit)	12	C3-6d	58.33%	5	30-Mar-19 A	13-Apr-19	30-May-19	04-Jun-19	39						
	C10530	TW for construction of pile cap (review & discuss)	6	C3-6d	0%	6	15-Apr-19	24-Apr-19	05-Jun-19	12-Jun-19	39						
	C10540	TW for construction of pile cap (resubmit)	6	C3-6d	0%	6	25-Apr-19	02-May-19	13-Jun-19	19-Jun-19	39						
	C10550	TW for construction of pile cap (accept)	21	C3-7d	0%	21	03-May-19	23-May-19	20-Jun-19	10-Jul-19	48						
	C10560	TW for construction of pier/column (prepare & submit)	18	C3-6d	33.33%	12	01-Apr-19 A	25-Apr-19	26-Jul-19	08-Aug-19	86						
	C10570	TW for construction of pier/column (review & discuss)	12	C3-6d	0%	12	26-Apr-19	10-May-19	09-Aug-19	22-Aug-19	86						
	C10580	TW for construction of pier/column (resubmit)	6	C3-6d	0%	6	11-May-19	18-May-19	23-Aug-19	29-Aug-19	86						
	C10590	TW for construction of pier/column (accept)	21	C3-7d	0%	21	19-May-19	08-Jun-19	30-Aug-19	19-Sep-19	103						
	C10600	TW for construction of bridge deck (prepare & submit)	18	C3-6d	0%	18	02-May-19*	23-May-19	03-Aug-19	23-Aug-19	77						
	C10610	TW for construction of bridge deck (review & discuss)	12	C3-6d	0%	12	24-May-19	06-Jun-19	24-Aug-19	06-Sep-19	77						
	C10620	TW for construction of bridge deck (resubmit)	6	C3-6d	0%	6	08-Jun-19	14-Jun-19	07-Sep-19	13-Sep-19	77						
	C10630	TW for construction of bridge deck (accept)	21	C3-7d	0%	21	15-Jun-19	05-Jul-19	14-Sep-19	04-Oct-19	91						
	C10640	TW for construction of lift shaft (prepare & submit)	18	C3-6d	0%	18	01-Jun-19*	22-Jun-19	03-Aug-19	23-Aug-19	52						
	C10650	TW for construction of lift shaft (review & discuss)	12	C3-6d	0%	12	24-Jun-19	08-Jul-19	24-Aug-19	06-Sep-19	52						
	C10660	TW for construction of lift shaft (resubmit)	6	C3-6d	0%	6	09-Jul-19	15-Jul-19	07-Sep-19	13-Sep-19	52						
	C10670	TW for construction of lift shaft (accept)	21	C3-7d	0%	21	16-Jul-19	05-Aug-19	14-Sep-19	04-Oct-19	60						
	C10680	TW for construction of staircase (prepare & submit)	18	C3-6d	0%	18	01-Jun-19*	22-Jun-19	03-Aug-19	23-Aug-19	52						
	C10690	TW for construction of staircase (review & discuss)	12	C3-6d	0%	12	24-Jun-19	08-Jul-19	24-Aug-19	06-Sep-19	52						
	C10700	TW for construction of staircase (resubmit)	6	C3-6d	0%	6	09-Jul-19	15-Jul-19	07-Sep-19	13-Sep-19	52						
	C10710	TW for construction of staircase (accept)	21	C3-7d	0%	21	16-Jul-19	05-Aug-19	14-Sep-19	04-Oct-19	60						
	Method Statements (MS)			894		469	22-Jan-18 A	20-Jul-20	23-Nov-18	18-Oct-20	90						
	C10720	MS tree felling (prepare & submit)	12	C3-6d	100%	0	22-Jan-18 A	26-Jan-18 A	23-Nov-18	23-Nov-18							
	C10730	MS tree felling (accept)	21	C3-7d	100%	0	27-Jan-18 A	07-Feb-18 A	23-Nov-18	23-Nov-18							
	C10740	MS for trench excavation (prepare & submit)	11	C3-6d	100%	0	13-Mar-18 A	09-Apr-18 A	23-Nov-18	23-Nov-18							
	C10770	MS for trench excavation (accept)	19	C3-7d	100%	0	10-Apr-18 A	19-Apr-18 A	23-Nov-18	23-Nov-18							
	C10780	MS for Contractor's site office (prepare & submit)	6	C3-6d	100%	0	08-Mar-18 A	12-Mar-18 A	13-Aug-20	13-Aug-20							
	C10790	MS for Contractor's site office (review & discuss)	6	C3-6d	100%	0	13-Mar-18 A	09-Apr-18 A	13-Aug-20	13-Aug-20							

- █ Actual Work
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NE/2017/02 - Tseung Kwan O - Lam Tin Tunnel
Road P2/D4 and Associated Works
Updated Programme (April 2019)

Date	Revision	Checked	Approved
08-Apr-19	RWP-2019-04 (Data date 8-Apr-19)	TC	

NE/2017/02 - Updated Programme (Apr 2019)

CE/NCE/PMI	Activity ID	Activity Name	Original Duration	Calendar	Activity % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	Time Risk Allowance	2019				
													Mar	Apr	May	Jun	Jul
	C10800	MS for Contractor's site office (resubmit)	5	C3-6d	100%	0	10-Apr-18 A	03-May-18 A	13-Aug-20	13-Aug-20							
	C10810	MS for Contractor's site office (accept)	19	C3-7d	100%	0	04-May-18 A	16-May-18 A	13-Aug-20	13-Aug-20							
	C10820	MS for temporary road construction (prepare & submit)	6	C3-6d	100%	0	08-Feb-18 A	22-Feb-18 A	22-Dec-18	22-Dec-18							
	C10830	MS for temporary road construction (review & discuss)	6	C3-6d	100%	0	23-Feb-18 A	05-Mar-18 A	22-Dec-18	22-Dec-18							
	C10840	MS for temporary road construction (resubmit)	6	C3-6d	100%	0	06-Mar-18 A	10-Apr-18 A	22-Dec-18	22-Dec-18							
	C10850	MS for temporary road construction (accept)	12	C3-7d	100%	0	11-Apr-18 A	23-May-18 A	22-Dec-18	22-Dec-18							
	C10860	MS for watermain (prepare & submit)	12	C3-6d	100%	0	08-May-18 A	26-Jul-18 A	23-Jan-19	23-Jan-19							
	C10890	MS for watermain (accept)	11	C3-7d	100%	0	27-Jul-18 A	05-Oct-18 A	23-Jan-19	23-Jan-19							
	C10900	MS for tree transplanting (prepare & submit)	6	C3-6d	100%	0	08-Mar-18 A	22-Mar-18 A	25-Mar-19	25-Mar-19							
	C10910	MS for tree transplanting (review & discuss)	6	C3-6d	100%	0	23-Mar-18 A	16-Apr-18 A	25-Mar-19	25-Mar-19							
	C10920	MS for tree transplanting (resubmit)	5	C3-6d	100%	0	17-Apr-18 A	30-May-18 A	25-Mar-19	25-Mar-19							
	C10930	MS for tree transplanting (accept)	19	C3-7d	100%	0	31-May-18 A	06-Jun-18 A	25-Mar-19	25-Mar-19							
	C10931	MS for tree protection (prepare & submit)	6	C3-6d	100%	0	06-Apr-18 A	16-Apr-18 A	16-Aug-19	16-Aug-19							
	C10932	MS for tree protection (review & discuss)	6	C3-6d	100%	0	17-Apr-18 A	25-Apr-18 A	16-Aug-19	16-Aug-19							
	C10933	MS for tree protection (resubmit)	6	C3-6d	50%	3	26-Apr-18 A	11-Apr-19	16-Aug-19	19-Aug-19	104						
	C10934	MS for tree protection (accept)	21	C3-7d	0%	21	12-Apr-19	02-May-19	20-Aug-19	09-Sep-19	130						
	C10940	MS for standpipe and piezometer (prepare & submit)	5	C3-6d	100%	0	21-Aug-18 A	28-Aug-18 A	01-Apr-19	01-Apr-19							
	C10970	MS for standpipe and piezometer (accept)	28	C3-7d	100%	0	29-Aug-18 A	13-Sep-18 A	01-Apr-19	01-Apr-19							
	C10980	MS for drainage (prepare & submit)	5	C3-6d	100%	0	09-Apr-18 A	16-Apr-18 A	23-Nov-18	23-Nov-18							
	C11010	MS for drainage (accept)	21	C3-7d	100%	0	17-Apr-18 A	11-Jun-18 A	23-Nov-18	23-Nov-18							
	C11020	MS for ground investigation (prepare & submit)	12	C3-6d	100%	0	29-Mar-18 A	13-Apr-18 A	01-Apr-19	01-Apr-19							
	C11030	MS for ground investigation (review & discuss)	12	C3-6d	100%	0	14-Apr-18 A	04-May-18 A	01-Apr-19	01-Apr-19							
	C11040	MS for ground investigation (resubmit)	6	C3-6d	100%	0	05-May-18 A	19-May-18 A	01-Apr-19	01-Apr-19							
	C11050	MS for ground investigation (accept by PM & MTRCL)	28	C3-7d	100%	0	20-May-18 A	29-May-18 A	01-Apr-19	01-Apr-19							
	C11060	MS for bored pile (prepare & submit)	12	C3-6d	100%	0	30-Nov-18 A	14-Dec-18 A	01-Apr-19	01-Apr-19							
	C11070	MS for bored pile (review & discuss)	12	C3-6d	100%	0	15-Dec-18 A	25-Feb-19 A	01-Apr-19	01-Apr-19							
	C11080	MS for bored pile (resubmit)	6	C3-6d	100%	0	26-Feb-19 A	19-Mar-19 A	01-Apr-19	01-Apr-19							
	C11090	MS for bored pile (accept by PM & MTRCL)	6	C3-7d	100%	0	20-Mar-19 A	28-Mar-19 A	01-Apr-19	01-Apr-19							
	C11100	MS for construction of socketted H-pile (prepare & submit)	12	C3-6d	100%	0	18-Jun-18 A	25-Jun-18 A	01-Apr-19	01-Apr-19							
	C11110	MS for construction of socketted H-pile (review & discuss)	6	C3-6d	100%	0	26-Jun-18 A	25-Jul-18 A	01-Apr-19	01-Apr-19							
	C11120	MS for construction of socketted H-pile (resubmit)	6	C3-6d	100%	0	26-Jul-18 A	20-Aug-18 A	01-Apr-19	01-Apr-19							
	C11130	MS for construction of socketted H-pile (accept by PM & MTRCL)	28	C3-7d	100%	0	21-Aug-18 A	04-Dec-18 A	01-Apr-19	01-Apr-19							
	C11140	MS for socketted H-pile testing (prepare & submit)	12	C3-6d	100%	0	30-Nov-18 A	14-Dec-18 A	24-Aug-19	24-Aug-19							
	C11150	MS for socketted H-pile testing (review & discuss)	6	C3-6d	100%	0	15-Dec-18 A	31-Dec-18 A	24-Aug-19	24-Aug-19							
	C11160	MS for socketted H-pile testing (resubmit)	6	C3-6d	100%	0	02-Jan-19 A	11-Mar-19 A	24-Aug-19	24-Aug-19							
	C11170	MS for socketted H-pile testing (accept)	21	C3-7d	100%	0	12-Mar-19 A	08-Apr-19 A	24-Aug-19	24-Aug-19							
	C11180	MS for bored pile testing (prepare & submit)	12	C3-6d	0%	12	02-May-19*	16-May-19	02-May-19	16-May-19	0						
	C11190	MS for bored pile testing (review & discuss)	6	C3-6d	0%	6	17-May-19	23-May-19	05-Sep-19	12-Sep-19	93						
	C11200	MS for bored pile testing (resubmit)	6	C3-6d	0%	6	24-May-19	30-May-19	12-Sep-19	20-Sep-19	93						
	C11210	MS for bored pile testing (accept)	21	C3-7d	0%	21	31-May-19	20-Jun-19	20-Sep-19	11-Oct-19	112						
	C11220	MS for construction of pile cap (prepare & submit)	6	C3-6d	0%	6	24-May-19	30-May-19	11-Jul-19	17-Jul-19	39						
	C11230	MS for construction of pile cap (review & discuss)	6	C3-6d	0%	6	31-May-19	06-Jun-19	18-Jul-19	24-Jul-19	39						
	C11240	MS for construction of pile cap (resubmit)	6	C3-6d	0%	6	08-Jun-19	14-Jun-19	25-Jul-19	31-Jul-19	39						
	C11250	MS for construction of pile cap (accept by PM & MTRCL)	28	C3-7d	0%	28	15-Jun-19	12-Jul-19	01-Aug-19	28-Aug-19	47						
	C11260	MS for construction of pier/column (prepare & submit)	12	C3-6d	0%	12	10-Jun-19	22-Jun-19	20-Sep-19	04-Oct-19	86						
	C11270	MS for construction of pier/column (review & discuss)	6	C3-6d	0%	6	24-Jun-19	29-Jun-19	25-Oct-19	01-Nov-19	103						
	C11280	MS for construction of pier/column (resubmit)	6	C3-6d	0%	6	02-Jul-19	08-Jul-19	01-Nov-19	08-Nov-19	103						
	C11290	MS for construction of pier/column (accept)	21	C3-7d	0%	21	09-Jul-19	29-Jul-19	08-Nov-19	29-Nov-19	123						
	C11300	MS for construction of bridge deck (prepare & submit)	12	C3-6d	0%	12	06-Jul-19	19-Jul-19	05-Oct-19	19-Oct-19	76						
	C11310	MS for construction of bridge deck (review & discuss)	6	C3-6d	0%	6	20-Jul-19	26-Jul-19	14-Jan-20	21-Jan-20	147						
	C11320	MS for construction of bridge deck (resubmit)	6	C3-6d	0%	6	27-Jul-19	02-Aug-19	21-Jan-20	31-Jan-20	147						
	C11330	MS for construction of bridge deck (accept)	21	C3-7d	0%	21	03-Aug-19	23-Aug-19	31-Jan-20	21-Feb-20	182						
	C11340	MS for construction of lift shaft (prepare & submit)	12	C3-6d	0%	12	06-Aug-19	19-Aug-19	05-Oct-19	19-Oct-19	50						
	C11350	MS for construction of lift shaft (review & discuss)	6	C3-6d	0%	6	20-Aug-19	26-Aug-19	23-Oct-19	29-Oct-19	52						
	C11360	MS for construction of lift shaft (resubmit)	6	C3-6d	0%	6	27-Aug-19	02-Sep-19	30-Oct-19	05-Nov-19	52						
	C11370	MS for construction of lift shaft (accept)	21	C3-7d	0%	21	03-Sep-19	23-Sep-19	06-Nov-19	26-Nov-19	64						
	C11380	MS for construction of staircase (prepare & submit)	12	C3-6d	0%	12	06-Aug-19	19-Aug-19	05-Oct-19	19-Oct-19	50						
	C11390	MS for construction of staircase (review & discuss)	6	C3-6d	0%	6	20-Aug-19	26-Aug-19	21-Oct-19	26-Oct-19	50						
	C11400	MS for construction of staircase (resubmit)	6	C3-6d	0%	6	27-Aug-19	02-Sep-19	28-Oct-19	02-Nov-19	50						
	C11410	MS for construction of staircase (accept)	21	C3-7d	0%	21	03-Sep-19	23-Sep-19	04-Nov-19	24-Nov-19	62						
	C11420	MS for installation of bearing and movement joints (prepare & submit)	12	C3-6d	0%	12	17-Jun-19	29-Jun-19	08-Jan-20	22-Jan-20	170						
	C11430	MS for installation of bearing and movement joints (review & discuss)	6	C3-6d	0%	6	02-Jul-19	08-Jul-19	22-Jan-20	01-Feb-20	170						
	C11440	MS for installation of bearing and movement joints (resubmit)	6	C3-6d	0%	6	09-Jul-19	15-Jul-19	01-Feb-20	08-Feb-20	170						
	C11450	MS for installation of bearing and movement joints (accept)	21	C3-7d	0%	21	16-Jul-19	05-Aug-19	08-Feb-20	29-Feb-20	208						
	C11460	MS for prestressing (prepare & submit)	12	C3-6d	0%	12	02-Dec-19*	14-Dec-19	18-Mar-20	01-Apr-20	87						
	C11470	MS for prestressing (review & discuss)	6	C3-6d	0%	6	16-Dec-19	21-Dec-19	01-Apr-20	09-Apr-20	87						
	C11480	MS for prestressing (resubmit)	6	C3-6d	0%	6	23-Dec-19	31-Dec-19	09-Apr-20	20-Apr-20	87						
	C11490	MS for prestressing (accept)	21	C3-7d	0%	21	01-Jan-20	21-Jan-20	20-Apr-20	11-May-20	111						
	C11500	MS for flexible pavement, kerb & road marking (prepare & submit)	12	C3-6d	100%	0	14-Jun-18 A	21-Jun-18 A	08-Apr-19	08-Apr-19							
	C11510	MS for flexible pavement, kerb & road marking (review & discuss)	6	C3-6d	100%	0	22-Jun-18 A	30-Jul-18 A	08-Apr-19	08-Apr-19							
	C11520	MS for flexible pavement, kerb & road marking (resubmit)	6	C3-6d	100%	0	31-Jul-18 A	16-Aug-18 A	08-Apr-19	08-Apr-19							
	C11530	MS for flexible pavement, kerb & road marking (accept)	21	C3-7d	100%	0	17-Aug-18 A	22-Oct-18 A	08-Apr-19	08-Apr-19							

- █ Actual Work
- █ Remaining Work
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- ◆ Milestone
- Summary

NE/2017/02 - Tseung Kwan O - Lam Tin Tunnel
Road P2/D4 and Associated Works
Updated Programme (April 2019)

Date	Revision	Checked	Approved
08-Apr-19	RWP-2019-04 (Data date 8-Apr-19)	TC	

C/NCE/PMI	Activity ID	Activity Name	Original Duration	Calendar	Activity % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	Time Risk Allowance	2019				
													Mar	Apr	May	Jun	Jul
	C11540	MS for fences, railing, parapets, crash gate and untensioned beam barriers (prepare & submit)	12	C3-6d	0%	12	16-Dec-19*	31-Dec-19	09-Oct-19	22-Oct-19		-58					
	C11550	MS for fences, railing, parapets, crash gate and untensioned beam barriers (review & discuss)	6	C3-6d	0%	6	02-Jan-20	08-Jan-20	23-Oct-19	29-Oct-19		-58					
	C11560	MS for fences, railing, parapets, crash gate and untensioned beam barriers (resubmit)	6	C3-6d	0%	6	09-Jan-20	15-Jan-20	30-Oct-19	05-Nov-19		-58					
	C11570	MS for fences, railing, parapets, crash gate and untensioned beam barriers (accept)	21	C3-7d	0%	21	16-Jan-20	05-Feb-20	06-Nov-19	26-Nov-19		-71					
	C11580	MS for footbridge waterproofing (prepare & submit)	12	C3-6d	0%	12	16-Mar-20	28-Mar-20	31-Aug-20	12-Sep-20		136					
	C11590	MS for footbridge waterproofing (review & discuss)	6	C3-6d	0%	6	30-Mar-20	06-Apr-20	14-Sep-20	19-Sep-20		136					
	C11600	MS for footbridge waterproofing (resubmit)	6	C3-6d	0%	6	07-Apr-20	16-Apr-20	21-Sep-20	26-Sep-20		136					
	C11610	MS for footbridge waterproofing (accept)	21	C3-7d	0%	21	17-Apr-20	07-May-20	28-Sep-20	18-Oct-20		164					
	C11620	MS for footbridge steelworks (steel arch & lift beams) (prepare & submit)	12	C3-6d	0%	12	01-Nov-19*	14-Nov-19	02-Dec-19	14-Dec-19		26					
	C11630	MS for footbridge steelworks (steel arch & lift beams) (review & discuss)	6	C3-6d	0%	6	15-Nov-19	21-Nov-19	16-Dec-19	21-Dec-19		26					
	C11640	MS for footbridge steelworks (steel arch & lift beams) (resubmit)	6	C3-6d	0%	6	22-Nov-19	28-Nov-19	23-Dec-19	31-Dec-19		26					
	C11650	MS for footbridge steelworks (steel arch & lift beams) (accept)	21	C3-7d	0%	21	29-Nov-19	19-Dec-19	01-Jan-20	21-Jan-20		33					
	C11660	MS for footbridge finishing (prepare & submit)	12	C3-6d	0%	12	01-Jun-20*	13-Jun-20	31-Aug-20	12-Sep-20		76					
	C11670	MS for footbridge finishing (review & discuss)	6	C3-6d	0%	6	15-Jun-20	20-Jun-20	14-Sep-20	19-Sep-20		76					
	C11680	MS for footbridge finishing (resubmit)	6	C3-6d	0%	6	22-Jun-20	29-Jun-20	21-Sep-20	26-Sep-20		76					
	C11690	MS for footbridge finishing (accept)	21	C3-7d	0%	21	30-Jun-20	20-Jul-20	28-Sep-20	18-Oct-20		90					
	C11700	MS for fall arrest system (prepare & submit)	18	C3-6d	0%	18	10-Sep-19	02-Oct-19	26-Mar-20	21-Apr-20		161					
	C11710	MS for fall arrest system (review & discuss)	12	C3-6d	0%	12	03-Oct-19	17-Oct-19	21-Apr-20	07-May-20		161					
	C11720	MS for fall arrest system (resubmit)	12	C3-6d	0%	12	18-Oct-19	31-Oct-19	07-May-20	21-May-20		161					
	C11730	MS for fall arrest system (accept)	21	C3-7d	0%	21	01-Nov-19	21-Nov-19	21-May-20	11-Jun-20		202					
	Community Liaison Centre (CLC)		271			0	30-Nov-17 A	27-Aug-18 A	10-Dec-21	10-Dec-21							
	C11740	PM's written instruction	1	C3-6d	100%	0	30-Nov-17 A	30-Nov-17 A	10-Dec-21	10-Dec-21							
	C11750	Proposed layout (prepare & submit)	6	C3-6d	100%	0	01-Dec-17 A	13-Jan-18 A	10-Dec-21	10-Dec-21							
	C11760	Proposed layout (review & discuss)	6	C3-6d	100%	0	14-Jan-18 A	22-Jan-18 A	10-Dec-21	10-Dec-21							
	C11770	Proposed layout (resubmit)	6	C3-6d	100%	0	23-Jan-18 A	18-Apr-18 A	10-Dec-21	10-Dec-21							
	C11780	Proposed layout (accept)	21	C3-7d	100%	0	19-Apr-18 A	29-May-18 A	10-Dec-21	10-Dec-21							
	C11785	Design of CLC foundation (submit & accept)	12	C3-6d	100%	0	19-Apr-18 A	08-May-18 A	10-Dec-21	10-Dec-21							
	C11790	Design of CLC (prepare & submit)	12	C3-6d	100%	0	19-Feb-18 A	19-Apr-18 A	10-Dec-21	10-Dec-21							
	C11800	Design of CLC (review & discuss)	6	C3-6d	100%	0	20-Apr-18 A	24-Apr-18 A	10-Dec-21	10-Dec-21							
	C11810	Design of CLC (resubmit)	6	C3-6d	100%	0	25-Apr-18 A	30-Apr-18 A	10-Dec-21	10-Dec-21							
	C11820	Design of CLC (accept)	21	C3-7d	100%	0	01-May-18 A	18-May-18 A	10-Dec-21	10-Dec-21							
	C11821	MS for CLC (prepare & submit)	6	C3-6d	100%	0	02-Apr-18 A	17-Apr-18 A	10-Dec-21	10-Dec-21							
	C11822	MS for CLC (review & discuss)	6	C3-6d	100%	0	18-Apr-18 A	08-May-18 A	10-Dec-21	10-Dec-21							
	C11823	MS for CLC (resubmit)	6	C3-6d	100%	0	09-May-18 A	10-May-18 A	10-Dec-21	10-Dec-21							
	C11824	MS for CLC (accept)	21	C3-7d	100%	0	11-May-18 A	18-May-18 A	10-Dec-21	10-Dec-21							
	Construction of CLC		69	C3-6d	0	0	18-Apr-18 A	27-Aug-18 A	10-Dec-21	10-Dec-21							
	C11830-1	Site formation	5	C3-6d	100%	0	18-Apr-18 A	19-Apr-18 A	10-Dec-21	10-Dec-21							
	C11830-2	Concrete slab	5	C3-6d	100%	0	20-Apr-18 A	23-Apr-18 A	10-Dec-21	10-Dec-21							
	C11830-3	Steel frame	17	C3-6d	100%	0	18-May-18 A	25-May-18 A	10-Dec-21	10-Dec-21							
	C11830-4	Wall, ceiling, doors, windows	24	C3-6d	100%	0	26-May-18 A	10-Aug-18 A	10-Dec-21	10-Dec-21							
	C11830-5	Furnishing	30	C3-6d	100%	0	03-Jul-18 A	10-Aug-18 A	10-Dec-21	10-Dec-21							
	C11830-6	E&M	30	C3-6d	100%	0	03-Jul-18 A	10-Aug-18 A	10-Dec-21	10-Dec-21							
	C11830-7	T&C of CLC	14	C3-6d	100%	0	10-Aug-18 A	27-Aug-18 A	10-Dec-21	10-Dec-21							
	Preservation and Protection of Existing Trees		852	C3-6d		373	27-Dec-17 A	28-Apr-21	23-Nov-18	10-Dec-20	-109						
	C11840	Tree survey and tree report	12	C3-6d	100%	0	27-Dec-17 A	13-Jan-18 A	23-Nov-18	23-Nov-18							
	C11850	Preservation and protection of existing trees	715	C3-6d	47.83%	373	08-Feb-18 A	28-Apr-21	10-Sep-19	10-Dec-20		-109					
	Footbridge Canopy		293			293	01-Jun-19	19-Mar-20	22-Aug-19	11-Jun-20	84						
	C11860	Design of steel canopy & cladding of arch (prepare & submit)	90	C3-6d	0%	90	01-Jun-19*	17-Sep-19	22-Aug-19	09-Dec-19		68					
	C11870	Design of steel canopy & cladding of arch (review & discuss)	18	C3-6d	0%	18	18-Sep-19	10-Oct-19	09-Dec-19	02-Jan-20		68					
	C11880	Design of steel canopy & cladding of arch (resubmit)	18	C3-6d	0%	18	11-Oct-19	31-Oct-19	02-Jan-20	23-Jan-20		68					
	C11890	Design of steel canopy & cladding of arch (accept)	21	C3-7d	0%	21	01-Nov-19	21-Nov-19	23-Jan-20	13-Feb-20		83					
	C11900	MS for steel canopy & cladding of arch (prepare & submit)	18	C3-6d	0%	18	22-Nov-19	12-Dec-19	26-Mar-20	21-Apr-20		101					
	C11910	MS for steel canopy & cladding of arch (review & discuss)	12	C3-6d	0%	12	13-Dec-19	28-Dec-19	21-Apr-20	07-May-20		101					
	C11920	MS for steel canopy & cladding of arch (resubmit)	12	C3-6d	0%	12	30-Dec-19	13-Jan-20	07-May-20	21-May-20		101					
	C11930	MS for steel canopy & cladding of arch (accept)	21	C3-7d	0%	21	14-Jan-20	03-Feb-20	21-May-20	11-Jun-20		128					
	C11940	Material order, fabrication and delivery of footbridge canopy & cladding of arch	96	C3-6d	0%	96	22-Nov-19	19-Mar-20	13-Feb-20	11-Jun-20		65					
	Lift System		852			723	12-Sep-18 A	01-Apr-21	21-Jun-19	10-Dec-20	-111						
	Design		180			51	12-Sep-18 A	29-May-19	21-Jun-19	07-Aug-19	70						
	C11950	Design of lift system (prepare & submit)	90	C3-6d	100%	0	12-Sep-18 A	13-Mar-19 A	21-Jun-19	21-Jun-19							
	C11960	Design of lift system (review & discuss)	18	C3-6d	77.78%	4	14-Mar-19 A	12-Apr-19	21-Jun-19	25-Jun-19		57					
	C11970	Design of lift system (resubmit)	18	C3-6d	0%	18	13-Apr-19	08-May-19	26-Jun-19	17-Jul-19		57					
	C11980	Design of lift system (accept)	21	C3-7d	0%	21	09-May-19	29-May-19	18-Jul-19	07-Aug-19		70					
	Method Statement		63			63	17-Dec-18 A	31-Jul-19	17-Dec-19	21-Feb-20	205						
	C11990	MS for lift installation (prepare & submit)	18	C3-6d	44.44%	10	17-Dec-18 A	11-Jun-19	17-Dec-19	30-Dec-19		167					
	C12000	MS for lift installation (review & discuss)	12	C3-6d	0%	12	12-Jun-19	25-Jun-19	31-Dec-19	14-Jan-20		167					
	C12010	MS for lift installation (resubmit)	12	C3-6d	0%	12	26-Jun-19	10-Jul-19	15-Jan-20	31-Jan-20		167					
	C12020	MS for lift installation (accept)	21	C3-7d	0%	21	11-Jul-19	31-Jul-19	01-Feb-20	21-Feb-20		205					
	Material Order & Delivery		334	C3-7d		334	30-May-19	27-Apr-20	08-Aug-19	13-Aug-20	108						
	C12030	Material order and delivery - Lift 2A & 2B	210	C3-7d	0%	210	30-May-19	25-Dec-19	08-Aug-19	04-Mar-20		70					
	C12031	Material order and delivery - Lift 3A & 3B	210	C3-7d	0%	210	01-Oct-19*	27-Apr-20	31-Oct-19	27-May-20		30					
	C12032	Material order and delivery - Lift 1A & 1B	210	C3-7d	0%	210	30-May-19*	25-Dec-19	17-Jan-20	13-Aug-20		232					
	Electricity Supply & Pillar Box		259	C3-6d		259	31-Jan-19 A	09-Apr-20	12-Dec-19	06-May-20	18						

█ Actual Work
█ Remaining Work
█ Critical Remaining Work
 ◆ Milestone
 ─ Summary

NE/2017/02 - Tseung Kwan O - Lam Tin Tunnel
Road P2/D4 and Associated Works
Updated Programme (April 2019)

Date	Revision	Checked	Approved
08-Apr-19	RWP-2019-04 (Data date 8-Apr-1		

NE/2017/02 - Updated Programme (Apr 2019)

CE/NCE/PMI	Activity ID	Activity Name	Original Duration	Calendar	Activity % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	Time Risk Allowance	2019				
													Mar	Apr	May	Jun	Jul
	C12040	Application for electricity supply	144	C3-6d	20.83%	114	31-Jan-19 A	15-Oct-19	12-Dec-19	06-May-20	163						
	C12060	Pillar box (for lift) construction	18	C3-6d	0%	18	19-Mar-20	09-Apr-20	14-Apr-20	06-May-20	18						
Lift 2A & 2B			86	C3-6d		86	02-May-20	12-Aug-20	22-Feb-20	12-Nov-20	76						
	C12050-10	Lift shaft scaffolding (2A & 2B)	10	C3-6d	0%	10	02-May-20	13-May-20	22-Feb-20	04-Mar-20	-54						
	C12050-15	Lift machine & guide rail (2A & 2B)	12	C3-6d	0%	12	14-May-20	27-May-20	05-Mar-20	18-Mar-20	-54						
	C12050-20	Lift door and landing (2A & 2B)	10	C3-6d	0%	10	28-May-20	08-Jun-20	19-Mar-20	30-Mar-20	-54						
	C12050-25	Control panel and lift shaft wiring (2A & 2B)	6	C3-6d	0%	6	09-Jun-20	15-Jun-20	31-Mar-20	07-Apr-20	-54						
	C12050-30	Modify lift shaft scaffolding (2A & 2B)	6	C3-6d	0%	6	16-Jun-20	22-Jun-20	08-Apr-20	17-Apr-20	-54						
	C12050-35	Lift car assembly and cage wiring (2A & 2B)	14	C3-6d	0%	14	23-Jun-20	10-Jul-20	18-Apr-20	06-May-20	-54						
	C12050-40	Connect temporary / permanent power supply to control panel (2A & 2B)	2	C3-6d	0%	2	11-Jul-20	13-Jul-20	07-May-20	08-May-20	-54						
	C12050-45	Remove lift shaft scaffold (2A & 2B)	6	C3-6d	0%	6	14-Jul-20	20-Jul-20	09-May-20	15-May-20	-54						
	C12050-50	Slow speed test (2A & 2B)	5	C3-6d	0%	5	21-Jul-20	25-Jul-20	20-Oct-20	24-Oct-20	76						
	C12050-55	CCTV and intercom system (2A & 2B)	5	C3-6d	0%	5	27-Jul-20	31-Jul-20	27-Oct-20	31-Oct-20	76						
	C12050-60	High speed & load test (2A & 2B)	10	C3-6d	0%	10	01-Aug-20	12-Aug-20	02-Nov-20	12-Nov-20	76						
Lift 3A & 3B			85	C3-6d		85	21-Jul-20	30-Oct-20	16-May-20	12-Nov-20	11						
	C12052-10	Lift shaft scaffolding (3A & 3B)	10	C3-6d	0%	10	21-Jul-20	31-Jul-20	16-May-20	27-May-20	-54						
	C12052-15	Lift machine & guide rail (3A & 3B)	12	C3-6d	0%	12	01-Aug-20	14-Aug-20	28-May-20	10-Jun-20	-54						
	C12052-20	Lift door and landing (3A & 3B)	10	C3-6d	0%	10	15-Aug-20	26-Aug-20	11-Jun-20	22-Jun-20	-54						
	C12052-25	Control panel and lift shaft wiring (3A & 3B)	6	C3-6d	0%	6	27-Aug-20	02-Sep-20	23-Jun-20	30-Jun-20	-54						
	C12052-30	Modify lift shaft scaffolding (3A & 3B)	6	C3-6d	0%	6	03-Sep-20	09-Sep-20	02-Jul-20	08-Jul-20	-54						
	C12052-35	Lift car assembly and cage wiring (3A & 3B)	14	C3-6d	0%	14	10-Sep-20	25-Sep-20	09-Jul-20	24-Jul-20	-54						
	C12052-40	Connect temporary / permanent power supply to control panel (3A & 3B)	2	C3-6d	0%	2	26-Sep-20	28-Sep-20	25-Jul-20	27-Jul-20	-54						
	C12052-45	Remove lift shaft scaffold (3A & 3B)	5	C3-6d	0%	5	29-Sep-20	06-Oct-20	28-Jul-20	01-Aug-20	-54						
	C12052-50	Slow speed test (3A & 3B)	5	C3-6d	0%	5	07-Oct-20	12-Oct-20	20-Oct-20	24-Oct-20	11						
	C12052-55	CCTV and intercom system (3A & 3B)	5	C3-6d	0%	5	13-Oct-20	17-Oct-20	27-Oct-20	31-Oct-20	11						
	C12052-60	High speed & load test (3A & 3B)	10	C3-6d	0%	10	19-Oct-20	30-Oct-20	02-Nov-20	12-Nov-20	11						
Lift 1A & 1B			85	C3-6d		85	07-Oct-20	18-Jan-21	03-Aug-20	12-Nov-20	-54						
	C12054-10	Lift shaft scaffolding (1A & 1B)	10	C3-6d	0%	10	07-Oct-20	17-Oct-20	03-Aug-20	13-Aug-20	-54						
	C12054-15	Lift machine & guide rail (1A & 1B)	12	C3-6d	0%	12	19-Oct-20	02-Nov-20	14-Aug-20	27-Aug-20	-54						
	C12054-20	Lift door and landing (1A & 1B)	10	C3-6d	0%	10	03-Nov-20	13-Nov-20	28-Aug-20	08-Sep-20	-54						
	C12054-25	Control panel and lift shaft wiring (1A & 1B)	6	C3-6d	0%	6	14-Nov-20	20-Nov-20	09-Sep-20	15-Sep-20	-54						
	C12054-30	Modify lift shaft scaffolding (1A & 1B)	6	C3-6d	0%	6	21-Nov-20	27-Nov-20	16-Sep-20	22-Sep-20	-54						
	C12054-35	Lift car assembly and cage wiring (1A & 1B)	14	C3-6d	0%	14	28-Nov-20	14-Dec-20	23-Sep-20	10-Oct-20	-54						
	C12054-40	Connect temporary / permanent power supply to control panel (1A & 1B)	2	C3-6d	0%	2	15-Dec-20	16-Dec-20	12-Oct-20	13-Oct-20	-54						
	C12054-45	Remove lift shaft scaffold (1A & 1B)	5	C3-6d	0%	5	17-Dec-20	22-Dec-20	14-Oct-20	19-Oct-20	-54						
	C12054-50	Slow speed test (1A & 1B)	5	C3-6d	0%	5	23-Dec-20	30-Dec-20	20-Oct-20	24-Oct-20	-54						
	C12054-55	CCTV and intercom system (1A & 1B)	5	C3-6d	0%	5	31-Dec-20	06-Jan-21	27-Oct-20	31-Oct-20	-54						
	C12054-60	High speed & load test (1A & 1B)	10	C3-6d	0%	10	07-Jan-21	18-Jan-21	02-Nov-20	12-Nov-20	-54						
EMSD			59	C3-6d		59	19-Jan-21	01-Apr-21	13-Nov-20	10-Dec-20	-89						
	C12080-10	Form LE5 submission	2	C3-6d	0%	2	19-Jan-21	20-Jan-21	13-Nov-20	14-Nov-20	-54						
	C12080-20	EMSD inspection	16	C3-6d	0%	16	06-Mar-21	25-Mar-21	16-Nov-20	03-Dec-20	-89						
	C12080-30	Use permit issuance	6	C3-6d	0%	6	25-Mar-21	01-Apr-21	04-Dec-20	10-Dec-20	-89						
Electrical System for Footbridge			700			697	15-Nov-18 A	06-Mar-21	13-Jan-20	14-Nov-20	-111						
	C12090	Design of electrical system for footbridge (prepare & submit)	90	C3-6d	100%	0	15-Nov-18 A	13-Mar-19 A	13-Jan-20	13-Jan-20							
	C12100	Design of electrical system for footbridge (review & discuss)	18	C3-6d	11.11%	16	14-Mar-19 A	30-Apr-19	13-Jan-20	03-Feb-20	226						
	C12110	Design of electrical system for footbridge (resubmit)	18	C3-6d	0%	18	02-May-19	23-May-19	04-Feb-20	24-Feb-20	226						
	C12120	Design of electrical system for footbridge (accept)	21	C3-7d	0%	21	24-May-19	13-Jun-19	25-Feb-20	16-Mar-20	277						
	C12130	MS for electrical system (prepare & submit)	18	C3-6d	0%	18	14-Jun-19	05-Jul-19	28-Apr-20	20-May-20	259						
	C12140	MS for electrical system (review & discuss)	18	C3-6d	0%	18	06-Jul-19	26-Jul-19	21-May-20	10-Jun-20	259						
	C12150	MS for electrical system (resubmit)	12	C3-6d	0%	12	27-Jul-19	09-Aug-19	11-Jun-20	24-Jun-20	259						
	C12160	MS for electrical system (accept)	21	C3-7d	0%	21	10-Aug-19	30-Aug-19	25-Jun-20	15-Jul-20	320						
	C12170	Material order and delivery of footbridge electrical system	96	C3-6d	0%	96	14-Jun-19	08-Oct-19	17-Mar-20	15-Jul-20	227						
	C12180	Install electrical system for footbridge (incl. footbridge lighting system)	78	C3-6d	0%	78	31-Oct-20	03-Feb-21	16-Jul-20	16-Oct-20	-89						
	C12190	Testing and commissioning of electrical system for footbridge	24	C3-6d	0%	24	03-Feb-21	06-Mar-21	17-Oct-20	14-Nov-20	-89						
Glazing System			753			722	09-Mar-19 A	30-Mar-21	23-May-19	10-Dec-20	-110						
	C12200	Design of glazing system (prepare & submit)	90	C3-6d	27.78%	65	09-Mar-19 A	29-Jun-19	23-May-19	08-Aug-19	33						
	C12210	Design of glazing system (review & discuss)	18	C3-6d	0%	18	02-Jul-19	22-Jul-19	09-Aug-19	29-Aug-19	33						
	C12220	Design of glazing system (resubmit)	18	C3-6d	0%	18	23-Jul-19	12-Aug-19	30-Aug-19	20-Sep-19	33						
	C12230	Design of glazing system (accept)	21	C3-7d	0%	21	13-Aug-19	02-Sep-19	21-Sep-19	11-Oct-19	39						
	C12240	MS for glazing system (prepare & submit)	18	C3-6d	0%	18	03-Sep-19	24-Sep-19	20-Nov-19	10-Dec-19	64						
	C12250	MS for glazing system (review & discuss)	18	C3-6d	0%	18	25-Sep-19	17-Oct-19	11-Dec-19	03-Jan-20	64						
	C12260	MS for glazing system (resubmit)	12	C3-6d	0%	12	18-Oct-19	31-Oct-19	04-Jan-20	17-Jan-20	64						
	C12270	MS for glazing system (accept)	21	C3-7d	0%	21	01-Nov-19	21-Nov-19	18-Jan-20	07-Feb-20	78						
	C12280	Material order and delivery of glazing system	96	C3-6d	0%	96	03-Sep-19	28-Dec-19	12-Oct-19	07-Feb-20	31						
	C12290	Install glazing system (Lift 2A & 2B)	12	C3-6d	0%	12	16-Apr-20	29-Apr-20	08-Feb-20	21-Feb-20	-54						
	C12292	Install glazing system (Lift 3A & 3B)	12	C3-6d	0%	12	01-Jun-20	13-Jun-20	02-May-20	15-May-20	-25						
	C12294	Install glazing system (Lift 1A & 1B)	12	C3-6d	0%	12	01-Jun-20	13-Jun-20	20-Jul-20	01-Aug-20	40						
	C12300	Install glazing system (canopy)	100	C3-6d	0%	100	26-Nov-20	30-Mar-21	13-Aug-20	10-Dec-20	-88						
Road Lighting System			659			515	15-Nov-18 A	04-Sep-20	03-May-19	29-May-20	-98						
	C12310	Design of road lighting system (prepare & submit)	70	C3-6d	100%	0	15-Nov-18 A	01-Apr-19 A	03-May-19	03-May-19							
	C12320	Design of road lighting system (review & discuss)	18	C3-6d	72.22%	5	02-Apr-19 A	13-Apr-19	03-May-19	08-May-19	17						
	C12330	Design of road lighting system (resubmit)	24	C3-6d	0%	24	15-Apr-19	17-May-19	09-May-19	06-Jun-19	17						

- Actual Work
- Remaining Work
- Critical Remaining Work
- Milestone
- Summary

NE/2017/02 - Tseung Kwan O - Lam Tin Tunnel
Road P2/D4 and Associated Works
Updated Programme (April 2019)

Date	Revision	Checked	Approved
08-Apr-19	RWP-2019-04 (Data date 8-Apr-19)	TC	

NE/2017/02 - Updated Programme (Apr 2019)

CE/NCE/PMI	Activity ID	Activity Name	Original Duration	Calendar	Activity % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	Time Risk Allowance	2019	Mar	Apr	May	Jun	Jul
	C12340	Design of road lighting system (accept by PM & HyD)	21	C3-7d	0%	21	18-May-19	07-Jun-19	07-Jun-19	27-Jun-19		20						
	C12350	MS for road lighting system (prepare & submit)	18	C3-6d	0%	18	08-Jun-19	28-Jun-19	05-Aug-19	24-Aug-19		48						
	C12360	MS for road lighting system (review & discuss)	18	C3-6d	0%	18	29-Jun-19	20-Jul-19	26-Aug-19	16-Sep-19		48						
	C12370	MS for road lighting system (resubmit)	12	C3-6d	0%	12	22-Jul-19	03-Aug-19	17-Sep-19	30-Sep-19		48						
	C12380	MS for road lighting system (accept)	21	C3-7d	0%	21	04-Aug-19	24-Aug-19	02-Oct-19	22-Oct-19		59						
	C12390	Material order and delivery of road lighting system	96	C3-6d	0%	96	08-Jun-19	30-Sep-19	28-Jun-19	22-Oct-19		17						
	C12400	Install road lighting system	128	C3-6d	0%	128	03-Feb-20	09-Jul-20	23-Oct-19	26-Mar-20		-82						
	C12410	Testing and commissioning of road lighting system	49	C3-6d	0%	49	10-Jul-20	04-Sep-20	27-Mar-20	29-May-20		-82						
	Stage 0 Works		124	C3-6d	0	0	01-Dec-17 A	07-Jul-18 A	23-Nov-18	13-Aug-20								
	Preliminary Works		124	C3-6d	0	0	01-Dec-17 A	07-Jul-18 A	23-Nov-18	13-Aug-20								
	C12420	Application of XP	75	C3-6d	100%	0	01-Dec-17 A	05-Mar-18 A	23-Nov-18	23-Nov-18								
	C12430	Utilities detection (Road P2 south of interchange)	6	C3-6d	100%	0	13-Jan-18 A	18-Jan-18 A	23-Nov-18	23-Nov-18								
	C12440	Initial site survey	6	C3-6d	100%	0	11-Dec-17 A	30-Dec-17 A	23-Nov-18	23-Nov-18								
	C12450	Pre-construction condition survey and manhole survey	24	C3-6d	100%	0	08-Mar-18 A	23-May-18 A	23-Nov-18	23-Nov-18								
	C12460	Contractor's site office	30	C3-6d	100%	0	10-Jan-18 A	07-Jul-18 A	13-Aug-20	13-Aug-20								
	Stage 1 Works		580		0	0	20-Dec-17 A	21-Mar-19 A	23-Nov-18	10-Dec-21								
	TTA Stage 1A		147	C3-6d	0	0	20-Dec-17 A	28-Apr-18 A	23-Nov-18	07-Mar-19								
	TTA		147	C3-6d	0	0	20-Dec-17 A	28-Apr-18 A	23-Nov-18	07-Mar-19								
	C12470	Design and acceptance of TTA Drg. 001A / 007, 002A / 008, and 006A	42	C3-6d	100%	0	20-Dec-17 A	20-Feb-18 A	23-Nov-18	23-Nov-18								
	C12480	Implementation of TTA Stage 1A (trial pits) (TTA Drg. 006A)	2	C3-6d	100%	0	08-Mar-18 A	09-Mar-18 A	23-Nov-18	23-Nov-18		1						
	C12490	Implementation of TTA Stage 1A (roundabout) (part of TTA Drg. 001A / 007)	2	C3-6d	100%	0	19-Mar-18 A	19-Mar-18 A	23-Nov-18	23-Nov-18		1						
	C12500	Utilities detection (Po Shun Road north of interchange)	4	C3-6d	100%	0	13-Jan-18 A	18-Jan-18 A	23-Nov-18	23-Nov-18								
	C12510	Modification of road layout at roundabout	12	C3-6d	100%	0	11-Apr-18 A	18-Apr-18 A	22-Dec-18	22-Dec-18								
	C12530	Tree felling (Road P2 south of interchange, TGC01 & TGC02)	12	C3-6d	100%	0	08-Feb-18 A	28-Apr-18 A	23-Nov-18	23-Nov-18								
	C12570	Utilities detection (Chui Ling Road south - existing cycle track)	5	C3-6d	100%	0	13-Jan-18 A	18-Jan-18 A	07-Mar-19	07-Mar-19								
	TTA Stage 1B-1, 1B-2, 1B-3 & 1B-4		440		0	0	23-Apr-18 A	09-Feb-19 A	23-Nov-18	10-Dec-21								
	TTA		379		0	0	23-Apr-18 A	04-Dec-18 A	22-Dec-18	10-Dec-21								
	C12520	Temporary footpath & cycle track at south of Chui Ling Road / Po Yap Road (for TTA Stage 1E)	11	C3-6d	100%	0	14-May-18 A	25-Jun-18 A	22-Dec-18	22-Dec-18								
	C12550	Implementation of TTA Stage 1B-1 (part of TTA Drg. 002A / 008)	2	C3-6d	100%	0	23-Apr-18 A	23-Apr-18 A	22-Dec-18	22-Dec-18		1						
	C12560	Implementation of TTA Stage 1B-2 (TTA Drg. 002A / 008, 030A & 031A)	2	C3-6d	100%	0	04-May-18 A	04-May-18 A	22-Dec-18	22-Dec-18		1						
	C12561	Implementation of TTA Stage 1B-3 (TTA Drg. 002A, 027B, 030A & 031A)	2	C3-6d	100%	0	31-Jul-18 A	31-Jul-18 A	11-Apr-19	11-Apr-19		1						
	C12562	Implementation of TTA Stage 1B-4 (TTA Drg. 038C)	2	C3-6d	100%	0	19-Oct-18 A	19-Oct-18 A	11-Apr-19	11-Apr-19		1						
	C12564	Preparation work & arrange RMO for TTA Stage 1C	12	C3-6d	100%	0	09-Nov-18 A	27-Nov-18 A	16-Mar-19	16-Mar-19								
	NCE-08	C12600	Modify north-east island at roundabout (affected by supply of aggregate)	32	C3-6d	100%	0	09-May-18 A	18-Oct-18 A	11-Apr-19	11-Apr-19							
	Modify central median (Po Shun Road) (TTA Drg. 038C)		30	C3-6d	0	0	20-Oct-18 A	30-Nov-18 A	11-Apr-19	11-Apr-19								
	C12605-1	Central median (Po Shun Road) - Demolish existing divider & excavation	30	C3-6d	100%	0	20-Oct-18 A	22-Nov-18 A	11-Apr-19	11-Apr-19								
	C12605-2	Central median (Po Shun Road) - Formation	3	C3-6d	100%	0	23-Nov-18 A	23-Nov-18 A	11-Apr-19	11-Apr-19								
	C12605-3	Central median (Po Shun Road) - Sub-base	5	C3-6d	100%	0	24-Nov-18 A	24-Nov-18 A	11-Apr-19	11-Apr-19								
	C12605-4	Central median (Po Shun Road) - Sub-base SRT	7	C3-6d	100%	0	25-Nov-18 A	30-Nov-18 A	11-Apr-19	11-Apr-19								
	Modify roundabout island (TTA Drg. 038C)		24	C3-6d	0	0	09-Nov-18 A	15-Nov-18 A	11-Apr-19	11-Apr-19								
	C12606-1	Roundabout - Demolish existing island & excavation	24	C3-6d	100%	0	09-Nov-18 A	15-Nov-18 A	11-Apr-19	11-Apr-19								
	Modify central median (Po Yap Road)		85		0	0	04-Jun-18 A	17-Nov-18 A	11-Apr-19	11-Apr-19								
	C12600-2	Modify central median (Po Yap Road)	36	C3-6d	100%	0	04-Jun-18 A	27-Jul-18 A	11-Apr-19	11-Apr-19								
	NCE-13	C12600-3	Arrangement of SRT	7	C3-7d	100%	0	28-Jul-18 A	03-Aug-18 A	11-Apr-19	11-Apr-19							
	C12600-4	Modify central median (Po Yap Road)	21	C3-6d	100%	0	04-Aug-18 A	17-Nov-18 A	11-Apr-19	11-Apr-19								
	Modify central median (Chui Ling Road)		137		0	0	06-Jun-18 A	22-Nov-18 A	16-Mar-19	16-Mar-19								
	C12650-1	Modify east portion of central median (Chui Ling Road) (TTA Drg. 029B) - Excavation	18	C3-6d	100%	0	06-Jun-18 A	16-Jul-18 A	16-Mar-19	16-Mar-19								
	C12650-1.1	Preparation work for TTA Stage 2.2	2	C3-6d	100%	0	17-Jul-18 A	18-Jul-18 A	16-Mar-19	16-Mar-19								
	CE-03	C12650-1.2	WSD emergency works Chiu Ling Road	6	C3-7d	100%	0	17-Jul-18 A	24-Jul-18 A	16-Mar-19	16-Mar-19							
	C12650-1.3	Arrange subcontractor for implementation of TTA Stage 2.2	2	C3-6d	100%	0	25-Jul-18 A	26-Jul-18 A	16-Mar-19	16-Mar-19								
	C12650-3	Mid portion of South central median (TTA Drg. 030A) - Excavation	18	C3-6d	100%	0	27-Jul-18 A	31-Aug-18 A	16-Mar-19	16-Mar-19								
	C12650-4.1	East portion & mid portion of central median (TTA Drg. 029B, 030A, 031A) - Gullies	12	C3-6d	100%	0	01-Sep-18 A	06-Sep-18 A	16-Mar-19	16-Mar-19								
	NCE-19	C12650-4.2	Design review of clash between existing CLP cables and gullies by PM	12	C3-7d	100%	0	07-Sep-18 A	20-Sep-18 A	16-Mar-19	16-Mar-19							
	C12650-4.3	East portion & mid portion of central median (TTA Drg. 029B, 030A, 031A) - Gullies restart	12	C3-6d	100%	0	21-Sep-18 A	20-Oct-18 A	16-Mar-19	16-Mar-19								
	C12650-5	East portion & mid portion of central median (TTA Drg. 029B, 030A, 031A) - Formation	5	C3-6d	100%	0	20-Oct-18 A	25-Oct-18 A	16-Mar-19	16-Mar-19								
	C12650-6	East portion & mid portion of central median (TTA Drg. 029B, 030A, 031A) - Sub-base	6	C3-6d	100%	0	26-Oct-18 A	06-Nov-18 A	16-Mar-19	16-Mar-19								
	C12650-6.1	East portion & mid portion of central median (TTA Drg. 029B, 030A, 031A) - Sub-base SRT	2	C3-6d	100%	0	07-Nov-18 A	08-Nov-18 A	16-Mar-19	16-Mar-19								
	C12650-7	East portion & mid portion of central median (TTA Drg. 029B, 030A, 031A) - Road paving	7	C3-6d	100%	0	09-Nov-18 A	16-Nov-18 A	16-Mar-19	16-Mar-19								
	C12650-7.1	East portion & mid portion of central median (TTA Drg. 029B, 030A, 031A) - Road paving core	5	C3-6d	100%	0	17-Nov-18 A	22-Nov-18 A	16-Mar-19	16-Mar-19								
	C12650-8	Modify mid portion of North central median (TTA Drg. 031A)	16	C3-6d	100%	0	13-Sep-18 A	16-Nov-18 A	16-Mar-19	16-Mar-19								
	Tree felling and transplanting		306	C3-6d	0	0	24-Apr-18 A	18-Sep-18 A	16-Mar-19	10-Dec-21								
	C12580	Tree felling (Po Yap Road)	12	C3-6d	100%	0	24-Apr-18 A	19-Jul-18 A	10-Dec-21	10-Dec-21								
	C12590	Tree transplanting (Po Yap Road) central median	54	C3-6d	100%	0	25-Jun-18 A	19-Jul-18 A	10-Dec-21	10-Dec-21								
	C12591	Tree transplanting (Po Yap Road) south side	21	C3-6d	100%	0	17-Sep-18 A	17-Sep-18 A	11-Apr-19	11-Apr-19								
	C12610	Tree transplanting (adjacent TKO Sports Centre) T304, T21005 to T21008	48	C3-6d	100%	0	01-Jun-18 A	02-Jun-18 A	01-Apr-19	01-Apr-19								
	C12611	Tree transplanting C100	1	C3-6d	100%	0	17-Sep-18 A	17-Sep-18 A	01-Apr-19	01-Apr-19								
	C12630	Tree transplanting (Chui Ling Road)	48	C3-6d	100%	0	17-Sep-18 A	18-Sep-18 A	25-Mar-19	25-Mar-19								
	C12770	Tree felling (Chui Ling Road)	11	C3-6d	100%	0	07-May-18 A	15-Aug-18 A	16-Mar-19	16-Mar-19								
	C13540	Tree felling (Po Shun Road central median)	6	C3-6d	100%	0	24-Apr-18 A	30-Apr-18 A	27-Apr-20	27-Apr-20								
	Groundwater monitoring point		105	C3-6d	0	0	22-Aug-18 A	04-Dec-18 A										

NE/2017/02 - Updated Programme (Apr 2019)

CE/NCE/PMI	Activity ID	Activity Name	Original Duration	Calendar	Activity % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	Time Risk Allowance	2019				
													Mar	Apr	May	Jun	Jul
	C12642	Install groundwater monitoring point GWMP 01	9	C3-6d	100%	0	05-Oct-18 A	16-Oct-18 A	01-Apr-19	01-Apr-19							
	Drainage		212			0	28-Jun-18 A	26-Nov-18 A	23-Nov-18	20-Aug-19							
	Stormwater SMH5101-SMH5101A		136			0	28-Jun-18 A	24-Oct-18 A	23-Nov-18	20-Aug-19							
	C12660-1	Install ELS & excavate	7	C3-6d	100%	0	28-Jun-18 A	03-Jul-18 A	23-Nov-18	23-Nov-18							
NCE-08, CE-08	C12660-2	Idle due to shortage of supply of aggregate & design review	15	C3-7d	100%	0	04-Jul-18 A	18-Jul-18 A	23-Nov-18	23-Nov-18							
	C12660-3	Re-excavate	7	C3-6d	100%	0	19-Jul-18 A	23-Jul-18 A	23-Nov-18	23-Nov-18							
	C12660-4	Lay drain pipe	7	C3-6d	100%	0	24-Jul-18 A	07-Aug-18 A	23-Nov-18	23-Nov-18							
	C12660-5	Manhole SMH5101	18	C3-6d	100%	0	20-Aug-18 A	18-Oct-18 A	20-Aug-19	20-Aug-19							
	C12660-6	Manhole SMH5101A	18	C3-6d	100%	0	27-Aug-18 A	18-Oct-18 A	20-Aug-19	20-Aug-19							
	C12660-7	Backfill	5	C3-6d	100%	0	19-Oct-18 A	24-Oct-18 A	20-Aug-19	20-Aug-19							
	Stormwater DN525		152			0	03-Jul-18 A	16-Nov-18 A	01-Apr-19	01-Apr-19							
PMI-03, CE-04	C12665-1	Trial pits, removal of existing planter, modify existing manhole	14	C3-6d	100%	0	03-Jul-18 A	08-Aug-18 A	01-Apr-19	01-Apr-19							
PMI-03, CE-04	C12665-2	Install ELS & excavate	18	C3-6d	100%	0	06-Nov-18 A	08-Nov-18 A	01-Apr-19	01-Apr-19		6					
PMI-03, CE-04	C12665-3	Lay drain DN525 pipe	8	C3-6d	100%	0	09-Nov-18 A	11-Nov-18 A	01-Apr-19	01-Apr-19							
PMI-03, CE-04	C12665-4	Manhole SMH6702	18	C3-6d	100%	0	19-Sep-18 A	03-Oct-18 A	01-Apr-19	01-Apr-19							
PMI-03, CE-04	C12665-5	Manhole SMH6703	18	C3-6d	100%	0	24-Sep-18 A	08-Oct-18 A	01-Apr-19	01-Apr-19							
PMI-03, CE-04	C12665-6	Connection to existing manholes	4	C3-6d	100%	0	12-Nov-18 A	13-Nov-18 A	01-Apr-19	01-Apr-19							
PMI-03, CE-04	C12665-7	Backfill	9	C3-6d	100%	0	14-Nov-18 A	16-Nov-18 A	01-Apr-19	01-Apr-19							
PMI-03, CE-04	C12665-8	Demolish existing manhole	6	C3-6d	100%	0	11-Nov-18 A	14-Nov-18 A	01-Apr-19	01-Apr-19							
	Stormwater SMH5001-SMH5001A		136			0	28-Jun-18 A	24-Oct-18 A	23-Nov-18	20-Aug-19							
	C12680-1	Install ELS & excavate	7	C3-6d	100%	0	28-Jun-18 A	03-Jul-18 A	23-Nov-18	23-Nov-18		1					
NCE-08, CE-08	C12680-2	Idle due to shortage of supply of aggregate & design review	15	C3-7d	100%	0	04-Jul-18 A	18-Jul-18 A	23-Nov-18	23-Nov-18							
	C12680-3	Re-excavate	7	C3-6d	100%	0	09-Aug-18 A	12-Aug-18 A	23-Nov-18	23-Nov-18							
	C12680-4	Lay drain pipe	7	C3-6d	100%	0	13-Aug-18 A	15-Aug-18 A	23-Nov-18	23-Nov-18							
	C12680-5	Manhole SMH5001	18	C3-6d	100%	0	17-Aug-18 A	18-Oct-18 A	20-Aug-19	20-Aug-19							
	C12680-6	Manhole SMH5001A	18	C3-6d	100%	0	24-Aug-18 A	18-Oct-18 A	20-Aug-19	20-Aug-19							
	C12680-7	Backfill	5	C3-6d	100%	0	19-Oct-18 A	24-Oct-18 A	20-Aug-19	20-Aug-19							
	Stormwater SMH5101A-SMH5101B		87			0	19-Jul-18 A	26-Nov-18 A	23-Nov-18	20-Aug-19							
	C12682-1	Install ELS & excavate (Stage 1)	7	C3-6d	100%	0	19-Jul-18 A	23-Jul-18 A	23-Nov-18	23-Nov-18							
	C12682-2	Lay drain pipe (Stage 1)	7	C3-6d	100%	0	24-Jul-18 A	07-Aug-18 A	23-Nov-18	23-Nov-18							
	C12682-3	Install ELS & excavate (Stage 2 start after part of Portion I & Portion II handed over by C2)	7	C3-6d	100%	0	16-Nov-18 A	20-Nov-18 A	23-Nov-18	23-Nov-18		1					
	C12682-4	Lay drain pipe (Stage 2)	7	C3-6d	100%	0	21-Nov-18 A	22-Nov-18 A	23-Nov-18	23-Nov-18							
	C12682-5	Manhole SMH5101B (Stage 2)	18	C3-6d	100%	0	20-Nov-18 A	20-Nov-18 A	20-Aug-19	20-Aug-19							
	C12682-6	Backfill (Stage 2)	5	C3-6d	100%	0	23-Nov-18 A	26-Nov-18 A	20-Aug-19	20-Aug-19							
	Stormwater SMH5101B-SMH5002		15			0	16-Nov-18 A	26-Nov-18 A	20-Aug-19	20-Aug-19							
	C12686-1	Install ELS & excavate (Stage 2)	4	C3-6d	100%	0	16-Nov-18 A	21-Nov-18 A	20-Aug-19	20-Aug-19		1					
	C12686-2	Lay drain pipe (Stage 2)	4	C3-6d	100%	0	22-Nov-18 A	22-Nov-18 A	20-Aug-19	20-Aug-19							
	C12686-3	Backfill (Stage 2)	4	C3-6d	100%	0	23-Nov-18 A	26-Nov-18 A	20-Aug-19	20-Aug-19							
	Stormwater SMH5001A-SMH5002		87			0	09-Aug-18 A	26-Nov-18 A	23-Nov-18	20-Aug-19							
	C12684-1	Install ELS & excavate (Stage 1)	7	C3-6d	100%	0	09-Aug-18 A	12-Aug-18 A	23-Nov-18	23-Nov-18							
	C12684-2	Lay drain pipe (Stage 1)	7	C3-6d	100%	0	13-Aug-18 A	15-Aug-18 A	23-Nov-18	23-Nov-18							
	C12684-3	Install ELS & excavate (Stage 2 start after part of Portion I & Portion II handed over by C2)	7	C3-6d	100%	0	16-Nov-18 A	22-Nov-18 A	23-Nov-18	23-Nov-18		1					
	C12684-4	Lay drain pipe (Stage 2)	7	C3-6d	100%	0	23-Nov-18 A	23-Nov-18 A	23-Nov-18	23-Nov-18							
	C12684-5	Manhole SMH5002 (Stage 2)	18	C3-6d	100%	0	20-Nov-18 A	20-Nov-18 A	24-Jul-19	24-Jul-19							
	C12684-6	Backfill (Stage 2)	5	C3-6d	100%	0	24-Nov-18 A	26-Nov-18 A	20-Aug-19	20-Aug-19							
	Utilities		142			0	23-Jul-18 A	26-Oct-18 A	23-Nov-18	11-Apr-19							
	C12700	Gas main at Chui Ling Road (central median) by HKCG	19	C3-6d	100%	0	23-Jul-18 A	02-Aug-18 A	11-Apr-19	11-Apr-19		1					
	C12790	Lay 11kV cables at Po Shun Road by CLPP	19	C3-6d	100%	0	10-Aug-18 A	28-Aug-18 A	01-Apr-19	01-Apr-19		1					
CE-18	C12791	Connection switch over of 11kV cables at Po Shun Road by CLPP	16	C3-6d	100%	0	02-Oct-18 A	05-Oct-18 A	01-Apr-19	01-Apr-19							
CE-25	C12800	Gas main at Po Shun Road by HKCG	19	C3-6d	100%	0	26-Sep-18 A	23-Oct-18 A	01-Apr-19	01-Apr-19		1					
	C12810	Telecom cables at Po Shun Road (North) by HGC & PCCW	19	C3-6d	100%	0	09-Oct-18 A	09-Oct-18 A	01-Apr-19	01-Apr-19		1					
NCE-24	C12820	Lay 11kV cables by CLPP - 1st Stage cross-road ducts at north Road P2	17	C3-6d	100%	0	25-Aug-18 A	05-Sep-18 A	23-Nov-18	23-Nov-18		1					
NCE-24	C12821	Lay 11kV cables by CLPP - 2nd Stage east of Road P2	14	C3-6d	100%	0	20-Aug-18 A	26-Oct-18 A	23-Nov-18	23-Nov-18		1					
	Fresh Watermain		257			0	25-Jun-18 A	09-Feb-19 A	22-Dec-18	08-Mar-19							
	C12862-10	Trial pits	66	C3-6d	100%	0	25-Jun-18 A	16-Aug-18 A	22-Dec-18	22-Dec-18							
PMI-12	C12862-20	Design review of fresh watermain CHA & CHA1 by PM	36	C3-7d	100%	0	17-Aug-18 A	21-Sep-18 A	22-Dec-18	22-Dec-18							
PMI-12	C12862-30	Material order & delivery FWM CHA 0 to 167	90	C3-7d	100%	0	19-Nov-18 A	21-Jan-19 A	23-Jan-19	23-Jan-19							
	Fresh watermain CHA 90 to 167.181		100			0	26-Sep-18 A	09-Feb-19 A	08-Mar-19	08-Mar-19							
	C12862-40	Install ELS & excavate CHA 130 to 167.181	12	C3-6d	100%	0	26-Sep-18 A	10-Nov-18 A	08-Mar-19	08-Mar-19							
	C12862-50	Lay fresh watermain CHA 130 to 161.413	24	C3-6d	100%	0	06-Dec-18 A	03-Jan-19 A	08-Mar-19	08-Mar-19							
	C12862-52	Install ELS & excavate CHA 90 to 130	9	C3-6d	100%	0	04-Jan-19 A	09-Feb-19 A	08-Mar-19	08-Mar-19							
	Salt Watermain		182			0	25-Jun-18 A	08-Feb-19 A	07-Mar-19	20-Mar-19							
	C12712-10	Trial pits	73	C3-6d	100%	0	25-Jun-18 A	16-Aug-18 A	07-Mar-19	07-Mar-19							
PMI-12	C12712-20	Design review of salt watermain CHA & CHB by PM	36	C3-7d	100%	0	17-Aug-18 A	21-Sep-18 A	07-Mar-19	07-Mar-19							
PMI-12	C12712-30	Material order & delivery SWM CHA 0 to 124	90	C3-7d	100%	0	19-Nov-18 A	21-Jan-19 A	20-Mar-19	20-Mar-19							
	Salt watermain CHA 70 to 124.388		93			0	26-Sep-18 A	08-Feb-19 A	07-Mar-19	07-Mar-19							
	C12712-40	Install ELS & excavate CHA 74 to 124.388	12	C3-6d	100%	0	26-Sep-18 A	20-Oct-18 A	07-Mar-19	07-Mar-19							
	C12712-50	Lay salt watermain CHA 74 to 118	24	C3-6d	100%	0	21-Oct-18 A	03-Jan-19 A	07-Mar-19	07-Mar-19							
	C12712-52	Install ELS & excavate CHA 70 to 74	10	C3-6d	100%	0	04-Jan-19 A	08-Feb-19 A	07-Mar-19	07-Mar-19							
	CCTV High Mast		5			0	04-Aug-18 A	21-Aug-18 A	17-Jun-19	17-Jun-19							
	C12920	Predrilling at CCTV/PH1 (1 no.) PD#1	5	C3-6d	100%	0	04-Aug-18 A	21-Aug-18 A	17-Jun-19	17-Jun-19							
	Footbridge Predrilling		410			0	11-May-18 A	27-Dec-18 A	01-Apr-19	07-Jan-20							

- Actual Work
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NE/2017/02 - Tseung Kwan O - Lam Tin Tunnel
Road P2/D4 and Associated Works
Updated Programme (April 2019)

Date	Revision	Checked	Approved
08-Apr-19	RWP-2019-04 (Data date 8-Apr-19)	TC	

NE/2017/02 - Updated Programme (Apr 2019)

CE/NCE/PMI	Activity ID	Activity Name	Original Duration	Calendar	Activity % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	Time Risk Allowance	2019				
													Mar	Apr	May	Jun	Jul
	C12720	Predrilling at PC5/PH4 (Pier 01) (1 no.) PD#1	4	C3-6d	100%	0	28-Nov-18 A	10-Dec-18 A	01-Apr-19	01-Apr-19							
	C12970	Predrilling at PC1-3/PH1 (1 no.) PD#1	4	C3-6d	100%	0	17-May-18 A	23-May-18 A	17-Jun-19	17-Jun-19							
	C12980	Propose founding level PC1-1	14	C3-6d	100%	0	20-Dec-18 A	27-Dec-18 A	01-Apr-19	01-Apr-19							
	C12981	Propose founding level PC8	14	C3-6d	100%	0	20-Dec-18 A	27-Dec-18 A	01-Apr-19	01-Apr-19							
	C13010	Predrilling at PC7/PH1 (1 no.) PD#1	4	C3-6d	100%	0	11-May-18 A	16-May-18 A	01-Apr-19	01-Apr-19							
	C13020	Predrilling at PC4/PH1 (1 no.) PD#1	4	C3-6d	100%	0	22-Jun-18 A	03-Jul-18 A	01-Apr-19	01-Apr-19							
	C13030	Propose founding level PC4	12	C3-6d	100%	0	09-Oct-18 A	27-Oct-18 A	01-Apr-19	01-Apr-19							
	C13040	Acceptance of founding level PC4	21	C3-7d	100%	0	28-Oct-18 A	28-Oct-18 A	01-Apr-19	01-Apr-19							
	C13051	Predrilling at PC2-1/PH1 & PH2 (Pier 02) (2 no.) PD#1	5	C3-6d	100%	0	03-Sep-18 A	10-Oct-18 A	22-Jul-19	22-Jul-19							
	C13320	Predrilling at PC2-2/PH3 & PH4 (Pier 03) (2 nos.) PD#1	16	C3-6d	100%	0	07-Jun-18 A	12-Jul-18 A	21-Jun-19	21-Jun-19							
	C13399	Predrilling at PC6/PH2 (Pier 05) (1 nos.) PD#1	4	C3-6d	100%	0	20-Oct-18 A	29-Oct-18 A	07-Jan-20	07-Jan-20							
	C13410	Predrilling at PC1-2/PH1 (1 no.) PD#1	4	C3-6d	100%	0	25-Jul-18 A	02-Aug-18 A	31-May-19	31-May-19							
	C13421	Predrilling at PC2-3/PH3 (Pier 04) (1 no.) PD#2	4	C3-6d	100%	0	14-Jul-18 A	20-Jul-18 A	03-Jul-19	03-Jul-19							
	C13450	Predrilling at PC3-2 (1 no.) PD#2	4	C3-6d	100%	0	05-Nov-18 A	15-Nov-18 A	03-Jul-19	03-Jul-19							
	Uncharted 2 nos. DI pipes near Sports Centre		45			0	03-Sep-18 A	16-Oct-18 A	01-Apr-19	01-Apr-19							
PMI-13, CE-19	C13425	Investigate uncharted 2 nos. DI pipes	44	C3-7d	100%	0	03-Sep-18 A	09-Oct-18 A	01-Apr-19	01-Apr-19							
PMI-15, CE-19	C13426	Remove and dispose of uncharted 2 nos. DI pipes	6	C3-6d	100%	0	10-Oct-18 A	16-Oct-18 A	01-Apr-19	01-Apr-19							
	Inspection pits for Pre-drilling		38	C3-6d		0	18-Oct-18 A	28-Nov-18 A	01-Apr-19	01-Apr-19							
	C13428	Inspection pits for pre-drilling at PC5 (6 nos.)	38	C3-6d	100%	0	18-Oct-18 A	28-Nov-18 A	01-Apr-19	01-Apr-19							
	Footbridge Piling		35			0	30-Oct-18 A	27-Nov-18 A	01-Apr-19	01-Apr-19							
	C13140	Mobilize plant SP#2	6	C3-6d	100%	0	30-Oct-18 A	05-Nov-18 A	01-Apr-19	01-Apr-19							
	C13150	Socketted H-pile at PC4/P4 (1 no.) SP#2	7	C3-6d	100%	0	06-Nov-18 A	06-Nov-18 A	01-Apr-19	01-Apr-19	1						
CE-26	C13151	Uncharted water pipes at PC4	21	C3-7d	100%	0	07-Nov-18 A	27-Nov-18 A	01-Apr-19	01-Apr-19							
	TTA Stage 1C		322			0	23-Apr-18 A	21-Mar-19 A	23-Nov-18	26-Aug-19							
TTA			223	C3-6d		0	23-Apr-18 A	24-Jan-19 A	02-Mar-19	26-Aug-19							
	C12740	Design and acceptance of TTA Stage 1C (south of roundabout)	42	C3-6d	100%	0	23-Apr-18 A	26-Sep-18 A	02-Mar-19	02-Mar-19							
	C12750	Implementation of TTA Stage 1C (TTA Drg. 053B)	2	C3-6d	100%	0	28-Nov-18 A	28-Nov-18 A	16-Mar-19	16-Mar-19	1						
	Modify central median (Chui Ling Road)		37	C3-6d		0	18-Dec-18 A	15-Jan-19 A	11-Apr-19	11-Apr-19							
	C12650-09	West portion of central median (TTA Drg. 063) - Excavation	16	C3-6d	100%	0	18-Dec-18 A	24-Dec-18 A	11-Apr-19	11-Apr-19							
	C12650-10	West portion of central median (TTA Drg. 063) - Gullies	11	C3-6d	100%	0	27-Dec-18 A	31-Dec-18 A	11-Apr-19	11-Apr-19							
	C12650-11	West portion of central median (TTA Drg. 063) - Formation	5	C3-6d	100%	0	02-Jan-19 A	04-Jan-19 A	11-Apr-19	11-Apr-19							
	C12650-12	West portion of central median (TTA Drg. 063) - Sub-base	12	C3-6d	100%	0	09-Jan-19 A	12-Jan-19 A	11-Apr-19	11-Apr-19							
	C12650-14	West portion of central median (TTA Drg. 063) - Sub-base SRT	2	C3-6d	100%	0	14-Jan-19 A	15-Jan-19 A	11-Apr-19	11-Apr-19							
	Modify central median (Po Shun Road) (TTA Drg. 038C)		6	C3-6d		0	04-Dec-18 A	05-Jan-19 A	11-Apr-19	11-Apr-19							
	C12605-5	Central median (Po Shun Road) - Temporary road paving	6	C3-6d	100%	0	04-Dec-18 A	05-Jan-19 A	11-Apr-19	11-Apr-19							
	Modify roundabout island (TTA Drg. 038C)		21	C3-6d		0	09-Dec-18 A	05-Jan-19 A	11-Apr-19	11-Apr-19							
	C12606-2	Roundabout - Formation	3	C3-6d	100%	0	09-Dec-18 A	11-Dec-18 A	11-Apr-19	11-Apr-19							
	C12606-3	Roundabout - Sub-base	5	C3-6d	100%	0	12-Dec-18 A	17-Dec-18 A	11-Apr-19	11-Apr-19							
	C12606-4	Roundabout - Sub-base SRT	7	C3-6d	100%	0	18-Dec-18 A	27-Dec-18 A	11-Apr-19	11-Apr-19							
	C12606-5	Roundabout - Temporary road paving	6	C3-6d	100%	0	28-Dec-18 A	05-Jan-19 A	11-Apr-19	11-Apr-19							
	Groundwater monitoring point		18	C3-6d		0	20-Dec-18 A	24-Jan-19 A	24-May-19	26-Aug-19							
	C12643	Install groundwater monitoring point GWMP 03	9	C3-6d	100%	0	18-Jan-19 A	24-Jan-19 A	24-May-19	24-May-19							
	C12644	Install groundwater monitoring point GWMP 02	9	C3-6d	100%	0	20-Dec-18 A	31-Dec-18 A	26-Aug-19	26-Aug-19							
	Drainage		72	C3-6d		0	29-Nov-18 A	30-Jan-19 A	11-Apr-19	11-Apr-19							
	Uncharted 2 nos. DI pipes near Sports Centre		10	C3-6d		0	05-Dec-18 A	08-Dec-18 A	11-Apr-19	11-Apr-19							
PMI-15, CE-26	C12669	Remove & dispose 2 nos. uncharted DI pipes near Pier 02	10	C3-6d	100%	0	05-Dec-18 A	08-Dec-18 A	11-Apr-19	11-Apr-19							
	Stormwater DN900		72	C3-6d		0	29-Nov-18 A	30-Jan-19 A	11-Apr-19	11-Apr-19							
PMI-04, CE-05	C12670-0	Inspection pits	4	C3-6d	100%	0	29-Nov-18 A	08-Dec-18 A	11-Apr-19	11-Apr-19							
PMI-04, CE-05	C12670-1	Install ELS & excavate for manhole	18	C3-6d	100%	0	21-Dec-18 A	14-Jan-19 A	11-Apr-19	11-Apr-19	1						
PMI-04, CE-05	C12670-2	Manhole SMH6701	18	C3-6d	100%	0	15-Jan-19 A	30-Jan-19 A	11-Apr-19	11-Apr-19							
	Utilities		94	C3-6d		0	28-Nov-18 A	21-Mar-19 A	23-Nov-18	11-Apr-19							
	C12701	Gas main at Chui Ling Road (North) by HKCG	19	C3-6d	100%	0	29-Nov-18 A	09-Jan-19 A	11-Apr-19	11-Apr-19	1						
NCE-24	C12822	Lay 11kV cables by CLPP - 3rd Stage cross-road ducts at south Road P2	14	C3-6d	100%	0	28-Nov-18 A	14-Dec-18 A	23-Nov-18	23-Nov-18							
NCE-24	C12823	Lay 11kV cables by CLPP - 4th Stage west of Road P2	55	C3-6d	100%	0	15-Jan-19 A	21-Mar-19 A	23-Nov-18	23-Nov-18							
	Footbridge Pre-drilling		106			0	11-Dec-18 A	15-Jan-19 A	01-Apr-19	22-Jul-19							
	C12990	Acceptance of founding level PC1-1	21	C3-7d	100%	0	28-Dec-18 A	03-Jan-19 A	01-Apr-19	01-Apr-19							
	C12991	Acceptance of founding level PC8	21	C3-7d	100%	0	28-Dec-18 A	03-Jan-19 A	01-Apr-19	01-Apr-19							
	C13050	Predrilling at PC2-1/PH3 (Pier 02) (1 nos.) PD#1	5	C3-6d	100%	0	03-Jan-19 A	15-Jan-19 A	22-Jul-19	22-Jul-19							
	C13109	Predrilling at PC5-PH5 (Pier 01) (1 no.) PD#1	4	C3-6d	100%	0	11-Dec-18 A	19-Dec-18 A	01-Apr-19	01-Apr-19							
	C13119	Inspection pits for pre-drilling at PC2-2/PH1 & PH2	9	C3-6d	100%	0	22-Dec-18 A	05-Jan-19 A	08-May-19	08-May-19							
	Footbridge Piling		73	C3-6d		0	28-Nov-18 A	18-Jan-19 A	01-Apr-19	01-Apr-19							
	C13152	Socketted H-piles at PC4 (4 nos.) SP#2 - restart	28	C3-6d	100%	0	28-Nov-18 A	15-Dec-18 A	01-Apr-19	01-Apr-19	4						
	C13250	Socketted H-piles at PC1-1 (2 nos.) SP#2	14	C3-6d	100%	0	02-Jan-19 A	18-Jan-19 A	01-Apr-19	01-Apr-19	2						
	C13260	Socketted H-piles at PC8 (2 nos.) SP#2	14	C3-6d	100%	0	07-Jan-19 A	18-Jan-19 A	01-Apr-19	01-Apr-19	2						
	Stage 2 Works		684			452	20-Aug-18 A	03-Jul-20	23-Nov-18	13-Jun-20	-20						
	TTA Stage 2A		484			252	20-Aug-18 A	16-Dec-19	23-Nov-18	27-Dec-19	11						
TTA			310	C3-6d		113	20-Aug-18 A	04-Sep-19	21-Jan-19	26-Nov-19	68						
	C13180	Design and acceptance of TTA Stage 2A	37	C3-6d	100%	0	20-Aug-18 A	02-Jan-19 A	02-Mar-19	02-Mar-19							
	C13182	Implementation of TTA Stage 2A-1 (TTA Drg. 061) (Po Yap Road - Area 1)	2	C3-6d	100%	0	28-Jan-19 A	28-Jan-19 A	02-Mar-19	02-Mar-19	1						
	C13190	Implementation of TTA Stage 2A-2 (TTA Drg. 058)	2	C3-6d	100%	0	13-Feb-19 A	13-Feb-19 A	11-Apr-19	11-Apr-19	1						
	C13191	Modify water barrier arrangement and junction signals test for TTA Stage 2A-3	18	C3-6d	100%	0	14-Feb-19 A	12-Mar-19 A	11-Apr-19	11-Apr-19							
	C13192	Implementation of TTA Stage 2A-3 (TTA Drg. 076)	2	C3-6d	100%	0	13-Mar-19 A	13-Mar-19 A	11-Apr-19	11-Apr-19	1						

- █ Actual Work
- █ Remaining Work
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NE/2017/02 - Tseung Kwan O - Lam Tin Tunnel
Road P2/D4 and Associated Works
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Date	Revision	Checked	Approved
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CEN/CE/PMI	Activity ID	Activity Name	Original Duration	Calendar	Activity % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	Time Risk Allowance	2019					
													Mar	Apr	May	Jun	Jul	
	C13193	Modify water barrier arrangement for TTA Stage 2A-4	12	C3-6d	0%	12	22-Jun-19	06-Jul-19	11-Nov-19	23-Nov-19	117	117						
	C13194	Implementation of TTA Stage 2A-4 (TTA Drg. 071)	2	C3-6d	0%	2	08-Jul-19*	09-Jul-19	25-Nov-19	26-Nov-19	117	1						
	C13196	Implementation of TTA Stage 2A-5 (TTA Drg. 072) (Chui Ling Road - Area 1)	2	C3-6d	100%	0	15-Mar-19 A	15-Mar-19 A	16-Mar-19	16-Mar-19		1						
	C13198	Implementation of TTA Stage 2A-6 (TTA Drg. 079) (Chui Shin Street)	2	C3-6d	0%	2	18-Apr-19*	23-Apr-19	21-Jan-19	22-Jan-19	-71	1						
	C13200	Temporary footpath and cycle track (for TTA Stage 2B)	30	C3-6d	0%	30	01-Aug-19	04-Sep-19	11-Apr-19	21-May-19	-89							
	C13372	Implementation of TTA Stage 2A-7 (Po Yap Road - Area 2)	2	C3-6d	0%	2	13-Jul-19	15-Jul-19	25-May-19	27-May-19	-40	1						
Modify central median (Chui Ling Road)			15	C3-6d		0	30-Jan-19 A	04-Feb-19 A	11-Apr-19	11-Apr-19								
	C12650-15	West portion of central median (TTA Drg. 063) - Road paving	10	C3-6d	100%	0	30-Jan-19 A	03-Feb-19 A	11-Apr-19	11-Apr-19								
	C12650-16	West portion of central median (TTA Drg. 063) - Road paving core test	5	C3-6d	100%	0	04-Feb-19 A	04-Feb-19 A	11-Apr-19	11-Apr-19								
Drainage			162	C3-6d		113	30-Jan-19 A	26-Aug-19	02-Mar-19	26-Aug-19	0							
Stormwater DN900			70	C3-6d		21	09-Feb-19 A	07-May-19	11-Apr-19	26-Aug-19	92							
PMI-04, CE-05	C12670-3	Lay drain DN900 pipe (SMH6701-SMH4026872)	9	C3-6d	100%	0	09-Feb-19 A	08-Mar-19 A	11-Apr-19	11-Apr-19								
PMI-04, CE-05	C12670-5	Backfill DN900 and reinstatement (SMH6701-SMH4026872)	5	C3-6d	100%	0	09-Mar-19 A	12-Mar-19 A	11-Apr-19	11-Apr-19								
PMI-04, CE-05	C12670-6	Lay drain DN900 pipe (SMH6701-SMH4052839)	5	C3-6d	0%	5	02-Apr-19 A	13-Apr-19	17-Jun-19	22-Jun-19	54							
PMI-04, CE-05	C12670-7	Connection DN900 to existing manholes SMH4052839 & SMHSMH4026872	11	C3-6d	0%	11	15-Apr-19	30-Apr-19	22-Jun-19	06-Jul-19	54							
PMI-04, CE-05	C12670-8	Backfill DN900 and reinstatement (SMH6701-SMH4052839)	5	C3-6d	0%	5	02-May-19	07-May-19	20-Aug-19	26-Aug-19	92							
Stormwater SMH5002-SMH5003			37	C3-6d		37	15-Jul-19	26-Aug-19	08-Jul-19	19-Aug-19	-6							
	C12688-1	Install ELS & excavate (Stage 2)	7	C3-6d	0%	7	15-Jul-19*	22-Jul-19	08-Jul-19	15-Jul-19	-6	1						
	C12688-2	Lay drain pipe (Stage 2)	7	C3-6d	0%	7	23-Jul-19	30-Jul-19	16-Jul-19	23-Jul-19	-6							
	C12688-3	Manhole SMH5003 (Stage 2)	18	C3-6d	0%	18	31-Jul-19	20-Aug-19	24-Jul-19	13-Aug-19	-6							
	C12688-4	Backfill (Stage 2)	5	C3-6d	0%	5	21-Aug-19	26-Aug-19	14-Aug-19	19-Aug-19	-6							
SMH6401 (Po Yap Road - Area 1)			64	C3-6d		30	30-Jan-19 A	29-May-19	02-Mar-19	06-Apr-19	-40							
	C13210-08	Inspection pits	12	C3-6d	100%	0	30-Jan-19 A	09-Mar-19 A	02-Mar-19	02-Mar-19								
	C13210-10	Install ELS & excavate (10m)	5	C3-6d	0%	5	23-Apr-19*	27-Apr-19	02-Mar-19	07-Mar-19	-40							
	C13210-20	Lay DN300 pipe (10m)	2	C3-6d	0%	2	29-Apr-19	30-Apr-19	08-Mar-19	09-Mar-19	-40							
	C13210-30	Manhole SMH6401	18	C3-6d	0%	18	02-May-19	23-May-19	11-Mar-19	30-Mar-19	-40							
	C13210-40	Backfill	5	C3-6d	0%	5	24-May-19	29-May-19	01-Apr-19	06-Apr-19	-40							
SMH6401-SMH6402-exist.manhole (Po Yap Road - Area 2)			29	C3-6d		29	16-Jul-19	17-Aug-19	28-May-19	10-Jul-19	-33							
	C13212-10	Install ELS & excavate SMH6401-SMH6402 and SMH6402-exist.manhole	10	C3-6d	0%	10	16-Jul-19	26-Jul-19	28-May-19	08-Jun-19	-40							
	C13212-20	Lay DN300 pipe (95m) SMH6401-SMH6402	16	C3-6d	0%	16	27-Jul-19	14-Aug-19	18-Jun-19	06-Jul-19	-33							
	C13212-30	Lay DN375 pipe (22m) SMH6402-exist.manhole	5	C3-6d	0%	5	27-Jul-19	01-Aug-19	18-Jun-19	22-Jun-19	-33							
	C13212-40	Manhole SMH6402	14	C3-6d	0%	14	02-Aug-19	17-Aug-19	24-Jun-19	10-Jul-19	-33							
	C13212-50	Connection to existing manhole	5	C3-6d	0%	5	02-Aug-19	07-Aug-19	05-Jul-19	10-Jul-19	-24							
Fresh Watermain			250	C3-6d		205	14-Jan-19 A	16-Dec-19	22-Dec-18	27-Dec-19	8							
Fresh watermain CHA 90 to 167.181			135	C3-6d		135	10-Apr-19	23-Sep-19	08-Mar-19	27-Dec-19	78							
	C12862-54	Lay fresh watermain CHA 90 to 130	7	C3-6d	0%	7	10-Apr-19	17-Apr-19	08-Mar-19	15-Mar-19	-27							
	C12862-70	Backfill CHA 111.181 to 167.181	11	C3-6d	0%	11	10-Sep-19	23-Sep-19	13-Dec-19	27-Dec-19	78							
Fresh Watermain CHA 0 to 90 and CHA1 0 to 15.540			191	C3-6d		139	15-Feb-19 A	08-Oct-19	22-Dec-18	26-Nov-19	42							
	C12860-05	Install ELS & excavate CHA 0 to 90	24	C3-6d	0%	24	14-May-19	11-Jun-19	22-Dec-18	22-Jan-19	-110							
	C12860-06	Lay fresh watermain CHA 0 to 90	42	C3-6d	0%	42	12-Jun-19	31-Jul-19	23-Jan-19	15-Mar-19	-110							
	C12860-07	Backfill CHA 0 to 111.181	19	C3-6d	0%	19	10-Sep-19	03-Oct-19	21-Jun-19	13-Jul-19	-68							
	C12860-08	Install ELS & excavate CHA1	4	C3-6d	0%	4	12-Jun-19	15-Jun-19	07-Mar-19	11-Mar-19	-76							
	C12860-09	Lay fresh watermain CHA1	4	C3-6d	0%	4	17-Jun-19	20-Jun-19	12-Mar-19	15-Mar-19	-76							
	C12860-10	Backfill CHA1	2	C3-6d	0%	2	10-Sep-19	11-Sep-19	19-Jun-19	20-Jun-19	-70							
	C12862-62	Stwling of CLP cable at footpath for further fresh water main installation	26	C3-6d	100%	0	15-Feb-19 A	16-Mar-19 A	22-Dec-18	22-Dec-18								
	C13220	Fresh watermain test, swab, sterilize, water sample CHA, CHA1	27	C3-6d	0%	27	01-Aug-19	31-Aug-19	16-Mar-19	17-Apr-19	-110							
PMI-021	C13222	Material ordering for FWM water connection	48	C3-6d	43.75%	27	14-Mar-19 A	24-May-19	16-Mar-19	17-Apr-19	-27							
	C13310	Watermain connection CHA, CHA1 (by WSD)	1	C3-6d	0%	1	02-Sep-19	02-Sep-19	18-Apr-19	18-Apr-19	-110							
NCE-35	C13312	Maintain existing and new freshwatermain	6	C3-6d	0%	6	03-Sep-19	09-Sep-19	23-Apr-19	29-Apr-19	-110							
	C13314	Removal of existing fresh water main	6	C3-6d	0%	6	10-Sep-19	17-Sep-19	30-Apr-19	07-May-19	-110							
	C13316	Connection of branch pipes (by WSD)	16	C3-6d	0%	16	18-Sep-19	08-Oct-19	08-Nov-19	26-Nov-19	42							
Fresh watermain CHB 0 to 37.202, CHC 0 to 74.858, CHD 0 to 29.591			93	C3-6d		93	14-Jan-19 A	16-Dec-19	20-Aug-19	09-Dec-19	-6							
	C12830-1	Install ELS & excavate CHC	19	C3-6d	0%	19	27-Aug-19	18-Sep-19	20-Aug-19	10-Sep-19	-6							
	C12830-2	Lay fresh watermain CHC	19	C3-6d	0%	19	07-Sep-19	02-Oct-19	31-Aug-19	24-Sep-19	-6							
	C12830-3	Backfill CHC	9	C3-6d	0%	9	06-Dec-19	16-Dec-19	29-Nov-19	09-Dec-19	-6							
	C12830-4	Install ELS & excavate CHD	8	C3-6d	25%	6	14-Jan-19 A	25-Sep-19	13-Sep-19	20-Sep-19	-4							
	C12830-5	Lay fresh watermain CHD	9	C3-6d	22.22%	7	14-Jan-19 A	11-Oct-19	25-Sep-19	03-Oct-19	-6							
	C12830-6	Backfill CHD	3	C3-6d	0%	3	06-Dec-19	09-Dec-19	06-Dec-19	09-Dec-19	0							
	C12830-7	Install ELS & excavate CHB	10	C3-6d	0%	10	26-Sep-19	09-Oct-19	21-Sep-19	03-Oct-19	-4							
	C12830-8	Lay fresh watermain CHB	11	C3-6d	0%	11	12-Oct-19	24-Oct-19	04-Oct-19	17-Oct-19	-6							
	C12830-9	Backfill CHB	4	C3-6d	0%	4	06-Dec-19	10-Dec-19	05-Dec-19	09-Dec-19	-1							
	C12840	Fresh watermain testing CHB, CHC, CHD	12	C3-6d	0%	12	24-Oct-19	07-Nov-19	17-Oct-19	31-Oct-19	-6							
	C12850	Connection of fresh watermain CHB, CHC, CHD	24	C3-6d	0%	24	08-Nov-19	05-Dec-19	01-Nov-19	28-Nov-19	-6							
Salt Watermain			159	C3-6d		110	09-Feb-19 A	22-Aug-19	05-Mar-19	26-Aug-19	3							
	C12890	Salt watermain CHC 0 to 9.178	9	C3-6d	0%	9	29-Jun-19*	10-Jul-19	06-Jul-19	17-Jul-19	6							
	C12900	Salt watermain testing CHC	12	C3-6d	0%	12	11-Jul-19	24-Jul-19	17-Jul-19	31-Jul-19	6							
	C12910	Connection and commissioning of salt watermain CHC	22	C3-6d	0%	22	25-Jul-19	19-Aug-19	31-Jul-19	26-Aug-19	6							
Salt watermain CHA 70 to 124.388			99	C3-6d		50	09-Feb-19 A	12-Jun-19	07-Mar-19	23-May-19	-16							
	C12712-53	Awaiting watermain design review by PM	24	C3-6d	100%	0	09-Feb-19 A	08-Mar-19 A	07-Mar-19	07-Mar-19								
	C12712-54	Lay salt watermain CHA 70 to 74	18	C3-6d	94.44%	1	19-Mar-19 A	09-Apr-19	07-Mar-19	07-Mar-19	-27							
PMI-022	C12712-64	Lay temporary bypass pipe near Sport Centre and water connection (by WSD)	31	C3-6d	80.65%	6	09-Mar-19 A	15-Apr-19	24-Apr-19	30-Apr-19	10							
	C12712-66	Swabbing, pressure test and water sampling for connection	31	C3-6d	0%	31	10-Apr-19	21-May-19	21-Mar-19	30-Apr-19	-16							

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NE/2017/02 - Tseung Kwan O - Lam Tin Tunnel
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Date	Revision	Checked	Approved
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NE/2017/02 - Updated Programme (Apr 2019)

C/NCE/PMI	Activity ID	Activity Name	Original Duration	Calendar	Activity % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	Time Risk Allowance	2019				
													Mar	Apr	May	Jun	Jul
	C12712-68	Slewing of CLP cable at connection point (by CLP)	14	C3-6d	100%	0	09-Mar-19 A	16-Mar-19 A	02-May-19	02-May-19							
PMI-022	C12712-72	Material ordering for SWM water connection	45	C3-6d	46.67%	24	14-Mar-19 A	10-May-19	29-Mar-19	30-Apr-19	-8						
	C12712-74	Watermain connection and blank off existing DN300 at Chui Shin Street (by WSD)	6	C3-6d	0%	6	22-May-19	28-May-19	02-May-19	08-May-19	-16						
	C12712-76	Removal of existing salt water main	12	C3-6d	0%	12	29-May-19	12-Jun-19	09-May-19	23-May-19	-16						
Salt Watermain CHA 0 to 70 and CHB 0 to 25.141			85	C3-6d		85	14-May-19	22-Aug-19	05-Mar-19	20-Jun-19	-53						
	C12710-05	Install ELS & excavate CHA 0 to 70	13	C3-6d	0%	13	14-May-19	28-May-19	05-Mar-19	19-Mar-19	-54						
	C12710-06	Lay salt watermain CHA 0 to 70	26	C3-6d	0%	26	29-May-19	28-Jun-19	20-Mar-19	23-Apr-19	-54						
	C12710-08	Install ELS & excavate CHB	7	C3-6d	0%	7	29-May-19	05-Jun-19	15-May-19	22-May-19	-12						
	C12710-09	Lay salt watermain CHB	9	C3-6d	0%	9	29-Jun-19	10-Jul-19	23-May-19	01-Jun-19	-31						
	C12710-10	Backfill CHB	4	C3-6d	0%	4	08-Aug-19	12-Aug-19	17-Jun-19	20-Jun-19	-44						
	C12710-15	Connection of remaining salt water main and removal of temporary bypass	46	C3-6d	0%	46	29-Jun-19	22-Aug-19	24-Apr-19	19-Jun-19	-54						
	C12870	Salt watermain test, swab CHA, CHB	30	C3-6d	0%	30	29-Jun-19	03-Aug-19	26-Apr-19	01-Jun-19	-52						
CCTV High Mast			45			45	23-Apr-19	06-Jun-19	14-Aug-19	03-Oct-19	119						
PMI-18	C12928	Predrilling at CCTV/PH1 (1 no.) - revised location	5	C3-6d	0%	5	23-Apr-19*	27-Apr-19	14-Aug-19	19-Aug-19	93						
	C12930	Propose founding levels at CCTV high mast	14	C3-6d	0%	14	29-Apr-19	16-May-19	20-Aug-19	04-Sep-19	93						
	C12940	Acceptance of proposed founding level at CCTV high mast	21	C3-7d	0%	21	17-May-19	06-Jun-19	05-Sep-19	25-Sep-19	111						
	C12949	Order and deliver steel casing for socketted H-piles CCTV High Mast	30	C3-7d	0%	30	29-Apr-19	28-May-19	04-Sep-19	03-Oct-19	128						
Utilities			45	C3-6d		31	16-Mar-19 A	20-May-19	23-Nov-18	25-Mar-19	-42						
	C12778	Inspection pits for telecom cables at Chui Ling Road	12	C3-6d	100%	0	16-Mar-19 A	25-Mar-19 A	16-Mar-19	16-Mar-19							
	C12780	Telecom cables at Chui Ling Road by HGC, CATV, PCCW (incl. Chui Shin Street)	19	C3-6d	57.89%	8	26-Mar-19 A	17-Apr-19	16-Mar-19	25-Mar-19	-19 1						
NCE-024	C12824	Connection and switch over of 11kV cables at Road P2 by CLPP	45	C3-6d	31.11%	31	22-Mar-19 A	20-May-19	23-Nov-18	31-Dec-18	-110 5						
Roadworks			67	C3-6d		67	19-Mar-19 A	12-Jul-19	11-Mar-19	08-Jun-19	-28						
Po Yap Road - Area 1			59	C3-6d		59	19-Mar-19 A	12-Jul-19	11-Mar-19	24-May-19	-40						
	C13230-10	Excavation (PYR Area 1)	12	C3-6d	100%	0	19-Mar-19 A	01-Apr-19 A	11-Mar-19	11-Mar-19	2						
	C13230-20	Gullies (PYR Area 1)	12	C3-6d	91.67%	1	02-Apr-19 A	02-May-19	11-Mar-19	11-Mar-19	-40 2						
	C13230-30	Road lighting ducting (PYR Area 1)	10	C3-6d	0%	10	03-May-19	15-May-19	12-Mar-19	22-Mar-19	-40						
	C13230-32	Directional sign DS26 footing	12	C3-6d	0%	12	16-May-19	29-May-19	23-Mar-19	06-Apr-19	-40						
	C13230-40	Formation, sub-base and kerbs (PYR Area 1)	12	C3-6d	0%	12	30-May-19	13-Jun-19	08-Apr-19	24-Apr-19	-40						
	C13230-50	Road paving and layby pavement (PYR Area 1)	12	C3-6d	0%	12	14-Jun-19	27-Jun-19	25-Apr-19	09-May-19	-40						
	C13230-60	Footpath and cycle track (PYR Area 1)	12	C3-6d	0%	12	28-Jun-19	12-Jul-19	10-May-19	24-May-19	-40						
Chui Ling Road - Area 1			58	C3-6d		58	18-Apr-19	02-Jul-19	26-Mar-19	08-Jun-19	-19						
	C13234-10	Excavation (CLR Area 1)	12	C3-6d	0%	12	18-Apr-19	06-May-19	26-Mar-19	09-Apr-19	-19						
	C13234-20	Gullies (CLR Area 1)	12	C3-6d	0%	12	07-May-19	21-May-19	10-Apr-19	26-Apr-19	-19						
	C13234-30	Road lighting ducting (CLR Area 1)	10	C3-6d	0%	10	22-May-19	01-Jun-19	27-Apr-19	09-May-19	-19						
	C13234-40	Formation, sub-base and kerbs (CLR Area 1)	12	C3-6d	0%	12	03-Jun-19	17-Jun-19	10-May-19	24-May-19	-19						
	C13234-50	Footpath and cycletrack (CLR Area 1)	12	C3-6d	0%	12	18-Jun-19	02-Jul-19	25-May-19	08-Jun-19	-19						
Footbridge Predrilling			261			197	28-Jan-19 A	22-Oct-19	01-Apr-19	25-Sep-19	-27						
	C12971	Propose founding level PC1-3	12	C3-6d	0%	12	09-Apr-19	25-Apr-19	17-Jun-19	29-Jun-19	53						
	C12972	Acceptance of founding level PC1-3	21	C3-7d	0%	21	26-Apr-19	16-May-19	02-Jul-19	22-Jul-19	67						
	C13011	Propose founding level PC7	12	C3-6d	0%	12	09-Apr-19	25-Apr-19	04-Jul-19	17-Jul-19	67						
	C13012	Acceptance of founding level PC7	21	C3-7d	0%	21	26-Apr-19	16-May-19	18-Jul-19	07-Aug-19	83						
	C13049	Predrilling at PC2-1/PH4 (Pier 02) (1 nos.) PD#1	5	C3-6d	100%	0	18-Mar-19 A	29-Mar-19 A	22-Jul-19	22-Jul-19							
	C13060	Propose founding level PC2-1 (Pier 02)	12	C3-6d	0%	12	09-Apr-19	25-Apr-19	22-Jul-19	05-Aug-19	83						
	C13070	Acceptance of founding level PC2-1 (Pier 02)	21	C3-7d	0%	21	26-Apr-19	16-May-19	05-Aug-19	26-Aug-19	102						
	C13110	Predrilling at PC5-PH1 to PH3, PH6 (Pier 01) (4 nos.) PD#1	17	C3-6d	100%	0	28-Jan-19 A	13-Mar-19 A	01-Apr-19	01-Apr-19							
	C13120	Propose founding level PC5 (Pier 01)	4	C3-6d	100%	0	14-Mar-19 A	27-Mar-19 A	01-Apr-19	01-Apr-19							
	C13130	Acceptance of founding level PC5 (Pier 01)	8	C3-7d	100%	0	28-Mar-19 A	03-Apr-19 A	01-Apr-19	01-Apr-19							
	C13321	Predrilling at PC2-2/PH1 & PH2 (Pier 03) (2 nos.) PD#1	8	C3-6d	0%	8	18-Sep-19	26-Sep-19	08-May-19	17-May-19	-110						
	C13322	Propose founding level PC2-2 (Pier 03)	2	C3-6d	0%	2	27-Sep-19	28-Sep-19	18-May-19	20-May-19	-110						
	C13323	Acceptance of founding level PC2-2 (Pier 03)	3	C3-6d	0%	3	30-Sep-19	03-Oct-19	21-May-19	23-May-19	-110						
	C13411	Propose founding level PC1-2	12	C3-6d	0%	12	09-Apr-19	25-Apr-19	22-Aug-19	04-Sep-19	109						
	C13412	Acceptance of founding level PC1-2	21	C3-7d	0%	21	26-Apr-19	16-May-19	05-Sep-19	25-Sep-19	132						
	C13413	Propose founding level PC3-1	12	C3-6d	0%	12	09-Apr-19	25-Apr-19	31-May-19	14-Jun-19	40						
	C13414	Acceptance of founding level PC3-1	21	C3-7d	0%	21	26-Apr-19	16-May-19	15-Jun-19	05-Jul-19	50						
	C13460	Propose founding level PC3-2	11	C3-6d	0%	11	10-Oct-19	22-Oct-19	03-Jul-19	15-Jul-19	-82						
Footbridge Piling			126	C3-6d		118	11-Mar-19 A	31-Aug-19	01-Apr-19	26-Aug-19	-5						
	C13340	Mobilize plant BP#1	6	C3-6d	100%	0	15-Mar-19 A	28-Mar-19 A	01-Apr-19	01-Apr-19							
CE-25	C13345	Protection of HGC cable	6	C3-6d	100%	0	11-Mar-19 A	28-Mar-19 A	01-Apr-19	01-Apr-19							
	C13350	Bored piles at PC5 (Pier 01) (6 nos.) BP#1	126	C3-6d	6.35%	118	29-Mar-19 A	31-Aug-19	01-Apr-19	26-Aug-19	-5 6						
TTA Stage 2B			542			452	03-Jan-19 A	03-Jul-20	23-Apr-19	13-Jun-20	-20						
TTA			214	C3-6d		141	03-Jan-19 A	28-Sep-19	23-Apr-19	23-Sep-19	-5						
	C13270	Design and acceptance of TTA Stage 2B	42	C3-6d	45.67%	23	03-Jan-19 A	09-May-19	23-Apr-19	21-May-19	9						
	C13280	Implementation of TTA Stage 2B	2	C3-6d	0%	2	05-Sep-19	06-Sep-19	22-May-19	23-May-19	-89 1						
	C13390	Temporary footpath and cycle track (for TTA Stage 3A)	18	C3-6d	0%	18	07-Sep-19	28-Sep-19	02-Sep-19	23-Sep-19	-5						
Drainage			45	C3-6d		45	19-Aug-19	12-Oct-19	11-Jul-19	26-Nov-19	38						
	C13300	Stormwater SMH6601-SMH6602, SMH5001-SMH6602	28	C3-6d	0%	28	07-Sep-19	12-Oct-19	25-Oct-19	26-Nov-19	38 1						
SMH6401-SMH6402-exist.manhole (Po Yap Road - Area 2)			8	C3-6d		8	19-Aug-19	27-Aug-19	11-Jul-19	19-Jul-19	-33						
	C13212-60	Backfill	8	C3-6d	0%	8	19-Aug-19	27-Aug-19	11-Jul-19	19-Jul-19	-33						
Fresh Watermain			10	C3-6d		10	23-Aug-19	03-Sep-19	20-Jun-19	02-Jul-19	-54						
Fresh Watermain CHA 0 to 90 and CHA1 0 to 15.540			10	C3-6d		10	23-Aug-19	03-Sep-19	20-Jun-19	02-Jul-19	-54						
	C12710-07	Backfill CHA 0 to 50	10	C3-6d	0%	10	23-Aug-19	03-Sep-19	20-Jun-19	02-Jul-19	-54						
Salt Watermain			15	C3-6d		15	05-Aug-19	21-Aug-19	03-Jun-19	20-Jun-19	-52						

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NE/2017/02 - Tseung Kwan O - Lam Tin Tunnel
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CEN/CE/PMI	Activity ID	Activity Name	Original Duration	Calendar	Activity % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	Time Risk Allowance	2019				
													Mar	Apr	May	Jun	Jul
Salt Watermain CHA 0 to 60 and CHB 0 to 25.141																	
	C12880	Connection and commissioning of salt watermain CHA, CHB	3	C3-6d	0%	3	05-Aug-19	07-Aug-19	03-Jun-19	05-Jun-19	-52						
Salt watermain CHA 60 to 124.388																	
	C12712-70	Backfill CHA 50 to 124.388	12	C3-6d	0%	12	08-Aug-19	21-Aug-19	06-Jun-19	20-Jun-19	-52						
Utilities																	
	C12690	Gas main at Chui Ling Road (South) by HKCG	19	C3-6d	0%	19	09-Apr-19	04-May-19	31-Aug-19	23-Sep-19	117						
Roadworks																	
	C13580	Roadworks at Chui Ling Road (North), Po Shun Road (North), Po Yap Road (North)	120	C3-6d	0%	120	06-Feb-20	03-Jul-20	27-Nov-19	25-Apr-20	-55						
	C13590	Roadwork within Portion IV	54	C3-6d	0%	54	21-Sep-19	25-Nov-19	07-Apr-20	13-Jun-20	161						
Po Yap Road - Area 2																	
	C13231-10	Excavation (PYR Area 2)	12	C3-6d	0%	12	27-Jul-19	09-Aug-19	10-Jun-19	22-Jun-19	-40 2						
	C13231-20	Gullies (PYR Area 2)	12	C3-6d	0%	12	10-Aug-19	23-Aug-19	24-Jun-19	08-Jul-19	-40 2						
	C13231-30	Road lighting ducting (PYR Area 2)	10	C3-6d	0%	10	24-Aug-19	04-Sep-19	09-Jul-19	19-Jul-19	-40						
	C13231-40	Formation, sub-base and kerbs (PYR Area 2)	12	C3-6d	0%	12	05-Sep-19	19-Sep-19	20-Jul-19	02-Aug-19	-40						
	C13231-50	Road paving (PYR Area 2)	12	C3-6d	0%	12	20-Sep-19	04-Oct-19	03-Aug-19	16-Aug-19	-40						
	C13231-60	Footpath and cycle track (PYR Area 2)	12	C3-6d	0%	12	05-Oct-19	19-Oct-19	17-Aug-19	30-Aug-19	-40						
	C13231-70	Type 2 railing and chain link fence (PYR Area 2)	10	C3-6d	0%	10	21-Oct-19	31-Oct-19	31-Aug-19	11-Sep-19	-40						
Footbridge Predrilling																	
	C13400	Predrilling at PC6/PH1 & PH3 (Pier 05) (2 nos.) PD#1	8	C3-6d	0%	8	27-Sep-19	08-Oct-19	21-Jun-19	29-Jun-19	-82						
	C13401	Propose founding level PC6 (Pier 05)	11	C3-6d	0%	11	09-Oct-19	21-Oct-19	07-Jan-20	20-Jan-20	75						
	C13402	Acceptance of founding level PC6 (Pier 05)	19	C3-7d	0%	19	22-Oct-19	09-Nov-19	20-Jan-20	08-Feb-20	91						
	C13420	Predrilling at PC2-3/PH1, PH2, PH4 (Pier 04) (3 nos.) PD#2	11	C3-6d	18.18%	9	30-Mar-19 A	09-Oct-19	21-Jun-19	02-Jul-19	-82						
	C13430	Propose founding level PC2-3 (Pier 04)	11	C3-6d	0%	11	10-Oct-19	22-Oct-19	27-Jul-19	08-Aug-19	-61						
	C13440	Acceptance of founding level PC2-3 (Pier 04)	19	C3-7d	0%	19	23-Oct-19	10-Nov-19	09-Aug-19	27-Aug-19	-75						
	C13470	Acceptance of founding level PC3-2	15	C3-7d	0%	15	23-Oct-19	06-Nov-19	16-Jul-19	30-Jul-19	-99						
Footbridge Piling																	
	C13160	Socketted H-piles at PC3-1 P1 & P3 (2 nos.) SP#1	14	C3-6d	0%	14	07-Sep-19	24-Sep-19	06-Jul-19	22-Jul-19	-54 2						
	C13170	Socketted H-piles at PC1-3 (2 nos.) SP#1	14	C3-6d	0%	14	25-Sep-19	12-Oct-19	23-Jul-19	07-Aug-19	-54 2						
	C13240	Socketted H-piles at PC7 (2 nos.) SP#1	14	C3-6d	0%	14	14-Oct-19	29-Oct-19	08-Aug-19	23-Aug-19	-54 2						
	C13330	First loading test (socketted H-piles)	22	C3-6d	81.82%	4	21-Mar-19 A	02-Nov-19	24-Aug-19	28-Aug-19	-54						
	C13480	Mobilize plant BP#2	6	C3-6d	0%	6	25-Sep-19	03-Oct-19	16-May-19	23-May-19	-110						
	C13490	Bored piles at PC2-2 (Pier 03) (4 nos.) BP#2	80	C3-6d	0%	80	04-Oct-19	09-Jan-20	24-May-19	27-Aug-19	-110 2						
	C13500	Mobilize plant SP#2	6	C3-6d	0%	6	07-Nov-19	13-Nov-19	31-Jul-19	06-Aug-19	-82						
	C13610	Bored pile testing (Pier 01)	10	C3-6d	0%	10	27-Sep-19	10-Oct-19	11-Oct-19	22-Oct-19	10						
	C13660	Bored pile at PC2-1 (Pier 02) (4 nos.) BP#1	80	C3-6d	0%	80	02-Sep-19	06-Dec-19	26-Aug-19	30-Nov-19	-5 2						
Stage 3 Works																	
TTA Stage 3A																	
	TTA		218	C3-6d		218	10-May-19	01-Feb-20	10-Jun-19	10-Dec-19	-40						
	C13520	Design and acceptance of TTA Stage 3A	42	C3-6d	0%	42	10-May-19	29-Jun-19	05-Aug-19	23-Sep-19	71						
	C13530	Implementation of TTA - Stage 3A-1	2	C3-6d	0%	2	30-Sep-19	02-Oct-19	24-Sep-19	25-Sep-19	-5 1						
	C13532	Implementation of TTA - Stage 3A-2 (Po Yap Road - Area 4)	2	C3-6d	0%	2	01-Nov-19	02-Nov-19	12-Sep-19	13-Sep-19	-40 1						
	C13534	Implementation of TTA - Stage 3A-3 (Po Yap Road - Area 5)	2	C3-6d	0%	2	31-Jan-20	01-Feb-20	09-Dec-19	10-Dec-19	-40 1						
	C13536	Implementation of TTA Stage 3A-4 (Chui Ling Road - Area 2)	2	C3-6d	0%	2	03-Jul-19	04-Jul-19	10-Jun-19	11-Jun-19	-19 1						
	C13538	Implementation of TTA Stage 3A-5 (Chui Ling Road - Area 3)	2	C3-6d	0%	2	08-Oct-19	09-Oct-19	12-Sep-19	13-Sep-19	-19 1						
	C13539	Implementation of TTA Stage 3A-6 (Chui Ling Road - Area 4)	2	C3-6d	0%	2	03-Jan-20	04-Jan-20	09-Dec-19	10-Dec-19	-19 1						
	C13550	Modification of existing roundabout to temporary signalized junction	30	C3-6d	0%	30	03-Oct-19	07-Nov-19	02-Nov-19	06-Dec-19	25						
Roadworks																	
	C13570	Footpath and cycle track (for TTA Stage 3B)	18	C3-6d	0%	18	03-Oct-19	24-Oct-19	16-Nov-19	06-Dec-19	37						
Po Yap Road Area 3																	
	C13233-10	Excavation (PYR Area 3)	9	C3-6d	0%	9	24-Sep-19	04-Oct-19	28-Dec-19	08-Jan-20	78						
	C13233-20	Gullies (PYR Area 3)	9	C3-6d	0%	9	05-Oct-19	16-Oct-19	09-Jan-20	18-Jan-20	78						
	C13233-30	Road lighting ducting (PYR Area 3)	6	C3-6d	0%	6	17-Oct-19	23-Oct-19	20-Jan-20	29-Jan-20	78						
	C13233-40	Formation, sub-base and kerbs (PYR Area 3)	9	C3-6d	0%	9	24-Oct-19	02-Nov-19	30-Jan-20	08-Feb-20	78						
	C13233-50	Road paving (PYR Area 3)	9	C3-6d	0%	9	04-Nov-19	13-Nov-19	10-Feb-20	19-Feb-20	78						
	C13233-60	Footpath and cycle track (PYR Area 3)	9	C3-6d	0%	9	14-Nov-19	23-Nov-19	20-Feb-20	29-Feb-20	78						
	C13233-70	Type 2 railing and chain link fence (PYR Area 3)	6	C3-6d	0%	6	25-Nov-19	30-Nov-19	02-Mar-20	07-Mar-20	78						
Po Yap Road Area 4																	
	C13962-10	Excavation (PYR Area 4)	12	C3-6d	0%	12	04-Nov-19	16-Nov-19	16-Sep-19	28-Sep-19	-40 2						
	C13962-20	Gullies (PYR Area 4)	12	C3-6d	0%	12	18-Nov-19	30-Nov-19	30-Sep-19	15-Oct-19	-40 2						
	C13962-30	Road lighting ducting (PYR Area 4)	10	C3-6d	0%	10	02-Dec-19	12-Dec-19	16-Oct-19	26-Oct-19	-40						
	C13962-40	Formation, sub-base and kerbs (PYR Area 4)	12	C3-6d	0%	12	13-Dec-19	28-Dec-19	28-Oct-19	09-Nov-19	-40						
	C13962-50	Concrete profile barrier (PYR Area 4)	12	C3-6d	0%	12	30-Dec-19	13-Jan-20	11-Nov-19	23-Nov-19	-40						
	C13962-60	Road paving (PYR Area 4)	12	C3-6d	0%	12	14-Jan-20	30-Jan-20	25-Nov-19	07-Dec-19	-40						
Po Yap Road Area 5																	
	C13964-10	Excavation (PYR Area 5)	12	C3-6d	0%	12	03-Feb-20	15-Feb-20	11-Dec-19	24-Dec-19	-40 2						
	C13964-20	Gullies (PYR Area 5)	12	C3-6d	0%	12	17-Feb-20	29-Feb-20	27-Dec-19	10-Jan-20	-40 2						
	C13964-30	Road lighting ducting (PYR Area 5)	10	C3-6d	0%	10	02-Mar-20	12-Mar-20	11-Jan-20	22-Jan-20	-40						
	C13964-40	Formation, sub-base and kerbs (PYR Area 5)	12	C3-6d	0%	12	13-Mar-20	26-Mar-20	23-Jan-20	08-Feb-20	-40						
	C13964-50	Concrete profile barrier (PYR Area 5)	12	C3-6d	0%	12	27-Mar-20	14-Apr-20	10-Feb-20	22-Feb-20	-40						
	C13964-60	Road paving (PYR Area 5)	12	C3-6d	0%	12	15-Apr-20	28-Apr-20	24-Feb-20	07-Mar-20	-40						
Chui Ling Road Area 2																	
	C13232-10	Excavation (CLR Area 2)	12	C3-6d	0%	12	05-Jul-19	18-Jul-19	12-Jun-19	25-Jun-19	-19						

- █ Actual Work
- █ Remaining Work
- █ Critical Remaining Work
- ◆ Milestone
- ▬ Summary

NE/2017/02 - Tseung Kwan O - Lam Tin Tunnel
Road P2/D4 and Associated Works
Updated Programme (April 2019)

Date	Revision	Checked	Approved
08-Apr-19	RWP-2019-04 (Data date 8-Apr-19)	TC	

CEN/CE/PMI	Activity ID	Activity Name	Original Duration	Calendar	Activity % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	Time Risk Allowance	2019					
													Mar	Apr	May	Jun	Jul	
	C13232-20	Gullies (CLR Area 2)	12	C3-6d	0%	12	19-Jul-19	01-Aug-19	26-Jun-19	10-Jul-19	-19							
	C13232-30	Road lighting ducting (CLR Area 2)	10	C3-6d	0%	10	02-Aug-19	13-Aug-19	11-Jul-19	22-Jul-19	-19							
	C13232-40	Formation, sub-base and kerbs (CLR Area 2)	20	C3-6d	0%	20	14-Aug-19	05-Sep-19	23-Jul-19	14-Aug-19	-19							
	C13232-50	Footpath, cycletrack and layby pavement (CLR Area 2)	24	C3-6d	0%	24	06-Sep-19	05-Oct-19	15-Aug-19	11-Sep-19	-19							
Chui Ling Road Area 3			70	C3-6d	0%	70	10-Oct-19	02-Jan-20	16-Sep-19	07-Dec-19	-19							
	C13236-10	Excavation (CLR Area 3)	12	C3-6d	0%	12	10-Oct-19	23-Oct-19	16-Sep-19	28-Sep-19	-19							
	C13236-20	Excavation (CLR Area 3)	12	C3-6d	0%	12	24-Oct-19	06-Nov-19	30-Sep-19	15-Oct-19	-19							
	C13236-30	Road lighting ducting (CLR Area 3)	10	C3-6d	0%	10	07-Nov-19	18-Nov-19	16-Oct-19	26-Oct-19	-19							
	C13236-40	Formation, sub-base and kerbs (CLR Area 3)	12	C3-6d	0%	12	19-Nov-19	02-Dec-19	28-Oct-19	09-Nov-19	-19							
	C13236-50	Concrete profile barrier (CLR Area 3)	12	C3-6d	0%	12	03-Dec-19	16-Dec-19	11-Nov-19	23-Nov-19	-19							
	C13236-60	Road paving (CLR Area 3)	12	C3-6d	0%	12	17-Dec-19	02-Jan-20	25-Nov-19	07-Dec-19	-19							
Chui Ling Road Area 4			70	C3-6d	0%	70	06-Jan-20	30-Mar-20	11-Dec-19	07-Mar-20	-19							
	C13237-10	Excavation (CLR Area 4)	12	C3-6d	0%	12	06-Jan-20	18-Jan-20	11-Dec-19	24-Dec-19	-19							
	C13237-20	Excavation (CLR Area 4)	12	C3-6d	0%	12	20-Jan-20	05-Feb-20	27-Dec-19	10-Jan-20	-19							
	C13237-30	Road lighting ducting (CLR Area 4)	10	C3-6d	0%	10	06-Feb-20	17-Feb-20	11-Jan-20	22-Jan-20	-19							
	C13237-40	Formation, sub-base and kerbs (CLR Area 4)	12	C3-6d	0%	12	18-Feb-20	02-Mar-20	23-Jan-20	08-Feb-20	-19							
	C13237-50	Concrete profile barrier (CLR Area 4)	12	C3-6d	0%	12	03-Mar-20	16-Mar-20	10-Feb-20	22-Feb-20	-19							
	C13237-60	Road paving (CLR Area 4)	12	C3-6d	0%	12	17-Mar-20	30-Mar-20	24-Feb-20	07-Mar-20	-19							
CCTV High Mast			51	C3-6d	0%	51	03-Oct-19	02-Dec-19	26-Sep-19	26-Nov-19	-5							
	C12950	Mobilize plant SP#1	6	C3-6d	0%	6	03-Oct-19	10-Oct-19	26-Sep-19	03-Oct-19	-5							
	C12960	Socketed H-piles at CCTV High Mast (3 nos.) SP#1	21	C3-6d	0%	21	11-Oct-19	04-Nov-19	04-Oct-19	29-Oct-19	-5	3						
	C13600	Pile cap for CCTV high mast	24	C3-6d	0%	24	05-Nov-19	02-Dec-19	30-Oct-19	26-Nov-19	-5							
Salt Watermain			51	C3-6d	0%	51	03-Oct-19	02-Dec-19	04-Dec-19	08-Feb-20	53							
DN200 SWM at Chui Shin Street			51	C3-6d	0%	51	03-Oct-19	02-Dec-19	04-Dec-19	08-Feb-20	53							
	PMI-012	C12712-1 Install ELS & excavate DN200 SWM	7	C3-6d	0%	7	03-Oct-19	11-Oct-19	04-Dec-19	12-Dec-19	53							
	PMI-012	C12712-2 Lay DN200 SWM	9	C3-6d	0%	9	12-Oct-19	22-Oct-19	12-Dec-19	23-Dec-19	53							
	PMI-012	C12712-3 Salt watermain testing DN200 SWM	6	C3-6d	0%	6	23-Oct-19	29-Oct-19	23-Dec-19	02-Jan-20	53							
	PMI-012	C12712-4 Connection of salt watermain DN200 SWM	22	C3-6d	0%	22	30-Oct-19	23-Nov-19	02-Jan-20	31-Jan-20	53							
	PMI-012	C12712-5 Backfill DN200 SWM	7	C3-6d	0%	7	25-Nov-19	02-Dec-19	31-Jan-20	08-Feb-20	53							
Footbridge Piling			126	C3-6d	0%	126	14-Nov-19	20-Apr-20	07-Aug-19	27-Apr-20	6							
	C13510	Socketed H-piles at PC3-2 (4 nos.) SP#2	28	C3-6d	0%	28	14-Nov-19	16-Dec-19	07-Aug-19	07-Sep-19	-82	4						
	C13620	Bored pile testing (Pier 03)	9	C3-6d	0%	9	07-Feb-20	17-Feb-20	22-Oct-19	31-Oct-19	-87							
	C13630	Bored piles at PC2-3 (Pier 04) (4 nos.) BP#2	80	C3-6d	0%	80	10-Jan-20	20-Apr-20	28-Aug-19	02-Dec-19	-110	2						
	C13650	Bored piles at PC6 (Pier 05) (3 nos.) BP#1	63	C3-6d	0%	63	07-Dec-19	25-Feb-20	08-Feb-20	27-Apr-20	49	3						
	C13670	Socketed H-piles at PC3-1 P2 & P4 (2 nos.) SP#2	14	C3-6d	0%	14	17-Dec-19	04-Jan-20	09-Sep-19	25-Sep-19	-82	2						
	C13680	Socketed H-piles at PC1-2 (2 nos.) SP#2	14	C3-6d	0%	14	06-Jan-20	21-Jan-20	26-Sep-19	14-Oct-19	-82	2						
	C13690	Second loading test (socketed H-piles)	22	C3-6d	0%	22	22-Jan-20	19-Feb-20	15-Oct-19	08-Nov-19	-82							
	C14020	Bored pile testing (Pier 02)	9	C3-6d	0%	9	04-Jan-20	14-Jan-20	28-Dec-19	08-Jan-20	-5							
Footbridge Substructure			164	C3-6d	0%	164	04-Nov-19	26-May-20	29-Aug-19	02-Jul-20	30							
	C13700	Pile cap PC1-3	20	C3-6d	0%	20	04-Nov-19	26-Nov-19	03-Sep-19	26-Sep-19	-50							
	C13710	Pile cap PC1-1	20	C3-6d	0%	20	04-Nov-19	26-Nov-19	29-Aug-19	21-Sep-19	-54							
	C13720	Pile cap PC8	24	C3-6d	0%	24	27-Nov-19	24-Dec-19	23-Sep-19	22-Oct-19	-54							
	C13730	Pile cap PC4	24	C3-6d	0%	24	27-Dec-19	24-Jan-20	28-Oct-19	23-Nov-19	-50							
	C13740	Pile cap PC5 (Pier 01)	30	C3-6d	0%	30	27-Dec-19	04-Feb-20	23-Oct-19	26-Nov-19	-54							
	C13760	Pile cap PC3-2	24	C3-6d	0%	24	20-Feb-20	18-Mar-20	09-Nov-19	06-Dec-19	-82							
	C13770	Pile cap PC1-2	20	C3-6d	0%	20	20-Feb-20	13-Mar-20	20-Feb-20	14-Mar-20	1							
	C13780	Pile cap PC3-1	24	C3-6d	0%	24	20-Feb-20	18-Mar-20	18-Jan-20	19-Feb-20	-24							
	C13790	Pile cap PC2-2 (Pier 03)	25	C3-6d	0%	25	18-Feb-20	17-Mar-20	31-Oct-19	29-Nov-19	-87							
	C13800	Column at PC2-2 (Pier 03)	54	C3-6d	0%	54	18-Mar-20	26-May-20	29-Nov-19	07-Feb-20	-87							
	C13810	Column at PC5 (Pier 01)	30	C3-6d	0%	30	06-Mar-20	15-Apr-20	26-May-20	02-Jul-20	63							
	C13820	Column PC1-2 (Staircase 01) - 1st pour	12	C3-6d	0%	12	14-Mar-20	27-Mar-20	14-Mar-20	28-Mar-20	1							
	C13850	Wall at PC5 (Lift shaft 2A & 2B)	45	C3-6d	0%	45	05-Feb-20	27-Mar-20	27-Nov-19	21-Jan-20	-54							
	C13860	Column at PC1-1 (Staircase 02) - 1st pour	18	C3-6d	0%	18	27-Nov-19	17-Dec-19	20-May-20	10-Jun-20	139							
	C13870	Wall at PC8 (Staircase 02) - 2nd pour	18	C3-6d	0%	18	27-Dec-19	17-Jan-20	20-May-20	10-Jun-20	115							
	C13880	Column at PC1-3 (Staircase 01) - 2nd pour	18	C3-6d	0%	18	30-Dec-19	21-Jan-20	21-Mar-20	16-Apr-20	67							
	C13890	Wall at PC4 (Staircase 03) - 1st pour	12	C3-6d	0%	12	29-Jan-20	11-Feb-20	25-Nov-19	07-Dec-19	-50							
	C13900	Wall at PC4 (Staircase 03) - 2nd pour	12	C3-6d	0%	12	12-Feb-20	25-Feb-20	09-Dec-19	21-Dec-19	-50							
	C13910	Wall at PC7 (Staircase 01) - 4th pour	18	C3-6d	0%	18	31-Jan-20	21-Feb-20	21-Mar-20	16-Apr-20	43							
	C14040	Pile cap PC7	24	C3-6d	0%	24	27-Nov-19	24-Dec-19	27-Sep-19	26-Oct-19	-50							
	C14050	Pile Cap PC2-1 (Pier 02)	24	C3-6d	0%	24	15-Jan-20	14-Feb-20	08-Jan-20	08-Feb-20	-5							
	C14060	Column at PC2-1 (Pier 02)	18	C3-6d	0%	18	15-Feb-20	06-Mar-20	08-Feb-20	29-Feb-20	-5							
Footbridge Superstructure			45	C3-6d	0%	45	26-Feb-20	22-Apr-20	23-Dec-19	19-Feb-20	-50							
	C14150	Staircase 03 structure - 3rd pour	45	C3-6d	0%	45	26-Feb-20	22-Apr-20	23-Dec-19	19-Feb-20	-50							
TTA Stage 3B			346	C3-6d	0%	346	02-Jul-19	27-Aug-20	19-Oct-19	04-Aug-20	-20							
TTA			235	C3-6d	0%	235	02-Jul-19	15-Apr-20	19-Oct-19	25-Apr-20	9							
	C13930	Design and acceptance of TTA Stage 3B	42	C3-6d	0%	42	02-Jul-19	19-Aug-19	19-Oct-19	06-Dec-19	91							
	C13940	Implementation of TTA - Stage 3B	2	C3-6d	0%	2	19-Mar-20	20-Mar-20	07-Dec-19	09-Dec-19	-82	1						
	C13950	Permanent footpath and cycle track (for TTA Stage 4A)	18	C3-6d	0%	18	21-Mar-20	15-Apr-20	01-Apr-20	25-Apr-20	9							
Roadworks			87	C3-6d	0%	87	21-Mar-20	09-Jul-20	10-Dec-19	25-Apr-20	-60							
	C13960	Drainage works along Chui Ling Road and Po Yap Road	48	C3-6d	0%	48	21-Mar-20	22-May-20	26-Feb-20	25-Apr-20	-21							
	C13970	Directional sign DS27 & 28 (footing & steel frame) and DS26 (steel frame)	30	C3-6d	0%	30	21-Mar-20	29-Apr-20	03-Feb-20	07-Mar-20	-41							
	C13980	Roadwork for carriageway and cycle track	72	C3-6d	0%	72	21-Mar-20	19-Jun-20	10-Dec-19	09-Mar-20	-82							

- Actual Work
- Remaining Work
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- ▶ Summary

NE/2017/02 - Tseung Kwan O - Lam Tin Tunnel
Road P2/D4 and Associated Works

CE/NCE/PMI	Activity ID	Activity Name	Original Duration	Calendar	Activity % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	Time Risk Allowance	2019				
													Mar	Apr	May	Jun	Jul
	C13990	Ductings for TCSS and road lighting	72	C3-6d	0%	72	21-Mar-20	19-Jun-20	10-Dec-19	09-Mar-20	-82						
	C14000	Signage	16	C3-6d	0%	16	02-May-20	20-May-20	09-Mar-20	26-Mar-20	-41						
	C14010	Lighting posts	15	C3-6d	0%	15	20-Jun-20	09-Jul-20	10-Mar-20	26-Mar-20	-82						
	Footbridge Piling		52	C3-6d		52	21-Mar-20	27-May-20	30-Dec-19	03-Jun-20	6						
	C13640	Bored pile testing (Pier 04)	9	C3-6d	0%	9	18-May-20	27-May-20	30-Dec-19	09-Jan-20	-110						
	C14030	Bored pile testing (Pier 05)	9	C3-6d	0%	9	21-Mar-20	31-Mar-20	25-May-20	03-Jun-20	49						
	Footbridge Substructure		77	C3-6d		77	28-May-20	27-Aug-20	10-Jan-20	16-Apr-20	-110						
	C13750	Pile cap PC2-3 (Pier 04)	23	C3-6d	0%	23	28-May-20	23-Jun-20	10-Jan-20	08-Feb-20	-110						
	C14070	Column at PC2-3 (Pier 04)	54	C3-6d	0%	54	24-Jun-20	27-Aug-20	10-Feb-20	16-Apr-20	-110						
	Footbridge Superstructure		100	C3-6d		100	07-Mar-20	10-Jul-20	22-Jan-20	04-Aug-20	21						
	C13830	Column PC1-2 (Staircase 01) - 3rd pour	12	C3-6d	0%	12	28-Mar-20	15-Apr-20	28-Mar-20	16-Apr-20	1						
	C13840	Wall at PC3-1 (Lift shaft 1A & 1B)	45	C3-6d	0%	45	19-Mar-20	16-May-20	19-Feb-20	16-Apr-20	-24						
	C13920	Wall at PC3-2 (Lift shaft 3A & 3B)	45	C3-6d	0%	45	19-Mar-20	16-May-20	19-Feb-20	15-Apr-20	-25						
	C14080	Bearing Pier 02	3	C3-6d	0%	3	07-Mar-20	10-Mar-20	29-Feb-20	04-Mar-20	-5						
	C14120	Bearing Pier 01	3	C3-6d	0%	3	15-Apr-20	18-Apr-20	15-Jul-20	18-Jul-20	74						
	C14130	Staircase 02 structure - 3rd pour	45	C3-6d	0%	45	28-Mar-20	26-May-20	10-Jun-20	04-Aug-20	58						
	C14160	Staircase 03 structure - 4th pour	45	C3-6d	0%	45	23-Apr-20	16-Jun-20	20-Feb-20	16-Apr-20	-50						
	C14170	Staircase 01 structure - 5th pour	45	C3-6d	0%	45	18-May-20	10-Jul-20	16-Apr-20	10-Jun-20	-24						
	C14200	Lift shaft steelworks (Lift 1A & 1B)	12	C3-6d	0%	12	18-May-20	30-May-20	06-Jul-20	18-Jul-20	40						
	C14210	Lift shaft steelworks (Lift 2A & 2B)	12	C3-6d	0%	12	28-Mar-20	15-Apr-20	22-Jan-20	07-Feb-20	-54						
	C14220	Lift shaft steelworks (Lift 3A & 3B)	12	C3-6d	0%	12	18-May-20	30-May-20	16-Apr-20	29-Apr-20	-25						
	C14230	Falsework Portion 1	12	C3-6d	0%	12	27-May-20	09-Jun-20	07-Feb-20	21-Feb-20	-87						
	C14240	Deck structure Portion 1	19	C3-6d	0%	19	10-Jun-20	03-Jul-20	21-Feb-20	14-Mar-20	-87						
	C14260	Falsework Portion 2	12	C3-6d	0%	12	07-Mar-20	20-Mar-20	29-Feb-20	14-Mar-20	-5						
	Stage 4 Works		500	C3-6d		500	20-Aug-19	28-Apr-21	04-Mar-20	10-Dec-20	-109						
	TTA Stage 4A		313	C3-6d		313	20-Aug-19	07-Sep-20	04-Mar-20	10-Dec-20	78						
	TTA		259	C3-6d		259	20-Aug-19	06-Jul-20	04-Mar-20	28-Apr-20	-55						
	C14320	Design and acceptance of TTA Stage 4A	42	C3-6d	0%	42	20-Aug-19	10-Oct-19	04-Mar-20	25-Apr-20	160						
	C14330	Implementation of TTA - Stage 4A	2	C3-6d	0%	2	04-Jul-20	06-Jul-20	27-Apr-20	28-Apr-20	-55 1						
	Roadworks		24	C3-6d		24	07-Jul-20	03-Aug-20	15-Jun-20	14-Jul-20	-17						
	C14360	Roadworks at Po Shun Road north and west of interchange	24	C3-6d	0%	24	07-Jul-20	03-Aug-20	15-Jun-20	14-Jul-20	-17						
	Salt Watermain		54	C3-6d		54	07-Jul-20	07-Sep-20	29-Apr-20	04-Jul-20	-55						
	DN150 bypass SWM		54	C3-6d		54	07-Jul-20	07-Sep-20	29-Apr-20	04-Jul-20	-55						
	C12714-0	Inspection pits for DN150SWM	12	C3-6d	0%	12	07-Jul-20	20-Jul-20	29-Apr-20	14-May-20	-55						
	C12714-1	Install ELS & excavate DN150 SWM	4	C3-6d	0%	4	21-Jul-20	24-Jul-20	15-May-20	19-May-20	-55						
	C12714-2	Lay DN150 SWM	6	C3-6d	0%	6	25-Jul-20	31-Jul-20	20-May-20	26-May-20	-55						
	C12714-3	Salt watermain testing DN150 SWM	6	C3-6d	0%	6	01-Aug-20	07-Aug-20	27-May-20	02-Jun-20	-55						
	C12714-4	Connection of salt watermain DN150 SWM	22	C3-6d	0%	22	08-Aug-20	02-Sep-20	03-Jun-20	29-Jun-20	-55						
	C12714-5	Backfill DN150 SWM	4	C3-6d	0%	4	03-Sep-20	07-Sep-20	30-Jun-20	04-Jul-20	-55						
	Footbridge substructure		43	C3-6d		43	01-Apr-20	27-May-20	03-Jun-20	25-Jul-20	49						
	C14090	Pile Cap PC6 (Pier 05)	25	C3-6d	0%	25	01-Apr-20	06-May-20	03-Jun-20	04-Jul-20	49						
	C14100	Column at PC6 (Pier 05)	18	C3-6d	0%	18	07-May-20	27-May-20	04-Jul-20	25-Jul-20	49						
	Footbridge superstructure		74	C3-6d		74	27-May-20	22-Aug-20	14-Mar-20	10-Dec-20	91						
	C14140	Staircase 02 structure - 4th pour	45	C3-6d	0%	45	27-May-20	20-Jul-20	04-Aug-20	25-Sep-20	58						
	C14250	Remove falsework Portion 1	6	C3-6d	0%	6	04-Jul-20	10-Jul-20	04-Dec-20	10-Dec-20	128						
	C14270	Deck structure Portion 2	43	C3-6d	0%	43	04-Jul-20	22-Aug-20	14-Mar-20	11-May-20	-87						
	TTA Stage 4B		458	C3-6d		458	11-Oct-19	28-Apr-21	17-Apr-20	10-Dec-20	-109						
	TTA		243	C3-6d		243	11-Oct-19	05-Aug-20	25-May-20	16-Jul-20	-17						
	C14430	Design and acceptance of TTA Stage 4B	42	C3-6d	0%	42	11-Oct-19	28-Nov-19	25-May-20	14-Jul-20	182						
	C14440	Implementation of TTA - Stage 4B	2	C3-6d	0%	2	04-Aug-20	05-Aug-20	15-Jul-20	16-Jul-20	-17 1						
	Drainage		34	C3-6d		34	08-Sep-20	19-Oct-20	06-Jul-20	13-Aug-20	-55						
	C14340	Stormwater SMH6501 to SMH6503	17	C3-6d	0%	17	08-Sep-20	26-Sep-20	06-Jul-20	24-Jul-20	-55 1						
	C14350	Stormwater SMH 6503 to SMH 6502	17	C3-6d	0%	17	28-Sep-20	19-Oct-20	25-Jul-20	13-Aug-20	-55 1						
	Roadworks		24	C3-6d		24	06-Aug-20	02-Sep-20	17-Jul-20	13-Aug-20	-17						
	C14450	Roadworks at Po Shun Road north of interchange	24	C3-6d	0%	24	06-Aug-20	02-Sep-20	17-Jul-20	13-Aug-20	-17						
	Footbridge superstructure		273	C3-6d		273	28-May-20	28-Apr-21	17-Apr-20	10-Dec-20	-109						
	C14110	Bearing Pier 05	3	C3-6d	0%	3	28-May-20	30-May-20	08-Aug-20	12-Aug-20	61						
	C14180	Staircase 01 structure - 6th pour	45	C3-6d	0%	45	11-Jul-20	01-Sep-20	10-Jun-20	04-Aug-20	-24						
	C14190	Staircase 01 structure - 7th pour	45	C3-6d	0%	45	02-Sep-20	27-Oct-20	04-Aug-20	25-Sep-20	-24						
	C14280	Cure and prestress Portion 2 (Stage 1 stressing)	28	C3-6d	0%	28	24-Aug-20	24-Sep-20	11-May-20	12-Jun-20	-87 1						
	C14290	Falsework at Portion 0 (Pier 04)	12	C3-6d	0%	12	28-Aug-20	10-Sep-20	17-Apr-20	02-May-20	-110						
	C14300	Deck structure Portion 0 (Pier 04)	19	C3-6d	0%	19	11-Sep-20	05-Oct-20	04-May-20	25-May-20	-110						
	C14310	Falsework Portion 3a	12	C3-6d	0%	12	28-Aug-20	10-Sep-20	12-May-20	25-May-20	-91						
	C14370	Bearing Pier 04	3	C3-6d	0%	3	06-Oct-20	08-Oct-20	19-Aug-20	21-Aug-20	-39						
	C14380	Remove falsework Portion 0 (Pier 04)	6	C3-6d	0%	6	06-Oct-20	12-Oct-20	04-Dec-20	10-Dec-20	50						
	C14390	Deck structure Portion 3a	43	C3-6d	0%	43	06-Oct-20	25-Nov-20	26-May-20	16-Jul-20	-110						
	C14400	Deck outer section Portion 2	9	C3-6d	0%	9	25-Sep-20	07-Oct-20	12-Jun-20	23-Jun-20	-87						
	C14410	Remove falsework Portion 2	6	C3-6d	0%	6	08-Oct-20	14-Oct-20	23-Jun-20	02-Jul-20	-87						
	C14420	Falsework Portion 3b	11	C3-6d	0%	11	15-Oct-20	28-Oct-20	02-Jul-20	15-Jul-20	-87						
	C14460	Erect steel canopy	150	C3-6d	0%	150	25-Sep-20	30-Mar-21	11-Jun-20	09-Dec-20	-89						
	C14470	Cure and prestress Portion 3a (Stage 2 stressing)	28	C3-6d	0%	28	26-Nov-20	30-Dec-20	17-Jul-20	18-Aug-20	-110 1						
	C14480	Deck outer section Portion 3a	9	C3-6d	0%	9	31-Dec-20	11-Jan-21	31-Aug-20	09-Sep-20	-100						

- █ Actual Work
- █ Remaining Work
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- ▶ Summary

NE/2017/02 - Tseung Kwan O - Lam Tin Tunnel
Road P2/D4 and Associated Works
Updated Programme (April 2019)

Date	Revision	Checked	Approved
08-Apr-19	RWP-2019-04 (Data date 8-Apr-19)	TC	

CE/NCE/PMI	Activity ID	Activity Name	Original Duration	Calendar	Activity % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	Time Risk Allowance	2019				
													Mar	Apr	May	Jun	Jul
	C14490	Deck structure Portion 3a adjacent Portion 0	19	C3-6d	0%	19	31-Dec-20	22-Jan-21	19-Aug-20	09-Sep-20	-110						
	C14500	Remove falsework Portion 3a	6	C3-6d	0%	6	23-Jan-21	29-Jan-21	10-Sep-20	16-Sep-20	-110						
	C14510	Deck structure Portion 3b	43	C3-6d	0%	43	29-Oct-20	17-Dec-20	15-Jul-20	03-Sep-20	-87						
	C14520	Cure and prestress Portion 3b (Stage 3 stressing)	28	C3-6d	0%	28	31-Dec-20	02-Feb-21	03-Sep-20	08-Oct-20	-96	1					
	C14530	Deck outer section Portion 3b	10	C3-6d	0%	10	03-Feb-21	17-Feb-21	06-Nov-20	18-Nov-20	-72						
	C14540	Remove falsework Portion 3b	6	C3-6d	0%	6	18-Feb-21	24-Feb-21	04-Dec-20	10-Dec-20	-59						
	C14550	Falsework Portion 4	12	C3-6d	0%	12	15-Oct-20	29-Oct-20	25-Jul-20	08-Aug-20	-67						
	C14560	Deck structure Portion 4	32	C3-6d	0%	32	30-Oct-20	05-Dec-20	08-Aug-20	15-Sep-20	-67						
	C14570	Remove falsework Portion 4	6	C3-6d	0%	6	07-Dec-20	12-Dec-20	15-Sep-20	22-Sep-20	-67						
	C14580	Falsework Portion 5	11	C3-6d	0%	11	30-Jan-21	11-Feb-21	25-Sep-20	10-Oct-20	-102						
	C14590	Deck structure Portion 5	32	C3-6d	0%	32	16-Feb-21	24-Mar-21	10-Oct-20	18-Nov-20	-102						
	C14600	Remove falsework Portion 5	6	C3-6d	0%	6	25-Mar-21	31-Mar-21	04-Dec-20	10-Dec-20	-89						
	C14610	Falsework Portion 6a	11	C3-6d	0%	11	14-Dec-20	28-Dec-20	25-Sep-20	10-Oct-20	-64						
	C14620	Deck structure Portion 6a	32	C3-6d	0%	32	03-Feb-21	15-Mar-21	10-Oct-20	18-Nov-20	-94						
	C14630	Remove falsework Portion 6a	6	C3-6d	0%	6	16-Mar-21	22-Mar-21	04-Dec-20	10-Dec-20	-81						
	C14640	Falsework Portion 6b	12	C3-6d	0%	12	14-Dec-20	29-Dec-20	22-Sep-20	08-Oct-20	-67						
	C14650	Bearing Portion 6b	3	C3-6d	0%	3	14-Dec-20	16-Dec-20	08-Oct-20	12-Oct-20	-55						
	C14660	Deck structure Portion 6b	34	C3-6d	0%	34	03-Feb-21	17-Mar-21	08-Oct-20	18-Nov-20	-96	2					
	C14670	Remove falsework Portion 6b	6	C3-6d	0%	6	18-Mar-21	24-Mar-21	04-Dec-20	10-Dec-20	-83						
	C14680	Install fabricated movement joints (4 nos.)	13	C3-6d	0%	13	25-Mar-21	13-Apr-21	18-Nov-20	03-Dec-20	-102						
	C14690	Falsework for arch structure and arch cladding	15	C3-6d	0%	15	30-Jan-21	19-Feb-21	17-Sep-20	06-Oct-20	-110						
	C14700	Erect arch structure and arch cladding	54	C3-6d	0%	54	20-Feb-21	28-Apr-21	07-Oct-20	09-Dec-20	-110						
	C14710	Finishing works	44	C3-6d	0%	44	04-Mar-21	28-Apr-21	19-Oct-20	09-Dec-20	-110						
	Irrigation System		630			562	05-Dec-18 A	23-Dec-20	19-Sep-19	13-Aug-20	-132						
	C14720	Details of irrigation system (prepare & submit)	18	C3-6d	100%	0	05-Dec-18 A	13-Dec-18 A	19-Sep-19	19-Sep-19							
	C14730	Details of irrigation system (review & discuss)	12	C3-6d	100%	0	14-Dec-18 A	23-Jan-19 A	19-Sep-19	19-Sep-19							
	C14740	Details of irrigation system (resubmit)	12	C3-6d	50%	6	24-Jan-19 A	17-Jun-19	19-Sep-19	25-Sep-19	84						
	C14750	Details of irrigation system (accept)	21	C3-7d	0%	21	18-Jun-19	08-Jul-19	26-Sep-19	16-Oct-19	100						
	C14760	MS for irrigation system (prepare & submit)	18	C3-6d	0%	18	01-Aug-19*	21-Aug-19	02-Dec-19	21-Dec-19	102						
	C14770	MS for irrigation system (review & discuss)	12	C3-6d	0%	12	22-Aug-19	04-Sep-19	23-Dec-19	08-Jan-20	102						
	C14780	MS for irrigation system (resubmit)	12	C3-6d	0%	12	05-Sep-19	19-Sep-19	09-Jan-20	22-Jan-20	102						
	C14790	MS for irrigation system (accept)	21	C3-7d	0%	21	20-Sep-19	10-Oct-19	23-Jan-20	12-Feb-20	125						
	C14800	Material order and delivery of irrigation system	96	C3-6d	0%	96	09-Jul-19	31-Oct-19	17-Oct-19	12-Feb-20	83						
	C14810	Install irrigation system	127	C3-6d	0%	127	29-Jun-20	27-Nov-20	13-Feb-20	18-Jul-20	-110						
	C14820	Testing and commissioning of irrigation system	22	C3-6d	0%	22	28-Nov-20	23-Dec-20	20-Jul-20	13-Aug-20	-110						
	Landscaping Softworks		667			667	02-Jul-19	28-Apr-21	02-Dec-19	10-Dec-20	-139						
	C14830	MS for landscaping works (prepare & submit)	18	C3-6d	0%	18	02-Jul-19*	22-Jul-19	02-Dec-19	21-Dec-19	128						
	C14840	MS for landscaping works (review & discuss)	18	C3-6d	0%	18	23-Jul-19	12-Aug-19	23-Dec-19	15-Jan-20	128						
	C14850	MS for landscaping works (resubmit)	6	C3-6d	0%	6	13-Aug-19	19-Aug-19	16-Jan-20	22-Jan-20	128						
	C14860	MS for landscaping works (accept)	21	C3-7d	0%	21	20-Aug-19	09-Sep-19	23-Jan-20	12-Feb-20	156						
	C14870	Landscaping Softworks (at-grade)	247	C3-6d	0%	247	29-Jun-20	28-Apr-21	13-Feb-20	09-Dec-20	-110						
	C14880	Landscaping Softworks (on footbridge)	94	C3-6d	0%	94	12-Nov-20	08-Mar-21	20-Aug-20	10-Dec-20	-69						
	Establishment Works		365	C3-7d		365	29-Apr-21	28-Apr-22	11-Dec-20	10-Dec-21	-139						
	C14890	Establishment Works	365	C3-7d	0%	365	29-Apr-21	28-Apr-22	11-Dec-20	10-Dec-21	-139						

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NE/2017/02 - Tseung Kwan O - Lam Tin Tunnel
Road P2/D4 and Associated Works
Updated Programme (April 2019)

Date	Revision	Checked	Approved
08-Apr-19	RWP-2019-04 (Data date 8-Apr-19)	TC	

Task No.	Task Name	Duration	Start	Finish	Actual Finish	Predecessors	Successors	2019				
								Apr	May	Jun	Jul	
1	Contract Award	0 days	Mon 29 Oct '18	Mon 29 Oct '18	NA							
2	Letter of Acceptance	0 days	Mon 29 Oct '18	Mon 29 Oct '18	NA		6,20,10,9,8					
3	Commencement of the Works	0 days	Fri 9 Nov '18	Fri 9 Nov '18	NA		18,14,11,12,13,16,17,7					
4												
5	Design Stage	316 days?	Mon 29 Oct '18	Mon 9 Sep '19	NA							
6	Prepare and Submit Initial Works Programme	5 days	Mon 29 Oct '18	Fri 2 Nov '18	Fri 2 Nov '18	2						
7	Submit Staffing Proposal	7 days	Fri 9 Nov '18	Thu 15 Nov '18	Thu 15 Nov '18	3						
8	Submit Quality Plan	17 days	Mon 29 Oct '18	Wed 14 Nov '18	Wed 14 Nov '18	2						
9	Submit Draft Safety Plan	12 days	Mon 29 Oct '18	Fri 9 Nov '18	Fri 9 Nov '18	2						
10	Submit Safety Plan	46 days	Mon 29 Oct '18	Thu 13 Dec '18	Thu 13 Dec '18	2						
11	Submit Draft Environmental Management Plan	6 days	Fri 9 Nov '18	Wed 14 Nov '18	Wed 14 Nov '18	3						
12	Submit Environmental Management Plan	53 days	Fri 9 Nov '18	Mon 31 Dec '18	Mon 31 Dec '18	3						
13	Submit Site Management Plan for Trip Ticket System	36 days	Fri 9 Nov '18	Fri 14 Dec '18	Fri 14 Dec '18	3						
14	Submit Sub-contractor Management Plan	17 days	Mon 29 Oct '18	Wed 14 Nov '18	Wed 14 Nov '18	3						
15												
16	Submit Software Quality Plan	57 days	Mon 29 Oct '18	Mon 24 Dec '18	Mon 24 Dec '18	3						
17	Submit Software Configuration Management Plan	60 days	Mon 29 Oct '18	Thu 27 Dec '18	Thu 27 Dec '18	3						
18	Submit Software Verification & Validation Plan	60 days	Mon 29 Oct '18	Thu 27 Dec '18	Thu 27 Dec '18	3						
19												
20	Prepare / Submission of PSP for TKO-LTT TCSS and CBL TCSS	316 days?	Mon 29 Oct '18	Mon 9 Sep '19	NA	2						
21	Submission of PSP - Central System Software	56 days	Fri 9 Nov '18	Thu 3 Jan '19	Thu 3 Jan '19		22					
22	Review and Comment the PSP	54 days	Thu 3 Jan '19	Tue 26 Feb '19	Tue 26 Feb '19	21	23					
23	Resubmission of the PSP	31 days	Tue 26 Feb '19	Fri 29 Mar '19	Fri 29 Mar '19	22	24					

Task		Project Summary		Inactive Summary		Manual Summary		External Milestone	
Split		External Tasks		Manual Task		Start-only		Progress	
Milestone		External Milestone		Duration-only		Finish-only		Deadline	
Summary		Inactive Milestone		Manual Summary Rollup		External Tasks			

Task No.	Task Name	Duration	Start	Finish	Actual Finish	Predecessors	Successors	2019			
								Apr	May	Jun	Jul
24	Review and Approval of the PSP	28 days	Fri 29 Mar '19	Fri 26 Apr '19	NA 23		102				
25											
26	Submission of PSP - Central System Hardware	53 days?	Fri 9 Nov '18	Mon 31 Dec '18	Mon 31 Dec '18		27				
27	Review and Comment the PSP	73 days	Mon 31 Dec '18	Thu 14 Mar '19	Thu 14 Mar '19	26	28				
28	Resubmission of the PSP	10 days	Thu 14 Mar '19	Sun 24 Mar '19	NA 27		29				
29	Review and Approval of the PSP	28 days	Sun 24 Mar '19	Sun 21 Apr '19	NA 28		107				
30											
31	Submission of PSP - Traffic Control Devices	53 days?	Fri 9 Nov '18	Mon 31 Dec '18	Mon 31 Dec '18		32				
32	Review and Comment the PSP	87 days	Mon 31 Dec '18	Thu 28 Mar '19	Thu 28 Mar '19	31	33				
33	Resubmission of the PSP	10 days	Thu 28 Mar '19	Sun 7 Apr '19	NA 32		34				
34	Review and Approval of the PSP	28 days	Sun 7 Apr '19	Sun 5 May '19	NA 33		112				
35											
36	Submission of PSP - Communication System	57 days?	Fri 9 Nov '18	Fri 4 Jan '19	Fri 4 Jan '19		37				
37	Review and Comment the PSP	53 days	Fri 4 Jan '19	Tue 26 Feb '19	Tue 26 Feb '19	36	38				
38	Resubmission of the PSP	35 days	Tue 26 Feb '19	Tue 2 Apr '19	Tue 2 Apr '19	37	39				
39	Review and Approval of the PSP	28 days	Tue 2 Apr '19	Tue 30 Apr '19	NA 38		117				
40											
41	Submission of PSP - Closed Circuit Television System	49 days?	Fri 9 Nov '18	Thu 27 Dec '18	Thu 27 Dec '18		42				
42	Review and Comment the PSP	62 days	Thu 27 Dec '18	Wed 27 Feb '19	Wed 27 Feb '19	41	43				
43	Resubmission of the PSP	10 days	Wed 27 Feb '19	Sat 9 Mar '19	NA 42		44				
44	Review and Approval of the PSP	28 days	Sat 9 Mar '19	Sat 6 Apr '19	NA 43		122				
45											
46	Submission of PSP - Building PABX System	50 days?	Fri 9 Nov '18	Fri 28 Dec '18	Fri 28 Dec '18		47				
47	Review and Comment the PSP	77 days	Fri 28 Dec '18	Fri 15 Mar '19	Fri 15 Mar '19	46	48				

Task		Project Summary		Inactive Summary		Manual Summary		External Milestone	
Split		External Tasks		Manual Task		Start-only		Progress	
Milestone		External Milestone		Duration-only		Finish-only		Deadline	
Summary		Inactive Milestone		Manual Summary Rollup		External Tasks			

Task No.	Task Name	Duration	Start	Finish	Actual Finish	Predecessors	Successors	2019				
								Apr	May	Jun	Jul	
48	Resubmission of the PSP	10 days	Fri 15 Mar '19	Mon 25 Mar '19	NA 47	49						
49	Review and Approval of the PSP	28 days	Mon 25 Mar '19	Mon 22 Apr '19	NA 48	127						
50												
51	Submission of PSP - Emergency Telephone System	57 days?	Fri 9 Nov '18	Fri 4 Jan '19	Fri 4 Jan '19	52						
52	Review and Comment the PSP	87 days	Fri 4 Jan '19	Mon 1 Apr '19	Mon 1 Apr '19 51	53						
53	Resubmission of the PSP	10 days	Mon 1 Apr '19	Thu 11 Apr '19	NA 52	54						
54	Review and Approval of the PSP	28 days	Thu 11 Apr '19	Thu 9 May '19	NA 53	132						
55												
56	Submission of PSP - Public Address System	71 days	Mon 29 Oct '18	Mon 7 Jan '19	Mon 7 Jan '19	57						
57	Review and Comment the PSP	86 days	Mon 7 Jan '19	Wed 3 Apr '19	Wed 3 Apr '19 56	58						
58	Resubmission of the PSP	10 days	Wed 3 Apr '19	Sat 13 Apr '19	NA 57	59						
59	Review and Approval of the PSP	28 days	Sat 13 Apr '19	Sat 11 May '19	NA 58	137						
60												
61	Submission of PSP - Radio System	71 days	Mon 29 Oct '18	Mon 7 Jan '19	Mon 7 Jan '19	62						
62	Review and Comment the PSP	50 days	Mon 7 Jan '19	Tue 26 Feb '19	Tue 26 Feb '19 61	63						
63	Resubmission of the PSP	59 days	Tue 26 Feb '19	Fri 26 Apr '19	Fri 26 Apr '19 62	64						
64	Review and Approval of the PSP	28 days	Fri 26 Apr '19	Fri 24 May '19	NA 63	142						
65												
66	Submission of PSP - Detection System	53 days	Fri 9 Nov '18	Mon 31 Dec '18	Mon 31 Dec '18	67						
67	Review and Comment the PSP	28 days	Mon 31 Dec '18	Mon 28 Jan '19	NA 66	68						
68	Resubmission of the PSP	10 days	Mon 28 Jan '19	Thu 7 Feb '19	NA 67	69						
69	Review and Approval of the PSP	28 days	Thu 7 Feb '19	Thu 7 Mar '19	NA 68	147						
70												
71	Submission of PSP - Manual Fallback System	46 days	Fri 9 Nov '18	Mon 24 Dec '18	Mon 24 Dec '18	72						

Task		Project Summary		Inactive Summary		Manual Summary		External Milestone	
Split		External Tasks		Manual Task		Start-only		Progress	
Milestone		External Milestone		Duration-only		Finish-only		Deadline	
Summary		Inactive Milestone		Manual Summary Rollup		External Tasks			

Task No.	Task Name	Duration	Start	Finish	Actual Finish	Predecessors	Successors	2019			
								Apr	May	Jun	Jul
72	Review and Comment the PSP	63 days	Mon 24 Dec '18	Mon 25 Feb '19	Mon 25 Feb '19	71	73				
73	Resubmission of the PSP	32 days	Mon 25 Feb '19	Fri 29 Mar '19	Fri 29 Mar '19	72	74				
74	Review and Approval of the PSP	28 days	Fri 29 Mar '19	Fri 26 Apr '19	NA	73	152				
75											
76	Submission of PSP - Operation Facilities	57 days	Fri 9 Nov '18	Fri 4 Jan '19	Fri 4 Jan '19		77				
77	Review and Comment the PSP	53 days	Fri 4 Jan '19	Tue 26 Feb '19	Tue 26 Feb '19	76	78				
78	Resubmission of the PSP	28 days	Tue 26 Feb '19	Tue 26 Mar '19	Tue 26 Mar '19	77	79				
79	Review and Approval of the PSP	29 days	Tue 26 Mar '19	Wed 24 Apr '19	Wed 24 Apr '19	78	157				
80											
81	Submission of PSP - Power Distribution System	57 days	Fri 9 Nov '18	Fri 4 Jan '19	Fri 4 Jan '19		82				
82	Review and Comment the PSP	55 days	Fri 4 Jan '19	Thu 28 Feb '19	Thu 28 Feb '19	81	83				
83	Resubmission of the PSP	10 days	Thu 28 Feb '19	Sun 10 Mar '19	NA	82	84				
84	Review and Approval of the PSP	28 days	Sun 10 Mar '19	Sun 7 Apr '19	NA	83	162				
85											
86	Submission of PSP - Enforcement System	68 days	Mon 29 Oct '18	Fri 4 Jan '19	Fri 4 Jan '19		87				
87	Review and Comment the PSP	28 days	Fri 4 Jan '19	Fri 1 Feb '19	NA	86	88				
88	Resubmission of the PSP	10 days	Fri 1 Feb '19	Mon 11 Feb '19	NA	87	89				
89	Review and Approval of the PSP	28 days	Mon 11 Feb '19	Mon 11 Mar '19	NA	88	167				
90											
91	Submission of PSP - Government Optical Fibre System	60 days	Fri 9 Nov '18	Mon 7 Jan '19	Mon 7 Jan '19		92				
92	Review and Comment the PSP	50 days	Mon 7 Jan '19	Tue 26 Feb '19	Tue 26 Feb '19	91	93				
93	Resubmission of the PSP	28 days	Tue 26 Feb '19	Tue 26 Mar '19	Tue 26 Mar '19	92	94				
94	Review and Approval of the PSP	23 days	Tue 26 Mar '19	Thu 18 Apr '19	Thu 18 Apr '19	93	172				
95											

Task		Project Summary		Inactive Summary		Manual Summary		External Milestone	
Split		External Tasks		Manual Task		Start-only		Progress	
Milestone		External Milestone		Duration-only		Finish-only		Deadline	
Summary		Inactive Milestone		Manual Summary Rollup		External Tasks			

Task No.	Task Name	Duration	Start	Finish	Actual Finish	Predecessors	Successors	2019					
								Apr	May	Jun	Jul		
96	Submission of PSP - Overview	60 days	Fri 9 Nov '18	Mon 7 Jan '19	Mon 7 Jan '19		97						
97	Review and Comment the PSP	28 days	Mon 7 Jan '19	Mon 4 Feb '19		NA 96	98						
98	Resubmission of the PSP	10 days	Mon 4 Feb '19	Thu 14 Feb '19		NA 97	99						
99	Review and Approval of the PSP	28 days	Thu 14 Feb '19	Thu 14 Mar '19		NA 98							
100													
101	Prepare / Submission of FSP for TKO-LTT TCSS and CBL TCSS	186 days	Thu 7 Mar '19	Mon 9 Sep '19	NA								
102	Submission of FSP - Central System Software	42 days	Fri 26 Apr '19	Fri 7 Jun '19		NA 24	103						
103	Review and Comment the FSP	28 days	Fri 7 Jun '19	Fri 5 Jul '19		NA 102	104						
104	Resubmission of the FSP	10 days	Fri 5 Jul '19	Mon 15 Jul '19		NA 103	105						
105	Review and Approval of the FSP	28 days	Mon 15 Jul '19	Mon 12 Aug '19		NA 104							
106													
107	Submission of FSP- Central System Hardware	42 days	Sun 21 Apr '19	Sun 2 Jun '19		NA 29	108						
108	Review and Comment the FSP	28 days	Sun 2 Jun '19	Sun 30 Jun '19		NA 107	109						
109	Resubmission of the FSP	10 days	Sun 30 Jun '19	Wed 10 Jul '19		NA 108	110						
110	Review and Approval of the FSP	28 days	Wed 10 Jul '19	Wed 7 Aug '19		NA 109							
111													
112	Submission of FSP - Traffic Control Devices	42 days	Sun 5 May '19	Sun 16 Jun '19		NA 34	113						
113	Review and Comment the FSP	28 days	Sun 16 Jun '19	Sun 14 Jul '19		NA 112	114						
114	Resubmission of the FSP	10 days	Sun 14 Jul '19	Wed 24 Jul '19		NA 113	115						
115	Review and Approval of the FSP	28 days	Wed 24 Jul '19	Wed 21 Aug '19		NA 114							
116													
117	Submission of FSP - Communication System	42 days	Tue 30 Apr '19	Tue 11 Jun '19		NA 39	118						
118	Review and Comment the FSP	28 days	Tue 11 Jun '19	Tue 9 Jul '19		NA 117	119						
119	Resubmission of the FSP	10 days	Tue 9 Jul '19	Fri 19 Jul '19		NA 118	120						

Task		Project Summary		Inactive Summary		Manual Summary		External Milestone	
Split		External Tasks		Manual Task		Start-only		Progress	
Milestone		External Milestone		Duration-only		Finish-only		Deadline	
Summary		Inactive Milestone		Manual Summary Rollup		External Tasks			

Task No.	Task Name	Duration	Start	Finish	Actual Finish	Predecessors	Successors	2019					
								Apr	May	Jun	Jul		
120	Review and Approval of the FSP	28 days	Fri 19 Jul '19	Fri 16 Aug '19	NA 119								
121													
122	Submission of FSP - Closed Circuit Television System	42 days	Sat 6 Apr '19	Sat 18 May '19	NA 44		123						
123	Review and Comment the FSP	28 days	Sat 18 May '19	Sat 15 Jun '19	NA 122		124						
124	Resubmission of the FSP	10 days	Sat 15 Jun '19	Tue 25 Jun '19	NA 123		125						
125	Review and Approval of the FSP	28 days	Tue 25 Jun '19	Tue 23 Jul '19	NA 124								
126													
127	Submission of FSP - Building PABX System	42 days	Mon 22 Apr '19	Mon 3 Jun '19	NA 49		128						
128	Review and Comment the FSP	28 days	Mon 3 Jun '19	Mon 1 Jul '19	NA 127		129						
129	Resubmission of the FSP	10 days	Mon 1 Jul '19	Thu 11 Jul '19	NA 128		130						
130	Review and Approval of the FSP	28 days	Thu 11 Jul '19	Thu 8 Aug '19	NA 129								
131													
132	Submission of FSP - Emergency Telephone System	42 days	Thu 9 May '19	Thu 20 Jun '19	NA 54		133						
133	Review and Comment the FSP	28 days	Thu 20 Jun '19	Thu 18 Jul '19	NA 132		134						
134	Resubmission of the FSP	10 days	Thu 18 Jul '19	Sun 28 Jul '19	NA 133		135						
135	Review and Approval of the FSP	28 days	Sun 28 Jul '19	Sun 25 Aug '19	NA 134								
136													
137	Submission of FSP - Public Address System	42 days	Sat 11 May '19	Sat 22 Jun '19	NA 59		138						
138	Review and Comment the FSP	28 days	Sat 22 Jun '19	Sat 20 Jul '19	NA 137		139						
139	Resubmission of the FSP	10 days	Sat 20 Jul '19	Tue 30 Jul '19	NA 138		140						
140	Review and Approval of the FSP	28 days	Tue 30 Jul '19	Tue 27 Aug '19	NA 139								
141													
142	Submission of FSP - Radio System	42 days	Fri 24 May '19	Fri 5 Jul '19	NA 64		143						
143	Review and Comment the FSP	28 days	Fri 5 Jul '19	Fri 2 Aug '19	NA 142		144						

Task		Project Summary		Inactive Summary		Manual Summary		External Milestone	
Split		External Tasks		Manual Task		Start-only		Progress	
Milestone		External Milestone		Duration-only		Finish-only		Deadline	
Summary		Inactive Milestone		Manual Summary Rollup		External Tasks			

Task No.	Task Name	Duration	Start	Finish	Actual Finish	Predecessors	Successors	2019			
								Apr	May	Jun	Jul
144	Resubmission of the FSP	10 days	Fri 2 Aug '19	Mon 12 Aug '19	NA 143	145					
145	Review and Approval of the FSP	28 days	Mon 12 Aug '19	Mon 9 Sep '19	NA 144						
146											
147	Submission of FSP - Detection System	42 days	Thu 7 Mar '19	Thu 18 Apr '19	NA 69	148	█				
148	Review and Comment the FSP	28 days	Thu 18 Apr '19	Thu 16 May '19	NA 147	149	█	█			
149	Resubmission of the FSP	10 days	Thu 16 May '19	Sun 26 May '19	NA 148	150		█			
150	Review and Approval of the FSP	28 days	Sun 26 May '19	Sun 23 Jun '19	NA 149				█		
151											
152	Submission of FSP - Manual Fallback System	42 days	Fri 26 Apr '19	Fri 7 Jun '19	NA 74	153		█	█		
153	Review and Comment the FSP	28 days	Fri 7 Jun '19	Fri 5 Jul '19	NA 152	154				█	
154	Resubmission of the FSP	10 days	Fri 5 Jul '19	Mon 15 Jul '19	NA 153	155				█	
155	Review and Approval of the FSP	28 days	Mon 15 Jul '19	Mon 12 Aug '19	NA 154					█	
156											
157	Submission of FSP - Operation Facilities	42 days	Wed 24 Apr '19	Wed 5 Jun '19	NA 79	158		█	█		
158	Review and Comment the FSP	28 days	Wed 5 Jun '19	Wed 3 Jul '19	NA 157	159				█	
159	Resubmission of the FSP	10 days	Wed 3 Jul '19	Sat 13 Jul '19	NA 158	160				█	
160	Review and Approval of the FSP	28 days	Sat 13 Jul '19	Sat 10 Aug '19	NA 159					█	
161											
162	Submission of FSP - Power Distribution System	42 days	Sun 7 Apr '19	Sun 19 May '19	NA 84	163	█	█			
163	Review and Comment the FSP	28 days	Sun 19 May '19	Sun 16 Jun '19	NA 162	164			█		
164	Resubmission of the FSP	10 days	Sun 16 Jun '19	Wed 26 Jun '19	NA 163	165				█	
165	Review and Approval of the FSP	28 days	Wed 26 Jun '19	Wed 24 Jul '19	NA 164					█	
166											
167	Submission of FSP - Enforcement System	42 days	Mon 11 Mar '19	Mon 22 Apr '19	NA 89	168	█				

Task		Project Summary		Inactive Summary		Manual Summary		External Milestone	
Split		External Tasks		Manual Task		Start-only		Progress	
Milestone		External Milestone		Duration-only		Finish-only		Deadline	
Summary		Inactive Milestone		Manual Summary Rollup		External Tasks			

**TSEUNG KWAN O – LAM TIN TUNNEL
TRAFFIC CONTROL SURVEILLANCE SYSTEM (TCSS) AND ASSOCIATED WORKS
3-MONTH ROLLING PROGRAMME**

Task No.	Task Name	Duration	Start	Finish	Actual Finish	Predecessors	Successors	2019			
								Apr	May	Jun	Jul
168	Review and Comment the FSP	28 days	Mon 22 Apr '19	Mon 20 May '19		NA 167	169				
169	Resubmission of the FSP	10 days	Mon 20 May '19	Thu 30 May '19		NA 168	170				
170	Review and Approval of the FSP	28 days	Thu 30 May '19	Thu 27 Jun '19		NA 169					
171											
172	Submission of FSP - Government Optical Fibre System	42 days	Thu 18 Apr '19	Thu 30 May '19		NA 94	173				
173	Review and Comment the FSP	28 days	Thu 30 May '19	Thu 27 Jun '19		NA 172	174				
174	Resubmission of the FSP	10 days	Thu 27 Jun '19	Sun 7 Jul '19		NA 173	175				
175	Review and Approval of the FSP	28 days	Sun 7 Jul '19	Sun 4 Aug '19		NA 174					

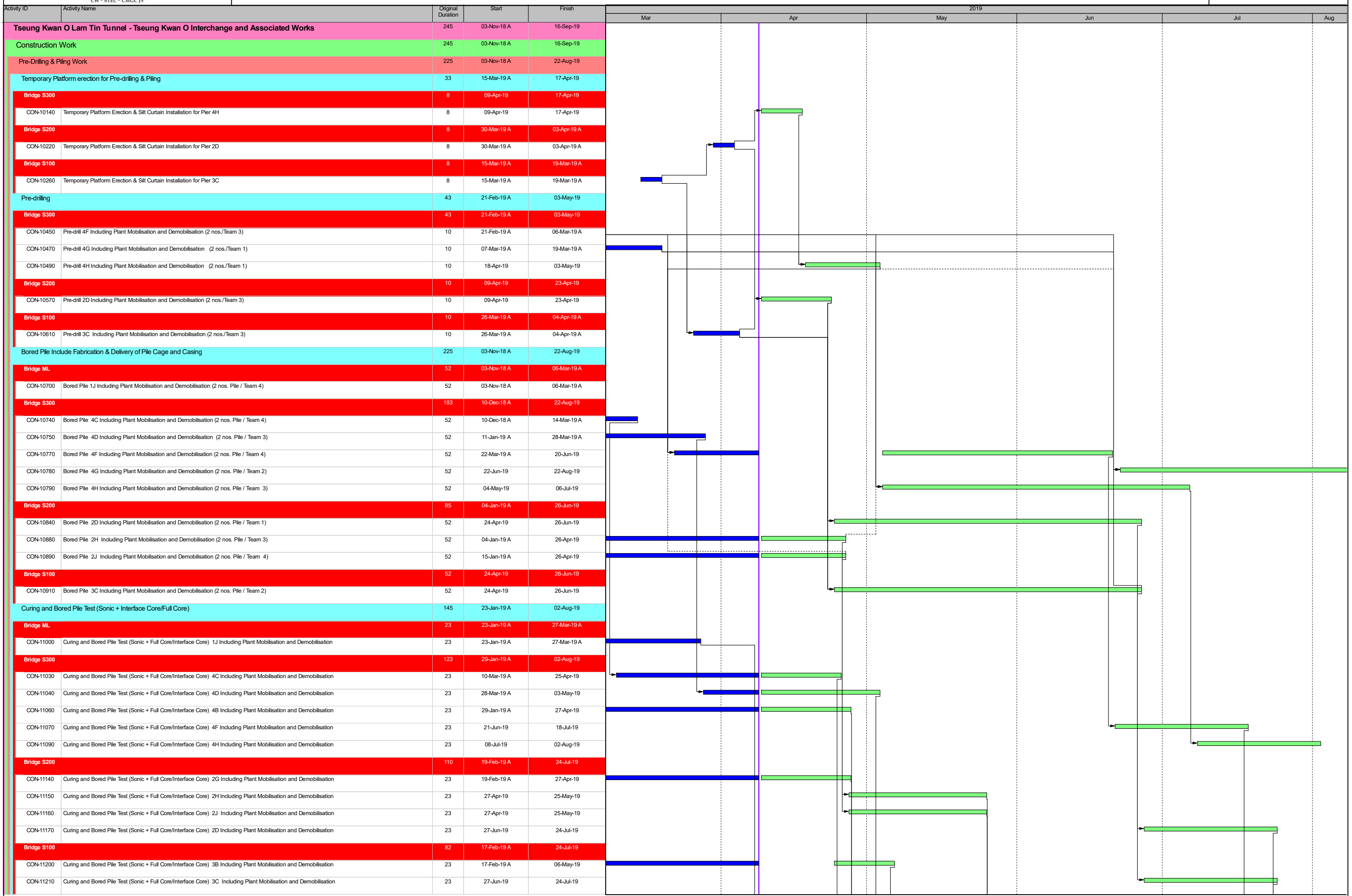
Task		Project Summary		Inactive Summary		Manual Summary		External Milestone	
Split		External Tasks		Manual Task		Start-only		Progress	
Milestone		External Milestone		Duration-only		Finish-only		Deadline	
Summary		Inactive Milestone		Manual Summary Rollup		External Tasks			

Subject: 3 Months Look Ahead Programme

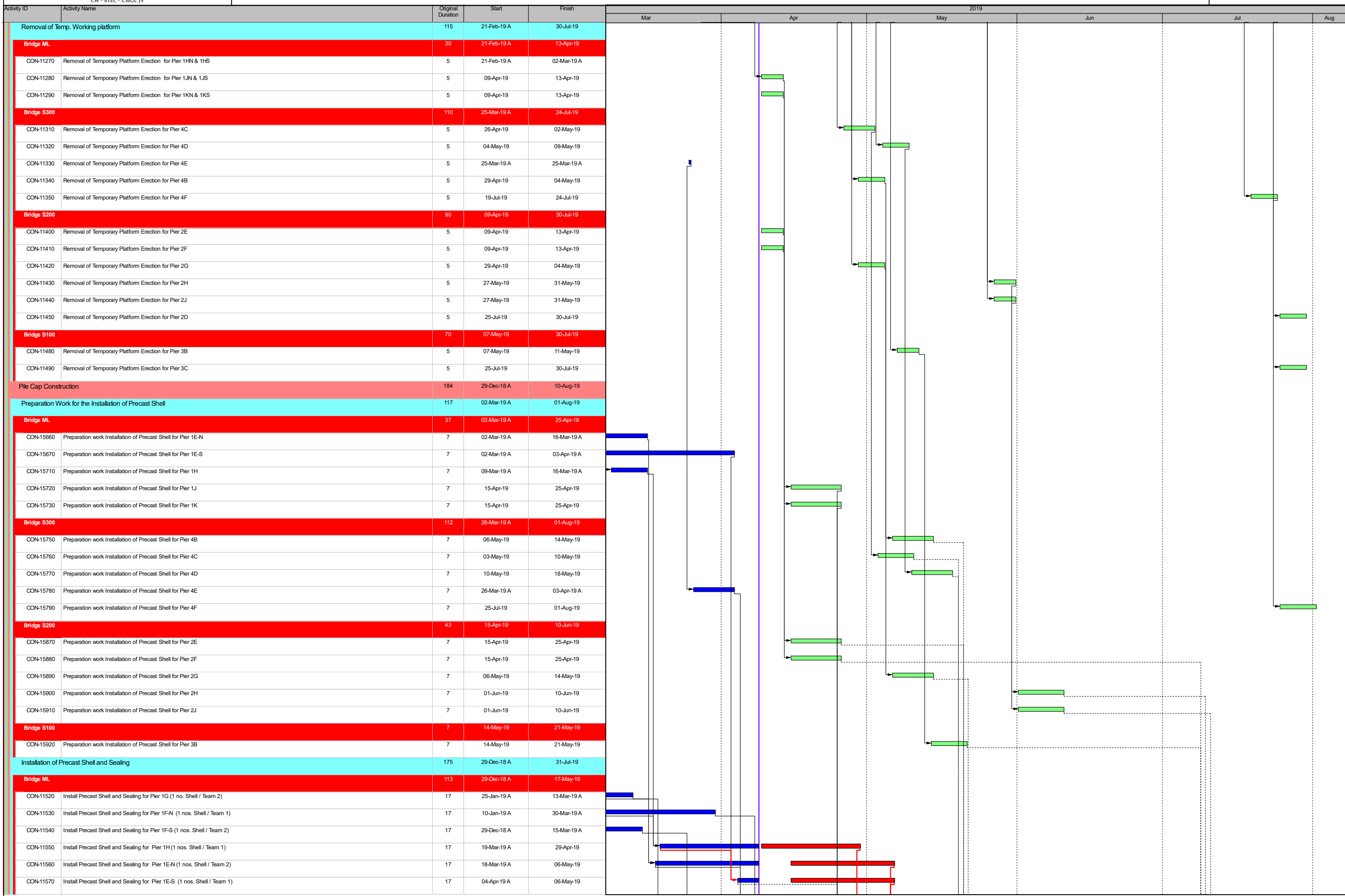
Activities	Apr, 2019	May, 2019	Jun, 2019
Installation of Kalzip Panels on +12.15mPD Platform & Staircase 1			
Erection of scaffolding for Pour 2 of Staircase 2			
Modification work of temporary platform on Main Deck			

Subject: Construction Programme (Apr, 2019)

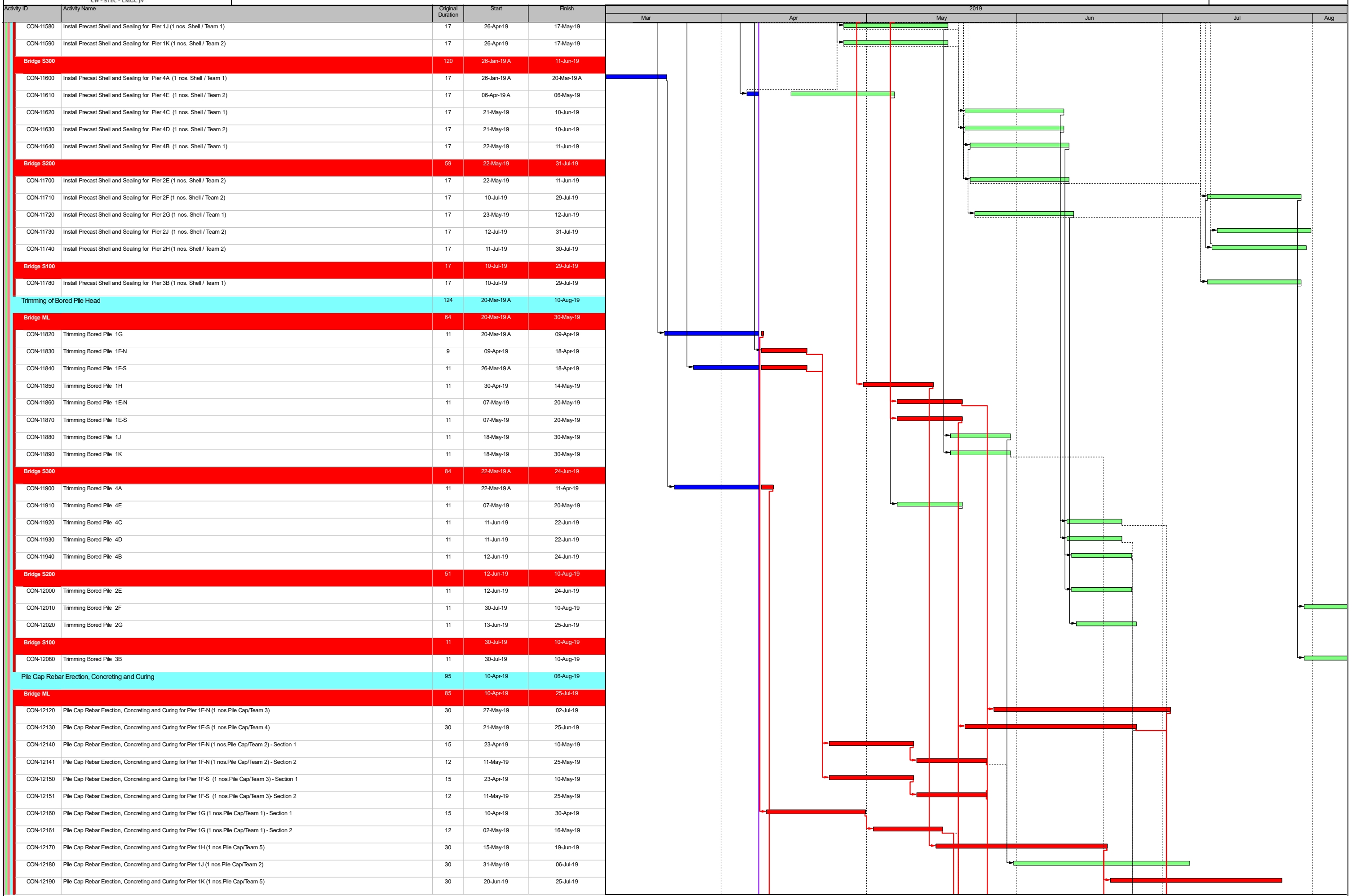
Activities	Week 1	Week 2	Week 3	Week 4
Erection of steel frames of canopy on +12.15mPD Platform & Staircase 1				
Installation of Lift Car				

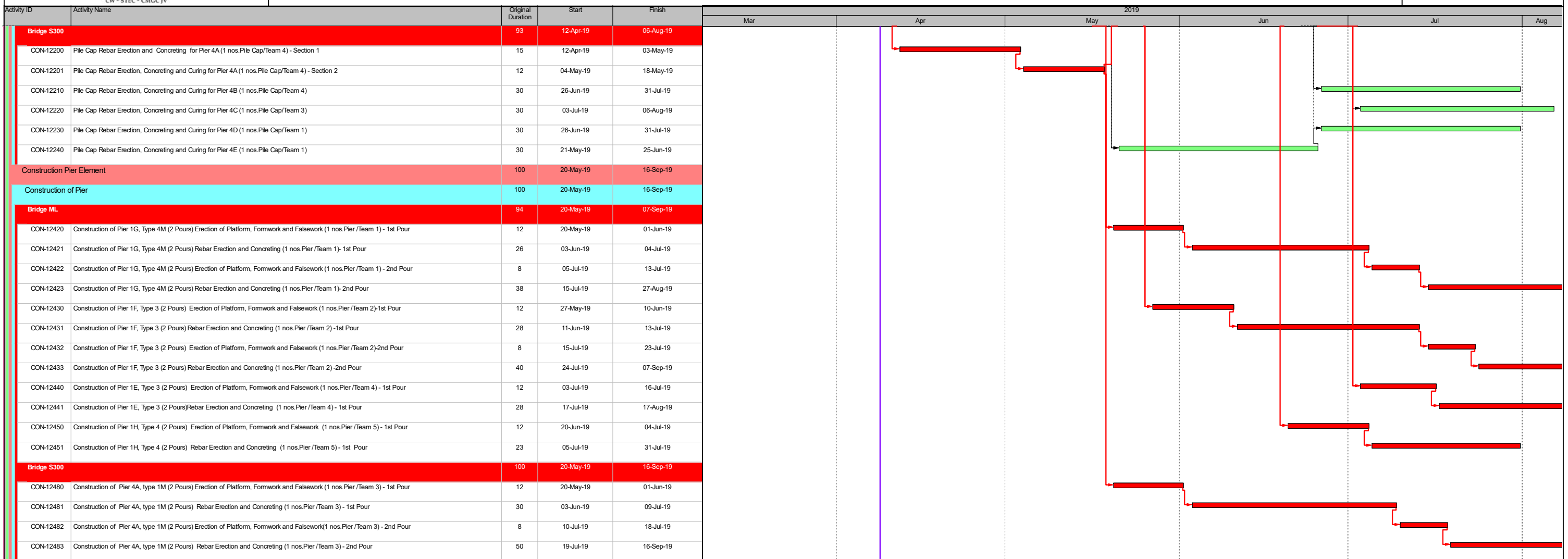


◆ Milestone ■ Works ■ Critical Works ■ Actual ■ Actual Progress of Regular Submission ◆ BL Milestone



◆ Milestone ■ Works ■ Critical Works ■ Actual ■ Actual Progress of Regular Submission ◆ BL Milestone





**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-Apr-19	8:15	Sunny	19	0	0	20.9
	2-Apr-19	13:10	Sunny	20	0	0	20.9
	2-Apr-19	14:40	Sunny	21	0	0	20.9
	2-Apr-19	14:50	Sunny	21	0	0	20.9
	2-Apr-19	15:00	Sunny	21	0	0	20.9
	3-Apr-19	8:10	Sunny	19	0	0	20.9
	3-Apr-19	13:10	Sunny	20	0	0	20.9
	3-Apr-19	14:30	Sunny	21	0	0	20.9
	3-Apr-19	14:40	Sunny	21	0	0	20.9
	3-Apr-19	14:50	Sunny	21	0	0	20.9
	6-Apr-19	8:10	Sunny	20	0	0	20.9
	6-Apr-19	13:10	Sunny	21	0	0	20.9
	6-Apr-19	14:30	Sunny	22	0	0	20.9
	6-Apr-19	14:40	Sunny	22	0	0	20.9
	6-Apr-19	14:50	Sunny	22	0	0	20.9
	8-Apr-19	8:10	Sunny	20	0	0	20.9
	8-Apr-19	13:10	Sunny	21	0	0	20.9
	8-Apr-19	14:30	Sunny	22	0	0	20.9
	8-Apr-19	14:40	Sunny	22	0	0	20.9
	8-Apr-19	14:50	Sunny	22	0	0	20.9
	9-Apr-19	8:10	Sunny	19	0	0	20.9
	9-Apr-19	13:30	Sunny	20	0	0	20.9
	9-Apr-19	14:50	Sunny	21	0	0	20.9
	9-Apr-19	15:00	Sunny	21	0	0	20.9
	9-Apr-19	15:10	Sunny	21	0	0	20.9
	10-Apr-19	8:15	Sunny	21	0	0	20.9
	10-Apr-19	13:10	Sunny	22	0	0	20.9
	10-Apr-19	14:30	Sunny	23	0	0	20.9
	10-Apr-19	14:50	Sunny	23	0	0	20.9
	10-Apr-19	15:00	Sunny	23	0	0	20.9
	11-Apr-19	8:15	Cloudy	18	0	0	20.9
	11-Apr-19	13:10	Cloudy	19	0	0	20.9
	11-Apr-19	14:30	Cloudy	20	0	0	20.9
	11-Apr-19	14:45	Cloudy	20	0	0	20.9
	11-Apr-19	15:15	Cloudy	20	0	0	20.9
	12-Apr-19	8:15	Rainy	21	0	0	20.9
	12-Apr-19	13:15	Cloudy	22	0	0	20.9
	12-Apr-19	14:30	Cloudy	23	0	0	20.9
	12-Apr-19	14:45	Cloudy	23	0	0	20.9

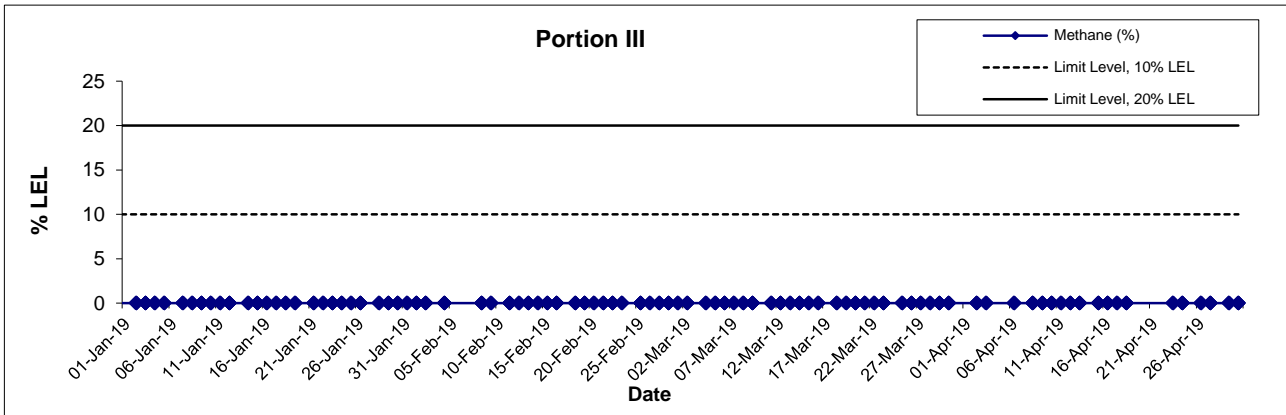
APPENDIX R - RECORD OF LANDFILL GAS MONITORING BY THE CONTRACTOR

Location	Date of Measurement	Sampling time	Weather Condition	Temperature (°C)	Methane (%)	Carbon dioxide (%)	Oxygen (%)
	12-Apr-19	15:05	Cloudy	23	0	0	20.9
	13-Apr-19	8:30	Rainy	20	0	0	20.9
	13-Apr-19	13:25	Rainy	21	0	0	20.9
	13-Apr-19	14:30	Cloudy	22	0	0	20.9
	13-Apr-19	14:50	Cloudy	22	0	0	20.9
	13-Apr-19	15:10	Cloudy	22	0	0	20.9
	15-Apr-19	8:15	Rainy	20	0	0	20.9
	15-Apr-19	13:20	Rainy	21	0	0	20.9
	15-Apr-19	14:40	Rainy	22	0	0	20.9
	15-Apr-19	14:55	Rainy	22	0	0	20.9
	15-Apr-19	15:05	Rainy	22	0	0	20.9
	16-Apr-19	8:15	Cloudy	20	0	0	20.9
	16-Apr-19	13:30	Cloudy	21	0	0	20.9
	16-Apr-19	14:20	Cloudy	22	0	0	20.9
	16-Apr-19	14:35	Cloudy	22	0	0	20.9
	16-Apr-19	14:50	Cloudy	22	0	0	20.9
	17-Apr-19	8:15	Cloudy	22	0	0	20.9
	17-Apr-19	13:20	Cloudy	23	0	0	20.9
	17-Apr-19	14:30	Cloudy	24	0	0	20.9
	17-Apr-19	14:50	Cloudy	24	0	0	20.9
	17-Apr-19	15:05	Cloudy	24	0	0	20.9
	18-Apr-19	8:10	Cloudy	21	0	0	20.9
	18-Apr-19	13:10	Cloudy	22	0	0	20.9
	18-Apr-19	15:00	Cloudy	23	0	0	20.9
	18-Apr-19	14:10	Cloudy	23	0	0	20.9
	18-Apr-19	15:20	Cloudy	23	0	0	20.9
	23-Apr-19	8:19	Sunny	23	0	0	20.9
	23-Apr-19	13:30	Sunny	24	0	0	20.9
	23-Apr-19	14:25	Sunny	25	0	0	20.9
	23-Apr-19	14:35	Sunny	25	0	0	20.9
	23-Apr-19	14:50	Sunny	25	0	0	20.9
	24-Apr-19	8:15	Cloudy	23	0	0	20.9
	24-Apr-19	13:10	Sunny	24	0	0	20.9
	24-Apr-19	14:30	Sunny	24	0	0	20.9
	24-Apr-19	14:40	Sunny	24	0	0	20.9
	24-Apr-19	15:00	Sunny	24	0	0	20.9
	26-Apr-19	8:10	Sunny	24	0	0	20.9
	26-Apr-19	13:15	Sunny	25	0	0	20.9
	26-Apr-19	14:35	Sunny	26	0	0	20.9

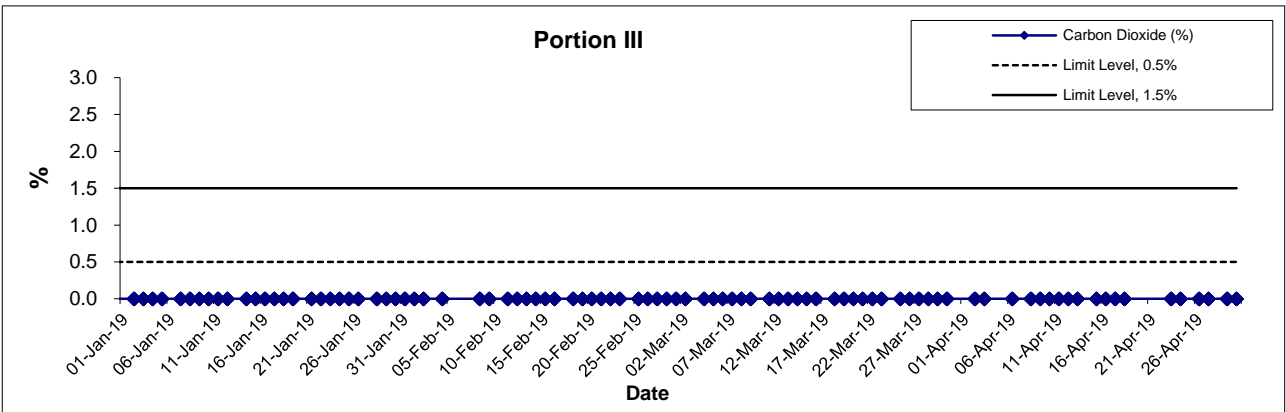
APPENDIX R - RECORD OF LANDFILL GAS MONITORING BY THE CONTRACTOR

Location	Date of Measurement	Sampling time	Weather Condition	Temperature (°C)	Methane (%)	Carbon dioxide (%)	Oxygen (%)
	26-Apr-19	14:40	Sunny	26	0	0	20.9
	26-Apr-19	14:50	Sunny	26	0	0	20.9
	27-Apr-19	8:10	Sunny	22	0	0	20.9
	27-Apr-19	13:30	Cloudy	23	0	0	20.9
	27-Apr-19	14:35	Rainy	24	0	0	20.9
	27-Apr-19	14:45	Rainy	24	0	0	20.9
	27-Apr-19	14:55	Rainy	24	0	0	20.9
	29-Apr-19	8:10	Cloudy	25	0	0	20.9
	29-Apr-19	13:10	Sunny	26	0	0	20.9
	29-Apr-19	14:30	Sunny	27	0	0	20.9
	29-Apr-19	14:40	Sunny	27	0	0	20.9
	29-Apr-19	15:00	Sunny	27	0	0	20.9
	30-Apr-19	8:10	Rainy	25	0	0	20.9
	30-Apr-19	13:15	Cloudy	26	0	0	20.9
	30-Apr-19	14:30	Cloudy	27	0	0	20.9
	30-Apr-19	14:50	Cloudy	27	0	0	20.9
	30-Apr-19	15:00	Cloudy	27	0	0	20.9

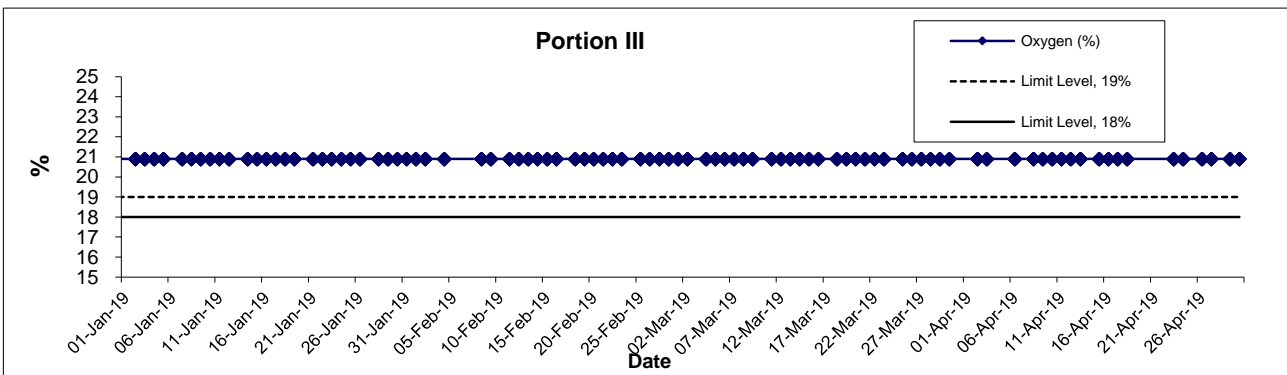
Methane



Carbon Dioxide



Oxygen



Title	Agreement No. CE 59/2015 (EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel – Design and Construction	Scale	Project	CINOTECH
		N.T.S	No. MA16034	
Date	Apr-19	Appendix	R	

**APPENDIX S
CONSTRUCTION NOISE MITIGATION
PLAN FOR CONTRACT NE/2017/01**

09Contract No:
NE/2017/01

Project Title:
Tseung Kwan O – Lam Tin Tunnel
Tseung Kwan O Interchange and Associated Works



俊和-上隧-中冶聯營
CW - STEC - CMGC JV

Noise Mitigation Plan

Document No: CWSTCMJV/940/CSF/0896-2019
Revision: 02
Date: 06 Apr 2019

Revision History

Revision No.	Amendment	Prepared/ Revised By	Date
00 First Submission	N/A	Clarence Yeung	15 Mar 2018
01 Second Submission	N/A	Clarence Yeung	01 Aug 2018
02 Third Submission	All the amendments are highlighted in yellow colour. 1. Table 2.4 is updated.	Clarence Yeung	06 Apr 2019

Noise Mitigation Plan

Document No: CWSTCMJV/940/CSF/0896-2019
Revision: 02
Date: 06 Apr 2018

Prepared and checked by:

Position	Signature	Name	Date
Site Agent		David Tung	
Deputy Site Agent		Yau Ming Hong	

Prepared by:

Environmental Officer		Clarence Yeung	
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CONTENTS

1.	<u>BACKGROUND</u>	3
1.1	PROJECT DESCRIPTION	3
1.2	REQUIREMENT FOR NOISE MITIGATION PLAN (NMP)	3
2.	<u>DESCRIPTION OF CONSTRUCTION WORKS IN THE STUDY AREA</u>	4
2.1	NOISE SENSITIVE RECEIVERS (NSRS).....	4
2.2	CONSTRUCTION ACTIVITIES	4
2.3	UPDATED PRELIMINARY CONSTRUCTION PROGRAMME.....	4
2.4	UPDATED POWERED MECHANICAL EQUIPMENT LIST	4
3.	<u>RECOMMENDED NOISE MITIGATION MEASURES</u>	6
3.1	CONCURRENT CONSTRUCTION WORKS.....	7
4.	<u>CONCLUSION</u>	8

LIST OF APPENDIXES

Appendix A	Site Layout
Appendix B	Construction Programme

1. BACKGROUND

1.1 PROJECT DESCRIPTION

To cope with the anticipated transport need, “Further Development of Tseung Kwan O – Feasibility Study” (the “TKO Study”) recommended the provision of Tseung Kwan O – Lam Tin Tunnel (TKO-LT Tunnel) and Cross Bay Link (CBL) to meet the long-term traffic demand between TKO and the external areas.

The Tseung Kwan O – Lam Tin Tunnel is a dual-two lane highway connecting Tseung Kwan O and East Kowloon. Together with the future Trunk Road T2 in Kai Tak Development and Central Kowloon Route, it will form the new strategic route network of Hong Kong providing an East-West Express Link between Kowloon and Tseung Kwan O.

CW – STEC – CMGC JV (JV) was commissioned by Civil Engineering and Development Department (CEDD) as the appointed contractor for one of the contracts.

The Works to be executed under this Contract included, but not exclusively, the following items:

- i. Construction of marine viaducts forming the Tseung Kwan O Interchange at Junk Bay;
- ii. Construction of 7 bridges and 28 bridge piers with 30 pile caps and approx. 59 piles (including 3 interfacing piers to CBL);

A Site Layout showing the site boundary is shown in *Appendix A*.

1.2 REQUIREMENT FOR NOISE MITIGATION PLAN (NMP)

In accordance with the condition 2.5 of the EP-458/2013/C, the Permit Holder shall, no later than one month before the commencement of construction of the project, submit to the Director of Environmental Protection for approval three hard copies and two electronic copies of Noise Mitigation Plan detailing the temporary and permanent mitigation measures for the construction and operation phase traffic noise impacts arising from the Project. All noise mitigation measures implemented shall be properly maintained during construction of the project.

2. DESCRIPTION OF CONSTRUCTION WORKS IN THE STUDY AREA

2.1 NOISE SENSITIVE RECEIVERS (NSRS)

None of the NSR is identified within the 300m study areas with predicted residual construction noise impacts as shown in the *Appendix A*.

2.2 CONSTRUCTION ACTIVITIES

As mentioned in Section 1.1, the construction of TKO interchange and associated works is covered by this contract. The construction noise impacts of the Project may arise from the following major construction activities:

- Construction of Marine Piling works
- Construction of Marine Viaducts works
- Construction of Road paving works

These construction activities will involve the use of PME including Cranes, Concrete lorry mixer, Derrick barge, Generator, Piling - Oscillator, Piling – Reverse Circulation Drill, Backhoe etc.

2.3 UPDATED PRELIMINARY CONSTRUCTION PROGRAMME

The updated preliminary construction programme prepared by CW – STEC – CMGC JV has been used in this NMP and has been presented on monthly basis for the duration of the construction works in corresponding worksites.

The construction schedule has been adjusted to minimize concurrent construction works to be carried out in the vicinity as far as practicable. The updated preliminary construction programme is provided in *Appendix B*.

2.4 UPDATED POWERED MECHANICAL EQUIPMENT LIST

The Sound Power Level (SWL) for the PMEs have been adopted from EPD's Technical Memorandum on Noise from Construction Work Other than Percussive Piling (GW-TM), list of SWLs of other commonly used PME or British Standard BS 5228-1:2009. It should be noted that the PMEs to be adopted for individual construction activities are provided in the table below.

Table 2.4 PMEs to be adopted for individual construction activities

Bridge Structure for TKO Interchange				
	PME	TM or other reference	No. of PME	Noise Mitigation Measures
1	Sea Piling Works, Pile Cap & Piers			
	Air Compressor, air flow > 10m ³ /min and < 30m ³ /min	CNP 002	6	-
	Concrete lorry mixer	CNP 044	12	-
	Crane, mobile/barge mounted (diesel)	CNP 048	4	-
	Derrick barge	CNP 061	6	Barrier
	Poker, vibratory, hand-held	CNP 170	4	-
	Generator, with Quality Powered Mechanical Equipment Label showing a Sound Power Level ≤ 93dB(A)	-	8	-
	Water pump (electric)	CNP 281	16	-
	Excavator/loader, wheeled/tracked	CNP 081	4	-
	Excavator/loader with a coring tool, wheeled/tracked	-	3	-
	Saw, circular, wood	CNP 201	2	-
	Bar bender and cutter (electric)	CNP 021	3	-
	Piling, large diameter bored, grab and chisel	CNP 164	2	-
	Piling, large diameter bored, reverse circulation drill	CNP 166	4	-
	Breaker, excavator mounted (pneumatic)	CNP 027	2	-
	Tug boat	CNP 221	2	-
	Drill rig, rotary type (diesel)	CNP 072	3	-
	Roro barge	-	2	-
	Power pack for hand-held items of PME	-	6	-
2	Bridge Deck Construction			
	Generator, with Quality Powered Mechanical Equipment Label showing a Sound Power Level ≤ 93dB(A)	-	4	-
	Breaker, hand-held, mass < 10kg	CNP 023	4	-
	Derrick barge	CNP 061	4	Barrier
	Tug boat	CNP 221	4	-
	Winch (electric)	CNP 262	4	-
	Bar bender and cutter (electric)	CNP 021	4	-

	Concrete lorry mixer	CNP 044	4	-
	Concrete pump, stationary/lorry mounted	CNP 047	4	-
	Poker, vibratory, hand-held	CNP 170	8	-
	Flat top barge	-	4	-
3 Roadworks, Drainage and Utilities				
	Dump truck, gross vehicle weight > 38 tonne	CNP067	2	-
	Asphalt paver	CNP 004	1	-
	Roller, vibratory	CNP 186	1	-
	Generator, with Quality Powered Mechanical Equipment Label showing a Sound Power Level ≤ 93dB(A)	-	1	-
	Paint line marker	CNP 161	1	-

2.5 Operation Phases Traffic Noise Impacts

For traffic noise was predicted using the methodology provided in the UK Department of Transport Calculation of Road Traffic Noise (CRTN) 1988. The assessment was based on projected peak hour flows for the worst year within 15 years after opening of the road. Road traffic noise levels is presented in terms of noise levels exceeded for 10% of the one-hour period during the peak traffic flow, i.e. $L_{10,1hr}$ dB(A). The projected 2036 peak hour traffic flows and vehicle compositions which have been agreed by Transport Department (TD) as stated in the EIA report section 4.5.

As mentioned in the section 2.1, none of the NSR is identified within the 300m study area for this project and therefore it is considered the project has insignificant noise impact to the NSR. As the result, no direct mitigation such as noise barrier would be needed for the operation phase.

3. RECOMMENDED NOISE MITIGATION MEASURES

As the construction works are marine-based and therefore the noise mitigation measures can only be placed on the barge which would be located and stabilize the majority of the PMEs. We suggested adopting the following mitigation measures for the purpose of reducing the noise impact arise from our construction activities.

- Noise barrier will be used for noisy plants such as barge, generator etc.

Movable temporary noise barriers that can be located close to noisy plant and be moved iteratively with the plant (Figure 1). The noise source from the barge mainly is the operation of the barge's winch, noise barrier will be erected surrounding the winch to mitigate the noise. The noise barrier will be made of minimum 50mm thick sound absorbing lining and minimum 10mm thick plywood.



Figure 1 Erection of noise barrier on the barge

- The JV will carefully plan the construction activity and locate all the PMEs as far as practicable to the NSR for the purpose of reducing the noise impacts to the surrounding environment.
- Reduce the percentage of using time of plant and equipment as far as practicable. It would be appropriate to restrict the number of operating PME within the works area at the same time and therefore reduce the level of noise impact.
- Regularly maintain the PMEs and plants for ensuring the PMEs are in good working orders and maximum the use of QPME.

3.1 CONCURRENT CONSTRUCTION WORKS

Until Feb 2018, it is noted that there are three concurrent construction works as stated below:

Table 3.1 Concurrent Construction Works

Contract No.	Project Title
NE/2015/01	Tseung Kwan O – Lam Tin Tunnel – Main Tunnel and Associated Works
NE/2015/02	Tseung Kwan O – Lam Tin Tunnel – Road P2 and Associated Works

NE/2015/03	Tseung Kwan O – Lam Tin Tunnel – Northern Footbridge
------------	--

4. CONCLUSION

In conclusion, since there is no NSR found within the 300m distance as mention in section 2.1, it would be considered the noise impact generated from the construction activities is insignificant to the NSR.

However, the JV would adopt and implement the mitigation measures to some of the PMEs during construction to minimize the noise impact arise from the construction activities, therefore the works would only have a slight effect to the NSR (Ocean Shores Block 1) during the construction phase.

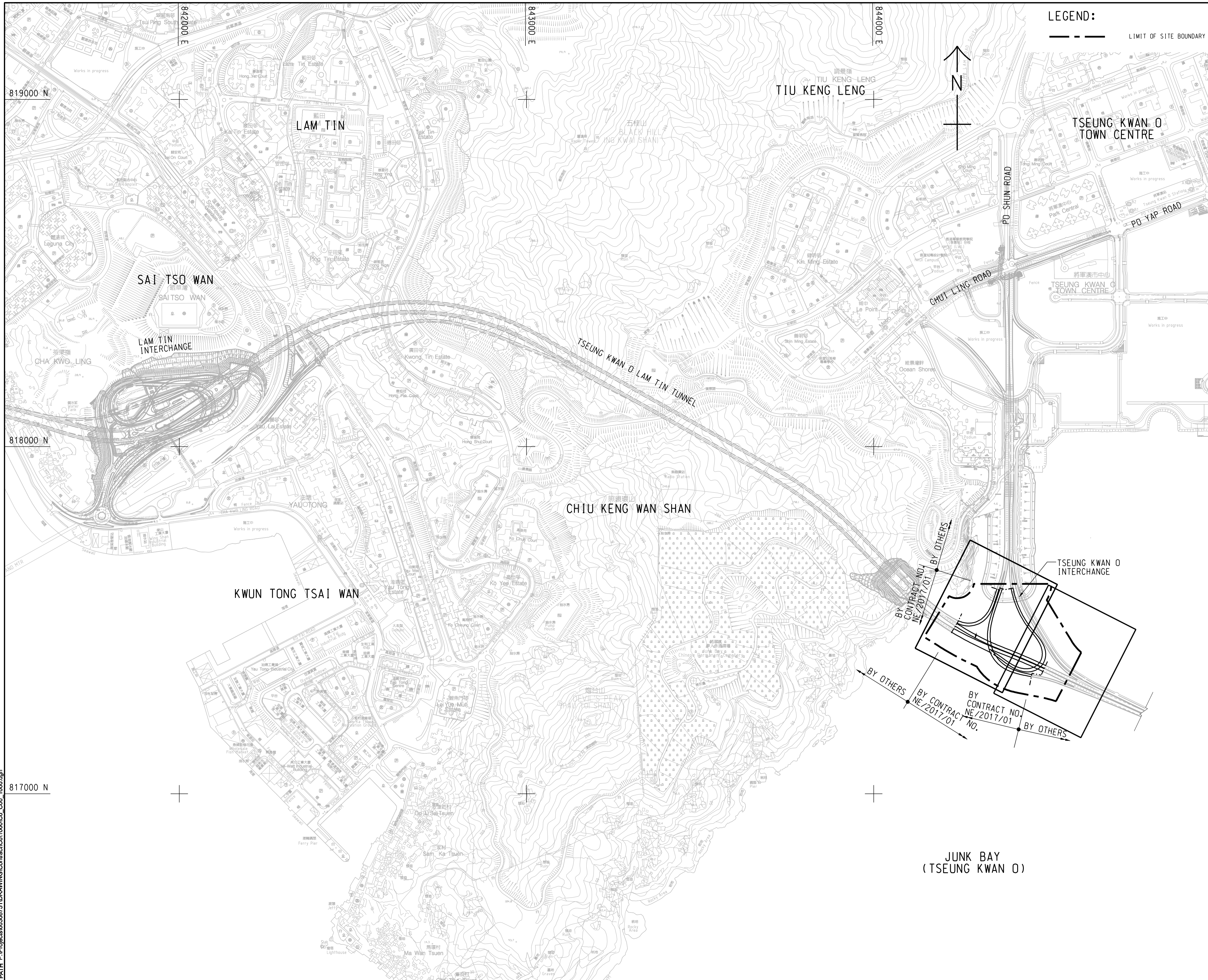
NE/2017/01

Tseung Kwan O – Lam Tin Tunnel: Tseung Kwan O Interchange and Associated Works

Noise Mitigation Plan

Appendix A – Site Layout

ISO A1 594mm x 841mm
 Approved: HKT
 Checked: RPCM
 Designer: WN
 Project Management Initials:
 2017/09
 HEDS
 PATH: P:\Projects\603075\DRAWING\Contract\603075\000\CS_C00_1000.dgn



LEGEND:
 --- LIMIT OF SITE BOUNDARY



PROJECT
 項目
TSEUNG KWAN O - LAM TIN TUNNEL

CONTRACT TITLE
 TSEUNG KWAN O - LAM TIN TUNNEL
 TSEUNG KWAN O INTERCHANGE AND ASSOCIATED WORKS

CLIENT
 業主
 土木工程拓展署
 Civil Engineering and Development Department

CONSULTANT
 工程顧問公司
 AECOM Asia Company Ltd.
 www.aecom.com

SUB-CONSULTANTS
 分判工程顧問公司

ISSUE/REVISION
 修訂

I/R	DATE	DESCRIPTION	CHK.
-	JUN.17	TENDER DRAWING	RPCM

STATUS
 階段

SCALE
 比例
 A1 1 : 5000

DIMENSION UNIT
 尺寸單位
 METRES

KEY PLAN
 索引圖

PROJECT NO.
 項目編號
 60308751

CONTRACT NO.
 合約編號
 NE/2017/01

SHEET TITLE
 圖紙名稱
 KEY PLAN AND LOCATION PLAN

SHEET NUMBER
 圖紙編號
 60308751/C6/C00/1000

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817200 N

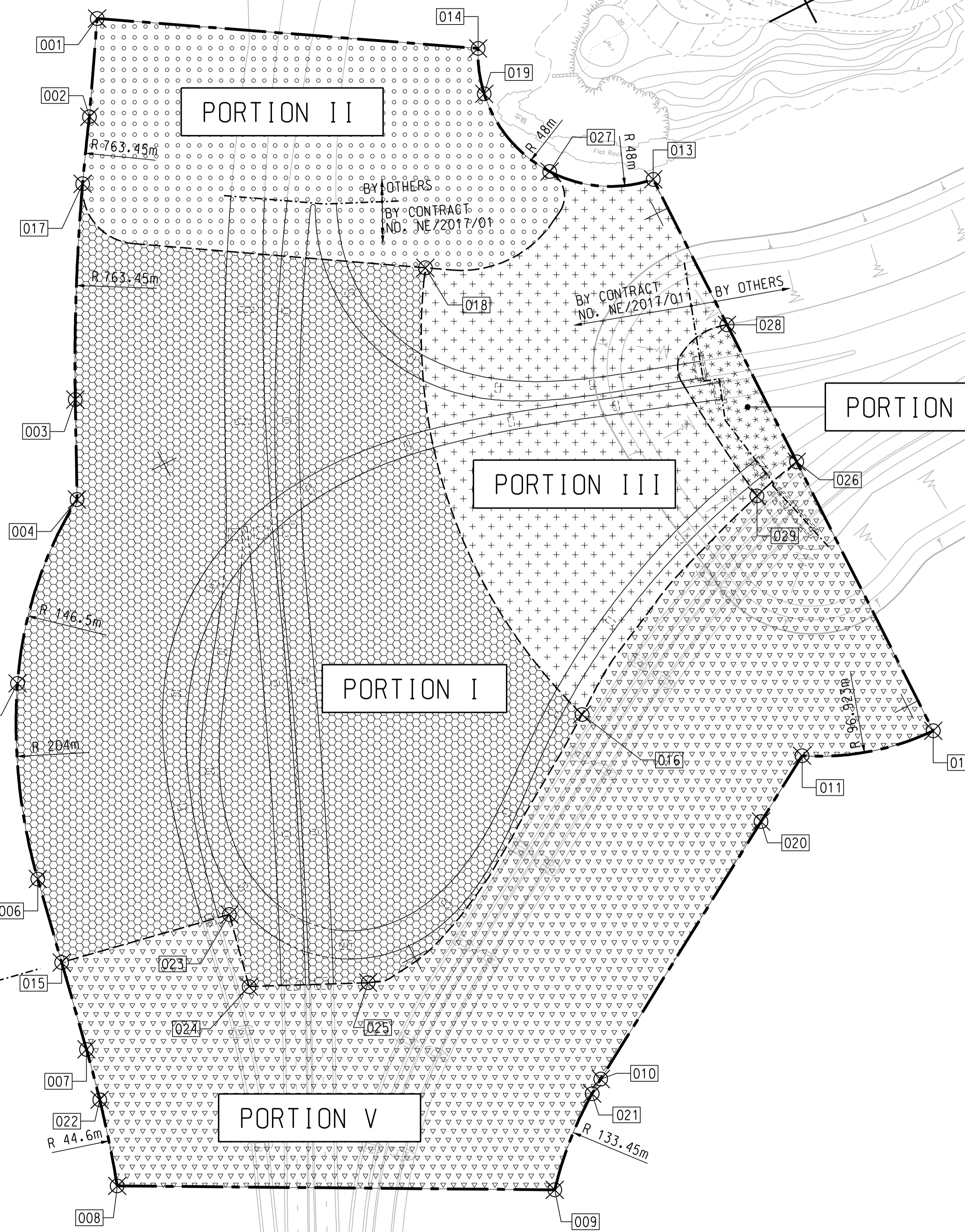
844100 E

NOTE:

1. ALL SETTING OUT POINTS SHOWN ON THIS SET OF DRAWINGS ARE FOR REFERENCE ONLY. THE EXACT LIMIT OF SITE BOUNDARY SHALL BE VERIFIED AND DETERMINED BY THE CONTRACTOR ON SITE.

LEGEND:

- LIMIT OF SITE BOUNDARY
- [Pattern] PORTION I
- [Pattern] PORTION II
- [Pattern] PORTION III
- [Pattern] PORTION IV
- [Pattern] PORTION V



SETTING OUT POINTS

POINTS	EASTING	NORTHING
001	844145.337	817451.381
002	844175.768	817432.789
003	844264.674	817381.875
004	844297.203	817366.044
005	844346.746	817316.716
006	844413.182	817291.188
007	844476.127	817278.972
008	844525.199	817266.527
009	844598.186	817407.066
010	844570.091	817440.045
011	844498.695	817557.994
012	844512.176	817604.423
013	844288.396	817604.423
014	844217.442	817569.406
015	844444.019	817285.204
016	844450.066	817495.320
017	844196.257	817419.620
018	844279.572	817516.430
019	844233.083	817563.928
020	844513.219	817533.974
021	844573.301	817434.873
022	844494.556	817274.992
023	844456.043	817347.195
024	844482.530	817341.744
025	844500.776	817380.791
026	844403.015	817604.423
027	844268.887	817572.299
028	844347.400	817604.380
029	844407.482	817586.009

PROJECT

TSEUNG KWAN O - LAM TIN TUNNEL

CONTRACT TITLE
TSEUNG KWAN O - LAM TIN TUNNEL
TSEUNG KWAN O INTERCHANGE AND ASSOCIATED WORKS

CLIENT

土木工務發展署
Civil Engineering and Development Department

CONSULTANT

AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS

ISSUE/REVISION

I/R	DATE	DESCRIPTION	CHK.
-	JUN.17	TENDER DRAWING	RPCM

STATUS

備註

SCALE

A1 1:1000

DIMENSION UNIT

公尺/英尺

KEY PLAN

索引圖

PROJECT NO.

60308751

CONTRACT NO.

NE/2017/01

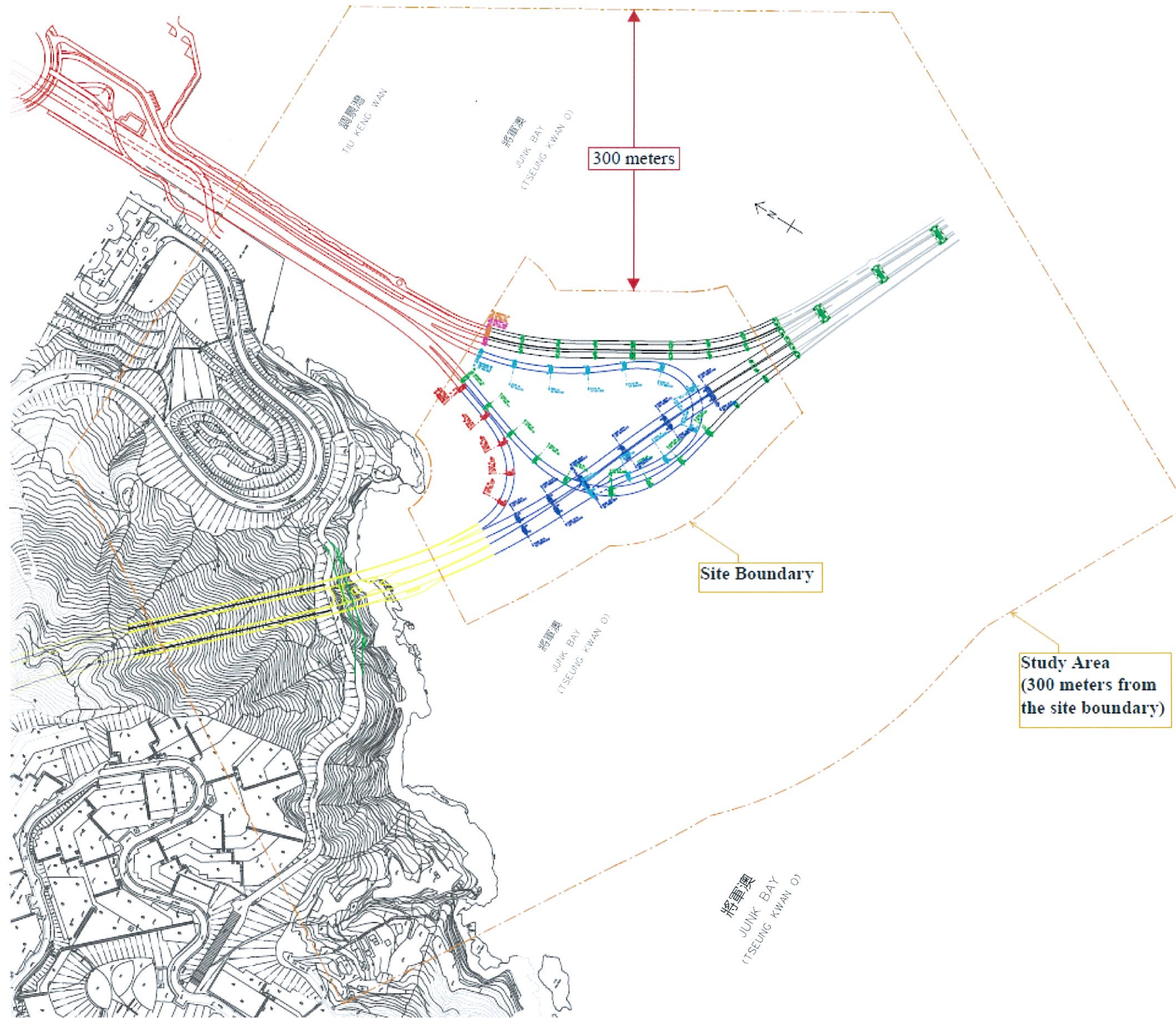
SHEET TITLE

PORTION OF SITE

SHEET NUMBER

60308751/C6/C00/1011

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PROJECT TITLE:
 TSEUNG KWAN O – LAM TIN TUNNEL
 TSEUNG KWAN O – INTERCHANGE AND
 ASSOCIATED WORKS

DRAWING TITLE:
**TKO SITE SETTING OUT
 POINT (300m study area)**

SCALE: 1:2000
 DRAWING NO: JV-940-SK-000 (NMP)
 REV: 0

REV.	DATE	REVISION NOTES	DRAWN BY	CHK BY	REV.	DATE	REVISION NOTES	DRAWN BY	CHK BY

CLIENT:
 土木工程拓展署
 Civil Engineering and
 Development Department

CONSULTING ENGINEER:


MAIN CONTRACTOR:

 俊和-上隧-中冶聯營
 CW - STEC - CMGC JV

NE/2017/01

Tseung Kwan O – Lam Tin Tunnel: Tseung Kwan O Interchange and Associated Works

Noise Mitigation Plan

Appendix B – Construction Programme

Activity ID	Activity Name	Original Duration	Start	Finish	2018												2019												2020												2021			
					Q1			Q2			Q3			Q4			Q1			Q2			Q3			Q4			Q1	Q2														
					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
NE/2017/01 - TKO-LTT C6 _180220		1168	10-Jan-18 A	22-Mar-21	[Summary Bar]																																							
Contract Date		1168	10-Jan-18 A	22-Mar-21	[Works Bar]																																							
Contract Date		12	10-Jan-18 A	22-Jan-18 A	[Milestone]																																							
CD000001	Contract Date	0	10-Jan-18 A		[Milestone]																																							
CD000003	Start Date	0	22-Jan-18 A		[Milestone]																																							
Key Dates		0	22-Mar-21	22-Mar-21	[Milestone]																																							
KD1000110	Completion date for the whole of the works	0		22-Mar-21*	[Milestone]																																							
Planned Completion Dates		173	30-Jul-20	19-Jan-21	[Works Bar]																																							
Preliminaries		1105	11-Jan-18 A	19-Jan-21	[Works Bar]																																							
Method Statement and Shop Drawing		442	26-Feb-18	13-May-19	[Works Bar]																																							
Contractor's Alternative Design (AD)		403	23-Jan-18 A	01-Mar-19	[Works Bar]																																							
Procurements & Subletting		752	26-Feb-18	18-Mar-20	[Works Bar]																																							
Regular Submission / Issue		1073	12-Feb-18	19-Jan-21	[Works Bar]																																							
Construction Works		796	16-Apr-18	16-Dec-20	[Works Bar]																																							
Temporary Platform and Ground Investigation		433	16-Apr-18	27-Sep-19	[Works Bar]																																							
Erect Temporary Platform		130	16-Apr-18	18-Sep-18	[Works Bar]																																							
Ground Investigation Works		423	27-Apr-18	27-Sep-19	[Works Bar]																																							
Bore Pile Construction (59nos) (Including plant mobilization)		442	03-Jul-18	23-Dec-19	[Works Bar]																																							
Bore Pile Construction at Bridge ML		198	03-Jul-18	28-Feb-19	[Works Bar]																																							
Bore Pile Construction at Bridge S200		260	05-Dec-18	23-Oct-19	[Works Bar]																																							
Bore Pile Construction at Bridge S300		439	06-Jul-18	23-Dec-19	[Works Bar]																																							
Bore Pile Construction at Bridge S100		140	13-Apr-19	03-Oct-19	[Works Bar]																																							
Pile Cap Construction		534	23-Jul-18	12-May-20	[Works Bar]																																							
Pre-cast Shell Casting		390	23-Jul-18	13-Nov-19	[Works Bar]																																							
Pre-cast Shell Installation (After Bore Pile Testing)		443	09-Nov-18	12-May-20	[Works Bar]																																							
In-fill Pour to Pile Cap		418	24-Nov-18	25-Apr-20	[Works Bar]																																							
Pier Construction		358	04-Mar-19	20-May-20	[Works Bar]																																							
Pier Construction at Bridge S100		127	09-Nov-19	16-Apr-20	[Works Bar]																																							
Pier Construction at Bridge S200		238	13-Jul-19	02-May-20	[Works Bar]																																							
Pier Construction at Bridge S300		358	04-Mar-19	20-May-20	[Works Bar]																																							
Pier Construction at Bridge ML		227	06-Mar-19	07-Dec-19	[Works Bar]																																							
Pier Head Segment Construction		344	26-Jun-19	20-Aug-20	[Works Bar]																																							
Precast Pier Head Segment Installation		330	26-Jun-19	04-Aug-20	[Works Bar]																																							
Cast-in-situ Diaphragm		343	27-Jun-19	20-Aug-20	[Works Bar]																																							
Segment Erection		342	28-Aug-19	21-Oct-20	[Works Bar]																																							
Bridge Furniture Installation		168	29-May-20	16-Dec-20	[Works Bar]																																							
Remaining works		142	31-Jul-20	19-Jan-21	[Works Bar]																																							



- ◆ Milestone
- Works
- Summary

**NE/2017/01 Tseung Kwan O - Lam Tin Tunnel
Tseung Kwan O Interchange and Associated Works**

Construction Programme

**APPENDIX T
CULTURAL HERITAGE MONITORING
RESULTS**

Appendix T – Cultural Heritage Monitoring Results

Date	Tilting				Settlement (mm)			Vibration (mm/s)		
	THT-TM-01	THT-TM-02	THT-TM-03	THT-TM-04	THT-BSP-1	THT-BSP-2	THT-BSP-3	Measurement Direction		
								Tran	Vertical	Longitudinal
1-Apr-19	-1 : 449967	1 : 34614	1 : 22500	1 : 18000	+2	Stop monitoring	Stop monitoring	0.166	0.323	0.134
2-Apr-19	1 : 89993	1 : 23683	1 : 15517	1 : 34615	+1	Stop monitoring	Stop monitoring	0.158	0.197	0.126
3-Apr-19	-1 : 112492	1 : 17999	1 : 19565	1 : 18000	+1	Stop monitoring	Stop monitoring	0.118	0.134	0.087
4-Apr-19	1 : 89993	1 : 17999	1 : 32142	1 : 23684	+2	Stop monitoring	Stop monitoring	0.118	0.229	0.102
6-Apr-19	1 : 32140	1 : 13235	1 : 22500	1 : 45000	+2	Stop monitoring	Stop monitoring	0.142	0.181	0.158
8-Apr-19	1 : 56246	1 : 14516	1 : 19565	1 : 28125	+2	Stop monitoring	Stop monitoring	0.292	0.441	0.331
9-Apr-19	1 : 224983	1 : 20454	1 : 15517	1 : 18000	+1	Stop monitoring	Stop monitoring	0.110	0.110	0.102
10-Apr-19	1 : 40906	1 : 64283	1 : 26470	1 : 23684	+1	Stop monitoring	Stop monitoring	0.197	0.520	0.166
11-Apr-19	1 : 56246	1 : 28124	1 : 19565	1 : 45000	+1	Stop monitoring	Stop monitoring	0.118	0.150	0.087
12-Apr-19	1 : 224983	1 : 17999	1 : 32142	1 : 28125	+1	Stop monitoring	Stop monitoring	0.150	0.189	0.095
13-Apr-19	1 : 89993	1 : 13235	1 : 26470	1 : 18000	+1	Stop monitoring	Stop monitoring	0.110	0.126	0.110
15-Apr-19	-1 : 449967	1 : 16071	1 : 17307	1 : 23684	+2	Stop monitoring	Stop monitoring	0.126	0.166	0.087
16-Apr-19	1 : 40906	1 : 20454	1 : 26470	1 : 34615	+2	Stop monitoring	Stop monitoring	0.166	0.142	0.110
17-Apr-19	1 : 89993	1 : 16071	1 : 40908	1 : 28125	+1	Stop monitoring	Stop monitoring	0.197	0.173	0.126
18-Apr-19	1 : 26469	1 : 13235	1 : 22500	1 : 112499	+2	Stop monitoring	Stop monitoring	0.126	0.134	0.079
23-Apr-19	1 : 224983	1 : 8181	1 : 26470	1 : 34615	+2	Stop monitoring	Stop monitoring	0.134	0.150	0.110

Date	Tilting				Settlement (mm)			Vibration (mm/s)		
	THT-TM-01	THT-TM-02	THT-TM-03	THT-TM-04	THT-BSP-1	THT-BSP-2	THT-BSP-3	Measurement Direction		
								Tran	Vertical	Longitudinal
24-Apr-19	1 : 19564	1 : 7377	1 : 89999	1 : 28125	+0	Stop monitoring	Stop monitoring	0.118	0.197	0.110
25-Apr-19	1 : 10227	1 : 10465	1 : 14062	1 : 64285	+2	Stop monitoring	Stop monitoring	0.126	0.173	0.079
26-Apr-19	1 : 11841	1 : 17999	1 : 9000	1 : 20454	+1	Stop monitoring	Stop monitoring	0.126	0.142	0.102
27-Apr-19	Tin Hau Festival					Stop monitoring	Stop monitoring	Tin Hau Festival		
29-Apr-19	1 : 10975	1 : 13235	1 : 10975	1 : 16071	+1	Stop monitoring	Stop monitoring	0.118	0.110	0.087
30-Apr-19	1 : 9574	1 : 16071	1 : 9574	1 : 449996	+1	Stop monitoring	Stop monitoring	0.134	0.110	0.102
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**

Appendix U – Construction Phase Daily Piezometer Monitoring Results

Date	Daily Piezometer Monitoring	
	38568-LDH1 (P)	
1-Apr-19	n.a.	
2-Apr-19	n.a.	
3-Apr-19	n.a.	
4-Apr-19	n.a.	
6-Apr-19	n.a.	
8-Apr-19	n.a.	
9-Apr-19	n.a.	
10-Apr-19	87.65	
11-Apr-19	n.a.	
12-Apr-19	n.a.	
13-Apr-19	n.a.	
15-Apr-19	n.a.	
16-Apr-19	n.a.	
17-Apr-19	87.65	
18-Apr-19	n.a.	
23-Apr-19	n.a.	
24-Apr-19	87.65	
25-Apr-19	n.a.	
26-Apr-19	n.a.	
27-Apr-19	n.a.	
29-Apr-19	87.65	
30-Apr-19	n.a.	
Action Level (mPD)	+74.65	TKO-LBH907 +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.

**APPENDIX V
SILT CURTAIN DEPLOYMENT PLAN
FOR CONTRACT NE/2017/01**

FaContract No:
NE/2017/01

Project Title:
Tseung Kwan O – Lam Tin Tunnel
Tseung Kwan O Interchange and Associated Works



俊和-上隧-中冶聯營
CW - STEC - CMGC JV

Silt Curtain Deployment Plan

Document No: CWSTCMJV/940/CSF/0878-2018
Revision: 05
Date: 04 May 2019

Revision History

Revision No.	Reason for Amendment	Amendment	Revised By	Date
00 First Submission	N/A	N/A	Clarence Yeung	16/03/2018
01 Second Submission	N/A	N/A	Clarence Yeung	18/04/2018
02 Third Submission	N/A	N/A	Clarence Yeung	03/08/2018
03 Forth Submission	N/A	N/A	Clarence Yeung	05/10/2018
04 Fifth Submission	The existing silt curtain were damaged by the typhoon Mangkhut and amendments were made to ensure the silt curtain can be removed before the adverse weather at further stage.	<ol style="list-style-type: none"> 1. Section 3, para. 1 - the deployment method of the silt curtain is revised. 2. Section 5, para. 2 - silt curtain will be removed temporarily during adverse weather. 3. Appendix B - drawing no. JV-940-SK-007 is revised and drawing no. JV-940-SK-008 is removed. 4. Appendix D - inspection item 2 (supporting frame in good condition) is removed. 	Clarence Yeung	26/10/2018

Revision No.	Reason for Amendment	Amendment	Revised By	Date
05 Sixth Submission	Silt curtain arrangement for wastewater discharge during pile cap construction is added.	<p>All the amendments are highlighted in yellow colour.</p> <ol style="list-style-type: none"> 1. Section 3 - deployment methods of silt curtain for wastewater discharge are added. 2. Appendix B - drawing no. JV-940-SK-009, JV-940-SK-010 and JV-940-SK-011 are added. 3. Appendix C - specification of BONTEC SG110/110 is added. 	Clarence Yeung	04/05/2019

Silt Curtain Deployment Plan

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Checked by :

Position	Signature	Name	Date
Site Agent		David Tung	
Deputy Site Agent		Yau Ming Hong	
Construction Works Manager		Patrick Chan	

Prepared by:

Environmental Officer		Clarence Yeung	
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Table of Content

1.0	General	1
2.0	Scope of Works and Construction Programme	1
3.0	Silt Curtain Design	2
4.0	Silt Curtain Installation	3
5.0	Silt Curtain Maintenance	4
6.0	Silt Curtain Removal/ Repositioning	5

Appendices

Appendix A–	Tentative Programme for Major Marine Works
Appendix B –	Typical Details of Proposed Silt Curtain
Appendix C–	Specification of Geotextile for Silt Curtain
Appendix D–	Silt Curtain Inspection Checklist
Appendix E–	Site Layout

1. General

1.1 Objective

Prior to the commencement of marine works as well as the whole construction period with marine works in the sea under Contract No. NE/2017/01, CW-STEC-CMGC Joint Venture (JV) will be responsible for the installation, operation and maintenance of the silt curtain. The silt curtain act as a measure to maintain the water quality in the vicinity of the marine works. JV will also be responsible to remove the aforementioned silt curtain after the completion of the works.

This deployment plan describes in detail the design, method of installation, operation and maintenance of the proposed silt curtain.

The silt curtain deployment plan shall also comply with the following reference Specifications and Drawings:

- General Specification Sections 21 and 25
- Particular Specification Sections 21 and 25
- Environmental Permit (EP No. EP-458/2013/C) Condition 2.8
- Working Drawings Nos. 60308751/C6/C00/1000 to 1002, 1011

1.2 Construction Plants

Plant and equipment to be used for the proposed silt curtain deployment include, but not limited to, the followings:

- | | |
|-------------------|-------|
| - Split Hopper | 1 no. |
| - Derrick Lighter | 1 no. |
| - Grab Dredger | 1 no. |

Adequate resources shall be deployed to suit the construction programme.

2. Scope of Works and Construction Programme

The works to be executed under this contract involves construction of Tseung Kwan O Interchange and Associated Works.

- Construction of marine viaducts forming the Tseung Kwan O Interchange at Junk Bay;
- Construction of 7 bridges and 28 bridge piers with 30 pile caps and approx. 59 piles (Including 3 interfacing piers to CBL);

In general, silt curtain will be deployed during all the marine works. A brief programme showing the tentative commencement and completion dates of the major marine works are enclosed in **Appendix A**.

3. Silt Curtain Design

General type silt curtain consists of a layer of geotextile mounted on the temporary working platform and extended to the seabed level secured by steel chain ballast. The silt curtain will surround the platform (8m*12m and 8m*18m) by tying the silt curtain to the railing of the platform. The panels can be assembled and connected by rope through a series of grommet. In between overlap sits the winching rope to adjust curtain depth whenever necessary.

Regarding the conditions of the discharge licence (WT00030716-2018), all the construction wastewater should be treated before discharge and the treated wastewater should be discharged within the silt curtain.

For the bore pile construction stage, wastewater will be generated during the drilling and piling works. The wastewater will be treated by sedimentation tank and discharged within silt curtain. The silt curtain will be deployed by surrounding the temporary platform as shown in **Appendix B – drawing no.:JV-940-SK-007**.

For the pile cap construction stage, ingress seawater needs to be pumped out from the precast pile cap shell to provide a dry condition for concreting. The effluent will be treated by sedimentation tank and discharged within silt curtain. The silt curtain will be deployed in the following ways:

- a. The silt curtain will surround two steel casings under the platform by tying the silt curtain to the railing of the platform (**Appendix B – drawing no.:JV-940-SK-009**).
- b. The silt curtain will surround the precast pile cap shell by tying the silt curtain to the railing of the precast pile cap shell (**Appendix B – drawing no.:JV-940-SK-010**).
- c. The enclosed silt curtain will be placed near the precast pile cap shell (**Appendix B – drawing no.:JV-940-SK-011**).

As for preventive measure against dropping of fresh concrete to the sea during the concreting stage at the shell, tarpaulin sheets will be provided between the barge and the shell to prevent the contamination to the seawater.

Woven geotextile will be used as the curtain fabric, heavy duty geotextile which is strong and has small pore size which consider suitable for such work. Reinforcement can be incorporated in the curtain body for strength and stiffness. Shackles will be placed as option at the reinforcement to strengthen panel connection.

Sufficient length of geotextile shall be allowed such that the silt curtain can be extended from the water surface to the seabed during high tide condition. The typical section of the proposed silt curtain is attached in **Appendix B** and the location of silt curtain is indicated in site layout attached in **Appendix E**. As the bridge piers in Portion V as shown in **Appendix E** do not belong to the scope of works of this contract, no silt curtain is proposed for them.

Product catalogue with specification and job reference of the proposed geotextile for the silt curtain is attached in **Appendix C**.

4. Silt Curtain Installation

JV will install the silt curtain as stated below:

1. Prepare the geotextile with size suitable for the specific platform size on the Derrick Lighter or Barge.
2. Tie the top end of the geotextile and connected to the reinforced belt, the bottom end with the steel chain ballast.
3. Row up the top part of the silt curtain to the specific length suitable for the lift up distance of the Derrick Lighter.
4. Lift the silt curtain up and place it above the temporary platform, make sure the bottom part of the silt curtain is surrounding the platform.
5. Lift down the silt curtain with steel chain ballast into sea and sit on seabed.
6. Workers with life jacket then tie the geotextile with the temporary platform by Steel plate.

In order to maintain the position of the silt curtain especially at location with strong current, spot check by workers will be carried out for each silt curtain before and after works every day.

JV will also conduct and submit weekly inspection with the supervisor throughout the periods of marine piling and pile cap construction to the *Project Manager* or *Supervisor* to demonstrate that the silt curtains are in good working conditions. Diver inspection would be carried out once per every three months or if necessary such as after the adverse weather and any unforeseeable condition which might damage the silt curtain physical condition to ensure the bottom of the silt curtain is well placed on the seabed level and no damage of silt curtain under water.

5. Silt Curtain Maintenance

On-board supervisors will be assigned to check the condition of the silt curtain before commencement of works every day. An inspection checklist will be prepared and filled in by the site supervisors. All checklists will be kept on site for record purpose. Refer **Appendix D** for the sample of Silt Curtain Inspection Checklist.

As the existing silt curtain were damaged by the typhoon Mangkhut, amendments were made to ensure the silt curtain can be removed before the adverse weather at further stage. For the tentative arrangement of silt curtain under adverse weather, the silt curtain will be removed temporarily during adverse weather and related works will be suspended immediately until the silt curtain is installed again.

Refuse around the silt curtains will be collected at regular intervals on a daily basis so that water behind the silt curtains will be kept free from floating debris.

Sufficient spare geotextile will be kept on site for replacing of damaged silt curtains. The spare geotextile shall be kept in place to avoid direct contact with water and sunlight.

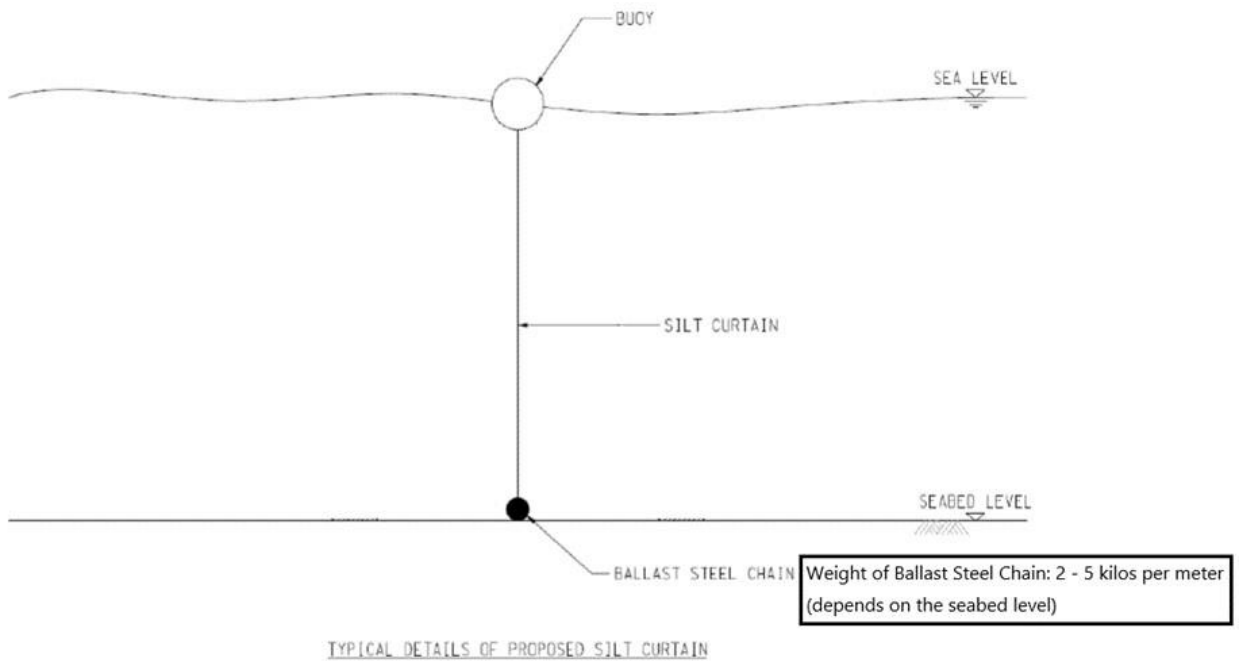


Figure 1 Typical details of proposed silt curtain

6. Silt Curtain Removal/ Repositioning

Removal of silt curtain shall be carried out by derrick lighter after completion of ground investigation and bored pile construction in order to reduce negative impact on water quality during ground investigation and bored pile construction.

Actions upon repositioning of silt curtain will be same as deployment of a new silt curtain. The condition of the silt curtain will be jointly inspected with the Supervisor before relocation to the new position. The JV will responsible to revise the SCDP if there is any amendments or changes from the original design in separate application.

NE/2017/01

Tseung Kwan O – Lam Tin Tunnel: Tseung Kwan O Interchange and Associated Works

Silt Curtain Deployment Plan

Appendix A – Tentative Programme for Major Marine Works

Activity ID	Activity Name	Original Duration	Start	Finish	2018												2019												2020												2021			
					Q1			Q2			Q3			Q4			Q1			Q2			Q3			Q4			Q1	Q2														
					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
NE/2017/01 - TKO-LTT C6 _180220		1168	10-Jan-18 A	22-Mar-21	[Summary bar]																																							
Contract Date		1168	10-Jan-18 A	22-Mar-21	[Works bar]																																							
Contract Date		12	10-Jan-18 A	22-Jan-18 A	[Milestone]																																							
CD000001	Contract Date	0	10-Jan-18 A		[Milestone]																																							
CD000003	Start Date	0	22-Jan-18 A		[Milestone]																																							
Key Dates		0	22-Mar-21	22-Mar-21	[Milestone]																																							
KD1000110	Completion date for the whole of the works	0		22-Mar-21*	[Milestone]																																							
Planned Completion Dates		173	30-Jul-20	19-Jan-21	[Works bar]																																							
Preliminaries		1105	11-Jan-18 A	19-Jan-21	[Works bar]																																							
Method Statement and Shop Drawing		442	26-Feb-18	13-May-19	[Works bar]																																							
Contractor's Alternative Design (AD)		403	23-Jan-18 A	01-Mar-19	[Works bar]																																							
Procurements & Subletting		752	26-Feb-18	18-Mar-20	[Works bar]																																							
Regular Submission / Issue		1073	12-Feb-18	19-Jan-21	[Works bar]																																							
Construction Works		796	16-Apr-18	16-Dec-20	[Works bar]																																							
Temporary Platform and Ground Investigation		433	16-Apr-18	27-Sep-19	[Works bar]																																							
Erect Temporary Platform		130	16-Apr-18	18-Sep-18	[Works bar]																																							
Ground Investigation Works		423	27-Apr-18	27-Sep-19	[Works bar]																																							
Bore Pile Construction (59nos) (Including plant mobilization)		442	03-Jul-18	23-Dec-19	[Works bar]																																							
Bore Pile Construction at Bridge ML		198	03-Jul-18	28-Feb-19	[Works bar]																																							
Bore Pile Construction at Bridge S200		260	05-Dec-18	23-Oct-19	[Works bar]																																							
Bore Pile Construction at Bridge S300		439	06-Jul-18	23-Dec-19	[Works bar]																																							
Bore Pile Construction at Bridge S100		140	13-Apr-19	03-Oct-19	[Works bar]																																							
Pile Cap Construction		534	23-Jul-18	12-May-20	[Works bar]																																							
Pre-cast Shell Casting		390	23-Jul-18	13-Nov-19	[Works bar]																																							
Pre-cast Shell Installation (After Bore Pile Testing)		443	09-Nov-18	12-May-20	[Works bar]																																							
In-fill Pour to Pile Cap		418	24-Nov-18	25-Apr-20	[Works bar]																																							
Pier Construction		358	04-Mar-19	20-May-20	[Works bar]																																							
Pier Construction at Bridge S100		127	09-Nov-19	16-Apr-20	[Works bar]																																							
Pier Construction at Bridge S200		238	13-Jul-19	02-May-20	[Works bar]																																							
Pier Construction at Bridge S300		358	04-Mar-19	20-May-20	[Works bar]																																							
Pier Construction at Bridge ML		227	06-Mar-19	07-Dec-19	[Works bar]																																							
Pier Head Segment Construction		344	26-Jun-19	20-Aug-20	[Works bar]																																							
Precast Pier Head Segment Installation		330	26-Jun-19	04-Aug-20	[Works bar]																																							
Cast-in-situ Diaphragm		343	27-Jun-19	20-Aug-20	[Works bar]																																							
Segment Erection		342	28-Aug-19	21-Oct-20	[Works bar]																																							
Bridge Furniture Installation		168	29-May-20	16-Dec-20	[Works bar]																																							
Remaining works		142	31-Jul-20	19-Jan-21	[Works bar]																																							



- ◆ Milestone
- Works
- Summary

**NE/2017/01 Tseung Kwan O - Lam Tin Tunnel
Tseung Kwan O Interchange and Associated Works**

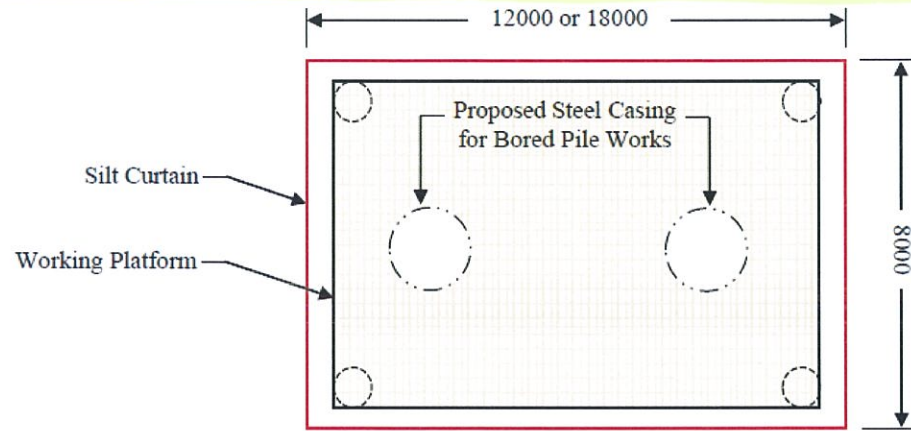
Construction Programme

NE/2017/01

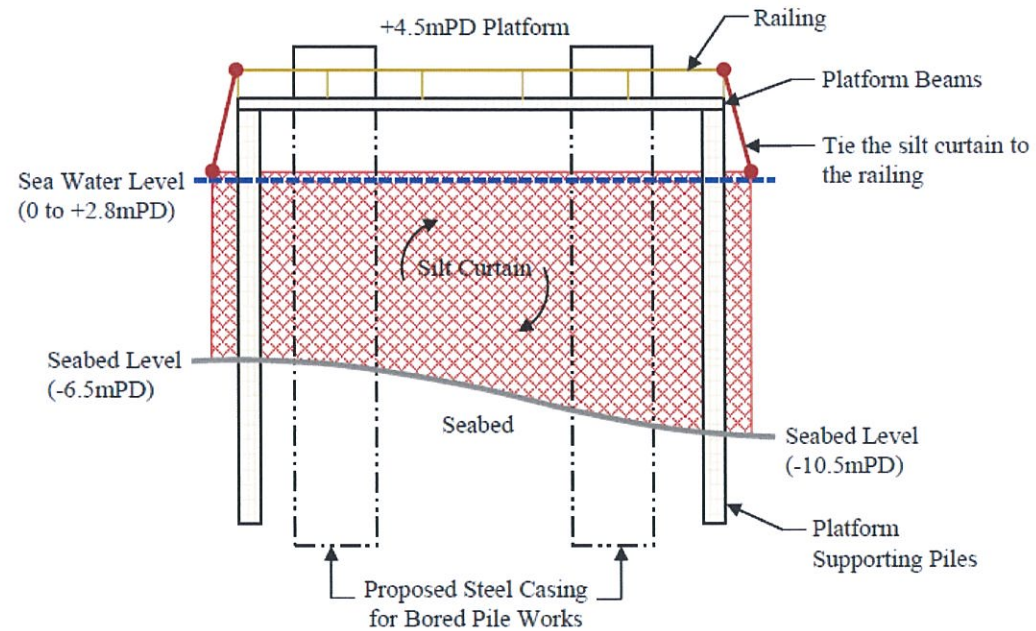
Tseung Kwan O – Lam Tin Tunnel: Tseung Kwan O Interchange and Associated Works

Silt Curtain Deployment Plan

Appendix B – Typical Details of Proposed Silt Curtain



PLAN



ELEVATION

PROJECT TITLE:
TSEUNG KWAN O - LAM TIN TUNNEL
TSEUNG KWAN O - INTERCHANGE AND
ASSOCIATED WORKS

DRAWING TITLE:
**SILT CURTAIN
ARRANGEMENT FOR BORE
PILE CONSTRUCTION**

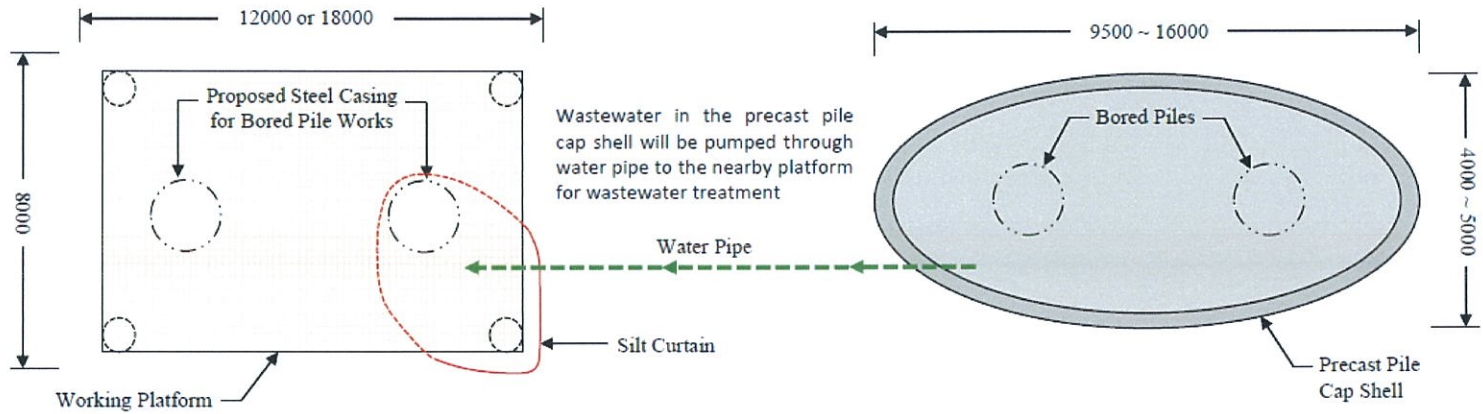
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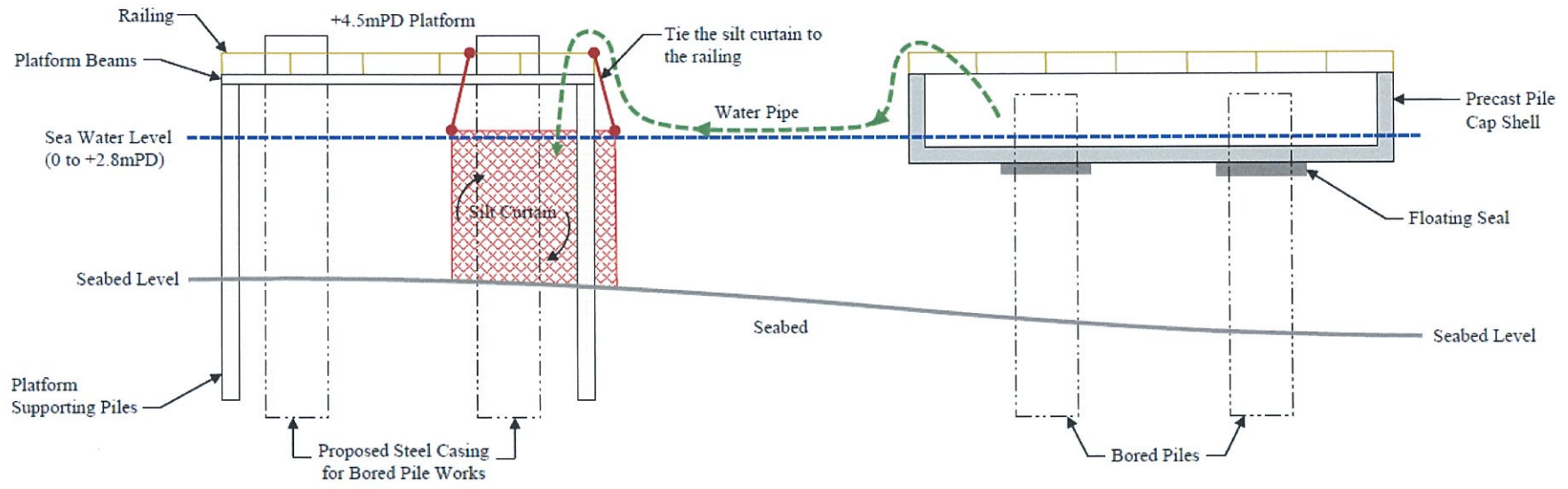
CLIENT:
CEDD 土木工程拓展署
Civil Engineering and
Development Department

CONSULTING ENGINEER:
AECOM

MAIN CONTRACTOR:
俊和-上隧-中冶聯營
CW - STEC - CMGC JV



PLAN



ELEVATION

PROJECT TITLE:
 TSEUNG KWAN O - LAM TIN TUNNEL
 TSEUNG KWAN O - INTERCHANGE AND
 ASSOCIATED WORKS

DRAWING TITLE:
 SILT CURTAIN ARRANGEMENT
 FOR PILE CAP CONSTRUCTION
 - OPTION A

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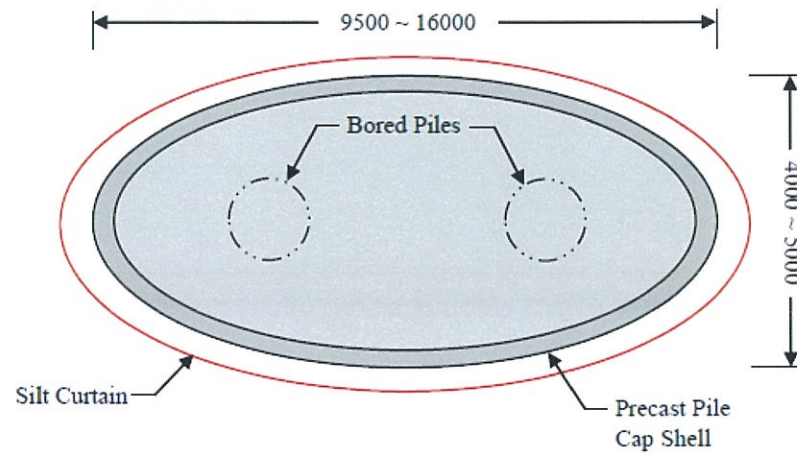
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CLIENT:
 土木工程拓展署
 Civil Engineering and
 Development Department

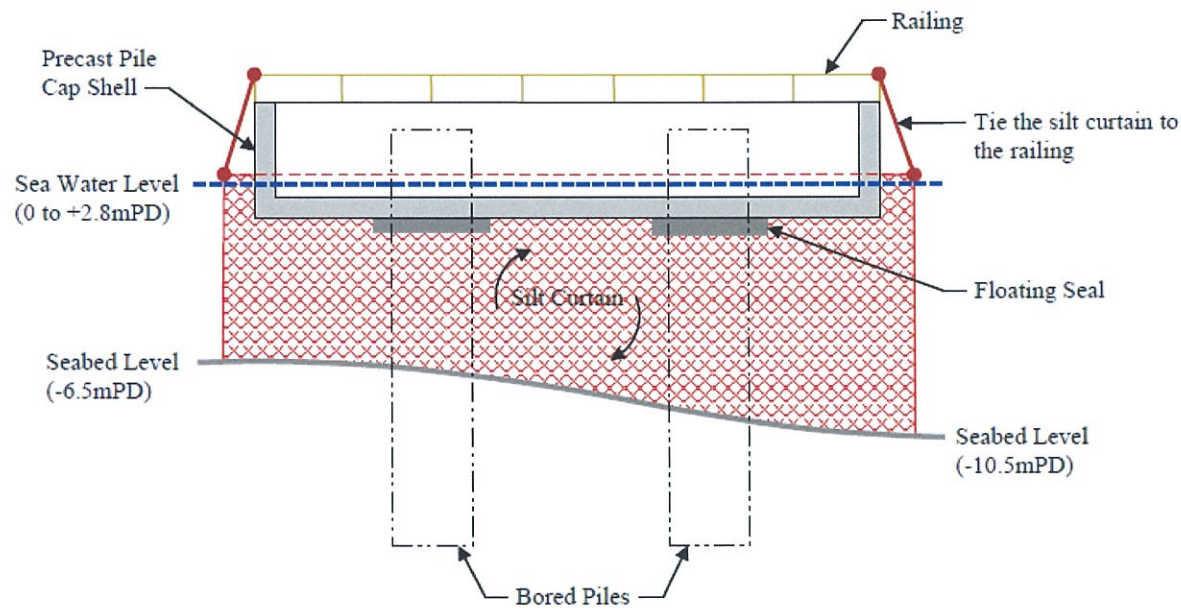
CONSULTING ENGINEER:


MAIN CONTRACTOR:

 俊和-上隧-中冶聯營
 CW - STEC - CMGC JV



PLAN



ELEVATION

PROJECT TITLE:
TSEUNG KWAN O - LAM TIN TUNNEL
TSEUNG KWAN O - INTERCHANGE AND
ASSOCIATED WORKS

DRAWING TITLE:
SILT CURTAIN ARRANGEMENT
FOR PILE CAP CONSTRUCTION -
OPTION B

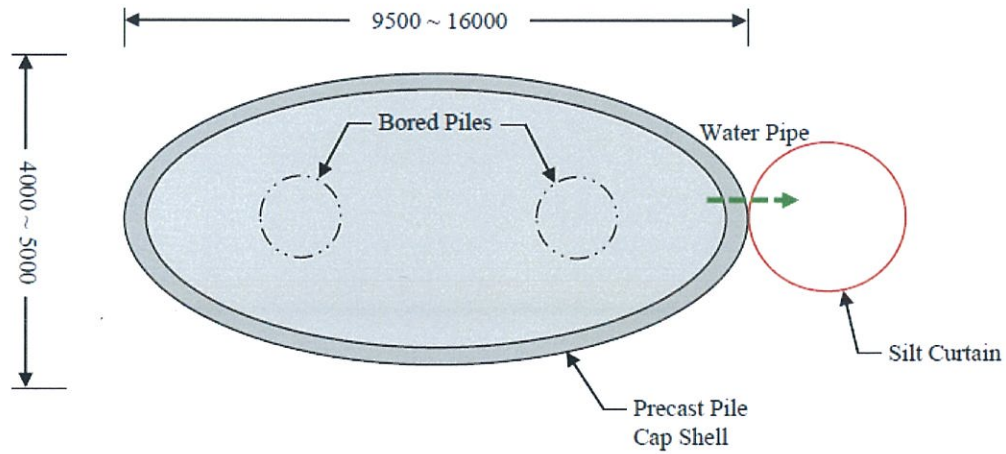
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CLIENT:
CEDD 土木工程拓展署
Civil Engineering and
Development Department

CONSULTING ENGINEER:
AECOM

MAIN CONTRACTOR:
TEC MCC
俊和-上隧-中冶聯營
CW - STEC - CMGC JV

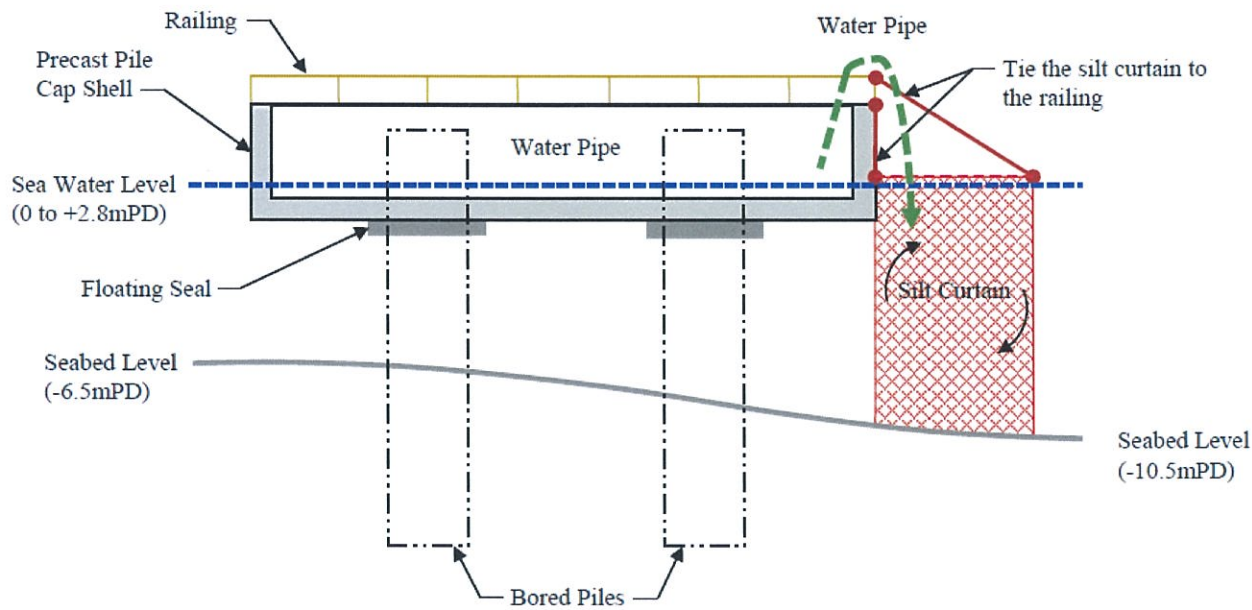


PLAN

Note:

The enclosed silt curtain will be placed near the precast pile cap shell for wastewater treatment under below conditions:

- there are no working platforms nearby the shell.
- the site areas are confined to deploy the silt curtain around the shell



ELEVATION

PROJECT TITLE:
TSEUNG KWAN O - LAM TIN TUNNEL
TSEUNG KWAN O - INTERCHANGE AND
ASSOCIATED WORKS

DRAWING TITLE:
SILT CURTAIN ARRANGEMENT
FOR PILE CAP CONSTRUCTION -
OPTION C

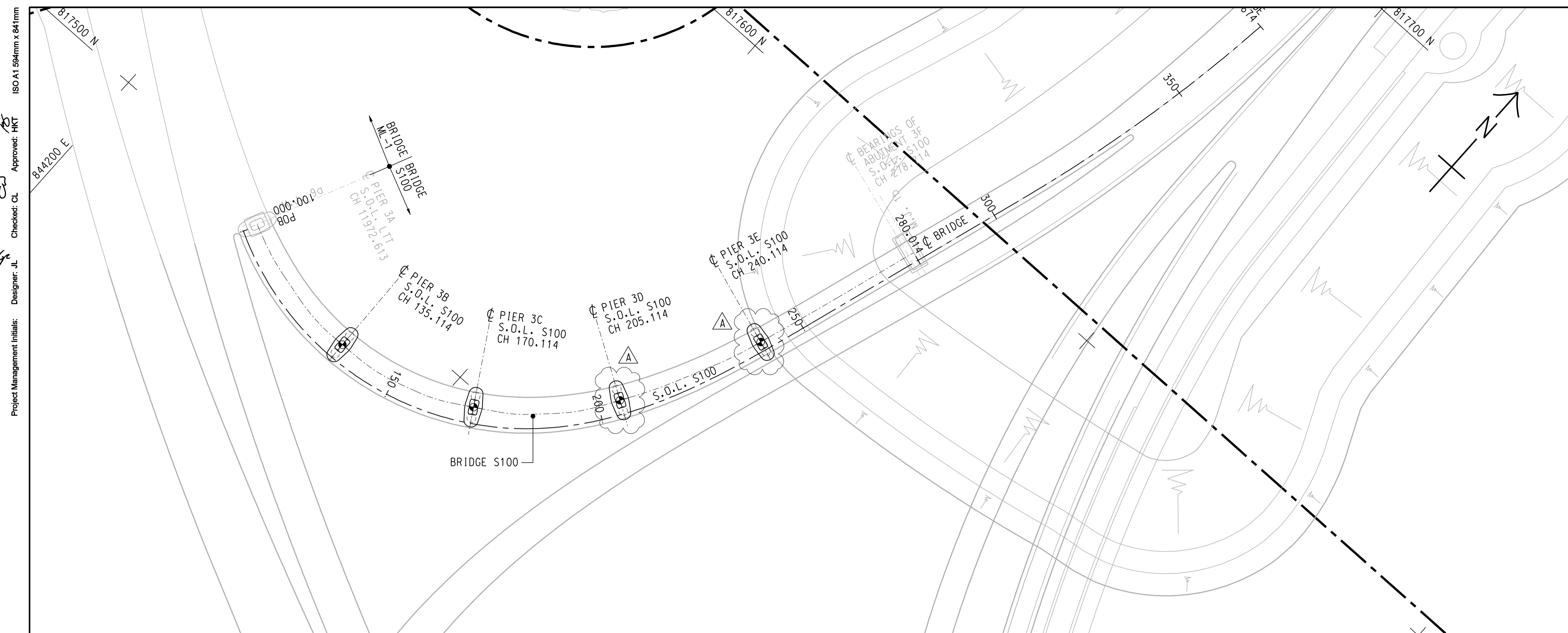
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REV: 0

REV.	DATE	REVISION NOTES	DRAWN BY	CHK BY	REV.	DATE	REVISION NOTES	DRAWN BY	CHK BY

CLIENT:
CEDD 土木工程拓展署
Civil Engineering and
Development Department

CONSULTING ENGINEER:
AECOM

MAIN CONTRACTOR:
俊和-上隧-中冶聯營
CW - STEC - CMGC JV



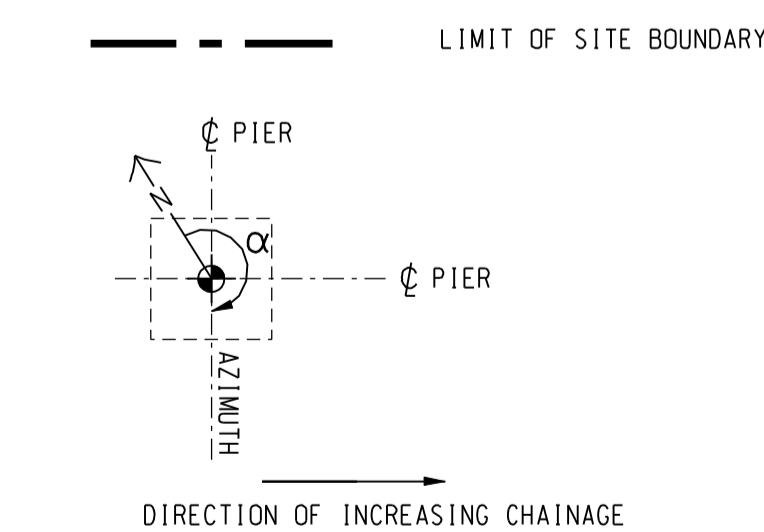
FOUNDATION SCHEDULE:

SUBSTRUCTURE REFERENCE NO.	TOP OF PILE CAP LEVEL (mPD)	S.O.L.	CHAINAGE	AZIMUTH OF FOUNDATION (α)	FOUNDATION TYPE	NO. OF PILES	TYPE OF PILE	PILE DIAMETER (mm)	PILE CUT OFF LEVEL (mPD)	TENTATIVE SEABED LEVEL (mPD)	TENTATIVE ROCKHEAD LEVEL (mPD)	TENTATIVE FOUNDING LEVEL (mPD)	MIN. SOCKET LENGTH (m)
3B	+2.50	S100	CH 135.114	178°35'32"	A2	2	BORED	2000	-0.40	-7.20	-16.0	-20.3	4.00
3C	+2.50	S100	CH 170.114	149°6'6"	A2	2	BORED	2000	-0.40	-7.20	-20.5	-23.8	3.00
3D	+2.50	S100	CH 205.114	121°54'54"	A2	2	BORED	2000	-0.40	-7.20	-21.5	-23.8	2.00
3E	+2.50	S100	CH 240.114	108°45'48"	A2	2	SLEEVED	2000	-0.40	-6.50	-19.0	-23.3	4.00

NOTES:

- FOR GENERAL NOTES AND LEGEND, REFER TO DRAWING NOS. 60308751/C6/C00/2000 AND 2001.
- ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS ARE IN mPD UNLESS OTHERWISE STATED.
- THE TENTATIVE FOUNDING LEVEL AND CUTOFF LEVEL SHOWN ARE FOR INFORMATION ONLY. THE CONTRACTOR SHALL ASCERTAIN THE ROCKHEAD LEVEL AND FINISH GROUND LEVEL AND SHALL AGREE WITH THE SUPERVISOR.
- ALL PILES SHALL BE SOCKETTED INTO SLIGHTLY TO MODERATELY DECOMPOSED MODERATELY STRONG ROCK OF MATERIAL WEATHERING GRADE III OR BETTER WITH A TOTAL CORE RECOVERY OF MORE THAN 85% AND A MINIMUM UNIAXIAL COMPRESSIVE STRENGTH OF NOT LESS THAN 25MPa WITH A MINIMUM SAFE BEARING CAPACITY OF 5000kPa.
- FOR TYPICAL FOUNDATION DETAILS REFER TO DRAWING NO. 60308751/C6/C00/2041.
- FOR TYPICAL BORED AND SLEEVED BORED PILE DETAILS REFER TO DRAWING NO. 60308751/C6/C00/2040.

LEGEND:



ISSUE/REVISION

REV	DATE	DESCRIPTION	CHK.
A	AUG.17	TENDER ADDENDUM NO.3	CL
-	JUN.17	TENDER DRAWING	CL

STATUS

擬定

SCALE

A1:500

DIMENSION UNIT

METRES

KEY PLAN

索引圖

PROJECT NO.

60308751

CONTRACT NO.

NE/2017/01

SHEET TITLE

BRIDGE S100
FOUNDATION LAYOUT

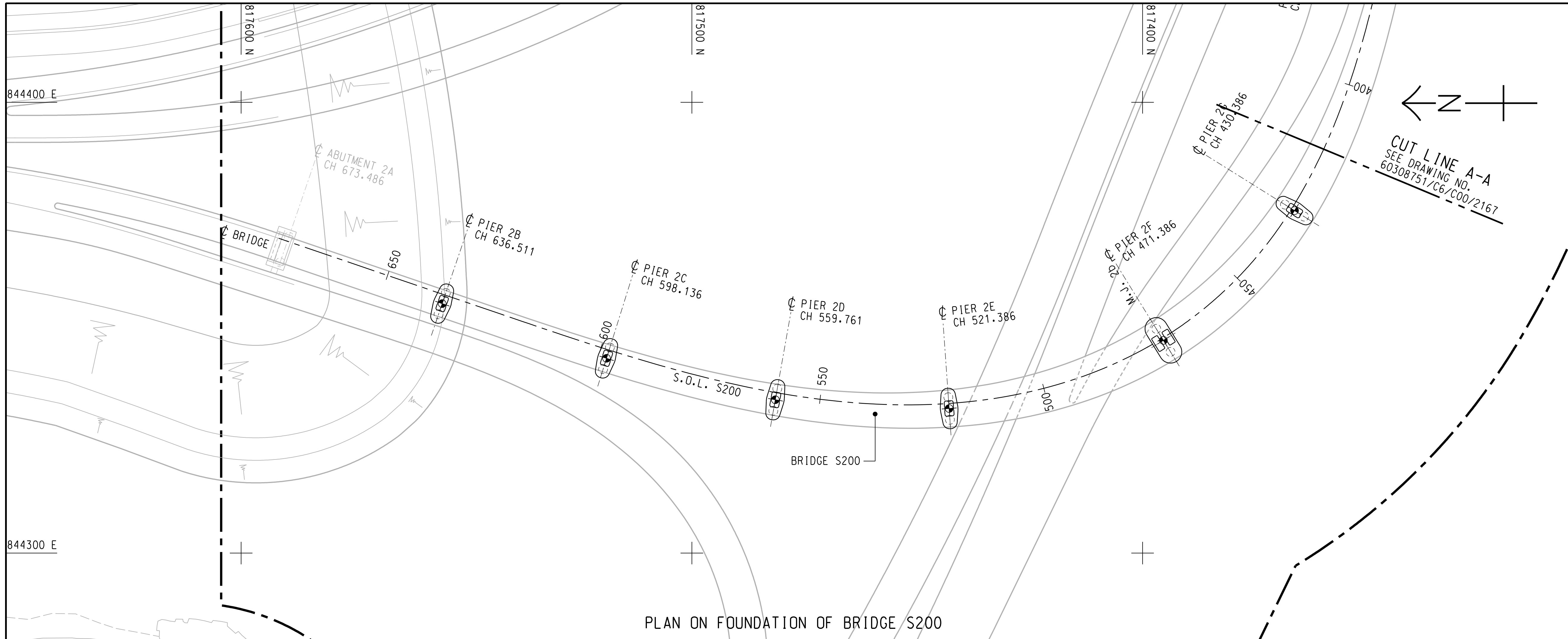
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60308751/C6/C00/2136A

ISO A1 594mm x 841mm
 Approved: HKT
 Checked: CL
 Designer: JL
 Project Management Initials:

Plot File by: LAIQW
 2017/06/15
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PLAN ON FOUNDATION OF BRIDGE S200

FOUNDATION SCHEDULE:

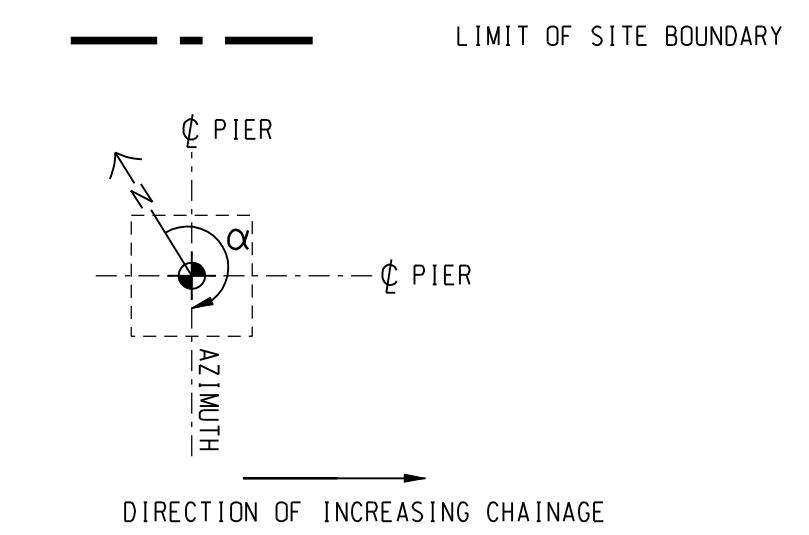
SUBSTRUCTURE REFERENCE NO.	TOP OF PILE CAP LEVEL (mPD)	S.O.L.	CHAINAGE	AZIMUTH OF FOUNDATION (α)	FOUNDATION TYPE	NO. OF PILES	TYPE OF PILE	PILE DIAMETER (mm)	PILE CUT OFF LEVEL (mPD)	TENTATIVE SEABED LEVEL (mPD)	TENTATIVE ROCKHEAD LEVEL (mPD)	TENTATIVE FOUNDING LEVEL (mPD)	MIN. SOCKET LENGTH (m)
2B	+2.50	S200	CH 636.511	108°50'17"	A2	2	SLEEVED	2000	-0.40	-6.50	-15.5	-19.3	3.50
2C	+2.50	S200	CH 598.136	107°23'3"	A2	2	BORED	2000	-0.40	-7.20	-21.5	-23.3	1.50
2D	+2.50	S200	CH 559.761	100°4'52"	A2	2	BORED	2000	-0.40	-7.20	-23.5	-25.3	1.50
2E	+2.50	S200	CH 521.386	85°56'2"	A2	2	BORED	2000	-0.40	-7.75	-25.0	-26.3	1.00
2F	+2.50	S200	CH 471.386	58°13'34"	B4	2	BORED	2000	-0.40	-10.20	-33.5	-35.8	2.00
2G	+2.50	S200	CH 430.386	32°0'53"	A2	2	BORED	2000	-0.40	-10.20	-39.0	-40.8	1.50

A

NOTES:

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- FOR TYPICAL FOUNDATION DETAILS REFER TO DRAWING NOS. 60308751/C6/COO/2041.
- FOR TYPICAL BORED AND SLEEVED BORED PILE DETAILS REFER TO DRAWING NO. 60308751/C6/COO/2040.
- THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING NO. 60308751/C6/COO/2167.

LEGEND:



ISSUE/REVISION
修訂

A/R	DATE	DESCRIPTION	CHK.
修訂	日期	內容摘要	核核
A	AUG.17	TENDER ADDENDUM NO.3	CL
-	JUN.17	TENDER DRAWING	CL

STATUS
階段

SCALE
比例

A1 1:500

DIMENSION UNIT
尺寸單位

METRES

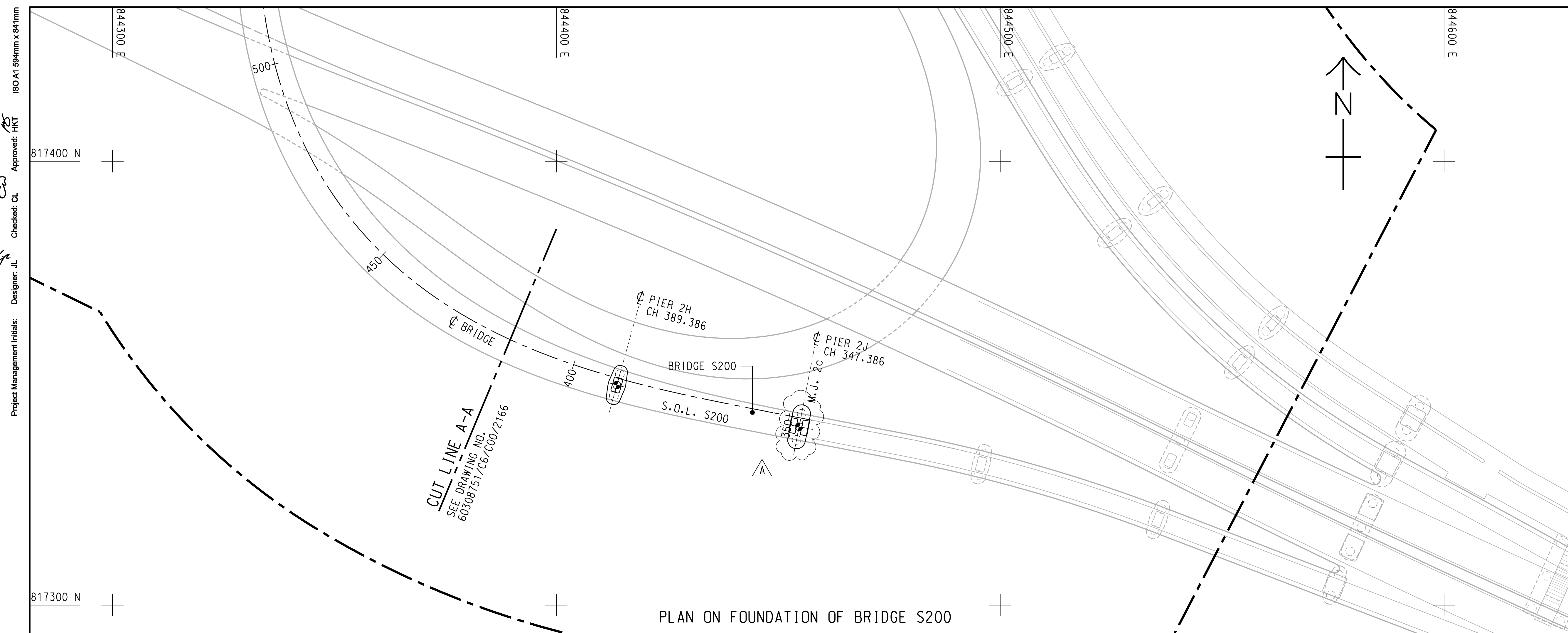
KEY PLAN
索引圖

60308751

NE/2017/01

BRIDGE S200
FOUNDATION LAYOUT

60308751/C6/COO/2166A



FOUNDATION SCHEDULE:

SUBSTRUCTURE REFERENCE NO.	TOP OF PILE CAP LEVEL (mPD)	S.O.L.	CHAINAGE	AZIMUTH OF FOUNDATION (α)	FOUNDATION TYPE	NO. OF PILES	TYPE OF PILE	PILE DIAMETER (mm)	PILE CUT OFF LEVEL (mPD)	TENTATIVE SEABED LEVEL (mPD)	TENTATIVE ROCKHEAD LEVEL (mPD)	TENTATIVE FOUNDING LEVEL (mPD)	MIN. SOCKET LENGTH (m)
2H	+2.50	S200	CH 389.386	15°32'33"	A2	2	BORED	2000	-0.40	-10.50	-47.0	-50.8	1.00
2J	+2.50	S200	CH 347.386	10°58'37"	B4	2	BORED	2000	-0.40	-10.50	-53.0	-54.8	1.00

- NOTES:**
- FOR GENERAL NOTES AND LEGEND, REFER TO DRAWING NO. 60308751/C6/C00/2166.
 - THIS DRAWING IS TO BE READ IN CONJUNCTION WITH DRAWING NOS. 60308751/C6/C00/2166.

AECOM

PROJECT
TSEUNG KWAN O - LAM TIN TUNNEL

CONTRACT TITLE
TSEUNG KWAN O - LAM TIN TUNNEL
TSEUNG KWAN O INTERCHANGE AND ASSOCIATED WORKS

CLIENT
土木工務發展署
Civil Engineering and Development Department

CONSULTANT
AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS
分列工程顧問公司

ISSUE/REVISION

I/R	DATE	DESCRIPTION	CHK.
A	AUG.17	TENDER ADDENDUM NO.3	CL
-	JUN.17	TENDER DRAWING	CL

STATUS
圖版

SCALE
A1 1 : 500

DIMENSION UNIT
METRES

KEY PLAN

PROJECT NO.
60308751

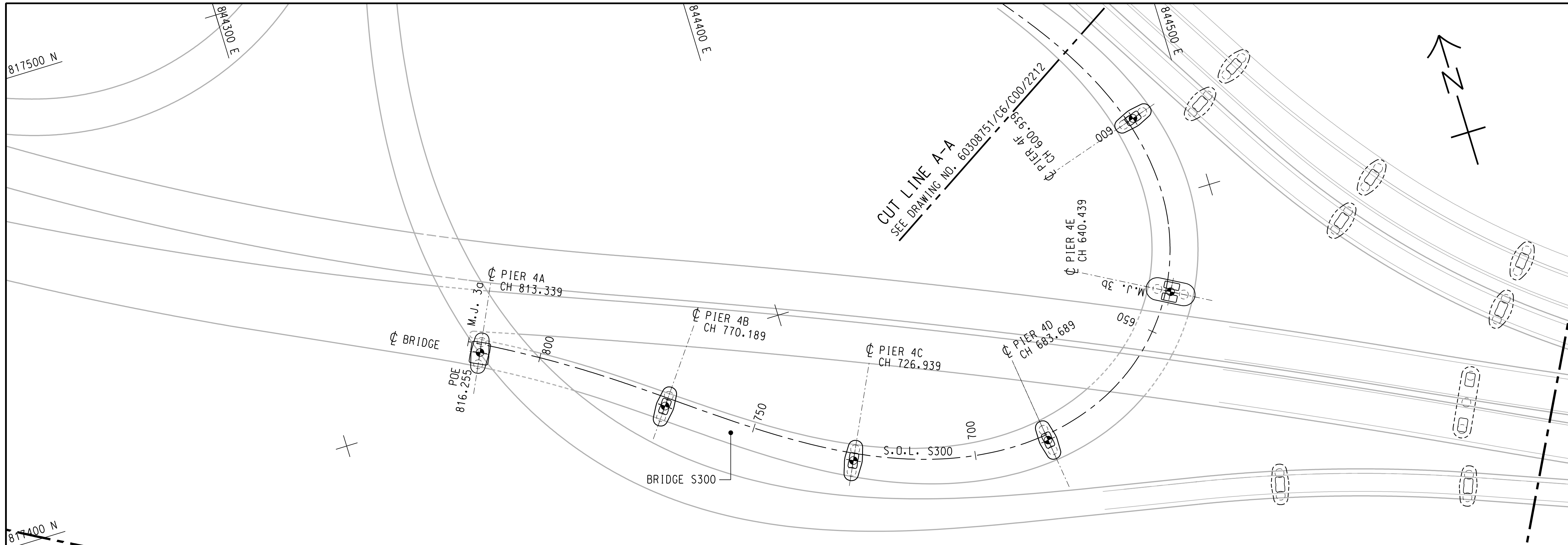
CONTRACT NO.
NE/2017/01

SHEET TITLE
BRIDGE S200
FOUNDATION LAYOUT

SHEET NUMBER
60308751/C6/C00/2167A

ISO A1 594mm x 841mm
 Approved: HKT
 Checked: CL
 Designer: JL
 Project Management Initials:
 2017/6/16
 PATH: P:\Projects\60308751\DRAWING\Contract\60308751\C6_C00_2167.dgn

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PLAN OF FOUNDATION OF BRIDGE S300

FOUNDATION SCHEDULE:

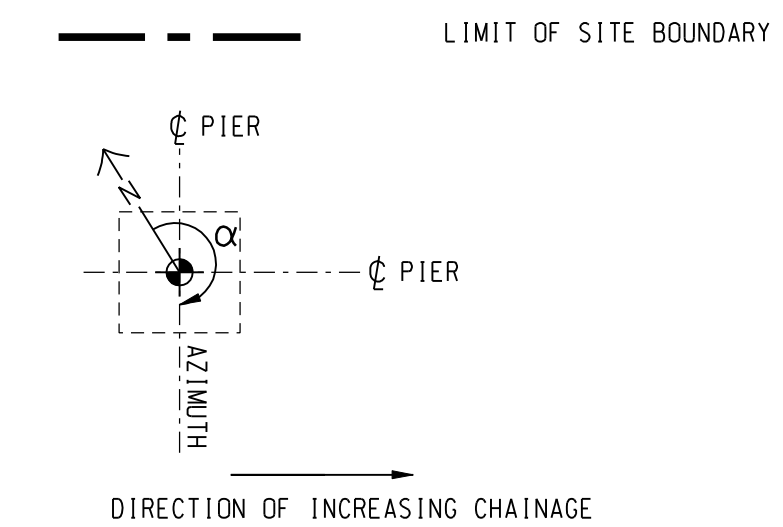
SUBSTRUCTURE REFERENCE NO.	TOP OF PILE CAP LEVEL (mPD)	S.O.L.	CHAINAGE	AZIMUTH OF FOUNDATION (α)	FOUNDATION TYPE	NO. OF PILES	TYPE OF PILE	PILE DIAMETER (mm)	PILE CUT OFF LEVEL (mPD)	TENTATIVE SEABED LEVEL (mPD)	TENTATIVE ROCKHEAD LEVEL (mPD)	TENTATIVE FOUNDING LEVEL (mPD)	MIN. SOCKET LENGTH (m)
4A	+2.50	S300	CH 813.339	25° 34' 26"	A2	2	BORED	2000	-0.40	-7.75	-29.0	-32.8	3.50
4B	+2.50	S300	CH 770.189	36° 33' 7"	A2	2	BORED	2000	-0.40	-10.20	-35.0	-38.3	3.00
4C	+2.50	S300	CH 726.939	26° 1' 12"	A2	2	BORED	2000	-0.40	-10.50	-45.0	-47.3	2.00
4D	+2.50	S300	CH 683.689	172° 35' 5"	A2	2	BORED	2000	-0.40	-10.50	-53.0	-54.3	1.00
4E	+2.50	S300	CH 640.439	118° 50' 18"	B4	2	BORED	2000	-0.40	-10.20	-53.0	-54.3	1.00
4F	+2.50	S300	CH 600.939	72° 36' 35"	A2	2	BORED	2000	-0.40	-10.20	-45.0	-46.3	1.00

A

NOTES:

- FOR GENERAL NOTES AND LEGEND, REFER TO DRAWING NOS. 60308751/C6/C00/2000 AND 2001.
- ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS ARE IN mPD UNLESS OTHERWISE STATED.
- THE TENTATIVE FOUNDING LEVEL AND CUTOFF LEVEL SHOWN ARE FOR INFORMATION ONLY. THE CONTRACTOR SHALL ASCERTAIN THE ROCKHEAD LEVEL AND FINISH GROUND LEVEL AND SHALL AGREE WITH THE SUPERVISOR.
- ALL PILES SHALL SOCKETTED INTO SLIGHTLY TO MODERATELY DECOMPOSED MODERATELY STRONG ROCK OF MATERIAL WEATHERING GRADE III OR BETTER WITH A TOTAL CORE RECOVERY OF MORE THAN 85% AND A MINIMUM UNIAXIAL COMPRESSIVE STRENGTH OF NOT LESS THAN 25MPa WITH A MINIMUM SAFE BEARING CAPACITY OF 5000KPa.
- EXACT ROCKHEAD LEVEL SHALL BE PROPOSED BY THE CONTRACTOR AND SUBJECTED TO THE ACCEPTANCE OF THE SUPERVISOR.
- FOR TYPICAL FOUNDATION DETAILS REFER TO DRAWING NO. 60308751/C6/C00/2041.
- FOR TYPICAL BORED AND SLEEVED BORED PILE DETAILS REFER TO DRAWING NO. 60308751/C6/C00/2040.
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH DRAWING NO. 60308751/C6/C00/2212.

LEGEND:



ISSUE/REVISION
修訂

A/R	DATE	DESCRIPTION	CHK.
修訂	日期	內容摘要	核核
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-	JUN.17	TENDER DRAWING	CL

STATUS
階段

SCALE
比例

A1 1:500

DIMENSION UNIT
尺寸單位

METRES

KEY PLAN
索引圖

PROJECT NO.
項目編號

60308751

CONTRACT NO.
合約編號

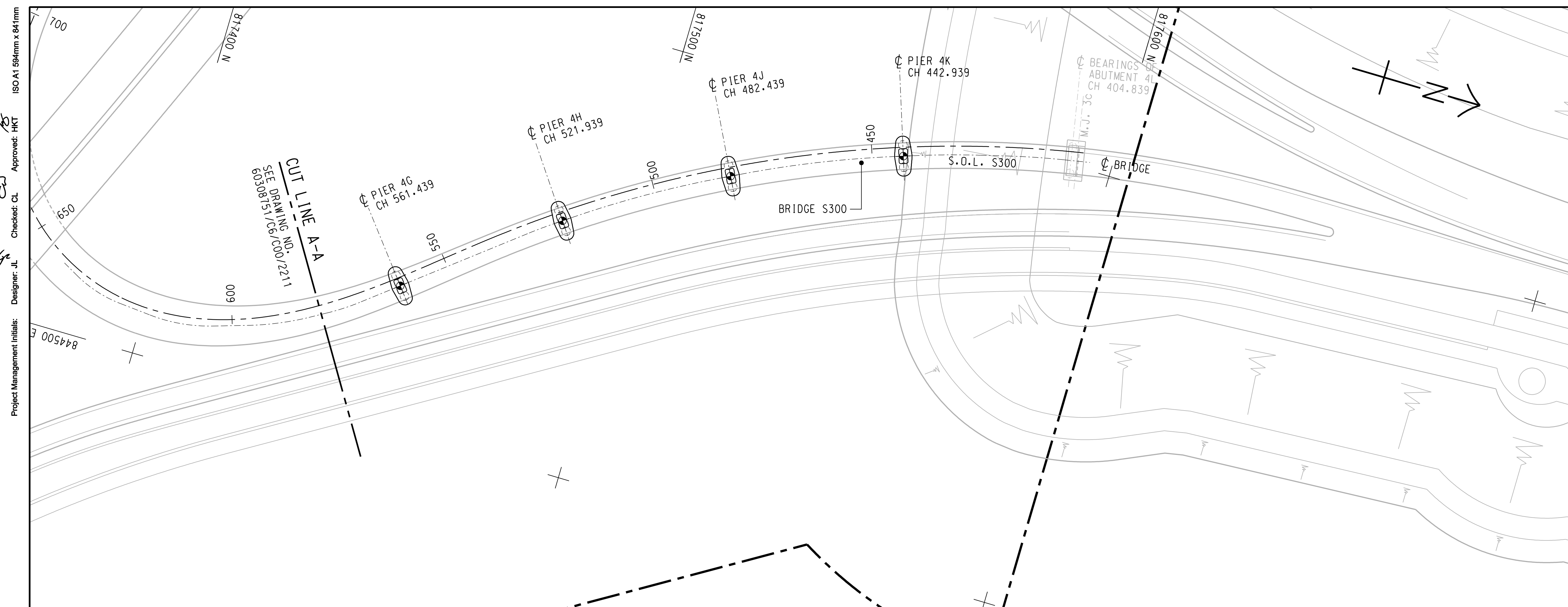
NE/2017/01

SHEET TITLE
圖紙名稱

BRIDGE S300
FOUNDATION LAYOUT

SHEET NUMBER
圖紙編號

60308751/C6/C00/2211A



PLAN OF FOUNDATION OF BRIDGE S300

FOUNDATION SCHEDULE:

SUBSTRUCTURE REFERENCE NO.	TOP OF PILE CAP LEVEL (mPD)	S.O.L.	CHAINAGE	AZIMUTH OF FOUNDATION (α)	FOUNDATION TYPE	NO. OF PILES	TYPE OF PILE	PILE DIAMETER (mm)	PILE CUT OFF LEVEL (mPD)	TENTATIVE SEABED LEVEL (mPD)	TENTATIVE ROCKHEAD LEVEL (mPD)	TENTATIVE FOUNDING LEVEL (mPD)	MIN. SOCKET LENGTH (m)
4G	+2.50	S300	CH 561.439	231°24'56"	A2	2	BORED	2000	-0.40	-9.85	-37.5	-40.8	3.00
4H	+2.50	S300	CH 521.939	234°41'14"	A2	2	BORED	2000	-0.40	-9.85	-32.0	-35.3	3.00
4J	+2.50	S300	CH 482.439	242°56'50"	A2	2	BORED	2000	-0.40	-7.75	-28.0	-32.3	4.00
4K	+2.50	S300	CH 442.939	251°12'25"	A2	2	SLEEVED	2000	-0.40	-7.10	-25.0	-29.8	4.50

NOTES:

- FOR GENERAL NOTES AND LEGEND, REFER TO DRAWING NO. 60308751/C6/C00/2211.
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH DRAWING NOS. 60308751/C6/C00/2211.

ISSUE/REVISION

I/R	DATE	DESCRIPTION	CHK.
A	AUG.17	TENDER ADDENDUM NO.3	CL
-	JUN.17	TENDER DRAWING	CL

STATUS

備註

SCALE

A1 1: 500

DIMENSION UNIT

METRES

KEY PLAN

索引圖

PROJECT NO.

60308751

CONTRACT NO.

NE/2017/01

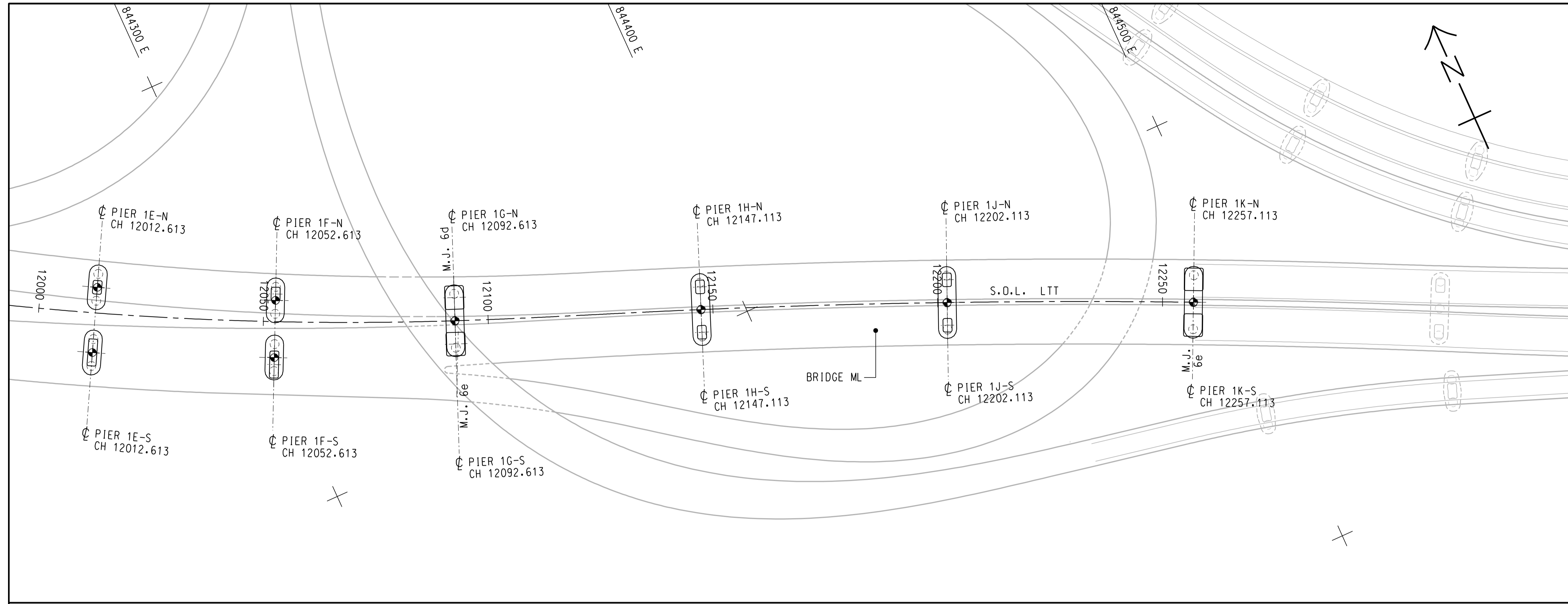
SHEET TITLE

BRIDGE S300
FOUNDATION LAYOUT

SHEET NUMBER

60308751/C6/C00/2212A

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FOUNDATION SCHEDULE:

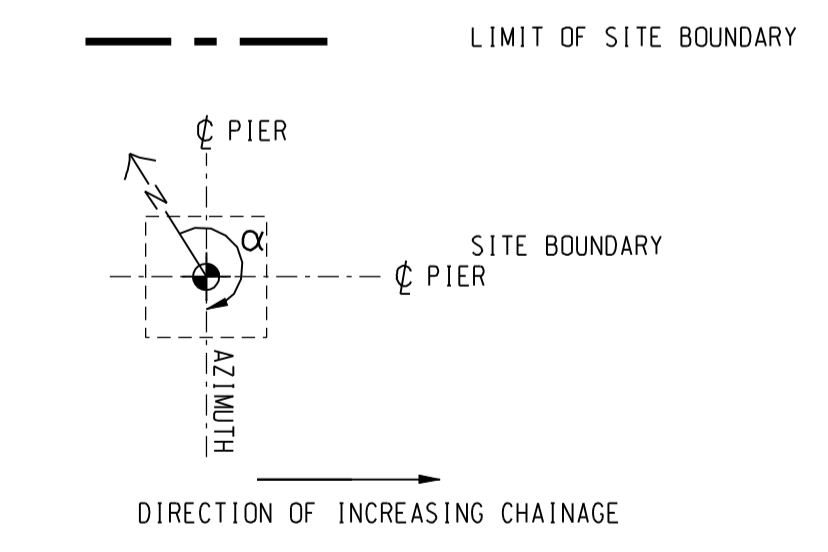
SUBSTRUCTURE REFERENCE NO.	TOP OF PILE CAP LEVEL (mPD)	S.O.L.	CHAINAGE	AZIMUTH OF FOUNDATION (α)	FOUNDATION TYPE	NO. OF PILES	TYPE OF PILE	PILE DIAMETER (mm)	PILE CUT OFF LEVEL (mPD)	TENTATIVE SEABED LEVEL (mPD)	TENTATIVE ROCKHEAD LEVEL m(PD)	TENTATIVE FOUNDING LEVEL (mPD)	MIN. SOCKET LENGTH (m)
1E-N	+2.50	LTT	CH 12012.613	208°37'47"	B1	2	BORED	2000	-0.40	-7.20	-16.5	-22.8	6.00
1E-S	+2.50	LTT	CH 12012.613	208°37'47"	B1	2	BORED	2000	-0.40	-7.20	-17.0	-23.3	6.00
1F-N	+2.50	LTT	CH 12052.613	205°34'26"	B1	2	BORED	2000	-0.40	-7.75	-22.0	-27.8	5.50
1F-S	+2.50	LTT	CH 12052.613	205°34'26"	B1	2	BORED	2000	-0.40	-7.75	-23.0	-28.8	5.50
1G	+2.50	LTT	CH 12092.613	202°31'27"	C	3	BORED	2000	-0.40	-7.75	-28.5	-34.8	6.00
1H	+2.50	LTT	CH 12147.113	201°53'37"	C	3	BORED	2000	-0.40	-10.30	-35.5	-41.3	5.50
1J	+2.50	LTT	CH 12202.113	203°28'10"	C	3	BORED	2000	-0.40	-10.30	-46.0	-51.8	5.50
1K	+2.50	LTT	CH 12257.113	205°4'34"	C	3	BORED	2000	-0.40	-10.20	-50.0	-55.8	5.50

A

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- FOR TYPICAL BORED AND SLEEVED BORED PILE DETAILS REFER TO DRAWING NO. 60308751/C6/C00/2040.

LEGEND:



ISSUE/REVISION

NO.	DATE	DESCRIPTION	CHK.
A	AUG.17	TENDER ADDENDUM NO.3	CL
-	JUN.17	TENDER DRAWING	CL

STATUS

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SCALE **DIMENSION UNIT**

A1:500	METRES
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KEY PLAN

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PROJECT NO. **CONTRACT NO.**

60308751	NE/2017/01
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SHEET TITLE

BRIDGE ML FOUNDATION LAYOUT

SHEET NUMBER

60308751/C6/C00/2311A

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NE/2017/01

Tseung Kwan O – Lam Tin Tunnel: Tseung Kwan O Interchange and Associated Works

Silt Curtain Deployment Plan

Appendix C – Specification of Geotextile for Silt Curtain

NE/2017/01

Tseung Kwan O – Lam Tin Tunnel: Tseung Kwan O Interchange and Associated Works

Silt Curtain Deployment Plan

1. DSP 15 Silt Curtain

Material Submission

Daeyoun Geotech

GEONIA Silt Protector



G AND E COMPANY LIMITED

14th Floor, Kiu Yin Commercial Building

361-363 Lockhart Road, Wanchai, HK

Tel: 2570 0103 Fax: 2570 0089 website: www.g-and-e.com

March 2018



Table of Contents

- 1) Manufacturing Company Catalogue**
- 2) Product Catalogue of Daeyoun Geotech GEONIA Silt Protector**
- 3) Product Specification of GEONIA Silt Protector**
- 4) Certificates**
- 5) Installation, Caution & Maintenance Guideline**
- 6) Project Reference**
- 7) Approval Letter**
- 8) Prototype Sample**
- 9) About the Supplier – G and E Company Limited**



Daeyoun Geotech
GEONIA Silt Protector

Manufacturing Company Catalogue

COMPANY INTRODUCTION



DAEYOUN GEOTECH

INDEX

- 1. Company Information**
- 2. Company History**
- 3. Factory Introduction**
- 4. Plant Investment Plan in the Future**
- 5. Manufacturing Process**
- 6. Main Buyer and Partnership with Construction Company**
- 7. Performance Experience in Vietnam & Overseas Market**
- 8. Certification**



COMPANY INFORMATION

Company Name	DAEYOUN GEOTECH CO., LTD
C.E.O	Mr. Sang Ki Lee
Establish	1991
Employee	35 people
Head office	No. 1121, Poonglim Bldg, Gongdeok-dong, Mapo-gu, Seoul, Korea
Main Business	PET/PP Woven Geotextiles Silt Protector / Curtain
Capacity	15 million sqm / year

HISTORY

- 2013 – Qualified for European Certification of **CE Mark** from SKZ in Germany
 - Became a member of **GMA**
 - **Built 2nd factory in Gimcheon city, Korea**
 - Attended the booth in Geosynthetics2013 in U.S.A.
- 2012 - Launched new brand "GEONIA[®]" of the geosynthetics by Daeyoun Geotech Co., Ltd.
 - Established Daeyoun Geotech Co., Ltd. **Geosynthetics's R & D Center**
 - Audit CE mark
 - IGS Membership
 - Attended the booth in Geosynthetics Asia 2012 in Bangkok, Thailand
- 2011 - Registered the certificate of Patent about the silt protector
- 2009 - Expansion of Gimcheon Plant, Korea
 - **Renewed ISO 9001, ISO 14001**
 - Assigned as a innovative company by Small and medium Business Administration
- 2008 - Completion of Gimcheon Plant
 - Annual contract with Korean Public Procurement Bureau for Woven Geotextile
- 2006 - Renamed to Daeyoun Geotech Co., Ltd.
 - Woven Geotextile business separated from Daeyoun Textech Co., Ltd.
- 1991 - Established Daeyoun Textech Co., Ltd

Factory Location

- Factory 1 (Gimcheon)**
 55-2, Dogok-ri, Jirye-myeon, Gimcheon-city,
 Gyeongsangbuk-do, Korea
 - It takes 3 hours from Seoul to Kimcheon by a Car
 - It take 1.5 hours from Seoul to Kimcheon by KTX
 - It takes 2 hours from Busan to Kimcheon factory by a Car
- Factory 2 (Gimcheon)**
 123, Apogongdan-gil, Apo-eup, Gimcheon-si,
 Gyeongsangbuk-do, Korea
- Veitnam Office (Hochiminh)**
 83 K7 ST, Ward 12, Tan Binh Dist.,
 Hochiminh city, Vietnam



DAEYOUN FACTORY 1

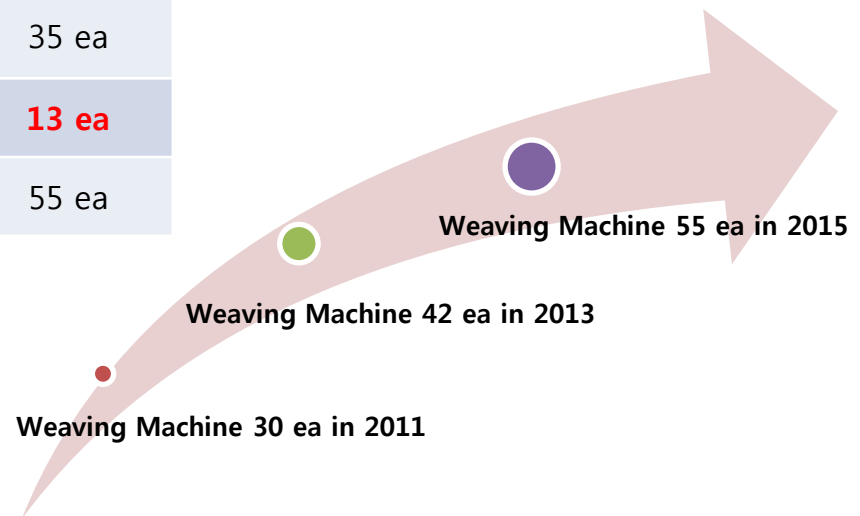


DAEYOUN FACTORY 2

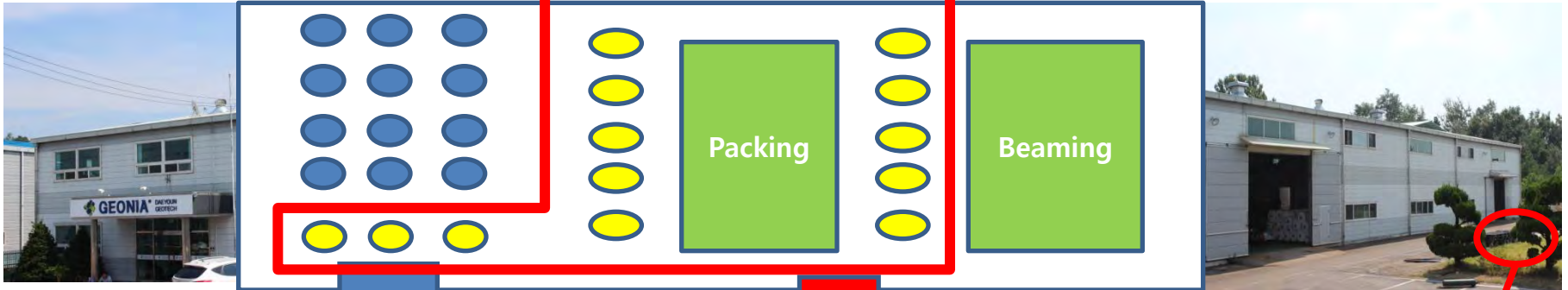


Plant Investment Plan in the Future

Weaving Machine	Factory 1	Factory 2	Total
2,100 mm	6 ea	1 ea	7 ea
3,600 mm	23 ea	12 ea	35 ea
5,200 mm	-	13 ea	13 ea
Total	29 ea	26 ea	55 ea



Plant Investment Plan in the Future



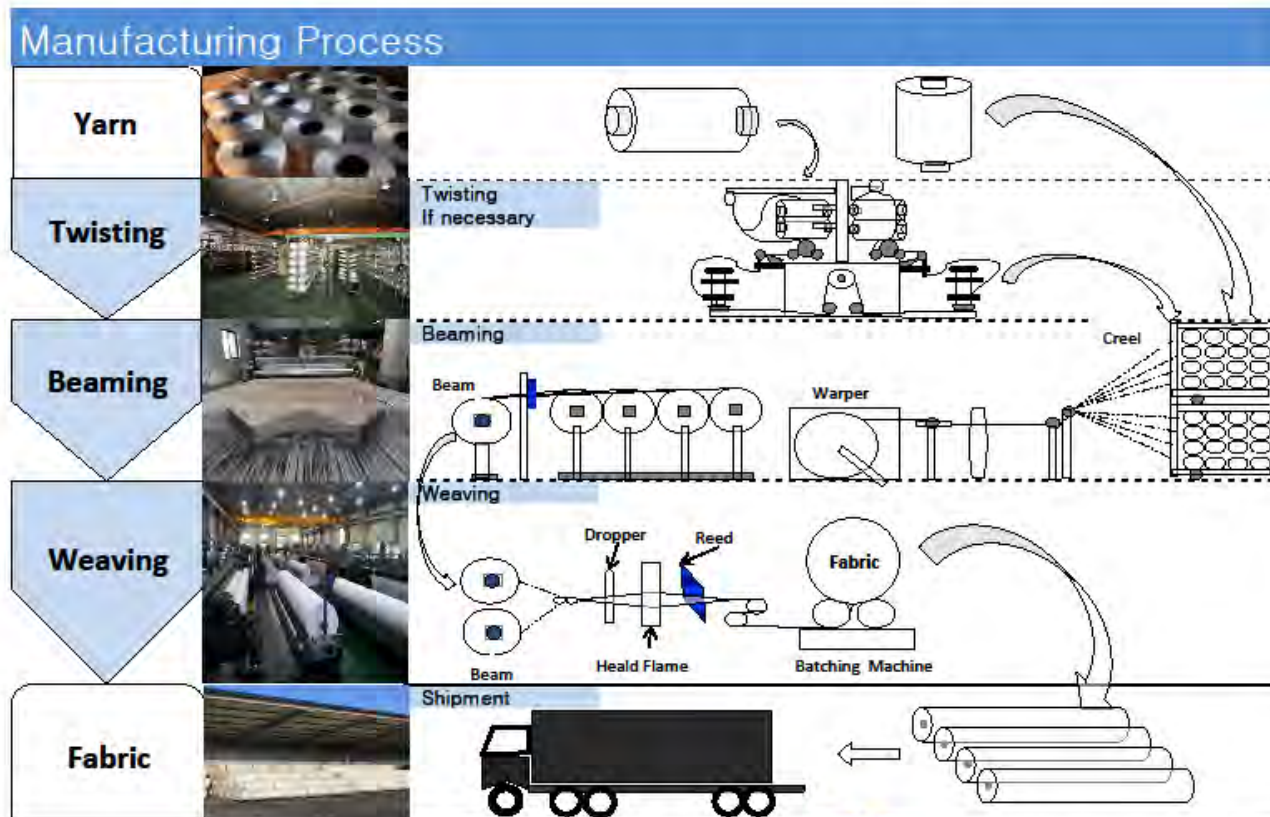
Office 12 Weaving Machines


New Plant – 13 Weaving Machines till 2015 year
and Build another new warehouse system.

New Warehouse

No. 1, Woven Geotextiles Manufacturer in Asia Market !!

MANUFACTURING PROCESS



 Daeyoun Geotech Kimcheon plant

PARTNERSHIP with Construction Company

ORDER



Performance Experience in Vietnam

ORDER

- 2012 : The Sothern Coastal Corridor-Minh Luong Project
Hanoi~Haiphong Express Way.
The Sothern Coastal Corridor-Kenh 14 Bridge
Rach Gia Giang Bypass Project
- 2011 : Hanoi~Haiphong Express Way.
Hochiminh TBO Project.
Caimep Industrial Park.
- 2010 : Hanoi~Haiphong Express Way.
Posco port for steel process factory in Phu My
Industrial Park 2nd area.
Caimep Industrial park.
National way No. 61B project.
National way Hochiminh ~Trung Luong project.
- 2009 : Hanoi~Hochiminh Express Way Cau gie-.Ninh binh project.
National way No. 51 project.
- 2008 : Hanoi~Hochiminh Express Way Cau gie-.Ninh binh project.
Hanoi Than Tri Bridge.

Market Share No. 1
in Vietnam Market
In 2012 & 2013

Performance Experience in Overseas

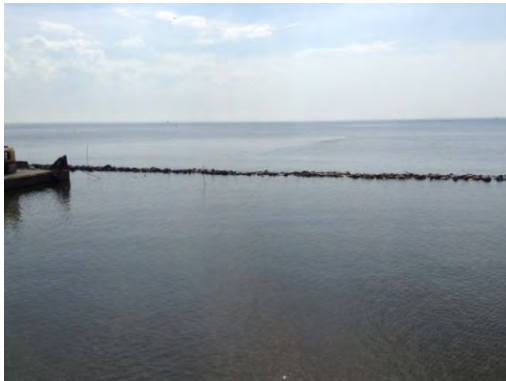
ORDER



Manila, Philippines



Manila, Philippines



Bangkok, Thailand



Korea

- Vietnam
- Philippines
- Thailand
- Malaysia
- Indonesia
- Singapore
- Colombia
- Middle East
- North Africa
- EU
- Russia

**No.1 Manufacturer for
Woven Geotextiles
in Asia**

CERTIFICATION



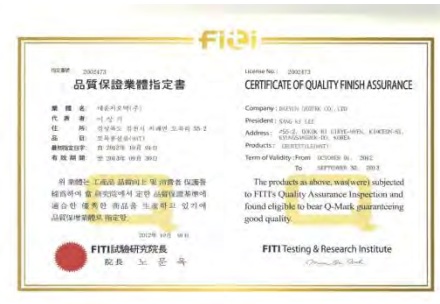
CE Mark by SKZ



ISO 9001 Certification



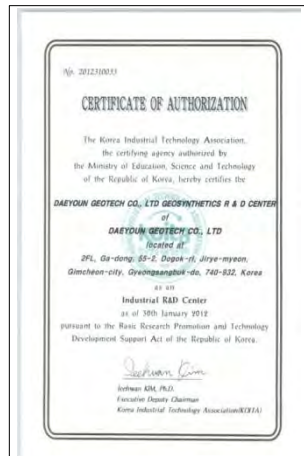
ISO 14001 Certification



Q Mark by FITI



Certificate of Patent DAEYOUN R&D CENTER



Certificate of Reliability



IGS membership (International Geosynthetics Society)

THANK YOU





**Daeyoun Geotech
GEONIA Silt Protector**

Product Catalogue of Daeyoun Geotech GEONIA
Silt Protector

Geonia® is a registered trademark of DAEYOUN GEOTECH.

www.DYGEOTECH.com



GEONIA®

Silt Protector

We develop geosynthetics, under the mission of protecting environment as well as human, and supplying highly efficient and cost-effective solutions to global clients.



HEAD OFFICE (SEOUL) W 1707 Dangsang SKV1 Center, 11, Dangsang-ro 41-gil, Yeongdeungpo-gu, Seoul, 150-806, Rep. of KOREA

Tel: +82-2-539-9700 Fax: +82-2-539-9710 E-mail: overseas@egeonia.com

R&D CENTER (GIMCHEON) 55-2, Dogok-ri, Jirye-myoen, Gimcheon-si, Gyeongsangbuk-do, 740-932, Rep. of KOREA

Tel: +82-2-539-9700 Fax: +82-2-539-9710

FACTORY 1 (GIMCHEON) 55-2, Dogok-ri, Jirye-myoen, Gimcheon-si, Gyeongsangbuk-do, 740-932, Rep. of KOREA

Tel: +82-54-436-0800 Fax: +82-54-436-0550

FACTORY 2 (GIMCHEON) 123, Apogongdan-gil, Apo-eup, Gimcheon-si, Gyeongsangbuk-do, 740-862, Rep. of KOREA

Tel: +82-54-436-0800 Fax: +82-54-436-0550

VIETNAM SALES OFFICE (HOCHIMINH) 41 le trung Nghia P12 Tan Binh district Hochiminh Vietnam

Tel: +84-8-3811-2772 Fax: +84-8-3948-1920 E-mail: day0323@naver.com

JAPAN SALES OFFICE (TOKYO) Nakagawa BLDG, 4FL, 1-14-8, Nishishinbashi, Minato-ku, Tokyo, JAPAN 105-0003

Tel: +81-3-3507-9595 Fax: +81-3-5532-8624



Printed in Jun. 2015

**DAEYOUN
GEOTECH**



SILT PROTECTOR

PRODUCT

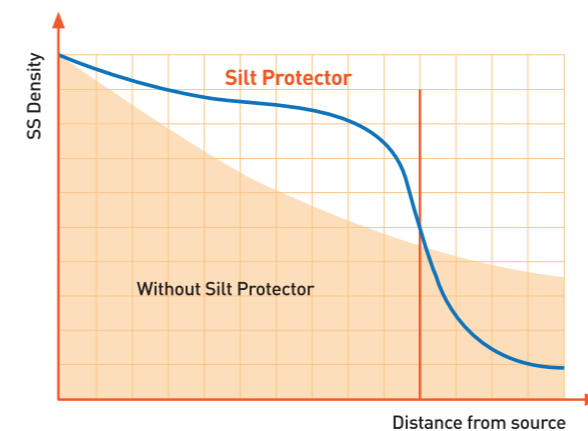
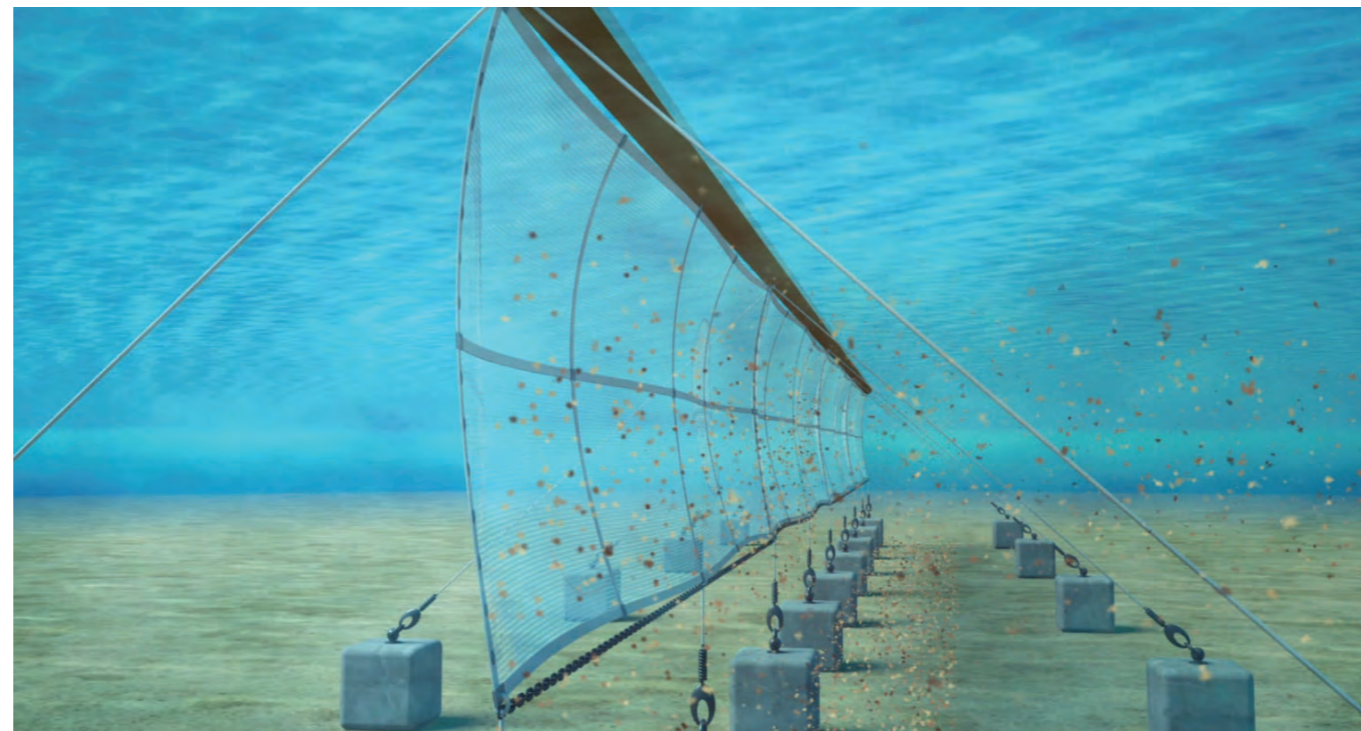
GEONIA® Silt Protector

GEONIA® Silt Protector is a silt fence installed in water for preventing spread of environmental contaminants induced by coastal and riverside construction. Leakage of silt from marine and sewage constructions has a serious influence on marine resources and natural environment of surrounding regions.

GEONIA® Silt Protector is used to preserve the natural environment and protect marine resources. By blocking a specific water zone with a special membrane composed of high strength synthetic fiber, soil particles that occur in the area are filtered and precipitated to prevent leakage and spread of silt water.

Application

- Protection of sea farming and swimming beach from nearby coastal construction
- Reclamation Protection
- Protection of revetment contamination
- Revetment of contaminant

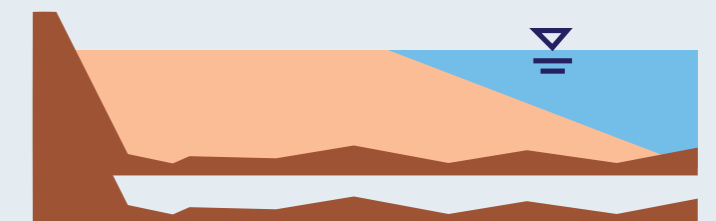


Function

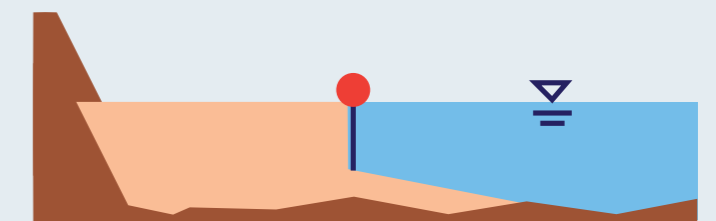
The main function of the GEONIA® Silt Protector is to enclose turbidity and to minimize the influences on outside sensitive areas. Enclosed by Silt Protector, current velocity inside is much lower than outside velocity. This means the GEONIA® Silt Protector is accelerating sedimentation of silt by reducing the flow of velocity.

- The acceleration of the settlement of silt by interference of particles – The installation of GEONIA® Silt Protector suppresses the diffusion of the pollution and make the soil particles interfere with each other to accelerate their settlement.
- The reduction of distance required to settle the silt – As shown, the installation of GEONIA® Silt Protectors narrows the settlement range, resulting in minimizing the diffusion of pollution after the unit.

Without GEONIA® Silt Protector



With GEONIA® Silt Protector

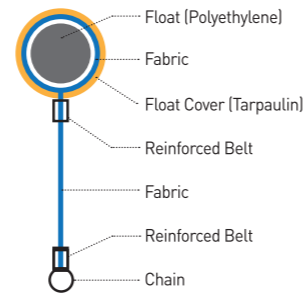
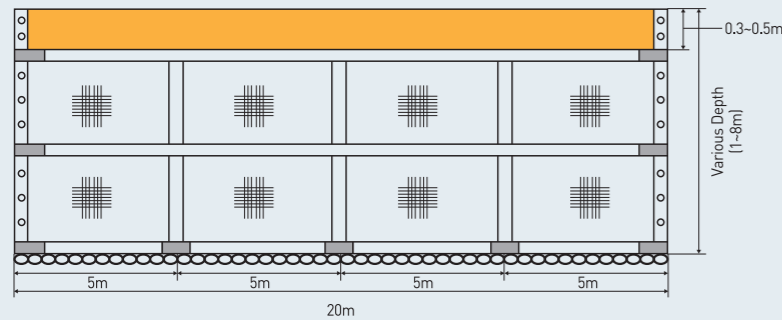


GEONIA® SILT PROTECTOR

TYPES

Tube Type

High external force of tide, wave and wind.

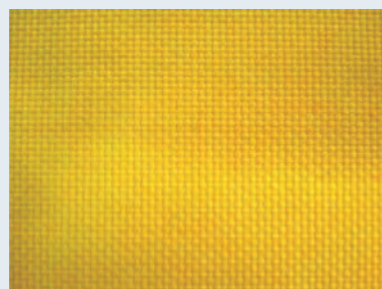


Durable Tube Type

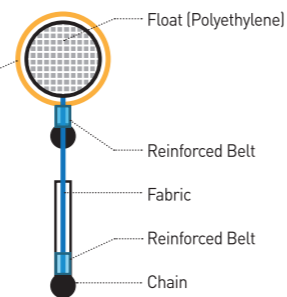
High external force of tide, wave and wind + long resistance from the sunlight



A broken PVC coated fabric in a part of the float



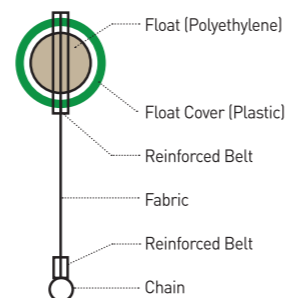
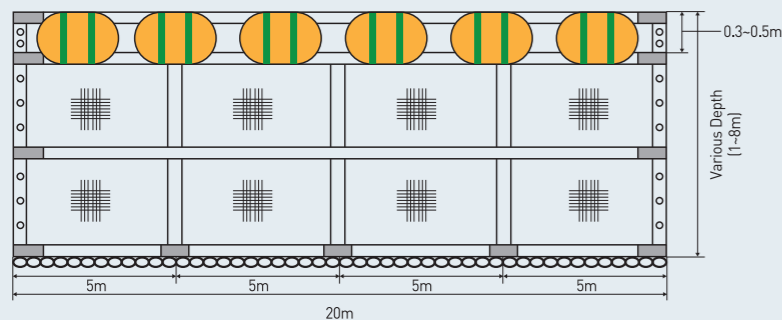
A durable fabric for the float using high tenacity colored yarn



Durable Tube Type GEONIA® Silt Protector applies a durable fabric for the float device by using high tenacity colored yarn, which was improved to solve the problem of fault construction, poor visibility caused by a damaged PVC coated fabric, and marine pollution of a broken PVC coated fabric.

Covering Head Type

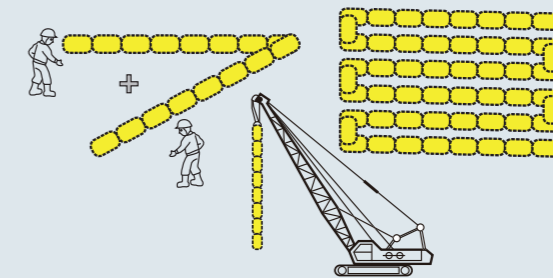
Less external force than tube type / easy to install



INSTALLATION

Installation of Tube Type GEONIA® Silt Protector

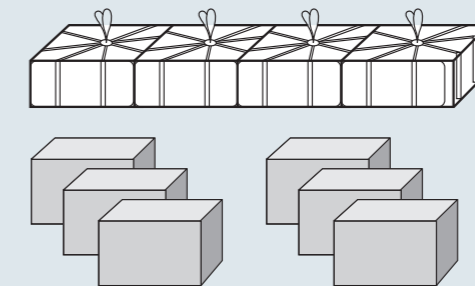
Assembly



Connect each unit of Silt Protectors (Assemble on land)



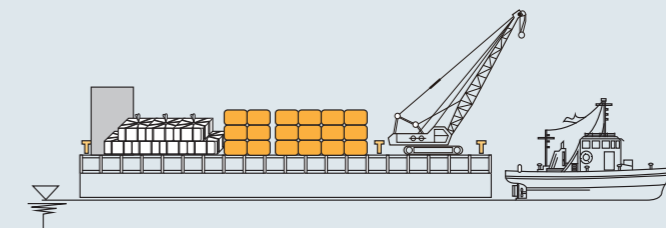
Production of Anchors



Make Ton Bag Anchors or Concrete Blocks



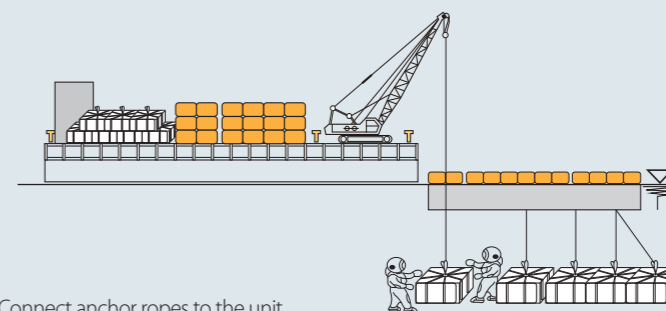
Transportation



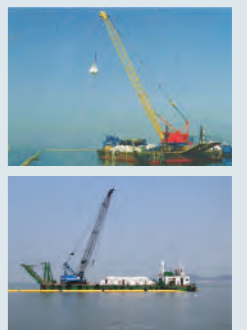
Load on to barge and move to where you want to install



Installation



Connect anchor ropes to the unit





Daeyoun Geotech
GEONIA Silt Protector

Product Specification of GEONIA Silt Protector

GEONIA® Silt Protector DSP Technical Data Sheet
 High Performance Silt Protector (Floating Curtain)

www.egeonia.com
DSP15 (150/150)

Mechanical Properties	Test Method		Unit		Value
Physical Properties					
Tensile Strength	MD	ASTM D4595	kN/m	≥	150
Tensile Strength	CD	ASTM D4595	kN/m	≥	150
Elongation	MD	ASTM D4595	%	≤	15
Elongation	CD	ASTM D4595	%	≤	15
Rate of Contraction		ISO 7771	%	±	0.2
Hydraulic Properties					
Water flow rate (h:50mm)		ASTM D4491	l/m ² /sec (mm/sec)	≥	1.0
Water Permittivity (h:50mm)		ASTM D4491	sec ⁻¹	≥	0.02
Apparent Opening Size(O ₉₅)		ASTM D4751	mm	≤	0.075

Above data sheet is our standard properties for the reference usage. DAEYOUN GEOTECH will not be responsible caused by any discrepancy with above data sheet. Please contact us if you need specified data sheet.

GEONIA® is a registered trademark of DAEYOUN GEOTECH.
MADE IN KOREA



DSP METALIC PARTS METARIAL AND COATING

2014-12-24

ITEM	METARIAL	COATING
EYELET	STEEL (S20C)	PAINTING (oil based paint)
STEEL PLATE	STEEL (S20C)	GALVANIZED (50~80μm)
REINFORCED STEEL PLATE	STEEL (S20C)	HOT DIP GALVANIZE (over 80μm)
BOLT&NUT	STEEL (S20C)	GALVANIZED (50~80μm)
CHAIN	STEEL (S20C)	COAL TAR PAINTING

* Above materials and coating methods can be changed according to manufacturer's decision.

* Any kind of change will be noticed to buyer in advance when it occurred.



Daeyoun Geotech
GEONIA Silt Protector

Certificate



Certification of Registration

DAEYOUN GEOTECH CO., LTD.

Head Office : 11, Dangsang-ro 41-gil, Yeongdeungpo-gu, Seoul, Korea
Factory : 123, Apogongdan-gil, Apo-eup, Gimcheon-si, Gyeongsangbuk-do, Korea

STANDARDS

ISO 9001 : 2008 / KS Q ISO 9001:2009

SCOPE OF SUPPLY

**Manufacture and Servicing of Industrial Fabrics
(PET Woven Geotextile, PP Woven Geotextile, Geocomposite, Base Cloth,
Geotextiles & Geosynthetics) , Twisted Yarns, Silt Protector & Sewing**

ITS Certification Body certifies that Quality Management System of this organization is conforming to the standard and certificate scope.

Certificate Valid Date : 19-Apr-2016 ~ 30-Aug-2019

Certificate No. : ITS-KQ-00426

Date of Initial Approval : 11-Oct-2010

Initial Certificate Expiry Date : 30-Aug-2016

Recertificate Issued Date : 13-Jul-2016

13-Jul-2016

by Joon Young Park

President



INTELLIGENCE TECHNOLOGY STANDARD ASSURANCE

서울시 영등포구 63로 32 (여의도동 라이프콤비 B/D) 1302 Website: www.itscert.or.kr webmaster@itscert.or.kr



- * KAB 마크는 한국인정원으로부터 품질/환경 인증기관으로 지정 (지정번호 : KAB-QC-46/KAB-EC-41) 되었음을 나타내는 인정마크입니다.
- * IAF MLA 마크는 QMS/EMS에 대한 국제인증기관협력기구의 국제다자간 상호 인정협정가입인증기관에 의한 인정마크입니다.



This certificate is the property of ITS Inc. and must be returned on request by ITS Inc.
*This certificate is available by September 14 2018 in accordance with the revised 2015 version of ISO standard.

Recertification Audit Date : 2016 07.11~12

Version 1.0



Certification of Registration

DAEYOUN GEOTECH CO., LTD.

Head Office : 11, Dangsang-ro 41-gil, Yeongdeungpo-gu, Seoul, Korea
Factory : 123, Apogongdan-gil, Apo-eup, Gimcheon-si, Gyeongsangbuk-do, Korea

STANDARDS

ISO 14001 : 2004 / KS I ISO 14001:2009

SCOPE OF SUPPLY

**Manufacture and Servicing of Industrial Fabrics
(PET Woven Geotextile, PP Woven Geotextile, Geocomposite, Base Cloth,
Geotextiles & Geosynthetics), Twisted Yarns, Silt Protector & Sewing**

ITS Certification Body certifies that Environment Management System of this organization is conforming to the standard and certificate scope.

Certificate Valid Date : 31-Aug-2016 ~ 30-Aug-2019

Certificate No. : ITS-KE-00231

Date of Initial Approval : 11-Oct-2010

Initial Certificate Expiry Date : 30-Aug-2016

Recertificate Issued Date : 13-Jul-2016

13-Jul-2016

by Joon Young Park

President



INTELLIGENCE TECHNOLOGY STANDARD ASSURANCE

서울시 영등포구 63로 32 (여의도동 라이프콤비 B/D) 1302 Website: www.itscert.or.kr webmaster@itscert.or.kr



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- * IAF MLA 마크는 QMS/EMS에 대한 국제인정기관협력기구의 국제다자간 상호 인정협정가입인정기관에 의한 인정마크입니다.



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*This certificate is available by September 14 2018 in accordance with the revised 2015 version of ISO standard.

Recertification Audit Date : 2016 07.11~12

Version 1.0



Daeyoun Geotech
GEONIA Silt Protector

Installation, Caution & Maintenance Guideline



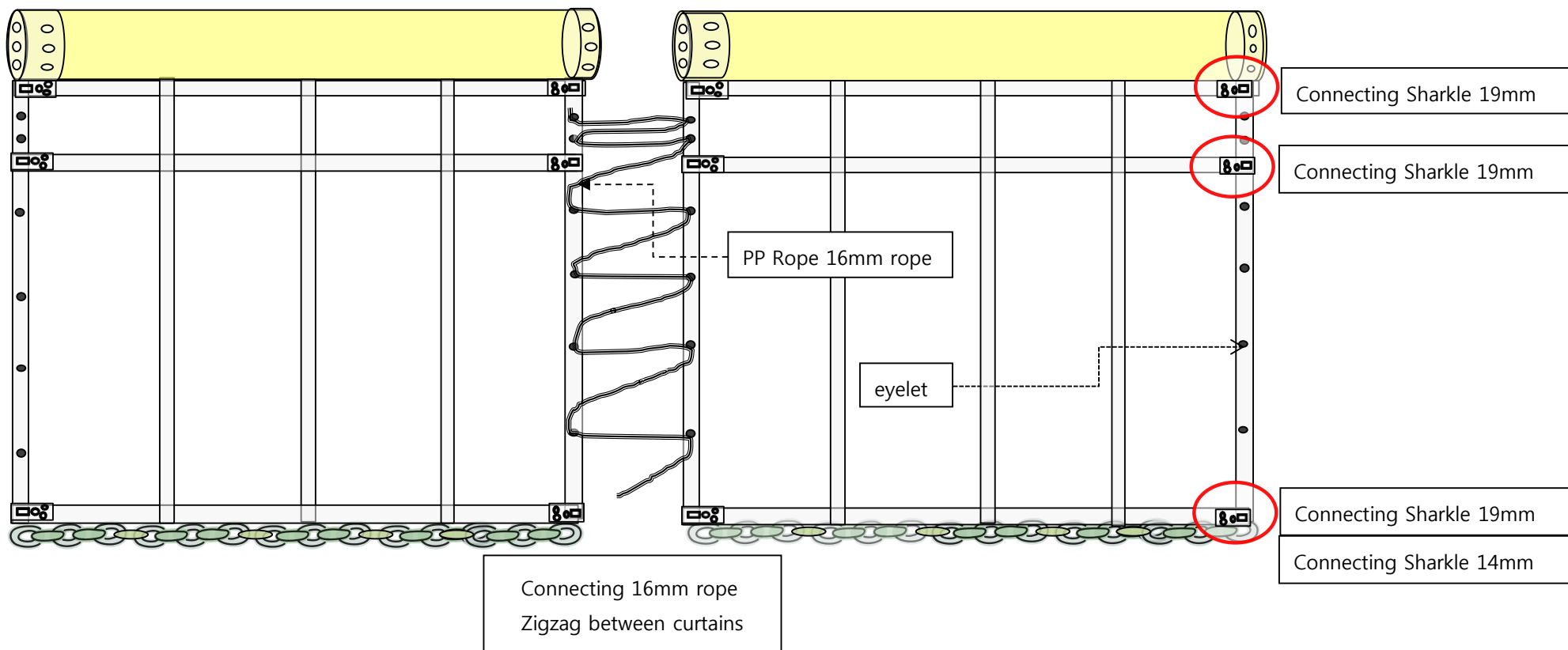
Silt Protector

Installation

Caution

Maintenance

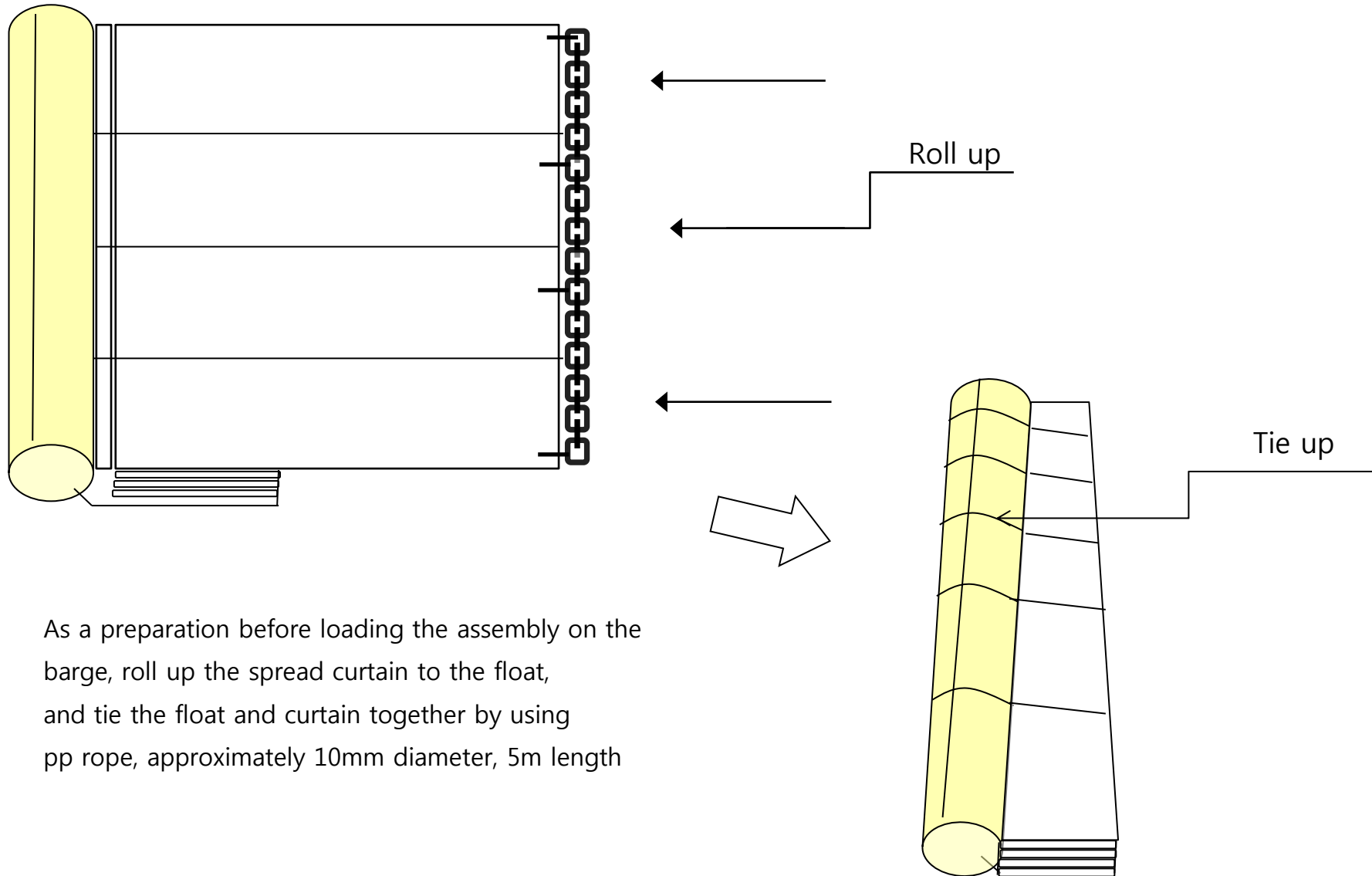
Installation Guide (Connecting curtain and curtain)



* Number of connections (between curtain and curtain)

	19mm sharkle	No. of eyelet
2m height of curtain	3	6
3m height of curtain	4	9
4m height of curtain	4	12
5m height of curtain	5	15
6m height of curtain	5	18

Installation Guide (Temporary tying curtains)



As a preparation before loading the assembly on the barge, roll up the spread curtain to the float, and tie the float and curtain together by using pp rope, approximately 10mm diameter, 5m length

Caution

Caution

Designate a person who is in charge of management of the Silt Protector.

If an environment that exceeds the design conditions is estimated, remove the Silt Protector immediately, or the unit may be damaged. If the Silt Protector requires a repair, take necessary actions soon. If it is left without being repaired, the function of the unit may be affected adversely or the damage may expand so that it cannot be repaired.

If the Silt Protector has been dislocated from the proper position or the layout has been deformed, restore it to original position or formation immediately. Otherwise, serious accident may be caused.

Be careful not to damage the float and curtain when removing sea shells and plants from these components. The float is made of Styrofoam which is inflammable. Keep fire away from this component.

Preconditions for maintenance

Check the Silt Protector periodically, and any component that have been deteriorated due to aging must be repaired or replaced with new component.

Maintenance 1

Maintenance

Daily inspection

The Silt Protector should be visually monitored by patrol during the period it is placed in the water. The patrol is performed on the boat for the purpose of preventing ships from running against the unit and of finding abnormality in earlier phase. (once per day)

Caution: In case the Silt Protector has a serious trouble, Failure to do the daily check may cause serious trouble in addition to the loss of its normal pollution protection performance.

Periodic inspection

In addition to visual inspection on the boat, periodically dive to check the unit thoroughly. (Once per every three months)

Caution: In case the Silt Protector has been damaged, failure to do the periodical check may cause the loss of its normal pollution protection performance and a damage that cannot be repaired to occur.

Extra inspection

After typhoon or other abnormal weather, check the unit for the purpose of finding possible damages or troubles earlier. This check is performed basically on the boat, but dive to check the unit if necessary.

Caution: In case the Silt Protector has been seriously damaged, failure to do the extra check may cause the loss of its normal pollution protection performance and a damage that cannot be repaired to occur.

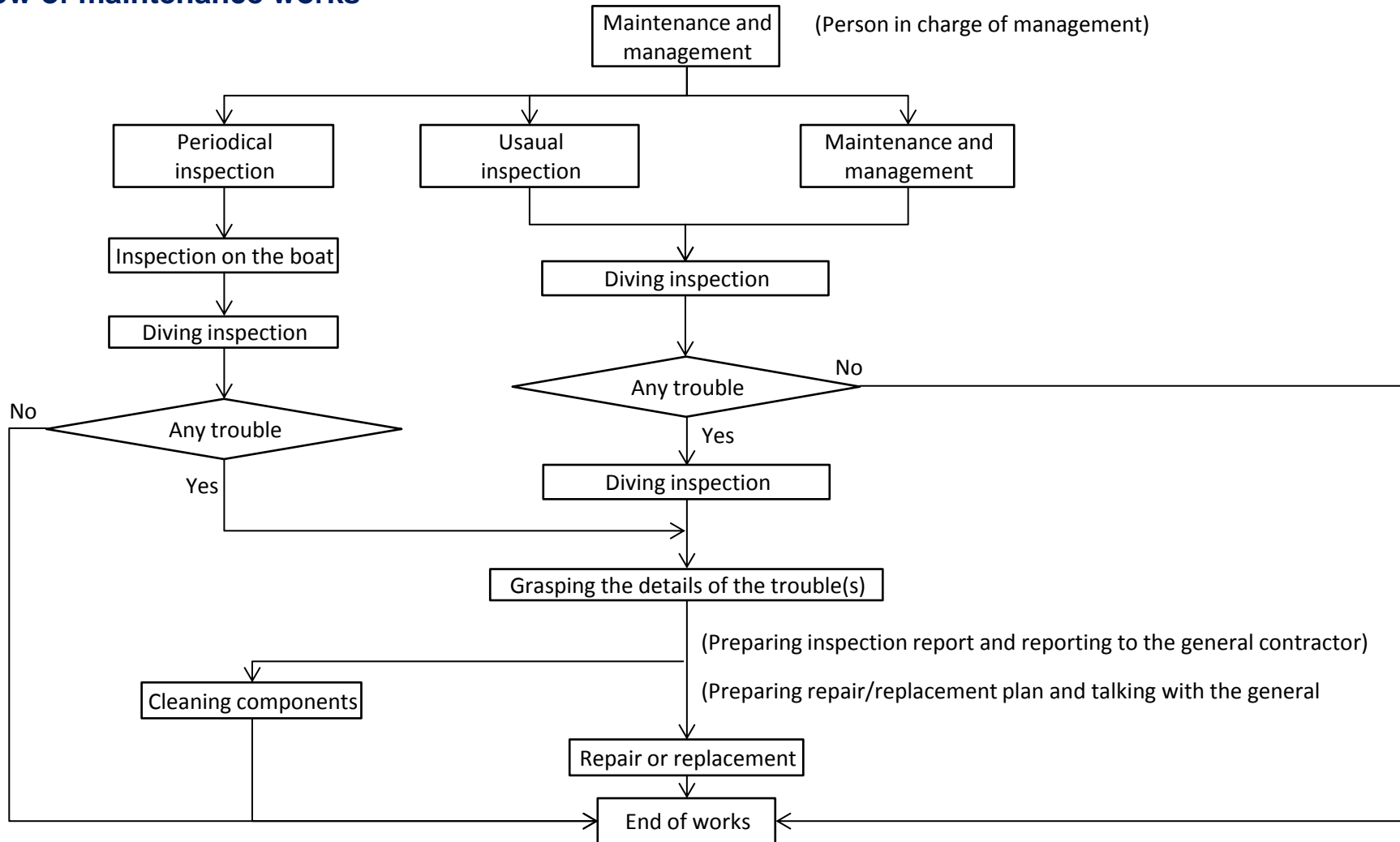
Sea shell removal

If it is found that the freeboard of the float is less than 1/2 of its diameter due to increase of the total weight with the growth of sea shells and plants on the float and curtain, dive to clean these components. It is recommended to monitor the change of the freeboard of the float. Check it at the periodical inspection, and record the growth of the sea organisms. (perform these works as necessary.)

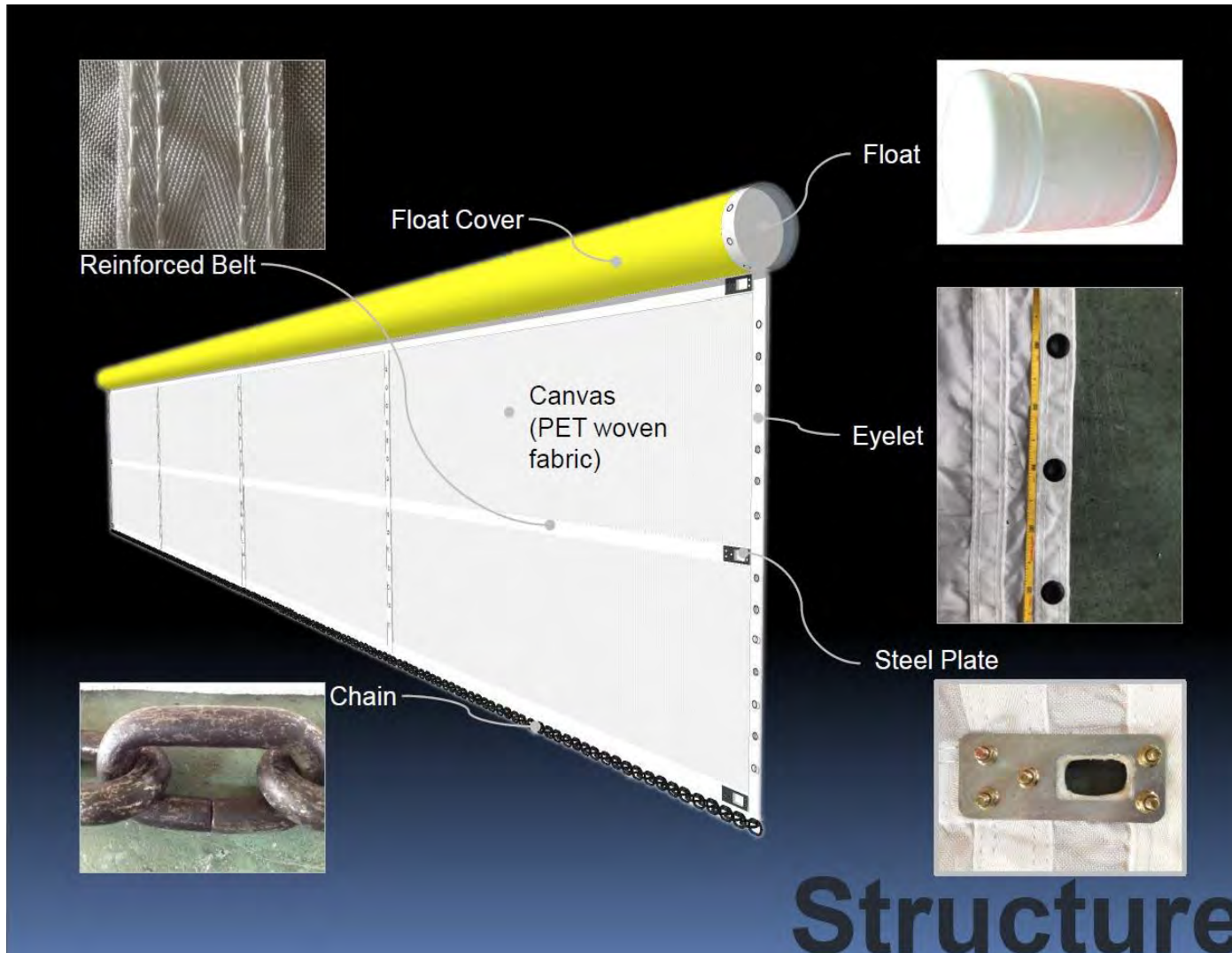
Caution: Failure to do the cleaning may increase the weight of the Silt Protector resulting in sinking it to cause loss of the function. Be careful not to damage the Silt Protector when cleaning the unit.

Maintenance 2

Flow of maintenance works



Parts



Project list of Silt Protector

We, Daeyoun Geotech, hereby certify that the following are our main project list in **Vietnam**.

Name of Project	Contract Amount (USD)	Month/Year	Span
NSRP Project	300,000	Sep. 2013	150 spans
Lach Huyen Project	100,000	Sep. 2013	100 spans
Total	400,000	-	250 spans

We, Daeyoun Geotech, hereby certify that the following are our main project list in **Korea**.

Name of Project	Contract Amount (USD)	Month/Year	Span
Gamcheon Port (International Fish Market) Construction	160,000	Nov. 2013	267 spans
Boryeong-Taeon 2 Sector	210,000	Oct. 2013	350 spans
Heaundae Beach	432,000	May. 2013	720 spans
Dangjin Thermal Power Plant Construction	450,000	Aug. 2013	750 spans
Incheon Port International Passenger Wharf Construction	10,000	Sep. 2012	17 spans
Pusan New Port Second (2-5 Step)	10,000	Sep. 2012	17 spans
Galsa Bay Shipbuilding Industry Construction	100,000	Aug. 2012	167 spans
Mokpo South-Port Government Ships Pier Construction	50,000	Aug. 2012	83 spans
Aewol Port Step 2	10,000	Jul. 2012	17 spans
Port Mooring Facilities Construction	15,000	Mar. 2012	25 spans
Gogyunsan 3 Sector	10,000	Jan. 2012	17 spans
Gwangyang Drainage Construction	15,000	Jan. 2012	25 spans
Sinma Port Construction	25,000	Jul. 2011	42 spans
Ulsan New Port Construction	12,000	Jul. 2011	20 spans
Gwangyang Plant Expansion Construction	20,000	May. 2011	33 spans
Yeosu Oil Tank Construction	10,000	Apr. 2011	17 spans
Samcheong Green Power Construction	13,000	Feb. 2011	22 spans
Pusan Port Coast Guard Pier Construction	10,000	Feb. 2011	17 spans
Jeongoghang Aquarium Relocation	10,000	Feb. 2011	17 spans
Dangjin Thermal Power Plant Construction	15,000	Feb. 2011	25 spans
Kyungin-Ara Waterway Construction	12,000	Feb. 2011	20 spans
Seogmun 5 Sector	10,000	Jan. 2010	17 spans
Daewoo Tongyeong LNG Construction	20,000	Sep. 2009	33 spans
Total	1,629,000	-	2715 spans

SILT PROTECTOR PROJECT LIST (OVERSEAS)

We, Daeyoun Geotech, hereby certify that the following are our main overseas project list in overseas

Name of Project	Nation	Contract (USD)	Month/Year
Pinang Island Reclamation Project	Malaysia	11,585	MAR. 2016
Tsuen Wan West Station, TW-6 Property Development	HongKong	898	AUG. 2015
Replacement and rehaulitaion of water mains at Peng Chau	HongKong	3,016	MAR. 2015
Deep vemet Mixing Trial Works	HongKong	10,186	MAR. 2015
Dual 2-lane carriageway between HZMB BCF and North Lantsu Highway	HongKong	20,306	APR. 2014
Catbi airport	VIETNAM	300,000	DEC. 2013
Congio Island development	VIETNAM	100,000	DEC. 2013
Congio Island development	VIETNAM	100,000	DEC. 2013
Pomosa Posco	VIETNAM	300,000	DEC. 2013
Hanoi-Haiphong pkg7 GS	VIETNAM	500,000	DEC. 2013
Pomosa Hathin Steel	VIETNAM	200,000	DEC. 2013
Camau Road & etc	VIETNAM	1,500,000	DEC. 2013
The Sothern Coastal Corridor-Minh Luong project	VIETNAM	730,000	DEC. 2012
Siltprotect(NSRP Project)	VIETNAM	300,000	SEP. 2013
Siltprotect(Lach Huyen Project)	VIETNAM	100,000	SEP. 2013
The Sothern Coastal Corridor-Kenh 14 Bridge	VIETNAM	100,000	NOV. 2012
Rach Gia Giang Bypass Project	VIETNAM	250,000	NOV. 2012
Hanoi-Haiphong Express Way 5 Sector	VIETNAM	500,000	AUG. 2012
Hanoi-Haiphong Express Way 4 Sector	VIETNAM	1,000,000	MAR. 2012
Hanoi-Haiphong Express Way 6 Sector	VIETNAM	520,000	MAR. 2012
Hanoi-Haiphong Express Way 2 Sector	VIETNAM	520,000	OCT. 2011
Hanoi-Haiphong Express Way 10 Sector	VIETNAM	520,000	SEP. 2011
Hanoi-Haiphong Express Way 3 Sector	VIETNAM	600,000	SEP. 2011
Hanoi-Haiphong Express Way 8 Sector	VIETNAM	600,000	SEP. 2011
Hanoi-Haiphong Express Way 7 Sector	VIETNAM	615,000	APR. 2011
Hochiminh TBO Project	VIETNAM	50,000	APR. 2011
Posco port for steel process factory in Phu My	VIETNAM	150,000	APR. 2010
National way Hochiminh~Trung Luong project	VIETNAM	200,000	FEB. 2010
Caimep Industrial Park	VIETNAM	200,000	JUN. 2010
National way No. 61B project	VIETNAM	200,000	JUN. 2010
National way No.51 project	VIETNAM	300,000	JUN. 2009
Hanoi-Hochiminh Express Way Caugie-Ninh binh project	VIETNAM	400,000	JAN. 2008
Hanoi Than Tri Bridge	VIETNAM	300,000	JAN. 2008



**Daeyoun Geotech
GEONIA Silt Protector**

Project Reference



Daeyoun Geotextile Silt Protector

Date	Project	Client	Consultant	Model	Size (W x Lm)	No. of Span
Jul-03	CV/2002/04 Penny's Bay Reclamation Stage 2	Gammon Construction Ltd	Scott Wilson Ltd		5 x 20m 5 x 10m	86 256
May-13	DC/2011/01 Drainage Maintenance and Construction in Mainland South Districts (2011-2015)	World Diamond Engineering Ltd	Drainage Services Department	GSP 15	5x20m 3x5m 3x2m 3x13m	1 10 1 4
Apr-14	HY/2012/07 Dual 2-lane carriageway between HZMB BCF and North Lantau Highway	Gammon Construction Ltd	AECOM Asia Co Ltd	DSP15	6 x 20 7 x 20 9 x 20	24 10 10
Mar-15	16/WSD/11 Replacement and rehabilitation of water mains at Peng Chau, Sunshine Island and Hei Ling Chau	Pipe Tech Ltd MIRDTEC HK Ltd	AECOM Asia Co Ltd	DSP 15 DSP 15 DSP 15	0.6 x 20 1.2 x 20 1.5 x 20	1 22 6
Mar-15	P552 Deep Cement Mixing Trial Works	Penta Ocean Construction Co	Atkins	DSP30 DSP30	8 x 20 8 x 25	2 6
Aug-15	Tsuen Wan West Station, TW-6 Property Development	Hip Hing Construction Co Ltd	Mannars Chan & Associates	DSP15	4 x 20	1
Dec-15	HK/2012/08 Wan Chai Development Phase II - Central Wan Chai Bypass at Wan Chai West	China State - Leader JV	AECOM Asia Co. Ltd	DSP30 DSP30 DSP15 DSP15 DSP15	10 x 20 5 x 10 10 x 20 9 x 20 8 x 20	6 6 5 5 5
Mar-16	Asia Pacific Gateway (APG) - Tseung Kwan O (Cape Collinson)	Maritime Mechanic Ltd	Environmental Resources Management	DSP15	14 x 12	20
Nov-16	Dredging works at Marina Cove	Fung Kau Kee Contractors Ltd		DSP15	5 x 20	2
Nov-16	HY/2012/08 Tuen Mun - Chek Lap Kok Link Northern Connection Sub-sea Tunnel Section	Crown Asia Engineering Ltd Dragages - Bouygues JV	AECOM Asia Co. Ltd	DSP15	8 x 20 9 x 20 10 x 20 Marker Buoy Dia: 520mm	5 5 5 12 nos.
Dec-16	C3203 3rd Runway System Project DCM Ground Improvement Works (Package 3)	Sambo E & C Co Ltd	Airport Authority	DSP 30 Barge Type	4 x 10 2 x 10 4 x 9 1.6 x 9 2.8 x 9 1.8 x 9 2 x 9	46 2 246 4 2 2 2
Dec-16	C3204 3rd Runway System Project DCM Ground Improvement Works (Package 4)	CRBC-Sambo JV	Airport Authority	DSP30	6 x 5.3 6 x 11.3 6 x 12.3 6 x 12.8 6 x 13.8 6 x 6	2 2 20 4 4 30
Jan-17	C3201 3rd Runway System Project DCM Ground Improvement Works (Package 1)	Penta Ocean-China State- Dong Ah JV	Airport Authority	DSP 30	6 x 8	134
Feb-17	P560 Aviation Fuel Pipeline Diversion Works	Kat Yue Construction Engineering Ltd	Airport Authority	DSP15	1.5 x 20	8
Apr-17	HKHA20120023 Public rental housing, Shek Mun Estate	Hin Sum Engineering Co Ltd	Housing Authority	DSP / SG110	3 x 20	2
Jun-17	C3204 3rd Runway System Project DCM Ground Improvement Works (Package 4)	CRBC - Sambo JV	Airport Authority	DSP30	6 x 6	50
Jul-17	Refuse Boom at Tai O by World Wide Fund	G and E Co Ltd		DSP15	0.5 x 20	3
Aug-17	Lyric Theater Complex and Extended Basement Project for the WKCD Authority	Gammon Construction Ltd	AECOM Asia Co. Ltd / Mott Macdonald HK	DSP15	8 x 20	6



G AND E COMPANY LIMITED

14/F Kiu Yin Commercial Building
361 - 363 Lockhart Road,
Wanchai, Hong Kong
Tel: 852-2570 0103 Fax: 852-2570 0089
website: www.g-and-e.com



Date	March 2016
Project	Asia Pacific Gateway (APG) - Tseung Kwan O
Client	China Mobile International Limited
Consultant	Environmental Resources Management
Main Contractor	Maritime Mechanic Ltd
Works	Fiber Optic Laying Turbidity Control
Material	DSP15 Silt Curtain



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361 - 363 Lockhart Road,
Wanchai, Hong Kong
Tel: 852-2570 0103 Fax: 852-2570 0089
website: www.g-and-e.com



Date	May 2014
Project	HY/2012/07 Tuen Mun - Chek Lap Kok Link- Sothern Connection Viaduct Section
Client	Highway Department
Consultant	AECOM Asia Co. Ltd
Main Contractor	Gammon Construction Ltd
Material	DSP 15 Silt Curtain
Quantity	6m x 20m 24 spans 7m x 20m 10 spans 9m x 20m 10 spans



G AND E COMPANY LIMITED

14/F Kiu Yin Commercial Building
361 - 363 Lockhart Road,
Wanchai, Hong Kong
Tel: 852-2570 0103 Fax: 852-2570 0089
website: www.g-and-e.com






Date	April 2015
Project	Contract No. 16/WSD/11 Replacement and rehabilitation of water mains, stage 4 phase 2
Client	Water Service Department
Consultant	AECOM Asia Company Limited
Main Contractor	Pipe Tech Ltd
Material	Daeyoun Geotech DSP 15 Silt Curtain
Quantity	1.2 x 20m 2 spans 1.5 x 20m 4 spans



**Daeyoun Geotech
GEONIA Silt Protector**

Approval Letter

		CONTRACTOR'S SUBMISSION	CR-CPJV 	CS No.	Rev
				CCOM No.	1503
NEC Option C					
CONTRACT:	Improvement of Fresh Water Supply to Cheung Chau	CONTRACT No.:	1/WSD/13		
LETTER REF.:	CR-CPJV/1WSD/13/S210(01)/574	ISSUE DATE:	26-Sep-2015		
CAPTION:	Submission of Alternative Design and Material for Silt Curtain	PREVIOUS SCOMM.:			
DISCIPLINE:	N/A	REVISION No.:			

Section A:

To: The Project Manager

Submission for Acceptance of:

Copies to: Mr. Stephen Cheung W/E

Period for reply:

- Drawings
- Programme
- Test Results
- Method Statement
- Others: _____



The following is submitted for your review and acceptance:-

Copies	Date	No.	Description
1	26-Sep-15		Submission of Alternative Design and Material for Silt Curtain

We submit herewith the alternative design and material for silt curtain. The material is supplied by "G AND E COMPANY LIMITED". Attached please find the quotation of materials, design drawings and materials catalogue for your information and approval. the proposed materials shall be "Covering Head Type" as shown in the

Signed for Contractor:

Title: Gordon Ng
(Site Agent)

Section B: Response **COMM No.:** _____ **Letter Ref.:** _____

To: The Contractor

The Submission is returned as indicated:

Copy to:

- Accepted
- Accepted as Noted
- Revise and Re-submit as Noted
- Rejected as Noted

Notes:




Contractor reply needed: Yes / No

Signed by: _____

Period for reply:

Name / Title: _____

Date: _____

		CONTRACTOR'S SUBMISSION	CR-CPJV 	CS No.	Rev
				CCOM No.	1541
NEC Option C					
CONTRACT:	Improvement of Fresh Water Supply to Cheung Chau	CONTRACT No.:	1/WSD/13		
LETTER REF.:	CR-CPJV/1WSD/13/S210(01)/589	ISSUE DATE:	13-Oct-2015		
CAPTION:	RE: Submission of Alternative Design and Material for Silt Curtain	PREVIOUS SCOMM.:	SCOM/01448		
DISCIPLINE:	N/A	REVISION No.:			

Section A:

To: The Project Manager

Copies to: Mr. Stephen Cheung W/E

Period for reply:

Submission for Acceptance of:

- Drawings
- Programme
- Test Results
- Method Statement
- Others: _____

LETTER IN
No. 1897

The following is submitted for your review and acceptance:-

Copies	Date	No.	Description
1	13-Oct-15		RE: Submission of Alternative Design and Material for Silt Curtain

We refer to your letter SCOM/01448 dated 7 October 2015 regarding the captioned, we submit herewith the supplementary document in response to the comments given for your approval.

1. Confirmation letter from supplier.
2. As shown in the quotation, one span is 20m length.
3. Verification of material from ET.

RECEIVED
20 OCT 2015

BY: 

Signed for Contractor: _____
(Original Signed)

Title: Gordon Ng
(Site Agent)

Section B:	Response	COMM No.: SCOM/01472	Letter Ref.: 1/WSD/13/M25/350/02655
-------------------	-----------------	-----------------------------	--

To: The Contractor
Attn: Mr. Gordon Ng (Site Agent)

Copy to:

Caption: **RE: Submission of Alternative Design and Material for Silt Curtain**

Notes:

We have no adverse comment on the proposed silt curtain subject to the following:

1. Please ensure the depth of the silt curtain is longer than the water depth at the installation location as recommended by the ET in the submitted email;
2. The verification from the ET would be forwarded to the IEC accordingly and addition comments may be issued; and
3. Please detail the subcontracting arrangement for the installation, maintenance and repair as commented in our previous reply (SCOM/01503).

Contractor reply needed: Yes / No (for comment no. 3)

Period for reply: 21 days

Signed by:

Name / Title:

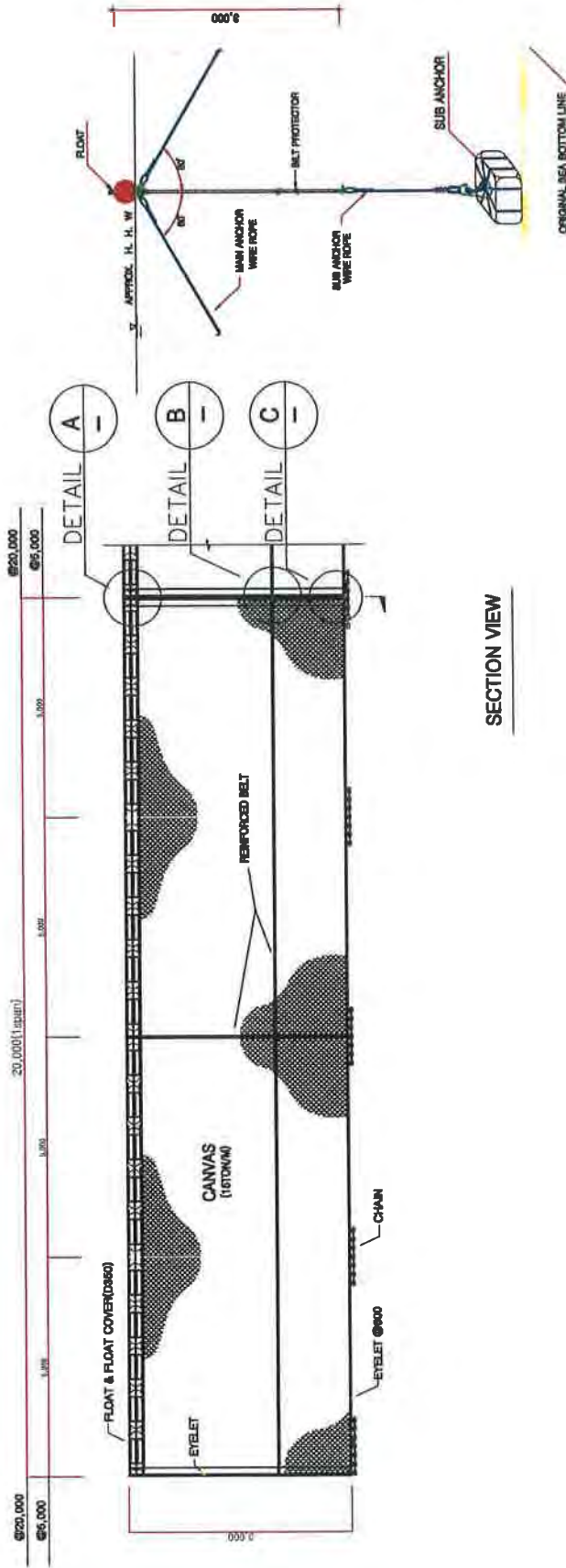
Date:



Stephen S. CHEUNG / SRE
Supervisor's representative

19 October 2015

SILT PROTECTOR (Cover Type)



SECTION VIEW



DETAIL A

DETAIL B

DETAIL C

설계자

실시자

DESIGNED BY

DATE

CHECKED

SCALE

APPROVED BY

DATE

DESIGN NO.

REVISION SHEET NO.

PROJECT

SHEET TITLE

DSP16/S120/D360



**Daeyoun Geotech
GEONIA Silt Protector**

Prototype Sample

Prototype Sample



Tube Type



Coverhead Type





Daeyoun Geonia DML80
Non Woven Geotextile

Introduction to G and E Co. Ltd



G AND E COMPANY LIMITED

14/F Kiu Yin Commercial Building
361 – 363 Lockhart Road,
Wanchai, Hong Kong
Tel: 2570 0103

Fax: 2570 0089

website: www.g-and-e.com

G and E – a Perspective

G and E, founded in 1984, is a geosynthetics specialist who distributes a wide variety of geosynthetics from a list of renowned global manufacturers. The Company also manages a competent installation contracting service. To better serve our clients, design and engineering service have also been established in our portfolio. We aspire to provide our client comprehensive engineering solutions, from technical application and design, the supply of materials and their installation, to the conformance testing and project commissioning.

G and E takes a strong vision on geosynthetics application and development by working closely with international consultants, academics, professional organizations, research institutions, testing laboratories and renowned manufacturers, a mission to broaden the versatility of geosynthetics and its innovation.



Our vast product range covers:

Geotextile, geomembrane, geodrain, geocomposite, geogrid, geocell, band drain, erosion control systems, geosynthetic clay liner, rockfall barrier, gabion, geofoam, silt curtain, concrete mattress and geotextile container, extending a very wide scope of application in most civil, geotechnical and marine engineering.

We offer our clients:

- Extensive product knowledge and installation method statement
- Comprehensive services, application, design, contracting and commissioning
- Highly attentive and superior professional work
- Superb quality products at competitive price



G and E is ISO9001:2008 quality management certified, and a VSRS registered subcontractor. G and E has a remarkably successful working relationship with a long list of clients, the Government, project owners, contractors, designers, consultant engineers, overseas distributors and trading partners. The clientele extends to Macau, Southeast Asia and Southern China.

Talk to us today and see how we can work together for cost-effective and time saving solutions. We are stepping into our 32nd year in the field and have valuable experience to share with you.

ISO9001:2008

International Geosynthetics
Society

Product Endorsement

A Registered Subcontractor



G and E is a distribution network and sourcing agent of geosynthetics, as well as a provider of professional design and installation services.



Central – Wan Chai Bypass - seawall separation using heavy non-woven geotextile Bontec SNW120

The company handles a comprehensive range of geosynthetic materials:

<u>GEOTEXTILE:</u>	PP, PET woven, non-woven, thermal bonded, needle punched, spun bond, special weave & composite
<u>GEOMEMBRANE:</u>	HDPE, LLDPE, PVC, keyed preformed, tunnel lining, concrete protection liner, gas barrier, basement waterproofing, leakage collection & effluent containment
<u>GEODRAIN:</u>	Geonet, geocomposite, band drain, sheet drain & roof drain
<u>GEOGRID:</u>	HDPE, PET, PP for reinforced slope and wall, MSEW, stabilization geogrid, special composite
<u>EROSION CONTROL:</u>	Erosion mat, concrete mat, coir mat, geocell, gabion, rockfall mesh, flexible rockfall fence
<u>MARINE ENGINEERING:</u>	Silt curtain, turbidity control, block mat, geotextile tube, trash boom, geotextile container
<u>GCL:</u>	Geosynthetic clay liner, bentonite liner and composite
<u>HDPE PIPE:</u>	Sewer pipe, dual wall pipe, submarine outfall
<u>TUNNELING:</u>	GFRP rebar for soft eye, tunnel support & invert drainage
<u>SPECIAL SERVICE:</u>	Geomembrane leak location survey, HDPE pipe welding, HDPE lining repair

Registration Certificate

This is to certify that the Management Systems of

G & E Company Limited

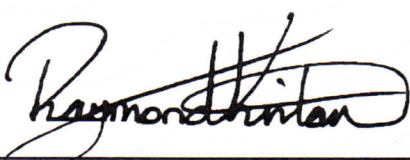
have been assessed by AJA Registrars and registered
against the requirements of

ISO 9001:2008

Certificate No. : **AJA14/17026** Date of Original Registration : **22nd January 2014**
Expiry Date : **15th September 2018** Date of Re-Registration : **16th February 2017**
Previous Expiry Date : **14th December 2016**



0059


Chief Executive - AJA Registrars Ltd



This certificate is issued in respect of the locations & scope of registration detailed in the Associated Registration Schedule.
This certificate is the property of AJA Registrars Ltd Unit 6 Gordano Court Gordano Gate Business Park Serbert Close Portishead Bristol UK BS20 7FS
and must be returned on request. A member of the AJA Group of Companies

NE/2017/01

Tseung Kwan O – Lam Tin Tunnel: Tseung Kwan O Interchange and Associated Works

Silt Curtain Deployment Plan

2. BONTEC SG110/110

Material Submission

BONTEC SG110/110 Woven Polypropylene Geotextile



G AND E COMPANY LIMITED

14/F., Kiu Yin Commercial Building,
361 - 363 Lockhart Road,
Wanchai, Hong Kong
Tel: 2570 0130 Fax: 2570 0089
website: www.g-and-e.com

January 2019



Table of Contents

1) **Manufacturing Company Profile**

- Low & Bonar NV Company Profile

2) **Product Profile**

- Introduction to Low & Bonar_Woven Geotextile

3) **Product Specification**

- Low & Bonar Bontec SG Range Technical Data Sheet

4) **Certification**

- ISO 9001:2015 Certificate
- ISO 14001:2015 Certificate
- Certificate of Conformity of the Factory Production Control
- Typical Conformance Certificate

5) **Installation Guideline**

- Recommendation on Installation

6) **Project Reference**

- Name and details of Project
- Photo References

7) **Approval Letters**

- Product Recognition and Acceptance

8) **About the Supplier – G and E Company Limited**

- An Introduction to G and E Company Limited
- ISO 9001:2015 Certificate

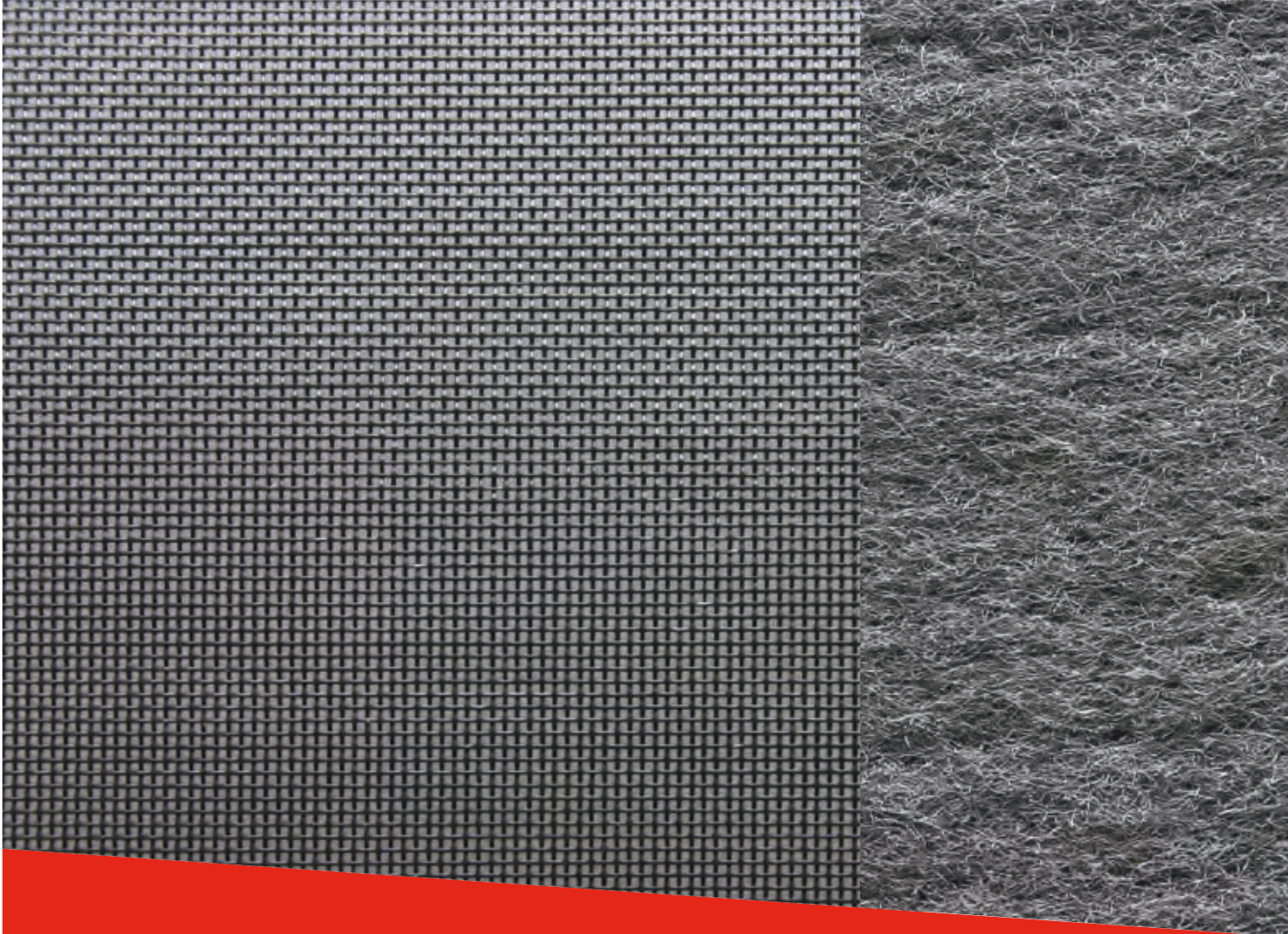


**Bontec SG110/110
Woven Geotextile**

Manufacturing Company Profile

bontec

woven and nonwoven geotextiles



GEOTEXTILE

WE UNDERCOVER
THE WORLD



Bonar
partners in performance

Bontec Geotextile

Bontec is an internationally renowned brand of geotextiles. We have earned this reputation over the past thirty years thanks to our quality, service and flexible production processes. This flexibility is a result of the vertical integration of our production. We control the entire process – from raw materials to finished product – for both our woven and nonwoven varieties.

We are therefore not dependent upon the quality or delivery time of others, and we can guarantee your success. Our Bontec brand offers state of the art woven and nonwoven geotextiles that provide answers to meet all of your challenges. Thanks to continuous research and investment in the latest technology, we provide the best solutions for all possible functions of geotextiles.

Nonwoven process Woven process

Starting with polypropylene granules,

we extrude endless synthetic filaments. After stretching and shrinking, these filaments are cut into fibres.

These fibres are then deposited in layers by a crosslapper.

By means of our own unique process we needle punch the layers into each other, after which they are thermo fixated. The result is an extremely high performance geotextile.

Starting with polypropylene granules,

we extrude an endless synthetic foil. This foil is then cut into fine tapes.

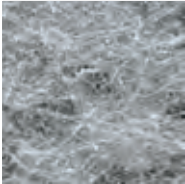
After stretching, the tapes are wound on spools that form the basis of a beam. That beam feeds the loom in the machine direction.

Subsequently the tapes are woven on a loom to a fabric with the desired specifications.



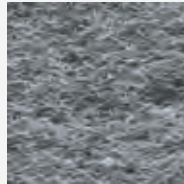
Nonwoven Geotextile

NW Thermally Bonded Nonwoven Geotextiles



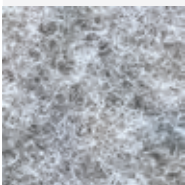
Produced by applying mechanical and thermal bonding processes. NW has the highest tensile strength of the range and is used primarily for lightweight separation and filtration. Its excellent hydraulic properties are ideal for use in filtration applications. Typical uses include the encapsulation of a trench drain.

VNW Nonwoven Needle Punched (Colored) Geotextile



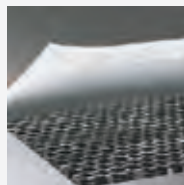
Produced by needle punching colored polypropylene fibres. The range varies from 200 to 2,000 g/m². VNW is used for protection of membranes, as a component for drainage composites, or as a component for erosion control composites.

SNW Superior Needle Punched Nonwoven Geotextiles



Produced in a manner similar to NW, SNW offers extraordinary properties for its very low weight. SNW is used primarily in circumstances that require both high tensile strength and elongation. Typical areas of application include membrane protection in reservoirs and landfills.

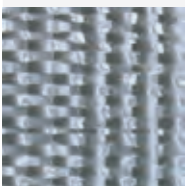
LG Geocomposites



For the production of LG, woven and nonwoven geotextile are needle punched together. This process combines the properties of the two types in a single layer. These products are used in situations that require a high tensile strength as well as extreme protection.

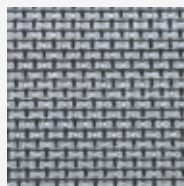
Woven Geotextile

SG Lightweight 'Standard Grade' Woven Geotextile



These lightweight, woven geotextiles from 65 to 250 g/m² are used primarily for separation. For example, SG prevents good quality sand or granules from mixing with underlying soil. It is used for the construction of roads, parking lots and airport runways.

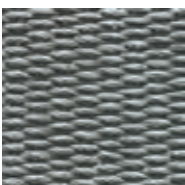
HF 'High Flow' Woven Geotextile



Thanks to their specific structure, HF geotextiles have high permeability. This quality is very important for erosion control and infiltration applications. Typical applications include:

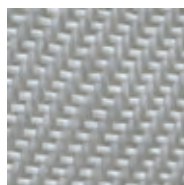
- As an under layer for concrete revetment blocks or between dissimilar layers of quick draining granular fill consisting of fine sand and rounded gravel.
- The envelopment of infiltration crates or tubes for rainwater management.

SG Heavyweight 'Standard Grade' Woven Geotextile



These heavyweight, woven geotextiles vary from 250 to 600g/m² and they possess tensile strengths up to 200 kN/m and above. Heavyweight SG is used in heavy load circumstances, such as temporary basal reinforcement, coastal reinforcement and soil stabilization.

HS 'High Strength' Woven Geotextile



The polyester wovens have a very high tensile strength of up to 600 kN /m. This strength and their very low stretch make them ideal for situations where:

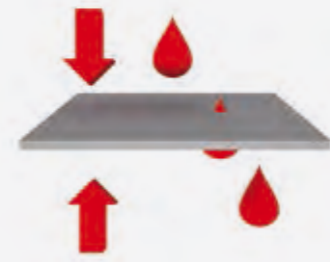
- Reinforcement of the ground is essential.
- The construction of very steep, or even vertical, slopes with different types of soil is required.

Use of Geotextiles



1 Erosion control

In erosion control, the geotextile protects soil surfaces from the tractive forces of moving water or wind and rainfall erosion.



2 Filtration

The use of geotextiles in filter applications is probably the oldest, most widely known, and most used function of geotextiles. The geotextile is used to prevent fine soil particles from moving with the water flow normal to the plane.



3 Protection

A geotextile can be used as a protective layer against mechanical damage during installation and after the completion of a particular construction project. It will help prevent the puncturing of geomembranes used in constructions such as tunnels, landfills or reservoirs.



4 Drainage

When functioning as a drain, a geotextile acts as a conduit for the movement of liquids or gasses in the plane of the geotextile. Relatively thick nonwoven geotextiles are the products most commonly used. Selection should be based on transmissivity, which is the capacity for in-plane flow.



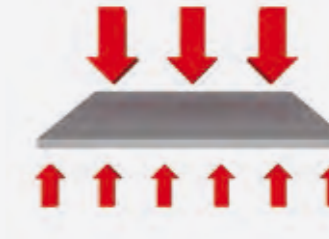
5 Stress relief

The geotextile provides a stress-relieving interlayer between the existing pavement and the overlay that reduces and retards reflective cracks under certain conditions. It also acts as a moisture barrier to prevent surface water from entering the pavement structure.



6 Reinforcement

The geotextile interacts with soil through friction or adhesion forces to resist tensile or shear forces. To provide reinforcement, a geotextile must have sufficient strength, low elongation and low creep to avoid movement of the structure.



7 Separation

Separation is the process of preventing two dissimilar materials from mixing. In this function, a geotextile is most often required to prevent the undesirable mixing of fill and natural soils or of two different types of fill.



Value chain

World player with local market presence

- Most complete product range
- Vertically integrated production - from raw material to finished stock
- Strong logistic service and stock supported key products to meet market needs
- Health and Safety from production right through delivery on site as an absolute priority
- Over 30 years of experience in a constantly evolving hi-tech market:
 - > Innovation driven
 - > Project specific engineered solutions

Advantages of Bontec Geotextiles

- Intelligent installation techniques
- Cost and energy saving
- Increased life-span of projects



PRODUCTION SITES

- Belgium - Zele & Lokeren
- China - Yizheng
- Germany - Groß Ippener & Obernburg
- Hungary - Tiszaújváros
- Saudi-Arabia - Yanbu
- The Netherlands - Arnhem & Emmen
- USA - Asheville, NC

Development Centers in the Netherlands, Belgium and USA
Sales offices in UK, France and China



PRODUCT PORTFOLIO

Geotextiles
Geocomposites
Geogrids
Geocells
Vertical Drains
Erosion Control Systems
Construction Fibres

Bonar N.V.

Industriestraat 39 / 9240 Zele
Belgium
T +32 52 45 74 11 / F +32 52 45 74 95
info@bonar.com / www.bonar.com

Bonar B.V.

P.O. Box 9600 / 6800 TC Arnhem
The Netherlands
T +31 85 744 1200 / F +31 85 744 1210
info@bonar.com / www.bonar.com

Bonar Inc.

P.O. Box 1057 / Enka, NC 28728
United States of America
T +1 828 665 5000 / F +1 828 665 5065
info-usa@bonar.com / www.bonar.com

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Bonar
partners in performance

www.bontec.be



**Bontec SG110/110
Woven Geotextile**

Product Specification



SG WOVEN GEOTEXTILES

we under^{cover} the world

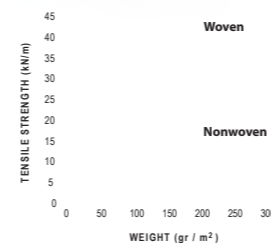
A TOTAL RANGE OF GEOTEXTILES

Headquarters:
BONAR TECHNICAL FABRICS NV/SA
 Industriestraat 39
 B-9240 Zele
 BELGIUM
 T.: +32 (0) 52 457 487
 F.: + 32 (0) 52 457 495
 E-MAIL: geotextiles@bonartf.com

For UK and Ireland:
BONAR YARNS & FABRICS Ltd
 St. Salvador Street
 Dundee Scotland
 DD3 7EU
 T.: +44 (0)1382 346102
 F.: +44 (0)1382 229238
 E-MAIL: geotextiles@bonaryarns.com

website: www.bonartf.com

bontec
 woven and nonwoven geotextiles



SEPARATION



REINFORCEMENT

Other geotextiles available within the Bontec range include Highflow, High strength Wovens and Thermally Bonded & Needle-punched Nonwovens

Visit us at our website:
www.bonartf.com

For UK and Ireland: **BONAR YARNS & FABRICS Ltd**
 St. Salvador Street | Dundee | Scotland | DD3 7EU
 T.: +44 (0)1382 346102 | F.: +44 (0)1382 229238
 E-MAIL: geotextiles@bonaryarns.com

SG Woven Geotextiles PRODUCT PROFILE

“An exciting range of Standard Grade geotextiles that offer the perfect solution to your Separation requirements. With tensile strengths ranging from 10 to 300 kN/m you can be certain that an SG fabric will be available with the performance that you are looking for.”

DAILY SEPARATION, SOIL STRENGTHENING OR GROUND REINFORCEMENT?

Bontec SG woven geotextiles are manufactured from polypropylene tapes & yarns, and exhibit an excellent chemical resistance to commonly encountered acids and alkalis at ambient temperatures. Available in a lightweight range with products from 80 to 200g/m², and a heavyweight range from 200 to 800g/m².

Bontec SG facts include:

Tensile strengths up to 300 kN per metre (kN/m) width
 CBR Puncture Strengths ranging from 1.800 N to 12.500 N

SG Mechanical Properties that offer maximum strength at minimal cost and ensure the products survivability both against installation damage and in the longer term.

Lightweight woven geotextiles typically offer greater mechanical strengths per unit weight than comparable nonwoven grades. This makes lightweight woven geotextiles the ideal choice for separation

Waterflows normal to the plane that are generally several times more than that required by design

A range of consistent opening sizes suited for use in soils ranging from clay to coarse granular fill.

SG hydraulic properties that are suited to the demands of everyday separators.

Available ex-stock in 4.5m and 5.25m wide rolls or other widths to order

Typical applications for SG woven geotextiles include:

- As a general purpose separator for use under site access roads and areas of hardstanding.
- As a separation and strengthening layer under new roadways, car parks, industrial units etc.
- As an erosion control layer under heavy rock armour in coastal defence projects.
- For any separation application where there exists a need to prevent the intermixing of soft foundation soils with good clean granular fill.

SG Woven Geotextiles have been manufactured as a cost effective solution to your soil separation and stabilisation applications. They are manufactured from highly durable polypropylene polymer and have a long life expectancy when used in permanent structures.

For further product information, be it a technical data sheet or to discuss your project with one of our in-house geotextile experts please do not hesitate to contact one of our offices listed below.

Headquarters: **BONAR TECHNICAL FABRICS NV/SA**
 Industriestraat 39 | B-9240 Zele | BELGIUM
 T.: +32 (0) 52 457 487 | F.: + 32 (0) 52 457 495
 E-MAIL: geotextiles@bonartf.com



**Bontec SG110/110
Woven Geotextile**

Product Profile

Bontec® SG 110/110

Heavy weight Polypropylene Woven Geotextiles

Technical data sheet

Product description

Polymer	Density	Melting Point	Construction
100% Polypropylene	0,91 kg/dm ³	165 °C	Tapes

Properties

Mechanical Properties	Standard	Performance	Tolerance
Tensile strength - MD	EN ISO 10319	110 kN/m	-9,9 kN/m
Tensile strength - CMD	EN ISO 10319	110 kN/m	-9,9 kN/m
Elongation at maximum load - MD	EN ISO 10319	10 %	+/-2,3 %
Elongation at maximum load - CMD	EN ISO 10319	8 %	+/-1,8 %
Static puncture resistance (CBR)	EN ISO 12236	12,5 kN	-2,5 kN
Dynamic perforation resistance (cone drop)	EN ISO 13433	10 mm	+2,0 mm
Tensile strength at 2% elongation - MD	EN ISO 10319	15 kN/m	
Tensile strength at 2% elongation - CMD	EN ISO 10319	25 kN/m	
Tensile strength at 5% elongation - MD	EN ISO 10319	45 kN/m	
Tensile strength at 5% elongation - CMD	EN ISO 10319	60 kN/m	
Hydraulic Properties	Standard	Performance	Tolerance
Water permeability normal to the plane (Vlh50)	EN ISO 11058	25 l/m ² s	-8 l/m ² s
Characteristic Opening Size (O90)	EN ISO 12956	230 µm	+/-69,0 µm
Physical Properties	Standard	Performance	Tolerance
Weight	EN ISO 9864	464 g/m ²	+/-46,4 g/m ²
Length (+/- 1%) x width (+/- 1%)		100 x 5,25 m	
Truck Load Volume (+/- 10%)		30450 m ²	
Roll diameter (+/- 10%)		45 cm	
Durability	Standard	Performance	
Predicted minimal durability in years in natural soils with 4 < pH < 9 and soil temperatures < 25°C	EN 13249 +1 : 2015	60 years	

Version date : 1/11/2014

3

Version n°

The Quality Management System of Bonar has been approved to the ISO 9001 Quality Management System Standard. Certificates are available on request.



The information set forth in this data sheet reflects the best knowledge at the time of publication. The document is subject to change pursuant to new developments and findings. The same reservation applies to the properties of the products described. No liability is undertaken for results obtained by usage of the products and information.



Low & Bonar NV
Industriestraat 39, 9240 Zele, Belgium
T: +32 (0) 52 457 487 / F: +32 (0) 52 457 495
info@lowandbonar.com / www.bontecgeosynthetics.com



**Bontec SG110/110
Woven Geotextile**

Certification

QUALITY MANAGEMENT SYSTEM CERTIFICATE

ISO 9001 : 2015

BQA nv hereby declares that the management system of the company

Low & Bonar NV – Site at Zele and Lokeren



Progress through performance

*located at Industriestraat 39 - 9240 Zele - Belgium, has been examined on 2017-03-20
and found in conformity with the ISO 9001, edition 2015, standard for the following application field:*

Development, manufacture and sales of a standard range of (concrete) fibres and textiles such as agrotextiles, building textiles and geosynthetics, as well as similar products especially designed to customer specifications.

This certificate has been issued by BQA nv according to its quality manual concerning the certification of systems, and after concluding the contract of certification N° CER_ELA_QMS2015_21-3-2017_301_N under which the company accepts a regular control of its management system.

Certificate N° BQA_QMS019_C_2004301

Valid until 2020-03-19



BQA N° 019-QMS

A blue ink signature of D. SIMOENS.

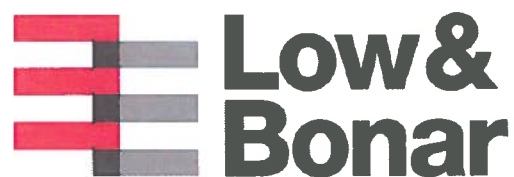
*D. SIMOENS
Directeur*



CERTIFICATE OF ENVIRONMENTAL MANAGEMENT SYSTEM ISO 14001 : 2015

BQA nv hereby declares that the environmental management system of the company

Low & Bonar NV – Site in Zele and Lokeren



Progress through performance

*located at Industriestraat 39 – 9240 Zele - Belgium, has been examined on 2017-03-20
and found in conformity with the ISO 14001, edition 2015, standard for the following application field:*

***Development, manufacture and sales of a standard range of (concrete) fibres and textiles such as agrotextiles,
building textiles and geosynthetics, as well as similar products especially designed to customer specifications.***

*This certificate has been issued by BQA nv according to its quality manual EMS concerning the certification of environmental
management systems, and after the contract of certification N° CER_ELA_EMS2015_21-3-2017_411_N
under which the company accepts a regular control of its environmental management system.*

Certificate N° BQA_EMS019_C_200402

Valid until 2020-03-19



BQA N° 019-EMS

*D. SIMOENS
Directeur*



Certificate of Conformity of the Factory Production Control 1213–CPR–5945

In compliance with Regulation 305/2011/EU of the European Parliament and of the Council of 9 March 2011 (the Construction Products Regulation or CPR), this certificate applies to the construction product(s)

NW 5, 6, 6 UV, 7, 8, 8 D, 8/8 ABG, 8.5, 9, 10, 10 UV, 10 UV IT, 11, 12, 12 UV, 13, 130 N, 15, 15 I, 15 UV, 150 I, 16, 16 ABG, 160 N, 18, 18 UV, 19 UV, 20, 20 XUV, 200 I, 21, 21 UV, 23 P, 250 I,

GTX-N, needle punched, thermally treated; PP; used for the functions: S + F + D

25, 25 R, 26, 29, 30, 32, 32 R, 40, 40 R, 45,

GTX-N, needle punched, thermally treated; PP; used for the functions: S + F + D + P

Forte, Light, Medium, Supra, UNI, X Forte, X Light

GTX-N, needle punched, thermally treated; PP; used for the functions: S + F

SNW 100, 120, 140, 25, 25 XUV, 31, 40 UV, 46, 50, 50 SP, 55, 55 M, 55 XUV, 62, 70, 75, 75 XUV, 80, 85, 90,

GTX-N, needle punched; PP; used for the functions: S + F + D + P

14, 17, 17 T,

GTX-N, needle punched; PP; used for the functions: S + F + D

VNW 200-PP-K, 200-PP-Z, 300-PP-K, 350-PPZ30, 400-PP-K, 450-PP-K, 500-PP-K, 600-PP-K, 600-PPZ30, 700-PP-K, 800-PP-K, 1000 PP-K, 1200-PP-K, 1500-PP-K, 1800-PP-K, 2000-PP-K,

GTX-N, needle punched; PP; used for the functions: S + F + D + P

produced by or for

Bonar NV
Industriestraat 39
9240 Zele / Belgium

and produced in the manufacturing plant(s)

615

This certificate attests that all provisions concerning the assessment and verification of constancy of performance described in Annex ZA of the standard(s)

**EN 13249:2000/A1:2005; EN 13250:2000/A1:2005; EN 13251:2000/A1:2005;
EN 13252:2000/A1:2005; EN 13253:2000/A1:2005; EN 13254:2000/A1:2005;
EN 13255:2000/A1:2005; EN 13257:2000/A1:2005; EN 13265:2000/A1:2005**

under system 2+ for the performances set out in this certificate are applied and that the factory production control

fulfils all the prescribed requirements for these performances.

This certificate was first issued on 2014-11-04 and will remain valid as long as the test methods and/or factory production control requirements included in the harmonised standard(s), used to assess the performance of the declared essential characteristics, do not change, and the construction product, and the manufacturing conditions in the plant are not modified significantly, unless suspended or withdrawn by the factory production control certification body.

i. V.

Certificate of Conformity of the Factory Production Control 1213–CPR–5945

In compliance with Regulation 305/2011/EU of the European Parliament and of the Council of 9 March 2011 (the Construction Products Regulation or CPR), this certificate applies to the construction product(s)

**PROTEC 250, 250 FR, 300, 33, 400, 500, 500 SP, 600, 700, 750, 750 XUV, 800 FR,
800, 800 XUV, 1000 FR,**

GTX-N, needle punched; PP; used for the functions: S + F + D + P

X 1000, X 1200

GTX-N, needle punched; PP; used for the functions: F + D + P

TS

1, 2,

GTX-N, thermally bonded; PP; used for the functions: S + F

3, 4, 5,

GTX-N, thermally bonded; PP; used for the functions: S + F + D

produced by or for

Bonar NV

Industriestraat 39
9240 Zele / Belgium

and produced in the manufacturing plant(s)

615

This certificate attests that all provisions concerning the assessment and verification of constancy of performance described in Annex ZA of the standard(s)

**EN 13249:2000/A1:2005; EN 13250:2000/A1:2005; EN 13251:2000/A1:2005;
EN 13252:2000/A1:2005; EN 13253:2000/A1:2005; EN 13254:2000/A1:2005;
EN 13255:2000/A1:2005; EN 13257:2000/A1:2005; EN 13265:2000/A1:2005**

under system 2+ for the performances set out in this certificate are applied and that the factory production control

fulfils all the prescribed requirements for these performances.

This certificate was first issued on 2014-11-04 and will remain valid as long as the test methods and/or factory production control requirements included in the harmonised standard(s), used to assess the performance of the declared essential characteristics, do not change, and the construction product, and the manufacturing conditions in the plant are not modified significantly, unless suspended or withdrawn by the factory production control certification body.

Würzburg, 04 November 2014

i. V.

Dipl.-Ing. Helmut Zanzinger
Certification Body



Ref: G&E042811(declaration SG110110)

Date: 26 April 2011

Attn: To whom it may concern

Declaration - Bontec SG 110/110 Woven Geotextile

We hereby would like to confirm that Bontec SG 110/110 woven geotextiles are made of silt film tapes. Silt film tapes are manufactured in our slit film extrusion department in Belgium, prior to being woven on Sulzer looms. The Geotextiles are being produced in accordance with:

- ISO 9001:2000 – Quality Certificate (in annex)
- ISO 14001: Environmental Certificate (in annex)

Bontec SG 110/110 woven geotextiles are:

- Resistant to all naturally occurring soil acids and alkalis;
- Resistant to biological attack;
- Resistant to deterioration caused by the effects of exposure to weather and burial; and
- Stable over the temperature range 0°C and 60°C.

The geotextiles have the following characteristics :

CBR Burst Strength (EN ISO 12236)	12,500N (*)
Tensile Strength (EN ISO 10319)	110kN/m (*)
Volume water flow rate (VWFR) at 100mm water head (EN ISO 11058)	25 l/m ² /s (at 50mm head) (*) 50 l/m ² /s (at 100mm head) (*)

(*) The common tolerances around the avg which are used in the industry are applied and are stated on the CE datasheets

Should you require further information, please do not hesitate to contact us.

Thank you.

Best Regards,

Koen Van Compernelle
Bonar Technical Fabrics

BONAR TECHNICAL FABRICS
Industriestraat 39
B-9240 Zele
BTW BE 421.053.442
T: 003252457483 - F. 003252457495

Zelee, 14/01/2019

CERTIFICATION OF COMFORMANCE

The undersigned supplier LOW & BONAR NV, hereby states under his responsibility that the following product complies with the indicated technical properties:

order 247038 your order PO 190110A

Type	NW 10 525	: 13.125,00 m ²
	SNW 120 525	: 2.756,25 m ²
	SG 20/20 F	: 7.875,00 m ²
	SG 110/110	: 10.500,00 m ²

Delivery docs : Packing list Nr T1900388 – T1900386

Manufacturer : Low & Bonar NV, Industriestraat 39, 9240 Zelee, Belgium
Goods are of Belgian (EU) origin

LOW AND BONAR NV



LOW & BONAR NV
Industriestraat 39
B - 9240 Zelee
BTW BE 0421 053 442
T. 0032 52 457 441
F. 0032 52 457 495



**Bontec SG110/110
Woven Geotextile**

Installation Guideline



RECOMMENDATION FOR THE INSTALLATION OF GEOTEXTILES

- The **BONTEC** geotextiles shall be kept in its original packaging in order to protect it from damaging UV-rays and high temperatures.
- The **BONTEC** geotextiles shall be stored protected from wind, rain, excess moisture or sunlight.
- The **BONTEC** geotextiles shall only be unpacked just before use. The material shall be covered within 1 week
- The **BONTEC** geotextiles shall be labelled and show the following data :
 - roll number
 - quality
 - name of the manufacturer
 - roll length & width
 - roll weight
- The **BONTEC** geotextiles shall be laid with the longitudinal ascis down slopes
- A minimum overlap of 500 mm between the different sheets shall be respected. Sewing of the different fabrics shall be done with a double prayer stitching technique with non deteriorating thread.
- Wherever visibility or installation of the **BONTEC** geotextile is poor an extra safety overlap of +/- 1 m shall be respected
- The surfaces to be covered with **BONTEC** geotextiles shall be smooth and free of sticks, roots, sharp objects, and all debris that may damage the fabric. The surface to be covered shall be firm and unyielding, with no sudden changes or brakes in grade.
- The compacted sub-base shall be maintained in a smooth, uniform and compacted condition during installation of the fabric.
- In area's where wind is prevalent, fabric installation shall be started at the upwind side of the project and proceed downwind. The leading edge of the fabric shall be secured at all times with sandbags or other means sufficient to hold it down during high winds. Sandbags or rubber tires may be used as required to hold the fabric in position during installation. Tires shall not have exposed steel cords or other sharp edges which may snag or cut the fabric. Materials, equipment or other items shall not be dragged across the fabric or be allowed to slide down slopes on the fabric.
- Should the fabric be damaged during any step of the installation, the damaged section shall be repaired by covering it with a piece of fabric which extends at least 0,6 meter in all directions beyond the damaged area. The fabric shall be secured as directed by the engineer.
- Smoking shall not be permitted by personnel working on the fabric.



**Bontec SG110/110
Woven Geotextile**

List of Project Reference

Bontec SG Range Woven Geotextile

Date	Project	Client	Consultant	Product	Qty
Feb-05	CV/2003/06 Stanley Waterfront Improvement Project - Construction Pier and Boardwalk	Sun Fook Kong (Civil) Ltd	Civil Engineering and Development Department	NW10 SG100/100	3,150 2,080
Feb-05	99/9028 Lamma Power Station	Wai Kee (Zens) Construction & Transportation Co Ltd	Maunsell Geotechnical Services Ltd	SG100/100	1,040
Feb-05	CV/2004/02 Reconst. of Wong Shek & Ko Lau Wan Public Piers	Kin Shing Construction Co Ltd	Civil Engineering and Development Department	SG100/100	4,680
Apr-05	CV/2002/04 Penny's Bay Reclamation Stage 2	Gammon Skanska Ltd Shun Tat Construction Engineering Ltd	Scott Wilson Ltd	SG100/100 SG100/100	4,160 3,150
Apr-05	HK/12/02 CED, Central Reclamation Phase III, Engineering Works	Best Leader Engineering Ltd Leighton - China State - Van Oord Joint Venture	Atkins China Ltd	SG100/100 SG100/100	1,040 2,615
May-05	03/8013 Lamma Island to Cyberport	Leader- Marine Contractors Ltd Honwin Engineering Ltd	Maunsell Geotechnical Services Ltd	SG100/100 SG100/100	1,040 1,050
Jul-05	Shenzhen to Tai Po Twin Submarine Gas Pipeline Project	Honwin Engineering Ltd		SG100/100	3,675
Sep-05	TP37/03 Remaining Engineering Infrastructure Works for Pak Shek Kok Development Package 2A	Leader - Wai Kee (C&T) Joint Venture	Hyder Consulting Ltd	SG100/100	1,040
Nov-05	HY/2002/26 Stonecutter's Bridge	Hong Kong River Engineering Co Ltd	Ove Arup & Partners HK Ltd	SG100/100	1,050
Feb-06	CV/2005/12 Fill Reception Facilities at Tseung Kwan O Area 137 Quarry Bay and Mui Wo	Penta-Ocean Construction Co Ltd	Civil Engineering and Development Department	SG100/100	525
Mar-06	Maintenance Dredging at Castle Peak Power Station (CPPS) Jetty	New Concepts Engineering Development Ltd	Civil Engineering and Development Department	SG100/100	525
Mar-06	CV/2004/04 Maintenance and Repairs to Government / Public Piers and Immersed Tubes of Hung Hom Cross-Harbor Tunnel	China Harbour Engineering Co. Ltd	Civil Engineering and Development Department	SG100/100	1,050
Mar-06	HY/2005/06 Castle Peak Road Improvement West of Tsing Lung Tau	Shun Tat Construction Engineering Limited Chun Wo Construction & Engineering Co Ltd	Mouchel Halcrow JV	SG100/100 SG100/100	1,050 525
May-06	212 Main Works for the Proposed Third Golf Course Development at Kau Sai Chau, Sai Kung	China Harbour Engineering Co. Ltd	Ove Arup & Partners HK Ltd	SG100/100	3,150
Jun-06	Hong Kong Convention and Exhibition Centre Project - Silt Screen for Intake Pipe	Wai Kee (Zens) Construction & Transportation Co Ltd Kaden - Wai Kee (C&T) JV	NA	SG100/100 SG100/100	2,100 2,100



Aug-06	EP/SP/52/06 Development of EcoPark in Tuen Mun Area 38	Kaden Construction Limited	Scott Wilson Ltd	SG100/100	1,050
Sep-06	CV/2004/06 Management and Capping of Contaminated Mud Pit IV at East of Sha Chau - Phase III	Kaden - Wai Kee (C&T) Joint Venture	Civil Engineering and Development Department	SG100/100	1,050
Oct-06	Lamma Island Cable Landing	United Marine Co Ltd	Hong Kong Electric Co Ltd	SG100/100	2,100
Nov-06	CV/2004/01 Maintenance and Repairs to Seawalls, Piers and Other Port Works	Kin Shing Construction Co Ltd	Civil Engineering and Development Department	SG100/100	2,625
Dec-06	Private project	Friendly Benefit Engineering Ltd	NA	SG100/100	525
Feb-07	Prebored Socketted H-Piles at Hong Kong Convention & Exhibition Centre	Yee Hop Engineering Co Ltd	NA	SG100/100	3,623
May-07	HY/2005/06 Castle Peak Road Improvement - West of Tsing Lung Tau	Chun Wo Construction & Engineering Co Ltd	Mouchel-Halcrow JV	SG100/100	525
May-07	CV/2004/05 Maintenance Dredging	China Harbour Engineering Co Ltd	Civil Engineering and Development Department	SG100/100	2,100
Aug-07	Dredging Project in Lai Chi Kok Shipyard	Maritime Mechanic Ltd	NA	SG100/100	525
Aug-07	6/WSD/06 Construction of Salt Water Supply System for Penny's Bay	Univic Engineering Ltd	Water Supplies Department	SG100/100	1,050
Nov-07	Permanent Aviation Fuel Facility Hong Kong International Airport (Contract No. H2104)	UDL Dredging Ltd	Babtie Asia Ltd	SG100/100	1,050
Dec-07	Seawall Modify, Tuen Mun Area 38	Cheer Engineering Ltd	Scott Wilson Ltd	SG100/100	525
May-08	DC/2007/10 Design and Construction of HK West Drainage Tunnel	Tapbo Civil Engineering Co Ltd	Ove Arup & Partners HK Ltd	SG100/100	5,486
Sep-08	CV/2006/05 Maintenance of Seawalls and Navigation Channels	China Harbour Engineering Co Ltd	Civil Engineering and Development Department	SG100/100	6,825
Sep-08	Marine Works at Maldives	Kwan Sing Engineering & Construction Co Ltd		SG100/100	525
Nov-08	DC/2007/06 River Improvement Works in Upper Lam Tsuen River, She Shan River and Upper Tai Po River	Kwan Lee Construction Co Ltd	Maunsell Consultants Asia Ltd	SG100/100	10,500
Mar-09	DC/2007/01 Drainage Improvement Works in Ki Lun Tsuen, Kwu Tung, Ma Tso Lung and Sha Ling	Shanghai Urban Construction Group Corp	Mott Connell Ltd	SG100/100 SG40/40	7,875 71,925
Jun-09	CHEC247 Lamma Power Station - Navigation Channel Improvement	China Harbour Engineering Co Ltd	Civil Engineering and Development Department	SG100/100	7,350



Jan-10	Tsing Yi	Sam Woo Bore Pile Foundation Ltd		SG110/110	525
Feb-10	HY/2009/11 Central - Wanchai Bypass - North Point Reclamation	China Harbour Engineering Co UDL Ship Management Ltd	AECOM Asia Co Ltd	SG110/110 SG110/110	21,541 1,050
Mar-10	KL/2009/01 Site formation for Kai Tak Cruise Terminal Development	Penta-Ocean Construction Co. Ltd Kwan Sing Construction Ltd Crown Asia Engineering Ltd	Scott Wilson Ltd	SG110/110 SG110/110 SG110/110	28,875 5,775 1,050
Apr-10	TK/2009/01 Infrastructure Works at Town Centre South and Tiu Keng Leng, Tseung Kwan O	Shun Tat Construction Engineering Ltd	Meinhardt (C&S) Ltd	SG110/110 SG40/40	9,450 1,050
Apr-10	Lau Fau Shan	Wang Hip Iron Works Wirks Co Ltd		SG110/110	525
May-10	HK/2009/01 Wan Chai Development Phase II Central Wanchai Bypass	Leader Civil Engineering Corp Ltd Chun Wo-CRGL Joint Venture	AECOM Asia Co Ltd	SG110/110 SG110/110	5,250 29,400
Jun-10	9/WSD/08 Laying of Western Cross Harbour Main and Associated Land Main Form West Kowloon to Sai Ying Pun	Shun Tat Construction Engineering Ltd	Mott Connell Ltd	SG110/110	10,470
Oct-10	DC/2007/12 Design and Construction of Tsuen Wan Drainage Tunnel	Shun Tat Construction Engineering Co Ltd	Hyder Consulting Ltd	SG110/110	2,100
Oct-10	TP/2010/02 Cycle Tracks from Sheung Shui to Ma On Shan	Richwell Machinery Engineering Ltd	Scott Wilson Ltd	SG110/110	525
Dec-10	CV/2010/03 Maintenance Contract for Seawalls and Navigation Channels	China Harbour Engineering Co Ltd	Civil Engineering and Development Department	SG110/110	12,075
Dec-10	HK/2009/02 Wan Chai Development Phase II	Tung Wo Engineering Co Ltd Chun Wo-CRGL Joint Venture Shun Tat Construction Eng Ltd	AECOM Asia Co Ltd	SG110/110 SG110/110 SG110/110	4,200 4,200 1,050
Jan-11	HY/2009/15 Central-Wanchai Bypass-Tunnel Causeway Bay Typhoon Shelter	Shun Tat Construction Eng Ltd China State Engineering Co Ltd Tung Wo Engineering Ltd Hong Kong River Engineering Co Ltd	AECOM Asia Co Ltd	SG110/110 SG110/110 SG110/110 SG110/110	50,400 2,625 1,050 10,831
Jan-10	DC/2008/09 Submarine outfall Aberdeen	Paul Y Construction Co Ltd	AECOM Asia Co Ltd	SG110/110	525
Jan-10	KL/2008/07 Kai Tak Development - Advance	Crown Asia Engineering Ltd	AECOM Asia Co Ltd	SG110/110	1,050
Jan-10	DC/2011/04 Reconstruction, improvement and rehabilitation of Kai Tak River	Leader - Sunnic JV	Scott Wilson Ltd	SG110/110	525
Jan-11	CV/2009/02 Handling of surplus public fill	China Harbour Engineering Co Ltd	Civil Engineering and Development Department	SG110/110	525
Mar-11	HK/2010/06 Wanchai Development Phase II-Central-Wanchai Bypass over MTR Tsuen Wan Line	Leader Civil Engineering Corp Ltd Gammon Construction Ltd	AECOM Asia Co Ltd	SG110/110 SG110/110	8,400 1,575
Apr-11	HY/2009/19 Central-Wanchai Bypass-Tunnel (North Point Section)	S W Marine Works Ltd Chun Wo Foundations Ltd Cheer Engineering Ltd	AECOM Asia Co. Ltd	SG110/110 SG110/110 SG110/110	4,200 19,950 525



May-11	DC/2009/13 Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan	Leader Civil Engineering Corp Ltd	Scott Wilson CDM Joint Venture	SG110/110	1,575
May-11	DC/2009/22 Drainage Improvement Works in Shuen Wan, Tai Po- Contract 1	Kwan Lee-Kuly Joint Venture	AECOM Asia Co. Ltd	SG110/110	2,625
Jul-11	SIL (E) 903 Stage 2 Ocean Park Station Wong Chuk Hang Station, Viaducts and Aberdeen Channel Bridge	Leighton Contractors (Asia) Ltd Cheer Engineering Ltd	Vector International Ltd	SG110/110 SG110/110	4,725 1,575
Aug-11	KL/2010/02 Kai Tak Approach Channel Improvement Works Stage 1	Kwan Sing Contractors Ltd	AECOM Asia Co. Ltd	SG110/110	7,350
Sep-11	DC/2010/02 Drainage Improvement Works in Shuen Wan And Shek Wu Wai	Kwan Lee-Kuly Joint Venture	AECOM Asia Co. Ltd	SG110/110	10,500
Oct-11	DC/2007/16 Design and Construction of Lai Chi Kok Transfer Scheme	Fortress Development Ltd	Maunsell Consultants Asia Ltd	SG110/110	2,100
Dec-11	HY/2010/02 HK-Zhuhai-Macau Bridge - HK Boundary Crossing Facilities Reclamation Works	China Harbour Engineering Co Ltd Sharon Asia Waste Sorting Eng Ltd Chung Kong Marine Engineering Ltd	Ove Arup & Partners HK Ltd	SG110/110 SG110/110 SG110/110	68,775 525 10,500
Jul-12	GSPD/SP/TKW-NP/089/2011 Installation of Submarine Gas Pipeliners and Associated Facilities from to Kwa Wan to North Point	Macdow - Kaden Joint Venture	Mott Connell Limited	SG110/110	3,150
Aug-11	HY/2011/03 HK-Zhuhai Macau Bridge - Hong Kong Link Road - Scenic Hill and Hong Kong Boundary Crossing Facilities	China State Construction Eng (HK) Ltd Will Pak Engineering Ltd Shun Tat Construction Engineering Ltd Chun Ngai Construction Engineering Ltd	Ove Arup & Partners HK Ltd	SG110/110 SG20/20F SG110/110 SG110/110 SG20/20F	23,100 23,625 1,575 6,825 10,500
Mar-13	1017EM10 Kai Tak Former Runway	Crown Asia Engineering Ltd	Civil Engineering and Development Department	SG110/110	1,050
Mar-13	2/WSD/09 Salt Water Supply for Northwest New Territories - Construction of Lok On Pai Salt Water Pumping Station and Associated Works	Sunrise Enterprises Ltd	Water Supplies Department	SG40/40	525
Apr-13	Yuen Long	Kwong Wah Electrical Co Ltd	-	SG40/40	525
May-13	HK/2012/08 Wan Chai Development Phase II - Central Wan Chai Bypass at Wan Chai West	Hong Kong River Engineering Co Ltd China State - Leader JV Will Pak Engineering Ltd	AECOM Asia Co. Ltd	SG110/110 SG110/110 SG110/110	47,250 525 525
Jun-13	SCL1111 Hung Hom North Approach Tunnels	Gammon - Kaden Joint Venture	AECOM Asia Co. Ltd	SG40/40 SG110/110	19,425 525
Aug-13	Near Hoi Sum Park, King Wan, Tokuawan	Hong Kong Marine Contractors Ltd		SG110/110	525



Sep-13	HY/2012/07 Tuen Mun - Chek Lap Kok Link-Sothorn Connection Viaduct Section	Gammon Construction Ltd Right Lead Construction Co Ltd	AECOM Asia Co. Ltd	SG110/110 SG110/110	9,450 1,050
Oct-13	Mongkok	S W Marine Works Ltd		SG110/110	525
Jan-14	2/WSD/09 Construction of Lok On Pai salt water pumping station and associated works	CPC Construction Hong Kong Ltd	Water Supplies Department	SG40/40	1,050
Jan-14	CV/2013/02 Maintenance contract for seawalls and navigation channels	China Harbour Engineering Co Ltd	Civil Engineering and Development Department	SG110/110	25,725
Feb-14	16/WSD/11 Replacement and rehabilitation of water mains at Peng Chau, Sunshine Island and Hei Ling Chau	MIRDTEC HK Ltd.	AECOM Asia Co. Ltd	SG110/110	2,625
Mar-14	Remodeling of New World Centre at Salisbury Road	Kaden Construction Ltd		SG110/110	1,050
Apr-14	KL/2011/01 Kai Tak Development - Reconstruction and Upgrading of Kai Tak Nullah	Chit Cheung Construction Co Ltd	AECOM Asia Co. Ltd	SG110/110 SG20/20F	2,100 8,400
Jul-14	CV/2013/05 Construction of Cycle Parking Area near Yung Shue Ferry Pier, Lamma Island	Tak Cheong Construction Co Ltd	Civil Engineering and Development Department	SG110/110	525
Oct-14	MTRC SIL (E) 902 Nam Fung Tunnel and Ventilation Buildings	Nishimatsu Construction Co. Ltd	Scott Wilson Ltd	SG110/110	7,875
Nov-14	HY/2010/08 Central-Wanchai Bypass-Tunnel (Slip Road 8 Section)	Shun Tat Construction Eng Ltd	AECOM Asia Co Ltd	SG110/110	8,925
Jan-15	SCL1121 Shatin to Central Link - NSL Cross Habour Tunnel	Penta Ocean - China State JV Crown Asia Engineering Ltd	AECOM Asia Co. Ltd	SG110/110 SG20/20F SG110/110	25,200 525 1,050
Apr-15	KL/2013/01 Site Formation for Kai Tak Cruise Terminal Development - Remaining Works	Zhen Hua Engineering Company Limited	URS Hong Kong Ltd	SG110/110	15,750
May-15	Yau Tong Bay Redevelopment - Land Decontamination Works	Hong Kong River Engineering Co Ltd	AECOM Asia Co Ltd	SG110/110	2,100
Sep-15	MTRC810A West Kowloon Terminus Station North	Leighton - Gammon JV	AECOM-Aedas JV	SG110/110	11,025
Oct-15	Private job in Crooked Island	Maritime Mechanic Ltd		SG110/110	1,050
Nov-15	Private job in Tung Chung	Fortress Development Ltd		SG110/110	525
Jan-16	MTRC810B West Kowloon Terminus Station South	Laing O'Rourke - Hsin Chong - Paul Y. Joint Venture Tapbo Civil Engineering Co Ltd	AECOM - Aedas JV	SG110/110 SG110/110	1,050 2,625
Jan-16	Proposed revitalization of Avenue of Star and east TST Promenade Waterfront	Kaden Construction Ltd	New World Development	SG110/110	1,575



Feb-16	HY/2013/01 HKZMB - Construction of Passenger Clearance Building	Leighton-Chun Wo Joint Venture S W marine Works Ltd Cheer Engineering Ltd	AECOM Asia Co Ltd	SG110/110 SG110/110 SG110/110	2,625 2,100 2,100
Mar-16	KL/2014/01 Kai Tak Development - Stage 2 Infrastructure Works for Developments at Southern Part of the Former Runway	CEC-CCC Joint Venture Cheer Engineering Ltd	AECOM Asia Co Ltd	SG110/110 SG110/110	10,500 525
Mar-16	1/WSD/15 Term Contract for Waterworks District E - New Territories East	Yick Sing Civil Engineering Ltd	Water Services Department	SG110/110	2,625
Mar-16	Fill Bank at Tuen Mun Area 38	Fortress Development Ltd	CH2M Hill (China) Limited	SG110/110	525
May-16	SCL 1128 Causeway Bay Typhoon Shelter to Admiralty Tunnels	Dragages-Bouygues J.V. Tapbo Civil Engineering Co Ltd VSL	Intrafor	SG110/110 SG110/110	1,575 525
Jun-16	Silt Curtain Repair	Hong Kong Marine Contractors Ltd		SG110/110	5,250
Jul-16	EP/SP/10/91 SENT Landfill, Tseung Kwan O	Green Valley Landfill, Limited	Rust Asia Pacific Ltd	SG40/40F	5,250
Sep-16	NE/2015/02 Tseung Kwan O - Lam Tin Tunnel Road P2 and Associated Works	CRBC-Build King Joint Venture Hong Kong River Engineering Shun Tat Construction Engineering	AECOM Asia Co Ltd	SG110/110 SG110/110	28,875 23,625
Nov-16	CC/2016/3B/045 Main Contract for the Park at West Kowloon Cultural Center	Sun Fook Kong Construction Ltd Chung Kong Marine Engineering Ltd	ACLA	SG110/110	525
Dec-16	HY/2011/03 HK-Zhuhai Macau Bridge - Hong Kong Link Road - Scenic Hill and Hong Kong Boundary Crossing Facilities	China State Construction Engineering (HK) Ltd Sun Rise Civil Engineering Ltd	Ove Arup & Partners HK Ltd	SG110/110 SG20/20F SG20/20F	2,625 1,050 2,625
Dec-16	C3206 Three Runway System - Main Reclamation Works	Chung Kong Marine Engineering Ltd WinSino Engineering Co China Dredging Co ZHEC-CCCC-CDC JV	Airport Authority	SG110/110 SG110/110 SG110/110 SG110/110	4,725 11,025 1,575 2,625
Feb-17	NE/2015/01 TKO - Lam Tin Tunnel - Main tunnel and associated works	Leighton - China State JV Shun Tat Construction Engineering Ltd	AECOM Asia Co Ltd	SG110/110 SG110/110	5,250 4,725
Mar-17	C3205 3rd Runway System Project DCM Ground Improvement Works (Package 5)	Bachy Soletanche -Sambo Joint Venture Tapbo Civil Engineering Co Ltd Crown Asia Engineering Ltd	Airport Authority	SG110/110 SG110/110	3,675 1,050
May-17	CV/2016/05 Reconstruction of Sharp Island Pier	Sze Fung Engineering Ltd	Civil Engineering and Development Department	SG110/110	2,625
Jun-17	SJC Hong Kong Shore-End Installation, Chung Hom Kok	Hong Kong Marine Contractors Ltd		SG110/110	1,575
Jul-17	CV/2016/01 Maintenance Contract for Seawalls and Navigation Channels	Chung Kong Marine Engineering Ltd China Harbor Engineering Co Ltd	AECOM Asia Co Ltd	SG110/110 SG110/110	1,050 3,675
Aug-17	CV/2012/05 Bathing Beach at Lung Mei, Tai Po	Welcome Construction Co Ltd Shun Tat Construction Engineering Ltd Hugh Loyal Management Ltd	Civil Engineering and Development Department	SG110/110 SG110/110 SG110/110	2,625 9,450 525
Sep-17	C3202 3rd Runway System Project DCM Ground Improvement Works (Package 2)	Samsung - Build King Joint Venture Shun Tat Construction Engineering Ltd	Fugro Hong Kong Ltd	SG110/110 SG110/110	2,100 1,050



Jan-18	KL/2015/02 Kai Tak development - Stage 5A, Infrastructure at Former North apron Area	Peako - Wo Hing Joint Venture	AECOM Asia Co Ltd	SG110/110	1,050
Jan-18	SCL1123 Exchange and Western Approach Tunnel	Leighton - China State Joint Venture Shun Tat Construction Engineering Ltd	Ove Arup & Partners HK Ltd	SG110/110	3,150
Jan-18	CHEC311 Marine dredging works (2017-2020) for Hong Kong Electric	China Harbour Engineering Co. Ltd	Hong Kong Electric	SG110/110	4,725
Jan-18	Pacific Light Cable Network - Deep Water Bay	Hong Kong Marine Contractors Ltd	Environmental Resources Management	SG110/110	525
Mar-18	HY/2012/08 Tuen Mun - Chek Lap Kok Link Northern Connection Sub-sea Tunnel Section	Dragages - Bouygues JV	AECOM Asia Co. Ltd	SG110/110	4,725
Apr-18	MTRC1121 Shatin to Central Link - NSL Cross Harbour Tunnels	Penta-Ocean - China State JV Crown Asia Engineering Ltd	AECOM Asia Co Ltd	SG110/110	1,050
May-18	Kowloon Inland Lot No. 11251 Design and Construction of Piling Foundation at Pine Street / Oat Street, Tai Kok Tsui	Yau Lee Construction Management Limited K. H. Foundation Ltd	David S. K. Au & Associates	SG110/110	1,050
May-18	NL/2017/03 Tung Chung New Town Extension - Reclamation and Advance Works	Build King - SCT JV Tapbo Civil Engineering Co Ltd Leader Marine - Yoon & Plac JV	AECOM Asia Co Ltd	SG110/110 SG110/110 SG110/110	1,050 2,100 2,100
May-18	KL/2014/03 Kai Tak Development - Stage 3, Infrastructure Works for Development at the Southern Part of the Former Runway	Hong Kong River Engineering Co Ltd	Hyder - Meinhardt JV	SG110/110	525
May-18	EP/SP/66/12 Integrated Waste Management Facilities Phase 1	Chung Kong Marine Engineering Ltd Shun Tat Construction Engineering Ltd	AECOM Asia Co Ltd	SG110/110 SG110/110	6,300 2,100
Jun-18	DC/2016/02 Building and Civil Maintenance and Minor Works to DSD Plants and Facilities	Paul Y. Construction Co Ltd World Diamond Engineering Ltd	Drainage Services Department	SG110/110	1,050
Aug-18	HY/2013/02 HZMB BCF - Infrastructure Works Stage 1 (Western Portion)	China Harbour Engineering Co. Ltd	AECOM Asia Co Ltd	SG110/110	525
Aug-18	Hong Kong Shipyard	Works of Diving Hong Kong Co Ltd		SG110/110	525
Sep-18	HY/2014/16 Hiram's Highway Improvement Stage 1 - Between Clearwater Bay Road and Marina Cove	China State Construction Engineering (HK) Ltd	Meinhart Infrastructure and Environmental Ltd	SG110/110	525
Sep-18	Private project in Lung Kwu Tan	S W Marine Works Ltd		SG110/110	1,575
Sep-18	P575 NCD Main Infrastructure Works	China State Construction Engineering (Hong Kong) Ltd Will Pak Engineering Ltd	Hong Kong Airport Authority	SG110/110	1,050
Oct-18	EP/SP/66/12 Integrated Waste Management Facilities Phase 1	Keppel Seghers - Zhen Hua Joint Venture Shun Tat Construction Engineering Ltd Denson Engineering Ltd	AECOM Asia Co Ltd	SG110/110	6,825



Oct-18	NE/2017/07 Cross Bay Link, Tseung Kwan O - Main Bridge and Associated Works	Hong Kong River Engineering Co Ltd	AECOM Asia Co Ltd	SG110/110	1,050
Oct-18	Yau Ma Tei project	Max Team Engineering Ltd		SG110/110	525



Date	June 2018
Project	Contract No. NE/2015/02 Tseung Kwan O - Lam Tin Tunnel Road P2 and Associated Works
Client	Civil Engineering and Development Department
Consultant	AECOM Asia Company Limited
Main Contractor	CRBC-Build King Joint Venture Shun Tat Construction Engineering
Works	Site Boundary Silt Curtain
Material	Bontec SG110/110 Geotextile fabric
Quantity	60,375 sqm



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Wanchai, Hong Kong
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website: www.g-and-e.com



Date	June 2014
Project	Contract No. HY/2012/08 Tuen Mun - Chek Lap Kok Link Northern Connection Sub-sea Tunnel Section
Client	Highway Department
Consultant	AECOM Asia Co. Ltd
Main Contractor	Dragages Bouygues Joint Venture
Works	Seawall Construction
Material	Bontec SG110/110
Quantity	4,725 sqm



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Date	August 2017
Project	Contract No. CV/2012/05 Bathing Beach at Lung Mei, Tai Po
Client	Civil Engineering and Development Department
Consultant	Civil Engineering and Development Department
Main Contractor	Welcome Construction Co Ltd Shun Tat Construction Engineering Ltd
Works	Silt Curtain
Material	Woven Geotextile Bontec SG110/110
Quantity	12,600 sqm



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Date	Jan 2016
Project	Proposed revitalization of Avenue of Star and east TST Promenade Waterfront
Client	New World Development
Main Contractor	Kaden Construction Ltd
Works	Silt Protector
Material	Woven Geotextile Bontec SG110/110
Quantity	1,050 sqm



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Date	May 2014
Project	HY/2012/07 Tuen Mun - Chek Lap Kok Link- Sothern Connection Viaduct Section
Client	Highway Department
Consultant	AECOM Asia Co. Ltd
Main Contractor	Gammon Construction Ltd
Material	Woven geotextile Bontec SG110/110
Works	Silt Protector
Quantity	8,925 sqm



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Date	Nov 2014
Project	Contract No. HY/2010/08 Central-Wanchai Bypass - Tunnel (Slip Road 8 Section)
Client	Highway Department
Consultant	AECOM Asia Co Ltd
Main Contractor	China State Construction Engineering (HK) Ltd
Works	Silt Curtain
Material	Woven Geotextile Bontec SG110/110
Quantity	1,575 sqm



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Date	May 2013
Project	Contract No. HK/2012/08 Wan Chai Development Phase II - Central Wan Chai Bypass at Wan Chai West
Client	Civil Engineering and Development Department
Consultant	AECOM Asia Co. Ltd
Main Contractor	China State Construction Engineering Co. Ltd Hong Kong River Engineering Co Ltd
Works	Silt Curtain
Material	Woven Geotextile SG110/110
Quantity	47,250 sqm



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Date	June 2013
Project	Contract No: HY/2011/03 HK-Zhuhai Macau Bridge Hong Kong Link Road - Scenic Hill and Hong Kong Boundary Crossing Facilities
Client	Highway Department
Consultant	Ove Arup & Partners HK Ltd
Main Contractor	China State Construction Engineering
Works	Tailor-made Silt Protector
Material	Woven Geotextile Bontec SG110/110
Quantity	37,275 sqm



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Date	January 2015
Project	Contract No. SCL1121 Shatin to Central Link - NSL Cross Harbour Tunnel
Client	MTR Corporation
Consultant	AECOM Asia Co. Ltd
Main Contractor	Penta Ocean - China State JV
Works	Silt Curtain
Material	Woven Geotextile Bontec SG110/110
Quantity	26,250 sqm



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Date	Jan 2014
Project	Contract No. CV/2013/02 Maintenance contract for seawalls and navigation channels
Client	CEDD
Consultant	CEDD
Main Contractor	China Harbour Engineering Co Ltd
Works	Silt Protector
Material	Woven Geotextile Bontec SG110/110



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Date	Feb 2014
Project	Contract No. DC/2011/04 Reconstruction, improvement and rehabilitation of Kai Tak River from Wong Tai Sin Police Station to Tung Tau II Estate
Client	Drainage Service Department
Consultant	Scott Wilson Limited
Main Contractor	Leader - Sunnic JV
Works	Silt Curtain to Kai Tak Nullah
Material	Woven Geotextile Bontec SG110/110
Quantity	525 sqm



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Date	June 2014
Project	Contract No. HY/2010/02 HK-Zhuhai-Macau Bridge - HK Boundary Crossing Facilities Reclamation Works
Client	Highway Department
Consultant	Ove Arup & Partners HK Ltd
Main Contractor	China Harbour Engineering Co Ltd
Works	Tailor-made Silt Protector
Material	Woven Geotextile Bontec SG110/110
Quantity	79,800 sqm



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Date	November 2005
Project	Contract No. HY/2002/26 Stonecutters Bridge
Client	Highway Department
Consultant	Ove Arup and Partners HK Ltd
Main Contractor	Hong Kong River Engineering Co Ltd Maeda - Hitachi - Yokogawa - Hsing Chong Joint Venture
Material	Woven geotextile Bontec SG110/110
Works	Tailor-made Silt Curtain
Size	1,050 sqm



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Date	May 2011
Project	Contract No. DC/2009/22 Drainage Improvement Works in Shuen Wan, Tai Po
Client	Drainage Service Department
Consultant	AECOM (Asia) Ltd
Main Contractor	Kwan Lee - Kuly Joint Venture
Works	Separation
Material	Woven geotextile SG110/110
Quantity	2,625 sqm



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Date	June 2013
Project	Contract No. HY/2009/15 Central-Wanchai Bypass-Tunnel (Causeway Bay Typhoon Shelter Section)
Client	Highway Department
Consultant	AECOM Asia Co. Ltd
Main Contractor	China State Construction Engineering (HK) Limited
Works	Tailor-made Silt Curtain
Material	Woven Geotextile Bontec SG110/110



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Date	March 2014
Project	Contract No. HK/2009/02 Wan Chai Development Phase II Central - Wan Chai Bypass Wan Chai East
Client	Civil Engineering and Development Department
Consultant	AECOM (Asia) Ltd
Main Contractor	Chun Wo Construction & Engineering Co.Ltd
Application	Silt Protector
Material	Woven Geotextile SG110/110
Quantity	9,450 sqm



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Date	March 2010
Project	Contract No. HK/2009/01 Wan Chai Development Phase II -Central - Wanchai Bypass at Hong Kong Convention and Exhibition Centre
Client	Civil Engineering and Development Department
Consultant	AECOM Asia Co. Ltd
Main Contractor	Chun Wo - Leader Joint Venture
Works	Intake Silt Curtain
Materials	Woven Geotextile SG110/110
Size	34,125 sqm



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Date	March 2010
Project	KL/2009/01 Site formation for Kai Tak Cruise Terminal Development
Client	CEDD
Consultant	Scott Wilson Ltd
Main Contractor	Penta-Ocean Construction Co. Ltd
Materials	SG110/110
Size	1,050 sqm



Date	March 2010
Project	Contract No. DC/2007/01 Drainage Improvement Works in Ki Lun Tsuen, Kwu Tung, Ma Tso Lung and Sha Ling
Client	Drainage Services Department
Consultant	Mott MacDonald
Main Contractor	Shanghai Urban Construction (Group) Corporation
Works	Soil filter
Material	Woven Geotextile Bontec SG110/110 Woven Geotextile Bontec SG40/40
Quantity	SG110/110 - 7,875 sqm SG40/40 - 71,925 sqm



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Date	April 2011
Project	Contract No. HY/2009/11 Central - Wanchai Bypass - North Point Reclamation
Client	Highways Department
Consultant	AECOM Asia Ltd
Main Contractor	China Harbour Engineering Company
Works	Tailor-made Silt Curtain
Materials	Woven Geotextile SG110/110
Quantity	22,066 sqm



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Date	May 2004
Project	Contract No. CV/2001/12 Reconstruction of Cheung Chau and Wu Kai Sha Public Piers
Client	Civil Engineering and Development Department
Engineer	Civil Engineering and Development Department
Main Contractor	Hong Kong and Macau Scent On Engineering & Construction Ltd
Works	Tailor-made Silt Curtain
Material	Woven Geotextile Bontec SG110/110



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Date	October 2006
Project	Lamma Island Cable Landing
Client	Hong Kong Electric Co Ltd
Consultant	Hong Kong Electric Co Ltd
Main Contractor	United Marine Co Ltd
Works	Tailor-made Silt Curtain
Material	Woven Geotextile SG110/110
Quantity	2,100 sqm



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Date	March 2006
Project	Contract No. HY/2005/06 Castle Peak Road Improvement West of Tsing Lung Tau
Client	Highway Department
Consultant	Mouchel Halcrow JV
Main Contractor	Chun Wo Construction & Engineering Co., Ltd.
Material	Woven Geotextile Bontec SG110/110
Works	Tailor-made Silt Curtain
Quantity	1,050 sqm



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Date	February 2005
Project	Contract No. CV/2003/06 Stanley Waterfront Improvement Project - Construction Pier &
Client	Civil Engineering and Development Department
Consultant	Civil Engineering and Development Department
Main Contractor	Sun Fook Kong (Civil) Ltd
Works	Silt Curtain - SG110/110
Quantity	2,080 sqm



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Date	May 2011
Project	Contract No. DC/2009/13 Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan
Client	Drainage Service Department
Consultant	Scott Wilson CDM Joint Venture
Main Contractor	Leader Civil Engineering Corp Ltd
Material	Bontec SG110/110 woven geotextile
Works	Silt Curtain
Quantity	1,575 sqm



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Date	Jan 2005
Project	Contract No. HK/12/02 Central Reclamation Phase III Engineering Works
Client	Civil Engineering and Development Department
Consultant	Atkins China Ltd
Main Contractor	Leighton - China State - Van Oord JV
Material	Woven Geotextile Bontec SG110/110
Works	Silt Curtain
Quantity	3,655 sqm



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website: www.g-and-e.com



Date	January 2010
Project	KL/2008/07 Kai Tak Development-Infrastructure works at Southern part of former runway, Stage 1
Client	CEDD
Consultant	AECOM
Main Contractor	Friendly Benefit Engineering Ltd
Works	Fabrication of Silt Curtain
Materials	SG110/110



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Tel: 852-2570 0103 Fax: 852-2570 0089
website: www.g-and-e.com



Date	March 2013
Project	Contract No. 1017EM10 Seawall Modification Work at Outfall Area at Kai Tak Development
Client	Civil Engineering and Development Department
Consultant	AECOM
Main Contractor	Crown Asia Engineering Ltd
Works	Silt Curtain
Material	Woven geotextile Bontec SG110/110
Quantity	1,050 sqm



**Bontec SG110/110
Woven Geotextile**

Approval Letters

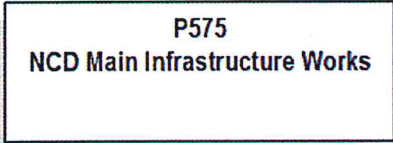
Karen Yip
CHINA STATE CONSTRUCTION ENGINEERING (HK)...

CSECEL/P575/M/00193C - Material Submission f... 2018-10-08
文件传送 CSECEL-TRANSMIT-000287

已回复

Bill Mar
AIRPORT AUTHORITY

Re: CSECEL/P575/M/00193C - Material Submissi... 下午3点13分
文件传送 AAHK-TRANSMIT-000306



邮件类型
文件传送
参考号
CSECEL-TRANSMIT-000287

邮件编号
AAHK-TRANSMIT-000306

Re: CSECEL/P575/M/00193C - Material Submission for Geotextile Type 1 for Seawall Modification and Box Culvert for Outfall 8A

发件人 Mr Bill Mar - Airport Authority
收件人 (2) Mr Bill Mar - Airport Authority (+1 更多...)
抄送收件人 (15) Mr Henry Chan - Airport Authority (+14 更多...)
已发送 2018年10月19日 星期五 3:13:56 PM HKT (GMT +08:00)
状态 不适用

详情

Discipline Civil
Area Outfall 8A
Submission number CSECEL/P575/M/00193C
Submission Response (AA reply) A -Notice of No-Objections

消息

PROJECT MANAGER'S REPLY TO CONTRACTOR'S SUBMISSION

TITLE OF SUBMISSION: Material Submission for Geotextile Type 1 for Seawall Modification and Box Culvert for Outfall 8A
SUBMISSION NUMBER: CSECEL/P575/M/00193C

RESPONSE:
Submission for Review
(Ref. GS 18.4)

A -Notice of No-Objections

A

Submission for Permission or Consent (Ref GS 18.5)	B1- No-Objection subj. to comments,resub	
	B2- Subj. to comments,resub not required	
	C -Notice of Objection, please resubmit	
	D -Notification of Permission or Consent	
	E -Notification of Permission or Consent subject to compliance with conditions; please confirm acceptance of conditions	
	F -Permission or Consent withheld	
Submission for information	R -Submission acknowledged	

COMMENTS:

We have no objection to your proposed use of Geotextile Type 1 "Bontec SG 110/110 Woven Polypropylene Geotextile".

AA DISTRIBUTION: File Ref:			From: PM's Representative	Contractor's Stamp
Name	Action	Info		
			Name:	
			Signature:	
			Date:	

CONTRACTOR'S SUBMISSION

TITLE OF SUBMISSION : CSEL/P575/M/00193C - MATERIAL SUBMISSION FOR GEOTEXTILE TYPE 1 FOR SEAWALL MODIFICATION AND BOX CULVERT FOR OUTFALL 8A

CSCE SUBMISSION REF. NO. : CSHK/CDP/A.3/7.23/2018/00713

SUBMISSION NUMBER : CSEL/P575/M/00193C

SPECIFICATION REFERENCE : PS / F / A14/ 1.17

DRAWING REFERENCE :PBA/P273/BDC/6532, PBA/P273/BDC/6533 & PBA/P273/BDC/6534

DESCRIPTION OF CONTENTS :

As per your comments given on AAHK-TRANSMIT-000256 dated 23 July 2018, we are pleased to submit herewith Geotextile Type 1 "Bontec SG 110/110 Woven Geotextile" information for review and approval.

Appendix A: Test report by Precision – TRI Geosynthetic Laboratory Int.

Appendix B: Certificate of Precision – TRI Geosynthetic Laboratory Int. by Geosynthetic Accreditation Institute.

Appendix C: Method of Sewing Seam.

Remarks :	AA Distribution
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To.: Cc.: Discipline: Area: Submission No.: CSECEL/P575/ Submission Response (AA reply):	File Ref.: 15.00/CFR <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">Name :</th> <th style="width: 25%;">Action</th> <th style="width: 25%;">Comments</th> <th style="width: 25%;">Info</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>	Name :	Action	Comments	Info																								
Name :	Action	Comments	Info																										
From: CSCE's Representative Name : Thomas Lui Signature : (N/A FOR ELECTRONIC SUBMISSION) Date:	Contractor's Name CHINA STATE CONSTRUCTION ENGINEERING (HONG KONG) LTD.																												

KYW/GY/WSC/ky

Key to "Document Type" in Submission No. D - Permanent Works or Plants Design; T - Temporary Works Design; S - Survey and Setting Out; O - Other Q - Quality Control/Quality Assurance; P - Progress and Programme; M - Materials; Z - General Construction

This mail has been approved for release by K Yip on 2018-10-08 11:17:11 HKT

此邮件已由J Law 准备



Your Ref : KSZHJV/OUT/2018/05/01.11/000513
Our Ref : IWMF/(EP/SP/66/12)/R20/820/B00076

7 June 2018

Keppel Seghers-Zhen Hua Joint Venture
19/F, China Harbour Building
370-374, King's Road
North Point
Hong Kong

Attn: Mr. Chung Tai Tung, Peter

Dear Sir,

Contract No. EP/SP/66/12
Integrated Waste Management Facilities Phase 1

Material Submission – Geotextile for Silt Curtain (Bontex SG110/110)

We refer to your letter ref No. KSZHJV/OUT/2018/05/01.11/000513 dated 1 June 2018 and our discussion on 1 June 2018 where you clarified the typo of "Bontex SC110/110" that the description should be "Bontex SG110/110" as per the manufacturer's information sheets.

We have no objection in principle to your proposed use of Geotextile Bontex SG110/110 for Silt Curtain, provided that the material shall be used and stored in strict compliance with the Specification and the manufacturer's recommendations.

Please also be reminded that, pursuant to Clause 3.3 of Condition of Contract, any of our comments on your submission, or any areas of the subject of your submission we have not provided comments on, shall not in any way operate to relieve any of your duties, responsibilities, obligations or liabilities under the Contract.

Yours faithfully,
For and on behalf of
AECOM Asia Co. Ltd.

Henry Chan
Chief Resident Engineer

c.c. PEPO(SFG),EPD - Attn: Mr. Yu Wang Pong
AACL - Attn: Mr. Bevis Mak

By Fax (3529 2991) only

HC/EW/CW/ml



Your Ref : KSZHJV/OUT/2018/05/01.11/000513
Our Ref : IWMF/(EP/SP/66/12)/R20/820/B00076

7 June 2018

Keppel Seghers-Zhen Hua Joint Venture
19/F, China Harbour Building
370-374, King's Road
North Point
Hong Kong

Attn: Mr. Chung Tai Tung, Peter

Dear Sir,

Contract No. EP/SP/66/12
Integrated Waste Management Facilities Phase 1

Material Submission – Geotextile for Silt Curtain (Bontex SG110/110)

We refer to your letter ref No. KSZHJV/OUT/2018/05/01.11/000513 dated 1 June 2018 and our discussion on 1 June 2018 where you clarified the typo of "Bontex SC110/110" that the description should be "Bontex SG110/110" as per the manufacturer's information sheets.

We have no objection in principle to your proposed use of Geotextile Bontex SG110/110 for Silt Curtain, provided that the material shall be used and stored in strict compliance with the Specification and the manufacturer's recommendations.

Please also be reminded that, pursuant to Clause 3.3 of Condition of Contract, any of our comments on your submission, or any areas of the subject of your submission we have not provided comments on, shall not in any way operate to relieve any of your duties, responsibilities, obligations or liabilities under the Contract.

Yours faithfully,
For and on behalf of
AECOM Asia Co. Ltd.

Henry Chan
Chief Resident Engineer

c.c. PEPO(SFG),EPD - Attn: Mr. Yu Wang Pong
AACL - Attn: Mr. Bevis Mak

By Fax (3529 2991) only

HC/EW/CW/ml

RESPONSE TO CONTRACTOR'S SUBMISSION

Our Ref. : C2/(HY/2012/08)/M25/110/B017642

To : DBJV

Attn. : Mr. Ivan Chau

Location : Southern Landfall - Outfall	CSF No. : TMCLKL8/MAS/SAA/001173/A	
Title of Submission : Geotextile for Seawall Reinstatement (Originated from DBJV) in Outfall Construction - Bontec SG110/110	Rev.: A	Date: 3 April 2018

The Supervising Officer's Representative's Comment(s) :

I refer to the captioned material submission dated 3 April 2018 proposing the Geotextile - Bontec SG110/110, supplied by G and E Company Limited to be used for the reinstatement of seawall at the drainage outfalls in the Southern Landfall.

I have no objection in principle to the proposed material subject to the method of jointing the geotextile attached in your submission should be strictly followed.

20224 APR 09 10:45:58

Project : TMCLKL8							
Date : 09 APR 2018							
Reg No. : 030224							
Dept	Name	Act	Info	Dept	Name	Act	Info
MGT	FGUE			Ext/Civil	DLA		
	ICH			-NVS/NVB	WAM		
Comm	PAT			-NAR/REC	WAM		
-Contract	LaC			-BoxCulv	WAM		
	NWc			-SLF	CDc		
	LCK			-SVS/SVB	MaH		
-Subcon	JDo			-MHS(Tun)	MaH		
Safety	TYC			-MHS(Cat)	PIM		
Q&E	ERe			Tun/Pla	DLA		
Technical	ASc			-Surface	KWc		
-Design	BSh			-Int Struc	KWc		
-Method	Eca			-FP	PCh		
-Geo	CCh			-Precast	RKw		
Planning	WYu			-Plant(N/S)	CY		
Survey	CWL			-Plant(S)	AM		
AGP	FGI			-Purch	AKw		
-Cost/ctrl	EYI			TBM	FDe		
-Admin	CSu			CrossP	FRg		
-PR	CSc			BYTP			
Board				OAP			
WJ				GLD			
MBN				ATK			
ACD				Instructor			

AOK

64

Status : Approved; Not approved and resubmission required;

Approved subject to condition(s) as stated / further required information as stated.

Approval not required. Others _____

(Please specify)

The Supervising Officer's Representative : _____ Date of Response : 7 April 2018

Roger Man

c.c. File No. - C20/670

AJW/AGX/EY/RKFL/ac

**ENGINEER'S OFFICE
BLACK & VEATCH
HONG KONG LTD.**
25th Floor, Millennium City 6
392 Kwun Tong Road, Kowloon, Hong Kong.
Tel : 2601 1000
Fax : 2601 3988



**ENGINEER'S
REPRESENTATIVE'S
OFFICE**
Butterfly Valley Fresh Water Primary Service Reservoir
Kowloon, Hong Kong
(Not a postal address)

Your ref. : C9103/BVSR/WF/0076/10/13
Our ref. : 4991/(4/WSD/11)/M25/120/L100071

Date: 22 October 2013

Contract: 4/WSD/11 Project Office
c/o China Geo – Engineering Corporation
Rooms 2421-2425, 24/F, Sun Hung Kai Centre
30 Harbour Road
Wan Chai
Hong Kong

By Hand

Attn: Mr. Wong Fai (Site Agent)

Dear Sirs,

**Agreement No. CE 55/2008 (WS)
Contract No. 4/WSD/11
Construction of Butterfly Valley Fresh Water Primary Service Reservoir Extension and
Associated Mainlaying
Material Submission – Geotextile Filter**

We refer to your letter of 10 October 2013 supplementing the additional information for your proposal to use the following material:

<i>Item</i>	<i>Material</i>	<i>Manufacturer</i>	<i>Supplier</i>
1.	Geotextile Filter	Bonar Technical Fabrics	G & E Co. Ltd.

Please be advised that we have no objection in principle to your proposal, provided that the application of such materials shall be in full compliance with the manufacturer's recommendations and the Contract Specification.

You are reminded, pursuant to PS Clause 7.196S(3)(d), to provide the sieve size of the base soil upon collection of soil sample on Site for our information.

Yours faithfully,

Peter K H Ng
Engineer's Representative

PNg/AC/JT/dt



Drainage Services Department
Drainage Projects Division
44/F, Revenue Tower, 5 Gloucester Road,
Wan Chai, Hong Kong

渠務署
排水工程部
香港灣仔告士打道5號
稅務大樓44樓

來函編號 Your Ref: KLKJV/DC201002/T40/0173

本署編號 Our Ref: () in DP/8/4109CD/DC1002/30

電話 Tel: (852) 2435 7031

傳真 Fax: (852) 2827 8700

By fax and post
(Fax No. 2674 6688)

29 August 2011

Kwan Lee – Kuly Joint Venture
Unit 6, 16/F Yuen Long Trading Centre,
33 Wang Yip Street West,
Yuen Long, N.T.

(Attention: Mr. CHAN Wing-kai – Project Manager)

Dear Sirs,

Contract No. DC/2010/02
Drainage Improvement Works in Shuen Wan and Shek Wu Wai

Material Submission – Type B Geotextile

I refer to your above quoted letter dated 19 August 2011 and the attached email dated 29 August 2011 enclosing further information in response to the comments given in my letter dated 25 August 2011 regarding the captioned subject.

Please be advised that I have no objection to your proposal of using "Bontec SG110/110 Woven Polypropylene Type B Geotextile" manufactured by "Bonar Technical Fabrics" and supplied by "G and E Company Limited" as the geotextile filter Type B / Geotextile Type 2 for this Contract subject to its satisfactory performance on site.

Yours faithfully,


(W. L. YIP)
Engineer's Representative
Drainage Projects Division
Drainage Services Department

Encl.

cc. DC/2010/02 Site Office

Internal (to note in file): E/D19

WLY/

D1045

RECEIVED
08 JUN 2011

BY:

Your Ref. : KLKJV/DC200922/M60/1498
Our Ref. : (DC/2009/22)/R20/106(0019)

8 June 2011

Kwan Lee – Kuly Joint Venture
Unit 6, 16/F, Yuen Long Trading Centre
33 Wang Yip Street West, Yuen Long
New Territories, Hong KongShuen Wan RE's Office
Fo Chun Road, Pak Shek Kok, Tai Po, H.K.
T +852 2603 6933
F +852 2603 7998Attn : Mr. WONG Ching Lung (Site Agent)

Dear Sirs

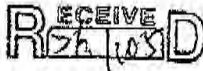
Contract No. DC/2009/22
Drainage Improvement Works in Shuen Wan, Tai Po – Contract 1**Material Submission – Type B Geotextile**

I refer to your above referenced letter dated 31 May 2011 enclosing further information in response to the comments given in my letter ref. (0017) in the same series dated 27 May 2011 on the captioned material submission for my approval.

Please be advised that I have no objection to your proposal of using "Bontec SG 110/110" manufactured by "Bonar Technical Fabrics Company" and supplied by "G & E Company Limited" "as the geotextile filter Type B / Geotextile Type 2 for this Contract subject to its satisfactory performance on site.

You are reminded to strictly follow the manufacturer's guidelines on storage, handling and installation procedures for application of the material.

Yours faithfully,
For and on behalf of
AECOM Asia Co. Ltd.
Eddie LUK
Resident Engineer
Water & Urban Developmentcc AECOM - Attn : Mr. Joseph HO
M/FEL/VH/pc
✓、



土木工程處
Civil Engineering Office

Web site 網址 : <http://www.cedd.gov.hk>
E-mail 電子郵件 :
Telephone 電話 : (852) 2760 3737
Facsimile 傳真 : (852) 2714 2054
Our reference 本署檔號 : () in PW WC/CV0402/R20/340 Pt.1
Your reference 來函檔號 : KS330/2005

香港九龍公主道101號
土木工程拓展署大樓四樓
4/F, Civil Engineering and Development Building,
101 Princess Margaret Road,
Kowloon, Hong Kong

Kin Shing Construction Company Limited
1/F,
27 Yin Chong Street,
Mong Kok
Kowloon
(Attn.: Mr. Patrick P K Chau - Site Agent)

24 January 2005

BY MAIL & FAX No. 2780 2085

Dear Sirs,

Contract No. CV/2004/02
Reconstruction of Wong Shek and Ko Lau Wan Public Piers

Material Submission - Geotextile for Silt Curtain

I refer to your letter of 14.1.2005 enclosing the particulars of the geotextile for fabrication of silt curtain.

In accordance with PS Clause 26.08(2), the proposed "SG 100/100" woven geotextile manufactured by Bonar Technical Fabrics is approved to be used under the captioned Contract.

Pursuant to PS Clause 26.08(1), you are required to submit details of the silt curtains 3 weeks before their deployment.

Contract No.	Post	Initial	Copy	Action
CV/2004/02	CM	W		
	PM	W		
	SA			
	Sub-A	W		
	Eng. (1)	W		
	Eng. (2)			
	G.F.			
	Foreman			
	Q.S.	W		
	Safety	W		
	Material	W		
	Survey			

Yours faithfully,

(W H LEE)
Engineer's Representative
Port Works Division
Civil Engineering and Development Department

c.c.
SIOW/P2B - Site Copy

cls

24-FEB-2005 18:57 FROM SFK

TO 25700089

P.01/01

10:47:10

土木工程拓展署
CEDD Civil Engineering and Development Department

Web site 網址 : <http://www.cedd.gov.hk>
 E-mail 電子郵件 :
 Telephone 電話 : (852) 2762 5035
 Facsimile 傳真 : (852) 2714 2054
 Our reference 本署編號 : (15) in PW WC/CV0306/R20/340 Pt.01
 Your reference 來函編號 : CIV:002091/1.2/HW/SY/CC/me(S0087), CIV:002091/1.2/HW/SY/CC/me(S0118)

土木工程處
 Civil Engineering Office

112

香港九龍公主道 101 號
 土木工程拓展署大樓 4 樓
 4/F, Civil Engineering and Development Building,
 101 Princess Margaret Road,
 Kowloon, Hong Kong

18 February 2005

Sun Fook Kong (Civil) Limited
 Rms. 3207-10,
 Great Eagle Centre,
 23 Harbour Road,
 Wan Chai,
 Hong Kong
 (Attn: Mr. Howard KONG - Fax No.2827 6275)

Dear Sirs,

Contract No. CV/2003/06
Stanley Waterfront Improvement Project -
Construction of Pier and Boardwalk

Fabric for Silt Curtain

I refer to your above letters dated 21.1.2005 and 15.2.2005 proposing the SG100/100 fabric supplied by "Bonar Technical Fabrics" for silt curtain.

I have no objection to your proposed material for silt curtain.

Yours faithfully,

Paul Y K MA
 (Paul Y K MA)

Engineer's Representative
 Port Works Division
 Civil Engineering and Development Department

c.c.
 Site Office (Attn: S1OW/PIA)
 CEG/PIA

File PW WC/CV0306/M10/300

YKM/olam

Post-It® Fax Note	7671	Date	24/2/05
To	MR. STANLEY WAN	From	CHANG SEE-FAU
Co./Dept.	G&E	Co.	SFK
Phone #	25700028	Phone #	60347709
Fax #	25700089	Fax #	

Maunsell Consultants Asia Ltd

8/F Grand Central Plaza, Tower 2, 138 Shatin Rural Committee Road, Shatin, N.T., Hong Kong

茂盛(亞洲)工程顧問有限公司

香港新界沙田鄉事會路 138 號新城市中央廣場第 2 座 8 樓

T +852 2605 6262 F +852 2691 2649 www.maunsell.aecom.com

SRE's Office T +852 2669 0708 F +852 2631 2889 E sre@ltriw.com.hk

Your Ref. : DC0706/M1.2/1512 & 1529

Our Ref. : (DC/2007/06)/R20/106(0023)

RECEIVED
13 NOV 2008

BY:

Chiu Hing Construction & Transportation Co. Ltd.
Room 201, 2/F Fuk Shing Commercial Building
28 On Lok Mun Street
On Lok Tsuen, Fanling
New Territories, Hong Kong

Attn : Mr. Roger Lau (Site Agent)

13 November 2008

Dear Sir,

Contract No. DC/2007/06

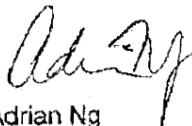
**River Improvement Works in Upper Lam Tsuen River,
She Shan River and Upper Tai Po River**

Proposed Geotextile at Gabion Wall in She Shan River and Upper Tai Po River

I refer to your letter dated 7 November 2008 and 12 November 2008 respectively.

Please be advised that since the water flow rate of the proposed geotextile model Bontec SG100/100 meets the requirements in accordance with P.S. Clause 7.150, I have no further objections to your proposed use of woven geotextile model Bontec SG100/100, supplied by "G and E Company Ltd." at gabion wall in She Shan River and Tai Po River, subject to its satisfactory performance on site.

Yours faithfully,



Adrian Ng
Resident Engineer

cc MCAL - Attn : Mr. Conder Yan
Chiu Hing H.O.

AN/BC/ek



**Bontec SG110/110
Woven Geotextile**

G and E Company Introduction



G AND E COMPANY LIMITED

14/F Kiu Yin Commercial Building

361 – 363 Lockhart Road,

Wanchai, Hong Kong

Tel: 2570 0103

Fax: 2570 0089

website: www.g-and-e.com

G and E – a Perspective

G and E, founded in 1984, is a geosynthetics specialist who distributes a wide variety of geosynthetics from a list of renowned global manufacturers. The Company also manages a competent installation contracting service. To better serve our clients, design and engineering service have also been established in our portfolio. We aspire to provide our client comprehensive engineering solutions, from application and design, supply of materials and their installation, to conformance testing and project commissioning.

G and E takes a strong vision in geosynthetics application and development by working closely with consultants, academics, professional organizations, research institutions, testing laboratories and manufacturers, a mission to broaden the versatility of geosynthetics and its innovation.



Our vast product range covers:

Geotextile, geomembrane, geodrain, geocomposite, geogrid, geocell, band drain, erosion control systems, geosynthetic clay liner, cementitious liner, rockfall barrier, gabion, geofoam, silt curtain, concrete mattress and geotextile container, extending a wide scope of application in most civil, geotechnical and marine engineering construction.

We offer our clients:

- Extensive product knowledge and installation method statement
- Comprehensive application, design, contracting and commissioning services
- High integrity and superior professional attention
- Superb quality products at competitive price



G and E is ISO 9001:2015 quality management certified and a VSRS registered contractor, with a remarkably successful working relationship with a long list of clients, the Government, project owners, contractors, designers, consultant engineers, overseas distributors and trading partners. The clientele extends to Macau, Southeast Asia and Southern China.

Talk to us today and see how we can work together for cost-effective and time saving solutions. We are into our 35th year in the industry, we have a library of experience to share and to support your project.

ISO9001:2015



IGAI



International Geosynthetics Society



Product Endorsement



Registered Subcontractor



G and E runs a distribution network and sourcing agent of geosynthetics, as well as a provider of professional design and installation services.



TKO - Lam Tin Tunnel - Main tunnel and associated works using DSP silt curtain

The company handles a comprehensive range of geosynthetic materials:

GEOTEXTILE: Woven, non-woven, thermal bonded, needle punched, spun bond, special weave & composite

GEOMEMBRANE: HDPE, LLDPE and PVC membrane, keyed preformed, tunnel, conductive and concrete protection liner, gas barrier, basement waterproofing, leakage collection & effluent containment

GEODRAIN: Geonet, geocomposite, band drain, sheet drain and miradrain

GEOGRID: Uni, mono direction and composite geogrid

EROSION CONTROL: Erosion mat, concrete mat, coir mat, geocell, gabion, rockfall mesh, flexible rockfall fence, cementitious liner

MARINE: Silt curtain, turbidity control, block mat, geotextile tube, oil & trash boom, geotextile bag & container

GEOSYNTHETIC CLAY LINER: Bentonite liner and composite

TUNNEL: Tunnel support & invert drainage void former

LANDSCAPING : Geotextile filter, root barrier and drainage mat and roof drain

SPECIAL SERVICE: Geomembrane leak location survey, HDPE pipe welding, HDPE lining repair and Dust Control

Registration Certificate

This is to certify that the Management Systems of

G & E Company Limited

have been assessed by AJA Registrars and registered
against the requirements of

ISO 9001:2015

Certificate No. : **AJA14/17026**

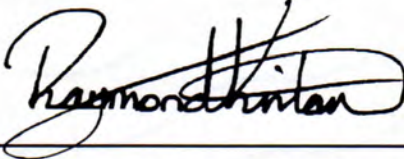
Date of Original Registration : **22nd January 2014**

Expiry Date : **27th March 2021**

Date of Re-Registration : **27th March 2018**



0059


Chief Executive - AJA Registrars Ltd



This certificate is issued in respect of the locations & scope of registration detailed in the Associated Registration Schedule.
This certificate is the property of AJA Registrars Ltd Unit 6 Gordano Court Gordano Gate Business Park Serbert Close Portishead Bristol UK BS20 7FS
and must be returned on request. A member of the AJA Group of Companies

NE/2017/01

Tseung Kwan O – Lam Tin Tunnel: Tseung Kwan O Interchange and Associated Works

Silt Curtain Deployment Plan

Appendix D – Silt Curtain Inspection Checklist



Contract No: NE/2017/01
 Project Title: Tseung Kwan O - Lam Tin Tunnel -
 Tseung Kwan O Interchange and Associated Works

Ref. no.: _____
 Date: _____

Daily Silt Curtain Inspection List (for JV internal use)

Item	Description	Condition		Immediate Action Required? *		Target Rectification Date	Remark
		Yes	No	Yes	No		
1	Any floating debris/ refuse within silt screen/ curtain?						
2	Tying to the platform in good condition?						
3	Geotextile intact and in good condition						
4	Any obstruction to water flow between geotextile?						

*Note: For silt curtain with defects which need to be rectified immediately, related marine works have to be stopped until rectification works are completed to the satisfaction of the *Supervisor*
 Please Tick the Appropriate Box

JV's Representative
 Inspected by : _____
 Post : _____
 Signature : _____
 Date : _____

Silt Curtain ID: _____

Location: _____

Inspection Date and Time: _____



Contract No: NE/2017/01
 Project Title: Tseung Kwan O - Lam Tin Tunnel -
 Tseung Kwan O Interchange and Associated Works

Ref. no.: _____
 Date: _____

Weekly Silt Curtain Inspection List (for JV and *Supervisor* joint inspection use)

Item	Description	Condition		Immediate Action Required? *		Target Rectification Date	Remark
		Yes	No	Yes	No		
1	Any floating debris/ refuse within silt screen/ curtain?						
2	Tying to the platform in good condition?						
3	Geotextile intact and in good condition						
4	Any obstruction to water flow between geotextile?						

*Note: For silt curtain with defects which need to be rectified immediately, related marine works have to be stopped until rectification works are completed to the satisfaction of the *Supervisor*
 Please Tick the Appropriate Box

JV's Representative
 Inspected by : _____
 Post : _____
 Signature : _____
 Date : _____

Supervisor's Representative
 Reviewed by : _____
 Post : _____
 Signature : _____
 Date : _____

Silt Curtain ID: _____

Location: _____

Inspection Date and Time: _____



Contract No: NE/2017/01
 Project Title: Tseung Kwan O - Lam Tin Tunnel -
 Tseung Kwan O Interchange and Associated Works

Ref. no.: _____
 Date: _____

Silt Curtain Inspection List (for Diver Team's use)

Item	Description	Condition		Immediate Action Required? *		Target Rectification Date	Remark
		Yes	No	Yes	No		
1	Any floating debris/ refuse within silt screen/ curtain?						
2	Tying to the platform in good condition?						
3	Geotextile intact and in good condition?						
4	Steel chain ballast in good condition?						
5	Any obstruction to water flow between geotextile?						

*Note: For silt curtain with defects which need to be rectified immediately, related marine works have to be stopped until rectification works are completed to the satisfaction of the *Supervisor*
 Please Tick the Appropriate Box

Diver Team's Representative
 Inspected by : _____
 Post : _____
 Signature : _____
 Date : _____

Supervisor's Representative
 Reviewed by : _____
 Post : _____
 Signature : _____
 Date : _____

Silt Curtain ID: _____

Location: _____

Inspection Date and Time: _____

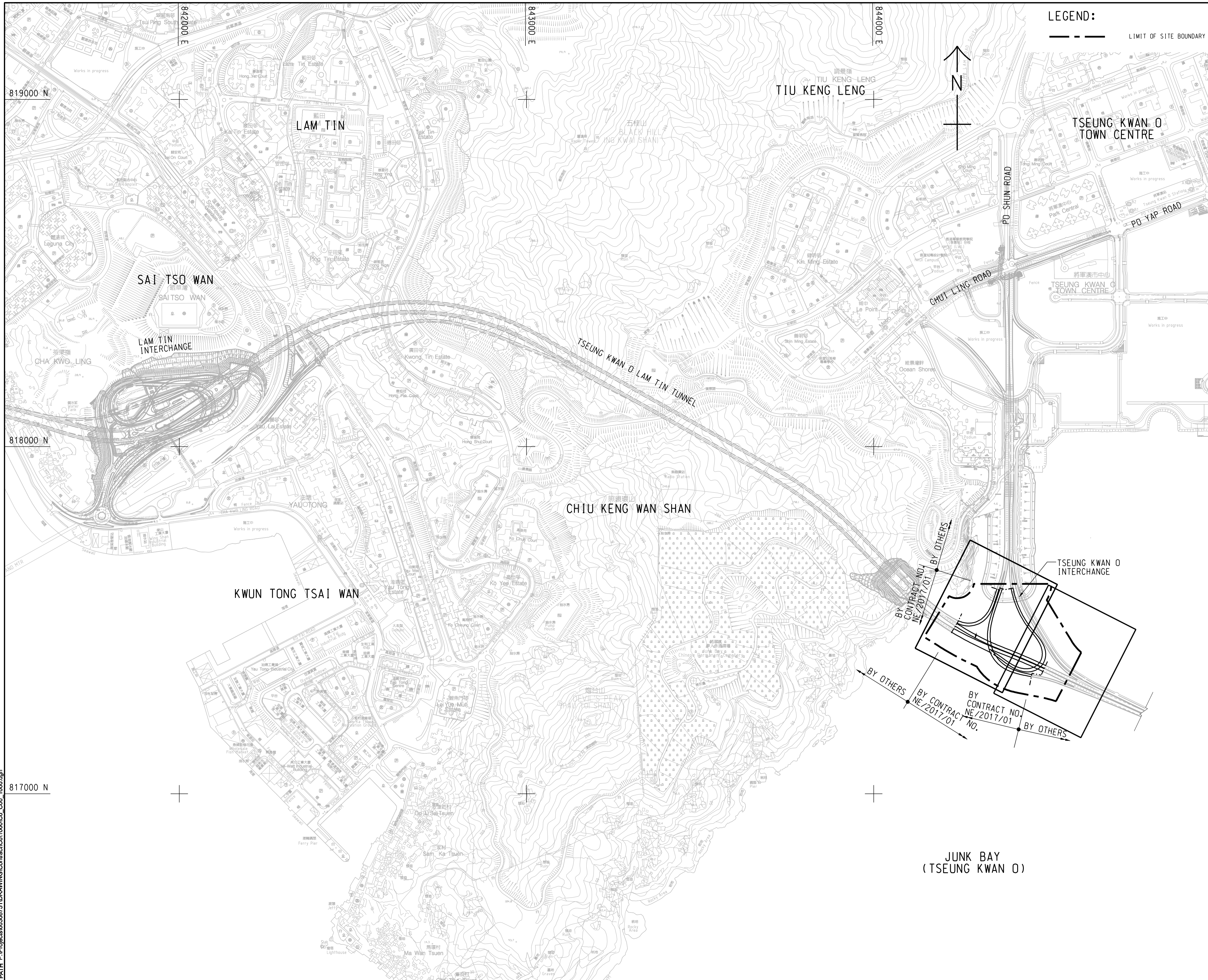
NE/2017/01

Tseung Kwan O – Lam Tin Tunnel: Tseung Kwan O Interchange and Associated Works

Silt Curtain Deployment Plan

Appendix E – Site Layout

ISO A1 594mm x 841mm
 Approved: HKT
 Checked: RPCM
 Designer: WN
 Project Management Initials:
 2017/09
 HEDS
 PATH: P:\Projects\603075\DRAWING\Contract\603075\000\CS_C00_1000.dgn



LEGEND:
 --- LIMIT OF SITE BOUNDARY

AECOM

PROJECT
 TSEUNG KWAN O - LAM TIN TUNNEL

CONTRACT TITLE
 TSEUNG KWAN O - LAM TIN TUNNEL
 TSEUNG KWAN O INTERCHANGE AND ASSOCIATED WORKS

CLIENT
 土木工程拓展署
 CEDD
 Civil Engineering and Development Department

CONSULTANT
 工程顧問公司
 AECOM Asia Company Ltd.
 www.aecom.com

SUB-CONSULTANTS
 分判工程顧問公司

ISSUE/REVISION
 修訂

I/R	DATE	DESCRIPTION	CHK.
-	JUN.17	TENDER DRAWING	RPCM

STATUS
 階段

SCALE
 比例
 A1 1 : 5000

DIMENSION UNIT
 尺寸單位
 METRES

KEY PLAN
 索引圖

PROJECT NO.
 項目編號
 60308751

CONTRACT NO.
 合約編號
 NE/2017/01

SHEET TITLE
 圖紙名稱
 KEY PLAN AND LOCATION PLAN

SHEET NUMBER
 圖紙編號
 60308751/C6/C00/1000

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817200 N

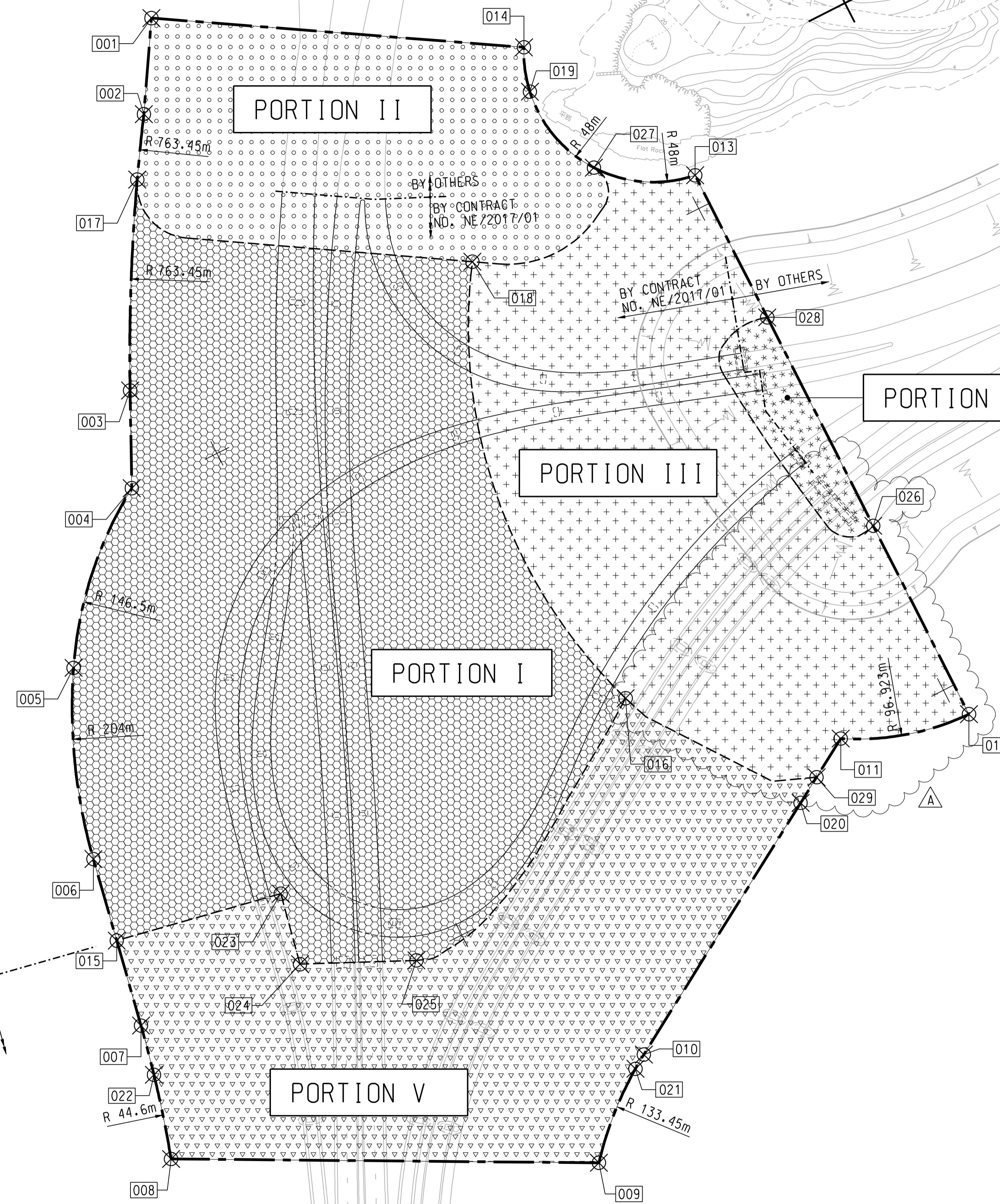
844100 E

NOTE:

1. ALL SETTING OUT POINTS SHOWN ON THIS SET OF DRAWINGS ARE FOR REFERENCE ONLY. THE EXACT LIMIT OF SITE BOUNDARY SHALL BE VERIFIED AND DETERMINED BY THE CONTRACTOR ON SITE.

LEGEND:

- LIMIT OF SITE BOUNDARY
- PORTION I
- PORTION II
- PORTION III
- PORTION IV
- PORTION V



SETTING OUT POINTS

POINTS	EASTING	NORTHING
001	844145.337	817451.381
002	844175.768	817432.789
003	844264.674	817381.875
004	844297.203	817366.044
005	844346.746	817316.716
006	844413.182	817291.188
007	844476.127	817278.972
008	844525.199	817266.527
009	844598.186	817407.066
010	844570.091	817440.045
011	844498.695	817557.994
012	844512.176	817604.423
013	844288.396	817604.423
014	844217.442	817569.406
015	844444.019	817285.204
016	844450.066	817495.320
017	844196.257	817419.620
018	844279.572	817516.430
019	844233.083	817563.928
020	844513.219	817533.974
021	844573.301	817434.873
022	844494.556	817274.992
023	844456.043	817347.195
024	844482.530	817341.744
025	844500.176	817380.791
026	844433.946	817604.423
027	844268.887	817572.299
028	844347.400	817604.380
029	844507.431	817545.547

PROJECT

TSEUNG KWAN O - LAM TIN TUNNEL

CONTRACT TITLE
TSEUNG KWAN O - LAM TIN TUNNEL
TSEUNG KWAN O INTERCHANGE AND
ASSOCIATED WORKS

CLIENT

土木工務拓展署
Civil Engineering and
Development Department

CONSULTANT

AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS

ISSUE/REVISION

I/R	DATE	DESCRIPTION	CHK.
A	JUL.17	TENDER ADDENDUM NO.1	RPCM
-	JUN.17	TENDER DRAWING	RPCM

STATUS

SCALE

A1:1000

KEY PLAN

PROJECT NO.

60308751

CONTRACT NO.

NE/2017/01

SHEET TITLE

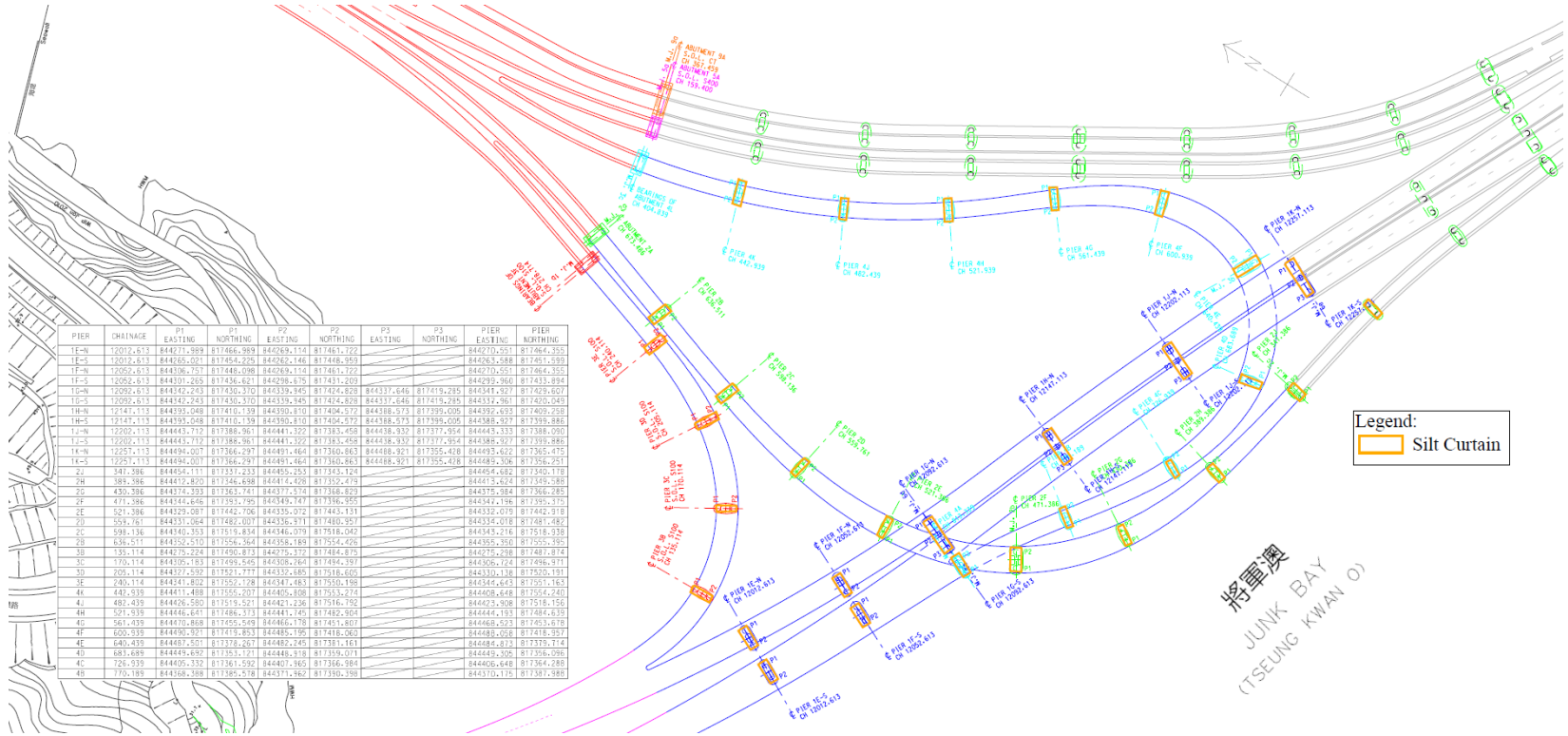
PORTION OF SITE

SHEET NUMBER

60308751/C6/C00/1011A

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JUNK BAY
(TSEUNG KWAN O)



PIER	ORANGE	P1 EASTING	P1 NORTHING	P2 EASTING	P2 NORTHING	P3 EASTING	P3 NORTHING	PIER EASTING	PIER NORTHING
1E-N	12072.613	844271.989	817466.989	844269.114	817461.222			844270.551	817464.355
1E-S	12072.613	844265.021	817464.225	844262.146	817456.999			844263.588	817451.999
1F-N	12052.613	844306.251	817448.098	844299.116	817451.222			844270.551	817464.355
1F-S	12052.613	844301.265	817436.621	844298.675	817431.209			844293.960	817433.894
1G-N	12052.613	844342.243	817430.210	844339.145	817424.888			844337.646	817419.215
1G-S	12052.613	844342.243	817430.210	844339.145	817424.888			844337.646	817419.215
1H-N	12141.113	844393.048	817410.139	844390.810	817404.972			844388.673	817399.029
1H-S	12141.113	844393.048	817410.139	844390.810	817404.972			844388.673	817399.029
1I-N	12202.113	844443.712	817388.961	844441.322	817383.458			844438.332	817377.954
1I-S	12202.113	844443.712	817388.961	844441.322	817383.458			844438.332	817377.954
1J-N	12251.113	844494.021	817366.297	844491.664	817360.863			844488.301	817355.428
1J-S	12251.113	844494.021	817366.297	844491.664	817360.863			844488.301	817355.428
2J	347.396	844454.111	817331.233	844455.253	817343.124			844454.682	817340.178
2H	381.386	844474.870	817346.898	844474.429	817352.014			844474.429	817352.014
2G	453.396	844374.393	817363.741	844377.574	817368.820			844376.584	817366.285
2F	471.396	844344.646	817351.795	844349.747	817356.955			844342.196	817351.375
2E	521.396	844325.091	817442.106	844335.072	817441.111			844332.079	817442.918
2D	554.781	844351.064	817482.007	844356.911	817480.957			844354.018	817481.482
2C	598.136	844340.353	817518.834	844346.079	817516.042			844343.216	817518.938
2B	645.571	844352.531	817454.664	844356.169	817552.226			844355.350	817552.999
2A	695.114	844275.224	817490.813	844275.372	817484.875			844275.236	817482.874
3C	170.114	844309.183	817489.545	844308.264	817484.397			844306.124	817486.971
3D	201.114	844372.539	817521.777	844372.689	817516.605			844370.136	817520.191
3E	240.114	844341.802	817552.128	844347.463	817550.190			844344.643	817551.163
4K	442.535	844411.498	817555.207	844405.808	817553.274			844408.648	817554.240
4J	481.439	844406.593	817519.211	844412.236	817516.192			844403.908	817518.150
4H	521.539	844446.641	817486.213	844441.145	817482.904			844444.193	817484.639
4G	561.439	844470.868	817465.549	844466.178	817451.807			844468.623	817453.678
4F	600.539	844406.991	817478.853	844405.195	817476.083			844403.608	817478.997
4E	640.439	844467.521	817378.267	844462.145	817371.161			844464.813	817379.114
4D	681.689	844449.697	817361.121	844444.318	817359.071			844443.305	817356.096
4C	726.939	844409.332	817481.092	844407.365	817366.884			844405.648	817364.285
4B	770.189	844368.398	817385.578	844371.962	817380.190			844370.175	817387.985

Legend:
 Silt Curtain

將軍澳
 JUNK BAY
 (TSEUNG KWAN O)

REV.	DATE	REVISION NOTE	DRAWN BY	CHK BY	REV.	DATE	REVISION NOTE	DRAWN BY	CHK BY	CLIENT:	CONSULTING ENGINEER:	DATE CONTRACTED:	PROJECT TITLE:	DRAWING TITLE:	SCALE:	GRIDING NO.:	REV.:
										CEDD 土木工程發展署 Civil Engineering and Development Department	AECOM		俊和-上隧-中冶聯營 CW - STEC - CMGC JV	TKO PIERS WITH COORDINATE	1:1	JV-940-TKO-PIERS-001	0