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 March 2020

(version 1.0)

Approved By

(Dr. HF Chan,
Environmental Team Leader)

REMARKS:

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

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

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EXECUTIVE SUMMARY

Introduction

1. This is the 41th 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 March 2020.

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	10	0	8	0	Refer to Appendix K & O
Marine Water Quality	46	122	0	0	Refer to Appendix K
Groundwater Level Monitoring (Piezometer Monitoring)	0	N/A[1]	0	N/A[1]	N/A
Ecological	N/A	N/A	N/A	N/A	N/A
Cultural Heritage	0	0	0	0	N/A
Landfill Gas	0	0	0	0	N/A

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

Air Quality Monitoring

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

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

Construction Noise Monitoring

7. Ten (10) Action Level exceedances were recorded due to the documented complaints received in this reporting month. The Summary of Documented Complaints in Reporting Month is tabulated in Table III.

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

Water Quality Monitoring

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

10. All marine water quality monitoring was conducted as scheduled in the reporting month. There were forty-six (46) Action Level and one-hundred and twenty-two (122) Limit Level exceedances in Monitoring Stations (M) during marine water quality monitoring. Thirty-one (31) Action Level and one-hundred and eleven (111) limit level exceedances were recorded in gradient stations (G). 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 construction works of the Project. Details of this investigation are presented in **Section 5**. Daily silt curtain inspection and weekly diving inspection have been carried out by contractor, the record, as reviewed by the site auditors, indicated that silt curtains were found in good conditions.

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

Ecological Monitoring

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

Monitoring on Cultural Heritage

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

Landscape and Visual Monitoring and Audit

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

Landfill Gas Monitoring

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

Environmental Site Inspection

16. Joint weekly site inspections were conducted by representatives of the Contractor, Engineer and Environmental Team. The representative of the IEC joined the site inspection for NE/2015/01, NE/2015/02, NE/2015/03, NE/2017/01 and NE/2017/02 on 25, 19, 19, 19 and 19 March 2020 respectively. Details of the audit findings and implementation status are presented in **Section 10**.

Waste Management

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

Key Information in the Reporting Month

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

Table II Key Information in the Reporting Month

Monthly Complaints	Event Details		Action Taken	Status
	Number	Nature		
March 2020	11	Noise / Odour / Water	Details refer to App O	Draft CIRs submitted/On-going
February 2020	4	Noise	Details refer to App O	Closed/Draft CIRs submitted
January 2020	6[1]	Noise	Details refer to App O	Closed/Draft CIRs submitted
December 2019	5	Noise	Details refer to App O	Closed
November 2019	6	Air / Noise / Working Hours[2]	Details refer to App O	Closed
October 2019	5	Noise / Working Hours[3]	Details refer to App O	Closed
Notifications of any summons & prosecutions received	0	---	N/A	N/A

1. One new complaint was received after the submission of the EMA Report (Jan 2020)
2. Request on delaying the starting time of normal working hour.
3. The validity of conducting works during Restricted Hours

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

Table III Summary of Complaints Details in Reporting Month

Complaint Type	Investigation Findings	Follow-up Action / Mitigation Measure
Tseung Kwan O Side		
Low Frequency Noise during Midnight	The noise source was the malfunctioned dewatering pumps.	The Contractor had immediately repaired it on the next morning.
Muddy Water at the Surcharge Area	The "muddy water" is generated by the screw propeller of the tugboat.	The Contractor proclaimed that the barge will enter the surcharge area at high tide to minimize the chances of stirring up seabed sediment.
Noise nuisance in early morning (Mar 2020)	No construction works had been conducted at the time of complaint for C3 and the major works area in C2 was at least 300m away from the complainant. It is believed that the major noise source was coming from ASD's work site.	The Contractor was reminded to strictly follow the latest CNMP conditions.

Complaint Type	Investigation Findings	Follow-up Action / Mitigation Measure
Odour and low frequency noise nuisance from construction site	Only minor works had been conducted at the time of complaint. No direct evidence showed that the odour source was originated from C3. The suspected nuisance source is believed to be ASD's works area.	The Contractor was reminded to maintain good site practices of `Implementation Schedule of Proposed Mitigation Measures".
Lam Tin Side		
Noise nuisance, vibration and suspectedly insufficient mitigation measures in Lam Tin	Ongoing	Ongoing
Groundborne Noise from Blasting in the Evening	Blasting were conducted on 23 March 2020. Results of piezometer monitoring at Tin Hiu Temple shows no AAA level exceedance.	The Contractor was reminded to close the blast door during blasting.
Noise nuisance from Construction Works during Holiday	No construction works were conducted at the concerned locations and no direct evidence showing the complaint is project-related.	The Contractor was reminded to strictly follow the CNPs and not violate the law.

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

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

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

Contract No.	Project Title	Site Activities (March 2020)	
NE/2015/01	Tseung Kwan O – Lam Tin Tunnel – Main Tunnel and Associated Works	Lam Tin Interchange	1) EHC2 U-Trough 2) Site Formation – Area 1G1, Area 1G2, Area 2, Area 3, Area 4 & Area 5 3) Administration Building
		Main Tunnel	4) Main Tunnel Excavation 5) Main Tunnel Lining Works
		TKO Interchange	6) Haul Road Construction and Site Formation & Slope Works 7) Cavern Excavation 8) Bridge Construction 9) East Ventilation Building
NE/2015/02	Tseung Kwan O – Lam Tin Tunnel – Road P2 and Associated Works	1) Site formation works and drainage for Road P2 CH500-CH650 and SR1 2) Site formation and drainage works for SR2 CH250 – CH350 3) Structure works for U-trough CH318 – CH363.50 4) Construction of utility trough and pre-cast concrete barrier at P2 U-trough CH411 – CH500 and SR2 CH170 – CH250 5) 1st and 2nd layer excavation for underpass CH105 – CH318	

Contract No.	Project Title	Site Activities (March 2020)
		6) Installation of strut/ wailing at 1st and 2nd layer of ELS for CH105 – CH318 underpass 7) Breaking the existing seawall at CH105 – CH318 cofferdam 8) Installation of socketed H-pile at S200 CH821 – P2 CH105 9) Pre-boring for sheetpile at S200 CH821 – P2 CH105 10) Pre-boring for sheetpile at storm water manhole 9101 – 9103 11) Bored pile works at abutment 12) Sloping seawall construction 13) Removal of temporary cofferdam 14) Construction of footing DS25, ADS22 15) Sheetpile installation at S200 CH821-P2 CH105 16) Installation of socketed H-pile at CT01 CH117 – CH336 17) TAM grouting works at CH105-CH318 cofferdam
NE/2015/03	Tseung Kwan O – Lam Tin Tunnel – Northern Footbridge	The construction works under the contract had been completed in December 2019. Materials were being removed from works area.
NE/2017/01	Tseung Kwan O – Lam Tin Tunnel – Tseung Kwan O Interchange and Associated Works	1) Construction of Pier 2) Construction of Pier Head Works 3) Pre-drilling Works 4) Bored Piling Works 5) Segment Erection Works
NE/2017/02	Tseung Kwan O – Lam Tin Tunnel – Road P2/D4 and Associated Works	1) Inspection pit excavation and utility diversion works 2) Road works 3) Watermain and drainage construction works 4) Asphalt paving 5) Proof drilling 6) Bored piles 7) Pile cap
NE/2017/06	Tseung Kwan O – Lam Tin Tunnel – Traffic Control and Surveillance System(TCSS) and Associated Works	Nil

Future Key Issues

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

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

Contract No. and Project Title	Site Activities (April 2020)		Key Environmental Issues *
NE/2015/01 - Tseung Kwan O – Lam Tin Tunnel – Main Tunnel and Associated Works	Lam Tin Interchange	1) EHC2 U-Trough 2) Site Formation – Area 1G1, Area 1G2, Area 2, Area 3, Area 4 & Area 5 3) Administration Building	(A) / (B) / (C) / (D) / (E) / (G)
	Main Tunnel	4) Main Tunnel Excavation 5) Main Tunnel Lining Works	(B)
	TKO Interchange	6) Haul Road Construction and Site Formation & Slope Works 7) Bridge Construction 8) East Ventilation Building	(A) / (C) / (D) / (E) / (F) / (I)
NE/2015/02 - Tseung Kwan O – Lam Tin Tunnel – Road P2 and Associated Works	1) Construction of pillar box and ducting system at Portion IV adjacent to Ocean Shores EVA 2) Construction of utility trough and road barriers at road P2 CH411 – 500 and SR2 CH110 – CH170 (land section) 3) Site formation at Road P2 CH500-CH650 and SR1 4) Road and drainage works at Road P2 CH500 – 650, slip road SR1 footpath and cycle track, slip road SR2 CH250 – CH350 5) Structure works for U-trough CH318-CH363 6) ELS at underpass P2 CH105 – CH318 7) Modification of dewatering system (P2 CH105 – CH318) 8) Pre-boring and sheetpile installation at S200 CH821 – P2 CH105 9) Drilling for de-watering system at S200 CH821 – CH105 10) Installation of socketed H-pile at CT01 CH117 – CH336 11) Bored pile works at abutment 12) ARC structure for abutment 13) Construction of abutments 14) Pre-boring and ELS works for construction of 900 dia. Pipe from SMH9101 – SMH9103 15) Construction of sloping seawall 16) Removal of temporary cofferdam 17) Construction of coping 18) Installation of profile barrier at P2 CH500-CH650 19) Construction of direction sign DS25, DS36 and sign gantry ADS22 footing		(A) / (B) / (C) / (D) / (E) / (G) / (I)

Contract No. and Project Title	Site Activities (April 2020)	Key Environmental Issues *
NE/2015/03 - Tseung Kwan O – Lam Tin Tunnel – Northern Footbridge	The construction works under the contract had been completed in December 2019. Materials are being removed from works area.	N/A
NE/2017/01 – Tseung Kwan O Interchange and Associated Works	1) Dismantling of Temporary Working Platforms 2) Bored Piling Works 3) Installation of Precast Pile Cap Shell 4) Construction of Pile Cap 5) Construction of Pier 6) Construction of Pier Head works 7) Segment erection works 8) Construction of Bridge Decks	(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 Road works 3) Temporary traffic arrangement Setup Bitumen paving 4) Construction of drainage and watermain Bored piles 5) Pile cap 6) Pre-bored Socket-H Pile 7) Proof Drilling 8) Asphalt Paving 9) Pier, Staircase and Lift Shalt Construction 10) Road Works	(A) / (B) / (E) / (F) / (G)
NE/2017/06 – Tseung Kwan O – Lam Tin Tunnel – Traffic Control and Surveillance System(TCSS) and Associated Works	Nil	N/A

Note:

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

1. INTRODUCTION

1.1 Cinotech Consultants Limited (Cinotech) was commissioned by Civil Engineering and Development Department (CEDD) as the Environmental Team (ET) to undertake environmental monitoring and auditing services for the Works Contracts involved in the implementation of Tseung Kwan O – Lam Tin Tunnel (TKO-LTT) project to ensure that the environmental performance of the Works Contracts comply with the requirements specified in the Environmental Permit (EP), Environmental Monitoring & Audit (EM&A) Manual, Environmental Impact Assessment (EIA) Report of the TKO-LTT project and other relevant statutory requirements. This is the 41th Monthly EM&A report summarizing the EM&A works for the Project in March 2020.

Purpose of the Report

1.2 This is the 41th Monthly EM&A Report which summarises the impact monitoring results and audit findings for the EM&A programme during the reporting period in March 2020.

Structure of the Report

1.3 The structure of the report is as follows:

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

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

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

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

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

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

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

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

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

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

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

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

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

Section 14: **Conclusions and Recommendation**

2. PROJECT INFORMATION

Background

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

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

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

2.4 The commencement dates of construction of this Project are:

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

Project Organizations

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

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

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

Table 2.1 Key Project Contacts

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

Construction Activities undertaken during the Reporting Month

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

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

Contract No.	Project Title	Site Activities (March 2020)	
NE/2015/01	Tseung Kwan O – Lam Tin Tunnel – Main Tunnel and Associated Works	Lam Tin Interchange	1) EHC2 U-Trough 2) Site Formation – Area 1G1, Area 1G2, Area 2, Area 3, Area 4 & Area 5 3) Administration Building
		Main Tunnel	4) Main Tunnel Excavation 5) Main Tunnel Lining Works
		TKO Interchange	6) Haul Road Construction and Site Formation & Slope Works 7) Cavern Excavation 8) Bridge Construction 9) East Ventilation Building
NE/2015/02	Tseung Kwan O – Lam Tin Tunnel – Road P2 and Associated Works	1) Site formation works and drainage for Road P2 CH500-CH650 and SR1 2) Site formation and drainage works for SR2 CH250 – CH350 3) Structure works for U-trough CH318 – CH363.50 4) Construction of utility trough and pre-cast concrete barrier at P2 U-trough CH411 – CH500 and SR2 CH170 – CH250 5) 1st and 2nd layer excavation for underpass CH105 – CH318 6) Installation of strut/ wailing at 1st and 2nd layer of ELS for CH105 – CH318 underpass 7) Breaking the existing seawall at CH105 – CH318 cofferdam 8) Installation of socketed H-pile at S200 CH821 – P2 CH105 9) Pre-boring for sheetpile at S200 CH821 – P2 CH105	

Contract No.	Project Title	Site Activities (March 2020)
		10) Pre-boring for sheetpile at storm water manhole 9101 – 9103 11) Bored pile works at abutment 12) Sloping seawall construction 13) Removal of temporary cofferdam 14) Construction of footing DS25, ADS22 15) Sheetpile installation at S200 CH821-P2 CH105 16) Installation of socketed H-pile at CT01 CH117 – CH336 17) TAM grouting works at CH105-CH318 cofferdam
NE/2015/03	Tseung Kwan O – Lam Tin Tunnel – Northern Footbridge	The construction works under the contract had been completed in December 2019. Materials were being removed from works area.
NE/2017/01	Tseung Kwan O – Lam Tin Tunnel – Tseung Kwan O Interchange and Associated Works	1) Construction of Pier 2) Construction of Pier Head Works 3) Pre-drilling Works 4) Bored Piling Works 5) Segment Erection Works
NE/2017/02	Tseung Kwan O – Lam Tin Tunnel – Road P2/D4 and Associated Works	1) Inspection pit excavation and utility diversion works 2) Road works 3) Watermain and drainage construction works 4) Asphalt paving 5) Proof drilling 6) Bored piles 7) Pile cap
NE/2017/06	Tseung Kwan O – Lam Tin Tunnel – Traffic Control and Surveillance System(TCSS) and Associated Works	Nil

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

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

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

		• Use of quiet plant and well-maintained construction plant • Provide movable noise barrier

Status of Environmental Licences, Notification and Permits

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

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

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

Contract No.	Permit / License No.	Valid Period		Status
		From	To	
	WT00027405-2017	22/03/2017	31/03/2022	Valid
	WT00028495-2017	11/08/2017	31/08/2022	Valid
NE/2015/02	WT00026386-2016	15/12/2016	31/12/2021	Valid
	WT00027226-2017	23/02/2017	28/02/2022	Valid
	WT00030654-2018	16/04/2018	30/04/2023	Valid
NE/2015/03	WT00027295-2017	20/03/2017	31/03/2022	Valid
NE/2017/01	WT00030711-2018	11/04/2018	30/04/2023	Valid
	WT00030716-2018	23/05/2018	31/05/2023	Valid
NE/2017/02	WT00030654-2018	16/04/2018	30/04/2023	Valid
Construction Noise Permit (CNP)				
NE/2015/01	GW-RE0955-19	04/12/2019	03/03/2020	Expired on 3 Mar 20
	GW-RE0959-19	08/12/2019	07/03/2020	Expired on 7 Mar 20
	GW-RE0962-19	05/12/2019	05/03/2020	Expired on 5 Mar 20
	GW-RE1000-19	23/12/2019	22/06/2020	Valid
	GW-RE0009-20	23/01/2020	22/03/2020	Expired on 22 Mar 20
	GW-RE0094-20	16/02/2020	15/05/2020	Valid
	GW-RE0110-20	05/03/2020	04/09/2020	Valid
	GW-RE0107-20	04/03/2020	20/05/2020	Valid
	GW-RE0113-20	08/03/2020	20/05/2020	Valid
	GW-RE0120-20	04/03/2020	03/06/2020	Valid
	GW-RE0149-20	23/03/2020	22/09/2020	Valid
NE/2015/02	GW-RE0791-19	11/10/2019	10/04/2020	Valid
	GW-RE0987-19	06/12/2019	01/06/2020	Valid
	GW-RE0995-19	15/12/2019	14/06/2020	Valid
	GW-RE1041-19	06/01/2020	05/03/2020	Expired on 5 Mar 20
	GW-RE0034-20	17/01/2020	13/07/2020	Valid
	GW-RE0114-20	06/03/2020	05/09/2020	Valid
	GW-RE0181-20	20/03/2020	10/09/2020	Valid
NE/2015/03	GW-RE0184-20	31/03/2020	30/06/2020	Valid
NE/2017/01	GW-RE0907-19	05/11/2019	04/05/2020	Valid
	GW-RE0909-19	13/11/2019	05/05/2020	Valid
Marine Dumping Permit				
NE/2017/01	N/A	N/A	N/A	N/A
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 March 2020.

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	5
	Met One Instruments Model No.: AEROCET-831	0
	Handheld Particle Counter Hal-HPC300 / Hal-HPC301	0
HVS Sampler	TISCH Model: TE-5170	1
	GMW Model: GS2310	5
Wind Anemometer	Davis Weather Monitor II, Model no. 7440	1
	Davis Weather Stations, Vantage Pro 2, Model No. 6152CUK	0

Monitoring Parameters and Frequency

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

Table 3.3 Frequency and Parameters of Air Quality Monitoring

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

Monitoring Methodology

1-hour TSP Monitoring

Measuring Procedures

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

(Model LD3 / LD3B / LD5R)

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

(AEROCET-531)

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

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

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

Maintenance/Calibration

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

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

24-hour TSP Monitoring

Instrumentation

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

3.10 The positioning of the HVS samplers are as follows:

- a horizontal platform with appropriate support to secure the samplers against gusty wind shall be provided;
- no two samplers shall be placed less than 2 meter apart

- the distance between the sampler and an obstacle, such as buildings, must be at least twice the height that the obstacle protrudes above the sampler;
- a minimum of 2 metres of separation from walls, parapets and penthouses is required for rooftop samplers;
- a minimum of 2 metres of separation from any supporting structure, measured horizontally is required;
- no furnace or incinerator flue is nearby;
- airflow around the sampler is unrestricted;
- the sampler is more than 20 metres from the dripline;
- any wire fence and gate, to protect the sampler, shall not cause any obstruction during monitoring;
- permission must be obtained to set up the samplers and to obtain access to the monitoring stations; and
- a secured supply of electricity is needed to operate the samplers.

Operating/analytical procedures for the operation of HVS

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

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

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

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

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

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

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

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

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

Maintenance/Calibration

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

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

Results and Observations

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

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

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

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

Table 3.4 Major Dust Source during Air Quality Monitoring

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

4. NOISE

Monitoring Requirements

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

Monitoring Locations

4.2 Noise monitoring was conducted at 9 designated monitoring stations (CM1, CM2, CM3, CM4, CM5, CM6(A), CM7(A), CM8(A), CM9(A)) in the reporting period. **Table 4.1** and **Figure 3** show the locations of these stations.

Table 4.1 Noise Monitoring Stations

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

Remarks:

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

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

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

Monitoring Equipment

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

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

Table 4.2 Noise Monitoring Equipment

Equipment	Model and Make	Quantity
Integrating Sound Level Meter	SVAN 957/ 959 / 979	2
	BSWA308 SLM	1
Calibrator	SV30A	1
	Brüel & Kjær 4231	0
	ST-120	3

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

Table 4.3 Frequency and Parameters of Noise Monitoring

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

Monitoring Methodology and QA/QC Procedure

4.6 The monitoring procedures are as follows:

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

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

Maintenance and Calibration

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

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

4.9 Immediately prior to and following each noise measurement the accuracy of the sound level meter was checked using an acoustic calibrator generating a known sound pressure level at a known frequency. Measurements may be accepted as valid only if the calibration levels from before and after the noise measurement agree to within 1.0 dB.

Results and Observations

4.10 Ten (10) Action Level exceedances were recorded due to the documented complaints received in this reporting month. No Limit level exceedances for night-time construction noise monitoring were recorded and no Limit Level exceedance for day time was recorded in the reporting month.

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

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

Table 4.4 Major Noise Source during Noise Monitoring

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

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

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

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

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

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

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

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

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

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

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

Current Tunnel Blasting Arrangement

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

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

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

5. WATER QUALITY

Monitoring Requirements

Groundwater Quality

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

Marine Water Quality

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

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

5.4 According to the Environmental Review Report (ERR) for Variations of Environmental Permit (Ref: C45-03), water quality monitoring and audit programme was implemented for monitoring of oxygen depletion (e.g. Dissolved Oxygen (DO) level) in this embayed waters during the period when the fully enclosed barrier is installed. A “Proposal for Water Quality Monitoring in Temporary Marine Embayment” has been submitted to EPD in July 2017 to propose the monitoring frequency, parameter, location, etc. EPD has no further comment on the Proposal. Since January 2020, the cofferdam has been partially removed and the seawater is no longer enclosed. Therefore, no embayment water quality monitoring is required.

Groundwater Level Monitoring (Piezometer Monitoring)

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

Monitoring Locations

Marine Water Quality

5.6 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**.

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

Monitoring Equipment

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

Dissolved Oxygen (DO) and Temperature Measuring Equipment

5.8 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.

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

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

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

Turbidity

5.12 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

5.13 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

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

Water Sampler

5.15 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

5.16 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

5.17 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.

5.18 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.

5.19 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.

5.20 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.

5.21 **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
	YSI 6820-C-M	0

Multi-parameter Water Quality System	Aquaread AP-2000-D	0
	YSI EXO1 Multiparameter Sondes	1
Monitoring Position Equipment	"Magellan" Handheld GPS Model GPS-320	1
Water Depth Detector	Fishfinder 140	1

Monitoring Parameters and Frequency

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

Table 5.4 Water Quality Monitoring Parameters and Frequency

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

Monitoring Methodology

Marine Water Quality

5.23 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.

5.24 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

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

Table 5.5 Methods for Laboratory Analysis for Water Samples

Parameters (Unit)	Proposed Method	Reporting Limit	Detection Limit
SS (mg/L)	APHA 2540 D	0.5 mg/L (1)	0.5 mg/L
BOD_5 (mg O_2/L)	APHA 19ed 5210B	2 mg O_2/L	--
TOC (mg-TOC/L)	In-house method SOP020 (Wet Oxidation)	1 mg-TOC/L	--
Total Nitrogen (mg/L)	In-house method SOP063 (FIA)	0.6 mg/L	--
Ammonia-N (mg NH_3-N/L)	In-house method SOP057 (FIA)	0.05 mg NH_3-N/L	--
Total Phosphorus (mg-P/L)(2)	In-house method SOP055 (FIA)	0.05 mg-P/L	--

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

QA/QC Requirements

Decontamination Procedures

5.26 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

5.27 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.

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

Results and Observations

Groundwater Quality Monitoring

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

Marine Water Quality Monitoring

5.30 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.

5.31 Calculated Action and Limit Levels for Marine Water Quality is presented in **Appendix I**. Forty-six (46) Action Level and one-hundred and twenty-two (122) limit level exceedances on Monitoring Stations (M) were recorded in marine water quality monitoring, while thirty-one (31) Action Level and one-hundred and eleven (111) limit level exceedances were recorded in gradient stations (G).

5.32 Exceedances of turbidity and suspended solid were recorded on from various monitoring stations non-specifically among all stations including the control stations. Investigations over March 2020 showed that the range of SS levels recorded in March 2020 remained consistent with the records in recent months. Since wet season is coming, the Contractors are reminded to be prepared for the rainy season. Drainage for rainwater shall be prepared and exposed stockpile surfaces shall be covered. Further details of the exceedance investigation reports can be found in **Appendix K**.

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

Groundwater Level Monitoring (Piezometer Monitoring)

5.34 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.

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

Mitigation Measures Adopted by Contractors for Surface runoff Prevention

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

NE2015/01

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

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

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

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

NE2015/02

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

5.41 Soak away pit with a 600mm in diameter were bored into the ground, down to -14mPD, near the piling works area to cater for the surface runoff at portion 9. The stormwater and the water generated from the piling works are stored temporary at the pit around the soak away pit, which shall be pumped automatically into the soak away pit where they are soaked into the soil naturally.

5.42 The stormwater received in Portion 9 shall be directed and pumped via the flex tube and sump towards the water treatment system in Area A and Z. The peripheral open U-channel are also provided along the site boundary, which shall be directed to the storage tank and WetSep for treatment in Area A.

5.43 Regular cleaning depending on site conditions are provided for the WetSep at Area A and Z; and the storage tanks and sedimentation tanks at Area A. The water treated by the sedimentation tank and the wetsep shall be discharged towards the designated discharge point. Quality of the effluent are also monitored regularly.

NE2017/02

5.44 Existing manholes are covered with sandbags and geotextiles to avoid surface run-off from entering the channels.

5.45 Stockpiles are covered with tarpaulin to avoid surface run-off.

5.46 Concrete blocks and sandbags are placed along the periphery of the site boundary to avoid surface run-off.

5.47 Stormwater within the site enters the excavated area and flow naturally into the sump due height difference. The stormwater collected in the sump shall be pumped into the sedimentation tank where the run-off are treated before discharging into the designated discharge point.

NE2015/03

5.48 The existing manhole cover are covered with geotextile to prevent muddy water from entering the existing U-channels along the side of Po Shun Road. Manhole inspection are carried out by taking silt measurement regularly in case if silt enters the channel, and silt shall be removed from the manhole if silt were found.

5.49 Sandbags were placed at the periphery of the site along the hoarding to prevent surface runoff from escaping the site.

5.50 Exposed slopes are covered with tarpaulin to prevent surface run-off.

5.51 The surface run-off shall be pumped into the sedimentation tank where they are treated before entering the designated discharge points

NE2017/01

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

6. ECOLOGY

Post-Translocation Coral Monitoring

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

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

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

7. CULTURAL HERITAGE

Monitoring Requirement

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

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

Monitoring Locations

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

Monitoring Equipment

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

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

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

Table 7.1 Cultural Heritage Monitoring Equipment

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

Monitoring Methodology

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

Alert, Alarm and Action Levels

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

Table 7.2 AAA Levels for Monitoring for Cultural Heritage

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

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

Results

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

Mitigation Measures for Cultural Heritage

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

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

8. LANDSCAPE AND VISUAL IMPACT REQUIREMENTS

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

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

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

9. LANDFILL GAS MONITORING

Monitoring Requirement

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

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

Monitoring Parameters and Frequency

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

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

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

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

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

Monitoring Locations

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

Monitoring Equipment noise mitigation

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

Table 9.1 Landfill Gas Monitoring Equipment

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

Results and Observations

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

10. ENVIRONMENTAL AUDIT

Site Audits

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

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

- Contract No. NE/2015/01: 04, 11, 18 and 25 March 2020
- Contract No. NE/2015/02: 05, 12, 19 and 26 March 2020
- Contract No. NE/2015/03: 05, 12, 19 and 26 March 2020
- Contract No. NE/2017/01: 05, 12, 19 and 26 March 2020
- Contract No. NE/2017/02: 05, 12, 19 and 26 March 2020

10.3 Monthly joint site inspection with the representative of IEC was conducted for NE/2015/01, NE/2015/02, NE/2015/03, NE/2017/01 and NE/2017/02 on 25, 19, 19, 19 and 19 March 2020 respectively.

Implementation Status of Environmental Mitigation Measures

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

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

11. WASTE MANAGEMENT

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

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

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

12. ENVIRONMENTAL NON-CONFORMANCE

Summary of Exceedances

12.1 Ten (10) Action Level exceedances of noise were recorded due to the documented complaints received in the reporting month. No 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 Forty-six (46) Action Level and one-hundred and twenty-two (122) exceedances were recorded in monitoring stations (M) during marine water quality monitoring.

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

Summary of Environmental Non-Compliance

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

Summary of Environmental Complaint

12.5 Eleven (11) environmental complaints were received in the reporting month. The Cumulative Complaint Log is presented in **Appendix O**. The investigation status and result is also reported in **Appendix O**.

Summary of Environmental Summon and Successful Prosecution

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

13. FUTURE KEY ISSUES

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

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

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

Contract No. and Project Title	Site Activities (April 2020)		Key Environmental Issues *
NE/2015/01 - Tseung Kwan O – Lam Tin Tunnel – Main Tunnel and Associated Works	Lam Tin Interchange	1) EHC2 U-Trough 2) Site Formation – Area 1G1, Area 1G2, Area 2, Area 3, Area 4 & Area 5 3) Administration Building	(A) / (B) / (C) / (D) / (E) / (G)
	Main Tunnel	4) Main Tunnel Excavation 5) Main Tunnel Lining Works	(B)
	TKO Interchange	6) Haul Road Construction and Site Formation & Slope Works 7) Bridge Construction 8) East Ventilation Building	(A) / (C) / (D) / (E) / (F) / (I)
NE/2015/02 - Tseung Kwan O – Lam Tin Tunnel – Road P2 and Associated Works	1) Construction of pillar box and ducting system at Portion IV adjacent to Ocean Shores EVA 2) Construction of utility trough and road barriers at road P2 CH411 – 500 and SR2 CH110 – CH170 (land section) 3) Site formation at Road P2 CH500-CH650 and SR1 4) Road and drainage works at Road P2 CH500 – 650, slip road SR1 footpath and cycle track, slip road SR2 CH250 – CH350 5) Structure works for U-trough CH318-CH363 6) ELS at underpass P2 CH105 – CH318 7) Modification of dewatering system (P2 CH105 – CH318) 8) Pre-boring and sheetpile installation at S200 CH821 – P2 CH105 9) Drilling for de-watering system at S200 CH821 – CH105 10) Installation of socketed H-pile at CT01 CH117 – CH336 11) Bored pile works at abutment 12) ARC structure for abutment 13) Construction of abutments 14) Pre-boring and ELS works for construction of 900 dia. Pipe from SMH9101 – SMH9103 15) Construction of sloping seawall 16) Removal of temporary cofferdam 17) Construction of coping		(A) / (B) / (C) / (D) / (E) / (G) / (I)

Contract No. and Project Title	Site Activities (April 2020)	Key Environmental Issues *
	18) Installation of profile barrier at P2 CH500-CH650 19) Construction of direction sign DS25, DS36 and sign gantry ADS22 footing	
NE/2015/03 - Tseung Kwan O – Lam Tin Tunnel – Northern Footbridge	The construction works under the contract had been completed in December 2019. Materials are being removed from works area.	N/A
NE/2017/01 – Tseung Kwan O Interchange and Associated Works	1) Dismantling of Temporary Working Platforms 2) Bored Piling Works 3) Installation of Precast Pile Cap Shell 4) Construction of Pile Cap 5) Construction of Pier 6) Construction of Pier Head works 7) Segment erection works 8) Construction of Bridge Decks	(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 Road works 3) Temporary traffic arrangement Setup Bitumen paving 4) Construction of drainage and watermain Bored piles 5) Pile cap 6) Pre-bored Socket-H Pile 7) Proof Drilling 8) Asphalt Paving 9) Pier, Staircase and Lift Shalt Construction 10) Road Works	(A) / (B) / (E) / (F) / (G)
NE/2017/06 – Tseung Kwan O – Lam Tin Tunnel – Traffic Control and Surveillance System(TCSS) and Associated Works	Nil	N/A

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

(I) Marine water quality impact and indirect impact to coral communities due to marine construction for TKO-LTT reclamation.

Key Issues for the Coming Month

13.3 Key environmental issues in the coming month include:

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

14. CONCLUSIONS AND RECOMMENDATIONS

Conclusions

14.1 This is the 41th Environmental Monitoring and Audit (EM&A) Report which presents the EM&A works undertaken during the period in March 2020 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 Ten (10) Action Level exceedances were recorded due to the documented complaints received in this reporting month.

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

Water Quality Monitoring

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

14.7 Forty-six (46) Action Level and one-hundred and twenty-two (122) Limit Level exceedances were recorded in Monitoring Stations (M) during marine water quality monitoring.

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

Ecological Monitoring

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

Monitoring on Cultural Heritage

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

Landscape and Visual Monitoring and Audit

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

Landfill Gas Monitoring

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

Environmental Site Inspection

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

Complaint, Prosecution and Notification of Summons

14.14 Eleven (11) environmental complaints, no successful prosecution and notification of summon were received during the reporting period.

Recommendations

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

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

Construction Noise

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

Water Quality Impact

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

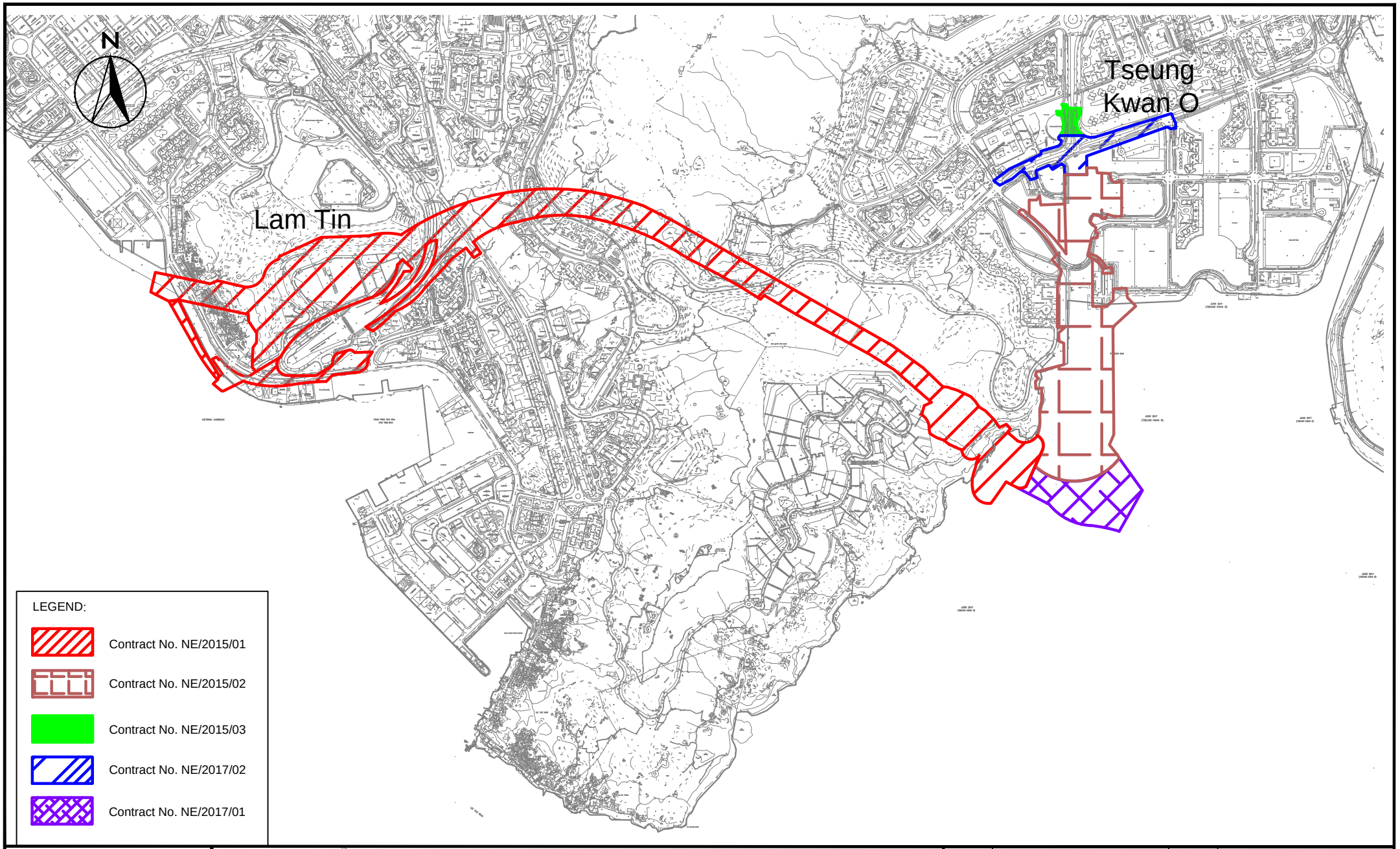
Waste/Chemical Management

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

Landscape and Visual

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

FIGURES



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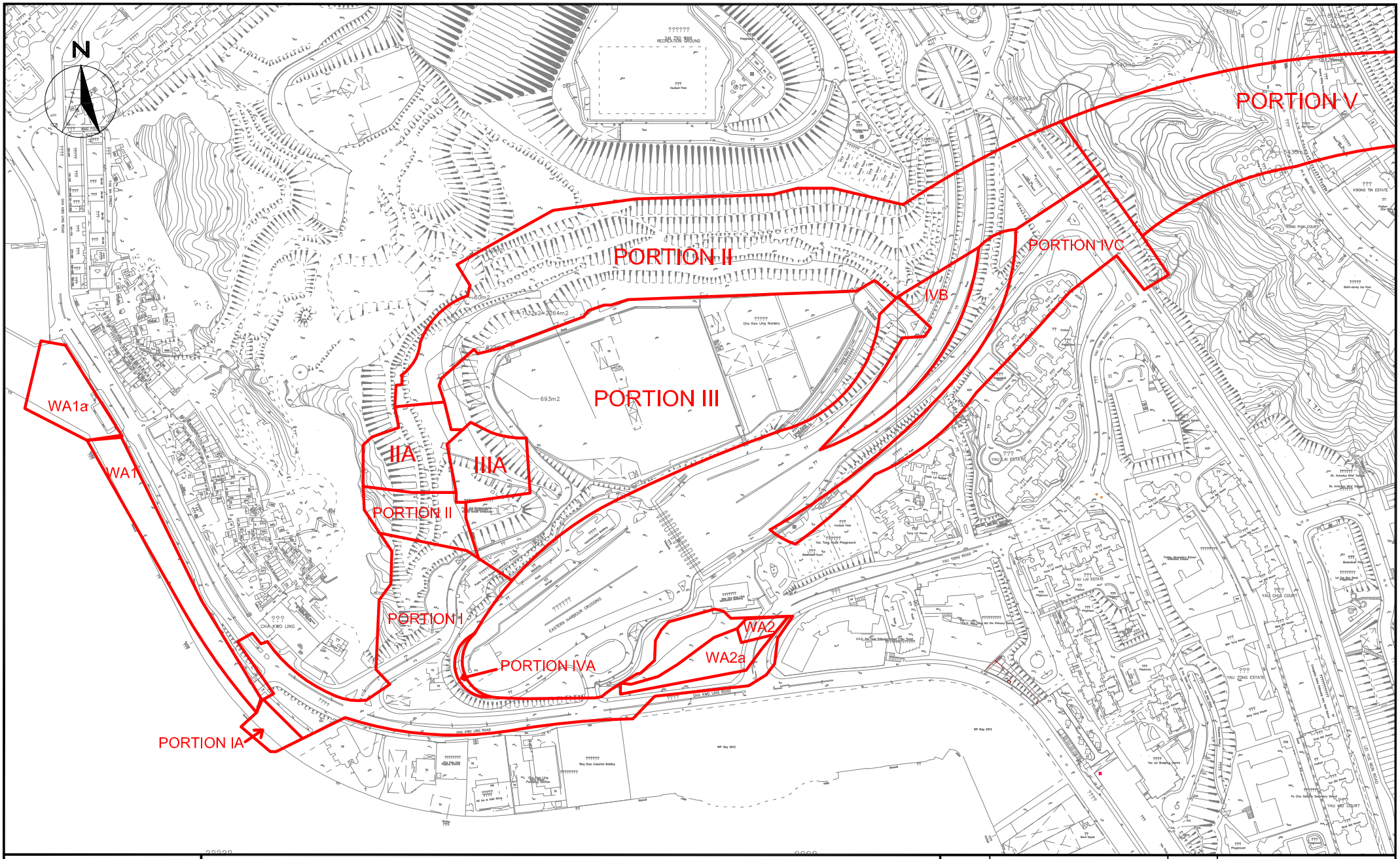
Agreement No. CE/59/2015 (EP)
Environmental Team for Tseung Kwan O - Lam Tin Tunnel
- Design and Construction

Site Layout Plan

SCALE	1:16000 @ A4	DATE	Jan 2020
CHECK	BC	DRAWN	KC
JOB No.	MA16034	FIGURE NO. 1	REV -



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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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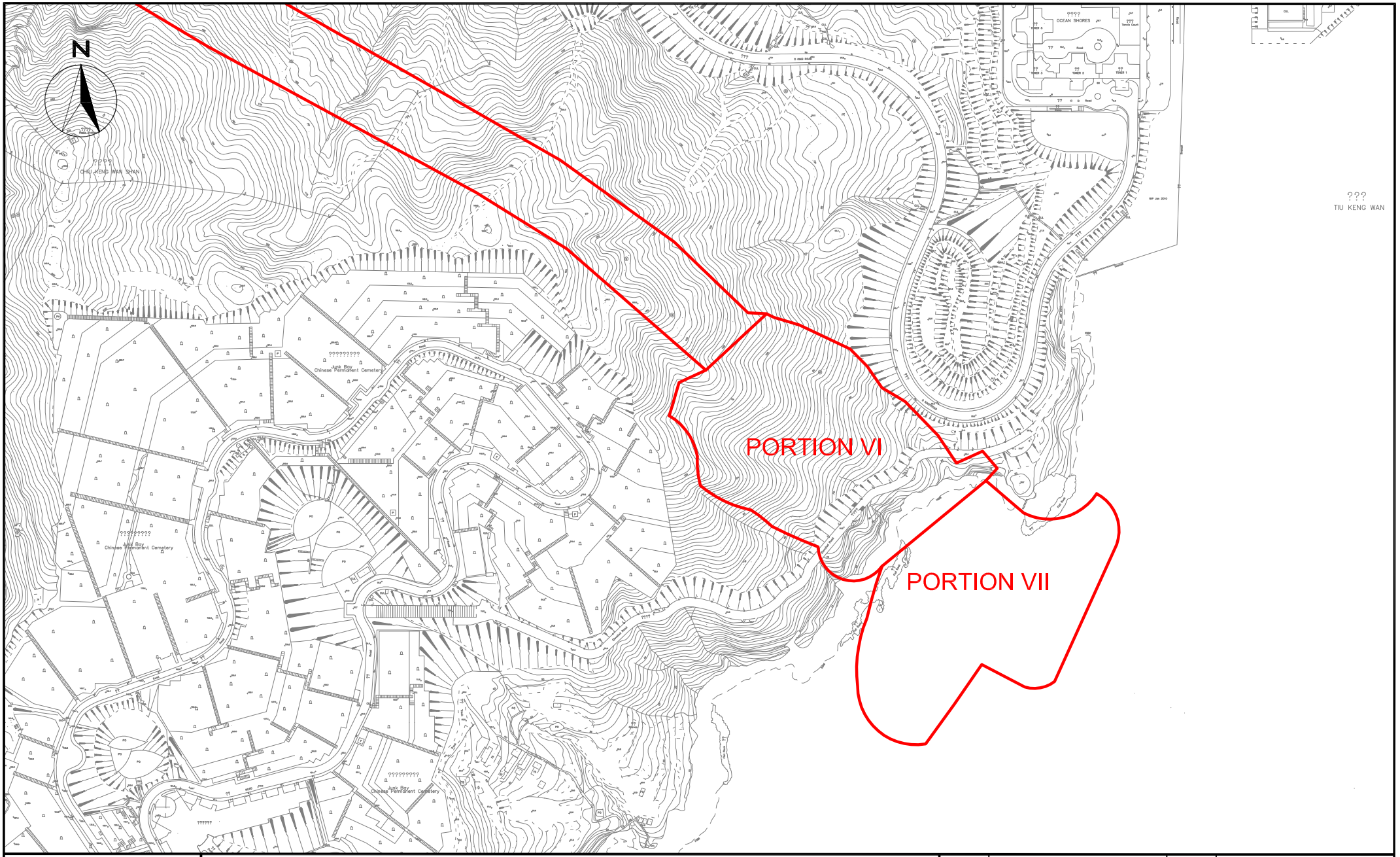

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Agreement No. CE/59/2015 (EP)
Environmental Team for Tseung Kwan O - Lam Tin Tunnel
- Design and Construction

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

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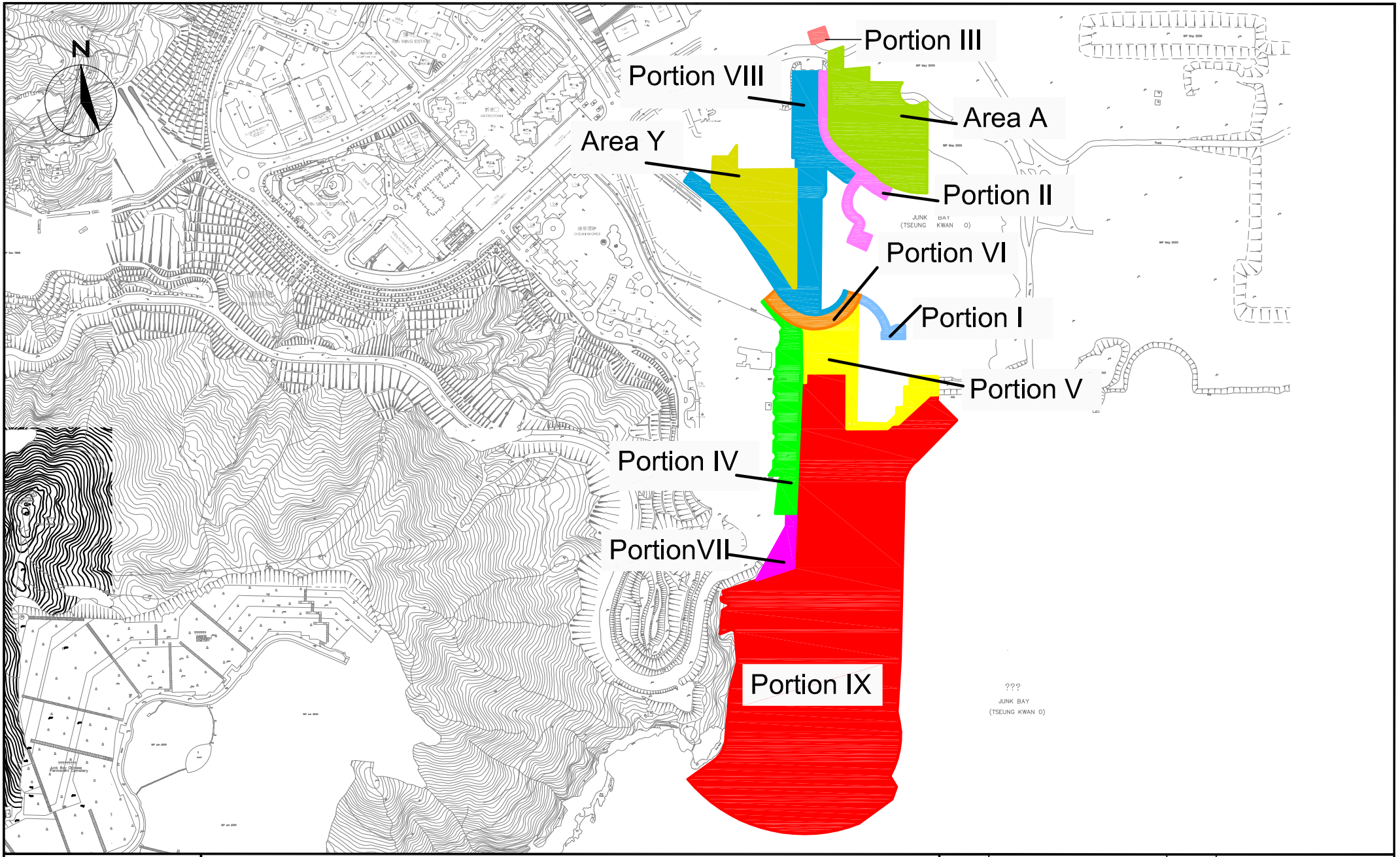

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Agreement No. CE/59/2015 (EP)
Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction
Site Portions under Works Contract No. NE/2015/02

SCALE	N.T.S.	DATE	AUG 2017
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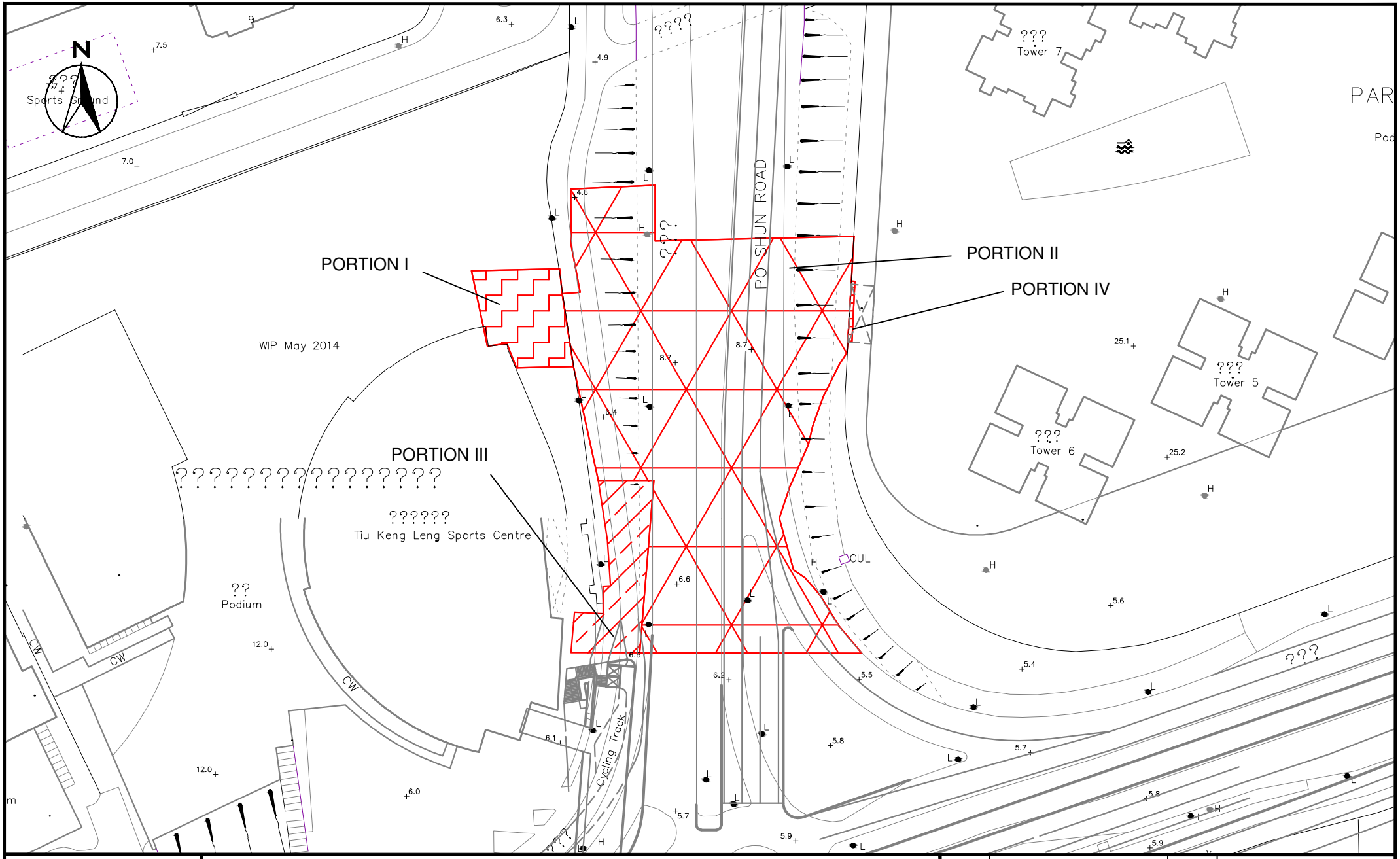
		REV	-



CINOTECH
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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/2015/03

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CHECK	VC	DRAWN	AC
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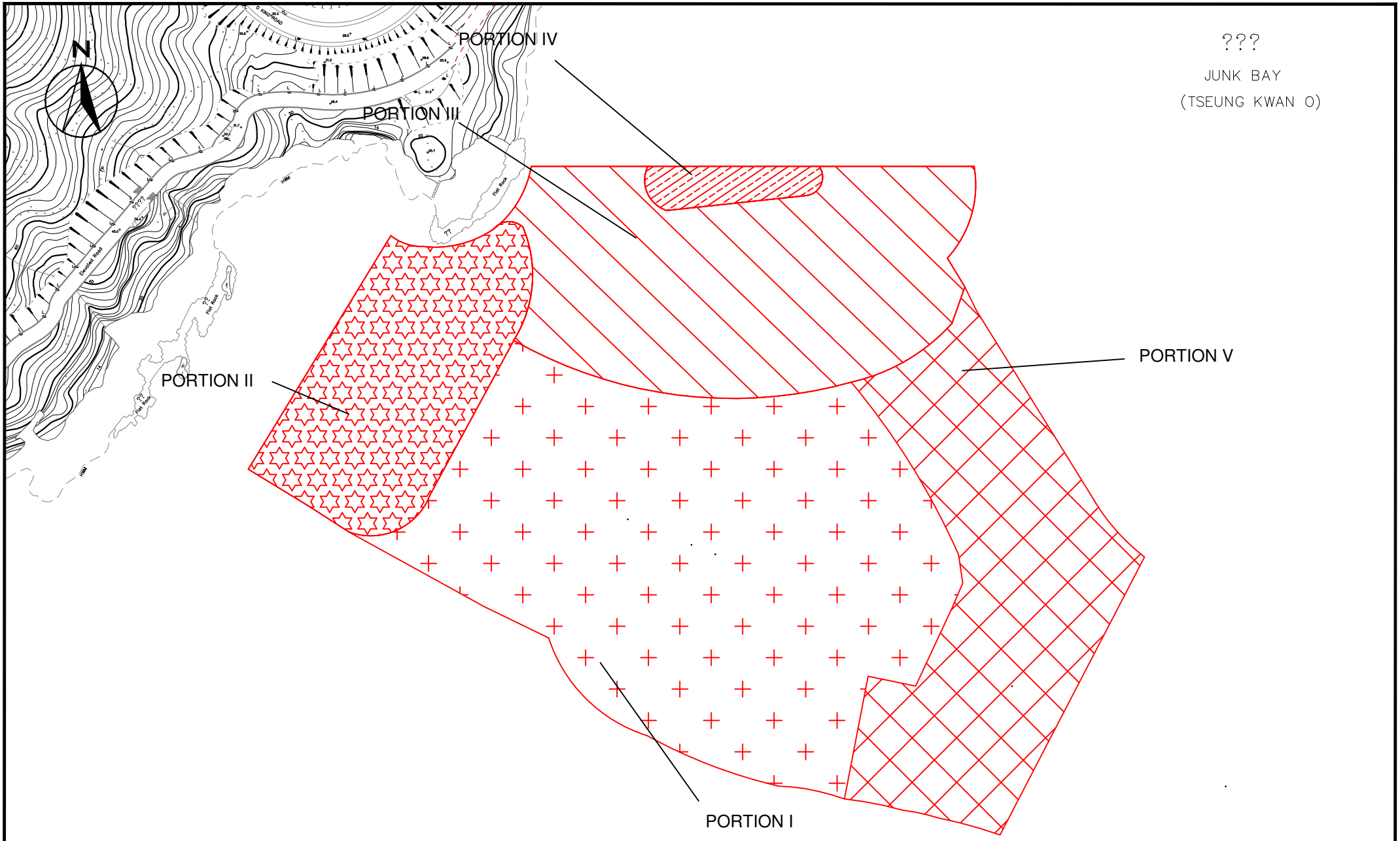

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Agreement No. CE/59/2015 (EP)
Environmental Team for Tseung Kwan O - Lam Tin Tunnel
- Design and Construction

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

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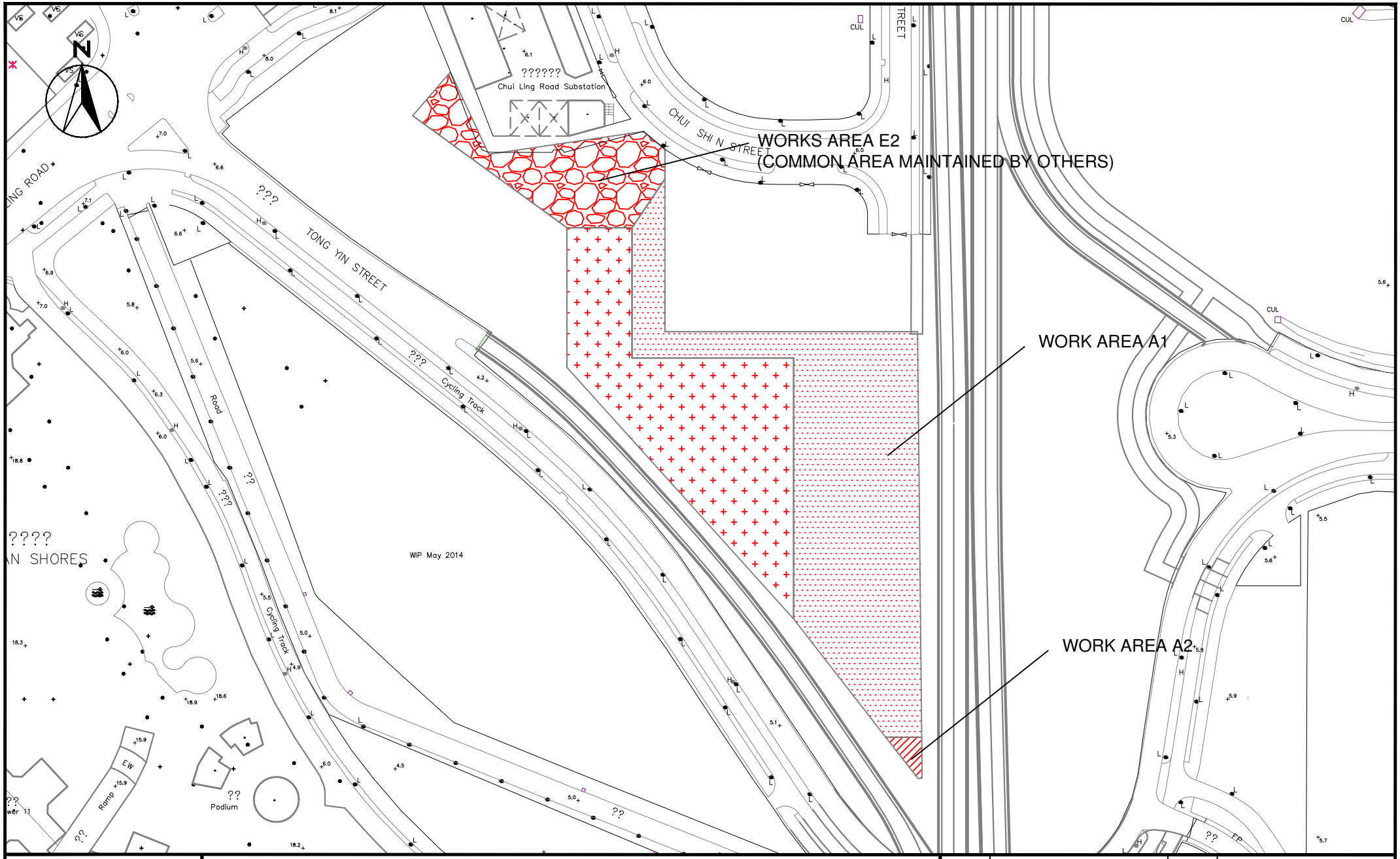

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Agreement No. CE/59/2015 (EP)
Environmental Team for Tseung Kwan O - Lam Tin Tunnel
- Design and Construction

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

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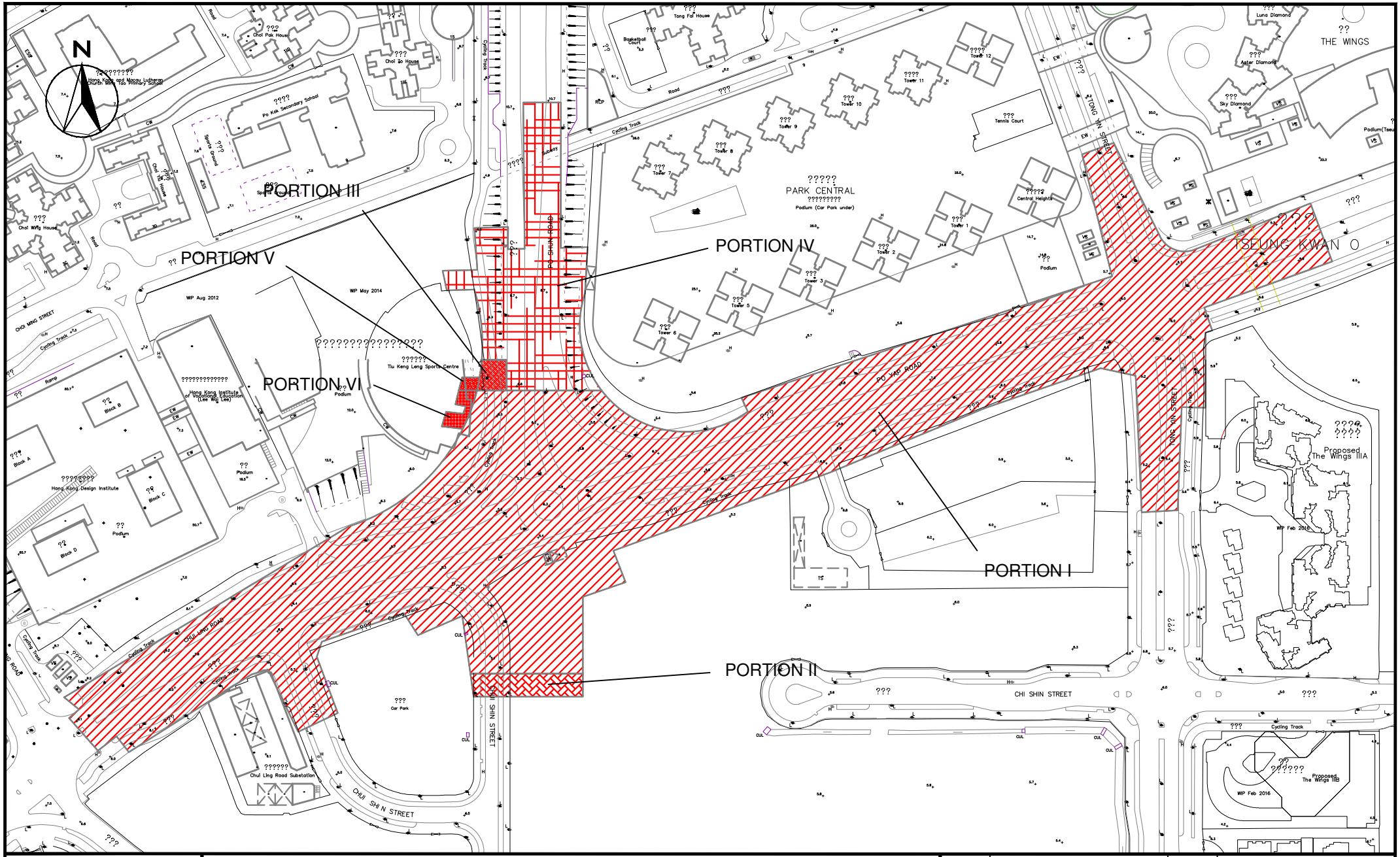

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Agreement No. CE/59/2015 (EP)
Environmental Team for Tseung Kwan O - Lam Tin Tunnel
- Design and Construction

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

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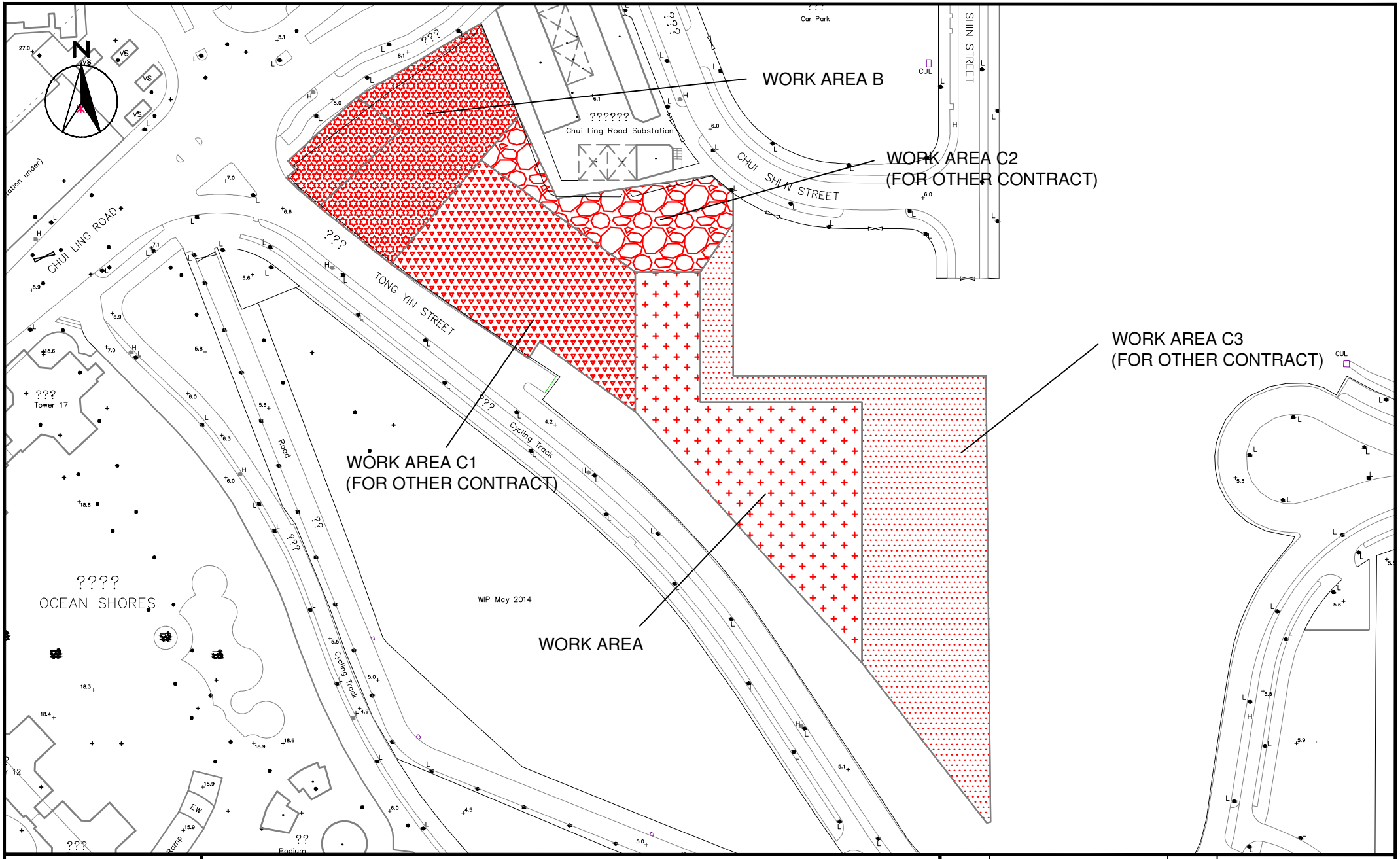
CHECK	VC	DRAWN	AC
JOB No.	MA16034	FIGURE NO. 1g	REV -



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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/2017/02

SCALE	1:1500 @ A4	DATE	AUG 2018
CHECK	VC	DRAWN	AC
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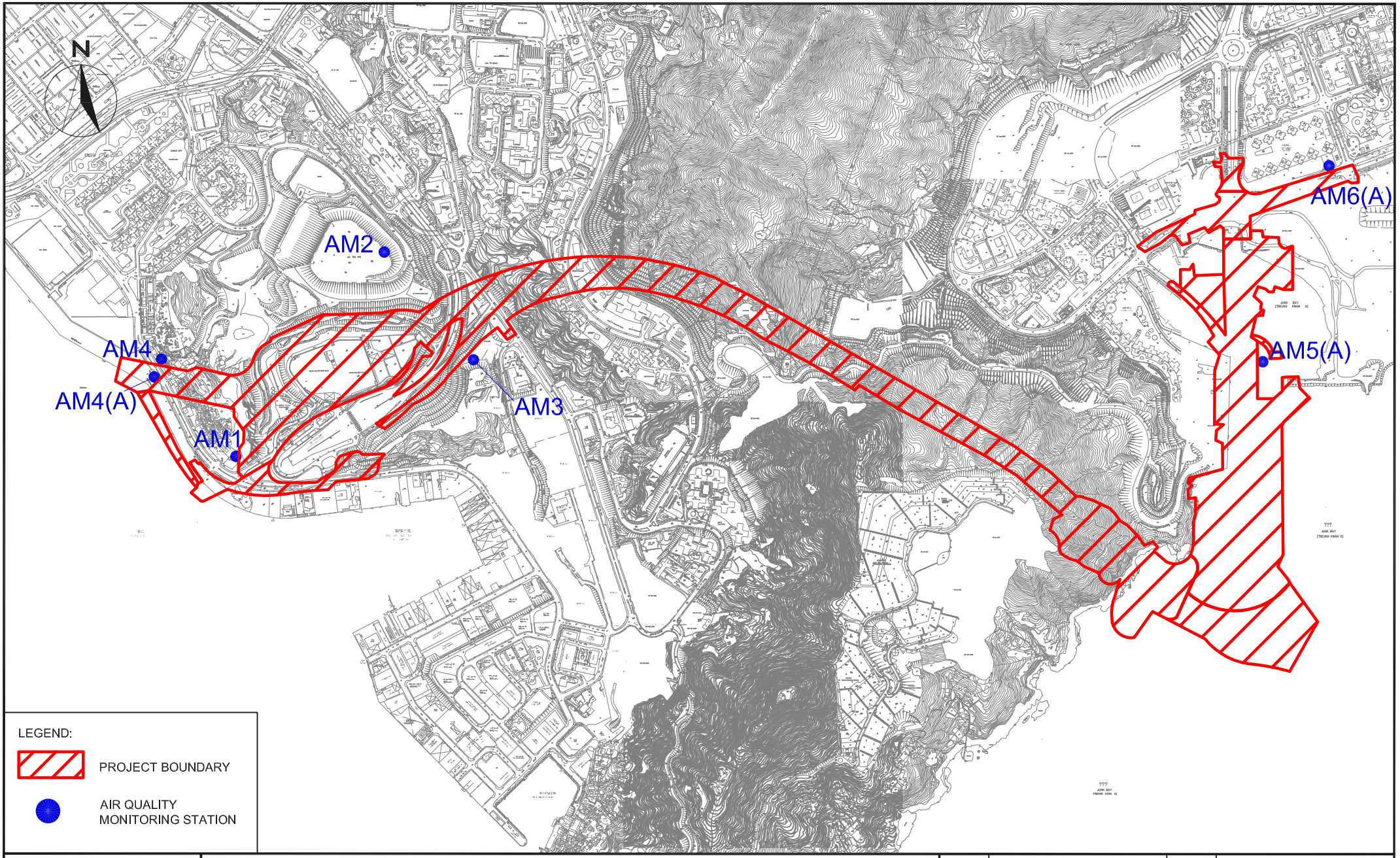

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Agreement No. CE/59/2015 (EP)
Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction
Air Quality Monitoring Stations

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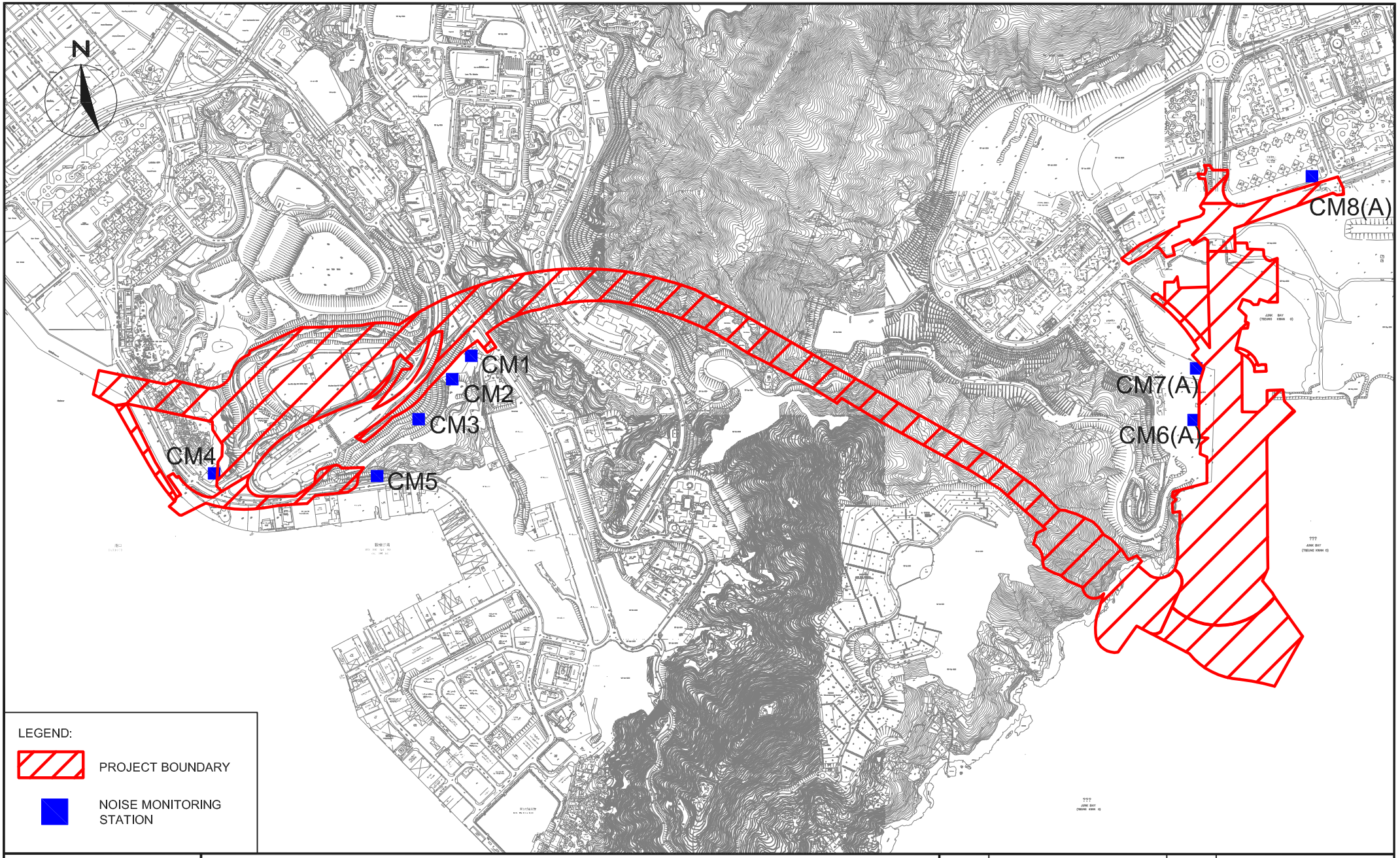

CINOTECH
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Agreement No. CE/59/2015 (EP)
Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction
Noise Monitoring Stations

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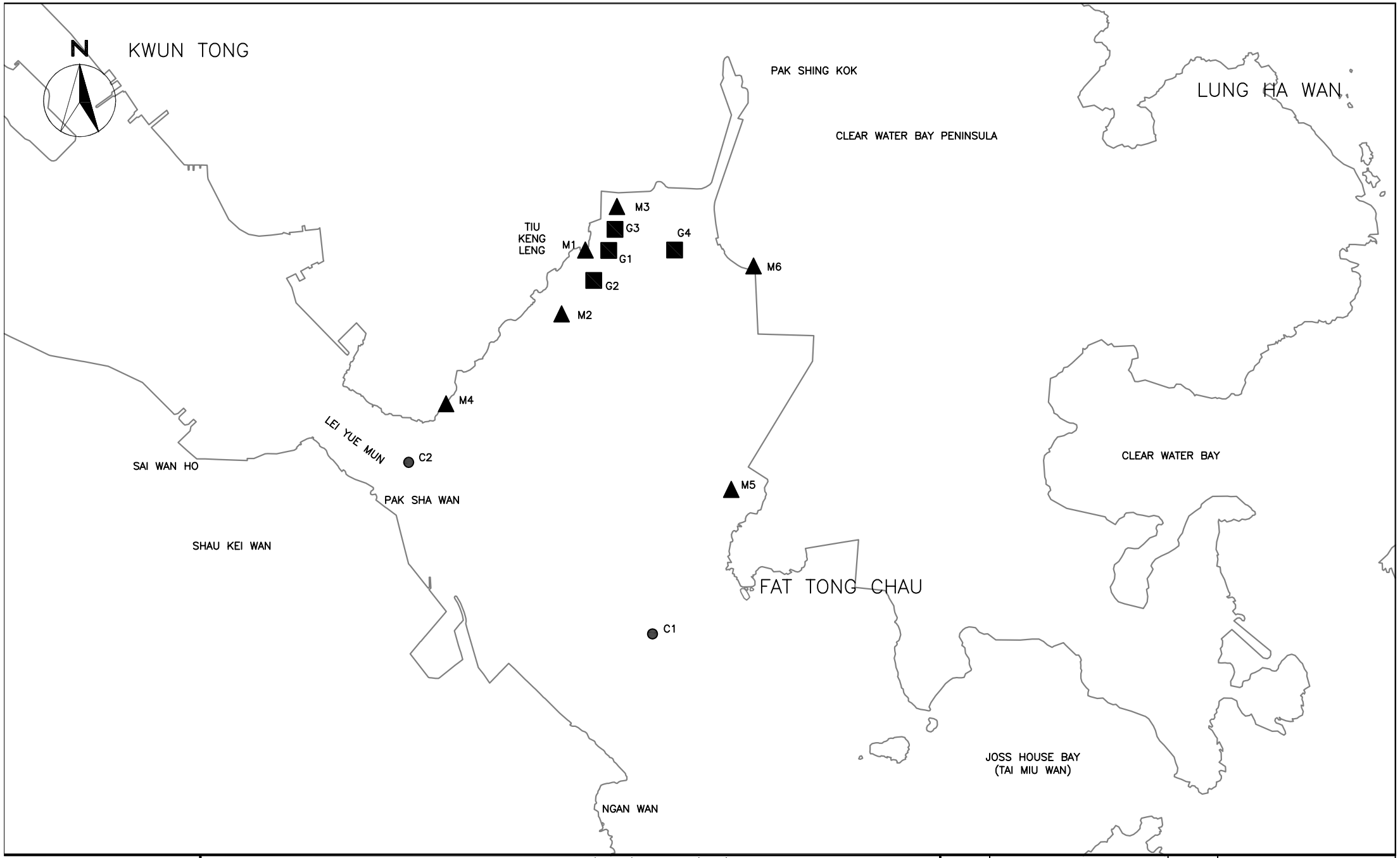
JOB No.	MA16034	FIGURE NO. 3	REV -



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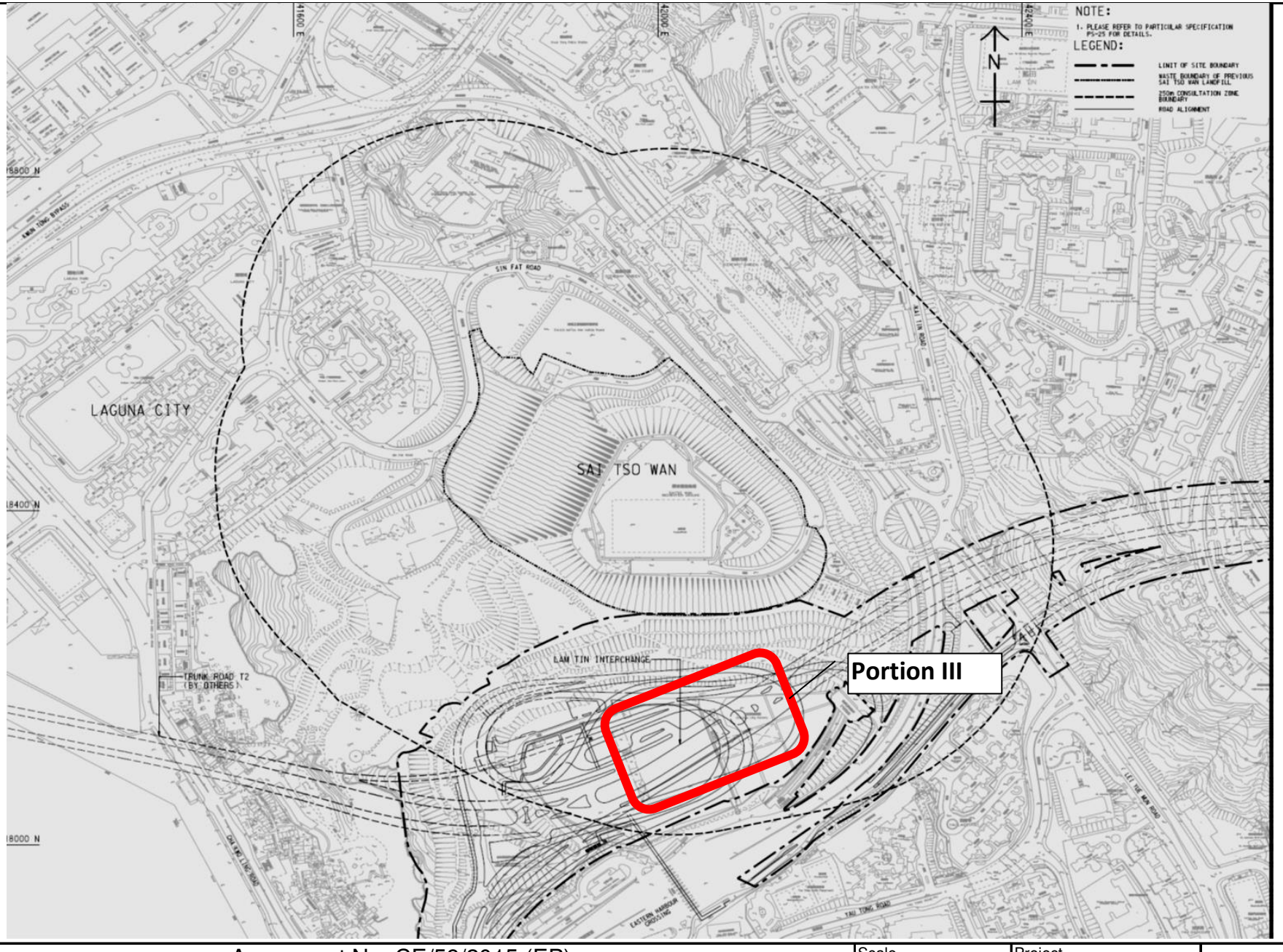
Agreement No. CE/59/2015 (EP)
Environmental Team for Tseung Kwan O – Lam Tin Tunnel – Design and Construction

Locations of Water Quality Monitoring Stations

SCALE	N.T.S	DATE	AUG 2016
CHECK	JF	DRAWN	JW
PROJECT NO.	MA16034	FIGURE NO.	5
		REV	–



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

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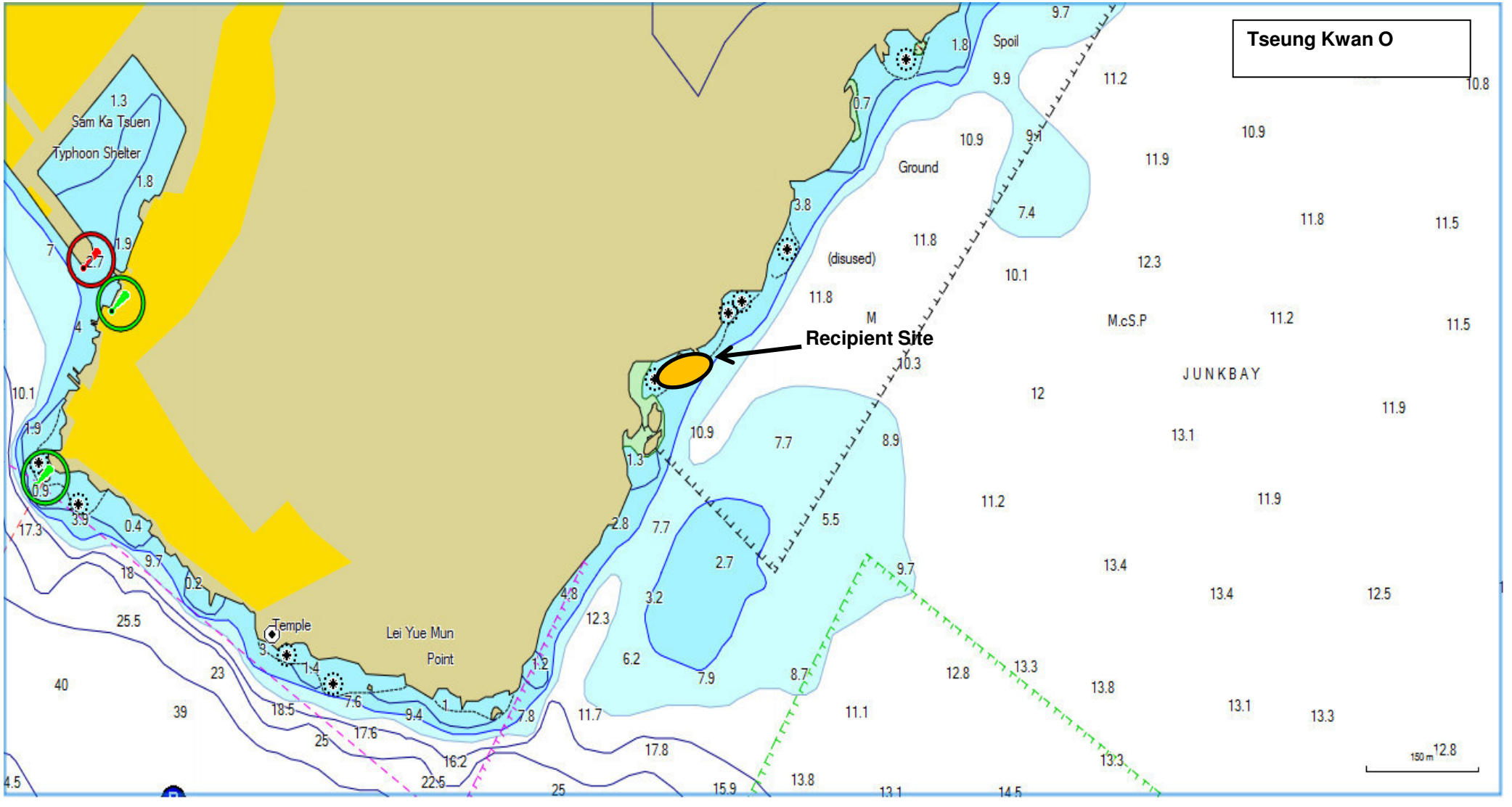
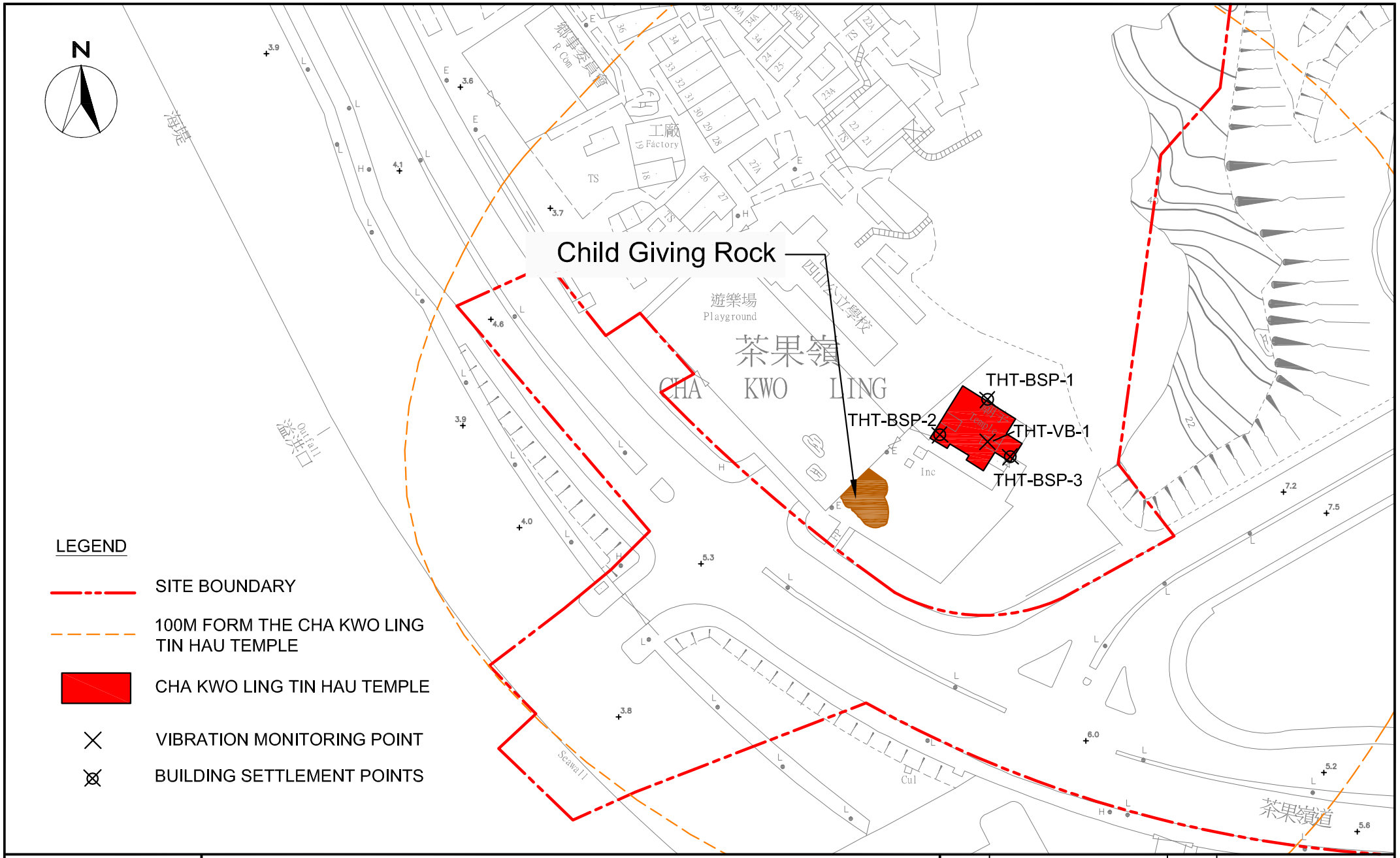


Title: Agreement No. CE/59/2015 (EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Location of Post-translocation Coral Monitoring	Scale: N.T.S	Project No.: MA16034	CINOTECH
	Date: Mar-17	Figure: 7	



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

Locations of Monitirong for Cultural Heritage

SCALE	N.T.S.	DATE	FEB 2018
CHECK	JF	DRAWN	AC
JOB No.	MA16034	FIGURE NO. 8	REV -

APPENDIX A
ACTION AND LIMIT LEVELS

APPENDIX A – Action and Limit Levels

Air Quality

1-hr TSP

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

24-hr TSP

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

Noise

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

[1] 70 dB(A) for schools and 65 dB(A) for schools during examination period.
[2] Acceptable Noise Levels for Area Sensitivity Rating of A/B/C
3 If works are to be carried out during restricted hours, the conditions stipulated in the construction noise permit issued by the Noise Control Authority have to be followed.

Water Quality

Groundwater

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

Notes:

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

Groundwater Level Monitoring

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

Marine Water Quality

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

Notes:

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

Water Quality Monitoring in Temporary Marine Embayment

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

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

Ecology

Post-translocation Coral Monitoring

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

Landfill Gas Monitoring

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

Alert, Alarm, Action Levels for Built Heritage Monitoring

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

APPENDIX B
COPIES OF CALIBRATION CERTIFICATES

High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET

File No. MA16034/05/0022

Project No. AM1 - Tin Hau Temple

Date: 12-Feb-20 Next Due Date: 12-Apr-20 Operator: SK

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

Ambient Condition			
Temperature, Ta (K)	293.6	Pressure, Pa (mmHg)	763.3

Orifice Transfer Standard Information					
Serial No.	3746	Slope, mc	0.0592	Intercept, bc	-0.02740
Last Calibration Date:	17-Jan-20	**mc x Qstd + bc = [ΔH x (Pa/760) x (298/Ta)]$^{1/2}$**			
Next Calibration Date:	17-Jan-21	**Qstd = {[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$ -bc} / mc**			

Calibration of TSP Sampler

Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$	Qstd (CFM) **X - axis**	ΔW (HVS), in. of water	[ΔW x (Pa/760) x (298/Ta)]$^{1/2}$ **Y-axis**
1	12.5	3.57	60.76	8.8	3.00
2	9.3	3.08	52.47	6.4	2.55
3	7.5	2.77	47.17	5.0	2.26
4	4.8	2.21	37.83	3.2	1.81
5	2.6	1.63	27.96	1.8	1.35

By Linear Regression of Y on X

Slope , mw = **0.0500** **Intercept, bw =** **-0.0699**

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

Therefore, Set Point; W = (mw x Qstd + bw)^2 x (760 / Pa) x (Ta / 298) = **4.25**

Remarks:

Conducted by: SK Wong Signature: Date: 12 February 2020

Checked by: Henry Leung Signature: Date: 12 February 2020

High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET

File No. MA16034/08/0022

Project No. AM2 - Sai Tso Wan Recreation Ground

Date: 12-Feb-20 Next Due Date: 12-Apr-20 Operator: SK

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

Ambient Condition			
Temperature, Ta (K)	293.6	Pressure, Pa (mmHg)	763.3

Orifice Transfer Standard Information					
Serial No.	3746	Slope, mc	0.0592	Intercept, bc	-0.02740
Last Calibration Date:	17-Jan-20	**mc x Qstd + bc = [ΔH x (Pa/760) x (298/Ta)]$^{1/2}$**			
Next Calibration Date:	17-Jan-21	**Qstd = {[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$ -bc} / mc**			

Calibration of TSP Sampler

Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$	Qstd (CFM) **X - axis**	ΔW (HVS), in. of water	[ΔW x (Pa/760) x (298/Ta)]$^{1/2}$ **Y-axis**
1	12.8	3.61	61.48	8.3	2.91
2	9.7	3.14	53.58	5.9	2.45
3	7.9	2.84	48.40	4.8	2.21
4	4.8	2.21	37.83	3.1	1.78
5	2.6	1.63	27.96	1.8	1.35

By Linear Regression of Y on X

Slope , mw = 0.0454 **Intercept, bw = 0.0579**

Correlation coefficient* = 0.9974

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

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

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

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

Therefore, Set Point; W = (mw x Qstd + bw)^2 x (760 / Pa) x (Ta / 298) = **3.97**

Remarks:

Conducted by: SK Wong Signature: Date: 12 February 2020

Checked by: Henry Leung Signature: Date: 12 February 2020

High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET

File No. MA16034/03/0022

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

Date: 12-Feb-20 Next Due Date: 12-Apr-20 Operator: SK

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

Ambient Condition			
Temperature, Ta (K)	293.6	Pressure, Pa (mmHg)	763.3

Orifice Transfer Standard Information					
Serial No.	3746	Slope, mc	0.0592	Intercept, bc	-0.02740
Last Calibration Date:	17-Jan-20	**mc x Qstd + bc = [ΔH x (Pa/760) x (298/Ta)]$^{1/2}$**			
Next Calibration Date:	17-Jan-21	**Qstd = {[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$ -bc} / mc**			

Calibration of TSP Sampler

Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$	Qstd (CFM) **X - axis**	ΔW (HVS), in. of water	[ΔW x (Pa/760) x (298/Ta)]$^{1/2}$ **Y-axis**
1	12.6	3.58	61.00	8.4	2.93
2	9.3	3.08	52.47	6.4	2.55
3	7.9	2.84	48.40	5.1	2.28
4	5.0	2.26	38.60	3.5	1.89
5	2.6	1.63	27.96	2.0	1.43

By Linear Regression of Y on X

Slope , mw = 0.0454 **Intercept, bw = 0.1400**

Correlation coefficient* = 0.9982

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

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

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

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

Therefore, Set Point; W = (mw x Qstd + bw)^2 x (760 / Pa) x (Ta / 298) = **4.30**

Remarks:

Conducted by: SK Wong Signature: Date: 12 February 2020

Checked by: Henry Leung Signature: Date: 12 February 2020

High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET

File No. MA16034/54/0022

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

Date: 12-Feb-20 Next Due Date: 12-Apr-20 Operator: SK

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

Ambient Condition			
Temperature, Ta (K)	293.6	Pressure, Pa (mmHg)	763.3

Orifice Transfer Standard Information					
Serial No.	3746	Slope, mc	0.0592	Intercept, bc	-0.02740
Last Calibration Date:	17-Jan-20	**mc x Qstd + bc = [ΔH x (Pa/760) x (298/Ta)]$^{1/2}$**			
Next Calibration Date:	17-Jan-21	**Qstd = {[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$ -bc} / mc**			

Calibration of TSP Sampler

Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$	Qstd (CFM) **X - axis**	ΔW (HVS), in. of water	[ΔW x (Pa/760) x (298/Ta)]$^{1/2}$ **Y-axis**
1	12.8	3.61	61.48	8.5	2.94
2	9.7	3.14	53.58	6.2	2.51
3	7.4	2.75	46.86	5.1	2.28
4	5.2	2.30	39.35	3.3	1.83
5	2.9	1.72	29.51	1.8	1.35

By Linear Regression of Y on X

Slope , mw = **0.0494** **Intercept, bw =** **-0.0963**

Correlation coefficient* = **0.9982**

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

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

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

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

Therefore, Set Point; W = (mw x Qstd + bw)^2 x (760 / Pa) x (Ta / 298) = **4.04**

Remarks:

Conducted by: SK Wong Signature: Date: 12 February 2020

Checked by: Henry Leung Signature: Date: 12 February 2020

High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET

File No. MA16034/37/0022

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

Date: 12-Feb-20 Next Due Date: 12-Apr-20 Operator: SK

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

Ambient Condition			
Temperature, Ta (K)	293.6	Pressure, Pa (mmHg)	763.3

Orifice Transfer Standard Information					
Serial No.	3746	Slope, mc	0.0592	Intercept, bc	-0.02740
Last Calibration Date:	17-Jan-20	**mc x Qstd + bc = [ΔH x (Pa/760) x (298/Ta)]$^{1/2}$**			
Next Calibration Date:	17-Jan-21	**Qstd = {[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$ -bc} / mc**			

Calibration of TSP Sampler

Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$	Qstd (CFM) **X - axis**	ΔW (HVS), in. of water	[ΔW x (Pa/760) x (298/Ta)]$^{1/2}$ **Y-axis**
1	12.8	3.61	61.48	8.7	2.98
2	9.7	3.14	53.58	6.3	2.53
3	7.7	2.80	47.79	5.1	2.28
4	5.2	2.30	39.35	3.4	1.86
5	2.9	1.72	29.51	2.0	1.43

By Linear Regression of Y on X

Slope , mw = **0.0482** **Intercept, bw =** **-0.0165**

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

Therefore, Set Point; W = (mw x Qstd + bw)^2 x (760 / Pa) x (Ta / 298) = **4.14**

Remarks:

Conducted by: SK Wong Signature: Date: 12 February 2020

Checked by: Henry Leung Signature: Date: 12 February 2020

High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET

File No. MA16034/07/0021

Project No. AM6 - Park Central

Date: 8-Jan-20 Next Due Date: 7-Mar-20 Operator: SK

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

Ambient Condition			
Temperature, Ta (K)	294.9	Pressure, Pa (mmHg)	763.7

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

Calibration of TSP Sampler

Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$	Qstd (CFM) **X - axis**	ΔW (HVS), in. of water	[ΔW x (Pa/760) x (298/Ta)]$^{1/2}$ **Y-axis**
1	11.9	3.48	59.53	7.1	2.69
2	8.8	2.99	51.31	5.6	2.39
3	7.1	2.69	46.08	4.6	2.16
4	4.5	2.14	36.83	2.9	1.70
5	2.8	1.69	29.09	1.9	1.39

By Linear Regression of Y on X

Slope , mw = 0.0435 **Intercept, bw = 0.1252**

Correlation coefficient* = 0.9985

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

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

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

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

Therefore, Set Point; W = (mw x Qstd + bw)^2 x (760 / Pa) x (Ta / 298) = **3.93**

Remarks:

Conducted by: SK Wong Signature: Date: 8 January 2020

Checked by: Henry Leung Signature: Date: 8 January 2020

High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET

File No. MA16034/07/0022

Project No. AM6 - Park Central

Date: 6-Mar-20 Next Due Date: 6-May-20 Operator: SK

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

Ambient Condition			
Temperature, Ta (K)	293.6	Pressure, Pa (mmHg)	760.4

Orifice Transfer Standard Information					
Serial No.	3746	Slope, mc	0.0592	Intercept, bc	-0.02740
Last Calibration Date:	17-Jan-20	**mc x Qstd + bc = [ΔH x (Pa/760) x (298/Ta)]$^{1/2}$**			
Next Calibration Date:	17-Jan-21	**Qstd = {[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$ -bc} / mc**			

Calibration of TSP Sampler

Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	[ΔH x (Pa/760) x (298/Ta)]$^{1/2}$	Qstd (CFM) **X - axis**	ΔW (HVS), in. of water	[ΔW x (Pa/760) x (298/Ta)]$^{1/2}$ **Y-axis**
1	12.2	3.52	59.92	7.3	2.72
2	8.9	3.01	51.25	5.7	2.41
3	7.2	2.70	46.14	4.6	2.16
4	4.6	2.16	36.97	3.0	1.75
5	2.9	1.72	29.45	2.1	1.46

By Linear Regression of Y on X

Slope , mw = **0.0423** **Intercept, bw =** **0.2062**

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

Therefore, Set Point; W = (mw x Qstd + bw)^2 x (760 / Pa) x (Ta / 298) = **4.04**

Remarks:

Conducted by: SK Wong Signature: Date: 06 March 2020

Checked by: Henry Leung Signature: Date: 06 March 2020

Cerificate of Calibration

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

Description: Digital Dust Indicator — Date of Calibration: 6-Feb-20

Manufacturer: Sibata Scientific Technology LTD. — Validity of Calibration Record: 6-Apr-20

Model No.: LD-5R

Serial No.: 972781

Equipment No.: SA-01-10 — Sensitivity: 0.001 mg/m3

High Volume Sampler No.: A-01-01A — Before Sensitivity Adjustment: 734 CPM

Tisch Calibration Orifice No.: 3607 — After Sensitivity Adjustment: 734 CPM

Calibration of 1 hr TSP		
Calibration Point	**Laser Dust Monitor**	**HVS**
	Mass Concentration (µg/m3) **X-axis**	Mass concentration (µg/m^3) **Y-axis**
1	50.0	112.5
2	43.0	108.0
3	32.0	102.5
Average	**41.7**	**107.7**

By Linear Regression of Y on X

Slope , mw = **0.5506** **Intercept, bw =** **84.7247**

Correlation coefficient* = **0.9976**

Set Correlation Factor	
Particaulate Concentration by High Volume Sampler (µg/m^3)	107.7
Particaulate Concentration by Dust Meter (µg/m^3)	41.7
Measureing time, (min)	60.0
Set Correlation Factor , SCF	
SCF = [K=High Volume Sampler / Dust Meter, (µg/m3)]	**2.6**

In-house method in according to the instruction manual:

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

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

Calibrated by: Wong Shing Kwai

Approved by: Henry Leung

Cerificate of Calibration

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

Description: Digital Dust Indicator
Date of Calibration 6-Feb-20
Manufacturer: Sibata Scientific Technology LTD.
Validity of Calibration Record 6-Apr-20
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** Mass Concentration (µg/m3) **X-axis**	**HVS** Mass concentration (µg/m^3) **Y-axis**
1	54.0	112.5
2	51.0	108.0
3	46.0	102.5
Average	**50.3**	**107.7**

By Linear Regression of Y on X

Slope , mw = **1.2347** **Intercept, bw =** **45.5204**

Correlation coefficient* = **0.9963**

Set Correlation Factor	
Particaulate Concentration by High Volume Sampler (µg/m^3)	107.7
Particaulate Concentration by Dust Meter (µg/m^3)	50.3
Measureing time, (min)	60.0

Set Correlation Factor , SCF

SCF = [K=High Volume Sampler / Dust Meter, (µg/m3)] **2.1**

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

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

Calibrated by: Wong Shing Kwai

Approved by: Henry Leung

Cerificate of Calibration

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

Description: Digital Dust Indicator
Date of Calibration 6-Feb-20
Manufacturer: Sibata Scientific Technology LTD.
Validity of Calibration Record 6-Apr-20
Model No.: LD-5R
Serial No.: 972778
Equipment No.: SA-01-07
Sensitivity 0.001 mg/m3
High Volume Sampler No.: A-01-01A
Before Sensitivity Adjustment 735 CPM
Tisch Calibration Orifice No.: 3607
After Sensitivity Adjustment 735 CPM

Calibration of 1 hr TSP		
Calibration Point	**Laser Dust Monitor**	**HVS**
	Mass Concentration (µg/m3) **X-axis**	Mass concentration (µg/m^3) **Y-axis**
1	48.0	112.5
2	38.0	108.0
3	27.0	102.5
Average	**37.7**	**107.7**

By Linear Regression of Y on X

Slope , mw = **0.4766** **Intercept, bw =** **89.7153**

Correlation coefficient* = **0.9995**

Set Correlation Factor	
Particaulate Concentration by High Volume Sampler (µg/m^3)	107.7
Particaulate Concentration by Dust Meter (µg/m^3)	37.7
Measureing time, (min)	60.0

Set Correlation Factor , SCF

SCF = [K=High Volume Sampler / Dust Meter, (µg/m3)] **2.9**

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

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

Calibrated by: .Wong Shing Kwai

Approved by: Henry Leung

Cerificate of Calibration

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

Description: Digital Dust Indicator
Date of Calibration 6-Feb-20
Manufacturer: Sibata Scientific Technology LTD.
Validity of Calibration Record 6-Apr-20
Model No.: LD-5R
Serial No.: 972779
Equipment No.: SA-01-08
Sensitivity 0.001 mg/m3
High Volume Sampler No.: A-01-01A
Before Sensitivity Adjustment 744 CPM
Tisch Calibration Orifice No.: 3607
After Sensitivity Adjustment 744 CPM

Calibration of 1 hr TSP		
Calibration Point	**Laser Dust Monitor** Mass Concentration (µg/m3) **X-axis**	**HVS** Mass concentration (µg/m^3) **Y-axis**
1	52.0	112.5
2	36.0	108.0
3	19.0	102.5
Average	**35.7**	**107.7**

By Linear Regression of Y on X

Slope , mw = **0.3032** **Intercept, bw =** **96.8510**

Correlation coefficient* = **0.9992**

Set Correlation Factor	
Particaulate Concentration by High Volume Sampler (µg/m^3)	107.7
Particaulate Concentration by Dust Meter (µg/m^3)	35.7
Measureing time, (min)	60.0

Set Correlation Factor , SCF

SCF = [K=High Volume Sampler / Dust Meter, (µg/m3)] **3.0**

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

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

Calibrated by: Wong Shing Kwai

Approved by: Henry Leung

Cerificate of Calibration

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

Description: Digital Dust Indicator

Date of Calibration 6-Feb-20

Manufacturer: Sibata Scientific Technology LTD.

Validity of Calibration Record 6-Apr-20

Model No.: LD-5R

Serial No.: 972780

Equipment No.: SA-01-09

Sensitivity 0.001 mg/m3

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

Before Sensitivity Adjustment 739 CPM

Tisch Calibration Orifice No.: 3607

After Sensitivity Adjustment 739 CPM

Calibration of 1 hr TSP		
Calibration Point	**Laser Dust Monitor**	**HVS**
	Mass Concentration (µg/m3) **X-axis**	Mass concentration (µg/m^3) **Y-axis**
1	49.0	112.5
2	42.0	108.0
3	32.0	102.5
Average	**41.0**	**107.7**

By Linear Regression of Y on X

Slope , mw = **0.5856** **Intercept, bw =** **83.6564**

Correlation coefficient* = **0.9990**

Set Correlation Factor	
Particaulate Concentration by High Volume Sampler (µg/m^3)	107.7
Particaulate Concentration by Dust Meter (µg/m^3)	41.0
Measureing time, (min)	60.0
Set Correlation Factor , SCF	
SCF = [K=High Volume Sampler / Dust Meter, (µg/m3)]	**2.6**

In-house method in according to the instruction manual:

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

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

Calibrated by: _____

Wong Shing Kwai

Approved by: _____

Henry Leung

Cerificate of Calibration - Wind Monitoring Station

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

1. Performance check of Wind Speed

Wind Speed, m/s		Difference D (m/s)
Wind Speed Reading (V1)	Anemometer Value (V1)	D = V1 – V2
0.0	0.0	0.0
1.2	1.3	-0.1
2.0	2.1	-0.1
3.0	3.2	-0.2

2. Performance check of Wind Direction

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

Test Specification:

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

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

Calibrated by: _____ Wong Shing Kwai

Approved by: _____ Henry Leung

TISCH Environmental

RECALIBRATION DUE DATE:
January 17, 2021

Certificate of Calibration

Calibration Certification Information				
Cal. Date:	January 17, 2020	**Rootsmeter S/N:** 438320	**Ta:** 295	°K
Operator:	Jim Tisch		**Pa:** 744.2	mm Hg
Calibration Model #:	TE-5025A	**Calibrator S/N:** **3746**		

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	1.0180	6.4	4.00
3	5	6	1	0.9080	7.9	5.00
4	7	8	1	0.8700	8.7	5.50
5	9	10	1	0.7150	12.6	8.00

Data Tabulation

Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H\left(Ta/Pa\right)}$ (y-axis)
0.9849	0.6868	1.4066	0.9957	0.6944	0.8904
0.9807	0.9633	1.9892	0.9914	0.9739	1.2592
0.9787	1.0779	2.2240	0.9894	1.0896	1.4078
0.9776	1.1237	2.3325	0.9883	1.1360	1.4765
0.9724	1.3601	2.8131	0.9831	1.3749	1.7808
QSTD	**m=**	**2.09221**	**QA**	**m=**	**1.31010**
	b=	**-0.02779**		**b=**	**-0.01759**
	r=	**0.99994**		**r=**	**0.99994**

Calculations

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

For subsequent flow rate calculations:

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

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

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

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

RECALIBRATION

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

Tisch Environmental, Inc.
145 South Miami Avenue
Village of Cleves, OH 45002

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

Calibration Certificate

0023155

Customer : Cinotech Consultants Limited RM 1710, Technology Park, 18 On Lai Street, Shatin, N.T. Hong Kong Customer Code : SVEC09005	Object 1 : SVAN979 SLM Serial No. /Ref. No. : 27189 / SN-01-01 Object 2 : Microphone Serial No. /Ref. No. : 25204 Manufacturer : BSWAtech
Date of calibration: 08/01/2020 Date of the recommended re-calibration: 08/01/2021	Certificate No.: 0023155 Handle by: E0002

Measuring results

Reference value	Indication value	Deviation	Allowed deviation	Object
94.0dB	93.7dB	-0.3dB	+/- 1.5dB	1
114.0dB	113.6dB	-0.4dB	+/- 1.5dB	1

Measuring equipment

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

Ambient conditions

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

Measuring procedure

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

Uncertainty

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

Conformity

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

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

Performed by

Calibration Technician

Approved by

Quality Manager

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

WELLAB LIMITED
Rms 1214, 1502, 1516, 1701 & 1716,
Technology Park, 18 On Lai Street,
Shatin, N.T., Hong Kong.
Tel: 2898 7388 Fax: 2898 7076
Website: www.wellab.com.hk

TEST REPORT

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

Test Report No.:	32151
Date of Issue:	2019-09-27
Date Received:	2019-09-26
Date Tested:	2019-09-26
Date Completed:	2019-09-27
Next Due Date:	2020-09-26
Page:	1 of 1

ATTN: **Mr. Henry Leung**

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 Temperatre	: 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

Equipment no.: N-12-02

Calibration Certificate

0022522

Customer : Cinotech Consultants Limited RM 1710, Technology Park, 18 On Lai Street, Shatin, N.T. Hong Kong Customer Code : SVEC09005	Object 1 : BSWA 308 SLM Serial No. /Ref. No. : 570187 / 550841 Object 2 : Serial No. /Ref. No. : Manufacturer : BSWAtech
Date of calibration: 23/09/2019 Date of the recommended re-calibration: 23/09/2020	Certificate No.: 0022522 Handle by: E0002

Measuring results

Reference value	Indication value	Deviation	Allowed deviation	Object
94.0dB	94.0dB	0.0dB	+/- 1.5dB	1
114.0dB	113.9dB	-0.1dB	+/- 1.5dB	1

Measuring equipment

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

Ambient conditions

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

Measuring procedure

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

Uncertainty

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

Conformity

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

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

Performed by

Calibration Technician

Approved by

Quality Manager

Calibration Certificate

0022673

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

Measuring results

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

Measuring equipment

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

Ambient conditions

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

Measuring procedure

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

Uncertainty

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

Conformity

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

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

Performed by

Calibration Technician

Approved by

Quality Manager

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

Calibration Certificate

0022676

Customer : Cinotech Consultants Limited RM 1710, Technology Park, 18 On Lai Street, Shatin, N.T. Hong Kong Customer Code : SVEC09005	Object 1 : ST-120 sound calibrator Serial No. /Ref. No. : 181001636 Object 2 : Serial No. /Ref. No. : Manufacturer : Soundtek
Date of calibration: 24/10/2019 Date of the recommended re-calibration: 24/10/2020	Certificate No.: 0022676 Handle by: E0002

Measuring results

Reference value	Indication value	Deviation	Allowed deviation	Object
94.0dB	93.7dB	-0.3dB	+/- 0.3dB	1
114.0dB	113.7dB	-0.3dB	+/- 0.5dB	1

Measuring equipment

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

Ambient conditions

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

Measuring procedure

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

Uncertainty

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

Conformity

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

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

Performed by

Calibration Technician

Approved by

Quality Manager

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

Calibration Certificate

0023002

Customer : Cinotech Consultants Limited RM 1710, Technology Park, 18 On Lai Street, Shatin, N.T. Hong Kong Customer Code : SVEC09005	Object 1 : SV30A sound calibrator Serial No. /Ref. No. : 10965 / N-09-02 Object 2 : Serial No. /Ref. No. : Manufacturer : Svantek
Date of calibration: 19/12/2019 Date of the recommended re-calibration: 19/12/2020	Certificate No.: 0023002 Handle by: E0002

Measuring results

Reference value	Indication value	Deviation	Allowed deviation	Object
94.0dB	93.9dB	-0.1dB	+/- 0.3dB	1
114.0dB	114.2dB	+0.2dB	+/- 0.3dB	1

Measuring equipment

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

Ambient conditions

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

Measuring procedure

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

Uncertainty

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

Conformity

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

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

Performed by

Calibration Technician

Approved by

Quality Manager

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

WELLAB 匯力
consulting . testing . research

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

TEST REPORT

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

Test Report No.:	33097
Date of Issue:	2020-01-08
Date Received:	2020-02-25
Date Tested:	2020-02-25 to 2020-02-28
Date Completed:	2020-02-28

ATTN: **Mr. Henry Leung**

Page: 1 of 2

Certificate of Calibration

Item for calibrati

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 Turbuduty Sensor, Ti	599101-01	16H102463
- EXO pH Sensor Assembly, Guarded, Ti	599701	17B103615

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

WELLAB 匯力
consulting . testing . research

WELLAB LIMITED
Room 1701, Technology Park,
18 On Lai Street, Shatin,
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TEST REPORT

Test Report No.:	33097
Date of Issue:	2020-01-08
Date Received:	2020-02-25
Date Tested:	2020-02-25 to 2020-02-28
Date Completed:	2020-02-28

Certificate of Calibration

Results:

Conductivity performance checking

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

Temperature performance checking

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

pH performance checking

	Instrument Readings (pH unit)	Accetance Criteria	Comment
pH QC buffer 4.00	4.00	4.00 ± 0.10	Pass
pH QC buffer 6.86	6.86	6.86 ± 0.10	Pass
pH QC buffer 9.18	9.19	9.18 ± 0.10	Pass

D.O. performance checking

	Instrument Readings (mg/L)	Accetance Criteria	Comment
Zero DO soultion	0.09	<0.1mg/L	Pass

Winkler Titration value (mg/L)	Instrument Readings (mg/L)	Accetance Criteria	Comment
8.00	8.12	Difference between Titration value and instrument reading <0.2mg/L	Pass

Turbidity performance checking

Turbidity stock solution	Instrument Readings (NTU)	Accetance Criteria	Comment
10 NTU	10.08	9.0-11.0	Pass
50 NTU	50.06	45.0-55.0	Pass
100 NTU	100.7	90.0-110.0	Pass

Depth performance checking

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

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

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Isaac Au Yeung)

Date: 22 March 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Isaac Au Yeung)

Date: 22 March 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 22 March 2019

SET 4

CALIBRATION CERTIFICATE

Calibration Item:	Minimate Plus Unit (Calibration with Geophone BG14852)
Model No.:	716A0403
Serial No.:	BE15890
Calibration Date:	12 March 2020
Next Calibration Date:	12 March 2021
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 12 March 2020

CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit BE15890)
Part Number:	714A9701
Serial No.:	BG14852
Calibration Date:	12 March 2020
Next Calibration Date:	12 March 2021
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 12 March 2020

CALIBRATION CERTIFICATE

Calibration Item:	Linear Microphone (Calibration with main unit BE15890)
Model No.:	714A9801
Serial No.:	BH11455
Calibration Date:	12 March 2020
Next Calibration Date:	12 March 2021
Method Used:	In-house Method MM-002
In-house Testing Procedure No.:	MM-002

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 12 March 2020

SET 5

CALIBRATION CERTIFICATE

Calibration Item:	Minimate Plus Unit (Calibration with Geophone BG16955)
Model No.:	716A0403
Serial No.:	BE16223
Calibration Date:	12 March 2020
Next Calibration Date:	12 March 2021
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 12 March 2020

CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit BE16223)
Part Number:	714A9701
Serial No.:	BG16955
Calibration Date:	12 March 2020
Next Calibration Date:	12 March 2021
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 12 March 2020

CALIBRATION CERTIFICATE

Calibration Item:	Linear Microphone (Calibration with main unit BE16223)
Model No.:	714A9801
Serial No.:	BH11458
Calibration Date:	12 March 2020
Next Calibration Date:	12 March 2021
Method Used:	In-house Method MM-002
In-house Testing Procedure No.:	MM-002

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 12 March 2020

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Isaac Au Yeung)

Date: 15 April 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Isaac Au Yeung)

Date: 15 April 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 15 April 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Isaac Au Yeung)

Date: 8 April 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Isaac Au Yeung)

Date: 8 April 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 8 April 2019

SET 9.

CALIBRATION CERTIFICATE

Calibration Item:	Minimate Plus Unit (Calibration with Geophone BG15353)
Model No.:	716A0403
Serial No.:	BE15891
Calibration Date:	26 February 2020
Next Calibration Date:	26 February 2021
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 26 February 2020

CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit BE15891)
Part Number:	714A9701
Serial No.:	BG15353
Calibration Date:	26 February 2020
Next Calibration Date:	26 February 2021
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 26 February 2020

SET 1

CALIBRATION CERTIFICATE

Calibration Item:	Minimate Plus Unit (Calibration with Geophone BG15180)
Model No.:	716A0403
Serial No.:	BE15894
Calibration Date:	24 February 2020
Next Calibration Date:	24 February 2021
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 24 February 2020

CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit BE15894)
Part Number:	714A9701
Serial No.:	BG15180
Calibration Date:	24 February 2020
Next Calibration Date:	24 February 2021
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 24 February 2020

CALIBRATION CERTIFICATE

Calibration Item:	Linear Microphone (Calibration with main unit BE17902)
Model No.:	714A9801
Serial No.:	BH14078
Calibration Date:	23 May 2019
Next Calibration Date:	23 May 2020
Method Used:	In-house Method MM-002
In-house Testing Procedure No.:	MM-002

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 23 May 2019

CALIBRATION CERTIFICATE

Calibration Item:	Minimate Plus Unit (Calibration with Geophone BG20674)
Model No.:	716A0403
Serial No.:	BE17902
Calibration Date:	23 May 2019
Next Calibration Date:	23 May 2020
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 23 May 2019

CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit BE17902)
Part Number:	714A9701
Serial No.:	BG20674
Calibration Date:	23 May 2019
Next Calibration Date:	23 May 2020
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 23 May 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 8 April 2019

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CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Isaac Au Yeung)

Date: 8 April 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Isaac Au Yeung)

Date: 8 April 2019

SET 15

CALIBRATION CERTIFICATE

Calibration Item:	Minimate Plus Unit (Calibration with Geophone BG20673)
Model No.:	716A0403
Serial No.:	BE13849
Calibration Date:	26 February 2020
Next Calibration Date:	26 February 2021
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 26 February 2020

CALIBRATION CERTIFICATE

Calibration Item:	Linear Microphone (Calibration with main unit BE13849)
Model No.:	714A9801
Serial No.:	BH13154
Calibration Date:	26 February 2020
Next Calibration Date:	26 February 2021
Method Used:	In-house Method MM-002
In-house Testing Procedure No.:	MM-002

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 26 February 2020

CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit BE13849)
Part Number:	714A9701
Serial No.:	BG20673
Calibration Date:	26 February 2020
Next Calibration Date:	26 February 2021
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 26 February 2020

SET 16

CALIBRATION CERTIFICATE

Calibration Item:	Minimate Plus Unit (Calibration with Geophone BG16512)
Model No.:	716A0403
Serial No.:	BE13853
Calibration Date:	24 February 2020
Next Calibration Date:	24 February 2021
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 24 February 2020

CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit BE13853)
Part Number:	714A9701
Serial No.:	BG16512
Calibration Date:	24 February 2020
Next Calibration Date:	24 February 2021
Method Used:	In-house Method B3-001
In-house Testing Procedure No.:	B3-001

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 24 February 2020

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Isaac Au Yeung)

Date: 8 April 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Isaac Au Yeung)

Date: 8 April 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 8 April 2019

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CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 8 April 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Isaac Au Yeung)

Date: 8 April 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Isaac Au Yeung)

Date: 8 April 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Isaac Au Yeung)

Date: 15 April 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Isaac Au Yeung)

Date: 15 April 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 15 April 2019

SET 21

CALIBRATION CERTIFICATE

Calibration Item:	Minimate Plus Unit (Calibration with Geophone BG17240)
Model No.:	716A0403
Serial No.:	BE20015
Calibration Date:	26 February 2020
Next Calibration Date:	26 February 2021
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: _____

(Au Yeung Hang Chuen, Isaac)

Date: 26 February 2020

CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit BE20015)
Part Number:	714A9701
Serial No.:	BG17240
Calibration Date:	26 February 2020
Next Calibration Date:	26 February 2021
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: _____

(Au Yeung Hang Chuen, Isaac)

Date: 26 February 2020

CALIBRATION CERTIFICATE

Calibration Item:	Linear Microphone (Calibration with main unit BE20015)
Model No.:	714A9801
Serial No.:	BH12658
Calibration Date:	26 February 2020
Next Calibration Date:	26 February 2021
Method Used:	In-house Method MM-002
In-house Testing Procedure No.:	MM-002

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

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 26 February 2020

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 14 May 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 14 May 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 14 May 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 14 May 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 14 May 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 14 May 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 14 May 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 14 May 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 14 May 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 22 March 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Au Yeung Hang Chuen, Isaac)

Date: 22 March 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Isaac Au Yeung)

Date: 22 March 2019

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CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit UM12907)
Part Number:	721A2901
Serial No.:	UM12907
Calibration Date:	24 February 2020
Next Calibration Date:	24 February 2021
Method Used:	In-house Method MM-001
In-house Testing Procedure No.:	MM-001

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Leung Man Hin, Eric)

Date: 24 February 2020

CALIBRATION CERTIFICATE

Calibration Item:	Micromate Linear Microphone (Calibration with main unit UM12907)
Model No.:	721A0201
Serial No.:	UL3398
Calibration Date:	24 February 2020
Next Calibration Date:	24 February 2021
Method Used:	In-house Method MM-002
In-house Testing Procedure No.:	MM-002

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

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Leung Man Hin, Eric)

Date: 24 February 2020

CALIBRATION CERTIFICATE

Calibration Item:	Micromate Unit (Calibration with Geophone UM12907)
Model No.:	721A2501
Serial No.:	UM12907
Calibration Date:	24 February 2020
Next Calibration Date:	24 February 2021
Method Used:	In-house Method MM-001
In-house Testing Procedure No.:	MM-001

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

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Leung Man Hin, Eric)

Date: 24 February 2020

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Leung Man Hin, Eric)

Date: 7 May 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Leung Man Hin, Eric)

Date: 7 May 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Leung Man Hin, Eric)

Date: 7 May 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Leung Man Hin, Eric)

Date: 2 May 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Leung Man Hin, Eric)

Date: 2 May 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Leung Man Hin, Eric)

Date: 2 May 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Leung Man Hin, Eric)

Date: 7 May 2019

CALIBRATION CERTIFICATE

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

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

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Authorized by: _____

(Leung Man Hin, Eric)

Date: 7 May 2019

CALIBRATION CERTIFICATE

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

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

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Authorized by: _____

(Leung Man Hin, Eric)

Date: 7 May 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Leung Man Hin, Eric)

Date: 7 May 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Leung Man Hin, Eric)

Date: 2 May 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Leung Man Hin, Eric)

Date: 2 May 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Leung Man Hin, Eric)

Date: 2 May 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Leung Man Hin, Eric)

Date: 30 April 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Leung Man Hin, Eric)

Date: 30 April 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Leung Man Hin, Eric)

Date: 30 April 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Leung Man Hin, Eric)

Date: 2 May 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Leung Man Hin, Eric)

Date: 2 May 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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: 2 May 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Leung Man Hin, Eric)

Date: 25 April 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Leung Man Hin, Eric)

Date: 25 April 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Leung Man Hin, Eric)

Date: 30 April 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Leung Man Hin, Eric)

Date: 30 April 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Leung Man Hin, Eric)

Date: 25 April 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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

Authorized by: _____

(Leung Man Hin, Eric)

Date: 25 April 2019

CALIBRATION CERTIFICATE

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

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

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Leung Man Hin, Eric)

Date: 25 April 2019

CALIBRATION CERTIFICATE

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

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

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Authorized by: _____

(Leung Man Hin, Eric)

Date: 25 April 2019

CALIBRATION CERTIFICATE

Calibration Item:	Micromate Unit (Calibration with Geophone UM14387)
Model No.:	721A2501
Serial No.:	UM14387
Calibration Date:	6 August 2019
Next Calibration Date:	6 August 2020
Method Used:	In-house Method MM-001
In-house Testing Procedure No.:	MM-001

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

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Leung Man Hin, Eric)

Date: 6 August 2019

CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit UM14387)
Part Number:	721A2901
Serial No.:	UM14387
Calibration Date:	6 August 2019
Next Calibration Date:	6 August 2020
Method Used:	In-house Method MM-001
In-house Testing Procedure No.:	MM-001

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

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Leung Man Hin, Eric)

Date: 6 August 2019

CALIBRATION CERTIFICATE

Calibration Item:	Micromate Linear Microphone (Calibration with main unit UM14387)
Model No.:	721A0201
Serial No.:	UL3687
Calibration Date:	6 August 2019
Next Calibration Date:	6 August 2020
Method Used:	In-house Method MM-002
In-house Testing Procedure No.:	MM-002

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

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Leung Man Hin, Eric)

Date: 6 August 2019

CALIBRATION CERTIFICATE

Calibration Item:	Micromate Unit (Calibration with Geophone UM15463)
Model No.:	721A2501
Serial No.:	UM15463
Calibration Date:	13 August 2019
Next Calibration Date:	13 August 2020
Method Used:	In-house Method MM-001
In-house Testing Procedure No.:	MM-001

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

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Authorized by: _____

(Leung Man Hin, Eric)

Date: 13 August 2019

CALIBRATION CERTIFICATE

Calibration Item:	TRIAXIAL GEOPHONE (Calibration with main unit UM15463)
Part Number:	721A2901
Serial No.:	UM15463
Calibration Date:	13August 2019
Next Calibration Date:	13 August 2020
Method Used:	In-house Method MM-001
In-house Testing Procedure No.:	MM-001

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

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Leung Man Hin, Eric)

Date: 13 August 2019

CALIBRATION CERTIFICATE

Calibration Item:	Micromate Linear Microphone (Calibration with main unit UM15463)
Model No.:	721A0201
Serial No.:	UL3688
Calibration Date:	13 August 2019
Next Calibration Date:	13 August 2020
Method Used:	In-house Method MM-002
In-house Testing Procedure No.:	MM-002

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

*References are traceable to NIST or equivalent.

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Authorized by: _____

(Leung Man Hin, Eric)

Date: 13 August 2019

APPENDIX C
WEATHER INFORMATION

March 2020

Day	Mean Pressure (hPa)	Air Temperature	Mean Relative Humidity (%)	Total Rainfall (mm)
		Mean (deg. C)		
1	1014.2	22.8	82	0
2	1017.6	20.1	84	Trace
3	1018.2	19.4	81	Trace
4	1018	19.9	84	3.1
5	1019.4	18.2	85	0.4
6	1017.5	18.3	80	Trace
7	1014	20.6	88	Trace
8	1010.7	22.1	92	Trace
9	1008.5	23.4	89	Trace
10	1013.3	23.4	67	Trace
11	1017.7	19.2	72	Trace
12	1015.7	19.2	89	Trace
13	1015.7	21.4	91	0
14	1017.6	21.6	78	0.4
15	1019.3	20.2	70	0
16	1019.7	20.3	75	0
17	1018.7	20.3	79	0
18	1015.8	20.5	86	10.7
19	1014.7	21.1	88	0.8
20	1015.4	21.2	87	0.4
21	1015.4	21.2	94	0.2
22	1014	24.2	84	0
23	1014.2	24.6	81	0
24	1015.3	22.8	82	Trace
25	1014.2	22.8	83	Trace
26	1013.5	23.3	90	1
27	1013	24.4	86	Trace
28	1013.3	22.8	91	9.8
29	1013.5	20.2	91	2.2
30	1012.2	20.4	95	6.5
31	1013.1	20.3	95	5.8

February 2020			
Date	**Time**	**Wind Speed m-s**	**Direction**
1-Mar-20	0:00	1.3	WNW
1-Mar-20	1:00	1.3	WNW
1-Mar-20	2:00	1.3	NW
1-Mar-20	3:00	1.8	NW
1-Mar-20	4:00	2.7	NNW
1-Mar-20	5:00	2.2	NW
1-Mar-20	6:00	2.7	WNW
1-Mar-20	7:00	1.8	ESE
1-Mar-20	8:00	1.3	N
1-Mar-20	9:00	1.3	WNW
1-Mar-20	10:00	4	NNW
1-Mar-20	11:00	4	NNW
1-Mar-20	12:00	1.3	NNW
1-Mar-20	13:00	0.9	WNW
1-Mar-20	14:00	0.9	WNW
1-Mar-20	15:00	1.3	WNW
1-Mar-20	16:00	1.3	WNW
1-Mar-20	17:00	0.9	WNW
1-Mar-20	18:00	0.9	WNW
1-Mar-20	19:00	0.9	WNW
1-Mar-20	20:00	0.9	WNW
1-Mar-20	21:00	1.3	WNW
1-Mar-20	22:00	0.9	WNW
1-Mar-20	23:00	0.9	WNW
2-Mar-20	0:00	1.3	WNW
2-Mar-20	1:00	1.3	WNW
2-Mar-20	2:00	1.3	WNW
2-Mar-20	3:00	0.9	WNW
2-Mar-20	4:00	0.9	WNW
2-Mar-20	5:00	0.9	WNW
2-Mar-20	6:00	0.9	WNW
2-Mar-20	7:00	1.3	WNW
2-Mar-20	8:00	1.3	WNW
2-Mar-20	9:00	2.7	NNW
2-Mar-20	10:00	4.5	NNW
2-Mar-20	11:00	5.4	NNW
2-Mar-20	12:00	4	NNW
2-Mar-20	13:00	2.2	NNW
2-Mar-20	14:00	0.9	ESE
2-Mar-20	15:00	1.3	ESE
2-Mar-20	16:00	1.3	ESE
2-Mar-20	17:00	1.8	E
2-Mar-20	18:00	1.3	ESE
2-Mar-20	19:00	1.8	ESE
2-Mar-20	20:00	1.8	ESE
2-Mar-20	21:00	1.8	ESE
2-Mar-20	22:00	2.2	ESE
2-Mar-20	23:00	1.8	ESE

Table II: Wind Speed and Directions			
Date	**Time**	**Wind Speed m-s**	**Direction**
3-Mar-20	0:00	1.8	E
3-Mar-20	1:00	1.3	E
3-Mar-20	2:00	1.8	ESE
3-Mar-20	3:00	1.8	SE
3-Mar-20	4:00	1.8	SE
3-Mar-20	5:00	1.8	ESE
3-Mar-20	6:00	1.8	ESE
3-Mar-20	7:00	1.3	ESE
3-Mar-20	8:00	0.9	SE
3-Mar-20	9:00	2.2	ESE
3-Mar-20	10:00	0.9	E
3-Mar-20	11:00	0.9	WNW
3-Mar-20	12:00	1.3	SE
3-Mar-20	13:00	1.3	ESE
3-Mar-20	14:00	1.8	ESE
3-Mar-20	15:00	1.8	E
3-Mar-20	16:00	1.8	ESE
3-Mar-20	17:00	1.3	ESE
3-Mar-20	18:00	1.3	ESE
3-Mar-20	19:00	1.3	ESE
3-Mar-20	20:00	1.3	ESE
3-Mar-20	21:00	0.9	ESE
3-Mar-20	22:00	0.9	SE
3-Mar-20	23:00	1.3	ESE
4-Mar-20	0:00	1.3	ESE
4-Mar-20	1:00	1.8	SE
4-Mar-20	2:00	1.3	SE
4-Mar-20	3:00	1.3	ESE
4-Mar-20	4:00	1.8	E
4-Mar-20	5:00	1.3	ESE
4-Mar-20	6:00	0.9	ESE
4-Mar-20	7:00	1.3	NW
4-Mar-20	8:00	1.8	WNW
4-Mar-20	9:00	1.8	NNW
4-Mar-20	10:00	2.2	NNW
4-Mar-20	11:00	1.3	NW
4-Mar-20	12:00	0.9	WNW
4-Mar-20	13:00	0.9	NNW
4-Mar-20	14:00	0.9	NW
4-Mar-20	15:00	0.9	WNW
4-Mar-20	16:00	0.9	WNW
4-Mar-20	17:00	0.9	WNW
4-Mar-20	18:00	0.4	WNW
4-Mar-20	19:00	0.9	ESE
4-Mar-20	20:00	0.4	WNW
4-Mar-20	21:00	0.4	WNW
4-Mar-20	22:00	0.4	WNW
4-Mar-20	23:00	0.4	WNW

Table II: Wind Speed and Directions			
Date	**Time**	**Wind Speed m-s**	**Direction**
5-Mar-20	0:00	0.4	WNW
5-Mar-20	1:00	0.4	NW
5-Mar-20	2:00	0	N
5-Mar-20	3:00	0.4	ESE
5-Mar-20	4:00	0.9	ESE
5-Mar-20	5:00	0.9	ESE
5-Mar-20	6:00	0.4	WNW
5-Mar-20	7:00	1.3	SE
5-Mar-20	8:00	1.3	SE
5-Mar-20	9:00	4	NNW
5-Mar-20	10:00	3.6	NNW
5-Mar-20	11:00	4.9	NNW
5-Mar-20	12:00	3.6	NNW
5-Mar-20	13:00	2.2	NNW
5-Mar-20	14:00	2.2	NNW
5-Mar-20	15:00	1.8	NNW
5-Mar-20	16:00	0	NNW
5-Mar-20	17:00	0.4	WNW
5-Mar-20	18:00	0.4	WNW
5-Mar-20	19:00	0.4	W
5-Mar-20	20:00	0.3	W
5-Mar-20	21:00	0.2	W
5-Mar-20	22:00	0.3	W
5-Mar-20	23:00	0.2	W
6-Mar-20	0:00	0.2	SSE
6-Mar-20	1:00	0.1	SSE
6-Mar-20	2:00	0	SSE
6-Mar-20	3:00	0.4	NW
6-Mar-20	4:00	1.3	NNW
6-Mar-20	5:00	1.3	WNW
6-Mar-20	6:00	2.2	NNW
6-Mar-20	7:00	1.3	WNW
6-Mar-20	8:00	1.3	WNW
6-Mar-20	9:00	1.3	WNW
6-Mar-20	10:00	1.3	NW
6-Mar-20	11:00	1.8	NNW
6-Mar-20	12:00	1.3	NNW
6-Mar-20	13:00	0.9	WNW
6-Mar-20	14:00	0.9	NW
6-Mar-20	15:00	0.9	WNW
6-Mar-20	16:00	0.9	WNW
6-Mar-20	17:00	0.9	WNW
6-Mar-20	18:00	1.3	WNW
6-Mar-20	19:00	0.9	WNW
6-Mar-20	20:00	0.9	WNW
6-Mar-20	21:00	1.3	WNW
6-Mar-20	22:00	0.9	WNW
6-Mar-20	23:00	0.9	WNW

Table II: Wind Speed and Directions			
Date	**Time**	**Wind Speed m-s**	**Direction**
7-Mar-20	0:00	0.4	E
7-Mar-20	1:00	0.4	WNW
7-Mar-20	2:00	0.4	WNW
7-Mar-20	3:00	0.9	WNW
7-Mar-20	4:00	1.3	WNW
7-Mar-20	5:00	1.3	NW
7-Mar-20	6:00	1.3	NW
7-Mar-20	7:00	1.3	NNW
7-Mar-20	8:00	1.3	WNW
7-Mar-20	9:00	1.3	NNW
7-Mar-20	10:00	1.8	NNW
7-Mar-20	11:00	1.8	WNW
7-Mar-20	12:00	1.3	WNW
7-Mar-20	13:00	0.9	WNW
7-Mar-20	14:00	0.9	NW
7-Mar-20	15:00	0.4	WNW
7-Mar-20	16:00	0.4	NNW
7-Mar-20	17:00	0.4	NW
7-Mar-20	18:00	0.4	NW
7-Mar-20	19:00	0.4	NNW
7-Mar-20	20:00	0.4	WNW
7-Mar-20	21:00	0.4	WNW
7-Mar-20	22:00	0.4	W
7-Mar-20	23:00	0.4	WNW
8-Mar-20	0:00	0.4	WNW
8-Mar-20	1:00	0.4	W
8-Mar-20	2:00	0.9	NNW
8-Mar-20	3:00	0.4	WNW
8-Mar-20	4:00	1.8	NNW
8-Mar-20	5:00	1.3	NNW
8-Mar-20	6:00	1.8	NNW
8-Mar-20	7:00	1.3	WNW
8-Mar-20	8:00	1.8	NNW
8-Mar-20	9:00	3.6	NNW
8-Mar-20	10:00	3.6	NNW
8-Mar-20	11:00	1.8	NW
8-Mar-20	12:00	2.7	NW
8-Mar-20	13:00	2.7	NW
8-Mar-20	14:00	2.2	WNW
8-Mar-20	15:00	2.7	WNW
8-Mar-20	16:00	2.2	WNW
8-Mar-20	17:00	1.3	WNW
8-Mar-20	18:00	1.3	WNW
8-Mar-20	19:00	1.3	WNW
8-Mar-20	20:00	0.4	NW
8-Mar-20	21:00	0.4	WNW
8-Mar-20	22:00	0.4	WNW
8-Mar-20	23:00	0.4	NNW

Table II: Wind Speed and Directions			
Date	**Time**	**Wind Speed m-s**	**Direction**
9-Mar-20	0:00	0.4	ESE
9-Mar-20	1:00	0.9	ESE
9-Mar-20	2:00	0.4	ESE
9-Mar-20	3:00	0.4	ESE
9-Mar-20	4:00	0	WNW
9-Mar-20	5:00	1.3	ENE
9-Mar-20	6:00	0.9	WNW
9-Mar-20	7:00	1.3	E
9-Mar-20	8:00	1.8	ENE
9-Mar-20	9:00	1.3	N
9-Mar-20	10:00	0.9	NW
9-Mar-20	11:00	0.4	NNW
9-Mar-20	12:00	0.9	N
9-Mar-20	13:00	0.9	N
9-Mar-20	14:00	0.9	N
9-Mar-20	15:00	0.4	N
9-Mar-20	16:00	0.9	ENE
9-Mar-20	17:00	0.9	E
9-Mar-20	18:00	0.9	ESE
9-Mar-20	19:00	0.4	W
9-Mar-20	20:00	0.9	ENE
9-Mar-20	21:00	0.9	N
9-Mar-20	22:00	0.4	NW
9-Mar-20	23:00	0.4	NNW
10-Mar-20	0:00	0	NW
10-Mar-20	1:00	0.4	N
10-Mar-20	2:00	0.4	NNE
10-Mar-20	3:00	0	NNE
10-Mar-20	4:00	0	NNE
10-Mar-20	5:00	0	N
10-Mar-20	6:00	0.4	NW
10-Mar-20	7:00	0.4	NW
10-Mar-20	8:00	0	NNW
10-Mar-20	9:00	0.4	NW
10-Mar-20	10:00	0.4	NW
10-Mar-20	11:00	0.4	NW
10-Mar-20	12:00	0.4	NW
10-Mar-20	13:00	0.4	WSW
10-Mar-20	14:00	0.4	NW
10-Mar-20	15:00	0.4	NW
10-Mar-20	16:00	0.4	NNW
10-Mar-20	17:00	0.4	NW
10-Mar-20	18:00	0.4	NNW
10-Mar-20	19:00	0	NNW
10-Mar-20	20:00	0.4	NW
10-Mar-20	21:00	0.4	NNW
10-Mar-20	22:00	0.9	NW
10-Mar-20	23:00	0.4	NNW

Table II: Wind Speed and Directions			
Date	**Time**	**Wind Speed m-s**	**Direction**
11-Mar-20	0:00	0.4	NNW
11-Mar-20	1:00	0.9	NW
11-Mar-20	2:00	0.9	NW
11-Mar-20	3:00	0.9	NNW
11-Mar-20	4:00	0.9	NNW
11-Mar-20	5:00	0.9	NNW
11-Mar-20	6:00	1.8	NW
11-Mar-20	7:00	0.9	NW
11-Mar-20	8:00	2.7	NW
11-Mar-20	9:00	2.2	NNW
11-Mar-20	10:00	1.3	NNW
11-Mar-20	11:00	0.4	NNW
11-Mar-20	12:00	0.4	NW
11-Mar-20	13:00	0.4	NW
11-Mar-20	14:00	0.4	NW
11-Mar-20	15:00	1.8	NW
11-Mar-20	16:00	3.1	NW
11-Mar-20	17:00	3.1	NW
11-Mar-20	18:00	2.2	NW
11-Mar-20	19:00	1.8	NW
11-Mar-20	20:00	1.3	NW
11-Mar-20	21:00	1.8	NW
11-Mar-20	22:00	1.8	NW
11-Mar-20	23:00	2.7	NW
12-Mar-20	0:00	2.2	NW
12-Mar-20	1:00	1.8	NW
12-Mar-20	2:00	1.3	NW
12-Mar-20	3:00	0.9	NW
12-Mar-20	4:00	0.4	NW
12-Mar-20	5:00	0.4	NW
12-Mar-20	6:00	0.4	NW
12-Mar-20	7:00	0.4	NW
12-Mar-20	8:00	0.4	NW
12-Mar-20	9:00	0.9	NW
12-Mar-20	10:00	0.9	NW
12-Mar-20	11:00	0.9	NW
12-Mar-20	12:00	0.9	NW
12-Mar-20	13:00	1.3	NW
12-Mar-20	14:00	0.9	NNW
12-Mar-20	15:00	1.8	NW
12-Mar-20	16:00	1.8	NW
12-Mar-20	17:00	1.3	NW
12-Mar-20	18:00	1.3	NW
12-Mar-20	19:00	1.3	NW
12-Mar-20	20:00	0.4	NW
12-Mar-20	21:00	0.4	NW
12-Mar-20	22:00	0.9	NW
12-Mar-20	23:00	0.4	NW

Table II: Wind Speed and Directions			
Date	**Time**	**Wind Speed m-s**	**Direction**
13-Mar-20	0:00	0	N
13-Mar-20	1:00	0	N
13-Mar-20	2:00	0	N
13-Mar-20	3:00	0	NNE
13-Mar-20	4:00	0.4	NNW
13-Mar-20	5:00	0.9	NW
13-Mar-20	6:00	0.4	NNE
13-Mar-20	7:00	0.4	NNE
13-Mar-20	8:00	0.9	NW
13-Mar-20	9:00	0.9	N
13-Mar-20	10:00	0.4	NNE
13-Mar-20	11:00	0.4	N
13-Mar-20	12:00	0.9	NW
13-Mar-20	13:00	1.3	NW
13-Mar-20	14:00	4	NW
13-Mar-20	15:00	3.6	NW
13-Mar-20	16:00	3.6	NW
13-Mar-20	17:00	4.5	NW
13-Mar-20	18:00	1.8	NW
13-Mar-20	19:00	0.4	NW
13-Mar-20	20:00	0.4	NW
13-Mar-20	21:00	0	NW
13-Mar-20	22:00	0	NW
13-Mar-20	23:00	0.4	NW
14-Mar-20	0:00	0	SE
14-Mar-20	1:00	0	SE
14-Mar-20	2:00	0	W
14-Mar-20	3:00	0	NNW
14-Mar-20	4:00	0	N
14-Mar-20	5:00	0	NW
14-Mar-20	6:00	0	NNE
14-Mar-20	7:00	0	N
14-Mar-20	8:00	0	N
14-Mar-20	9:00	0	NE
14-Mar-20	10:00	0	NNW
14-Mar-20	11:00	0.4	NW
14-Mar-20	12:00	3.1	NW
14-Mar-20	13:00	3.1	NNW
14-Mar-20	14:00	1.8	NNW
14-Mar-20	15:00	0.9	NW
14-Mar-20	16:00	0.4	NW
14-Mar-20	17:00	0.4	NW
14-Mar-20	18:00	0.4	NW
14-Mar-20	19:00	0.4	NW
14-Mar-20	20:00	0	NW
14-Mar-20	21:00	0	WSW
14-Mar-20	22:00	0	SE
14-Mar-20	23:00	0	WSW

Table II: Wind Speed and Directions			
Date	**Time**	**Wind Speed m-s**	**Direction**
15-Mar-20	0:00	0	WSW
15-Mar-20	1:00	0	NW
15-Mar-20	2:00	0	NW
15-Mar-20	3:00	0	NW
15-Mar-20	4:00	0	WNW
15-Mar-20	5:00	0	NW
15-Mar-20	6:00	0	NNW
15-Mar-20	7:00	0	NNW
15-Mar-20	8:00	0	W
15-Mar-20	9:00	0.4	W
15-Mar-20	10:00	0.4	W
15-Mar-20	11:00	0.9	NNW
15-Mar-20	12:00	1.8	NW
15-Mar-20	13:00	1.8	NW
15-Mar-20	14:00	1.3	NNW
15-Mar-20	15:00	0.9	NNW
15-Mar-20	16:00	0.9	NNW
15-Mar-20	17:00	1.3	NNW
15-Mar-20	18:00	1.8	NNW
15-Mar-20	19:00	0.9	WNW
15-Mar-20	20:00	0.9	NNW
15-Mar-20	21:00	1.3	WNW
15-Mar-20	22:00	0.9	WNW
15-Mar-20	23:00	0.9	WNW
16-Mar-20	0:00	0.9	WNW
16-Mar-20	1:00	0.4	ESE
16-Mar-20	2:00	0.9	WNW
16-Mar-20	3:00	0.9	NW
16-Mar-20	4:00	0.9	NNW
16-Mar-20	5:00	0.9	NNW
16-Mar-20	6:00	1.3	NNW
16-Mar-20	7:00	1.3	WNW
16-Mar-20	8:00	1.3	NNW
16-Mar-20	9:00	1.3	NNW
16-Mar-20	10:00	1.3	NNW
16-Mar-20	11:00	1.8	NNW
16-Mar-20	12:00	1.3	WNW
16-Mar-20	13:00	1.3	NNW
16-Mar-20	14:00	1.3	NNW
16-Mar-20	15:00	0.9	NNW
16-Mar-20	16:00	1.8	NNW
16-Mar-20	17:00	2.2	NNW
16-Mar-20	18:00	2.7	NNW
16-Mar-20	19:00	2.7	NNW
16-Mar-20	20:00	1.8	NNW
16-Mar-20	21:00	1.3	NNW
16-Mar-20	22:00	1.3	NNW
16-Mar-20	23:00	0.9	NNW

Table II: Wind Speed and Directions			
Date	**Time**	**Wind Speed m-s**	**Direction**
17-Mar-20	0:00	0.9	NNW
17-Mar-20	1:00	0.9	NNW
17-Mar-20	2:00	0.4	WNW
17-Mar-20	3:00	0.4	E
17-Mar-20	4:00	0.4	N
17-Mar-20	5:00	0.4	ENE
17-Mar-20	6:00	0.9	NNW
17-Mar-20	7:00	0.9	NNW
17-Mar-20	8:00	0.9	NNW
17-Mar-20	9:00	0.4	N
17-Mar-20	10:00	0.9	NNW
17-Mar-20	11:00	0.9	ESE
17-Mar-20	12:00	0.9	NNW
17-Mar-20	13:00	0.9	NW
17-Mar-20	14:00	0.4	NNW
17-Mar-20	15:00	0.9	NNW
17-Mar-20	16:00	0.9	WNW
17-Mar-20	17:00	0.9	WNW
17-Mar-20	18:00	0.9	WNW
17-Mar-20	19:00	0.9	WNW
17-Mar-20	20:00	0.9	WNW
17-Mar-20	21:00	0.9	WNW
17-Mar-20	22:00	0.9	WNW
17-Mar-20	23:00	0.9	WNW
18-Mar-20	0:00	0.9	WNW
18-Mar-20	1:00	3.1	NNW
18-Mar-20	2:00	4	NNW
18-Mar-20	3:00	4.5	NNW
18-Mar-20	4:00	4.9	NNW
18-Mar-20	5:00	2.7	NNW
18-Mar-20	6:00	1.3	NNW
18-Mar-20	7:00	1.3	NNW
18-Mar-20	8:00	0.9	NW
18-Mar-20	9:00	1.8	NNW
18-Mar-20	10:00	0.9	NW
18-Mar-20	11:00	0.9	WNW
18-Mar-20	12:00	0.9	NW
18-Mar-20	13:00	0.9	NW
18-Mar-20	14:00	0.4	WNW
18-Mar-20	15:00	0.4	WNW
18-Mar-20	16:00	0.4	ESE
18-Mar-20	17:00	0	SE
18-Mar-20	18:00	0	W
18-Mar-20	19:00	0	E
18-Mar-20	20:00	0.4	WNW
18-Mar-20	21:00	0.9	WNW
18-Mar-20	22:00	1.3	NNW
18-Mar-20	23:00	1.3	NNW

Table II: Wind Speed and Directions			
Date	**Time**	**Wind Speed m-s**	**Direction**
19-Mar-20	0:00	2.2	NNW
19-Mar-20	1:00	4	NNW
19-Mar-20	2:00	4	NNW
19-Mar-20	3:00	3.6	NNW
19-Mar-20	4:00	3.6	NNW
19-Mar-20	5:00	3.6	NNW
19-Mar-20	6:00	2.7	NNW
19-Mar-20	7:00	2.7	NNW
19-Mar-20	8:00	0.9	NNW
19-Mar-20	9:00	0.9	NNW
19-Mar-20	10:00	0	NNW
19-Mar-20	11:00	0.4	NNW
19-Mar-20	12:00	0.4	NNW
19-Mar-20	13:00	3.6	NNW
19-Mar-20	14:00	2.7	NNW
19-Mar-20	15:00	2.7	NNW
19-Mar-20	16:00	0.9	NNW
19-Mar-20	17:00	0.9	NNW
19-Mar-20	18:00	0	NNW
19-Mar-20	19:00	0.4	ESE
19-Mar-20	20:00	0.4	ESE
19-Mar-20	21:00	0.4	ESE
19-Mar-20	22:00	0.4	SSE
19-Mar-20	23:00	1.3	ESE
20-Mar-20	0:00	1.3	ESE
20-Mar-20	1:00	1.8	ESE
20-Mar-20	2:00	1.3	ESE
20-Mar-20	3:00	1.8	ESE
20-Mar-20	4:00	1.8	ESE
20-Mar-20	5:00	1.8	ESE
20-Mar-20	6:00	2.2	E
20-Mar-20	7:00	2.2	E
20-Mar-20	8:00	1.8	E
20-Mar-20	9:00	2.7	E
20-Mar-20	10:00	2.7	E
20-Mar-20	11:00	1.8	ESE
20-Mar-20	12:00	1.8	SE
20-Mar-20	13:00	1.8	SE
20-Mar-20	14:00	2.2	SE
20-Mar-20	15:00	2.2	ESE
20-Mar-20	16:00	1.8	SE
20-Mar-20	17:00	1.8	SE
20-Mar-20	18:00	1.8	ESE
20-Mar-20	19:00	2.2	ESE
20-Mar-20	20:00	1.8	ESE
20-Mar-20	21:00	1.8	ESE
20-Mar-20	22:00	1.8	ESE
20-Mar-20	23:00	1.3	E

Table II: Wind Speed and Directions			
Date	**Time**	**Wind Speed m-s**	**Direction**
21-Mar-20	0:00	1.8	E
21-Mar-20	1:00	1.3	ESE
21-Mar-20	2:00	0.9	ESE
21-Mar-20	3:00	0.9	ESE
21-Mar-20	4:00	1.3	ESE
21-Mar-20	5:00	0.4	WNW
21-Mar-20	6:00	1.3	SE
21-Mar-20	7:00	0.4	SE
21-Mar-20	8:00	0.4	NW
21-Mar-20	9:00	0.9	SE
21-Mar-20	10:00	1.3	SE
21-Mar-20	11:00	1.3	E
21-Mar-20	12:00	1.3	SE
21-Mar-20	13:00	0.9	ESE
21-Mar-20	14:00	0.4	SSE
21-Mar-20	15:00	0.9	SE
21-Mar-20	16:00	0.9	ESE
21-Mar-20	17:00	0.9	ESE
21-Mar-20	18:00	0.9	ESE
21-Mar-20	19:00	1.3	ESE
21-Mar-20	20:00	0.9	SE
21-Mar-20	21:00	1.3	SE
21-Mar-20	22:00	0.4	ESE
21-Mar-20	23:00	0.9	E
22-Mar-20	0:00	1.3	ESE
22-Mar-20	1:00	1.8	ESE
22-Mar-20	2:00	1.8	ESE
22-Mar-20	3:00	1.8	SE
22-Mar-20	4:00	2.7	NNW
22-Mar-20	5:00	2.2	NNW
22-Mar-20	6:00	2.2	NNW
22-Mar-20	7:00	0.9	WNW
22-Mar-20	8:00	0.4	NW
22-Mar-20	9:00	0.4	WNW
22-Mar-20	10:00	0.4	WNW
22-Mar-20	11:00	0.9	WNW
22-Mar-20	12:00	0.4	WNW
22-Mar-20	13:00	0.9	WNW
22-Mar-20	14:00	0.9	SE
22-Mar-20	15:00	0.9	SE
22-Mar-20	16:00	0.4	ESE
22-Mar-20	17:00	0.4	ESE
22-Mar-20	18:00	0.9	SE
22-Mar-20	19:00	0.4	SSE
22-Mar-20	20:00	0.4	SE
22-Mar-20	21:00	1.3	N
22-Mar-20	22:00	0.9	NW
22-Mar-20	23:00	0.9	NW

Table II: Wind Speed and Directions			
Date	**Time**	**Wind Speed m-s**	**Direction**
23-Mar-20	0:00	1.3	NW
23-Mar-20	1:00	0.9	NW
23-Mar-20	2:00	0.9	NNW
23-Mar-20	3:00	0.9	NW
23-Mar-20	4:00	0.9	NW
23-Mar-20	5:00	0.9	NW
23-Mar-20	6:00	0.9	NW
23-Mar-20	7:00	0.9	NW
23-Mar-20	8:00	0.9	NW
23-Mar-20	9:00	0.4	NW
23-Mar-20	10:00	0.9	NW
23-Mar-20	11:00	0.9	N
23-Mar-20	12:00	1.8	NW
23-Mar-20	13:00	2.2	N
23-Mar-20	14:00	3.1	N
23-Mar-20	15:00	2.7	N
23-Mar-20	16:00	4.9	N
23-Mar-20	17:00	4	N
23-Mar-20	18:00	2.7	N
23-Mar-20	19:00	3.1	N
23-Mar-20	20:00	2.2	N
23-Mar-20	21:00	0.9	NW
23-Mar-20	22:00	0.4	NW
23-Mar-20	23:00	0.9	NW
24-Mar-20	0:00	0.4	NW
24-Mar-20	1:00	0.9	NW
24-Mar-20	2:00	0.9	NW
24-Mar-20	3:00	0.9	NW
24-Mar-20	4:00	0.9	NW
24-Mar-20	5:00	0.9	NW
24-Mar-20	6:00	0.9	NW
24-Mar-20	7:00	0.9	NW
24-Mar-20	8:00	0.9	NW
24-Mar-20	9:00	0.9	NW
24-Mar-20	10:00	1.3	NW
24-Mar-20	11:00	1.3	NW
24-Mar-20	12:00	1.3	NW
24-Mar-20	13:00	0.9	N
24-Mar-20	14:00	1.8	N
24-Mar-20	15:00	1.8	N
24-Mar-20	16:00	1.8	N
24-Mar-20	17:00	4	N
24-Mar-20	18:00	3.6	N
24-Mar-20	19:00	2.2	N
24-Mar-20	20:00	1.3	N
24-Mar-20	21:00	0.4	NW
24-Mar-20	22:00	0.9	N
24-Mar-20	23:00	0.4	NW

Table II: Wind Speed and Directions			
Date	**Time**	**Wind Speed m-s**	**Direction**
25-Mar-20	0:00	0.4	NW
25-Mar-20	1:00	0.4	NNW
25-Mar-20	2:00	0.9	N
25-Mar-20	3:00	0.9	NNW
25-Mar-20	4:00	0.9	WNW
25-Mar-20	5:00	0.4	NW
25-Mar-20	6:00	0.9	NW
25-Mar-20	7:00	0.9	NW
25-Mar-20	8:00	0.4	N
25-Mar-20	9:00	1.3	N
25-Mar-20	10:00	0.9	N
25-Mar-20	11:00	1.8	N
25-Mar-20	12:00	0.4	NW
25-Mar-20	13:00	1.3	N
25-Mar-20	14:00	2.7	N
25-Mar-20	15:00	4	N
25-Mar-20	16:00	4	N
25-Mar-20	17:00	4	N
25-Mar-20	18:00	3.6	N
25-Mar-20	19:00	2.2	N
25-Mar-20	20:00	1.8	N
25-Mar-20	21:00	0.9	N
25-Mar-20	22:00	0.4	NE
25-Mar-20	23:00	0.4	NE
26-Mar-20	0:00	0.4	NNE
26-Mar-20	1:00	0.4	ENE
26-Mar-20	2:00	0.4	ENE
26-Mar-20	3:00	0.4	NNE
26-Mar-20	4:00	0.4	NE
26-Mar-20	5:00	0.9	E
26-Mar-20	6:00	0.4	E
26-Mar-20	7:00	0.4	N
26-Mar-20	8:00	0.4	NNE
26-Mar-20	9:00	0.9	N
26-Mar-20	10:00	1.3	N
26-Mar-20	11:00	3.6	N
26-Mar-20	12:00	4.9	N
26-Mar-20	13:00	5.8	N
26-Mar-20	14:00	4.9	N
26-Mar-20	15:00	4.9	N
26-Mar-20	16:00	4.9	N
26-Mar-20	17:00	4	N
26-Mar-20	18:00	3.6	N
26-Mar-20	19:00	3.1	N
26-Mar-20	20:00	1.3	N
26-Mar-20	21:00	0.9	N
26-Mar-20	22:00	0.9	N
26-Mar-20	23:00	0.4	ENE

Table II: Wind Speed and Directions			
Date	**Time**	**Wind Speed m-s**	**Direction**
27-Mar-20	0:00	0.9	ENE
27-Mar-20	1:00	0.9	N
27-Mar-20	2:00	1.3	N
27-Mar-20	3:00	0.4	E
27-Mar-20	4:00	0.4	E
27-Mar-20	5:00	0	---
27-Mar-20	6:00	0.4	N
27-Mar-20	7:00	0	NE
27-Mar-20	8:00	0.4	NE
27-Mar-20	9:00	0.4	N
27-Mar-20	10:00	1.3	N
27-Mar-20	11:00	1.3	N
27-Mar-20	12:00	1.3	N
27-Mar-20	13:00	0.9	N
27-Mar-20	14:00	1.8	N
27-Mar-20	15:00	0.9	NNW
27-Mar-20	16:00	0.9	N
27-Mar-20	17:00	1.3	N
27-Mar-20	18:00	0.9	N
27-Mar-20	19:00	1.3	N
27-Mar-20	20:00	0.4	SE
27-Mar-20	21:00	0.4	NW
27-Mar-20	22:00	1.8	NW
27-Mar-20	23:00	1.8	NW
28-Mar-20	0:00	0	SE
28-Mar-20	1:00	0	SE
28-Mar-20	2:00	0.4	SE
28-Mar-20	3:00	0.9	ESE
28-Mar-20	4:00	0.9	NNW
28-Mar-20	5:00	0.9	NNW
28-Mar-20	6:00	1.3	NNW
28-Mar-20	7:00	0.9	E
28-Mar-20	8:00	0.9	WNW
28-Mar-20	9:00	4	NNW
28-Mar-20	10:00	2.7	NNW
28-Mar-20	11:00	3.1	NNW
28-Mar-20	12:00	1.8	NNW
28-Mar-20	13:00	0.9	NNW
28-Mar-20	14:00	0.9	NNW
28-Mar-20	15:00	0.9	NNW
28-Mar-20	16:00	1.8	NNW
28-Mar-20	17:00	1.3	NNW
28-Mar-20	18:00	0.4	ENE
28-Mar-20	19:00	0.9	NW
28-Mar-20	20:00	0.9	NE
28-Mar-20	21:00	0.9	SE
28-Mar-20	22:00	1.3	SE
28-Mar-20	23:00	0.9	SE

Table II: Wind Speed and Directions			
Date	**Time**	**Wind Speed m-s**	**Direction**
29-Mar-20	0:00	0.4	NE
29-Mar-20	1:00	0.9	WNW
29-Mar-20	2:00	1.8	WNW
29-Mar-20	3:00	1.8	NW
29-Mar-20	4:00	1.8	WNW
29-Mar-20	5:00	1.3	WNW
29-Mar-20	6:00	1.8	NNW
29-Mar-20	7:00	1.3	NNW
29-Mar-20	8:00	1.3	WNW
29-Mar-20	9:00	1.3	NW
29-Mar-20	10:00	1.3	WNW
29-Mar-20	11:00	2.2	WNW
29-Mar-20	12:00	2.7	WNW
29-Mar-20	13:00	2.7	WNW
29-Mar-20	14:00	2.7	WNW
29-Mar-20	15:00	3.1	NNW
29-Mar-20	16:00	1.3	NNW
29-Mar-20	17:00	1.3	NNW
29-Mar-20	18:00	0.9	NW
29-Mar-20	19:00	0.4	NNW
29-Mar-20	20:00	0.9	NW
29-Mar-20	21:00	0.4	WNW
29-Mar-20	22:00	0.4	NW
29-Mar-20	23:00	0.4	NW
30-Mar-20	0:00	0.9	ENE
30-Mar-20	1:00	1.3	ESE
30-Mar-20	2:00	1.8	E
30-Mar-20	3:00	1.3	E
30-Mar-20	4:00	1.3	E
30-Mar-20	5:00	1.8	SE
30-Mar-20	6:00	1.3	ESE
30-Mar-20	7:00	1.8	E
30-Mar-20	8:00	1.8	E
30-Mar-20	9:00	1.8	ESE
30-Mar-20	10:00	1.8	E
30-Mar-20	11:00	2.2	E
30-Mar-20	12:00	1.8	E
30-Mar-20	13:00	1.8	ESE
30-Mar-20	14:00	1.8	ESE
30-Mar-20	15:00	1.8	SE
30-Mar-20	16:00	1.3	ESE
30-Mar-20	17:00	1.3	E
30-Mar-20	18:00	1.8	E
30-Mar-20	19:00	1.8	ESE
30-Mar-20	20:00	0.9	ESE
30-Mar-20	21:00	0.9	SE
30-Mar-20	22:00	0.9	E
30-Mar-20	23:00	0.4	E

Table II: Wind Speed and Directions			
Date	**Time**	**Wind Speed m-s**	**Direction**
31-Mar-20	0:00	0.9	ESE
31-Mar-20	1:00	1.8	ESE
31-Mar-20	2:00	2.2	ESE
31-Mar-20	3:00	1.8	ESE
31-Mar-20	4:00	2.2	ESE
31-Mar-20	5:00	2.2	ESE
31-Mar-20	6:00	1.8	ESE
31-Mar-20	7:00	2.7	ESE
31-Mar-20	8:00	1.3	E
31-Mar-20	9:00	0.9	E
31-Mar-20	10:00	0.9	ESE
31-Mar-20	11:00	0.9	WNW
31-Mar-20	12:00	1.3	NW
31-Mar-20	13:00	0.4	WNW
31-Mar-20	14:00	0.4	E
31-Mar-20	15:00	0.9	WNW
31-Mar-20	16:00	0.9	WNW
31-Mar-20	17:00	0.9	WNW
31-Mar-20	18:00	0.9	WNW
31-Mar-20	19:00	0.9	W
31-Mar-20	20:00	1.3	WNW
31-Mar-20	21:00	1.3	WNW
31-Mar-20	22:00	1.8	WNW
31-Mar-20	23:00	0	0

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 (March 2020)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1-Mar	2-Mar	3-Mar	4-Mar	5-Mar	6-Mar	7-Mar
		24 hrs TSP	**1 hr TSP X3** [AM5(A), AM6(A)] [AM1, AM2, AM3, AM4] **Noise [Daytime (07:00-19:00)]** [CM6(A), CM7(A), CM8(A))] [CM1, CM2, CM3, CM4, CM5] **Noise [Evening time (19:00-23:00)]** [CM6(A)]		**Noise [Evening time (19:00-23:00)]** [CM1, CM2, CM3] **Noise [Night-time (23:00-07:00)]** [CM1, CM2, CM3]	
8-Mar	9-Mar	10-Mar	11-Mar	12-Mar	13-Mar	14-Mar
	24 hrs TSP	**1 hr TSP X3** [AM5(A), AM6(A)] [AM1, AM2, AM3, AM4] **Noise [Daytime (07:00-19:00)]** [CM6(A), CM7(A), CM8(A))] [CM1, CM2, CM3, CM4, CM5] **Noise [Evening time (19:00-23:00)]** [CM6(A)]			**Noise [Evening time (19:00-23:00)]** [CM1, CM2, CM3] **Noise [Night-time (23:00-07:00)]** [CM1, CM2, CM3] **24 hrs TSP**	
15-Mar	16-Mar	17-Mar	18-Mar	19-Mar	20-Mar	21-Mar
	1 hr TSP X3 [AM5(A), AM6(A)] [AM1, AM2, AM3, AM4] **Noise [Daytime (07:00-19:00)]** [CM6(A), CM7(A), CM8(A))] [CM1, CM2, CM3, CM4, CM5] **Noise [Evening time (19:00-23:00)]** [CM6(A)]			**24 hrs TSP**	**1 hr TSP X3** [AM5(A), AM6(A)] [AM1, AM2, AM3, AM4] **Noise [Evening time (19:00-23:00)]** [CM1, CM2, CM3] **Noise [Night-time (23:00-07:00)]** [CM1, CM2, CM3]	
22-Mar	23-Mar	24-Mar	25-Mar	26-Mar	27-Mar	28-Mar
			24 hrs TSP	**1 hr TSP X3** [AM5(A), AM6(A)] [AM1, AM2, AM3, AM4] **Noise [Daytime (07:00-19:00)]** [CM6(A), CM7(A), CM8(A))] [CM1, CM2, CM3, CM4, CM5] **Noise [Evening time (19:00-23:00)]** [CM6(A)]	**Noise [Evening time (19:00-23:00)]** [CM1, CM2, CM3] **Noise [Night-time (23:00-07:00)]** [CM1, CM2, CM3]	
29-Mar	30-Mar	31-Mar	1-Apr	2-Apr	3-Apr	4-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 (19:00-23:00)]** [CM6(A)]		**Noise [Evening time (19:00-23:00)]** [CM1, CM2, CM3] **Noise [Night-time (23:00-07:00)]** [CM1, CM2, CM3]	

Air Quality Monitoring Station

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

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

Noise Monitoring Station

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

Agreement No. CE/59/2015 (EP)
Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction
Tentative Impact Water Quality Monitoring Schedule (March 2020)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1-Mar	2-Mar	3-Mar	4-Mar	5-Mar	6-Mar	7-Mar
	Mid-Flood 10:24 Mid-Ebb 17:34		Mid-Flood 8:35 Mid-Ebb N/A		Mid-Flood 8:55 Mid-Ebb N/A	
8-Mar	9-Mar	10-Mar	11-Mar	12-Mar	13-Mar	14-Mar
	Mid-Ebb 12:16 Mid-Flood 17:58		Mid-Flood 8:00 Mid-Ebb 13:36		Mid-Flood 8:52 Mid-Ebb 15:01	
15-Mar	16-Mar	17-Mar	18-Mar	19-Mar	20-Mar	21-Mar
	Mid-Flood 10:47 Mid-Ebb 18:10		Mid-Flood 8:41 Mid-Ebb N/A		Mid-Ebb 10:42 Mid-Flood 15:39	
22-Mar	23-Mar	24-Mar	25-Mar	26-Mar	27-Mar	28-Mar
	Mid-Ebb 12:20 Mid-Flood 17:55		Mid-Flood 8:00 Mid-Ebb 13:13		Mid-Flood 8:00 Mid-Ebb 14:11	
29-Mar	30-Mar	31-Mar	1-Apr	2-Apr	3-Apr	4-Apr
	Mid-Flood 8:33 Mid-Ebb 15:30					

The schedule may be changed due to unforeseen circumstances (adverse weather, etc)

Monitoring Station:

C1, C2, G1, G2, G3, G4, M1, M2, M3, M4, M5, M6

APPENDIX E
1-HOUR TSP MONITORING RESULTS AND GRAPHICAL PRESENTATIONS

APPENDIX E - 1-HOUR TSP MONITORING RESULTS

Location AM1 - Tin Hau Temple			
Date	Time	Weather	Particulate Concentration (µg/m^3)
4-Mar-20	13:00	Cloudy	98.8
4-Mar-20	14:00	Cloudy	91.0
4-Mar-20	15:00	Cloudy	91.0
10-Mar-20	9:00	Sunny	28.6
10-Mar-20	10:00	Sunny	33.8
10-Mar-20	11:00	Sunny	49.4
16-Mar-20	13:00	Fine	91.0
16-Mar-20	14:00	Fine	80.6
16-Mar-20	15:00	Fine	91.0
20-Mar-20	9:00	Cloudy	67.6
20-Mar-20	10:00	Cloudy	72.8
20-Mar-20	11:00	Cloudy	65.0
26-Mar-20	13:00	Fine	150.8
26-Mar-20	14:00	Fine	156.0
26-Mar-20	15:00	Fine	174.2
		Average	89.4
		Maximum	174.2
		Minimum	28.6

Location AM2 - Sai Tso Wan Recreation Ground			
Date	Time	Weather	***Particulate Concentration (µg/m^3)***
4-Mar-20	13:00	Rainy	216.0
4-Mar-20	14:00	Rainy	228.0
4-Mar-20	15:00	Rainy	231.0
10-Mar-20	9:00	Fine	72.0
10-Mar-20	10:00	Fine	78.0
10-Mar-20	11:00	Fine	63.0
16-Mar-20	9:00	Sunny	87.0
16-Mar-20	10:00	Sunny	90.0
16-Mar-20	11:00	Sunny	84.0
20-Mar-20	9:00	Cloudy	75.0
20-Mar-20	10:00	Cloudy	87.0
20-Mar-20	11:00	Cloudy	96.0
26-Mar-20	9:00	Cloudy	78.0
26-Mar-20	10:00	Cloudy	96.0
26-Mar-20	11:00	Cloudy	84.0
		Average	111.0
		Maximum	231.0
		Minimum	63.0

APPENDIX E - 1-HOUR TSP MONITORING RESULTS

Location AM3 - Yau Lai Estate Bik Lai House			
Date	Time	Weather	***Particulate Concentration (µg/m^3)***
4-Mar-20	16:00	Cloudy	104.0
4-Mar-20	17:00	Cloudy	98.8
4-Mar-20	18:00	Cloudy	98.8
10-Mar-20	15:00	Sunny	33.8
10-Mar-20	16:00	Sunny	28.6
10-Mar-20	17:00	Sunny	36.4
16-Mar-20	9:00	Fine	83.2
16-Mar-20	10:00	Fine	96.2
16-Mar-20	11:00	Fine	104.0
20-Mar-20	16:00	Cloudy	72.8
20-Mar-20	17:00	Cloudy	67.6
20-Mar-20	18:00	Cloudy	75.4
26-Mar-20	9:00	Cloudy	197.6
26-Mar-20	10:00	Cloudy	213.2
26-Mar-20	11:00	Cloudy	215.8
		Average	101.7
		Maximum	215.8
		Minimum	28.6

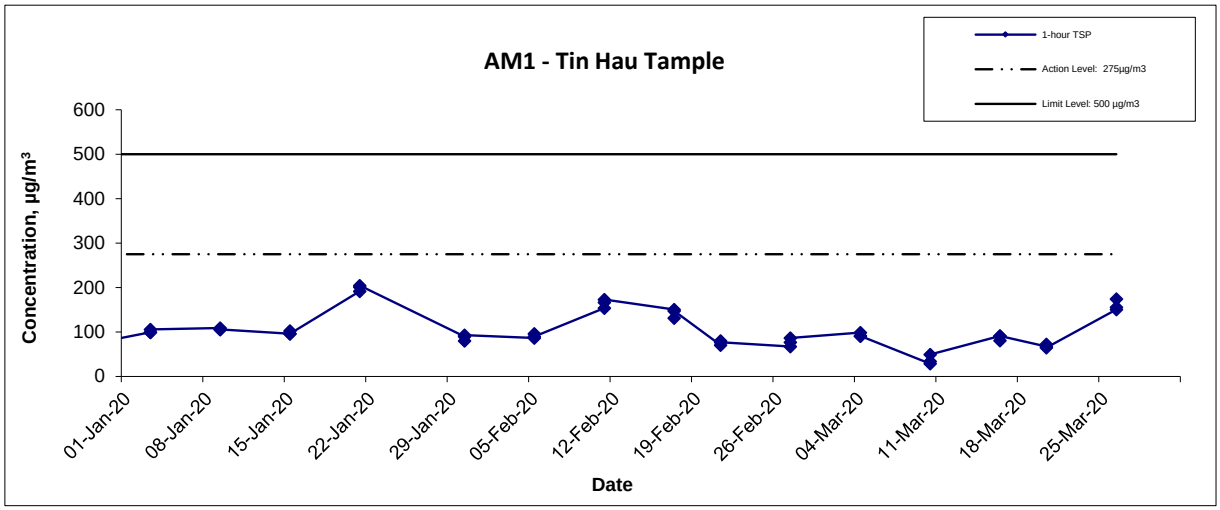
Location AM4 - Sitting-out Area at Cha Kwo Ling Village			
Date	Time	Weather	***Particulate Concentration (µg/m^3)***
4-Mar-20	9:00	Cloudy	104.0
4-Mar-20	10:00	Cloudy	109.2
4-Mar-20	11:00	Cloudy	101.4
10-Mar-20	9:00	Sunny	52.0
10-Mar-20	10:00	Sunny	62.4
10-Mar-20	11:00	Sunny	78.0
16-Mar-20	9:00	Fine	98.8
16-Mar-20	10:00	Fine	93.6
16-Mar-20	11:00	Fine	78.0
20-Mar-20	13:00	Cloudy	80.6
20-Mar-20	14:00	Cloudy	85.8
20-Mar-20	15:00	Cloudy	75.4
26-Mar-20	16:00	Fine	179.4
26-Mar-20	17:00	Fine	187.2
26-Mar-20	18:00	Fine	189.8
		Average	105.0
		Maximum	189.8
		Minimum	52.0

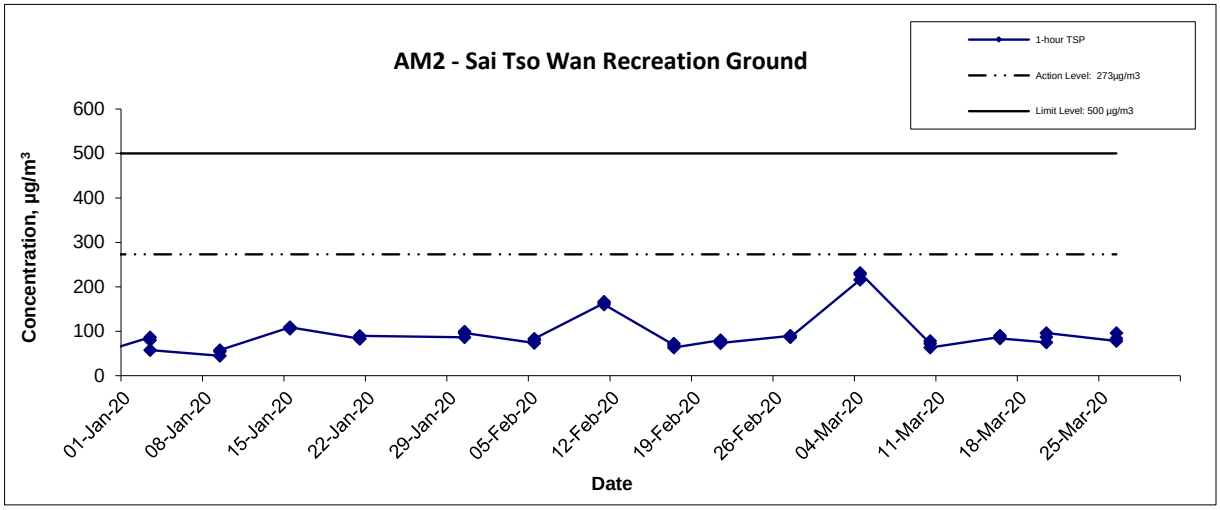
APPENDIX E - 1-HOUR TSP MONITORING RESULTS

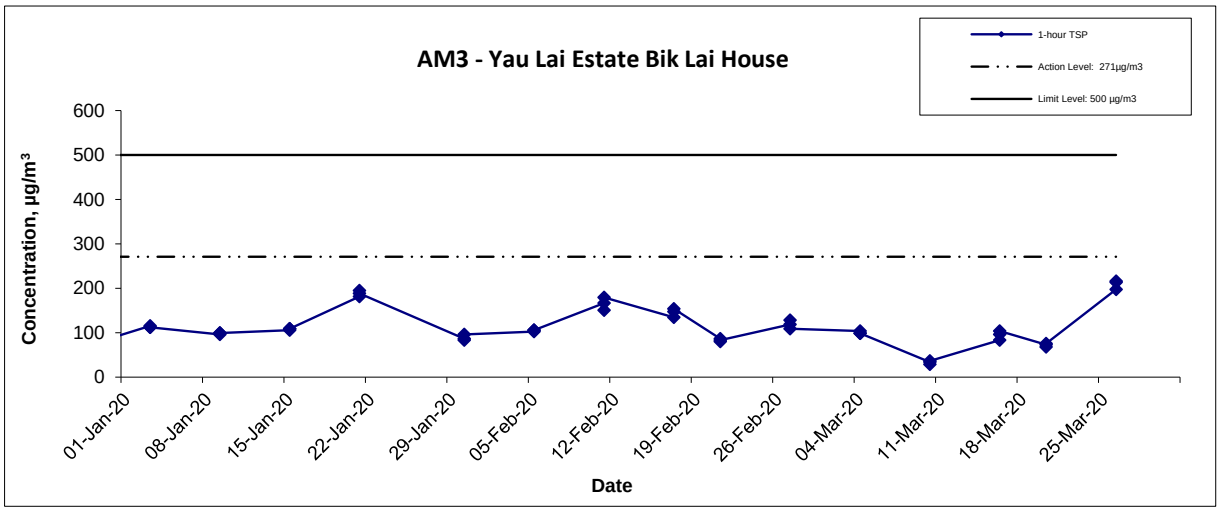
Location AM5(A) - Tseung Kwan O DSD Desilting Compound			
Date	Time	Weather	***Particulate Concentration (µg/m^3)***
4-Mar-20	15:00	Rainy	270.0
4-Mar-20	16:00	Rainy	240.0
4-Mar-20	17:00	Rainy	252.0
10-Mar-20	13:00	Fine	63.0
10-Mar-20	14:00	Fine	60.0
10-Mar-20	15:00	Fine	66.0
16-Mar-20	16:00	Sunny	93.0
16-Mar-20	17:00	Sunny	99.0
16-Mar-20	18:00	Sunny	99.0
20-Mar-20	13:00	Cloudy	105.0
20-Mar-20	14:00	Cloudy	87.0
20-Mar-20	15:00	Cloudy	99.0
26-Mar-20	13:00	Cloudy	69.0
26-Mar-20	14:00	Cloudy	75.0
26-Mar-20	15:00	Cloudy	87.0
		Average	117.6
		Maximum	270.0
		Minimum	60.0

Location AM6(A) - Park Central, L1/F Open Space Area			
Date	Time	Weather	Particulate Concentration (µg/m^3)
4-Mar-20	9:00	Fine	168.0
4-Mar-20	10:00	Fine	150.0
4-Mar-20	11:00	Fine	162.0
10-Mar-20	16:00	Fine	72.0
10-Mar-20	17:00	Fine	75.0
10-Mar-20	18:00	Fine	81.0
16-Mar-20	13:00	Sunny	96.0
16-Mar-20	14:00	Sunny	93.0
16-Mar-20	15:00	Sunny	99.0
20-Mar-20	16:00	Cloudy	66.0
20-Mar-20	17:00	Cloudy	78.0
20-Mar-20	18:00	Cloudy	72.0
26-Mar-20	16:00	Cloudy	90.0
26-Mar-20	17:00	Cloudy	81.0
26-Mar-20	18:00	Cloudy	102.0
		Average	99.0
		Maximum	168.0
		Minimum	66.0

1-hr TSP Concentration Levels

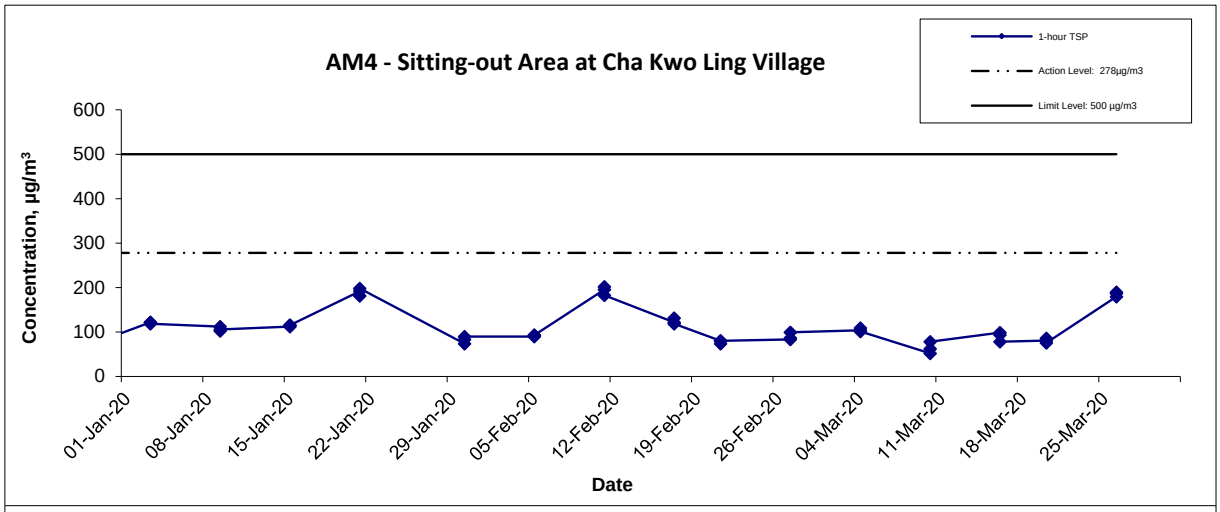


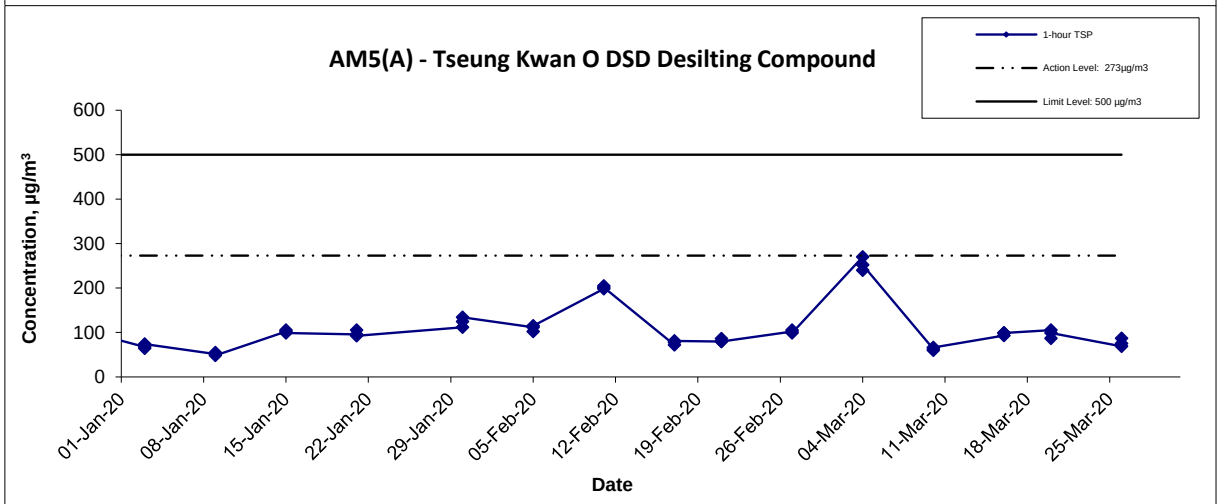


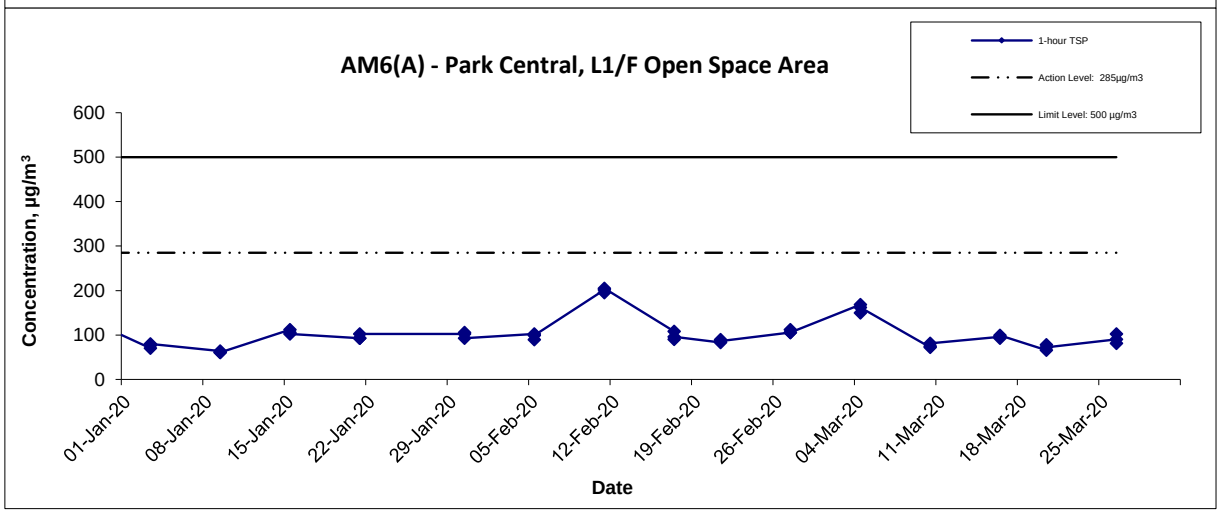


Agreement No. CE/59/2015 (EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Graphical Presentation of 1-hour TSP Monitoring Results	Scale N.T.S Date Mar-20	Project No. MA16034 Appendix E	CINOTECH

1-hr TSP Concentration Levels







Agreement No. CE/59/2015 (EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Graphical Presentation of 1-hour TSP Monitoring Results	Scale N.T.S Date Mar-20	Project No. MA16034 Appendix E	CINOTECH

APPENDIX F
24-HOUR TSP MONITORING RESULTS AND GRAPHICAL PRESENTATIONS

Appendix F - 24-hour TSP Monitoring Results

Location AM1 - Tin Hau Temple

Start Date	Weather	Air	Atmospheric	Filter Weight (g)		Particulate	Elapse Time		Sampling	Flow Rate (m^3/min.)		Av. flow	Total vol.	Conc.
	Condition	Temp. (K)	Pressure, Pa (mmHg)	Initial	Final	Weight (g)	Initial	Final	Time(hrs.)	Initial	Final	(m^3/min)	(m^3)	(µg/m^3)
3-Mar-20	Cloudy	294.3	764.6	3.4668	3.5320	0.0652	6535.1	6559.1	24.0	1.21	1.21	1.21	1745.2	37.4
9-Mar-20	Sunny	299.8	759.2	3.4790	3.6105	0.1315	6559.1	6583.1	24.0	1.20	1.20	1.20	1723.7	76.3
13-Mar-20	Cloudy	298.5	763.5	3.4617	3.6345	0.1728	6583.1	6607.1	24.0	1.23	1.23	1.23	1771.2	97.6
19-Mar-20	Cloudy	296.0	762.3	3.4213	3.5994	0.1781	6607.1	6631.1	24.0	1.21	1.21	1.21	1745.4	102.0
25-Mar-20	Cloudy	299.4	761.4	3.5019	3.6438	0.1419	6631.1	6655.1	24.0	1.20	1.20	1.20	1734.8	81.8
31-Mar-20	Cloudy	294.3	761.5	3.4581	3.5870	0.1289	6655.1	6679.1	24.0	1.21	1.21	1.21	1745.5	73.8
													Min	37.4
													Max	102.0
													Average	78.1

Location AM2 - Sai Tso Wan Recreation Ground

Start Date	Weather	Air	Atmospheric	Filter Weight (g)		Particulate	Elapse Time		Sampling	Flow Rate (m^3/min.)		Av. flow	Total vol.	Conc.
	Condition	Temp. (K)	Pressure, Pa (mmHg)	Initial	Final	Weight (g)	Initial	Final	Time(hrs.)	Initial	Final	(m^3/min)	(m^3)	(µg/m^3)
3-Mar-20	Cloudy	294.3	764.6	3.4958	3.5710	0.0752	27069.6	27093.6	24.0	1.21	1.21	1.21	1745.2	43.1
9-Mar-20	Sunny	299.8	759.2	3.4645	3.5394	0.0749	27093.6	27117.6	24.0	1.19	1.20	1.20	1722.9	43.5
13-Mar-20	Cloudy	298.5	763.5	3.4458	3.5159	0.0701	27117.6	27141.6	24.0	1.23	1.23	1.23	1771.2	39.6
19-Mar-20	Cloudy	296.0	762.3	3.4504	3.5152	0.0648	27141.6	27165.6	24.0	1.21	1.21	1.21	1745.3	37.1
25-Mar-20	Cloudy	299.4	761.4	3.5026	3.5927	0.0901	27165.6	27189.6	24.0	1.20	1.20	1.20	1734.0	52.0
31-Mar-20	Cloudy	294.3	761.5	3.5048	3.5710	0.0662	27189.6	27213.6	24.0	1.22	1.23	1.23	1764.5	37.5
													Min	37.1
													Max	52.0
													Average	43.0

Location AM3 - Yau Lai Estate, Bik Lai House

Start Date	Weather	Air	Atmospheric	Filter Weight (g)		Particulate	Elapse Time		Sampling	Flow Rate (m^3/min.)		Av. flow	Total vol.	Conc.
	Condition	Temp. (K)	Pressure, Pa (mmHg)	Initial	Final	Weight (g)	Initial	Final	Time(hrs.)	Initial	Final	(m^3/min)	(m^3)	(µg/m^3)
3-Mar-20	Cloudy	294.3	764.6	3.5073	3.5856	0.0783	1377.1	1401.1	24.0	1.21	1.21	1.21	1744.5	44.9
9-Mar-20	Sunny	299.8	759.2	3.5764	3.6624	0.0860	1401.1	1425.1	24.0	1.19	1.20	1.20	1721.4	50.0
13-Mar-20	Cloudy	298.5	763.5	3.4677	3.5534	0.0857	1425.1	1449.1	24.0	1.21	1.21	1.21	1738.5	49.3
19-Mar-20	Cloudy	296.0	762.3	3.4560	3.5449	0.0889	1449.1	1473.1	24.0	1.21	1.21	1.21	1744.8	51.0
25-Mar-20	Cloudy	299.4	761.4	3.5787	3.6524	0.0737	1473.1	1497.1	24.0	1.20	1.20	1.20	1733.0	42.5
31-Mar-20	Cloudy	294.3	761.5	3.4731	3.5566	0.0835	1497.1	1521.1	24.0	1.23	1.23	1.23	1766.3	47.3
													Min	42.5
													Max	51.0
													Average	48.2

Appendix F - 24-hour TSP Monitoring Results

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

Start Date	Weather	Air	Atmospheric	Filter Weight (g)		Particulate	Elapse Time		Sampling	Flow Rate (m^3/min.)		Av. flow	Total vol.	Conc.
	Condition	Temp. (K)	Pressure, Pa (mmHg)	Initial	Final	Weight (g)	Initial	Final	Time(hrs.)	Initial	Final	(m^3/min)	(m^3)	(μg/m^3)
3-Mar-20	Cloudy	294.3	764.6	3.5173	3.5949	0.0776	12337.3	12361.3	24.0	1.21	1.21	1.21	1745.4	44.5
9-Mar-20	Sunny	299.8	759.2	3.5080	3.6445	0.1365	12361.3	12385.3	24.0	1.20	1.20	1.20	1723.8	79.2
13-Mar-20	Cloudy	298.5	763.5	3.4617	3.6345	0.1728	12385.3	12409.3	24.0	1.21	1.21	1.21	1740.1	99.3
19-Mar-20	Cloudy	296.0	762.3	3.4739	3.5950	0.1211	12409.3	12433.3	24.0	1.21	1.21	1.21	1745.6	69.4
25-Mar-20	Cloudy	299.4	761.4	3.4479	3.6322	0.1843	12433.3	12457.3	24.0	1.20	1.20	1.20	1735.2	106.2
31-Mar-20	Cloudy	294.3	761.5	3.4529	3.5282	0.0753	12457.3	12481.3	24.0	1.23	1.23	1.23	1765.2	42.7
													Min	69.4
													Max	106.2
													Average	88.5

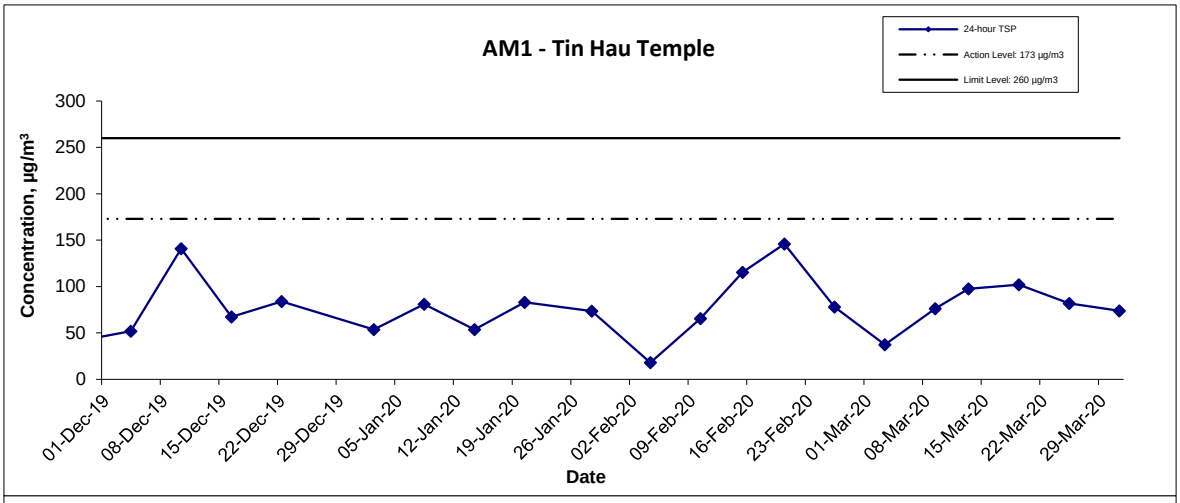
Location AM5(A) - Tseung Kwan O DSD Desilting Compound

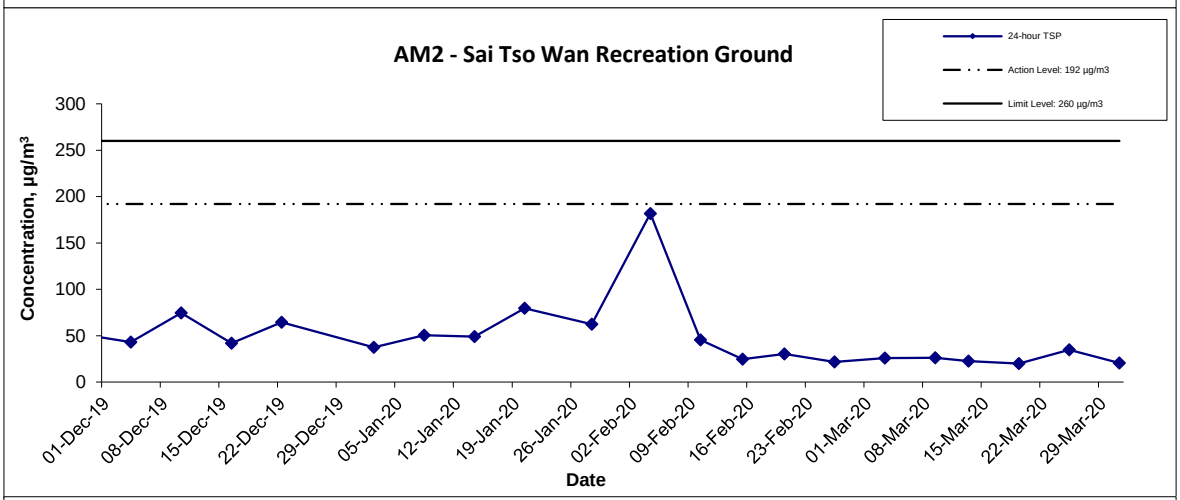
Start Date	Weather	Air	Atmospheric	Filter Weight (g)		Particulate	Elapse Time		Sampling	Flow Rate (m^3/min.)		Av. flow	Total vol.	Conc.
	Condition	Temp. (K)	Pressure, Pa (mmHg)	Initial	Final	Weight (g)	Initial	Final	Time(hrs.)	Initial	Final	(m^3/min)	(m^3)	(μg/m^3)
3-Mar-20	Cloudy	294.3	764.6	3.4971	3.6002	0.1031	28773.1	28797.1	24.0	1.21	1.21	1.21	1743.2	59.1
9-Mar-20	Sunny	299.8	759.2	3.5430	3.6646	0.1216	28797.1	28821.1	24.0	1.19	1.20	1.20	1721.8	70.6
13-Mar-20	Cloudy	298.5	763.5	3.5065	3.6463	0.1398	28821.1	28845.1	24.0	1.21	1.21	1.21	1736.9	80.5
19-Mar-20	Cloudy	296.0	762.3	3.4325	3.5248	0.0923	28845.1	28869.1	24.0	1.21	1.21	1.21	1742.6	53.0
25-Mar-20	Cloudy	299.4	761.4	3.4844	3.6086	0.1242	28869.1	28893.1	24.0	1.20	1.20	1.20	1731.8	71.7
31-Mar-20	Cloudy	294.3	761.5	3.5099	3.5778	0.0679	28893.1	28917.1	24.0	1.22	1.23	1.23	1764.8	38.5
													Max	80.5
													Average	68.9

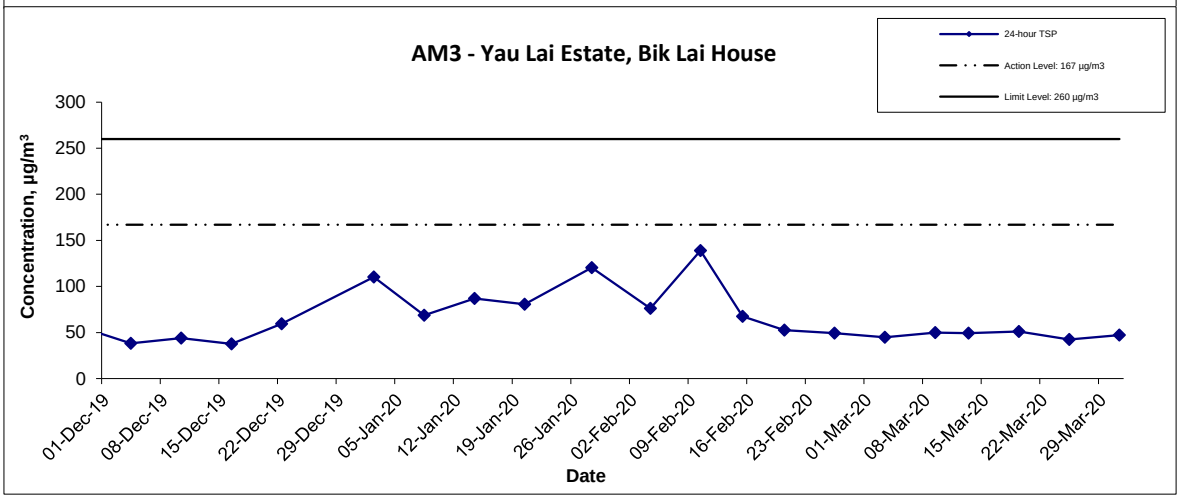
Location AM6(A) - Park Central, L1/F Open Space Area

Start Date	Weather	Air	Atmospheric	Filter Weight (g)		Particulate	Elapse Time		Sampling	Flow Rate (m^3/min.)		Av. flow	Total vol.	Conc.
	Condition	Temp. (K)	Pressure, Pa (mmHg)	Initial	Final	Weight (g)	Initial	Final	Time(hrs.)	Initial	Final	(m^3/min)	(m^3)	(μg/m^3)
3-Mar-20	Cloudy	294.3	764.6	3.5065	3.5799	0.0734	1330.2	1354.2	24.0	1.22	1.22	1.22	1758.0	41.8
9-Mar-20	Sunny	299.8	759.2	3.4672	3.5520	0.0848	1354.2	1378.2	24.0	1.20	1.21	1.20	1735.2	48.9
13-Mar-20	Cloudy	298.5	763.5	3.4554	3.5534	0.0980	1378.2	1402.2	24.0	1.21	1.21	1.21	1742.8	56.2
19-Mar-20	Cloudy	296.0	762.3	3.4139	3.4786	0.0647	1402.2	1426.2	24.0	1.21	1.21	1.21	1749.0	37.0
25-Mar-20	Cloudy	299.4	761.4	3.4292	3.5222	0.0930	1426.2	1450.2	24.0	1.21	1.21	1.21	1737.2	53.5
31-Mar-20	Cloudy	294.3	761.5	3.5131	3.5831	0.0700	1450.2	1474.2	24.0	1.22	1.22	1.22	1753.4	39.9
													Min	37.0
													Max	56.2
													Average	48.9

24-hr TSP Concentration Levels







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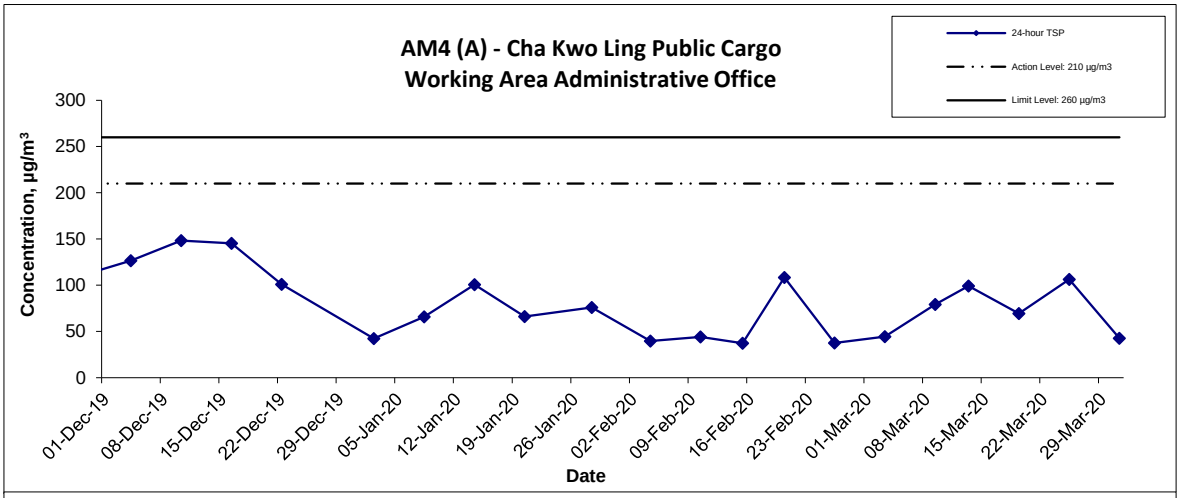
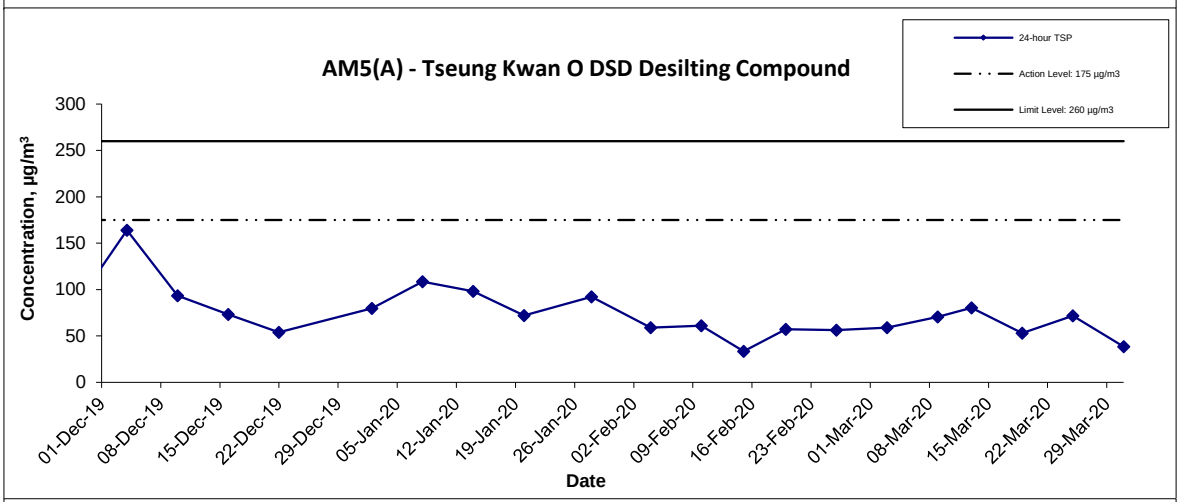
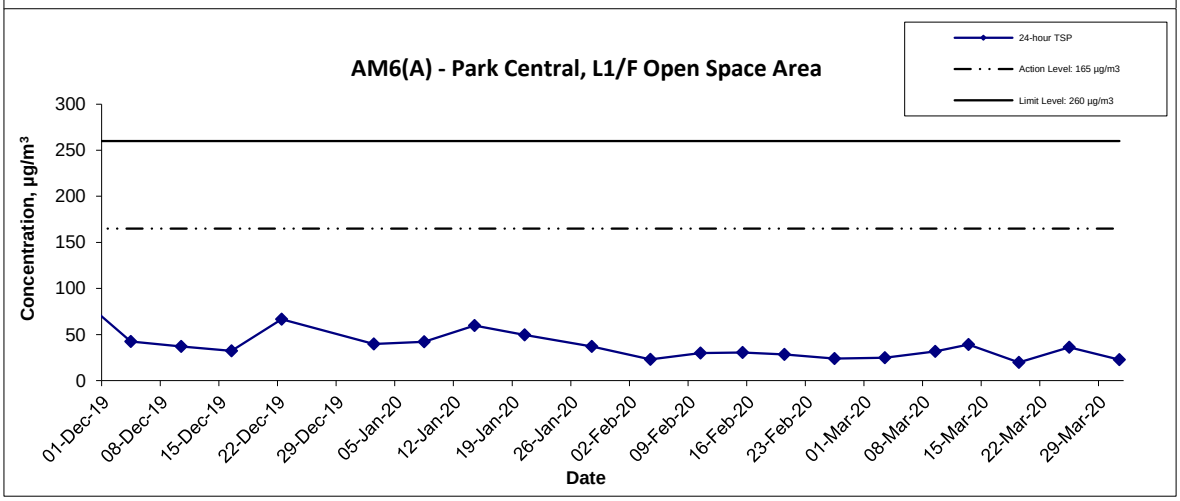
24-hr TSP Concentration Levels







Agreement No. CE/59/2015 (EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Graphical Presentation of 24-hour TSP Monitoring Results	Scale N.T.S Date Mar-20	Project No. MA16034 Appendix F	CINOTECH

APPENDIX G
NOISE MONITORING RESULTS AND GRAPHICAL PRESENTATIONS

Appendix G - Noise Monitoring Results

(0700-1900 hrs on Normal Weekdays)

Location CM1 - Nga Lai House, Yau Lai Estate Phase 1, Yau Tong							
Date	Time	Weather	Unit: dB (A) (30-min)				
			Measured Noise Level			Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}
4-Mar-20	17:20	Rainy	73.1	75.7	70.4	65.5	72
10-Mar-20	15:35	Sunny	71.8	73.9	68.9		71
16-Mar-20	13:00	Sunny	72.1	74.8	67.1		71
26-Mar-20	11:25	Cloudy	70.4	72.2	68.5		69

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-Mar-20	16:40	Rainy	73.4	75.4	70.8	63.6	73
10-Mar-20	14:50	Sunny	73.2	75.0	71.0		73
16-Mar-20	10:35	Sunny	72.8	74.9	70.1		72
26-Mar-20	10:20	Cloudy	73.2	74.6	71.6		73

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-Mar-20	16:00	Rainy	75.4	77.0	73.0	65.6	75
10-Mar-20	14:00	Sunny	73.5	75.2	71.0		73
16-Mar-20	11:05	Sunny	70.9	72.2	68.3		69
26-Mar-20	13:30	Cloudy	72.6	74.5	68.4		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-Mar-20	10:05	Rainy	65.4	68.5	62.2	62.0	63
10-Mar-20	9:15	Sunny	60.9	64.2	56.4		61Measured ≦ Baseline
16-Mar-20	10:00	Sunny	73.3	75.1	70.8		73
26-Mar-20	15:20	Cloudy	60.7	64.0	54.8		61Measured ≦ 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-Mar-20	11:00	Rainy	69.0	72.6	64.9	68.2	61
10-Mar-20	14:00	Sunny	72.1	74.8	67.1		70
16-Mar-20	13:00	Sunny	69.8	71.1	67.3		65
26-Mar-20	14:30	Cloudy	68.2	71.3	63.9		68Measured ≦ Baseline

Appendix G - Noise Monitoring Results

(0700-1900 hrs on Normal Weekdays)

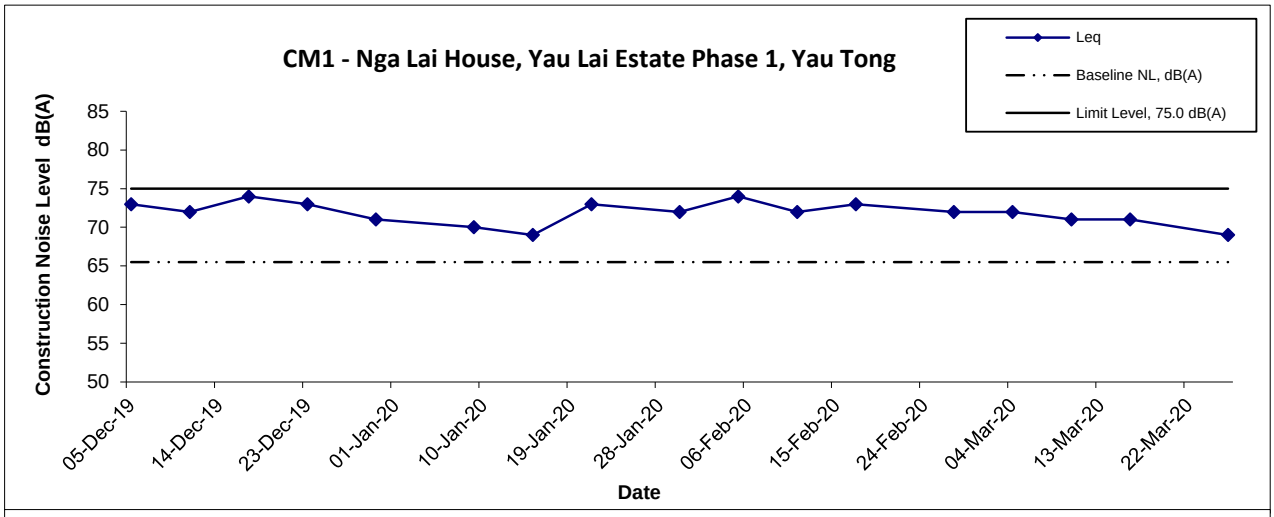
Location CM6(A) - Site Boundary of Contract No. NE/2015/02 near Tower 1, Ocean Shores							
Date	Time	Weather	Unit: dB (A) (30-min)				
			Measured Noise Level			Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}
4-Mar-20	14:30	Rainy	68.9	70.3	67.2	61.9	68
10-Mar-20	13:46	Cloudy	62.9	66.7	60.1		56
16-Mar-20	16:30	Sunny	72.2	73.8	70.0		72
26-Mar-20	14:00	Cloudy	71.4	74.3	68.6		71

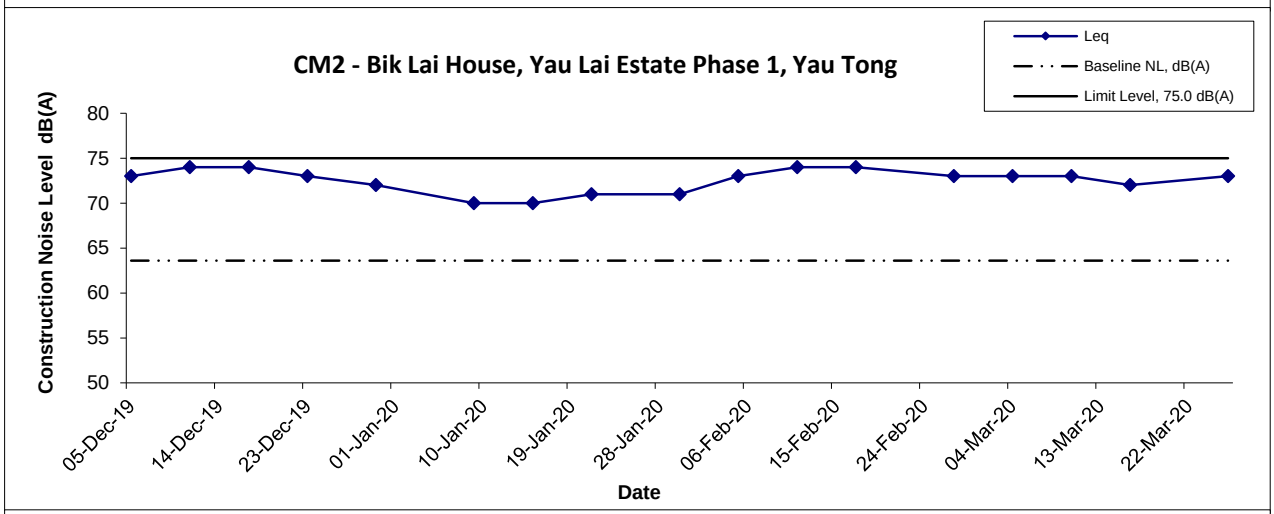
Location CM7(A) - Site Boundary of Contract No. NE/2015/02 near Tower 7, Ocean Shores							
Date	Time	Weather	Unit: dB (A) (30-min)				
			Measured Noise Level			Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}
4-Mar-20	13:45	Rainy	63.3	64.6	60.0	58.3	62
10-Mar-20	13:00	Cloudy	60.2	62.8	55.4		56
16-Mar-20	15:30	Sunny	64.1	69.3	57.7		63
26-Mar-20	15:00	Cloudy	70.2	73.8	68.3		70

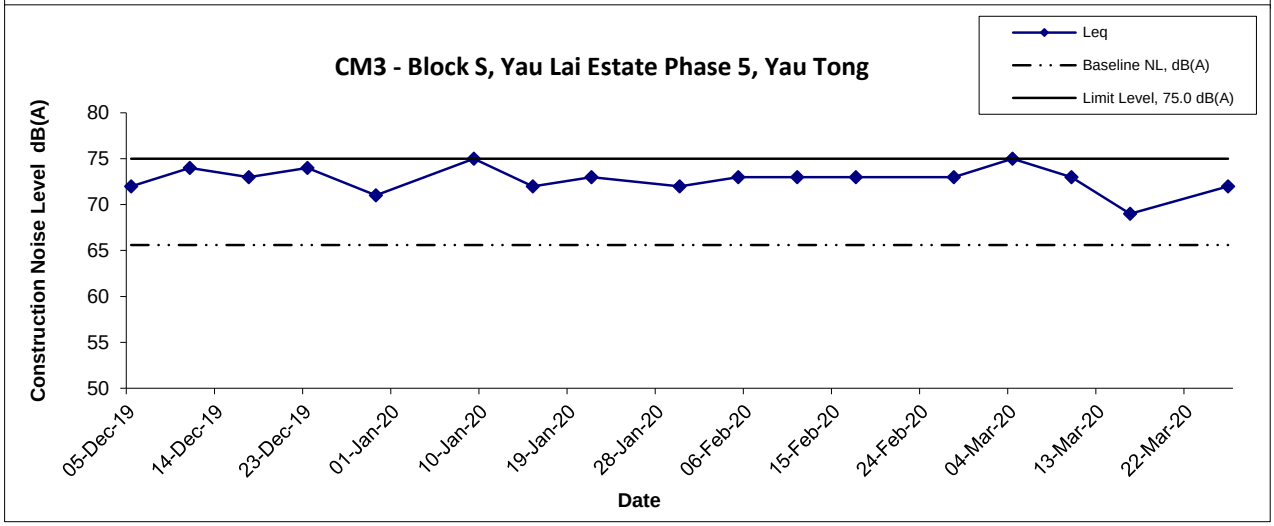
Location CM8(A) - Park Central, L1/F Open Space Area							
Date	Time	Weather	Unit: dB (A) (30-min)				
			Measured Noise Level			Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}
4-Mar-20	9:20	Cloudy	66.4	69.1	63.5	69.1	66Measured ≦ Baseline
10-Mar-20	11:00	Cloudy	65.5	69.0	59.2		66Measured ≦ Baseline
16-Mar-20	13:45	Sunny	64.5	66.0	62.2		65Measured ≦ Baseline
26-Mar-20	16:00	Cloudy	63.6	66.2	61.3		64Measured ≦ Baseline

Location CM9(A) - Roof top of the Capri Tower 10							
Date	Time	Weather	Unit: dB (A) (30-min)				
			Measured Noise Level			Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}
4-Mar-20	11:25	Cloudy	61.1	63.4	58.0	60.9	48

Noise Levels

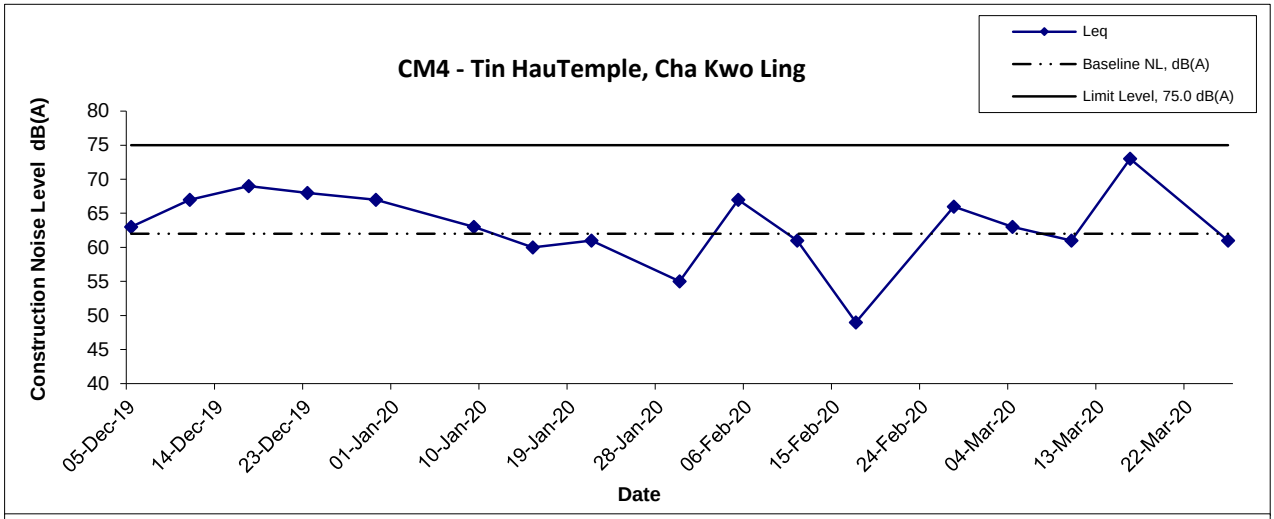


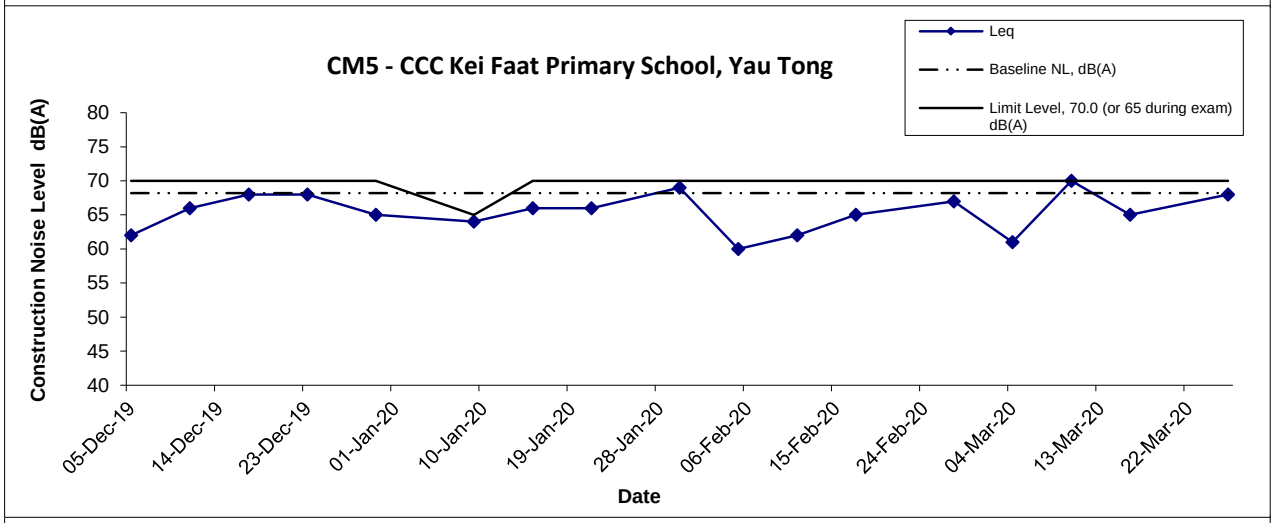


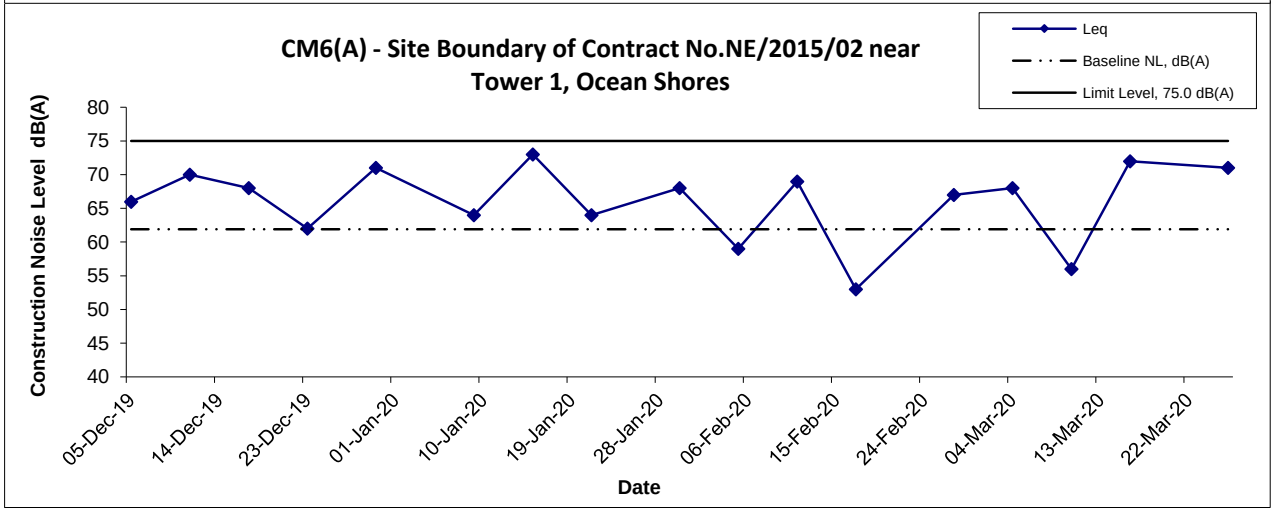


Title	Agreement No. CE/59/2015 (EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Graphical Presentation of Construction Noise Monitoring Results	Scale N.T.S	Project No. MA16034	CINOTECH
		Date Mar 20	Appendix G	

Noise Levels

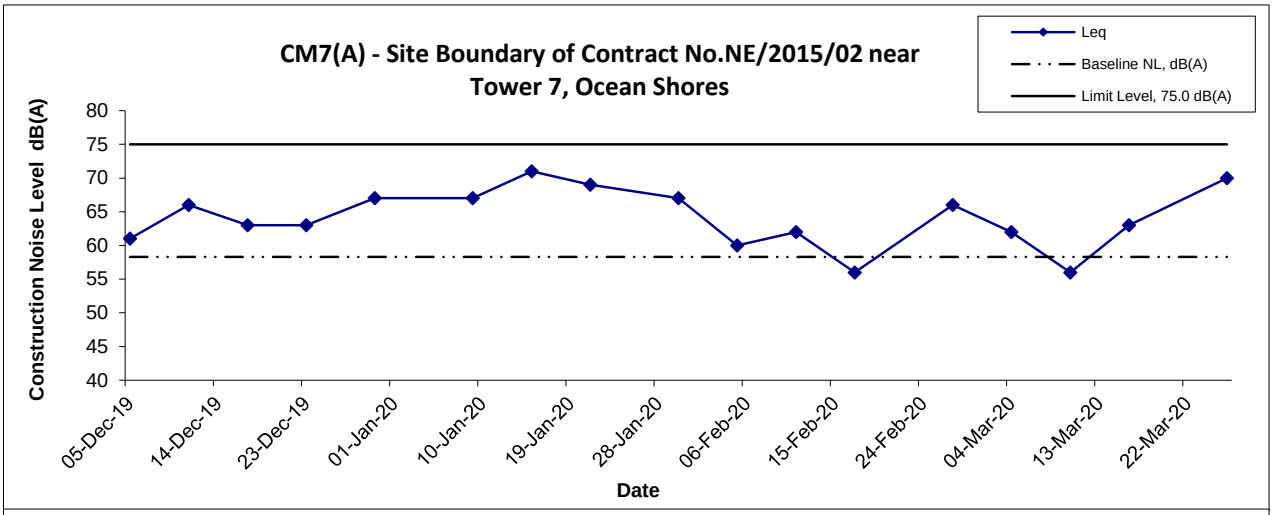


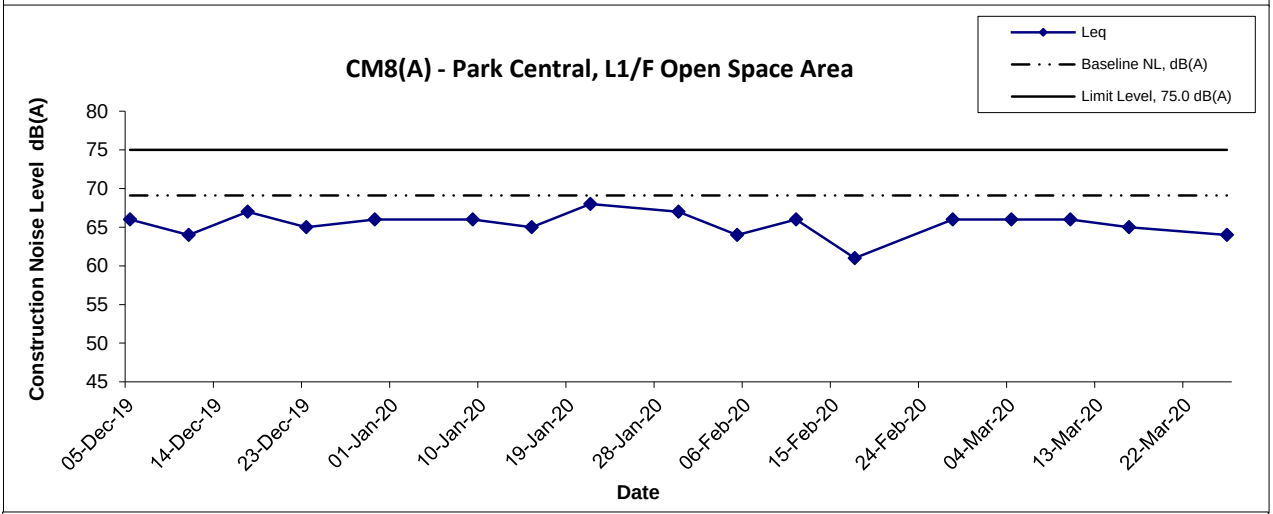


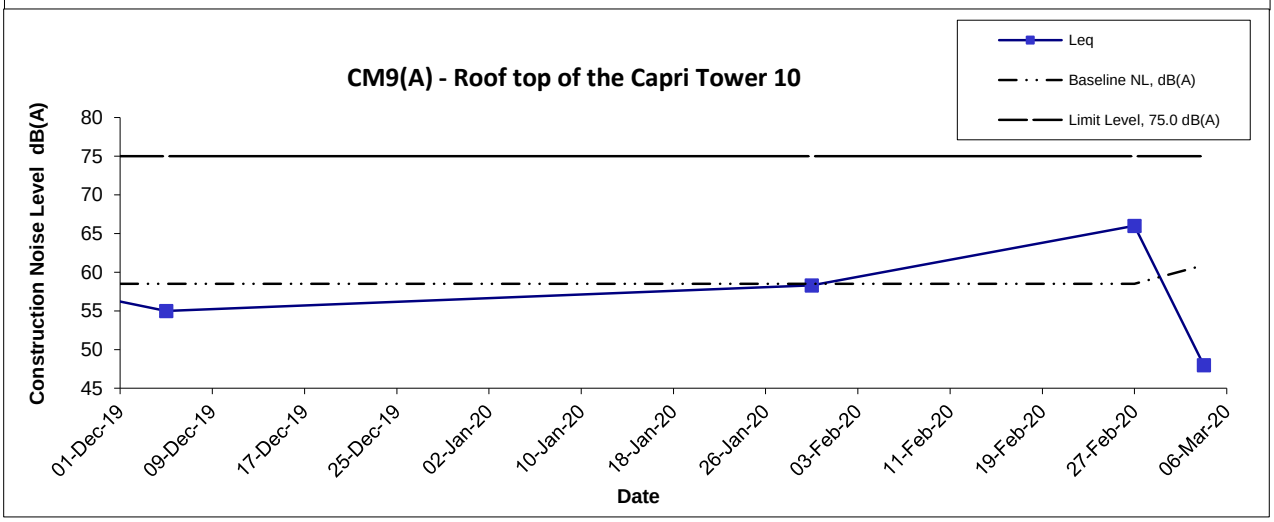


Title: Agreement No. CE/59/2015 (EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Graphical Presentation of Construction Noise Monitoring Results	Scale: N.T.S Date: Mar 20	Project No.: MA16034 Appendix: G	CINOTECH

Noise Levels







Title: Agreement No. CE/59/2015 (EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Graphical Presentation of Construction Noise Monitoring Results	Scale: N.T.S Date: Mar 20	Project No. MA16034 Appendix G	CINOTECH

Appendix G - Noise Monitoring Results

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

Location CM1 - Nga Lai House, Yau Lai Estate Phase 1, Yau Tong

Date	Time	Weather	dB (A) (5-min)				Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	Average L_{eq}	L_{eq}	L_{eq}
6-Mar-20	22:20	Cloudy	63.7	65.1	62.2	63.7	64.4	64Measured ≦ Baseline
	22:25		63.9	65.4	64.0			
	22:30		63.6	64.8	62.0			
13-Mar-20	20:32	Fine	64.2	67.1	60.8	64.1		64Measured ≦ Baseline
	20:37		64.0	67.5	61.0			
	20:42		64.1	67.4	61.0			
20-Mar-20	21:00	Fine	62.9	64.1	61.5	63.2		63Measured ≦ Baseline
	21:05		63.2	65.1	60.4			
	21:10		63.5	65.2	62.0			
27-Mar-20	21:20	Fine	64.0	65.8	60.9	64.6		51
	21:25		64.7	66.1	62.4			
	21:30		65.1	67.2	65.9			

Location CM2 - Bik Lai House, Yau Lai Estate Phase 1, Yau Tong

Date	Time	Weather	dB (A) (5-min)				Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	Average L_{eq}	L_{eq}	L_{eq}
6-Mar-20	22:40	Cloudy	64.0	65.3	62.8	63.9	62.2	59
	22:45		63.8	65.0	61.9			
	22:50		63.8	65.1	62.1			
13-Mar-20	20:45	Fine	63.9	67.0	60.2	64.0		59
	20:50		64.0	67.3	60.7			
	20:55		64.2	67.5	61.1			
20-Mar-20	21:20	Fine	64.5	65.8	63.0	64.8		61
	21:25		64.9	66.6	62.4			
	21:30		65.0	66.8	63.5			
27-Mar-20	21:00	Fine	64.2	65.6	62.0	64.3		60
	21:05		64.4	65.9	62.4			
	21:10		64.2	65.2	61.1			

Location CM3 - Block S, Yau Lai Estate Phase 5, Yau Tong

Date	Time	Weather	dB (A) (5-min)				Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	Average L_{eq}	L_{eq}	L_{eq}
6-Mar-20	22:00	Cloudy	63.2	64.6	61.8	63.8	64.7	64Measured ≦ Baseline
	22:05		63.5	65.0	62.1			
	22:10		64.7	67.0	62.6			
13-Mar-20	21:03	Fine	63.2	66.4	61.5	64.4		64Measured ≦ Baseline
	21:08		64.7	67.9	61.1			
	21:13		65.0	67.8	61.0			
20-Mar-20	21:45	Fine	65.2	66.9	63.1	65.8		59
	21:50		66.5	67.8	64.8			
	21:55		65.7	66.7	63.1			
27-Mar-20	21:45	Fine	62.2	64.3	59.2	62.2		62Measured ≦ Baseline
	21:50		62.0	64.4	59.1			
	21:55		62.3	64.5	59.0			

Location CM6(A) - Site Boundary of Contract No. NE/2015/02 near Tower 1, Ocean Shores

Date	Time	Weather	dB (A) (5-min)				Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	Average L_{eq}	L_{eq}	L_{eq}
4-Mar-20	19:00	Fine	66.3	67.8	65.0	65.7	60.2	64
	19:05		65.8	66.9	65.1			
	19:10		64.8	65.7	63.4			
10-Mar-20	19:00	Rainy	60.3	64.1	56.2	60.5		48
	19:05		60.7	64.5	56.3			
	19:10		60.4	64.4	55.9			
16-Mar-20	19:00	Fine	56.2	58.5	52.2	57.6		58Measured ≦ Baseline
	19:05		56.3	58.5	51.4			
	19:10		59.5	64.2	52.5			
26-Mar-20	19:00	Cloudy	61.7	64.1	58.2	61.5		56
	19:05		61.4	64.2	58.1			
	19:10		61.3	64.0	58.0			

Appendix G - Noise Monitoring Results

(Restricted Hours - 2300-0700 on all days)

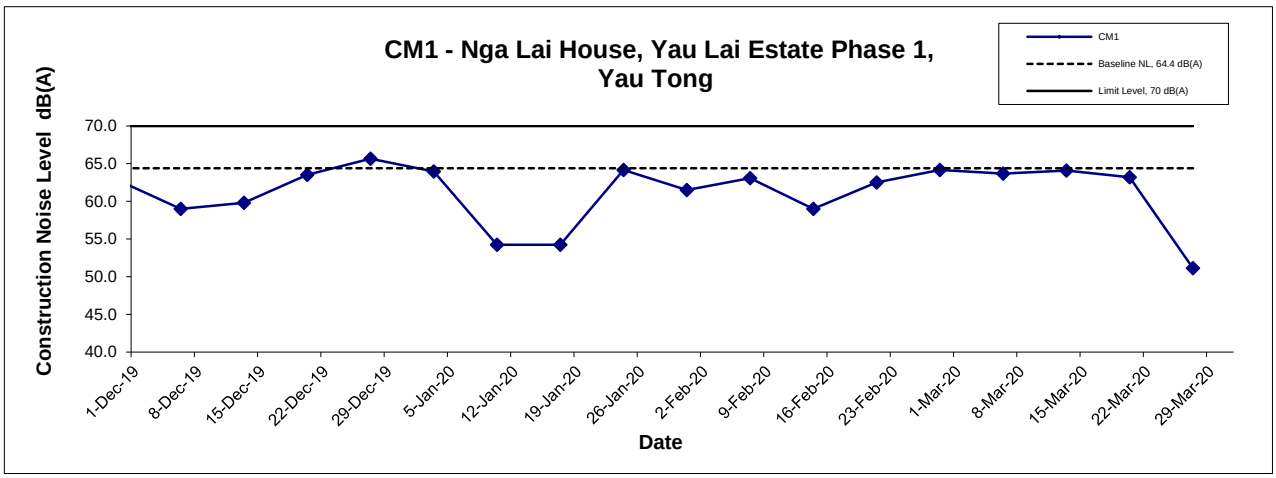
Location CM1 - Nga Lai House, Yau Lai Estate Phase 1, Yau Tong								
Date	Time	Weather	dB (A) (5-min)				Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	Average L_{eq}	L_{eq}	L_{eq}
6-Mar-20	23:20	Cloudy	61.3	63.0	59.6	61.6	63.7	62Measured ≦ Baseline
	23:25		61.6	63.2	59.0			
	23:30		61.8	63.4	59.6			
13-Mar-20	23:45	Cloudy	60.1	62.5	58.4	60.1	62.8	60Measured ≦ Baseline
	23:50		60.0	62.9	58.6			
	23:55		60.2	62.6	58.6			
20-Mar-20	23:00	Fine	62.1	63.8	61.1	62.3	63.7	62Measured ≦ Baseline
	23:05		62.3	63.6	60.6			
	23:10		62.4	63.5	61.1			
27-Mar-20	23:00	Fine	61.6	63.6	59.2	61.6	63.7	62Measured ≦ Baseline
	23:05		61.4	63.7	59.4			
	23:10		61.8	63.9	59.8			

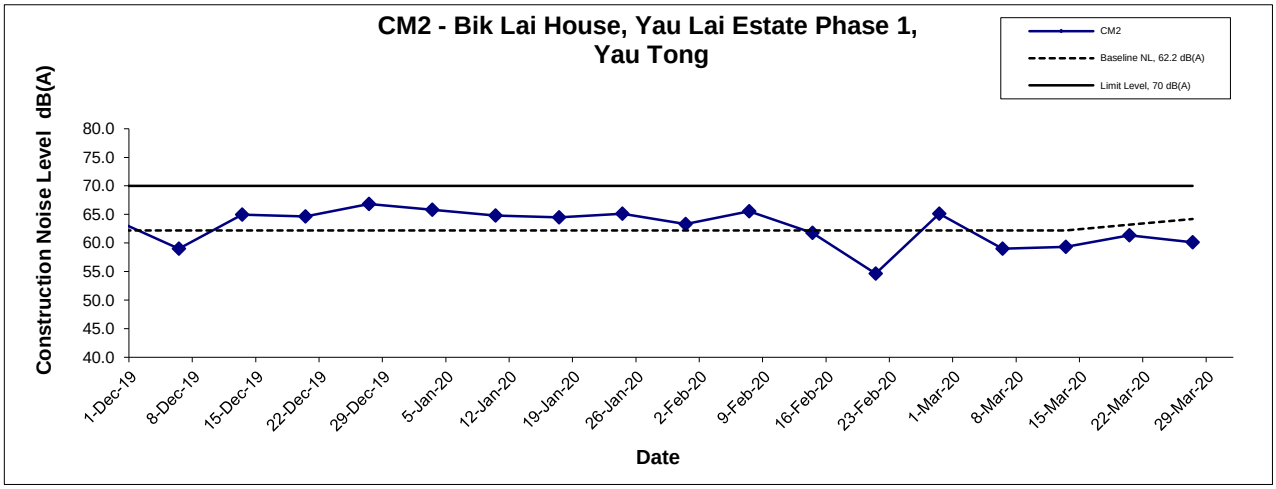
Location CM2 - Bik Lai House, Yau Lai Estate Phase 1, Yau Tong								
Date	Time	Weather	dB (A) (5-min)				Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	Average L_{eq}	L_{eq}	L_{eq}
6-Mar-20	23:00	Cloudy	61.4	63.2	59.8	61.4	61.6	61Measured ≦ Baseline
	23:05		61.6	63.5	60.1			
	23:10		61.3	62.9	59.9			
13-Mar-20	23:25	Cloudy	60.4	62.4	58.3	60.3	61.6	60Measured ≦ Baseline
	23:30		60.3	62.5	58.0			
	23:35		60.3	62.5	58.2			
20-Mar-20	23:30	Fine	61.3	62.8	59.3	61.5	60.8	53
	23:35		61.2	62.7	60.1			
	23:40		61.9	63.9	58.8			
27-Mar-20	23:20	Fine	60.7	62.9	58.2	60.5	61.6	61Measured ≦ Baseline
	23:25		60.4	62.7	58.4			
	23:30		60.5	62.8	58.6			

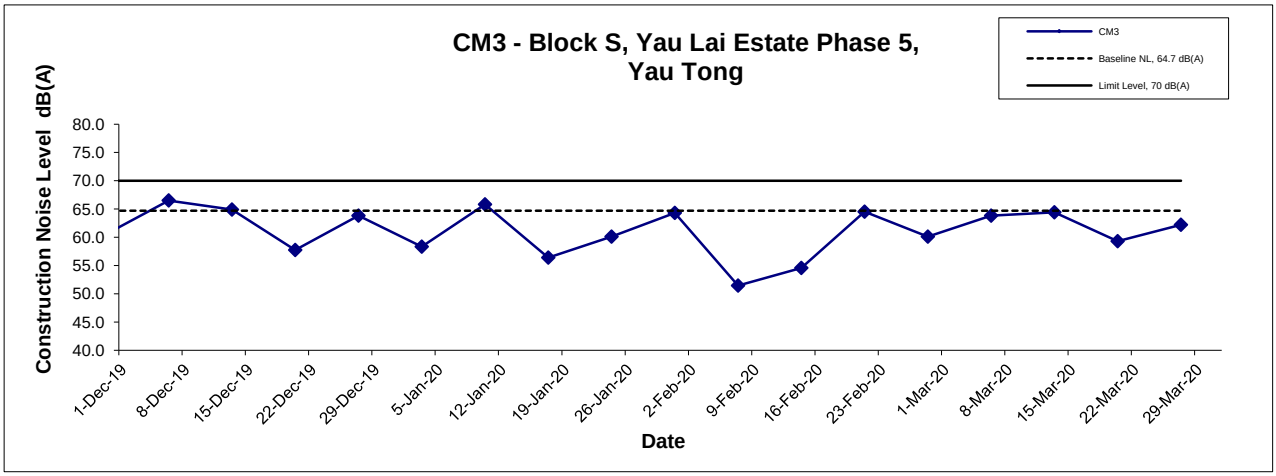
Location CM3 - Block S, Yau Lai Estate Phase 5, Yau Tong								
Date	Time	Weather	dB (A) (5-min)				Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	Average L_{eq}	L_{eq}	L_{eq}
6-Mar-20	23:40	Cloudy	62.0	63.7	60.2	61.6	62.9	62Measured ≦ Baseline
	23:45		61.5	62.9	60.1			
	23:50		61.4	62.7	60.1			
13-Mar-20	23:00	Cloudy	60.1	63.2	57.7	60.2	64.0	60Measured ≦ Baseline
	23:05		60.5	63.5	57.1			
	23:10		60.0	63.0	56.5			
21-Mar-20	0:00	Fine	60.6	62.0	59.1	60.8	61.8	61Measured ≦ Baseline
	0:05		60.7	62.2	58.8			
	0:10		61.2	62.4	59.7			
27-Mar-20	23:45	Fine	59.8	61.3	58.1	59.6	62.9	60Measured ≦ Baseline
	23:50		59.7	60.9	58.2			
	23:55		59.4	60.6	57.7			

Remark: The exceedanes of night time noise limit level (55dB(A)) were not due to the Project but the road traffic near Eastern Harbour Crossing tunnel.
"Measured ≦ Baseline" means that the averaged measured Leq is smaller than the baseline Leq, and therefore the measured levels are not valid exceedances.

Noise Levels
(Restricted Hours - 19:00 - 23:00 on normal weekdays)

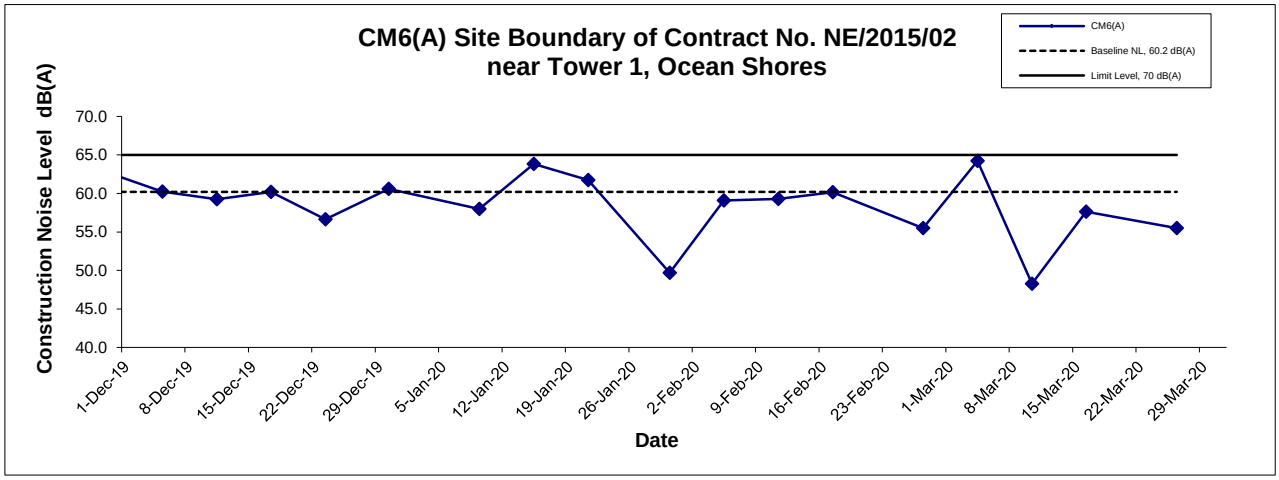






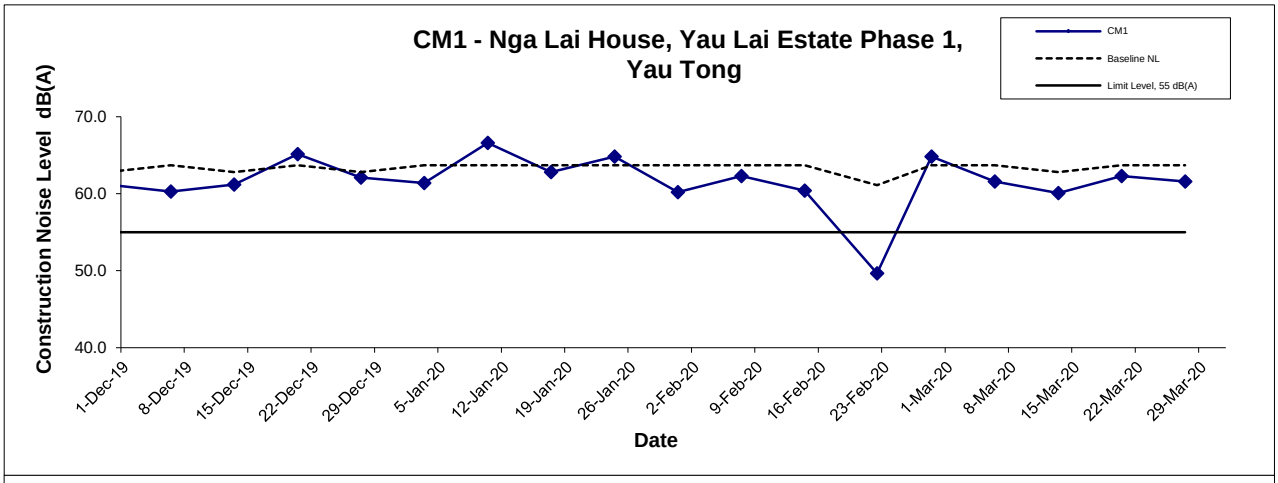
Title: Agreement No. CE/59/2015 (EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Graphical Presentation of Restricted Noise Monitoring Results	Scale: N.T.S Date: Mar 20	Project No.: MA16034 Appendix: G	CINOTECH

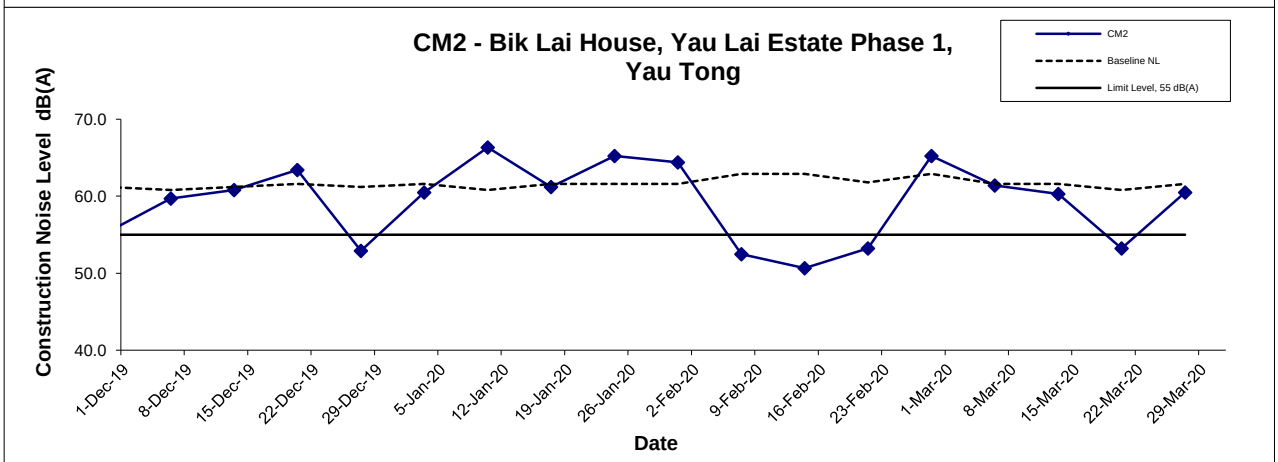
Noise Levels
(Restricted Hours - 19:00 - 23:00 on normal weekdays)

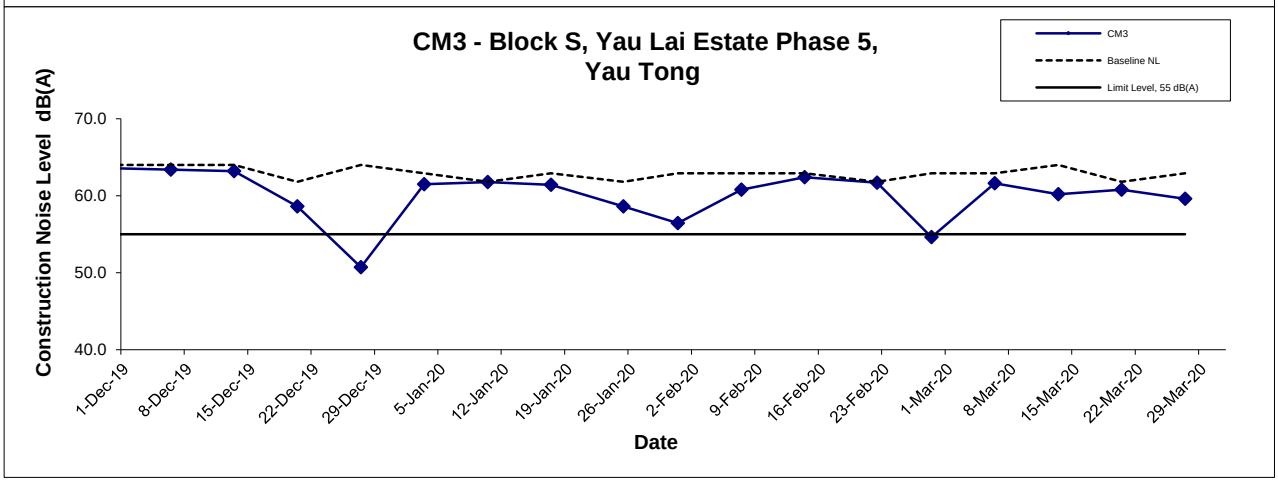


Title	Agreement No. CE/59/2015 (EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Graphical Presentation of Restricted Noise Monitoring Results	Scale N.T.S	Project No. MA16034	CINOTECH
		Date Mar 20	Appendix G	

Noise Levels
(Restricted Hours - 2300-0700 on normal weekdays)







Title: Graphical Presentation of Restricted Noise Monitoring Results	Agreement No. CE/59/2015 (EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction	Scale: N.T.S Date: Mar 20	Project No.: MA16034 Appendix: G

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APPENDIX I
MARINE WATER QUALITY MONITORING RESULTS AND GRAPHICAL PRESENTATIONS

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 02 March 2020

(Mid-Ebb Tide)

Location	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
C1	Sunny	Calm	11:25	Surface	1.1	19.3 18.9	19.1	8.1 8.1	8.1	33.9 34.0	33.9	99.1 99.3	99.2	7.5 7.5	7.5	7.5	1.1 1.1	1.1	1.3	5.0 4.9	5.0	4.6
				Middle	9.0	18.5 18.5	18.5	8.2 8.2	8.2	34.1 34.1	34.1	97.9 98.0	98.0	7.5 7.5	7.5		1.4 1.4	1.4		5.1 5.0	5.1	
				Bottom	17.0	18.5 18.6	18.5	8.2 8.2	8.2	34.3 34.2	34.2	98.4 98.8	98.6	7.5 7.5	7.5	7.5	1.7 1.4	1.5		3.8 3.8	3.8	
C2	Sunny	Calm	9:53	Surface	1.1	19.0 18.8	18.9	8.1 8.1	8.1	33.8 33.9	33.8	98.5 98.0	98.3	7.5 7.4	7.5	7.4	0.9 1.1	1.0	1.3	5.2 5.2	5.2	17.5
				Middle	16.0	18.5 18.5	18.5	8.1 8.1	8.1	34.1 34.1	34.1	96.3 96.3	96.3	7.3 7.4	7.3		1.6 1.4	1.5		23.3 23.6	23.5	
				Bottom	31.0	18.5 18.5	18.5	8.1 8.1	8.1	34.1 34.1	34.1	96.2 96.1	96.2	7.3 7.3	7.3	7.3	1.6 1.5	1.5		24.5 23.2	23.9	
G1	Sunny	Calm	10:31	Surface	1.0	19.3 19.3	19.3	8.1 8.1	8.1	34.0 34.0	34.0	112.6 112.6	112.6	8.5 8.5	8.5	8.4	1.8 1.6	1.7	1.9	5.2 5.3	5.3	6.4
				Middle	4.1	19.1 18.8	18.9	8.1 8.1	8.1	34.0 34.0	34.0	110.6 107.5	109.1	8.4 8.2	8.3		2.3 2.0	2.1		7.4 7.9	7.7	
				Bottom	7.0	18.6 18.5	18.6	8.1 8.1	8.1	34.1 34.1	34.1	102.9 99.9	101.4	7.8 7.6	7.7	7.7	1.7 2.2	2.0		6.4 6.4	6.4	
G2	Sunny	Calm	10:12	Surface	1.1	19.6 19.4	19.5	8.1 8.1	8.1	34.0 34.0	34.0	103.9 104.3	104.1	7.8 7.8	7.8	7.7	1.0 0.9	0.9	1.5	5.8 5.8	5.8	6.2
				Middle	5.0	18.7 18.7	18.7	8.1 8.1	8.1	34.1 34.1	34.1	101.2 101.1	101.2	7.7 7.7	7.7		1.3 1.7	1.5		7.6 7.2	7.4	
				Bottom	9.0	18.5 18.5	18.5	8.1 8.1	8.1	34.3 34.2	34.3	98.6 98.9	98.8	7.5 7.5	7.5	7.5	2.0 2.2	2.1		5.3 5.2	5.3	
G3	Sunny	Calm	10:36	Surface	1.0	19.4 19.3	19.4	8.1 8.1	8.1	33.9 34.0	33.9	112.3 109.2	110.8	8.4 8.2	8.3	8.2	0.9 0.8	0.8	1.5	5.1 5.0	5.1	5.4
				Middle	4.0	18.8 18.8	18.8	8.1 8.1	8.1	34.0 34.0	34.0	108.6 106.7	107.7	8.2 8.1	8.2		1.4 1.5	1.4		5.7 5.7	5.7	
				Bottom	7.1	18.6 18.7	18.6	8.1 8.1	8.1	34.1 34.1	34.1	100.7 105.3	103.0	7.7 8.0	7.8	7.8	2.2 2.1	2.1		5.4 5.4	5.4	
G4	Sunny	Calm	10:55	Surface	1.0	19.6 19.5	19.5	8.1 8.1	8.1	34.0 34.0	34.0	105.3 107.6	106.5	7.9 8.1	8.0	8.0	0.7 0.9	0.8	1.2	6.8 6.8	6.8	6.5
				Middle	4.1	19.2 19.2	19.2	8.1 8.1	8.1	34.0 34.0	34.0	105.5 106.4	106.0	8.0 8.0	8.0		0.9 1.0	0.9		7.4 7.3	7.4	
				Bottom	7.0	18.8 18.8	18.8	8.1 8.2	8.1	34.1 34.1	34.1	106.0 106.2	106.1	8.0 8.1	8.0	8.0	1.8 1.8	1.8		5.2 5.6	5.4	
M1	Sunny	Calm	10:20	Surface	1.0	19.6 19.7	19.7	8.1 8.2	8.1	34.0 34.0	34.0	107.9 107.9	107.9	8.1 8.1	8.1	8.0	1.3 1.3	1.3	1.7	6.5 6.6	6.6	6.0
				Middle	3.0	19.4 19.0	19.2	8.2 8.2	8.2	34.0 34.0	34.0	107.8 105.1	106.5	8.1 7.9	8.0		1.8 1.8	1.8		6.7 6.5	6.6	
				Bottom	5.0	18.9 18.8	18.8	8.2 8.2	8.2	34.1 34.1	34.1	101.7 103.0	102.4	7.7 7.8	7.8	7.8	2.0 2.1	2.1		4.9 5.0	5.0	
M2	Sunny	Calm	10:07	Surface	1.1	19.3 19.4	19.4	8.1 8.1	8.1	34.0 34.0	34.0	105.0 104.7	104.9	7.9 7.9	7.9	7.8	0.7 0.6	0.7	1.3	6.6 6.6	6.6	11.2
				Middle	6.0	18.6 18.5	18.6	8.1 8.1	8.1	34.1 34.1	34.1	101.3 100.2	100.8	7.7 7.6	7.7		1.1 1.1	1.1		20.9 20.4	20.7	
				Bottom	11.1	18.5 18.5	18.5	8.1 8.1	8.1	34.3 34.3	34.3	98.9 98.6	98.8	7.5 7.5	7.5	7.5	2.0 2.2	2.1		6.3 6.1	6.2	
M3	Sunny	Calm	10:46	Surface	1.0	19.8 19.7	19.8	8.1 8.1	8.1	33.9 33.9	33.9	105.8 108.3	107.1	7.9 8.1	8.0	8.1	1.0 0.9	0.9	1.1	5.3 5.7	5.5	5.0
				Middle	4.0	18.9 19.0	19.0	8.1 8.1	8.1	34.0 34.0	34.0	110.4 109.1	109.8	8.4 8.3	8.3		1.1 1.1	1.1		4.1 4.1	4.1	
				Bottom	7.0	18.7 18.7	18.7	8.1 8.1	8.1	34.0 34.0	34.0	101.4 103.2	102.3	7.7 7.8	7.8	7.8	1.1 1.2	1.1		5.6 5.4	5.5	
M4	Sunny	Calm	10:00	Surface	1.0	18.8 18.7	18.7	8.1 8.1	8.1	34.0 34.1	34.0	98.8 99.2	99.0	7.5 7.5	7.5	7.5	0.9 1.1	1.0	1.3	6.5 6.8	6.7	5.8
				Middle	5.0	18.7 18.6	18.7	8.1 8.1	8.1	34.1 34.1	34.1	99.3 98.6	99.0	7.6 7.5	7.5		1.2 1.2	1.2		5.5 5.3	5.4	
				Bottom	9.0	18.5 18.5	18.5	8.1 8.1	8.1	34.2 34.2	34.2	97.5 97.8	97.7	7.4 7.5	7.4	7.4	1.8 1.6	1.7		5.3 5.3	5.3	
M5	Sunny	Calm	11:13	Surface	1.0	19.2 19.2	19.2	8.1 8.1	8.1	34.0 34.0	34.0	101.3 102.4	101.9	7.6 7.7	7.7	7.7	0.8 0.8	0.8	1.2	5.7 5.9	5.8	4.8
				Middle	6.0	18.8 18.9	18.9	8.1 8.1	8.1	34.0 34.0	34.0	101.0 101.7	101.4	7.7 7.7	7.7		0.9 1.0	1.0		4.3 4.3	4.3	
				Bottom	11.1	18.6 18.6	18.6	8.2 8.2	8.2	34.3 34.2	34.3	99.7 100.1	99.9	7.6 7.6	7.6	7.6	1.8 1.8	1.8		4.5 4.3	4.4	
M6	Sunny	Calm	11:03	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	7.8	- -	-	0.5	- -	-	4.2
				Middle	2.1	19.6 19.8	19.7	8.1 8.1	8.1	33.9 33.9	33.9	103.7 104.4	104.1	7.8 7.8	7.8		0.6 0.5	0.5		4.2 4.1	4.2	
				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 2 March 2020 (Mid-Ebb Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU*** or 120% of upstream control station's Turbidity at the same tide of the same day ***C2: 1.8 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C2: 2.0 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 6.2 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 6.8 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 6.2 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 6.8 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 28.6 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 31.0 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 02 March 2020

(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	18:11	Surface	1.0	18.6 18.6	18.6	8.1 8.1	8.1	34.0 33.9	34.0	97.1 97.4	97.3	7.4 7.4	7.4	7.5	1.1 1.0	1.0	1.3	7.6 7.5	7.6	6.9
				Middle	8.0	18.5 18.5	18.5	8.1 8.1	8.1	34.2 34.2	34.2	99.1 98.3	98.7	7.6 7.5	7.5		1.0 1.1	1.1		6.4 6.4	6.4	
				Bottom	15.0	18.5 18.5	18.5	8.2 8.1	8.1	34.5 34.5	34.5	98.4 98.5	98.5	7.5 7.5	7.5	7.5	1.8 2.1	1.9		6.8 6.8	6.8	
C2	Sunny	Calm	16:35	Surface	1.0	18.6 18.5	18.5	8.0 8.0	8.0	34.0 34.1	34.0	97.7 98.0	97.9	7.5 7.5	7.5	7.4	1.3 1.3	1.3	1.3	5.9 5.9	5.9	5.4
				Middle	16.0	18.5 18.5	18.5	8.0 8.0	8.0	34.1 34.1	34.1	96.9 97.4	97.2	7.4 7.4	7.4		1.1 1.0	1.1		6.4 6.3	6.4	
				Bottom	31.1	18.5 18.5	18.5	8.0 8.0	8.0	34.2 34.2	34.2	96.7 96.9	96.8	7.4 7.4	7.4	7.4	1.4 1.5	1.4		4.0 3.9	4.0	
G1	Sunny	Calm	17:15	Surface	1.0	18.6 18.6	18.6	8.1 8.1	8.1	34.0 34.0	34.0	99.5 99.7	99.6	7.6 7.6	7.6	7.6	1.0 0.9	0.9	1.1	6.3 6.1	6.2	7.7
				Middle	4.1	18.6 18.6	18.6	8.1 8.1	8.1	34.0 34.1	34.0	99.6 99.6	99.6	7.6 7.6	7.6		1.1 1.3	1.2		10.6 10.6	10.6	
				Bottom	7.0	18.5 18.5	18.5	8.1 8.1	8.1	34.1 34.1	34.1	99.4 99.0	99.2	7.6 7.6	7.6	7.6	1.3 1.2	1.2		6.4 6.3	6.4	
G2	Sunny	Calm	16:56	Surface	1.1	18.7 18.6	18.7	8.1 8.1	8.1	34.0 34.0	34.0	100.2 100.4	100.3	7.6 7.7	7.6	7.6	0.7 0.8	0.8	0.9	6.6 6.4	6.5	6.9
				Middle	5.0	18.6 18.5	18.6	8.1 8.1	8.1	34.0 34.1	34.0	100.1 99.9	100.0	7.6 7.6	7.6		0.8 0.9	0.9		4.3 4.5	4.4	
				Bottom	9.0	18.5 18.5	18.5	8.1 8.1	8.1	34.1 34.1	34.1	99.5 99.9	99.7	7.6 7.6	7.6	7.6	1.0 0.9	0.9		9.9 9.7	9.8	
G3	Sunny	Calm	17:22	Surface	1.0	18.7 18.7	18.7	8.1 8.1	8.1	34.0 34.0	34.0	102.7 104.0	103.4	7.8 7.9	7.9	7.9	0.6 0.7	0.6	0.9	7.5 7.0	7.3	6.8
				Middle	4.0	18.5 18.5	18.5	8.1 8.1	8.1	34.1 34.1	34.1	103.8 103.4	103.6	7.9 7.9	7.9		0.8 0.7	0.7		4.9 5.1	5.0	
				Bottom	7.0	18.4 18.4	18.4	8.1 8.1	8.1	34.1 34.2	34.2	101.1 100.6	100.9	7.7 7.7	7.7	7.7	1.3 1.4	1.3		8.4 8.1	8.3	
G4	Sunny	Calm	17:37	Surface	1.0	18.8 18.7	18.7	8.1 8.1	8.1	34.0 33.9	33.9	100.1 100.2	100.2	7.6 7.6	7.6	7.6	0.9 0.9	0.9	1.0	9.1 9.2	9.2	18.0
				Middle	4.0	18.5 18.5	18.5	8.1 8.1	8.1	34.0 34.0	34.0	98.7 99.3	99.0	7.5 7.6	7.6		1.1 1.0	1.1		22.5 22.6	22.6	
				Bottom	7.0	18.5 18.5	18.5	8.1 8.1	8.1	34.1 34.1	34.1	99.9 99.4	99.7	7.6 7.6	7.6	7.6	1.1 0.9	1.0		22.5 22.0	22.3	
M1	Sunny	Calm	17:01	Surface	1.0	18.7 18.6	18.7	8.1 8.1	8.1	34.0 34.0	34.0	101.6 101.6	101.6	7.7 7.7	7.7	7.7	0.7 0.8	0.8	0.8	8.6 9.1	8.9	7.8
				Middle	3.0	18.6 18.6	18.6	8.1 8.1	8.1	34.0 34.0	34.0	102.0 101.3	101.7	7.8 7.7	7.7		0.7 0.8	0.7		6.7 6.8	6.8	
				Bottom	5.0	18.6 18.6	18.6	8.1 8.1	8.1	34.0 34.0	34.0	101.6 101.5	101.6	7.7 7.7	7.7	7.7	0.9 0.8	0.8		7.7 7.6	7.7	
M2	Sunny	Calm	16:48	Surface	1.0	18.7 18.8	18.7	8.1 8.1	8.1	34.0 34.0	34.0	97.8 98.2	98.0	7.4 7.5	7.5	7.4	0.9 0.8	0.9	1.0	5.0 4.7	4.9	6.1
				Middle	5.5	18.5 18.5	18.5	8.1 8.1	8.1	34.0 34.0	34.0	97.5 97.6	97.6	7.4 7.5	7.4		1.0 1.1	1.0		8.1 7.9	8.0	
				Bottom	10.0	18.5 18.5	18.5	8.1 8.1	8.1	34.1 34.1	34.1	98.3 98.0	98.2	7.5 7.5	7.5	7.5	1.2 1.1	1.1		5.5 5.5	5.5	
M3	Sunny	Calm	17:30	Surface	1.0	18.8 18.7	18.7	8.1 8.1	8.1	33.7 34.0	33.8	102.8 105.6	104.2	7.8 8.0	7.9	8.0	0.7 0.9	0.8	1.2	7.1 7.4	7.3	6.3
				Middle	4.0	18.5 18.5	18.5	8.1 8.1	8.1	34.1 34.1	34.1	106.7 106.9	106.8	8.1 8.2	8.1		1.0 1.0	1.0		5.7 5.6	5.7	
				Bottom	7.0	18.4 18.4	18.4	8.1 8.1	8.1	34.2 34.2	34.2	98.0 98.2	98.1	7.5 7.5	7.5	7.5	1.9 2.0	1.9		6.0 6.0	6.0	
M4	Sunny	Calm	16:41	Surface	1.0	18.6 18.6	18.6	8.0 8.0	8.0	34.0 34.0	34.0	98.7 99.4	99.1	7.5 7.6	7.6	7.5	0.9 0.9	0.9	1.0	6.4 6.8	6.6	5.4
				Middle	5.1	18.5 18.5	18.5	8.1 8.1	8.1	34.1 34.1	34.1	97.9 98.4	98.2	7.5 7.5	7.5		1.1 1.2	1.2		5.5 5.5	5.5	
				Bottom	9.0	18.5 18.5	18.5	8.1 8.1	8.1	34.1 34.1	34.1	97.8 97.9	97.9	7.5 7.5	7.5	7.5	1.1 0.9	1.0		4.0 3.9	4.0	
M5	Sunny	Calm	18:00	Surface	1.1	18.7 18.6	18.6	8.1 8.1	8.1	33.9 33.9	33.9	95.3 95.7	95.5	7.3 7.3	7.3	7.4	0.9 0.8	0.9	1.7	5.5 5.3	5.4	7.7
				Middle	6.0	18.5 18.5	18.5	8.1 8.1	8.1	34.3 34.2	34.2	97.8 97.8	97.8	7.5 7.5	7.5		1.9 1.8	1.9		10.8 10.7	10.8	
				Bottom	10.9	18.5 18.5	18.5	8.1 8.1	8.1	34.4 34.4	34.4	99.2 99.3	99.3	7.6 7.6	7.6	7.6	2.4 2.3	2.3		6.9 6.7	6.8	
M6	Sunny	Calm	17:51	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	7.4	- -	-	0.9	- -	-	7.0
				Middle	2.0	18.7 18.7	18.7	8.1 8.1	8.1	33.9 33.9	33.9	97.6 97.6	97.6	7.4 7.4	7.4		1.0 0.9	0.9		7.1 6.8	7.0	
				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 2 March 2020 (Mid-Flood Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU*** or 120% of upstream control station's Turbidity at the same tide of the same day ***C1: 2.3 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C1: 2.5 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 9.1 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 9.8 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 9.1 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 9.8 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 8.2 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 8.8 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 04 March 2020

(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	Calm	12:01	Surface	1.0	19.1 19.1	19.1	8.1 8.1	8.1	34.6 34.6	34.6	101.3 102.5	101.9	7.6 7.7	7.7	7.7	0.9 1.0	0.9	0.9	4.4 4.3	4.4	5.5
				Middle	8.0	19.1 19.1	19.1	8.1 8.1	8.1	34.6 34.6	34.6	101.4 101.9	101.7	7.7 7.7	7.7		1.2 1.1	1.1		7.1 7.1	7.1	
				Bottom	15.0	19.1 19.1	19.1	8.1 8.1	8.1	34.6 34.6	34.6	101.1 101.4	101.3	7.6 7.7	7.6	7.6	0.7 0.7	0.7		5.2 5.0	5.1	
C2	Cloudy	Calm	10:59	Surface	1.0	19.2 19.1	19.2	8.1 8.1	8.1	34.5 34.5	34.5	101.7 102.2	102.0	7.7 7.7	7.7	7.7	0.7 0.7	0.7	0.7	8.1 7.6	7.9	6.8
				Middle	16.0	19.1 19.1	19.1	8.1 8.1	8.1	34.5 34.5	34.5	101.0 101.2	101.1	7.6 7.6	7.6		0.4 0.4	0.4		5.1 4.7	4.9	
				Bottom	31.1	19.1 19.1	19.1	8.1 8.1	8.1	34.6 34.6	34.6	100.1 101.1	100.6	7.6 7.6	7.6	7.6	1.0 1.2	1.1		7.7 7.6	7.7	
G1	Cloudy	Calm	11:29	Surface	1.0	19.2 19.2	19.2	8.1 8.1	8.1	34.5 34.4	34.4	100.5 100.2	100.4	7.6 7.5	7.6	7.6	1.3 1.3	1.3	1.4	7.7 7.4	7.6	7.4
				Middle	3.5	19.2 19.2	19.2	8.1 8.1	8.1	34.5 34.5	34.5	100.5 100.2	100.4	7.6 7.6	7.6		1.2 1.3	1.2		9.8 9.3	9.6	
				Bottom	7.0	19.1 19.1	19.1	8.1 8.1	8.1	34.6 34.6	34.6	97.8 98.9	98.4	7.4 7.5	7.4	7.4	1.7 1.8	1.7		5.2 5.1	5.2	
G2	Cloudy	Calm	11:20	Surface	1.0	19.2 19.1	19.2	8.1 8.1	8.1	34.6 34.6	34.6	101.9 100.0	101.0	7.7 7.5	7.6	7.6	0.8 0.9	0.8	1.0	4.5 4.6	4.6	6.3
				Middle	5.1	19.1 19.1	19.1	8.1 8.1	8.1	34.6 34.6	34.6	101.3 101.0	101.2	7.6 7.6	7.6		1.0 0.9	0.9		10.2 9.4	9.8	
				Bottom	9.0	19.1 19.1	19.1	8.1 8.1	8.1	34.6 34.6	34.6	99.2 100.1	99.7	7.5 7.5	7.5	7.5	1.3 1.3	1.3		4.4 4.4	4.4	
G3	Cloudy	Calm	11:34	Surface	1.0	19.2 19.2	19.2	8.1 8.1	8.1	34.4 34.5	34.5	100.7 100.2	100.5	7.6 7.6	7.6	7.6	1.0 1.1	1.0	1.1	5.2 5.2	5.2	6.2
				Middle	4.0	19.2 19.2	19.2	8.1 8.1	8.1	34.5 34.5	34.5	100.3 99.7	100.0	7.6 7.5	7.5		1.1 1.1	1.1		7.9 8.4	8.2	
				Bottom	7.0	19.2 19.1	19.2	8.1 8.1	8.1	34.5 34.6	34.6	99.9 99.1	99.5	7.5 7.5	7.5	7.5	1.2 1.2	1.2		5.1 5.2	5.2	
G4	Cloudy	Calm	11:46	Surface	1.0	19.2 19.2	19.2	8.1 8.1	8.1	34.5 34.5	34.5	101.7 101.6	101.7	7.7 7.7	7.7	7.6	1.2 1.1	1.2	1.4	5.9 6.0	6.0	4.7
				Middle	4.0	19.2 19.2	19.2	8.1 8.1	8.1	34.5 34.5	34.5	101.5 100.3	100.9	7.6 7.6	7.6		1.3 1.4	1.3		4.1 4.0	4.1	
				Bottom	7.1	19.2 19.2	19.2	8.1 8.1	8.1	34.6 34.6	34.6	100.0 99.5	99.8	7.5 7.5	7.5	7.5	1.6 1.5	1.6		4.1 4.3	4.2	
M1	Cloudy	Calm	11:24	Surface	1.0	19.2 19.2	19.2	8.1 8.1	8.1	34.5 34.5	34.5	100.1 100.0	100.1	7.5 7.5	7.5	7.5	1.8 1.8	1.8	1.8	9.5 10.3	9.9	8.1
				Middle	3.0	19.2 19.2	19.2	8.1 8.1	8.1	34.5 34.5	34.5	99.8 99.9	99.9	7.5 7.5	7.5		1.9 2.0	1.9		7.4 7.0	7.2	
				Bottom	4.9	19.2 19.2	19.2	8.1 8.1	8.1	34.5 34.5	34.5	99.7 99.7	99.7	7.5 7.5	7.5	7.5	1.7 1.7	1.7		7.2 6.9	7.1	
M2	Cloudy	Calm	11:14	Surface	1.0	19.2 19.2	19.2	8.1 8.1	8.1	34.5 34.5	34.5	103.0 102.4	102.7	7.8 7.7	7.7	7.7	1.1 1.2	1.2	1.5	13.8 13.5	13.7	7.7
				Middle	6.1	19.1 19.1	19.1	8.1 8.1	8.1	34.5 34.6	34.5	101.7 101.3	101.5	7.7 7.6	7.7		1.3 1.0	1.1		4.6 4.6	4.6	
				Bottom	11.5	19.1 19.1	19.1	8.1 8.1	8.1	34.6 34.6	34.6	98.8 98.7	98.8	7.5 7.4	7.4	7.4	2.2 2.2	2.2		5.0 4.8	4.9	
M3	Cloudy	Calm	11:41	Surface	1.0	19.3 19.2	19.2	8.1 8.1	8.1	34.4 34.5	34.4	98.0 97.3	97.7	7.4 7.3	7.3	7.3	1.9 2.0	2.0	1.9	8.8 9.2	9.0	8.8
				Middle	4.0	19.2 19.2	19.2	8.1 8.1	8.1	34.5 34.5	34.5	96.7 97.2	97.0	7.3 7.3	7.3		1.9 1.9	1.9		11.1 11.1	11.1	
				Bottom	6.9	19.2 19.2	19.2	8.1 8.1	8.1	34.6 34.6	34.6	97.8 96.9	97.4	7.4 7.3	7.3	7.3	1.8 1.8	1.8		6.2 6.5	6.4	
M4	Cloudy	Calm	11:08	Surface	1.0	19.2 19.2	19.2	8.1 8.1	8.1	34.5 34.5	34.5	101.8 102.3	102.1	7.7 7.7	7.7	7.7	0.8 0.8	0.8	1.0	6.1 6.2	6.2	5.5
				Middle	5.0	19.1 19.1	19.1	8.1 8.1	8.1	34.6 34.6	34.6	100.8 101.0	100.9	7.6 7.6	7.6		1.0 1.1	1.1		4.8 5.0	4.9	
				Bottom	9.0	19.1 19.1	19.1	8.1 8.1	8.1	34.6 34.6	34.6	100.2 100.3	100.3	7.6 7.6	7.6	7.6	1.2 1.2	1.2		5.6 5.5	5.6	
M5	Cloudy	Calm	11:55	Surface	1.0	19.2 19.2	19.2	8.1 8.1	8.1	34.6 34.6	34.6	102.6 102.5	102.6	7.7 7.7	7.7	7.7	1.0 1.0	1.0	1.4	4.8 4.8	4.8	6.2
				Middle	6.0	19.1 19.1	19.1	8.1 8.1	8.1	34.6 34.6	34.6	100.6 101.3	101.0	7.6 7.6	7.6		1.4 1.3	1.4		6.5 6.7	6.6	
				Bottom	11.0	19.1 19.1	19.1	8.1 8.1	8.1	34.6 34.6	34.6	100.0 100.2	100.1	7.5 7.6	7.6	7.6	1.9 1.9	1.9		7.0 7.1	7.1	
M6	Cloudy	Calm	11:50	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	7.5	- -	-	1.0	- -	-	3.3
				Middle	2.2	19.2 19.2	19.2	8.1 8.1	8.1	34.6 34.6	34.6	99.8 99.8	99.8	7.5 7.5	7.5		1.0 1.0	1.0		3.3 3.3	3.3	
				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 4 March 2020 (Mid-Flood Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU*** or 120% of upstream control station's Turbidity at the same tide of the same day ***C1: 0.8 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C1: 0.9 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 5.2 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 5.7 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 5.2 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 5.7 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 6.1 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 6.6 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 06 March 2020

(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	9:36	Surface	1.1	21.2 21.2	21.2	8.5 8.5	8.5	32.6 32.5	32.5	101.1 101.4	101.3	7.0 7.0	7.0	6.9	1.5 1.5	1.5	1.4	4.5 4.7	4.6	7.2
				Middle	9.1	21.0 21.0	21.0	8.5 8.5	8.5	32.6 32.6	32.6	100.3 100.4	100.4	6.9 6.9	6.9		1.0 1.0	1.0		9.1 9.0	9.1	
				Bottom	17.1	20.8 20.8	20.8	8.5 8.5	8.5	32.9 32.9	32.9	96.3 96.3	96.3	6.7 6.7	6.7	6.7	1.6 1.6	1.6		7.8 7.8	7.8	
C2	Cloudy	Moderate	8:03	Surface	1.1	21.3 21.3	21.3	8.4 8.4	8.4	32.5 32.5	32.5	103.0 103.0	103.0	7.1 7.1	7.1	6.9	0.4 0.4	0.4	1.3	9.4 9.5	9.5	7.7
				Middle	16.0	20.8 20.8	20.8	8.4 8.4	8.4	32.8 32.8	32.8	97.5 97.7	97.6	6.7 6.8	6.7		1.0 1.0	1.0		7.8 7.6	7.7	
				Bottom	31.1	20.8 20.8	20.8	8.5 8.5	8.5	32.8 32.8	32.8	95.9 96.0	96.0	6.6 6.6	6.6	6.6	2.8 2.3	2.6		6.0 5.6	5.8	
G1	Cloudy	Moderate	8:44	Surface	1.1	21.3 21.3	21.3	8.5 8.5	8.5	32.5 32.5	32.5	101.8 102.0	101.9	7.0 7.0	7.0	7.0	1.3 1.3	1.3	1.0	7.4 7.9	7.7	6.2
				Middle	4.1	21.2 21.2	21.2	8.5 8.5	8.5	32.6 32.6	32.6	101.9 101.9	101.9	7.0 7.0	7.0		0.8 0.8	0.8		4.1 4.3	4.2	
				Bottom	7.1	21.2 21.2	21.2	8.5 8.5	8.5	32.6 32.6	32.6	101.7 101.7	101.7	7.0 7.0	7.0	7.0	0.8 0.8	0.8		6.8 6.9	6.9	
G2	Cloudy	Moderate	8:24	Surface	1.1	21.3 21.3	21.3	8.5 8.5	8.5	32.5 32.5	32.5	102.4 102.4	102.4	7.0 7.0	7.0	7.0	1.7 1.7	1.7	1.1	3.0 3.0	3.0	4.5
				Middle	5.1	21.1 21.1	21.1	8.5 8.5	8.5	32.6 32.6	32.6	100.9 100.9	100.9	6.9 6.9	6.9		0.9 1.0	1.0		4.6 4.6	4.6	
				Bottom	9.2	21.0 21.0	21.0	8.5 8.5	8.5	32.7 32.7	32.7	100.0 99.7	99.9	6.9 6.9	6.9	6.9	0.6 0.7	0.6		5.8 5.7	5.8	
G3	Cloudy	Moderate	8:51	Surface	1.0	21.2 21.2	21.2	8.5 8.5	8.5	32.5 32.5	32.5	102.1 102.1	102.1	7.0 7.0	7.0	7.0	1.0 1.0	1.0	0.9	5.3 5.3	5.3	7.4
				Middle	4.1	21.2 21.2	21.2	8.5 8.5	8.5	32.6 32.6	32.6	101.8 101.9	101.9	7.0 7.0	7.0		0.8 0.8	0.8		12.5 12.5	12.5	
				Bottom	7.1	21.2 21.2	21.2	8.5 8.5	8.5	32.6 32.6	32.6	101.5 101.5	101.5	7.0 7.0	7.0	7.0	1.0 1.1	1.1		4.4 4.6	4.5	
G4	Cloudy	Moderate	9:06	Surface	1.1	21.3 21.3	21.3	8.5 8.5	8.5	32.5 32.5	32.5	102.3 102.3	102.3	7.0 7.0	7.0	7.0	1.1 1.2	1.1	0.9	6.1 6.1	6.1	13.5
				Middle	4.1	21.2 21.2	21.2	8.5 8.5	8.5	32.5 32.5	32.5	102.1 102.2	102.2	7.0 7.0	7.0		0.8 0.8	0.8		7.9 8.1	8.0	
				Bottom	7.1	21.2 21.2	21.2	8.5 8.5	8.5	32.6 32.6	32.6	101.6 101.5	101.6	7.0 7.0	7.0	7.0	0.7 0.7	0.7		26.0 26.7	26.4	
M1	Cloudy	Moderate	8:31	Surface	1.1	21.3 21.3	21.3	8.5 8.5	8.5	32.5 32.5	32.5	102.6 102.6	102.6	7.0 7.0	7.0	7.0	1.4 1.4	1.4	1.1	6.0 6.4	6.2	6.9
				Middle	3.1	21.3 21.3	21.3	8.5 8.5	8.5	32.5 32.5	32.5	102.5 102.5	102.5	7.0 7.0	7.0		1.3 1.4	1.4		5.4 5.3	5.4	
				Bottom	5.1	21.2 21.2	21.2	8.5 8.5	8.5	32.6 32.6	32.6	101.9 101.9	101.9	7.0 7.0	7.0	7.0	0.5 0.5	0.5		9.4 8.8	9.1	
M2	Cloudy	Moderate	8:17	Surface	1.1	21.3 21.3	21.3	8.5 8.5	8.5	32.5 32.5	32.5	102.5 102.5	102.5	7.0 7.0	7.0	7.0	1.4 1.4	1.4	1.5	6.8 6.8	6.8	6.7
				Middle	6.2	21.1 21.1	21.1	8.5 8.5	8.5	32.6 32.6	32.6	101.1 101.2	101.2	7.0 7.0	7.0		1.4 1.4	1.4		7.6 7.9	7.8	
				Bottom	11.1	20.9 20.9	20.9	8.5 8.5	8.5	32.8 32.8	32.8	98.3 98.2	98.3	6.8 6.8	6.8	6.8	1.7 1.7	1.7		5.4 5.8	5.6	
M3	Cloudy	Moderate	9:00	Surface	1.1	21.2 21.3	21.3	8.5 8.5	8.5	32.5 32.5	32.5	102.2 102.2	102.2	7.0 7.0	7.0	7.0	1.5 1.5	1.5	1.2	5.3 5.3	5.3	6.2
				Middle	4.1	21.2 21.2	21.2	8.5 8.5	8.5	32.5 32.5	32.5	102.2 102.3	102.3	7.0 7.0	7.0		1.2 1.3	1.3		3.4 3.5	3.5	
				Bottom	7.1	21.2 21.2	21.2	8.5 8.5	8.5	32.6 32.6	32.6	101.5 101.5	101.5	7.0 7.0	7.0	7.0	0.9 0.8	0.8		9.4 10.2	9.8	
M4	Cloudy	Moderate	8:10	Surface	1.1	21.3 21.3	21.3	8.5 8.5	8.5	32.5 32.5	32.5	102.4 102.4	102.4	7.0 7.0	7.0	7.0	1.5 1.5	1.5	1.3	8.9 8.8	8.9	6.9
				Middle	5.1	21.2 21.2	21.2	8.5 8.5	8.5	32.6 32.6	32.6	101.7 101.8	101.8	7.0 7.0	7.0		1.5 1.6	1.6		4.5 4.3	4.4	
				Bottom	9.1	21.0 21.0	21.0	8.5 8.5	8.5	32.6 32.7	32.6	99.9 99.8	99.9	6.9 6.9	6.9	6.9	1.0 0.9	0.9		7.3 7.7	7.5	
M5	Cloudy	Moderate	9:25	Surface	1.1	21.2 21.2	21.2	8.5 8.5	8.5	32.5 32.5	32.5	102.1 102.1	102.1	7.0 7.0	7.0	7.0	1.3 1.4	1.4	1.1	3.4 3.7	3.6	4.9
				Middle	6.1	21.1 21.1	21.1	8.5 8.5	8.5	32.6 32.6	32.6	101.6 101.6	101.6	7.0 7.0	7.0		0.8 0.8	0.8		5.6 5.7	5.7	
				Bottom	11.1	20.9 20.9	20.9	8.5 8.5	8.5	32.7 32.7	32.7	99.1 99.0	99.1	6.8 6.8	6.8	6.8	1.0 1.0	1.0		5.7 5.4	5.6	
M6	Cloudy	Moderate	9:14	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	7.0	- -	-	1.3	- -	-	5.7
				Middle	2.1	21.2 21.2	21.2	8.5 8.5	8.5	32.5 32.5	32.5	102.2 102.2	102.2	7.0 7.0	7.0		1.3 1.3	1.3		5.6 5.7	5.7	
				Bottom	-	- -	-	- -	-	- -	-	- -	-	- -	-	-	- -	-		- -	-	

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

Appendix I - Action and Limit Levels for Marine Water Quality on 6 March 2020 (Mid-Flood Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU*** or 120% of upstream control station's Turbidity at the same tide of the same day ***C1: 1.9 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C1: 2.1 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 5.5 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 6.0 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 5.5 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 6.0 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 9.4 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 10.1 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 09 March 2020

(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	12:59	Surface	1.0	19.2 19.1	19.2	8.4 8.5	8.4	31.7 31.9	31.8	91.0 88.0	89.5	7.0 6.7	6.8	6.8	2.3 2.7	2.5	3.1	5.5 5.2	5.4	5.2
				Middle	8.9	19.0 19.0	19.0	8.5 8.5	8.5	32.6 32.5	32.5	87.8 87.4	87.6	6.7 6.7	6.7		3.4 3.2	3.3		4.8 4.7	4.8	
				Bottom	17.0	18.7 18.4	18.6	8.5 8.5	8.5	33.5 34.4	34.0	88.2 88.1	88.2	6.8 6.7	6.7	6.7	3.4 3.7	3.5		5.5 5.2	5.4	
C2	Sunny	Calm	12:02	Surface	1.0	19.5 19.4	19.4	8.6 8.6	8.6	30.8 30.8	30.8	91.5 88.5	90.0	7.0 6.8	6.9	6.8	3.0 3.2	3.1	4.7	9.3 9.1	9.2	7.4
				Middle	15.9	18.9 18.8	18.8	8.6 8.6	8.6	32.9 33.1	33.0	86.8 87.6	87.2	6.7 6.7	6.7		5.4 5.3	5.4		4.3 4.2	4.3	
				Bottom	31.0	18.8 18.8	18.8	8.6 8.6	8.6	33.1 33.1	33.1	87.2 87.6	87.4	6.7 6.7	6.7	6.7	5.6 5.5	5.5		8.6 8.6	8.6	
G1	Sunny	Calm	12:28	Surface	0.9	19.1 19.1	19.1	8.5 8.5	8.5	32.2 32.4	32.3	100.3 96.6	98.5	7.6 7.3	7.4	7.4	1.7 1.9	1.8	1.8	7.0 6.8	6.9	6.9
				Middle	3.9	19.1 19.1	19.1	8.5 8.5	8.5	32.6 32.6	32.6	95.7 97.0	96.4	7.3 7.3	7.3		1.5 1.8	1.6		8.9 8.4	8.7	
				Bottom	7.0	19.0 19.0	19.0	8.5 8.5	8.5	33.0 32.8	32.9	94.7 95.2	95.0	7.2 7.2	7.2	7.2	1.8 2.1	2.0		5.3 5.2	5.3	
G2	Sunny	Calm	12:19	Surface	1.0	19.2 19.1	19.1	8.6 8.6	8.6	32.6 32.8	32.7	98.9 94.4	96.7	7.5 7.2	7.3	7.3	2.4 2.3	2.4	2.3	6.8 7.0	6.9	6.0
				Middle	5.0	19.1 19.0	19.0	8.6 8.6	8.6	32.8 33.0	32.9	96.4 93.7	95.1	7.3 7.1	7.2		2.3 2.2	2.2		7.3 7.5	7.4	
				Bottom	9.0	18.9 18.9	18.9	8.6 8.5	8.5	33.2 33.3	33.2	93.7 92.6	93.2	7.1 7.0	7.1	7.1	2.6 2.3	2.4		3.7 3.7	3.7	
G3	Sunny	Calm	12:31	Surface	1.0	19.4 19.0	19.2	8.5 8.5	8.5	31.3 31.6	31.5	99.9 96.7	98.3	7.5 7.4	7.5	7.4	1.8 2.1	1.9	1.6	7.7 7.9	7.8	7.4
				Middle	4.0	19.0 19.0	19.0	8.5 8.5	8.5	32.7 32.8	32.7	98.7 96.8	97.8	7.5 7.3	7.4		1.2 1.2	1.2		7.8 8.3	8.1	
				Bottom	7.0	18.9 18.9	18.9	8.5 8.5	8.5	33.1 33.0	33.1	91.1 90.6	90.9	6.9 6.9	6.9	6.9	1.7 1.6	1.6		6.4 6.1	6.3	
G4	Sunny	Calm	12:43	Surface	1.0	19.0 19.3	19.2	8.3 8.3	8.3	32.2 31.2	31.7	98.7 100.7	99.7	7.5 7.6	7.5	7.4	2.9 2.4	2.7	2.9	4.0 4.1	4.1	5.7
				Middle	4.5	19.0 19.0	19.0	8.3 8.3	8.3	32.6 32.8	32.7	96.9 96.6	96.8	7.3 7.3	7.3		2.8 2.8	2.8		5.1 5.1	5.1	
				Bottom	7.0	18.9 18.9	18.9	8.3 8.3	8.3	33.1 33.2	33.1	91.8 90.0	90.9	7.0 6.9	6.9	6.9	3.1 3.6	3.3		8.0 8.1	8.1	
M1	Sunny	Calm	12:23	Surface	1.0	19.4 19.0	19.2	8.5 8.5	8.5	31.8 32.8	32.3	99.9 92.3	96.1	7.5 7.0	7.3	7.2	3.1 3.3	3.2	3.2	8.4 8.5	8.5	6.9
				Middle	3.0	19.2 19.1	19.1	8.5 8.5	8.5	32.3 32.6	32.5	96.6 93.1	94.9	7.3 7.1	7.2		3.0 3.0	3.0		5.4 5.6	5.5	
				Bottom	4.9	19.0 19.0	19.0	8.5 8.5	8.5	32.9 32.9	32.9	92.1 91.8	92.0	7.0 7.0	7.0	7.0	3.3 3.7	3.5		6.7 7.0	6.9	
M2	Sunny	Calm	12:15	Surface	0.9	19.3 19.0	19.1	8.7 8.7	8.7	32.4 33.0	32.7	100.4 94.1	97.3	7.6 7.1	7.3	7.3	1.4 1.3	1.3	1.7	5.8 5.6	5.7	5.8
				Middle	6.0	18.9 19.0	19.0	8.7 8.6	8.7	33.1 32.9	33.0	95.3 95.7	95.5	7.2 7.2	7.2		0.7 1.0	0.8		5.8 5.8	5.8	
				Bottom	11.0	18.7 18.7	18.7	8.7 8.6	8.7	33.8 34.0	33.9	92.9 90.8	91.9	7.1 6.9	7.0	7.0	2.6 3.0	2.8		6.0 5.9	6.0	
M3	Sunny	Calm	12:38	Surface	1.0	19.1 19.0	19.0	8.4 8.4	8.4	31.8 32.7	32.2	98.7 95.1	96.9	7.5 7.2	7.3	7.2	3.1 2.8	3.0	2.9	6.9 7.0	7.0	6.6
				Middle	4.0	19.0 19.0	19.0	8.4 8.4	8.4	32.7 32.7	32.7	92.5 90.9	91.7	7.0 6.9	7.0		2.5 2.7	2.6		5.2 5.2	5.2	
				Bottom	7.0	18.9 18.9	18.9	8.4 8.4	8.4	33.0 33.2	33.1	91.7 89.2	90.5	7.0 6.8	6.9	6.9	3.1 3.0	3.0		7.9 7.4	7.7	
M4	Sunny	Calm	12:09	Surface	1.0	19.4 19.1	19.2	8.6 8.6	8.6	31.5 32.0	31.8	93.2 87.4	90.3	7.1 6.7	6.9	6.8	3.9 3.7	3.8	3.8	7.7 7.7	7.7	6.3
				Middle	4.9	19.0 19.0	19.0	8.6 8.7	8.6	32.2 32.4	32.3	87.8 87.6	87.7	6.7 6.7	6.7		3.4 3.8	3.6		5.1 5.3	5.2	
				Bottom	8.9	18.9 19.0	19.0	8.6 8.6	8.6	32.7 32.7	32.7	89.4 89.4	89.4	6.8 6.8	6.8	6.8	4.2 3.9	4.0		6.2 5.7	6.0	
M5	Sunny	Calm	12:54	Surface	1.0	19.3 19.1	19.2	8.4 8.4	8.4	32.0 32.1	32.0	94.3 88.4	91.4	7.2 6.8	7.0	6.9	3.0 2.7	2.9	2.7	7.3 7.4	7.4	7.9
				Middle	6.0	19.1 19.1	19.1	8.4 8.4	8.4	32.1 32.2	32.2	89.9 88.2	89.1	6.9 6.8	6.8		2.8 2.3	2.5		10.3 10.1	10.2	
				Bottom	11.0	19.1 19.1	19.1	8.4 8.4	8.4	32.2 32.2	32.2	88.4 88.2	88.3	6.8 6.8	6.8	6.8	2.5 2.7	2.6		6.1 5.9	6.0	
M6	Sunny	Calm	12:47	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	7.4	- -	-	1.9	- -	-	5.3
				Middle	2.0	19.2 19.0	19.1	8.4 8.4	8.4	31.9 32.7	32.3	100.1 96.9	98.5	7.6 7.3	7.4		1.8 2.0	1.9		5.4 5.1	5.3	
				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 9 March 2020 (Mid-Ebb Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU*** or 120% of upstream control station's Turbidity at the same tide of the same day ***C2: 6.7 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C2: 7.2 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 11.0 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 12.0 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 11.0 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 12.0 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 10.3 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 11.2 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 09 March 2020

(Mid-Flood Tide)

Location	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
C1	Sunny	Calm	17:44	Surface	1.1	19.0 19.0	19.0	8.5 8.5	8.5	32.8 32.8	32.8	97.2 92.9	95.1	7.2 6.9	7.1	7.0	1.8 1.8	1.8	3.4	4.8 4.8	4.8	5.2
				Middle	8.5	18.7 18.8	18.7	8.5 8.5	8.5	33.6 33.4	33.5	93.7 93.0	93.4	7.0 6.9	7.0		1.9 1.9	1.9		3.2 3.2	3.2	
				Bottom	16.1	18.7 18.7	18.7	8.5 8.5	8.5	33.7 33.7	33.7	93.3 92.9	93.1	7.0 6.9	6.9	6.9	6.5 6.5	6.5		7.5 7.9	7.7	
C2	Sunny	Calm	16:43	Surface	1.1	19.0 19.0	19.0	8.6 8.7	8.6	32.0 32.0	32.0	92.2 91.4	91.8	6.9 6.8	6.9	6.9	2.3 2.3	2.3	2.2	5.1 5.5	5.3	5.8
				Middle	16.5	18.7 18.7	18.7	8.6 8.7	8.6	33.8 33.6	33.7	92.4 92.5	92.5	6.9 6.9	6.9		2.1 2.2	2.1		8.0 7.9	8.0	
				Bottom	31.0	18.7 18.6	18.7	8.6 8.7	8.6	33.7 33.9	33.8	92.4 92.2	92.3	6.9 6.9	6.9	6.9	2.1 2.1	2.1		4.3 4.1	4.2	
G1	Sunny	Calm	17:09	Surface	1.0	18.9 18.9	18.9	8.6 8.6	8.6	33.0 33.0	33.0	98.8 97.3	98.1	7.3 7.2	7.3	7.3	1.6 1.7	1.6	1.7	6.1 5.7	5.9	14.0
				Middle	3.7	18.9 18.9	18.9	8.6 8.6	8.6	33.0 33.0	33.0	97.9 97.5	97.7	7.3 7.2	7.2		1.7 1.7	1.7		26.8 26.3	26.6	
				Bottom	6.5	18.9 18.9	18.9	8.6 8.6	8.6	33.1 33.2	33.1	97.0 96.7	96.9	7.2 7.2	7.2	7.2	1.4 1.8	1.6		9.1 9.8	9.5	
G2	Sunny	Calm	16:58	Surface	1.0	18.8 18.8	18.8	8.6 8.7	8.6	33.2 33.3	33.2	103.0 95.9	99.5	7.6 7.1	7.4	7.3	1.8 1.7	1.8	1.5	8.3 8.6	8.5	6.4
				Middle	5.1	18.8 18.8	18.8	8.7 8.6	8.7	33.2 33.3	33.2	98.4 96.6	97.5	7.3 7.2	7.2		1.3 1.3	1.3		4.7 4.5	4.6	
				Bottom	9.0	18.6 18.7	18.7	8.6 8.6	8.6	34.1 33.8	33.9	94.9 94.9	94.9	7.1 7.1	7.1	7.1	1.5 1.5	1.5		6.3 6.2	6.3	
G3	Sunny	Calm	17:14	Surface	1.1	18.9 18.9	18.9	8.5 8.6	8.6	31.9 32.7	32.3	95.9 93.7	94.8	7.2 7.0	7.1	7.0	1.6 1.7	1.7	1.5	5.5 5.6	5.6	5.3
				Middle	3.7	18.9 19.0	18.9	8.6 8.6	8.6	33.1 32.6	32.8	93.8 93.4	93.6	7.0 7.0	7.0		1.3 1.4	1.3		6.0 6.0	6.0	
				Bottom	6.5	18.6 18.9	18.8	8.6 8.5	8.6	34.0 33.1	33.6	93.9 93.0	93.5	7.0 6.9	7.0	7.0	1.4 1.5	1.4		4.2 4.2	4.2	
G4	Sunny	Calm	17:26	Surface	1.1	19.0 18.9	18.9	8.5 8.5	8.5	31.6 32.5	32.0	100.2 95.2	97.7	7.5 7.1	7.3	7.1	1.7 1.7	1.7	1.5	7.2 7.5	7.4	6.4
				Middle	3.7	18.9 18.9	18.9	8.5 8.5	8.5	32.9 33.1	33.0	93.3 92.6	93.0	7.0 6.9	6.9		0.9 1.0	0.9		3.7 3.6	3.7	
				Bottom	6.5	18.8 18.7	18.7	8.5 8.5	8.5	33.6 33.9	33.7	93.0 93.3	93.2	6.9 6.9	6.9	6.9	1.9 2.0	2.0		8.3 8.3	8.3	
M1	Sunny	Calm	17:03	Surface	1.0	19.0 18.9	18.9	8.6 8.6	8.6	32.2 32.9	32.6	98.0 96.2	97.1	7.3 7.2	7.2	7.2	2.0 2.0	2.0	2.1	8.2 8.4	8.3	6.0
				Middle	3.0	18.9 18.9	18.9	8.6 8.6	8.6	32.6 32.8	32.7	97.0 95.9	96.5	7.2 7.1	7.2		2.0 2.1	2.0		5.3 4.8	5.1	
				Bottom	5.0	18.8 18.8	18.8	8.6 8.6	8.6	33.2 33.2	33.2	96.4 96.0	96.2	7.2 7.1	7.2	7.2	2.2 2.2	2.2		4.8 4.7	4.8	
M2	Sunny	Calm	16:53	Surface	1.0	18.8 18.8	18.8	8.6 8.6	8.6	33.3 33.3	33.3	99.3 96.1	97.7	7.4 7.1	7.2	7.2	1.1 1.1	1.1	1.0	4.4 4.1	4.3	8.8
				Middle	5.2	18.6 18.8	18.7	8.6 8.6	8.6	34.1 33.6	33.8	94.9 95.7	95.3	7.1 7.1	7.1		0.9 0.9	0.9		10.1 9.5	9.8	
				Bottom	9.5	18.6 18.6	18.6	8.7 8.7	8.7	34.2 34.2	34.2	94.8 95.0	94.9	7.1 7.1	7.1	7.1	0.9 0.9	0.9		12.3 12.4	12.4	
M3	Sunny	Calm	17:21	Surface	1.0	18.9 18.9	18.9	8.5 8.5	8.5	31.6 33.0	32.3	96.0 93.1	94.6	7.2 6.9	7.1	7.0	1.8 1.8	1.8	1.1	4.8 5.1	5.0	4.8
				Middle	3.7	18.9 18.9	18.9	8.5 8.5	8.5	33.0 32.8	32.9	93.3 92.8	93.1	7.0 6.9	6.9		0.4 0.4	0.4		4.9 4.8	4.9	
				Bottom	6.5	18.7 18.7	18.7	8.5 8.5	8.5	33.9 34.0	34.0	92.7 92.7	92.7	6.9 6.9	6.9	6.9	1.0 1.0	1.0		4.7 4.5	4.6	
M4	Sunny	Calm	16:48	Surface	1.0	18.9 18.8	18.9	8.7 8.7	8.7	32.5 33.2	32.9	92.8 93.4	93.1	6.9 7.0	7.0	7.0	0.7 0.7	0.7	1.2	7.7 8.3	8.0	6.9
				Middle	5.0	18.8 18.8	18.8	8.7 8.7	8.7	33.4 33.3	33.4	93.4 93.2	93.3	7.0 7.0	7.0		1.2 1.2	1.2		8.0 7.9	8.0	
				Bottom	9.0	18.7 18.7	18.7	8.7 8.6	8.6	33.6 33.6	33.6	93.4 94.1	93.8	7.0 7.0	7.0	7.0	1.6 1.6	1.6		4.6 4.8	4.7	
M5	Sunny	Calm	17:38	Surface	1.0	18.9 18.9	18.9	8.5 8.5	8.5	33.0 33.1	33.1	97.3 94.3	95.8	7.2 7.0	7.1	7.1	1.1 1.1	1.1	1.5	5.3 5.8	5.6	6.8
				Middle	5.5	18.8 18.8	18.8	8.5 8.5	8.5	33.1 33.1	33.1	94.6 94.1	94.4	7.0 7.0	7.0		1.5 1.5	1.5		6.5 6.3	6.4	
				Bottom	10.0	18.8 18.8	18.8	8.5 8.5	8.5	33.3 33.3	33.3	93.9 93.7	93.8	7.0 7.0	7.0	7.0	1.7 1.8	1.7		8.2 8.5	8.4	
M6	Sunny	Calm	17:32	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	7.3	- -	-	2.3	- -	-	7.1
				Middle	2.1	18.9 18.9	18.9	8.5 8.5	8.5	32.4 32.4	32.4	99.6 97.9	98.8	7.4 7.3	7.3		2.3 2.3	2.3		7.2 6.9	7.1	
				Bottom	-	- -	-	- -	-	- -	-	- -	-	- -	-	-	- -	-		- -	-	

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

Appendix I - Action and Limit Levels for Marine Water Quality on 9 March 2020 (Mid-Flood Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU*** or 120% of upstream control station's Turbidity at the same tide of the same day ***C1: 7.8 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C1: 8.5 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 5.8 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 6.2 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 5.8 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 6.2 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 9.2 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 10.0 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 11 March 2020

(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	Calm	14:47	Surface	1.1	19.4 19.5	19.5	8.1 8.1	8.1	34.3 34.3	34.3	96.3 96.2	96.3	7.2 7.2	7.2	7.2	1.4 1.5	1.4	1.2	7.8 8.4	8.1	7.4
				Middle	9.1	19.5 19.6	19.5	8.1 8.1	8.1	34.3 34.3	34.3	94.7 94.7	94.7	7.1 7.1	7.1		0.9 0.8	0.9		7.0 7.0	7.0	
				Bottom	17.0	19.5 19.5	19.5	8.1 8.1	8.1	34.3 34.3	34.3	94.4 94.4	94.4	7.1 7.1	7.1	7.1	1.4 1.4	1.4		7.0 7.0	7.0	
C2	Cloudy	Calm	13:06	Surface	1.0	19.6 19.4	19.5	7.8 7.8	7.8	34.3 34.3	34.3	95.3 95.3	95.3	7.2 7.2	7.2	7.1	2.2 2.2	2.2	2.2	7.6 7.7	7.7	7.8
				Middle	16.6	19.4 19.5	19.4	7.9 7.8	7.8	34.3 34.3	34.3	94.4 94.5	94.5	7.1 7.1	7.1		2.2 2.3	2.3		4.7 4.7	4.7	
				Bottom	32.0	19.4 19.4	19.4	7.9 7.9	7.9	34.3 34.3	34.3	94.2 94.1	94.2	7.1 7.1	7.1	7.1	2.3 2.3	2.3		11.0 11.0	11.0	
G1	Cloudy	Calm	13:48	Surface	1.0	20.3 19.5	19.9	8.1 8.1	8.1	34.2 34.2	34.2	99.1 98.8	99.0	7.4 7.4	7.4	7.4	2.0 2.0	2.0	2.3	6.8 7.0	6.9	6.3
				Middle	4.0	19.5 19.5	19.5	8.1 8.1	8.1	34.2 34.2	34.2	97.2 97.4	97.3	7.3 7.3	7.3		2.0 2.0	2.0		5.9 6.1	6.0	
				Bottom	7.1	19.5 19.5	19.5	8.1 8.1	8.1	34.3 34.3	34.3	96.8 96.6	96.7	7.3 7.3	7.3	7.3	2.7 2.9	2.8		6.0 5.8	5.9	
G2	Cloudy	Calm	13:27	Surface	1.1	19.7 19.5	19.6	8.0 8.0	8.0	34.3 34.3	34.3	98.2 97.9	98.1	7.4 7.4	7.4	7.3	0.9 0.9	0.9	1.4	5.0 5.2	5.1	6.7
				Middle	5.0	19.4 19.4	19.4	8.0 8.0	8.0	34.3 34.3	34.3	96.1 96.2	96.2	7.2 7.2	7.2		1.6 1.5	1.5		6.3 6.8	6.6	
				Bottom	9.0	19.4 19.4	19.4	8.0 8.0	8.0	34.4 34.4	34.4	95.6 95.6	95.6	7.2 7.2	7.2	7.2	1.8 1.8	1.8		8.3 8.5	8.4	
G3	Cloudy	Calm	13:54	Surface	1.1	20.5 19.5	20.0	8.1 8.1	8.1	34.1 34.1	34.1	98.6 98.5	98.6	7.4 7.4	7.4	7.4	1.5 1.4	1.5	1.5	6.8 6.8	6.8	8.1
				Middle	4.1	19.5 19.5	19.5	8.1 8.1	8.1	34.2 34.2	34.2	97.2 97.4	97.3	7.3 7.3	7.3		1.3 1.3	1.3		8.7 8.6	8.7	
				Bottom	7.0	19.5 19.5	19.5	8.1 8.1	8.1	34.3 34.3	34.3	95.3 95.2	95.3	7.2 7.2	7.2	7.2	1.8 1.8	1.8		8.8 9.0	8.9	
G4	Cloudy	Calm	14:06	Surface	1.1	19.8 19.5	19.7	8.1 8.1	8.1	34.2 34.2	34.2	97.8 97.7	97.8	7.3 7.3	7.3	7.3	2.4 2.3	2.3	2.1	6.0 6.1	6.1	7.3
				Middle	4.0	19.5 19.5	19.5	8.1 8.1	8.1	34.3 34.3	34.3	97.2 97.3	97.3	7.3 7.3	7.3		1.7 1.9	1.8		7.6 7.5	7.6	
				Bottom	7.0	19.3 19.3	19.3	8.1 8.1	8.1	34.4 34.4	34.4	95.6 95.6	95.6	7.2 7.2	7.2	7.2	2.3 2.2	2.3		8.5 8.3	8.4	
M1	Cloudy	Calm	13:35	Surface	1.0	19.6 19.5	19.6	8.0 8.0	8.0	34.2 34.2	34.2	94.5 94.6	94.6	7.1 7.1	7.1	7.1	3.8 3.7	3.7	2.4	5.8 5.7	5.8	5.8
				Middle	3.1	19.5 19.5	19.5	8.0 8.0	8.0	34.3 34.3	34.3	95.5 95.4	95.5	7.2 7.2	7.2		1.6 1.6	1.6		6.0 5.8	5.9	
				Bottom	5.0	19.5 19.4	19.4	8.0 8.0	8.0	34.3 34.3	34.3	94.8 94.6	94.7	7.1 7.1	7.1	7.1	1.9 1.9	1.9		5.6 5.6	5.6	
M2	Cloudy	Calm	13:21	Surface	1.1	19.6 19.5	19.5	8.0 8.0	8.0	34.3 34.3	34.3	97.9 97.8	97.9	7.4 7.3	7.3	7.3	1.1 1.0	1.1	1.1	6.8 6.9	6.9	6.3
				Middle	5.6	19.5 19.5	19.5	8.0 8.0	8.0	34.3 34.3	34.3	97.6 97.7	97.7	7.3 7.3	7.3		1.0 1.0	1.0		6.1 5.6	5.9	
				Bottom	10.0	19.3 19.4	19.4	8.0 8.0	8.0	34.4 34.4	34.4	96.2 96.1	96.2	7.2 7.2	7.2	7.2	1.3 1.3	1.3		6.3 6.0	6.2	
M3	Cloudy	Calm	14:00	Surface	1.1	19.7 19.6	19.6	8.1 8.1	8.1	34.0 34.0	34.0	98.2 98.6	98.4	7.4 7.4	7.4	7.4	1.3 1.2	1.3	1.3	5.2 5.4	5.3	5.4
				Middle	4.1	19.5 19.5	19.5	8.1 8.1	8.1	34.2 34.2	34.2	98.1 98.3	98.2	7.4 7.4	7.4		1.2 1.3	1.2		5.3 5.5	5.4	
				Bottom	7.1	19.4 19.4	19.4	8.1 8.1	8.1	34.3 34.3	34.3	95.4 95.1	95.3	7.2 7.1	7.2	7.2	1.3 1.4	1.3		5.5 5.3	5.4	
M4	Cloudy	Calm	13:14	Surface	1.0	20.2 19.4	19.8	7.9 7.9	7.9	34.3 34.3	34.3	96.4 96.2	96.3	7.2 7.2	7.2	7.2	1.5 1.5	1.5	1.8	8.8 8.2	8.5	7.4
				Middle	5.0	19.4 19.4	19.4	7.9 7.9	7.9	34.3 34.3	34.3	95.0 95.1	95.1	7.1 7.1	7.1		1.9 1.9	1.9		6.2 6.1	6.2	
				Bottom	9.0	19.4 19.4	19.4	7.9 7.9	7.9	34.3 34.3	34.3	94.8 94.7	94.8	7.1 7.1	7.1	7.1	1.9 1.9	1.9		7.4 7.9	7.7	
M5	Cloudy	Calm	14:36	Surface	1.1	19.5 19.5	19.5	8.1 8.1	8.1	34.3 34.3	34.3	96.1 96.0	96.1	7.2 7.2	7.2	7.2	1.6 1.6	1.6	1.6	7.9 7.8	7.9	7.1
				Middle	6.1	19.4 19.7	19.6	8.1 8.1	8.1	34.4 34.4	34.4	95.4 95.5	95.5	7.2 7.2	7.2		1.7 1.6	1.7		7.7 7.4	7.6	
				Bottom	11.0	19.3 19.3	19.3	8.1 8.1	8.1	34.4 34.4	34.4	95.6 95.7	95.7	7.2 7.2	7.2	7.2	1.7 1.6	1.7		5.9 5.8	5.9	
M6	Cloudy	Calm	14:18	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	7.0	- -	-	2.8	- -	-	6.4
				Middle	2.2	20.0 19.5	19.7	8.1 8.1	8.1	34.2 34.3	34.2	93.5 93.4	93.5	7.0 7.0	7.0		2.8 2.8	2.8		6.4 6.3	6.4	
				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 11 March 2020 (Mid-Ebb Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU*** or 120% of upstream control station's Turbidity at the same tide of the same day ***C2: 2.8 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C2: 3.0 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 9.2 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 9.9 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 9.2 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 9.9 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 0.0 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 0.0 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 11 March 2020

(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	Calm	9:21	Surface	1.1	19.4 19.4	19.4	8.1 8.1	8.1	34.3 34.3	34.3	96.0 95.8	95.9	7.2 7.2	7.2	7.2	1.5 1.5	1.5	1.2	5.3 5.4	5.4	6.1
				Middle	8.5	19.4 19.4	19.4	8.1 8.1	8.1	34.3 34.3	34.3	94.7 94.8	94.8	7.1 7.1	7.1		0.8 0.8	0.8		7.2 6.7	7.0	
				Bottom	16.0	19.4 19.4	19.4	8.1 8.1	8.1	34.3 34.3	34.3	94.4 94.4	94.4	7.1 7.1	7.1	7.1	1.4 1.3	1.4		6.1 6.1	6.1	
C2	Cloudy	Calm	7:50	Surface	1.0	19.4 19.4	19.4	7.8 7.8	7.8	34.3 34.3	34.3	95.5 95.4	95.5	7.2 7.2	7.2	7.1	2.2 2.1	2.1	2.2	8.2 8.5	8.4	7.3
				Middle	16.0	19.4 19.4	19.4	7.9 7.9	7.9	34.3 34.3	34.3	94.3 94.4	94.4	7.1 7.1	7.1		2.2 2.2	2.2		8.2 8.1	8.2	
				Bottom	31.1	19.4 19.4	19.4	7.9 7.9	7.9	34.3 34.3	34.3	94.2 94.2	94.2	7.1 7.1	7.1	7.1	2.3 2.3	2.3		5.5 5.4	5.5	
G1	Cloudy	Calm	8:29	Surface	1.1	19.5 19.5	19.5	8.1 8.1	8.1	34.2 34.2	34.2	98.7 98.5	98.6	7.4 7.4	7.4	7.4	2.0 2.0	2.0	2.4	4.3 4.3	4.3	5.3
				Middle	3.8	19.5 19.5	19.5	8.1 8.1	8.1	34.2 34.2	34.2	97.5 97.6	97.6	7.3 7.3	7.3		2.0 2.0	2.0		6.0 5.9	6.0	
				Bottom	6.6	19.4 19.4	19.4	8.1 8.1	8.1	34.3 34.3	34.3	96.5 96.4	96.5	7.3 7.2	7.2	7.2	3.1 3.2	3.1		5.6 5.7	5.7	
G2	Cloudy	Calm	8:10	Surface	1.1	19.4 19.4	19.4	8.0 8.0	8.0	34.3 34.3	34.3	97.6 97.5	97.6	7.3 7.3	7.3	7.3	0.9 0.9	0.9	1.4	5.6 5.6	5.6	5.2
				Middle	5.1	19.4 19.4	19.4	8.0 8.0	8.0	34.3 34.3	34.3	96.3 96.5	96.4	7.2 7.3	7.2		1.4 1.4	1.4		3.9 4.0	4.0	
				Bottom	9.1	19.3 19.3	19.3	8.0 8.0	8.0	34.4 34.4	34.4	95.5 95.4	95.5	7.2 7.2	7.2	7.2	1.8 1.8	1.8		6.1 5.9	6.0	
G3	Cloudy	Calm	8:36	Surface	1.1	19.5 19.5	19.5	8.1 8.1	8.1	34.1 34.1	34.1	98.7 98.7	98.7	7.4 7.4	7.4	7.3	1.6 1.5	1.6	1.5	5.5 5.1	5.3	5.5
				Middle	3.8	19.4 19.4	19.4	8.1 8.1	8.1	34.2 34.2	34.2	96.8 97.0	96.9	7.3 7.3	7.3		1.3 1.3	1.3		7.0 7.3	7.2	
				Bottom	6.6	19.4 19.4	19.4	8.1 8.1	8.1	34.3 34.3	34.3	95.6 95.5	95.6	7.2 7.2	7.2	7.2	1.7 1.7	1.7		4.0 4.0	4.0	
G4	Cloudy	Calm	8:52	Surface	1.0	19.5 19.5	19.5	8.1 8.1	8.1	34.2 34.2	34.2	98.0 97.9	98.0	7.4 7.3	7.3	7.3	2.5 2.4	2.5	2.1	6.5 6.5	6.5	6.4
				Middle	3.8	19.4 19.4	19.4	8.1 8.1	8.1	34.3 34.3	34.3	96.8 97.0	96.9	7.3 7.3	7.3		1.5 1.6	1.5		6.6 6.8	6.7	
				Bottom	6.6	19.3 19.3	19.3	8.1 8.1	8.1	34.4 34.4	34.4	95.5 95.5	95.5	7.2 7.2	7.2	7.2	2.3 2.3	2.3		5.9 6.0	6.0	
M1	Cloudy	Calm	8:18	Surface	1.0	19.4 19.4	19.4	8.0 8.0	8.0	34.2 34.2	34.2	94.1 94.3	94.2	7.1 7.1	7.1	7.1	3.9 3.9	3.9	2.4	8.9 9.0	9.0	7.5
				Middle	3.1	19.4 19.4	19.4	8.0 8.0	8.0	34.3 34.3	34.3	95.6 95.5	95.6	7.2 7.2	7.2		1.6 1.6	1.6		6.6 6.7	6.7	
				Bottom	5.0	19.4 19.4	19.4	8.0 8.0	8.0	34.3 34.3	34.3	95.1 95.0	95.1	7.1 7.1	7.1	7.1	1.8 1.8	1.8		7.0 6.8	6.9	
M2	Cloudy	Calm	8:04	Surface	1.1	19.4 19.4	19.4	8.0 8.0	8.0	34.3 34.3	34.3	98.1 98.0	98.1	7.4 7.4	7.4	7.3	1.0 1.0	1.0	1.1	5.6 5.6	5.6	7.4
				Middle	5.2	19.4 19.4	19.4	8.0 8.0	8.0	34.3 34.3	34.3	97.4 97.5	97.5	7.3 7.3	7.3		1.0 1.0	1.0		7.0 7.2	7.1	
				Bottom	9.5	19.4 19.3	19.3	8.0 8.0	8.0	34.4 34.4	34.4	96.6 96.4	96.5	7.3 7.2	7.3	7.3	1.2 1.3	1.2		9.5 9.5	9.5	
M3	Cloudy	Calm	8:44	Surface	1.1	19.5 19.5	19.5	8.1 8.1	8.1	34.0 34.0	34.0	98.8 99.0	98.9	7.4 7.4	7.4	7.4	1.2 1.2	1.2	1.3	6.4 6.3	6.4	6.0
				Middle	3.8	19.5 19.5	19.5	8.1 8.1	8.1	34.2 34.2	34.2	98.5 98.7	98.6	7.4 7.4	7.4		1.3 1.3	1.3		6.1 6.4	6.3	
				Bottom	6.6	19.4 19.4	19.4	8.1 8.1	8.1	34.3 34.3	34.3	94.7 94.3	94.5	7.1 7.1	7.1	7.1	1.4 1.4	1.4		5.3 5.5	5.4	
M4	Cloudy	Calm	7:58	Surface	1.0	19.4 19.4	19.4	7.9 7.9	7.9	34.3 34.3	34.3	96.0 95.8	95.9	7.2 7.2	7.2	7.2	1.5 1.7	1.6	1.8	9.0 9.2	9.1	8.1
				Middle	5.0	19.4 19.4	19.4	7.9 7.9	7.9	34.3 34.3	34.3	95.2 95.2	95.2	7.2 7.2	7.2		1.9 1.9	1.9		10.4 10.5	10.5	
				Bottom	9.1	19.4 19.4	19.4	7.9 7.9	7.9	34.3 34.3	34.3	94.7 94.7	94.7	7.1 7.1	7.1	7.1	1.8 1.8	1.8		4.7 4.6	4.7	
M5	Cloudy	Calm	9:10	Surface	1.1	19.4 19.4	19.4	8.1 8.1	8.1	34.3 34.3	34.3	96.6 96.3	96.5	7.3 7.2	7.2	7.2	1.7 1.7	1.7	1.7	5.4 5.6	5.5	8.0
				Middle	5.5	19.4 19.4	19.4	8.1 8.1	8.1	34.4 34.4	34.4	95.3 95.4	95.4	7.2 7.2	7.2		1.8 1.8	1.8		11.3 11.4	11.4	
				Bottom	10.1	19.3 19.3	19.3	8.1 8.1	8.1	34.4 34.4	34.4	95.5 95.5	95.5	7.2 7.2	7.2	7.2	1.8 1.8	1.8		6.8 7.3	7.1	
M6	Cloudy	Calm	9:01	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	7.0	- -	-	3.0	- -	-	12.8
				Middle	2.0	19.5 19.4	19.4	8.1 8.1	8.1	34.3 34.3	34.3	93.3 93.1	93.2	7.0 7.0	7.0		2.9 3.0	3.0		12.8 12.7	12.8	
				Bottom	-	- -	-	- -	-	- -	-	- -	-	- -	-	-	- -	-		- -	-	

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

Appendix I - Action and Limit Levels for Marine Water Quality on 11 March 2020 (Mid-Flood Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU*** or 120% of upstream control station's Turbidity at the same tide of the same day ***C1: 1.6 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C1: 1.8 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 6.4 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 7.0 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 6.4 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 7.0 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 7.3 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 7.9 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 13 March 2020

(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	15:11	Surface	1.1	20.9 20.9	20.9	8.5 8.5	8.5	32.4 32.4	32.4	95.1 95.8	95.5	7.1 7.1	7.1	7.0	1.1 1.1	1.1	1.4	3.5 3.6	3.6	5.3
				Middle	9.1	20.8 20.8	20.8	8.5 8.5	8.5	32.5 32.5	32.5	93.3 93.4	93.4	7.0 7.0	7.0		1.4 1.5	1.4		5.8 5.7	5.8	
				Bottom	17.1	20.8 20.8	20.8	8.5 8.5	8.5	32.5 32.5	32.5	91.5 91.6	91.6	6.8 6.8	6.8	6.8	1.7 1.4	1.6		6.6 6.3	6.5	
C2	Cloudy	Moderate	14:09	Surface	1.1	20.9 20.9	20.9	8.5 8.5	8.5	32.3 32.3	32.3	94.8 95.0	94.9	7.1 7.1	7.1	7.0	0.9 1.1	1.0	1.4	5.2 5.1	5.2	5.3
				Middle	16.1	20.8 20.8	20.8	8.5 8.5	8.5	32.2 32.2	32.2	91.9 91.8	91.9	6.9 6.9	6.9		1.6 1.4	1.5		3.7 3.5	3.6	
				Bottom	31.1	20.8 20.8	20.8	8.5 8.5	8.5	32.1 32.2	32.1	91.4 91.5	91.5	6.8 6.9	6.8	6.8	1.6 1.5	1.6		7.1 7.4	7.3	
G1	Cloudy	Moderate	14:35	Surface	1.1	20.8 20.8	20.8	8.5 8.5	8.5	32.7 32.7	32.7	94.5 94.3	94.4	7.1 7.0	7.0	7.0	1.8 1.6	1.7	1.9	6.6 7.1	6.9	6.1
				Middle	4.1	20.8 20.8	20.8	8.5 8.5	8.5	32.7 32.7	32.7	93.4 93.4	93.4	7.0 7.0	7.0		2.3 2.0	2.2		4.6 4.8	4.7	
				Bottom	7.1	20.8 20.8	20.8	8.5 8.5	8.5	32.8 32.8	32.8	92.9 92.8	92.9	6.9 6.9	6.9	6.9	1.7 2.2	2.0		6.5 6.8	6.7	
G2	Cloudy	Moderate	14:24	Surface	1.1	20.8 20.8	20.8	8.5 8.5	8.5	32.7 32.7	32.7	96.2 96.1	96.2	7.2 7.2	7.2	7.1	1.0 0.9	1.0	1.5	7.0 7.0	7.0	7.3
				Middle	5.1	20.8 20.8	20.8	8.5 8.5	8.5	32.7 32.7	32.7	95.0 95.3	95.2	7.1 7.1	7.1		1.4 1.7	1.5		6.0 6.0	6.0	
				Bottom	9.1	20.7 20.7	20.7	8.5 8.5	8.5	32.7 32.7	32.7	92.6 93.0	92.8	6.9 7.0	6.9	6.9	2.0 2.2	2.1		8.8 8.9	8.9	
G3	Cloudy	Moderate	14:40	Surface	1.1	20.7 20.7	20.7	8.5 8.5	8.5	32.6 32.6	32.6	93.8 93.7	93.8	7.0 7.0	7.0	6.9	0.9 0.8	0.8	1.5	5.8 5.9	5.9	11.1
				Middle	4.0	20.7 20.7	20.7	8.5 8.5	8.5	32.7 32.7	32.7	91.9 92.0	92.0	6.9 6.9	6.9		1.4 1.5	1.5		8.9 9.0	9.0	
				Bottom	7.1	20.7 20.7	20.7	8.5 8.5	8.5	32.8 32.8	32.8	91.9 91.8	91.9	6.9 6.9	6.9	6.9	2.2 2.1	2.1		18.1 18.9	18.5	
G4	Cloudy	Moderate	14:52	Surface	1.1	20.9 20.9	20.9	8.5 8.6	8.6	32.8 32.8	32.8	94.9 94.7	94.8	7.1 7.1	7.1	7.0	0.8 1.0	0.9	1.2	4.2 4.3	4.3	4.8
				Middle	4.2	20.7 20.7	20.7	8.6 8.6	8.6	32.8 32.8	32.8	93.2 93.3	93.3	7.0 7.0	7.0		0.9 1.0	1.0		6.2 5.8	6.0	
				Bottom	7.2	20.6 20.6	20.6	8.6 8.5	8.5	32.8 32.8	32.8	92.1 92.0	92.1	6.9 6.9	6.9	6.9	1.8 1.8	1.8		4.1 4.3	4.2	
M1	Cloudy	Moderate	14:30	Surface	1.1	20.8 20.8	20.8	8.5 8.5	8.5	32.7 32.7	32.7	94.5 94.3	94.4	7.1 7.0	7.0	7.0	1.3 1.3	1.3	1.8	5.3 5.3	5.3	6.2
				Middle	3.0	20.8 20.8	20.8	8.5 8.5	8.5	32.7 32.7	32.7	93.2 92.9	93.1	7.0 6.9	6.9		1.8 1.9	1.8		6.1 6.3	6.2	
				Bottom	5.0	20.8 20.8	20.8	8.5 8.5	8.5	32.7 32.7	32.7	93.2 93.2	93.2	7.0 7.0	7.0	7.0	2.1 2.2	2.1		7.1 7.2	7.2	
M2	Cloudy	Moderate	14:20	Surface	1.1	20.9 20.9	20.9	8.5 8.5	8.5	32.7 32.7	32.7	98.4 98.3	98.4	7.3 7.3	7.3	7.2	0.7 0.7	0.7	1.3	7.3 7.5	7.4	5.9
				Middle	6.1	20.9 20.9	20.9	8.5 8.5	8.5	32.7 32.7	32.7	96.3 96.4	96.4	7.2 7.2	7.2		1.1 1.1	1.1		5.4 5.2	5.3	
				Bottom	11.0	20.8 20.8	20.8	8.5 8.5	8.5	32.7 32.7	32.7	94.4 94.2	94.3	7.0 7.0	7.0	7.0	2.0 2.3	2.2		4.9 4.8	4.9	
M3	Cloudy	Moderate	14:48	Surface	1.1	20.8 20.8	20.8	8.5 8.5	8.5	32.6 32.6	32.6	90.6 92.1	91.4	6.8 6.9	6.8	6.8	1.0 0.9	0.9	1.1	4.1 3.9	4.0	5.6
				Middle	4.1	20.8 20.8	20.8	8.5 8.5	8.5	32.7 32.7	32.7	91.4 91.4	91.4	6.8 6.8	6.8		1.2 1.2	1.2		5.4 5.0	5.2	
				Bottom	7.1	20.7 20.7	20.7	8.5 8.5	8.5	32.8 32.8	32.8	90.7 90.7	90.7	6.8 6.8	6.8	6.8	1.1 1.2	1.2		7.5 7.8	7.7	
M4	Cloudy	Moderate	14:14	Surface	1.0	20.8 20.8	20.8	8.5 8.5	8.5	32.6 32.6	32.6	96.2 96.2	96.2	7.2 7.2	7.2	7.1	1.0 1.2	1.1	1.3	8.6 8.4	8.5	7.6
				Middle	4.9	20.8 20.8	20.8	8.5 8.5	8.5	32.6 32.6	32.6	95.1 95.1	95.1	7.1 7.1	7.1		1.2 1.3	1.2		9.1 9.1	9.1	
				Bottom	9.1	20.8 20.8	20.8	8.5 8.5	8.5	32.6 32.6	32.6	94.8 94.9	94.9	7.1 7.1	7.1	7.1	1.9 1.6	1.8		5.2 5.2	5.2	
M5	Cloudy	Moderate	15:05	Surface	1.0	20.9 20.9	20.9	8.5 8.5	8.5	32.3 32.3	32.3	96.6 95.0	95.8	7.2 7.1	7.2	7.1	0.8 0.9	0.8	1.2	5.9 6.2	6.1	5.7
				Middle	6.1	20.8 20.8	20.8	8.5 8.5	8.5	32.4 32.4	32.4	93.7 93.9	93.8	7.0 7.0	7.0		1.0 1.0	1.0		4.9 4.8	4.9	
				Bottom	11.1	20.8 20.8	20.8	8.5 8.5	8.5	32.4 32.4	32.4	92.8 92.6	92.7	6.9 6.9	6.9	6.9	1.8 1.8	1.8		6.1 6.4	6.3	
M6	Cloudy	Moderate	14:58	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	7.2	- -	-	0.6	- -	-	3.6
				Middle	2.2	20.9 20.9	20.9	8.5 8.5	8.5	32.8 32.8	32.8	96.2 96.2	96.2	7.2 7.2	7.2		0.6 0.6	0.6		3.6 3.5	3.6	
				Bottom	-	- -	-	- -	-	- -	-	- -	-	- -	-	-	- -	-		- -	-	

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

Appendix I - Action and Limit Levels for Marine Water Quality on 13 March 2020 (Mid-Ebb Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU*** or 120% of upstream control station's Turbidity at the same tide of the same day ***C2: 1.9 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C2: 2.0 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 6.2 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 6.7 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 6.2 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 6.7 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 8.7 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 9.4 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

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Water Quality Monitoring Results on 13 March 2020

(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	9:06	Surface	1.1	20.8 20.8	20.8	8.5 8.5	8.5	32.4 32.4	32.4	95.3 95.5	95.4	7.1 7.1	7.1	7.1	1.1 1.0	1.0	1.3	6.9 7.0	7.0	6.3
				Middle	9.1	20.7 20.7	20.7	8.5 8.5	8.5	32.5 32.5	32.5	93.6 93.6	93.6	7.0 7.0	7.0		1.1 1.1	1.1		5.5 5.4	5.5	
				Bottom	17.0	20.7 20.7	20.7	8.5 8.5	8.5	32.5 32.5	32.5	92.2 92.1	92.2	6.9 6.9	6.9	6.9	1.8 2.1	1.9		6.4 6.6	6.5	
C2	Cloudy	Moderate	8:10	Surface	1.1	20.8 20.8	20.8	8.4 8.4	8.4	32.1 30.2	31.1	95.8 95.7	95.8	7.3 7.2	7.2	7.1	1.3 1.4	1.3	1.3	5.2 5.6	5.4	5.9
				Middle	16.1	20.7 20.7	20.7	8.5 8.5	8.5	32.0 32.0	32.0	92.7 92.7	92.7	7.0 7.0	7.0		1.2 1.0	1.1		7.3 7.0	7.2	
				Bottom	31.0	20.7 20.7	20.7	8.5 8.5	8.5	32.1 32.1	32.1	91.9 91.9	91.9	6.9 6.9	6.9	6.9	1.5 1.5	1.5		5.1 5.4	5.3	
G1	Cloudy	Moderate	8:36	Surface	1.1	20.7 20.7	20.7	8.5 8.5	8.5	32.7 32.7	32.7	95.2 95.1	95.2	7.1 7.1	7.1	7.1	1.0 0.9	0.9	1.1	6.6 6.9	6.8	6.4
				Middle	4.1	20.7 20.7	20.7	8.5 8.5	8.5	32.7 32.7	32.7	93.8 93.9	93.9	7.0 7.0	7.0		1.1 1.3	1.2		5.7 5.7	5.7	
				Bottom	7.2	20.7 20.7	20.7	8.5 8.5	8.5	32.8 32.8	32.8	93.5 93.5	93.5	7.0 7.0	7.0	7.0	1.3 1.2	1.3		6.7 6.5	6.6	
G2	Cloudy	Moderate	8:26	Surface	1.1	20.7 20.7	20.7	8.5 8.5	8.5	32.7 32.7	32.7	96.9 96.6	96.8	7.2 7.2	7.2	7.2	0.7 0.8	0.8	0.9	8.6 8.5	8.6	6.8
				Middle	5.1	20.7 20.7	20.7	8.5 8.5	8.5	32.7 32.7	32.7	95.1 95.3	95.2	7.1 7.1	7.1		0.9 0.9	0.9		5.3 5.1	5.2	
				Bottom	9.1	20.6 20.6	20.6	8.5 8.5	8.5	32.7 32.7	32.7	92.4 92.5	92.5	6.9 6.9	6.9	6.9	1.0 0.9	0.9		6.6 6.8	6.7	
G3	Cloudy	Moderate	8:39	Surface	1.0	20.7 20.7	20.7	8.5 8.5	8.5	32.6 32.6	32.6	94.1 93.9	94.0	7.0 7.0	7.0	7.0	0.6 0.7	0.7	0.9	5.5 5.4	5.5	6.0
				Middle	4.1	20.7 20.7	20.7	8.5 8.5	8.5	32.7 32.7	32.7	92.7 92.9	92.8	6.9 6.9	6.9		0.8 0.7	0.7		7.0 6.7	6.9	
				Bottom	7.1	20.6 20.6	20.6	8.5 8.5	8.5	32.8 32.8	32.8	92.2 92.1	92.2	6.9 6.9	6.9	6.9	1.3 1.4	1.3		5.8 5.8	5.8	
G4	Cloudy	Moderate	8:50	Surface	1.0	20.8 20.8	20.8	8.6 8.6	8.6	32.8 32.8	32.8	95.1 95.0	95.1	7.1 7.1	7.1	7.1	0.9 0.9	0.9	1.0	5.5 5.4	5.5	6.1
				Middle	4.2	20.7 20.7	20.7	8.6 8.6	8.6	32.8 32.8	32.8	94.0 94.3	94.2	7.0 7.0	7.0		1.1 1.0	1.1		5.5 5.7	5.6	
				Bottom	7.1	20.5 20.5	20.5	8.5 8.5	8.5	32.8 32.8	32.8	92.3 92.2	92.3	6.9 6.9	6.9	6.9	1.1 0.9	1.0		7.4 7.1	7.3	
M1	Cloudy	Moderate	8:30	Surface	1.1	20.7 20.7	20.7	8.5 8.5	8.5	32.7 32.7	32.7	94.7 94.5	94.6	7.1 7.1	7.1	7.0	0.7 0.8	0.8	0.8	4.4 4.6	4.5	6.2
				Middle	3.0	20.7 20.7	20.7	8.5 8.5	8.5	32.7 32.7	32.7	93.1 92.9	93.0	7.0 6.9	6.9		0.7 0.8	0.8		7.0 6.6	6.8	
				Bottom	5.0	20.7 20.7	20.7	8.5 8.5	8.5	32.7 32.7	32.7	93.5 93.3	93.4	7.0 7.0	7.0	7.0	0.9 0.8	0.8		7.4 7.2	7.3	
M2	Cloudy	Moderate	8:22	Surface	1.1	20.8 20.8	20.8	8.5 8.5	8.5	32.7 32.7	32.7	98.7 98.6	98.7	7.4 7.3	7.3	7.3	0.9 0.8	0.9	1.0	6.5 6.6	6.6	5.9
				Middle	6.1	20.8 20.8	20.8	8.5 8.5	8.5	32.7 32.7	32.7	96.9 96.9	96.9	7.2 7.2	7.2		1.0 1.1	1.0		4.5 4.6	4.6	
				Bottom	11.0	20.7 20.7	20.7	8.5 8.5	8.5	32.7 32.7	32.7	94.7 94.5	94.6	7.1 7.1	7.1	7.1	1.2 1.1	1.2		6.6 6.5	6.6	
M3	Cloudy	Moderate	8:46	Surface	1.1	20.7 20.7	20.7	8.5 8.5	8.5	32.5 32.6	32.5	92.5 92.5	92.5	6.9 6.9	6.9	6.9	0.8 0.9	0.8	1.3	7.2 7.7	7.5	6.9
				Middle	4.1	20.7 20.7	20.7	8.5 8.5	8.5	32.7 32.7	32.7	92.1 92.0	92.1	6.9 6.9	6.9		1.0 1.0	1.0		7.7 7.7	7.7	
				Bottom	7.0	20.7 20.7	20.7	8.5 8.5	8.5	32.8 32.8	32.8	91.4 91.2	91.3	6.8 6.8	6.8	6.8	1.9 2.0	2.0		5.6 5.4	5.5	
M4	Cloudy	Moderate	8:17	Surface	1.0	20.7 20.7	20.7	8.5 8.5	8.5	32.6 32.6	32.6	96.9 96.9	96.9	7.2 7.2	7.2	7.2	0.9 0.9	0.9	1.0	6.4 6.5	6.5	7.4
				Middle	5.0	20.7 20.7	20.7	8.5 8.5	8.5	32.6 32.6	32.6	95.6 95.6	95.6	7.1 7.1	7.1		1.1 1.2	1.2		7.5 7.6	7.6	
				Bottom	9.1	20.7 20.7	20.7	8.5 8.5	8.5	32.6 32.6	32.6	95.3 95.3	95.3	7.1 7.1	7.1	7.1	1.1 0.9	1.0		8.1 8.3	8.2	
M5	Cloudy	Moderate	9:01	Surface	1.1	20.8 20.8	20.8	8.5 8.5	8.5	32.3 32.3	32.3	95.7 95.6	95.7	7.1 7.1	7.1	7.1	0.9 0.8	0.9	1.7	4.8 4.7	4.8	5.6
				Middle	6.1	20.7 20.8	20.8	8.5 8.5	8.5	32.3 32.3	32.3	94.6 94.8	94.7	7.1 7.1	7.1		1.9 1.8	1.9		5.7 5.8	5.8	
				Bottom	11.1	20.7 20.7	20.7	8.5 8.5	8.5	32.4 32.4	32.4	93.9 92.9	93.4	7.0 7.0	7.0	7.0	2.5 2.3	2.4		6.4 6.3	6.4	
M6	Cloudy	Moderate	8:54	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	7.2	- -	-	1.0	- -	-	10.8
				Middle	2.2	20.8 20.8	20.8	8.5 8.5	8.5	32.8 32.8	32.8	96.9 96.8	96.9	7.2 7.2	7.2		1.0 1.0	1.0		10.7 10.9	10.8	
				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 13 March 2020 (Mid-Flood Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU***	***22.2 NTU***
		or 120% of upstream control station's Turbidity at the same tide of the same day ***C1: 2.3 NTU***	or 130% of upstream control station's Turbidity at the same tide of the same day ***C1: 2.5 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L***	***6.9 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C1: 8.3 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C1: 9.0 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L***	***7.4 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C1: 8.3 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C1: 9.0 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L***	***7.9 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C1: 7.8 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C1: 8.5 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 16 March 2020

(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	17:45	Surface	1.1	19.7 19.7	19.7	8.2 8.2	8.2	34.4 34.4	34.4	107.5 107.7	107.6	8.0 8.0	8.0	8.0	0.6 0.5	0.5	0.5	5.4 5.3	5.4	7.0
				Middle	9.1	19.6 19.6	19.6	8.2 8.2	8.2	34.5 34.5	34.5	107.6 107.6	107.6	8.0 8.0	8.0		0.6 0.6	0.6		7.5 7.8	7.7	
				Bottom	17.0	19.5 19.5	19.5	8.2 8.2	8.2	34.5 34.5	34.5	106.9 106.9	106.9	8.0 8.0	8.0		0.5 0.5	0.5		7.9 7.8	7.9	
C2	Sunny	Calm	16:42	Surface	1.0	19.7 19.7	19.7	7.8 7.8	7.8	34.3 34.3	34.3	102.1 102.1	102.1	7.6 7.6	7.6	7.6	2.3 2.2	2.3	1.4	3.9 3.9	3.9	9.7
				Middle	16.1	19.7 19.7	19.7	7.8 7.8	7.8	34.3 34.3	34.3	102.0 102.0	102.0	7.6 7.6	7.6		1.0 1.1	1.0		12.8 12.2	12.5	
				Bottom	31.0	19.5 19.5	19.5	7.8 7.8	7.8	34.3 34.4	34.3	100.5 100.2	100.4	7.5 7.5	7.5	7.5	1.0 1.0	1.0		12.8 12.5	12.7	
G1	Sunny	Calm	17:13	Surface	1.1	20.0 20.0	20.0	8.1 8.1	8.1	34.3 34.3	34.3	106.9 107.4	107.2	7.9 8.0	8.0	7.8	2.7 2.7	2.7	3.5	10.9 11.0	11.0	9.7
				Middle	4.0	19.7 19.7	19.7	8.1 8.1	8.1	34.4 34.4	34.4	103.0 102.8	102.9	7.7 7.7	7.7		2.5 2.4	2.4		7.5 7.6	7.6	
				Bottom	7.0	19.5 19.5	19.5	8.1 8.1	8.1	34.4 34.4	34.4	97.1 96.9	97.0	7.3 7.3	7.3	7.3	5.0 5.5	5.3		10.7 10.5	10.6	
G2	Sunny	Calm	16:57	Surface	1.0	19.7 19.7	19.7	8.1 8.1	8.1	34.3 34.3	34.3	103.3 103.3	103.3	7.7 7.7	7.7	7.7	1.1 1.1	1.1	1.3	6.2 6.0	6.1	8.5
				Middle	5.0	19.6 19.6	19.6	8.1 8.1	8.1	34.4 34.4	34.4	102.6 102.3	102.5	7.7 7.7	7.7		1.1 1.2	1.2		8.5 8.6	8.6	
				Bottom	9.0	19.4 19.4	19.4	8.1 8.1	8.1	34.4 34.4	34.4	97.7 97.7	97.7	7.3 7.3	7.3	7.3	1.7 1.7	1.7		10.8 11.0	10.9	
G3	Sunny	Calm	17:18	Surface	1.1	20.0 20.0	20.0	8.2 8.2	8.2	34.3 34.3	34.3	109.9 110.2	110.1	8.2 8.2	8.2	7.9	1.0 1.1	1.0	1.9	6.4 6.1	6.3	8.7
				Middle	4.1	19.7 19.7	19.7	8.1 8.1	8.1	34.4 34.4	34.4	102.8 102.7	102.8	7.7 7.7	7.7		2.2 2.2	2.2		13.0 13.3	13.2	
				Bottom	7.1	19.5 19.5	19.5	8.1 8.1	8.1	34.4 34.4	34.4	99.1 98.7	98.9	7.4 7.4	7.4	7.4	2.5 2.6	2.6		6.5 6.7	6.6	
G4	Sunny	Calm	17:26	Surface	1.0	19.7 19.7	19.7	8.1 8.1	8.1	34.4 34.4	34.4	100.5 100.5	100.5	7.5 7.5	7.5	7.5	2.1 2.0	2.1	2.0	3.5 3.4	3.5	5.2
				Middle	4.0	19.6 19.6	19.6	8.1 8.1	8.1	34.4 34.4	34.4	99.9 99.9	99.9	7.5 7.5	7.5		1.8 1.7	1.8		6.6 6.8	6.7	
				Bottom	7.1	19.6 19.6	19.6	8.1 8.1	8.1	34.4 34.4	34.4	99.5 99.5	99.5	7.5 7.4	7.4	7.4	2.2 2.3	2.2		5.3 5.3	5.3	
M1	Sunny	Calm	17:06	Surface	1.0	19.9 19.9	19.9	8.1 8.1	8.1	34.3 34.3	34.3	101.8 101.8	101.8	7.6 7.6	7.6	7.5	1.6 1.6	1.6	1.8	3.3 3.3	3.3	5.4
				Middle	3.0	19.6 19.6	19.6	8.1 8.1	8.1	34.3 34.3	34.3	100.3 100.0	100.2	7.5 7.5	7.5		1.6 1.6	1.6		5.4 5.5	5.5	
				Bottom	5.1	19.5 19.5	19.5	8.1 8.1	8.1	34.3 34.4	34.3	98.4 98.5	98.5	7.4 7.4	7.4	7.4	2.1 2.2	2.1		7.5 7.2	7.4	
M2	Sunny	Calm	16:53	Surface	1.0	19.7 19.7	19.7	8.0 8.0	8.0	34.3 34.3	34.3	106.9 106.9	106.9	8.0 8.0	8.0	7.9	1.6 1.6	1.6	1.4	7.9 7.8	7.9	5.9
				Middle	6.0	19.6 19.6	19.6	8.0 8.0	8.0	34.3 34.3	34.3	104.8 104.7	104.8	7.8 7.8	7.8		1.1 1.1	1.1		3.9 3.9	3.9	
				Bottom	11.1	19.5 19.5	19.5	8.0 8.0	8.0	34.4 34.4	34.4	101.8 101.7	101.8	7.6 7.6	7.6	7.6	1.5 1.5	1.5		5.8 5.9	5.9	
M3	Sunny	Calm	17:22	Surface	1.1	20.2 20.2	20.2	8.2 8.2	8.2	34.0 34.0	34.0	108.5 109.3	108.9	8.1 8.1	8.1	7.9	1.4 1.4	1.4	1.5	5.2 5.2	5.2	7.8
				Middle	4.0	19.6 19.6	19.6	8.2 8.2	8.2	34.4 34.4	34.4	102.8 102.6	102.7	7.7 7.7	7.7		1.4 1.4	1.4		7.7 7.5	7.6	
				Bottom	7.1	19.5 19.5	19.5	8.1 8.1	8.1	34.4 34.4	34.4	99.6 99.0	99.3	7.5 7.4	7.4	7.4	1.7 1.8	1.7		10.9 10.4	10.7	
M4	Sunny	Calm	16:48	Surface	1.0	19.5 19.5	19.5	7.9 7.9	7.9	34.4 34.4	34.4	100.4 100.5	100.5	7.5 7.5	7.5	7.5	1.0 0.9	0.9	0.9	12.8 13.0	12.9	10.4
				Middle	5.0	19.5 19.5	19.5	7.9 7.9	7.9	34.4 34.4	34.4	100.4 100.4	100.4	7.5 7.5	7.5		1.0 1.0	1.0		10.9 10.7	10.8	
				Bottom	9.1	19.5 19.5	19.5	8.0 8.0	8.0	34.4 34.4	34.4	100.4 100.4	100.4	7.5 7.5	7.5	7.5	0.8 0.9	0.8		7.5 7.4	7.5	
M5	Sunny	Calm	17:37	Surface	1.2	19.6 19.6	19.6	8.2 8.2	8.2	34.4 34.4	34.4	105.9 105.9	105.9	7.9 7.9	7.9	7.8	1.5 1.5	1.5	1.8	10.7 10.8	10.8	8.5
				Middle	6.0	19.4 19.4	19.4	8.2 8.2	8.2	34.5 34.5	34.5	102.7 102.6	102.7	7.7 7.7	7.7		1.8 1.8	1.8		6.2 6.2	6.2	
				Bottom	11.1	19.4 19.4	19.4	8.2 8.2	8.2	34.5 34.5	34.5	100.8 100.7	100.8	7.6 7.6	7.6	7.6	2.1 2.1	2.1		8.5 8.7	8.6	
M6	Sunny	Calm	17:30	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	7.6	- -	-	3.4	- -	-	3.3
				Middle	2.1	19.6 19.6	19.6	8.1 8.1	8.1	34.4 34.4	34.4	100.9 101.0	101.0	7.6 7.6	7.6		3.5 3.3	3.4		3.3 3.3	3.3	
				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 16 March 2020 (Mid-Ebb Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU***	***22.2 NTU***
		or 120% of upstream control station's Turbidity at the same tide of the same day ***C2: 1.2 NTU***	or 130% of upstream control station's Turbidity at the same tide of the same day ***C2: 1.3 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L***	***6.9 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C2: 4.7 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C2: 5.1 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L***	***7.4 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C2: 4.7 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C2: 5.1 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L***	***7.9 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C2: 15.2 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C2: 16.4 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 16 March 2020

(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	10:25	Surface	1.1	19.7 19.7	19.7	8.2 8.2	8.2	34.4 34.4	34.4	106.9 107.2	107.1	8.0 8.0	8.0	8.0	0.7 0.6	0.6	0.6	5.2 5.2	5.2	5.4
				Middle	9.0	19.6 19.6	19.6	8.2 8.2	8.2	34.5 34.5	34.5	107.6 107.6	107.6	8.0 8.0	8.0		0.6 0.6	0.6		6.0 6.0	6.0	
				Bottom	17.0	19.5 19.5	19.5	8.2 8.2	8.2	34.5 34.5	34.5	107.0 107.0	107.0	8.0 8.0	8.0		0.5 0.5	0.5		5.0 5.1	5.1	
C2	Sunny	Calm	9:10	Surface	1.1	19.7 19.7	19.7	7.8 7.8	7.8	34.3 34.3	34.3	102.1 102.1	102.1	7.6 7.6	7.6	7.6	2.4 2.3	2.4	1.5	7.4 7.8	7.6	7.8
				Middle	16.1	19.7 19.7	19.7	7.8 7.8	7.8	34.3 34.3	34.3	102.1 102.1	102.1	7.6 7.6	7.6		1.2 1.1	1.1		9.7 9.4	9.6	
				Bottom	31.1	19.6 19.6	19.6	7.8 7.8	7.8	34.3 34.3	34.3	101.1 100.8	101.0	7.6 7.6	7.6	7.6	1.0 1.0	1.0		6.3 6.4	6.4	
G1	Sunny	Calm	9:39	Surface	1.1	19.9 19.9	19.9	8.1 8.1	8.1	34.3 34.3	34.3	105.7 106.2	106.0	7.9 7.9	7.9	7.8	2.2 2.4	2.3	2.9	11.4 12.1	11.8	18.4
				Middle	4.1	19.7 19.7	19.7	8.1 8.1	8.1	34.3 34.4	34.3	105.0 104.3	104.7	7.8 7.8	7.8		2.2 2.2	2.2		22.2 22.8	22.5	
				Bottom	7.1	19.6 19.6	19.6	8.1 8.1	8.1	34.4 34.4	34.4	97.8 97.4	97.6	7.3 7.3	7.3	7.3	4.0 4.4	4.2		20.8 21.0	20.9	
G2	Sunny	Calm	9:27	Surface	1.0	19.7 19.7	19.7	8.1 8.1	8.1	34.3 34.3	34.3	103.0 103.2	103.1	7.7 7.7	7.7	7.7	1.1 1.1	1.1	1.3	13.5 13.9	13.7	10.2
				Middle	5.1	19.6 19.6	19.6	8.1 8.1	8.1	34.3 34.4	34.3	103.0 102.8	102.9	7.7 7.7	7.7		1.1 1.1	1.1		4.7 4.9	4.8	
				Bottom	9.0	19.4 19.4	19.4	8.1 8.1	8.1	34.4 34.4	34.4	98.2 98.1	98.2	7.4 7.4	7.4	7.4	1.7 1.7	1.7		11.8 12.6	12.2	
G3	Sunny	Calm	9:46	Surface	1.1	20.0 20.0	20.0	8.2 8.2	8.2	34.3 34.3	34.3	108.9 109.5	109.2	8.1 8.1	8.1	7.9	0.8 0.9	0.8	1.8	5.3 5.5	5.4	7.1
				Middle	4.1	19.7 19.7	19.7	8.2 8.1	8.1	34.4 34.4	34.4	103.5 103.4	103.5	7.7 7.7	7.7		2.3 2.3	2.3		9.5 9.8	9.7	
				Bottom	7.1	19.6 19.5	19.5	8.1 8.1	8.1	34.4 34.4	34.4	100.5 100.0	100.3	7.5 7.5	7.5	7.5	2.4 2.5	2.4		6.4 6.1	6.3	
G4	Sunny	Calm	10:04	Surface	1.0	19.7 19.7	19.7	8.1 8.1	8.1	34.4 34.4	34.4	100.5 100.5	100.5	7.5 7.5	7.5	7.5	2.0 2.0	2.0	2.0	9.5 8.8	9.2	7.5
				Middle	4.0	19.7 19.6	19.6	8.1 8.1	8.1	34.4 34.4	34.4	100.2 99.9	100.1	7.5 7.5	7.5		1.8 1.8	1.8		4.9 4.7	4.8	
				Bottom	7.0	19.6 19.6	19.6	8.1 8.1	8.1	34.4 34.4	34.4	99.6 99.6	99.6	7.5 7.5	7.5	7.5	2.0 2.1	2.1		8.5 8.6	8.6	
M1	Sunny	Calm	9:32	Surface	1.1	20.0 20.0	20.0	8.1 8.1	8.1	34.3 34.3	34.3	101.6 101.7	101.7	7.6 7.6	7.6	7.5	1.7 1.6	1.7	1.7	7.9 8.3	8.1	6.8
				Middle	3.0	19.7 19.6	19.6	8.1 8.1	8.1	34.3 34.3	34.3	100.7 100.5	100.6	7.5 7.5	7.5		1.6 1.6	1.6		5.9 6.1	6.0	
				Bottom	5.1	19.5 19.5	19.5	8.1 8.1	8.1	34.3 34.3	34.3	98.5 98.5	98.5	7.4 7.4	7.4	7.4	1.8 2.0	1.9		6.2 6.3	6.3	
M2	Sunny	Calm	9:20	Surface	1.0	19.7 19.7	19.7	8.0 8.0	8.0	34.3 34.3	34.3	106.3 106.9	106.6	7.9 8.0	8.0	7.9	1.6 1.5	1.6	1.4	7.6 7.2	7.4	7.6
				Middle	6.0	19.6 19.6	19.6	8.0 8.0	8.0	34.3 34.3	34.3	105.0 104.9	105.0	7.9 7.9	7.9		1.1 1.1	1.1		6.2 6.0	6.1	
				Bottom	11.0	19.5 19.5	19.5	8.0 8.0	8.0	34.4 34.4	34.4	102.8 102.4	102.6	7.7 7.7	7.7	7.7	1.4 1.4	1.4		9.6 8.8	9.2	
M3	Sunny	Calm	9:54	Surface	1.1	20.1 20.2	20.1	8.2 8.2	8.2	34.1 34.1	34.1	107.8 108.2	108.0	8.0 8.0	8.0	7.9	1.2 1.3	1.3	1.4	10.1 10.2	10.2	7.6
				Middle	4.1	19.8 19.7	19.8	8.2 8.2	8.2	34.3 34.3	34.3	103.7 103.2	103.5	7.7 7.7	7.7		1.5 1.5	1.5		7.0 7.1	7.1	
				Bottom	7.0	19.6 19.5	19.5	8.1 8.1	8.1	34.4 34.4	34.4	101.5 100.2	100.9	7.6 7.5	7.5	7.5	1.5 1.6	1.6		5.7 5.6	5.7	
M4	Sunny	Calm	9:16	Surface	1.0	19.5 19.5	19.5	7.9 7.9	7.9	34.4 34.4	34.4	100.1 100.2	100.2	7.5 7.5	7.5	7.5	1.0 1.0	1.0	0.9	9.3 9.7	9.5	7.9
				Middle	5.0	19.5 19.5	19.5	7.9 7.9	7.9	34.4 34.4	34.4	100.4 100.4	100.4	7.5 7.5	7.5		1.0 1.0	1.0		6.9 6.9	6.9	
				Bottom	9.0	19.5 19.5	19.5	8.0 8.0	8.0	34.4 34.4	34.4	100.4 100.4	100.4	7.5 7.5	7.5	7.5	0.9 0.8	0.8		7.2 7.5	7.4	
M5	Sunny	Calm	10:17	Surface	1.1	19.6 19.6	19.6	8.2 8.2	8.2	34.4 34.4	34.4	105.5 105.6	105.6	7.9 7.9	7.9	7.8	1.5 1.5	1.5	1.8	5.3 5.3	5.3	8.2
				Middle	6.1	19.4 19.4	19.4	8.2 8.2	8.2	34.5 34.5	34.5	103.7 103.4	103.6	7.8 7.8	7.8		1.9 1.9	1.9		10.5 10.8	10.7	
				Bottom	11.5	19.4 19.4	19.4	8.2 8.2	8.2	34.5 34.5	34.5	101.2 101.0	101.1	7.6 7.6	7.6	7.6	2.1 2.1	2.1		8.7 8.5	8.6	
M6	Sunny	Calm	10:11	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	7.6	- -	-	3.3	- -	-	9.2
				Middle	2.1	19.6 19.6	19.6	8.1 8.1	8.1	34.4 34.4	34.4	101.0 100.9	101.0	7.6 7.6	7.6		3.3 3.4	3.3		9.1 9.3	9.2	
				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 16 March 2020 (Mid-Flood Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU*** or 120% of upstream control station's Turbidity at the same tide of the same day ***C1: 0.6 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C1: 0.7 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 6.2 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 6.8 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 6.2 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 6.8 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 6.1 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 6.6 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 18 March 2020

(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	Moderate	9:21	Surface	1.0	19.7 19.7	19.7	8.1 8.1	8.1	34.4 34.4	34.4	100.1 100.1	100.1	7.5 7.5	7.5	7.5	1.2 1.2	1.2	1.1	7.3 7.1	7.2	7.4
				Middle	9.0	19.7 19.7	19.7	8.1 8.1	8.1	34.5 34.5	34.5	99.3 99.4	99.4	7.5 7.5	7.5		0.8 0.8	0.8		6.9 7.0	7.0	
				Bottom	17.0	19.7 19.7	19.7	8.1 8.2	8.1	34.6 34.6	34.6	98.8 98.7	98.8	7.4 7.4	7.4	7.4	1.2 1.2	1.2		8.1 8.2	8.2	
C2	Rainy	Moderate	7:50	Surface	1.0	19.5 19.5	19.5	7.7 7.9	7.8	34.4 34.4	34.4	100.3 99.3	99.8	7.5 7.4	7.5	7.5	1.1 1.2	1.1	1.0	9.7 9.5	9.6	8.9
				Middle	16.1	19.5 19.5	19.5	7.8 7.9	7.8	34.4 34.4	34.4	99.5 99.3	99.4	7.5 7.4	7.5		0.8 0.9	0.8		5.3 5.1	5.2	
				Bottom	31.1	19.5 19.5	19.5	7.8 7.9	7.9	34.4 34.4	34.4	99.3 99.5	99.4	7.4 7.5	7.4	7.4	1.1 1.1	1.1		12.2 11.5	11.9	
G1	Rainy	Moderate	8:29	Surface	1.1	19.5 19.5	19.5	8.1 8.1	8.1	34.3 34.4	34.3	98.1 98.2	98.2	7.4 7.4	7.4	7.4	1.4 1.4	1.4	2.5	7.9 7.8	7.9	12.7
				Middle	4.0	19.5 19.5	19.5	8.1 8.1	8.1	34.4 34.4	34.4	98.2 98.2	98.2	7.4 7.4	7.4		1.4 1.5	1.5		9.5 9.2	9.4	
				Bottom	7.0	19.4 19.4	19.4	8.2 8.2	8.2	34.5 34.5	34.5	97.6 97.6	97.6	7.3 7.3	7.3	7.3	4.8 4.8	4.8		20.8 20.8	20.8	
G2	Rainy	Moderate	8:10	Surface	1.0	19.5 19.5	19.5	8.1 8.1	8.1	34.4 34.4	34.4	100.1 100.1	100.1	7.5 7.5	7.5	7.5	0.9 0.9	0.9	1.0	28.5 29.1	28.8	13.9
				Middle	5.1	19.4 19.4	19.4	8.2 8.1	8.1	34.5 34.5	34.5	99.3 99.4	99.4	7.5 7.5	7.5		1.1 1.1	1.1		6.3 6.6	6.5	
				Bottom	9.0	19.4 19.4	19.4	8.2 8.2	8.2	34.6 34.6	34.6	98.8 98.7	98.8	7.4 7.4	7.4	7.4	1.2 1.2	1.2		6.3 6.8	6.6	
G3	Rainy	Moderate	8:36	Surface	1.1	19.5 19.5	19.5	8.1 8.1	8.1	34.3 34.3	34.3	97.5 97.5	97.5	7.3 7.3	7.3	7.3	1.9 1.9	1.9	1.7	6.2 6.3	6.3	6.3
				Middle	4.1	19.5 19.5	19.5	8.1 8.1	8.1	34.4 34.4	34.4	97.1 97.1	97.1	7.3 7.3	7.3		1.8 1.9	1.9		6.6 6.9	6.8	
				Bottom	7.0	19.5 19.5	19.5	8.1 8.1	8.1	34.5 34.5	34.5	97.5 97.8	97.7	7.3 7.3	7.3	7.3	1.4 1.4	1.4		5.8 6.1	6.0	
G4	Rainy	Moderate	8:52	Surface	1.1	19.5 19.5	19.5	8.1 8.1	8.1	34.4 34.4	34.4	97.9 97.9	97.9	7.3 7.3	7.3	7.3	2.0 2.0	2.0	2.5	8.6 8.6	8.6	7.6
				Middle	4.1	19.5 19.5	19.5	8.1 8.1	8.1	34.5 34.4	34.4	97.3 97.6	97.5	7.3 7.3	7.3		2.4 2.3	2.4		8.3 8.7	8.5	
				Bottom	7.0	19.5 19.5	19.5	8.1 8.1	8.1	34.5 34.5	34.5	97.0 96.8	96.9	7.3 7.3	7.3	7.3	3.2 3.3	3.3		5.8 5.5	5.7	
M1	Rainy	Moderate	8:18	Surface	1.1	19.5 19.5	19.5	8.1 8.1	8.1	34.4 34.4	34.4	97.5 97.2	97.4	7.3 7.3	7.3	7.3	1.5 1.6	1.6	2.1	10.1 9.5	9.8	9.3
				Middle	3.0	19.4 19.5	19.5	8.1 8.1	8.1	34.4 34.4	34.4	97.9 97.7	97.8	7.3 7.3	7.3		2.1 2.1	2.1		8.5 8.7	8.6	
				Bottom	5.1	19.5 19.5	19.5	8.1 8.1	8.1	34.4 34.4	34.4	98.2 98.1	98.2	7.4 7.4	7.4	7.4	2.6 2.6	2.6		9.5 9.2	9.4	
M2	Rainy	Moderate	8:04	Surface	1.1	19.5 19.5	19.5	8.1 8.1	8.1	34.4 34.4	34.4	99.3 99.3	99.3	7.4 7.4	7.4	7.5	1.6 1.7	1.6	1.8	8.7 8.3	8.5	8.0
				Middle	6.1	19.4 19.4	19.4	8.1 8.1	8.1	34.5 34.5	34.5	99.6 99.6	99.6	7.5 7.5	7.5		1.7 1.8	1.7		6.3 6.0	6.2	
				Bottom	11.0	19.4 19.4	19.4	8.1 8.1	8.1	34.6 34.6	34.6	98.9 98.8	98.9	7.4 7.4	7.4	7.4	2.1 2.1	2.1		9.8 9.1	9.5	
M3	Rainy	Moderate	8:44	Surface	1.1	19.5 19.5	19.5	8.1 8.1	8.1	34.4 34.4	34.4	99.1 98.9	99.0	7.4 7.4	7.4	7.4	1.3 1.3	1.3	1.2	7.1 6.9	7.0	9.9
				Middle	4.2	19.5 19.5	19.5	8.1 8.1	8.1	34.4 34.4	34.4	98.8 98.7	98.8	7.4 7.4	7.4		1.3 1.3	1.3		8.2 8.4	8.3	
				Bottom	7.1	19.5 19.5	19.5	8.1 8.1	8.1	34.5 34.5	34.5	99.1 99.0	99.1	7.4 7.4	7.4	7.4	1.0 1.1	1.0		14.5 14.3	14.4	
M4	Rainy	Moderate	7:58	Surface	1.0	19.5 19.5	19.5	8.1 8.1	8.1	34.4 34.4	34.4	99.4 99.3	99.4	7.4 7.4	7.4	7.4	1.2 1.2	1.2	1.1	24.8 24.2	24.5	11.5
				Middle	6.1	19.5 19.5	19.5	8.1 8.1	8.1	34.5 34.5	34.5	98.8 98.8	98.8	7.4 7.4	7.4		0.8 0.8	0.8		4.7 4.8	4.8	
				Bottom	11.1	19.4 19.4	19.4	8.1 8.1	8.1	34.5 34.5	34.5	98.9 98.9	98.9	7.4 7.4	7.4	7.4	1.2 1.2	1.2		5.1 5.1	5.1	
M5	Rainy	Moderate	9:10	Surface	1.0	19.5 19.5	19.5	8.1 8.1	8.1	34.4 34.4	34.4	100.3 99.3	99.8	7.5 7.4	7.5	7.5	0.6 0.7	0.6	0.9	8.2 8.1	8.2	9.4
				Middle	6.0	19.5 19.5	19.5	8.1 8.1	8.1	34.4 34.4	34.4	99.5 99.3	99.4	7.5 7.4	7.5		0.8 0.8	0.8		10.8 10.9	10.9	
				Bottom	11.0	19.5 19.5	19.5	8.1 8.2	8.1	34.4 34.4	34.4	99.3 99.5	99.4	7.4 7.5	7.4	7.4	1.1 1.2	1.1		9.2 9.1	9.2	
M6	Rainy	Moderate	9:01	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	7.5	- -	-	0.7	- -	-	6.9
				Middle	2.2	19.4 19.4	19.4	8.2 8.2	8.2	34.4 34.4	34.4	100.5 100.5	100.5	7.5 7.5	7.5		0.7 0.7	0.7		6.8 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 18 March 2020 (Mid-Flood Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU*** or 120% of upstream control station's Turbidity at the same tide of the same day ***C1: 1.5 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C1: 1.6 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 8.6 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 9.4 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 8.6 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 9.4 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 4.7 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 5.1 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 20 March 2020

(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	Calm	11:41	Surface	1.1	19.6 19.6	19.6	8.1 8.1	8.1	34.4 34.4	34.4	95.4 95.4	95.4	7.1 7.1	7.1	7.1	0.8 0.6	0.7	0.8	8.8 8.7	8.8	7.1
				Middle	9.0	19.6 19.6	19.6	8.1 8.1	8.1	34.4 34.4	34.4	94.7 94.8	94.8	7.1 7.1	7.1		0.8 0.8	0.8		8.1 8.4	8.3	
				Bottom	17.1	19.3 19.4	19.4	8.2 8.1	8.1	34.7 34.6	34.6	94.9 94.6	94.8	7.1 7.1	7.1	7.1	0.9 0.7	0.8		4.2 4.1	4.2	
C2	Cloudy	Calm	10:27	Surface	1.0	19.6 19.6	19.6	7.5 8.0	7.8	34.2 34.3	34.3	92.5 94.1	93.3	6.9 7.0	7.0	7.0	1.1 1.3	1.2	1.1	7.2 7.5	7.4	7.9
				Middle	16.0	19.4 19.4	19.4	8.0 8.0	8.0	34.6 34.6	34.6	94.9 94.9	94.9	7.1 7.1	7.1		1.1 1.0	1.1		4.9 5.0	5.0	
				Bottom	31.1	19.4 19.4	19.4	8.0 8.0	8.0	34.6 34.6	34.6	94.9 94.9	94.9	7.1 7.1	7.1	7.1	1.3 1.2	1.2		11.3 11.4	11.4	
G1	Cloudy	Calm	11:05	Surface	1.0	19.5 19.5	19.5	8.1 8.1	8.1	34.4 34.4	34.4	94.1 93.0	93.6	7.1 7.0	7.0	7.0	1.9 1.8	1.9	2.5	7.8 7.8	7.8	8.9
				Middle	4.0	19.5 19.5	19.5	8.1 8.1	8.1	34.4 34.4	34.4	92.8 92.8	92.8	7.0 7.0	7.0		3.0 3.1	3.0		10.8 11.2	11.0	
				Bottom	7.0	19.5 19.5	19.5	8.1 8.1	8.1	34.5 34.4	34.4	92.7 92.6	92.7	6.9 6.9	6.9	6.9	2.5 2.6	2.5		7.7 7.9	7.8	
G2	Cloudy	Calm	10:53	Surface	1.0	19.5 19.5	19.5	8.1 8.1	8.1	34.4 34.4	34.4	96.6 94.4	95.5	7.2 7.1	7.2	7.1	1.0 0.9	1.0	1.1	6.5 6.3	6.4	7.8
				Middle	5.0	19.5 19.5	19.5	8.1 8.1	8.1	34.5 34.5	34.5	94.3 94.0	94.2	7.1 7.0	7.1		0.9 0.8	0.8		9.0 8.6	8.8	
				Bottom	9.0	19.4 19.4	19.4	8.1 8.1	8.1	34.5 34.5	34.5	93.7 93.5	93.6	7.0 7.0	7.0	7.0	1.4 1.6	1.5		8.2 8.1	8.2	
G3	Cloudy	Calm	11:12	Surface	1.0	19.6 19.6	19.6	8.1 8.1	8.1	34.3 34.3	34.3	94.3 94.4	94.4	7.1 7.1	7.1	7.1	0.9 1.1	1.0	1.1	7.3 6.8	7.1	6.9
				Middle	4.0	19.5 19.5	19.5	8.1 8.1	8.1	34.4 34.4	34.4	94.2 94.1	94.2	7.1 7.0	7.0		1.1 1.1	1.1		9.0 9.6	9.3	
				Bottom	7.0	19.5 19.5	19.5	8.1 8.1	8.1	34.4 34.4	34.4	94.0 94.2	94.1	7.0 7.1	7.0	7.0	1.2 1.1	1.2		4.2 4.2	4.2	
G4	Cloudy	Calm	11:23	Surface	1.1	19.6 19.6	19.6	8.1 8.1	8.1	34.3 34.3	34.3	95.3 93.7	94.5	7.1 7.0	7.1	7.1	1.3 1.2	1.2	1.4	9.0 8.5	8.8	7.8
				Middle	4.0	19.5 19.5	19.5	8.1 8.1	8.1	34.4 34.4	34.4	94.4 94.0	94.2	7.1 7.0	7.1		1.3 1.1	1.2		9.0 8.7	8.9	
				Bottom	7.0	19.5 19.5	19.5	8.1 8.1	8.1	34.5 34.4	34.4	90.7 90.7	90.7	6.8 6.8	6.8	6.8	1.5 1.9	1.7		5.7 5.9	5.8	
M1	Cloudy	Calm	11:00	Surface	1.0	19.6 19.6	19.6	8.1 8.1	8.1	34.3 34.3	34.3	91.6 91.5	91.6	6.9 6.9	6.9	6.9	1.9 2.1	2.0	2.9	5.1 5.1	5.1	8.3
				Middle	3.0	19.5 19.5	19.5	8.1 8.1	8.1	34.4 34.4	34.4	91.8 92.1	92.0	6.9 6.9	6.9		2.8 3.5	3.1		10.5 11.1	10.8	
				Bottom	5.0	19.5 19.5	19.5	8.1 8.1	8.1	34.4 34.4	34.4	92.0 92.6	92.3	6.9 6.9	6.9	6.9	3.6 3.6	3.6		9.0 8.8	8.9	
M2	Cloudy	Calm	10:47	Surface	1.0	19.5 19.5	19.5	8.1 8.1	8.1	34.4 34.4	34.4	95.2 94.8	95.0	7.1 7.1	7.1	7.1	1.0 1.1	1.1	1.3	5.1 5.3	5.2	5.5
				Middle	6.1	19.5 19.5	19.5	8.1 8.1	8.1	34.5 34.5	34.5	94.7 94.6	94.7	7.1 7.1	7.1		1.4 1.2	1.3		4.8 4.6	4.7	
				Bottom	11.0	19.4 19.4	19.4	8.1 8.1	8.1	34.6 34.6	34.6	94.8 94.8	94.8	7.1 7.1	7.1	7.1	1.3 1.6	1.5		6.5 6.7	6.6	
M3	Cloudy	Calm	11:16	Surface	1.0	19.6 19.6	19.6	8.1 8.1	8.1	34.3 34.3	34.3	94.9 94.5	94.7	7.1 7.1	7.1	7.1	0.8 0.7	0.8	0.8	6.1 6.1	6.1	6.2
				Middle	4.0	19.6 19.5	19.5	8.1 8.1	8.1	34.4 34.4	34.4	94.5 94.4	94.5	7.1 7.1	7.1		0.8 0.8	0.8		5.0 5.3	5.2	
				Bottom	7.0	19.5 19.5	19.5	8.1 8.1	8.1	34.4 34.5	34.4	94.3 92.9	93.6	7.1 7.0	7.0	7.0	0.9 1.0	0.9		7.4 7.3	7.4	
M4	Cloudy	Calm	10:39	Surface	1.0	19.5 19.6	19.6	8.0 8.0	8.0	34.4 34.3	34.3	96.4 92.9	94.7	7.2 7.0	7.1	7.1	1.0 1.1	1.0	1.1	8.3 8.1	8.2	7.3
				Middle	5.0	19.5 19.5	19.5	8.1 8.1	8.1	34.5 34.5	34.5	94.1 94.0	94.1	7.1 7.0	7.0		0.9 1.1	1.0		7.2 7.2	7.2	
				Bottom	9.1	19.4 19.4	19.4	8.1 8.1	8.1	34.6 34.6	34.6	94.7 94.8	94.8	7.1 7.1	7.1	7.1	1.0 1.3	1.2		6.5 6.4	6.5	
M5	Cloudy	Calm	11:35	Surface	1.0	19.6 19.6	19.6	8.1 8.1	8.1	34.3 34.3	34.3	92.6 91.7	92.2	6.9 6.9	6.9	7.0	1.1 0.9	1.0	1.6	5.9 6.1	6.0	8.0
				Middle	6.0	19.4 19.5	19.5	8.1 8.1	8.1	34.5 34.5	34.5	94.1 92.9	93.5	7.1 7.0	7.0		1.7 1.5	1.6		9.0 9.4	9.2	
				Bottom	11.0	19.4 19.4	19.4	8.1 8.1	8.1	34.6 34.6	34.6	94.0 93.6	93.8	7.1 7.0	7.0	7.0	2.3 2.3	2.3		8.9 8.6	8.8	
M6	Cloudy	Calm	11:30	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	7.0	- -	-	1.3	- -	-	6.1
				Middle	2.0	19.6 19.6	19.6	8.1 8.1	8.1	34.4 34.4	34.4	93.3 93.5	93.4	7.0 7.0	7.0		1.3 1.3	1.3		6.0 6.2	6.1	
				Bottom	-	- -	-	- -	-	- -	-	- -	-	- -	-	-	- -	-		- -	-	

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

Appendix I - Action and Limit Levels for Marine Water Quality on 20 March 2020 (Mid-Ebb Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU***	***22.2 NTU***
		or 120% of upstream control station's Turbidity at the same tide of the same day ***C2: 1.5 NTU***	or 130% of upstream control station's Turbidity at the same tide of the same day ***C2: 1.6 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L***	***6.9 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C2: 8.8 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C2: 9.6 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L***	***7.4 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C2: 8.8 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C2: 9.6 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L***	***7.9 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C2: 13.6 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C2: 14.8 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 20 March 2020

(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	Calm	16:03	Surface	1.1	19.5 19.6	19.5	8.1 8.1	8.1	34.5 34.4	34.5	98.0 96.2	97.1	7.4 7.2	7.3	7.2	0.7 1.0	0.9	1.3	5.8 5.8	5.8	5.7
				Middle	9.1	19.4 19.4	19.4	8.2 8.2	8.2	34.6 34.6	34.6	95.5 95.6	95.6	7.2 7.2	7.2		1.2 1.1	1.1		4.9 4.7	4.8	
				Bottom	17.1	19.4 19.4	19.4	8.2 8.2	8.2	34.7 34.7	34.7	95.7 95.6	95.7	7.2 7.2	7.2	7.2	1.8 1.8	1.8		6.4 6.5	6.5	
C2	Cloudy	Calm	14:48	Surface	1.1	19.6 19.6	19.6	8.1 8.1	8.1	34.4 34.4	34.4	97.3 96.3	96.8	7.3 7.2	7.2	7.2	1.1 0.9	1.0	1.0	7.5 7.8	7.7	8.6
				Middle	16.6	19.4 19.4	19.4	8.1 8.1	8.1	34.6 34.6	34.6	94.6 94.7	94.7	7.1 7.1	7.1		1.1 1.0	1.0		12.3 12.5	12.4	
				Bottom	32.0	19.4 19.4	19.4	8.1 8.1	8.1	34.6 34.6	34.6	94.5 94.7	94.6	7.1 7.1	7.1	7.1	1.1 1.0	1.0		5.7 5.7	5.7	
G1	Cloudy	Calm	15:27	Surface	1.1	19.6 19.7	19.7	8.1 8.1	8.1	34.2 34.2	34.2	96.8 95.3	96.1	7.2 7.1	7.2	7.2	1.2 1.2	1.2	1.3	6.0 6.4	6.2	7.1
				Middle	4.1	19.6 19.6	19.6	8.1 8.1	8.1	34.3 34.3	34.3	95.4 94.9	95.2	7.1 7.1	7.1		1.4 1.3	1.3		5.7 5.8	5.8	
				Bottom	7.1	19.5 19.5	19.5	8.1 8.1	8.1	34.4 34.4	34.4	94.8 94.5	94.7	7.1 7.1	7.1	7.1	1.4 1.5	1.5		9.2 9.3	9.3	
G2	Cloudy	Calm	15:14	Surface	1.1	19.6 19.5	19.5	8.1 8.1	8.1	34.4 34.4	34.4	94.8 94.8	94.8	7.1 7.1	7.1	7.1	1.4 1.4	1.4	1.4	8.4 8.3	8.4	6.1
				Middle	5.0	19.5 19.5	19.5	8.1 8.1	8.1	34.4 34.4	34.4	94.7 94.7	94.7	7.1 7.1	7.1		1.3 1.1	1.2		3.2 3.1	3.2	
				Bottom	9.1	19.5 19.5	19.5	8.1 8.1	8.1	34.5 34.5	34.5	94.7 94.2	94.5	7.1 7.1	7.1	7.1	1.5 1.7	1.6		6.9 6.9	6.9	
G3	Cloudy	Calm	15:32	Surface	1.1	19.7 19.7	19.7	8.1 8.1	8.1	34.3 34.3	34.3	97.9 95.6	96.8	7.3 7.1	7.2	7.2	0.9 1.0	0.9	1.1	9.6 9.7	9.7	13.2
				Middle	4.0	19.6 19.6	19.6	8.1 8.1	8.1	34.3 34.4	34.3	96.4 95.1	95.8	7.2 7.1	7.2		1.0 1.0	1.0		24.7 23.5	24.1	
				Bottom	7.1	19.5 19.5	19.5	8.1 8.1	8.1	34.4 34.4	34.4	95.2 94.7	95.0	7.1 7.1	7.1	7.1	1.3 1.4	1.4		6.0 5.9	6.0	
G4	Cloudy	Calm	15:44	Surface	1.1	19.6 19.6	19.6	8.1 8.1	8.1	34.4 34.4	34.4	96.2 94.6	95.4	7.2 7.1	7.1	7.1	2.0 2.0	2.0	2.0	8.3 8.2	8.3	7.0
				Middle	4.0	19.5 19.5	19.5	8.1 8.1	8.1	34.4 34.4	34.4	94.4 94.2	94.3	7.1 7.1	7.1		1.9 2.1	2.0		3.7 3.8	3.8	
				Bottom	7.0	19.5 19.5	19.5	8.1 8.2	8.1	34.4 34.4	34.4	94.1 94.0	94.1	7.1 7.0	7.0	7.0	2.3 1.9	2.1		9.3 8.9	9.1	
M1	Cloudy	Calm	15:20	Surface	1.0	19.6 19.5	19.6	8.1 8.2	8.1	34.3 34.4	34.4	94.6 92.3	93.5	7.1 6.9	7.0	7.0	1.9 2.3	2.1	2.6	11.8 11.7	11.8	10.7
				Middle	3.1	19.6 19.5	19.6	8.2 8.2	8.2	34.4 34.4	34.4	93.1 92.2	92.7	7.0 6.9	6.9		2.4 2.3	2.3		9.3 8.5	8.9	
				Bottom	5.1	19.5 19.5	19.5	8.2 8.2	8.2	34.4 34.4	34.4	92.5 91.8	92.2	6.9 6.9	6.9	6.9	3.6 3.2	3.4		11.2 11.4	11.3	
M2	Cloudy	Calm	15:07	Surface	1.0	19.6 19.6	19.6	8.1 8.1	8.1	34.4 34.4	34.4	96.6 96.3	96.5	7.2 7.2	7.2	7.2	0.8 0.8	0.8	1.0	8.8 8.4	8.6	8.8
				Middle	6.0	19.5 19.5	19.5	8.1 8.1	8.1	34.4 34.5	34.4	96.0 95.8	95.9	7.2 7.2	7.2		0.8 0.8	0.8		9.5 9.1	9.3	
				Bottom	11.0	19.4 19.4	19.4	8.1 8.1	8.1	34.6 34.6	34.6	95.3 95.4	95.4	7.1 7.2	7.1	7.1	1.2 1.5	1.4		8.7 8.2	8.5	
M3	Cloudy	Calm	15:37	Surface	1.1	19.6 19.6	19.6	8.1 8.1	8.1	34.3 34.4	34.4	97.4 94.8	96.1	7.3 7.1	7.2	7.2	1.0 1.3	1.1	1.3	4.4 4.4	4.4	7.0
				Middle	4.1	19.6 19.6	19.6	8.1 8.1	8.1	34.4 34.4	34.4	95.8 95.2	95.5	7.2 7.1	7.2		1.2 1.0	1.1		6.9 6.9	6.9	
				Bottom	7.1	19.5 19.5	19.5	8.1 8.1	8.1	34.4 34.5	34.5	95.2 94.4	94.8	7.1 7.1	7.1	7.1	1.4 1.7	1.6		10.0 9.6	9.8	
M4	Cloudy	Calm	14:59	Surface	1.1	19.6 19.6	19.6	8.1 8.1	8.1	34.4 34.4	34.4	97.5 95.8	96.7	7.3 7.2	7.2	7.2	1.0 0.9	0.9	1.0	8.3 8.3	8.3	5.7
				Middle	5.0	19.5 19.6	19.5	8.1 8.1	8.1	34.5 34.4	34.4	96.2 96.0	96.1	7.2 7.2	7.2		1.1 1.2	1.1		3.6 3.8	3.7	
				Bottom	9.1	19.4 19.5	19.4	8.1 8.1	8.1	34.6 34.5	34.5	94.9 95.1	95.0	7.1 7.1	7.1	7.1	1.1 1.1	1.1		5.2 5.1	5.2	
M5	Cloudy	Calm	15:56	Surface	1.0	19.6 19.6	19.6	8.1 8.1	8.1	34.4 34.4	34.4	97.0 95.8	96.4	7.3 7.2	7.2	7.2	0.8 0.7	0.8	1.3	6.2 6.2	6.2	6.6
				Middle	6.0	19.6 19.5	19.5	8.1 8.1	8.1	34.4 34.4	34.4	95.6 95.2	95.4	7.2 7.1	7.1		1.1 1.0	1.0		7.0 6.9	7.0	
				Bottom	11.1	19.4 19.4	19.4	8.2 8.2	8.2	34.6 34.6	34.6	94.9 95.0	95.0	7.1 7.1	7.1	7.1	2.0 2.0	2.0		6.4 6.6	6.5	
M6	Cloudy	Calm	15:52	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	6.9	- -	-	3.2	- -	-	8.5
				Middle	2.2	19.5 19.5	19.5	8.1 8.1	8.1	34.5 34.5	34.5	92.5 92.4	92.5	6.9 6.9	6.9		3.1 3.2	3.2		8.2 8.8	8.5	
				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 20 March 2020 (Mid-Flood Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU***	***22.2 NTU***
		or 120% of upstream control station's Turbidity at the same tide of the same day ***C1: 2.1 NTU***	or 130% of upstream control station's Turbidity at the same tide of the same day ***C1: 2.3 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L***	***6.9 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C1: 7.0 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C1: 7.5 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L***	***7.4 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C1: 7.0 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C1: 7.5 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L***	***7.9 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C1: 7.7 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C1: 8.4 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 23 March 2020

(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	Calm	12:56	Surface	1.1	21.7 21.6	21.7	8.5 8.5	8.5	33.6 33.7	33.7	92.7 92.4	92.6	7.1 7.1	7.1	7.1	1.3 1.3	1.3	1.3	5.9 6.3	6.1	6.1
				Middle	8.5	21.6 21.6	21.6	8.5 8.5	8.5	33.7 33.7	33.7	91.1 91.3	91.2	7.0 7.0	7.0		1.4 1.4	1.4		6.1 6.0	6.1	
				Bottom	16.1	21.6 21.6	21.6	8.5 8.5	8.5	33.7 33.7	33.7	90.1 90.2	90.2	6.9 6.9	6.9		1.3 1.3	1.3		6.1 6.1	6.1	
C2	Cloudy	Calm	11:25	Surface	1.1	21.9 21.8	21.8	8.4 8.4	8.4	33.4 33.4	33.4	91.2 91.1	91.2	7.0 7.0	7.0	6.9	1.5 1.5	1.5	1.8	5.9 5.7	5.8	10.3
				Middle	16.0	21.6 21.6	21.6	8.4 8.4	8.4	33.6 33.6	33.6	89.5 89.5	89.5	6.9 6.9	6.9		1.9 1.9	1.9		5.1 5.1	5.1	
				Bottom	31.1	21.5 21.5	21.5	8.5 8.5	8.5	33.7 33.7	33.7	89.2 89.3	89.3	6.9 6.9	6.9	6.9	2.0 2.0	2.0		20.2 19.9	20.1	
G1	Cloudy	Calm	12:05	Surface	1.0	21.8 21.7	21.7	8.5 8.5	8.5	33.5 33.5	33.5	91.5 91.2	91.4	7.0 7.0	7.0	7.0	1.8 1.9	1.9	2.2	24.4 23.4	23.9	13.8
				Middle	3.7	21.6 21.7	21.6	8.5 8.5	8.5	33.6 33.6	33.6	89.9 90.0	90.0	6.9 6.9	6.9		2.7 2.7	2.7		9.6 9.7	9.7	
				Bottom	6.6	21.5 21.5	21.5	8.5 8.5	8.5	33.7 33.8	33.7	89.8 89.9	89.9	6.9 6.9	6.9	6.9	2.2 2.0	2.1		8.0 7.6	7.8	
G2	Cloudy	Calm	11:45	Surface	1.1	21.6 21.6	21.6	8.5 8.5	8.5	33.7 33.7	33.7	92.4 92.2	92.3	7.1 7.1	7.1	7.1	1.2 1.2	1.2	1.2	4.1 4.0	4.1	5.1
				Middle	5.0	21.6 21.6	21.6	8.5 8.5	8.5	33.7 33.7	33.7	91.3 91.4	91.4	7.0 7.0	7.0		1.1 1.1	1.1		6.6 6.6	6.6	
				Bottom	9.1	21.5 21.5	21.5	8.5 8.5	8.5	33.8 33.8	33.8	90.5 90.5	90.5	7.0 7.0	7.0	7.0	1.2 1.2	1.2		4.5 4.7	4.6	
G3	Cloudy	Calm	12:11	Surface	1.0	21.8 21.8	21.8	8.5 8.5	8.5	33.3 33.3	33.3	93.2 93.1	93.2	7.2 7.2	7.2	7.1	0.7 0.7	0.7	0.8	9.2 8.9	9.1	7.2
				Middle	3.7	21.6 21.6	21.6	8.5 8.5	8.5	33.7 33.6	33.6	91.4 91.5	91.5	7.0 7.0	7.0		0.8 0.8	0.8		7.3 7.2	7.3	
				Bottom	6.6	21.6 21.6	21.6	8.5 8.5	8.5	33.7 33.8	33.7	90.9 90.6	90.8	7.0 7.0	7.0	7.0	0.8 0.8	0.8		5.2 5.2	5.2	
G4	Cloudy	Calm	12:29	Surface	1.1	21.9 21.8	21.9	8.5 8.5	8.5	33.4 33.4	33.4	92.6 92.6	92.6	7.1 7.1	7.1	7.0	0.9 0.9	0.9	0.9	6.3 6.6	6.5	7.8
				Middle	3.7	21.7 21.7	21.7	8.5 8.5	8.5	33.6 33.6	33.6	91.0 91.2	91.1	7.0 7.0	7.0		0.9 0.9	0.9		6.9 6.8	6.9	
				Bottom	6.6	21.6 21.6	21.6	8.5 8.5	8.5	33.7 33.7	33.7	90.4 90.3	90.4	7.0 6.9	6.9	6.9	1.0 1.0	1.0		10.2 10.0	10.1	
M1	Cloudy	Calm	11:53	Surface	1.1	21.7 21.7	21.7	8.5 8.5	8.5	33.5 33.5	33.5	90.1 90.0	90.1	6.9 6.9	6.9	6.9	2.8 3.0	2.9	2.9	5.1 4.8	5.0	5.0
				Middle	3.0	21.7 21.7	21.7	8.5 8.5	8.5	33.5 33.5	33.5	89.6 89.6	89.6	6.9 6.9	6.9		3.3 3.3	3.3		5.0 5.0	5.0	
				Bottom	5.0	21.7 21.6	21.6	8.5 8.5	8.5	33.5 33.6	33.6	89.5 89.5	89.5	6.9 6.9	6.9	6.9	2.6 2.5	2.6		5.3 4.9	5.1	
M2	Cloudy	Calm	11:39	Surface	1.0	21.8 21.7	21.7	8.5 8.5	8.5	33.5 33.6	33.6	93.3 93.0	93.2	7.2 7.1	7.1	7.1	1.2 1.1	1.1	1.0	5.3 5.3	5.3	6.3
				Middle	5.3	21.6 21.6	21.6	8.5 8.5	8.5	33.7 33.7	33.7	91.7 91.8	91.8	7.0 7.1	7.0		0.9 1.0	1.0		7.6 7.5	7.6	
				Bottom	9.5	21.6 21.5	21.6	8.5 8.5	8.5	33.7 33.7	33.7	91.1 91.1	91.1	7.0 7.0	7.0	7.0	0.8 0.8	0.8		6.3 6.0	6.2	
M3	Cloudy	Calm	12:21	Surface	1.1	22.0 22.0	22.0	8.5 8.5	8.5	32.7 32.8	32.7	89.5 89.4	89.5	6.9 6.9	6.9	6.9	1.9 2.0	1.9	1.6	5.1 4.9	5.0	5.0
				Middle	3.7	21.7 21.7	21.7	8.5 8.5	8.5	33.2 33.1	33.2	89.2 89.2	89.2	6.9 6.9	6.9		1.7 1.7	1.7		6.7 7.1	6.9	
				Bottom	6.5	21.6 21.6	21.6	8.5 8.5	8.5	33.6 33.7	33.7	90.4 90.3	90.4	7.0 6.9	6.9	6.9	1.2 1.3	1.3		3.3 3.1	3.2	
M4	Cloudy	Calm	11:32	Surface	1.1	21.5 21.5	21.5	8.5 8.5	8.5	33.7 33.7	33.7	91.6 91.5	91.6	7.1 7.0	7.0	7.0	1.8 1.8	1.8	1.9	6.9 7.2	7.1	5.1
				Middle	5.0	21.4 21.4	21.4	8.5 8.5	8.5	33.7 33.7	33.7	91.1 91.1	91.1	7.0 7.0	7.0		1.8 1.8	1.8		4.3 4.5	4.4	
				Bottom	9.1	21.4 21.4	21.4	8.5 8.5	8.5	33.8 33.8	33.8	91.1 91.1	91.1	7.0 7.0	7.0	7.0	1.9 2.0	2.0		3.8 3.8	3.8	
M5	Cloudy	Calm	12:45	Surface	1.0	22.0 21.8	21.9	8.5 8.5	8.5	33.3 33.4	33.4	91.7 91.7	91.7	7.0 7.0	7.0	7.1	1.5 1.5	1.5	1.9	3.4 3.4	3.4	5.1
				Middle	5.5	21.3 21.3	21.3	8.5 8.5	8.5	33.8 33.8	33.8	92.1 92.1	92.1	7.1 7.1	7.1		2.1 2.0	2.0		4.4 4.6	4.5	
				Bottom	10.0	21.3 21.3	21.3	8.5 8.5	8.5	33.8 33.8	33.8	92.1 92.1	92.1	7.1 7.1	7.1	7.1	2.3 2.3	2.3		7.3 7.6	7.5	
M6	Cloudy	Calm	12:36	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	7.1	- -	-	0.9	- -	-	7.2
				Middle	2.1	22.2 22.0	22.1	8.5 8.5	8.5	33.4 33.5	33.5	93.0 92.6	92.8	7.1 7.1	7.1		0.9 0.9	0.9		7.5 6.9	7.2	
				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 23 February 2020 (Mid-Ebb Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU***	***22.2 NTU***
		or 120% of upstream control station's Turbidity at the same tide of the same day ***C2: 2.4 NTU***	or 130% of upstream control station's Turbidity at the same tide of the same day ***C2: 2.6 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L***	***6.9 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C2: 7.0 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C2: 7.5 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L***	***7.4 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C2: 7.0 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C2: 7.5 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L***	***7.9 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C2: 24.1 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C2: 26.1 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 23 March 2020

(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	Calm	18:35	Surface	1.0	21.8 21.7	21.8	8.5 8.5	8.5	33.6 33.6	33.6	92.9 92.8	92.9	7.1 7.1	7.1	7.0	1.4 1.4	1.4	1.5	6.0 6.0	6.0	5.6
				Middle	9.1	21.7 22.3	22.0	8.5 8.5	8.5	33.7 33.7	33.7	90.8 91.0	90.9	7.0 7.0	7.0		1.6 1.6	1.6		6.3 6.6	6.5	
				Bottom	17.1	21.6 21.6	21.6	8.5 8.5	8.5	33.7 33.7	33.7	90.1 90.1	90.1	6.9 6.9	6.9	6.9	1.6 1.5	1.5		4.5 4.4	4.5	
C2	Cloudy	Calm	16:53	Surface	1.0	22.3 21.6	22.0	8.4 8.4	8.4	33.5 33.6	33.5	90.9 90.8	90.9	7.0 7.0	7.0	6.9	1.7 1.7	1.7	1.9	3.8 3.9	3.9	5.4
				Middle	16.5	21.6 21.6	21.6	8.4 8.4	8.4	33.6 33.6	33.6	89.6 89.7	89.7	6.9 6.9	6.9		2.0 2.0	2.0		5.2 5.4	5.3	
				Bottom	32.1	21.5 21.5	21.5	8.5 8.5	8.5	33.7 33.7	33.7	89.3 89.6	89.5	6.9 6.9	6.9	6.9	2.1 2.2	2.1		6.7 7.3	7.0	
G1	Cloudy	Calm	17:32	Surface	1.1	22.3 21.8	22.1	8.5 8.5	8.5	33.4 33.4	33.4	91.8 91.7	91.8	7.0 7.0	7.0	7.0	1.9 1.9	1.9	2.5	4.1 4.1	4.1	4.2
				Middle	4.0	21.7 21.7	21.7	8.5 8.5	8.5	33.7 33.6	33.6	89.7 89.8	89.8	6.9 6.9	6.9		2.9 2.9	2.9		5.0 5.0	5.0	
				Bottom	7.0	21.5 21.5	21.5	8.5 8.5	8.5	33.7 33.7	33.7	89.6 89.7	89.7	6.9 6.9	6.9	6.9	2.7 2.6	2.6		3.4 3.5	3.5	
G2	Cloudy	Calm	17:14	Surface	1.1	22.0 21.6	21.8	8.5 8.5	8.5	33.7 33.7	33.7	92.7 92.6	92.7	7.1 7.1	7.1	7.1	1.4 1.4	1.4	1.3	4.4 4.5	4.5	4.3
				Middle	5.1	21.6 21.6	21.6	8.5 8.5	8.5	33.7 33.7	33.7	91.1 91.2	91.2	7.0 7.0	7.0		1.3 1.3	1.3		4.5 4.3	4.4	
				Bottom	9.1	21.5 21.5	21.5	8.5 8.5	8.5	33.8 33.8	33.8	90.5 90.5	90.5	7.0 7.0	7.0	7.0	1.3 1.3	1.3		4.0 4.2	4.1	
G3	Cloudy	Calm	17:38	Surface	1.1	22.0 21.8	21.9	8.5 8.5	8.5	33.4 33.4	33.4	93.0 92.8	92.9	7.1 7.1	7.1	7.1	0.9 0.9	0.9	0.9	3.9 4.0	4.0	6.9
				Middle	4.1	21.7 21.7	21.7	8.5 8.5	8.5	33.6 33.6	33.6	91.7 91.9	91.8	7.0 7.1	7.0		0.9 1.0	0.9		8.0 7.5	7.8	
				Bottom	7.0	21.6 21.6	21.6	8.5 8.5	8.5	33.8 33.8	33.8	90.6 90.3	90.5	7.0 6.9	6.9	6.9	1.0 1.0	1.0		8.9 8.8	8.9	
G4	Cloudy	Calm	17:52	Surface	1.0	22.6 21.9	22.2	8.5 8.5	8.5	33.4 33.5	33.4	92.4 92.2	92.3	7.1 7.1	7.1	7.0	1.1 1.1	1.1	1.1	3.4 3.4	3.4	4.5
				Middle	4.1	21.8 21.8	21.8	8.5 8.5	8.5	33.6 33.5	33.5	91.3 91.5	91.4	7.0 7.0	7.0		1.1 1.1	1.1		5.6 5.3	5.5	
				Bottom	7.0	21.6 21.6	21.6	8.5 8.5	8.5	33.7 33.7	33.7	90.2 90.1	90.2	6.9 6.9	6.9	6.9	1.1 1.1	1.1		4.6 4.7	4.7	
M1	Cloudy	Calm	17:19	Surface	1.1	22.5 21.7	22.1	8.5 8.5	8.5	33.5 33.5	33.5	90.0 89.9	90.0	6.9 6.9	6.9	6.9	3.4 3.5	3.4	3.2	7.1 7.3	7.2	6.8
				Middle	3.1	21.7 21.8	21.7	8.5 8.5	8.5	33.5 33.5	33.5	89.6 89.7	89.7	6.9 6.9	6.9		3.6 3.6	3.6		5.9 5.9	5.9	
				Bottom	5.1	21.6 21.6	21.6	8.5 8.5	8.5	33.6 33.6	33.6	89.5 89.5	89.5	6.9 6.9	6.9	6.9	2.5 2.6	2.5		7.3 7.5	7.4	
M2	Cloudy	Calm	17:07	Surface	1.0	21.9 21.7	21.8	8.5 8.5	8.5	33.6 33.6	33.6	93.0 92.9	93.0	7.1 7.1	7.1	7.1	1.3 1.3	1.3	1.2	3.2 3.3	3.3	6.2
				Middle	5.5	21.7 21.7	21.7	8.5 8.5	8.5	33.6 33.6	33.6	91.9 92.1	92.0	7.1 7.1	7.1		1.2 1.2	1.2		6.6 6.5	6.6	
				Bottom	10.0	21.6 21.5	21.6	8.5 8.5	8.5	33.7 33.7	33.7	91.0 90.9	91.0	7.0 7.0	7.0	7.0	1.1 1.1	1.1		9.0 8.3	8.7	
M3	Cloudy	Calm	17:45	Surface	1.0	22.4 22.1	22.3	8.5 8.5	8.5	32.7 32.7	32.7	89.9 89.7	89.8	6.9 6.9	6.9	6.9	1.8 1.9	1.9	1.7	24.2 23.3	23.8	14.6
				Middle	4.0	21.7 21.8	21.7	8.5 8.5	8.5	33.3 33.2	33.3	89.4 89.3	89.4	6.9 6.9	6.9		1.8 1.8	1.8		9.3 9.9	9.6	
				Bottom	7.0	21.7 21.6	21.7	8.5 8.5	8.5	33.6 33.6	33.6	90.3 90.4	90.4	6.9 7.0	6.9	6.9	1.3 1.4	1.3		10.4 10.2	10.3	
M4	Cloudy	Calm	17:01	Surface	1.0	22.1 21.5	21.8	8.5 8.5	8.5	33.7 33.7	33.7	91.8 91.6	91.7	7.1 7.1	7.1	7.0	1.8 1.9	1.8	2.0	3.9 3.7	3.8	4.5
				Middle	5.1	21.5 21.5	21.5	8.5 8.5	8.5	33.7 33.7	33.7	91.1 91.1	91.1	7.0 7.0	7.0		2.0 2.0	2.0		4.0 4.2	4.1	
				Bottom	9.1	21.4 21.4	21.4	8.5 8.5	8.5	33.8 33.8	33.8	91.0 91.1	91.1	7.0 7.0	7.0	7.0	2.1 2.1	2.1		5.5 5.5	5.5	
M5	Cloudy	Calm	18:23	Surface	1.1	21.8 21.6	21.7	8.5 8.5	8.5	33.5 33.6	33.6	91.7 91.8	91.8	7.0 7.1	7.0	7.1	1.7 1.7	1.7	2.1	10.1 10.9	10.5	7.7
				Middle	6.0	21.4 22.0	21.7	8.5 8.5	8.5	33.8 33.8	33.8	92.0 92.0	92.0	7.1 7.1	7.1		2.1 2.0	2.0		5.2 5.5	5.4	
				Bottom	11.0	21.3 21.3	21.3	8.5 8.5	8.5	33.8 33.8	33.8	92.1 92.2	92.2	7.1 7.1	7.1	7.1	2.5 2.6	2.6		7.2 7.3	7.3	
M6	Cloudy	Calm	18:06	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	7.1	- -	-	0.8	- -	-	4.4
				Middle	2.3	22.5 22.3	22.4	8.5 8.5	8.5	33.3 33.4	33.3	93.4 93.2	93.3	7.1 7.1	7.1		0.8 0.8	0.8		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.

Appendix I - Action and Limit Levels for Marine Water Quality on 23 March 2020 (Mid-Flood Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU***	***22.2 NTU***
		or 120% of upstream control station's Turbidity at the same tide of the same day ***C1: 1.9 NTU***	or 130% of upstream control station's Turbidity at the same tide of the same day ***C1: 2.0 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L***	***6.9 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C1: 7.2 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C1: 7.8 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L***	***7.4 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C1: 7.2 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C1: 7.8 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L***	***7.9 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C1: 5.3 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C1: 5.8 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 25 March 2020

(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	14:42	Surface	1.1	20.7 20.7	20.7	8.1 8.1	8.1	34.5 34.5	34.5	96.8 96.7	96.8	7.1 7.1	7.1	7.0	0.9 1.1	1.0	1.0	6.7 6.8	6.8	7.4
				Middle	9.1	20.6 21.3	21.0	8.1 8.1	8.1	34.5 34.5	34.5	95.5 95.6	95.6	7.0 7.0	7.0		1.0 1.0	1.0		8.0 8.3	8.2	
				Bottom	17.0	20.6 20.6	20.6	8.1 8.1	8.1	34.5 34.5	34.5	94.7 94.5	94.6	7.0 6.9	6.9	6.9	1.1 1.1	1.1		7.3 7.2	7.3	
C2	Sunny	Calm	12:58	Surface	1.0	20.7 20.6	20.6	7.9 7.9	7.9	34.4 34.4	34.4	92.7 92.7	92.7	6.8 6.8	6.8	6.8	0.9 0.9	0.9	0.9	5.0 5.2	5.1	4.9
				Middle	16.6	20.6 20.6	20.6	7.9 7.9	7.9	34.4 34.4	34.4	92.4 92.4	92.4	6.8 6.8	6.8		1.0 1.0	1.0		4.3 4.4	4.4	
				Bottom	32.1	20.6 20.6	20.6	7.9 7.9	7.9	34.4 34.4	34.4	92.3 92.3	92.3	6.8 6.8	6.8	6.8	0.9 1.0	0.9		5.3 5.3	5.3	
G1	Sunny	Calm	13:38	Surface	1.0	21.3 20.8	21.1	8.1 8.1	8.1	34.3 34.4	34.3	97.3 97.2	97.3	7.1 7.1	7.1	7.1	1.1 1.2	1.2	1.5	4.5 4.7	4.6	5.8
				Middle	4.1	20.5 20.5	20.5	8.1 8.1	8.1	34.5 34.5	34.5	95.0 95.2	95.1	7.0 7.0	7.0		1.6 1.5	1.5		3.9 3.9	3.9	
				Bottom	7.0	20.5 20.4	20.5	8.1 8.1	8.1	34.5 34.5	34.5	94.2 94.0	94.1	6.9 6.9	6.9	6.9	1.7 1.8	1.8		8.6 9.0	8.8	
G2	Sunny	Calm	13:19	Surface	1.0	21.3 20.6	21.0	8.1 8.1	8.1	34.4 34.4	34.4	95.8 95.6	95.7	7.0 7.0	7.0	7.0	1.1 1.1	1.1	1.5	9.3 9.1	9.2	7.6
				Middle	5.0	20.5 20.5	20.5	8.1 8.1	8.1	34.5 34.5	34.5	94.0 94.1	94.1	6.9 6.9	6.9		1.7 1.6	1.6		4.4 4.2	4.3	
				Bottom	9.1	20.5 20.5	20.5	8.1 8.1	8.1	34.5 34.6	34.6	93.6 93.6	93.6	6.9 6.9	6.9	6.9	1.8 1.7	1.8		9.1 9.3	9.2	
G3	Sunny	Calm	13:44	Surface	1.1	21.0 20.8	20.9	8.1 8.1	8.1	34.3 34.4	34.3	96.7 97.1	96.9	7.1 7.1	7.1	7.1	0.8 0.8	0.8	0.9	24.1 23.1	23.6	18.0
				Middle	4.0	20.7 20.7	20.7	8.1 8.1	8.1	34.4 34.4	34.4	97.5 97.6	97.6	7.2 7.2	7.2		0.8 0.8	0.8		5.0 4.9	5.0	
				Bottom	7.0	20.5 20.5	20.5	8.1 8.1	8.1	34.5 34.5	34.5	95.9 95.5	95.7	7.1 7.0	7.0	7.0	1.0 1.1	1.0		26.1 24.9	25.5	
G4	Sunny	Calm	13:59	Surface	1.0	21.0 20.8	20.9	8.1 8.1	8.1	34.4 34.4	34.4	97.0 96.7	96.9	7.1 7.1	7.1	7.1	1.4 1.4	1.4	1.3	6.5 6.4	6.5	5.8
				Middle	4.1	20.7 20.7	20.7	8.1 8.1	8.1	34.4 34.4	34.4	96.1 96.2	96.2	7.0 7.1	7.0		1.3 1.3	1.3		4.6 4.7	4.7	
				Bottom	7.0	20.5 20.5	20.5	8.1 8.1	8.1	34.5 34.5	34.5	95.8 95.8	95.8	7.1 7.1	7.1	7.1	1.3 1.2	1.3		6.2 6.3	6.3	
M1	Sunny	Calm	13:26	Surface	1.1	21.5 20.7	21.1	8.1 8.1	8.1	34.4 34.4	34.4	95.3 95.1	95.2	7.0 7.0	7.0	6.9	1.8 1.8	1.8	2.2	5.5 5.4	5.5	5.1
				Middle	3.1	20.6 20.5	20.6	8.1 8.1	8.1	34.5 34.5	34.5	93.4 93.5	93.5	6.9 6.9	6.9		2.2 2.3	2.3		3.9 3.9	3.9	
				Bottom	5.0	20.6 20.6	20.6	8.1 8.1	8.1	34.5 34.5	34.5	93.3 93.2	93.3	6.9 6.9	6.9	6.9	2.4 2.4	2.4		5.8 6.0	5.9	
M2	Sunny	Calm	13:12	Surface	1.0	21.5 20.7	21.1	8.0 8.0	8.0	34.4 34.4	34.4	96.8 96.7	96.8	7.1 7.1	7.1	7.1	1.2 1.1	1.2	1.0	4.3 4.2	4.3	4.8
				Middle	5.6	20.6 20.6	20.6	8.1 8.0	8.0	34.5 34.5	34.5	95.7 95.7	95.7	7.0 7.0	7.0		0.8 0.8	0.8		5.2 5.5	5.4	
				Bottom	10.0	20.5 20.5	20.5	8.1 8.1	8.1	34.5 34.6	34.5	95.9 95.9	95.9	7.1 7.1	7.1	7.1	1.1 1.1	1.1		4.7 4.7	4.7	
M3	Sunny	Calm	13:53	Surface	1.0	21.1 20.7	20.9	8.1 8.1	8.1	34.4 34.4	34.4	95.4 95.7	95.6	7.0 7.0	7.0	7.0	0.5 0.5	0.5	0.5	4.9 5.0	5.0	4.9
				Middle	4.1	20.6 20.6	20.6	8.1 8.1	8.1	34.5 34.5	34.5	96.2 96.2	96.2	7.1 7.1	7.1		0.5 0.5	0.5		3.7 3.6	3.7	
				Bottom	7.1	20.5 20.5	20.5	8.1 8.1	8.1	34.5 34.5	34.5	95.8 95.7	95.8	7.1 7.0	7.0	7.0	0.5 0.4	0.4		6.2 6.2	6.2	
M4	Sunny	Calm	13:05	Surface	1.1	20.6 20.5	20.5	8.0 8.0	8.0	34.5 34.5	34.5	93.7 93.5	93.6	6.9 6.9	6.9	6.9	1.5 1.5	1.5	1.6	7.1 6.9	7.0	6.6
				Middle	5.1	20.5 20.5	20.5	8.0 8.0	8.0	34.5 34.5	34.5	92.8 92.9	92.9	6.8 6.8	6.8		1.7 1.7	1.7		7.1 6.8	7.0	
				Bottom	9.1	20.5 20.5	20.5	8.0 8.0	8.0	34.5 34.5	34.5	92.5 92.5	92.5	6.8 6.8	6.8	6.8	1.7 1.7	1.7		6.1 5.8	6.0	
M5	Sunny	Calm	14:30	Surface	1.0	20.6 20.6	20.6	8.1 8.1	8.1	34.6 34.6	34.6	95.1 94.9	95.0	7.0 7.0	7.0	7.0	1.5 1.6	1.5	1.6	3.7 3.7	3.7	4.2
				Middle	6.0	20.6 21.1	20.9	8.2 8.2	8.2	34.7 34.7	34.7	97.0 96.8	96.9	7.1 7.1	7.1		1.7 1.7	1.7		4.2 4.2	4.2	
				Bottom	11.0	20.6 20.5	20.6	8.2 8.2	8.2	34.7 34.7	34.7	97.5 97.5	97.5	7.2 7.2	7.2	7.2	1.6 1.6	1.6		4.6 4.8	4.7	
M6	Sunny	Calm	14:11	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	6.9	- -	-	1.0	- -	-	7.0
				Middle	2.2	21.5 20.6	21.0	8.1 8.1	8.1	34.4 34.4	34.4	94.5 94.1	94.3	6.9 6.9	6.9		1.0 1.0	1.0		7.0 7.0	7.0	
				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 25 March 2020 (Mid-Ebb Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU***	***22.2 NTU***
		or 120% of upstream control station's Turbidity at the same tide of the same day ***C2: 1.1 NTU***	or 130% of upstream control station's Turbidity at the same tide of the same day ***C2: 1.2 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L***	***6.9 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C2: 6.1 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C2: 6.6 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L***	***7.4 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C2: 6.1 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C2: 6.6 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L***	***7.9 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C2: 6.4 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C2: 6.9 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 25 March 2020

(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	9:15	Surface	1.1	20.7 20.7	20.7	8.1 8.1	8.1	34.5 34.5	34.5	96.6 96.5	96.6	7.1 7.1	7.1	7.1	0.9 0.9	0.9	1.0	5.2 5.2	5.2	6.0
				Middle	8.5	20.6 20.6	20.6	8.1 8.1	8.1	34.5 34.5	34.5	95.7 95.8	95.8	7.0 7.0	7.0		1.0 0.9	0.9		6.4 6.6	6.5	
				Bottom	16.0	20.6 20.5	20.5	8.1 8.1	8.1	34.5 34.5	34.5	94.4 94.3	94.4	6.9 6.9	6.9	6.9	1.1 1.0	1.0		6.4 6.1	6.3	
C2	Sunny	Calm	7:47	Surface	1.1	20.6 20.6	20.6	7.9 7.9	7.9	34.4 34.4	34.4	92.8 92.7	92.8	6.8 6.8	6.8	6.8	0.9 0.9	0.9	0.9	5.5 5.5	5.5	5.6
				Middle	16.0	20.6 20.6	20.6	7.9 7.9	7.9	34.4 34.4	34.4	92.6 92.4	92.5	6.8 6.8	6.8		0.9 1.0	0.9		5.7 5.9	5.8	
				Bottom	31.1	20.6 20.6	20.6	7.9 7.9	7.9	34.4 34.4	34.4	92.4 92.3	92.4	6.8 6.8	6.8	6.8	0.9 0.9	0.9		5.4 5.3	5.4	
G1	Sunny	Calm	8:22	Surface	1.0	20.8 20.8	20.8	8.1 8.1	8.1	34.4 34.4	34.4	97.2 97.1	97.2	7.1 7.1	7.1	7.1	1.1 1.1	1.1	1.5	8.1 7.9	8.0	8.6
				Middle	3.7	20.5 20.6	20.5	8.1 8.1	8.1	34.5 34.5	34.5	95.4 95.7	95.6	7.0 7.0	7.0		1.5 1.4	1.4		8.4 8.7	8.6	
				Bottom	6.6	20.4 20.4	20.4	8.1 8.1	8.1	34.5 34.5	34.5	93.8 93.5	93.7	6.9 6.9	6.9	6.9	1.9 1.9	1.9		9.1 9.3	9.2	
G2	Sunny	Calm	8:06	Surface	1.0	20.6 20.6	20.6	8.1 8.1	8.1	34.4 34.4	34.4	95.4 95.2	95.3	7.0 7.0	7.0	7.0	1.1 1.2	1.1	1.5	8.2 8.5	8.4	5.9
				Middle	5.1	20.5 20.5	20.5	8.1 8.1	8.1	34.5 34.5	34.5	94.2 94.4	94.3	6.9 6.9	6.9		1.6 1.5	1.5		4.7 4.7	4.7	
				Bottom	9.0	20.4 20.4	20.4	8.1 8.1	8.1	34.6 34.6	34.6	93.7 93.8	93.8	6.9 6.9	6.9	6.9	1.7 1.7	1.7		4.5 4.7	4.6	
G3	Sunny	Calm	8:30	Surface	1.0	20.8 20.8	20.8	8.1 8.1	8.1	34.3 34.3	34.3	96.5 96.6	96.6	7.1 7.1	7.1	7.1	0.9 0.8	0.8	0.9	8.1 8.0	8.1	7.5
				Middle	3.8	20.6 20.6	20.6	8.1 8.1	8.1	34.4 34.4	34.4	97.2 97.4	97.3	7.1 7.2	7.1		0.8 0.8	0.8		8.7 8.9	8.8	
				Bottom	6.6	20.5 20.5	20.5	8.1 8.1	8.1	34.5 34.5	34.5	96.4 96.2	96.3	7.1 7.1	7.1	7.1	1.0 1.0	1.0		5.7 5.7	5.7	
G4	Sunny	Calm	8:47	Surface	1.0	20.9 20.8	20.9	8.1 8.1	8.1	34.4 34.4	34.4	97.3 97.2	97.3	7.1 7.1	7.1	7.1	1.4 1.4	1.4	1.3	7.3 7.5	7.4	6.2
				Middle	3.8	20.6 20.7	20.7	8.1 8.1	8.1	34.4 34.4	34.4	95.9 96.0	96.0	7.0 7.0	7.0		1.3 1.3	1.3		5.7 5.8	5.8	
				Bottom	6.5	20.5 20.5	20.5	8.1 8.1	8.1	34.5 34.5	34.5	95.7 95.7	95.7	7.0 7.0	7.0	7.0	1.3 1.3	1.3		5.4 5.4	5.4	
M1	Sunny	Calm	8:12	Surface	1.0	20.8 20.7	20.7	8.1 8.1	8.1	34.4 34.4	34.4	95.9 95.5	95.7	7.0 7.0	7.0	6.9	1.8 1.8	1.8	2.1	5.1 5.1	5.1	5.5
				Middle	3.1	20.5 20.5	20.5	8.1 8.1	8.1	34.4 34.5	34.4	93.5 93.4	93.5	6.9 6.9	6.9		2.3 2.3	2.3		6.9 6.9	6.9	
				Bottom	5.1	20.5 20.5	20.5	8.1 8.1	8.1	34.4 34.5	34.4	93.4 93.4	93.4	6.9 6.9	6.9	6.9	2.3 2.3	2.3		4.6 4.6	4.6	
M2	Sunny	Calm	7:59	Surface	1.1	20.7 20.7	20.7	8.0 8.0	8.0	34.4 34.4	34.4	97.3 97.1	97.2	7.1 7.1	7.1	7.1	1.3 1.2	1.2	1.0	6.1 6.0	6.1	5.8
				Middle	5.3	20.5 20.5	20.5	8.1 8.1	8.1	34.5 34.5	34.5	95.6 95.6	95.6	7.0 7.0	7.0		0.9 0.9	0.9		4.4 4.4	4.4	
				Bottom	9.5	20.5 20.5	20.5	8.1 8.1	8.1	34.5 34.5	34.5	95.8 95.9	95.9	7.0 7.1	7.0	7.0	1.0 1.0	1.0		6.9 7.1	7.0	
M3	Sunny	Calm	8:40	Surface	1.1	20.6 20.6	20.6	8.1 8.1	8.1	34.4 34.4	34.4	95.9 96.2	96.1	7.0 7.1	7.1	7.1	0.5 0.5	0.5	0.5	6.7 7.0	6.9	13.2
				Middle	3.7	20.5 20.5	20.5	8.1 8.1	8.1	34.5 34.5	34.5	96.2 96.2	96.2	7.1 7.1	7.1		0.5 0.5	0.5		8.0 8.2	8.1	
				Bottom	6.6	20.5 20.5	20.5	8.1 8.1	8.1	34.5 34.5	34.5	95.5 95.2	95.4	7.0 7.0	7.0	7.0	0.4 0.4	0.4		24.7 24.3	24.5	
M4	Sunny	Calm	7:54	Surface	1.1	20.5 20.5	20.5	8.0 8.0	8.0	34.5 34.5	34.5	93.4 93.3	93.4	6.9 6.9	6.9	6.9	1.6 1.6	1.6	1.7	21.8 22.1	22.0	11.5
				Middle	5.0	20.5 20.5	20.5	8.0 8.0	8.0	34.5 34.5	34.5	92.9 93.0	93.0	6.8 6.8	6.8		1.7 1.8	1.7		5.5 5.7	5.6	
				Bottom	9.1	20.5 20.5	20.5	8.0 8.0	8.0	34.5 34.5	34.5	92.5 92.5	92.5	6.8 6.8	6.8	6.8	1.7 1.7	1.7		6.9 6.9	6.9	
M5	Sunny	Calm	9:04	Surface	1.1	20.7 20.6	20.7	8.1 8.1	8.1	34.5 34.5	34.5	95.6 95.3	95.5	7.0 7.0	7.0	7.1	1.5 1.5	1.5	1.6	5.4 5.5	5.5	5.3
				Middle	5.5	20.5 20.5	20.5	8.2 8.2	8.2	34.7 34.7	34.7	97.3 97.2	97.3	7.1 7.1	7.1		1.7 1.8	1.7		6.0 6.1	6.1	
				Bottom	10.1	20.5 20.5	20.5	8.2 8.2	8.2	34.7 34.7	34.7	97.5 97.5	97.5	7.2 7.2	7.2	7.2	1.6 1.6	1.6		4.4 4.4	4.4	
M6	Sunny	Calm	8:54	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	6.9	- -	-	1.0	- -	-	6.9
				Middle	2.1	20.5 20.5	20.5	8.1 8.1	8.1	34.4 34.4	34.4	93.7 93.5	93.6	6.9 6.9	6.9		1.0 1.0	1.0		6.9 6.8	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 25 March 2020 (Mid-Flood Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU***	***22.2 NTU***
		or 120% of upstream control station's Turbidity at the same tide of the same day ***C1: 1.2 NTU***	or 130% of upstream control station's Turbidity at the same tide of the same day ***C1: 1.4 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L***	***6.9 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C1: 6.2 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C1: 6.8 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L***	***7.4 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C1: 6.2 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C1: 6.8 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L***	***7.9 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C1: 7.5 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C1: 8.1 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 27 March 2020

(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	15:29	Surface	1.0	21.1 21.0	21.1	8.1 8.1	8.1	34.5 34.5	34.5	97.4 97.4	97.4	7.1 7.1	7.1	7.1	0.8 0.9	0.9	0.8	9.1 8.8	9.0	7.2
				Middle	9.0	20.9 21.3	21.1	8.2 8.2	8.2	34.8 34.8	34.8	97.1 97.1	97.1	7.1 7.1	7.1		0.8 0.7	0.7		5.1 4.8	5.0	
				Bottom	17.1	20.9 20.9	20.9	8.2 8.2	8.2	34.8 34.8	34.8	97.0 96.9	97.0	7.1 7.1	7.1	7.1	1.0 0.9	0.9		7.6 7.6	7.6	
C2	Sunny	Calm	13:46	Surface	1.1	21.6 20.9	21.2	7.8 7.8	7.8	34.5 34.6	34.5	94.7 94.6	94.7	6.9 6.9	6.9	6.9	0.9 0.9	0.9	0.9	6.7 6.9	6.8	6.9
				Middle	16.5	20.9 20.9	20.9	7.9 7.9	7.9	34.6 34.6	34.6	94.9 94.9	94.9	6.9 6.9	6.9		0.9 0.9	0.9		8.2 8.4	8.3	
				Bottom	32.0	20.9 20.9	20.9	8.0 8.0	8.0	34.7 34.7	34.7	93.7 93.5	93.6	6.8 6.8	6.8	6.8	1.0 1.0	1.0		5.6 5.4	5.5	
G1	Sunny	Calm	14:26	Surface	1.0	21.8 20.9	21.3	8.2 8.2	8.2	34.4 34.4	34.4	99.2 99.3	99.3	7.2 7.2	7.2	7.2	0.9 0.9	0.9	1.3	5.2 5.3	5.3	5.2
				Middle	4.1	20.9 20.8	20.9	8.2 8.2	8.2	34.4 34.4	34.4	98.5 98.7	98.6	7.2 7.2	7.2		1.1 1.2	1.2		7.4 7.1	7.3	
				Bottom	7.0	20.8 20.8	20.8	8.2 8.2	8.2	34.5 34.4	34.5	97.7 97.3	97.5	7.1 7.1	7.1	7.1	1.8 1.7	1.8		3.2 3.0	3.1	
G2	Sunny	Calm	14:06	Surface	1.1	21.7 20.9	21.3	8.2 8.1	8.1	34.4 34.4	34.4	97.4 97.3	97.4	7.1 7.1	7.1	7.1	1.0 1.0	1.0	1.2	3.7 3.4	3.6	5.0
				Middle	5.1	20.9 20.9	20.9	8.1 8.1	8.1	34.5 34.5	34.5	96.4 96.4	96.4	7.0 7.0	7.0		1.1 1.1	1.1		5.6 5.8	5.7	
				Bottom	9.0	20.8 20.8	20.8	8.1 8.1	8.1	34.5 34.5	34.5	94.9 94.4	94.7	6.9 6.9	6.9	6.9	1.5 1.5	1.5		5.8 5.8	5.8	
G3	Sunny	Calm	14:33	Surface	1.0	21.8 20.9	21.4	8.2 8.2	8.2	34.4 34.5	34.4	97.1 97.2	97.2	7.1 7.1	7.1	7.1	0.6 0.7	0.7	0.8	5.3 5.3	5.3	6.8
				Middle	4.1	20.8 20.9	20.9	8.2 8.2	8.2	34.5 34.4	34.4	98.2 98.3	98.3	7.2 7.2	7.2		0.8 0.8	0.8		10.1 10.2	10.2	
				Bottom	7.1	20.7 20.8	20.8	8.2 8.2	8.2	34.4 34.5	34.4	96.5 96.3	96.4	7.0 7.0	7.0	7.0	0.9 1.0	0.9		5.1 5.0	5.1	
G4	Sunny	Calm	14:46	Surface	1.1	21.8 21.0	21.4	8.1 8.1	8.1	34.4 34.4	34.4	98.9 99.1	99.0	7.2 7.2	7.2	7.2	0.9 0.8	0.8	1.4	3.8 3.6	3.7	5.4
				Middle	4.0	21.0 20.9	21.0	8.1 8.1	8.1	34.4 34.4	34.4	98.5 98.7	98.6	7.2 7.2	7.2		0.9 0.9	0.9		6.0 5.7	5.9	
				Bottom	7.0	20.9 20.9	20.9	8.1 8.1	8.1	34.5 34.4	34.4	96.9 96.5	96.7	7.1 7.0	7.0	7.0	2.4 2.4	2.4		6.6 6.9	6.8	
M1	Sunny	Calm	14:14	Surface	1.1	21.8 21.1	21.4	8.1 8.1	8.1	34.3 34.4	34.3	96.0 96.0	96.0	7.0 7.0	7.0	7.0	0.9 0.8	0.9	1.0	4.3 4.0	4.2	4.7
				Middle	3.1	20.8 21.0	20.9	8.1 8.1	8.1	34.3 34.4	34.4	96.0 96.0	96.0	7.0 7.0	7.0		1.0 1.0	1.0		4.7 4.5	4.6	
				Bottom	5.1	20.8 20.8	20.8	8.1 8.1	8.1	34.5 34.5	34.5	95.7 95.7	95.7	7.0 7.0	7.0	7.0	1.0 1.1	1.1		5.5 5.2	5.4	
M2	Sunny	Calm	13:59	Surface	1.0	21.5 20.9	21.2	8.1 8.1	8.1	34.4 34.5	34.4	97.3 97.4	97.4	7.1 7.1	7.1	7.1	1.3 1.3	1.3	1.2	6.0 5.5	5.8	6.7
				Middle	5.5	20.8 20.9	20.8	8.1 8.1	8.1	34.5 34.6	34.5	97.0 97.1	97.1	7.1 7.1	7.1		1.2 1.3	1.2		5.4 5.4	5.4	
				Bottom	10.0	20.8 20.8	20.8	8.1 8.1	8.1	34.6 34.5	34.6	95.7 95.3	95.5	7.0 7.0	7.0	7.0	1.1 1.1	1.1		9.0 8.6	8.8	
M3	Sunny	Calm	14:40	Surface	1.0	21.5 21.0	21.2	8.2 8.1	8.1	34.4 34.3	34.4	97.9 97.9	97.9	7.1 7.1	7.1	7.1	0.3 0.4	0.3	0.6	5.3 5.4	5.4	10.2
				Middle	4.0	20.9 20.9	20.9	8.2 8.2	8.2	34.4 34.4	34.4	97.5 97.4	97.5	7.1 7.1	7.1		0.5 0.5	0.5		5.3 5.5	5.4	
				Bottom	7.0	20.7 20.8	20.7	8.2 8.2	8.2	34.5 34.5	34.5	95.9 95.7	95.8	7.0 7.0	7.0	7.0	0.9 0.9	0.9		19.8 19.6	19.7	
M4	Sunny	Calm	13:53	Surface	1.0	21.1 21.0	21.0	8.3 8.3	8.3	34.5 34.4	34.4	94.6 94.6	94.6	6.9 6.9	6.9	6.9	0.6 0.8	0.7	0.9	6.4 6.4	6.4	5.7
				Middle	5.0	20.9 20.9	20.9	8.3 8.3	8.3	34.5 34.5	34.5	94.4 94.4	94.4	6.9 6.9	6.9		0.9 0.8	0.9		5.0 5.2	5.1	
				Bottom	9.0	20.8 20.8	20.8	8.3 8.3	8.3	34.5 34.6	34.6	94.4 94.5	94.5	6.9 6.9	6.9	6.9	1.1 1.2	1.2		5.3 5.6	5.5	
M5	Sunny	Calm	15:17	Surface	1.1	21.0 21.0	21.0	8.2 8.2	8.2	34.6 34.7	34.6	96.0 96.1	96.1	7.0 7.0	7.0	7.0	2.0 2.1	2.0	2.5	4.5 4.5	4.5	5.9
				Middle	6.1	20.9 21.3	21.1	8.2 8.2	8.2	34.6 34.7	34.7	95.3 95.5	95.4	7.0 7.0	7.0		2.9 2.8	2.9		5.6 5.7	5.7	
				Bottom	11.1	20.9 20.9	20.9	8.2 8.2	8.2	34.7 34.7	34.7	95.8 95.7	95.8	7.0 7.0	7.0	7.0	2.7 2.7	2.7		7.3 7.5	7.4	
M6	Sunny	Calm	15:00	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	7.1	- -	-	0.9	- -	-	7.4
				Middle	2.2	21.2 20.9	21.1	8.1 8.1	8.1	34.4 34.4	34.4	96.7 96.9	96.8	7.1 7.1	7.1		0.9 1.0	0.9		7.2 7.5	7.4	
				Bottom	-	- -	-	- -	-	- -	-	- -	-	- -	-	-	- -	-		- -	-	

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

Appendix I - Action and Limit Levels for Marine Water Quality on 27 March 2020 (Mid-Ebb Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU***	***22.2 NTU***
		or 120% of upstream control station's Turbidity at the same tide of the same day ***C2: 1.2 NTU***	or 130% of upstream control station's Turbidity at the same tide of the same day ***C2: 1.3 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L***	***6.9 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C2: 8.2 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C2: 8.8 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L***	***7.4 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C2: 8.2 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C2: 8.8 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L***	***7.9 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C2: 6.6 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C2: 7.2 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

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Water Quality Monitoring Results on 27 March 2020

(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	11:25	Surface	1.1	21.1 21.0	21.1	8.1 8.1	8.1	34.5 34.4	34.4	94.0 93.8	93.9	6.8 6.8	6.8	6.9	0.8 0.8	0.8	0.8	3.6 3.5	3.6	3.9
				Middle	11.0	20.9 20.9	20.9	8.2 8.2	8.2	34.7 34.7	34.7	96.4 96.1	96.3	7.0 7.0	7.0		0.8 0.7	0.7		3.7 3.5	3.6	
				Bottom	21.1	20.9 20.9	20.9	8.2 8.2	8.2	34.9 34.9	34.9	97.4 97.3	97.4	7.1 7.1	7.1	7.1	0.8 0.9	0.8		4.7 4.4	4.6	
C2	Sunny	Calm	9:33	Surface	1.1	20.9 20.9	20.9	7.8 8.0	7.9	34.4 34.5	34.5	94.1 93.9	94.0	6.9 6.9	6.9	6.8	0.6 0.8	0.7	0.8	7.7 7.7	7.7	14.1
				Middle	16.0	20.9 20.8	20.9	7.9 8.0	7.9	34.5 34.5	34.5	93.7 93.1	93.4	6.9 6.8	6.8		0.7 0.8	0.8		13.3 12.5	12.9	
				Bottom	31.1	20.8 20.8	20.8	7.9 8.0	8.0	34.6 34.5	34.6	93.8 93.1	93.5	6.9 6.8	6.8	6.8	0.8 0.8	0.8		22.2 21.3	21.8	
G1	Sunny	Calm	10:27	Surface	1.0	21.0 20.9	20.9	8.2 8.1	8.1	34.4 34.4	34.4	95.1 94.1	94.6	6.9 6.9	6.9	6.9	0.7 0.8	0.7	1.2	26.8 24.7	25.8	12.2
				Middle	4.5	20.9 20.8	20.8	8.2 8.1	8.1	34.4 34.4	34.4	94.4 93.6	94.0	6.9 6.8	6.9		1.0 1.0	1.0		5.0 5.2	5.1	
				Bottom	8.0	20.8 20.7	20.8	8.1 8.1	8.1	34.4 34.5	34.4	92.7 91.2	92.0	6.8 6.7	6.7	6.7	2.0 1.8	1.9		5.6 6.0	5.8	
G2	Sunny	Calm	10:06	Surface	1.1	20.9 20.9	20.9	8.1 8.1	8.1	34.4 34.4	34.4	94.4 94.6	94.5	6.9 6.9	6.9	6.9	0.8 1.1	0.9	1.2	7.4 7.1	7.3	5.0
				Middle	5.1	20.9 20.9	20.9	8.1 8.1	8.1	34.4 34.4	34.4	93.8 94.1	94.0	6.9 6.9	6.9		1.0 1.2	1.1		4.0 3.9	4.0	
				Bottom	9.1	20.8 20.8	20.8	8.1 8.1	8.1	34.5 34.5	34.5	93.2 93.4	93.3	6.8 6.8	6.8	6.8	1.5 1.4	1.5		3.7 3.8	3.8	
G3	Sunny	Calm	10:38	Surface	1.0	20.9 20.9	20.9	8.2 8.1	8.1	34.3 34.4	34.3	94.9 95.0	95.0	6.9 6.9	6.9	6.9	0.5 0.6	0.5	0.6	6.5 6.2	6.4	6.7
				Middle	4.5	20.8 20.9	20.9	8.2 8.1	8.1	34.4 34.4	34.4	94.1 95.1	94.6	6.9 7.0	6.9		0.7 0.5	0.6		9.0 9.1	9.1	
				Bottom	8.1	20.7 20.8	20.7	8.1 8.1	8.1	34.5 34.4	34.4	92.3 94.9	93.6	6.8 6.9	6.9	6.9	0.8 0.8	0.8		4.6 4.6	4.6	
G4	Sunny	Calm	10:57	Surface	1.1	21.0 21.0	21.0	8.1 8.1	8.1	34.4 34.4	34.4	94.9 94.7	94.8	6.9 6.9	6.9	6.9	0.7 0.7	0.7	1.4	6.4 6.7	6.6	7.3
				Middle	4.5	21.0 20.9	21.0	8.2 8.1	8.1	34.4 34.4	34.4	94.6 94.4	94.5	6.9 6.9	6.9		0.8 0.8	0.8		4.3 4.5	4.4	
				Bottom	8.1	20.8 20.9	20.9	8.1 8.1	8.1	34.5 34.4	34.5	93.3 93.8	93.6	6.8 6.9	6.8	6.8	2.6 2.7	2.7		11.0 11.0	11.0	
M1	Sunny	Calm	10:15	Surface	1.0	21.0 21.1	21.0	8.1 8.1	8.1	34.3 34.2	34.3	94.2 94.2	94.2	6.9 6.9	6.9	6.9	0.7 0.8	0.8	0.9	5.6 5.7	5.7	4.3
				Middle	3.9	20.8 21.0	20.9	8.1 8.1	8.1	34.4 34.3	34.3	93.7 94.1	93.9	6.9 6.9	6.9		0.8 0.9	0.8		3.1 2.9	3.0	
				Bottom	6.0	20.8 20.8	20.8	8.1 8.1	8.1	34.5 34.4	34.4	91.6 93.5	92.6	6.7 6.8	6.8	6.8	1.0 1.0	1.0		4.0 4.2	4.1	
M2	Sunny	Calm	9:57	Surface	1.1	20.9 20.9	20.9	8.1 8.1	8.1	34.4 34.4	34.4	94.0 93.8	93.9	6.9 6.9	6.9	6.8	1.3 1.3	1.3	1.2	4.2 4.3	4.3	5.4
				Middle	6.0	20.8 20.8	20.8	8.1 8.1	8.1	34.5 34.5	34.5	93.2 92.9	93.1	6.8 6.8	6.8		1.3 1.1	1.2		7.6 7.4	7.5	
				Bottom	11.1	20.8 20.8	20.8	8.1 8.1	8.1	34.5 34.5	34.5	92.8 92.4	92.6	6.8 6.8	6.8	6.8	1.1 1.0	1.0		4.3 4.5	4.4	
M3	Sunny	Calm	10:47	Surface	1.0	21.0 21.0	21.0	8.2 8.1	8.2	34.3 34.3	34.3	95.7 95.8	95.8	7.0 7.0	7.0	7.0	0.4 0.4	0.4	0.7	3.6 3.6	3.6	4.5
				Middle	4.5	20.9 20.9	20.9	8.2 8.1	8.2	34.4 34.4	34.4	96.2 96.4	96.3	7.0 7.0	7.0		0.5 0.5	0.5		6.2 6.2	6.2	
				Bottom	8.0	20.6 20.7	20.7	8.1 8.1	8.1	34.5 34.5	34.5	89.3 91.4	90.4	6.6 6.7	6.6	6.6	1.1 1.0	1.0		3.6 3.6	3.6	
M4	Sunny	Calm	9:47	Surface	1.0	21.0 21.0	21.0	8.1 8.1	8.1	34.4 34.4	34.4	95.4 95.1	95.3	7.0 6.9	6.9	6.9	0.6 0.5	0.5	0.8	2.1 2.0	2.1	5.6
				Middle	5.0	20.9 20.8	20.8	8.1 8.1	8.1	34.4 34.4	34.4	94.0 93.3	93.7	6.9 6.8	6.8		0.8 0.9	0.8		4.5 4.5	4.5	
				Bottom	9.0	20.8 20.8	20.8	8.1 8.1	8.1	34.5 34.5	34.5	93.3 92.9	93.1	6.8 6.8	6.8	6.8	1.0 0.9	0.9		10.3 9.9	10.1	
M5	Sunny	Calm	11:14	Surface	1.1	21.0 20.9	20.9	8.2 8.1	8.1	34.5 34.5	34.5	93.8 94.2	94.0	6.8 6.9	6.9	6.9	1.9 1.9	1.9	2.6	22.6 22.3	22.5	12.6
				Middle	6.6	20.9 20.9	20.9	8.2 8.2	8.2	34.7 34.7	34.7	94.8 95.1	95.0	6.9 6.9	6.9		3.2 2.9	3.1		10.7 10.3	10.5	
				Bottom	12.1	20.9 20.9	20.9	8.2 8.2	8.2	34.8 34.8	34.8	96.1 96.1	96.1	7.0 7.0	7.0	7.0	2.8 2.8	2.8		4.8 4.7	4.8	
M6	Sunny	Calm	11:08	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	6.8	- -	-	1.0	- -	-	6.3
				Middle	2.1	20.9 20.9	20.9	8.1 8.1	8.1	34.4 34.4	34.4	93.3 93.5	93.4	6.8 6.8	6.8		1.1 1.0	1.0		6.1 6.4	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 27 March 2020 (Mid-Flood Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU***	***22.2 NTU***
		or 120% of upstream control station's Turbidity at the same tide of the same day ***C1: 1.0 NTU***	or 130% of upstream control station's Turbidity at the same tide of the same day ***C1: 1.1 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L***	***6.9 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C1: 4.3 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C1: 4.6 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L***	***7.4 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C1: 4.3 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C1: 4.6 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L***	***7.9 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C1: 5.5 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C1: 5.9 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 30 March 2020

(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	15:59	Surface	1.0	18.7 18.7	18.7	8.3 8.3	8.3	33.8 33.8	33.8	100.0 100.0	100.0	7.8 7.8	7.8	7.7	1.1 1.1	1.1	1.2	5.2 5.1	5.2	6.2
				Middle	9.0	18.5 18.5	18.5	8.3 8.3	8.3	33.8 33.8	33.8	97.7 97.7	97.7	7.6 7.6	7.6		1.1 1.1	1.1		6.1 6.3	6.2	
				Bottom	17.0	18.4 18.4	18.4	8.3 8.3	8.3	33.9 33.9	33.9	96.6 96.6	96.6	7.6 7.6	7.6	7.6	1.2 1.3	1.3		7.0 7.4	7.2	
C2	Rainy	Moderate	14:58	Surface	1.0	18.8 18.8	18.8	8.2 8.3	8.3	33.8 33.8	33.8	98.5 98.7	98.6	7.7 7.7	7.7	7.6	0.9 0.7	0.8	0.8	20.8 21.9	21.4	13.2
				Middle	16.1	18.5 18.5	18.5	8.3 8.3	8.3	33.8 33.8	33.8	96.7 96.7	96.7	7.6 7.5	7.5		0.8 0.8	0.8		9.1 8.9	9.0	
				Bottom	31.0	18.5 18.5	18.5	8.3 8.3	8.3	33.8 33.8	33.8	96.3 96.3	96.3	7.5 7.5	7.5	7.5	0.7 0.7	0.7		9.2 9.3	9.3	
G1	Rainy	Moderate	15:29	Surface	1.0	19.0 19.0	19.0	8.3 8.3	8.3	33.6 33.6	33.6	97.1 97.1	97.1	7.5 7.5	7.5	7.5	2.2 2.2	2.2	2.2	4.1 4.0	4.1	4.9
				Middle	4.0	18.6 18.6	18.6	8.3 8.3	8.3	33.7 33.7	33.7	96.1 96.1	96.1	7.5 7.5	7.5		2.3 2.3	2.3		6.2 6.2	6.2	
				Bottom	7.0	18.6 18.6	18.6	8.3 8.3	8.3	33.8 33.8	33.8	96.0 96.0	96.0	7.5 7.5	7.5	7.5	2.1 2.2	2.1		4.4 4.3	4.4	
G2	Rainy	Moderate	15:21	Surface	1.0	18.9 18.9	18.9	8.2 8.2	8.2	33.7 33.7	33.7	96.6 96.6	96.6	7.5 7.5	7.5	7.5	2.3 2.3	2.3	2.1	3.9 3.7	3.8	4.9
				Middle	5.0	18.7 18.7	18.7	8.3 8.3	8.3	33.8 33.8	33.8	96.6 96.6	96.6	7.5 7.5	7.5		2.1 2.1	2.1		5.2 5.2	5.2	
				Bottom	9.0	18.5 18.5	18.5	8.3 8.3	8.3	33.8 33.8	33.8	96.0 96.0	96.0	7.5 7.5	7.5	7.5	1.8 1.8	1.8		5.6 5.5	5.6	
G3	Rainy	Moderate	15:35	Surface	1.0	19.3 19.3	19.3	8.4 8.4	8.4	33.7 33.7	33.7	97.6 97.6	97.6	7.5 7.5	7.5	7.5	2.0 1.9	2.0	2.7	6.2 6.2	6.2	9.0
				Middle	4.1	18.6 18.6	18.6	8.4 8.4	8.4	33.8 33.8	33.8	95.7 95.7	95.7	7.5 7.5	7.5		3.0 2.9	3.0		14.9 15.0	15.0	
				Bottom	7.1	18.5 18.5	18.5	8.4 8.4	8.4	33.8 33.8	33.8	94.8 94.8	94.8	7.4 7.4	7.4	7.4	3.2 3.2	3.2		5.7 6.1	5.9	
G4	Rainy	Moderate	15:46	Surface	1.1	18.8 18.8	18.8	8.3 8.3	8.3	33.7 33.7	33.7	98.1 97.9	98.0	7.6 7.6	7.6	7.6	2.5 2.5	2.5	2.5	6.4 6.5	6.5	7.4
				Middle	4.0	18.6 18.6	18.6	8.3 8.3	8.3	33.7 33.7	33.7	96.3 96.2	96.3	7.5 7.5	7.5		3.0 3.0	3.0		10.1 10.8	10.5	
				Bottom	7.0	18.5 18.5	18.5	8.3 8.3	8.3	33.8 33.8	33.8	95.7 95.7	95.7	7.5 7.5	7.5	7.5	2.2 2.1	2.1		5.3 5.4	5.4	
M1	Rainy	Moderate	15:26	Surface	1.0	19.1 19.1	19.1	8.2 8.3	8.3	33.7 33.7	33.7	96.2 96.2	96.2	7.4 7.4	7.4	7.4	3.3 3.3	3.3	3.2	7.3 7.4	7.4	6.9
				Middle	3.1	18.9 18.8	18.9	8.3 8.3	8.3	33.7 33.7	33.7	95.2 95.1	95.2	7.4 7.4	7.4		3.0 3.0	3.0		5.8 5.8	5.8	
				Bottom	5.0	18.6 18.6	18.6	8.3 8.3	8.3	33.8 33.8	33.8	94.8 94.8	94.8	7.4 7.4	7.4	7.4	3.3 3.3	3.3		7.5 7.5	7.5	
M2	Rainy	Moderate	15:11	Surface	1.1	18.8 18.8	18.8	8.2 8.2	8.2	33.8 33.8	33.8	100.4 100.3	100.4	7.8 7.8	7.8	7.7	0.7 0.7	0.7	1.2	6.9 6.7	6.8	7.2
				Middle	6.1	18.6 18.6	18.6	8.2 8.2	8.2	33.8 33.8	33.8	97.6 97.7	97.7	7.6 7.6	7.6		1.2 1.2	1.2		7.2 7.3	7.3	
				Bottom	11.0	18.4 18.4	18.4	8.3 8.3	8.3	33.8 33.8	33.8	96.3 96.3	96.3	7.5 7.5	7.5	7.5	1.7 1.7	1.7		7.5 7.5	7.5	
M3	Rainy	Moderate	15:39	Surface	1.0	19.0 19.0	19.0	8.3 8.3	8.3	33.7 33.6	33.6	96.3 96.3	96.3	7.5 7.5	7.5	7.4	2.0 2.0	2.0	2.7	6.0 5.5	5.8	7.0
				Middle	4.1	18.7 18.7	18.7	8.3 8.3	8.3	33.8 33.8	33.8	94.4 94.2	94.3	7.4 7.3	7.3		3.4 3.6	3.5		7.9 8.0	8.0	
				Bottom	7.0	18.6 18.6	18.6	8.3 8.3	8.3	33.8 33.8	33.8	94.1 94.1	94.1	7.3 7.3	7.3	7.3	2.6 2.6	2.6		7.6 7.1	7.4	
M4	Rainy	Moderate	15:05	Surface	1.1	18.8 18.8	18.8	8.2 8.2	8.2	33.8 33.8	33.8	99.1 99.0	99.1	7.7 7.7	7.7	7.7	0.7 0.7	0.7	0.9	9.0 8.9	9.0	6.4
				Middle	5.1	18.7 18.7	18.7	8.3 8.3	8.3	33.8 33.8	33.8	98.4 98.4	98.4	7.7 7.7	7.7		0.9 0.9	0.9		5.6 5.7	5.7	
				Bottom	9.1	18.7 18.7	18.7	8.3 8.3	8.3	33.8 33.8	33.8	97.8 97.8	97.8	7.6 7.6	7.6	7.6	1.1 1.1	1.1		4.5 4.6	4.6	
M5	Rainy	Moderate	15:54	Surface	1.1	18.5 18.5	18.5	8.3 8.3	8.3	33.8 33.8	33.8	100.0 99.8	99.9	7.8 7.8	7.8	7.7	1.4 1.4	1.4	1.2	3.6 3.3	3.5	5.9
				Middle	6.0	18.4 18.4	18.4	8.3 8.3	8.3	33.8 33.8	33.8	97.6 97.6	97.6	7.6 7.6	7.6		1.1 1.0	1.0		6.8 6.7	6.8	
				Bottom	11.0	18.4 18.4	18.4	8.3 8.3	8.3	33.9 33.9	33.9	97.0 96.9	97.0	7.6 7.6	7.6	7.6	1.2 1.2	1.2		7.4 7.5	7.5	
M6	Rainy	Moderate	15:50	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	7.5	- -	-	1.5	- -	-	8.8
				Middle	2.0	18.6 18.6	18.6	8.3 8.3	8.3	33.7 33.7	33.7	96.8 96.8	96.8	7.5 7.5	7.5		1.5 1.5	1.5		8.8 8.7	8.8	
				Bottom	-	- -	-	- -	-	- -	-	- -	-	- -	-	-	- -	-		- -	-	

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

Appendix I - Action and Limit Levels for Marine Water Quality on 30 March 2020 (Mid-Ebb Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU***	***22.2 NTU***
		or 120% of upstream control station's Turbidity at the same tide of the same day ***C2: 0.9 NTU***	or 130% of upstream control station's Turbidity at the same tide of the same day ***C2: 0.9 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L***	***6.9 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C2: 25.6 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C2: 27.8 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L***	***7.4 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C2: 25.6 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C2: 27.8 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L***	***7.9 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C2: 11.1 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C2: 12.0 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 30 March 2020

(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	Moderate	10:10	Surface	1.1	18.6 18.5	18.5	8.3 8.3	8.3	33.8 33.8	33.8	98.4 97.2	97.8	7.7 7.6	7.6	7.6	1.0 1.0	1.0	1.0	5.6 5.4	5.5	6.3
				Middle	9.1	18.4 18.4	18.4	8.3 8.3	8.3	33.8 33.8	33.8	97.4 97.0	97.2	7.6 7.6	7.6		0.8 0.9	0.9		5.9 6.1	6.0	
				Bottom	17.1	18.4 18.4	18.4	8.3 8.3	8.3	33.8 33.8	33.8	96.7 96.5	96.6	7.6 7.5	7.6	7.6	1.1 1.0	1.0		7.4 7.3	7.4	
C2	Rainy	Moderate	8:30	Surface	1.1	18.5 18.5	18.5	8.2 8.3	8.3	33.7 33.8	33.8	98.0 97.1	97.6	7.7 7.6	7.6	7.6	1.2 1.0	1.1	0.9	7.6 7.5	7.6	5.9
				Middle	16.1	18.5 18.5	18.5	8.3 8.3	8.3	33.8 33.8	33.8	96.7 96.4	96.6	7.6 7.5	7.5		0.8 0.7	0.8		4.4 4.4	4.4	
				Bottom	31.1	18.5 18.5	18.5	8.3 8.3	8.3	33.8 33.8	33.8	96.4 96.1	96.3	7.5 7.5	7.5	7.5	0.9 0.9	0.9		5.9 5.8	5.9	
G1	Rainy	Moderate	9:31	Surface	1.1	18.6 18.6	18.6	8.3 8.3	8.3	33.6 33.6	33.6	95.6 94.4	95.0	7.5 7.4	7.4	7.4	2.1 2.1	2.1	2.6	11.2 11.0	11.1	9.8
				Middle	4.0	18.5 18.5	18.5	8.3 8.3	8.3	33.7 33.7	33.7	95.0 94.5	94.8	7.4 7.4	7.4		2.2 2.5	2.3		8.8 9.1	9.0	
				Bottom	7.0	18.5 18.5	18.5	8.3 8.3	8.3	33.8 33.8	33.8	94.9 94.7	94.8	7.4 7.4	7.4	7.4	3.0 3.4	3.2		9.6 9.1	9.4	
G2	Rainy	Moderate	9:16	Surface	1.1	18.5 18.5	18.5	8.2 8.2	8.2	33.8 33.8	33.8	96.8 96.0	96.4	7.6 7.5	7.5	7.5	1.1 1.0	1.0	1.3	7.6 7.6	7.6	7.2
				Middle	5.1	18.5 18.5	18.5	8.3 8.3	8.3	33.8 33.8	33.8	95.9 95.8	95.9	7.5 7.5	7.5		1.3 1.1	1.2		8.5 8.8	8.7	
				Bottom	9.1	18.5 18.5	18.5	8.3 8.3	8.3	33.8 33.8	33.8	95.2 95.4	95.3	7.4 7.5	7.5	7.5	2.0 1.6	1.8		5.3 5.1	5.2	
G3	Rainy	Moderate	9:38	Surface	1.0	18.7 18.7	18.7	8.4 8.4	8.4	33.5 33.5	33.5	95.4 93.9	94.7	7.4 7.3	7.4	7.3	1.6 1.4	1.5	2.0	5.3 5.1	5.2	5.0
				Middle	4.1	18.6 18.6	18.6	8.4 8.4	8.4	33.8 33.8	33.8	93.9 93.6	93.8	7.3 7.3	7.3		1.9 2.0	1.9		4.7 4.9	4.8	
				Bottom	7.1	18.5 18.5	18.5	8.4 8.4	8.4	33.8 33.8	33.8	94.2 93.5	93.9	7.4 7.3	7.3	7.3	2.6 2.5	2.6		4.8 5.1	5.0	
G4	Rainy	Moderate	9:54	Surface	1.1	18.5 18.5	18.5	8.3 8.3	8.3	33.7 33.7	33.7	97.8 95.1	96.5	7.6 7.4	7.5	7.5	2.0 2.1	2.0	2.2	6.7 6.4	6.6	6.1
				Middle	4.0	18.5 18.5	18.5	8.3 8.3	8.3	33.7 33.8	33.7	96.0 94.8	95.4	7.5 7.4	7.5		2.3 2.2	2.2		4.6 4.7	4.7	
				Bottom	7.1	18.4 18.4	18.4	8.3 8.3	8.3	33.8 33.8	33.8	95.2 94.7	95.0	7.5 7.4	7.4	7.4	2.2 2.3	2.3		7.0 7.1	7.1	
M1	Rainy	Moderate	9:24	Surface	1.0	18.5 18.5	18.5	8.2 8.3	8.3	33.8 33.8	33.8	99.5 95.8	97.7	7.8 7.5	7.6	7.6	2.3 1.9	2.1	2.1	4.9 4.5	4.7	4.5
				Middle	3.1	18.5 18.5	18.5	8.3 8.3	8.3	33.8 33.8	33.8	96.4 95.7	96.1	7.5 7.5	7.5		2.2 2.1	2.2		3.6 3.7	3.7	
				Bottom	5.0	18.5 18.5	18.5	8.3 8.3	8.3	33.8 33.8	33.8	95.4 95.2	95.3	7.5 7.4	7.5	7.5	2.0 1.9	1.9		5.0 5.3	5.2	
M2	Rainy	Moderate	9:09	Surface	1.0	18.5 18.5	18.5	8.2 8.2	8.2	33.8 33.8	33.8	97.9 96.4	97.2	7.7 7.5	7.6	7.6	1.0 0.9	0.9	1.3	8.6 8.5	8.6	7.7
				Middle	6.1	18.5 18.5	18.5	8.2 8.2	8.2	33.8 33.8	33.8	96.4 96.1	96.3	7.5 7.5	7.5		1.2 1.2	1.2		8.8 8.7	8.8	
				Bottom	11.1	18.5 18.5	18.5	8.3 8.3	8.3	33.8 33.8	33.8	95.9 94.9	95.4	7.5 7.4	7.5	7.5	1.6 1.6	1.6		5.7 5.9	5.8	
M3	Rainy	Moderate	9:44	Surface	1.1	18.7 18.8	18.7	8.3 8.3	8.3	33.7 33.7	33.7	96.0 92.0	94.0	7.5 7.2	7.3	7.3	2.0 2.0	2.0	2.1	4.9 4.9	4.9	6.1
				Middle	4.0	18.6 18.6	18.6	8.3 8.3	8.3	33.7 33.8	33.7	95.0 93.2	94.1	7.4 7.3	7.3		2.1 2.1	2.1		8.1 8.0	8.1	
				Bottom	7.0	18.5 18.5	18.5	8.3 8.3	8.3	33.8 33.8	33.8	95.0 94.3	94.7	7.4 7.4	7.4	7.4	2.2 2.2	2.2		5.2 5.2	5.2	
M4	Rainy	Moderate	8:54	Surface	1.1	18.5 18.5	18.5	8.2 8.2	8.2	33.8 33.8	33.8	96.7 96.4	96.6	7.6 7.5	7.5	7.6	1.8 1.5	1.7	1.6	5.8 5.7	5.8	5.1
				Middle	5.1	18.5 18.5	18.5	8.3 8.3	8.3	33.8 33.8	33.8	97.0 96.4	96.7	7.6 7.5	7.6		1.5 1.6	1.6		4.0 4.1	4.1	
				Bottom	9.1	18.4 18.4	18.4	8.3 8.3	8.3	33.8 33.8	33.8	96.7 96.7	96.7	7.6 7.6	7.6	7.6	1.7 1.5	1.6		5.6 5.4	5.5	
M5	Rainy	Moderate	10:05	Surface	1.0	18.5 18.6	18.6	8.3 8.3	8.3	33.8 33.8	33.8	99.3 96.4	97.9	7.8 7.5	7.6	7.6	1.1 1.2	1.1	1.4	8.1 7.7	7.9	7.5
				Middle	6.1	18.5 18.5	18.5	8.3 8.3	8.3	33.8 33.8	33.8	97.1 96.5	96.8	7.6 7.5	7.6		1.5 1.6	1.5		7.3 6.9	7.1	
				Bottom	11.1	18.4 18.4	18.4	8.3 8.3	8.3	33.8 33.8	33.8	96.9 96.5	96.7	7.6 7.6	7.6	7.6	1.7 1.6	1.6		7.4 7.4	7.4	
M6	Rainy	Moderate	10:00	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	7.5	- -	-	2.5	- -	-	10.1
				Middle	2.0	18.5 18.5	18.5	8.3 8.3	8.3	33.8 33.8	33.8	95.8 95.6	95.7	7.5 7.5	7.5		2.5 2.6	2.5		10.3 9.8	10.1	
				Bottom	-	- -	-	- -	-	- -	-	- -	-	- -	-	-	- -	-		- -	-	

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

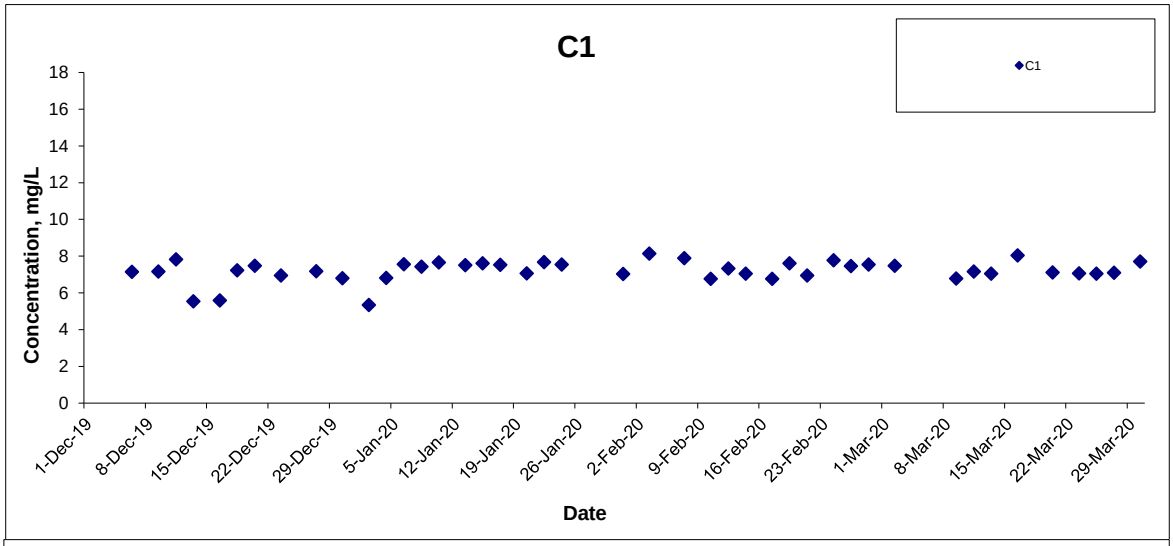
Appendix I - Action and Limit Levels for Marine Water Quality on 30 March 2020 (Mid-Flood Tide)

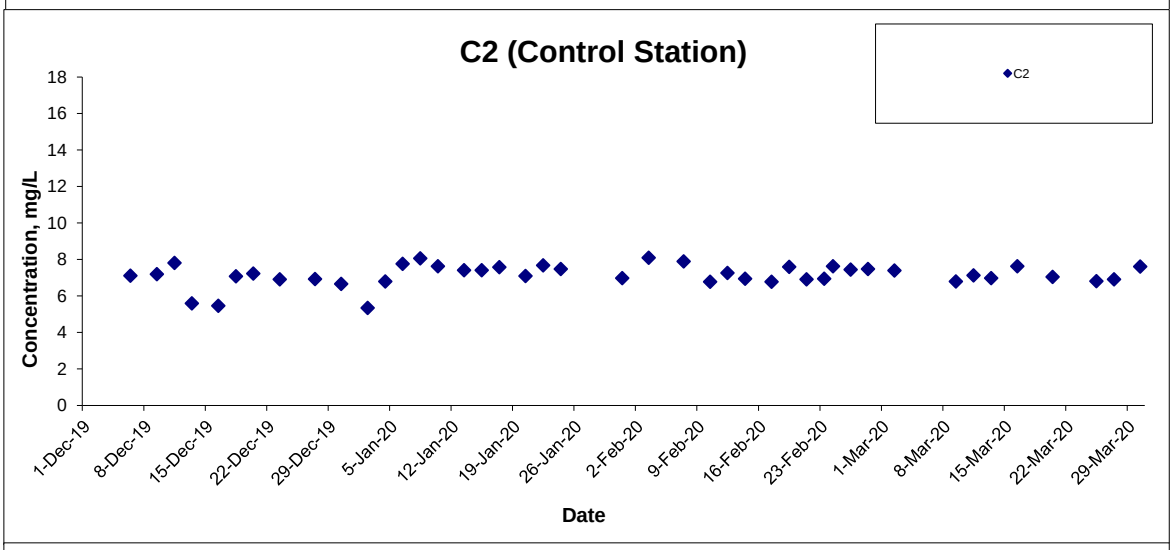
Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU***	***22.2 NTU***
		or 120% of upstream control station's Turbidity at the same tide of the same day ***C1: 1.2 NTU***	or 130% of upstream control station's Turbidity at the same tide of the same day ***C1: 1.3 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L***	***6.9 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C1: 6.6 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C1: 7.2 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L***	***7.4 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C1: 6.6 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C1: 7.2 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L***	***7.9 mg/L***
		or 120% of upstream control station's SS at the same tide of the same day ***C1: 8.8 mg/L***	or 130% of upstream control station's SS at the same tide of the same day ***C1: 9.6 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

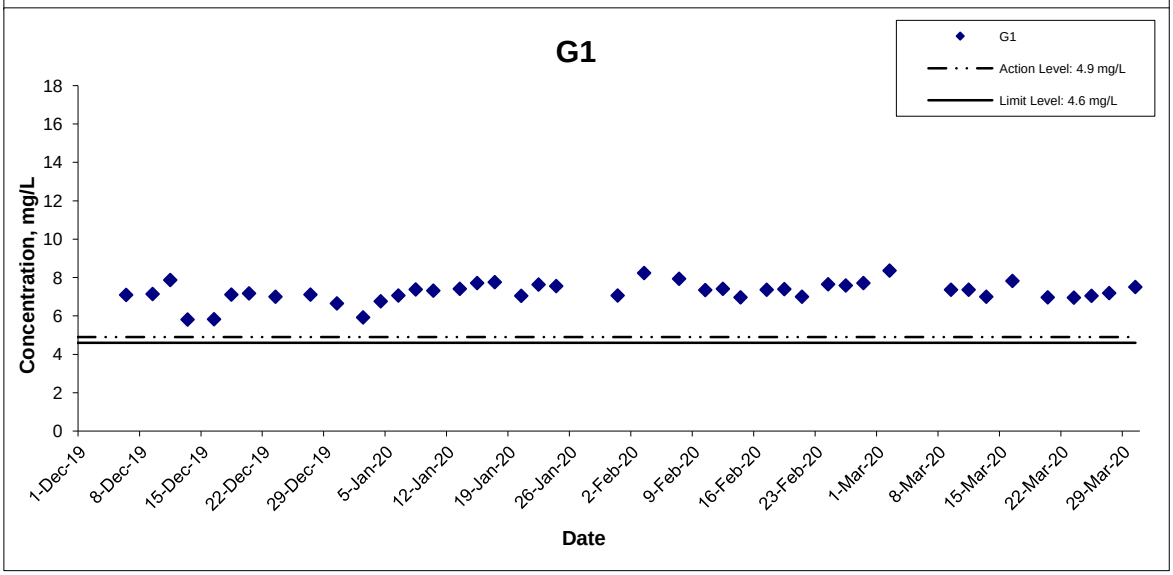
Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

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







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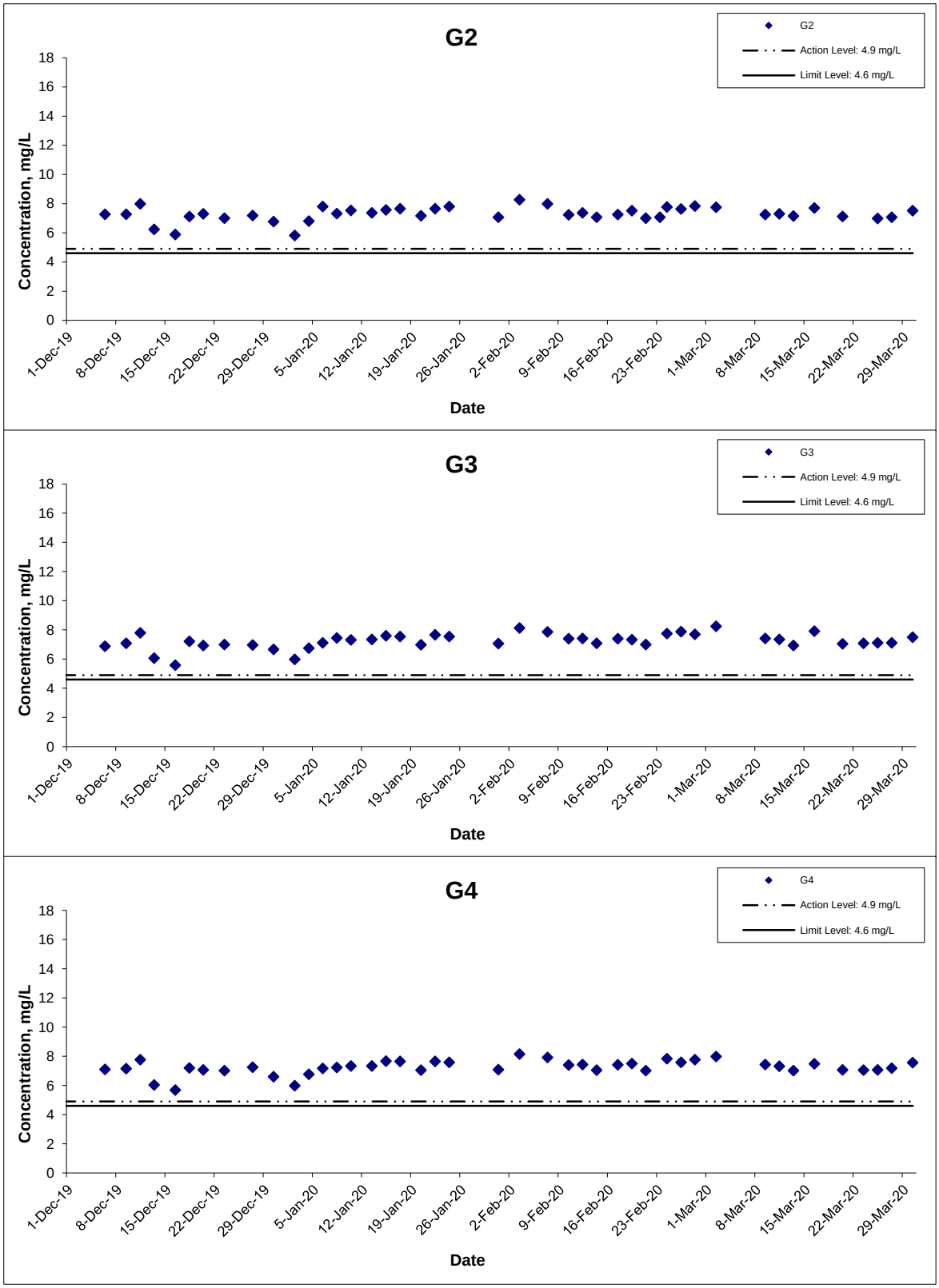
Dissolved Oxygen (Depth-averaged) at Mid-Ebb Tide



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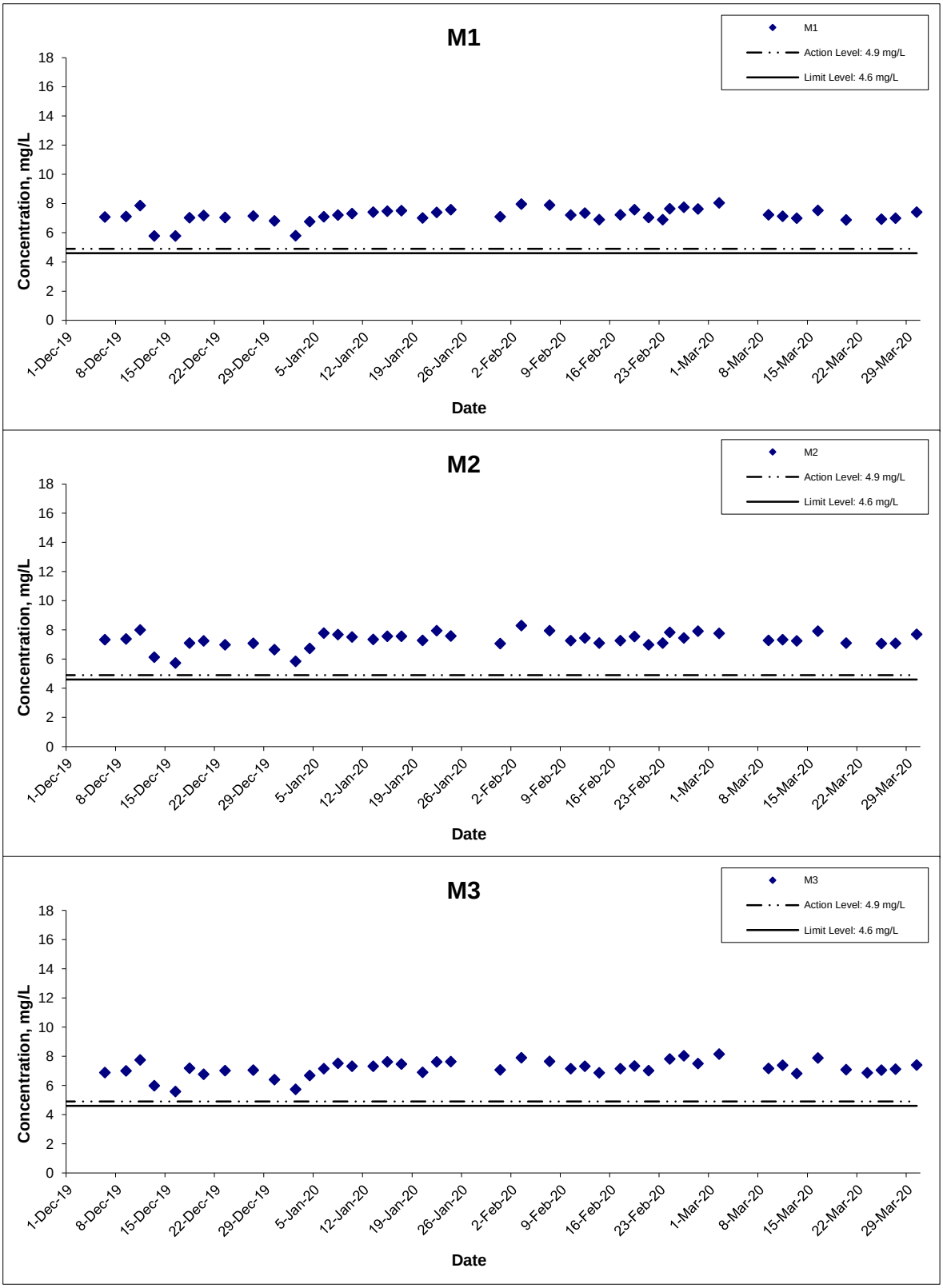
Dissolved Oxygen (Depth-averaged) at Mid-Ebb Tide



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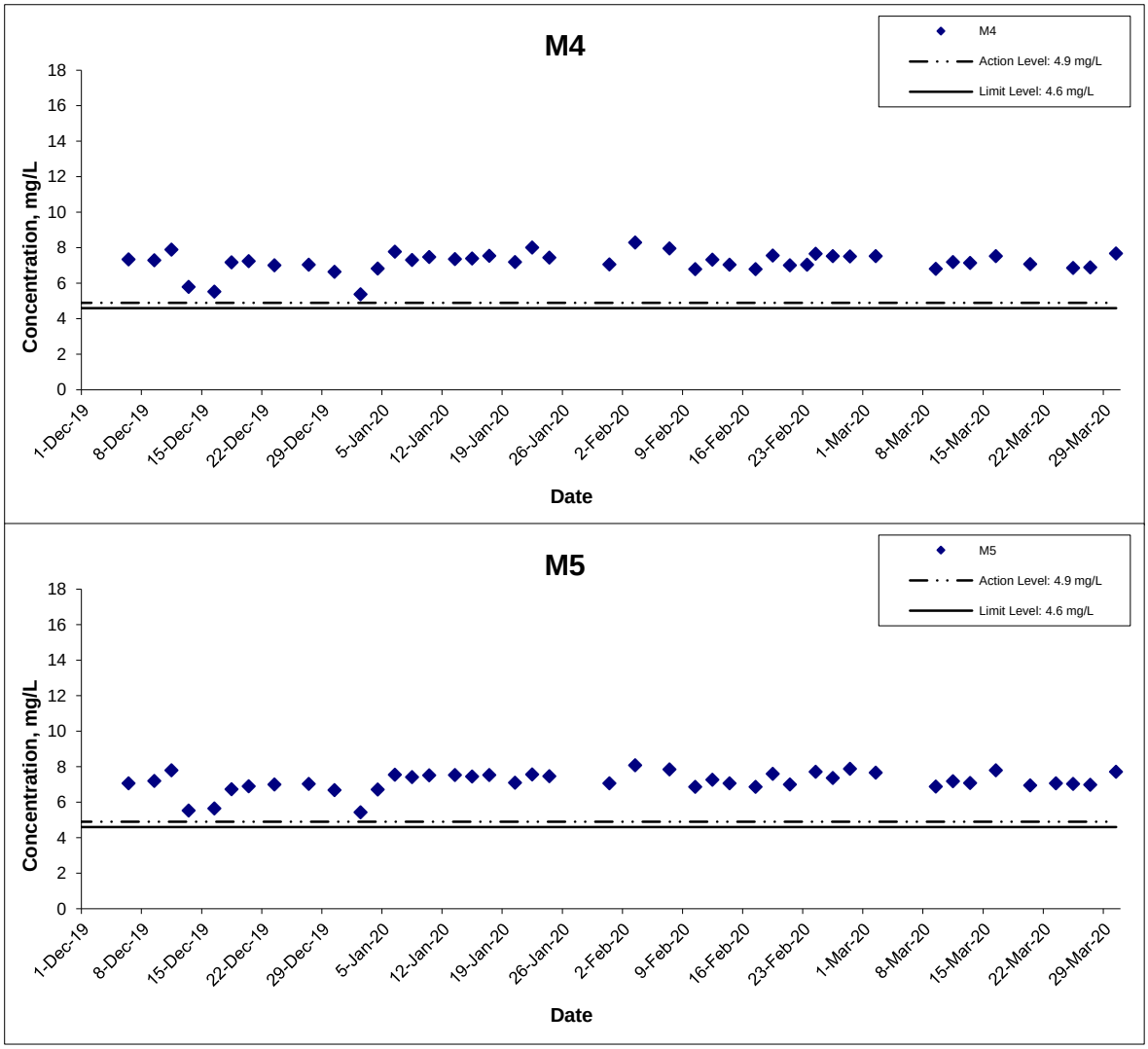
Dissolved Oxygen (Depth-averaged) at Mid-Ebb Tide



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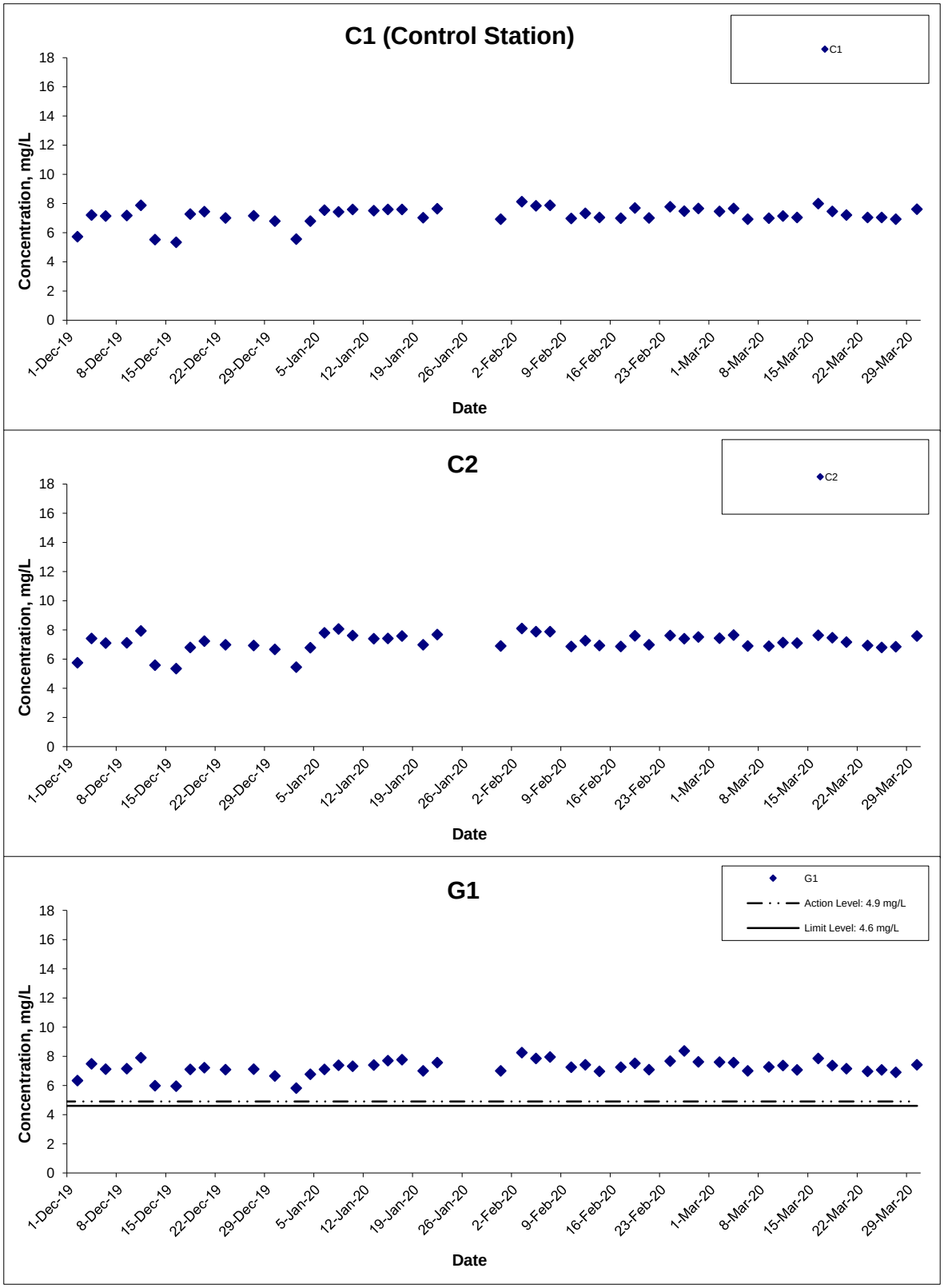
Dissolved Oxygen (Depth-averaged) at Mid-Flood Tide



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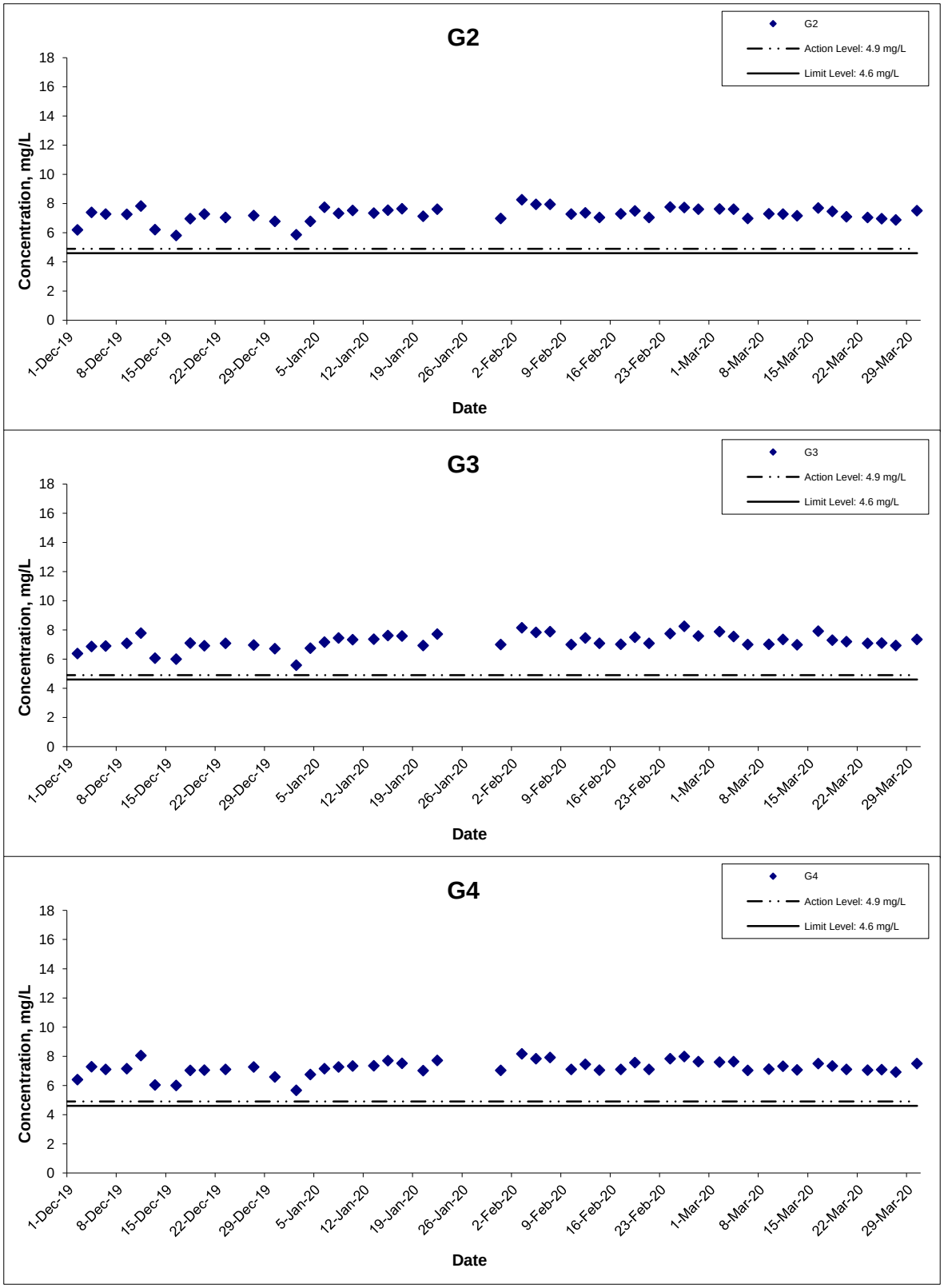
Dissolved Oxygen (Depth-averaged) at Mid-Flood Tide



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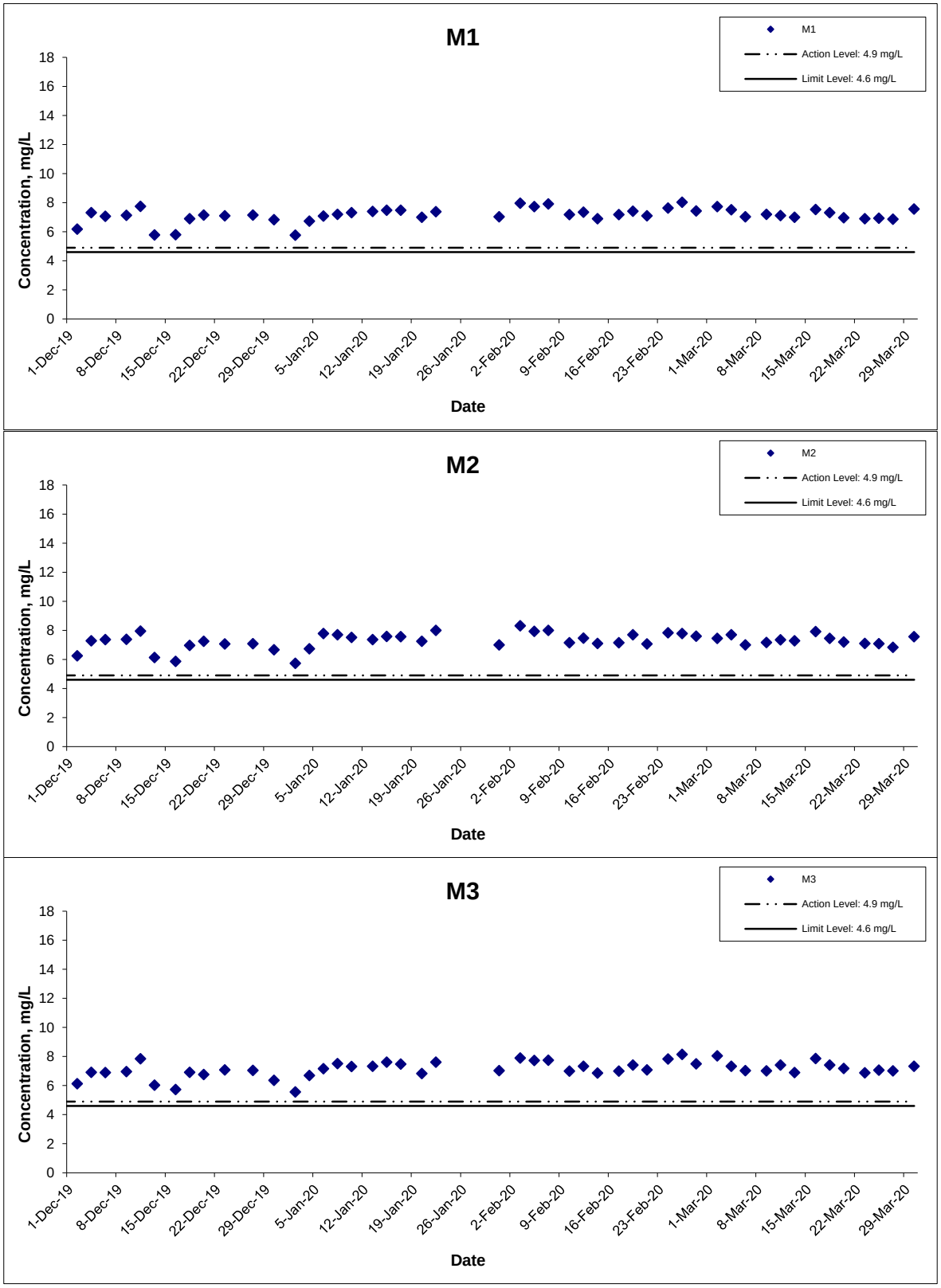
Dissolved Oxygen (Depth-averaged) at Mid-Flood Tide



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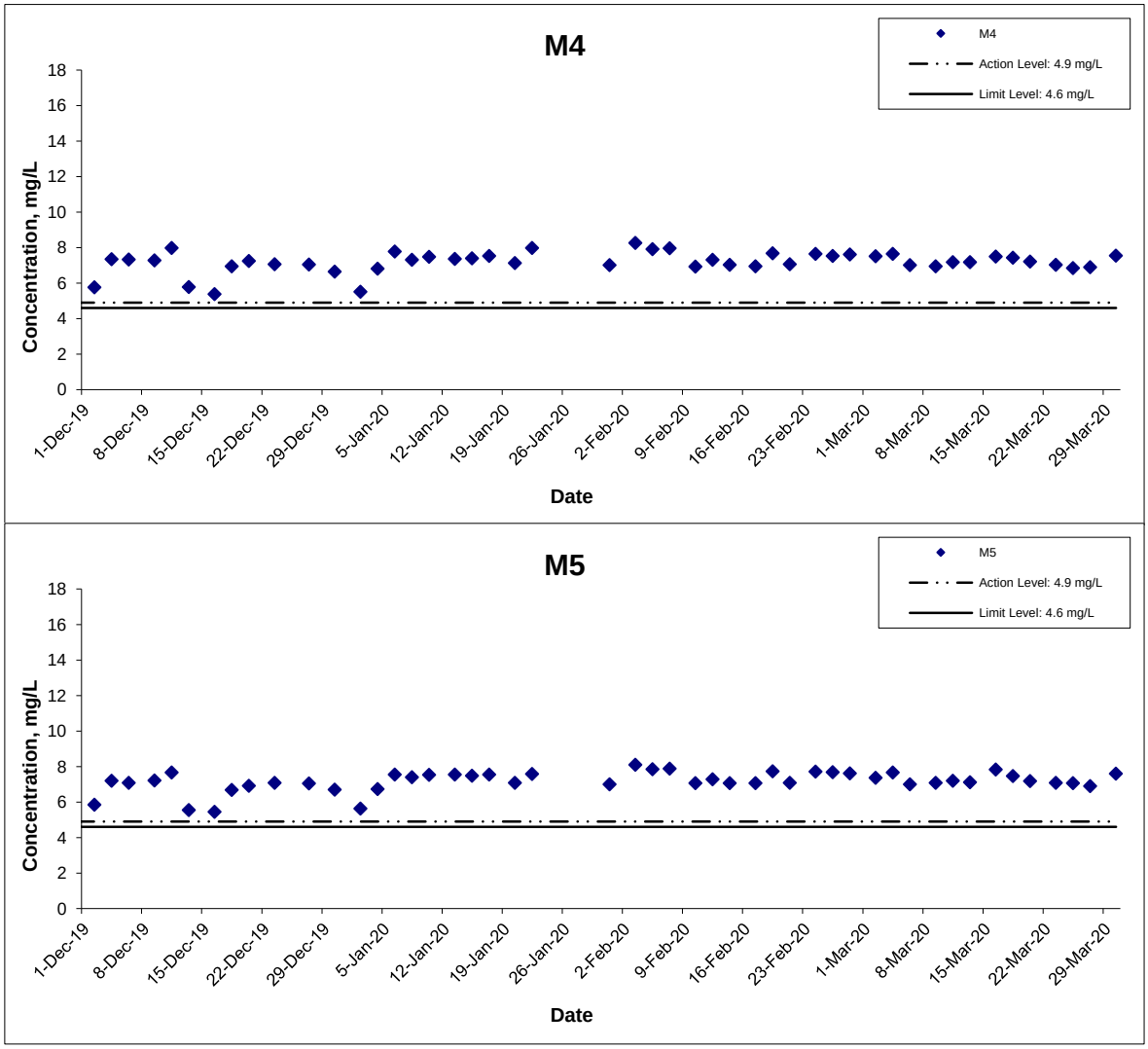
Dissolved Oxygen (Depth-averaged) at Mid-Flood Tide



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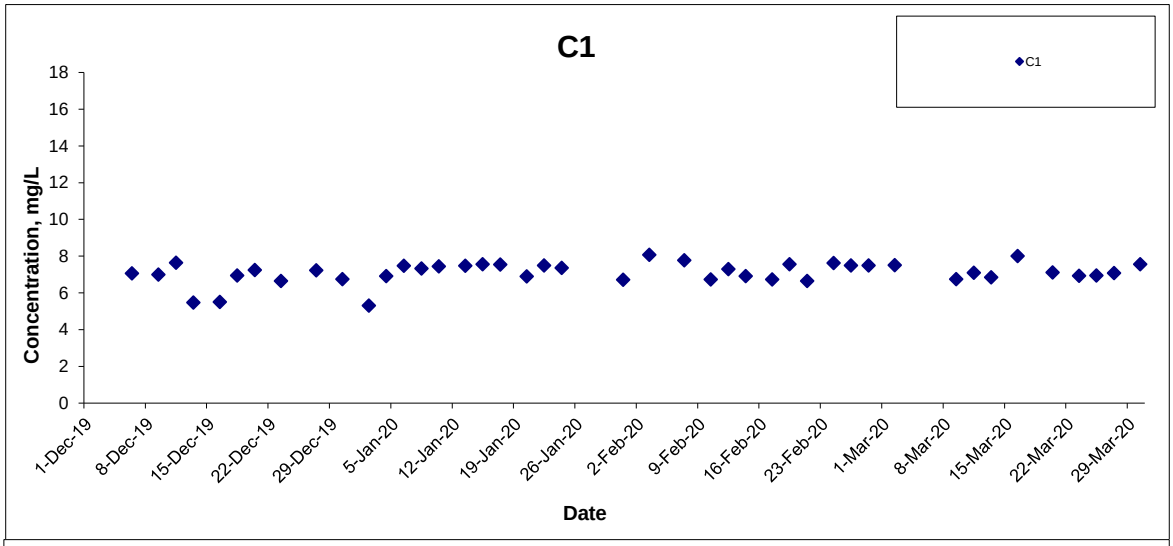
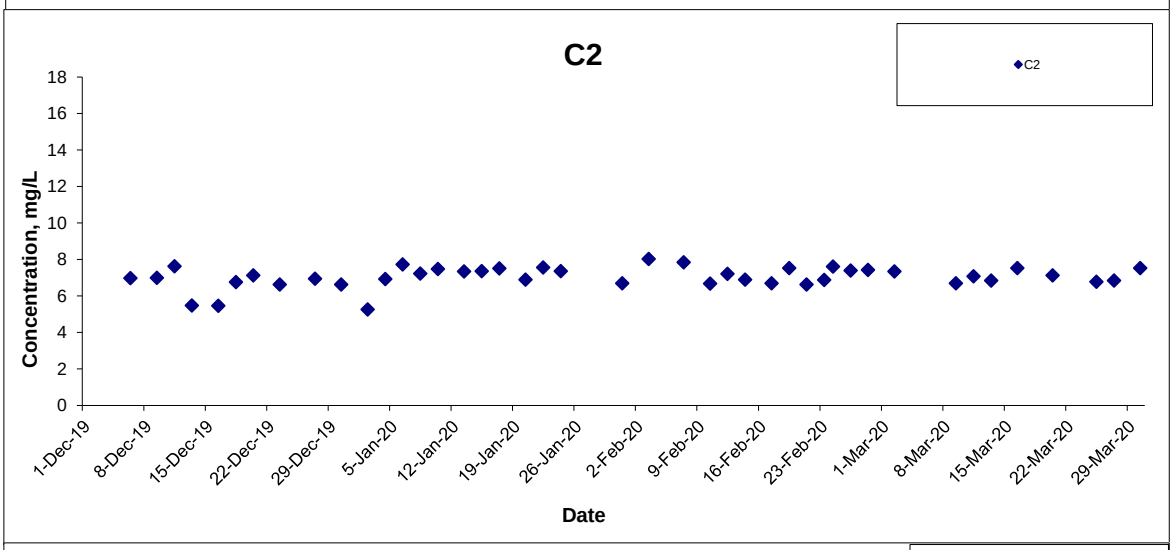
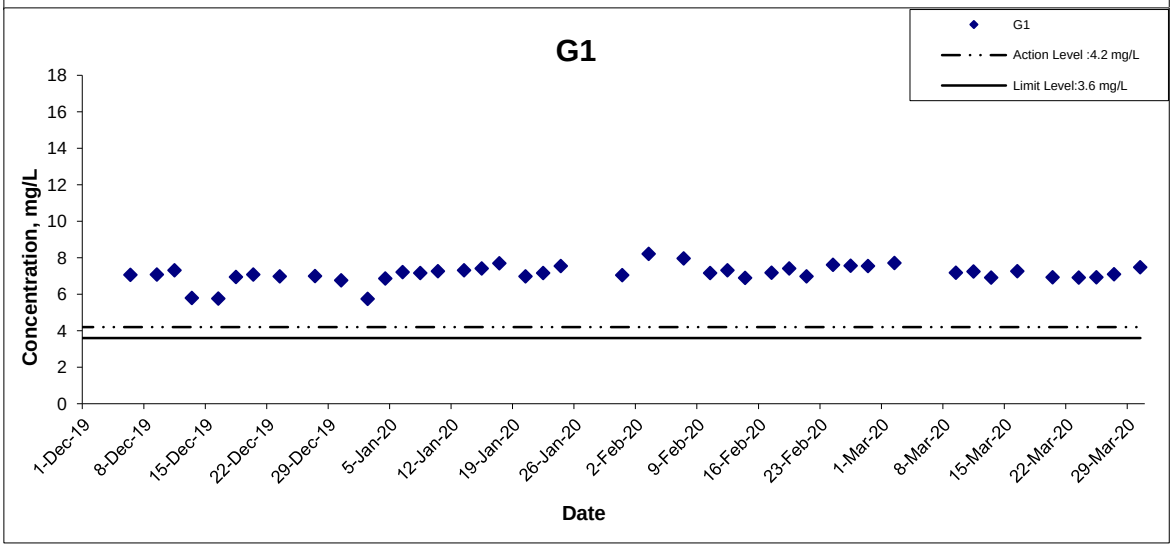
Dissolved Oxygen (Bottom) at Mid-Ebb Tide







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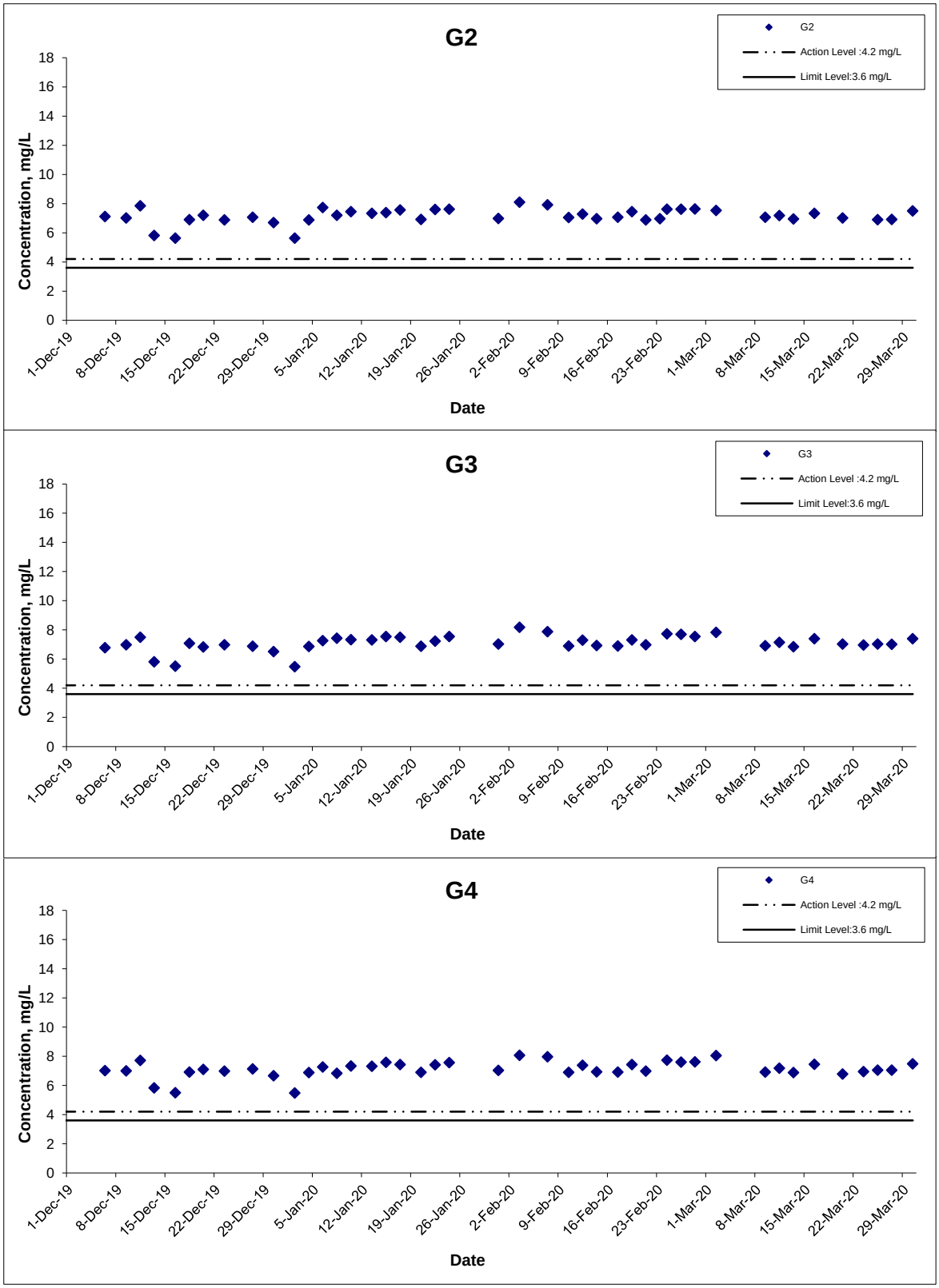
Dissolved Oxygen (Bottom) at Mid-Ebb Tide



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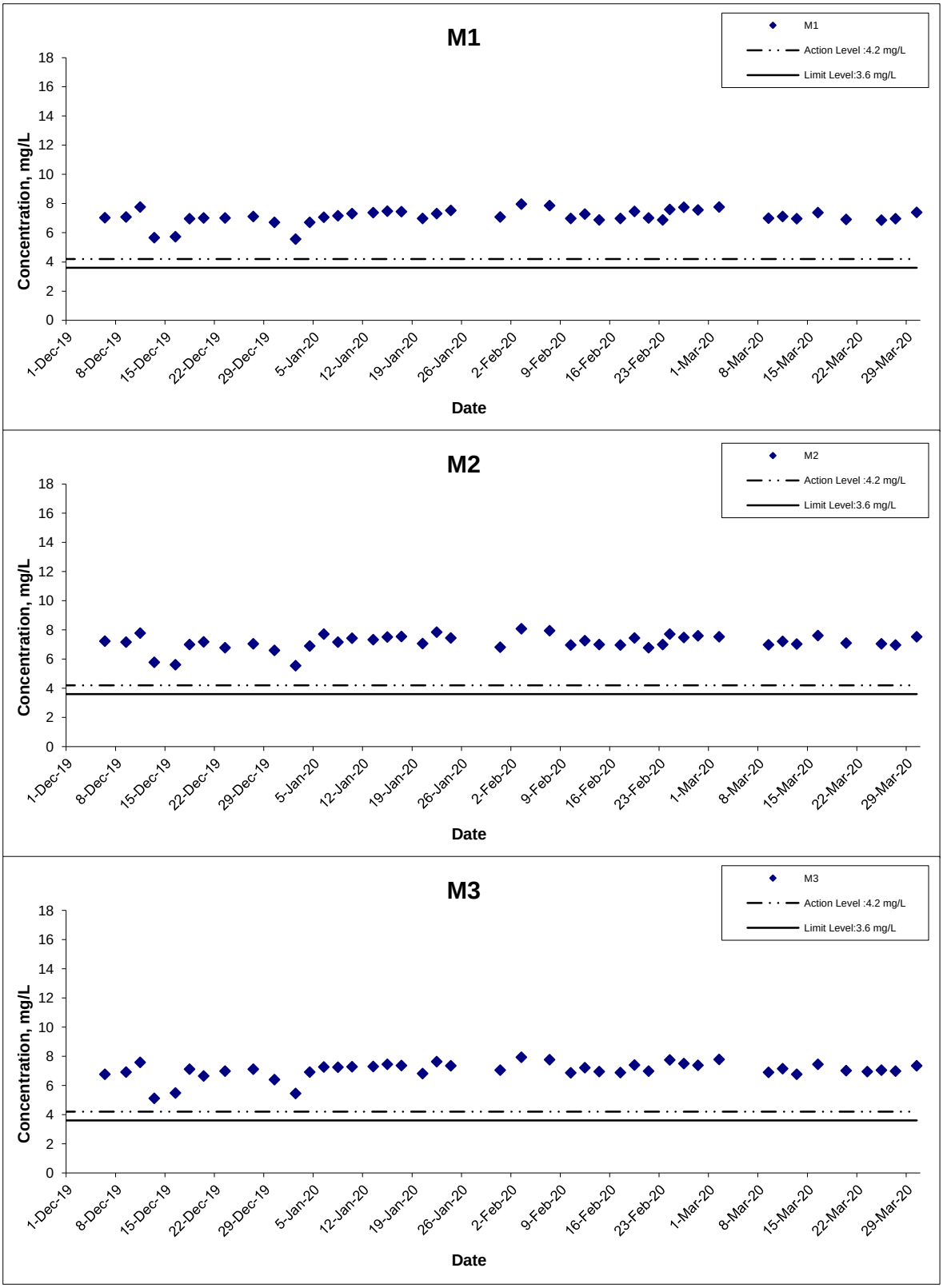
Dissolved Oxygen (Bottom) at Mid-Ebb Tide



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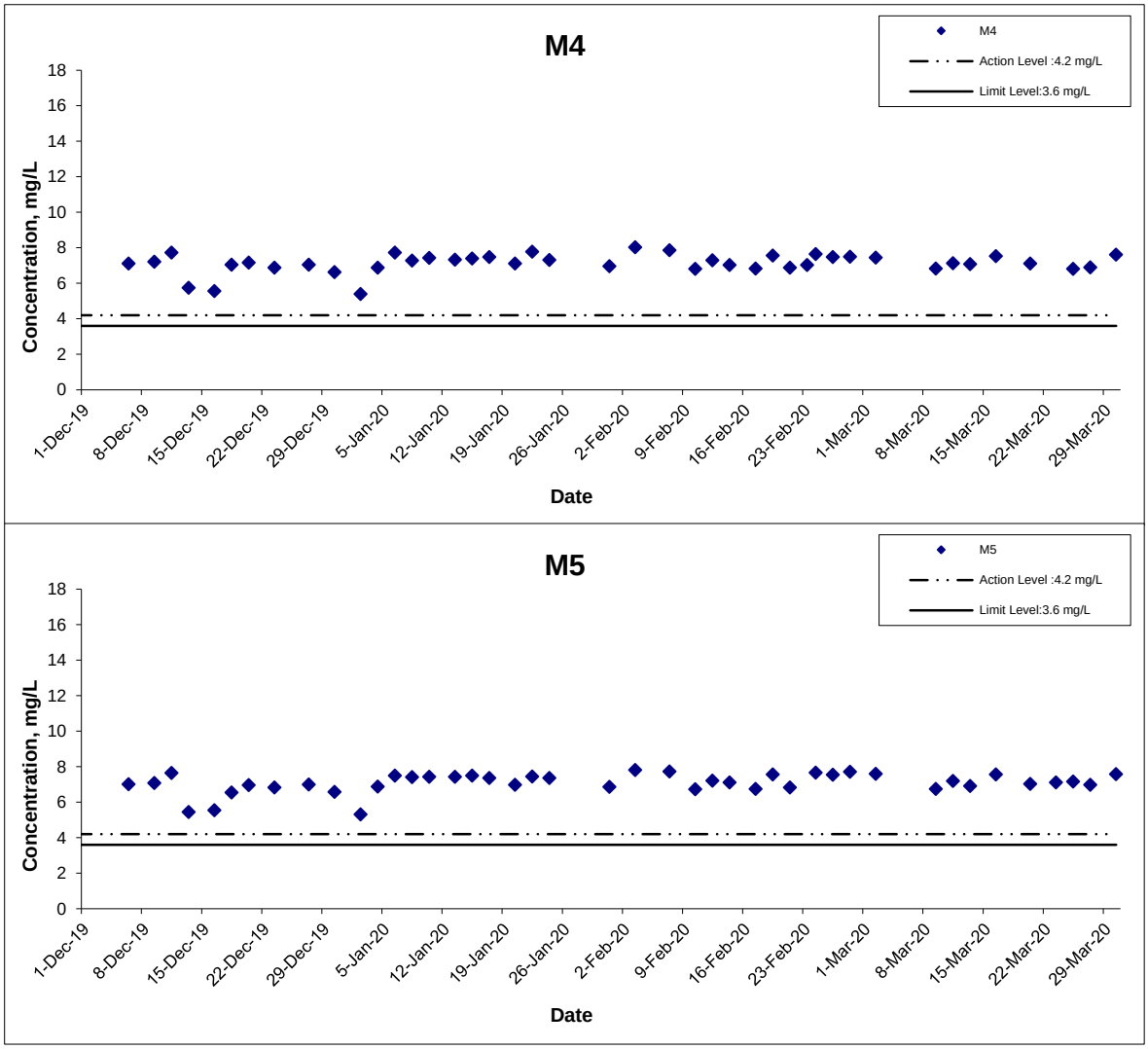
Dissolved Oxygen (Bottom) at Mid-Ebb Tide



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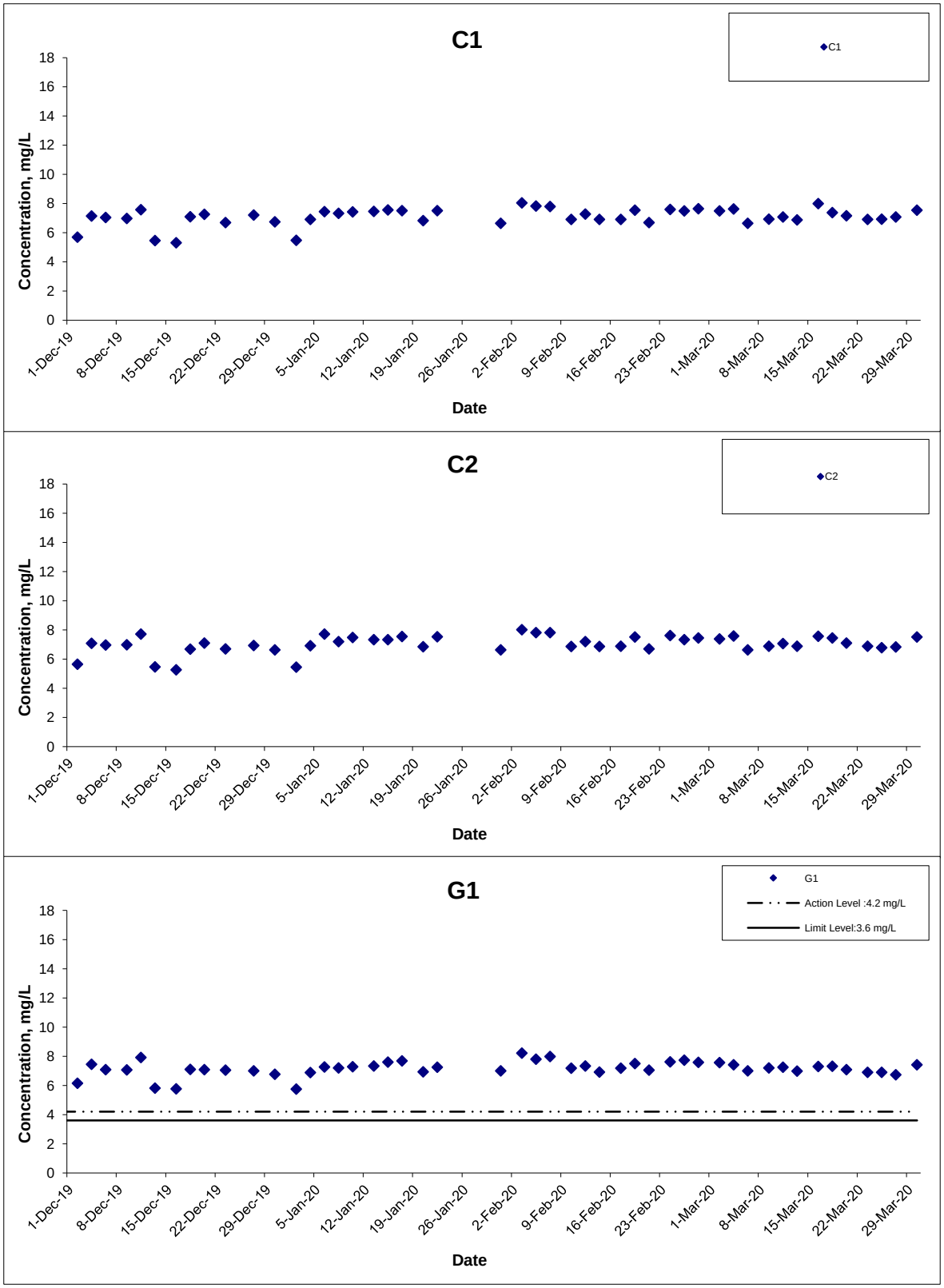
Dissolved Oxygen (Bottom) at Mid-Flood Tide



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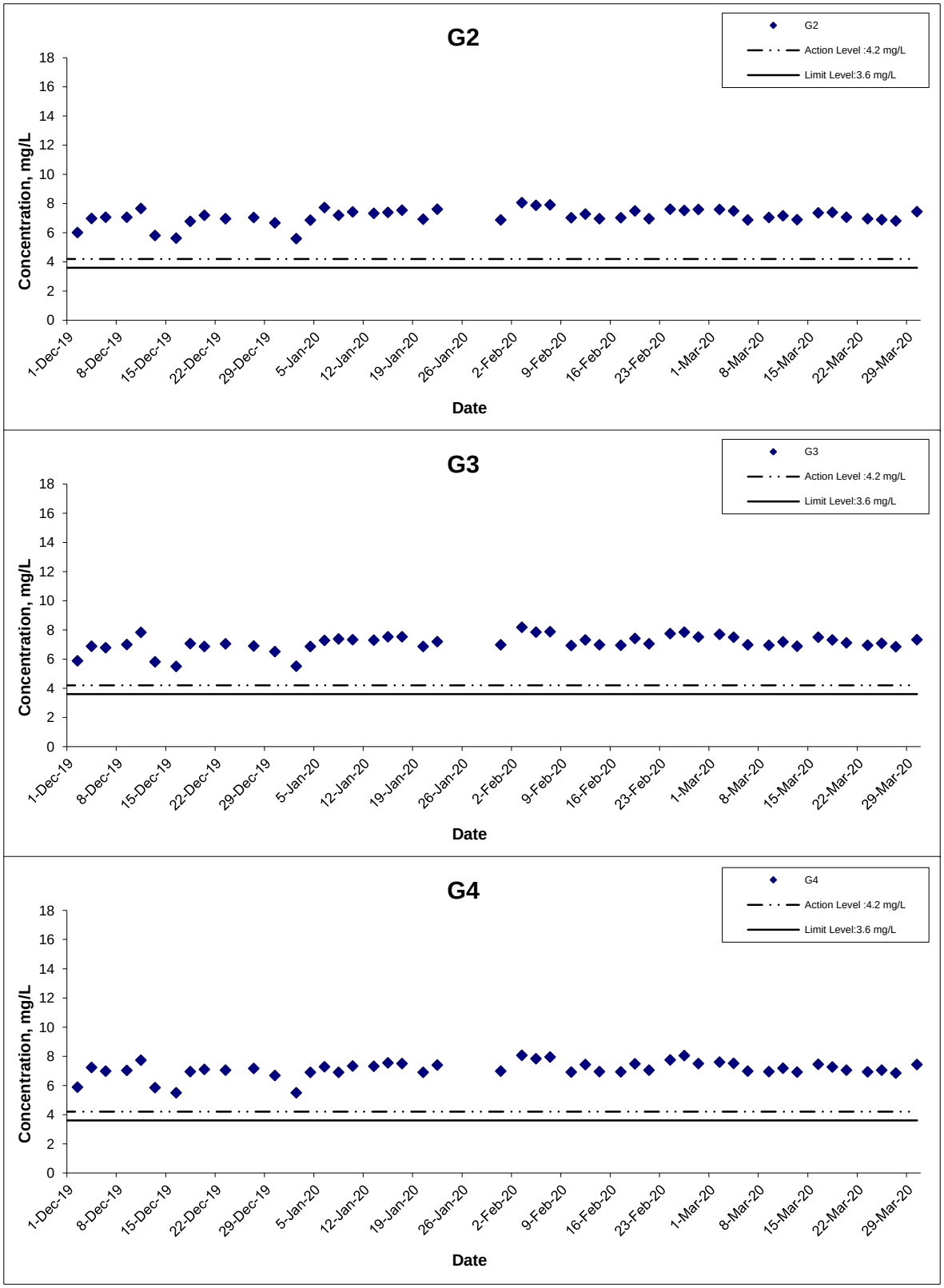
Dissolved Oxygen (Bottom) at Mid-Flood Tide



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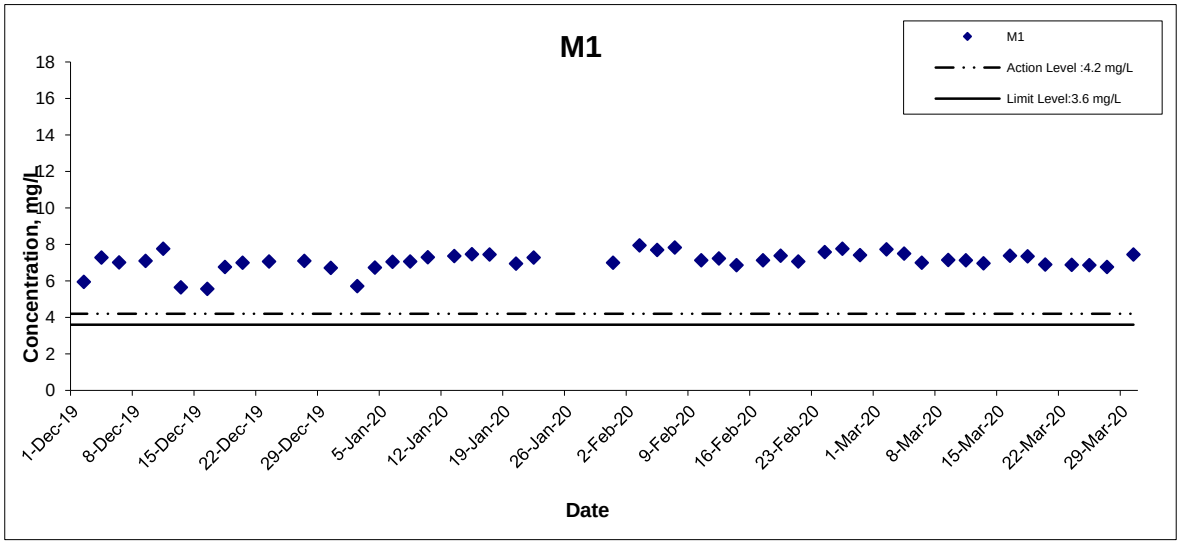
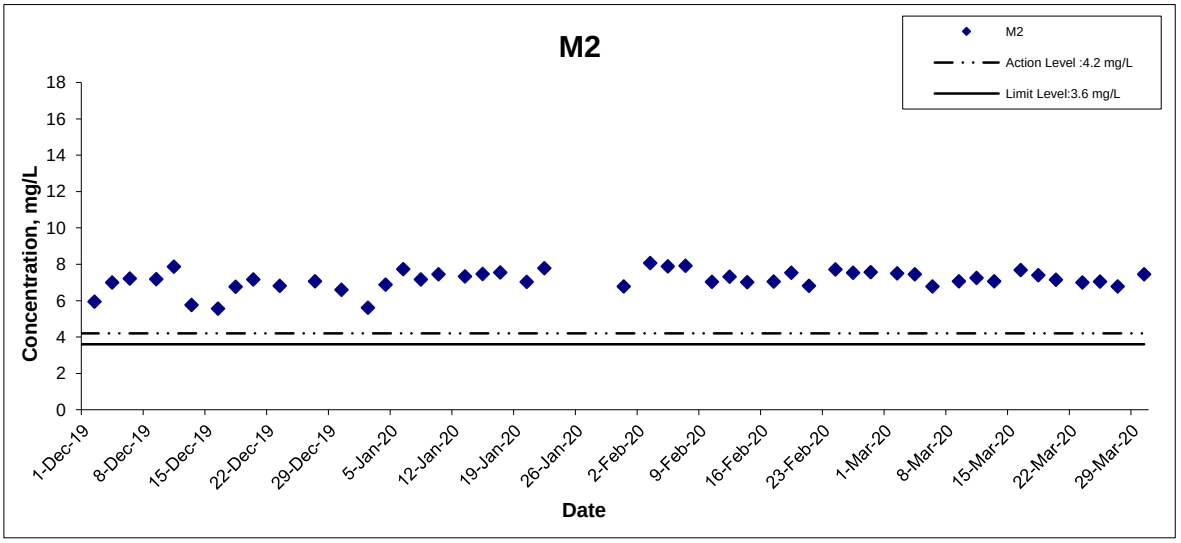
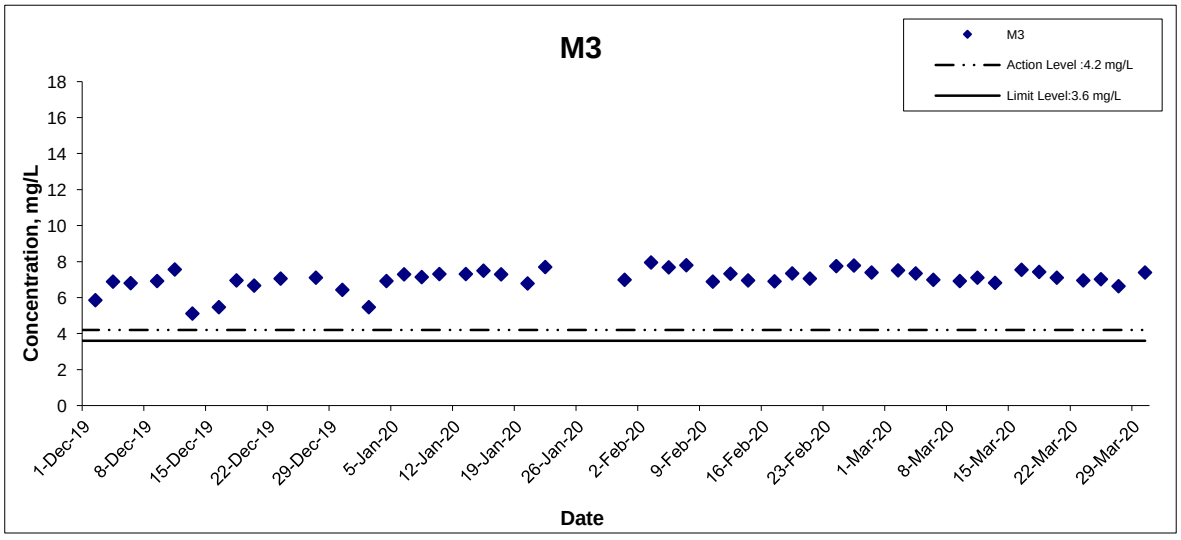
Dissolved Oxygen (Bottom) at Mid-Flood Tide







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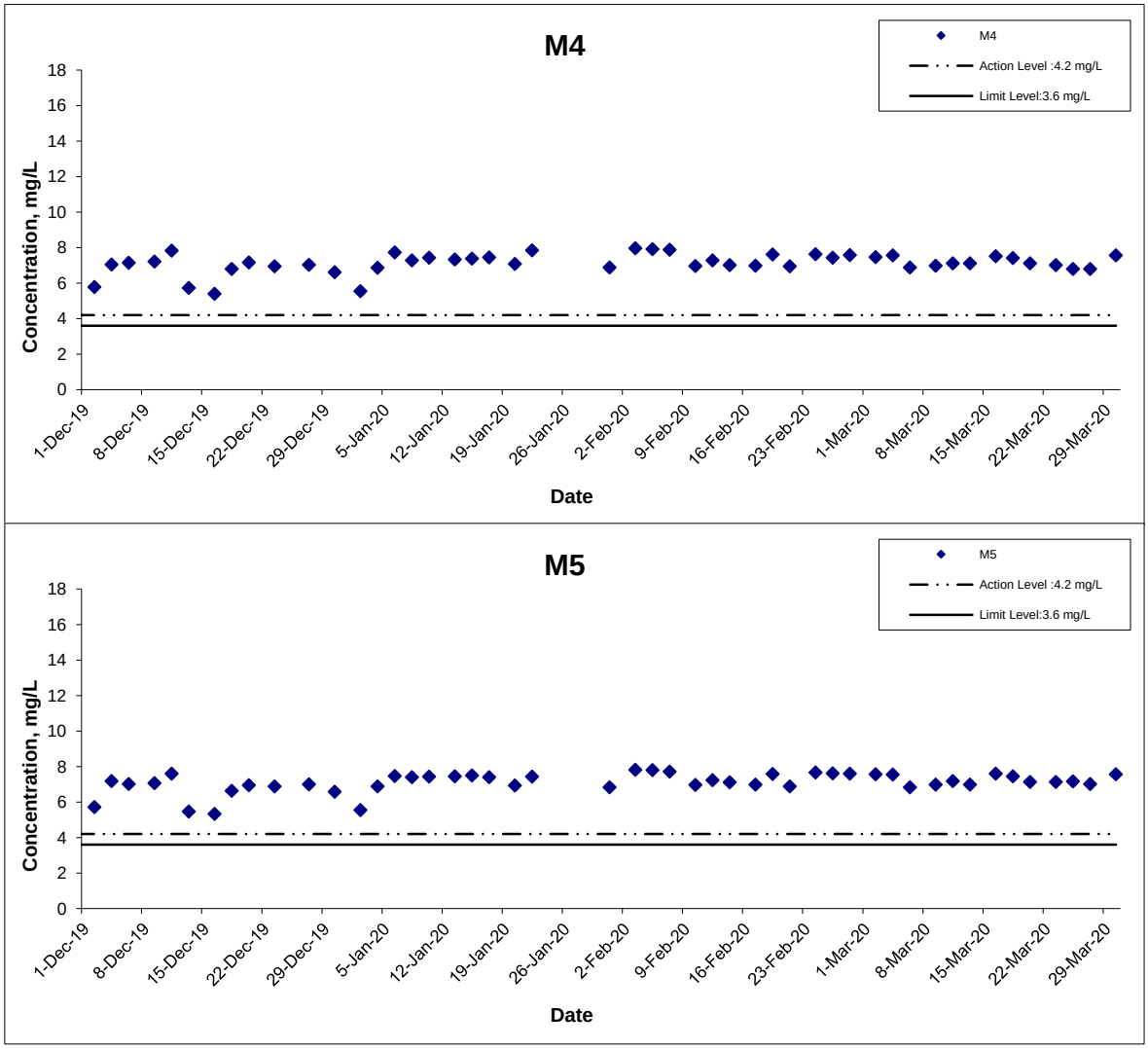
Dissolved Oxygen (Bottom) at Mid-Flood Tide



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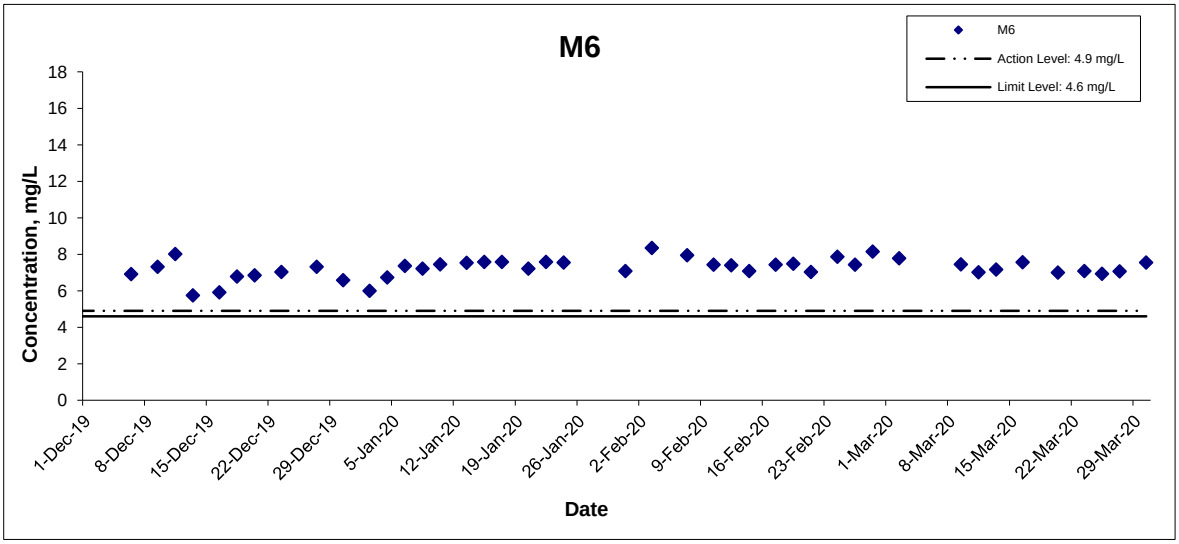
Dissolved Oxygen (Intake Level of WSD Salt Water Intake) at Mid-Ebb Tide



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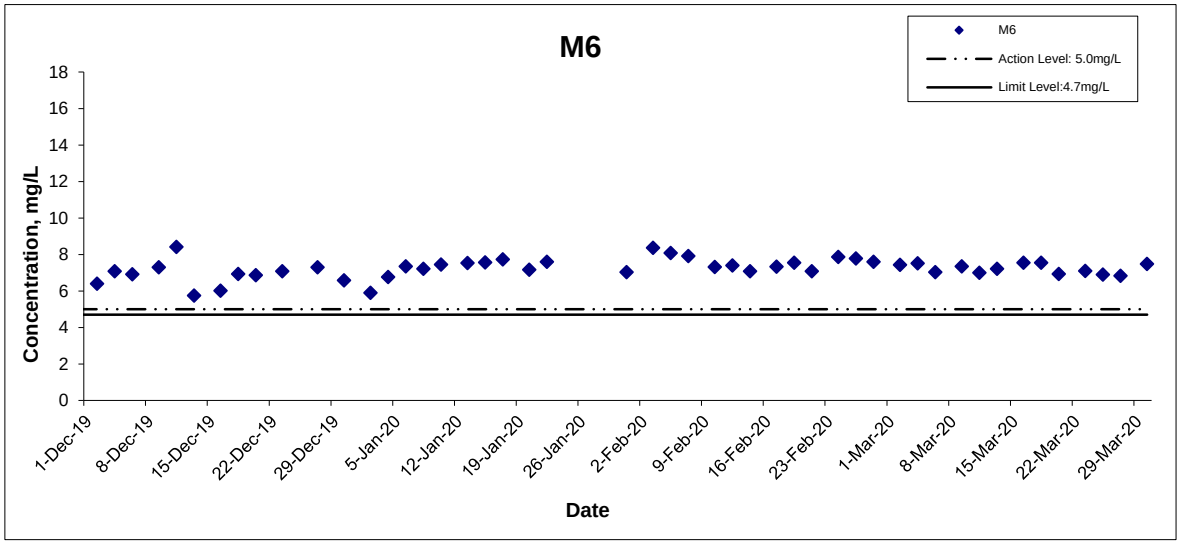
Dissolved Oxygen (Intake Level of WSD Salt Water Intake) at Mid-Flood Tide



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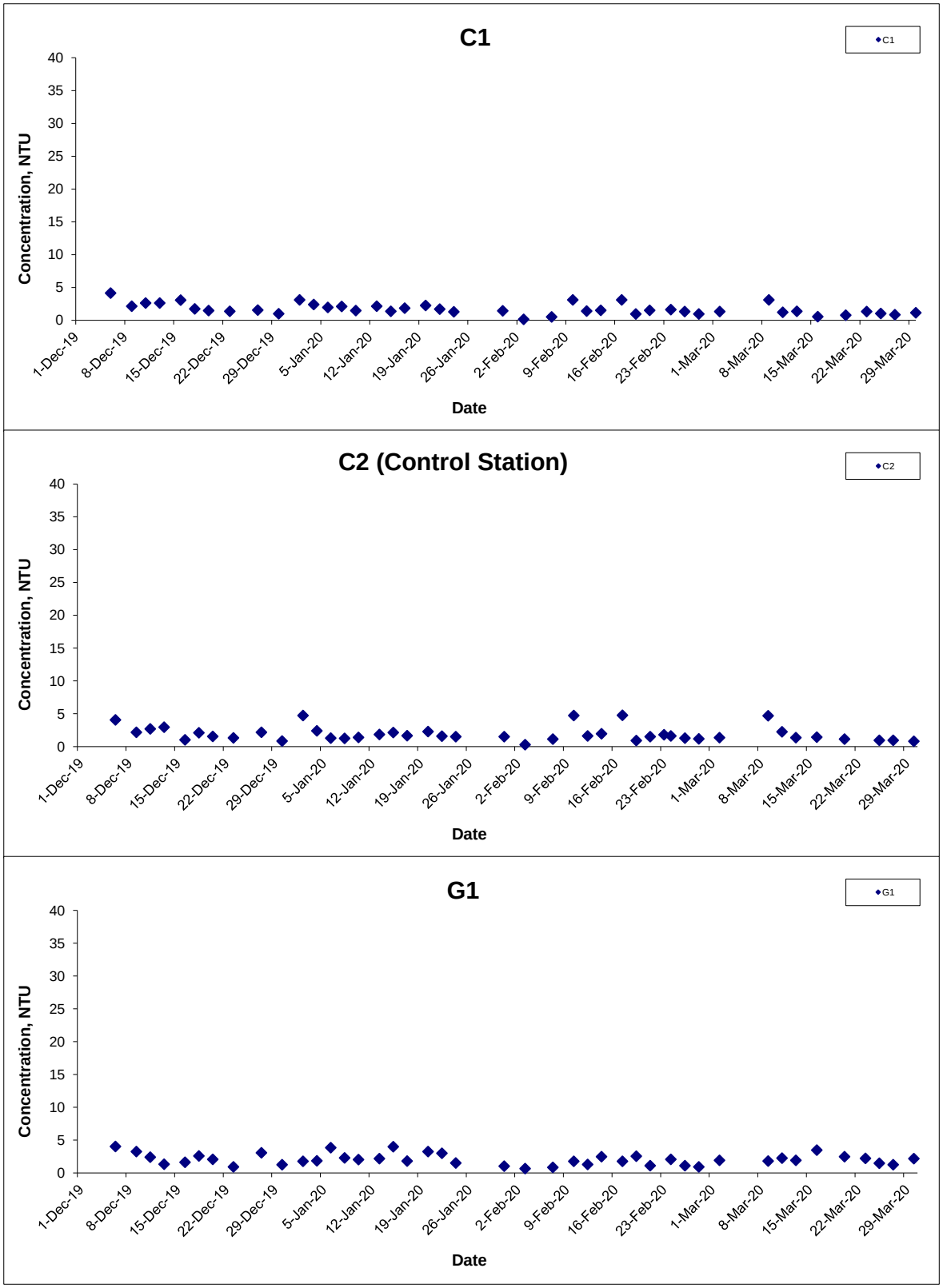
Turbidity (Depth-averaged) at Mid-Ebb Tide



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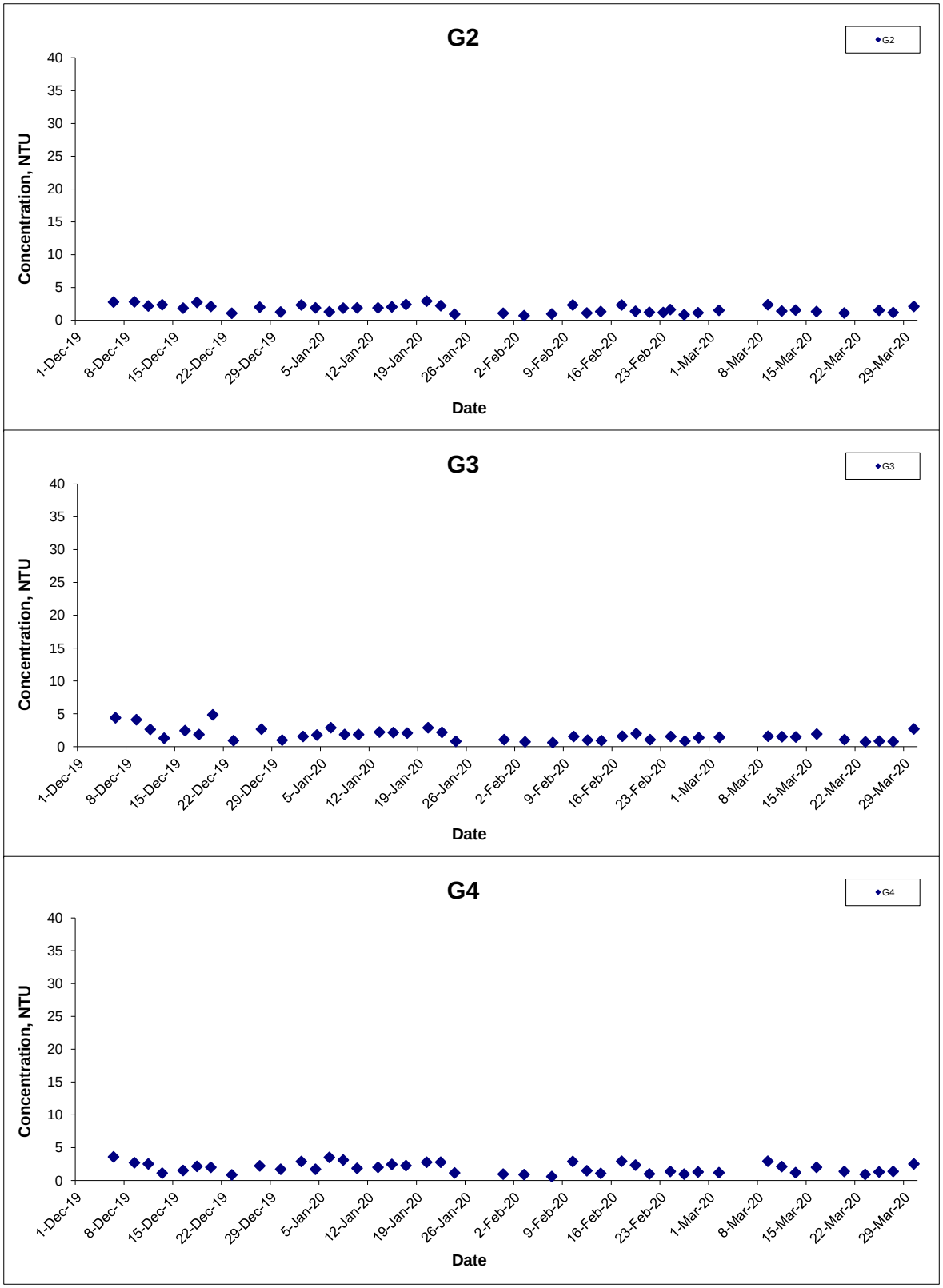

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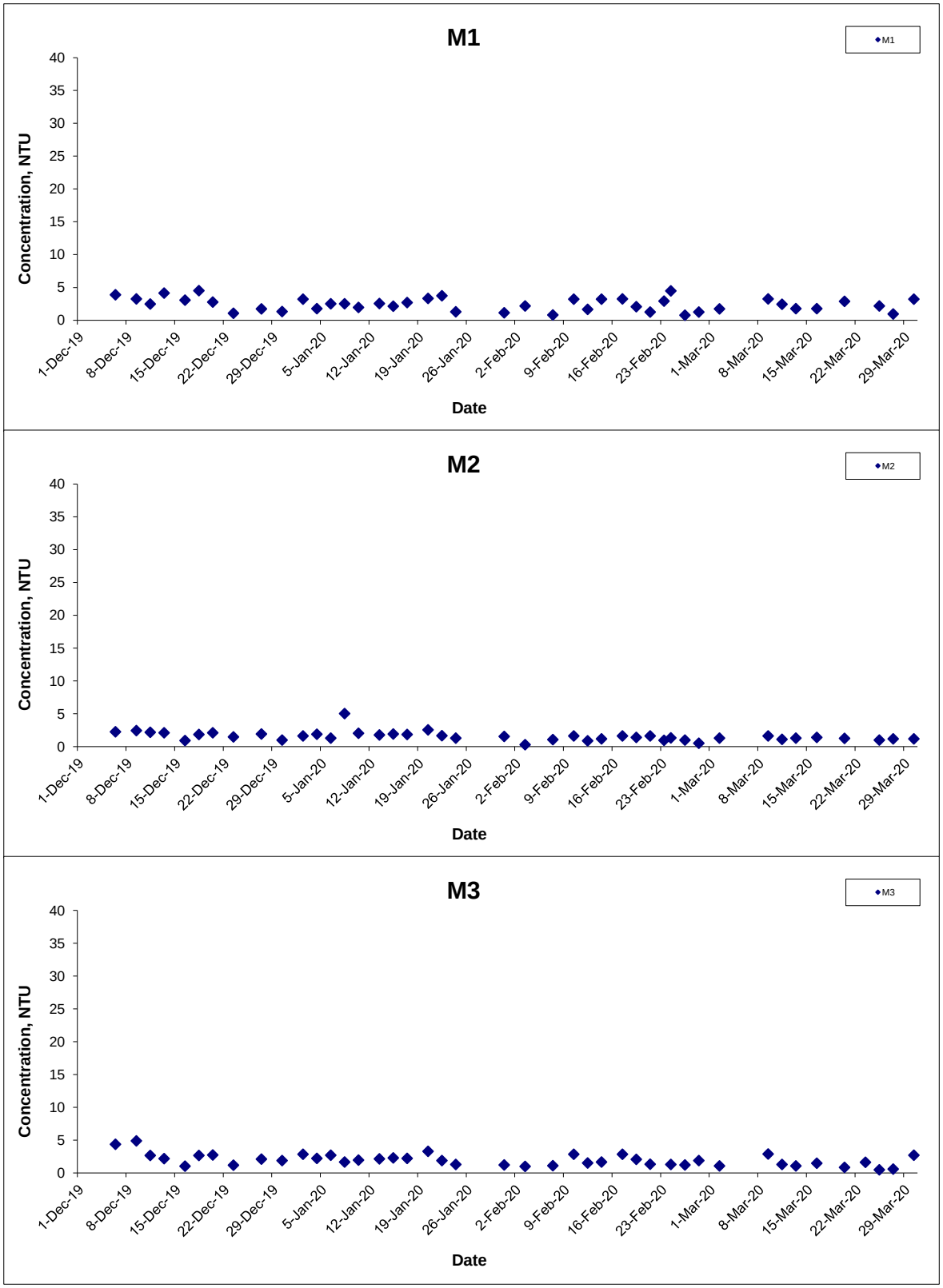

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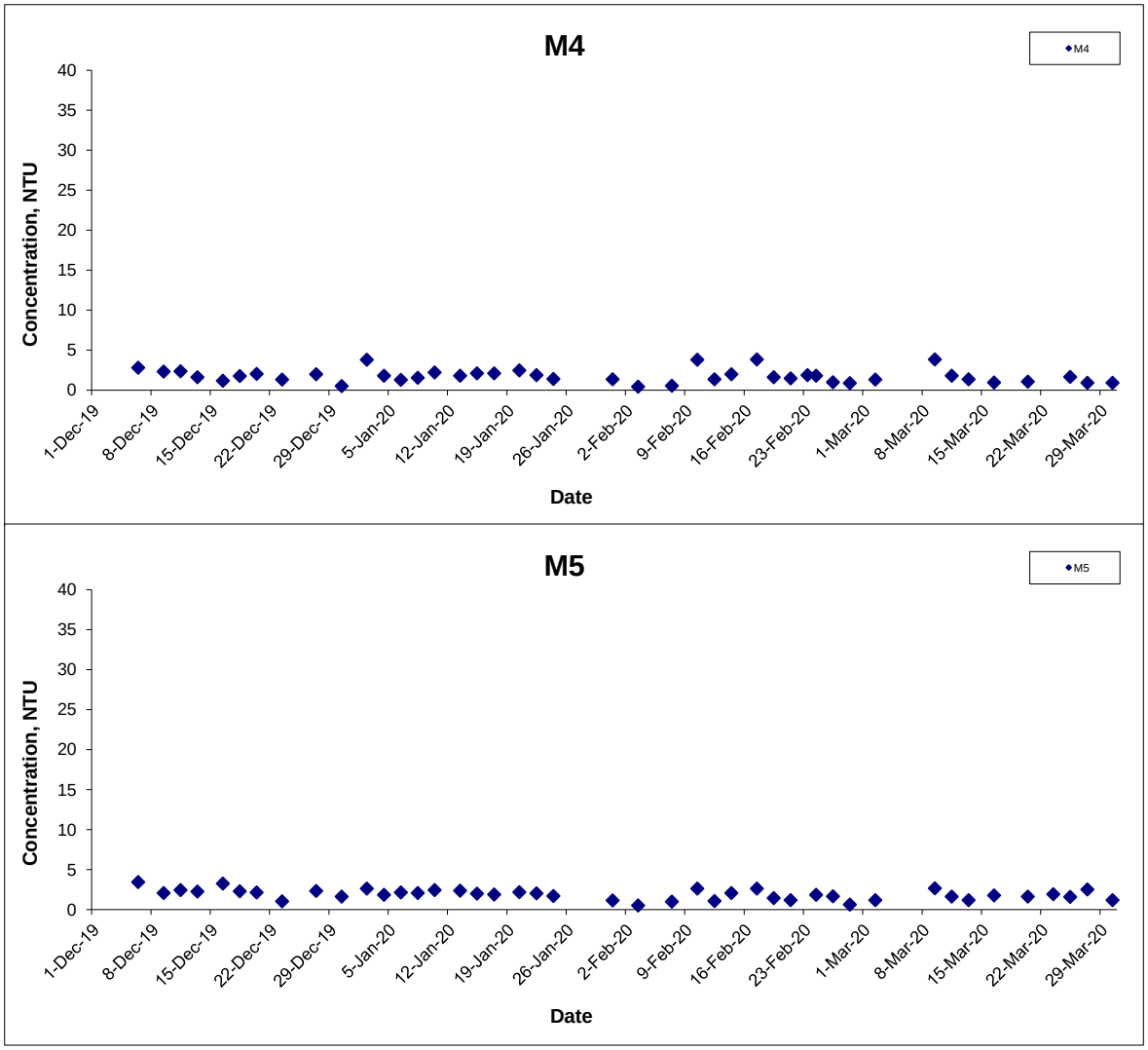

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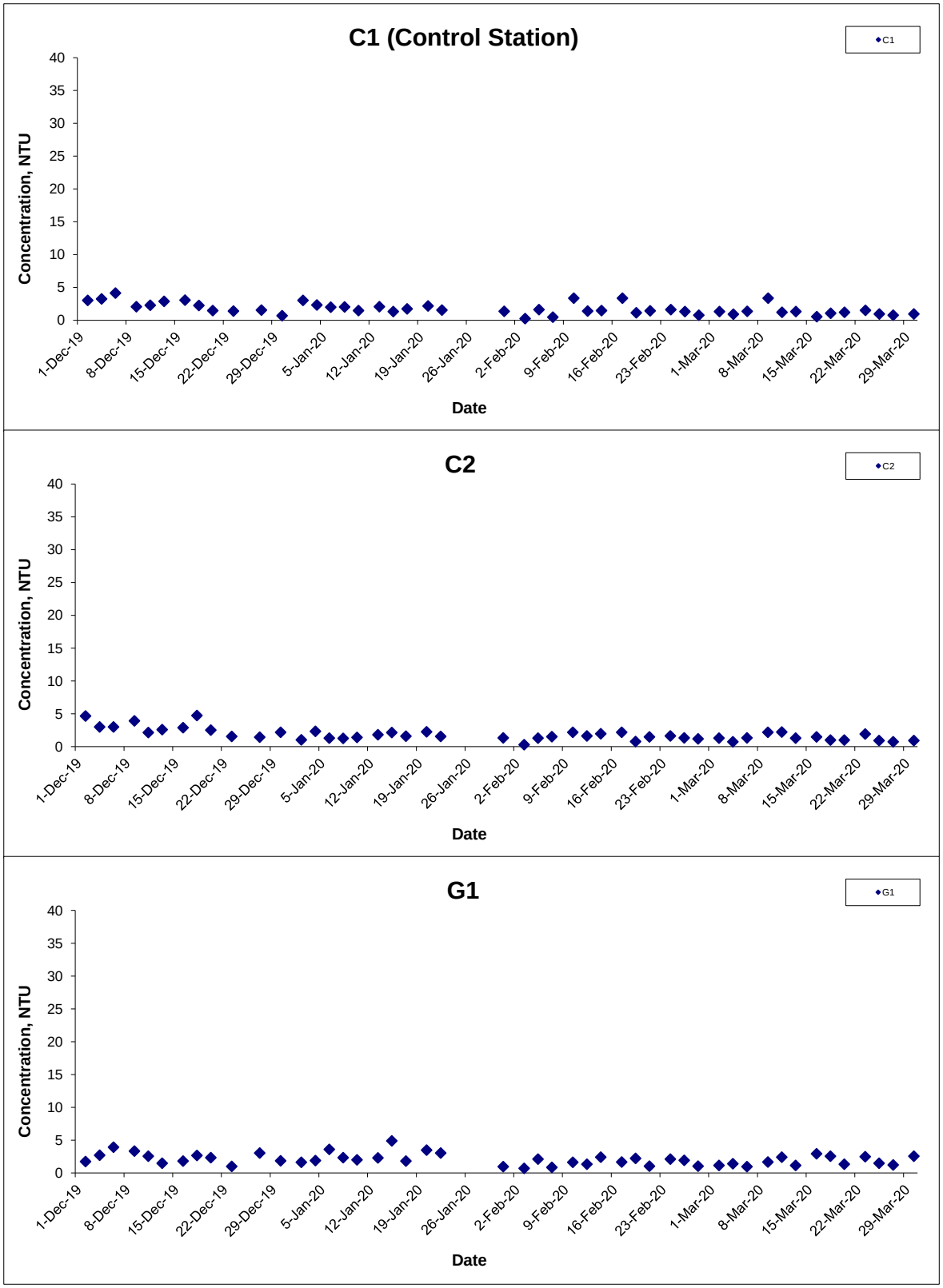

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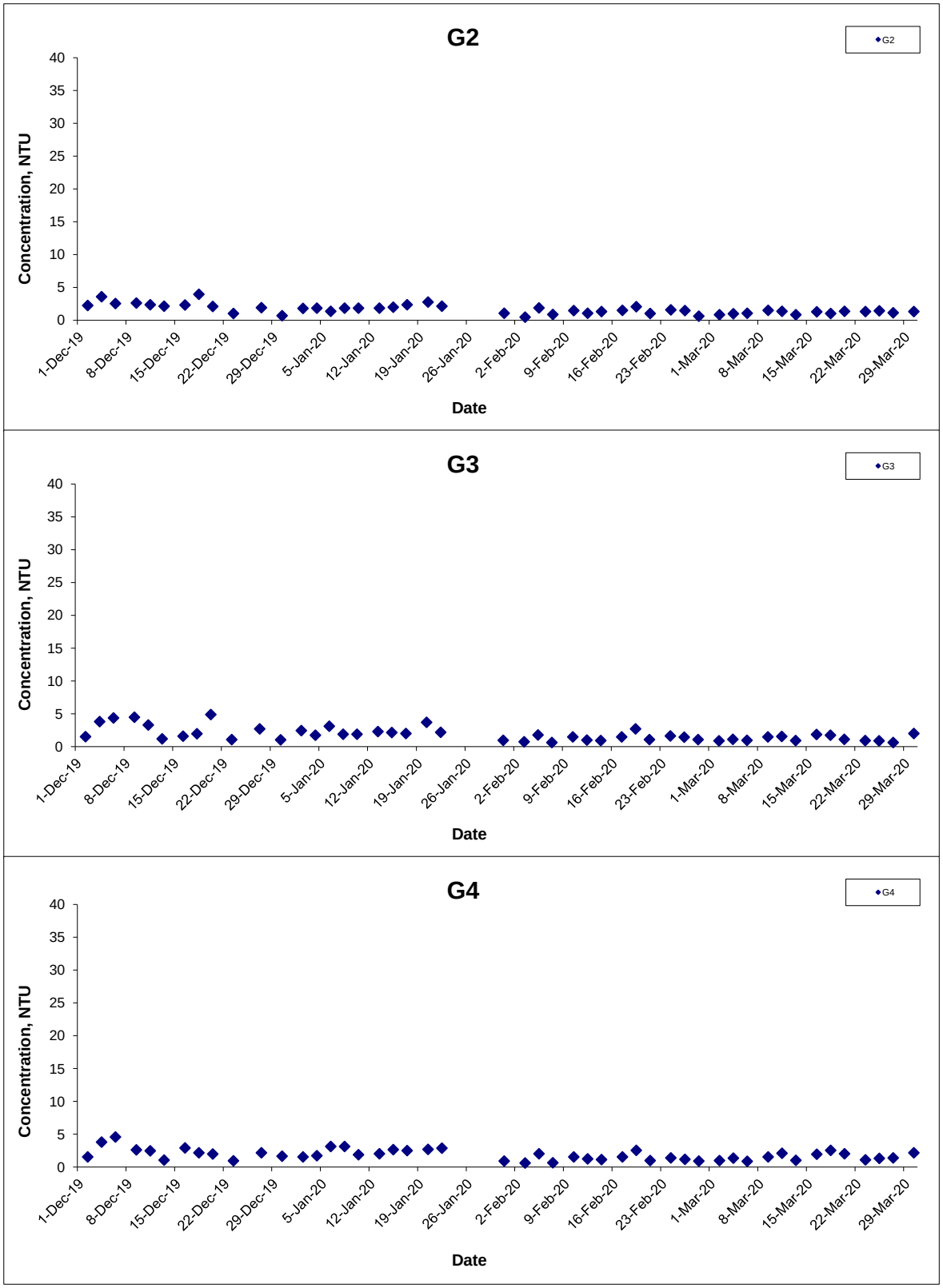

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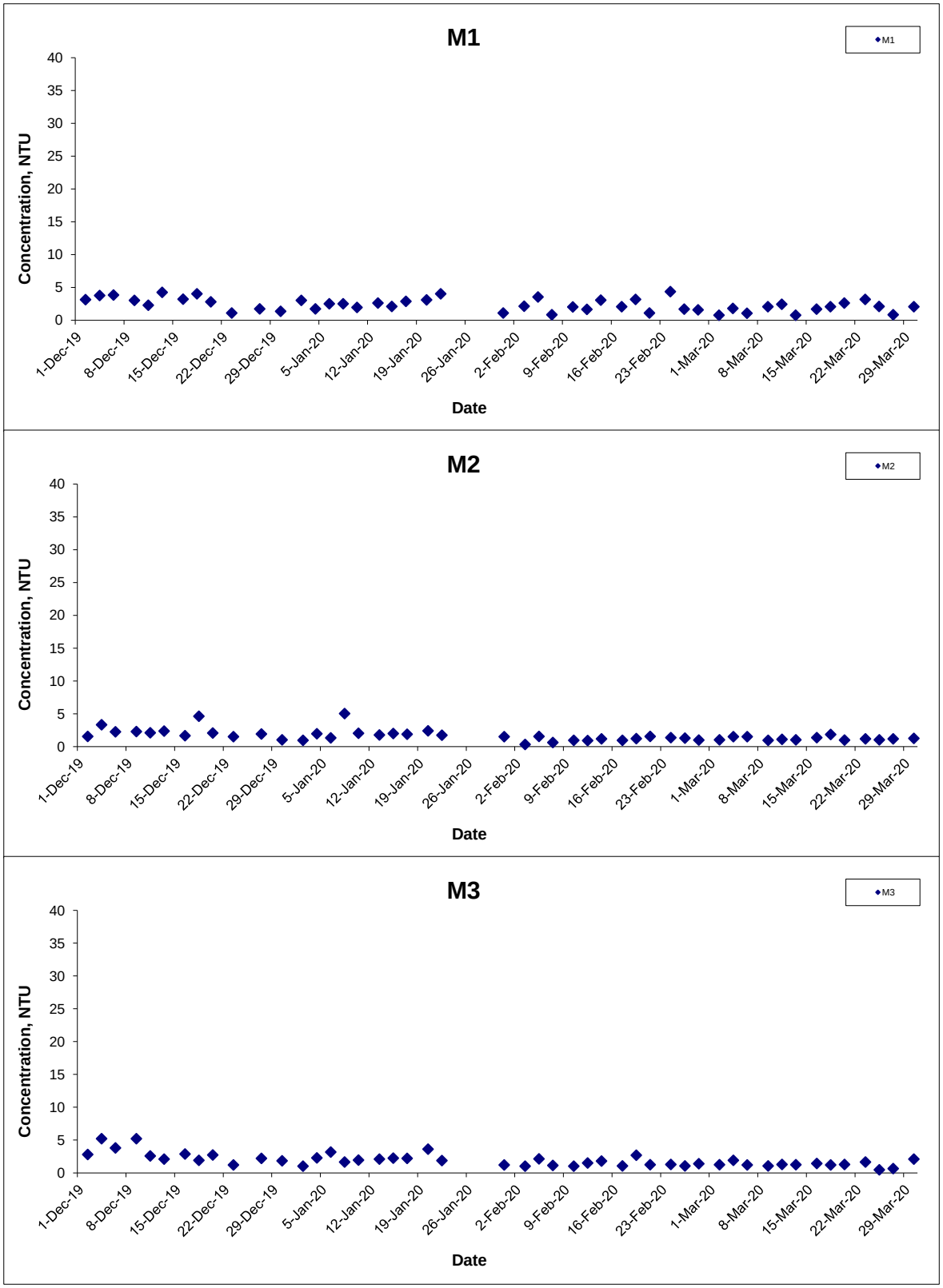
Turbidity (Depth-averaged) at Mid-Flood Tide



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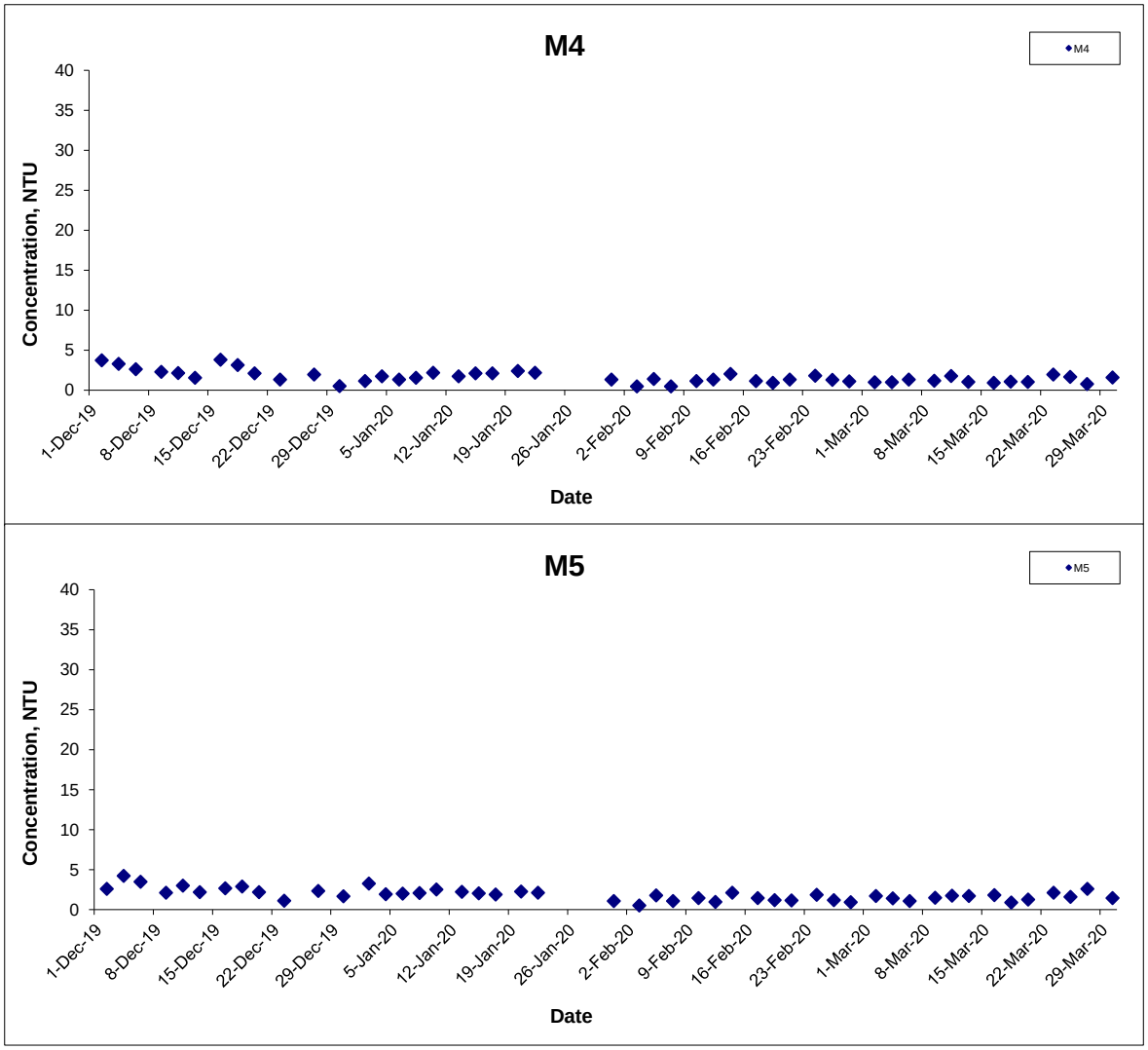
Turbidity (Depth-averaged) at Mid-Flood Tide



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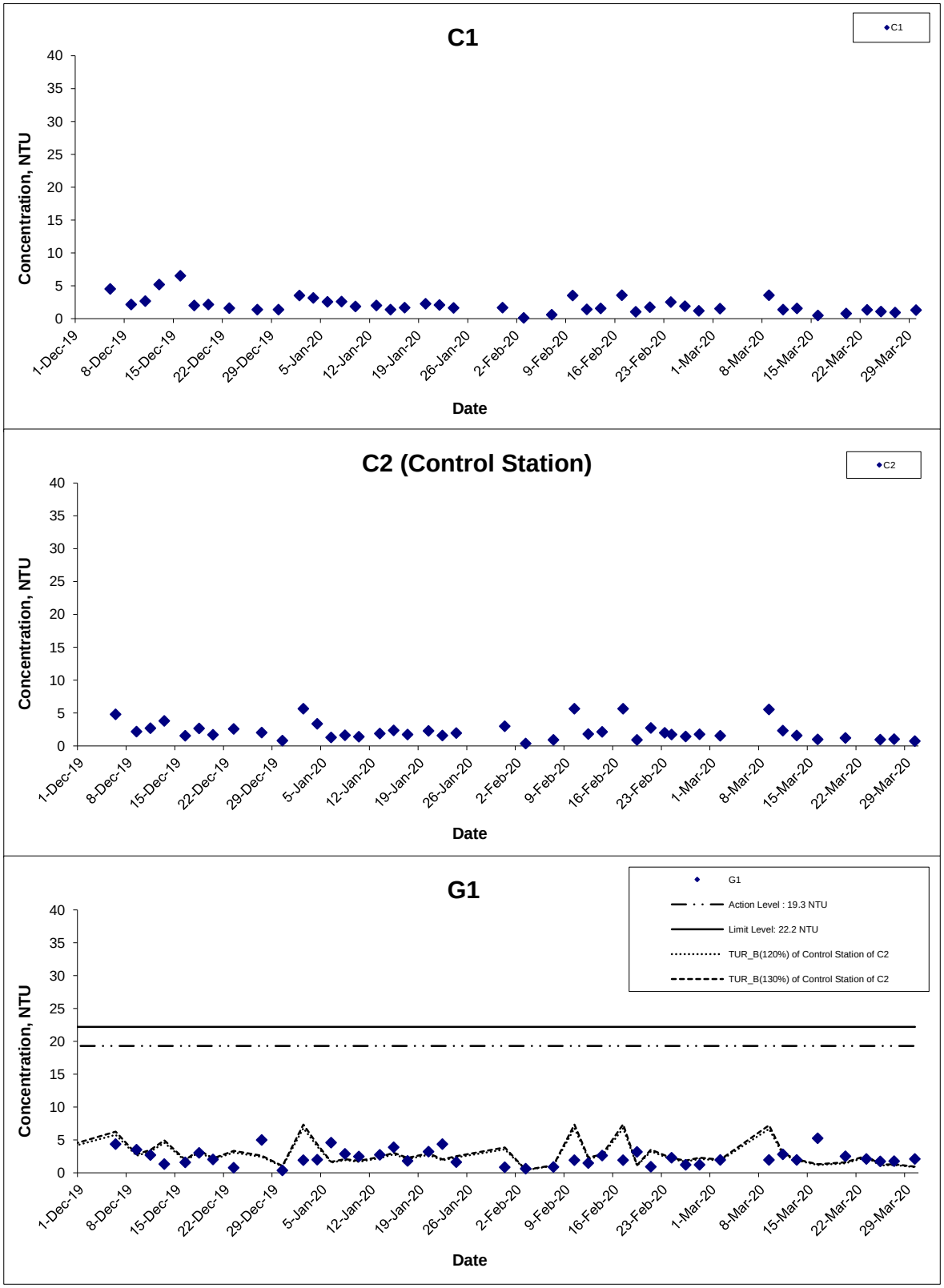
Turbidity (Bottom) at Mid-Ebb Tide



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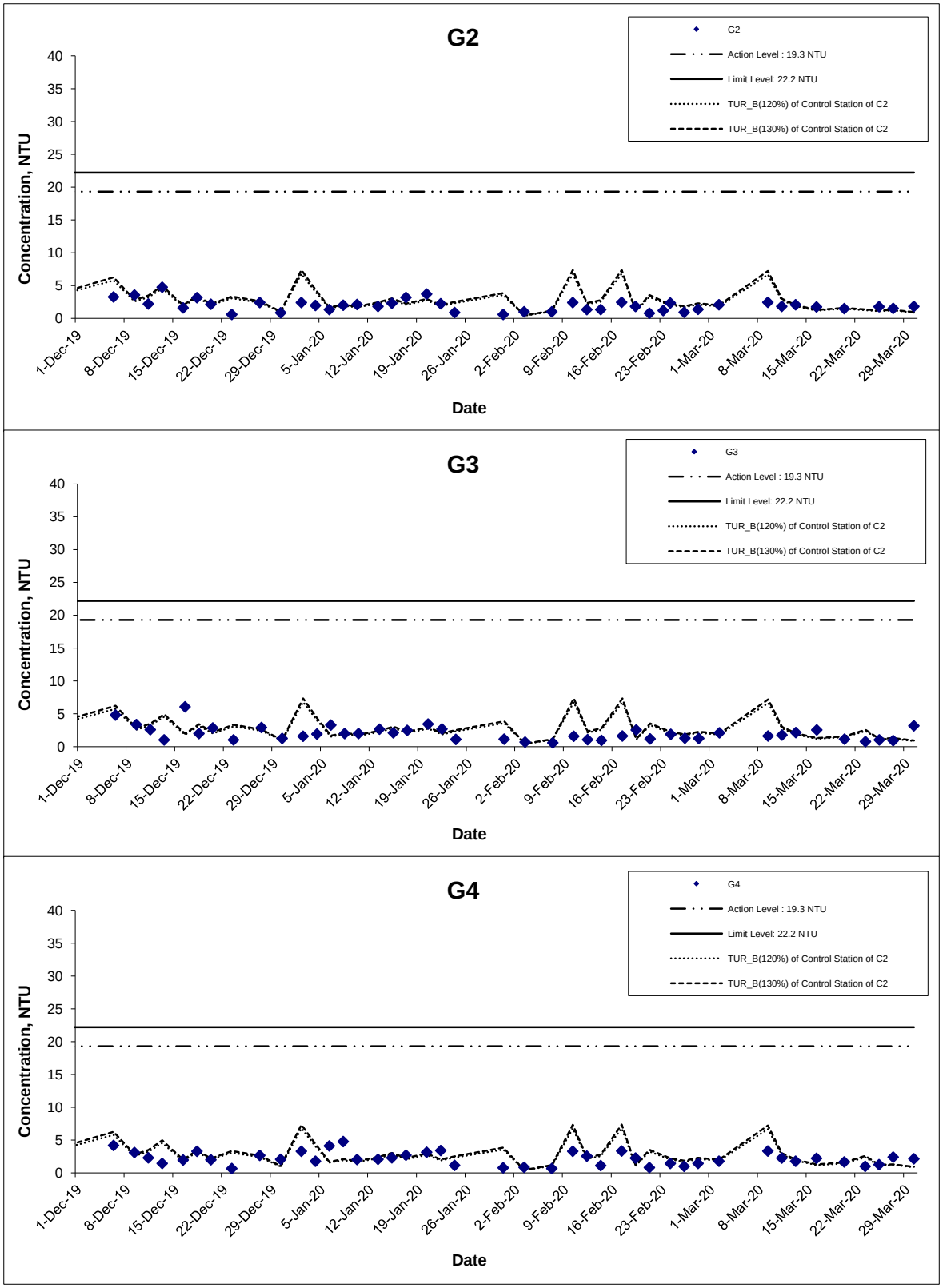
Turbidity (Bottom) at Mid-Ebb Tide



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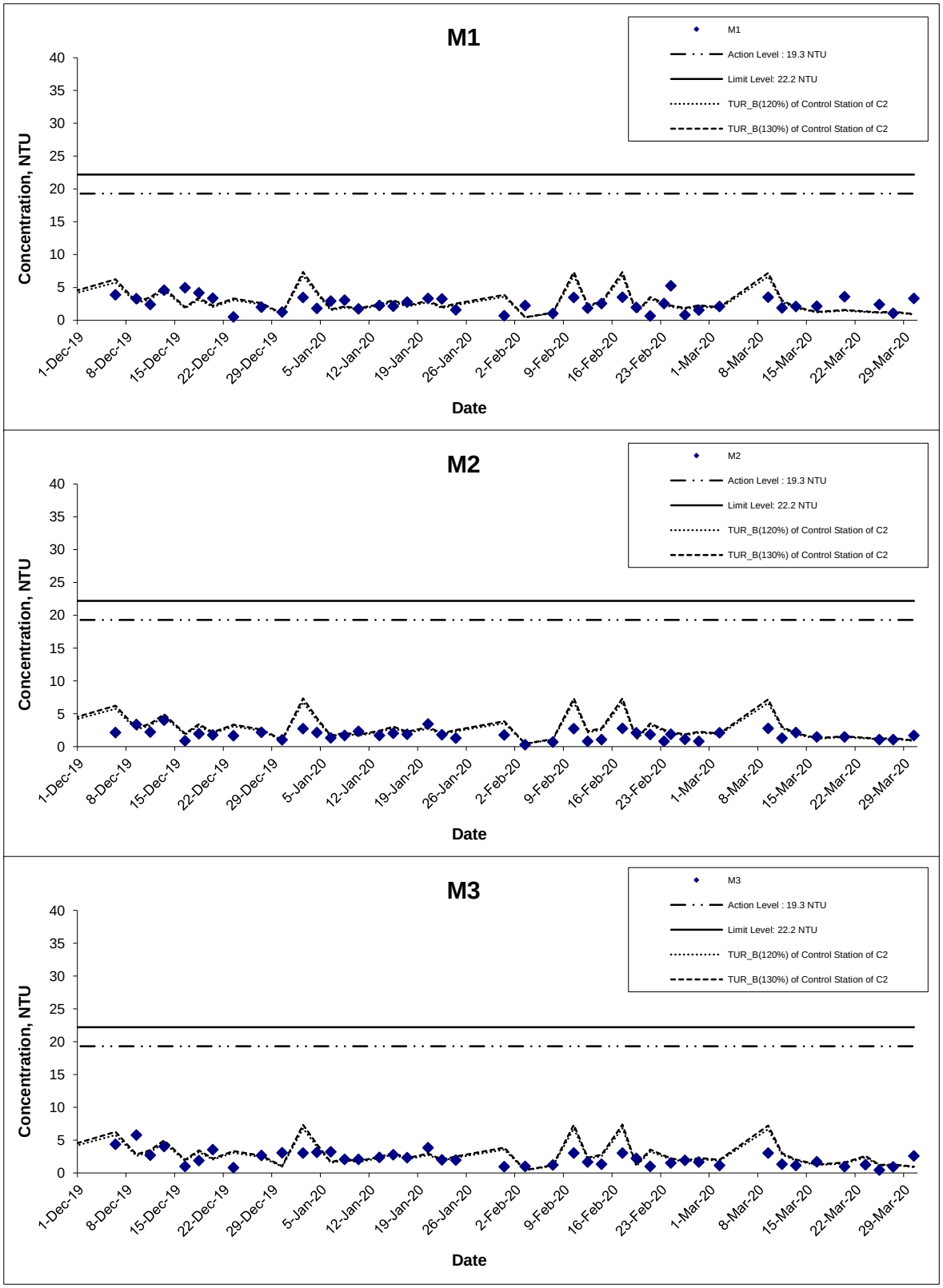
Turbidity (Bottom) at Mid-Ebb Tide



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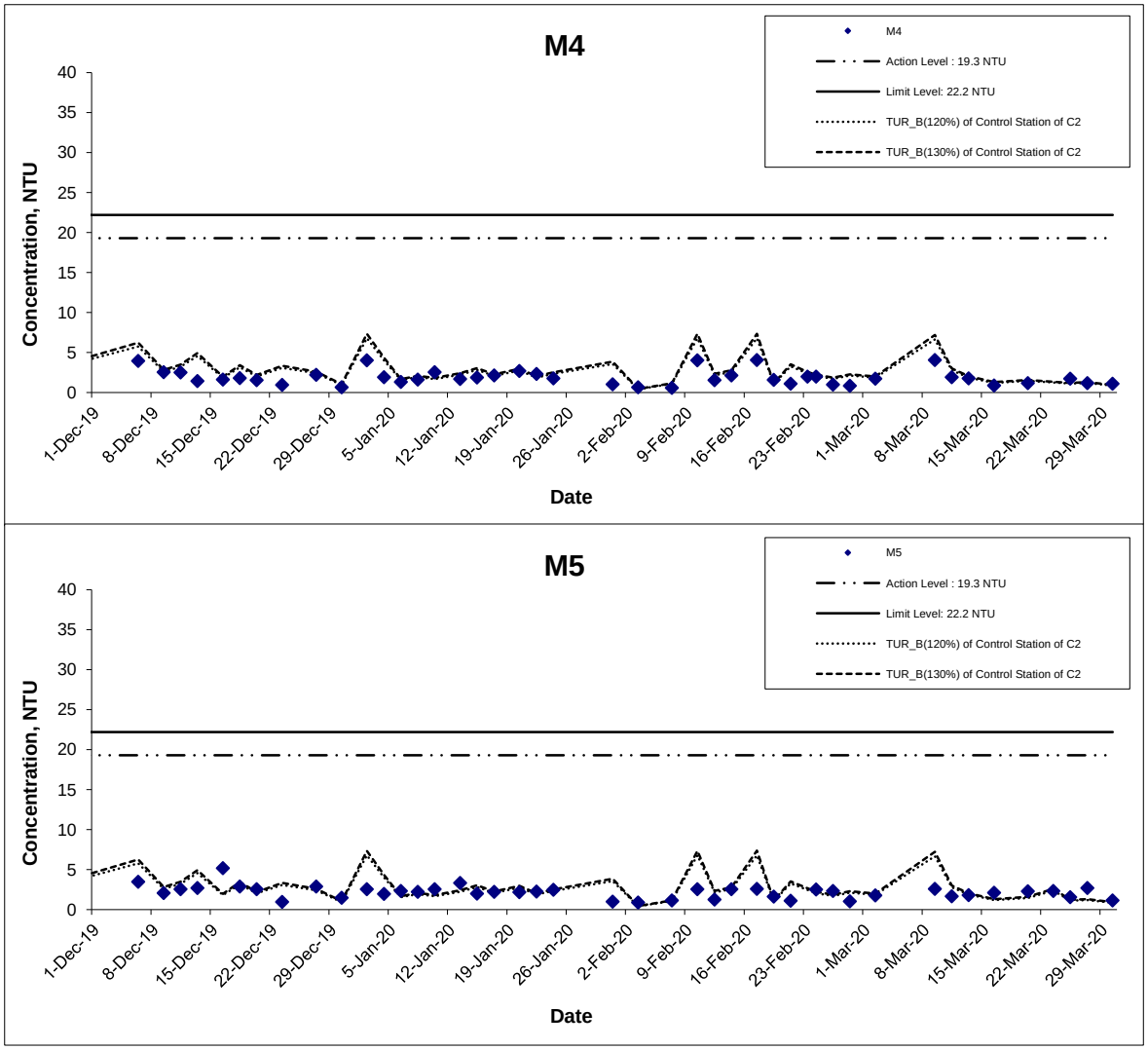
Turbidity (Bottom) at Mid-Ebb Tide



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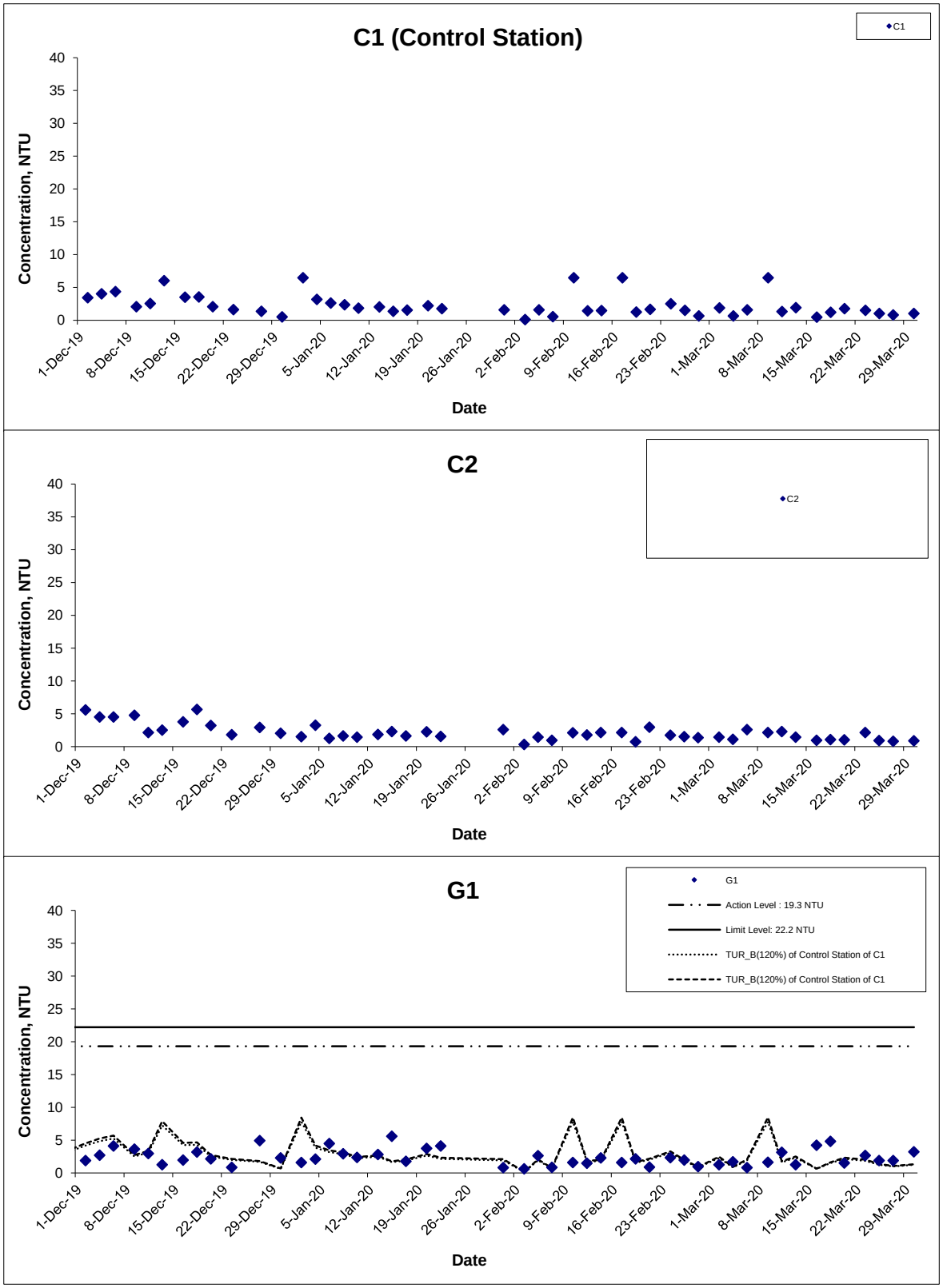
Turbidity (Bottom) at Mid-Flood Tide



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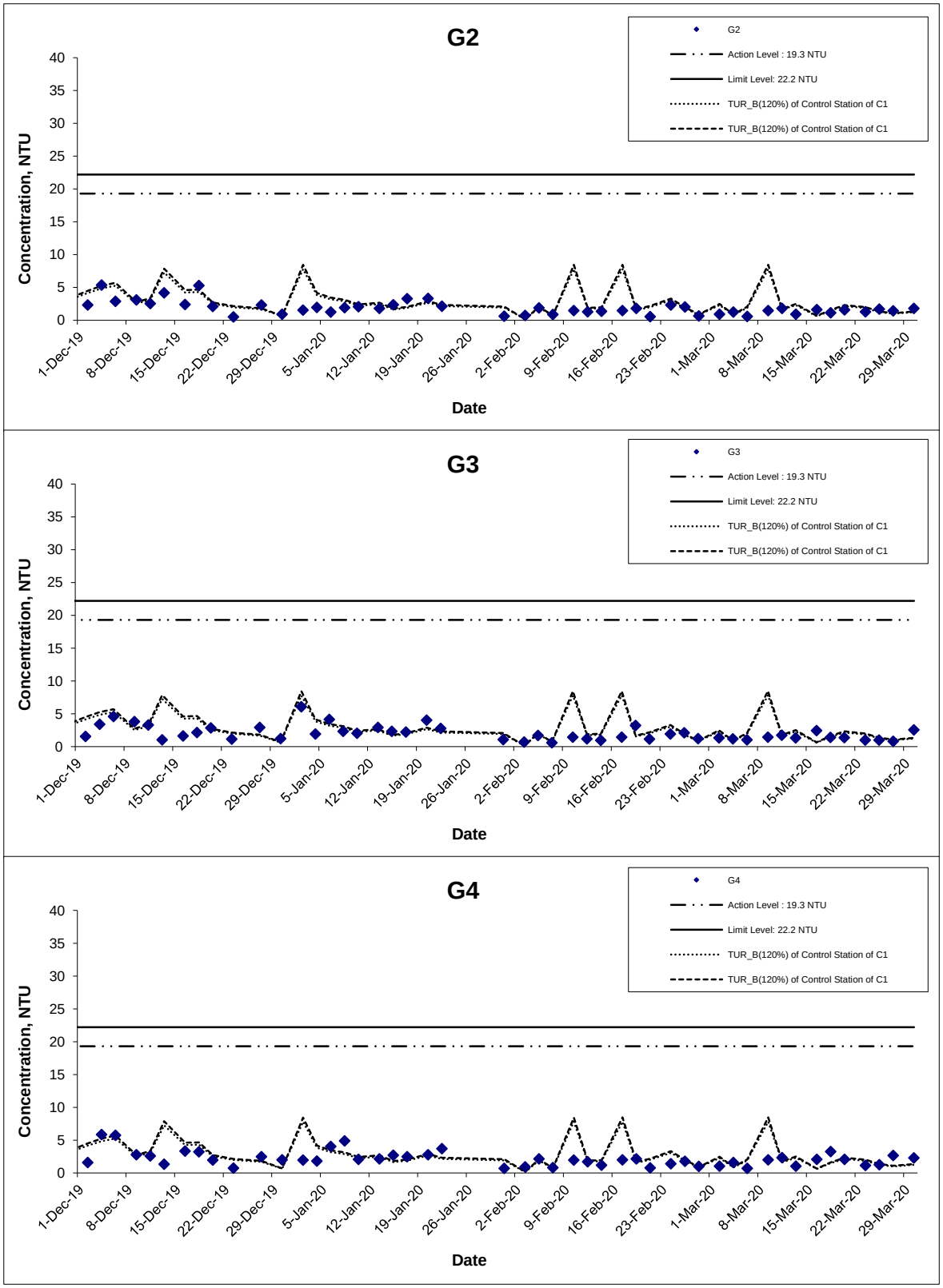
		Date Mar 20	Appendix I	

Turbidity (Bottom) at Mid-Flood Tide



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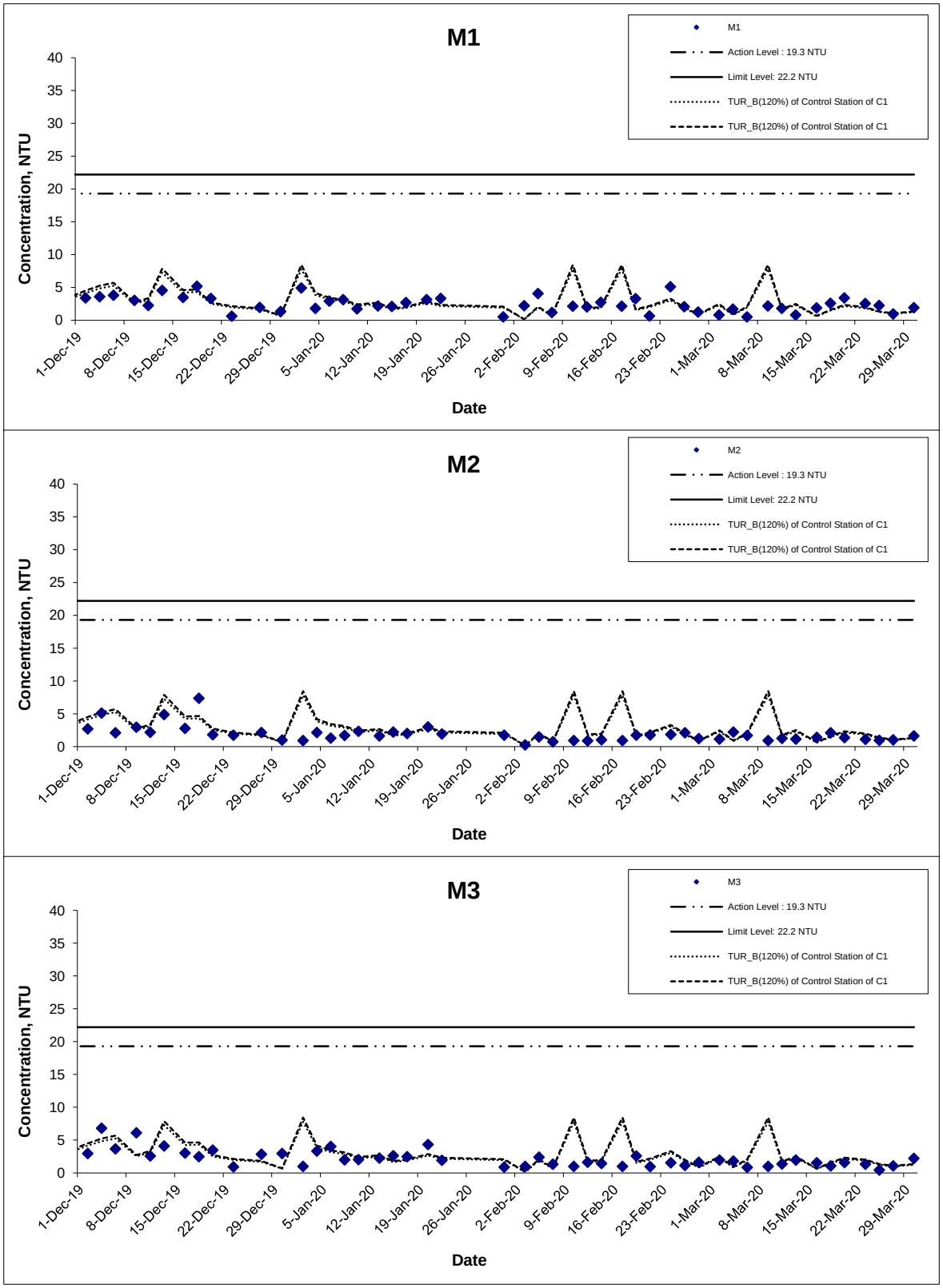

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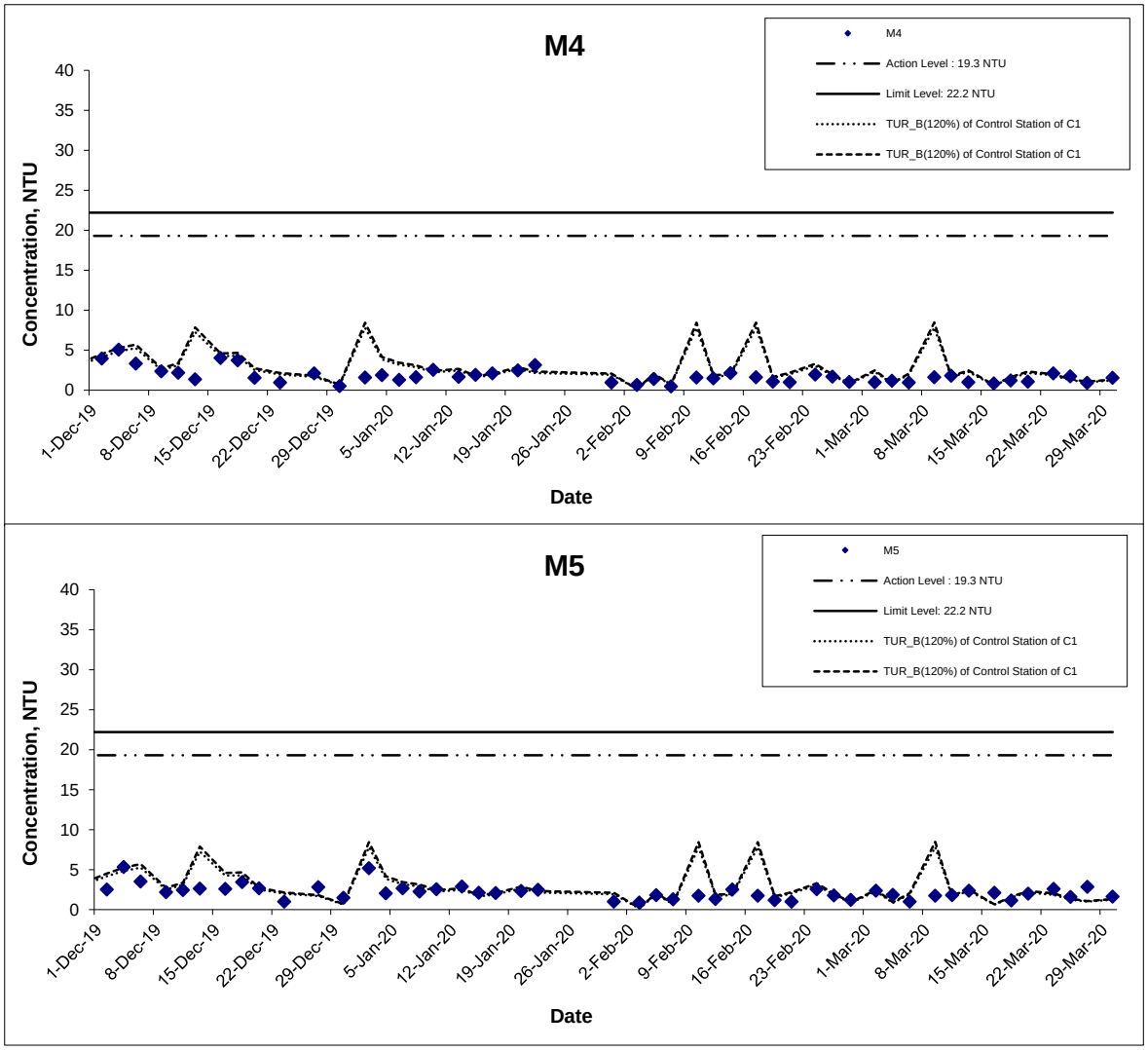

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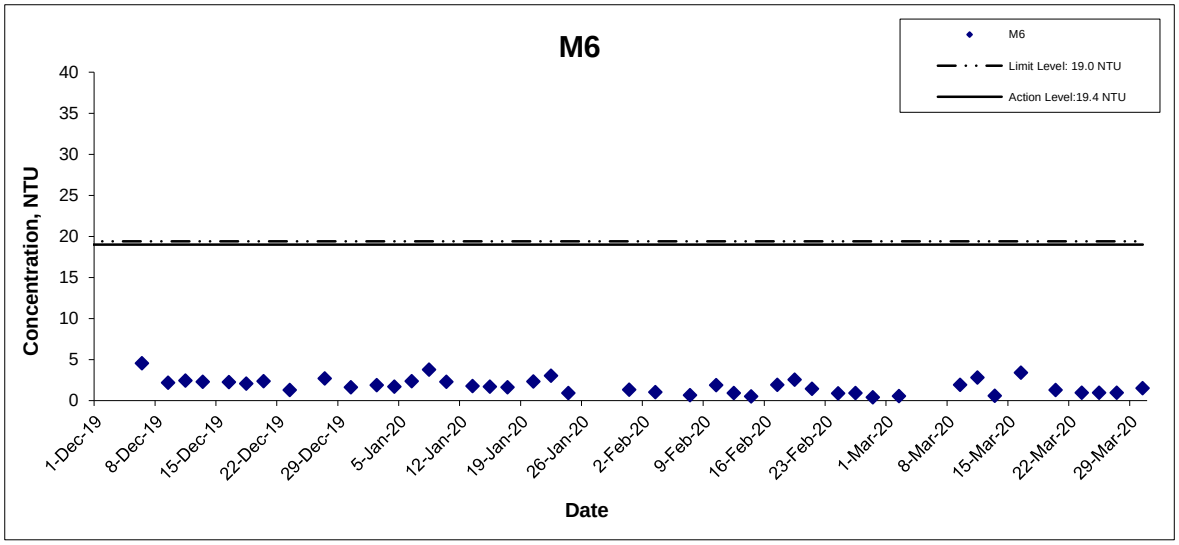
Turbidity (Intake Level of WSD Salt Water Intake) at Mid-Ebb Tide



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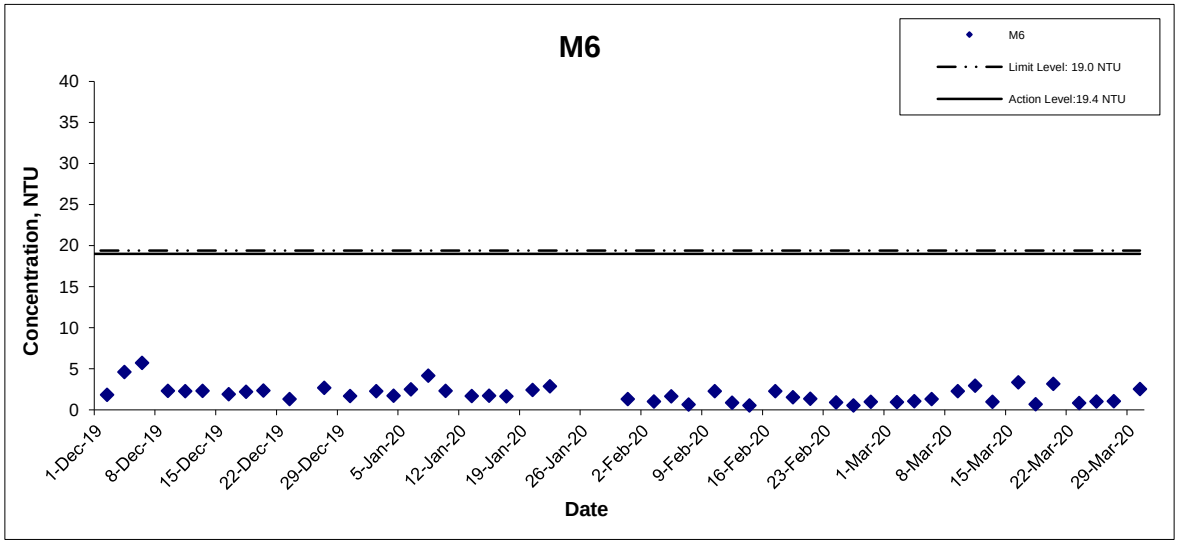

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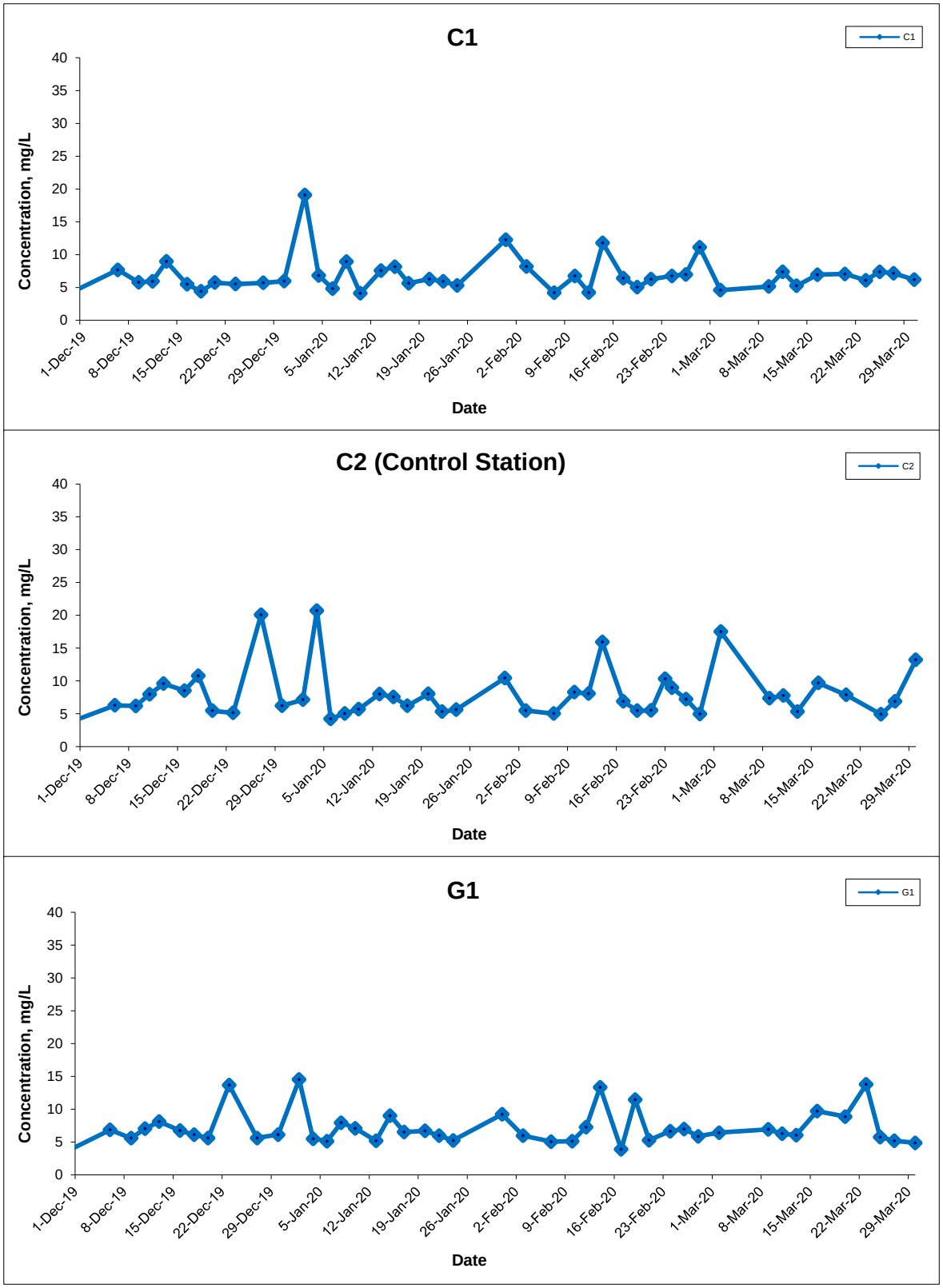
Suspended Solids (Depth-averaged) at Mid-Ebb Tide



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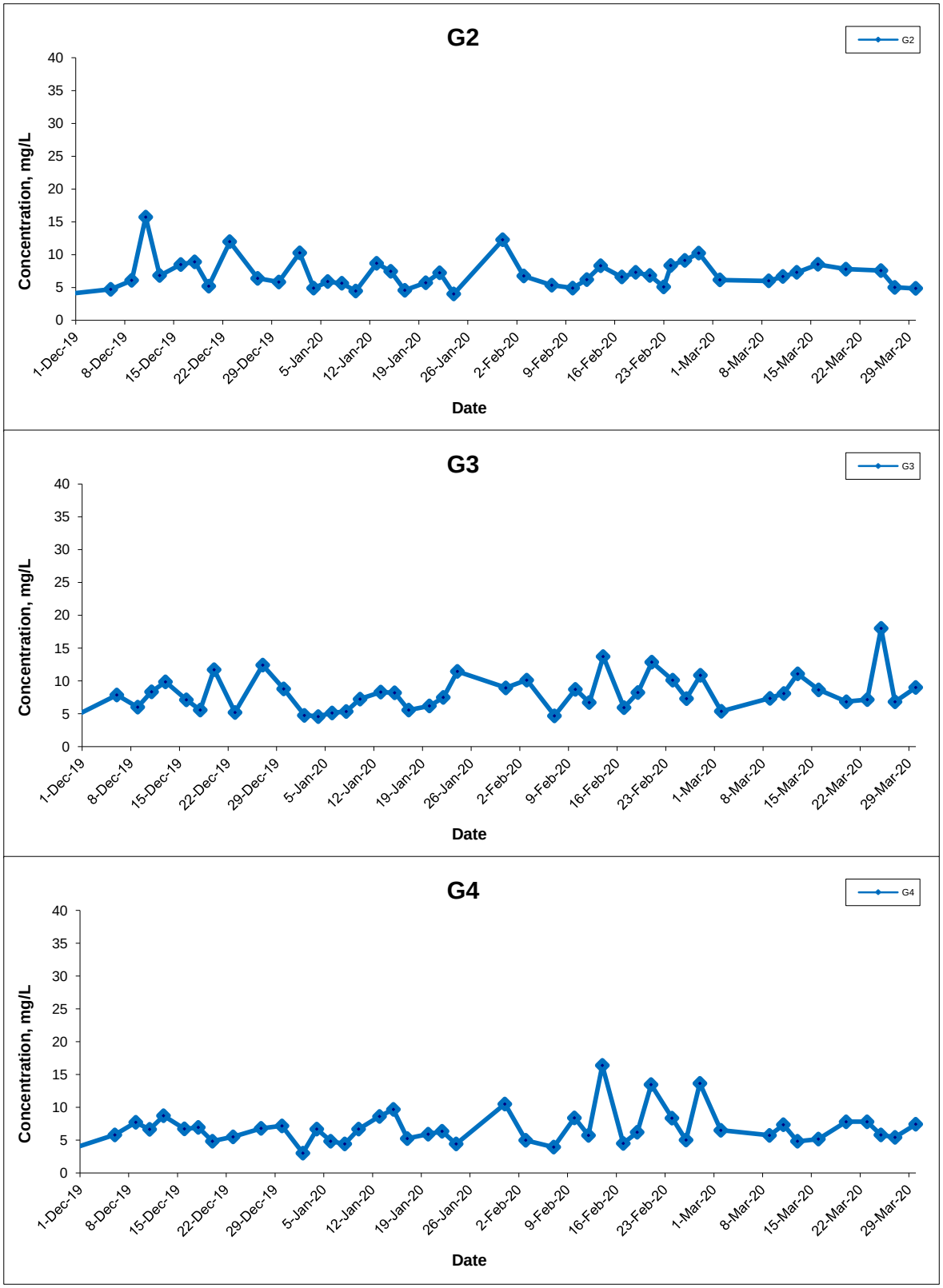

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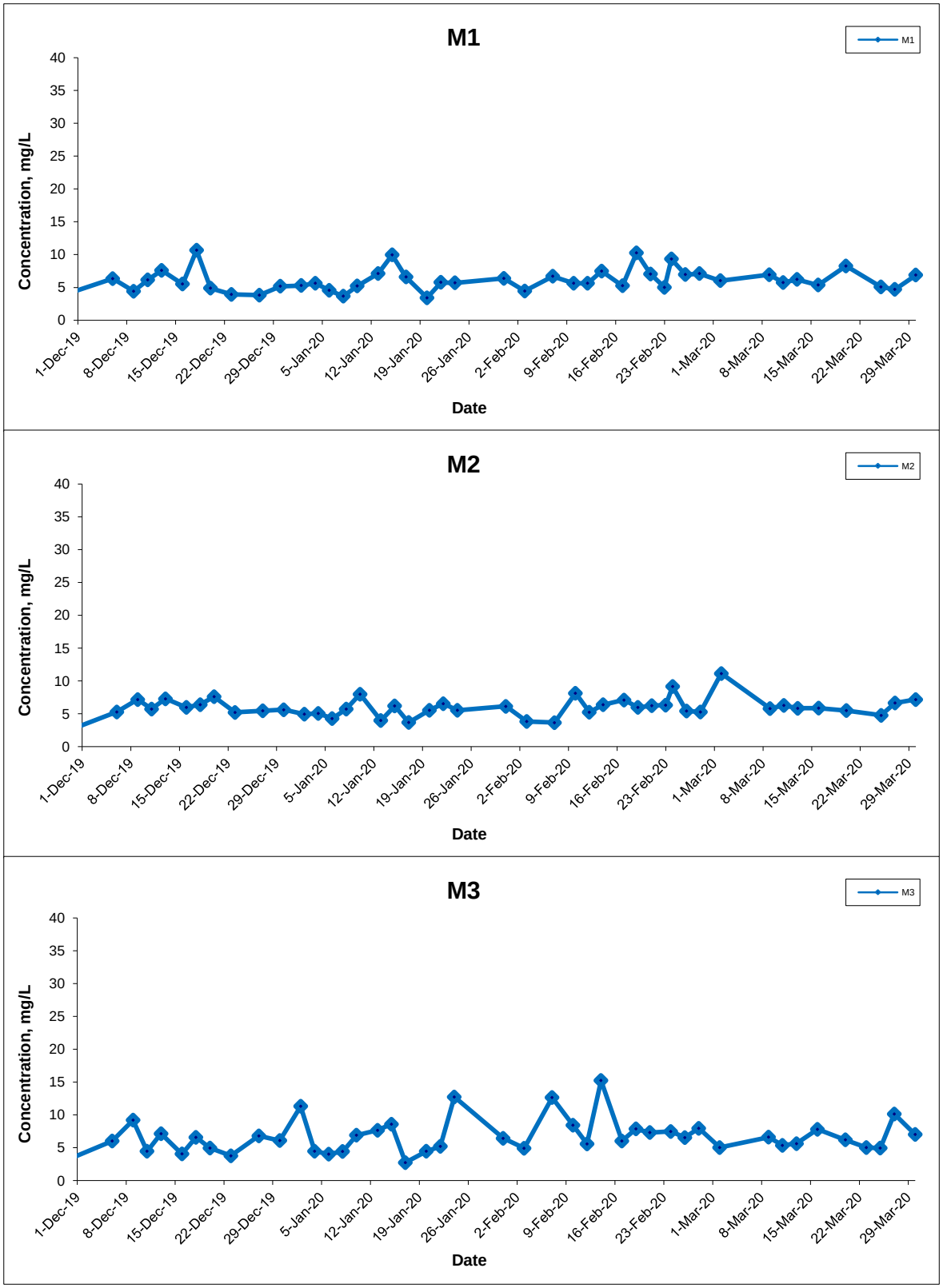

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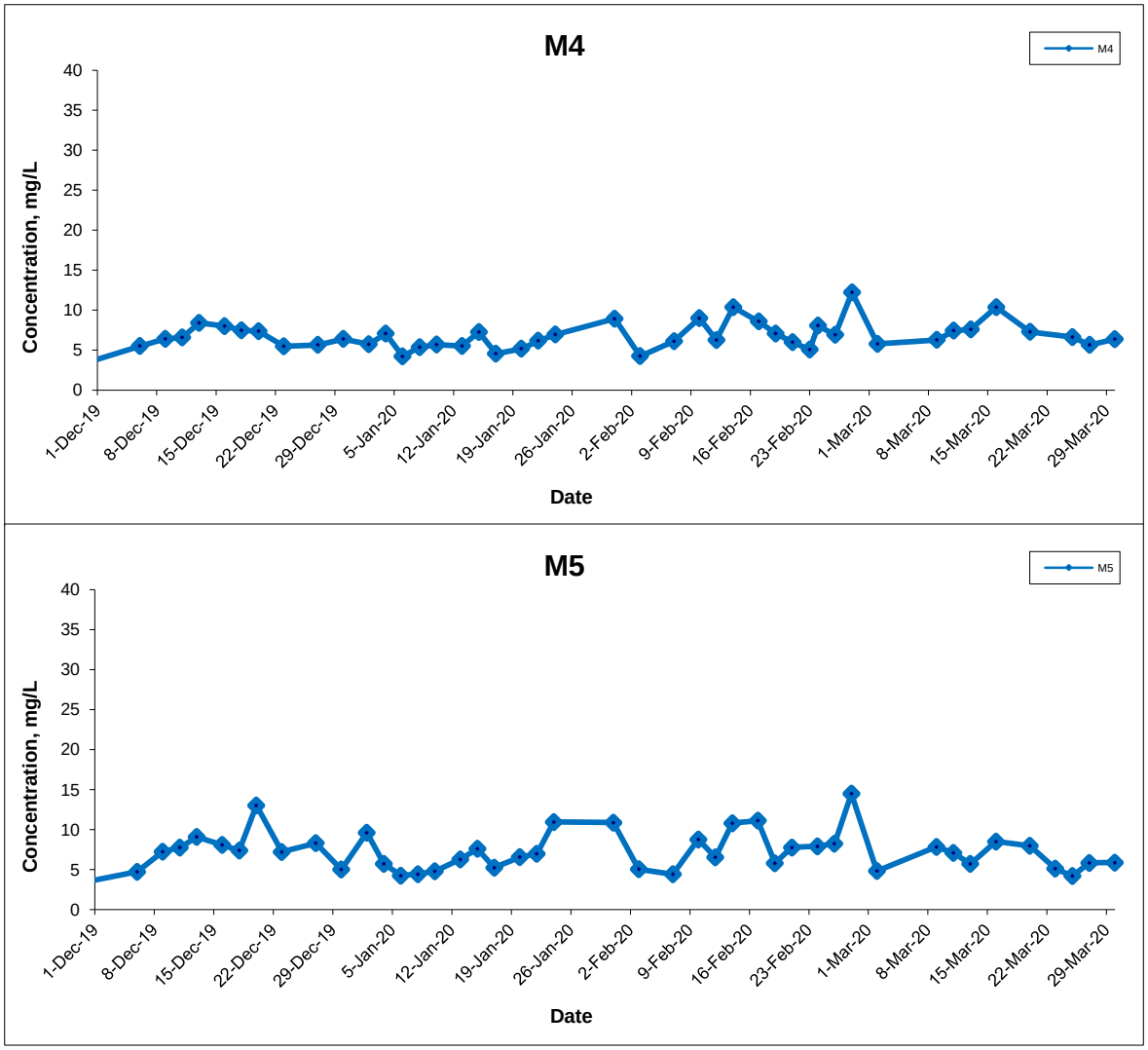

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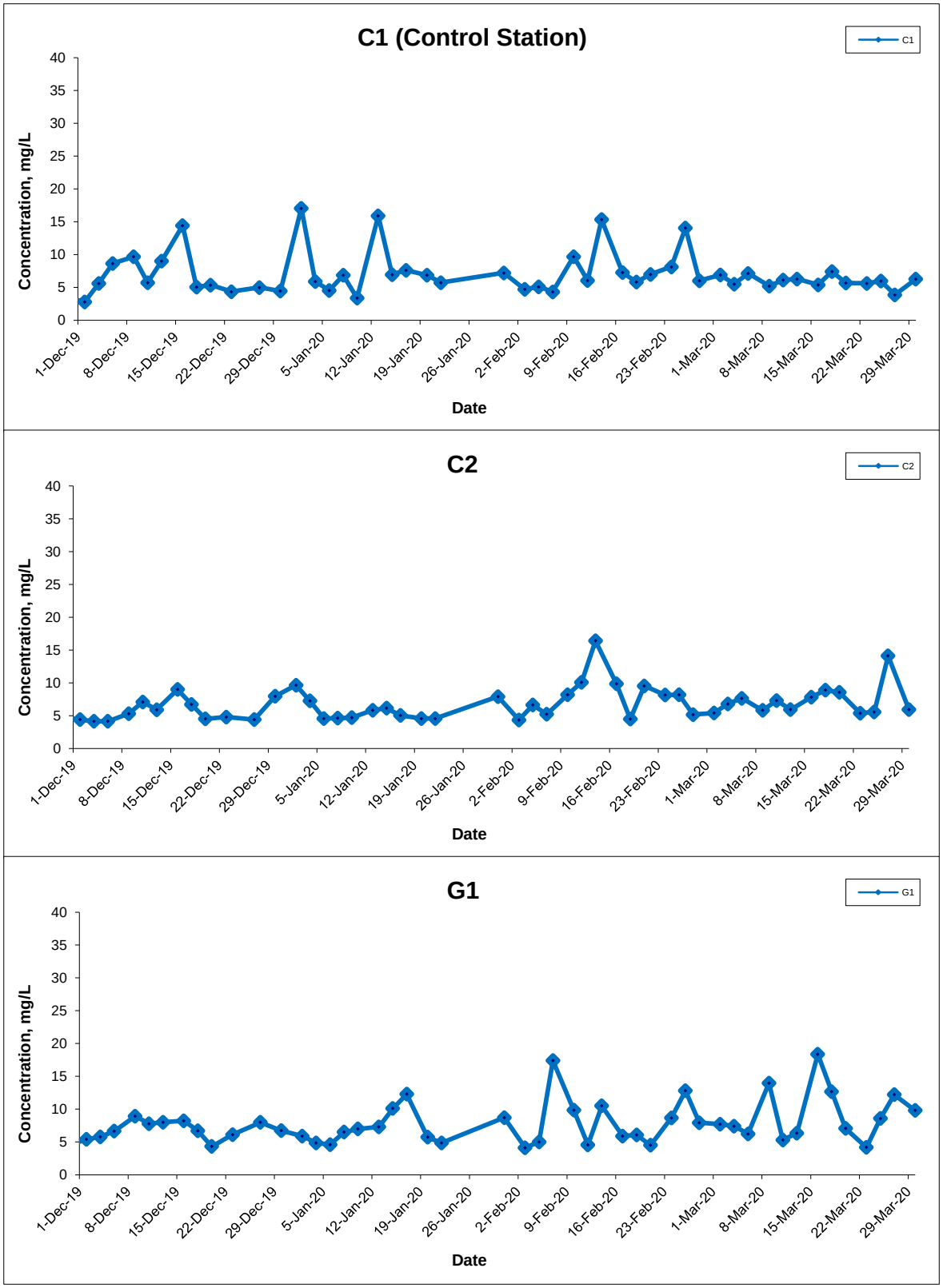

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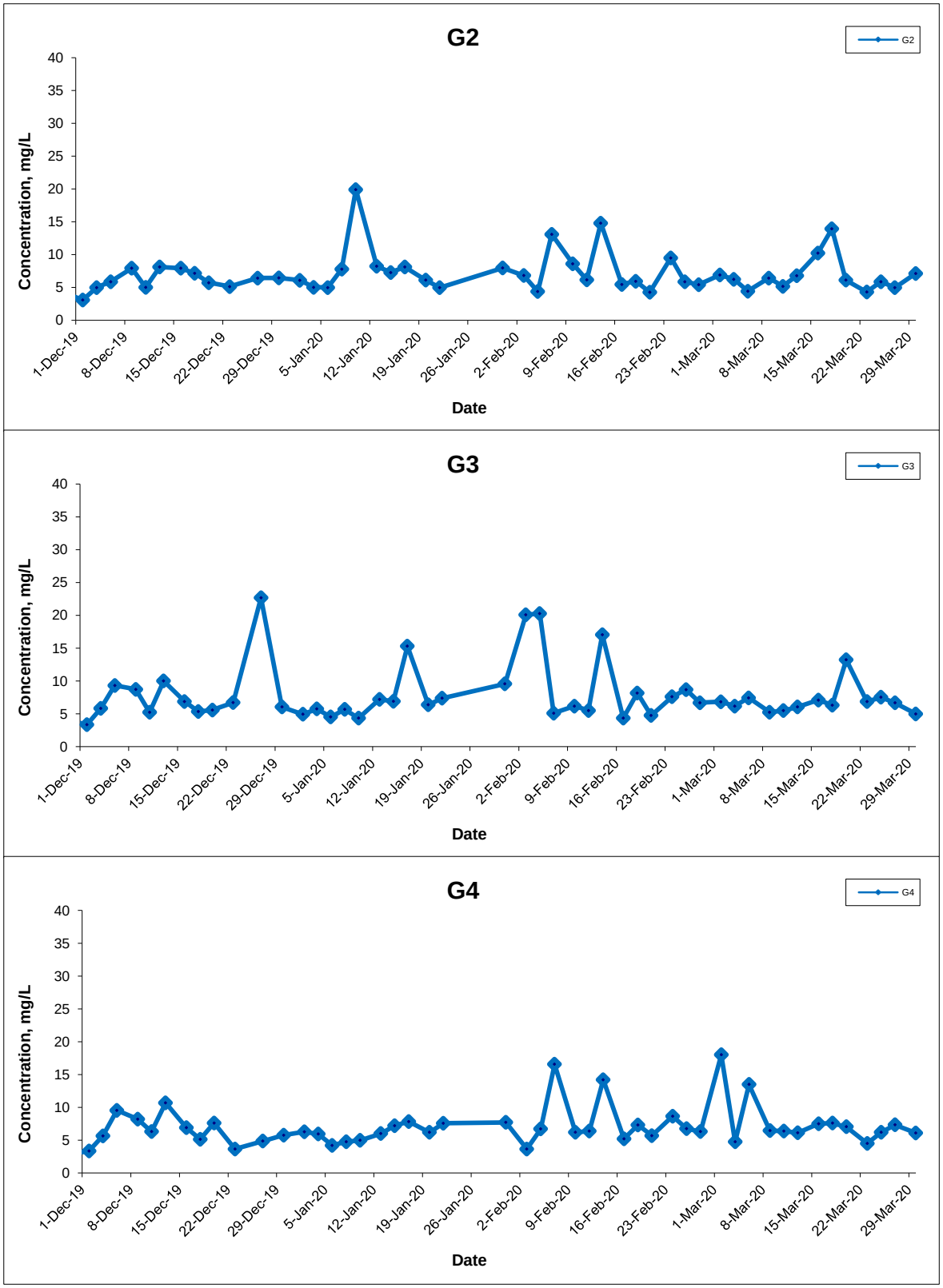

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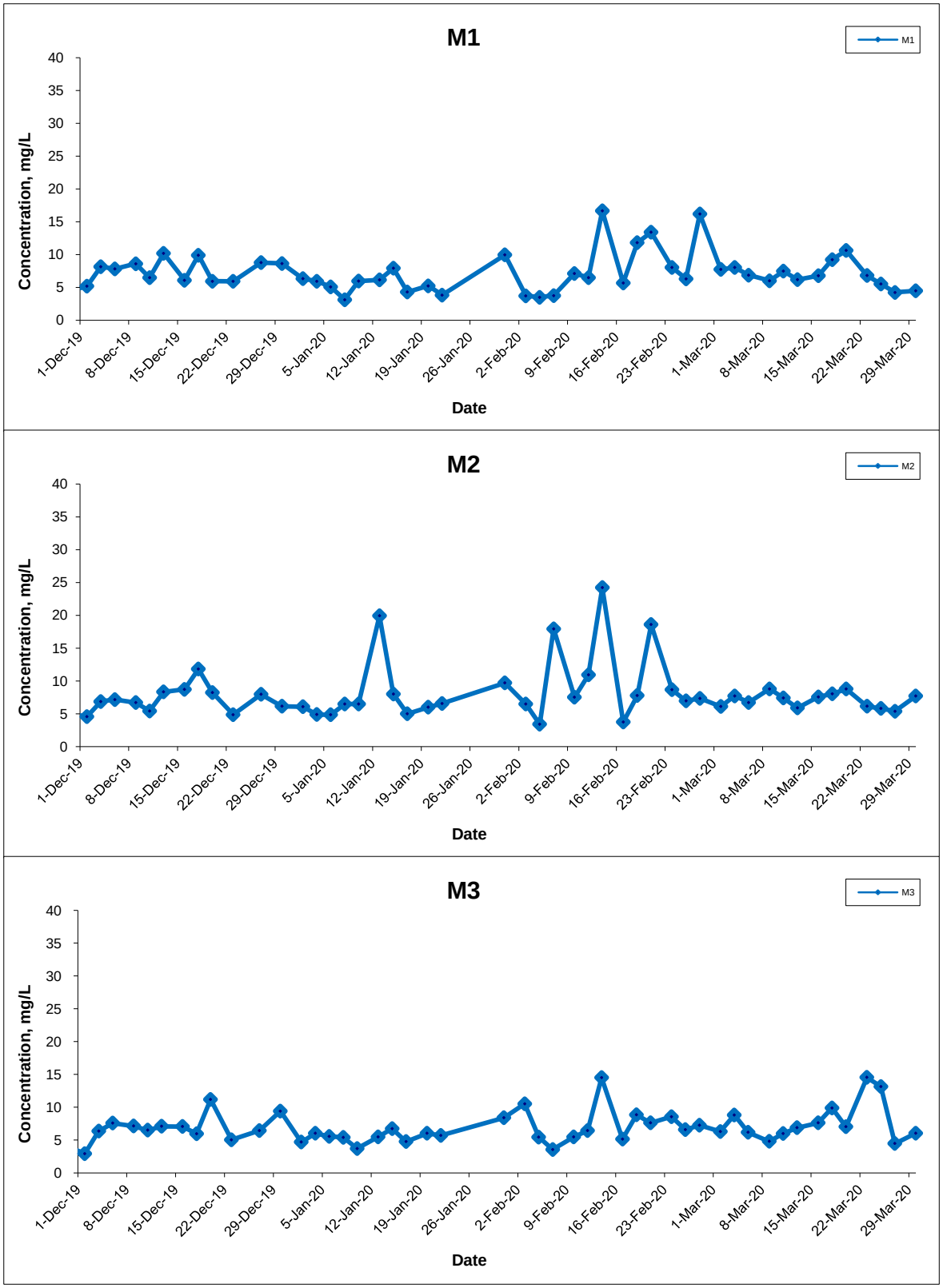

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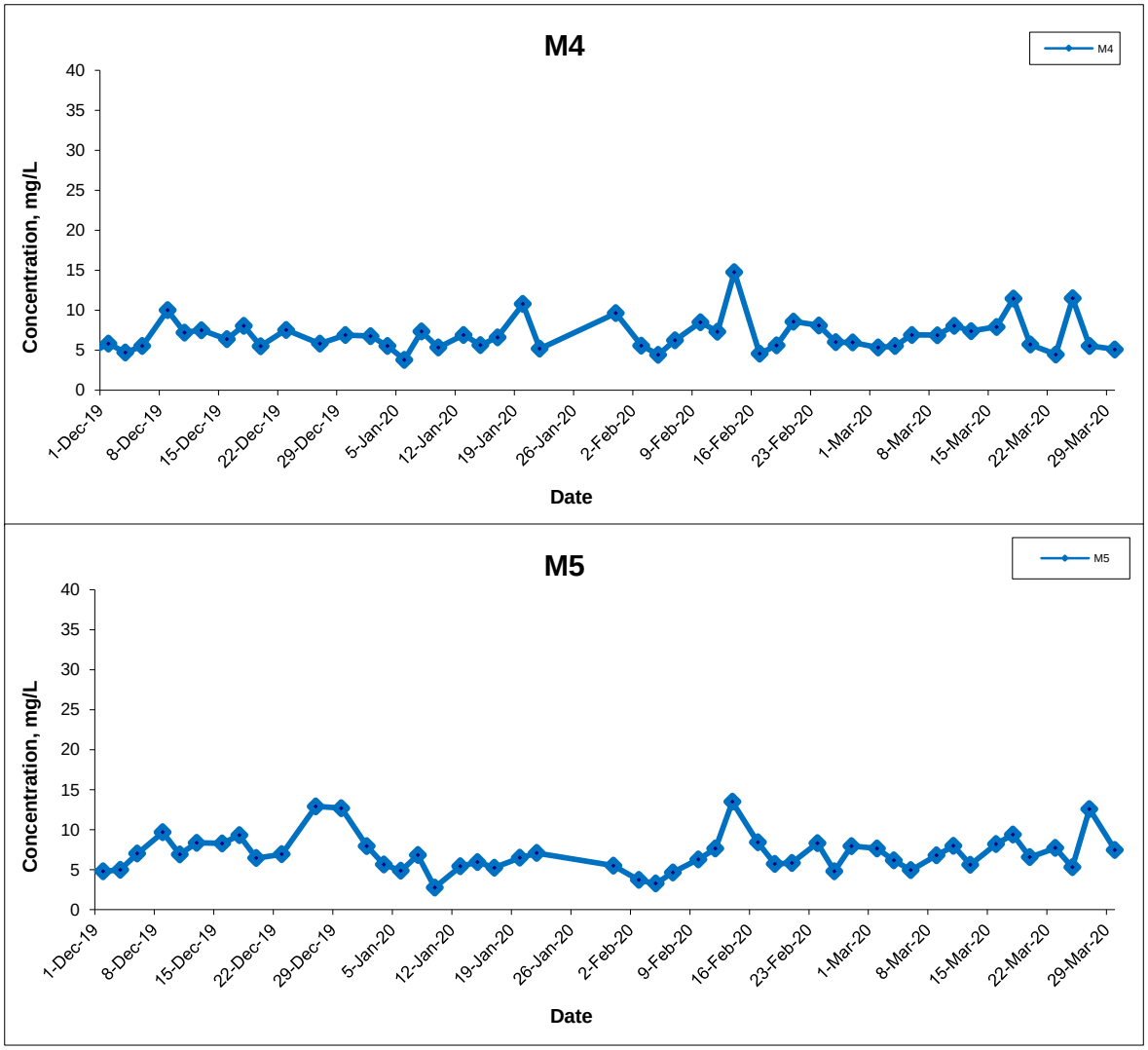

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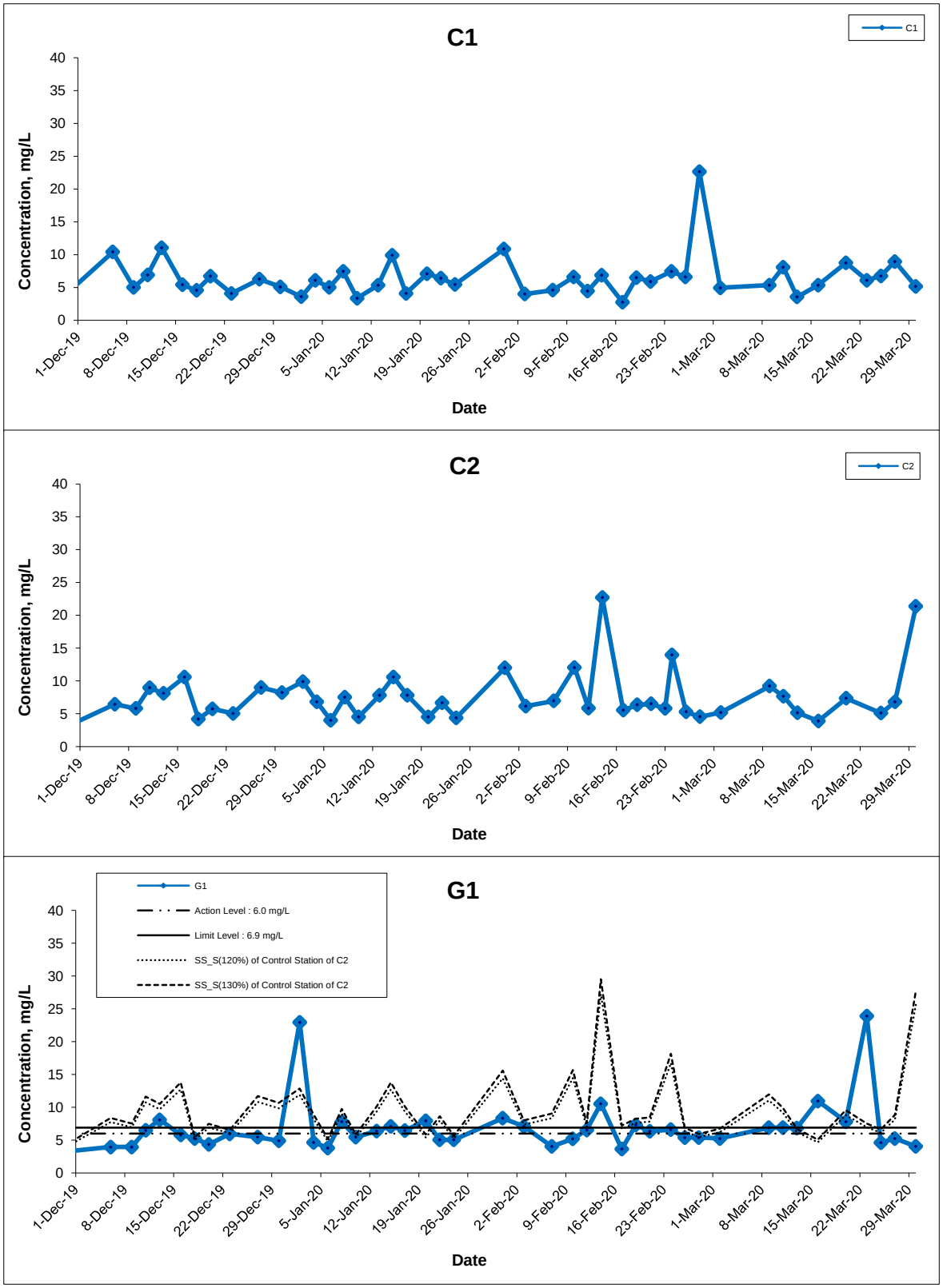
Suspended Solids (Surface) at Mid-Ebb Tide



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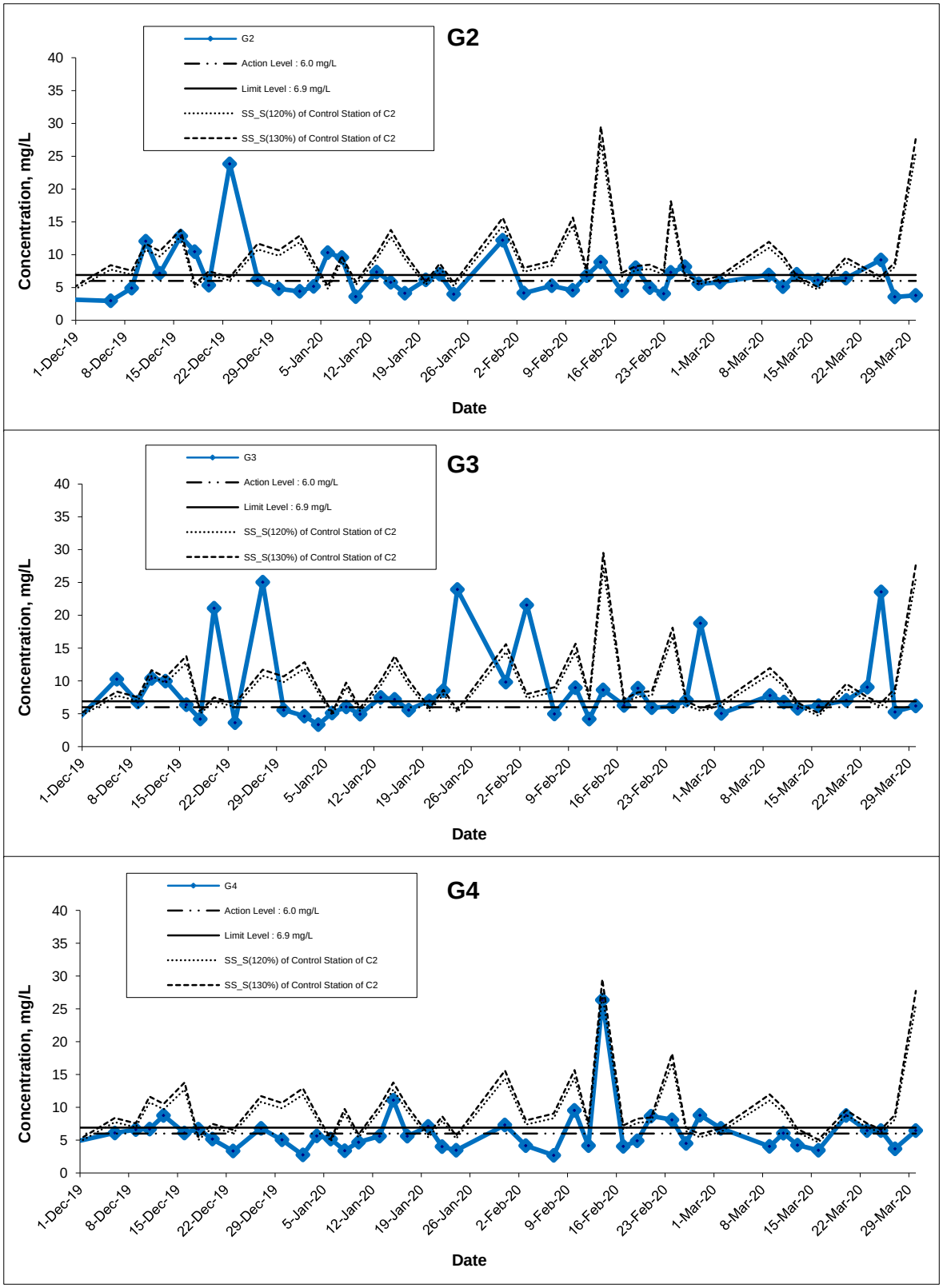

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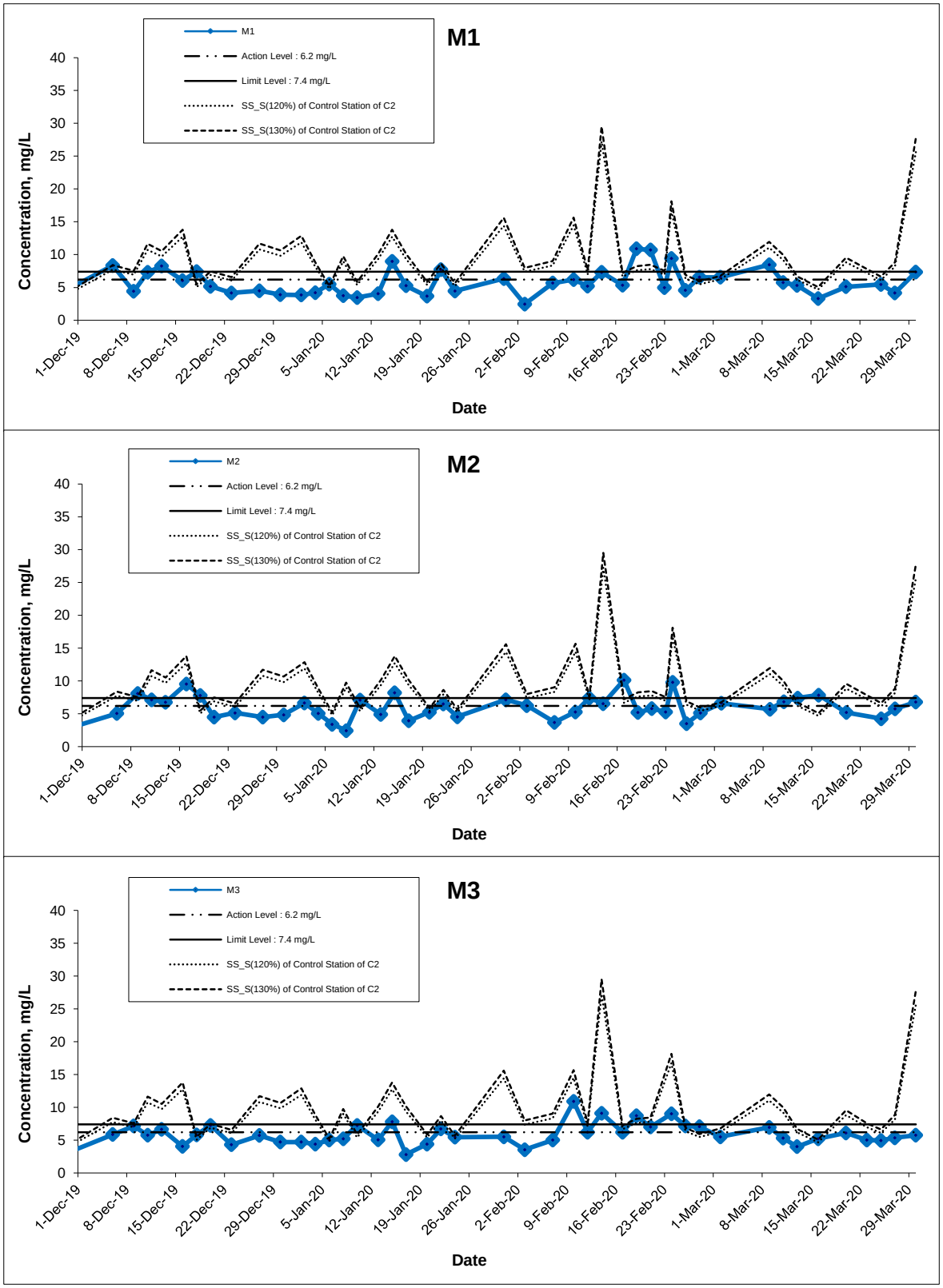

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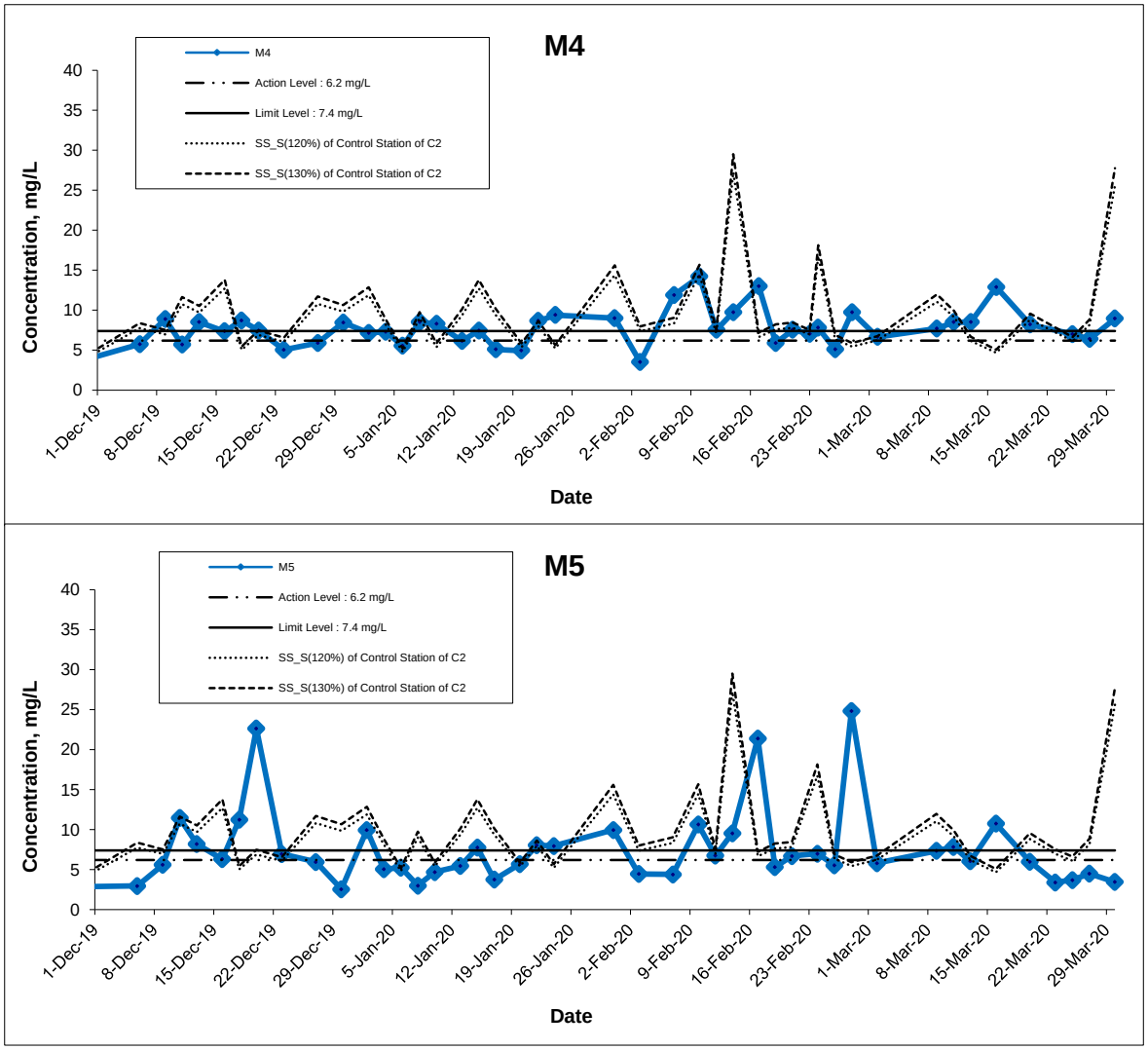

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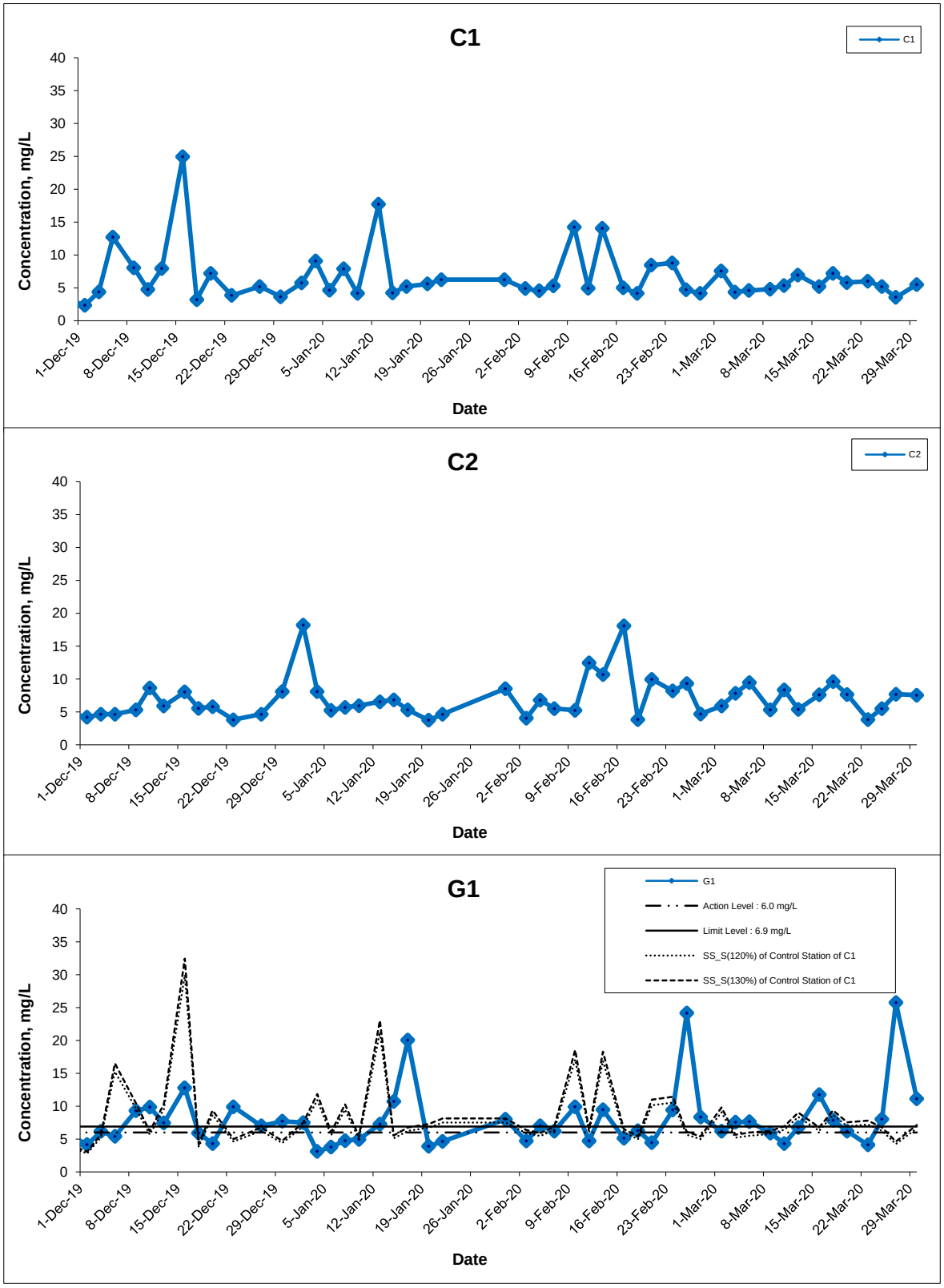
Suspended Solids (Surface) at Mid-Flood Tide



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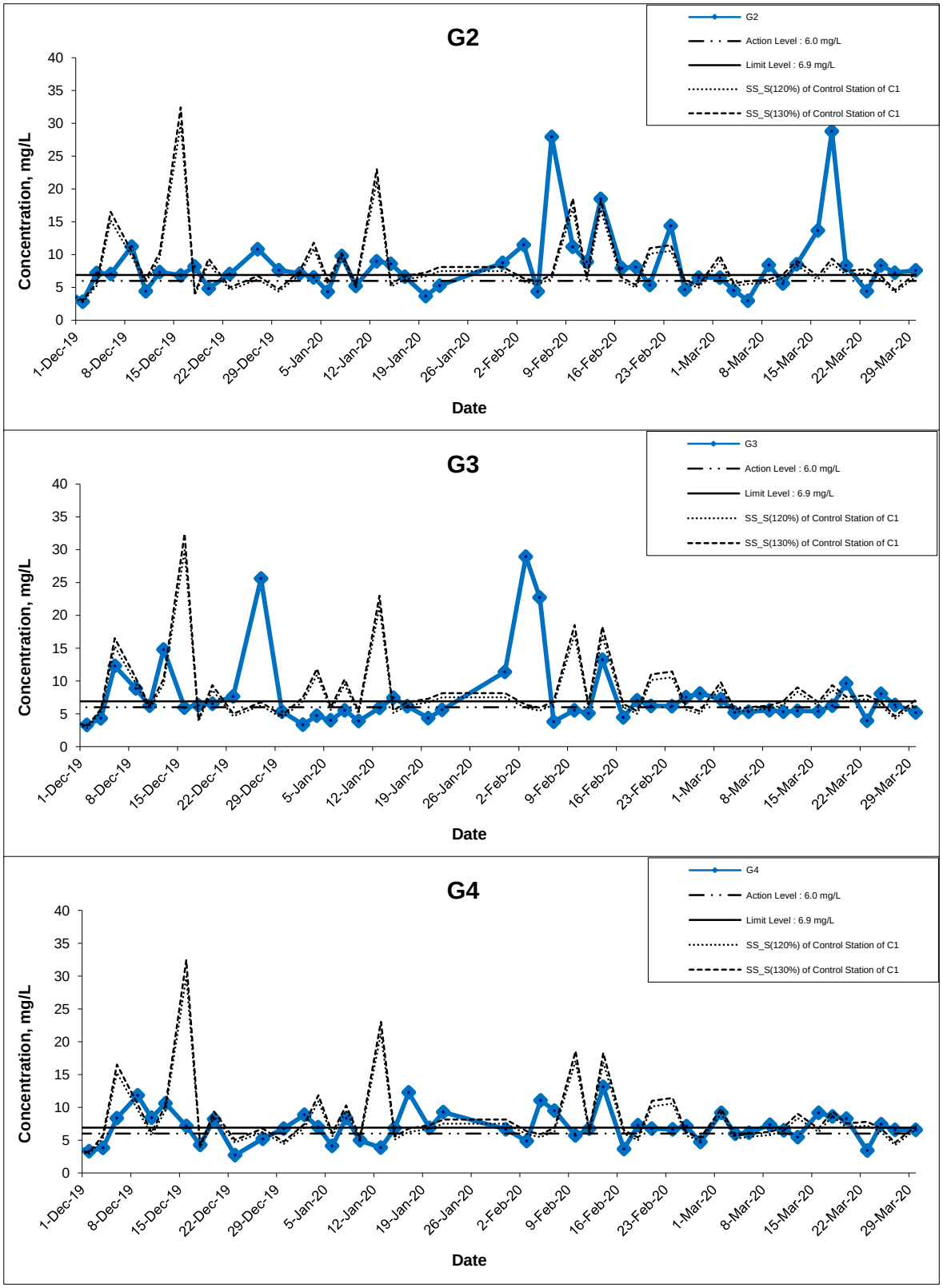

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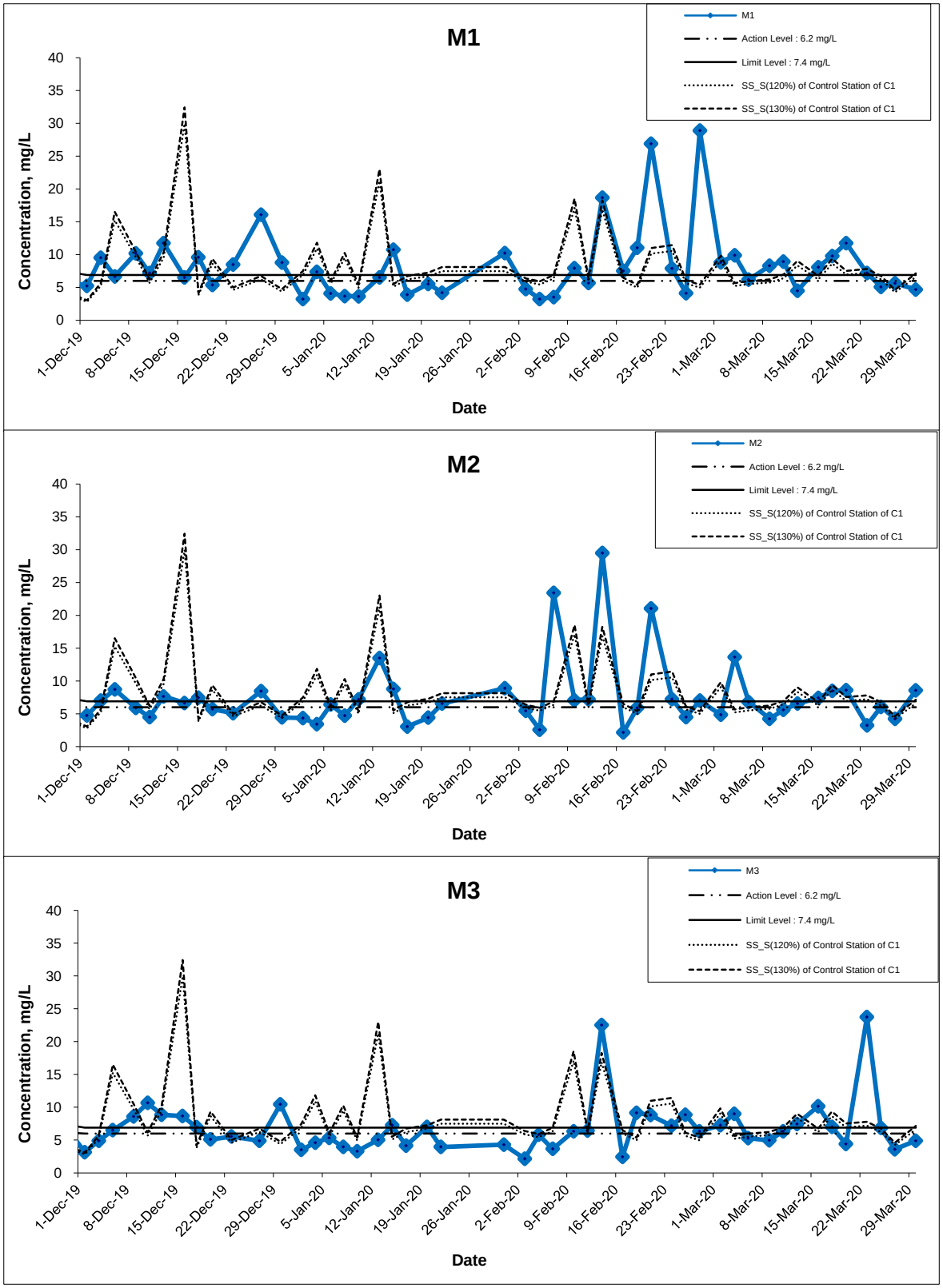

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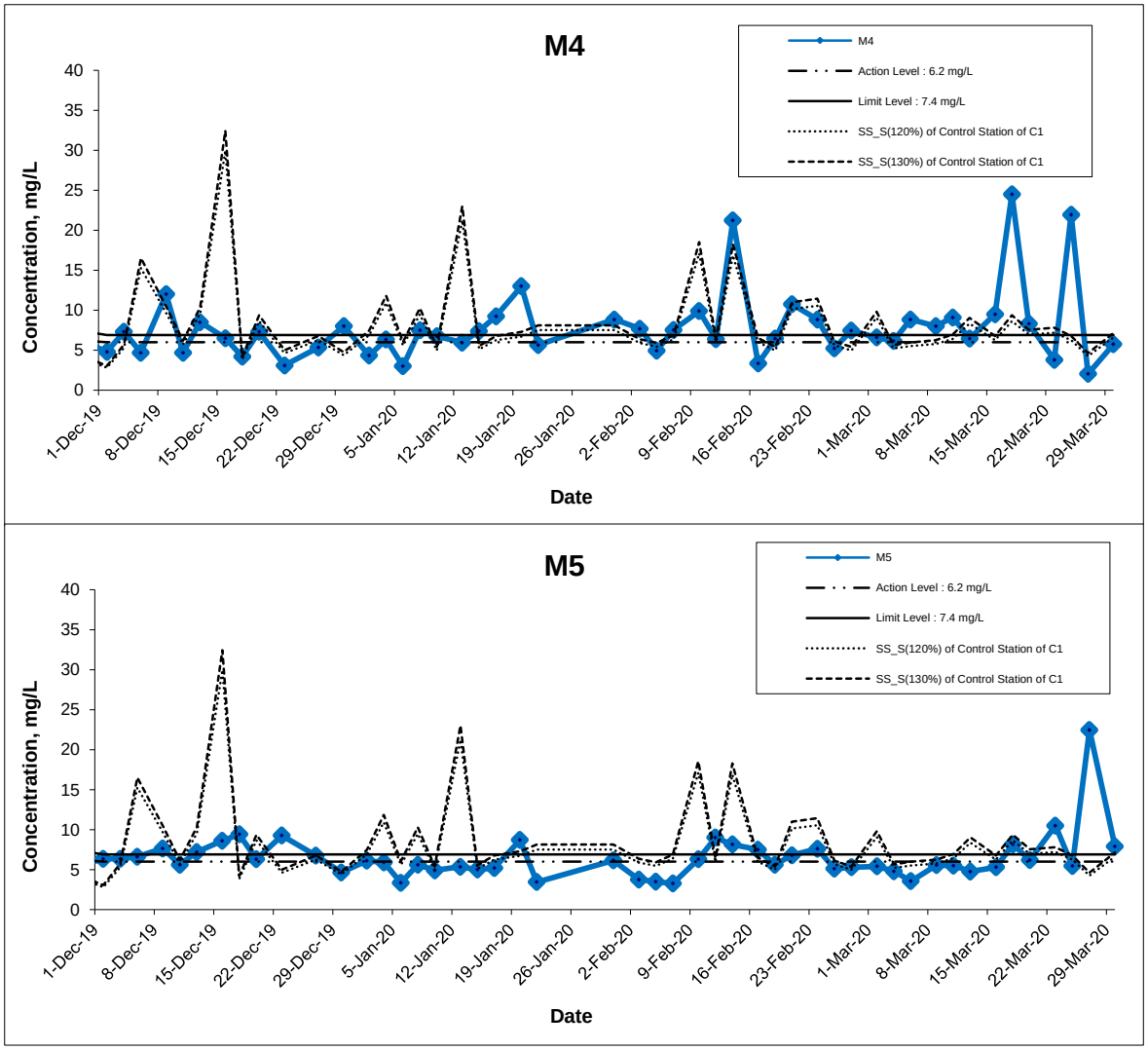

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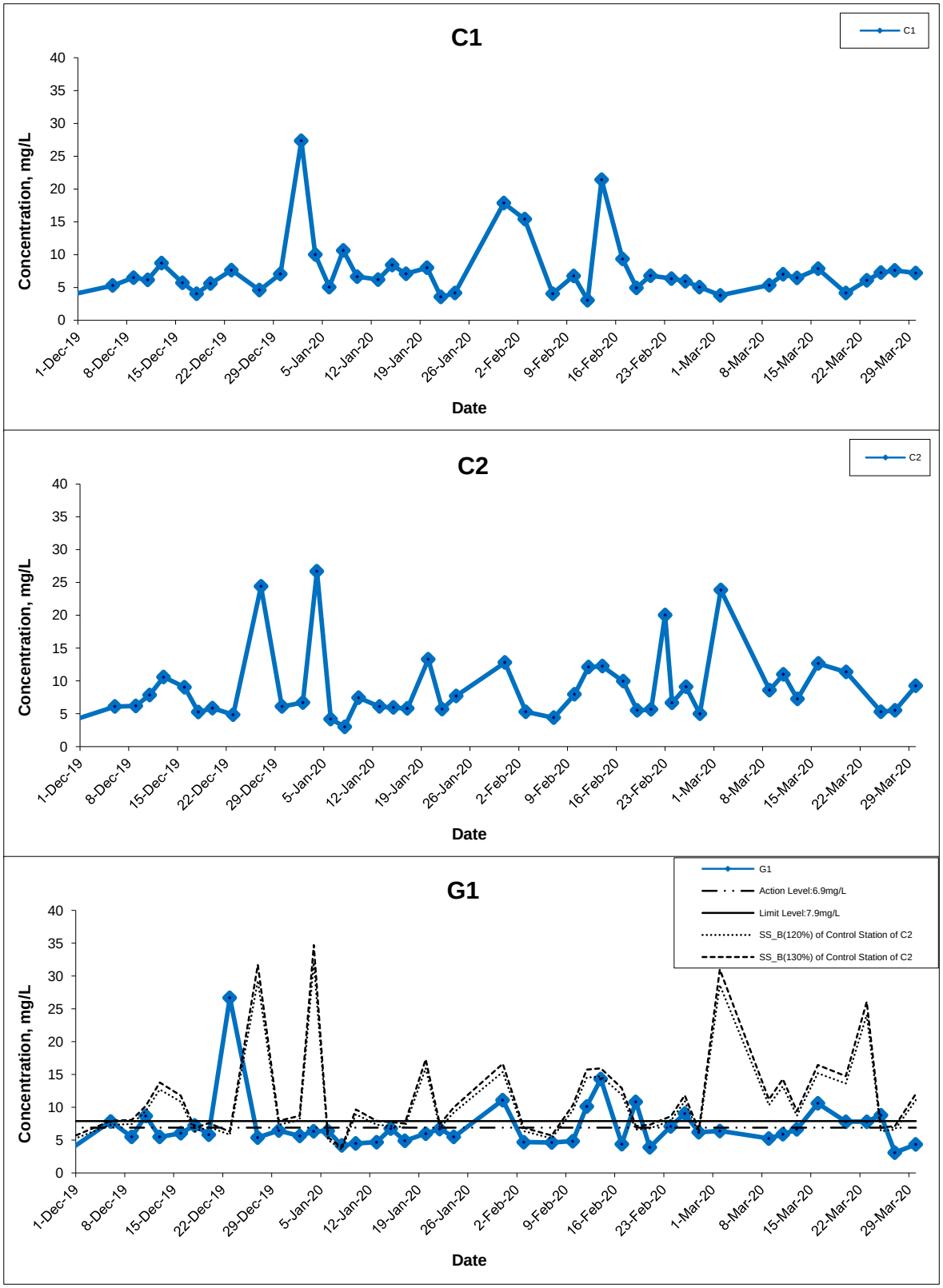
Suspended Solids (Bottom) at Mid-Ebb Tide



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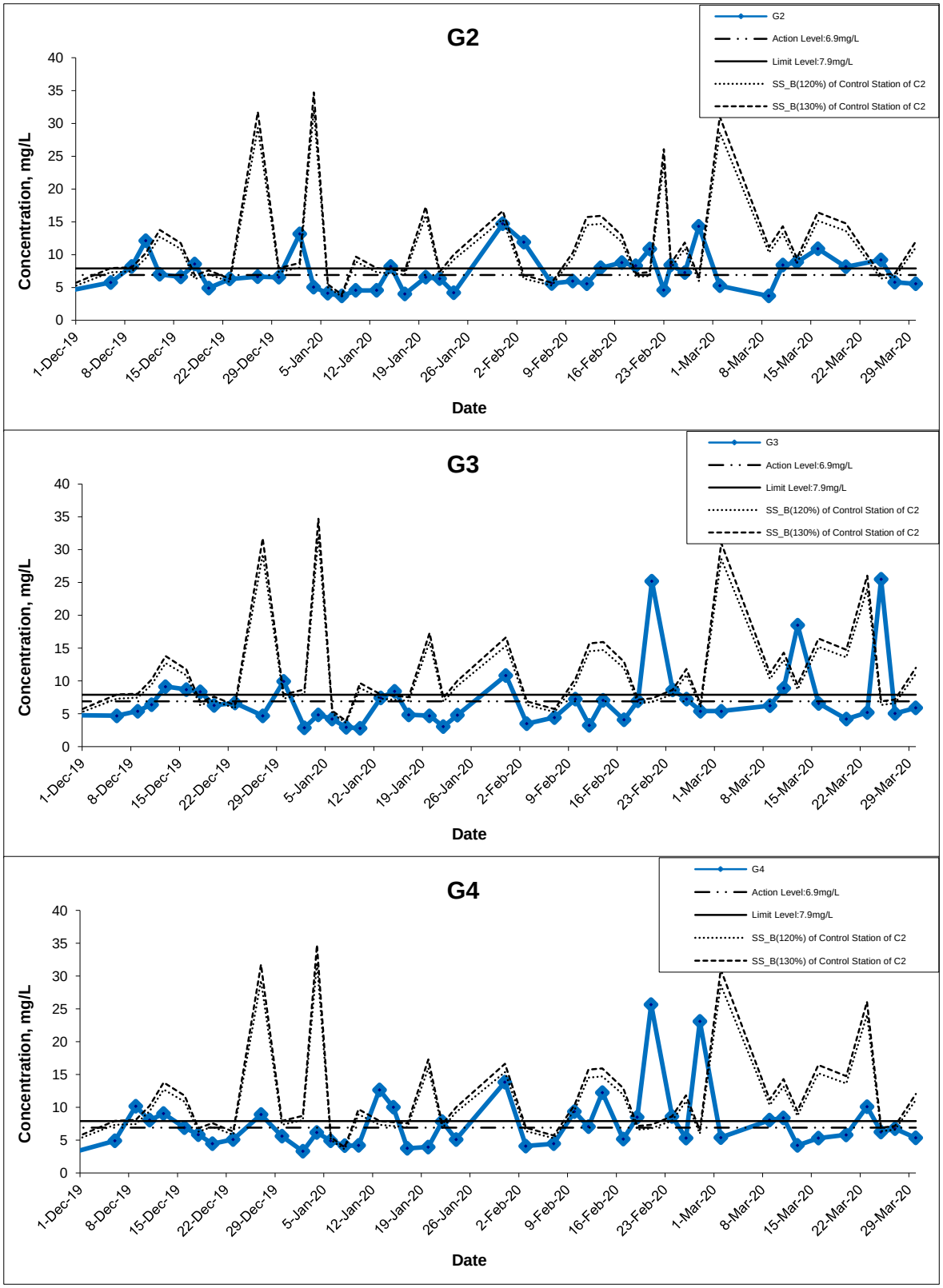

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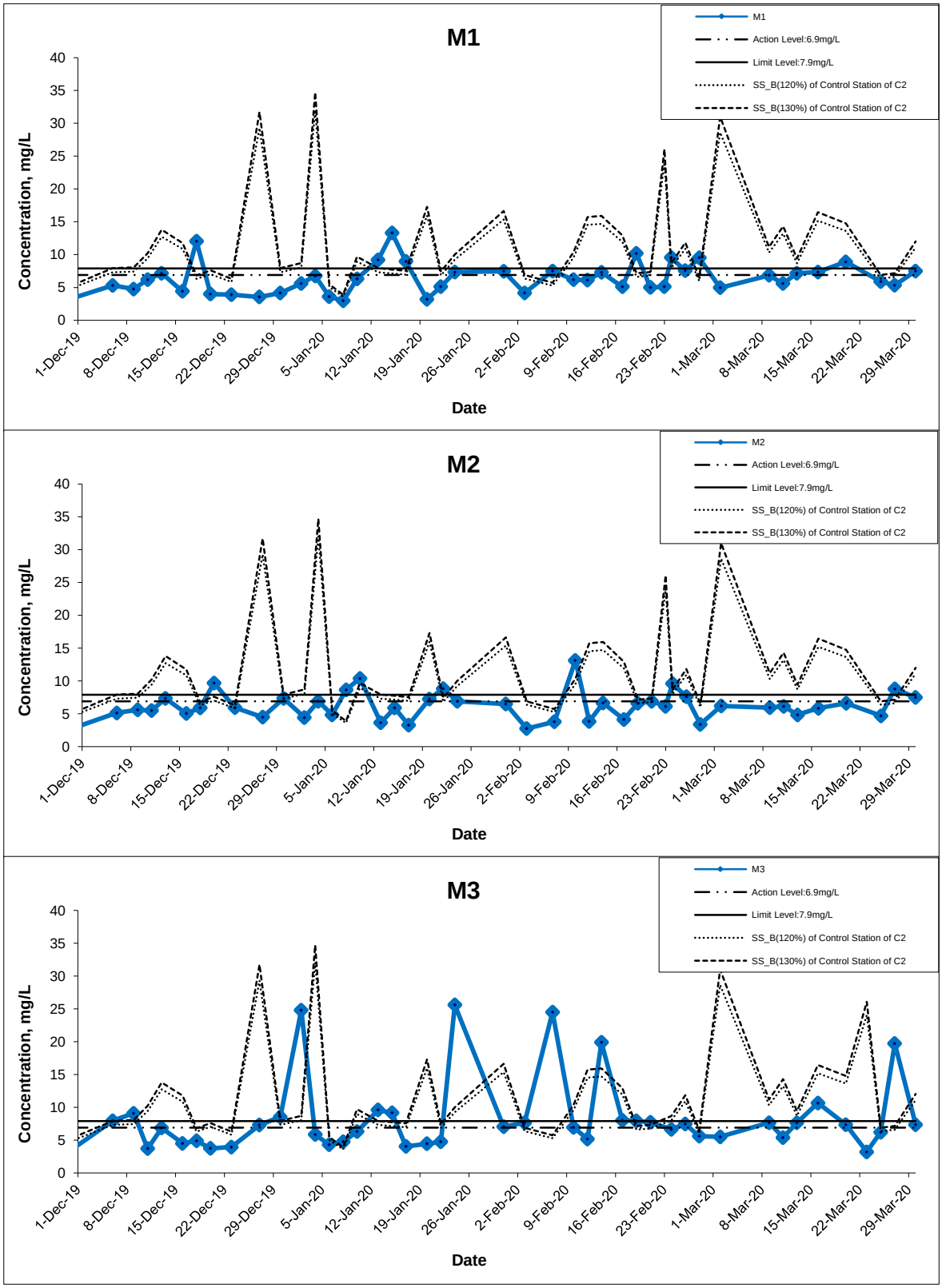

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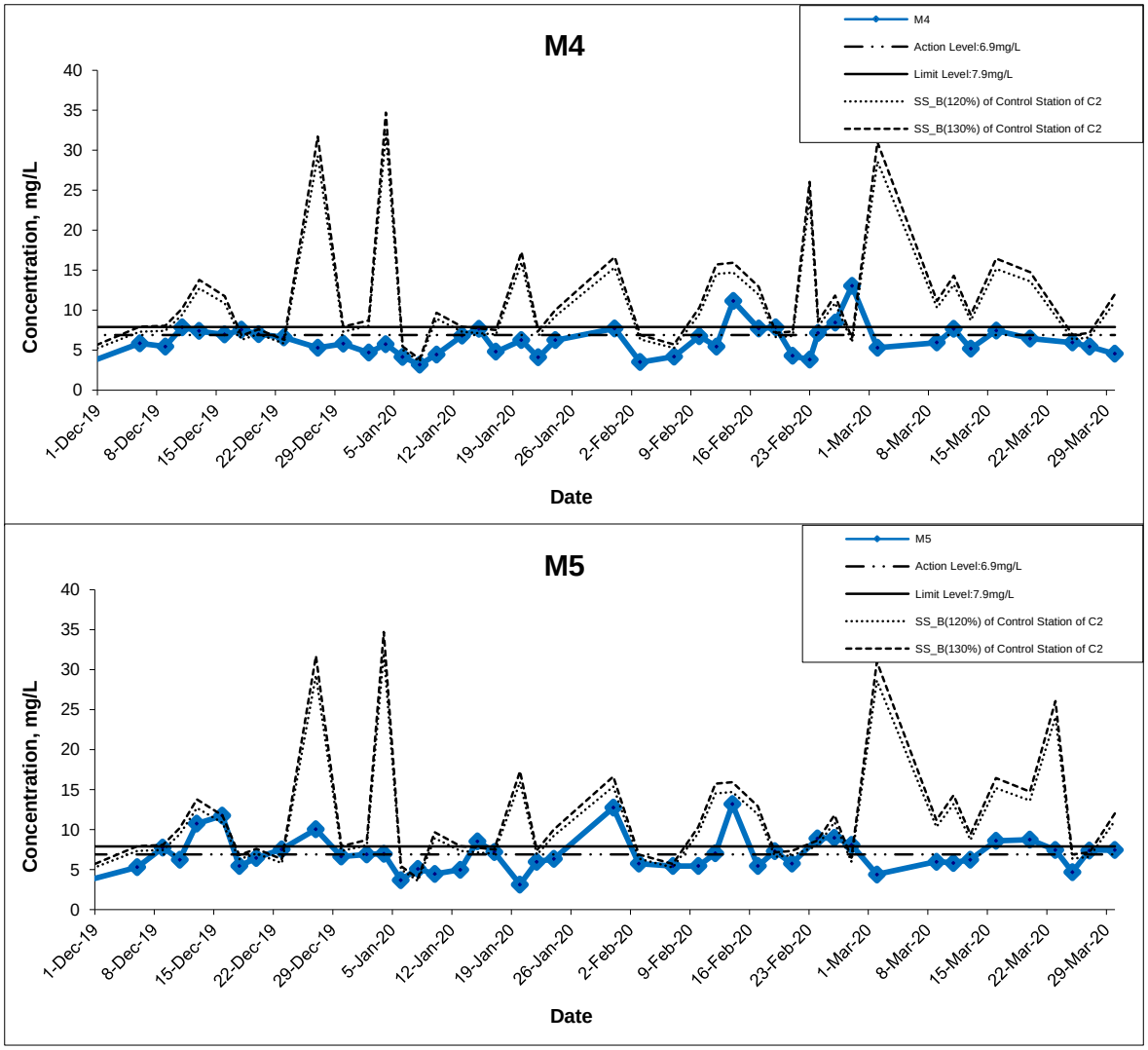

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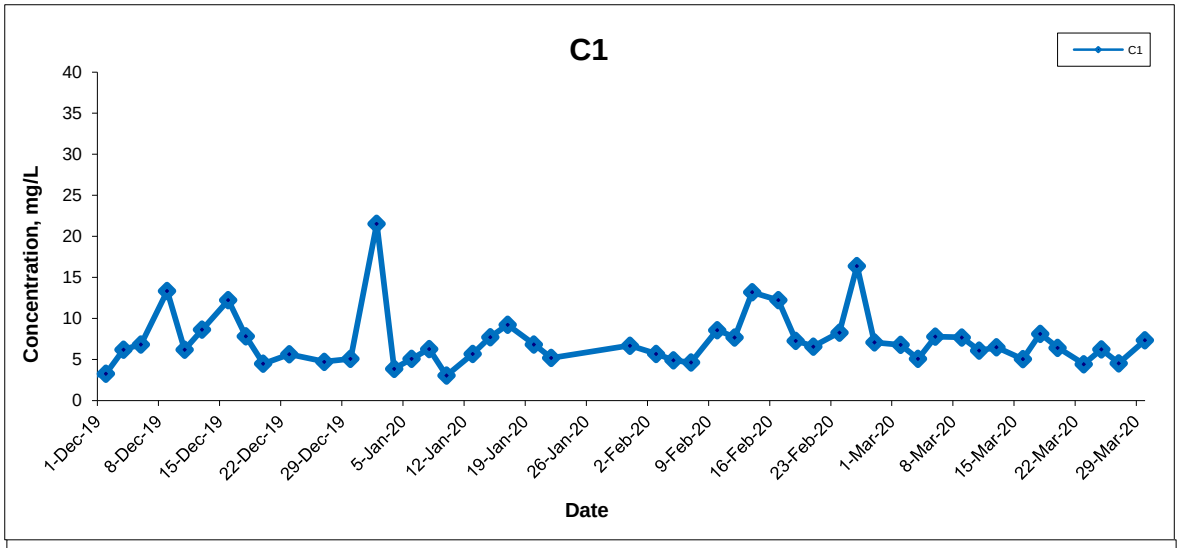

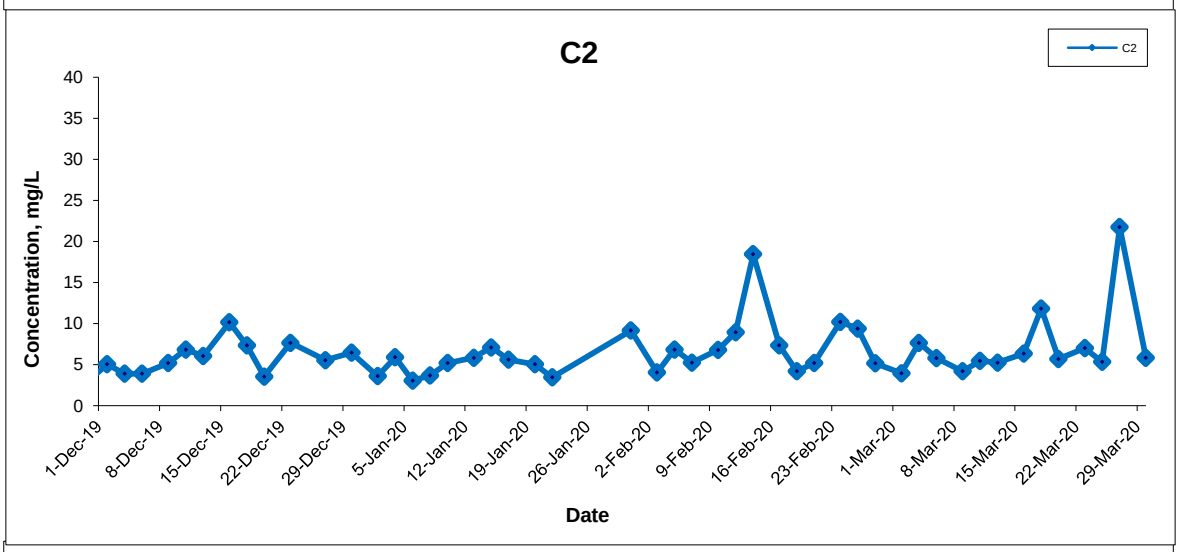

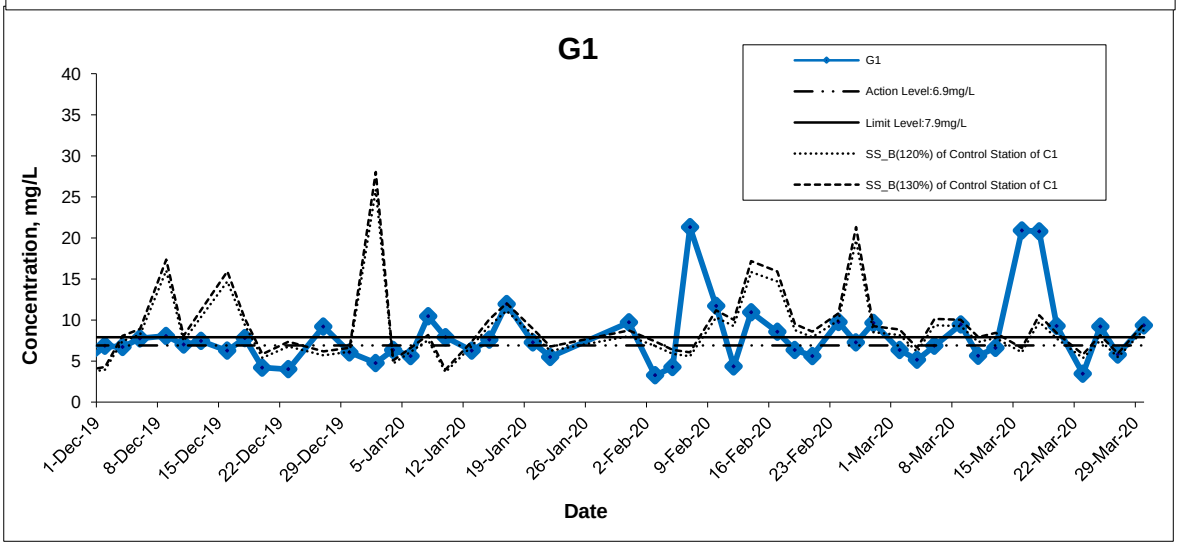

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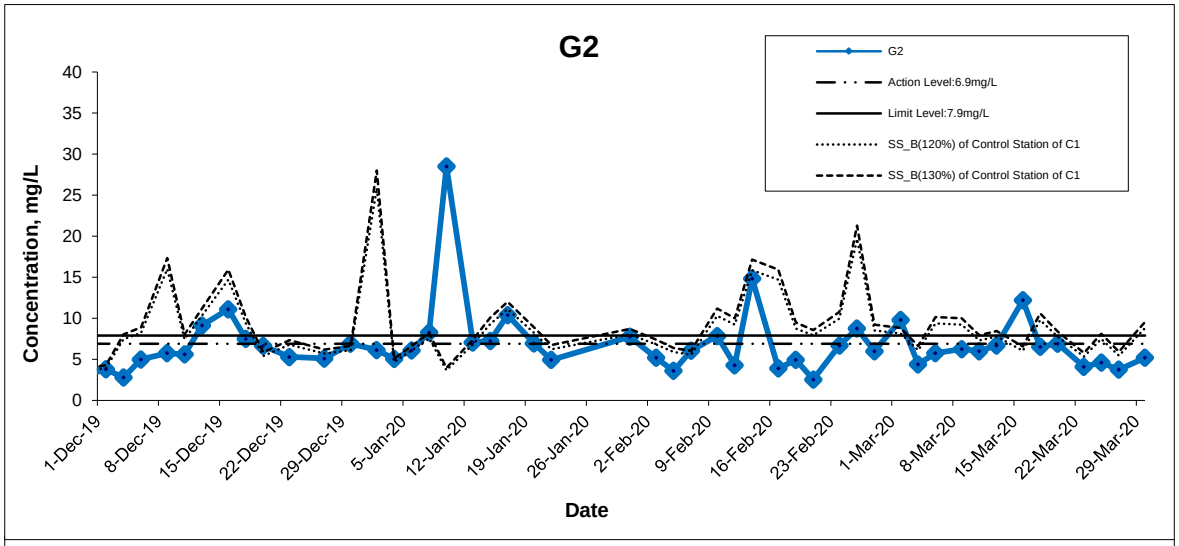

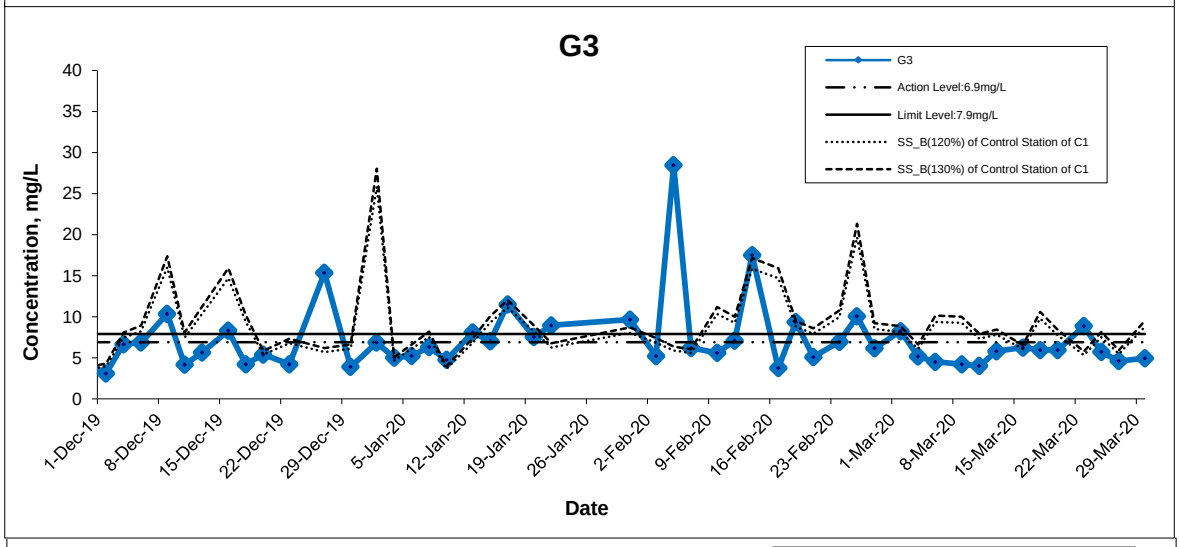

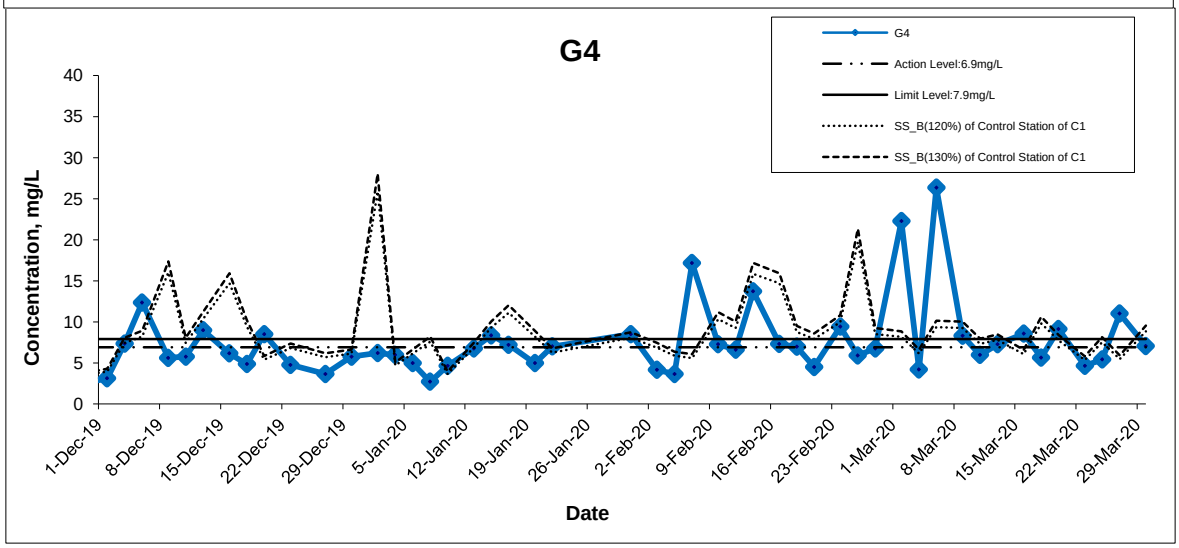

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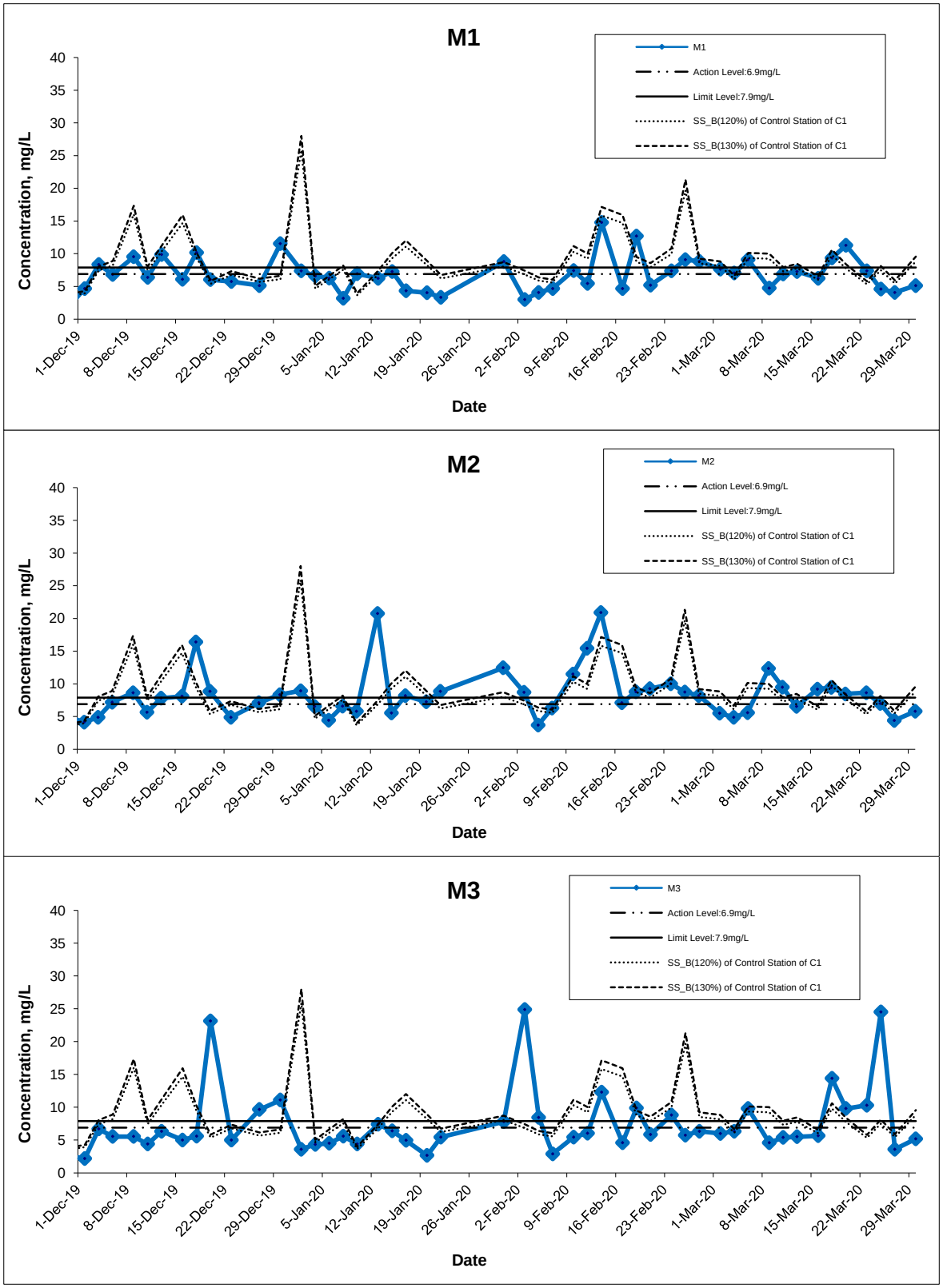

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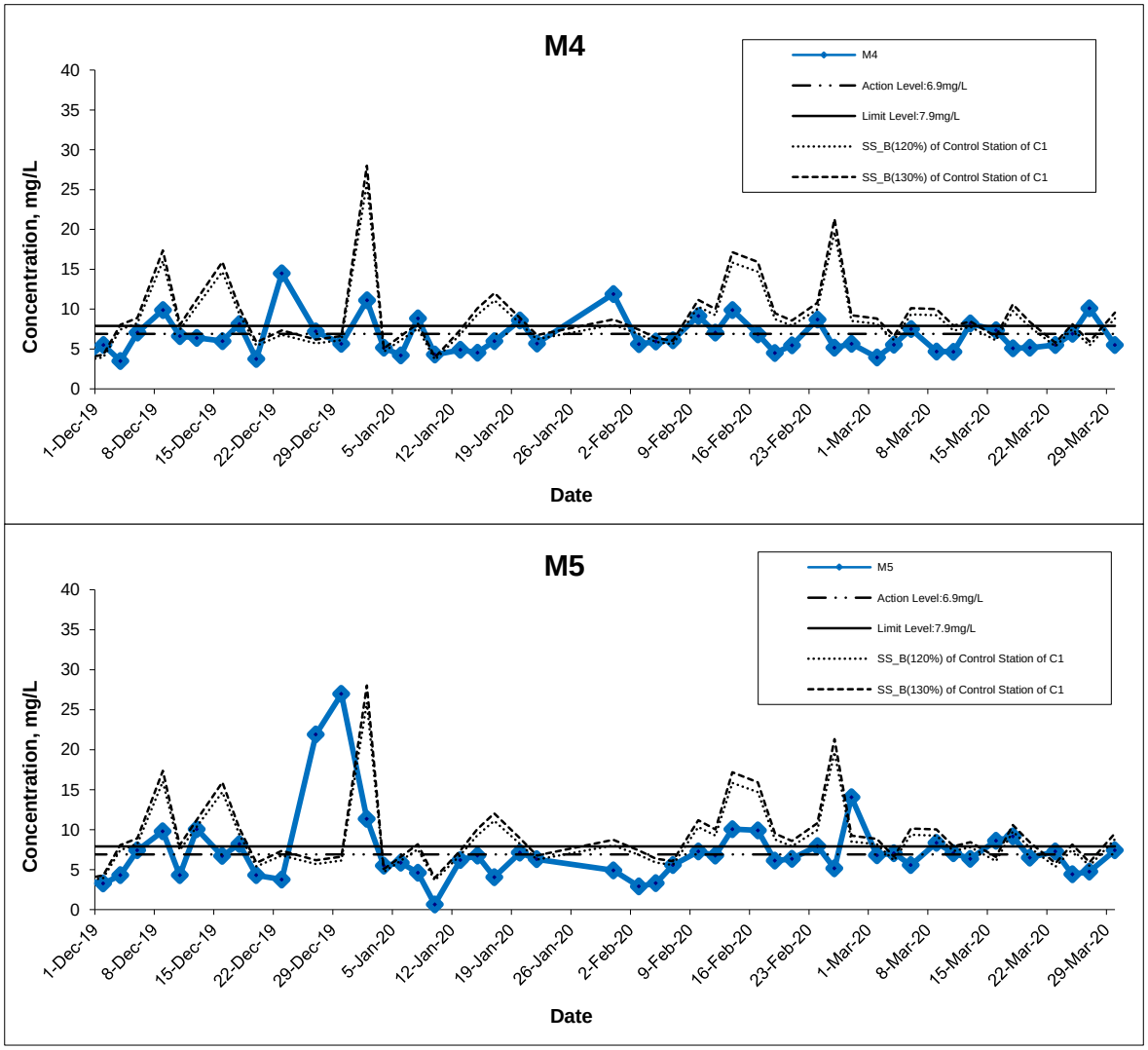

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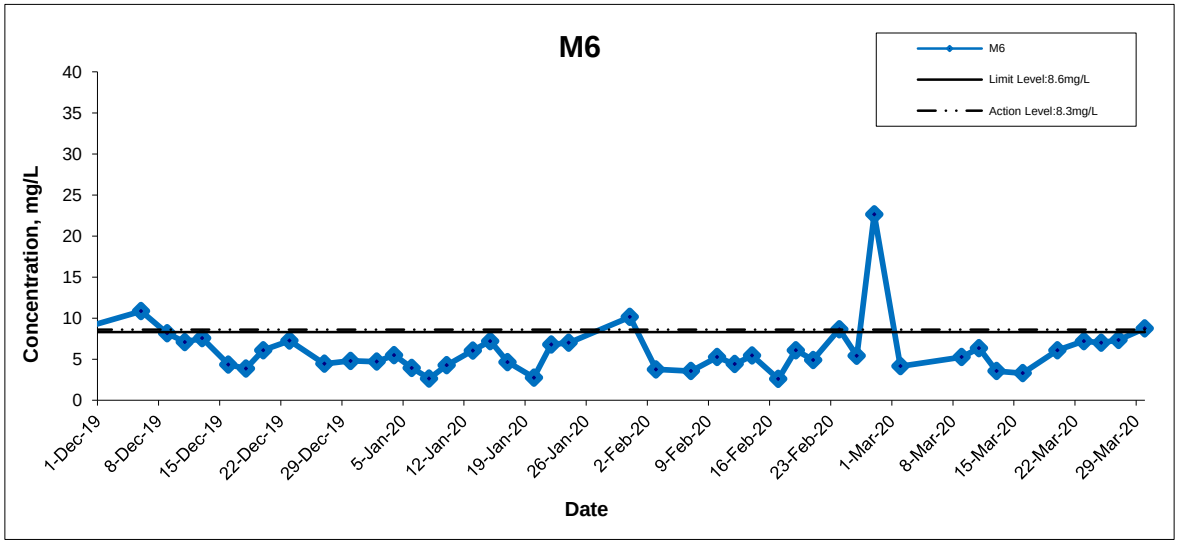
Suspended Solids (Intake Level of WSD Salt Water Intake) at Mid-Ebb Tide



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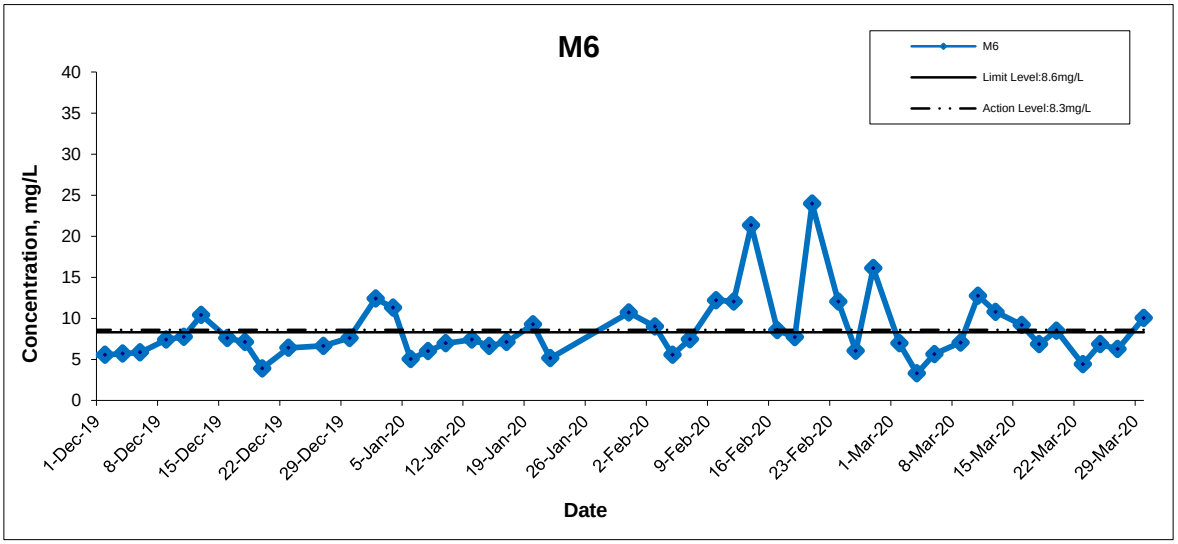

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APPENDIX K
SUMMARY OF EXCEEDANCE

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: March 2020

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

(B) Exceedance Report for Construction Noise

Action Level for Construction Noise
Ten (10) Action Level exceedances were recorded due to the documented complaints received in this reporting month.

Limit Level for Construction Noise
No exceedance for daytime and evening-time construction noise monitoring was recorded in the reporting month.

No limit level exceedances for nighttime construction noise monitoring was recorded in the reporting month.

Exceedance recorded during daytime
(NIL in the reporting month)

Exceedance recorded during night-time
(NIL in the reporting month)

(C) Exceedance Report for Water Quality
Forty-six (46) Action Level and one-hundred and twenty-two (122) Limit Level exceedances in Monitoring Stations (M) of marine water quality monitoring. Thirty-one (31) Action level and one-hundred and eleven (111) limit level exceedances in Gradient Stations (G) were also recorded. Refer to the attached notifications and investigation report for details.

Since October 2019, groundwater monitoring had been suspended.

(D) Exceedance Report for Ecology
(NIL in the reporting month)

(E) Exceedance Report for Cultural Heritage
(NIL in the reporting month)

(F) Exceedance Report for Landfill Gas
(NIL in the reporting month)

Date of Water Quality Monitoring: **02 March 2020**

Part A – Exceedance Summary Tables

Table I: Parameter(s) – ~~Dissolved Oxygen (DO) / Turbidity (TURB) /~~ Suspended Solids (SS)

Tide	Control Station(s)	Depth	Measured Value at Control Station (mg/L)	Station(s)	Time (hrs)	Baseline Action Level (mg/L)	Baseline Limit Level (mg/L)	120% of Control Station Action Level (mg/L)	130% of Control Station Limit Level (mg/L)	Measured Value (mg/L)
Mid-Ebb	C2	surface	5.2	G4	10:55	6.0	6.9	6.2	6.8	***6.8***
Mid-Ebb	C2	surface	5.2	M1	10:20	6.2	7.4	6.2	6.8	***6.6***
Mid-Ebb	C2	surface	5.2	M2	10:07	6.2	7.4	6.2	6.8	***6.6***
Mid-Ebb	C2	surface	5.2	M4	10:00	6.2	7.4	6.2	6.8	***6.7***
Mid-Flood	C1	surface	7.6	G1	17:15	6.0	6.9	9.1	9.8	***6.2***
Mid-Flood	C1	surface	7.6	G2	16:56	6.0	6.9	9.1	9.8	***6.5***
Mid-Flood	C1	surface	7.6	G3	17:22	6.0	6.9	9.1	9.8	***7.3***
Mid-Flood	C1	surface	7.6	G4	17:37	6.0	6.9	9.1	9.8	***9.2***
Mid-Flood	C1	surface	7.6	M1	17:01	6.2	7.4	9.1	9.8	***8.9***
Mid-Flood	C1	surface	7.6	M3	17:30	6.2	7.4	9.1	9.8	***7.3***
Mid-Flood	C1	surface	7.6	M4	16:41	6.2	7.4	9.1	9.8	***6.6***
Mid-Flood	C1	bottom	6.8	G2	16:56	6.9	7.9	8.2	8.8	***9.8***
Mid-Flood	C1	bottom	6.8	G3	17:22	6.9	7.9	8.2	8.8	***8.3***
Mid-Flood	C1	bottom	6.8	G4	17:37	6.9	7.9	8.2	8.8	***22.3***
Mid-Flood	C1	bottom	6.8	M1	17:01	6.9	7.9	8.2	8.8	***7.7***

Note: ***Bold Italic*** means Action Level exceedance

Bold Italic with underline means Limit Level exceedance

Contract No. CE 59/2015 (EP)
Environmental Team for Tseung Kwan O – Lam Tin Tunnel
Design and Construction
- Notification of Environmental Quality Limit Exceedances

Date of Water Quality Monitoring: **02 March 2020**

Part A – Exceedance Summary Tables

Table II: Parameter(s) – ~~Dissolved Oxygen (DO)~~ / Turbidity (TURB) / ~~Suspended Solids (SS)~~

Depth	Baseline Action Level (NTU)	Baseline Limit Level (NTU)	Tide	Control Station(s)	Measured Value at Control Station (NTU)	Station(s)	Time (hrs)	120% of Control Station Action Level (NTU)	130% of Control Station Limit Level (NTU)	Measured Value (NTU)
Bottom	19.3	22.2	Mid-Ebb	C2	1.5	G1	10:31	1.8	2.0	***2.0***
Bottom	19.3	22.2	Mid-Ebb	C2	1.5	G2	10:12	1.8	2.0	***2.1***
Bottom	19.3	22.2	Mid-Ebb	C2	1.5	G3	10:36	1.8	2.0	***2.1***
Bottom	19.3	22.2	Mid-Ebb	C2	1.5	M1	10:20	1.8	2.0	***2.1***
Bottom	19.3	22.2	Mid-Ebb	C2	1.5	M2	10:07	1.8	n.a.	***2.1***

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

Date of Water Quality Monitoring: **04 March 2020**

Part A – Exceedance Summary Tables

Table I: Parameter(s) – ~~Dissolved Oxygen (DO) / Turbidity (TURB) /~~ Suspended Solids (SS)

Tide	Control Station(s)	Depth	Measured Value at Control Station (mg/L)	Station(s)	Time (hrs)	Baseline Action Level (mg/L)	Baseline Limit Level (mg/L)	120% of Control Station Action Level (mg/L)	130% of Control Station Limit Level (mg/L)	Measured Value (mg/L)
Mid-Flood	C1	surface	4.4	G1	11:29	6.0	6.9	5.2	5.7	***7.6***
Mid-Flood	C1	surface	4.4	G4	11:46	6.0	6.9	5.2	5.7	***6.0***
Mid-Flood	C1	surface	4.4	M1	11:24	6.2	7.4	5.2	5.7	***9.9***
Mid-Flood	C1	surface	4.4	M2	11:14	6.2	7.4	5.2	5.7	***13.7***
Mid-Flood	C1	surface	4.4	M3	11:41	6.2	7.4	5.2	5.7	***9.0***
Mid-Flood	C1	surface	4.4	M4	11:08	6.2	7.4	5.2	5.7	***6.2***
Mid-Flood	C1	bottom	5.1	M1	11:24	6.9	7.9	6.1	6.6	***7.1***
Mid-Flood	C1	bottom	5.1	M3	11:41	6.9	7.9	6.1	6.6	***6.4***
Mid-Flood	C1	bottom	5.1	M5	11:55	6.9	7.9	6.1	6.6	***7.1***

Note: ***Bold Italic*** means Action Level exceedance

Bold Italic with underline means Limit Level exceedance

Date of Water Quality Monitoring: **04 March 2020**

Part A – Exceedance Summary Tables

Table II: Parameter(s) – ~~Dissolved Oxygen (DO)~~ / Turbidity (TURB) / ~~Suspended Solids (SS)~~

Depth	Baseline Action Level (NTU)	Baseline Limit Level (NTU)	Tide	Control Station(s)	Measured Value at Control Station (NTU)	Station(s)	Time (hrs)	120% of Control Station Action Level (NTU)	130% of Control Station Limit Level (NTU)	Measured Value (NTU)
Bottom	19.3	22.2	Mid-flood	C1	0.7	G1	11:29	0.8	0.9	***1.7***
Bottom	19.3	22.2	Mid-flood	C1	0.7	G2	11:20	0.8	0.9	***1.3***
Bottom	19.3	22.2	Mid-flood	C1	0.7	G3	11:34	0.8	0.9	***1.2***
Bottom	19.3	22.2	Mid-flood	C1	0.7	G4	11:46	0.8	0.9	***1.6***
Bottom	19.3	22.2	Mid-flood	C1	0.7	M1	11:24	0.8	0.9	***1.7***
Bottom	19.3	22.2	Mid-flood	C1	0.7	M2	11:14	0.8	0.9	***2.2***
Bottom	19.3	22.2	Mid-flood	C1	0.7	M3	11:41	0.8	0.9	***1.8***
Bottom	19.3	22.2	Mid-flood	C1	0.7	M4	11:08	0.8	0.9	***1.2***
Bottom	19.3	22.2	Mid-flood	C1	0.7	M5	11:55	0.8	0.9	***1.9***

Note: ***Bold Italic*** means Action Level exceedance

Bold Italic with underline means Limit Level exceedance

Date of Water Quality Monitoring: **06 March 2020**

Part A – Exceedance Summary Tables

Table I: Parameter(s) – ~~Dissolved Oxygen (DO) / Turbidity (TURB) /~~ Suspended Solids (SS)

Tide	Control Station(s)	Depth	Measured Value at Control Station (mg/L)	Station(s)	Time (hrs)	Baseline Action Level (mg/L)	Baseline Limit Level (mg/L)	120% of Control Station Action Level (mg/L)	130% of Control Station Limit Level (mg/L)	Measured Value (mg/L)
Mid-Flood	C1	surface	4.6	G1	8:44	6.0	6.9	5.5	6.0	***7.7***
Mid-Flood	C1	surface	4.6	G4	9:06	6.0	6.9	5.5	6.0	***6.1***
Mid-Flood	C1	surface	4.6	M1	8:31	6.2	7.4	5.5	6.0	***6.2***
Mid-Flood	C1	surface	4.6	M2	8:17	6.2	7.4	5.5	6.0	***6.8***
Mid-Flood	C1	surface	4.6	M4	8:10	6.2	7.4	5.5	6.0	***8.9***
Mid-Flood	C1	bottom	7.8	G4	9:06	6.9	7.9	9.4	10.1	***26.4***
Mid-Flood	C1	bottom	7.8	M1	8:31	6.9	7.9	9.4	10.1	***9.1***
Mid-Flood	C1	bottom	7.8	M3	9:00	6.9	7.9	9.4	10.1	***9.8***
Mid-Flood	C1	bottom	7.8	M4	8:10	6.9	7.9	9.4	10.1	***7.5***

Note: ***Bold Italic*** means Action Level exceedance

Bold Italic with underline means Limit Level exceedance

Date of Water Quality Monitoring: **09 March 2020**

Part A – Exceedance Summary Tables

Table I: Parameter(s) – ~~Dissolved Oxygen (DO) / Turbidity (TURB) /~~ Suspended Solids (SS)

Tide	Control Station(s)	Depth	Measured Value at Control Station (mg/L)	Station(s)	Time (hrs)	Baseline Action Level (mg/L)	Baseline Limit Level (mg/L)	120% of Control Station Action Level (mg/L)	130% of Control Station Limit Level (mg/L)	Measured Value (mg/L)
Mid-Ebb	C2	surface	9.2	G1	12:28	6.0	6.9	11.0	12.0	***6.9***
Mid-Ebb	C2	surface	9.2	G2	12:19	6.0	6.9	11.0	12.0	***6.9***
Mid-Ebb	C2	surface	9.2	G3	12:31	6.0	6.9	11.0	12.0	***7.8***
Mid-Ebb	C2	surface	9.2	M1	12:23	6.2	7.4	11.0	12.0	***8.5***
Mid-Ebb	C2	surface	9.2	M3	12:38	6.2	7.4	11.0	12.0	***7.0***
Mid-Ebb	C2	surface	9.2	M4	12:09	6.2	7.4	11.0	12.0	***7.7***
Mid-Ebb	C2	surface	9.2	M5	12:54	6.2	7.4	11.0	12.0	***7.4***
Mid-Ebb	C2	bottom	8.6	G4	12:43	6.9	7.9	10.3	11.2	***8.1***
Mid-Ebb	C2	bottom	8.6	M3	12:38	6.9	7.9	10.3	11.2	***7.7***
Mid-Flood	C1	surface	4.8	G1	17:09	6.0	6.9	5.8	6.2	***5.9***
Mid-Flood	C1	surface	4.8	G2	16:58	6.0	6.9	5.8	6.2	***8.5***
Mid-Flood	C1	surface	4.8	G4	17:26	6.0	6.9	5.8	6.2	***7.4***
Mid-Flood	C1	surface	4.8	M1	17:03	6.2	7.4	5.8	6.2	***8.3***
Mid-Flood	C1	surface	4.8	M4	16:48	6.2	7.4	5.8	6.2	***8.0***
Mid-Flood	C1	bottom	7.7	G1	17:09	6.9	7.9	9.2	10.0	***9.5***
Mid-Flood	C1	bottom	7.7	G4	17:26	6.9	7.9	9.2	10.0	***8.3***
Mid-Flood	C1	bottom	7.7	M2	16:53	6.9	7.9	9.2	10.0	***12.4***
Mid-Flood	C1	bottom	7.7	M5	17:38	6.9	7.9	9.2	10.0	***8.4***

Date of Water Quality Monitoring: **11 March 2020**

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	7.65	G1	13:48	6.0	6.9	9.2	9.9	***6.9***
Mid-Ebb	C2	surface	7.7	G3	13:54	6.0	6.9	9.2	9.9	***6.8***
Mid-Ebb	C2	surface	7.7	G4	14:06	6.0	6.9	9.2	9.9	***6.1***
Mid-Ebb	C2	surface	7.65	M2	13:21	6.2	7.4	9.2	9.9	***6.9***
Mid-Ebb	C2	surface	7.7	M4	13:14	6.2	7.4	9.2	9.9	***8.5***
Mid-Ebb	C2	surface	7.7	M5	14:36	6.2	7.4	9.2	9.9	***7.9***
Mid-Ebb	C2	bottom	11	G2	13:27	6.9	7.9	13.2	14.3	***8.4***
Mid-Ebb	C2	bottom	11	G3	13:54	6.9	7.9	13.2	14.3	***8.9***
Mid-Ebb	C2	bottom	11.0	G4	14:06	6.9	7.9	13.2	14.3	***8.4***
Mid-Flood	C1	surface	5.4	G4	8:52	6.0	6.9	6.4	7.0	***6.5***
Mid-Flood	C1	surface	5.4	M1	8:18	6.2	7.4	6.4	7.0	***9.0***
Mid-Flood	C1	surface	5.4	M3	8:44	6.2	7.4	6.4	7.0	***6.4***
Mid-Flood	C1	surface	5.4	M4	7:58	6.2	7.4	6.4	7.0	***9.1***
Mid-Flood	C1	intake	n.a.	M6	9:01	8.3	8.6	n.a.	n.a.	***12.8***
Mid-Flood	C1	bottom	6.1	M2	8:04	6.9	7.9	7.3	7.9	***9.5***
Mid-Flood	C1	bottom	6.1	M5	9:10	6.9	7.9	7.3	7.9	***7.1***

Note: ***Bold Italic*** means Action Level exceedance

Bold Italic with underline means Limit Level exceedance

Date of Water Quality Monitoring: **11 March 2020**

Part A – Exceedance Summary Tables

Table II: Parameter(s) – ~~Dissolved Oxygen (DO)~~ / Turbidity (TURB) / ~~Suspended Solids (SS)~~

Depth	Baseline Action Level (NTU)	Baseline Limit Level (NTU)	Tide	Control Station(s)	Measured Value at Control Station (NTU)	Station(s)	Time (hrs)	120% of Control Station Action Level (NTU)	130% of Control Station Limit Level (NTU)	Measured Value (NTU)
Bottom	19.3	22.2	Mid-flood	C1	1.4	G1	8:29	1.6	1.8	***3.1***
Bottom	19.3	22.2	Mid-flood	C1	1.4	G2	8:10	1.6	1.8	***1.8***
Bottom	19.3	22.2	Mid-flood	C1	1.4	G3	8:36	1.6	1.8	***1.7***
Bottom	19.3	22.2	Mid-flood	C1	1.4	G4	8:52	1.6	1.8	***2.3***
Bottom	19.3	22.2	Mid-flood	C1	1.4	M1	8:18	1.6	1.8	***1.8***
Bottom	19.3	22.2	Mid-flood	C1	1.4	M4	7:58	1.6	1.8	***1.8***
Bottom	19.3	22.2	Mid-flood	C1	1.4	M5	9:10	1.6	1.8	***1.8***

Note: ***Bold Italic*** means Action Level exceedance

Bold Italic with underline means Limit Level exceedance

Date of Water Quality Monitoring: **13 March 2020**

Part A – Exceedance Summary Tables

Table I: Parameter(s) – ~~Dissolved Oxygen (DO) / Turbidity (TURB) /~~ Suspended Solids (SS)

Tide	Control Station(s)	Depth	Measured Value at Control Station (mg/L)	Station(s)	Time (hrs)	Baseline Action Level (mg/L)	Baseline Limit Level (mg/L)	120% of Control Station Action Level (mg/L)	130% of Control Station Limit Level (mg/L)	Measured Value (mg/L)
Mid-Ebb	C2	surface	5.15	G1	14:35	6.0	6.9	6.2	6.7	***6.9***
Mid-Ebb	C2	surface	5.2	G2	14:24	6.0	6.9	6.2	6.7	***7.0***
Mid-Ebb	C2	surface	5.15	M2	14:20	6.2	7.4	6.2	6.7	***7.4***
Mid-Ebb	C2	surface	5.2	M4	14:14	6.2	7.4	6.2	6.7	***8.5***
Mid-Ebb	C2	bottom	7.25	G2	14:24	6.9	7.9	8.7	9.4	***8.9***
Mid-Ebb	C2	bottom	7.25	G3	14:40	6.9	7.9	8.7	9.4	***18.5***
Mid-Ebb	C2	bottom	7.3	M1	14:30	6.9	7.9	8.7	9.4	***7.2***
Mid-Ebb	C2	bottom	7.25	M3	14:48	6.9	7.9	8.7	9.4	***7.7***
Mid-Flood	C1	surface	7.0	G1	8:36	6.0	6.9	8.3	9.0	***6.8***
Mid-Flood	C1	surface	7.0	G2	8:26	6.0	6.9	8.3	9.0	***8.6***
Mid-Flood	C1	surface	7.0	M2	8:22	6.2	7.4	8.3	9.0	***6.6***
Mid-Flood	C1	surface	7.0	M3	8:46	6.2	7.4	8.3	9.0	***7.5***
Mid-Flood	C1	surface	7.0	M4	8:17	6.2	7.4	8.3	9.0	***6.5***
Mid-Flood	C1	intake	n.a.	M6	8:54	8.3	8.6	n.a.	n.a.	***10.8***
Mid-Flood	C1	bottom	6.5	G4	8:50	6.9	7.9	7.8	8.5	***7.3***
Mid-Flood	C1	bottom	6.5	M1	8:30	6.9	7.9	7.8	8.5	***7.3***
Mid-Flood	C1	bottom	6.5	M4	8:17	6.9	7.9	7.8	8.5	***8.2***

Note: ***Bold Italic*** means Action Level exceedance

Date of Water Quality Monitoring: **13 March 2020**

Part A – Exceedance Summary Tables

Table II: Parameter(s) – ~~Dissolved Oxygen (DO)~~ / Turbidity (TURB) / ~~Suspended Solids (SS)~~

Depth	Baseline Action Level (NTU)	Baseline Limit Level (NTU)	Tide	Control Station(s)	Measured Value at Control Station (NTU)	Station(s)	Time (hrs)	120% of Control Station Action Level (NTU)	130% of Control Station Limit Level (NTU)	Measured Value (NTU)
Bottom	19.3	22.2	Mid-Ebb	C2	1.6	G1	14:35	1.9	2.0	***2.0***
Bottom	19.3	22.2	Mid-Ebb	C2	1.6	G2	14:24	1.9	2.0	***2.1***
Bottom	19.3	22.2	Mid-Ebb	C2	1.6	G3	14:40	1.9	2.0	***2.1***
Bottom	19.3	22.2	Mid-Ebb	C2	1.6	M1	14:30	1.9	2.0	***2.1***
Bottom	19.3	22.2	Mid-Ebb	C2	1.6	M2	14:20	1.9	n.a.	***2.2***
Bottom	19.3	22.2	Mid-flood	C1	1.9	M5	9:01	2.3	2.5	***2.4***

Note: ***Bold Italic*** means Action Level exceedance

Bold Italic with underline means Limit Level exceedance

Date of Water Quality Monitoring: **16 March 2020**

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	3.9	G1	17:13	6.0	6.9	4.7	5.1	***11.0***
Mid-Ebb	C2	surface	3.9	G2	16:57	6.0	6.9	4.7	5.1	***6.1***
Mid-Ebb	C2	surface	3.9	G3	17:18	6.0	6.9	4.7	5.1	***6.3***
Mid-Ebb	C2	surface	3.9	M2	16:53	6.2	7.4	4.7	5.1	***7.9***
Mid-Ebb	C2	surface	3.9	M3	17:22	6.2	7.4	4.7	5.1	***5.2***
Mid-Ebb	C2	surface	3.9	M4	16:48	6.2	7.4	4.7	5.1	***12.9***
Mid-Ebb	C2	surface	3.9	M5	17:37	6.2	7.4	4.7	5.1	***10.8***
Mid-Ebb	C2	bottom	12.65	G1	17:13	6.9	7.9	15.2	16.4	***10.6***
Mid-Ebb	C2	bottom	12.65	G2	16:57	6.9	7.9	15.2	16.4	***10.9***
Mid-Ebb	C2	bottom	12.7	M1	17:06	6.9	7.9	15.2	16.4	***7.4***
Mid-Ebb	C2	bottom	12.65	M3	17:22	6.9	7.9	15.2	16.4	***10.7***
Mid-Ebb	C2	bottom	12.7	M5	17:37	6.9	7.9	15.2	16.4	***8.6***
Mid-Flood	C1	surface	5.2	G1	9:39	6.0	6.9	6.2	6.8	***11.8***
Mid-Flood	C1	surface	5.2	G2	9:27	6.0	6.9	6.2	6.8	***13.7***
Mid-Flood	C1	surface	5.2	G4	10:04	6.0	6.9	6.2	6.8	***9.2***
Mid-Flood	C1	surface	5.2	M1	9:32	6.2	7.4	6.2	6.8	***8.1***
Mid-Flood	C1	surface	5.2	M2	9:20	6.2	7.4	6.2	6.8	***7.4***
Mid-Flood	C1	surface	5.2	M3	9:54	6.2	7.4	6.2	6.8	***10.2***

Date of Water Quality Monitoring: **16 March 2020**

Part A – Exceedance Summary Tables

Table I: Parameter(s) – ~~Dissolved Oxygen (DO) / Turbidity (TURB) /~~ Suspended Solids (SS)

Tide	Control Station(s)	Depth	Measured Value at Control Station (mg/L)	Station(s)	Time (hrs)	Baseline Action Level (mg/L)	Baseline Limit Level (mg/L)	120% of Control Station Action Level (mg/L)	130% of Control Station Limit Level (mg/L)	Measured Value (mg/L)
Mid-Flood	C1	surface	5.2	M4	9:16	6.2	7.4	6.2	6.8	***9.5***
Mid-Flood	C1	intake	n.a.	M6	10:11	8.3	8.6	n.a.	n.a.	***9.2***
Mid-Flood	C1	bottom	5.05	G1	9:39	6.9	7.9	6.1	6.6	***20.9***
Mid-Flood	C1	bottom	5.05	G2	9:27	6.9	7.9	6.1	6.6	***12.2***
Mid-Flood	C1	bottom	5.1	G3	9:46	6.9	7.9	6.1	6.6	***6.3***
Mid-Flood	C1	bottom	5.1	G4	10:04	6.9	7.9	6.1	6.6	***8.6***
Mid-Flood	C1	bottom	5.1	M1	9:32	6.9	7.9	6.1	6.6	***6.3***
Mid-Flood	C1	bottom	5.1	M2	9:20	6.9	7.9	6.1	6.6	***9.2***
Mid-Flood	C1	bottom	5.05	M4	9:16	6.9	7.9	6.1	6.6	***7.4***
Mid-Flood	C1	bottom	5.1	M5	10:17	6.9	7.9	6.1	6.6	***8.6***

Note: ***Bold Italic*** means Action Level exceedance

Bold Italic with underline means Limit Level exceedance

Date of Water Quality Monitoring: **16 March 2020**

Part A – Exceedance Summary Tables

Table II: Parameter(s) – ~~Dissolved Oxygen (DO)~~ / Turbidity (TURB) / ~~Suspended Solids (SS)~~

Depth	Baseline Action Level (NTU)	Baseline Limit Level (NTU)	Tide	Control Station(s)	Measured Value at Control Station (NTU)	Station(s)	Time (hrs)	120% of Control Station Action Level (NTU)	130% of Control Station Limit Level (NTU)	Measured Value (NTU)
Bottom	19.3	22.2	Mid-Ebb	C2	1.0	G1	17:13	1.2	1.3	***5.3***
Bottom	19.3	22.2	Mid-Ebb	C2	1.0	G2	16:57	1.2	1.3	***1.7***
Bottom	19.3	22.2	Mid-Ebb	C2	1.0	G3	17:18	1.2	1.3	***2.6***
Bottom	19.3	22.2	Mid-Ebb	C2	1.0	G4	17:26	1.2	1.3	***2.2***
Bottom	19.3	22.2	Mid-Ebb	C2	1.0	M1	17:06	1.2	1.3	***2.1***
Bottom	19.3	22.2	Mid-Ebb	C2	1.0	M2	16:53	1.2	n.a.	***1.5***
Bottom	19.3	22.2	Mid-Ebb	C2	1.0	M3	17:22	1.2	1.3	***1.7***
Bottom	19.3	22.2	Mid-Ebb	C2	1.0	M5	17:37	1.2	1.3	***2.1***
Bottom	19.3	22.2	Mid-flood	C1	0.5	G1	9:39	0.6	0.7	***4.2***
Bottom	19.3	22.2	Mid-flood	C1	0.5	G2	9:27	0.6	0.7	***1.7***
Bottom	19.3	22.2	Mid-flood	C1	0.5	G3	9:46	0.6	0.7	***2.4***
Bottom	19.3	22.2	Mid-flood	C1	0.5	G4	10:04	0.6	0.7	***2.1***
Bottom	19.3	22.2	Mid-flood	C1	0.5	M1	9:32	0.6	0.7	***1.9***
Bottom	19.3	22.2	Mid-flood	C1	0.5	M2	9:20	0.6	0.7	***1.4***
Bottom	19.3	22.2	Mid-flood	C1	0.5	M3	9:54	0.6	0.7	***1.6***
Bottom	19.3	22.2	Mid-flood	C1	0.5	M4	9:16	0.6	0.7	***0.8***
Bottom	19.3	22.2	Mid-flood	C1	0.5	M5	10:17	0.6	0.7	***2.1***

Note: ***Bold Italic*** means Action Level exceedance

Date of Water Quality Monitoring: **18 March 2020**

Part A – Exceedance Summary Tables

Table I: Parameter(s) – ~~Dissolved Oxygen (DO) / Turbidity (TURB) /~~ Suspended Solids (SS)

Tide	Control Station(s)	Depth	Measured Value at Control Station (mg/L)	Station(s)	Time (hrs)	Baseline Action Level (mg/L)	Baseline Limit Level (mg/L)	120% of Control Station Action Level (mg/L)	130% of Control Station Limit Level (mg/L)	Measured Value (mg/L)
Mid-Flood	C1	surface	7.2	G1	8:29	6.0	6.9	8.6	9.4	***7.9***
Mid-Flood	C1	surface	7.2	G2	8:10	6.0	6.9	8.6	9.4	***28.8***
Mid-Flood	C1	surface	7.2	G3	8:36	6.0	6.9	8.6	9.4	***6.3***
Mid-Flood	C1	surface	7.2	G4	8:52	6.0	6.9	8.6	9.4	***8.6***
Mid-Flood	C1	surface	7.2	M1	8:18	6.2	7.4	8.6	9.4	***9.8***
Mid-Flood	C1	surface	7.2	M2	8:04	6.2	7.4	8.6	9.4	***8.5***
Mid-Flood	C1	surface	7.2	M3	8:44	6.2	7.4	8.6	9.4	***7.0***
Mid-Flood	C1	surface	7.2	M4	7:58	6.2	7.4	8.6	9.4	***24.5***
Mid-Flood	C1	surface	7.2	M5	9:10	6.2	7.4	8.6	9.4	***8.2***
Mid-Flood	C1	bottom	8.15	G1	8:29	6.9	7.9	9.8	10.6	***20.8***
Mid-Flood	C1	bottom	8.2	M1	8:18	6.9	7.9	9.8	10.6	***9.4***
Mid-Flood	C1	bottom	8.2	M2	8:04	6.9	7.9	9.8	10.6	***9.5***
Mid-Flood	C1	bottom	8.2	M3	8:44	6.9	7.9	9.8	10.6	***14.4***
Mid-Flood	C1	bottom	8.2	M5	9:10	6.9	7.9	9.8	10.6	***9.2***

Note: ***Bold Italic*** means Action Level exceedance

Bold Italic with underline means Limit Level exceedance

Date of Water Quality Monitoring: **18 March 2020**

Part A – Exceedance Summary Tables

Table II: Parameter(s) – ~~Dissolved Oxygen (DO)~~ / Turbidity (TURB) / ~~Suspended Solids (SS)~~

Depth	Baseline Action Level (NTU)	Baseline Limit Level (NTU)	Tide	Control Station(s)	Measured Value at Control Station (NTU)	Station(s)	Time (hrs)	120% of Control Station Action Level (NTU)	130% of Control Station Limit Level (NTU)	Measured Value (NTU)
Bottom	19.3	22.2	Mid-flood	C1	1.2	G1	8:29	1.5	1.6	***4.8***
Bottom	19.3	22.2	Mid-flood	C1	1.2	G4	8:52	1.5	1.6	***3.3***
Bottom	19.3	22.2	Mid-flood	C1	1.2	M1	8:18	1.5	1.6	***2.6***
Bottom	19.3	22.2	Mid-flood	C1	1.2	M2	8:04	1.5	1.6	***2.1***

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

Date of Water Quality Monitoring: **20 March 2020**

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	7.35	G1	11:05	6.0	6.9	8.8	9.6	***7.8***
Mid-Ebb	C2	surface	7.4	G2	10:53	6.0	6.9	8.8	9.6	***6.4***
Mid-Ebb	C2	surface	7.4	G3	11:12	6.0	6.9	8.8	9.6	***7.1***
Mid-Ebb	C2	surface	7.4	G4	11:23	6.0	6.9	8.8	9.6	***8.8***
Mid-Ebb	C2	surface	7.4	M4	10:39	6.2	7.4	8.8	9.6	***8.2***
Mid-Ebb	C2	bottom	11.35	G1	11:05	6.9	7.9	13.6	14.8	***7.8***
Mid-Ebb	C2	bottom	11.35	G2	10:53	6.9	7.9	13.6	14.8	***8.2***
Mid-Ebb	C2	bottom	11.4	M1	11:00	6.9	7.9	13.6	14.8	***8.9***
Mid-Ebb	C2	bottom	11.35	M3	11:16	6.9	7.9	13.6	14.8	***7.4***
Mid-Ebb	C2	bottom	11.4	M5	11:35	6.9	7.9	13.6	14.8	***8.8***
Mid-Flood	C1	surface	5.8	G1	15:27	6.0	6.9	7.0	7.5	***6.2***
Mid-Flood	C1	surface	5.8	G2	15:14	6.0	6.9	7.0	7.5	***8.4***
Mid-Flood	C1	surface	5.8	G3	15:32	6.0	6.9	7.0	7.5	***9.7***
Mid-Flood	C1	surface	5.8	G4	15:44	6.0	6.9	7.0	7.5	***8.3***
Mid-Flood	C1	surface	5.8	M1	15:20	6.2	7.4	7.0	7.5	***11.8***
Mid-Flood	C1	surface	5.8	M2	15:07	6.2	7.4	7.0	7.5	***8.6***
Mid-Flood	C1	surface	5.8	M4	14:59	6.2	7.4	7.0	7.5	***8.3***
Mid-Flood	C1	intake	n.a.	M6	15:52	8.3	8.6	n.a.	n.a.	***8.5***

Date of Water Quality Monitoring: **20 March 2020**

Part A – Exceedance Summary Tables

Table I: Parameter(s) – ~~Dissolved Oxygen (DO) / Turbidity (TURB) /~~ Suspended Solids (SS)

Tide	Control Station(s)	Depth	Measured Value at Control Station (mg/L)	Station(s)	Time (hrs)	Baseline Action Level (mg/L)	Baseline Limit Level (mg/L)	120% of Control Station Action Level (mg/L)	130% of Control Station Limit Level (mg/L)	Measured Value (mg/L)
Mid-Flood	C1	bottom	6.45	G1	15:27	6.9	7.9	7.7	8.4	***9.3***
Mid-Flood	C1	bottom	6.5	G4	15:44	6.9	7.9	7.7	8.4	***9.1***
Mid-Flood	C1	bottom	6.5	M1	15:20	6.9	7.9	7.7	8.4	***11.3***
Mid-Flood	C1	bottom	6.5	M2	15:07	6.9	7.9	7.7	8.4	***8.5***
Mid-Flood	C1	bottom	6.5	M3	15:37	6.9	7.9	7.7	8.4	***9.8***

Note: ***Bold Italic*** means Action Level exceedance

Bold Italic with underline means Limit Level exceedance

Contract No. CE 59/2015 (EP)
Environmental Team for Tseung Kwan O – Lam Tin Tunnel
Design and Construction
- Notification of Environmental Quality Limit Exceedances

Date of Water Quality Monitoring: **20 March 2020**

Part A – Exceedance Summary Tables

Table II: Parameter(s) – ~~Dissolved Oxygen (DO)~~ / Turbidity (TURB) / ~~Suspended Solids (SS)~~

Depth	Baseline Action Level (NTU)	Baseline Limit Level (NTU)	Tide	Control Station(s)	Measured Value at Control Station (NTU)	Station(s)	Time (hrs)	120% of Control Station Action Level (NTU)	130% of Control Station Limit Level (NTU)	Measured Value (NTU)
Bottom	19.3	22.2	Mid-Ebb	C2	1.2	G1	11:05	1.5	1.6	***2.5***
Bottom	19.3	22.2	Mid-Ebb	C2	1.2	G4	11:23	1.5	1.6	***1.7***
Bottom	19.3	22.2	Mid-Ebb	C2	1.2	M1	11:00	1.5	1.6	***3.6***
Bottom	19.3	22.2	Mid-Ebb	C2	1.2	M5	11:35	1.5	1.6	***2.3***
Bottom	19.3	22.2	Mid-flood	C1	1.8	M1	15:20	2.1	2.3	***3.4***

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

Date of Water Quality Monitoring: **23 March 2020**

Part A – Exceedance Summary Tables

Table I: Parameter(s) – ~~Dissolved Oxygen (DO) / Turbidity (TURB) /~~ Suspended Solids (SS)

Tide	Control Station(s)	Depth	Measured Value at Control Station (mg/L)	Station(s)	Time (hrs)	Baseline Action Level (mg/L)	Baseline Limit Level (mg/L)	120% of Control Station Action Level (mg/L)	130% of Control Station Limit Level (mg/L)	Measured Value (mg/L)
Mid-Ebb	C2	surface	5.8	G1	12:05	6.0	6.9	7.0	7.5	***23.9***
Mid-Ebb	C2	surface	5.8	G3	12:11	6.0	6.9	7.0	7.5	***9.1***
Mid-Ebb	C2	surface	5.8	G4	12:29	6.0	6.9	7.0	7.5	***6.5***
Mid-Ebb	C2	surface	5.8	M4	11:32	6.2	7.4	7.0	7.5	***7.1***
Mid-Ebb	C2	bottom	20.05	G1	12:05	6.9	7.9	24.1	26.1	***7.8***
Mid-Ebb	C2	bottom	20.1	G4	12:29	6.9	7.9	24.1	26.1	***10.1***
Mid-Ebb	C2	bottom	20.1	M5	12:45	6.9	7.9	24.1	26.1	***7.5***
Mid-Flood	C1	surface	6.0	M1	17:19	6.2	7.4	7.2	7.8	***7.2***
Mid-Flood	C1	surface	6.0	M3	17:45	6.2	7.4	7.2	7.8	***23.8***
Mid-Flood	C1	surface	6.0	M5	18:23	6.2	7.4	7.2	7.8	***10.5***
Mid-Flood	C1	bottom	4.5	G3	17:38	6.9	7.9	5.3	5.8	***8.9***
Mid-Flood	C1	bottom	4.5	M1	17:19	6.9	7.9	5.3	5.8	***7.4***
Mid-Flood	C1	bottom	4.5	M2	17:07	6.9	7.9	5.3	5.8	***8.7***
Mid-Flood	C1	bottom	4.5	M3	17:45	6.9	7.9	5.3	5.8	***10.3***
Mid-Flood	C1	bottom	4.45	M4	17:01	6.9	7.9	5.3	5.8	***5.5***
Mid-Flood	C1	bottom	4.5	M5	18:23	6.9	7.9	5.3	5.8	***7.3***

Note: ***Bold Italic*** means Action Level exceedance

Bold Italic with underline means Limit Level exceedance

Contract No. CE 59/2015 (EP)
Environmental Team for Tseung Kwan O – Lam Tin Tunnel
Design and Construction
- Notification of Environmental Quality Limit Exceedances

Date of Water Quality Monitoring: **23 March 2020**

Part A – Exceedance Summary Tables

Table II: Parameter(s) – ~~Dissolved Oxygen (DO)~~ / Turbidity (TURB) / ~~Suspended Solids (SS)~~

Depth	Baseline Action Level (NTU)	Baseline Limit Level (NTU)	Tide	Control Station(s)	Measured Value at Control Station (NTU)	Station(s)	Time (hrs)	120% of Control Station Action Level (NTU)	130% of Control Station Limit Level (NTU)	Measured Value (NTU)
Bottom	19.3	22.2	Mid-Ebb	C2	2.0	M1	11:53	2.4	2.6	***2.6***
Bottom	19.3	22.2	Mid-flood	C1	1.5	G1	17:32	1.9	2.0	***2.6***
Bottom	19.3	22.2	Mid-flood	C1	1.5	M1	17:19	1.9	2.0	***2.5***
Bottom	19.3	22.2	Mid-flood	C1	1.5	M4	17:01	1.9	2.0	***2.1***
Bottom	19.3	22.2	Mid-flood	C1	1.5	M5	18:23	1.9	2.0	***2.6***

Note: ***Bold Italic*** means Action Level exceedance

Bold Italic with underline means Limit Level exceedance

Date of Water Quality Monitoring: **25 March 2020**

Part A – Exceedance Summary Tables

Table I: Parameter(s) – ~~Dissolved Oxygen (DO) / Turbidity (TURB) /~~ Suspended Solids (SS)

Tide	Control Station(s)	Depth	Measured Value at Control Station (mg/L)	Station(s)	Time (hrs)	Baseline Action Level (mg/L)	Baseline Limit Level (mg/L)	120% of Control Station Action Level (mg/L)	130% of Control Station Limit Level (mg/L)	Measured Value (mg/L)
Mid-Ebb	C2	surface	5.1	G2	13:19	6.0	6.9	6.1	6.6	***9.2***
Mid-Ebb	C2	surface	5.1	G3	13:44	6.0	6.9	6.1	6.6	***23.6***
Mid-Ebb	C2	surface	5.1	G4	13:59	6.0	6.9	6.1	6.6	***6.5***
Mid-Ebb	C2	surface	5.1	M4	13:05	6.2	7.4	6.1	6.6	***7.0***
Mid-Ebb	C2	bottom	5.3	G1	13:38	6.9	7.9	6.4	6.9	***8.8***
Mid-Ebb	C2	bottom	5.3	G2	13:19	6.9	7.9	6.4	6.9	***9.2***
Mid-Ebb	C2	bottom	5.3	G3	13:44	6.9	7.9	6.4	6.9	***25.5***
Mid-Flood	C1	surface	5.2	G1	8:22	6.0	6.9	6.2	6.8	***8.0***
Mid-Flood	C1	surface	5.2	G2	8:06	6.0	6.9	6.2	6.8	***8.4***
Mid-Flood	C1	surface	5.2	G3	8:30	6.0	6.9	6.2	6.8	***8.1***
Mid-Flood	C1	surface	5.2	G4	8:47	6.0	6.9	6.2	6.8	***7.4***
Mid-Flood	C1	surface	5.2	M3	8:40	6.2	7.4	6.2	6.8	***6.9***
Mid-Flood	C1	surface	5.2	M4	7:54	6.2	7.4	6.2	6.8	***22.0***
Mid-Flood	C1	bottom	6.25	G1	8:22	6.9	7.9	7.5	8.1	***9.2***
Mid-Flood	C1	bottom	6.3	M2	7:59	6.9	7.9	7.5	8.1	***7.0***
Mid-Flood	C1	bottom	6.3	M3	8:40	6.9	7.9	7.5	8.1	***24.5***

Note: ***Bold Italic*** means Action Level exceedance

Bold Italic with underline means Limit Level exceedance

Date of Water Quality Monitoring: **25 March 2020**

Part A – Exceedance Summary Tables

Table II: Parameter(s) – ~~Dissolved Oxygen (DO)~~ / Turbidity (TURB) / ~~Suspended Solids (SS)~~

Depth	Baseline Action Level (NTU)	Baseline Limit Level (NTU)	Tide	Control Station(s)	Measured Value at Control Station (NTU)	Station(s)	Time (hrs)	120% of Control Station Action Level (NTU)	130% of Control Station Limit Level (NTU)	Measured Value (NTU)
Bottom	19.3	22.2	Mid-Ebb	C2	0.9	G1	13:38	1.1	1.2	***1.8***
Bottom	19.3	22.2	Mid-Ebb	C2	0.9	G2	13:19	1.1	1.2	***1.8***
Bottom	19.3	22.2	Mid-Ebb	C2	0.9	G4	13:59	1.1	1.2	***1.3***
Bottom	19.3	22.2	Mid-Ebb	C2	0.9	M1	13:26	1.1	1.2	***2.4***
Bottom	19.3	22.2	Mid-Ebb	C2	0.9	M4	13:05	1.1	1.2	***1.7***
Bottom	19.3	22.2	Mid-Ebb	C2	0.9	M5	14:30	1.1	1.2	***1.6***
Bottom	19.3	22.2	Mid-flood	C1	1.0	G1	8:22	1.2	1.4	***1.9***
Bottom	19.3	22.2	Mid-flood	C1	1.0	G2	8:06	1.2	1.4	***1.7***
Bottom	19.3	22.2	Mid-flood	C1	1.0	G4	8:47	1.2	1.4	***1.3***
Bottom	19.3	22.2	Mid-flood	C1	1.0	M1	8:12	1.2	1.4	***2.3***
Bottom	19.3	22.2	Mid-flood	C1	1.0	M4	7:54	1.2	1.4	***1.7***
Bottom	19.3	22.2	Mid-flood	C1	1.0	M5	9:04	1.2	1.4	***1.6***

Note: ***Bold Italic*** means Action Level exceedance

Bold Italic with underline means Limit Level exceedance

Date of Water Quality Monitoring: **27 March 2020**

Part A – Exceedance Summary Tables

Table I: Parameter(s) – ~~Dissolved Oxygen (DO) / Turbidity (TURB) /~~ Suspended Solids (SS)

Tide	Control Station(s)	Depth	Measured Value at Control Station (mg/L)	Station(s)	Time (hrs)	Baseline Action Level (mg/L)	Baseline Limit Level (mg/L)	120% of Control Station Action Level (mg/L)	130% of Control Station Limit Level (mg/L)	Measured Value (mg/L)
Mid-Ebb	C2	surface	6.8	M4	13:53	6.2	7.4	8.2	8.8	***6.4***
Mid-Ebb	C2	bottom	5.5	G4	14:46	6.9	7.9	6.6	7.2	***6.8***
Mid-Ebb	C2	bottom	5.5	M2	13:59	6.9	7.9	6.6	7.2	***8.8***
Mid-Ebb	C2	bottom	5.5	M3	14:40	6.9	7.9	6.6	7.2	***19.7***
Mid-Ebb	C2	bottom	5.5	M5	15:17	6.9	7.9	6.6	7.2	***7.4***
Mid-Flood	C1	surface	3.6	G1	10:27	6.0	6.9	4.3	4.6	***25.8***
Mid-Flood	C1	surface	3.6	G2	10:06	6.0	6.9	4.3	4.6	***7.3***
Mid-Flood	C1	surface	3.6	G3	10:38	6.0	6.9	4.3	4.6	***6.4***
Mid-Flood	C1	surface	3.6	G4	10:57	6.0	6.9	4.3	4.6	***6.6***
Mid-Flood	C1	surface	3.6	M1	10:15	6.2	7.4	4.3	4.6	***5.7***
Mid-Flood	C1	surface	3.6	M5	11:14	6.2	7.4	4.3	4.6	***22.5***
Mid-Flood	C1	bottom	4.55	G1	10:27	6.9	7.9	5.5	5.9	***5.8***
Mid-Flood	C1	bottom	4.6	G4	10:57	6.9	7.9	5.5	5.9	***11.0***
Mid-Flood	C1	bottom	4.55	M4	9:47	6.9	7.9	5.5	5.9	***10.1***

Note: ***Bold Italic*** means Action Level exceedance

Bold Italic with underline means Limit Level exceedance

Date of Water Quality Monitoring: **27 March 2020**

Part A – Exceedance Summary Tables

Table II: Parameter(s) – ~~Dissolved Oxygen (DO)~~ / Turbidity (TURB) / ~~Suspended Solids (SS)~~

Depth	Baseline Action Level (NTU)	Baseline Limit Level (NTU)	Tide	Control Station(s)	Measured Value at Control Station (NTU)	Station(s)	Time (hrs)	120% of Control Station Action Level (NTU)	130% of Control Station Limit Level (NTU)	Measured Value (NTU)
Bottom	19.3	22.2	Mid-Ebb	C2	1.0	G1	14:26	1.2	1.3	***1.8***
Bottom	19.3	22.2	Mid-Ebb	C2	1.0	G2	14:06	1.2	1.3	***1.5***
Bottom	19.3	22.2	Mid-Ebb	C2	1.0	G4	14:46	1.2	1.3	***2.4***
Bottom	19.3	22.2	Mid-Ebb	C2	1.0	M5	15:17	1.2	1.3	***2.7***
Bottom	19.3	22.2	Mid-flood	C1	0.8	G1	10:27	1.0	1.1	***1.9***
Bottom	19.3	22.2	Mid-flood	C1	0.8	G2	10:06	1.0	1.1	***1.5***
Bottom	19.3	22.2	Mid-flood	C1	0.8	G4	10:57	1.0	1.1	***2.7***
Bottom	19.3	22.2	Mid-flood	C1	0.8	M5	11:14	1.0	1.1	***2.8***

Note: ***Bold Italic*** means Action Level exceedance

Bold Italic with underline means Limit Level exceedance

Date of Water Quality Monitoring: **30 March 2020**

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	21.4	G3	15:35	6.0	6.9	25.6	27.8	***6.2***
Mid-Ebb	C2	surface	21.4	G4	15:46	6.0	6.9	25.6	27.8	***6.5***
Mid-Ebb	C2	surface	21.4	M1	15:26	6.2	7.4	25.6	27.8	***7.4***
Mid-Ebb	C2	surface	21.35	M2	15:11	6.2	7.4	25.6	27.8	***6.8***
Mid-Ebb	C2	surface	21.4	M4	15:05	6.2	7.4	25.6	27.8	***9.0***
Mid-Ebb	C2	intake	n.a.	M6	15:50	8.3	8.6	n.a.	n.a.	***8.8***
Mid-Ebb	C2	bottom	9.3	M1	15:26	6.9	7.9	11.1	12.0	***7.5***
Mid-Ebb	C2	bottom	9.25	M2	15:11	6.9	7.9	11.1	12.0	***7.5***
Mid-Ebb	C2	bottom	9.25	M3	15:39	6.9	7.9	11.1	12.0	***7.4***
Mid-Ebb	C2	bottom	9.3	M5	15:54	6.9	7.9	11.1	12.0	***7.5***
Mid-Flood	C1	surface	5.5	G1	9:31	6.0	6.9	6.6	7.2	***11.1***
Mid-Flood	C1	surface	5.5	G2	9:16	6.0	6.9	6.6	7.2	***7.6***
Mid-Flood	C1	surface	5.5	G4	9:54	6.0	6.9	6.6	7.2	***6.6***
Mid-Flood	C1	surface	5.5	M2	9:09	6.2	7.4	6.6	7.2	***8.6***
Mid-Flood	C1	surface	5.5	M5	10:05	6.2	7.4	6.6	7.2	***7.9***
Mid-Flood	C1	intake	n.a.	M6	10:00	8.3	8.6	n.a.	n.a.	***10.1***
Mid-Flood	C1	bottom	7.35	G1	9:31	6.9	7.9	8.8	9.6	***9.4***
Mid-Flood	C1	bottom	7.4	G4	9:54	6.9	7.9	8.8	9.6	***7.1***
Mid-Flood	C1	bottom	7.4	M5	10:05	6.9	7.9	8.8	9.6	***7.4***

Date of Water Quality Monitoring: **30 March 2020**

Part A – Exceedance Summary Tables

Table II: Parameter(s) – ~~Dissolved Oxygen (DO)~~ / Turbidity (TURB) / ~~Suspended Solids (SS)~~

Depth	Baseline Action Level (NTU)	Baseline Limit Level (NTU)	Tide	Control Station(s)	Measured Value at Control Station (NTU)	Station(s)	Time (hrs)	120% of Control Station Action Level (NTU)	130% of Control Station Limit Level (NTU)	Measured Value (NTU)
Bottom	19.3	22.2	Mid-Ebb	C2	0.7	G1	15:29	0.9	0.9	***2.1***
Bottom	19.3	22.2	Mid-Ebb	C2	0.7	G2	15:21	0.9	0.9	***1.8***
Bottom	19.3	22.2	Mid-Ebb	C2	0.7	G3	15:35	0.9	0.9	***3.2***
Bottom	19.3	22.2	Mid-Ebb	C2	0.7	G4	15:46	0.9	0.9	***2.1***
Bottom	19.3	22.2	Mid-Ebb	C2	0.7	M1	15:26	0.9	0.9	***3.3***
Bottom	19.3	22.2	Mid-Ebb	C2	0.7	M2	15:11	0.9	n.a.	***1.7***
Bottom	19.3	22.2	Mid-Ebb	C2	0.7	M3	15:39	0.9	0.9	***2.6***
Bottom	19.3	22.2	Mid-Ebb	C2	0.7	M4	15:05	0.9	0.9	***1.1***
Bottom	19.3	22.2	Mid-Ebb	C2	0.7	M5	15:54	0.9	0.9	***1.2***
Bottom	19.3	22.2	Mid-flood	C1	1.0	G1	9:31	1.2	1.3	***3.2***
Bottom	19.3	22.2	Mid-flood	C1	1.0	G2	9:16	1.2	1.3	***1.8***
Bottom	19.3	22.2	Mid-flood	C1	1.0	G3	9:38	1.2	1.3	***2.6***
Bottom	19.3	22.2	Mid-flood	C1	1.0	G4	9:54	1.2	1.3	***2.3***
Bottom	19.3	22.2	Mid-flood	C1	1.0	M1	9:24	1.2	1.3	***1.9***
Bottom	19.3	22.2	Mid-flood	C1	1.0	M2	9:09	1.2	1.3	***1.6***
Bottom	19.3	22.2	Mid-flood	C1	1.0	M3	9:44	1.2	1.3	***2.2***
Bottom	19.3	22.2	Mid-flood	C1	1.0	M4	8:54	1.2	1.3	***1.6***
Bottom	19.3	22.2	Mid-flood	C1	1.0	M5	10:05	1.2	1.3	***1.6***

Contract No. CE 59/2015 (EP)

Environmental Team for Tseung Kwan O – Lam Tin Tunnel Design and Construction

- Investigation Report of Environmental Quality Limit Exceedances (Mar 2020)

Part A Details of Investigation

For the March 2020, exceedances for suspended solids and turbidity have been recorded continuously at various monitoring stations. During water quality monitoring, the water outside the site boundary seemed to be clear and clean (Photo 1 to 4)

During site inspections, the sea appears to be clear (Photo 5 and 6). The sediment tank was free from silt and sediments and the drainage system remained well-maintained. No sand plumes were observed during the site inspection.

Despite it was discovered that the tug boat will stir up seabed sediments when pulling/pushing the barge into the western surcharge area, the Contractor will deploy silt curtain to allow suspended sediment settle down and prevent accidental spillage to the sea (Photo 7 and 8). The exceedance on relevant days remained similar to other monitoring days.

No direct evidence that the recent exceedances were due to the ongoing reclamation activities of the Project. Therefore, no additional marine water quality monitoring is required.

Part B Photo Record

	
Photo 1 (Recorded on 2nd March 2020)	Photo 2 (Recorded on 16th March 2020)
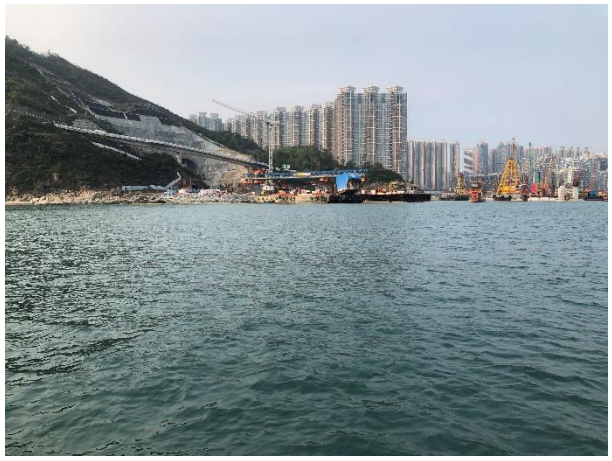	
Photo 3 (Recorded on 18th Mar 2020)	Photo 4 (Recorded on 25th Mar 2020)

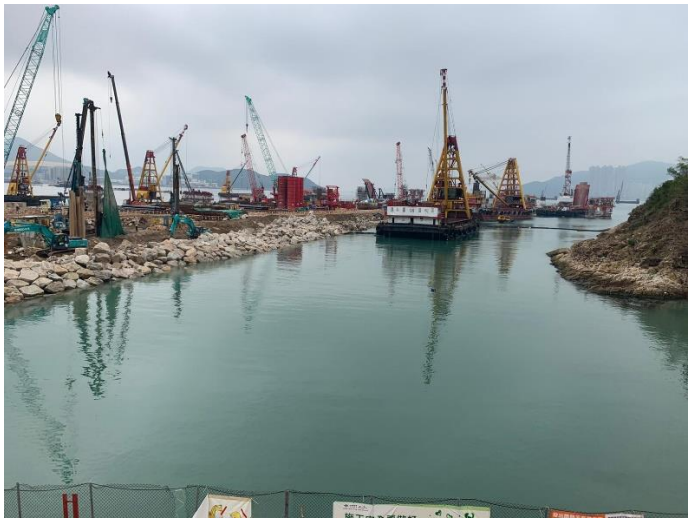	
Photo 5 (Recorded on 19th Mar 2020)	Photo 6 (Recorded on 26th Mar 2020)
	
Photo 7 (Recorded on 26th Mar 2020)	Photo 8 (Recorded on 26th Mar 2020)

Part C – Recommendations

Since wet season is approaching, all Contractors are reminded to maintain the drainage system and get prepare for any rainfall. Diversions and channels should be cleared to prevent spilling muddy water into the sea due to overflow or flooding.

Appropriate diversion of received rainwater to the wastewater treatment system within the site should be provided to minimise the chance of accidental runoff. Cofferdam and silt curtain should be checked and maintained regularly; diver inspection for checking damage and leakage should be conducted weekly to ensure the functionality of cofferdam and silt curtains.

Reviewed by: (Environmental Team Leader:(Dr. HF Chan) Date: 5th April 2020

APPENDIX L
SITE AUDIT SUMMARY

Appendix L - Site Audit Summary

Contract No. — NE2015/01
Tseung Kwan O - Lam Tin Tunnel — Main Tunnel and Associated Works

Items	Date	Status*	Follow up Action
Water Quality			
Inadequate silt socks/sandbags and gaps between them could make some silts discharge into water and tracks of dry mud at edges of the barge point were observed. Contractor is reminded to provide enough measures such as provide bund capacity/ enough materials to prevent accident leakage especially when it is rainy.	19-Feb-20 26-Feb-20	✓	04-Mar-20 The silt sock/sandbags had been properly placed
Mud stains were observed near one edge of the roro barge and between gaps of the gangway. Contractor is reminded to put sandbags/ silt socks to cover whole boundary and possible areas of leakage.	18-Mar-20	✓	25-Mar-20 No mud stains were observed at edges of the roro barge and deeper bunds were constructed to minimize the accidental spillage of effluent
Ecology			
--	--	--	--
Noise			
An acoustic sheet of a breaker in CKLR of Portion I was broken. Contractor is reminded to repair it to reduce noise impacts.	25-Mar-20	#	--
Landscape and Visual			
--	--	--	--
Air Quality			
Sand piles and dry surface in Portion I should be covered by tarpaulins and /or be watered.	25-Mar-20	#	--
Waste/Chemical Management			
Chemical tanks shall be covered with a drip tray in Slope Q.	26-Feb-20	✓	04-Mar-20 The tanks had been removed.
Impact on Cultural Heritage			
--	--	--	--
Permit/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 improved by the contractor

Appendix L - Site Audit Summary

Contract No. — NE2015/02
Tseung Kwan O - Lam Tin Tunnel — Road P2 and Associated Works

Items	Date	Status*	Follow up Action
Water Quality			
--	--	--	--
Ecology			
--	--	--	--
Noise			
The Contractor is reminded to repair the semi-enclosure as soon as possible.	12-Mar-20 19-Mar-20	✓	13-Mar-20 / 19-Mar-20 The Contractor had repaired the semi-enclosure as far as possible.
The Contractor is reminded to apply noise barrier before the PME(s) operates.	12-Mar-20	✓	12-Mar-20 The Contractor stopped the PME immediately and requested workers to put up Silence-Up barrier before they continue
Noise mitigation measure should provide on the derrick barge before starting the works.	26-Mar-20	#	--
Landscape and Visual			
--	--	--	--
Air Quality			
--	--	--	--
Waste/Chemical Management			
The excavator in Portion IX shall be well-maintained and avoid oil leakage	27-Feb-20	✓	05-Mar-20 The excavator had been removed.
Impact on Cultural Heritage			
--	--	--	--
Permit/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 improved by the contractor

Appendix L - Site Audit Summary

Contract No. — NE2017/02
Tseung Kwan O - Lam Tin Tunnel — Road P2/D4 and Associated Works

Items	Date	Status*	Follow up Action
Water Quality			
--	--	--	--
Ecology			
--	--	--	--
Noise			
--	--	--	--
Landscape and Visual			
--	--	--	--
Air Quality			
--	--	--	--
Waste/Chemical Management			
The oil stain nearby generator MG-09 shall be cleaned up.	5-Mar-20 19-Mar-20	✓	6-Mar-20 & 20-Mar-20 The oil stain had been cleaned.
Impact on Cultural Heritage			
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Permit/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 improved by the contractor

Appendix L - Site Audit Summary

Contract No. — NE2015/03
Tseung Kwan O - Lam Tin Tunnel — Northern Footbridge

Items	Date	Status*	Follow up Action
Water Quality			
--	--	--	--
Ecology			
--	--	--	--
Noise			
--	--	--	--
Landscape and Visual			
--	--	--	--
Air Quality			
--	--	--	--
Waste/Chemical Management			
--	--	--	--
Impact on Cultural Heritage			
--	--	--	--
Permit/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 improved by the contractor

Appendix L - Site Audit Summary

Contract No. — NE2017/01
Tseung Kwan O - Lam Tin Tunnel — Tseung Kwan O Interchange and Associated Works

Items	Date	Status*	Follow up Action
Water Quality			
--	--	--	--
Ecology			
--	--	--	--
Noise			
--	--	--	--
Landscape and Visual			
--	--	--	--
Air Quality			
--	--	--	--
Waste/Chemical Management			
--	--	--	--
Impact on Cultural Heritage			
--	--	--	--
Permit/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 improved by the contractor

APPENDIX M
EVENT AND ACTION PLANS

Event and Action Plan for Air Quality (Dust)

EVENT	ACTION			
	ET	**IEC**	**ER**	**CONTRACTOR**
Action level being exceeded by one sampling	1. Identify source, investigate the causes of complaint and propose remedial measures; 2. Inform IEC and ER; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method.	1. Notify Contractor.	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
Action level being exceeded by two or more consecutive sampling	1. Identify source; 2. Inform IEC and ER; 3. Advise the ER on the effectiveness of the proposed remedial measures; 4. Repeat measurements to confirm findings; 5. Increase monitoring frequency to daily; 6. Discuss with IEC and Contractor on remedial actions required; 7. If exceedance continues, arrange meeting with IEC and ER;	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ET on the effectiveness of the proposed remedial measures; 5. Supervise Implementation of remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Submit proposals for remedial actions to IEC within three working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.

EVENT	ACTION			
	ET	**IEC**	**ER**	**CONTRACTOR**
	8. If exceedance stops, cease additional monitoring.			
Limit level being exceeded by one sampling	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform Contractor ,IEC, ER, and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within three working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.
Limit level being exceeded by two or more consecutive sampling	1. Notify IEC, ER, Contractor and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily;	1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly;	1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented;	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within three working days of notification; 3. Implement the agreed proposals;

EVENT	ACTION			
	ET	**IEC**	**ER**	**CONTRACTOR**
	5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Arrange meeting with IEC and ER to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring.	3. Supervise the implementation of remedial measures.	4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Event and Action Plan for Construction Noise

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Action Level	1. Notify IEC and Contractor; 2. Carry out investigation; 3. Report the results of investigation to the IEC, ER and Contractor; 4. Discuss with the Contractor and formulate remedial measures; 5. Increase monitoring frequency to check mitigation effectiveness.	1. Review the analysed results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures are properly implemented.	1. Submit noise mitigation proposals to IEC; 2. Implement noise mitigation proposals.
Limit Level	1. Identify source; 2. Inform IEC, ER, EPD and Contractor; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Inform IEC, ER and EPD the causes and actions taken for the exceedances;	1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractors remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

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

Event and Action Plan for Marine Water Quality

Event	Action			
	ET	**IEC**	**ER**	**CONTRACTOR**
Action level being exceeded by one sampling day at water sensitive receiver(s)	• Identify the source(s) of impact by comparing the results with those collected at the control stations as appropriate; • If exceedance is found to be caused by the reclamation activities, repeat *in-situ* measurement to confirm findings; • Inform IEC and contractor; • Check monitoring data, all plant, equipment and Contractor's working methods; • If exceedance occurs at WSD salt water intake, inform WSD; • Discuss mitigation measures with IEC and Contractor; • Repeat measurement on next day of exceedance.	• Discuss with ET and Contractor on the mitigation measures; • Review proposal on mitigation measures submitted by Contractor and advise the ER accordingly; • Assess the effectiveness of the implemented mitigation measures.	• Discuss with IEC on the proposed mitigation measures; • Make agreement on the mitigation proposal.	• Inform the ER and confirm notification of the non-compliance in writing; • Rectify unacceptable practice; • Check all plant and equipment; • Amend working methods if appropriate; • Discuss with ET and IEC and propose mitigation measures to IEC and ER; • Implement the agree mitigation measures.
Action level being exceeded by two or more consecutive	• Identify the source(s) of impact by comparing the results with those collected at the control stations as appropriate;	• Discuss with ET and Contractor on the mitigation measures;	• Discuss with IEC on the proposed mitigation measures; • Make agreement on the mitigation proposal;	• Inform the Engineer and confirm notification of the non-compliance in writing; • Rectify unacceptable practice;

Event	Action			
	ET	**IEC**	**ER**	**CONTRACTOR**
sampling days at water sensitive receiver(s)	• If exceedance is found to be caused by the reclamation activities, repeat in-situ measurement to confirm findings; • Inform IEC and contractor; • Check monitoring data, all plant, equipment and Contractor's working methods; • Discuss mitigation measures with IEC and Contractor; • Ensure mitigation measures are implemented; • Prepare to increase the monitoring frequency to daily; • If exceedance occurs at WSD salt water intake, inform WSD; • Repeat measurement on next day of exceedance.	• Review proposal on mitigation measures submitted by Contractor and advise the ER accordingly; • Assess the effectiveness of the implemented mitigation measures.	• Assess the effectiveness of the implemented mitigation measures.	• Check all plant and equipment and consider changes of working methods; • Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within 3 working days; • Implement the agreed mitigation measures.
Limit level being exceeded by one sampling day at water sensitive receiver(s)	• Identify the source(s) of impact by comparing the results with those collected at the control stations as appropriate;	• Discuss with ET and Contractor on the mitigation measures; • Review proposal on mitigation measures submitted by Contractor and advise the ER accordingly;	• Discuss with IEC, ET and Contractor on the proposed mitigation measures; • Request Contractor to critically review the working methods;	• Inform the ER and confirm notification of the non-compliance in writing; • Rectify unacceptable practice;

Event	Action			
	ET	**IEC**	**ER**	**CONTRACTOR**
	• If exceedance is found to be caused by the reclamation activities, repeat *in-situ* measurement to confirm findings; • Inform IEC, contractor, AFCD and EPD • Check monitoring data, all plant, equipment and Contractor's working methods; • Discuss mitigation measures with IEC, ER and Contractor; • Ensure mitigation measures are implemented; • Increase the monitoring frequency to daily until no exceedance of Limit level; • If exceedance occurs at WSD salt water intake, inform WSD.	• Assess the effectiveness of the implemented mitigation measures.	• Make agreement on the mitigation measures to be implemented; • Assess the effectiveness of the implemented mitigation measures.	• Check all plant and equipment and consider changes of working methods; • Discuss with ET, IEC and ER and submit proposal of mitigation measures to IEC and ER within 3 working days of notification; • Implement the agreed mitigation measures.
Limit level being exceeded by two or more consecutive sampling days at	• Identify the source(s) of impact by comparing the results with those collected at the control stations as appropriate;	• Discuss with ET and Contractor on the mitigation measures; • Review proposal on mitigation measures submitted by Contractor and advise the ER accordingly;	• Discuss with IC(E), ET and Contractor on the proposed mitigation measures; • Request Contractor to critically review the working methods;	• Inform the ER and confirm notification of the non-compliance in writing; • Rectify unacceptable practice;

Event	Action			
	ET	**IEC**	**ER**	**CONTRACTOR**
water sensitive receiver(s)	• If exceedance is found to be caused by the reclamation activities, repeat in-situ measurement to confirm findings; • Inform IC(E), AFCD, contractor and EPD; • Check monitoring data, all plant, equipment and Contractor's working methods; • Discuss mitigation measures with IC(E), ER and Contractor; • Ensure mitigation measures are implemented; • Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days; • If exceedance occurs at WSD salt water intake, inform WSD.	• Assess the effectiveness of the implemented mitigation measures.	• Make agreement on the mitigation measures to be implemented; • Assess the effectiveness of the implemented mitigation measures; • Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the marine work until no exceedance of Limit level.	• Check all plant and equipment and consider changes of working methods; • Discuss with ET, IC(E) and ER and submit proposal of mitigation measures to IC(E) and ER within 3 working days of notification; • Implement the agreed mitigation measures; • As directed by the Engineer, to slow down or to stop all or part of the construction activities.

Limit Levels and Action Plan for Landfill Gas

Parameter	Limit Level	Action
Oxygen	<19%	• Ventilate to restore oxygen to >19%
	<18%	• Stop works • Evacuate personnel/prohibit entry • Increase ventilation to restore oxygen to >19%
Methane	>10% LEL (i.e. > 0.5% by volume)	• Prohibit hot works • Ventilate to restore methane to <10% LEL
	>20% LEL (i.e. > 1% by volume)	• Stop works • Evacuate personnel / prohibit entry • Increase ventilation to restore methane to <10% LEL
Carbon Dioxide	>0.5%	• Ventilate to restore carbon dioxide to < 0.5%
	>1.5%	• Stop works • Evacuate personnel / prohibit entry • Increase ventilation to restore carbon dioxide to < 0.5%

Event and Action Plan for Coral Post-Translocation Monitoring

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Action Level Exceedance	1. Check monitoring data; 2. Inform the IEC, ER and Contractor of the findings; 3. Increase the monitoring to at least once a month to confirm findings; 4. Propose mitigation measures for consideration	1.Discuss monitoring with the ET and the Contractor; 2. Review proposals for additional Monitoring and any other measures submitted by the Contractor and advise the ER accordingly.	1. Discuss with the IEC additional monitoring requirements and any other measures proposed by the ET; 2. Make agreement on the measures to be implemented.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Discuss with the ET and the IEC and propose measures to the IEC and the ER; 3. Implement the agreed measures.
Limit Level Exceedance	Undertake Steps 1-4 as in the Action Level Exceedance. If further exceedance of Limit Level, suspend construction works until an effective solution is identified.	1.Discuss monitoring with the ET and the Contractor; 2. Review proposals for additional Monitoring and any other measures submitted by the Contractor and advise the ER accordingly.	1. Discuss with the IEC additional monitoring requirements and any other measures proposed by the ET; 2. Make agreement on the measures to be implemented.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Discuss with the ET and the IEC and propose measures to the IEC and the ER; 3. Implement the agreed measures.

Mitigation Measures for Vibration Monitoring

Level	Contingency Action
Alert Level	● The Engineer shall be informed immediately. ● The Contractor shall submit an investigation report to describe works being undertaken. To review the instrument responses and to study the cause of undue response. ● The Contractor shall review and increase the instrumentation monitoring and reporting frequency, if applicable. ● The Contractor shall submit a detailed plan of action describing the measures to be taken should the concerned instrument reach the action level to the Engineer for approval.
Alarm Level	● The Engineer shall be informed immediately. ● The active construction works may require to be suspended subject to the Engineer's review of monitoring data. ● The Contractor shall immediately implement the measures as defined in the detailed plan of action to prevent further ground movement and groundwater drawdown etc. ● The Contractor shall prepare a detailed investigation report to study the cause of the exceedance ● The Contractor shall propose a contingency plan for the Engineer's approval in the event that alarm value is reached or exceeded ● The Contractor shall develop an emergency plan for the Engineer's approval in the event the applied contingency measures cannot control the situation. ● The Contractor shall meet the Engineer to discuss the instrument response and review the effectiveness of the implemented measures. ● The Contractor shall carry out design review of the works

Action Level	● Consideration shall be given to suspend all active construction works and the Engineer shall be informed immediately ● The Contractor shall immediately implement the measures defined in the contingency plan ● The Contractor shall implement the measures defined in the emergency plan in the event that the applied contingency measures are found inadequate ● The Contractor shall provide a complete report to examine the construction method and review the response of the instruments with full history of the monitoring data and construction activities and necessary design update ● To resume the suspended activities, the Contractor shall demonstrate to the Engineer's satisfaction that it is safe to do so with approval from the Engineer.

APPENDIX N
ENVIRONMENTAL MITIGATION
IMPLEMENTATION SCHEDULE (EMIS)

App N1 - IMPLEMENTATION SCHEDULE AND RECOMMANDED MITIGATION MEASURES

Table I - Recommended Mitigation Measures stipulated in EM&A Manual for the Project

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?
Air Quality						
S3.8.1	Watering eight times a day on active works areas, exposed areas and paved haul roads	To minimize the dust impact	Contractor	All Active Work Sites	Construction phase	APCO
S3.8.1	Enclosing the unloading process at barging point by a 3-sided screen with top tipping hall / mixing area in Work Area A, provision of water spraying and flexible dust curtains	To minimize the dust impact	Contractor	Barging Points	Construction phase	APCO
S3.8.7	Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides. • Use of frequent watering for particularly dusty construction areas and areas close to ASRs.. • Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines. • Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs. • Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations. • Establishment and use of vehicle wheel and body washing facilities at the exit points of the site. • Provision of wind shield and dust extraction units or similar dust mitigation measures at the loading area of barging point, and use of water sprinklers at the loading area where dust generation is likely during the loading process of loose material, particularly in dry seasons/ periods. • Provision of not less than 2.4m high hoarding from ground level along site boundary where adjoins a road, streets or other accessible to the public except for a site entrance or exit. • Imposition of speed controls for vehicles on site haul roads. • Where possible, routing of vehicles and positioning of construction plant should be at the maximum possible distance from ASRs • Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides. • Instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise.	To minimize the dust impact	Contractor	All Construction Work Sites	Construction phase	APCO and Air Pollution Control (Construction Dust) Regulation
/	Emission from Vehicles and Plants • All vehicles shall be shut down in intermittent use. • Only well-maintained plant should be operated on-site and plant should be serviced regularly to avoid emission of black smoke. • All diesel fuelled construction plant within the works areas shall be powered by ultra low sulphur diesel fuel (ULSD)	Reduce air pollution emission from construction vehicles and plants	Contractor	All construction sites	Construction stage	APCO
/	Valid No-road Mobile Machinery (NRMM) labels should be provided to regulated machines	Reduce air pollution emission from construction vehicles and plants	Contractor	All construction sites	Construction stage	APCO
Noise Impact (Construction Phase)						
S4.8	• Use of quiet PME. Use of movable noise barriers for Excavator, Lorry, Dump Truck, Mobile Crane, Compactor, Concrete Mixer Truck, Concrete Lorry Mixer, Breaker, Mobile Crusher, Backhoe, Vibratory Poker, Saw, Asphalt Paver, Vibratory Roller, Vibrolance, Hydraulic Vibratory Lance and Piling (Vibration Hammer). Use of full enclosure for Air Compressor, Compressor, Bar Bender, Generator, Drilling Rig, Chisel, Large Diameter Bore Piling, Grout Mixer & Pump and Concrete Pump.	To minimize construction noise impact arising from the Project at the affected NSRs	Contractor	Work Sites	Construction phase	EIAO-TM, NCO
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

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?
S4.9	**Good Site Practice** • Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program • Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction program. • Mobile plant, if any, should be sited as far away from NSRs as possible. • Machines and plant (such as trucks) that may be in intermittent use should be shut down between works periods or should be throttled down to a minimum. • Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs. • Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities.	To minimize construction noise impact arising from the Project at the affected NSRs	Project Proponent	Work sites	Construction Period	EIAO-TM, NCO
S4.9	Scheduling of Construction Works during School Examination Period	To minimize construction noise impact arising from the 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
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
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
Silt Curtain Deployment Plan	• Silt curtains should be deployed properly to surround the works area. • Maintenance of silt curtain should be provided. • Sufficient stock of silt curtain should be provided on site.	Control potential impacts from marine woroks	Contractor	NE/2015/01	Construction stage	EIAO
S5.8.3	Other good site practices should be undertaken during filling operations include: • all marine works should adopt the environmental friendly construction methods as far as practically possible including the use of cofferdams to cover the construction area to separate the construction works from the sea; • floating single silt curtain shall be employed for all marine works; • all vessels should be sized so that adequate clearance is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash; • all hopper barges should be fitted with tight fitting seals to their bottom openings to prevent leakage of material; • excess material shall be cleaned from the decks and exposed fittings of barges before the vessel is moved; • adequate freeboard shall be maintained on barges to reduce the likelihood of decks being washed by wave action; • loading of barges and hoppers should be controlled to prevent splashing of filling material into the surrounding water. Barges or hoppers should not be filled to a level that will cause the overflow of materials or polluted water during loading or transportation; • any pipe leakages shall be repaired quickly. Plant should not be operated with leaking pipes; • construction activities should not cause foam, oil, grease, scum, litter or other objectionable matter to be present on the water within the site or dumping grounds; and	Control potential impacts from filling activities and marine-based construction	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO, Waste Disposal Ordinance (WDO)

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?
	• 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.					
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
ERR S5.6.1	To minimize water quality impact arising from the dredging and filling works for Reclamation for Road P2, the following mitigation measures shall be implemented: - Before carrying out any dredging and underwater filling works, a temporary barrier shall first be constructed to a height above the high water mark to completely enclose the works site (without any opening at the barrier wall) - The temporary barrier fully enclosing the dredging and underwater filling works site shall not be removed before completion of all dredging and underwater filling works. - Water quality sampling and testing shall be carried out to demonstrate that the water quality inside the enclosed barrier is comparable to the ambient or baseline levels prior to the removal of the fully enclosed barrier. - Silt curtains shall be deployed for the installation and removal of the temporary barrier and at the double water gates marine access opening during its operation.	Control potential impacts from dredging and filling works for Reclamation for Road P2	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO
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
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

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?
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
S5.8.12	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
S5.8.13	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
S5.8.14	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 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
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 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

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?
S5.8.24	Under normal circumstances, groundwater pumped out of wells, etc. for the lowering of ground water level in basement or foundation construction, and groundwater seepage pumped out of tunnels or caverns under construction should be discharged into storm drains after the removal of silt in silt removal facilities.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO
S5.8.25 - S5.8.27 & Table 5.18	Grouting would be adopted as measure to reduce the groundwater inflow into the tunnel. During the tunnel excavation, the inflow rate of groundwater into the tunnel will be measured during the excavation. The groundwater levels above the tunnel will also be monitored by piezometers. If the inflow rate exceeds the pre-determined groundwater control criteria or the groundwater drawdown exceeds the required limit, pre-excavation grouting will be required to reduce the groundwater inflow. No significant change of groundwater levels would therefore be expected. Any chemicals/ foaming agents which would be entrained to the groundwater should be biodegradable and non-toxic throughout the tunnel construction. Potential groundwater quality impact would be minimal as the used material is non-toxic and biodegradable. No adverse groundwater quality would therefore be expected. Prescriptive measures in the form of an Action Plan with pre-emptive and re-active to preserve the groundwater levels at all times during the tunnel construction are set out in Table 5.18.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO, Buildings Ordinance
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
S5.8.29 - S5.8.31	Wastewater generated from the washing down of mixing trucks and drum mixers and similar equipment should whenever practicable be recycled. The discharge of wastewater should be kept to a minimum. To prevent pollution from wastewater overflow, the pump sump of any water recycling system should be provided with an online standby pump of adequate capacity and with automatic alternating devices. Under normal circumstances, surplus wastewater may be discharged into foul sewers after treatment in silt removal and pH adjustment facilities (to within the pH range of 6 to 10). Disposal of wastewater into storm drains will require more elaborate treatment.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO
S5.8.32	All vehicles and plant should be cleaned before they leave a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. A wheel washing bay should be provided at every site exit if practicable and wash-water should have sand and silt settled out or removed before discharging into storm drains. The section of construction road between the wheel washing bay and the public road should be paved with backfall to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO
S5.8.33	Bentonite slurries used in diaphragm wall and borepile construction should be reconditioned and reused wherever practicable. If the disposal of a certain residual quantity cannot be avoided, the used slurry may be disposed of at the marine spoil grounds subject to obtaining a marine dumping licence from EPD on a case-by-case basis.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO
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
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
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
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
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

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?
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
S5.8.41	Drainage serving an open oil filling point should be connected to storm drains via a petrol interceptor with peak storm bypass.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO
S5.8.42	Vehicle and plant servicing areas, vehicle wash bays and lubrication bays should as far as possible be located within roofed areas. The drainage in these covered areas should be connected to foul sewers via a petrol interceptor. Oil leakage or spillage should be contained and cleaned up immediately. Waste oil should be collected and stored for recycling or disposal in accordance with the Waste Disposal Ordinance.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO
S5.8.43	Construction work force sewage discharges on site are expected to be connected to the existing trunk sewer or sewage treatment facilities. The construction sewage may need to be handled by portable chemical toilets prior to the commission of the on-site sewer system. Appropriate numbers of portable toilets shall be provided by a licensed contractor to serve the large number of construction workers over the construction site. The Contractor shall also be responsible for waste disposal and maintenance practices.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO
S5.8.44	Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes.	Control potential impacts from accidental spillage of chemicals	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO, WDO
S5.8.45	Any service shop and maintenance facilities should be located on hard standings within a bunded area, and sumps and oil interceptors should be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage should only be undertaken within the areas appropriately equipped to control these discharges.	Control potential impacts from accidental spillage of chemicals	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO
S5.8.46	Disposal of chemical wastes should be carried out in compliance with the Waste Disposal Ordinance. The "Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes" published under the Waste Disposal Ordinance details the requirements to deal with chemical wastes. General requirements are given as follows: • suitable containers should be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport; • chemical waste containers should be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents; and • storage area should be selected at a safe location on site and adequate space should be allocated to the storage area.	Control potential impacts from accidental spillage of chemicals	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO, WDO
S5.8.47	Collection and removal of floating refuse should be performed at regular intervals on a daily basis. The contractor should be responsible for keeping the water within the site boundary and the neighbouring water free from rubbish.	Control potential impacts from floating refuse and debris	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO,
Ecological Impact						
S6.8.4	**Measures to Minimize Disturbance** • Use of Quiet Mechanical Plant during the construction phase should be adopted wherever possible. • Hoarding or fencing should be erected around the works area boundaries during the 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
	Standard Good Site Practice • Placement of equipment or stockpile in designated works areas and access routes selected on existing disturbed land to minimise disturbance to natural habitats.					

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?
S6.8.5	• Construction activities should be restricted to works areas that should be clearly demarcated. The works areas should be reinstated after completion of the works. • Waste skips should be provided to collect general refuse and construction wastes. The wastes should be properly disposed off-site in a timely manner. • General drainage arrangements should include sediment and oil traps to collect and control construction site run-off. • Open burning on works sites is illegal, and should be strictly prohibited. • Measures should also be put into place so that litter, fuel and solvents do not enter the nearby watercourses.	Reduce disturbance to surrounding habitats	Contractor	Land-based works are	Construction Phase	N/A
S6.8.6	**Measure to Minimize Groundwater Inflow** • The drained tunnel construction method with groundwater inflow control measures would generally be adopted. • During the tunnel excavation, pre-excavation grouting could be adopted to reduce the groundwater inflow and ensure that the tunnel would meet the long term water tightness requirements.	Minimize groundwater inflow	Contractor	Tunnel	Construction Phase	N/A
S6.8.8	**Measure to Minimize Impact on Corals** <u>Coral translocation</u> • It is recommended to translocate the affected coral colonies, except the locally common *Oulastrea crispata* , within the reclamation area and bridge footprint to the other suitable locations as far as practicable. • The coral translocation should be conducted during the winter months (November-March) in order to avoid disturbance during their spawning period (i.e. July to October). • A detailed coral translocation plan with a description on the methodology for pretranslocation coral survey, translocation methodology, identification/proposal of coral recipient site, monitoring methodology for posttranslocation should be prepared during the detailed design stage. • The coral translocation plan should be subject to approval by relevant authorities (e.g. EPD and AFCD) before commencement of the coral translocation. All the translocation exercises should be conducted by experienced marine ecologist(s) who is/are approved by AFCD prior to commencement of coral translocation. <u>Post translocation Monitoring</u> • A coral monitoring programme is recommended to assess any adverse and unacceptable impacts to the translocated coral communities • Information gathered during each posttranslocation monitoring survey should include observations on the presence, survival, health condition and growth of the translocated coral colonies. These parameters should then be compared with the baseline results collected from the pre-translocation survey.	Minimize loss of coral	Design team, contractor, project operator	Within reclamation areas and pier footprint	Prior construction	N/A
S6.8.9 S6.8.10	**Measure to Control Water Quality Impact** • Deployment of silt curtains around the active stone column installation points, opening of newly installed seawall and marine works area. • Diverting of the site runoff to silt trap facilities before discharging into storm drain; • Proper waste and dumping management; and • Standard good-site practice for land-based construction.	Control water quality impact, especially on suspended solid level; minimize the contamination of wastewater discharge, accidental chemical spillage and construction site runoff to the receiving water bodies	Design Team, contractor	Marine and landbased works area	Construction phase	WQO
S6.8.11	**Compensation for Vegetation Loss** • Felling of mature trees should be compensated by planting of standard or heavy standard trees within or in vicinity of the affected area as far as practicable. Such compensatory planting for trees should be provided with at least a 1:1 ratio. In addition, vegetation at the temporarily affected area should be reinstated with species similar to the existing condition.	Compensate for the vegetation loss	Design Team, contractor	Land-based works area	Construction phase	N/A
Fisheries Impact						
	Measure to Control Water Quality Impact	Control water quality impact, especially on				

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?
S7.7.3	• Deployment of silt curtains around the active stone column installation points, opening of newly installed seawall and marine works area.	[illegible] suspended solid level	Design Team / Contractor	Marine work area	Construction phase	WQO
Waste Management (Construction Phase)						
S8.6.3	**Good Site Practices and Waste Reduction Measures** • Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site; • Training of site personnel in site cleanliness, proper waste management and chemical handling procedures; • Provision of sufficient waste disposal points and regular collection of waste; • Appropriate measures to minimize windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers; and • Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors.	To reduce waste management impacts	Contractor	All work sites	Construction Phase	Waste Disposal Ordinance (Cap. 354) Land (Miscellaneous Provisions) Ordinance (Cap. 28)
S8.6.4	***Good Site Practices and Waste Reduction Measures (con't)*** • Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal; • Encourage collection of aluminium cans by providing separate labelled bins to enable this waste to be segregated from other general refuse generated by the workforce; • Proper storage and site practices to minimize the potential for damage or contamination of construction materials; and • Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste.	To achieve waste reduction	Contractor	All work sites	Construction Phase	Waste Disposal Ordinance (Cap. 354) Land (Miscellaneous Provisions) Ordinance (Cap. 28)
S8.6.5	**Good Site Practices and Waste Reduction Measures (con't)** The Contractor shall prepare and implement a WMP as part of the EMP in accordance with ETWB TCW No. 19/2005 which describes the arrangements for avoidance, reuse, recovery, recycling, storage, collection, treatment and disposal of different categories of waste to be generated from the construction activities. Such a management plan should incorporate site specific factors, such as the designation of areas for segregation and temporary storage of reusable and recyclable materials. The EMP should be submitted to the Engineer for approval. The Contractor should implement the waste management practices in the EMP throughout the construction stage of the Project. The EMP should be reviewed regularly and updated by the Contractor.	To achieve waste reduction	Contractor	All work sites	Construction Phase	ETWB TCW No. 19/2005
S8.6.6	**Good Site Practices and Waste Reduction Measures (con't)** • C&D materials would be reused in the project and other local concurrent projects as far as possible.	To achieve waste reduction	Contractor	All work sites	Construction Phase	ETWB TCW No. 19/2005
S8.6.7	**Storage, Collection and Transportation of Waste** Should any temporary storage or stockpiling of waste is required, recommendations to minimize the impacts include: • Waste, such as soil, should be handled and stored well to ensure secure containment, thus minimizing the potential of pollution; • Maintain and clean storage areas routinely; • Stockpiling area should be provided with covers and water spraying system to prevent materials from wind-blown or being washed away; and • Different locations should be designated to stockpile each material to enhance reuse.	To minimize potential adverse environmental impacts arising from waste storage	Contractor	All work sites	Construction Phase	ETWB TCW No. 19/2005
	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;					

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?
S8.6.8/ Waste Management Plan	• 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	ETWB TCW No. 19/2005
S8.6.9/ Waste Management Plan	**Storage, Collection and Transportation of Waste (con't)** • Implementation of trip ticket system with reference to DEVB TC(W) No. 6/2010, Trip Ticket System for Disposal of Construction & Demolition Materials, to monitor disposal of waste and to control fly-tipping at PFRFs or landfills. A recording system for the amount of waste generated, recycled and disposed (including disposal sites) should be proposed.	To minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	All work sites	Construction Phase	DEVB TCW No. 6/2010
S8.6.11 - S8.6.13/ Waste Management Plan	**Sorting of C&D Materials** • Sorting to be performed to recover the inert materials, reusable and recyclable materials before disposal off-site. • Specific areas shall be provided by the Contractors for sorting and to provide temporary storage areas for the sorted materials. • The C&D materials should at least be segregated into inert and non-inert materials, in which the inert portion could be reused and recycled in the reclamation as far as practicable before delivery to PFRFs. While opportunities for reusing the non-inert portion should be investigated before disposal of at designated landfills	To minimize potential adverse environmental	Contractor	All work sites	Construction Phase	DEVB TCW No. 6/2010 ETWB TCW No. 33/2002 ETWB TCW No. 19/2005
S8.6.17 – S8.6.20	**Sediments (con't)** • Requirements of the Air Pollution Control (Construction Dust) Regulation, where relevant, shall be adhered to during boring, excavation, transportation and disposal of sediments or cement stabilization of sediment. • A treatment area should be confined for carrying out the cement stabilization mixing and temporary stockpile. The area should be designed to prevent leachate from entering the ground. Leachate, if any, should be collected and discharged according to the Water Pollution Control Ordinance (WPCO). • In order to minimise the potential odour / dust emissions during boring, excavation and transportation of the sediment, the excavated sediments should be kept wet during excavation/boring and should be properly covered when placed on barges/trucks. Loading of the excavated sediment to the barge should be controlled to avoid splashing and overflowing of the sediment slurry to the surrounding water. • In order to minimise the exposure to contaminated materials, workers should, when necessary, wear appropriate personal protective equipments (PPE) when handling contaminated sediments. Adequate washing and cleaning facilities should also be provided on site.	To determine the best handling and treatment of sediment	Contractor	All works areas with sediments concern	Construction Phase	ETWB TCW No. 19/2005
	Sediments (con't) • The excavated sediments is expected to be loaded onto the barge and transported to the designated disposal sites allocated by the MFC. The excaveted sediment would be disposed of according to its determined disposal options and ETWB TC(W) No. 34/2002. • Stockpiling of contaminated sediments should be avoided as far as possible. If temporary stockpiling of contaminated sediments is necessary, the excavated sediment should be covered by tarpaulin and the area should be placed within earth bunds or sand bags to prevent leachate from entering the ground, nearby drains and surrounding water bodies. The stockpiling areas should be completely paved or covered by linings in order to avoid contamination to underlying soil or groundwater. Separate and clearly defined areas should be provided for stockpiling of contaminated and uncontaminated materials. Leachate, if any, should be collected and discharged according to the Water Pollution Control Ordinance (WPCO).					

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?
S8.6.24 - S8.6.28/ Waste Management Plan	• In order to minimise the potential odour / dust emissions during boring and transportation of the sediment, the excavated sediments should be kept wet during excavation/boring and should be properly covered when placed on barges. Loading of the excavated sediment to the barge should be controlled to avoid splashing and overflowing of the sediment slurry to the surrounding water. • The barge transporting the sediments to the designated disposal sites should be equipped with tight fitting seals to prevent leakage and should not be filled to a level that would cause overflow of materials or laden water during loading or transportation. In addition, monitoring of the barge loading shall be conducted to ensure that loss of material does not take place during transportation. Transport barges or vessels shall be equipped with automatic self-monitoring devices as specified by the DEP. • In order to minimise the exposure to contaminated materials, workers should, when necessary, wear appropriate personal protective equipments (PPE) when handling contaminated sediments. Adequate washing and cleaning facilities should also be provided on site. • Another possible arrangement for Type 3 disposal is by geosynthetic containment. A geosynthetic containment method is a method whereby the sediments are sealed in geosynthetic containers and, at the disposal site, the containers would be dropped into the designated contaminated mud pit where they would be covered by further mud disposal and later by the mud pit capping, thereby meeting the requirements for fully confined mud disposal.	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
S8.6.26/ Waste Management Plan	**Chemical Wastes.** • If chemical wastes are produced at the construction site, the Contractor would be required to register with the EPD as a Chemical Waste Producer and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. The Contractor shall use a licensed collector to transport and dispose of the chemical wastes, to either the Chemical Waste Treatment Centre at Tsing Yi, or other licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.	To ensure proper management of chemical waste	Contractor	All works sites	Construction Phase	Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes Waste Disposal (Chemical Waste) (General) Regulation
S8.6.27/ Waste Management Plan	**General Refuse** • General refuse should be stored in enclosed bins or compaction units separate from C&D material. A reputable waste collector should be employed by the contractor to remove general refuse from the site, separately from C&D material. Preferably an enclosed and covered area should be provided to reduce the occurrence of 'wind blown' light material.	To ensure proper management of general refuse	Contractor	All works sites	Construction Phase	Public Health and Municipal Services Ordinance (Cap. 132)
Impact on Cultural Heritage (Construction Phase)						
S9.6.4	**Dust and visual impacts** • Temporarily fenced off buffer zone with allowance for public access (minimum 1 m) should be provided; • The open yard in front of the temple should be kept as usual for annual Tin Hau festival; • Monitoring of vibration impacts should be conducted when the construction works are 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.	To prevent indirect vibration impact	Contractors	Work areas	Construction Phase	Vibration Limits on Heritage Buildings by CEDD; GCHIA; AMO.

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?
	• 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.					
Built Heritage Mitigation Plan	• Established Alert, Alarm and Action Level for the monitoring parameters. • To increase the instrumentation monitoring and reporting frequency. • To propose detailed action plan or contingency plan for the Engineer's approval when AAA Level is reached or exceeded.	To prevent vibration impacts	NE/2015/01	Tin Hau Temple	Construction Phase	Vibration Limits on Heritage Buildings by CEDD; GCHIA; AMO.
Landscape and Visual Impact (Construction Phase)						
Table 10.8.1/ Landscape Mitigation Plan	CM1 - Construction area and contractor's temporary works areas to be minimised to avoid impacts on adjacent landscape.	Avoid impact on adjacent landscape areas	CEDD (via Contractor)	General	Construction planning and during construction period	N/A
Table 10.8.1/ Landscape Mitigation Plan	CM2 - Reduction of construction period to practical minimum.	Minimise duration of impact	CEDD (via Contractor)	N/A	Construction planning	N/A
Table 10.8.1/ Landscape Mitigation Plan	CM3 - Topsoil, where the soil material meets acceptable criteria and where practical, to be stripped and stored for re-use in the construction of the soft landscape works. The Contract Specification shall include storage and reuse of topsoil as appropriate.	To allow re-use of topsoil	CEDD (via Contractor)	General	Site clearance	As per the Particular Specification
Table 10.8.1/ Landscape Mitigation Plan	CM4 - Existing trees at boundary of site and retained trees within site boundary to be carefully protected during construction. Detailed Tree Protection Specification shall be provided in the Contract Specification, under which the Contractor shall be required to submit, for approval, a detailed working method statement for the protection of trees prior to undertaking any works adjacent to all retained trees, including trees in contractor's works areas. (Tree protection measures will be detailed at Tree Removal Application stage).	To minimize tree loss	CEDD (via Contractor)	As per approved Tree Removal Application(s)	Site clearance and throughout construction period	ETWB TC 3/2006 and as per tree protection measures in Particular Specification
Table 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
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 roadworks	Throughout construction period	N/A
Table 10.8.1	CM12 - Minimise area of reclamation and design the edges sensitively to tie in with adjacent coastline characte	Minimise loss of Junk Bay and integration with existing coastlin	CEDD (via Contractor)	Temporary reclamation for barging points at TKO and Lam Tin and permanent reclamation for TKO Interchange slip roads and Road P2	Construction planning and reclamation stages	N/A
Landfill Gas Hazard (Design and Construction Phase)						

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?
S11.5.9	A Safety Officer, trained in the use of gas detection equipment and landfill gas-related hazards, should be present on site throughout the groundworks phase. The Safety Officer should be provided with an intrinsically safe portable instrument, which is appropriately calibrated and able to measure the following gases in the ranges indicated below: Methane 0-100% LEL and 0100% v/v Carbon dioxide 0-100% Oxygen 0-21%	Protect the workers from landfill gas hazards	Contractor	Project sites within the Sai Tso Wan Landfill Consultation Zone	Construction phase	EPD's Landfill Gas Hazard Assessment Guidance Note
S11.5.10 S11.5.25	**Safety Measures** • For staff who work in, or have responsibility for "at risk" area, such as all excavation workers, supervisors and engineers working within the Consultation Zone, should receive appropriate training on working in areas susceptible to landfill gas, fire and explosion hazards. • An excavation procedure or code of practice to minimize landfill gas related risk should be devised and carried out. • No worker should be allowed to work alone at any time in or near to any excavation. At least one other worker should be available to assist with a rescue if needed. • Smoking, naked flames and all other sources of ignition should be prohibited within 15m of any excavation or ground-level confined space. "No smoking" and "No naked flame" notices should be posted prominently on the construction site and, if necessary, special areas should be designed for smoking. • Welding, flame-cutting or other hot works should be confined to open areas at least 15m from any trench or excavation. • Welding, flame-cutting or other hot works may only be carried out in trenches or confined spaces when controlled by a "permit to work" procedure, properly authorized by the Safety Officer (or, in the case of small developments, other appropriately qualified person). • The permit to work procedure should set down clearly the requirements for continuous monitoring for methane, carbon dioxide and oxygen throughout the period during which the hot works are in progress. The procedure should also require the presence of an appropriately qualified person, in attendance outside the 'confined area', who should be responsible for reviewing the gas measurements as they are made, and who should have executive responsibility for suspending the work in the event of unacceptable or hazardous conditions. Only those workers who are appropriately trained and fully aware of the potentially hazardous conditions which may arise should be permitted to carry out hot works in confined areas. • Where there are any temporary site offices, or any other buildings located within the Sai Tso Wan Landfill Consultation Zone which have enclosed spaces with the capacity to accumulate landfill gas, then they should either be located in an area which has been proven to be free of landfill gas (by survey using portable gas detectors); or be raised clear of the ground by a minimum of 500mm. This aims to create a clear void under the structure which is ventilated by natural air movement such that emission of gas from the ground are mixed and diluted by air. • Any electrical equipment, such as motors and extension cords, should be intrinsically safe. During piping assembly or conduiting construction, all valves/seals should be closed immediately after installation. As construction progresses, all valves/seals should be closed to prevent the migration of gases through the pipeline/conduit. All piping /conduiting should be capped at the end of each working day. • During construction, adequate fire extinguishing equipment, fire-resistant clothing and breathing apparatus (BA) sets should be made available on site. • Fire drills should be organized at not less than six monthly intervals. • The contractor should formulate a health and safety policy, standards and instructions for site personnel to follow.	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

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?
	• All personnel who work on the site and all visitors to the site should be made aware of the possibility of ignition of gas in the vicinity of excavations. Safety notices (in Chinese and English) should be posted at prominent position around the site warning danger of the potential hazards. • Service runs within the Consultation Zone should be designated as "special routes"; utilities companies should be informed of this and precautionary measures should be implemented. Precautionary measures should include ensuring that staff members are aware of the potential hazards of working in confined spaces such as manholes and service chambers, and that appropriate monitoring procedures are in place to prevent hazards due to asphyxiating atmospheres in confined spaces. Detailed guidance on entry into confined spaces is given in Code of Practice on Safety and Health at Work in Confined Spaces (Labour Department, Hong Kong). • Periodically during ground-works construction within the 250m Consultation Zone, the works area should be monitored for methane, carbon dioxide and oxygen using appropriately calibrated portable gas detection equipment. The monitoring frequency and areas to be monitored should be set down prior to commencement of ground-works either by the Safety Officer or an approved and appropriately qualified person.					
S11.5.26 - S11.5.31	**Monitoring** ● Routine monitoring should be carried out in all excavations, manholes, chambers, relocation of monitoring wells and any other confined spaces that may have been created. All measurements in excavations should be made with the extended monitoring tube located not more than 10 mm from the exposed ground surface. Monitoring should be performed properly to make sure that the area is free of landfill gas before any man enters into the area. ● For excavations **deeper than 1m**, measurements should be carried out: • at the ground surface before excavation commences;- • immediately before any worker enters the excavation; • at the beginning of each working day for the entire period the excavation remains open; and • periodically throughout the working day whilst workers are in the excavation. ● For excavations **between 300mm and 1m deep**, measurements should be carried out: • directly after the excavation has been completed; and • periodically whilst the excavation remains open. ● For excavations less than 300mm deep, monitoring may be omitted, at the discretion of the Safety Officer or other appropriately qualified person. ● Depending on the results of the measurements, actions required will vary and should be set down by the Safety Officer or other appropriately qualified person. ● The exact frequency of monitoring should be determined prior to the commencement of works, but should be at least once per day, and be carried out by a suitably qualified or qualified person before starting the work of the day. Measurements shall be recorded and kept as a record of safe working conditions with copies of the site diary and submitted to the Engineer for approval. The Contractor may elect to carry out monitoring via an automated monitoring system.	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
S11.5.32	The hazards from landfill gas during the construction stage within the Sai Tso Wan Landfill Consultation Zone should be minimized by suitable precautionary measures recommended in Chapter 8 of the Landfill Gas Hazard Assessment Guidance Note.	construction stage within the Sai Tso Wan Protect the workers from landfill gas hazards	Contractor	Project sites within the Sai Tso Wan Landfill Consultation Zone	Construction phase	EPD's Landfill Gas Hazard Assessment Guidance Note

Table II - Observation / Reminder / Non-compliance made during Site Audit

Key:
✓ 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

EIA Ref	Recommended Mitigation Measures	Contract No.	Work Sites	Details of Reminder/Observation	Recorded Date	Status
Air Quality						
S3.8.1	Watering eight times a day on active works areas, exposed areas and paved haul roads	NE2015/01	Portion I	Sand piles and dry surface in Portion I should be covered by tarpaulins and /or be watered.	25 Mar 2020	#
Construction Noise Impact						
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.	NE2015/01	CKLR	An acoustic sheet of a breaker in CKLR of Portion I was broken. Contractor is reminded to repair it to reduce noise impacts.	25 Mar 2020	#
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.	NE2015/02	Portion IX	The Contractor is reminded to repair the semi-enclosure as soon as possible.	12 Mar 20 19 Mar 20	✓
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.	NE2015/02	Portion IX	The Contractor is reminded to apply noise barrier before the PME(s) operates.	12 Mar 2020	✓
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.	NE2015/02	C2 Marine Works Area	Noise mitigation measure should provide on the derrick barge before starting the works.	26 Mar 2020	#
Water Quality Impact						

EIA Ref	Recommended Mitigation Measures	Contract No.	Work Sites	Details of Reminder/Observation	Recorded Date	Status
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.	NE2015/01	C1 Marine Works Area	Inadequate silt socks/sandbags and gaps between them could make some silts discharge into water and tracks of dry mud at edges of the barge point were observed. Contractor is reminded to provide enough measures such as provide bund capacity/ enough materials to prevent accident leakage especially when it is rainy.	19 Feb 20 26 Feb 20	✓
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.	NE2015/01	C1 Marine Works Area	Mud stains were observed near one edge of the roro barge and between gaps of the gangway. Contractor is reminded to put sandbags/ silt socks to cover whole boundary and possible areas of leakage.	18 Mar 2020	✓
Ecological Impact						
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Fisheries Impact						
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Waste Management						
ETWB TCW No. 19/2005	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.	NE2015/02	Portion IX	The excavator in Portion IX shall be well-maintained and avoid oil leakage	27 Feb 2020	✓
ETWB TCW No. 19/2005	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.	NE2017/02	C3 Works Area	The oil stain nearby generator MG-09 shall be cleaned up.	5-Mar-20 19-Mar-20	✓
Landscape and Visual Impact						
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Landfill Gas Hazards						
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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
437	27-Mar-20	27-Mar-2020 / Surcharge Area (c2)	Resident of Ocean Shores	Noise	Low Frequency Noise during Midnight	Y	The noise source was the malfunctioned dewatering pumps. The details shall be referred to CIR-N103	Draft CIR submitted
436	26-Mar-20	26-Mar-20/ Portion IVC	District Council Member (Mr. Wong)	Noise	Noise nuisance, vibration and spectedly insufficient mitigation measures in Lam Tin	Y	Investigation unfdergoing	Investigation undergoing
435	23-Mar-20	23-Mar-20/ Lam Tin Tunnel	Resident of Cha Kwo Ling Village	Noise	Groundborne Noise from Blasting in the Evening	Y	Blasting was conducted at the time of complaint. The vibration monitoring conducted near Tin Hau Temple was considered the vibration level was acceptable. The details shall be referred to CIR-N102.	Draft CIR submitted
434	23-Mar-20	20-Mar-20/ Lam Tin	District Council Member (Mr. Wong)	Noise	Noise nuisance from Construction Works during Holiday	Y	See compliant #427.	Draft CIR submitted
433	20-Mar-20	20-Mar-20/ Lam Tin	Resident of Hong Pak Court	Noise	Noise nuisance, vibration and suspectedly insufficient mitigation measures in Lam Tin	Y	Investigation undergoing	Investigation undergoing

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
432	18-Mar-20	18-Mar-20 / Portion IVC	Resident of Yau Lai Estate	Noise	Noise nuisance, vibration and suspectedly insufficient mitigation measures in Lam Tin	Y	Investigation undergoing	Investigation undergoing
431	14-Mar-20	14-Mar-20 / Portion IVC	Residents of Yau Lai Estate	Noise	Noise nuisance, vibration and suspectedly insufficient mitigation measures in Lam Tin	Y	Investigation undergoing	Investigation undergoing
430	17-Mar-20	17-Mar-20 / Surcharge Area / C2	Anonymous	Water	Muddy Water at the Surcharge Area	N	The “muddy water” was created by the tug boat’s screw propeller. The Contractor claimed the propeller stirred up seedbed sediment and generated “muddy water”. The details shall be referred to CIR-W13.	Draft CIR submitted
429	10-Mar-20	10-Mar-20 / Site Nearby Park Central	Resident of Park Central	Noise	Noise nuisance in early morning (Mar 2020)	Y	No construction works had been conducted at the time of complaint for C3 and the major works area in C2 was at least 300m away from the complainant. It is believed that the major noise source was coming from ASD’s work site. The details shall be referred to CIR-N100	Draft CIR submitted
428	4-Mar-20	Not Specified / Tseung Kwan O	Mr. Lui, Sai Kung District Council	Odour / Noise	Odour and low frequency noise nuisance from construction site	Y	Only minor works had been conducted at the time of complaint. No direct evidence showed that the odour source was originated from C3. The suspected nuisance source is believed to be ASD’s works area. The details shall be referred to CIR-C33	Draft CIR submitted

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
427	1-Mar-20	1-Mar-20 / Portion IVC	Resident of Yung Kai House	Noise	Noise nuisance from Construction Works during Holiday	Y	No construction works were conducted at the concerned locations and no direct evidence showing the complaint is project-related. The details shall be referred to CIR-N99	Draft CIR submitted
426	19-Feb-20	11-Feb-20 / Works area outside TKL Sports Centre	Anonymous	Noise	Noise nuisance from breaking works	Y	Refer to complaint #423 and #424.	Draft CIR submitted
425	18-Feb-20	29-Jan-2020 / Marine works Area	Mr. Chan from Ocean Shore		Noise nuisance from barge in morning	Y	No works had been conducted in the time period of complaint. The noise is believed to be non-project-related. The details shall be referred to CIR-N95.	Draft CIR submitted
424	11-Feb-20	8 and 11-Feb-2020 / Site near TKL Station	Resident of Park Central		Noise nuisance from breaking works	Y	The complaint was valid and the contractor had been operating only 1 breaker at a time. The contractor is suggested to further increase the mitigation measures to reduce impact to the surrounding neighborhood. The details shall be referred to CIR-N97	Draft CIR submitted
423	3-Feb-20	03-Feb-2020 / Site Near TKL Station				Y		
422	3-Feb-20	2-Feb-20 / Lam Tin Interchange	Resident of Cheuk Lai House, Yau Lai Estate		Noise nuisance suspected to be related to works involving metal hammering on Site near EHC	Y	No construction activities were conducted at the concerned locations during the period of complaint. The Contractor is reminded to keep conducting good site practice and strictly follows the requirements of approved CNP. The details shall be referred to CIR-N98	Closed
421	21-Jan-20	21-Jan-20 / Portion IX	Ocean Shores Residents	Noise	Noise nuisance due to Blasting at midnight	Y	Blasting was conducted around 1:30am due to the vicinity of the Railway protection zone of MTR. The Contractor is reminded to keep the blast door closed during blasting to minimize noise impacts and re-schedule blasting to less sensitive hours as far as practicable. The details shall be referred to CIR-N96.	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
420	7-Jan-20	7-Jan-20 / Portion IX	Ocean Shores Residents		Irritating loud noise nuisance from Portion IX (C2)	Y	See complaint #417	Closed
419	7-Jan-20	Sundays before 7-Jan-20 / Tunnel Works	Resident of Hong Pak Court		Noise nuisance from Tunnel Works	Y	See Complaint #416.	Closed
418	7-Jan-20	5-6-Jan-20 / C1 Marine Works Area	Ocean Shores Residents		High-frequency noise during night-time	Y	The high frequency noise was believe to be noise emitted from the marine works area of C1. The details shall be referred to CIR-N94.	Closed
417	3-Jan-20	2-Jan-20 / Portion IX	Former District Member (Mr. Chan)		Annoying noise emission and inefficient noise mitigation measures	Y	The noise source is believed to come from a breaker and mitigation was insufficient. The Contractor was requested to strictly follow the Noise Mitigation Plan. The details shall be referred to CIR-N93.	Closed
416	29-Dec-19	29-Dec-19 / Non-specific	Resident of Hong Pak Court	Noise	Groundborne Noise from Works area	Y	Project-related with valid CNP. Contractor is reminded to reduce noise emission and prevent breaking and noisy activities during restricted hours. The details shall be referred to CIR-N92.	Closed
415	27-Dec-19	25-Dec-19 / Lam Tin Interchange (Portion IVC)	Resident of Yau Estate	Noise	Noise nuisance from Portion IVC	Y	Non project-related due to maintenance works of East Cross-harbor Tunnel. The details shall be referred to CIR-N91.	Closed
414	24-Dec-19	22-Dec-19 / Lam Tin Interchange (Portion IVC)	Resident of Yau Estate	Noise	Piling noise nuisance near Lam Tin Interchange	Y	Project-related with valid CNP. Contractor is reminded to reduce noise emission and prevent breaking and noisy activities during restricted hours. The details shall be referred to CIR-N91.	Closed
413	24-Dec-19	24-Dec-19 / Portion IX of Contract 2	Resident of Capri & Ocean Shores	Noise	Loud and continuous noise emission from Portion IX	Y	No breaking activity was conducted by the C3. It was believed that C2 was the major noise source and the mitigation measures were insufficient. The details shall be referred to CIR-C32.	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
412	19-Dec-19	14-Dec-19 / marine works area	Resident of Ocean Shores	Noise	Noise nuisance from the marine works area	Y	The major construction work was driven by pin piles. The noise emitted due to the construction activities is considered to be reduced to an acceptable level as no NSR falls under the ambit of 300m study area of the work site. Details should be referred to CIR-N90.	Closed
411	2-Dec-19	30-Nov-19 / Construction Sites Outside TKL Sports Center	Resident of Park Central	Air / Noise	Non-effective noise mitigation measures and related dust and noise nuisance	Y	The construction noise created by breaking works are considered non-project related due to the large separation distance between noise source and the Complainant's Location. Major dust emission from the works area next to C3 was recorded. The Contractor is reminded to provide regular watering to dusty works. Details should be referred to CIR-C31.	Closed
410	28-Nov-19	25-Nov-19 / Portion 4C	Anonymous	Noise	Noise nuisance from Lam Tin Works Area and operation hours	Y	Refer to Complaint #408	Closed
409	27-Nov-19	20-Nov-19 27-Nov-19 / Construction Sites near Po Yap Road & Chui Ling Road	Resident of Park Central	Air / Noise	Dust emission due to excavation works and noise nuisance from Piling works	Y	Although noise barrier had been erected and around the breakers, the direct line of sight to the NSRs at Park Central could not be totally blocked. The Contractor is recommended to provide cantilevered noise barrier with noise absorbing materials to minimise noise impact as far as practicable. Details should be referred to CIR-C31.	Closed
408	25-Nov-19	Non-specific (Nov-19) / Portion 4C	Resident of Yau Lai Estate	Noise	Serious Noise Nuisance from Lam Tin Works Area	Y	Despite the Contractor had applied different noise mitigation measures (e.g. semi enclosure and noise barrier). Environmental deficiency was observed during site audit session. The Contractor is recommended to apply alternative noise mitigation measures to improve the situation. The details shall be refer to CIR-N89.	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
407	12-Nov-19	Non-specific (Nov-19) / LT Construction Site	Non-specified(Complainant has previously made complaints on LTI)	Operation Hours	Inquiries on operating hours & Noise Nuisance	N	The time of complaint falls under day-time. According to the Contractor and RE, the general starting time of construction works are 08:15 on normal week days. The Contractor had avoid conduct noisy works on morning to minimize noise impacts for the nearby residents. The details shall be refer to CIR-O3	Closed
406	5-Nov-19	5-Nov-19 / Tunnel near TKO	District Council Member (Mr. Chan)	Noise	Noise nuisance from Blasting activities during night-time	Y	No blasting was carried out on that night. The construction activities were conducted inside the tunnel with the blast door closed. The CNP that the Contractor held remained valid during the time of complaint. The details shall be refer to CIR-N88	Closed
405	29-Oct-19	17-Oct-2019 / Marine Works area near Ocean Shore	District Council Member (Mr. Chan)	Noise	Daytime times noise nuisance	Y	The complaint details does not tally up with the information provided with the Contractor and RE. Referring to the Contractor, there was construction works was starting at 09:00. Noise mitigation measures, such as acoustic mats, were applied to minimize noise impact. The details shall be refer to CIR-N87	Closed
404	15-Oct-19	12-Oct-19 / Marine Works area near Ocean Shore	Residents of Ocean Shores	Noise / Working Hours	Noise nuisance due to operation of barge on Saturday early morning	Y	The time of complaint falls within daytime and the major works conducted are dredging and reclamation. The contractor did not require any extra mitigation measures. The contractor had applied sound-proofing mat on the engine floor of the barges and is recommended to strictly follow the requirements of noise mitigation plan. The details shall be refer to CIR-N86	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
403	15-Oct-19	Oct-19 (Not Specified) / C2 Construction Site	Residents of Ocean Shores	Noise / Working Hours	Operation of marine construction works during late hours	Y	The major construction works is trimming works for the rock mount during the time period of complaint. Mitigation measures provided by the Contractor included provision of noise insulating mats to the engine floor of the barges and shorten the work hours by ending construction works on or before 21:00 since early Oct 2019. Details shall be referred to CIR-N85.	Closed
402	10-Oct-19	09-Oct-2019/ Site near TKO CPC	Residents of Ocean Shores	Noise	Noise nuisance of construction works at marine work area during early morning	Y	No construction activity at both the Cavern near the BCMCP Bridge and Platform 1B, including the barge, in particular during the complaint period between 2am and 3am on 9 Oct 2019. Since no works had conducted during the time of complaint, no mitigation measures are required. The details shall be referred to CIR-N84.	Closed
401	5-Oct-19	05-Oct-2019 / C2 Portion IX	District Council Member (Mr. Chan)	Noise	High noise level from works area during daytime	Y	The time period of complaint falls under day-time and therefore the Contractor is required to carry out mitigation measures according to the latest CNMP only. The construction activities had been reviewed and no non-compliance was identified. No Limit Level of Exceedance at daytime was recorded during October 2019. For mitigation measures, the Contractor had set up sound-proofing mats and SlientUp to reduce noise impact. The details shall be refer to CIR-N83.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
400	16-Sep-19	10-Sep-19 / TKO Marine Works Area	District Council Member (Mr. Chan)	Water	Muddy water discharge and deficiency in water quality mitigation measures	N	With accordance to the Contractor and RE, the silt curtains were deployed regarding to SCDP ver. 8 since 10-Sep-19, site inspection on 12-Sep-19 also showed the silt curtains were deployed properly. Despite there are chances of accidental muddy water discharge due to the removal of cofferdam on 13-Sep-19, local silt curtain had been place in order to minimize the unavoidable impact by related loading and unloading of fill materials. No muddy water had been observed outside the silt curtain area. Nevertheless, the Contractor is recommend to expand the coverage of the local silt curtain in order to well-confine the muddy water released from the grab. On top of that, the Contractor shall always follow the SCDP to ensure the minimization of impacts. Details should be referred to CIR-C30.	Closed
399	16-Sep-19	16-Sep-19 (Not Specified) / LT Interchange Potion III	Resident of Bik Lai House, Yau Lai Estate	Noise	Noise emission from the tunnel entrance (Potion III)	Y	No construction works was carried out during the time of complaint. Details should be referred to CIR-N82.	Closed
398	16-Sep-19	13-Sep-19 / Works Area of LT-TKO Tunnel outside Tiu King Leng MTR Station	Anonymous	Air / Water	Dark smoke emission and muddy water discharge from the marine work vessels near shore	N	No dark smoke emission was observed during the site inspection conducted in the week of the complaint. The Contractor has applied an air filtering tank to clean the exhaust from the barge before emission. Details should be referred to CIR-C30.	Closed
397	6-Sep-19	30 Aug-19 / Works area near Ocean Shores	Resident of Ocean Shores	Noise / Working hours	Noise emitted from Barge during Evening times	Y	The unloading works had been reviewed and no limit level of exceedance were recorded during August to early September. Since the period of complaint falls under evening times, no mitigation measures were required by the CNP. Details should be referred to CIR-N81.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
396	6-Sep-19	30 Aug-19 / Works area near Ocean Shores	Resident	Noise	Noise nuisance from LT-TKO Tunnel	Y	The major works conducted were shortcreting, mucking out, maintaining, drilling and unloading. No limit level of exceedance in the restricted hours (19:00-23:00) between late August and early September were recorded. The Contractor is recommended to keep following noise mitigation plan to minimize noise nuisance. Details should be referred to CIR-N80.	Closed
395	6-Sep-19	31 Aug-19 / Works area near Ocean Shores	District Council Member (Mr. Chan)	Noise	Noise Nuisance during evening and night times	Y		Closed
394	6-Sep-19	Not specified (Sep-19) / Works area near Ocean Shores	Anonymous	Noise / Operating Hours	Noise nuisance during Evening & occasionally in Night time	Y		Closed
393	30-Aug-19	30 Aug-19 / Marine works Area	District Council Member (Mr. Chan)	Water	Alleged muddy water discharge	N	High rainfall was recorded during period of complaint, therefore muddy water discharge at outfall from upstream and some surface runoff within the site is expected. However, no major silt curtain deficiency was observed during on-site observation and no leakage of muddy water from the marine works area was observed. Details should be referred to CIR-W12.	Closed
392	29-Aug-19	20-27 Aug-19/ Portion 4C	Resident of Bik Lai House, Yau Lai Estate	Noise	Noise nuisance from the operation of heavy machineries and missing of noise mitigation measures at Portion 4C	Y	A noise insulating cover was erected before the period of complaint, however, due to restricted site condition in the relocated breaking works area, the erection of the cover could not be carried out. Nevertheless, movable noise barriers and local semi-enclosure was adopted for breaking works. Details should be referred to CIR-N79.	Closed
391	26-Aug-19	10-Jul-19 / Construction site near Ocean shore	District Council Member (Mr. Chan)	Noise	Operation of construction works during late hours	Y	1 derrick barge was operated during the period of complaint with valid CNP. Regular maintenance and checking should be conducted for all operating barges. Details should be referred to CIR-N78.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
390	26-Aug-19	31-Jul-19 / Construction site near Ocean shore	District Council Member (Mr. Chan)	Noise	Intermittent noise emitted from collision during night-time	Y	The noise source is suspected to be the collision between cofferdam and its broken part as the cofferdam was found damaged next morning. No construction was conducted at night time of 31 July. The contractor is recommended to maintain and check cofferdam regularly. Details should be referred to CIR-N77.	Closed
389	29-Jul-19	17 to 24-Jul-19 / Marine Construction Site near O King Road	Resident of Ocean Shore	Noise	Noise nuisance from the barge operating in reclamation works area near O King Road during evening times.	Y	1 derrick barge was operated during the period of complaint with valid CNP. Regular maintenance should be provided for all operating barges. Details shall refer to CIR-N76.	Closed
388	12-Jul-19	8-Jul-19 / Construction Site near Ocean Shores	District Council Member (Mr. Chan)	Noise	Noise nuisance and inadequate noise barrier at the construction site near Ocean shore	Y	Although Contractor has adopted a noise mitigation measure of drill rigs at Portion IV near Ocean Shore such as noise barrier with sound insulating fabric, the existing noise barrier in Portion IX and some in Portion IV are not adequate in screening the direct line of sight to Ocean Shore. Details should be referred to CIR-N75.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
387	12-Jul-19	8 to 12-Jul-19 / Portion 4C of C1 Construction Site	Resident of Bik Lai House	Noise	Breaking noise emitted from the operation of 2 PMEs at Portion 4C during weekday daytime.	Y	Two breakers were operated intermittently at the Portion 4C of C1 construction site during the period of complaint between 07:00 to 19:00. As observed during the site inspection/noise monitoring, movable noise barrier could not completely screen off the direct line-of-sight from PMEs to Yau Lai Estate. Contractor has adopted mitigation measure to minimize the noise impact from breakers including using a noise barrier with noise insulating fabric, adopted a less noisy hydraulic spiting method for breaking works and has been developing a semi-enclosure noise barrier to replace the existing movable noise barrier. Details should be referred to CIR-N74.	Closed
386	10-Jul-19	9 to 10-Jul-19 / Not Specific	District Council Member (Mr. Chan)	Noise	Noise nuisance and disturbance from the TKOLT tunnel construction site involves intermittent noise emitted from collision during night-time.	Y	No construction works was carried out during the time of complaint. Details should be referred to CIR-N73.	Closed
385	4-Jul-19	Late Jun-19 to 4-Jul-19 / Reclamation Area	Resident of Ocean Shore	Noise	The reclamation works continued into the evening during weekdays and works were also operated on Sunday.	Y	See Complaint no 384.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
384	3-Jul-19	3-Jul-19 / Near Ocean Shore	District Council	Noise	The construction site was constantly emitting metallic percussion noise in the early morning.	Y	The concerned metallic percussion noise source was suspected from the collision between the detached sheet pile and the adjacent sheet pile of the broken cofferdam. The detached sheet pile was fixed by re-sealing it to the adjacent sheet pile. Details should be referred to CIR-N72.	Closed
383	29-Jun-19	Jun-19 / Lam Tin Interchange	Resident of Yau Lai Estate, Yung Lai House	Noise	Noise nuisance from construction works during weekday daytime and evening times. Noise barriers was found missing in certain parts of the construction areas.	Y	Some noise mitigation measures were observed during the site inspection including idle equipment were turned off and noise barrier has been erected close to noisy PMEs in the right direction facing Yau Lai Estate. However, the above mitigation measures were not applied to whole construction site such as noise barriers were not placed close enough to the noisy PMEs due to the uneven surface and other inconvenience. Details should be referred to CIR-N71.	Closed
382 (N08/RE/000 11019-19)	17-Jun-19	6-Jun-19 / Cofferdam area	District Council	Air	Dark smoke nuisance from the tug boat inside the cofferdam area.	N	During site audit, no violation of the Air Pollution Control (Smoke) Regulation from the construction site was observed by the ET. Air filter has been replaced on derrick barge to reduce the dark smoke emission upon the receipt of the complaint. The Contractor is recommended to replace the air filters regularly. Details should be referred to CIR-A15.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
381 (N08/RE/00 015098-19)	11-Jun-19	1-Jun-19 / Near confferdam	District Council	Water	Muddy water discharge from construction site near the cofferdam area on 4 June 19	N	High volume of upstream muddy water was collected due high rainfall according to reports and observation. As a result, the muddy water from upstream was discharged into the Junk Bay via various outfalls in Junk Bay, as observed during the rainstorm events. No sand plume within the cofferdam area and no muddy water discharge at the designated discharge point within the Site was identified during the site inspection and water quality monitoring. Details should be referred to CIR-W11.	Closed
380	11-Jun-19	6-Jun-19 / Near Tong Yin Street	Resident of Ocean Shore	Air	Odour nuisance from construction site near Tong Yin Street	N	No oil leakage from mobile crane was observed during the site inspection in June 2019. According to the testing reports, all ULSD fuel applied in the PMEs during the construction period contains sulphur content lower than 0.005% by weight, which complied with the Air Pollution Control (Fuel Restriction) Regulations. Details should be referred to CIR-A14.	Closed
379	11-Jun-19	4-Jun-19 / Near cofferdam area	General Public	Water	Discharge of mud water into Junk Bay from TKOLT construction site	N	See Complaint no 381.	Closed
378	11-Jun-19	13-Apr-19 / Near cofferdam area	General Public	Air	Dark smoke nuisance from construction site involves derrick barge operation near cofferdam area (daytime)	N	No violation of the Air Pollution Control (Smoke) Regulation was recorded from the construction site was observed. The contractor was recommended to install carbon filter at smoke exhaust of the barge as a more effective mitigation measures. Details should be referred to CIR-C27.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
377	11-Jun-19	2-Jun-19 / Lam Tin Interchange	General Public	Noise	Complaint about the noise nuisance from Lam Tin Interchange construction site in daytime holiday.	Y	Only drilling works inside the tunnel was conducted during daytime under valid CNP. Groundborne noise is considered as the major factor contributing to the noise nuisance, the Contractor are recommended to re-schedule the drilling works inside the tunnel to less sensitive hours. Details should be referred to CIR-N70.	Closed
376	11-Jun-19	9-Jun-19 / Near Yau Lai Estate	Resident of Yau Lai Estate	Noise	Complaint about the noise nuisance near Yau Lai Estate involves vehicle movement (roller) during morning to 15:00 in holiday.	Y	No works involving roller was involved. Only drilling works inside the tunnel and ddismantling of crusher shelter was conducted during Sunday daytime under valid CNP. Groundborne noise is considered as the major factor contributing to the noise nuisance, the Contractor are recommended to re-schedule the drilling works inside the tunnel to less sensitive hours. Details should be referred to CIR-N70.	Closed
375	11-Jun-19	9-Jun-19 / Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Complaint about the noise nuisance from Lam Tin Interchange construction site in daytime holiday.	Y	See Complaint no. 376.	Closed
374	4-Jun-19	3-Jun-19 / Near Ping Tin Estate	Resident of Ping Sin House in Ping Tin Estate	Noise	Vibration from the construction of Lam Tin Interchange in evening time at around 20:00	Y	Groundborne noise is considered as the major factor contributing to the noise nuisance. The reverse circulation drilling works may have emitted groundborne noise, however, only 1 unit was used in Portion II. Therefore, blasting is considered as the major cause for the vibration. Details should be referred to CIR-N69.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
373	4-Jun-19	2-Jun-19 / Near ocean Shore	Resident of Ocean Shore	Noise	Complaint about the noise nuisance from the construction site near Ocean Shore and the construction site operation in day time holiday.	Y	No construction activity was conducted at the time of complaint as confirmed by Engineer. Therefore, the noise nuisance was not due to the construction site. Details should be referred to CIR-N68.	Closed
372	4-Jun-19	1-Jun-19 / Near ocean Shore	Resident of Ocean Shore	Others	Complaint about the construction site operation in the early morning on Saturday.	N	See Complaint no. 373.	Closed
371	30-May-19	30-May-19 / Near Ocean Shore	Resident of Ocean Shore	Noise	Noise nuisance from construction site near Ocean Shore during night time.	Y	See Complaint no. 373.	Closed
370 (N08/RE/00 015098-19)	29-May-19	19 & 26-May-19 / Near Ocean Shore	Resident of Ocean Shore	Noise	Noise nuisance about dredging mud and loudspeaker in the construction site near Ocean Shore during daytime holiday.	Y	Noise barriers/ Noise absorptive materials have been used to mitigate the noise generated from the construction works. Only walkie-talkies were used for communication in the construction site. Details should be referred to CIR-N67.	Closed
369	13-May-19	Not specific / Lam Tin interchange	Resident of Yau Lai Estate	Noise	Noise nuisance from the blasting work inside tunnel which involves explosion noise impact during midnight	Y	Contractor has adopted a mitigation measure for reduce the blasting noise impact from the tunnel such as blasting doors and did not conduct blasting works during mid-night blasting since mid-May 2019. Details should be referred to CIR-N66.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
368	19-May-19	19-May-19 / Near cofferdam area	General Public	Noise	Noise nuisance from barge with in cofferdam area in daytime holiday	Y	See Investigation / Mitigation Action for complaint no. 361.	Closed
367	5-May-19	5-May-19 / Lam Tin Tunnel - TKO entrance	Resident near Lam Tin Tunnel - TKO entrance	Noise & Air	Noise and air nuisance from construction near Lam Tin Tunnel - TKO entrance	Y	The major works during the period of complaint is scaling by breaker on day time holiday (Sunday). The works is compiled with CNP and no air quality action and noise limit level exceedance during the monitoring. Regarding the existing air quality mitigation measures, the water spray for the breaker was insufficient and the dust emission during unloading of dusty materials was observed. As the review of exiting noise mitigation measure, a broken noise SilentMat was found on the hammer of breaker. According to the above observation, Contractor has adopted serval improvement such as conduct a sufficient water spray during breaking and unloading materials, replaced the noise SilentMat of the breaker and placed the noise barrier between PME and NSRs. Details should be referred to CIR-C29.	Closed
366	4-May-19	4-May-19 / Lam Tin Interchange	Resident of Ping Tin Estate	Noise	Noise nuisance from construction of Lam Tin Interchange in daytime.	Y	Regarding the observation during site inspection, the hammer of the breaker was surrounded by a broken noise absorption material and a noise barrier of a driller was placed in the incorrect direction of NSRs. Contractor has improved the above mitigation measures including replaced the noise absorption materials and relocated the noise barrier to facing the NSRs. Details should be referred to CIR-N65.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
365	1-May-19	1-May-19 / Lam Tin Interchange	Resident of Ping Tin Estate	Noise	Noise nuisance from construction of Lam Tin Interchange in daytime.	Y	See investigation / mitigation actions for Complaint No.366	Closed
364	1-May-19	1-May-19 / Lam Tin Interchange	Resident of Ping Tin Estate	Noise	Noise nuisance from construction of Lam Tin Interchange in daytime	Y	See investigation / mitigation actions for Complaint No.366	Closed
363	30-Apr-19	6th – 22th April -19 / Lam Tin Interchange	Resident of Ping Tin Estate	Noise	Noise nuisance from construction of Lam Tin Interchange in daytime and evening time	Y	See investigation / mitigation actions for Complaint No.366	Closed
362 (N08/RE/00 013396-19)	8-May-19	7-May-2019 / Junk Bay	District Council	Noise	Noise nuisance from marine works in the Junk Bay in the night-time (06:45)	Y	No marine works in the Junk Bay was conducted as confirmed by RE. No CCTV footage was recorded during the time of complaint. It was suggested that Contractor should conduct 24 hours CCTV monitoring. Details should be referred to CIR-N64.	Closed
361	7-May-19	28 Apr 2019 / Cofferdam Area	General Public	Noise	Noise nuisance from construction site at cofferdam area in holiday	Y	The reclamation works involves barges during the time of complaints has been compiled with the CNP. As review of existing mitigation measure, the sound proofing canvases for the barges were hanged up. Details should be referred to CIR-N63.	Closed
360	2-May-19	27-04-2019/ Construction in Tong Tin Street	General Public	Noise	The complaint about the noise nuisance from cofferdam area during daytime and evening-time.	Y	The light source was found from the lighting of derrick barge within the cofferdam area and the noise source was found from the barge during filling works. Contractor has adopted The sound proofing canvases for the derrick barge was hanged up but no light	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
359	30-Apr-19	30-04-2019/ Near Ocean Shore	Resident of Ocean Shore	Noise	The complaint about the noise nuisance involve percussion noise near Ocean Shore during daytime.	Y	mitigation measure. Details should be referred to CIR-C28.	Closed
358	30-Apr-19	27-04-2019/ Near cofferdam area	General Public	Noise	The complaint about the noise nuisance during evening time.	Y		Closed
357	23-Apr-19	20-04-2019/ Near cofferdam area	General Public	Noise	The complaint about the noise nuisance near cofferdam area during daytime.	Y		Closed
356	23-Apr-19	19-04-2019/ Near cofferdam area	General Public	Noise	The complaint about the noise nuisance near cofferdam area during holiday.	Y		Closed
355	17-Apr-19	17-04-2019/ Near cofferdam area	General Public	Noise & light	The complaint about the noise nuisance and light pollution near cofferdam area during evening-time.	Y		Closed
354	30-Apr-19	20 Apr 2019 / Cofferdam Area 19 Apr 2019 / Cofferdam Area 15 Apr 2019 / Cofferdam Area	Resident of Ocean Shore (Mr. Chan)	Others	The construction site near O King Road is operated in holiday during day-time and weekday during night-time.	N	The marine reclamation works at the Portion IX in C2 construction site was the major construction activity during the period of complaints. The concerned reclamation works is compiled with the relevant CNP. Details should be referred to CIR-O2.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
		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	See Investigation / Mitigation Action for complaint no. 329.	Closed
352	13-Apr-19	13-04-2019/Cofferdam Area	Resident of Ocean Shore	Noise	The complainant complained about the noise nuisance from the cofferdam area in Tiu Keng Leng during day-time.	Y	The major works during the time of complaints was a crawler crane unloading H piles to the Portion V of C2 construction site. Noise barriers were erected between the crane and NSRs to reduce noise impact. Details should be referred to CIR-N62.	Closed
351	13-Apr-19	13-04-2019/Cofferdam Area	Resident of Ocean Shore	Noise	The complainant complained the noise nuisance from the cofferdam area in Tiu Keng Leng during day-time.	Y		
350	8-Apr-19	07 Apr 2019 / Cofferdam Area in TKO	-	Air & Others	The complainant complained the dark smoke generation and the construction works from the cofferdam area in Tiu Keng Leng during holiday.	N	See Investigation / Mitigation Action for complaint no. 329.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
349	7-Apr-19	07-04-2019/Cofferdam Area	Resident of Ocean Shore	Air	Dark smoke generation from the cofferdam area in Tiu Keng Leng during day-time.	N		Closed
348	2-Apr-19	02 Apr 2019 / LTT-TKO	-	Others	The complainant complained the LTT construction site was working during holiday.	N		Closed
347	1-Apr-19	01 Apr 2019 / Cofferdam Area	Resident of Ocean Shore	Noise	Percussive noise from the cofferdam area in Tiu Keng Leng during day-time.	Y		Closed
346	31-Mar-19	31st March 2019 / Construction of Road P2	District Council	Others	Complaint about the construction site operation of Road P2 in day time holiday	N	A tug boat and a derrick barge were operated for the marine reclamation work within the cofferdam area during the time of complaint. As the review of relevant CNP, no violation was observed. Details should be referred to CIR-O1.	Closed
345	26-Mar-19	26th March 2019 / Construction of Road D4	Resident of Park Central	Noise	Complaint about the noise nuisance in day time.	Y	See Investigation / Mitigation Action for complaint no. 329.	Closed
344	28-Mar-19	26th March 2019 / Construction of Road P2	District Council	Noise	Complaint letter received regarding noise nuisance and dark smoke generation from the marine barges	Y	See Investigation / Mitigation Action for complaint no. 378.	Closed
343	25-Mar-19	25th March 2019 / Construction of Road D4	Resident of Park Central	Noise	Complaint about the noise nuisance sound like a breaking works in day time.	Y	See Investigation / Mitigation Action for complaint no. 329.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
342	25-Mar-19	24th March 2019 / Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	Complaint about the noise nuisance from the construction of Lam Tin Interchange in day time hoilday (Sunday). The noise monitoring was conducted in Hong Nga Court by staff after the complaint and the noise level is result in acceptable level, but the complainant replied that the noise monitoring is meaningless and the noise nuisance is not acceptable for her.	Y	See Investigation / Mitigation Action for complaint no. 330.	Closed
341	24-Mar-19	24th March 2019 / Construction of Lam Tin Interchange	Management Section of Hong Nga Court	Noise	Complaint about the noise nuisance from Lam Tin Tunnel construction works in day time.	Y		Closed
340	24-Mar-19	24th March 2019 / Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	Complaint about the noise nuisance from the construction site day time holiday (Sunday).	Y		Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
339	21-Mar-19	21st March 2019 / Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	Complaint about the construction noise nuisance involving percussive noise in early morning (07:00)	Y		Closed
338	21-Mar-19	21st March 2019 / Construction of Lam Tin Interchange	Resident of Ocean Shore	Noise	Construction noise nuisance in night time (03:00 – 04:00)	Y	See Investigation / Mitigation Action for complaint no. 323.	Closed
337	20-Mar-19	19th March 2019 / Construction of Road D4 and Footbridge between Tiu Keng Leng Sport Centre and Park Central	Resident of Park Central	Noise	Complaint about the noise nuisance from the construction vehicle near Park Central in night time.	Y	See Investigation / Mitigation Action for complaint no. 329.	Closed
336	20-Mar-19	20th March 2019 / Construction of Road	Resident of Park Central	Noise & Pest	Complaint about the noise and pest nuisance from the construction site near Park Central in evening time.	Y		Closed
335	19-Mar-19	19th March 2019 / Construction of Road P2	Resident of Ocean Shore	Noise	Construction noise nuisance from reclamation works near the TKO-LTT reclamation site during the evening time (19:00-23:00).	Y	See Investigation / Mitigation Action for complaint no. 323.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
334	19-Mar-19	19th March 2019 / Construction of Road P2	District Council	Noise	Construction noise nuisance from the TKO-LTT reclamation site during evening time (after 19:00).	Y		Closed
333	19-Mar-19	18th - 19th March 2019 / Construction of Road P2	Resident of Ocean Shore	Noise	Construction noise nuisance from construction noise in evening time (around 20:30).	Y		Closed
332	18-Mar-19	18th March 2019 / Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Complaint about the noise nuisance during day time, evening time and night time.	Y	The construction activities in the complaint dates are complied with CNP. No noise limited level exceedance was recorded. During the site inspection, no noise barriers were erected between noisy PMEs and NSRs at LTI. Regarding the observation in the inspection, Contractor has adopted an improvement such as placed the noise barriers between the PMEs and NSPs to reduce noise nuisance. Details should be referred to CIR-N61.	Closed
331	18-Mar-19	18th March 2019 / Construction of Lam Tin Interchange	Resident of Hong Pak Court	Noise	Complaint about the noise nuisance in night time and the past few days. (Before 07:00)	Y		Closed
330	17-Mar-19	17th March 2019 / Construction of Lam Tin Interchange	General Public	Noise	Complaint about the noise nuisance from in night time holiday.	Y		Closed
329	15-Mar-19	15th March 2019 / Construction of Road D4	Resident of Park Central	Noise & Air	Complaint about the noise from the construction works and the odour nuisance involves engine oil from construction machine	Y	The construction activities in the complaint dates are compiled with the CNMP. No noise and air quality limit level exceedance were recorded. Contractor had implemented the mitigation measures for the noise and odour nuisances including acoustic mat was erected between the PME and NSR, ultra-low sulphur diesel was applied as fuel oil in PME and general refuses were disposed properly. Details should be referred to CIR-C26.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
328	14-Mar-19	9th March 2019 / Construction Site of Footbridge between Tiu Keng Leng Sport Centre and Park Central	Resident of Park Central	Noise	Complaint about the noise nuisance involve drilling work in the day time (08:00).	Y	A formation works was conducted in 7 am to 7pm on 9 Mar 2019. No noise limit level exceedance was recorded in the nearest noise monitoring result. However, there was no any adoption of mitigation measure to minimize the noise nuisance from the site. As response the received complaint, the contractor should place the noise barrier between the PMEs and NSR. Details should be referred to CIR-N58.	Closed
327	13-Mar-19	13th March 2019 / Construction of Lam Tin Interchange	Resident of Bik Lai House	Noise	Noise nuisance suspected from the construction works involving chiseling during evening time (22:07).	Y	A handing processed rock at Lam Tin Interchange was conducted on the complaint date in 7 pm to 11 pm involving dump truck and excavator which construction activities was compiled with the CNP. No noise limit level exceedance was record in the evening time monitoring. However, the noise barrier was not placed in the direction of the Yau Lai Estate during breaking works, the contractor had implemented a mitigation measure such as placed the noise barrier to reduce noise level from the breaker but the noise barrier was far from the concerned breaker. Details should be referred to CIR-N59.	Closed
326	13-Mar-19	13th March 2019 / Construction of Road P2	Resident of Ocean Shore	Noise	Noise nuisance suspected from marine works near Ocean Shores in the day time (16:30)	Y	See Investigation / Mitigation Action for complaint no. 322.	Closed
325	9-Mar-19	9th March 2019 / Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	Complaint about the noise nuisance involve machine and percussive noise in night time (02:00 -03:00).	Y	Only drilling works were conducted inside the tunnel in early morning under valid CNP. Groundborne noise is considered as the factor that contributes to the noise nuisance. The Contractor is recommended to reschedule drilling works to less sensitive hours. Details should be referred to CIR-N56.	Closed

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	Complaint about the noise nuisance involving chiseling noise from the construction site near Hong Pak Court during day time and evening time in the past few months.	Y	Only drilling works were conducted inside the tunnel in early morning and daytime under valid CNP. Groundborne noise is considered as the factor that contributes to the noise nuisance. The Contractor is recommended to reschedule drilling works to less sensitive hours. Details should be referred to CIR-N56.	Closed
323 (EPD-N08/RE/00006523-19)	4-Mar-19	4th March 2019/ Cofferdam Area	Resident of Ocean Shore	Noise	Construction noise (Evening time)	Y	Only 1 derrick barge and a tug boat was used in the evening time under valid CNP. No Limit Level Exceedances were recorded at Station CM6(A) during evening time. Acoustic mat should be used to screen the engine of the barge to reduce the noise nuisance from the reclamation works. Lubricants should be applied to the barge to reduce the noise emission during barge movement.	Closed
322	13-Mar-19	1st March 2019 / Construction of Road P2	Resident of Ocean Shore	Noise	Noise nuisance suspected from a yellow excavator near Ocean Shores in day time (15:44).	Y	No noise limit level exceedance was recorded and the number of operating PMEs complied with the CNMP. The sound proofing canvases were not always adopted as a mitigation measure to screen the noise emitted from the engine of the barge. Contractor should adopt the aforementioned mitigation measures as far as practicable. The contractor was also be recommended to enhance the mitigation measure including frequently checking the noise barriers/sound proofing canvases, frequent checking and repair the gaps or broken acoustic sheets and continue to strictly follow the requirements in the approved CNMP.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
321	28-Feb-19	28th February 2019 / Construction of Lam Tin Interchange	Management Section of Yau Lai Estate	Noise	Construction noise (Night time)	Y	Only drilling works were conducted inside the tunnel in early morning under valid CNP. Groundborne noise is considered as the factor that contributes to the noise nuisance. The Contractor is recommended to reschedule drilling works to less sensitive hours. Details should be referred to CIR-N55.	Closed
320	22-Feb-19	22nd February 2019 / Construction of Lam Tin Interchange	Resident of Hong Pak Court	Noise	Complaint about the noise nuisance involving percussive noise in early morning (Day time). Complainant said the construction should be operated after 08:00.	Y	See Investigation / Mitigation Action for complaint no. 313.	Closed
319	21-Feb-19	21st February 2019 / Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	Complaint about the noise nuisance involving percussive noise in night time	Y		Closed
318	21-Feb-19	21st February 2019 / Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	Complaint about the noise nuisance involving percussive noise from the construction in night time	Y		Closed
317	25-Feb-19	23th February 2019 / Construction of Road P2	Resident in O King Road	Air	Complained about the odour nuisance of petroleum smell	N	See Investigation/ Mitigation Action on Complaint no.294. Details should be referred to CIR-A12.	Closed
316	18-Feb-19	18th February 2019 / Construction of Road P2	Resident in O King Road	Air	Complaint about the dark smoke and odour nuisances	N		Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
315	17-Feb-19	15th February 2019 / Construction of Lam Tin Interchange, Road P2 and Tseung Kwan O Interchange	General Public	Noise	Complained about construction noise (Daytime)	Y	The metal wire used for anchoring the barge inside the cofferdam area are the source for the noise nuisance. Ropes were used to replace metal wire to reduce noise nuisance from metal collision while mooring boats. Details should be referred to CIR-N54.	Closed
314	17-Feb-19	16th February 2019 / Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Air	Dust nuisance suspected from the construction works and absence of water spraying near Lam Tin Interchange in daytime.	N	No Air Quality action level or limit level exceedance during the monitoring conducted by ETL. Contractor had implemented mitigation measure to reduce and prevent dust emission including conducted water sprays and covered the cement bags. Details should be referred to CIR-A13.	Closed
313	17-Feb-19	17th February 2019 / Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	Construction noise nuisance from the drilling and breaking works at Branch Tunnel in the morning (Day time)	Y	Breaking and drilling works were conducted during the time of complaint. The breakers were often seen wrapped with acoustic mat, however, they are easily damaged during the breaking works. Noise barrier are more effective in reducing the noise nuisance than the acoustic mat, but the erection of noise barrier are not often adopted properly to screen the noise from the NSR due to the additional works involved and the landform on site. Groundborne noise could also be a factor contributing to noise nuisance. Details should be referred to CIR-N53.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
312	16-Feb-19	16th February 2019 / Construction of Lam Tin Interchange	District Council	Noise	Complained about the explosion noise (Daytime)	Y	No exceedances were recorded and recommendation were made to further enhance the mitigation measures, such as regularly and reviewing the noise control activities that are being carried out on site regularly to ensure compliance with statutory requirement, provide training for the workers to prevent unnecessary noise disturbance and frequently check and maintain the absorptive lining adhered on blasting doors on a regular basis.	Closed
311	15-Feb-19	15th February 2019 / Construction of Lam Tin Interchange	Public	Noise	Complained about the explosion noise (Daytime)	Y	See Investigation / Mitigation Action for complaint no. 312.	Closed
310	14-Feb-19	14th February 2019 / Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Construction noise nuisance about the rock handling work at LTI (Daytime)	Y	Dump truck and excavator was used to transfer crushed rocks from the crusher with valid CNP. Additional noise barrier was added at the site boundary near Shun Lai house, Yau Lai Estate to reduce the direct-line of sight from the NSRs to the site. Details should be referred to the CIR-N51.	Closed
309	13-Feb-19	13th February 2019 / Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Construction noise nuisance about the rock handling work at LTI (evening time)	Y		Closed
308	13-Feb-19	1th - 13th February 2019 / Construction of works at the TKO-Lam Tin tunnel	Management Section of Kwong Tin Estate	Noise	Complaint about construction noise (Night time)	Y	See Investigation/ Mitigation Action on Complaint no.302. Details should be referred to CIR-N48.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
307	13-Feb-19	13th February 2019 / Construction at Tsueng Kwan O (C1)	Resident of Ocean Shore	Noise	The complaint about the noise nuisance in day time	Y	Noise nuisance was originated from the beeping noise emitted during vehicle reversing of the loader. The total length of beeping noise should be less than 5 mins. The reverse alarm system is a necessary safety measure that cannot be revoked. Details should be referred to CIR-N50.	Closed
306	13-Feb-19	13th February 2019 / Construction of works at the TKO-Lam Tin tunnel	Resident of Hong Nga Court	Noise	Noise nuisance suspected from the construction works involving chiseling noise in night time	Y	See Investigation/ Mitigation Action on Complaint no.302. Details should be referred to CIR-N48.	Closed
305	12-Feb-19	12th February 2019 / Construction of works at the TKO-Lam Tin tunnel	Resident of Hong Nga Court	Noise	Noise nuisance suspected from the construction works involving chiseling noise in night time.	Y		Closed
304	8-Feb-19	8th February 2019 / Construction of Road P2 and Associated Works	Resident of Ocean Shore	Noise	Noise nuisance suspected from marine works near Ocean Shores in the day time	Y	There were two construction activities in the site including dredging and trimming in day time on 8 Feb 2019. Details should be referred to CIR-N49.	Closed
303	2-Feb-19	27th January - 2nd February 2019 / Construction of works at the TKO-Lam Tin tunnel	Resident of Ping Tin Estate	Noise	Noise nuisance suspected from the construction works involving chiseling noise during day time, evening time and night time.	Y	Project-related. The following recommendations were made to further enhance the mitigation measures: □ Frequent checking and repair the gaps or broken acoustic sheets; □ Replace any broken SilentMat for wrapping the breaker head;	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
302	2-Feb-19	27th January - 2nd February 2019 / Construction of works at the TKO-Lam Tin tunnel	Resident of Hong Pak Court	Noise	Noise nuisance suspected from the construction works involving chiseling noise during day time	Y	To adopt Cantilever noise barriers at Lam Tin Interchange to screen noise effectively; The deployment of Cantilever noise barrier should screen the line-of-sight from sensitive receivers To continue to strictly follow the requirements in the approved CNMP. To conduct an ad hoc ground-borne noise monitoring with the coordination of the Engineer; and Engineer should monitor the plant and machine to ensure construction activities are in compliance of CNP.	Closed
301	31th January 2019	27th - 31th January 2019 / Construction of Lam Tin Interchange	Management Section of Hong Nga Court	Noise	Noise nuisance suspected from the construction involving chiselling works	Y	See Investigation/ Mitigation Action on Complaint no.290. Details should be referred to CIR-N45.	Closed
300	30th January 2019	30th January 2019 / Construction Site of Footbridge between Tiu Keng Leng Sport Centre and Park Central	Resident of Park Central	Noise	Beeping Noise nuisance suspected from the construction works involving mobile crane	Y	See investigation / Mitigation Action for complaint no. 296. Details should be referred to CIR-N47.	Closed

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	27th - 29th January 2019 / Construction Site of Footbridge between Tiu Keng Leng Sport Centre and Park Central	Resident of Park Central	Noise	Beeping Noise nuisance suspected from the construction works involving mobile crane and also suspected from elevation platform	Y	See investigation / Mitigation Action for complaint no. 296. Details should be referred to CIR-N47.	Closed
298	30th January 2019	Not specific / Near Po Shun Road	Resident of Park Central	Noise & Air Quality	The dust generation and noise nuisance from the construction site near Po Shun Road	Y	There were several construction activities in the site including the removal of steel mould & scaffolding of bridge deck, erection of scaffolding for staircase and construction of Pour 1 of main deck (GL4-5) during time of complaint. Details should be referred to CIR-C25.	Closed
297	30th January 2019	27th - 30th January 2019 / Construction works at TKO-Lam Tin tunnel	Resident of Hong Nga Court	Noise	Noise nuisance suspected from the construction involving chiselling works	Y	See Investigation/ Mitigation Action on Complaint no.290. Details should be referred to CIR-N45.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
296	29th January 2019	27th - 29th January 2019 / Construction Site of Footbridge near Tiu Keng Leng Sport Centre.	Resident of Park Central	Noise	Beeping Noise nuisance suspected from the mobile crane at the Footbridge near Park Central Block 6	Y	Project-related. The following recommendations were made to further enhance the mitigation measures: □ To arrange a signalman instead of mobile crane reversing signal for minimize the beeping noise disturbance; □ Frequent checking and repair the operating PME; □ The deployment of Cantilever noise barrier should screen the line-of-sight from sensitive receivers □ To continue to strictly follow the requirements in the approved CNMP; □ To ensure noise barrier and sound proofing canvases wrapped on PME are intact and in good condition.	Closed
295	29th January 2019	29th January 2019 / Construction of Road P2	Resident of Ocean Shore	Noise	Complaint about the noise nuisance from the steel cable wire for anchoring between barge and pier	Y	There was a salvage works for the sunken barge (CS306) in a whole day on 27 Jan, 12 am to 3 pm on 28 Jan and 11:40 am on 29 Jan 2019. Details should be referred to CIR-N46.	Closed
294	29th January 2019	29th January 2019 / Construction of Road P2	Resident in O King Road	Air Quality	Complaint about the dark smoke and odour nuisances from barge.	Y	The sulphur content percentage of the adopted diesel fuel was lower than 0.05% which is compiled with the Hong Kong Air Pollution Control (Marine Light Diesel) Regulation, therefore the odour problem should be minimised. Smoke filtering tanks were adopted on deck level of derrick barges to reduce emission of dark smoke and exhaust smell. The situation has improved after the filter has been replaced. Details should be referred to CIR-A12.	Closed

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293 (EPD-K15/RE/00003291-19)	29th January 2019	29th January 2019 / Construction of Lam Tin Interchange	Cha Kwo Ling Tsuen	Noise & Air Quality	Complained about construction noise & dust (Day & Night time)	Y	See investigation / Mitigation Action for complaint no. 270. Details should be referred to CIR-C29.	Closed
292	29th January 2019	29th January 2019 / Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	Complained about the construction noise from breaking work.	Y	Project-related. The following recommendations were made to further enhance the mitigation measures: □ Frequent checking and repair the gaps or broken acoustic sheets; □ Replace any broken SilentMat for wrapping the breaker head; □ To adopt Cantilever noise barriers at Lam Tin Interchange to screen noise effectively; □ The deployment of Cantilever noise barrier should screen the line-of-sight from sensitive receivers □ To continue to strictly follow the requirements in the approved CNMP. □ RE/RSS should monitor the plant and machine to ensure construction activities are in compliance of CNP.	Closed
291	29th January 2019	29th January 2019 / Construction of Lam Tin Interchange	Resident of Hong Pak Court	Noise	Complained about the construction noise from breaking work.	Y		Closed
290	29th January 2019	29th January 2019 / Construction of Lam Tin Interchange	District Council	Noise	Complained about the construction noise from Tunnel Works	Y		Closed
289 (EPD-N08/RE/00000859-19)	24th January 2019	Early December 2018 -24-Jan-2019 / Construction of Road P2	Resident of Ocean Shore	Noise	Complained about the construction noise from Tunnel Works	Y	See Investigation/ Mitigation Action on Complaint no.288. Details should be referred to CIR-N44.	Closed

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 (Unknown)/ Construction of Road P2	Public	Noise	Complained about the construction noise from Tunnel Works	Y	No major construction works at the concerned night time. There was only salvage operation carried out in 11 pm to 12 pm on 17 Jan 2019. No violation of CNP nor Noise Control Ordinance is found in this regard. Details should be referred to CIR-N44.	Closed
287	17th January 2019	17th January 2019 / Construction of Lam Tin Interchange	Resident of Yung Lai House	Noise	Complained about the construction noise from Kam Tin Interchange.	Y	Project-related. The following recommendations are made to further enhance the mitigation measures: □ To regularly check and review the noise control activities that are being carried out on site to ensure compliance with statutory requirement. □ Machines may be in intermittent use should be shut down between works periods or should be throttled down to a minimum. □ To provide training for the workers to prevent unnecessary noise disturbance. □ To provide cantilever barrier to screen the construction noise from the NSRs	Closed
286	17th January 2019	17th January 2019 / Construction of Road D4	Resident of Park Central	Noise	High frequency machine noise nuisance involving air compressor from the construction site near the Park Central in day time	N	See Investigation/ Mitigation Action on Complaint no. 285. The concerned air compressor has been removed on 16th Jan 2019. Details should be referred to CIR-N41.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
285	17th January 2019	17th January 2019 / Construction of Road D4	Resident of Park Central	Noise	Complained about the construction noise from an air blower/fan with generator near Tiu Keng Leng Sport Centre and Park Central.	N	The concerned air compressor was removed from the construction site since 16 January 2019 afternoon, but the high frequency noise nuisance complaints were received on 17 January 2019. According to the CM8(A) noise monitoring record by environmental team, the other noise source from construction site are beeping noise of the reverse alarm system of the plant. Therefore, the high frequency noise nuisance is considered project related after 16 January 2019. Details should be referred to CIR-N41.	Closed
284	16th January 2019	16th January 2019 / Construction of Road D4	Resident of Park Central	Noise	Complained about the construction noise from an air compressor near Tiu Keng Leng Sport Centre and Park Central.	N	See Investigation/ Mitigation Action on Complaint no. 272. Additional noise barrier was erected around the said air compressor. Details should be referred to CIR-N41.	Closed
283	15th January 2019	15th January 2019 / Construction of Road D4	Resident of Park Central	Noise	Complained about the construction noise from an air compressor near Tiu Keng Leng Sport Centre and Park Central.	N	See Investigation/ Mitigation Action on Complaint no. 272. Additional noise barrier was erected around the said air compressor. Details should be referred to CIR-N41.	Closed
282	15th January 2019	15th January 2019 / Construction of Road D4	Resident of Park Central	Noise	Complained about the construction noise from an air compressor near Tiu Keng Leng Sport Centre and Park Central.	N	See Investigation/ Mitigation Action on Complaint no. 272. Additional noise barrier was erected around the said air compressor. Details should be referred to CIR-N41.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
281	15th January 2019	15th January 2019 / Construction of Road D4	Resident of Park Central	Noise	High frequency machine noise nuisance involving air compressor from the construction site near Chui Ling Road roundabout and Tiu Keng Leng Sport Centre in day time.	N	See Investigation/ Mitigation Action on Complaint no. 272. Additional noise barrier was erected around the said air compressor. Details should be referred to CIR-N41.	Closed
280	14th January 2019	14th January 2019 / Construction of Road D4	Resident of Park Central	Noise	High frequency machine noise nuisance involving air compressor from the construction site near Chui Ling Road roundabout and Tiu Keng Leng Sport Centre in day time.	N	See Investigation/ Mitigation Action on Complaint no. 272. Details should be referred to CIR-N41.	Closed
279	14th January 2019	14th January 2019 / Construction of Road D4	Resident of Park Central	Noise	High frequency machine noise nuisance involving air compressor from the construction site near Tiu Keng Leng Sport Centre in day time Saturday and Holiday (Sunday).	N	See Investigation/ Mitigation Action on Complaint no. 272. Details should be referred to CIR-N41.	Closed

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	High frequency machine noise nuisance involving air compressor from the construction site between Tiu Keng Leng Sport Centre and Park Central in day time	Y	See Investigation/ Mitigation Action on Complaint no. 272. Details should be referred to CIR-N41.	Closed
277	12th January 2019	12th January 2019 / Construction of Road P2	Resident of Ocean Shore	Noise	Complained about the noise from breaking activities.	N	See investigation/ Mitigation Action on Complaint no. 264. Details should be referred to N39.	Closed
276	11th - 12th January 2019	11th - 12th January 2019 / Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	Complained about the construction noise from Tunnel Works	Y	The complaints are considered as project-related. The following recommendations were made to further enhance the mitigation measures: □ Frequent checking and repair the gaps or broken acoustic sheets; □ Replace any broken SilentMat for wrapping the breaker head; □ To adopt Cantilever noise barriers at Lam Tin Interchange to screen noise effectively; □ The deployment of Cantilever noise barrier □ To continue to strictly follow the requirements in the relevant CNP. □ To conduct an ad hoc ground-borne noise monitoring with the coordination of the Engineer. □ Engineer should monitor the plant and machine to ensure construction activities are in compliance of CNP. Details refer to CIR-N40.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
275	11th January 2019	11th January 2019 / Construction of Road D4	Resident of Park Central	Noise	Complained about the construction noise from a crane near footbridge between Tiu Keng Leng Sport Centre and Park Central	Y	See Investigation/ Mitigation Action on Complaint no. 272.	Closed
274 (EPD-N08/RE/00001234-19)	11th January 2019	11th January 2019 / Construction of Road D4	Public	Noise	Complaint about the high frequency machine noise nuisance from the construction site of footbridge between Tiu Keng Leng Sport Centre and park Central.	Y	No high-frequency noise was detected near the complaint location, however, the noise similar to description was detected within the renovation works inside Park Central. Details should be referred to complaint no. 272 and CIR-N41.	Closed
273	10th January 2019	10th January 2019 / Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	Complained about the construction noise from Tunnel Works	Y	The complaints are considered as project-related. The following recommendations were made to further enhance the mitigation measures: □ Frequent checking and repair the gaps or broken acoustic sheets; □ Replace any broken SilentMat for wrapping the breaker head; □ To adopt Cantilever noise barriers at Lam Tin Interchange to screen noise effectively; □ The deployment of Cantilever noise barrier □ To continue to strictly follow the requirements in the relevant CNP. □ To conduct an ad hoc ground-borne noise monitoring with the coordination of the Engineer. □ Engineer should monitor the plant and machine to ensure construction activities are in compliance of CNP.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
272	8th January 2019	8th January 2019 / Construction of Road D4	Resident of Park Central	Noise	Complaint about the high frequency machine noise nuisance from the construction site near Park Central in day time.	Y	High frequency noise emitted from an air compressor was suspected. Noise barrier was seen erected. Noise barrier using material with higher absorption coefficient such as mineral wool is recommended. Details should be referred to CIR-N41.	Closed
271	8th January 2019	8th January 2019 / Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	Complained about the construction noise from Tunnel Works	Y	The complaints are considered as project-related. The following recommendations were made to further enhance the mitigation measures: □ Frequent checking and repair the gaps or broken acoustic sheets; □ Replace any broken SilentMat for wrapping the breaker head; □ To adopt Cantilever noise barriers at Lam Tin Interchange to screen noise effectively; □ The deployment of Cantilever noise barrier □ To continue to strictly follow the requirements in the relevant CNP. □ To conduct an ad hoc ground-borne noise monitoring with the coordination of the Engineer. □ Engineer should monitor the plant and machine to ensure construction activities are in compliance of CNP.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
270 (EPD-K15/RE/000 00691-19)	7th January 2019	7th January 2019 / Construction of Lam Tin Interchange	Cha Kwo Ling Tsuen	Noise & Air Quality	Complained about construction noise & dust (Day & Night-time)	Y	Regular noise monitoring results for day time and night time show full compliance of the noise criteria. Air quality monitoring result in all stations show that no adverse air quality impact has been brought about to the nearby sensitive receivers during the time of complain. During Site audit, damaged acoustic material on the breaker was observed. Watering was provided at during rock breaking to avoid dust generation. The Contractor was reminded to deploy noise barrier to screen the line-of-sight from sensitive receiver; during breaking works.	Closed
269	7th January 2019	7th January 2019 / Construction of Road D4	Resident of Park Central	Noise	Complained about the night time construction noise near Park Central.	Y	No noticeable high frequency noise was detected from the air compressor and noise barrier was seen erected in the line-of-sight from the NSR to the Air compressor. Refer to CIR-41 for details.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
268	7th January 2019	7th January 2019 / Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Complained about the construction noise at Lam Tin Interchange.	Y	No exceedances were record at the nearest monitoring station. The following recommendation were made to further enhance the mitigation measure: • Frequent checking and repair the gaps or broken acoustic sheets; • Replace any broken Silent Mat for wrapping the breaker head; • To adopt Cantilever noise barriers at Lam Tin Interchange to screen noise effectively; • The deployment of Cantilever noise barrier should screen the line-of-sight from sensitive receiver; • To continue to strictly follow the requirements in the relevant CNP; • To conduct an ad hoc ground-borne noise monitoring with the coordination of the Engineer; and • Engineer should monitor the plant and machine to ensure construction activities are in compliance of CNP.	Closed
267	7th January 2019	7th January 2019 / Construction of Road P2	Resident of Ocean Shore	Noise	Complained about the construction noise from breaking activities.	Y	Refer to Investigation/ Mitigation Action on Complaint no. 264. Details should be referred to N39.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
266	7th January 2019	7th January 2019 / Construction of Road P2	Resident of Ocean Shore	Noise	Complained about the construction noise from breaking activities.	Y	No exceedances were recorded at the nearest monitoring station, however, the approved location for noise monitoring was located at the podium of Ocean Shores. Due to inaccessibility to private unit, it is not possible to perform monitoring at higher floor. ET will keep approaching Ocean Shore Management Office for impact noise monitoring at higher floor. The recommendations for Contractor is as follows: • only well-maintained plant on-site and plant should be serviced regularly during the construction program; • Plants known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby noise sensitive receivers; Machines and plants that may be in intermittent use should be shut down between works periods or should be throttled down to minimum.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
265	7th January 2019	7th January 2019 / Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	Complained about the construction noise from Tunnel Works	Y	No exceedances were record at the nearest monitoring station. The following recommendation were made to further enhance the mitigation measure: • Frequent checking and repair the gaps or broken acoustic sheets; • Replace any broken Silent Mat for wrapping the breaker head; • To adopt Cantilever noise barriers at Lam Tin Interchange to screen noise effectively; • The deployment of Cantilever noise barrier should screen the line-of-sight from sensitive receiver; • To continue to strictly follow the requirements in the relevant CNP; • To conduct an ad hoc ground-borne noise monitoring with the coordination of the Engineer; and • Engineer should monitor the plant and machine to ensure construction activities are in compliance of CNP.	Closed
264	2nd January 2019	2nd January 2019 / Construction of Road P2	Resident of Ocean Shore	Noise	Complained about the construction noise from breaking activities.	Y	No noise limit level exceedance was recorded at the noise monitoring stations near ocean shores. The contractor has applied lubricants to the joint of the excavators to dampen the noise emitted from the PMEs. The contractor is recommended to use noise barriers to screen the PMEs from the NSRs as per the Noise mitigation plan.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
263 (EPD-)	1st January 2019	31st December 2018 / Coastal near TKO cemetery	General Public	Water	Complained concerning oil leakage/ on the sea surface near the sunken barge at C2 site.	N	Oil leakage happened due to the derrick lighter was submerged to the sea within the cofferdam. As the oil leakage was found outside the cofferdam during site inspection, there was a gap in the cofferdam. The oil leakage was cleaned up and the floating oil absorber has been used to surround the cofferdam by Contractor. The Contractor are reminded to1) regular check if the site vessels and cofferdam are in good-condition; 2) To regular monitor the operation of any activities in the cofferdam area; 3) To implement the proposed site vessels safety and the emergency responses including clearance measures Details of the investigation should be referred to CIR-W10	Closed
262	30th December 2018	26th December 2018/ Construction of Lam Tin Interchange	Resident of Hong Pak Court	Noise	Complained about the construction noise from tunnel works of Lam Tin Interchange.	Y	Refer to investigation for complaint no. 254	Closed
261	26th December 2018	26th December 2018/ Construction of Lam Tin Interchange	Management Section of Hong Nga Court	Noise	Complained about the construction noise from tunnel works of Lam Tin Interchange.	Y	Refer to investigation for complaint no. 254	Closed
260	26th December 2018	26th December 2018/ Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	Complained about the construction noise of Lam Tin Interchange.	Y	Refer to investigation for complaint no. 254	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
259	26th December 2018	26th December 2018/ Construction of Lam Tin Interchange	Management Section of Hong Nga Court	Noise	Complained about the construction noise of Lam Tin Interchange.	Y	Refer to investigation for complaint no. 254	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
258	18th December 2018	18th December 2018/ Construction of Lam Tin Interchange	Engineering Section of Ocean Shore	Noise	Complained about the construction noise from the marine works.	Y	There was no major construction works at the concerned area during the time of complaint and confirmed by the Resident Engineer. Steel cable wire for anchoring between barge and pier is considered as a possible noise source. The complaint is considered project related. Mitigation measures: Cable wire for anchoring between barge and pier has been replaced by rope between 27 Dec and 2 Jan to reduce noise impact. In addition, other good site practices recommended in the "Implementation Schedule of Proposed Mitigation Measures" of EM&A Manual and the approved CNMP of this Contract had been implemented by the Contractor, including the following: • Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program; • Plants known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby noise sensitive receivers; • Machines and plants that may be in intermittent use should be shut down between works periods or should be throttled down to minimum.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
257	18th December 2018	18th December 2018/ Construction of Road P2	Resident of Ocean Shore	Noise	Complained about the construction noise from the marine works.	Y	There was no major construction works at the concerned area during the time of complaint and confirmed by the Resident Engineer. Steel cable wire for anchoring between barge and pier is considered as a possible noise source. The Contractor has replaced the cable wire for anchoring between barge and pier with ropes between 27 Dec and 2 Jan to reduce noise impact.	Closed
256	17th December 2018	15th December 2018/ Construction of Road P2	Resident of Ocean Shore	Noise	Complained about the construction noise from breaking and piling activities	N	No exceedance was recorded in the noise monitoring result. The number of PME operated in LTI was consistent with the proposed Construction Noise mitigation Plan (CNMP) The following recommendations were made for the Contractor to enhance the mitigation measures: • To frequently check and repair operating PME if any loosen or worn parts of the equipment to reduce excessive noise disturbance; • Noise barriers should be designed and erected around the noise sources to block the direct line-of-sight from the NSR as per the CNMP; To ensure all erected noise barriers and sound proofing canvases wrapped on PME are intact and in good condition.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
254	16th December 2018	16th December 2018/ Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	Complained about the construction noise from Tunnel Works	Y	• The night-time works were only conducted inside the tunnels with valid CNP. The noise nuisances are not considered as air-borne in nature, but ground-borne noise. 2.17 In order to confirm the possible ground-borne nature of the noise nuisances for complaints summarized in this report, CEDD has engaged the environmental team to conduct ad hoc ground-borne noise monitoring with the coordination of the Engineer. The findings will be provided in a separate report for the ad hoc monitoring.	Closed
253	15th December 2018	15th December 2018/ Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	Complained about the construction noise from Tunnel Works	Y	Refer to the investigation for complaint no. 254	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
252	30th November 2018	30th November 2018/ Construction of Road D4	Resident of Park Central	Noise & Air	Complained about the construction noise and dust resuspension in Road D4.	Y	The number of PMEs operated on site and on-time percentage from 19 to 30 November complied with the CNMP, thus, no violation was identified. Based on the noise and air monitoring results in November 2018, no Limit Level Exceedance was recorded. **Mitigation Measures** • A more effective acoustic barrier was erected between the drill rig and Park Central. • Frequent water spraying along the Po Yap Road for eight times a day, Stockpile are covered with impervious material to avoid dust resuspension	Closed
251	28th November 2018	27th November 2018/ Construction of TKO portal	Public	Noise	Complained about the construction noise from the marine works.	Y	The complaint lodged on 25th November 2018 is considered as non-project related, as no works was conducted on that day. The complaint on 27th November 2018 is considered project related. The contractor is reminded to 1) frequently check and repair operating PME if any loosen or worn parts of the equipment to reduce excessive noise disturbance; 2) Ensure no further use of PA system for marine works.	Closed
250	26th November 2018	26th November 2018/ Public sea in TKO	Resident of Ocean Shore	Noise	Complained about the noise nuisance from the operation of derrick barge on Sunday.	Y	Refer to the investigation for complaint no. 251	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
249	25th November 2018	20th November 2018/ Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Complained about the noise nuisance from the Excavators in LTI on Sunday morning.	Y	Refer to the investigation for complaint no. 251	Closed
248	20th November 2018	20th November 2018/ Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Complained about the noise nuisance during transfer of material in evening time at LTI	Y	Regular noise monitoring results for restricted and non-restricted hours show full compliance of the noise criteria (night-time noise exceedance is considered non-project related). The contractor is reminded to adopt cantilever noise barriers at Lam Tin Interchange to screen noise effectively by screening the line-of-sight from sensitive receivers	Closed
247	20th November 2018	19th November 2018/ Lam Tin Interchange	Public	Noise	Complained about the noise nuisance from rock dropping during evening time	Y	Refer to the investigation for complaint no. 248	Closed
246	19th November 2018	19th November 2018/ Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Complained about the noise nuisance from dump truck in evening time	Y	Refer to the investigation for complaint no. 248	Closed
245	8th November 2018	8th November 2018/ Lam Tin Interchange	Public	Noise	Complained about construction noise during night time from LTI	Y	Refer to the investigation for complaint no. 248	Closed
243	8th November 2018	8th November 2018/ Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Complained about the construction noise during evening time from LTI.	Y	Refer to the investigation for complaint no. 248	Closed
242	7th November 2018	7th November 2018/ Lam Tin Interchange	Public	Noise	Complained about the construction noise and dust nuisance.	Y	Refer to the investigation for complaint no. 248	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
241	6th November 2018	6th November 2018/ Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Complained about the noise nuisance from LTI during evening time	Y	Refer to the investigation for complaint no. 248	Closed
240	6th November 2018	6th November 2018/ Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Complained about the noise nuisance from LTI during evening time	Y	Refer to the investigation for complaint no. 248	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
239	25th October 2018	25th October 2018/ Construction of Road P2	Resident of Ocean Shore	Noise	Complained about daytime construction noise near Ocean Shore.	Y	No exceedance was recorded in the noise monitoring result. The number of PME operated in LTI was consistent with the proposed Construction Noise mitigation Plan (CNMP) **Additional mitigation measures adopted by Contractor upon receipt of complaint:** ➢ A more effective acoustic barrier was erected that covered the direct line of sight from the entire Ocean Shore during piling works. **Existing Mitigation Measures adopted by Contractor** ➢ Silent up barrier was provided for drill rig/vibration hammer. Acoustic barriers was erected along site boundary); ➢ Maintenance for acoustic barriers along the site boundary to ensure the integrity effectiveness of sound barrier; ➢ Metal chain attached on the vibration hammer was wrapped with rubbery material to reduce the excessive noise produced during piling works.	Closed
238	23rd October 2018	23rd October 2018/ Construction of Road P2	Resident of Ocean Shore	Noise	Complained about the noise created by an excavator during morning	Y	See Investigation / Mitigation Measures for Complaint No. 239	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
237	18th October 2018	18th October 2018/ Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Complained about construction noise at LTI	Y	See Investigation / Mitigation Measures for Complaint No. 227	Closed
236	18th October 2018	18th October 2018/ Lam Tin Interchange	Resident of Cha Kwo Ling Village	Noise	Complained about the vibration and noise near	Y	See Investigation / Mitigation Measures for Complaint No. 227	Closed
235	18th October 2018	18th October 2018/ Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Complained about the noise nuisance from LTI and Portion 4C	Y	See Investigation / Mitigation Measures for Complaint No. 227	Closed
234	18th October 2018	18th October 2018/ Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Complained about the Excavator in LTI was not properly wrapped and produce noise nuisance from LTI.	Y	See Investigation / Mitigation Measures for Complaint No. 227	Closed
233	15th October 2018	15th October 2018/ Lam Tin Interchange	DC member	Noise	Complained about the noise and dust nuisance from LTI	Y	See Investigation / Mitigation Measures for Complaint No. 227	Closed
232	14th October 2018	14th October 2018/ Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Complained about the noise nuisance from LTI during night time	Y	See Investigation / Mitigation Measures for Complaint No. 227	Closed
231	12th October 2018	12th October 2018/ Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Complained about the noise nuisance from LTI	Y	See Investigation / Mitigation Measures for Complaint No. 227	Closed
230	11th October 2018	11th October 2018/ Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Complained about the noise from rocks unloading in LTI	Y	See Investigation / Mitigation Measures for Complaint No. 227	Closed
229	9th October 2018	9th October 2018/ Lam Tin Interchange	Resident of Bik Lai House, Yau Lai Estate	Noise	Complained about the noise nuisance from LTI, and lack of effective noise barrier.	Y	See Investigation / Mitigation Measures for Complaint No. 227	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
228	9th October 2018	9th October 2018/ Lam Tin Interchange	Public	Noise	Complained about the noise nuisance from LTI	Y	See Investigation / Mitigation Measures for Complaint No. 227	Closed
227	3rd October 2018	3rd October 2018/ Lam Tin Interchange	Resident of Yung Lai House, Yau Lai Estate	Noise	Complained about the noise nuisance from LTI during night time	Y	No exceedance was recorded in the noise monitoring result. The number of PME operated in LTI was consistent with the proposed Construction Noise mitigation Plan (CNMP) and approved Construction Noise Permit (CNP). **Mitigation Measures adopted by Contractor** <u>Noise:</u> ➢ Noise barriers were repaired to reduce noise nuisance at Portion 4C; ➢ Noise barriers were erected between the PMEs and NSR to reduce noise nuisance at Portion 4C; Powered mechanical equipment (PME) for breaker was equipped with noise barriers at Portion 4C.	Closed
226	28th September 2018	28th September 2018/ Construction of Road P2	Resident of Ocean Shores	Noise	Complained about noise nuisance from portion IV	Y	➢ See Investigation / Mitigation Measures for Complaint No. 222	Closed
225	26th September 2018	26th September 2018/ Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Complained about the noise from rocks unloading in LTI	Y	See Investigation / Mitigation Measures for Complaint No. 218	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
224	18th September 2018	18th September 2018/ Construction of Road P2	Public	Noise	Complained about noise nuisance from derrick barge	Y	See Investigation / Mitigation Measures for Complaint No. 219	Closed
223	13th September 2018	9th September 2018/Construction of Portion VII on TKO side	Resident of Ocean Shores	Noise	Complained about noise nuisance from derrick barges	Y	See Investigation / Mitigation Measures for Complaint No. 218	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
222	12th September 2018	12th September 2018/ Construction of Road P2	Resident of Ocean Shores	Noise	Complained about the noise nuisance from piling works	Y	**Mitigation Measures adopted by the Contractor** ➢ Acoustics barriers were provided to the vibration hammer for piling works. ➢ Maintenance for acoustic barriers on the PME and along the site boundary to ensure the integrity and effectiveness of sound barriers. ➢ Regular site checking would be performed to ensure the type and quantity of powered mechanical equipment are in order with the updated Construction Noise Assessment. ➢ Acoustics mats were provided to cover the noise source from vibration hammer. ➢ The metal chain on vibration hammer was wrapped with rubbery material to minimize sound impact. ➢ The schedule for piling works was set with a 5 minutes interval to reduce the accumulated noise level.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
221	11th September 2018	9th September 2018/ Construction of Portion VII on TKO side	Public	Noise	Complained about the noise from broadcasting at barging point	Y	The Contractor had implemented environmental mitigation measures in accordance with the "Implementation Schedule of Proposed Mitigation Measures" of EM&A Manual as follows: <u>Noise:</u> Walkie-talkie was used instead of broadcasting to reduce the noise nuisance.	Closed
220	11th September 2018	26th September 2018/ Lam Tin Interchange	Public	Noise	Complained about the construction noise	Y	➢ See Investigation / Mitigation Measures for Complaint No. 218	Closed
219	7th September 2018	7th September 2018/ Construction of Road P2	Resident of Ocean Shores	Noise	Complained about the noise from sheet piling	Y	**Mitigation Measures adopted by the Contractor** ➢ Silent up barrier was provided for piling works in between vibration hammer and Ocean Shores. Acoustic barriers was erected along site boundary ➢ Noise barrier surround the engine of the derrick barge ➢ Acoustic material wrapped on vibration hammer for sheet piling works	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
218	6th September 2018	6th September 2018/ Construction in LTI	Public	Noise	Complained about noise nuisance in LTI	Y	The Contractor had implemented environmental mitigation measures in accordance with the "Implementation Schedule of Proposed Mitigation Measures" of EM&A Manual as follows: <u>Noise:</u> ➢ Noise barriers were erected between the PMEs and NSR to reduce noise nuisance at Portion 4C; ➢ Powered mechanical equipment (PME) for breaker was equipped with noise barriers at Portion 4C.	Closed
217	5th September 2018	5th September 2018/ Construction of Road P2	Public	Air Quality	Complained about dark smoke emission from derrick barges.	N	The Contractors has adopted the following environmental mitigation measures to reduce dark smoke nuisance from construction barges since June for dark smoke complaints: ➢ Smoke filtering tanks were adopted on deck level of derrick barges to reduce emission of dark smoke and exhaust smell; ➢ New engine has been installed on derrick barge to reduce the dark smoke emission.	Closed
216	5th September 2018	5th September 2018/ Construction of Road P2	Public	Air Quality	Complained about dark smoke emission from derrick barges.	N	See Investigation / Mitigation Measures for Complaint No. 217	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
215	5th September 2018	5th September 2018/ Construction of Road P2	Public	Water Quality	Complained about the oil leakage within the cofferdam	N	The Contractors had taken measures to clean up and prevent any further oil spillage for marine works in the future: ➢ Oil was absorbed and cleared with sorbents ➢ Wire was applied with suitable amount of oil to prevent further oil spill ➢ Training was provided for frontline staff on applying lubricant oil on wire rope of derrick barge. The Contractor had implemented environmental measures in accordance with the "Implementation Schedule of Proposed Mitigation Measures" of EM&A Manual as below: ➢ Construction activities should not cause foam, oil, grease, scum, little or other objectionable matter to be present on the water within the site. Standard good-site practice is adopted to prevent any fuels and solvent entering the nearby watercourses.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
214	4th September 2018	4th September 2018/ Construction of Road P2	Ocean Shores Management Office	Air Quality	Follow up complaint on 21 and 22 August, regarding dark smoke emission from derrick barges.	N	➢ See Investigation / Mitigation Measures for Complaint No. 217	Closed
213	31st August 2018	31st August 2018/ Construction of Lam Tin Interchange	Public	Air Quality	The complainant complained about the dust nuisance at LTI.	N	See Investigation / Mitigation Measures for Complaint No. 207	Closed
212	27th August 2018	27th August 2018/ Construction of Road P2	Resident of Yau Lai Estate	Noise	The complainant complained about the noise nuisance from breaker and excavator in LTI.	Y	See Investigation / Mitigation Measures for Complaint No. 203	Closed
211	22nd August 2018	22nd August 2018/ Construction of Road P2	Public	Air Quality	The complainant complained about the dark smoke emitted from derrick barge outside Ocean Shores.	N	See Investigation / Mitigation Measures for Complaint No. 209	Closed
210	21st August 2018	21st August 2018/ Construction of Road P2	Public	Air Quality	The complainant complained about the dark smoke emitted from derrick barge outside Ocean Shores.	N	See Investigation / Mitigation Measures for Complaint No. 209	Closed

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	21st August 2018	20th & 21st August 2018/ Construction of Road P2	DC Member	Air Quality	The complainant complained about the dark smoke emitted from derrick barge outside Ocean Shores on 20 and 21 of August.	N	The Contractors had implemented environmental mitigation measures to reduce dark smoke nuisance from construction barges to the nearby sensitive receivers as follows: ➢ Additional water filter tank was adopted on deck level of derrick barges to reduce emission of dark smoke and exhaust smell ➢ There were five derrick barges operating on 20 & 22 of August and four of them had water filter installed. The one without water filter was demobilized away from the site on 22 August.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
208	20th August 2018	17th August/ Construction of Road P2	DC Member	Water Quality	The complainant complained that muddy water was discharged from the construction site.	N	Based on the information gathered in the investigation. As the location of muddy discharge was appeared adjoining the Tseung Kwan O DSD Desilting Compound, a high volume of upstream discharge collected from rain events is a possible cause of such muddy discharge event. There are no direct evidence that the muddy discharge near the outfall of DSD Desilting Compound was due to the Project. Measure Taken by the Contractor The Contractors had taken initiatives to ensure the quality of wastewater discharge from land-based works and to enhance mitigation measure to prevent silt from marine works from entering surrounding waters: ➢ Additional geotextile was installed between steel tanks to prevent migration of filling materials outside the cofferdam ➢ Cofferdams in form of steel tanks filled with aggregated material were covered with geotextile to prevent spillage of silty materials into nearby waters	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
207	18th August 2018	18th August 2018/ Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Air Quality	The complainant complained about dust nuisance from surface blasting.	N	According to the EM&A Manual of this Project, regular air quality monitoring has been carried out at following Stations. AM2 – Sai Tso Wan Recreation Ground; AM3 Yau Lai Estate, Bik Lai House. No exceedance was recorded in the above station during August. Mitigation Measures and Follow up Actions by Contractor The Contractor had implemented environmental mitigation measures in accordance with the "Implementation Schedule of Proposed Mitigation Measures" of EM&A Manual as follows: Air Quality: ➢ Blasting cage were surrounded with impervious material during surface blasting ➢ Water spraying was provided at the blasting cage and stone crusher to enhance dust suppression	Closed
206	13th August 2018	13th August 2018/ Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	The complainant complained about the noise nuisance from the breaker at LTI and complained lack of noise barrier.	Y	See Investigation / Mitigation Measures for Complaint No. 203	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
205	10th August 2018	10th August 2018/ Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	The complainant complained about the noise nuisance of construction work starting from 7 am and lack of noise barrier.	Y	See Investigation / Mitigation Measures for Complaint No. 203	Closed
204	9th August 2018	9th August 2018/ Construction of Lam Tin Interchange	Resident of Tak Tin Estate	Noise	The complainant complained about noise nuisance and vibration from blasting activity	Y	According to the EM&A Manual of this Project, weekly noise monitoring in Cha Kwo Ling and Lam Tin during s been carried out at the following Stations. CM1 – Nga Lai House, Yau Lai Estate Phase 1, Yau Tong, Station; CM2 – Bik Lai House, Yau Lai Estate Phase 1, Yau Tong; CM3 - Block S, Yau Lai Estate Phase 5, Yau Tong. There was no exceedance recorded in the above station during daytime in August.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
203	9th August 2018	9th August 2018/ Construction of Lam Tin Interchange	Property Management of Tak Tin Estate	Noise	The complainant complained about the noise nuisance during 8pm	Y	Mitigation Measures and Follow up Actions by Contractor The Contractor had implemented environmental mitigation measures in accordance with the "Implementation Schedule of Proposed Mitigation Measures" of EM&A Manual as follows: Noise: ➢ Noise barriers were erected between the PMEs and NSR to reduce noise nuisance at Portion 4C ➢ Powered mechanical equipment (PME) for rock breaking were equipped with noise barriers at Portion 4C According to the EM&A Manual of this Project, weekly noise monitoring in Cha Kwo Ling and Lam Tin during s been carried out at the following Stations. CM1 – Nga Lai House, Yau Lai Estate Phase 1, Yau Tong, Station; CM2 – Bik Lai House, Yau Lai Estate Phase 1, Yau Tong; CM3 - Block S, Yau Lai Estate Phase 5, Yau Tong. There was no exceedance recorded in the above station during daytime in August.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
202	1st August 2018	1st August 2018/ Construction of Lam Tin Interchange	Resident of Yeung Mei House	Noise	The complainant complained about the construction noise during night-time.	Y	A valid Construction Noise Permit (CNP) (No. GW-RE0421-18) was granted to the Contractor for the construction site at Lam Tin Interchange The number of excavators that were used on 01 August was covered by the CNP. The Contractor had implemented environmental mitigation measures in accordance with the "Implementation Schedule of Proposed Mitigation Measures" of EM&A Manual as follows: ➢ Noise barriers were erected between the PMEs and NSR to reduce noise nuisance ➢ Powered mechanical equipment (PME) for rock breaking were equipped with TMD and SilentMat	Closed
201	26th July 2018	26th July 2018 / Construction of P2/D4	Public	Water quality	The complainant complained about the polluted effluent at the nearby surface drain near the construction of elevator.	N	The Contractor had implemented environmental mitigation measures in accordance with the "Implementation Schedule of Proposed Mitigation Measures" of EM&A Manual as follows: ➢ Sandbags barrier was placed along the working area to prevent direct discharge	Closed
200	26th July 2018	26th July 2018 / Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Follow up on 24th July 2018, the situation has yet been addressed.	Y	See Investigation / Mitigation Measures for Complaint No. 197	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
199	24th July 2018	23rd July 2018 / Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	The complainant complained about a yellow breaker working without noise barrier.	Y	See Investigation / Mitigation Measures for Complaint No. 197	Closed
	25th July 2018	25th July 2018 / Construction of Road P2	SKDC member	Noise	The complainant complained about the noise from piling works at Portion IV.	Y	See Investigation / Mitigation Measures for Complaint No. 198	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
198	21st July 2018	21st July 2018 / Construction of Road P2	SKDC member	Noise	The complainant complained about the noise from metal occasionally in the marine works area.	Y	Based on the noise monitoring results in July 2018, no Limit Level Exceedance was recorded at Station CM6(A) and CM7(A). It is considered that no adverse construction noise impact was brought to the nearby sensitive receivers during the construction. The Contractors had implemented environmental mitigation measures to reduce construction nuisance from construction activities to the nearby sensitive receivers as follows: <u>Noise:</u> ➢ Acoustic box was utilized for breaking works to minimize noise nuisance ➢ Acoustic barriers were provided for pre-boring works ➢ Regular site checking would be performed to ensure the type and quantity of PME are in order with the updated Construction Noise Assessment. ➢ Additional acoustic materials were wrapped around the vibration hammer ➢ Quieter plant, i.e. quality powered mechanical equipment was used as far as practicable to minimize noise impact from PME	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
197	21st July 2018	21st July 2018 / Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	The complainant complained about the noise nuisance from breaker.	Y	According to the EM&A Manual of this Project, additional weekly noise monitoring in Cha Kwo Ling and Lam Tin during night-time has been carried out at Station CM1 – Nga Lai House, Yau Lai Estate Phase 1, Yau Tong, Station CM2 – Bik Lai House, Yau Lai Estate Phase 1, Yau Tong, CM3 - Block S, Yau Lai Estate Phase 5, Yau Tong. no Limit Level Exceedance was recorded at Station CM1, CM2 and CM3. The summary of daytime and evening time noise monitoring results which conducted by ET in July and early August 2018 at Station CM1, CM2 and CM3 The Contractor had implemented environmental mitigation measures in accordance with the "Implementation Schedule of Proposed Mitigation Measures" of EM&A Manual as follows: ➢ Noise barriers were erected between the PMEs and NSR to reduce noise nuisance ➢ Powered mechanical equipment (PME) for rock breaking were equipped with TMD and SilentMat	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
196	20th July 2018	Not specified / Construction of Lam Tin Interchange	Property Management Office of Hong Pak Court	Air Quality	The complainant complained about the dust problem after blasting work in the afternoon.	N	The Contractor had implemented environmental mitigation measures in accordance with the "Implementation Schedule of Proposed Mitigation Measures" of EM&A Manual as follows: ➢ Blasting cage were surrounded with impervious material during surface blasting ➢ Water spraying was provided at the blasting cage to enhance dust suppression	Closed
195	17th July 2018	16th July 2018 / Construction of Road P2	SKDC member	Noise	The complainant complained the noise from works area near Ocean Shores	Y	See Investigation / Mitigation Measures for Complaint No. 198	Closed
194	12th July 2018	12th July 2018/ Construction of Road P2/ D4 and Northern Footbridge	Residents of Metrotown	Air Quality	The complainant complained the dusty problem next to Chui Ling Road Substation.	N	The Contractor had implemented environmental mitigation measures in accordance with the "Implementation Schedule of Proposed Mitigation Measures" of EM&A Manual as follows: ➢ Water spraying was provided at least 8 times a day. ➢ Access road was paved to minimize dust emission from truck traffic.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
193	12th July 2018	12th July 2018 / Construction of Road P2	Residents of Metrotown	Air Quality	The complainant complained the dust problem from the partially covered stockpile in Work Area A.	N	According to the information provided and confirmed by the Engineer, loading and unloading of treated sediment was conducted in Work Area A. According to the EM&A Manual of this Project, regular air quality monitoring has been carried out at Station AM5(A) – Tseung Kwan O DSD Desilting Compound and AM6(A) – Park Central, L1/F Open Space Area. no Action or Limit Level Exceedance was recorded at Station AM5(A) and AM6(A) from 3 to 12 July 2018. It is considered that no adverse air quality impact was brought to the nearby sensitive receivers during the construction period The Contractors had implemented environmental mitigation measures to reduce dust nuisance from construction activities to the nearby sensitive receivers as follows: ➢ Covered the stockpile of treated marine sediment with tarpaulin sheets	Closed
192	23rd July 2018	Not specified/ Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Follow up on the complaint on 27th June, 2nd and 3rd July 2018, the complainant complained that the situation has not yet been addressed.	Y	The Contractor had implemented environmental mitigation measures in accordance with the "Implementation Schedule of Proposed Mitigation Measures" of EM&A Manual as follows: ➢ Replaced and fixed the uneven metal plate on Lei Yue Mun Road near ambulance depot	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
191	3rd July 2018	3rd July 2018/ Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Follow up on the complaint on 27th June, 2nd July 2018, the complainant complained that the situation has not yet been addressed.	Y	The Contractor had implemented environmental mitigation measures in accordance with the "Implementation Schedule of Proposed Mitigation Measures" of EM&A Manual as follows: ➢ Replaced and fixed the uneven metal plate on Lei Yue Mun Road near ambulance depot According to the information provided and confirmed by the Engineer, dredging and welding works are conducted on 23 June 2018 during the time of complaint. The Contractors had implemented environmental mitigation measures to reduce odour nuisance from construction activities to the nearby sensitive receivers as follows: ➢ Air blowers were provided at the location where welding works to be carried out to dilute the smell ➢ Additional water filter tank was adopted on deck level of derrick barges to reduce emission of dark smoke and exhaust smell	Closed
	2nd July 2018	2nd July 2018/ Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	Follow up on the complaint on 27th June 2018, the complainant complained that the situation has not yet been addressed.	Y		Closed
	27th June 2018	26th and 27th June 2018/ Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	The complainant complained the construction noise at Lam Tin Interchange during night-time.	Y		Closed
	25th June 2018	23rd June 2018/ Construction of Road P2	Public	Air Quality	The complainant complained the dark smoke emission from construction barge and the smell from welding works.	N		Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
190	22nd June 2018	Not Specific/ Construction of Lam Tin Interchange	Public	Waste Management	The complainant complaint about the housekeeping of the construction site.	N	From the Daily Record Summary provided by the Contractor and confirmation by the RE, there was no irregularity, and together with the site inspection conducted by the environmental team in June, construction waste on pavement was not observed. Despite, the Contractor was reminded to follow the relevant mitigation measures related to waste management: ➢ Ensure trucks have enclosed the containers before leaving the site to reduce the impact during transportation (Photo 3); ➢ Training of site personnel in proper waste management and chemical handling procedures to ensure proper disposal of construction waste; ➢ Proper storage and site practices to minimize the potential for damage or contamination of construction materials	Closed
189	20th June 2018	28th May 2018/ Construction of Road P2	SKDC member	Air Quality	The complainant complained the dark smoke emission from the same construction vessel.	N	See Investigation / Mitigation Measures for Complaint No. 181.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
188	20th June 2018	20th June 2018/ Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	The complainant complained about construction noise starting from 6 am.	Y	The construction activities in Lam Tin Interchange (Work site No.101) on 20th of June possessed of 6 no. of excavators between 7-8 am, 6 no. of breakers, excavator mounted between 8-10 am. The quantity of excavators and breakers were consistent with the Construction Noise Mitigation Plan (Construction Activity Group 1.1) The Contractor had implemented environmental mitigation measures in accordance with the "Implementation Schedule of Proposed Mitigation Measures" of EM&A Manual as follows: ➢ Powered mechanical equipment (PME) for rock breaking were equipped with TMD and SilentMat	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
187	7th June 2018	7th June 2018/ Construction of Road P2	Resident of Ocean Shores	Air Quality	The complainant complained about the smell of machinery exhaust affecting the podium of Ocean Shores (swimming pool). The complainant suspected the exhaust was originated from the nearby barges.	N	According to the information provided and confirmed by the Engineer, dredging works and placing rock fill were conducted during the time of complaint. Dredger, derrick barge, tug boat and hopper barge were being operated for the mentioned works. According to the site inspections conducted by ET and IEC in May and June 2018, no exhausted smell from construction vessel was identified in Portion IV, VII and IX. The Contractors had implemented environmental mitigation measures to minimize the air nuisance to the nearby sensitive receivers as follows: *Odour Emission from Exhausted Gas:* ➢ Additional water filter tank was adopted on the deck level of derrick barges to reduce emission of dark smoke and exhaust smell	Closed
186	6th June 2018	6th June 2018/ Construction of Lam Tin Interchange	Resident of Chung Pak House, Hong Pak Court	Noise	The complainant complained about the construction noise at Lam Tin Interchange.	Y	A valid Construction Noise Permit (CNP) (No. GW-RE0278-18) was granted to the Contractor for the construction site at Lam Tin Interchange. The number of excavator and dump trucks that were used on 6 June were covered by the CNP.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
185	6th June 2018	30th May and 30th September 2017/ Construction of Road P2	SKDC member	Noise	The complainant complained about the noise affecting nearby resident in early morning near Ocean Shores.	Y	See Investigation / Mitigation Measures for Complaint No. 50 and 81.	Closed
184	6th June 2018	Not specified / Construction of Road P2	SKDC member	Landscape	The complainant complained about excessive tree felling near Ocean Shores.	N	According to the information provided and confirmed by the Engineer, tree removal application for the concerned area has granted approval from District Lands Office (DLO) on 1 August 2017 and 18 April 2018 together with the tree compensatory plans. The felling of a total of 85 trees at the concerned area were in accordance with the approved tree removal application by the DLO. None of them are registered Old and Valuable Tree and neither of them are rare nor endangered species. The number of retained trees at the concerned location complies with the latest tree removal application. The Contractor had taken initiatives to minimize nuisance from construction works to the nearby sensitive receivers as follows: ➢ Tree protection zones were established and surrounded by fences to protect retained trees adjacent to the construction area. ➢ Tree protection zone were free of machinery and material that are likely to be injurious to the tree. ➢ Regular tree assessments were conducted by qualified Arborist to monitor the condition of retained trees.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
183	4th June 2018	4th June 2018/ Construction of Lam Tin Interchange	Resident of Hong Pak Court	N/A	The complainant complained about the blasting works during night-time.	N	The Contractor had implemented environmental mitigation measures in accordance with the "Implementation Schedule of Proposed Mitigation Measures" ➢ Ensured blasting doors were closed while blasting associated works was undertaken in the tunnel ➢ Installed steel-type blasting door mounted with sound absorptive lining to absorb construction noise in the tunnel	Closed
182	1st June 2018	Not specified/ Construction of Lam Tin Interchange	Sin Fat Road Tennis Court	Air Quality	The complainant complained about the dust	N	The Contractor had taken initiatives to minimize nuisance from construction works to the nearby sensitive receivers as follows: ➢ Frequent water spraying along the slope area at LTI. ➢ Tarpaulin sheets were provided along the slope adjacent to the tennis court during preparation of surface blasting.	Closed

Cumulative Complaint Log since commencement of Project

Reporting Month/Year	Number of Complaints in Reporting Month	Number of Summons in Reporting Month	Number of Prosecutions in Reporting Month
2016	11	0	0
2017	99	1	0
2018	150	0	1
2019	156	0	0
January 2020	6[1]	0	0
February 2020	4	0	0
March 2020	11	0	0
Total	**437**	**1**	**1**

1. One new complaint was received after the submission of the EMA Report (Jan 2020)

Cumulative Log for Notifications of Summons

Contract No.	Log Ref.	Date/Location	Subject	Status	Total no. Received in this reporting month	Total no. Received since project commencement
NE/2015/01	--	--	--	--	--	--
NE/2015/02	KTS24 138/2017	25 June 2017/ Marine construction site at Junk Bay	Contrary to: Sections 6 (1) (b) and 6 (5), Noise Control Ordinance, Cap.400	The Summon was issued on 22 Dec 2017 First hearing on 29 Mar 2018	0	1
NE/2015/03	--	--	--	--	--	--
NE/2017/01	--	--	--	--	--	--
NE/2017/02	--	--	--	--	--	--

Cumulative Log for Successful Prosecutions

Contract No.	Log Ref.	Date/Location	Subject	Status	Total no. Received in this reporting month	Total no. Received since project commencement
NE/2015/01	--	--	--	--	--	--
NE/2015/02	KTS24 138/2017	25 June 2017/ Marine construction site at Junk Bay	Contrary to: Sections 6 (1) (b) and 6 (5), Noise Control Ordinance, Cap.400	Successful prosecution to the subcontractor on 27 June 2018	1	1
NE/2015/03	--	--	--	--	--	--
NE/2017/01	--	--	--	--	--	--
NE/2017/02	--	--	--	--	--	--

APPENDIX P
WASTE GENERATION IN THE REPORTING MONTH

Name of Department: Civil Engineering Development Department

Contract No.: NE/2015/01

Monthly Summary Waste Flow Table for Mar 2020

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	131.325	42.581	0.000	42.581	88.744	0.000	0.000	0.000	0.000	3.040	0.360
February	124.053	43.467	0.000	43.467	80.586	0.000	0.000	0.000	0.000	0.000	0.336
March	159.135	35.849	0.000	35.849	123.286	0.000	0.000	0.000	0.000	0.000	0.489
April											
May											
June											
Sub-total	414.513	121.897	0.000	121.897	292.616	0.000	0.000	0.000	0.000	3.040	1.185
July											
August											
September											
October											
November											
December											
Total											

Total inert C&D waste generated = c+d+e

Total inert C&D waste recycled = c+d

% of recycled inert C&D waste = Total C&D waste recycled / Total C&D waste generated

Notes:
(1) The performance target are given in PS Clause 6(14)
(2) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site
(3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material
(4) The Contractor shall also submit the latest forecast of the amount of C&D materials expected to be generated from the Works, together with a break down of the nature where the total amount of C&D materials expected to be generated from the Works is equal to or exceeding 50,000m3. (PS Clause 1.105(4) refers)
(5) All recyclable materials, including metals, paper / cardboard packaging, plastics, etc. will be collected by registered collector for recycling.
(6) Conversion factors for reporting purpose:
in-situ: rock = 2.5 tonnes/m^3; soil = 2.0 tonnes/m^3
(7) excavated: rock = 2.0 tonnes/m^3; soil = 1.8 tonnes/m^3; broken concrete and bitumen = 2.4 tonnes/m^3, soil and rock = 1.9 tonnes/m^3
(8) C&D Waste = 0.9 tonnes/m^3; bentonite slurry = 2.8 tonnes/m^3
Diesel density: 0.8kg/l
Numbers are rounded off to the nearest three decimal places
The "Total Quantity Generated" equals to the sum of "Reuse in the Contract", "Reuse in Other Projects" and "Disposed as Public Fill"

Contract No.: 2015/02

Monthly Summary Waste Flow Table for 2020 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	30.64412	0.00000	0.00000	0.00000	24.22533	6.41880	5.41000	0.00000	0.00000	0.00000	0.04746
Feb	39.14024	0.00000	0.00000	0.00000	32.17651	6.96373	370.20000	0.00000	0.00000	0.00000	0.07116
Mar	27.14772	0.00000	0.00000	0.00000	15.34531	11.80241	29.85000	0.00000	0.00000	0.00000	0.06906
Apr											
May											
June											
SUB-TOTAL	96.93207	0.00000	0.00000	0.00000	71.74714	25.18493	405.46000	0.00000	0.00000	0.00000	0.18768
Jul											
Aug											
Sep											
Oct											
Nov											
Dec											
TOTAL											

Note: **Conversion to 1000m^3 for general refuse is weight in 1000kg multiply by 0.002**

Conversion to 1000m^3 for Inert C&D is weight in 1000kg multiply by 0.0005

Plastics refer to plastic bottles / containers, plastic sheets / foam from packaging material

Plastics refer to plastic bottles / containers, plastic sheets / foam from packaging material

Monthly Summary of Waste Flow Table for 2020

Name of Person completing the Record: Martin Yiu

Month	Actual Quantities of Inert C&D Materials Generated Monthly					Actual Quantities of Non-inert C&D Wastes Generated Monthly				
	Total Quantity Generated	Broken Concrete *(see Note 1)*	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Metals	Paper/ cardboard packaging	Plastics *(see Note 2)*	Chemical Waste	Others, e.g. general refuse
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000 Kg)	(in '000 Kg)	(in '000 Kg)	(in '000 Kg)	(in '000m^3)
Jan	0.4469	0	0	0	0.4469	0	0	0	0	0.0195
Feb	0.5532	0	0	0	0.5532	0	0	0	0	0.0390
Mar	0.6280	0	0	0	0.6280	0	0	0	0	0.0079
Apr	0.0000	0	0	0	0.0000	0	0	0	0	0.0000
May	0.0000	0	0	0	0.0000	0	0	0	0	0.0000
Jun	0.0000	0	0	0	0.0000	0	0	0	0	0.0000
Sub-total	1.6281	0	0	0	1.6281	0	0	0	0	0.0664
Jul	0.0000	0	0	0	0.0000	0	0	0	0	0.0000
Aug	0.0000	0	0	0	0.0000	0	0	0	0	0.0000
Sep	0.0000	0	0	0	0.0000	0	0	0	0	0.0000
Oct	0.0000	0	0	0	0.0000	0	0	0	0	0.0000
Nov	0.0000	0	0	0	0.0000	0	0	0	0	0.0000
Dec	0.0000	0	0	0	0.0000	0	0	0	0	0.0000
Total	1.6281	0	0	0	1.6281	0	0	0	0	0.0664

Notes:

(1) Broken concrete for recycling into aggregates.

(2) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.

(3) Use the conversion factor: 1 full load of 24t / 30t dumping truck being equivalent to 6.5m3 / 8.125 m3 by volume.

GTECH Services (Hong Kong) Limited

Name of Department: Civil Engineering & Development Department

Contract No.: NE/2017/06

Monthly Summary Waste Flow Table For 2020

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
Mar	0	0	0	0	0	0	0	0	0	0	0
Apr											
May											
Jun											
Sub-total	0	0	0	0	0	0	0	0	0	0	0
Jul											
Aug											
Sep											
Oct											
Nov											
Dec											
Total	0	0	0	0	0	0	0	0	0	0	0

Notes: (1) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.

(2) Plastics refer to plastic bottles / containers, plastic sheets / foam from packaging material.

(3) Each dump truck carries 6m^3 of general refuse.

(4) The commencement date of the Contract is 9 November 2018. The current reporting period is from 1 March 2020 to 31 March 2020.

Tseung Kwan O - Lam Tin Tunnel - Tseung Kwan O Interchange and Associated Works
(NE/2017/01)

俊和－上隧－中冶聯營
CW - STEC - CMGC JV

Monthly Summary Waste Flow Table for 2020

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	0.0163	0.0000	0.0000	0.0000	0.0163	0.0000	0.0000	0.0000	0.0000	0.0000	0.0033
Feb	0.2601	0.0000	0.0000	0.0000	0.2601	0.0000	11.2600	0.0000	0.0000	0.0000	0.0017
Mar	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0044
Apr											
May											
Jun											
Sub-total	0.2764	0.0000	0.0000	0.0000	0.2764	0.0000	11.2600	0.0000	0.0000	0.0000	0.0093
Jul											
Aug											
Sep											
Oct											
Nov											
Dec											
Total	0.2764	0.0000	0.0000	0.0000	0.2764	0.0000	11.2600	0.0000	0.0000	0.0000	0.0093

Notes:

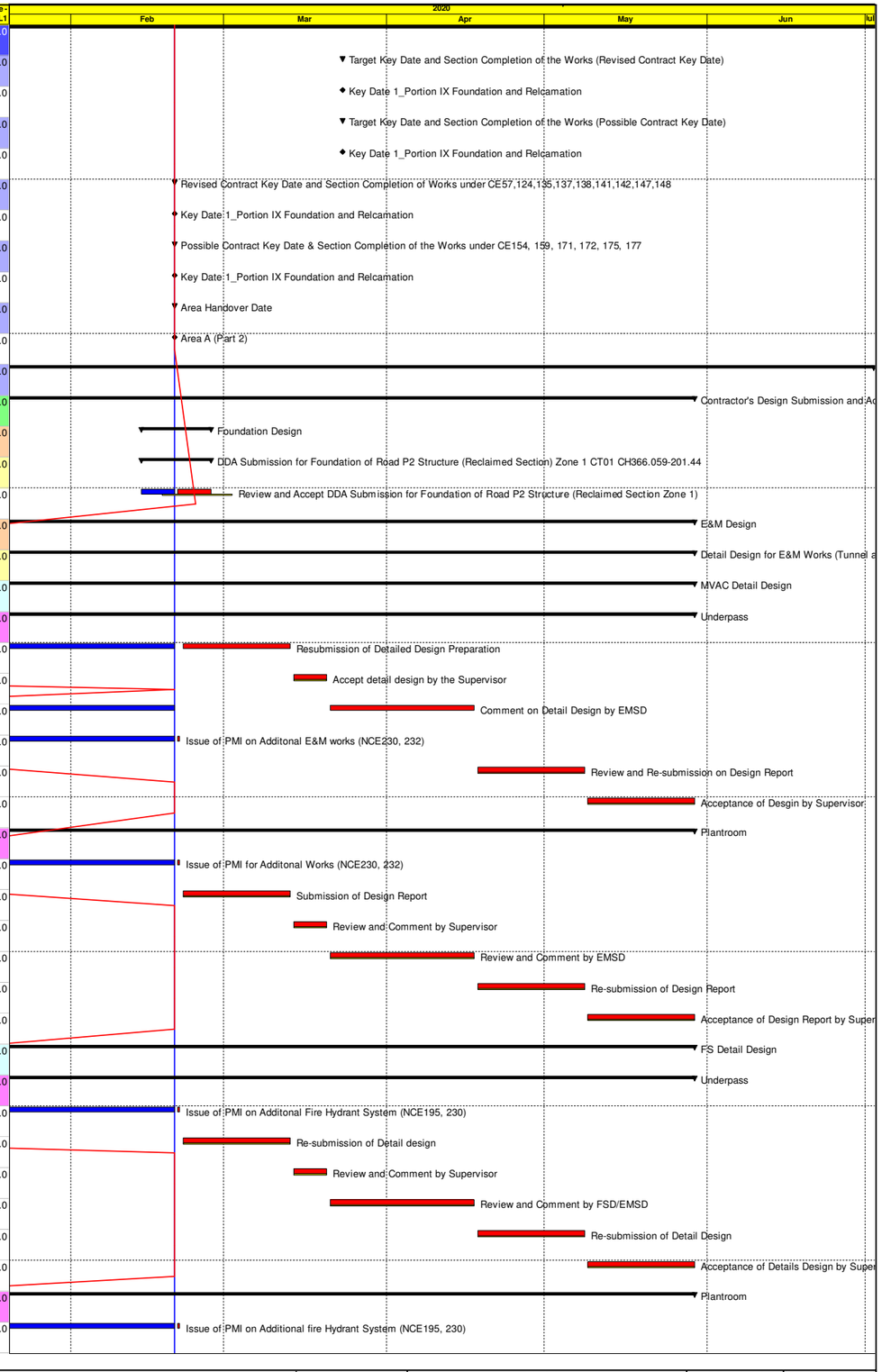
1. Assume the density of soil fill is 2 ton/m^3.
2. Assume the density of rock and broken concrete is 2.5 ton/m^3.
3. Assume the density of mixed rock and soil is 1.9 ton/m^3.
4. Assume the density of slurry and bentonite is 2.8 ton/m^3.
5. The slurry and bentonite are disposed at Tseung Kwan O Area 137 Fill Bank.
6. Assume the density of C&D waste is 0.9 ton/m^3.
7. The non-inert C&D wastes are disposed at NENT.

APPENDIX Q
TENTATIVE CONSTRUCTION PROGRAMME

High Level 3 Months Look Ahead Programme

Activities	Apr-20	May-20	Jun-20
Lam Tin Interchange			
EHC2 U-Trough			
Site Formation - Area 1G1 & 1G2 &5			
Site Formation - Area 2			
Site Formation - Area 3 and 4 Slope stabilisation			
Administration Building			
Bridge Construction			
Main Tunnel			
MT Excavation			
MT Lining Works			
TKO Interchange			
Haul Road Construction, Site Formation & Slope Works			
Bridge Construction			
East Ventilation Building			

Activity ID	Activity Name	Calendar	Original Duration	Remaining Duration	Start	Finish	Total Float	Activity % Complete	TRA	Variance - BL1
NE/2015/02 Tseung Kwan O - Lam Tin Tunnel-Road P2 and Associated Works (Feb-20)			1302.0	497.0	12-Jan-17 A	25-Oct-21	-122.5			-114.0
Target Key Date and Section Completion of the Works (Revised Contract Key Date)		P2-Cal.A	0.0	0.0	23-Mar-20	23-Mar-20	-202.5			0.0
A10420	Key Date 1_Portion IX Foundation and Relcamation	P2-Cal.A	0.0	0.0		23-Mar-20*	-202.5	0%		0.0
Target Key Date and Section Completion of the Works (Possible Contract Key Date)		P2-Cal.A	0.0	0.0	23-Mar-20	23-Mar-20	-189.5			0.0
A10770	Key Date 1_Portion IX Foundation and Relcamation	P2-Cal.A	0.0	0.0		23-Mar-20*	-189.5	0%		0.0
Revised Contract Key Date and Section Completion of Works under CE57,124,135,137,138,1		P2-Cal.A	0.0	0.0	20-Feb-20	20-Feb-20	-170.5			0.0
K10402	Key Date 1_Portion IX Foundation and Relcamation	P2-Cal.A	0.0	0.0		20-Feb-20*	-170.5	0%		0.0
Possible Contract Key Date & Section Completion of the Works under CE154, 159, 171, 172,		P2-Cal.A	0.0	0.0	20-Feb-20	20-Feb-20	-157.5			0.0
K10419-11	Key Date 1_Portion IX Foundation and Relcamation	P2-Cal.A	0.0	0.0		20-Feb-20*	-157.5	0%		0.0
Area Handover Date		P2-Cal.A	0.0	0.0	20-Feb-20	20-Feb-20	-20.0			0.0
A10630	Area A (Part 2)	P2-Cal.A	0.0	0.0		20-Feb-20*	-20.0	0%		0.0
Preliminaries, Submission, Contractor's Design Submission and Approval		P2-Cal.A	1260.0	133.0	20-Jan-17 A	02-Jul-20	109.5			0.0
Contractor's Design Submission and Acceptance		P2-Cal.A	618.0	99.0	15-Sep-18 A	29-May-20	-1.5			-5.0
Foundation Design		P2-Cal.A	14.0	7.0	14-Feb-20 A	27-Feb-20	-115.5			0.0
DDA Submission for Foundation of Road P2 Structure (Reclaimed Section) Zone 1 CT01 CH366.059-201.44		P2-Cal.A	14.0	7.0	14-Feb-20 A	27-Feb-20	-115.5			0.0
S11420	Review and Accept DDA Submission for Foundation of Road P2 Structure (Reclaimed Section Zone 1)	P2-Cal.A	14.0	7.0	14-Feb-20 A	27-Feb-20	-115.5	50%		0.0
E&M Design		P2-Cal.A	360.0	99.0	05-Jun-19 A	29-May-20	-1.5			0.0
Detail Design for E&M Works (Tunnel and associated)		P2-Cal.A	360.0	99.0	05-Jun-19 A	29-May-20	-1.5			0.0
MVAC Detail Design		P2-Cal.A	360.0	99.0	05-Jun-19 A	29-May-20	-41.5			0.0
Underpass		P2-Cal.A	360.0	99.0	05-Jun-19 A	29-May-20	-41.5			0.0
S11640-01	Resubmission of Detailed Design Preparation	P2-Cal.A	7.0	21.0	05-Jun-19 A	13-Mar-20	-41.5	0%		-276.0
S11640-02	Accept detail design by the Supervisor	P2-Cal.A	7.0	7.0	14-Mar-20	20-Mar-20	-41.5	0%		0.0
S11640-03	Comment on Detail Design by EMSD	P2-Cal.A	7.0	28.0	22-Nov-19 A	17-Apr-20	-41.5	0%		-141.0
S11640-04	Issue of PMI on Additonal E&M works (NCE230, 232)	P2-Cal.A	5.0	1.0	04-Dec-19 A	21-Feb-20	-41.5	80%		-75.0
S11640-13	Review and Re-submission on Design Report	P2-Cal.A	21.0	21.0	18-Apr-20	08-May-20	-41.5	0%		0.0
S11640-23	Acceptance of Desgin by Supervisor	P2-Cal.A	21.0	21.0	09-May-20	29-May-20	-41.5	0%		0.0
Plantroom		P2-Cal.A	190.0	99.0	04-Dec-19 A	29-May-20	-41.5			12.0
S11578-03	Issue of PMI for Additonal Works (NCE230, 232)	P2-Cal.A	7.0	1.0	04-Dec-19 A	21-Feb-20	-41.5	85.71%		-73.0
S11578-13	Submission of Design Report	P2-Cal.A	21.0	21.0	22-Feb-20	13-Mar-20	-41.5	0%		0.0
S11578-15	Review and Comment by Supervisor	P2-Cal.A	7.0	7.0	14-Mar-20	20-Mar-20	-41.5	0%		0.0
S11578-23	Review and Comment by EMSD	P2-Cal.A	28.0	28.0	21-Mar-20	17-Apr-20	-41.5	0%		0.0
S11578-33	Re-submission of Design Report	P2-Cal.A	21.0	21.0	18-Apr-20	08-May-20	-41.5	0%		0.0
S11578-43	Acceptance of Design Report by Supervisor	P2-Cal.A	21.0	21.0	09-May-20	29-May-20	-41.5	0%		0.0
FS Detail Design		P2-Cal.A	309.0	99.0	26-Jul-19 A	29-May-20	-1.5			0.0
Underpass		P2-Cal.A	309.0	99.0	26-Jul-19 A	29-May-20	-1.5			0.0
S11651-01	Issue of PMI on Additonal Fire Hydrant System (NCE195, 230)	P2-Cal.A	5.0	1.0	26-Jul-19 A	21-Feb-20	-1.5	80%		-206.0
S11651-11	Re-submission of Detail design	P2-Cal.A	21.0	21.0	22-Feb-20	13-Mar-20	-1.5	0%		0.0
S11651-21	Review and Comment by Supervisor	P2-Cal.A	7.0	7.0	14-Mar-20	20-Mar-20	-1.5	0%		0.0
S11651-31	Review and Comment by FSD/EMSD	P2-Cal.A	28.0	28.0	21-Mar-20	17-Apr-20	-1.5	0%		0.0
S11651-41	Re-submission of Detail Design	P2-Cal.A	21.0	21.0	18-Apr-20	08-May-20	-1.5	0%		0.0
S11651-51	Acceptance of Details Design by Supervisor	P2-Cal.A	21.0	21.0	09-May-20	29-May-20	-1.5	0%		0.0
Plantroom		P2-Cal.A	309.0	99.0	26-Jul-19 A	29-May-20	-1.5			0.0
S11652-22	Issue of PMI on Additional fire Hydrant System (NCE195, 230)	P2-Cal.A	5.0	1.0	26-Jul-19 A	21-Feb-20	-1.5	80%		-206.0



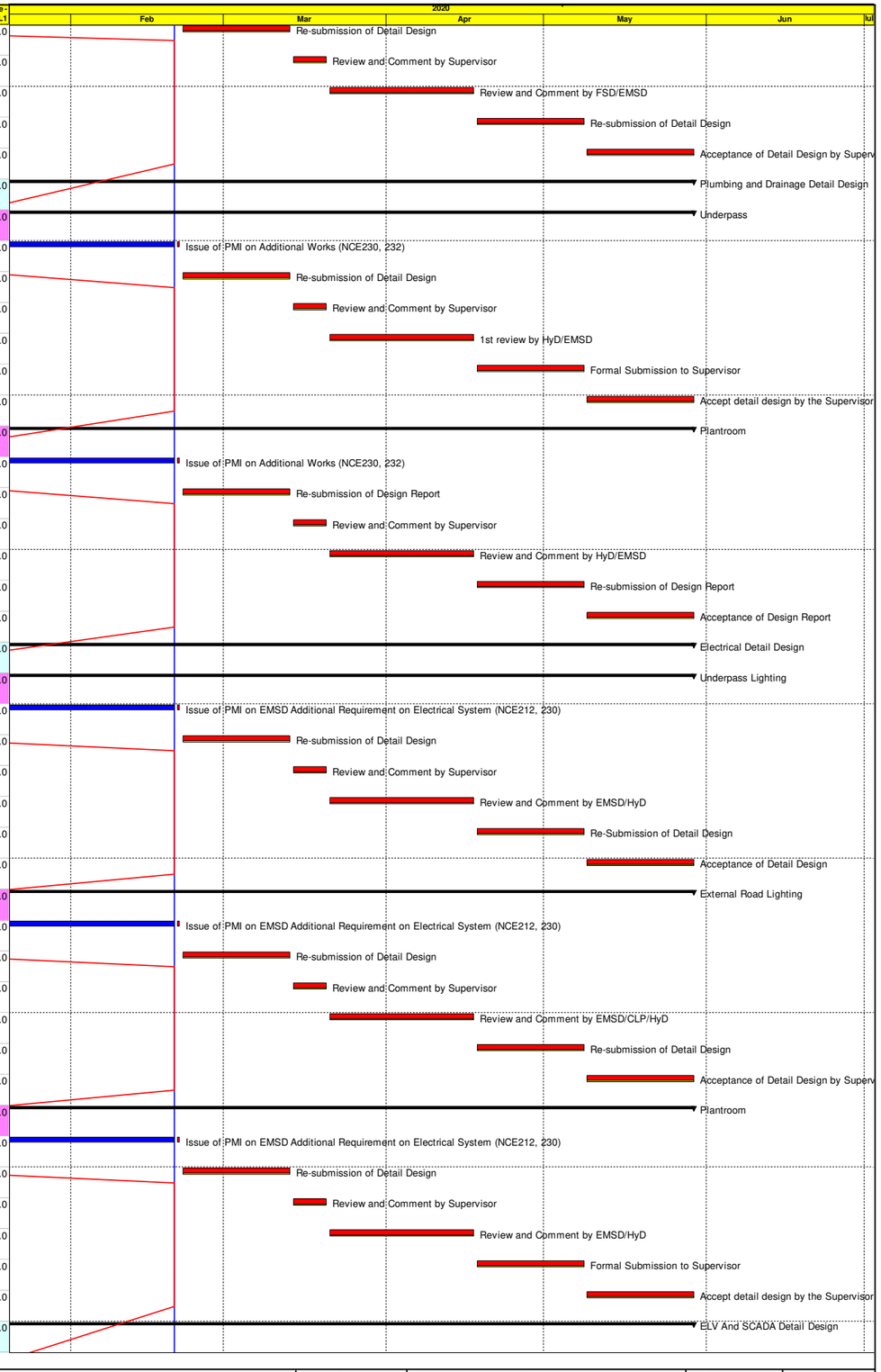
Primary Baseline
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

NE/2015/02 Tseung Kwan O - Lam Tin Tunnel-Road P2 and Associated Works (Feb-20)

3 Monthly Rolling Programme
(Data Date : 20-Feb-2020)

Date	Revision	Checked	Approved
20-Feb-20			

Activity ID	Activity Name	Calendar	Original Duration	Remaining Duration	Start	Finish	Total Float	Activity % Complete	TRA	Variance - BL1
S11652-33	Re-submission of Detail Design	P2-Cal.A	21.0	21.0	22-Feb-20	13-Mar-20	-1.5	0%		0.0
S11652-43	Review and Comment by Supervisor	P2-Cal.A	7.0	7.0	14-Mar-20	20-Mar-20	-1.5	0%		0.0
S11652-53	Review and Comment by FSD/EMSD	P2-Cal.A	28.0	28.0	21-Mar-20	17-Apr-20	-1.5	0%		0.0
S11652-63	Re-submission of Detail Design	P2-Cal.A	21.0	21.0	18-Apr-20	08-May-20	-1.5	0%		0.0
S11652-73	Acceptance of Detail Design by Supervisor	P2-Cal.A	21.0	21.0	09-May-20	29-May-20	-1.5	0%		0.0
Plumbing and Drainage Detail Design		P2-Cal.A	178.0	99.0	04-Dec-19 A	29-May-20	-141.5			0.0
Underpass		P2-Cal.A	178.0	99.0	04-Dec-19 A	29-May-20	-141.5			0.0
S11656-01	Issue of PMI on Additional Works (NCE230, 232)	P2-Cal.A	5.0	1.0	04-Dec-19 A	21-Feb-20	-141.5	80%		-75.0
S11656-11	Re-submission of Detail Design	P2-Cal.A	21.0	21.0	22-Feb-20	13-Mar-20	-141.5	0%		0.0
S11656-21	Review and Comment by Supervisor	P2-Cal.A	7.0	7.0	14-Mar-20	20-Mar-20	-141.5	0%		0.0
S11657	1st review by HyD/EMSD	P2-Cal.A	28.0	28.0	21-Mar-20	17-Apr-20	-141.5	0%		0.0
S11658	Formal Submission to Supervisor	P2-Cal.A	21.0	21.0	18-Apr-20	08-May-20	-141.5	0%		0.0
S11659	Accept detail design by the Supervisor	P2-Cal.A	21.0	21.0	09-May-20	29-May-20	-141.5	0%		0.0
Plantroom		P2-Cal.A	178.0	99.0	04-Dec-19 A	29-May-20	-141.5			0.0
S11660-37	Issue of PMI on Additional Works (NCE230, 232)	P2-Cal.A	5.0	1.0	04-Dec-19 A	21-Feb-20	-141.5	80%		-75.0
S11660-47	Re-submission of Design Report	P2-Cal.A	21.0	21.0	22-Feb-20	13-Mar-20	-141.5	0%		0.0
S11660-57	Review and Comment by Supervisor	P2-Cal.A	7.0	7.0	14-Mar-20	20-Mar-20	-141.5	0%		0.0
S11660-67	Review and Comment by HyD/EMSD	P2-Cal.A	28.0	28.0	21-Mar-20	17-Apr-20	-141.5	0%		0.0
S11660-77	Re-submission of Design Report	P2-Cal.A	21.0	21.0	18-Apr-20	08-May-20	-141.5	0%		0.0
S11660-87	Acceptance of Design Report	P2-Cal.A	21.0	21.0	09-May-20	29-May-20	-141.5	0%		0.0
Electrical Detail Design		P2-Cal.A	229.0	99.0	14-Oct-19 A	29-May-20	-131.5			0.0
Underpass Lighting		P2-Cal.A	229.0	99.0	14-Oct-19 A	29-May-20	-131.5			0.0
S11660-30	Issue of PMI on EMSD Additional Requirement on Electrical System (NCE212, 230)	P2-Cal.A	5.0	1.0	14-Oct-19 A	21-Feb-20	-131.5	80%		-126.0
S11660-40	Re-submission of Detail Design	P2-Cal.A	21.0	21.0	22-Feb-20	13-Mar-20	-131.5	0%		0.0
S11660-50	Review and Comment by Supervisor	P2-Cal.A	7.0	7.0	14-Mar-20	20-Mar-20	-131.5	0%		0.0
S11660-60	Review and Comment by EMSD/HyD	P2-Cal.A	28.0	28.0	21-Mar-20	17-Apr-20	-131.5	0%		0.0
S11660-70	Re-Submission of Detail Design	P2-Cal.A	21.0	21.0	18-Apr-20	08-May-20	-131.5	0%		0.0
S11660-80	Acceptance of Detail Design	P2-Cal.A	21.0	21.0	09-May-20	29-May-20	-131.5	0%		0.0
External Road Lighting		P2-Cal.A	229.0	99.0	14-Oct-19 A	29-May-20	-131.5			0.0
S11660-29	Issue of PMI on EMSD Additional Requirement on Electrical System (NCE212, 230)	P2-Cal.A	5.0	1.0	14-Oct-19 A	21-Feb-20	-131.5	80%		-126.0
S11660-39	Re-submission of Detail Design	P2-Cal.A	21.0	21.0	22-Feb-20	13-Mar-20	-131.5	0%		0.0
S11660-49	Review and Comment by Supervisor	P2-Cal.A	7.0	7.0	14-Mar-20	20-Mar-20	-131.5	0%		0.0
S11660-59	Review and Comment by EMSD/CLP/HyD	P2-Cal.A	28.0	28.0	21-Mar-20	17-Apr-20	-131.5	0%		0.0
S11660-69	Re-submission of Detail Design	P2-Cal.A	21.0	21.0	18-Apr-20	08-May-20	-131.5	0%		0.0
S11660-79	Acceptance of Detail Design by Supervisor	P2-Cal.A	21.0	21.0	09-May-20	29-May-20	-131.5	0%		0.0
Plantroom		P2-Cal.A	229.0	99.0	14-Oct-19 A	29-May-20	-131.5			0.0
S11666-01	Issue of PMI on EMSD Additional Requirement on Electrical System (NCE212, 230)	P2-Cal.A	5.0	1.0	14-Oct-19 A	21-Feb-20	-131.5	80%		-126.0
S11666-11	Re-submission of Detail Design	P2-Cal.A	21.0	21.0	22-Feb-20	13-Mar-20	-131.5	0%		0.0
S11666-21	Review and Comment by Supervisor	P2-Cal.A	7.0	7.0	14-Mar-20	20-Mar-20	-131.5	0%		0.0
S11666-31	Review and Comment by EMSD/HyD	P2-Cal.A	28.0	28.0	21-Mar-20	17-Apr-20	-131.5	0%		0.0
S11667	Formal Submission to Supervisor	P2-Cal.A	21.0	21.0	18-Apr-20	08-May-20	-131.5	0%		0.0
S11668	Accept detail design by the Supervisor	P2-Cal.A	21.0	21.0	09-May-20	29-May-20	-131.5	0%		0.0
ELV And SCADA Detail Design		P2-Cal.A	158.0	99.0	24-Dec-19 A	29-May-20	-131.5			0.0



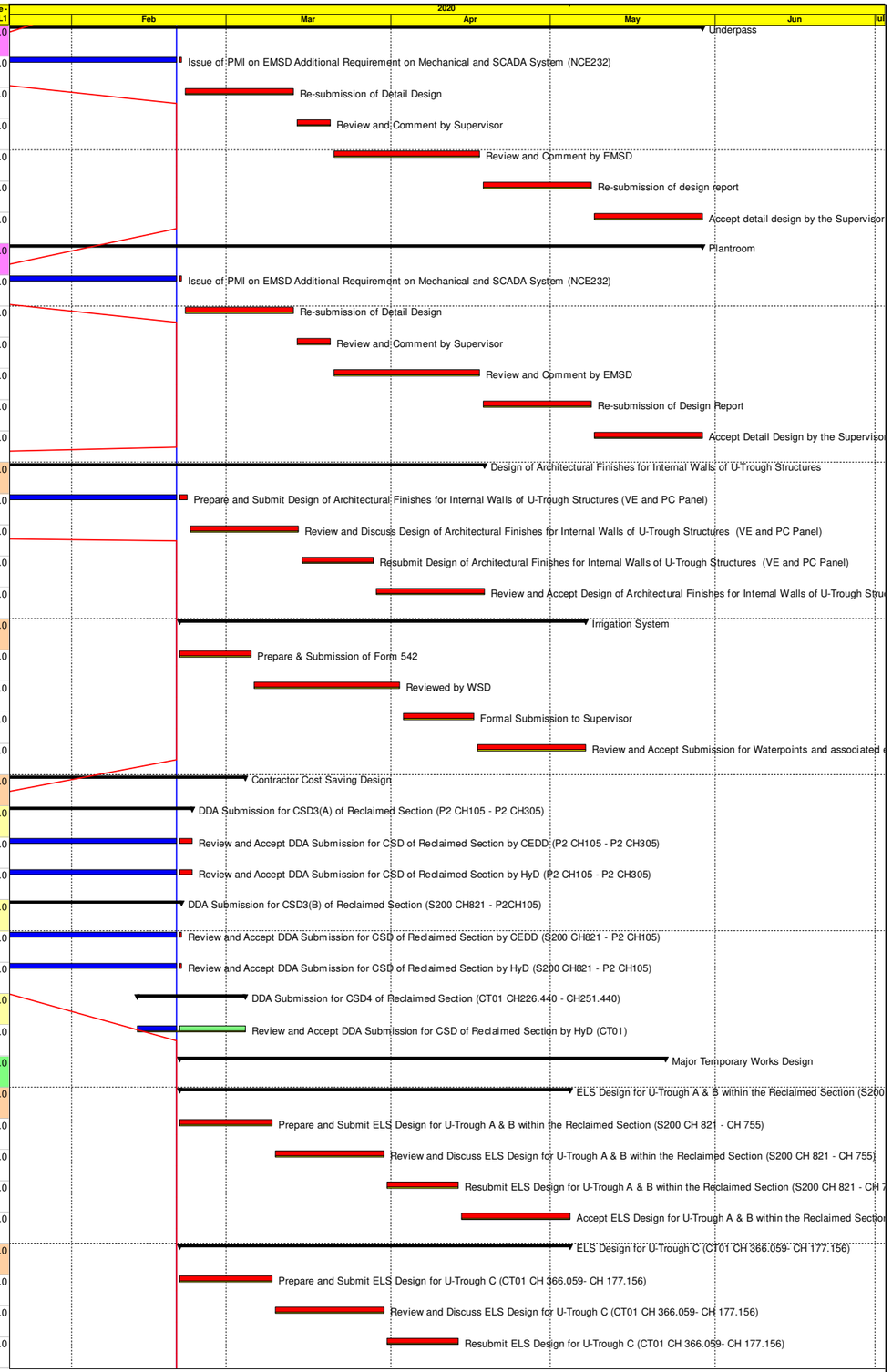
Primary Baseline
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

NE/2015/02 Tseung Kwan O - Lam Tin Tunnel-Road P2 and Associated Works (Feb-20)

3 Monthly Rolling Programme
(Data Date : 20-Feb-2020)

Date	Revision	Checked	Approved
20-Feb-20			

Activity ID	Activity Name	Calendar	Original Duration	Remaining Duration	Start	Finish	Total Float	Activity % Complete	TRA	Variance - BL1
Underpass		P2-Cal.A	158.0	99.0	24-Dec-19 A	29-May-20	-131.5			0.0
S11669-39	Issue of PMI on EMSD Additional Requirement on Mechanical and SCADA System (NCE232)	P2-Cal.A	5.0	1.0	24-Dec-19 A	21-Feb-20	-131.5	80%		-55.0
S11669-40	Re-submission of Detail Design	P2-Cal.A	21.0	21.0	22-Feb-20	13-Mar-20	-131.5	0%		0.0
S11669-41	Review and Comment by Supervisor	P2-Cal.A	7.0	7.0	14-Mar-20	20-Mar-20	-131.5	0%		0.0
S11669-42	Review and Comment by EMSD	P2-Cal.A	28.0	28.0	21-Mar-20	17-Apr-20	-131.5	0%		0.0
S11669-49	Re-submission of design report	P2-Cal.A	21.0	21.0	18-Apr-20	08-May-20	-131.5	0%		0.0
S11669-59	Accept detail design by the Supervisor	P2-Cal.A	21.0	21.0	09-May-20	29-May-20	-131.5	0%		0.0
Plantroom		P2-Cal.A	158.0	99.0	24-Dec-19 A	29-May-20	-131.5			0.0
S11670-291	Issue of PMI on EMSD Additional Requirement on Mechanical and SCADA System (NCE232)	P2-Cal.A	5.0	1.0	24-Dec-19 A	21-Feb-20	-131.5	80%		-55.0
S11670-292	Re-submission of Detail Design	P2-Cal.A	21.0	21.0	22-Feb-20	13-Mar-20	-131.5	0%		0.0
S11670-293	Review and Comment by Supervisor	P2-Cal.A	7.0	7.0	14-Mar-20	20-Mar-20	-131.5	0%		0.0
S11670-294	Review and Comment by EMSD	P2-Cal.A	28.0	28.0	21-Mar-20	17-Apr-20	-131.5	0%		0.0
S11670-30	Re-submission of Design Report	P2-Cal.A	21.0	21.0	18-Apr-20	08-May-20	-131.5	0%		0.0
S11670-49	Accept Detail Design by the Supervisor	P2-Cal.A	21.0	21.0	09-May-20	29-May-20	-131.5	0%		0.0
Design of Architectural Finishes for Internal Walls of U-Trough Structures		P2-Cal.A	577.0	58.0	15-Sep-18 A	18-Apr-20	-49.5			-5.0
S11675	Prepare and Submit Design of Architectural Finishes for Internal Walls of U-Trough Structures (VE and PC Panel)	P2-Cal.A	21.0	2.0	15-Sep-18 A	22-Feb-20	-49.5	90.48%		-505.0
S11680	Review and Discuss Design of Architectural Finishes for Internal Walls of U-Trough Structures (VE and PC Panel)	P2-Cal.A	21.0	21.0	23-Feb-20	14-Mar-20	-49.5	0%		0.0
S11700	Resubmit Design of Architectural Finishes for Internal Walls of U-Trough Structures (VE and PC Panel)	P2-Cal.A	14.0	14.0	15-Mar-20	28-Mar-20	-49.5	0%		0.0
S11720	Review and Accept Design of Architectural Finishes for Internal Walls of U-Trough Structures (VE and PC Panel)	P2-Cal.A	21.0	21.0	29-Mar-20	18-Apr-20	-49.5	0%		0.0
Irrigation System		P2-Cal.A	77.0	77.0	21-Feb-20	07-May-20	1.5			0.0
S11788	Prepare & Submission of Form 542	P2-Cal.A	14.0	14.0	21-Feb-20	05-Mar-20	1.5	0%		0.0
S11789	Reviewed by WSD	P2-Cal.A	28.0	28.0	06-Mar-20	02-Apr-20	1.5	0%		0.0
S11790	Formal Submission to Supervisor	P2-Cal.A	14.0	14.0	03-Apr-20	16-Apr-20	1.5	0%		0.0
S11800	Review and Accept Submission for Waterpoints and associated elements	P2-Cal.A	21.0	21.0	17-Apr-20	07-May-20	1.5	0%		0.0
Contractor Cost Saving Design		P2-Cal.A	124.0	13.0	01-Nov-19 A	04-Mar-20	7.5			-1.0
DDA Submission for CSD3(A) of Reclaimed Section (P2 CH105 - P2 CH305)		P2-Cal.A	21.0	3.0	01-Nov-19 A	23-Feb-20	-58.5			-94.0
S11978	Review and Accept DDA Submission for CSD of Reclaimed Section by CEDD (P2 CH105 - P2 CH305)	P2-Cal.A	21.0	3.0	01-Nov-19 A	23-Feb-20	-58.5	85.71%		-94.0
S11979	Review and Accept DDA Submission for CSD of Reclaimed Section by HyD (P2 CH105 - P2 CH305)	P2-Cal.A	21.0	3.0	01-Nov-19 A	23-Feb-20	-58.5	85.71%		-94.0
DDA Submission for CSD3(B) of Reclaimed Section (S200 CH821 - P2CH105)		P2-Cal.A	21.0	1.0	21-Dec-19 A	21-Feb-20	-56.5			-42.0
S18088	Review and Accept DDA Submission for CSD of Reclaimed Section by CEDD (S200 CH821 - P2 CH105)	P2-Cal.A	21.0	1.0	21-Dec-19 A	21-Feb-20	-56.5	95.24%		-42.0
S18108	Review and Accept DDA Submission for CSD of Reclaimed Section by HyD (S200 CH821 - P2 CH105)	P2-Cal.A	21.0	1.0	21-Dec-19 A	21-Feb-20	-56.5	95.24%		-42.0
DDA Submission for CSD4 of Reclaimed Section (CT01 CH226.440 - CH251.440)		P2-Cal.A	21.0	13.0	13-Feb-20 A	04-Mar-20	7.5			0.0
S18178	Review and Accept DDA Submission for CSD of Reclaimed Section by HyD (CT01)	P2-Cal.A	21.0	13.0	13-Feb-20 A	04-Mar-20	7.5	38.1%		0.0
Major Temporary Works Design		P2-Cal.A	92.0	92.0	21-Feb-20	22-May-20	-20.5			0.0
ELS Design for U-Trough A & B within the Reclaimed Section (S200 CH 821 - CH 755)		P2-Cal.A	74.0	74.0	21-Feb-20	04-May-20	-115.5			0.0
S12620	Prepare and Submit ELS Design for U-Trough A & B within the Reclaimed Section (S200 CH 821 - CH 755)	P2-Cal.A	18.0	18.0	21-Feb-20	09-Mar-20	-115.5	0%		0.0
S12640	Review and Discuss ELS Design for U-Trough A & B within the Reclaimed Section (S200 CH 821 - CH 755)	P2-Cal.A	21.0	21.0	10-Mar-20	30-Mar-20	-115.5	0%		0.0
S12660	Resubmit ELS Design for U-Trough A & B within the Reclaimed Section (S200 CH 821 - CH 755)	P2-Cal.A	14.0	14.0	31-Mar-20	13-Apr-20	-115.5	0%		0.0
S12680	Accept ELS Design for U-Trough A & B within the Reclaimed Section (S200 CH 821 - CH 755)	P2-Cal.A	21.0	21.0	14-Apr-20	04-May-20	-115.5	0%		0.0
ELS Design for U-Trough C (CT01 CH 366.059- CH 177.156)		P2-Cal.A	74.0	74.0	21-Feb-20	04-May-20	-115.5			0.0
S12780	Prepare and Submit ELS Design for U-Trough C (CT01 CH 366.059- CH 177.156)	P2-Cal.A	18.0	18.0	21-Feb-20	09-Mar-20	-115.5	0%		0.0
S12800	Review and Discuss ELS Design for U-Trough C (CT01 CH 366.059- CH 177.156)	P2-Cal.A	21.0	21.0	10-Mar-20	30-Mar-20	-115.5	0%		0.0
S12820	Resubmit ELS Design for U-Trough C (CT01 CH 366.059- CH 177.156)	P2-Cal.A	14.0	14.0	31-Mar-20	13-Apr-20	-115.5	0%		0.0



Primary Baseline
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

NE/2015/02 Tseung Kwan O - Lam Tin Tunnel-Road P2 and Associated Works (Feb-20)

3 Monthly Rolling Programme
(Data Date : 20-Feb-2020)

Date	Revision	Checked	Approved
20-Feb-20			

Activity ID	Activity Name	Calendar	Original Duration	Remaining Duration	Start	Finish	Total Float	Activity % Complete	TRA	Variance - BL1
S12840	Accept ELS Design for U-Trough C (CT01 CH 366.059- CH 177.156)	P2-Cal.A	21.0	21.0	14-Apr-20	04-May-20	-115.5	0%		0.0
ELS Design for U-Trough A & B (P2 CH363 - CH411)		P2-Cal.A	74.0	74.0	28-Feb-20	11-May-20	-92.5			0.0
S12940	Prepare and Submit ELS Design for U-Trough A & B (P2 CH363 - CH411)	P2-Cal.A	18.0	18.0	28-Feb-20	16-Mar-20	-92.5	0%		0.0
S12960	Review and Discuss ELS Design for U-Trough A & B (P2 CH363 - CH411)	P2-Cal.A	21.0	21.0	17-Mar-20	06-Apr-20	-92.5	0%		0.0
S12980	Resubmit ELS Design for U-Trough A & B (P2 CH363 - CH411)	P2-Cal.A	14.0	14.0	07-Apr-20	20-Apr-20	-92.5	0%		0.0
S13000	Accept ELS Design for U-Trough A & B (P2 CH363 - CH411)	P2-Cal.A	21.0	21.0	21-Apr-20	11-May-20	-92.5	0%		0.0
ELS Design for U-Trough A & B SR2 (CH100-CH170)		P2-Cal.A	74.0	74.0	28-Feb-20	11-May-20	-46.5			0.0
S13002	Prepare and Submit ELS Design for U-Trough A & B (SR2 CH100 - CH170)	P2-Cal.A	18.0	18.0	28-Feb-20	16-Mar-20	-46.5	0%		0.0
S13004	Review and Discuss ELS Design for U-Trough A & B (SR2 CH100 - CH170)	P2-Cal.A	21.0	21.0	17-Mar-20	06-Apr-20	-46.5	0%		0.0
S13006	Resubmit ELS Design for U-Trough A & B (SR2 CH100 - CH170)	P2-Cal.A	14.0	14.0	07-Apr-20	20-Apr-20	-46.5	0%		0.0
S13008	Accept ELS Design for U-Trough A & B (SR2 CH100 - CH170)	P2-Cal.A	21.0	21.0	21-Apr-20	11-May-20	-46.5	0%		0.0
Formwork/Falsework Design (For reclamation area)		P2-Cal.A	74.0	74.0	10-Mar-20	22-May-20	-20.5			0.0
S13161	Prepare and Submit Formwork/Falsework Design	P2-Cal.A	18.0	18.0	10-Mar-20	27-Mar-20	-20.5	0%		0.0
S13161-1	Review and Discuss Formwork/Falsework Design	P2-Cal.A	21.0	21.0	28-Mar-20	17-Apr-20	-20.5	0%		0.0
S13161-2	Resubmit Formwork/Falsework Design	P2-Cal.A	14.0	14.0	18-Apr-20	01-May-20	-20.5	0%		0.0
S13161-3	Accept Formwork/Falsework Design	P2-Cal.A	21.0	21.0	02-May-20	22-May-20	-20.5	0%		0.0
ELS Design for Abutment Pile Cap		P2-Cal.A	67.0	67.0	21-Feb-20	27-Apr-20	-103.5			0.0
S13179-11	Prepare and Submit ELS Design for Abutment Pile Cap	P2-Cal.A	18.0	18.0	21-Feb-20	09-Mar-20	-103.5	0%		0.0
S13179-12	Review and Discuss ELS Design for Abutment Pile Cap	P2-Cal.A	14.0	14.0	10-Mar-20	23-Mar-20	-103.5	0%		0.0
S13179-13	Resubmit ELS Design for Abutment Pile Cap	P2-Cal.A	14.0	14.0	24-Mar-20	06-Apr-20	-103.5	0%		0.0
S13179-14	Accept ELS Design for Abutment Pile Cap	P2-Cal.A	21.0	21.0	07-Apr-20	27-Apr-20	-103.5	0%		0.0
Major Construction Works Method Statement		P2-Cal.A	99.0	99.0	21-Feb-20	29-May-20	7.5			0.0
Construction Road P2 Underpass Structure CH105-318		P2-Cal.A	67.0	67.0	24-Feb-20	30-Apr-20	-58.5			0.0
S13190	Prepare and Submit Method Statement for Construction Road P2 Underpass Structure	P2-Cal.A	18.0	18.0	24-Feb-20	12-Mar-20	-58.5	0%		0.0
S13200	Review and Discuss Method Statement for Construction Road P2 Underpass Structure	P2-Cal.A	21.0	21.0	13-Mar-20	02-Apr-20	-58.5	0%		0.0
S13220	Resubmit Method Statement for Construction Road P2 Underpass Structure	P2-Cal.A	7.0	7.0	03-Apr-20	09-Apr-20	-58.5	0%		0.0
S13240	Accept Method Statement for Construction Road P2 Underpass Structure	P2-Cal.A	21.0	21.0	10-Apr-20	30-Apr-20	-58.5	0%		0.0
Abutment Pile Cap Construction		P2-Cal.A	67.0	67.0	21-Feb-20	27-Apr-20	16.5			0.0
S13500	Prepare and Submit Method Statement for Abutment Pile Cap Construction	P2-Cal.A	18.0	18.0	21-Feb-20	09-Mar-20	16.5	0%		0.0
S13520	Review and Discuss Method Statement for Abutment Pile Cap Construction	P2-Cal.A	21.0	21.0	10-Mar-20	30-Mar-20	16.5	0%		0.0
S13540	Resubmit Method Statement for Abutment Pile Cap Construction	P2-Cal.A	7.0	7.0	31-Mar-20	06-Apr-20	16.5	0%		0.0
S13560	Accept Method Statement for Abutment Pile Cap Construction	P2-Cal.A	21.0	21.0	07-Apr-20	27-Apr-20	16.5	0%		0.0
ELS of U-Troughs (P2 CH363-411)		P2-Cal.A	18.0	18.0	12-May-20	29-May-20	-92.5			0.0
S14120-02	Prepare and Submit Method Statement for Excavation and ELS of U-Troughs (P2 CH363-411)	P2-Cal.A	18.0	18.0	12-May-20	29-May-20	-92.5	0%		0.0
ELS of U-Troughs (SR2 100-170)		P2-Cal.A	18.0	18.0	12-May-20	29-May-20	-46.5			0.0
S14120-22	Prepare and Submit Method Statement for Excavation and ELS of U-Troughs (SR2 100-170)	P2-Cal.A	18.0	18.0	12-May-20	29-May-20	-46.5	0%		0.0
ELS of "U-Trough A Type 1" from S200 CH674 - CH755		P2-Cal.A	39.0	39.0	14-Apr-20	22-May-20	-115.5			0.0
S14121-09	Prepare and Submit Method Statement for Excavation and ELS of U-Troughs	P2-Cal.A	18.0	18.0	14-Apr-20	01-May-20	-115.5	0%		0.0
S14121-10	Review and Discuss Method Statement for Excavation and ELS of U-Troughs	P2-Cal.A	21.0	21.0	02-May-20	22-May-20	-115.5	0%		0.0
ELS of "U-Trough A Type 1 & 2" from S300 CH326 - 355 and S400 CH124 - 158		P2-Cal.A	39.0	39.0	14-Apr-20	22-May-20	-115.5			0.0
S14121-13	Prepare and Submit Method Statement for Excavation and ELS of U-Troughs	P2-Cal.A	18.0	18.0	14-Apr-20	01-May-20	-115.5	0%		0.0
S14121-14	Review and Discuss Method Statement for Excavation and ELS of U-Troughs	P2-Cal.A	21.0	21.0	02-May-20	22-May-20	-115.5	0%		0.0
ELS of U-Trough C Structures CT01 CH201 - CH366 & CT01 CH117 - CH201		P2-Cal.A	39.0	39.0	15-Apr-20	23-May-20	-100.5			0.0

Primary Baseline
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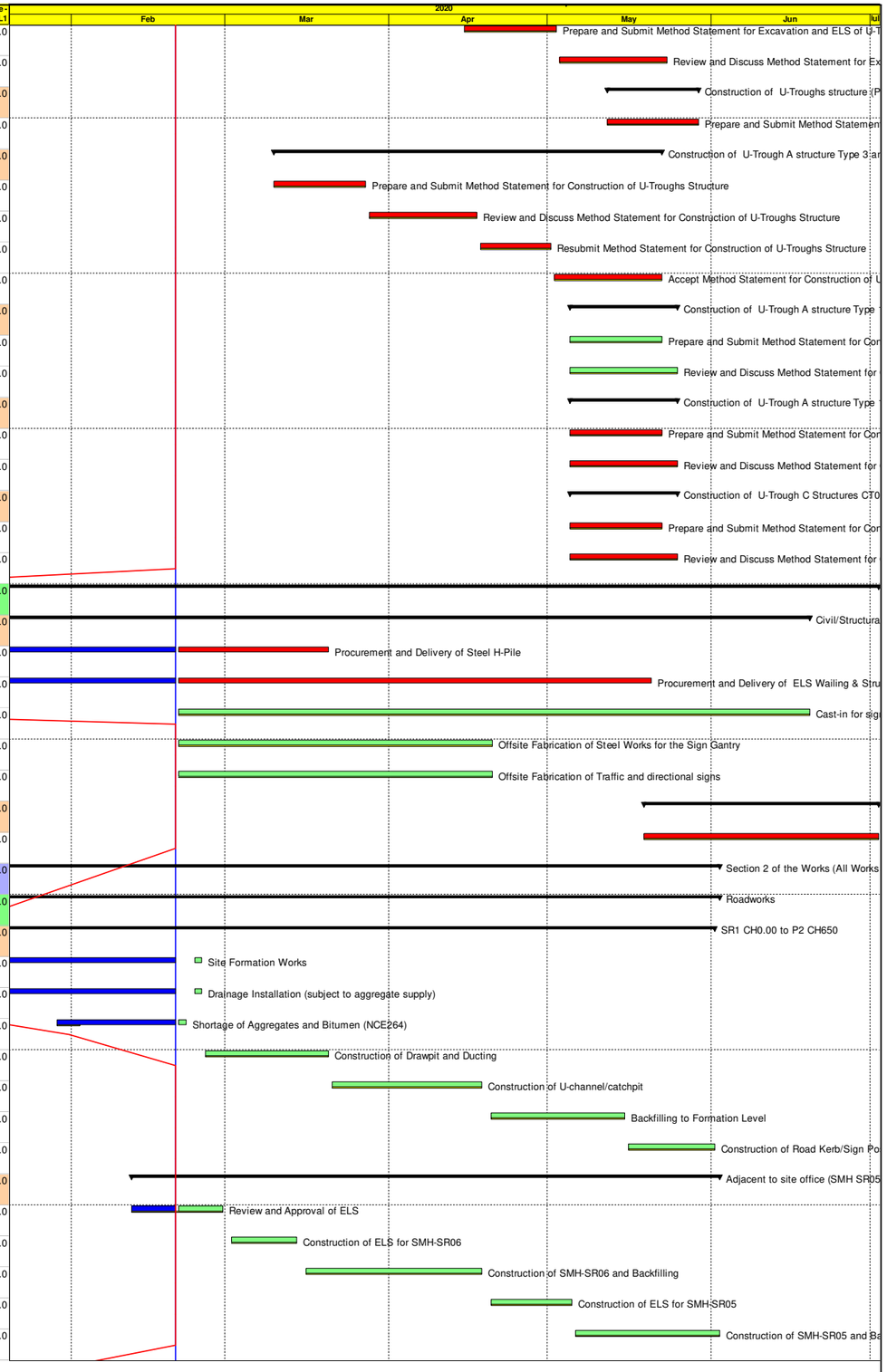
NE/2015/02 Tseung Kwan O - Lam Tin Tunnel-Road P2 and Associated Works (Feb-20)

3 Monthly Rolling Programme
(Data Date : 20-Feb-2020)

Date	Revision	Checked	Approved
20-Feb-20			

Activity ID	Activity Name	Calendar	Original Duration	Remaining Duration	Start	Finish	Total Float	Activity % Complete	TRA	Variance - BL1
S14121-17	Prepare and Submit Method Statement for Excavation and ELS of U-Troughs	P2-Cal.A	18.0	18.0	15-Apr-20	02-May-20	-100.5	0%		0.0
S14121-18	Review and Discuss Method Statement for Excavation and ELS of U-Troughs	P2-Cal.A	21.0	21.0	03-May-20	23-May-20	-100.5	0%		0.0
Construction of U-Troughs structure (P2 CH363-411)		P2-Cal.A	18.0	18.0	12-May-20	29-May-20	-30.5			0.0
S14130	Prepare and Submit Method Statement for Construction of U-Troughs Structure (P2 CH363-411)	P2-Cal.A	18.0	18.0	12-May-20	29-May-20	-30.5	0%		0.0
Construction of U-Trough A structure Type 3 and U-Trough B Type 4" from S200 CH821 to P2 CH105		P2-Cal.A	74.0	74.0	10-Mar-20	22-May-20	-20.5			0.0
S14201	Prepare and Submit Method Statement for Construction of U-Troughs Structure	P2-Cal.A	18.0	18.0	10-Mar-20	27-Mar-20	-20.5	0%		0.0
S14202	Review and Discuss Method Statement for Construction of U-Troughs Structure	P2-Cal.A	21.0	21.0	28-Mar-20	17-Apr-20	-20.5	0%		0.0
S14203	Resubmit Method Statement for Construction of U-Troughs Structure	P2-Cal.A	14.0	14.0	18-Apr-20	01-May-20	-20.5	0%		0.0
S14204	Accept Method Statement for Construction of U-Troughs Structure	P2-Cal.A	21.0	21.0	02-May-20	22-May-20	-20.5	0%		0.0
Construction of U-Trough A structure Type 1" from S200 CH674 - CH755		P2-Cal.A	21.0	21.0	05-May-20	25-May-20	11.5			0.0
S14209	Prepare and Submit Method Statement for Construction of U-Troughs Structure	P2-Cal.A	18.0	18.0	05-May-20	22-May-20	11.5	0%		0.0
S14210	Review and Discuss Method Statement for Construction of U-Troughs Structure	P2-Cal.A	21.0	21.0	05-May-20	25-May-20	11.5	0%		0.0
Construction of U-Trough A structure Type 1 & 2" from S300 CH326 - 355 and S400 CH124 - 158		P2-Cal.A	21.0	21.0	05-May-20	25-May-20	-84.5			0.0
S14213	Prepare and Submit Method Statement for Construction of U-Troughs Structure	P2-Cal.A	18.0	18.0	05-May-20	22-May-20	-84.5	0%		0.0
S14214	Review and Discuss Method Statement for Construction of U-Troughs Structure	P2-Cal.A	21.0	21.0	05-May-20	25-May-20	-84.5	0%		0.0
Construction of U-Trough C Structures CT01 CH201 - CH366 & CT01 CH117 - CH201		P2-Cal.A	21.0	21.0	05-May-20	25-May-20	-44.5			0.0
S14217	Prepare and Submit Method Statement for Construction of U-Troughs Structure	P2-Cal.A	18.0	18.0	05-May-20	22-May-20	-44.5	0%		0.0
S14218	Review and Discuss Method Statement for Construction of U-Troughs Structure	P2-Cal.A	21.0	21.0	05-May-20	25-May-20	-44.5	0%		0.0
Procurement of Major Material		P2-Cal.A	1260.0	133.0	20-Jan-17 A	02-Jul-20	109.5			0.0
Civil/Structural		P2-Cal.A	1247.0	120.0	20-Jan-17 A	19-Jun-20	122.5			0.0
S14981	Procurement and Delivery of Steel H-Pile	P2-Cal.A	800.0	29.0	31-Jan-17 A	20-Mar-20	-139.5	96.38%		-345.0
S14983	Procurement and Delivery of ELS Wailing & Struts Members	P2-Cal.A	1015.0	90.0	20-Jan-17 A	20-May-20	-139.5	91.13%		-202.0
S14987	Cast-in for sign gantry and Road Works	P2-Cal.A	120.0	120.0	21-Feb-20	19-Jun-20	88.5	0%		0.0
S14997	Offsite Fabrication of Steel Works for the Sign Gantry	P2-Cal.A	60.0	60.0	21-Feb-20	20-Apr-20	148.5	0%		0.0
S14999	Offsite Fabrication of Traffic and directional signs	P2-Cal.A	60.0	60.0	21-Feb-20	20-Apr-20	182.5	0%		0.0
Architectural		P2-Cal.A	45.0	45.0	19-May-20	02-Jul-20	-49.5			0.0
S15142	Trial Panels for V-Panel / Precast Concrete Panel	P2-Cal.A	45.0	45.0	19-May-20	02-Jul-20	-49.5	0%		0.0
Section 2 of the Works (All Works Within Portion II)			163.0	82.0	11-Nov-19 A	02-Jun-20	51.0			-1.0
Roadworks			163.0	82.0	11-Nov-19 A	02-Jun-20	51.0			-1.0
SR1 CH0.00 to P2 CH650			162.0	81.0	11-Nov-19 A	01-Jun-20	52.0			-1.0
LC12004	Site Formation Works	P2-Cal.C	18.0	2.0	11-Nov-19 A	25-Feb-20	52.0	88.89%		-68.0
LC12014	Drainage Installation (subject to aggregate supply)	P2-Cal.C	25.0	2.0	26-Nov-19 A	25-Feb-20	52.0	92%		-48.0
LC12014-02	Shortage of Aggregates and Bitumen (NCE264)	P2-Cal.A	5.0	2.0	29-Jan-20 A	22-Feb-20	66.0	60%		-20.0
LC12074	Construction of Drawpit and Ducting	P2-Cal.C	21.0	21.0	26-Feb-20	20-Mar-20	52.0	0%		0.0
LC12084	Construction of U-channel/catchpit	P2-Cal.C	21.0	21.0	21-Mar-20	18-Apr-20	52.0	0%		0.0
LC12094	Backfilling to Formation Level	P2-Cal.C	21.0	21.0	20-Apr-20	15-May-20	52.0	0%		0.0
LC12104	Construction of Road Kerb/Sign Post	P2-Cal.C	14.0	14.0	16-May-20	01-Jun-20	52.0	0%		0.0
Adjacent to site office (SMH SR05 & SR06)		P2-Cal.C	90.0	82.0	12-Feb-20 A	02-Jun-20	23.0			0.0
LC12134	Review and Approval of ELS	P2-Cal.C	16.0	8.0	12-Feb-20 A	29-Feb-20	23.0	50%		0.0
LC12144	Construction of ELS for SMH-SR06	P2-Cal.C	12.0	12.0	02-Mar-20	14-Mar-20	23.0	0%		0.0
LC12154	Construction of SMH-SR06 and Backfilling	P2-Cal.C	26.0	26.0	16-Mar-20	18-Apr-20	23.0	0%		0.0
LC12164	Construction of ELS for SMH-SR05	P2-Cal.C	12.0	12.0	20-Apr-20	05-May-20	23.0	0%		0.0
LC12174	Construction of SMH-SR05 and Backfilling	P2-Cal.C	24.0	24.0	06-May-20	02-Jun-20	23.0	0%		0.0



Primary Baseline
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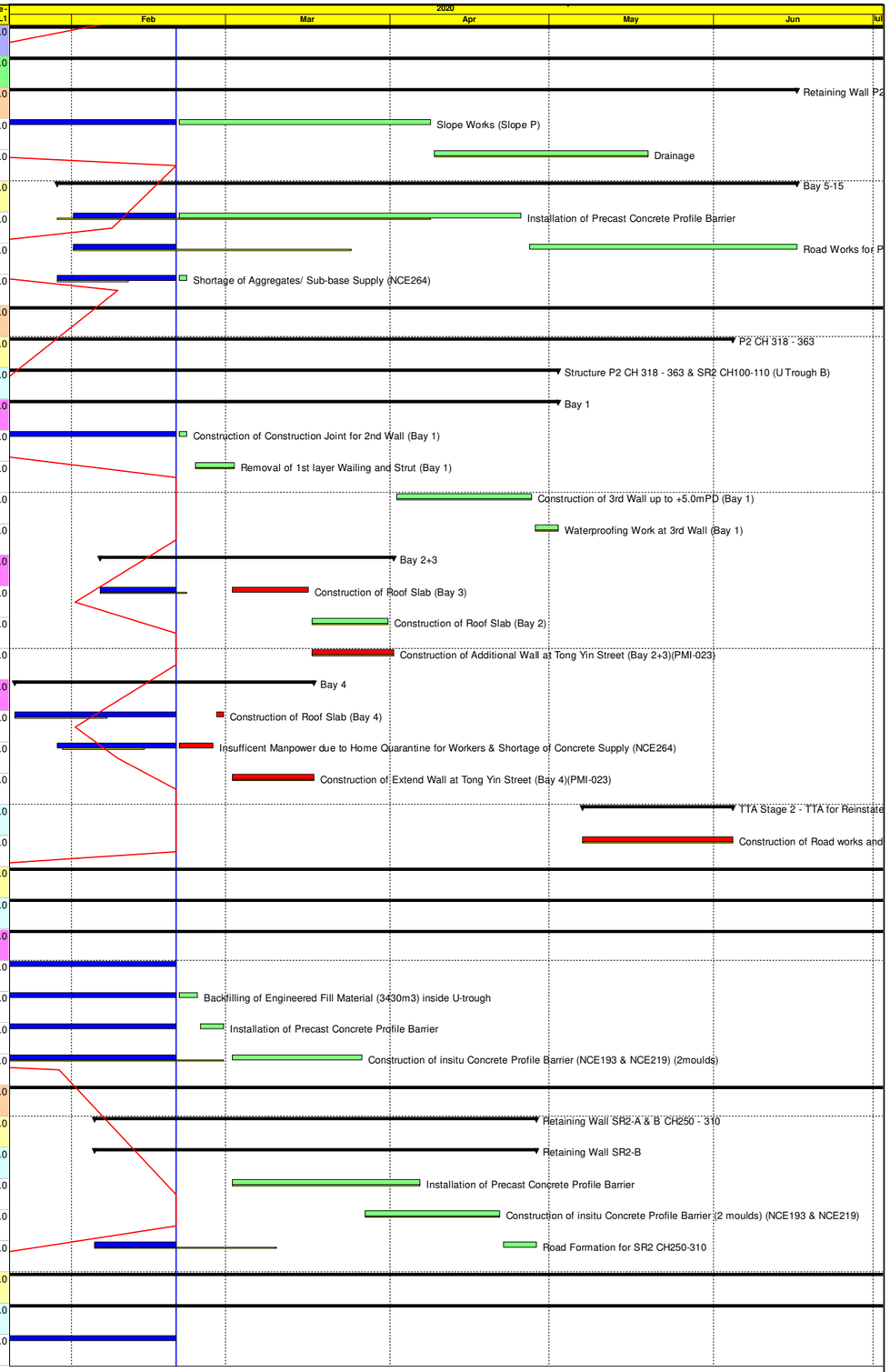
NE/2015/02 Tseung Kwan O - Lam Tin Tunnel-Road P2 and Associated Works (Feb-20)

3 Monthly Rolling Programme
(Data Date : 20-Feb-2020)

Date	Revision	Checked	Approved
20-Feb-20			

Activity ID	Activity Name	Calendar	Original Duration	Remaining Duration	Start	Finish	Total Float	Activity % Complete	TRA	Variance - BL1
Section 3 of the Works All Works within Portion IV, V, VI, VII,VIII, and IX			780.0	430.0	15-May-18 A	04-Aug-21	-55.5			-176.0
Existing Land Section			525.0	206.0	15-May-18 A	30-Oct-20	168.5			-207.0
Retaining Wall P2-A CH 500- 650			195.0	94.0	20-Sep-19 A	16-Jun-20	280.5			-23.0
LC11933	Slope Works (Slope P)	P2-Cal.C	45.0	40.0	20-Sep-19 A	08-Apr-20	157.5	11.11%		-119.0
LC11993	Drainage	P2-Cal.C	30.0	30.0	09-Apr-20	19-May-20	157.5	0%		0.0
Bay 5-15			60.0	94.0	29-Jan-20 A	16-Jun-20	280.5			-54.0
LC11990	Installation of Precast Concrete Profile Barrier	P2-Cal.C	60.0	52.0	01-Feb-20 A	25-Apr-20	235.5	13.33%		-9.0
LC12000	Road Works for P2 CH500-650	P2-Cal.C	45.0	42.0	01-Feb-20 A	16-Jun-20	280.5	6.67%		-66.0
LC12010	Shortage of Aggregates/ Sub-base Supply (NCE264)	P2-Cal.A	14.0	2.0	29-Jan-20 A	22-Feb-20	410.5	85.71%		-11.0
P2 Road		P2-Cal.C	481.0	206.0	15-May-18 A	30-Oct-20	108.5			-251.0
P2 CH 318 - 363		P2-Cal.C	132.0	84.0	20-Dec-19 A	04-Jun-20	163.5			0.0
Structure P2 CH 318 - 363 & SR2 CH100-110 (U Trough B)		P2-Cal.C	104.0	56.0	20-Dec-19 A	02-May-20	191.5			0.0
Bay 1		P2-Cal.C	104.0	56.0	20-Dec-19 A	02-May-20	191.5			0.0
LC08160	Construction of Construction Joint for 2nd Wall (Bay 1)	P2-Cal.C	2.0	2.0	20-Dec-19 A	22-Feb-20	217.5	0%		-48.0
LC08170	Removal of 1st layer Wailing and Strut (Bay 1)	P2-Cal.C	7.0	7.0	24-Feb-20	02-Mar-20	217.5	0%		0.0
LC08180	Construction of 3rd Wall up to +5.0mPD (Bay 1)	P2-Cal.C	18.0	18.0	02-Apr-20	27-Apr-20	191.5	0%		0.0
LC08190	Waterproofing Work at 3rd Wall (Bay 1)	P2-Cal.C	3.0	3.0	28-Apr-20	02-May-20	191.5	0%		0.0
Bay 2+3		P2-Cal.C	48.0	27.0	06-Feb-20 A	01-Apr-20	191.5			0.0
LC08530	Construction of Roof Slab (Bay 3)	P2-Cal.C	15.0	13.0	06-Feb-20 A	16-Mar-20	-49.5	13.33%		-19.0
LC08530-01	Construction of Roof Slab (Bay 2)	P2-Cal.C	13.0	13.0	17-Mar-20	31-Mar-20	192.5	0%		0.0
LC08540	Construction of Additional Wall at Tong Yin Street (Bay 2+3)(PMI-023)	P2-Cal.C	14.0	14.0	17-Mar-20	01-Apr-20	-49.5	0%		0.0
Bay 4		P2-Cal.C	46.0	22.0	21-Jan-20 A	17-Mar-20	-36.5			0.0
LC08510	Construction of Roof Slab (Bay 4)	P2-Cal.C	13.0	2.0	21-Jan-20 A	29-Feb-20	-118.5	84.62%		-19.0
LC08510-01	Insufficent Manpower due to Home Quarantine for Workers & Shortage of Concrete Supply (NCE264)	P2-Cal.C	14.0	6.0	29-Jan-20 A	27-Feb-20	-118.5	57.14%		-12.0
LC08520	Construction of Extend Wall at Tong Yin Street (Bay 4)(PMI-023)	P2-Cal.C	14.0	14.0	02-Mar-20	17-Mar-20	-36.5	0%		0.0
TTA Stage 2 - TTA for Reinstatement of Tong Yin Street at P2 CH318 to CH363		P2-Cal.C	25.0	25.0	07-May-20	04-Jun-20	-73.5			0.0
LC13400	Construction of Road works and drainage/watermain and backfilling on top of roof slab	P2-Cal.C	25.0	25.0	07-May-20	04-Jun-20	-73.5	0%		0.0
P2 CH 411- 500		P2-Cal.C	405.0	206.0	15-May-18 A	30-Oct-20	108.5			-327.0
Structure P2 CH 411 - 500 (U Trough A)		P2-Cal.C	405.0	206.0	15-May-18 A	30-Oct-20	108.5			-327.0
Wall Stem		P2-Cal.C	405.0	206.0	15-May-18 A	30-Oct-20	108.5			-327.0
LC15240	Backfilling and Removal of Sheetpile at the edge	P2-Cal.C	35.0	14.0	19-Mar-19 A	30-Oct-20	108.5	60%		-445.0
LC15260	Backfilling of Engineered Fill Material (3430m3) inside U-trough	P2-Cal.C	15.0	3.0	15-May-18 A	24-Feb-20	44.5	80%		-514.0
LC15270	Installation of Precast Concrete Profile Barrier	P2-Cal.C	30.0	5.0	23-Jul-19 A	29-Feb-20	44.5	83.33%		-152.0
LC15270-01	Construction of insitu Concrete Profile Barrier (NCE193 & NCE219) (2moulds)	P2-Cal.C	44.0	22.0	07-Jan-20 A	26-Mar-20	44.5	50%		-22.0
SR2		P2-Cal.C	437.0	174.0	28-Feb-19 A	29-Sep-20	192.5			-35.0
Retaining Wall SR2-A & B CH250 - 310		P2-Cal.C	62.0	46.0	05-Feb-20 A	28-Apr-20	320.5			-6.0
Retaining Wall SR2-B		P2-Cal.C	62.0	46.0	05-Feb-20 A	28-Apr-20	320.5			-6.0
LC16880	Installation of Precast Concrete Profile Barrier	P2-Cal.C	30.0	30.0	02-Mar-20	06-Apr-20	249.5	0%		0.0
LC16880-01	Construction of insitu Concrete Profile Barrier (2 moulds) (NCE193 & NCE219)	P2-Cal.C	18.0	18.0	27-Mar-20	21-Apr-20	159.5	0%		0.0
LC16880-11	Road Formation for SR2 CH250-310	P2-Cal.C	30.0	6.0	05-Feb-20 A	28-Apr-20	320.5	80%		-38.0
SR2 CH170 - 250		P2-Cal.C	437.0	134.0	28-Feb-19 A	29-Sep-20	105.5			-35.0
Structure SR2 CH 170 - 250 (U Trough A)		P2-Cal.C	437.0	134.0	28-Feb-19 A	29-Sep-20	105.5			-35.0
LC17510	Waterproofing, Backfilling and Remove sheetpile	P2-Cal.C	40.0	10.0	28-Feb-19 A	29-Sep-20	-7.5	75%		-432.0



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LC17520	Construction of insitu Concrete Profile Barrier (2 moulds) (NCE193 & NCE219)	P2-Cal.C	80.0	80.0	22-Apr-20	28-Jul-20	159.5	0%		0.0
Portion IV & VII		P2-Cal.C	134.0	74.0	06-Dec-19 A	23-May-20	-73.5			0.0
Construction of DN2100 stormwater at Portion IV & VII		P2-Cal.C	134.0	74.0	06-Dec-19 A	23-May-20	-73.5			0.0
Drainage works		P2-Cal.C	134.0	74.0	06-Dec-19 A	23-May-20	-73.5			0.0
SMH9101-SMH9103		P2-Cal.C	134.0	74.0	06-Dec-19 A	23-May-20	-73.5			0.0
LC17689-057	Inspection Trenches, Utilties record, review of design of ELS and Subletting Procedure (PMI162, NCE263)	P2-Cal.C	70.0	9.0	06-Dec-19 A	02-Mar-20	-73.5	87.14%		1.0
LC17689-058	Construction of Temporary Road for Diversion	P2-Cal.C	6.0	6.0	03-Mar-20	09-Mar-20	-73.5	0%		0.0
LC17709	Preboring and sheet pile installation for Dia. 900 Drain Pipe SMH9102 to SMH9103	P2-Cal.C	20.0	20.0	10-Mar-20	01-Apr-20	-73.5	0%		0.0
LC17739	Trench Excavation and Strut Installation for Constrcution of Dia. 900 Drain Pipe (SMH9102 to SMH9103)	P2-Cal.C	14.0	14.0	02-Apr-20	22-Apr-20	-73.5	0%		0.0
LC17749	Bedding And Inspection	P2-Cal.C	5.0	5.0	23-Apr-20	28-Apr-20	-73.5	0%		0.0
LC17759	Manhole construction and Pipe Laying (SMH9101 & 9102)	P2-Cal.C	20.0	20.0	29-Apr-20	23-May-20	-73.5	0%		0.0
New Reclaimed Section			546.0	430.0	15-Jul-19 A	04-Aug-21	-55.5			-65.0
Marine Works			211.0	48.0	15-Jul-19 A	21-Apr-20	326.5			-18.0
Armour Protection			211.0	48.0	15-Jul-19 A	21-Apr-20	144.5			-18.0
Laying of Underlayer Armour Rock (West)			91.0	5.0	22-Oct-19 A	26-Feb-20	146.5			-13.0
MC13655	Armour CH415-440 (2559m3)	P2-Cal.C	10.0	2.0	22-Oct-19 A	26-Feb-20	146.5	80%	5	-94.0
MC13685	Shortage of Armour (NCE264)	P2-Cal.A	14.0	2.0	29-Jan-20 A	22-Feb-20	165.5	85.71%		-11.0
Laying of Armour Rock (West)		P2-Cal.C	45.0	45.0	25-Feb-20	21-Apr-20	133.5			0.0
MC13715	Armour CH311-375 (4767m3)	P2-Cal.C	15.0	15.0	31-Mar-20	21-Apr-20	133.5	0%	5	0.0
MC13735	Armour CH375-440 (4882m3)	P2-Cal.C	15.0	15.0	13-Mar-20	30-Mar-20	133.5	0%	5	0.0
MC13755	Armour CH440-500 (4735m3)	P2-Cal.C	15.0	15.0	25-Feb-20	12-Mar-20	133.5	0%	5	0.0
Laying of Underlayer Armour Rock (East)		P2-Cal.C	185.0	20.0	15-Jul-19 A	17-Mar-20	140.5			-18.0
MC13775	Armour CH71-190 (berm stone 820m3)	P2-Cal.C	15.0	15.0	29-Feb-20	17-Mar-20	140.5	0%	5	0.0
MC13795	Armour CH190-250 (1218m3)	P2-Cal.C	10.0	4.0	02-Dec-19 A	28-Feb-20	140.5	60%	5	-61.0
MC13875	Armour CH440-525 South (8670m3)	P2-Cal.C	12.0	1.0	15-Jul-19 A	24-Feb-20	133.5	91.67%	5	-172.0
Laying of Armour Rock (East)		P2-Cal.C	185.0	29.0	09-Aug-19 A	28-Mar-20	160.5			-6.0
MC13895	Armour CH190-250 (2310m3)	P2-Cal.C	9.0	9.0	19-Mar-20	28-Mar-20	160.5	0%	5	0.0
MC13935	Armour CH300-375 (4767m3)	P2-Cal.C	12.0	5.0	06-Feb-20 A	18-Mar-20	160.5	58.33%	5	-24.0
MC13955	Armour CH375-440 (4882m3)	P2-Cal.C	12.0	12.0	28-Feb-20	12-Mar-20	160.5	0%	5	0.0
MC13975	Armour CH440-525 South (14878m3)	P2-Cal.C	20.0	3.0	09-Aug-19 A	27-Feb-20	160.5	85%	5	-145.0
Removal of Temporary Works		P2-Cal.C	103.0	27.0	19-Nov-19 A	23-Mar-20	-164.5			1.0
MC14095	Removal of Temporary Cofferdam - Stage 2 (West Part)	P2-Cal.C	45.0	8.0	19-Dec-19 A	29-Feb-20	-164.5	82.22%	22	-12.0
MC14095-01	Removal of Temporary Cofferdam - Stage 2 (East Part)	P2-Cal.C	45.0	20.0	14-Dec-19 A	14-Mar-20	-164.5	55.56%	22	-28.0
MC14115	Removal of Water Gate	P2-Cal.C	21.0	26.0	19-Nov-19 A	21-Mar-20	-164.5	0%	22	-80.0
MC14135	Removal of Silt Curtain	P2-Cal.C	7.0	7.0	16-Mar-20	23-Mar-20	-164.5	0%		0.0
Modification Works of Existing Seawall		P2-Cal.C	64.0	45.0	30-Jan-20 A	17-Apr-20	329.5			0.0
MC14145	Excavation and Removal of existing seawall	P2-Cal.C	15.0	0.0	30-Jan-20 A	20-Feb-20 A		100%		-4.0
MC14165	Excavation down to -0.5mPD	P2-Cal.C	20.0	10.0	03-Feb-20 A	03-Mar-20	329.5	50%		-6.0
MC14185	Installation of Guidance Rail	P2-Cal.C	4.0	4.0	04-Mar-20	07-Mar-20	329.5	0%		0.0
MC14205	Installation of Leveling Stone (47nos.)	P2-Cal.C	6.0	6.0	09-Mar-20	14-Mar-20	329.5	0%		0.0
MC14225	Installation of Seawall (39nos)	P2-Cal.C	5.0	5.0	16-Mar-20	20-Mar-20	329.5	0%		0.0
MC14245	Construction of Mass Concrete Coping	P2-Cal.C	10.0	10.0	21-Mar-20	01-Apr-20	329.5	0%		0.0
MC14265	Reinstatement of 1.5m thick rock amour type 5	P2-Cal.C	3.0	3.0	02-Apr-20	06-Apr-20	329.5	0%		0.0

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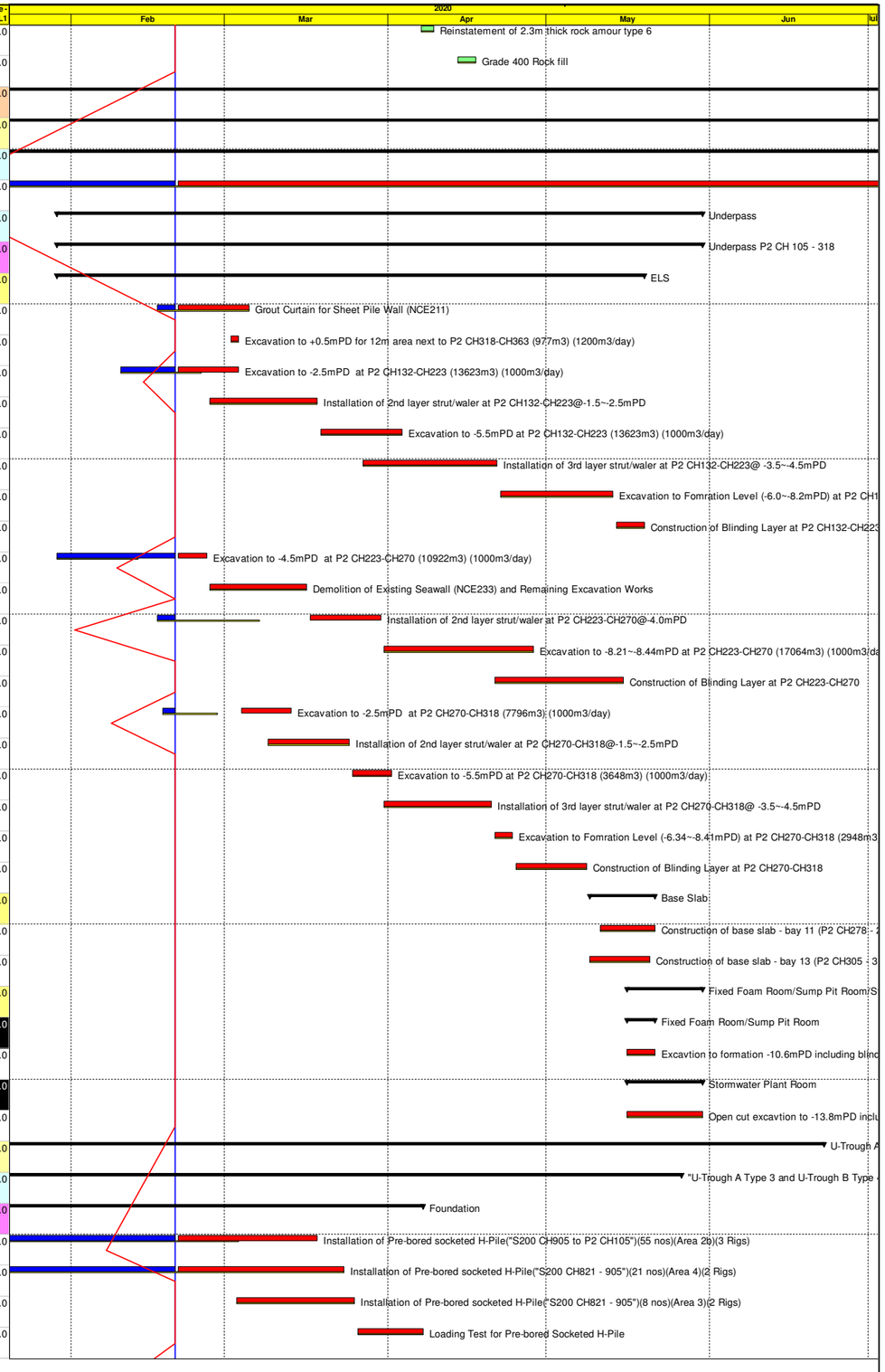
MC14285	Reinstatement of 2.3m thick rock amour type 6	P2-Cal.C	3.0	3.0	07-Apr-20	09-Apr-20	329.5	0%		0.0
MC14305	Grade 400 Rock fill	P2-Cal.C	4.0	4.0	14-Apr-20	17-Apr-20	329.5	0%		0.0
Land Works			473.0	430.0	01-Nov-19 A	04-Aug-21	-55.5			-47.0
Road P2 Underpass (CH105-CH318)		P2-Cal.C	460.0	430.0	16-Nov-19 A	04-Aug-21	-55.5			-47.0
Instrumentation and Monitoring for Road P2 Structure Construction		P2-Cal.C	460.0	430.0	16-Nov-19 A	04-Aug-21	-55.5			-47.0
LC17760	Monitoring of Instrumentation	P2-Cal.C	460.0	430.0	16-Nov-19 A	04-Aug-21	-55.5	6.52%		-47.0
Underpass		P2-Cal.C	100.0	80.0	29-Jan-20 A	30-May-20	-92.5			0.0
Underpass P2 CH 105 - 318		P2-Cal.C	100.0	80.0	29-Jan-20 A	30-May-20	-92.5			0.0
ELS		P2-Cal.C	90.0	70.0	29-Jan-20 A	19-May-20	-127.5			0.0
LC18000-6	Grout Curtain for Sheet Pile Wall (NCE211)	P2-Cal.C	16.0	12.0	17-Feb-20 A	05-Mar-20	-136.5	25%		0.0
LC18020-01	Excavation to +0.5mPD for 12m area next to P2 CH318-CH363 (977m3) (1200m3/day)	P2-Cal.C	2.0	2.0	02-Mar-20	03-Mar-20	-118.5	0%		0.0
LC30040	Excavation to -2.5mPD at P2 CH132-CH223 (13623m3) (1000m3/day)	P2-Cal.C	14.0	10.0	10-Feb-20 A	03-Mar-20	-131.5	28.57%		-6.0
LC30050	Installation of 2nd layer strut/waler at P2 CH132-CH223@-1.5~-2.5mPD	P2-Cal.C	18.0	18.0	27-Feb-20	18-Mar-20	-131.5	0%		0.0
LC30060	Excavation to -5.5mPD at P2 CH132-CH223 (13623m3) (1000m3/day)	P2-Cal.C	14.0	14.0	19-Mar-20	03-Apr-20	-131.5	0%		0.0
LC30070	Installation of 3rd layer strut/waler at P2 CH132-CH223@ -3.5~-4.5mPD	P2-Cal.C	18.0	18.0	27-Mar-20	21-Apr-20	-131.5	0%		0.0
LC30080	Excavation to Fomration Level (-6.0~-8.2mPD) at P2 CH132-CH223 (16674m3) (1000m3/day)	P2-Cal.C	17.0	17.0	22-Apr-20	13-May-20	-131.5	0%		0.0
LC30090	Construction of Blinding Layer at P2 CH132-CH223	P2-Cal.C	5.0	5.0	14-May-20	19-May-20	-131.5	0%		0.0
LC30250	Excavation to -4.5mPD at P2 CH223-CH270 (10922m3) (1000m3/day)	P2-Cal.C	14.0	5.0	29-Jan-20 A	26-Feb-20	-157.5	64.29%		-11.0
LC30250-11	Demolition of Existing Seawall (NCE233) and Remaining Excavation Works	P2-Cal.C	16.0	16.0	27-Feb-20	16-Mar-20	-157.5	0%		0.0
LC30260	Installation of 2nd layer strut/waler at P2 CH223-CH270@-4.0mPD	P2-Cal.C	18.0	12.0	17-Feb-20 A	30-Mar-20	-157.5	33.33%		-19.0
LC30270	Excavation to -8.21~-8.44mPD at P2 CH223-CH270 (17064m3) (1000m3/day)	P2-Cal.C	21.0	21.0	31-Mar-20	28-Apr-20	-157.5	0%		0.0
LC30300	Construction of Blinding Layer at P2 CH223-CH270	P2-Cal.C	20.0	20.0	21-Apr-20	15-May-20	-157.5	0%		0.0
LC30340	Excavation to -2.5mPD at P2 CH270-CH318 (7796m3) (1000m3/day)	P2-Cal.C	10.0	9.0	18-Feb-20 A	13-Mar-20	-118.5	10%		-12.0
LC30350	Installation of 2nd layer strut/waler at P2 CH270-CH318@-1.5~-2.5mPD	P2-Cal.C	14.0	14.0	09-Mar-20	24-Mar-20	-118.5	0%		0.0
LC30360	Excavation to -5.5mPD at P2 CH270-CH318 (3648m3) (1000m3/day)	P2-Cal.C	7.0	7.0	25-Mar-20	01-Apr-20	-118.5	0%		0.0
LC30370	Installation of 3rd layer strut/waler at P2 CH270-CH318@ -3.5~-4.5mPD	P2-Cal.C	14.0	14.0	31-Mar-20	20-Apr-20	-118.5	0%		0.0
LC30380	Excavation to Fomration Level (-6.34~-8.41mPD) at P2 CH270-CH318 (2948m3) (1000m3/day)	P2-Cal.C	4.0	4.0	21-Apr-20	24-Apr-20	-118.5	0%		0.0
LC30390	Construction of Blinding Layer at P2 CH270-CH318	P2-Cal.C	10.0	10.0	25-Apr-20	08-May-20	-118.5	0%		0.0
Base Slab		P2-Cal.C	11.0	11.0	09-May-20	21-May-20	-118.5			0.0
LC18105	Construction of base slab - bay 11 (P2 CH278 - 292)	P2-Cal.C	10.0	10.0	11-May-20	21-May-20	-118.5	0%		0.0
LC18112	Construction of base slab - bay 13 (P2 CH305 - 318)	P2-Cal.C	10.0	10.0	09-May-20	20-May-20	-117.5	0%		0.0
Fixed Foam Room/Sump Pit Room/Stormwater Plant Room		P2-Cal.C	13.0	13.0	16-May-20	30-May-20	-92.5			0.0
Fixed Foam Room/Sump Pit Room		P2-Cal.C	5.0	5.0	16-May-20	21-May-20	-84.5			0.0
LC18370	Excavtion to formation -10.6mPD including blinding & waterproofing (1190m3)	P2-Cal.C	5.0	5.0	16-May-20	21-May-20	-84.5	0%		0.0
Stormwater Plant Room		P2-Cal.C	13.0	13.0	16-May-20	30-May-20	-157.5			0.0
LC18415	Open cut excavtion to -13.8mPD including blinding & waterproofing (3260m3)	P2-Cal.C	13.0	13.0	16-May-20	30-May-20	-157.5	0%		0.0
U-Trough A and B		P2-Cal.C	166.0	99.0	01-Nov-19 A	22-Jun-20	-70.5			-23.0
"U-Trough A Type 3 and U-Trough B Type 4" from S200 CH821 to P2 CH105		P2-Cal.C	166.0	76.0	01-Nov-19 A	26-May-20	-121.5			0.0
Foundation		P2-Cal.C	129.0	39.0	01-Nov-19 A	07-Apr-20	-92.5			0.0
LC20830	Installation of Pre-bored socketed H-Pile("S200 CH905 to P2 CH105")(55 nos)(Area 2b)(3 Rigs)	P2-Cal.C	100.0	23.0	01-Nov-19 A	18-Mar-20	-86.5	77%		-13.0
LC20840	Installation of Pre-bored socketed H-Pile("S200 CH821 - 905")(21 nos)(Area 4)(2 Rigs)	P2-Cal.C	67.0	27.0	21-Dec-19 A	23-Mar-20	-90.5	59.7%		-7.0
LC20850	Installation of Pre-bored socketed H-Pile("S200 CH821 - 905")(8 nos)(Area 3)(2 Rigs)	P2-Cal.C	20.0	20.0	03-Mar-20	25-Mar-20	-92.5	0%		0.0
LC20860	Loading Test for Pre-bored Socketed H-Pile	P2-Cal.C	10.0	10.0	26-Mar-20	07-Apr-20	-92.5	0%		0.0



Primary Baseline
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

NE/2015/02 Tseung Kwan O - Lam Tin Tunnel-Road P2 and Associated Works (Feb-20)

3 Monthly Rolling Programme
(Data Date : 20-Feb-2020)

Date	Revision	Checked	Approved
20-Feb-20			

Activity ID	Activity Name	Calendar	Original Duration	Remaining Duration	Start	Finish	Total Float	Activity % Complete	TRA	Variance - BL1
ELS		P2-Cal.C	125.0	76.0	19-Dec-19 A	26-May-20	-121.5			0.0
LC20990	Pre-boring Works for Sheetpile Wall	P2-Cal.C	72.0	39.0	19-Dec-19 A	07-Apr-20	-121.5	45.83%		-16.0
LC20990-02	Delay Delivery of Drill Bit (NCE264)	P2-Cal.C	20.0	0.0	29-Jan-20 A	20-Feb-20 A		100%		0.0
LC21000	Installation of sheetpile wall (368m, 920pcs. @20pcs/d)	P2-Cal.C	48.0	56.0	07-Feb-20 A	16-May-20	-121.5	0%		-32.0
LC21010	Installation of dewatering well and king posts	P2-Cal.C	48.0	48.0	16-Mar-20	16-May-20	-121.5	0%		0.0
LC21025	Excavation to +1.5 ~ +3.0mPD (7420m3)	P2-Cal.C	8.0	8.0	18-May-20	26-May-20	-121.5	0%		0.0
"U-Trough A Type 1 & 2" from S200 CH674 - CH821, S100/CH280, S300/CH403.5 & S400/CH158.1		P2-Cal.C	53.0	99.0	05-Feb-20 A	22-Jun-20	-70.5			-60.0
Foundation		P2-Cal.C	53.0	99.0	05-Feb-20 A	22-Jun-20	-70.5			-60.0
LC22180	Installation of Pre-bored socketed H-Pile(S200 CH674-821, S100/CH280, S300/CH403.5 & S400/CH158.1)(16nos)(Area5)(4-5Rig)	P2-Cal.C	16.0	14.0	15-Feb-20 A	07-Mar-20	14.5	12.5%		-3.0
LC22200	Installation of Pre-bored socketed H-Pile(S200 CH674-821, S100/CH280, S300/CH403.5 & S400/CH158.1)(87nos)(Area6)(4-5Rig)	P2-Cal.C	53.0	50.0	05-Feb-20 A	22-Jun-20	-95.5	5.66%		-60.0
U-Trough C Structures		P2-Cal.C	105.0	105.0	21-Feb-20	30-Jun-20	-87.5			0.0
"U-Trough C Type 1, 2, 3 & 4" from CT01 CH117.156 - CH366		P2-Cal.C	105.0	105.0	21-Feb-20	30-Jun-20	-87.5			0.0
Foundation		P2-Cal.C	105.0	105.0	21-Feb-20	30-Jun-20	-87.5			0.0
LC23400	Plant mobilization and set up for piling works	P2-Cal.C	10.0	10.0	21-Feb-20	03-Mar-20	-87.5	0%		0.0
LC23420	Installation of Pre-bored socketed H-Pile (96 nos)(4 Rigs)	P2-Cal.C	102.0	102.0	25-Feb-20	30-Jun-20	-87.5	0%		0.0
TKO Bridge Abutment			107.0	76.0	20-Jan-20 A	26-May-20	-86.5			6.0
LC24940	Installation of Bored Piles (10 nos) 3 plants, 14D/pile	P2-Cal.C	56.0	44.0	20-Jan-20 A	22-Apr-20	-95.5	21.43%		-18.0
LC24940-01	Shortage of Concrete Supply (NCE264)	P2-Cal.A	14.0	6.0	29-Jan-20 A	26-Feb-20	-118.5	57.14%		-15.0
LC24950	Construction of Coping Seawall along Abutment Area (precast method)	P2-Cal.C	27.0	27.0	23-Apr-20	26-May-20	-86.5	0%		0.0
LC24960	Sonic Test, IC and Full Core for Bored Pile	P2-Cal.A	21.0	21.0	23-Apr-20	13-May-20	-119.5	0%		0.0
LC24980	Excavation to +2.0mPD and Pilehead Treatment	P2-Cal.C	6.0	6.0	14-May-20	20-May-20	-93.5	0%		0.0
Section 4 of the Works - Preservation and Protection of Existing Trees		P2-Cal.A	1563.0	586.0	12-Jan-17 A	25-Oct-21	-149.5			-185.0
LC25260	Preservation and Protection of Existing Trees	P2-Cal.A	1451.0	586.0	12-Jan-17 A	25-Oct-21	-149.5	59.61%		-297.0
LC25280	Nursery Transplanted Trees at the Contractor's holding nursery	P2-Cal.A	1177.0	586.0	28-Apr-17 A	25-Oct-21	-149.5	50.21%		-465.0

Primary Baseline
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

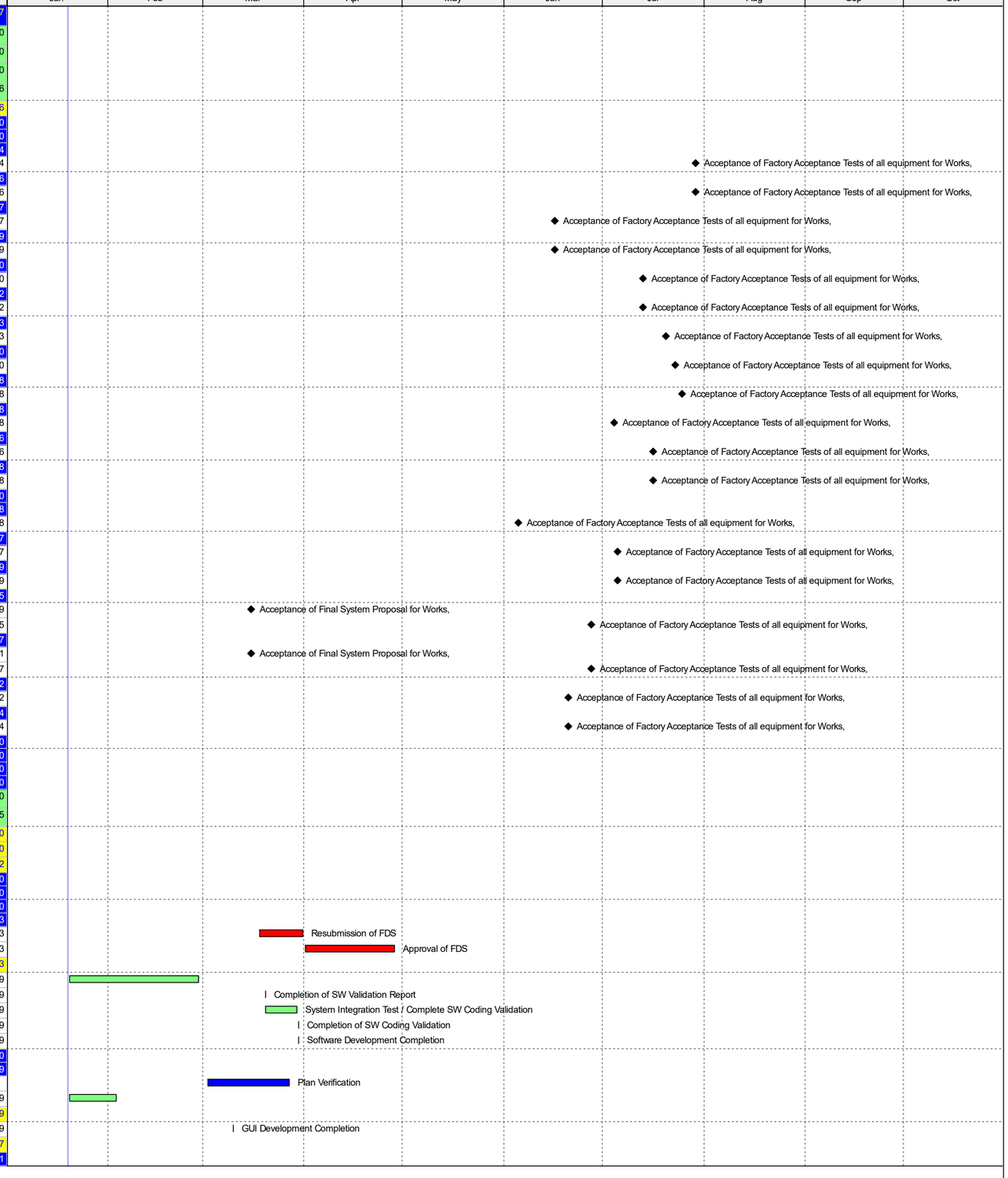
NE/2015/02 Tseung Kwan O - Lam Tin Tunnel-Road P2 and Associated Works (Feb-20)

3 Monthly Rolling Programme
(Data Date : 20-Feb-2020)

Date	Revision	Checked	Approved
20-Feb-20			

High Level 3 Months Look Ahead Programme			
Activities	Apr-20	May-20	Jun-20
Trial pit			
Underground utilities detection			
Temporary traffic arrangement Setup			
Construction of drainage and watermain			
Pile Cap construction			
Pre-bored Socket-H Pile			
Proof Drilling			
Asphalt Paving			
Pier, Staircase and lift shaft construction			

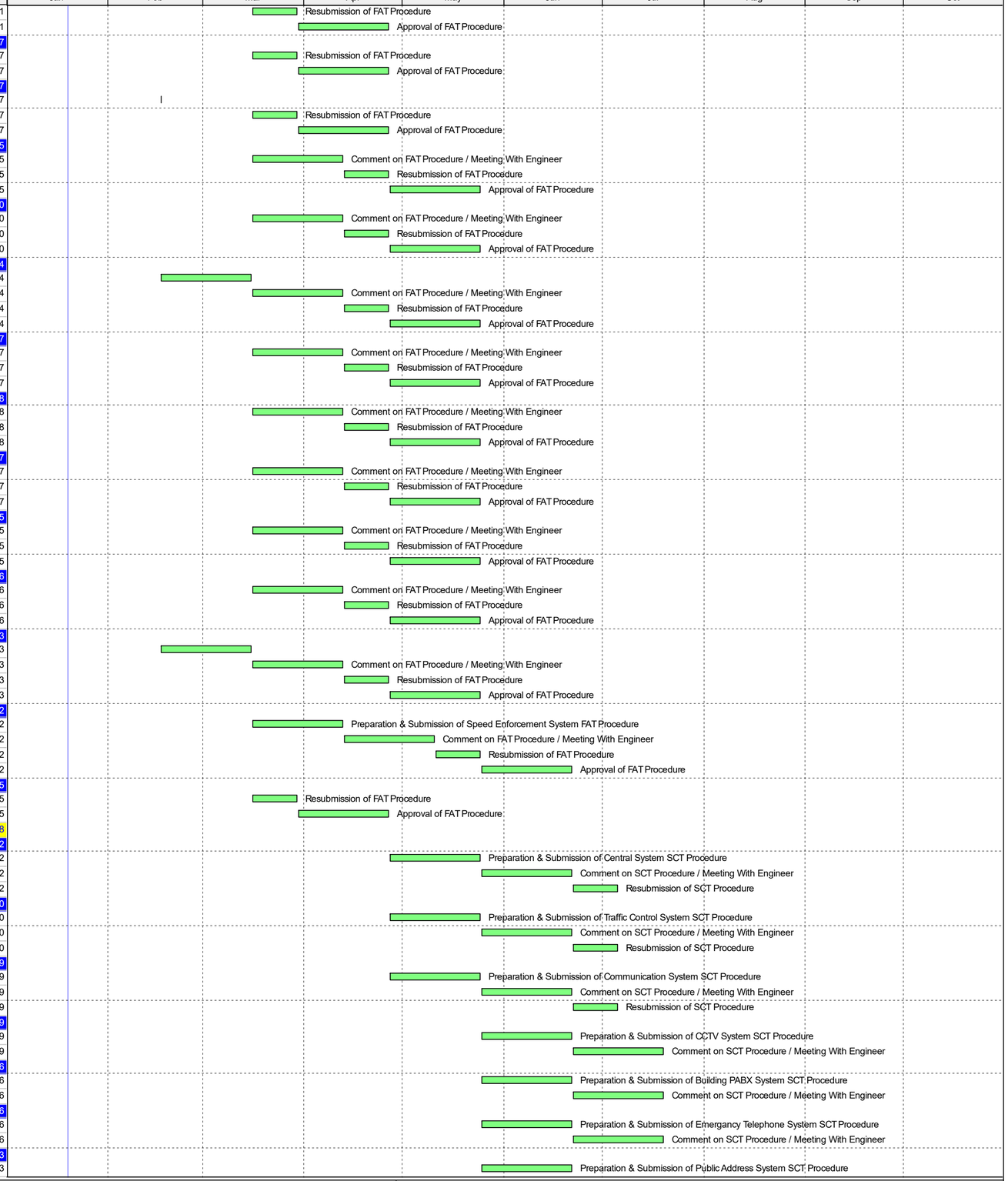
Activity ID	Activity Name	Original Duration	Start	Finish	Late Start	Late Finish	Total Float
NE/2017/06-4	NE/2017/06 TKO-LTT TCSS_3MRP	120	02-Mar-20 A	29-Jul-20	15-Mar-20	04-Dec-23	1027
NE/2017/06-4.CW	Contract Award / Commencement of Wor	0					0
NE/2017/06-4.AD	Access Date	0					0
NE/2017/06-4.KD	Key Date and Stages / Sections of the Acl	0					0
NE/2017/06-4.MD	Cost Centre Milestone Dates	108	15-Mar-20	29-Jul-20	27-Jun-21	02-Sep-22	636
NE/2017/06-4.MD.1	General	108	15-Mar-20	29-Jul-20	27-Jun-21	02-Sep-22	636
NE/2017/06-4.MD.1.1	CC B - Central System - TKOLTT	0					0
NE/2017/06-4.MD.1.2	CC B1 - Central System - CBL	0					0
NE/2017/06-4.MD.1.3	CC C - Traffic Control Devices - TKOLTT	0	29-Jul-20	29-Jul-20	27-Jun-21	27-Jun-21	334
DWP8970	Acceptance of Factory Acceptance Tests of all equipn	0		29-Jul-20		27-Jun-21	334
NE/2017/06-4.MD.1.4	CC C1 - Traffic Control Devices - CBL	0	29-Jul-20	29-Jul-20	02-Sep-22	02-Sep-22	766
DWP9030	Acceptance of Factory Acceptance Tests of all equipn	0		29-Jul-20		02-Sep-22	766
NE/2017/06-4.MD.1.5	CC D - Communication System - TKOLTT	0	16-Jun-20	16-Jun-20	27-Jun-21	27-Jun-21	377
DWP9150	Acceptance of Factory Acceptance Tests of all equipn	0		16-Jun-20		27-Jun-21	377
NE/2017/06-4.MD.1.6	CC D1 - Communication System - CBL	0	16-Jun-20	16-Jun-20	02-Sep-22	02-Sep-22	809
DWP9090	Acceptance of Factory Acceptance Tests of all equipn	0		16-Jun-20		02-Sep-22	809
NE/2017/06-4.MD.1.7	CC E - CCTV System - TKOLTT	0	13-Jul-20	13-Jul-20	27-Jun-21	27-Jun-21	350
DWP9210	Acceptance of Factory Acceptance Tests of all equipn	0		13-Jul-20		27-Jun-21	350
NE/2017/06-4.MD.1.8	CC E1 - CCTV System - CBL	0	13-Jul-20	13-Jul-20	02-Sep-22	02-Sep-22	782
DWP9270	Acceptance of Factory Acceptance Tests of all equipn	0		13-Jul-20		02-Sep-22	782
NE/2017/06-4.MD.1.9	CC F - Building PABX System - TKOLTT	0	20-Jul-20	20-Jul-20	27-Jun-21	27-Jun-21	343
DWP9330	Acceptance of Factory Acceptance Tests of all equipn	0		20-Jul-20		27-Jun-21	343
NE/2017/06-4.MD.1.11	CC G - ET System - TKOLTT	0	23-Jul-20	23-Jul-20	27-Jun-21	27-Jun-21	340
DWP9450	Acceptance of Factory Acceptance Tests of all equipn	0		23-Jul-20		27-Jun-21	340
NE/2017/06-4.MD.1.10	CC H - PA System - TKOLTT	0	25-Jul-20	25-Jul-20	27-Jun-21	27-Jun-21	338
DWP9390	Acceptance of Factory Acceptance Tests of all equipn	0		25-Jul-20		27-Jun-21	338
NE/2017/06-4.MD.1.12	CC I - Radio System - TKOLTT	0	04-Jul-20	04-Jul-20	27-Jun-21	27-Jun-21	358
DWP9510	Acceptance of Factory Acceptance Tests of all equipn	0		04-Jul-20		27-Jun-21	358
NE/2017/06-4.MD.1.13	CC J - Detection System - TKOLTT	0	16-Jul-20	16-Jul-20	27-Jun-21	27-Jun-21	346
DWP9570	Acceptance of Factory Acceptance Tests of all equipn	0		16-Jul-20		27-Jun-21	346
NE/2017/06-4.MD.1.15	CC J1 - Detection System - CBL	0	16-Jul-20	16-Jul-20	02-Sep-22	02-Sep-22	778
DWP9690	Acceptance of Factory Acceptance Tests of all equipn	0		16-Jul-20		02-Sep-22	778
NE/2017/06-4.MD.1.14	CC K - Manual Fallback System - TKOLTT	0					0
NE/2017/06-4.MD.1.16	CC L - Operation Facilities - TKOLTT	0	05-Jun-20	05-Jun-20	27-Jun-21	27-Jun-21	388
DWP9750	Acceptance of Factory Acceptance Tests of all equipn	0		05-Jun-20		27-Jun-21	388
NE/2017/06-4.MD.1.17	CC M - Power Distribution System - TKOLTT	0	05-Jul-20	05-Jul-20	27-Jun-21	27-Jun-21	357
DWP9810	Acceptance of Factory Acceptance Tests of all equipn	0		05-Jul-20		27-Jun-21	357
NE/2017/06-4.MD.1.18	CC M1 - Power Distribution System - CBL	0	05-Jul-20	05-Jul-20	02-Sep-22	02-Sep-22	789
DWP9870	Acceptance of Factory Acceptance Tests of all equipn	0		05-Jul-20		02-Sep-22	789
NE/2017/06-4.MD.1.19	CC N - Speed Enforcement System - TKOLTT	104	15-Mar-20	27-Jun-20	27-Jun-21	27-Jun-21	365
DWP9920	Acceptance of Final System Proposal for Works	0		15-Mar-20		27-Jun-21	469
DWP9930	Acceptance of Factory Acceptance Tests of all equipn	0		27-Jun-20		27-Jun-21	365
NE/2017/06-4.MD.1.20	CC N1 - Speed Enforcement System - CBL	104	15-Mar-20	27-Jun-20	02-Sep-22	02-Sep-22	797
DWP10400	Acceptance of Final System Proposal for Works	0		15-Mar-20		02-Sep-22	901
DWP10410	Acceptance of Factory Acceptance Tests of all equipn	0		27-Jun-20		02-Sep-22	797
NE/2017/06-4.MD.1.21	CC O - Government Optical Fibre System - TKOLTT	0	20-Jun-20	20-Jun-20	27-Jun-21	27-Jun-21	372
DWP10050	Acceptance of Factory Acceptance Tests of all equipn	0		20-Jun-20		27-Jun-21	372
NE/2017/06-4.MD.1.22	CC O1 - Government Optical Fibre System - CBL	0	20-Jun-20	20-Jun-20	02-Sep-22	02-Sep-22	804
DWP10110	Acceptance of Factory Acceptance Tests of all equipn	0		20-Jun-20		02-Sep-22	804
NE/2017/06-4.MD.1.23	CC P - Training and Documentation - TKOLTT	0					0
NE/2017/06-4.MD.1.24	CC P1 - Training and Documentation - CBL	0					0
NE/2017/06-4.MD.1.25	CC Q - Comprehensive Maintenance Services and DL	0					0
NE/2017/06-4.MD.1.26	CC Q1 - Comprehensive Maintenance Services and D	0					0
NE/2017/06-4.1	Preliminary	0					0
NE/2017/06-4.DS	Design Stage	112	02-Mar-20 A	19-Jul-20	15-Mar-20	04-Dec-23	1035
NE/2017/06-4.DS.PSP	Prepare / Submission of PSP for TKO-LTT TCSS and	0					0
NE/2017/06-4.DS.FSP	Prepare / Submission of FSP For TKO-LTT TCSS and	0					0
NE/2017/06-4.DS.FDS	Preparation of Functional Design Specification (FDS)	32	18-Mar-20	28-Apr-20	15-Mar-20	26-Apr-20	-2
NE/2017/06-4.DS.FDS.1	Preparation of Software Project Plan (SPP)	0					0
NE/2017/06-4.DS.FDS.2	Preparation of Software Architect Document	0					0
NE/2017/06-4.DS.FDS.3	Preparation of Software requirment Specification	0					0
NE/2017/06-4.DS.FDS.4	Preparation & Submission of Function Design Specif	42	18-Mar-20	28-Apr-20	15-Mar-20	26-Apr-20	-3
DWP8240	Resubmission of FDS	14	18-Mar-20	31-Mar-20	15-Mar-20	29-Mar-20	-3
DWP8250	Approval of FDS	28	01-Apr-20	28-Apr-20	29-Mar-20	26-Apr-20	-3
NE/2017/06-4.DS.SWD	Software Development (except GUI) for TKO-LTT TC	48	02-Mar-20 A	30-Mar-20	14-Sep-20	04-Dec-23	1123
DWP7660	Software Module Testing	40	24-Mar-20 A	28-Feb-20	14-Sep-20	24-Oct-20	239
DWP7690	Completion of SW Validation Report	0	20-Mar-20	20-Mar-20	13-Nov-20	13-Nov-20	239
DWP7700	System Integration Test / Complete SW Coding Valida	10	20-Mar-20	29-Mar-20	13-Nov-20	23-Nov-20	239
DWP7810	Completion of SW Coding Validation	0	30-Mar-20	30-Mar-20	23-Nov-20	23-Nov-20	239
DWP7820	Software Development Completion	0	30-Mar-20	30-Mar-20	23-Nov-20	23-Nov-20	239
NE/2017/06-4.DS.SWD.2	Allocation of New Functionality to Existing or New M	0					0
NE/2017/06-4.DS.SWD.6	Traffic Plan Coding	40	02-Mar-20 A	27-Mar-20	19-Nov-23	04-Dec-23	1399
DWP2440	Plan Verification	25	02-Mar-20 A	27-Mar-20 A	19-Nov-23	19-Nov-23	
DWP2450	Plan Finalization	15	27-Mar-20 A	03-Feb-20	19-Nov-23	04-Dec-23	1399
NE/2017/06-4.DS.GUI	GUI Development for TKO-LTT TCSS and CBL TCSS	0	10-Mar-20	10-Mar-20	23-Nov-20	23-Nov-20	259
DWP2540	GUI Development Completion	0	10-Mar-20	10-Mar-20	23-Nov-20	23-Nov-20	259
NE/2017/06-4.DS.FAT	Preparation / Submission of FAT Procedures	98	16-Mar-20 A	21-Jun-20	29-Jul-20	25-Mar-21	277
NE/2017/06-4.DS.FAT.1	Central System	42	16-Mar-20	26-Apr-20	12-Oct-20	23-Nov-20	211



Actual Level of Effort | Remaining Work | Milestone
Actual Work | Critical Remaining Work

TASK filter: 3M-C1.

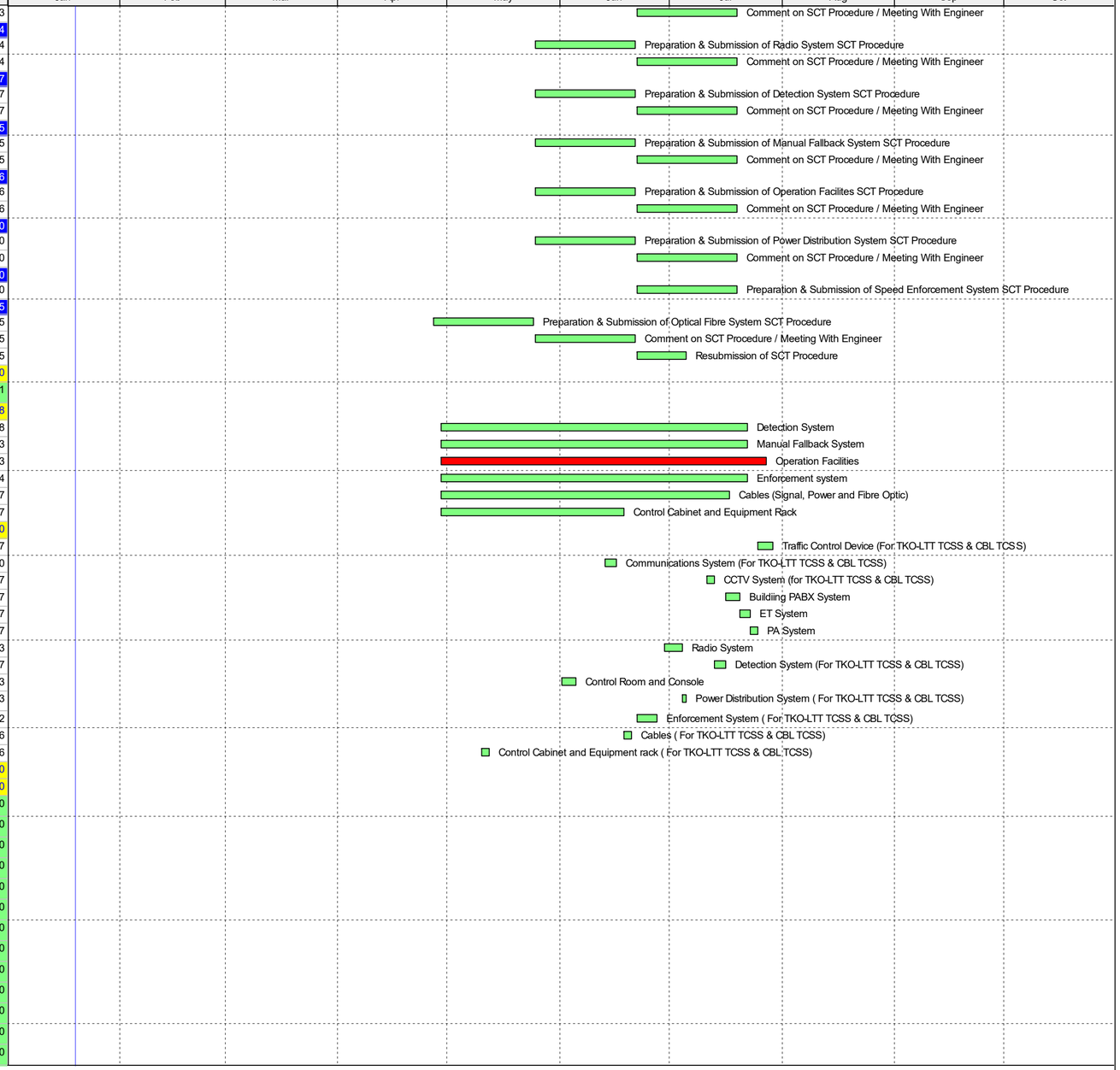
Activity ID	Activity Name	Original Duration	Start	Finish	Late Start	Late Finish	Total Float
DWP2570	Resubmission of FAT Procedure	14	16-Mar-20	29-Mar-20	12-Oct-20	26-Oct-20	211
DWP2580	Approval of FAT Procedure	28	30-Mar-20	26-Apr-20	26-Oct-20	23-Nov-20	211
NE/2017/06-4.DS.FAT2	**Traffic Control Devices**	42	16-Mar-20	26-Apr-20	08-Oct-20	19-Nov-20	207
DWP2610	Resubmission of FAT Procedure	14	16-Mar-20	29-Mar-20	08-Oct-20	22-Oct-20	207
DWP2620	Approval of FAT Procedure	28	30-Mar-20	26-Apr-20	22-Oct-20	19-Nov-20	207
NE/2017/06-4.DS.FAT3	**Communication System**	42	16-Mar-20 A	26-Apr-20	11-Sep-20	20-Nov-20	207
DWP2630	Preparation & Submission of Communication System	28	27-Mar-20 A	17-Feb-20	11-Sep-20	11-Sep-20	207
DWP2650	Resubmission of FAT Procedure	14	16-Mar-20	29-Mar-20	09-Oct-20	23-Oct-20	207
DWP2660	Approval of FAT Procedure	28	30-Mar-20	26-Apr-20	23-Oct-20	20-Nov-20	207
NE/2017/06-4.DS.FAT4	**CCTV System**	70	16-Mar-20	24-May-20	27-Aug-20	05-Nov-20	165
DWP2680	Comment on FAT Procedure / Meeting With Engineer	28	16-Mar-20	12-Apr-20	27-Aug-20	24-Sep-20	165
DWP2690	Resubmission of FAT Procedure	14	13-Apr-20	26-Apr-20	24-Sep-20	08-Oct-20	165
DWP2700	Approval of FAT Procedure	28	27-Apr-20	24-May-20	08-Oct-20	05-Nov-20	165
NE/2017/06-4.DS.FAT5	**Building PABX System**	70	16-Mar-20	24-May-20	02-Sep-20	11-Nov-20	170
DWP2720	Comment on FAT Procedure / Meeting With Engineer	28	16-Mar-20	12-Apr-20	02-Sep-20	30-Sep-20	170
DWP2730	Resubmission of FAT Procedure	14	13-Apr-20	26-Apr-20	30-Sep-20	14-Oct-20	170
DWP2740	Approval of FAT Procedure	28	27-Apr-20	24-May-20	14-Oct-20	11-Nov-20	170
NE/2017/06-4.DS.FAT6	**Emergancy Telephone System**	70	16-Mar-20 A	24-May-20	08-Aug-20	14-Nov-20	174
DWP2750	Preparation & Submission of Emergancy Telephone S	28	27-Mar-20 A	15-Mar-20	08-Aug-20	05-Sep-20	174
DWP2760	Comment on FAT Procedure / Meeting With Engineer	28	16-Mar-20	12-Apr-20	05-Sep-20	03-Oct-20	174
DWP2770	Resubmission of FAT Procedure	14	13-Apr-20	26-Apr-20	03-Oct-20	17-Oct-20	174
DWP2780	Approval of FAT Procedure	28	27-Apr-20	24-May-20	17-Oct-20	14-Nov-20	174
NE/2017/06-4.DS.FAT7	**Public Address System**	70	16-Mar-20	24-May-20	08-Sep-20	17-Nov-20	177
DWP2800	Comment on FAT Procedure / Meeting With Engineer	28	16-Mar-20	12-Apr-20	08-Sep-20	06-Oct-20	177
DWP2810	Resubmission of FAT Procedure	14	13-Apr-20	26-Apr-20	06-Oct-20	20-Oct-20	177
DWP2820	Approval of FAT Procedure	28	27-Apr-20	24-May-20	20-Oct-20	17-Nov-20	177
NE/2017/06-4.DS.FAT8	**Radio System**	70	16-Mar-20	24-May-20	21-Aug-20	30-Oct-20	158
DWP2840	Comment on FAT Procedure / Meeting With Engineer	28	16-Mar-20	12-Apr-20	21-Aug-20	18-Sep-20	158
DWP2850	Resubmission of FAT Procedure	14	13-Apr-20	26-Apr-20	18-Sep-20	02-Oct-20	158
DWP2860	Approval of FAT Procedure	28	27-Apr-20	24-May-20	02-Oct-20	30-Oct-20	158
NE/2017/06-4.DS.FAT9	**Detection System**	70	16-Mar-20	24-May-20	29-Aug-20	07-Nov-20	167
DWP2880	Comment on FAT Procedure / Meeting With Engineer	28	16-Mar-20	12-Apr-20	29-Aug-20	26-Sep-20	167
DWP2890	Resubmission of FAT Procedure	14	13-Apr-20	26-Apr-20	26-Sep-20	10-Oct-20	167
DWP2900	Approval of FAT Procedure	28	27-Apr-20	24-May-20	10-Oct-20	07-Nov-20	167
NE/2017/06-4.DS.FAT10	**Manual Fallback System**	70	16-Mar-20	24-May-20	15-Jan-21	25-Mar-21	305
DWP2920	Comment on FAT Procedure / Meeting With Engineer	28	16-Mar-20	12-Apr-20	15-Jan-21	11-Feb-21	305
DWP2930	Resubmission of FAT Procedure	14	13-Apr-20	26-Apr-20	12-Feb-21	25-Feb-21	305
DWP2940	Approval of FAT Procedure	28	27-Apr-20	24-May-20	26-Feb-21	25-Mar-21	305
NE/2017/06-4.DS.FAT11	**Operation Facilities**	70	16-Mar-20	24-May-20	27-Nov-20	04-Feb-21	256
DWP2960	Comment on FAT Procedure / Meeting With Engineer	28	16-Mar-20	12-Apr-20	27-Nov-20	24-Dec-20	256
DWP2970	Resubmission of FAT Procedure	14	13-Apr-20	26-Apr-20	25-Dec-20	07-Jan-21	256
DWP2980	Approval of FAT Procedure	28	27-Apr-20	24-May-20	08-Jan-21	04-Feb-21	256
NE/2017/06-4.DS.FAT12	**Power Distribution System**	70	16-Mar-20 A	24-May-20	29-Jul-20	04-Nov-20	163
DWP2990	Preparation & Submission of Power Distribution Syste	28	21-Mar-20 A	15-Mar-20	29-Jul-20	26-Aug-20	163
DWP3000	Comment on FAT Procedure / Meeting With Engineer	28	16-Mar-20	12-Apr-20	26-Aug-20	23-Sep-20	163
DWP3010	Resubmission of FAT Procedure	14	13-Apr-20	26-Apr-20	23-Sep-20	07-Oct-20	163
DWP3020	Approval of FAT Procedure	28	27-Apr-20	24-May-20	07-Oct-20	04-Nov-20	163
NE/2017/06-4.DS.FAT13	**Speed Enforcement System**	87	27-Mar-20 A	21-Jun-20	12-Nov-20	18-Feb-21	242
DWP3030	Preparation & Submission of Speed Enforcement Sys	28	27-Mar-20 A	12-Apr-20	12-Nov-20	10-Dec-20	242
DWP3040	Comment on FAT Procedure / Meeting With Engineer	28	13-Apr-20	10-May-20	10-Dec-20	07-Jan-21	242
DWP3050	Resubmission of FAT Procedure	14	11-May-20	24-May-20	07-Jan-21	21-Jan-21	242
DWP3060	Approval of FAT Procedure	28	25-May-20	21-Jun-20	21-Jan-21	18-Feb-21	242
NE/2017/06-4.DS.FAT14	**Optical Fibre system**	42	16-Mar-20	26-Apr-20	16-Nov-20	27-Dec-20	245
DWP3090	Resubmission of FAT Procedure	14	16-Mar-20	29-Mar-20	16-Nov-20	29-Nov-20	245
DWP3100	Approval of FAT Procedure	28	30-Mar-20	26-Apr-20	30-Nov-20	27-Dec-20	245
NE/2017/06-4.DS.SCT	**Preparation / Submission of SCT Procedures**	84	27-Apr-20	19-Jul-20	21-Dec-20	27-Jul-22	738
NE/2017/06-4.DS.SCT.1	**Central System**	70	27-Apr-20	05-Jul-20	19-May-22	27-Jul-22	752
DWP8260	Preparation & Submission of Central System SCT Prc	28	27-Apr-20	24-May-20	19-May-22	15-Jun-22	752
DWP8270	Comment on SCT Procedure / Meeting With Enginee	28	25-May-20	21-Jun-20	16-Jun-22	13-Jul-22	752
DWP8280	Resubmission of SCT Procedure	14	22-Jun-20	05-Jul-20	14-Jul-22	27-Jul-22	752
NE/2017/06-4.DS.SCT.2	**Traffic Control Devices**	70	27-Apr-20	05-Jul-20	01-Feb-21	11-Apr-21	280
DWP8300	Preparation & Submission of Traffic Control System S	28	27-Apr-20	24-May-20	01-Feb-21	28-Feb-21	280
DWP8310	Comment on SCT Procedure / Meeting With Enginee	28	25-May-20	21-Jun-20	01-Mar-21	28-Mar-21	280
DWP8320	Resubmission of SCT Procedure	14	22-Jun-20	05-Jul-20	29-Mar-21	11-Apr-21	280
NE/2017/06-4.DS.SCT.3	**Communication System**	70	27-Apr-20	05-Jul-20	11-Jan-21	21-Mar-21	259
DWP8340	Preparation & Submission of Communication System	28	27-Apr-20	24-May-20	11-Jan-21	07-Feb-21	259
DWP8350	Comment on SCT Procedure / Meeting With Enginee	28	25-May-20	21-Jun-20	08-Feb-21	07-Mar-21	259
DWP8360	Resubmission of SCT Procedure	14	22-Jun-20	05-Jul-20	08-Mar-21	21-Mar-21	259
NE/2017/06-4.DS.SCT.4	**CCTV System**	56	25-May-20	19-Jul-20	29-Jan-21	25-Mar-21	249
DWP8380	Preparation & Submission of CCTV System SCT Proc	28	25-May-20	21-Jun-20	29-Jan-21	25-Feb-21	249
DWP8390	Comment on SCT Procedure / Meeting With Enginee	28	22-Jun-20	19-Jul-20	26-Feb-21	25-Mar-21	249
NE/2017/06-4.DS.SCT.5	**Building PABX System**	56	25-May-20	19-Jul-20	05-Feb-21	01-Apr-21	256
DWP8420	Preparation & Submission of Building PABX System S	28	25-May-20	21-Jun-20	05-Feb-21	04-Mar-21	256
DWP8430	Comment on SCT Procedure / Meeting With Enginee	28	22-Jun-20	19-Jul-20	05-Mar-21	01-Apr-21	256
NE/2017/06-4.DS.SCT.6	**Emergancy Telephone System**	56	25-May-20	19-Jul-20	05-Feb-21	01-Apr-21	256
DWP8460	Preparation & Submission of Emergancy Telephone S	28	25-May-20	21-Jun-20	05-Feb-21	04-Mar-21	256
DWP8470	Comment on SCT Procedure / Meeting With Enginee	28	22-Jun-20	19-Jul-20	05-Mar-21	01-Apr-21	256
NE/2017/06-4.DS.SCT.7	**Public Address System**	56	25-May-20	19-Jul-20	12-Feb-21	08-Apr-21	263
DWP8500	Preparation & Submission of Public Address System S	28	25-May-20	21-Jun-20	12-Feb-21	11-Mar-21	263



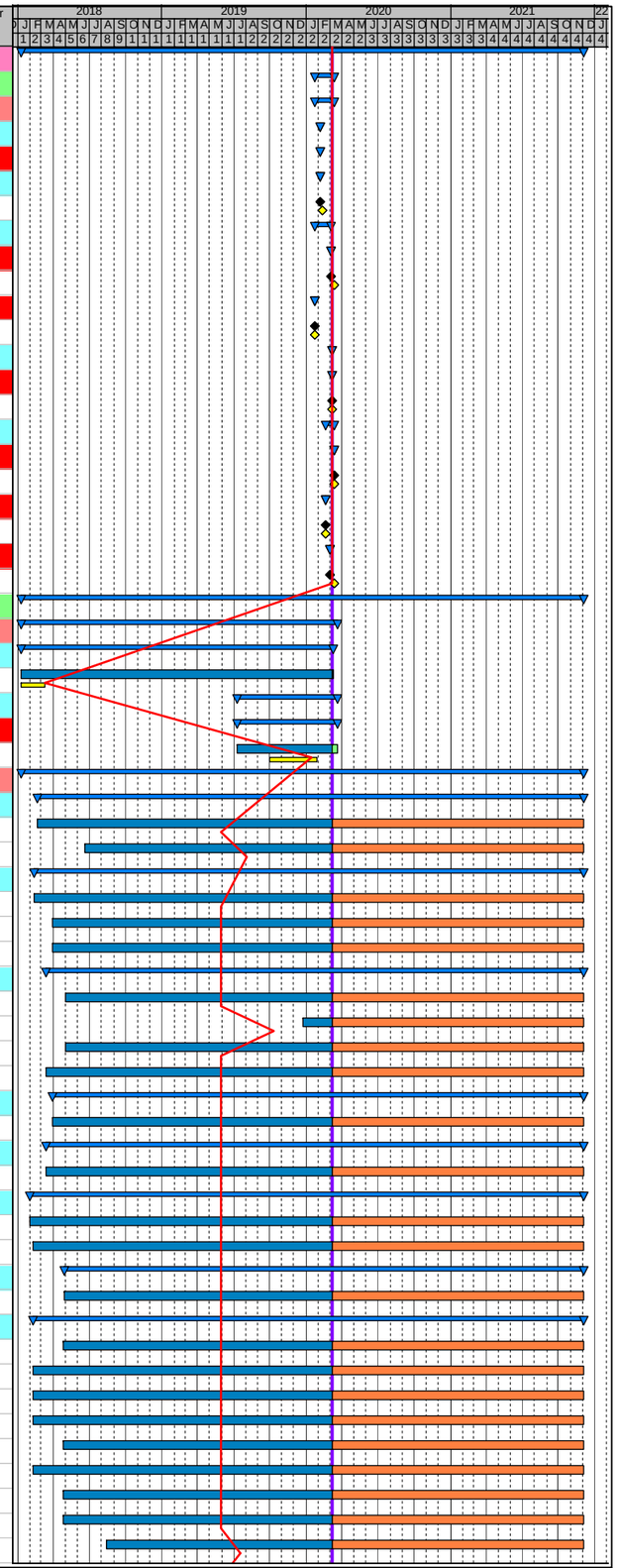
Actual Level of Effort | Remaining Work | Milestone
Actual Work | Critical Remaining Work

TASK filter: 3M-C1.

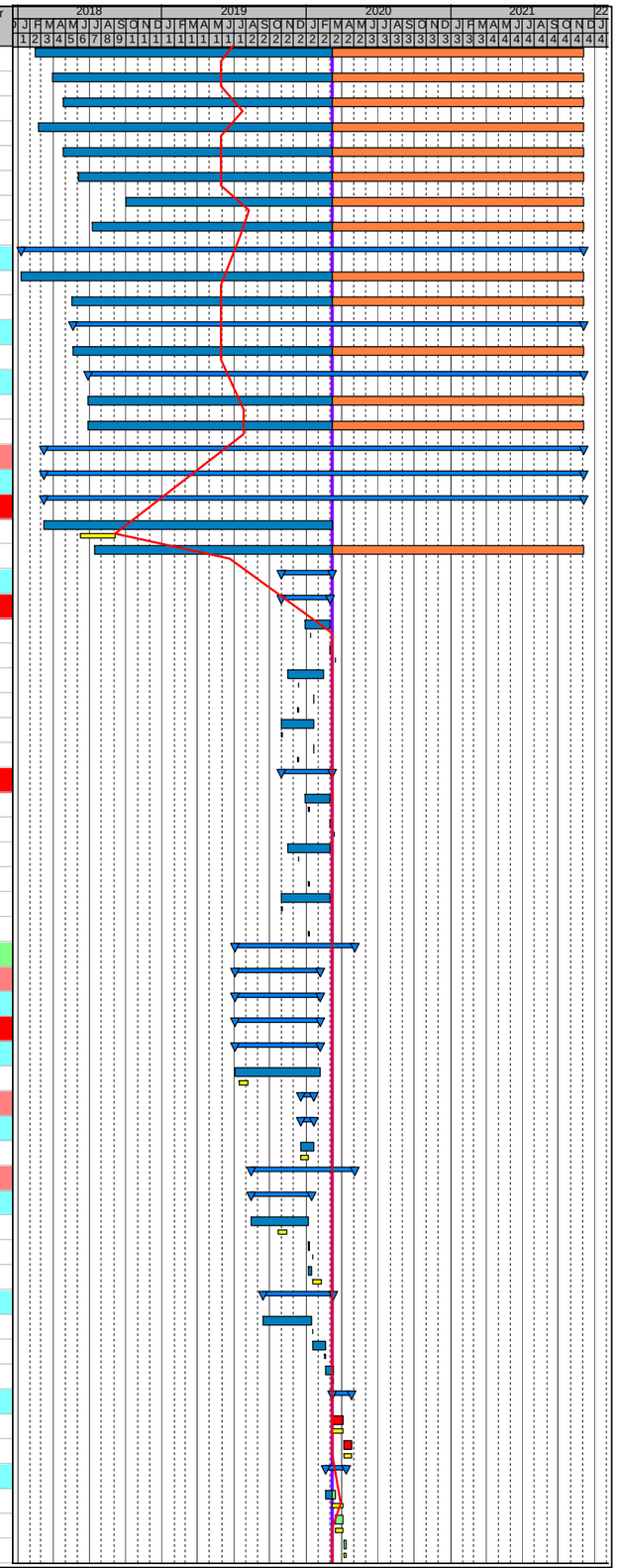
Activity ID	Activity Name	Original Duration	Start	Finish	Late Start	Late Finish	Total Float
DWP8510	Comment on SCT Procedure / Meeting With Enginee	28	22-Jun-20	19-Jul-20	12-Mar-21	08-Apr-21	263
NE/2017/06-4.DS.SCT.8	Radio System	56	25-May-20	19-Jul-20	05-Mar-21	29-Apr-21	284
DWP8540	Preparation & Submission of Radio System SCT Proc	28	25-May-20	21-Jun-20	05-Mar-21	01-Apr-21	284
DWP8550	Comment on SCT Procedure / Meeting With Enginee	28	22-Jun-20	19-Jul-20	02-Apr-21	29-Apr-21	284
NE/2017/06-4.DS.SCT.9	Detection System	56	25-May-20	19-Jul-20	27-Jan-21	23-Mar-21	247
DWP8580	Preparation & Submission of Detection System SCT F	28	25-May-20	21-Jun-20	27-Jan-21	23-Feb-21	247
DWP8590	Comment on SCT Procedure / Meeting With Enginee	28	22-Jun-20	19-Jul-20	24-Feb-21	23-Mar-21	247
NE/2017/06-4.DS.SCT.10	Manual Fallback System	56	25-May-20	19-Jul-20	26-Mar-21	20-May-21	305
DWP8620	Preparation & Submission of Manual Fallback Systerr	28	25-May-20	21-Jun-20	26-Mar-21	22-Apr-21	305
DWP8630	Comment on SCT Procedure / Meeting With Enginee	28	22-Jun-20	19-Jul-20	23-Apr-21	20-May-21	305
NE/2017/06-4.DS.SCT.11	Operation Facilities	56	25-May-20	19-Jul-20	05-Feb-21	01-Apr-21	256
DWP8660	Preparation & Submission of Operation Facilites SCT	28	25-May-20	21-Jun-20	05-Feb-21	04-Mar-21	256
DWP8670	Comment on SCT Procedure / Meeting With Enginee	28	22-Jun-20	19-Jul-20	05-Mar-21	01-Apr-21	256
NE/2017/06-4.DS.SCT.12	Power Distribution System	56	25-May-20	19-Jul-20	21-Dec-20	14-Feb-21	210
DWP8700	Preparation & Submission of Power Distribution Syste	28	25-May-20	21-Jun-20	21-Dec-20	17-Jan-21	210
DWP8710	Comment on SCT Procedure / Meeting With Enginee	28	22-Jun-20	19-Jul-20	18-Jan-21	14-Feb-21	210
NE/2017/06-4.DS.SCT.13	Speed Enforcement System	28	22-Jun-20	19-Jul-20	19-Mar-21	15-Apr-21	270
DWP8740	Preparation & Submission of Speed Enforcement Sys	28	22-Jun-20	19-Jul-20	19-Mar-21	15-Apr-21	270
NE/2017/06-4.DS.SCT.14	Optical Fibre system	70	27-Apr-20	05-Jul-20	28-Dec-20	07-Mar-21	245
DWP8780	Preparation & Submission of Optical Fibre System SC	28	27-Apr-20	24-May-20	28-Dec-20	24-Jan-21	245
DWP8790	Comment on SCT Procedure / Meeting With Enginee	28	25-May-20	21-Jun-20	25-Jan-21	21-Feb-21	245
DWP8800	Resubmission of SCT Procedure	14	22-Jun-20	05-Jul-20	22-Feb-21	07-Mar-21	245
NE/2017/06-4.DS.SAT	Preparation / Submission of SAT Procedures	0					0
NE/2017/06-4.EMT	Equipment Manufacturing and FAT Stag	74	29-Apr-20	29-Jul-20	26-Apr-20	24-Feb-21	171
NE/2017/06-4.EMT.1	Sub-systems Equipment Manufacturing (Including FAT	90	29-Apr-20	27-Jul-20	26-Apr-20	22-Nov-20	118
DWP3740	Detection System	84	29-Apr-20	22-Jul-20	06-Jun-20	29-Aug-20	38
DWP3750	Manual Fallback System	84	29-Apr-20	22-Jul-20	30-Aug-20	22-Nov-20	123
DWP3760	Operation Facilities	90	29-Apr-20	27-Jul-20	26-Apr-20	25-Jul-20	-3
DWP3780	Enforcement system	84	29-Apr-20	22-Jul-20	13-May-20	05-Aug-20	14
DWP3790	Cables (Signal, Power and Fibre Optic)	80	29-Apr-20	17-Jul-20	05-May-20	24-Jul-20	7
DWP3800	Control Cabinet and Equipment Rack	51	29-Apr-20	18-Jun-20	05-May-20	25-Jun-20	7
NE/2017/06-4.EMT.2	System and Equipment FAT	80	10-May-20	29-Jul-20	30-Oct-20	24-Feb-21	210
DWP3820	Traffic Control Device (For TKO-LTT TCSS & CBL TCS	4	25-Jul-20	29-Jul-20	19-Nov-20	23-Nov-20	117
DWP3830	Communications System (For TKO-LTT TCSS & CBL	3	13-Jun-20	16-Jun-20	20-Nov-20	23-Nov-20	160
DWP3840	CCTV System (for TKO-LTT TCSS & CBL TCSS)	2	11-Jul-20	13-Jul-20	05-Nov-20	07-Nov-20	117
DWP3850	Buildiing PABX System	3	16-Jul-20	20-Jul-20	11-Nov-20	14-Nov-20	117
DWP3860	ET System	3	20-Jul-20	23-Jul-20	14-Nov-20	17-Nov-20	117
DWP3870	PA System	2	23-Jul-20	25-Jul-20	17-Nov-20	19-Nov-20	117
DWP3880	Radio System	5	29-Jun-20	04-Jul-20	30-Oct-20	04-Nov-20	123
DWP3890	Detection System (For TKO-LTT TCSS & CBL TCSS)	3	13-Jul-20	16-Jul-20	07-Nov-20	11-Nov-20	117
DWP3910	Control Room and Console	3	01-Jun-20	05-Jun-20	09-Feb-21	12-Feb-21	253
DWP3920	Power Distribution System (For TKO-LTT TCSS & CBI	1	04-Jul-20	05-Jul-20	04-Nov-20	05-Nov-20	123
DWP3930	Enforcement System (For TKO-LTT TCSS & CBL TCS	6	22-Jun-20	27-Jun-20	18-Feb-21	24-Feb-21	242
DWP3940	Cables (For TKO-LTT TCSS & CBL TCSS)	2	18-Jun-20	20-Jun-20	10-Feb-21	12-Feb-21	236
DWP3950	Control Cabinet and Equipment rack (For TKO-LTT T	2	10-May-20	12-May-20	11-Jan-21	13-Jan-21	246
NE/2017/06-4.EMT.3	Sub-systems Equipment delivery (Main Batch)	0					0
NE/2017/06-4.EMT.4	Assembly of Equipment in Control Cabinet	0					0
NE/2017/06-4.CST	Construction Stage for TKO-LTT TCSS	0					0
NE/2017/06-4.SATT	SAT for TKO-LTT TCSS	0					0
NE/2017/06-4.OPTT	Operability Period Test for the TKO-LTT	0					0
NE/2017/06-4.DLPT	DLP for the TKO-LTT TCSS	0					0
NE/2017/06-4.DOC1	Documentation Submission for TKO-L	0					0
NE/2017/06-4.TRT	Training for TKO-LTT TCSS	0					0
NE/2017/06-4.EMC	Equipment Manufacturing and Delivery	0					0
NE/2017/06-4.CSC1	Construction Stage for CBL TCSS	0					0
NE/2017/06-4.SATC	SAT for CBL TCSS	0					0
NE/2017/06-4.OPTC	Operability Period Test For the CBL TC	0					0
NE/2017/06-4.DLPC	DLP for the CBL TCSS	0					0
NE/2017/06-4.DOC	Documentation Submission for CBL TC	0					0
NE/2017/06-4.TRC	Training for CBL TCSS	0					0



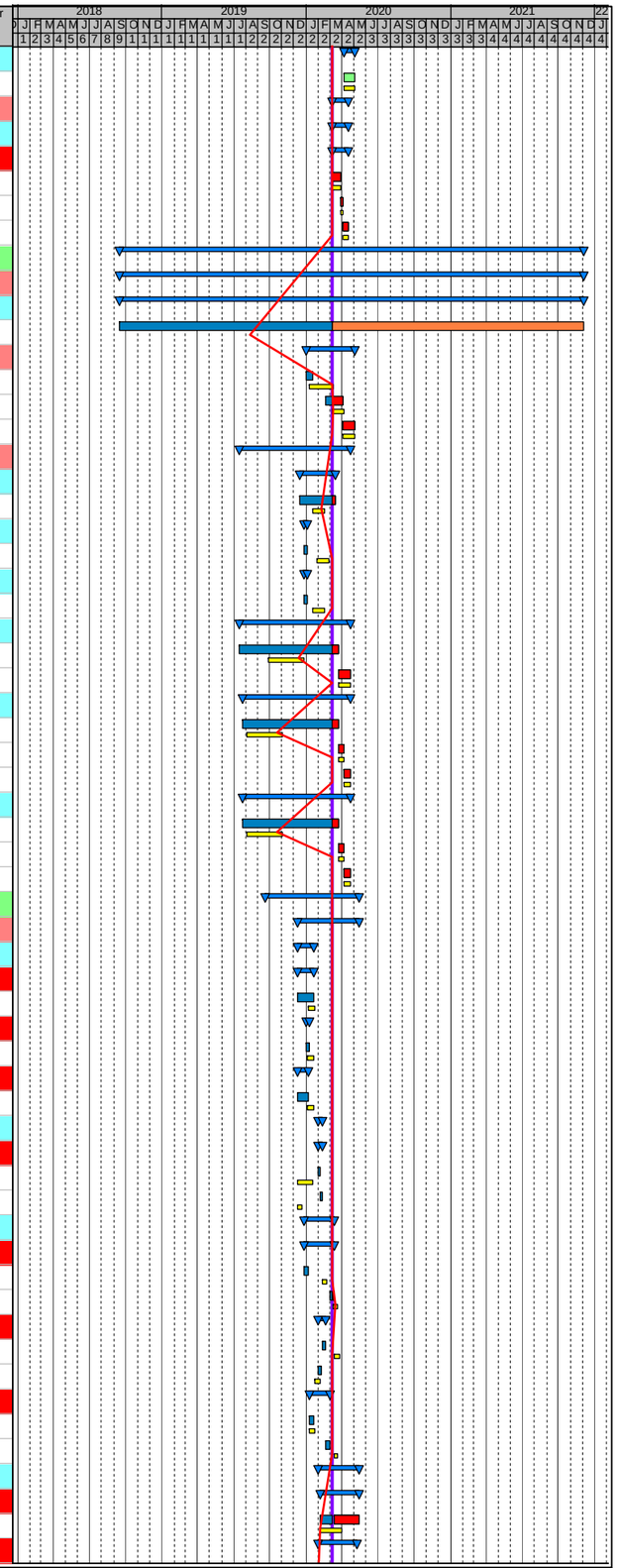
Activity ID	Activity Name	Original Duration	Remaining Duration	Activity % Complete	BL Project Start	BL Project Finish	Start	Finish	Late Start	Late Finish	Time Risk Allowance	Total Float	Free Float	Calendar
Tseung Kwan O Interchange and Associated Works 202003 _200310		1245	636		10-Jan-18	06-Aug-21	10-Jan-18 A	04-Dec-21	11-Jan-18	05-Dec-21		2	0	
Contract Key Date & Milestone		50	5		17-Jan-20	10-Mar-20	22-Jan-20 A	12-Mar-20	10-Jan-20	05-Dec-21		633	0	CD
Contractor's Target Key Date		50	5		17-Jan-20	10-Mar-20	22-Jan-20 A	12-Mar-20	10-Jan-20	05-Dec-21		633	0	CD
Major Design Work		0	0		17-Jan-20	17-Jan-20	07-Feb-20 A	07-Feb-20 A	05-Dec-21	05-Dec-21			0	CD
Superstructure		0	0		17-Jan-20	17-Jan-20	07-Feb-20 A	07-Feb-20 A	05-Dec-21	05-Dec-21			0	CD
Bridge S200		0	0		17-Jan-20	17-Jan-20	07-Feb-20 A	07-Feb-20 A	05-Dec-21	05-Dec-21			0	CD
CD-10330	Acceptance of Detail Design of Bridge S200 (Pier and Deck)	0	0	100%		17-Jan-20		07-Feb-20 A		05-Dec-21	0			CD
Major Safety/ Environment Element		48	0		22-Jan-20	08-Feb-20	22-Jan-20 A	04-Mar-20 A	05-Dec-21	05-Dec-21			0	CD
Independent Safety Audit		0	0		08-Feb-20	08-Feb-20	04-Mar-20 A	04-Mar-20 A	05-Dec-21	05-Dec-21			0	CD
CD-10430	Completion of 4th Independent Safety Audit	0	0	100%		08-Feb-20		04-Mar-20 A		05-Dec-21	0			CD
Safety Bulletin Board		0	0		22-Jan-20	22-Jan-20	22-Jan-20 A	22-Jan-20 A	05-Dec-21	05-Dec-21			0	CD
CD-10461	Completion of 2nd Safety Bulletin Board	0	0	100%		22-Jan-20		22-Jan-20 A		05-Dec-21	0			CD
Miscellaneous Work		0	0		08-Feb-20	08-Feb-20	08-Mar-20	08-Mar-20	10-Jan-20	10-Jan-20		-57	0	CD
Video Film		0	0		08-Feb-20	08-Feb-20	08-Mar-20	08-Mar-20	10-Jan-20	10-Jan-20		-57	0	CD
CD-10480	Completion of Construction Video Film for Release II	0	0	0%		08-Feb-20		08-Mar-20*		10-Jan-20	0	-57	638	CD
Major Construction Work		21	0		24-Feb-20	10-Mar-20	20-Feb-20 A	12-Mar-20	05-Dec-21	05-Dec-21		633	0	CD
Bridge S300		0	0		10-Mar-20	10-Mar-20	12-Mar-20	12-Mar-20	05-Dec-21	05-Dec-21		633	0	CD
CD-10590	Completion of Pre-drilling Bridge S300	0	0	0%		10-Mar-20		12-Mar-20		05-Dec-21	0	633	568	CD
Bridge S200		0	0		27-Feb-20	27-Feb-20	20-Feb-20 A	20-Feb-20 A	05-Dec-21	05-Dec-21			0	CD
CD-10680	Completion of Pre-drilling Bridge S200	0	0	100%		27-Feb-20		20-Feb-20 A		05-Dec-21	0			CD
Bridge S100		0	0		24-Feb-20	24-Feb-20	02-Mar-20 A	02-Mar-20 A	05-Dec-21	05-Dec-21			0	CD
CD-10770	Completion of Pre-drilling Bridge S100	0	0	100%		24-Feb-20		02-Mar-20 A		05-Dec-21	0			CD
Preliminary & Pre-Construction Work		1245	636		10-Jan-18	06-Aug-21	10-Jan-18 A	04-Dec-21	11-Jan-18	05-Dec-21		2	0	CD
Initial Document Submission		749	14		10-Jan-18	21-Feb-20	10-Jan-18 A	21-Mar-20	21-Jul-19	20-Apr-21		395	0	CD
Insurance		60	1		10-Jan-18	08-Feb-20	10-Jan-18 A	08-Mar-20	21-Jul-19	22-Jul-19		-230	0	CD
PRE-10570	Prepare, Submit and Acceptance of Professional Indemnity Insurance for the Work in Respect of the Designer	60	1	98.33%	10-Jan-18	08-Feb-20	10-Jan-18 A	08-Mar-20	21-Jul-19	22-Jul-19	0	-230	0	CD
BIM & Simulation of Construction Method		120	14		10-Jul-19	21-Feb-20	10-Jul-19 A	21-Mar-20	07-Apr-21	20-Apr-21		395	0	CD
Construction Method Simulation (CMS)		120	14		10-Jul-19	21-Feb-20	10-Jul-19 A	21-Mar-20	07-Apr-21	20-Apr-21		395	0	CD
PRE-10810	Prepare and Submit the Construction Method Simulation - Span Segment Erection	120	14	88.33%	10-Jul-19	21-Feb-20	10-Jul-19 A	21-Mar-20	07-Apr-21	20-Apr-21	0	395	622	CD
Regular/ Routine Submission		1244	636		10-Jan-18	06-Aug-21	10-Jan-18 A	04-Dec-21	11-Jan-18	20-Apr-21		-227	0	CD
Programme		1165	636		20-Feb-18	06-Aug-21	20-Feb-18 A	04-Dec-21	21-Feb-18	20-Apr-21		-227	0	CD
PRE-11380	Regular Submission of 3-Month Rolling Programme	1100	636	42.15%	20-Feb-18	06-Aug-21	20-Feb-18 A	04-Dec-21	21-Feb-18	20-Apr-21	0	-227	0	CD
PRE-11390	Regular Submission of Detailed Monthly Programme	1007	636	36.8%	19-Jun-18	06-Aug-21	19-Jun-18 A	04-Dec-21	20-Jun-18	20-Apr-21	0	-227	0	CD
Webpage, Video, Photos and Physical Model		1109	636		11-Feb-18	06-Aug-21	11-Feb-18 A	04-Dec-21	12-Feb-18	20-Apr-21		-227	0	CD
PRE-11400	Maintenance / Update Contract Website	1109	636	42.61%	11-Feb-18	06-Aug-21	11-Feb-18 A	04-Dec-21	12-Feb-18	20-Apr-21	0	-227	0	CD
PRE-11410	Regular Progress Site Photo	1064	636	40.19%	28-Mar-18	06-Aug-21	28-Mar-18 A	04-Dec-21	29-Mar-18	20-Apr-21	0	-227	0	CD
PRE-11420	Regular Progress Site Video	1064	636	40.19%	28-Mar-18	06-Aug-21	28-Mar-18 A	04-Dec-21	29-Mar-18	20-Apr-21	0	-227	0	CD
Management Plan		1181	636		14-Mar-18	06-Aug-21	14-Mar-18 A	04-Dec-21	15-Mar-18	20-Apr-21		-227	0	CD
PRE-11430	Regular Submission of Project Quality Plan	1029	636	38.15%	02-May-18	06-Aug-21	02-May-18 A	04-Dec-21	03-May-18	20-Apr-21	0	-227	0	CD
PRE-11440	Regular Submission of Subcontractor Management Plan	607	636	0%	23-Dec-19	06-Aug-21	23-Dec-19 A	04-Dec-21	24-Dec-19	20-Apr-21	0	-227	0	CD
PRE-11450	Regular Submission/ Implementation of the use of the Quality Powered Mechanical Equipment	1029	636	38.15%	02-May-18	06-Aug-21	02-May-18 A	04-Dec-21	03-May-18	20-Apr-21	0	-227	0	CD
PRE-11460	Regular Submission of Site Management Plan (Trip Ticket System)	1078	636	40.96%	14-Mar-18	06-Aug-21	14-Mar-18 A	04-Dec-21	15-Mar-18	20-Apr-21	0	-227	0	CD
Audit and Certificate		1063	636		29-Mar-18	06-Aug-21	29-Mar-18 A	04-Dec-21	30-Mar-18	20-Apr-21		-227	0	CD
PRE-11470	Prepare and Implementation of Regular Safety Audit	1063	636	40.13%	29-Mar-18	06-Aug-21	29-Mar-18 A	04-Dec-21	30-Mar-18	20-Apr-21	0	-227	0	CD
Key Personnel		1137	636		14-Mar-18	06-Aug-21	14-Mar-18 A	04-Dec-21	15-Mar-18	20-Apr-21		-227	0	CD
PRE-11500	Regular Submission of Organisation Chart	1137	636	44.02%	14-Mar-18	06-Aug-21	14-Mar-18 A	04-Dec-21	15-Mar-18	20-Apr-21	0	-227	0	CD
Payment Wages and Labour Officer		1121	636		30-Jan-18	06-Aug-21	30-Jan-18 A	04-Dec-21	31-Jan-18	20-Apr-21		-227	0	CD
PRE-11510	Regular Submission / Implementation of Monitoring System of Payment of Wages	1121	636	43.23%	30-Jan-18	06-Aug-21	30-Jan-18 A	04-Dec-21	31-Jan-18	20-Apr-21	0	-227	0	CD
PRE-11520	Regular Implementation/Maintenance of Contractor's Labour Officer	1111	636	42.72%	09-Feb-18	06-Aug-21	09-Feb-18 A	04-Dec-21	10-Feb-18	20-Apr-21	0	-227	0	CD
BIM		1136	636		28-Apr-18	06-Aug-21	28-Apr-18 A	04-Dec-21	29-Apr-18	20-Apr-21		-227	0	CD
PRE-11530	Regular Submission / Updating of BIM	1136	636	43.98%	28-Apr-18	06-Aug-21	28-Apr-18 A	04-Dec-21	29-Apr-18	20-Apr-21	0	-227	0	CD
Safety, Environmental & Weather Protection		1181	636		09-Feb-18	06-Aug-21	09-Feb-18 A	04-Dec-21	10-Feb-18	20-Apr-21		-227	0	CD
PRE-11540	Regular Implementation/Maintenance of Contractor's Safety Officer	1035	636	38.51%	26-Apr-18	06-Aug-21	26-Apr-18 A	04-Dec-21	27-Apr-18	20-Apr-21	0	-227	0	CD
PRE-11550	Regular Implementation/Maintenance of Contractor's Environmental Officer	1111	636	42.72%	09-Feb-18	06-Aug-21	09-Feb-18 A	04-Dec-21	10-Feb-18	20-Apr-21	0	-227	0	CD
PRE-11560	Regular Implementation/ Maintenance of Site Safety and Environmental Management Committee Meeting	1111	636	42.72%	09-Feb-18	06-Aug-21	09-Feb-18 A	04-Dec-21	10-Feb-18	20-Apr-21	0	-227	0	CD
PRE-11570	Regular Implementation/Maintenance of Site Safety and Environmental Committee Meeting	1111	636	42.72%	09-Feb-18	06-Aug-21	09-Feb-18 A	04-Dec-21	10-Feb-18	20-Apr-21	0	-227	0	CD
PRE-11580	Regular Implementation/Maintenance of Weekly Safety Walk	1035	636	38.51%	26-Apr-18	06-Aug-21	26-Apr-18 A	04-Dec-21	27-Apr-18	20-Apr-21	0	-227	0	CD
PRE-11590	Regular Implementation/Maintenance of Weekly Environmental Walk	1111	636	42.72%	09-Feb-18	06-Aug-21	09-Feb-18 A	04-Dec-21	10-Feb-18	20-Apr-21	0	-227	0	CD
PRE-11600	Regular Implementation/Maintenance of Site Specific Induction Training and Toolbox Talks	1035	636	38.51%	26-Apr-18	06-Aug-21	26-Apr-18 A	04-Dec-21	27-Apr-18	20-Apr-21	0	-227	0	CD
PRE-11610	Regular Implementation/Maintenance of Pre-Work Activities of Site Safety Cycle	1035	636	38.51%	26-Apr-18	06-Aug-21	26-Apr-18 A	04-Dec-21	27-Apr-18	20-Apr-21	0	-227	0	CD
PRE-11620	Regular Submission & Application of Type I DASO (Under EPD Statutory Submission)	969	636	34.32%	13-Aug-18	06-Aug-21	13-Aug-18 A	04-Dec-21	14-Aug-18	20-Apr-21	0	-227	0	CD



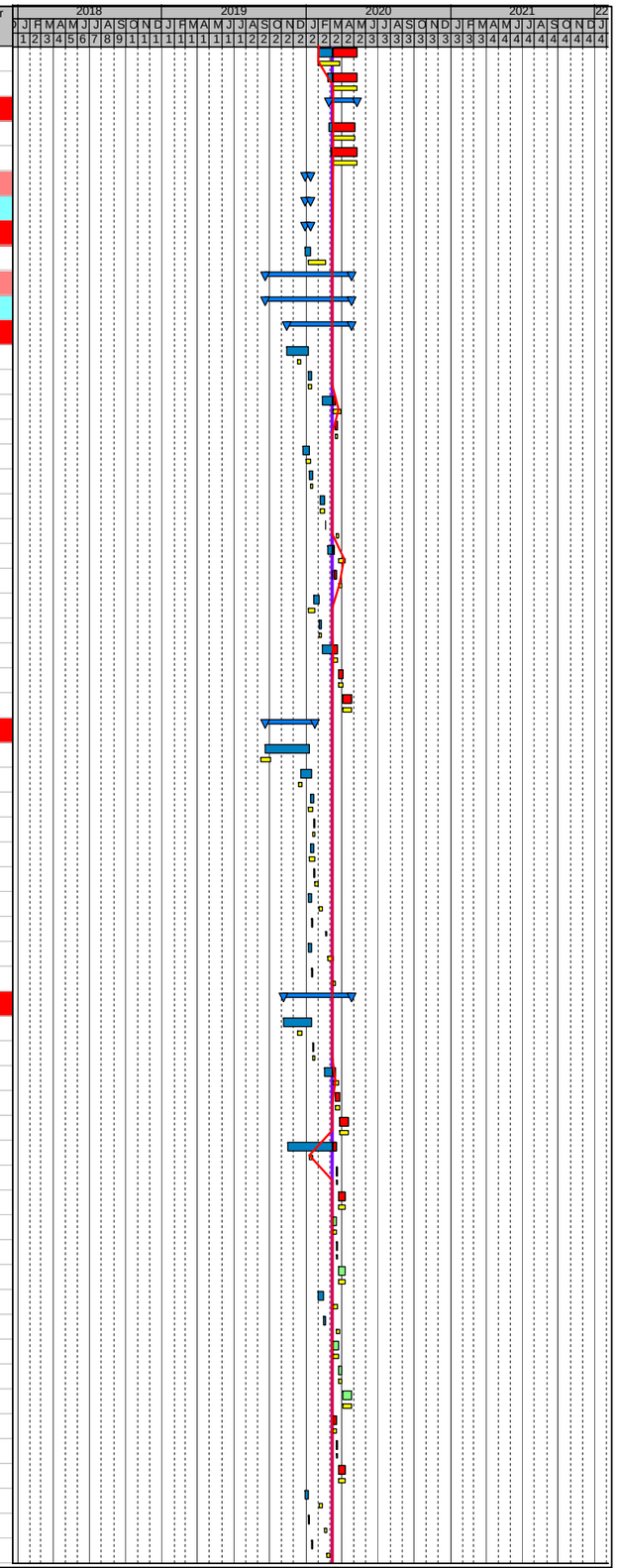
Activity ID	Activity Name	Original Duration	Remaining Duration	Activity % Complete	BL Project Start	BL Project Finish	Start	Finish	Late Start	Late Finish	Time Risk Allowance	Total Float	Free Float	Calendar
PRE-11630	Regular Submission of Environmental Management Plan	1107	636	42.51%	13-Feb-18	06-Aug-21	13-Feb-18 A	04-Dec-21	14-Feb-18	20-Apr-21	0	-227	0	CD
PRE-11640	Regular Submission and implementation of Construction Health and Safety Plan & Safety	1063	636	40.13%	29-Mar-18	06-Aug-21	29-Mar-18 A	04-Dec-21	30-Mar-18	20-Apr-21	0	-227	0	CD
PRE-11650	Regular Submission and Update the Temporary Drainage Management Plan	899	636	29.21%	26-Apr-18	06-Aug-21	26-Apr-18 A	04-Dec-21	27-Apr-18	20-Apr-21	0	-227	0	CD
PRE-11660	Regular Submission of Safety Plan & Safety Bulletin Board	1097	636	41.99%	23-Feb-18	06-Aug-21	23-Feb-18 A	04-Dec-21	24-Feb-18	20-Apr-21	0	-227	0	CD
PRE-11670	Regular Submission of Waste Management Plan	1016	636	37.36%	26-Apr-18	06-Aug-21	26-Apr-18 A	04-Dec-21	27-Apr-18	20-Apr-21	0	-227	0	CD
PRE-11680	Regular Submission & Implementation of Weather Protection	996	636	36.1%	04-Jun-18	06-Aug-21	04-Jun-18 A	04-Dec-21	05-Jun-18	20-Apr-21	0	-227	0	CD
PRE-11690	Regular Submission & Application of Type II DASO (Under EPD Statutory Submission)	952	636	33.15%	02-Oct-18	06-Aug-21	02-Oct-18 A	04-Dec-21	03-Oct-18	20-Apr-21	0	-227	0	CD
PRE-11700	Regular Submission of Systematic Risk Management Plan	976	636	34.8%	09-Jul-18	06-Aug-21	09-Jul-18 A	04-Dec-21	10-Jul-18	20-Apr-21	0	-227	0	CD
Security & Telephone System		1141	636		10-Jan-18	06-Aug-21	10-Jan-18 A	04-Dec-21	11-Jan-18	20-Apr-21		-227	0	CD
PRE-11710	Regular Operation and Maintenance of 24-hour Telephone Hotline	1141	636	44.22%	10-Jan-18	06-Aug-21	10-Jan-18 A	04-Dec-21	11-Jan-18	20-Apr-21	0	-227	0	CD
PRE-11720	Regular maintenance and operation of Security system	1013	636	37.18%	18-May-18	06-Aug-21	18-May-18 A	04-Dec-21	19-May-18	20-Apr-21	0	-227	0	CD
Interface Work		1074	636		21-May-18	06-Aug-21	21-May-18 A	04-Dec-21	22-May-18	20-Apr-21		-227	0	CD
PRE-11730	Regular Submission and Implementation of Interface Management Plan and Marine Traffic Flow	1074	636	40.74%	21-May-18	06-Aug-21	21-May-18 A	04-Dec-21	22-May-18	20-Apr-21	0	-227	0	CD
Survey		995	636		28-Jun-18	06-Aug-21	28-Jun-18 A	04-Dec-21	29-Jun-18	20-Apr-21		-227	0	CD
PRE-11740	Regular Submission of Tide Information	995	636	36.04%	28-Jun-18	06-Aug-21	28-Jun-18 A	04-Dec-21	29-Jun-18	20-Apr-21	0	-227	0	CD
PRE-11750	Regular Submission of Hydrographic Survey	995	636	36.04%	28-Jun-18	06-Aug-21	28-Jun-18 A	04-Dec-21	29-Jun-18	20-Apr-21	0	-227	0	CD
Pre-Construction Work		1015	636		07-Mar-18	06-Aug-21	07-Mar-18 A	04-Dec-21	14-Jul-18	05-Dec-21		2	0	CD
Site Accommodation		1015	636		07-Mar-18	06-Aug-21	07-Mar-18 A	04-Dec-21	14-Jul-18	05-Dec-21		2	0	CD
Site Accommodation (Construction Work)		1015	636		07-Mar-18	06-Aug-21	07-Mar-18 A	04-Dec-21	14-Jul-18	05-Dec-21		2	0	CD
PRE-11770	Hoarding Erection	90	0	100%	07-Mar-18	08-Feb-20	07-Mar-18 A	08-Mar-20	05-Dec-21	05-Dec-21	0	638	638	CD
PRE-11790	Maintenance CSA during Contract Period including the Furniture,Equipment, Personnel,Computer Facilities, Land Transport	979	636	34.99%	13-Jul-18	06-Aug-21	13-Jul-18 A	04-Dec-21	14-Jul-18	20-Apr-21	0	-227	0	CD
Survey		138	0		01-Nov-19	13-Feb-20	01-Nov-19 A	06-Mar-20 A	18-Sep-19	14-Feb-20			0	CD
Conditional Survey (Documentation)		138	0		01-Nov-19	13-Feb-20	01-Nov-19 A	03-Mar-20 A	18-Sep-19	14-Feb-20			0	CD
PRE-11933	Prepare and Submit Report for Condition Survey (Portion II)	3	0	100%	29-Dec-19	10-Feb-20	29-Dec-19 A	02-Mar-20 A	16-Oct-19	16-Oct-19	0			CD
PRE-11934	Project Manager to acknowledge the Report Submission of Condition Survey (Portion II)	3	0	100%	11-Feb-20	13-Feb-20	03-Mar-20 A	03-Mar-20 A	16-Oct-19	16-Oct-19	0			CD
PRE-11937	Prepare and Submit Report for Condition Survey (Portion III –3D,3E, 2B,2C)	3	0	100%	15-Nov-19	08-Feb-20	15-Nov-19 A	14-Feb-20 A	18-Sep-19	18-Sep-19	0			CD
PRE-11938	Project Manager to acknowledge the Report Submission of Condition Survey (Portion III -3D,3E, 2B,2C)	3	0	100%	08-Feb-20	10-Feb-20	22-Jan-20 A	22-Jan-20 A	18-Sep-19	18-Sep-19	0			CD
PRE-11939	Prepare and Submit Report for Condition Survey (Portion III -4J)	3	0	100%	01-Nov-19	20-Dec-19	01-Nov-19 A	21-Jan-20 A	14-Feb-20	14-Feb-20	0			CD
PRE-11939a	Project Manager to acknowledge the Report Submission of Condition Survey (Portion III -4J)	3	0	100%	21-Dec-19	21-Dec-19	22-Jan-20 A	22-Jan-20 A	14-Feb-20	14-Feb-20	0			CD
Initial Survey (Documentation)		135	0		01-Nov-19	13-Feb-20	01-Nov-19 A	06-Mar-20 A	18-Sep-19	14-Feb-20			0	CD
PRE-11953	Prepare and Submit Report for Initial Survey (Portion II)	3	0	100%	29-Dec-19	10-Feb-20	29-Dec-19 A	02-Mar-20 A	16-Oct-19	16-Oct-19	0			CD
PRE-11954	Project Manager to acknowledge the Report Submission of Initial Survey (Portion II)	3	0	100%	11-Feb-20	13-Feb-20	03-Mar-20 A	03-Mar-20 A	16-Oct-19	16-Oct-19	0			CD
PRE-11957	Prepare and Submit Report for Initial Survey (Portion III -3D,3E, 2B,2C)	3	0	100%	15-Nov-19	08-Feb-20	15-Nov-19 A	02-Mar-20 A	18-Sep-19	18-Sep-19	0			CD
PRE-11958	Project Manager to acknowledge the Report Submission of Initial Survey (Portion III -3D,3E, 2B,2C)	3	0	100%	08-Feb-20	10-Feb-20	06-Mar-20 A	06-Mar-20 A	18-Sep-19	18-Sep-19	0			CD
PRE-11959	Prepare and Submit Report for Initial Survey (Portion III -4J)	3	0	100%	01-Nov-19	20-Dec-19	01-Nov-19 A	02-Mar-20 A	14-Feb-20	14-Feb-20	0			CD
PRE-11959a	Project Manager to acknowledge the Report Submission of Initial Survey (Portion III -4J)	3	0	100%	21-Dec-19	21-Dec-19	06-Mar-20 A	06-Mar-20 A	14-Feb-20	14-Feb-20	0			CD
Document Submission (Design, Drawing , Method Statement, Application etc)		292	56		06-Jul-19	24-Apr-20	06-Jul-19 A	02-May-20	21-Jul-19	04-Sep-20		125	0	CD
Contractor's Alternative Design (AD) & Contractor's Design		21	0		06-Jul-19	17-Jan-20	06-Jul-19 A	07-Feb-20 A	21-Jul-19	21-Jul-19			0	CD
Superstructure Design (Pier and Deck) [Contractor's Alternative Design (AD)]		21	0		06-Jul-19	17-Jan-20	06-Jul-19 A	07-Feb-20 A	21-Jul-19	21-Jul-19			0	CD
Bridge S200		21	0		06-Jul-19	17-Jan-20	06-Jul-19 A	07-Feb-20 A	21-Jul-19	21-Jul-19			0	CD
Detail Design [Deck]		21	0		06-Jul-19	17-Jan-20	06-Jul-19 A	07-Feb-20 A	21-Jul-19	21-Jul-19			0	CD
PRE-15620	Project Manager to Review & Approve the Detail Design of Bridge S200 (Deck)	21	0	100%	06-Jul-19	17-Jan-20	06-Jul-19 A	07-Feb-20 A	21-Jul-19	21-Jul-19	0			CD
Major Material Submission		21	0		13-Dec-19	25-Jan-20	19-Dec-19 A	20-Jan-20 A	27-Aug-19	27-Aug-19			0	CD
Bridge Strands		21	0		13-Dec-19	25-Jan-20	19-Dec-19 A	20-Jan-20 A	27-Aug-19	27-Aug-19			0	CD
PRE-13330	Result Submission and Review & Acceptance by the Project Manager	21	0	100%	13-Dec-19	25-Jan-20	19-Dec-19 A	20-Jan-20 A	27-Aug-19	27-Aug-19	0			CD
Major Method Statement		193	56		16-Aug-19	24-Apr-20	16-Aug-19 A	02-May-20	02-Aug-19	04-Sep-20		125	0	CD
Span Segment Erection		109	0		16-Aug-19	17-Jan-20	16-Aug-19 A	16-Jan-20 A	15-Aug-19	15-Aug-19			0	CD
PRE-14070	Contractor's Review with Project Manager, Revised Method Statement Construction of Span Segment Erection	21	0	100%	16-Aug-19	06-Jan-20	16-Aug-19 A	06-Jan-20 A	15-Aug-19	15-Aug-19	0			CD
PRE-14090	ICE Certification & Submit Revised Method Statement for Construction of Span Segment Erection	1	0	100%	06-Jan-20	08-Jan-20	06-Jan-20 A	08-Jan-20 A	15-Aug-19	15-Aug-19	0			CD
PRE-14100	Project Manager to review and approve Method Statement Construction of Span Segment Erection	21	0	100%	08-Jan-20	17-Jan-20	08-Jan-20 A	16-Jan-20 A	15-Aug-19	15-Aug-19	0			CD
Bridge Stressing (Internal & External)		51	1		13-Sep-19	08-Feb-20	13-Sep-19 A	08-Mar-20	02-Aug-19	14-Aug-19		-207	0	CD
PRE-14130	Contractor's Review with Project Manager, Revised Method Statement for Bridge Stressing (Internal & External)	1	0	100%	13-Sep-19	17-Jan-20	13-Sep-19 A	16-Jan-20 A	02-Aug-19	02-Aug-19	0			CD
PRE-14150	ICE Certification & Submit Revised Method Statement for Bridge Stressing (Internal & External)	1	0	100%	17-Jan-20	08-Feb-20	17-Jan-20 A	20-Feb-20 A	14-Aug-19	14-Aug-19	0			CD
PRE-14160	Project Manager to review and approve Method Statement Bridge Stressing (Internal & External)	1	1	0%	08-Feb-20	08-Feb-20	21-Feb-20 A	08-Mar-20	14-Aug-19	14-Aug-19	0	-207	0	CD
Key Segment Erection		49	49		08-Feb-20	27-Mar-20	08-Mar-20	25-Apr-20	02-Aug-19	19-Sep-19		-219	0	CD
PRE-14170	Prepare 1st Submission of Method Statement Construction of Key Segment Erection	28	28	0%	08-Feb-20	06-Mar-20	08-Mar-20	04-Apr-20	02-Aug-19	29-Aug-19	0	-219	0	CD
PRE-14190	Contractor's Review with Project Manager, Revised Method Statement for Construction of Key Segment Erection	21	21	0%	07-Mar-20	27-Mar-20	05-Apr-20	25-Apr-20	30-Aug-19	19-Sep-19	0	-219	0	CD
Construction of Parapet & Installation of Utility Through		35	35		08-Feb-20	03-Apr-20	20-Feb-20 A	11-Apr-20	11-Jul-20	01-Sep-20		143	0	CD
PRE-14230	Prepare1st Submission of Method Statement Parapet Construction & Installation of Utility Through	28	7	75%	08-Feb-20	06-Mar-20	20-Feb-20 A	14-Mar-20	11-Jul-20	17-Jul-20	0	125	0	CD
PRE-14250	Contractor's Review with Project Manager, Revised Method Statement	21	21	0%	07-Mar-20	27-Mar-20	15-Mar-20	04-Apr-20	18-Jul-20	07-Aug-20	0	125	0	CD
PRE-14270	ICE Certification & Submit Revised Method Statement for Parapet Construction & Installation of Utility Through	7	7	0%	28-Mar-20	03-Apr-20	05-Apr-20	11-Apr-20	26-Aug-20	01-Sep-20	0	143	0	CD



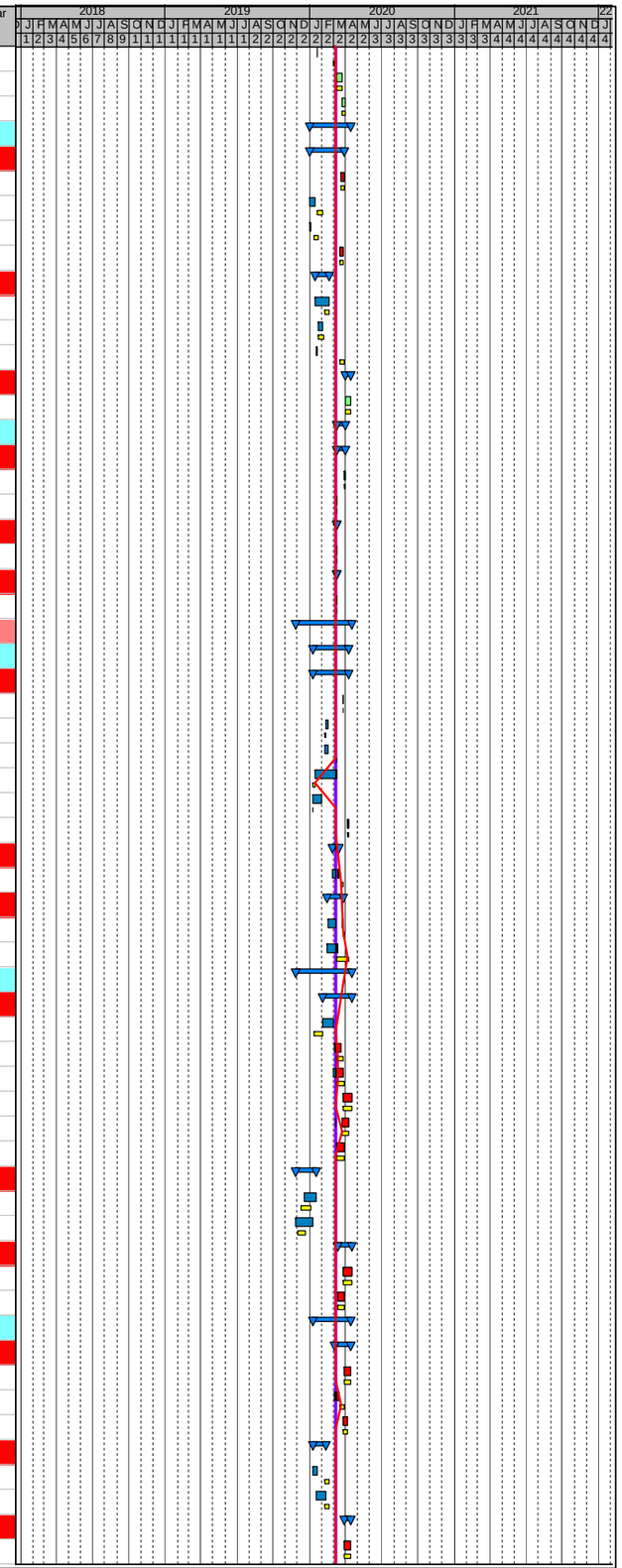
Activity ID	Activity Name	Original Duration	Remaining Duration	Activity % Complete	BL Project Start	BL Project Finish	Start	Finish	Late Start	Late Finish	Time Risk Allowance	Total Float	Free Float	Calendar
	Installation of Bridge Furniture	28	28		28-Mar-20	24-Apr-20	05-Apr-20	02-May-20	08-Aug-20	04-Sep-20		125	0	CD
PRE-14290	Prepare 1st Submission of Method Statement Installation of Bridge Furniture	28	28	0%	28-Mar-20	24-Apr-20	05-Apr-20	02-May-20	08-Aug-20	04-Sep-20	0	125	0	CD
	Design Calculation/ Drawing of Temporary Work	40	40		08-Feb-20	18-Mar-20	08-Mar-20	16-Apr-20	21-Feb-20	31-Mar-20		-16	0	CD
	Fabrication Drawing for the Mould of Precast Element	40	40		08-Feb-20	18-Mar-20	08-Mar-20	16-Apr-20	21-Feb-20	31-Mar-20		-16	0	CD
	Mould for Precast Parapet Skin	40	40		08-Feb-20	18-Mar-20	08-Mar-20	16-Apr-20	21-Feb-20	31-Mar-20		-16	0	CD
PRE-15010	Prepare Design & Fabrication Drawing for Mould of Precast Parapet Skin	21	21	0%	08-Feb-20	28-Feb-20	08-Mar-20	28-Mar-20	21-Feb-20	12-Mar-20	0	-16	0	CD
PRE-15020	ICE Certification and Submit the Design & Fabrication Drawing for Mould of Precast Parapet Skin	5	5	0%	29-Feb-20	04-Mar-20	29-Mar-20	02-Apr-20	13-Mar-20	17-Mar-20	0	-16	0	CD
PRE-15030	Contractor's Review with Project Manager,Revised & Resubmit of the Fabrication Drawing for Mould of Precast Parapet Skin	14	14	0%	05-Mar-20	18-Mar-20	03-Apr-20	16-Apr-20	18-Mar-20	31-Mar-20	0	-16	0	CD
	Pre-Fabrication Element	900	636		15-Sep-18	06-Aug-21	15-Sep-18 A	04-Dec-21	16-Sep-18	20-Apr-21		-227	0	CD
	Off- site Accommodation & Precast/Fabrication Yard	900	636		15-Sep-18	06-Aug-21	15-Sep-18 A	04-Dec-21	16-Sep-18	20-Apr-21		-227	0	CD
	Off-Site Accommodation (Construction Work)	900	636		15-Sep-18	06-Aug-21	15-Sep-18 A	04-Dec-21	16-Sep-18	20-Apr-21		-227	0	CD
PRE-15170	Maintenance Off Site-Accommodation for Project Manager	900	636	29.29%	15-Sep-18	06-Aug-21	15-Sep-18 A	04-Dec-21	16-Sep-18	20-Apr-21	0	-227	0	CD
	Pre-Fabrication of Precast Segment	115	57		02-Jan-20	07-Apr-20	02-Jan-20 A	04-May-20	21-Jul-19	16-Sep-19		-230	0	CD
FD-10191	Pre-Fabrication for Segment (Batch 1B) - 81 to 101 nos. Pier Head/ Span/ Key Segment	59	0	100%	02-Jan-20	18-Jan-20	02-Jan-20 A	18-Jan-20 A	21-Jul-19	21-Jul-19	0			CD
FD-10192	Pre-Fabrication for Segment (Batch 2) - 102 to 151 nos. Pier Head/ Span/ Key Segment	29	26	10%	08-Feb-20	07-Mar-20	20-Feb-20 A	03-Apr-20	21-Jul-19	16-Aug-19	0	-230	0	CD
FD-10193	Pre-Fabrication for Segment (Batch 3) - 152 to 202 nos. Pier Head/ Span/ Key Segment	31	31	0%	08-Mar-20	07-Apr-20	03-Apr-20	04-May-20	17-Aug-19	16-Sep-19	0	-230	0	CD
	Pre-Fabrication of Segment Erector	263	46		15-Jul-19	24-Mar-20	15-Jul-19 A	23-Apr-20	07-Aug-19	01-Feb-20		-82	0	CD
	Segment Lifting Frame	30	8		17-Dec-19	15-Feb-20	17-Dec-19 A	15-Mar-20	07-Aug-19	14-Aug-19		-214	0	CD
FD-10320	Delivery of Segment Lifting Frame	30	8	73.33%	17-Dec-19	15-Feb-20	17-Dec-19 A	15-Mar-20	07-Aug-19	14-Aug-19	0	-214	1	CD
	Segment Hanging Beam No. 1	30	0		28-Dec-19	03-Jan-20	28-Dec-19 A	03-Jan-20 A	01-Feb-20	01-Feb-20			0	CD
FD-10350	Delivery of Segment Hangng Beam No. 1	30	0	100%	28-Dec-19	03-Jan-20	28-Dec-19 A	03-Jan-20 A	01-Feb-20	01-Feb-20	0			CD
	Segment Hanging Beam No. 2	30	0		28-Dec-19	03-Jan-20	28-Dec-19 A	03-Jan-20 A	27-Aug-19	27-Aug-19			0	CD
FD-10380	Delivery of Segment Hangng Beam No. 2	30	0	100%	28-Dec-19	03-Jan-20	28-Dec-19 A	03-Jan-20 A	27-Aug-19	27-Aug-19	0			CD
	Segment Truss Beam No. 1	206	44		15-Jul-19	22-Mar-20	15-Jul-19 A	21-Apr-20	12-Aug-19	25-Sep-19		-208	0	CD
FD-10390	Pre-Fabrication of Segment Truss Beam No.1	90	14	84.44%	15-Jul-19	21-Feb-20	15-Jul-19 A	22-Mar-20	12-Aug-19	26-Aug-19	0	-208	0	CD
FD-10400	Test & Commisioning of Segment Truss Beam No.1	30	30	0%	22-Feb-20	22-Mar-20	22-Mar-20	21-Apr-20	27-Aug-19	25-Sep-19	0	-208	0	CD
	Segment Key Segment Erector No. 1	263	46		23-Jul-19	24-Mar-20	23-Jul-19 A	23-Apr-20	05-Dec-19	20-Jan-20		-93	0	CD
FD-10450	Pre-Fabrication of Key Segment Erector No.1	90	14	84.44%	23-Jul-19	21-Feb-20	23-Jul-19 A	22-Mar-20	05-Dec-19	19-Dec-19	0	-93	0	CD
FD-10460	Test & Commisioning of Key Segment ErectorNo.1	16	16	0%	22-Feb-20	08-Mar-20	22-Mar-20	07-Apr-20	20-Dec-19	04-Jan-20	0	-93	0	CD
FD-10470	Delivery of Key Segment Erector No.1	16	16	0%	09-Mar-20	24-Mar-20	07-Apr-20	23-Apr-20	05-Jan-20	20-Jan-20	0	-93	32	CD
	Segment Key Segment Erector No. 2	263	46		23-Jul-19	24-Mar-20	23-Jul-19 A	23-Apr-20	01-Sep-19	17-Oct-19		-188	0	CD
FD-10480	Pre-Fabrication of Key Segment Erector No.2	90	14	84.44%	23-Jul-19	21-Feb-20	23-Jul-19 A	22-Mar-20	01-Sep-19	15-Sep-19	0	-188	0	CD
FD-10490	Test & Commisioning of Key Segment Erector No.2	16	16	0%	22-Feb-20	08-Mar-20	22-Mar-20	07-Apr-20	16-Sep-19	01-Oct-19	0	-188	0	CD
FD-10500	Delivery of Key Segment Erector No.2	16	16	0%	09-Mar-20	24-Mar-20	07-Apr-20	23-Apr-20	02-Oct-19	17-Oct-19	0	-188	46	CD
	Construction Work	195	52		18-Sep-19	26-Jun-20	18-Sep-19 A	14-May-20	22-Jul-19	08-Sep-20		98	0	WD
	Pre-Drilling & Piling Work	120	52		09-Dec-19	26-Jun-20	09-Dec-19 A	14-May-20	18-Sep-19	14-Apr-20		-24	0	WD
	Temporary Platform erection for Pre-drilling & Piling	18	0		09-Dec-19	08-Jan-20	09-Dec-19 A	20-Jan-20 A	18-Sep-19	10-Feb-20			0	WD
	Bridge S300	15	0		11-Dec-19	03-Jan-20	11-Dec-19 A	20-Jan-20 A	10-Feb-20	10-Feb-20			0	WD
CON-10160	Temporary Platform Erection & Silt Curtain Installation for Pier 4K (Portion III Possession)	15	0	100%	11-Dec-19	03-Jan-20	11-Dec-19 A	20-Jan-20 A	10-Feb-20	10-Feb-20	0			WD
	Bridge S200	15	0		31-Dec-19	08-Jan-20	31-Dec-19 A	10-Jan-20 A	18-Sep-19	18-Sep-19			0	WD
CON-10240	Temporary Platform Erection & Silt Curtain Installation for Pier 2C (Portion III Possession)	15	0	100%	31-Dec-19	08-Jan-20	31-Dec-19 A	10-Jan-20 A	18-Sep-19	18-Sep-19	0			WD
	Bridge S100	15	0		09-Dec-19	07-Jan-20	09-Dec-19 A	07-Jan-20 A	21-Oct-19	21-Oct-19			0	WD
CON-10270	Temporary Platform Erection & Silt Curtain Installation for Pier 3D (Portion III Possession)	15	0	100%	09-Dec-19	07-Jan-20	09-Dec-19 A	07-Jan-20 A	21-Oct-19	21-Oct-19	0			WD
	Sloping Sea Wall for Pier 2B(Bridge S200) , 3E (Bridge S100) and 4K (Bridge S300)	33	0		14-Dec-19	25-Jan-20	31-Jan-20 A	12-Feb-20 A	18-Sep-19	10-Feb-20			0	WD
	Work to Facilitate Piling	33	0		14-Dec-19	25-Jan-20	31-Jan-20 A	12-Feb-20 A	18-Sep-19	10-Feb-20			0	WD
CON-10311	Removal of Armour Rock for 2B & 3E remaining area	33	0	100%	14-Dec-19	25-Jan-20	31-Jan-20 A	05-Feb-20 A	18-Sep-19	18-Sep-19	0			WD
CON-10312	Removal of Armour Rock for 4K remaining area	11	0	100%	14-Dec-19	28-Dec-19	06-Feb-20 A	12-Feb-20 A	10-Feb-20	10-Feb-20	0			WD
	Pre-drilling	62	4		28-Dec-19	10-Mar-20	28-Dec-19 A	12-Mar-20	18-Sep-19	14-Feb-20		-24	0	WD
	Bridge S300	33	4		28-Dec-19	10-Mar-20	28-Dec-19 A	12-Mar-20	10-Feb-20	14-Feb-20		-24	0	WD
CON-10500	Pre-drill 4J Including Plant Mobilisation and Demobilisation (2 nos./Team 2)	10	0	100%	28-Dec-19	08-Jan-20	28-Dec-19 A	08-Jan-20 A	14-Feb-20	14-Feb-20	0			WD
CON-10510	Pre-drill 4K Including Plant Mobilisation and Demobilisation (2 nos./Team 1)	10	4	60%	28-Feb-20	10-Mar-20	03-Mar-20 A	12-Mar-20	10-Feb-20	13-Feb-20	0	-24	0	WD
	Bridge S200	52	0		22-Jan-20	27-Feb-20	31-Jan-20 A	20-Feb-20 A	18-Sep-19	18-Sep-19			0	WD
CON-10580	Pre-drill 2B Including Plant Mobilisation and Demobilisation (2 nos./Team 4)	13	0	100%	13-Feb-20	27-Feb-20	11-Feb-20 A	20-Feb-20 A	18-Sep-19	18-Sep-19	0			WD
CON-10590	Pre-drill 2C Including Plant Mobilisation and Demobilisation (2 nos./Team 2)	10	0	100%	22-Jan-20	12-Feb-20	31-Jan-20 A	10-Feb-20 A	18-Sep-19	18-Sep-19	0			WD
	Bridge S100	59	0		10-Jan-20	24-Feb-20	09-Jan-20 A	02-Mar-20 A	18-Sep-19	21-Oct-19			0	WD
CON-10620	Pre-drill 3D Including Plant Mobilisation and Demobilisation (2 nos./Team 1)	11	0	100%	10-Jan-20	22-Jan-20	09-Jan-20 A	21-Jan-20 A	21-Oct-19	21-Oct-19	0			WD
CON-10630	Pre-drill 3E Including Plant Mobilisation and Demobilisation (2 nos./Team 3)	10	0	100%	13-Feb-20	24-Feb-20	20-Feb-20 A	02-Mar-20 A	18-Sep-19	18-Sep-19	0			WD
	Bored Pile Include Fabrication & Delivery of Pile Cage and Casing	80	52		25-Feb-20	26-Jun-20	31-Jan-20 A	14-May-20	18-Sep-19	14-Apr-20		-24	0	WD
	Bridge S300	48	48		29-Apr-20	26-Jun-20	06-Feb-20 A	14-May-20	14-Feb-20	14-Apr-20		-24	0	WD
CON-10810	Bored Pile 4K Including Plant Mobilisation and Demobilisation (2 nos. Pile / Team 4) [portion iii - team4]	48	48	0%	29-Apr-20	26-Jun-20	06-Feb-20 A	14-May-20	14-Feb-20	14-Apr-20	0	-24	0	WD
	Bridge S200	80	48		25-Feb-20	28-Apr-20	31-Jan-20 A	09-May-20	21-Oct-19	08-Jan-20		-96	0	WD



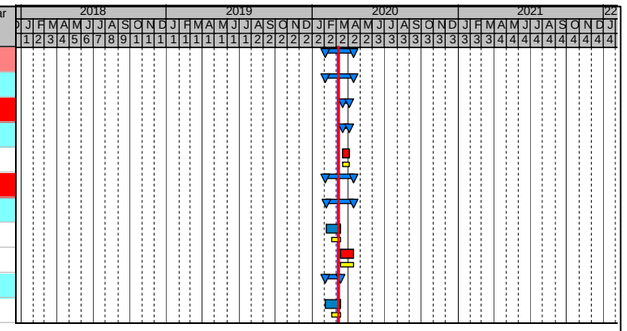
Activity ID	Activity Name	Original Duration	Remaining Duration	Activity % Complete	BL Project Start	BL Project Finish	Start	Finish	Late Start	Late Finish	Time Risk Allowance	Total Float	Free Float	Calendar
CON-10820	Bored Pile 2B Including Plant Mobilisation and Demobilisation (2 nos. Pile / Team 4) [portion iii - team4]	48	48	0%	28-Feb-20	28-Apr-20	31-Jan-20 A	09-May-20	11-Nov-19	08-Jan-20	0	-96	0	WD
CON-10830	Bored Pile 2C Including Plant Mobilisation and Demobilisation (2 nos. Pile / Team 3)	48	48	0%	25-Feb-20	24-Apr-20	25-Feb-20 A	09-May-20	21-Oct-19	14-Dec-19	0	-114	0	WD
Bridge S100		48	48		25-Feb-20	28-Apr-20	28-Feb-20 A	09-May-20	18-Sep-19	11-Dec-19		-117	0	WD
CON-10920	Bored Pile 3D Including Plant Mobilisation and Demobilisation (2 nos. Pile / Team 1)	43	43	0%	25-Feb-20	24-Apr-20	28-Feb-20 A	04-May-20	23-Oct-19	11-Dec-19	0	-112	0	WD
CON-10930	Bored Pile 3E Including Plant Mobilisation and Demobilisation (2 nos. Pile / Team 2) [portion iii - team2]	48	48	0%	28-Feb-20	28-Apr-20	05-Mar-20 A	09-May-20	18-Sep-19	14-Nov-19	0	-140	0	WD
Pile Cap Construction		33	0		30-Dec-19	11-Jan-20	30-Dec-19 A	11-Jan-20 A	07-Feb-20	07-Feb-20			0	WD
Pile Cap Rebar Erection, Concreting and Curing		33	0		30-Dec-19	11-Jan-20	30-Dec-19 A	11-Jan-20 A	07-Feb-20	07-Feb-20			0	WD
Bridge S300		33	0		30-Dec-19	11-Jan-20	30-Dec-19 A	11-Jan-20 A	07-Feb-20	07-Feb-20			0	WD
CON-12270	Pile Cap Rebar Erection, Concreting and Curing for Pier 4H (1 nos.Pile Cap/Team 3)	33	0	100%	30-Dec-19	11-Jan-20	30-Dec-19 A	11-Jan-20 A	07-Feb-20	07-Feb-20	3			WD
Construction Pier Element		184	37		18-Sep-19	06-Apr-20	18-Sep-19 A	24-Apr-20	10-Aug-19	08-Sep-20		113	0	WD
Construction of Pier		184	37		18-Sep-19	28-Mar-20	18-Sep-19 A	24-Apr-20	10-Aug-19	08-Sep-20		113	0	WD
Bridge ML		109	37		14-Nov-19	27-Mar-20	14-Nov-19 A	24-Apr-20	10-Aug-19	09-Mar-20		-36	0	WD
CON-12422	Construction of Pier 1G, Type 4M (3 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 1) - 2nd Pour	10	0	100%	14-Nov-19	07-Jan-20	14-Nov-19 A	07-Jan-20 A	28-Sep-19	28-Sep-19	0			WD
CON-12423	Construction of Pier 1G, Type 4M (3 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 1)- 2nd Pour	6	0	100%	07-Jan-20	13-Jan-20	07-Jan-20 A	14-Jan-20 A	28-Sep-19	28-Sep-19	0			WD
CON-12424	Construction of Pier 1G, Type 4M (3 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 1) - 3rd Pour	18	6	66.67%	14-Jan-20	14-Feb-20	11-Feb-20 A	14-Mar-20	28-Sep-19	05-Oct-19	0	-131	0	WD
CON-12425	Construction of Pier 1G, Type 4M (3 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 1)- 3rd Pour	5	5	0%	15-Feb-20	20-Feb-20	16-Mar-20	20-Mar-20	08-Oct-19	12-Oct-19	0	-131	0	WD
CON-12464	Construction of Pier 1J ,Type 4 (5 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 5)- 3rd Pour	11	0	100%	23-Dec-19	13-Jan-20	23-Dec-19 A	10-Jan-20 A	10-Aug-19	10-Aug-19	0			WD
CON-12465	Construction of Pier 1J ,Type 4 (5 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 5) - 3rd Pour	6	0	100%	13-Jan-20	11-Feb-20	11-Jan-20 A	17-Jan-20 A	10-Aug-19	10-Aug-19	0			WD
CON-12466	Construction of Pier 1J ,Type 4 (5 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 5)- 4th Pour	9	0	100%	12-Feb-20	21-Feb-20	07-Feb-20 A	17-Feb-20 A	10-Aug-19	10-Aug-19	0			WD
CON-12467	Construction of Pier 1J ,Type 4 (5 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 5) - 4th Pour	6	0	100%	22-Feb-20	28-Feb-20	19-Feb-20 A	21-Feb-20 A	10-Aug-19	10-Aug-19	0			WD
CON-12468	Construction of Pier 1J ,Type 4 (5 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 5)- 5th Pour	15	4	73.33%	29-Feb-20	17-Mar-20	26-Feb-20 A	12-Mar-20	10-Aug-19	14-Aug-19	0	-172	0	WD
CON-12469	Construction of Pier 1J ,Type 4 (5 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 5) - 5th Pour	9	5	44.44%	18-Mar-20	27-Mar-20	06-Mar-20 A	18-Mar-20	15-Aug-19	20-Aug-19	0	-172	0	WD
CON-12470	Construction of Pier 1K , Type 4M (5 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 1) -1st Pour	13	0	100%	08-Jan-20	22-Jan-20	20-Jan-20 A	03-Feb-20 A	23-Jan-20	23-Jan-20	0			WD
CON-12471	Construction of Pier 1K , Type 4M (5 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 1) - 1st Pour	5	0	100%	04-Feb-20	08-Feb-20	04-Feb-20 A	08-Feb-20 A	23-Jan-20	23-Jan-20	0			WD
CON-12472	Construction of Pier 1K , Type 4M (5 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 1) -2nd Pour	12	12	0%	08-Feb-20	17-Feb-20	12-Feb-20 A	21-Mar-20	23-Jan-20	08-Feb-20	0	-36	0	WD
CON-12473	Construction of Pier 1K , Type 4M (5 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 1) -2nd Pour	10	10	0%	18-Feb-20	21-Feb-20	23-Mar-20	02-Apr-20	10-Feb-20	20-Feb-20	0	-36	0	WD
CON-12474	Construction of Pier 1K , Type 4M (5 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 1) -3rd Pour	15	15	0%	22-Feb-20	02-Mar-20	03-Apr-20	24-Apr-20	21-Feb-20	09-Mar-20	0	-36	0	WD
Bridge S300		154	0		18-Sep-19	22-Jan-20	18-Sep-19 A	22-Jan-20 A	01-Nov-19	13-Aug-20			0	WD
CON-12482	Construction of Pier 4A, type 1M (2 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 3) - 2nd Pour	19	0	100%	18-Sep-19	17-Dec-19	18-Sep-19 A	11-Jan-20 A	01-Nov-19	01-Nov-19	0			WD
CON-12483	Construction of Pier 4A, type 1M (2 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 3) - 2nd Pour	8	0	100%	18-Dec-19	14-Jan-20	18-Dec-19 A	14-Jan-20 A	01-Nov-19	01-Nov-19	0			WD
CON-12530	Construction of Pier 4H, type 1 (2 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 4) - 1st Pour	8	0	100%	09-Jan-20	22-Jan-20	13-Jan-20 A	20-Jan-20 A	13-Aug-20	13-Aug-20	0			WD
CON-12531	Construction of Pier 4H, type 1 (2 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 4) -1st Pour	4	0	100%	18-Jan-20	22-Jan-20	20-Jan-20 A	22-Jan-20 A	13-Aug-20	13-Aug-20	0			WD
CON-12532	Construction of Pier 4H, type 1 (2 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 4)- 2nd Pour	13	0	100%	09-Jan-20	22-Jan-20	13-Jan-20 A	20-Jan-20 A	13-Aug-20	13-Aug-20	0			WD
CON-12533	Construction of Pier 4H, type 1 (2 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 4)- 2nd Pour	6	0	100%	18-Jan-20	22-Jan-20	20-Jan-20 A	22-Jan-20 A	13-Aug-20	13-Aug-20	0			WD
CON-12540	Construction of Pier 4G, type 1 (2 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 4) - 1st Pour	8	0	100%	30-Dec-19	17-Jan-20	07-Jan-20 A	16-Jan-20 A	12-May-20	12-May-20	0			WD
CON-12541	Construction of Pier 4G, type 1 (2 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 4)- 1st Pour	4	0	100%	13-Jan-20	17-Jan-20	16-Jan-20 A	17-Jan-20 A	12-May-20	12-May-20	0			WD
CON-12542	Construction of Pier 4G, type 1 (2 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 4)- 2nd Pour	13	0	100%	30-Dec-19	17-Jan-20	07-Jan-20 A	16-Jan-20 A	12-May-20	12-May-20	0			WD
CON-12543	Construction of Pier 4G, type 1 (2 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 4)- 2nd Pour	6	0	100%	13-Jan-20	17-Jan-20	16-Jan-20 A	17-Jan-20 A	12-May-20	12-May-20	0			WD
Bridge S200		109	37		06-Nov-19	28-Mar-20	06-Nov-19 A	24-Apr-20	03-Feb-20	08-Sep-20		113	0	WD
CON-12582	Construction of Pier 2F, type 6 (4 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 6) -2nd Pour	11	0	100%	06-Nov-19	17-Jan-20	06-Nov-19 A	15-Jan-20 A	11-Feb-20	11-Feb-20	0			WD
CON-12583	Construction of Pier 2F, type 6 (4 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 6) -2nd Pour	6	0	100%	18-Jan-20	24-Jan-20	18-Jan-20 A	22-Jan-20 A	11-Feb-20	11-Feb-20	0			WD
CON-12584	Construction of Pier 2F, type 6 (4 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 6)-3rd Pour	13	7	50%	08-Feb-20	22-Feb-20	18-Feb-20 A	16-Mar-20	11-Feb-20	18-Feb-20	0	-23	0	WD
CON-12585	Construction of Pier 2F, type 6 (4 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 6)-3rd Pour	8	8	0%	24-Feb-20	03-Mar-20	16-Mar-20	25-Mar-20	19-Feb-20	27-Feb-20	0	-23	0	WD
CON-12586	Construction of Pier 2F, type 6 (4 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 6)-4th Pour	16	16	0%	04-Mar-20	21-Mar-20	25-Mar-20	17-Apr-20	28-Feb-20	17-Mar-20	0	-23	0	WD
CON-12594	Construction of Pier 2G, type 1 (4 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 3) -3rd Pour	8	8	0%	16-Nov-19	17-Feb-20	16-Nov-19 A	17-Mar-20	29-Feb-20	09-Mar-20	0	-7	0	WD
CON-12595	Construction of Pier 2G, type 1 (4 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 3) -3rd Pour	4	4	0%	18-Feb-20	21-Feb-20	18-Mar-20	21-Mar-20	10-Mar-20	13-Mar-20	0	-7	0	WD
CON-12596	Construction of Pier 2G, type 1 (4 Pours) Including Erection of Formwork & Temp. Work (1 nos.Pier /Team 3) -4th Pour	13	13	0%	22-Feb-20	07-Mar-20	23-Mar-20	07-Apr-20	14-Mar-20	28-Mar-20	0	-7	0	WD
CON-12604	Construction of Pier 2E, type 1 (4 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 4)- 3rd Pour	8	8	0%	08-Feb-20	17-Feb-20	09-Mar-20	17-Mar-20	23-Apr-20	04-May-20	0	35	0	WD
CON-12605	Construction of Pier 2E, type 1 (4 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 4)- 3rd Pour	4	4	0%	18-Feb-20	21-Feb-20	18-Mar-20	21-Mar-20	05-May-20	08-May-20	0	35	0	WD
CON-12606	Construction of Pier 2E, type 1 (4 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 4)- 4th Pour	13	13	0%	22-Feb-20	07-Mar-20	23-Mar-20	07-Apr-20	09-May-20	23-May-20	0	35	0	WD
CON-12612	Construction of Pier 2J, type 6 (4 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 6)- 2nd Pour	11	0	100%	09-Jan-20	08-Feb-20	01-Feb-20 A	14-Feb-20 A	28-Jul-20	28-Jul-20	0			WD
CON-12613	Construction of Pier 2J, type 6 (4 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 6)-2rd pour	6	0	100%	08-Feb-20	14-Feb-20	15-Feb-20 A	21-Feb-20 A	28-Jul-20	28-Jul-20	0			WD
CON-12614	Construction of Pier 2J, type 6 (4 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 6)- 3rd Pour	13	13	0%	15-Feb-20	29-Feb-20	09-Mar-20	23-Mar-20	28-Jul-20	11-Aug-20	0	113	0	WD
CON-12615	Construction of Pier 2J, type 6 (4 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 6) - 3rd Pour	8	8	0%	02-Mar-20	10-Mar-20	24-Mar-20	01-Apr-20	12-Aug-20	20-Aug-20	0	113	0	WD
CON-12616	Construction of Pier 2J, type 6 (4 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 6)- 4th Pour	16	16	0%	11-Mar-20	28-Mar-20	02-Apr-20	24-Apr-20	21-Aug-20	08-Sep-20	0	113	0	WD
CON-12624	Construction of Pier 2H, type 1 (4 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 7)- 3rd Pour	8	8	0%	08-Feb-20	17-Feb-20	09-Mar-20	17-Mar-20	03-Feb-20	11-Feb-20	0	-30	0	WD
CON-12625	Construction of Pier 2H, type 1 (4 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 7)- 3rd Pour	4	4	0%	18-Feb-20	21-Feb-20	18-Mar-20	21-Mar-20	12-Feb-20	15-Feb-20	0	-30	0	WD
CON-12626	Construction of Pier 2H, type 1 (4 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 7)- 4th Pour	13	13	0%	22-Feb-20	07-Mar-20	23-Mar-20	07-Apr-20	17-Feb-20	02-Mar-20	0	-30	0	WD
CON-12630	Construction of Pier 2D, type 1 (3 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 3) -1st Pour	8	0	100%	30-Dec-19	06-Jan-20	30-Dec-19 A	06-Jan-20 A	11-Mar-20	11-Mar-20	0			WD
CON-12631	Construction of Pier 2D, type 1 (3 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 3) -1st Pour	4	0	100%	07-Jan-20	09-Jan-20	07-Jan-20 A	09-Jan-20 A	11-Mar-20	11-Mar-20	0			WD
CON-12632	Construction of Pier 2D, type 1 (3 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 3)-2nd Pour	8	0	100%	10-Jan-20	18-Jan-20	15-Jan-20 A	18-Jan-20 A	11-Mar-20	11-Mar-20	0			WD



Activity ID	Activity Name	Original Duration	Remaining Duration	Activity % Complete	BL Project Start	BL Project Finish	Start	Finish	Late Start	Late Finish	Time Risk Allowance	Total Float	Free Float	Calendar
CON-12633	Construction of Pier 2D, type 1 (3 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 3)-2nd Pour	4	0	100%	20-Jan-20	22-Jan-20	20-Jan-20 A	22-Jan-20 A	11-Mar-20	11-Mar-20	0			WD
CON-12634	Construction of Pier 2D, type 1 (3 Pours) Erection of Platform & Rebar (1 nos.Pier /Team 3)-3rd Pour	13	13	0%	08-Feb-20	22-Feb-20	09-Mar-20	23-Mar-20	11-Mar-20	25-Mar-20	0	2	0	WD
CON-12635	Construction of Pier 2D, type 1 (3 Pours) Falsework, Formwork and Concreting (1 nos.Pier /Team 3)-3rd Pour	6	6	0%	24-Feb-20	29-Feb-20	24-Mar-20	30-Mar-20	26-Mar-20	01-Apr-20	0	2	0	WD
Concrete Curing and Removal of Temp. Work		74	20		01-Jan-20	06-Apr-20	01-Jan-20 A	15-Apr-20	21-Aug-19	13-Aug-20		98	0	WD
Bridge ML		63	9		01-Jan-20	06-Apr-20	01-Jan-20 A	28-Mar-20	21-Aug-19	21-Oct-19		-131	0	WD
CON-12700	Concrete Curing and Removal Temp. Work of Pier 1G	7	7	0%	21-Feb-20	28-Feb-20	21-Mar-20	28-Mar-20	14-Oct-19	21-Oct-19	0	-131	0	WD
CON-12710	Concrete Curing and Removal Temp. Work of Pier 1F	10	0	100%	01-Jan-20	17-Jan-20	01-Jan-20 A	15-Jan-20 A	05-Oct-19	05-Oct-19	0			WD
CON-12730	Concrete Curing and Removal Temp. Work of Pier 1H	10	0	100%	01-Jan-20	03-Jan-20	01-Jan-20 A	03-Jan-20 A	07-Sep-19	07-Sep-19	0			WD
CON-12740	Concrete Curing and Removal Temp. Work of Pier 1J	7	7	0%	28-Mar-20	06-Apr-20	19-Mar-20	26-Mar-20	21-Aug-19	28-Aug-19	0	-172	7	WD
Bridge S300		53	0		18-Jan-20	19-Feb-20	15-Jan-20 A	21-Feb-20 A	01-Nov-19	13-Aug-20			0	WD
CON-12760	Concrete Curing and Removal Temp. Work of Pier 4A	10	0	100%	08-Feb-20	19-Feb-20	15-Jan-20 A	21-Feb-20 A	01-Nov-19	01-Nov-19	0			WD
CON-12810	Concrete Curing and Removal Temp. Work of Pier 4H	10	0	100%	23-Jan-20	03-Feb-20	23-Jan-20 A	03-Feb-20 A	13-Aug-20	13-Aug-20	0			WD
CON-12820	Concrete Curing and Removal Temp. Work of Pier 4G	10	0	100%	18-Jan-20	20-Jan-20	18-Jan-20 A	20-Jan-20 A	12-May-20	12-May-20	0			WD
Bridge S200		10	10		02-Mar-20	12-Mar-20	31-Mar-20	15-Apr-20	02-Apr-20	17-Apr-20		2	0	WD
CON-12900	Concrete Curing and Removal Temp. Work of Pier 2D	10	10	0%	02-Mar-20	12-Mar-20	31-Mar-20	15-Apr-20	02-Apr-20	17-Apr-20	0	2	54	WD
Bearing Installation		20	20		11-Feb-20	02-Mar-20	09-Mar-20	31-Mar-20	16-Oct-19	20-Nov-19		-107	0	WD
Bridge ML		20	20		11-Feb-20	02-Mar-20	09-Mar-20	31-Mar-20	22-Oct-19	20-Nov-19		-107	0	WD
CON-12980	Bearing Installation Pier 1GN & GS	2	2	0%	29-Feb-20	02-Mar-20	30-Mar-20	31-Mar-20	22-Oct-19	23-Oct-19	0	-131	17	WD
CON-13030	Bearing Installation Pier 1DN & 1DS (Portion II)	2	2	0%	11-Feb-20	12-Feb-20	09-Mar-20	10-Mar-20	19-Nov-19	20-Nov-19	0	-89	59	WD
Bridge S300		2	2		20-Feb-20	21-Feb-20	09-Mar-20	10-Mar-20	01-Nov-19	02-Nov-19		-104	0	WD
CON-13050	Bearing Installation Pier 4A	2	2	0%	20-Feb-20	21-Feb-20	09-Mar-20	10-Mar-20	01-Nov-19	02-Nov-19	0	-104	0	WD
Bridge S100		2	2		11-Feb-20	12-Feb-20	09-Mar-20	10-Mar-20	16-Oct-19	17-Oct-19		-118	0	WD
CON-13250	Bearing Installation Pier 3A (Portion II)	2	2	0%	11-Feb-20	12-Feb-20	09-Mar-20	10-Mar-20	16-Oct-19	17-Oct-19	0	-118	51	WD
Construction of Pier Head Segment Diaphragm		109	31		26-Nov-19	14-May-20	26-Nov-19 A	18-Apr-20	22-Jul-19	18-Dec-19		-94	0	WD
Installation of Pier Head Segment & Temporary Works		74	25		10-Jan-20	08-Apr-20	09-Jan-20 A	08-Apr-20	22-Jul-19	08-Nov-19		-122	0	WD
Bridge ML		72	25		10-Jan-20	08-Apr-20	09-Jan-20 A	08-Apr-20	22-Jul-19	08-Oct-19		-149	0	WD
CON-13340	Installation Pier Head Segment 1FN (1 no. Pier Head Segment)	2	2	0%	10-Mar-20	11-Mar-20	25-Mar-20	27-Mar-20	05-Oct-19	08-Oct-19	0	-140	0	WD
CON-13350	Installation Pier Head Segment 1HS (1 no. Pier Head Segment)	2	0	100%	08-Feb-20	10-Feb-20	12-Feb-20 A	17-Feb-20 A	30-Sep-19	30-Sep-19	0			WD
CON-13360	Installation Pier Head Segment 1HN (1 no. Pier Head Segment)	2	0	100%	08-Feb-20	10-Feb-20	10-Feb-20 A	17-Feb-20 A	07-Sep-19	07-Sep-19	0			WD
CON-13370	Installation Pier Head Segment 1ES (2 no. Pier Head Segment)	5	0	100%	10-Jan-20	08-Feb-20	15-Jan-20 A	09-Mar-20	22-Jul-19	22-Jul-19	0	-188	0	WD
CON-13380	Installation Pier Head Segment 1EN(1 no. Pier Head Segment)	1	0	100%	10-Jan-20	30-Jan-20	09-Jan-20 A	31-Jan-20 A	07-Aug-19	07-Aug-19	0			WD
CON-13390	Installation Pier Head Segment 1JS(1 no. Pier Head Segment)	2	2	0%	07-Apr-20	08-Apr-20	06-Apr-20	08-Apr-20	29-Aug-19	30-Aug-19	0	-179	0	WD
Bridge S300		5	5		22-Feb-20	27-Feb-20	28-Feb-20 A	16-Mar-20	04-Nov-19	08-Nov-19		-104	0	WD
CON-13450	Installation Pier Head Segment 4A (2 no. Pier Head Segment)	5	5	0%	22-Feb-20	27-Feb-20	28-Feb-20 A	16-Mar-20	04-Nov-19	08-Nov-19	0	-104	51	WD
Bridge S100		27	14		08-Feb-20	28-Feb-20	13-Feb-20 A	25-Mar-20	06-Aug-19	13-Aug-19		-183	0	WD
CON-13660	Installation Pier Head Segment 3B (1 no. Pier Head Segment)	2	2	0%	27-Feb-20	28-Feb-20	17-Feb-20 A	25-Mar-20	06-Aug-19	07-Aug-19	0	-188	0	WD
CON-13670	Installation Pier Head Segment 3C (1 no. Pier Head Segment)	27	3	88.89%	08-Feb-20	10-Feb-20	13-Feb-20 A	11-Mar-20	10-Aug-19	13-Aug-19	0	-172	0	WD
Construction Cast-in-situ Diaphragm		109	31		26-Nov-19	14-May-20	26-Nov-19 A	18-Apr-20	22-Jul-19	25-Oct-19		-140	0	WD
Bridge ML		77	31		11-Jan-20	14-May-20	03-Feb-20 A	18-Apr-20	22-Jul-19	25-Oct-19		-140	0	WD
CON-13730	Rebar, Formwork/Falsework & Concreting for Pier Head Segment Diaphragm 1EN (1 no. Pier Head Segment/ Team 3)	18	0	100%	11-Jan-20	18-Feb-20	03-Feb-20 A	03-Mar-20 A	07-Aug-19	07-Aug-19	3			WD
CON-13740	Rebar, Formwork/Falsework & Concreting for Pier Head Segment Diaphragm 1ES-1 (1 no. Pier Head Segment/ Team 1)	15	12	20%	08-Feb-20	25-Feb-20	05-Mar-20 A	21-Mar-20	24-Aug-19	06-Sep-19	0	-160	0	WD
CON-13741	Rebar, Formwork/Falsework & Concreting for Pier Head Segment Diaphragm 1ES-2 (1 no. Pier Head Segment/ Team 4)	18	14	20%	08-Feb-20	28-Feb-20	02-Mar-20 A	25-Mar-20	22-Jul-19	07-Aug-19	3	-188	0	WD
CON-13750	Rebar, Formwork/Falsework & Concreting for Pier Head Segment Diaphragm 1FN (1 no. Pier Head Segment/ Team 3)	15	15	0%	25-Apr-20	14-May-20	27-Mar-20	18-Apr-20	09-Oct-19	25-Oct-19	0	-140	0	WD
CON-13790	Rebar, Formwork/Falsework & Concreting for Pier Head Segment Diaphragm 1HN (1 no. Pier Head Segment/ Team 1)	15	15	0%	26-Feb-20	13-Mar-20	06-Mar-20 A	09-Apr-20	07-Sep-19	25-Sep-19	0	-160	0	WD
CON-13800	Rebar, Formwork/Falsework & Concreting for Pier Head Segment Diaphragm 1HS (1 no. Pier Head Segment/ Team 6)	18	18	0%	11-Feb-20	02-Mar-20	09-Mar-20	28-Mar-20	30-Sep-19	22-Oct-19	3	-130	0	WD
Bridge S300		25	0		26-Nov-19	17-Jan-20	26-Nov-19 A	17-Jan-20 A	14-Aug-19	24-Aug-19			0	WD
CON-13880	Rebar, Formwork/Falsework & Concreting for Pier Head Segment Diaphragm 4D (1 no. Pier Head Segment/ Team 5)	18	0	100%	18-Dec-19	17-Jan-20	18-Dec-19 A	17-Jan-20 A	14-Aug-19	14-Aug-19	3			WD
CON-13890	Rebar, Formwork/Falsework & Concreting for Pier Head Segment Diaphragm 4E (1 no. Pier Head Segment/ Team 1)	18	0	100%	26-Nov-19	28-Dec-19	26-Nov-19 A	10-Jan-20 A	24-Aug-19	24-Aug-19	3			WD
Bridge S100		26	26		11-Feb-20	17-Mar-20	12-Mar-20	16-Apr-20	08-Aug-19	30-Aug-19		-183	0	WD
CON-14060	Rebar, Formwork/Falsework & Concreting for Pier Head Segment Diaphragm 3B (1 no. Pier Head Segment/ Team 4)	15	15	0%	29-Feb-20	17-Mar-20	25-Mar-20	16-Apr-20	08-Aug-19	24-Aug-19	0	-188	0	WD
CON-14070	Rebar, Formwork/Falsework & Concreting for Pier Head Segment Diaphragm 3C (1 no. Pier Head Segment/ Team 5)	15	15	0%	11-Feb-20	27-Feb-20	12-Mar-20	28-Mar-20	14-Aug-19	30-Aug-19	0	-172	0	WD
Concrete Curing and Formwork Removal		53	28		08-Feb-20	13-Mar-20	11-Jan-20 A	14-Apr-20	07-Aug-19	18-Dec-19		-91	0	WD
Bridge ML		21	28		19-Feb-20	13-Mar-20	04-Mar-20 A	14-Apr-20	07-Aug-19	18-Dec-19		-91	0	WD
CON-14150	Concrete Curing & Formwork Removal for Pier Head Segment Diaphragm 1HS (1 no.)	10	10	0%	03-Mar-20	13-Mar-20	30-Mar-20	14-Apr-20	23-Oct-19	02-Nov-19	0	-130	0	WD
CON-14170	Concrete Curing & Formwork Removal for Pier Head Segment Diaphragm 1EN (1 no.)	11	7	36.36%	19-Feb-20	26-Feb-20	04-Mar-20 A	16-Mar-20	07-Aug-19	14-Aug-19	0	-175	0	WD
CON-14190	Concrete Curing & Formwork Removal for Pier Head Segment Diaphragm 1ES (2 nos.)	10	10	0%	29-Feb-20	11-Mar-20	25-Mar-20	07-Apr-20	07-Dec-19	18-Dec-19	0	-87	84	WD
Bridge S300		10	0		08-Feb-20	19-Feb-20	11-Jan-20 A	11-Feb-20 A	27-Aug-19	31-Aug-19			0	WD
CON-14260	Concrete Curing & Formwork Removal for Pier Head Segment Diaphragm 4E (1 no.)	10	0	100%	08-Feb-20	19-Feb-20	11-Jan-20 A	20-Jan-20 A	27-Aug-19	27-Aug-19	0			WD
CON-14290	Concrete Curing & Formwork Removal for Pier Head Segment Diaphragm 4D (1 no.)	10	0	100%	08-Feb-20	19-Feb-20	18-Jan-20 A	11-Feb-20 A	31-Aug-19	31-Aug-19	0			WD
Bridge S100		10	10		28-Feb-20	10-Mar-20	30-Mar-20	14-Apr-20	16-Sep-19	26-Sep-19		-160	0	WD
CON-14470	Concrete Curing & Formwork Removal for Pier Head Segment Diaphragm 3C (1 no.)	10	10	0%	28-Feb-20	10-Mar-20	30-Mar-20	14-Apr-20	16-Sep-19	26-Sep-19	0	-160	28	WD



Activity ID	Activity Name	Original Duration	Remaining Duration	Activity % Complete	BL Project Start	BL Project Finish	Start	Finish	Late Start	Late Finish	Time Risk Allowance	Total Float	Free Float	Calendar
Span Segment Erection		44	29		19-Feb-20	17-Apr-20	04-Feb-20 A	15-Apr-20	15-Aug-19	30-Sep-19		-158	0	WD
Span Segment Erection (Including Plant Mobilisation, Erection & removal of Temp. Work)		44	29		19-Feb-20	17-Apr-20	04-Feb-20 A	15-Apr-20	15-Aug-19	30-Sep-19		-158	0	WD
Bridge ML		16	16		27-Feb-20	21-Mar-20	17-Mar-20	03-Apr-20	15-Aug-19	02-Sep-19		-175	0	WD
Span Segment ML-2N		16	16		27-Feb-20	21-Mar-20	17-Mar-20	03-Apr-20	15-Aug-19	02-Sep-19		-175	0	WD
CON-14530	[LF-01] Erection of Span Segment@Bridge ML- 2N - Span 1E-N (14 nos./ 7 Pairs - LF)	16	16	0%	27-Feb-20	21-Mar-20	17-Mar-20	03-Apr-20	15-Aug-19	02-Sep-19	3	-175	13	WD
Bridge S300		44	29		19-Feb-20	17-Apr-20	04-Feb-20 A	15-Apr-20	27-Aug-19	30-Sep-19		-158	0	WD
Span Segment S300-1		44	29		19-Feb-20	17-Apr-20	07-Feb-20 A	15-Apr-20	27-Aug-19	30-Sep-19		-158	0	WD
CON-14700	[HB2-01] Erection of Span Segment@Bridge S300-1 - Span 4E (6nos. - HB 2)	19	4	79.42%	19-Feb-20	17-Mar-20	07-Feb-20 A	12-Mar-20	27-Aug-19	30-Aug-19	3	-158	0	WD
CON-14720	[HB2-02] Erection of Span Segment@Bridge S300-1 - Span 4D (14 nos./ 7 Pairs- HB2)	25	25	0%	17-Mar-20	17-Apr-20	12-Mar-20	15-Apr-20	31-Aug-19	30-Sep-19	0	-158	21	WD
Span Segment S300-2		19	4		19-Feb-20	17-Mar-20	04-Feb-20 A	12-Mar-20	27-Aug-19	30-Aug-19		-158	0	WD
CON-14750	[HB2-01] Erection of Span Segment@Bridge S300-2- Span 4E (6 nos - HB 2)	19	4	79.42%	19-Feb-20	17-Mar-20	04-Feb-20 A	12-Mar-20	27-Aug-19	30-Aug-19	3	-158	0	WD



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-Mar-20	8:20	Sunny	18	0	0	20.9
	2-Mar-20	13:20	Sunny	20	0	0	20.9
	2-Mar-20	15:00	Sunny	20	0	0	20.9
	2-Mar-20	15:10	Sunny	20	0	0	20.9
	2-Mar-20	15:20	Sunny	20	0	0	20.9
	3-Mar-20	8:15	Sunny	17	0	0	20.9
	3-Mar-20	13:20	Sunny	19	0	0	20.9
	3-Mar-20	14:50	Sunny	19	0	0	20.9
	3-Mar-20	15:05	Sunny	19	0	0	20.9
	3-Mar-20	15:15	Sunny	19	0	0	20.9
	4-Mar-20	8:15	Sunny	17	0	0	20.9
	4-Mar-20	13:25	Sunny	20	0	0	20.9
	4-Mar-20	15:05	Sunny	20	0	0	20.9
	4-Mar-20	15:15	Sunny	20	0	0	20.9
	4-Mar-20	15:20	Sunny	20	0	0	20.9
	5-Mar-20	8:15	Sunny	15	0	0	20.9
	5-Mar-20	13:20	Sunny	18	0	0	20.9
	5-Mar-20	15:00	Sunny	19	0	0	20.9
	5-Mar-20	15:10	Sunny	19	0	0	20.9
	5-Mar-20	15:20	Sunny	19	0	0	20.9
	6-Mar-20	8:20	Sunny	14	0	0	20.9
	6-Mar-20	13:25	Sunny	18	0	0	20.9
	6-Mar-20	14:50	Sunny	18	0	0	20.9
	6-Mar-20	15:00	Sunny	18	0	0	20.9
	6-Mar-20	15:10	Sunny	18	0	0	20.9
	7-Mar-20	8:25	Sunny	18	0	0	20.9
	7-Mar-20	13:15	Sunny	20	0	0	20.9
	7-Mar-20	15:05	Sunny	20	0	0	20.9
	7-Mar-20	15:15	Sunny	20	0	0	20.9
	7-Mar-20	15:20	Sunny	20	0	0	20.9
	9-Mar-20	8:15	Sunny	20	0	0	20.9
	9-Mar-20	13:20	Sunny	24	0	0	20.9
	9-Mar-20	15:10	Sunny	24	0	0	20.9
	9-Mar-20	15:20	Sunny	24	0	0	20.9
	9-Mar-20	15:30	Sunny	24	0	0	20.9
	10-Mar-20	8:20	Sunny	16	0	0	20.9
	10-Mar-20	13:10	Sunny	24	0	0	20.9
	10-Mar-20	14:50	Sunny	24	0	0	20.9
	10-Mar-20	15:00	Sunny	24	0	0	20.9
	10-Mar-20	15:10	Sunny	24	0	0	20.9
	11-Mar-20	8:15	Sunny	14	0	0	20.9
	11-Mar-20	13:20	Sunny	19	0	0	20.9
	11-Mar-20	15:05	Sunny	19	0	0	20.9
	11-Mar-20	15:15	Sunny	19	0	0	20.9

APPENDIX R - RECORD OF LANDFILL GAS MONITORING BY THE CONTRACTOR

Location	Date of Measurement	Sampling time	Weather Condition	Temperature (°C)	Methane (%)	Carbon dioxide (%)	Oxygen (%)
Portion III	11-Mar-20	15:25	Sunny	19	0	0	20.9
	12-Mar-20	8:20	Sunny	18	0	0	20.9
	12-Mar-20	13:20	Sunny	20	0	0	20.9
	12-Mar-20	15:00	Sunny	20	0	0	20.9
	12-Mar-20	15:10	Sunny	20	0	0	20.9
	12-Mar-20	15:20	Sunny	20	0	0	20.9
	13-Mar-20	8:15	Sunny	19	0	0	20.9
	13-Mar-20	13:25	Sunny	25	0	0	20.9
	13-Mar-20	15:05	Sunny	25	0	0	20.9
	13-Mar-20	15:15	Sunny	25	0	0	20.9
	13-Mar-20	15:20	Sunny	25	0	0	20.9
	14-Mar-20	8:15	Sunny	19	0	0	20.9
	14-Mar-20	13:20	Sunny	25	0	0	20.9
	14-Mar-20	15:00	Sunny	25	0	0	20.9
	14-Mar-20	15:10	Sunny	25	0	0	20.9
	14-Mar-20	15:20	Sunny	25	0	0	20.9
	16-Mar-20	8:25	Sunny	18	0	0	20.9
	16-Mar-20	13:20	Sunny	22	0	0	20.9
	16-Mar-20	14:55	Sunny	22	0	0	20.9
	16-Mar-20	15:05	Sunny	22	0	0	20.9
	16-Mar-20	15:15	Sunny	22	0	0	20.9
	17-Mar-20	8:20	Sunny	19	0	0	20.9
	17-Mar-20	13:25	Sunny	22	0	0	20.9
	17-Mar-20	15:05	Sunny	22	0	0	20.9
	17-Mar-20	15:15	Sunny	22	0	0	20.9
	17-Mar-20	15:25	Sunny	22	0	0	20.9
	18-Mar-20	8:25	Rainy	19	0	0	20.9
	18-Mar-20	13:20	Cloudy	22	0	0	20.9
	18-Mar-20	15:10	Cloudy	22	0	0	20.9
	18-Mar-20	15:20	Cloudy	22	0	0	20.9
	18-Mar-20	15:30	Cloudy	22	0	0	20.9
	19-Mar-20	8:15	Cloudy	20	0	0	20.9
	19-Mar-20	13:15	Sunny	23	0	0	20.9
	19-Mar-20	14:50	Sunny	23	0	0	20.9
	19-Mar-20	15:00	Sunny	23	0	0	20.9
	19-Mar-20	15:10	Sunny	23	0	0	20.9
	20-Mar-20	8:15	Sunny	20	0	0	20.9
	20-Mar-20	13:15	Sunny	23	0	0	20.9
	20-Mar-20	15:00	Sunny	23	0	0	20.9
	20-Mar-20	15:10	Sunny	23	0	0	20.9
	20-Mar-20	15:20	Sunny	23	0	0	20.9
	21-Mar-20	8:20	Cloudy	20	0	0	20.9
	21-Mar-20	13:25	Sunny	23	0	0	20.9
	21-Mar-20	15:05	Sunny	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 (%)
Portion III	21-Mar-20	15:15	Sunny	23	0	0	20.9
	21-Mar-20	15:25	Sunny	23	0	0	20.9
	23-Mar-20	8:20	Sunny	21	0	0	20.9
	23-Mar-20	13:25	Sunny	28	0	0	20.9
	23-Mar-20	15:05	Sunny	28	0	0	20.9
	23-Mar-20	15:15	Sunny	28	0	0	20.9
	23-Mar-20	15:25	Sunny	28	0	0	20.9
	24-Mar-20	8:25	Sunny	20	0	0	20.9
	24-Mar-20	13:15	Sunny	26	0	0	20.9
	24-Mar-20	15:00	Sunny	26	0	0	20.9
	24-Mar-20	15:10	Sunny	26	0	0	20.9
	24-Mar-20	15:20	Sunny	26	0	0	20.9
	25-Mar-20	8:15	Cloudy	20	0	0	20.9
	25-Mar-20	13:20	Cloudy	26	0	0	20.9
	25-Mar-20	15:05	Cloudy	26	0	0	20.9
	25-Mar-20	15:15	Cloudy	26	0	0	20.9
	25-Mar-20	15:25	Cloudy	26	0	0	20.9
	26-Mar-20	8:20	Cloudy	21	0	0	20.9
	26-Mar-20	13:15	Cloudy	26	0	0	20.9
	26-Mar-20	15:10	Cloudy	26	0	0	20.9
	26-Mar-20	15:20	Cloudy	26	0	0	20.9
	26-Mar-20	15:30	Cloudy	26	0	0	20.9
	27-Mar-20	8:20	Cloudy	22	0	0	20.9
	27-Mar-20	13:25	Cloudy	27	0	0	20.9
	27-Mar-20	15:00	Cloudy	27	0	0	20.9
	27-Mar-20	15:10	Cloudy	27	0	0	20.9
	27-Mar-20	15:20	Cloudy	27	0	0	20.9
	28-Mar-20	8:13	Rainy	20	0	0	20.9
	28-Mar-20	13:25	Cloudy	25	0	0	20.9
	28-Mar-20	14:55	Cloudy	25	0	0	20.9
	28-Mar-20	15:05	Cloudy	25	0	0	20.9
	28-Mar-20	15:15	Cloudy	25	0	0	20.9
	30-Mar-20	8:25	Rainy	19	0	0	20.9
	30-Mar-20	13:20	Rainy	21	0	0	20.9
	30-Mar-20	15:00	Rainy	21	0	0	20.9
	30-Mar-20	15:10	Rainy	21	0	0	20.9
	30-Mar-20	15:20	Rainy	21	0	0	20.9
	31-Mar-20	8:20	Rainy	19	0	0	20.9
	31-Mar-20	13:15	Rainy	21	0	0	20.9
	31-Mar-20	15:00	Rainy	21	0	0	20.9
	31-Mar-20	15:10	Rainy	21	0	0	20.9
	31-Mar-20	15:20	Rainy	21	0	0	20.9

APPENDIX S
UPDATED CONSTRUCTION NOISE ASSESSMENT

Contract No.: NE/2015/02

Project Title:

Tseung Kwan O – Lam Tin Tunnel – Road P2 and Associated Works

Noise Mitigation Plan

Document No: CSF/0/0008E
Revision: 17
Date: 23 March 2020

Noise Mitigation Plan

Document No: CSF/0/0008E
Revision: 17
Date: 23 March 2020

Revision History

Revision No.	Description	Revised By	Date
00	First Release	Wendy NG	13 September 2016
01	Addressed EPD's comments dated on 12 October 2016	Wendy NG	09 November 2016
02	Addressed EPD's commented dated on 18 November 2016	Wendy NG	12 December 2016
03	Addressed EPD's commented dated on 27 February 2017	Gary Fung	20 March 2017
04	Addressed EPD's commented dated on 13 June 2017	Gary Fung	30 June 2017
05	Addressed EPD's commented dated on 7 September 2017	Gary Fung	2 November 2017
06	Revise PME list	Gary Fung	5 February 2018
07	Revise PME list	Gary Fung	4 April 2018
08	Revise PME list	Gary Fung	4 June 2018
09	Revise PME list	Gary Fung	28 July 2018
10	Update Construction Programme	Gary Fung	8 October 2018
11	Update Construction Programme	Gary Fung	6 April 2019
12	Update Construction Programme	Gary Fung	10 May 2019

Revision History

Revision No.	Description	Revised By	Date
13	Update Construction Programme and PME list	Gary Fung	9 August 2019
14	Update Construction Programme and PME list	Gary Fung	4 September 2019
15	Update Construction Programme and PME list	Gary Fung	17 December 2019
16	Update Construction Programme and PME list	Gary Fung	7 March 2020
17	Update Construction Programme and PME list	Gary Fung	23 March 2020

Noise Mitigation Plan

Document No: CSF/0/0008E
Revision: 17
Date: 23 March 2020

Checked by:

Position	Signature	Name	Date

Prepared by:

Environmental Officer		Gary Fung	23 March 2020

Contents

List of Appendices

PART A GENERAL

1.0 Introduction

Due to the recent update of the construction programme, the PME list will be changed in the noise mitigation plan revision 17 to suit with the on-site construction activities accordingly.

2.0 Background

2.1 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 TKO-LT Tunnel, together with the proposed Trunk Road T2 in Kai Tak Development (KTD) and Central Kowloon (CKR), will form Route 6 in the strategic road network. Route 6 will provide an east-west express link between Kowloon and TKO areas. Upon completion, this strategic route will also provide the necessary relief to the existing heavily trafficked road network in the central and eastern Kowloon areas, and reduce the related environmental impacts on these areas.

CRBC - Build King Joint Venture (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 about 500m long seawall structure and reclamation about 3 hectares at Tseung Kwan O;
ii. Construction of about 200m long Road P2 Underpass including landscape deck, Road P2 Electrical Plant Room, Road P2 Underground Fixed Foam Tank Room, Road P2 Underground Sump Pit Room and Road P2 Stormwater Plant Room;
iii. Construction of U troughs A and B of about 300m long, within the reclamation, from the abutments of the proposed viaducts to the southern end of Road P2 Underpass;
iv. Construction of U troughs A and B of about 200m long from the northern end of Road P2 Underpass structure to CH550 of setting out line P2 including the box structure supporting existing Tong Yin Street; and U trough C with associated cycle track, footpath and amenity area;
v. Construction of Slip Road 2 of about 156m long;
vi. Reprovisioning of Drainage Services Department (DSD) Transformer Room and
vii. Associated roads, retaining wall, drainages, traffic aids, lighting, utilities, landscaping and electrical and mechanical work

A Site Layout showing the site boundary is shown in Appendix A.

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2.2 Requirements for Noise Mitigation Plan (NMP)

According to 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 (DEP) for approval three hard copies and two electronic copies of Noise Mitigation Plan (NMP) detailing the temporary and permanent mitigation measures for the construction and operation phases traffic noise impacts arising from the Project. All noise mitigation measures implemented shall be properly maintained during construction and operation phases of the Project.
The NMP shall include:

- A layout plan to show the location of major construction activities
- A layout plan to show the location of Noise Sensitive Receivers (NSRs)
- A schedule of construction works to be carried out at the works areas of the Project within 300m from the NSRs
- An updated construction methodology of the proposed construction works
- An updated powered mechanical equipment (PME) list for the proposed construction works
- An updated proposal of air-borne noise and operation traffic noise mitigation measures for the NSRs including the provision of noise barriers, enclosures and other measures
- An updated prediction of noise levels in accordance with the above updated information and mitigation proposals in place

All measures recommended in the approved NMP will be fully and properly implemented during the construction and operation phases of the Project.

The Project Manager will review the construction program and list of PMEs from time to time, which formed the basis of construction noise assessments, to be practicable and reasonable.

3.0 Description of Construction Works in the Study Area

3.1 Noise Sensitive Receivers NSRs

The 300m study areas of the identified 4 NSRs with predicted residual construction noise impacts are shown in Table 2.1. The location of NSRs and its Assessment Point (AP), works area and the notional distance between NSRs and works area are depicted in Appendix A. Refer to EIA Report Section 4.7.1, the predicted unmitigated construction noise levels of NSR ID 9 (AP ID N6101) are below 75 dB(A) and the distance between N6101 and notional sources positions of all portions are more than 300m. In addition, noise mitigation measures would therefore be required to reduce noise levels at the NSRs for compliance with the noise standard. In addition, CM6(A), CM7(A) and CM8(A) will be the noise impact monitoring station during the construction period. However, CM6, CM7 and CM8 will be still the noise sensitive receiver for the prediction of construction noise impacts.

Table 2.1 NSRs with Predicted Unmitigated Construction Noise Impacts during Normal Daytime Working Hours (Extracted from Table 4.10 of EIA Report)

NSR ID EIA	AP ID	NSR ID EM&A Manual	Name of NSR	Noise Criteria, dB(A)	Predicted Unmitigated Construction Noise Levels during Normal Daytime Working Hour (Leq_{30min}), dB(A)	Exceedance, dB(A)
8	N5012	CM6	Block 1, Ocean Shores	75	60-84	9
8	N5012	CM7	Block 7, Ocean Shores	75	59-77	2
9	N6101	N/A	Tower 1, Metro Town	75	56-73	0
10	N7603	CM8	Tower 6, Park Central	75	54-81	6

Traffic noise levels have been predicted at NSR Assessment Point (AP) including existing residential, institutional uses, and future uses on planned receivers for the scenarios of “with” and “without” Project at the assessment year. Without the noise mitigation measures in place, the predicted noise levels at the identified NSRs and its APs have been fulfilled any of the three sensitivity tests, direct mitigation measures would be required.

3.2 Construction Activities

As mentioned in Section 1.1, the construction of Road P2 and associated works is covered by this Contract. The potential construction noise impacts of the Project may arise from the following major construction activities:

- Seawall construction at TKO side
- Filling activities at TKO side
- Road and road pavement formation and associated earthworks
- Drainage culvert construction
- Reprovisioning of infrastructure, services and utilities

These construction activities will involve the use of PME including breakers, excavators, lorries, mobile cranes, concrete truck mixers, pokers, rollers, derrick barge, bulldozer, dump truck, compressor, vibratory poker, generator, piling, vibrator hammer, etc. A breakdown of the major construction activities in sequence to be carried out within the Project are provided in Appendix B.

3.3 Updated Preliminary Construction Programme

The updated preliminary construction programme prepared by CRBC – Build King Joint Venture (JV) has been used in this NMP and has been presented on a monthly basis for the duration of the construction works in corresponding worksites.

The construction schedule has been adjusted such that 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.

3.4 Updated Powered Mechanical Equipment List

The updated Powered Mechanical Equipment (PME) list for the construction works is provided in Table 3.1. The Sound Power Levels (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 Appendix C.

3.5 Operation Phase Fixed Plant Noise

The maximum allowable sound power levels for the proposed pumping station to meet the relevant noise criteria are determined. Table 2.2 shows the required sound power level for the nearest affected NSRs to achieve noise compliance and Table 2.3 shows the predicted noise levels at representative NSR AP.

Table 2.2 Predicted Maximum Allowable Sound Power Levels for Fixed Noise Sources

Fixed Plant Noise Source	Sound Power Level (SWL, dB(A)) required at source in order to meet the criteria	
	Daytime / Evening Time	Night Time
P2 Pumping Station	106	96

Table 2.3 Summary of Predicted Operation Noise Levels

NSR AP	NSR Description	Predicted Noise Level, dB(A) / Criteria, dB(A)		
		Day time	Evening time	Night time
N5012	Block 1, Ocean Shores	60/60	60/60	50/50
N5031	Block 3, Ocean Shores	60/60	60/60	50/50

All representative NSR APs are predicted to meet their own respective daytime, evening time and night time noise criterion.

4.0 Noise Assessment and Assumptions

4.1 Assessment Methodology and Assumptions

The construction noise assessment has been carried out in accordance with the methodology used in the approved EIA Report (Register No. AEIAR-173/2013). The individual work sites and relative distance from the NSRs are the same as that adopted in the EIA Report.

The methodology outlined in the GW-TM was used for the assessment of construction noise (excluding percussive piling) and the Sound Power Levels (SWLs) of the equipment were taken from Table 3 of GW-TM. Where no SWL is provided in the GW-TM, reference was made to BS 5228 or other previous similar studies or from measurements taken at other sites in Hong Kong. In determine the distance from the source position to the NSR and in cases where the NSR is a building, a positive 3 dB(A) shall be applied to the predicted noise level (PNL). The percentage on-time for each PME has been estimated individually for each construction activity to ensure practicality and is consistent with the assumptions made in the EIA Report.

For the TKO side, the separation distance between the CBL and the nearest NSR (Ocean Shores) would be more than 600m. In addition, the distance of the nearest NSR (Ocean Shores) to Area 68, and from the nearest NSR (Ocean Shores) to Area GIC (4) would be more than 300m. No cumulative impacts would be expected during the construction phase.

All mitigation measures and their effectiveness proposed in the EIA Report including the use of temporary movable noise barrier, acoustic mat and quiet plant have been considered as shown in Table 3.1. The use of quiet plant associated with construction work is prescribed in British Standard "Code of practice for noise and vibration control on construction and open sites, BS5228" which contains the SWLs for specific quiet PME.

Movable temporary noise barriers that can be located close to noisy plant and be moved iteratively with the plant along a worksite can be very effective for screening noise from NSRs. A typical design which has been used locally is a wooden/steel framed barrier with a small cantilevered upper portion of superficial density no less than 14 kg/m^2 on a skid footing. A cantilevered top cover would be required to achieve screening benefits at upper floors of NSRs and it could achieve at least 5-10 dB(A) reduction. In addition, use of full enclosure can provide about 10 dB(A) noise reduction.

<u>SilentUp barrier at Portion IV and Portion V and Portion IX</u>

According to Insertion Loss (IL) Measurement Report of Movable Noise Barrier for Drilling Rig, the noise insertion loss of the SilentUp barrier demonstrated that when a drilling rig is located 1.5m away

from the sound barrier, noise level at the NSR (CM6) can be reduced by 11.7 dB(A) up to a height of 39m. For use of SilentUp barrier in Portion IV, the drill rig will be located at an angle of 45 degrees so that the distance from sound barrier will be approx. 5.1m (refer to schematic diagram in Appendix D).

For Portion V, when the drill rig is located 1.5m away from the sound barrier, noise reduction of 11.7 dB(A) can be covered up to a height of 102m of the NSR (CM6) (refer to schematic diagram in Appendix D).

Table 3.1 PME List with Proposed Mitigation Measures

Location	**PME Type**	**TM Ref. / Other Ref / BS5228 Ref**	**Type of Noise Mitigation Measures**	**Noise Level Reduction dB(A)**
Portion III (Demolition of DSD Transformer room)	Breaker, excavator mounted (hydraulic)	CNP 028	Noise Barrier	-5
Portion IV DN2100 SMH9101-9108 (Pre-boring) (Scenario 1-2)	Crane (240 kw) (105T)	BS C4/52	Noise Barrier	-5
	Drill Rig, Rotary Type (Diesel)	CNP 072	Noise Barrier (SilentUp)	-11.7
	Air Compressor	CNP 002	Noise Barrier	-5
	Concrete Lorry Mixer (6 m^3)	BS D6/33	Noise Barrier	-5
	Water pump, submersible (electric)	CNP 283	Noise Barrier	-5
	Breaker, excavator mounted (hydraulic)	CNP 028	Acoustic box / Noise Barrier (SilentUp)	-10 / -11.7
Portion IV DN2100 SMH9101-9108 (Sheet Piling)	Piling, Vibration Hammer	CNP 172	Noise Barrier	-5
	Power pack (diesel)	CNP 174	Noise Barrier	-5
	Water pump, subersible (electric)	CNP 283	Noise Barrier	-5
	Excavator (223 kw) (40T)	BS C4/63	Noise Barrier	-5
	Generator, Silenced,<=75 dB(A) at 7m	CNP 102	Noise Barrier	-5
	Welding Machine	CNP 107	Noise Barrier	-5
Portion IV DN2100 SMH9101-9108 (ELS)	Crane (240 kw) (105T)	BS C4/52	Noise Barrier	-5
	Water pump, subersible (electric)	CNP 283	Noise Barrier	-5
	Excavator (223 kw) (40T)	BS C4/63	Noise Barrier	-5
	Dump Truck	CNP 068	Noise Barrier	-5
	Generator, Silenced,<=75 dB(A) at 7m	CNP 102	Noise Barrier	-5
	Welding Machine	CNP 107	Noise Barrier	-5
Portion IV Installation of DN2100 and Manhole Construction (Scenario 1)	Crane (240 kw) (105T)	BS C4/52	Noise Barrier	-5
	Excavator (223 kw) (40T)	BS C4/63	Noise Barrier	-5
	Dump Truck	CNP 068	Noise Barrier	-5
	Generator, Silenced,<=75 dB(A) at 7m	CNP 102	Noise Barrier	-5
Portion IV Installation of DN2100 and Manhole Construction (Scenario 2)	Crane (240 kw) (105T)	BS C4/52	Noise Barrier	-5
	Excavator (223 kw) (40T)	BS C4/63	Noise Barrier	-5
	Roller, Vibratory (51 kw)	BS D8/30	Noise Barrier	-5
	Concrete Lorry Mixer (6 m^3)	BS D6/33	Noise Barrier	-5
	Light goods vehicle, gross vehicle weight < 5.5 tonne	CNP 143	Noise Barrier	-5
	Water pump, subersible (electric)	CNP 283	Noise Barrier	-5
	Dump Truck	CNP 068	Noise Barrier	-5
	Road Roller	CNP 185	Noise Barrier	-5

Portion IV DN2100 SMH9101 -9103(Pre Drill & Sheet piling works)	Crane (240 kw) (105T)	BS C4/52	Noise Barrier	-5
	Drill Rig, Rotary Type (Diesel)	CNP 072	Noise Barrier	-5
	Generator, Silenced,<=75 dB(A) at 7m	CNP 102	Noise Barrier	-5
	Air Compressor	CNP 002	Noise Barrier	-5
	Excavator (223 kw) (40T)	BS C4/63	Noise Barrier	-5
	Piling, Vibration Hammer	CNP 172	Noise Barrier	-5
	Power pack (diesel)	CNP 173	Noise Barrier	-5
	Breaker, excavator mounted (hydraulic)	CNP 028	Acoustic box / Noise Barrier (SilentUp)	-10 / -11.7

Portion V Road P2 U-Trough B CH318-363 (Pre-boring) (Scenario 1 & 2)	Drill Rig, Rotary Type (Diesel)	CNP 072	Noise Barrier	-5
	Breaker, excavator mounted (hydraulic)	CNP 028	Acoustic box / Noise Barrier (SilentUp)	-10 / -11.7
	Air Compressor	CNP 002	Noise Barrier	-5
Portion V Road P2 U-Trough B CH318-363 (Sheet Piling)	Piling, Vibration Hammer	CNP 172	Noise Barrier	-5
	Power pack (diesel)	CNP 174	Noise Barrier	-5
Portion VI Installation of Dewatering System	Drill Rig, Rotary Type (Diesel)	CNP 072	Noise Barrier	-5
Portion VI Road P2 U-Trough B CH318-363 (Sheet Piling)	Piling, Vibration Hammer	CNP 172	Noise Barrier	-5
	Power pack (diesel)	CNP 174	Noise Barrier	-5
Portion VIII (Road P2 Underpass, U Trough (Piling))	Drill Rig, Rotary Type (Diesel)	CNP 072	Noise Barrier	-5
Portion VIII (Road P2 Underpass, U Trough (ELS))	Breaker, excavator mounted (hydraulic)	CNP 028	Acoustic box / Noise Barrier (SilentUp)	-10 / -11.7
Portion VIII Road P2 U-Trough B CH318-363 (Installation of Dewatering System)	Air Compressor	CNP 002	Noise Barrier	-5
	Drill Rig, Rotary Type (Diesel)	CNP 072	Noise Barrier	-5
Face Towards Ocean Shore				
Portion IV Road P2 Underpass CH105-318, (Non Surcharge & On Top Surcharge)(Pre Drill) (Scenario 1-2)	G.I. Drilling Rig	BS C2/43	Noise Barrier	-5
	Drill Rig, Rotary Type (Diesel)	CNP 072	Noise Barrier	-5
	Air Compressor	CNP 002	Noise Barrier	-5
Portion IV Road P2 Underpass CH105-318, (Non Surcharge & On Top Surcharge)(Piling) (Scenario 1-2)	Crane (240 kw) (105T)	BS C4/52	Noise Barrier	-5
	Drill Rig, Rotary Type (Diesel)	CNP 072	Noise Barrier (SilentUp)	-11.7
	Generator, Silenced,<=75 dB(A) at 7m	CNP 102	Noise Barrier	-5
	Air Compressor	CNP 002	Noise Barrier	-5
	Excavator (223 kw) (40T)	BS C4/63	Noise Barrier	-5
	Concrete Lorry Mixer	BS D6/33	Noise Barrier	-5
	Water pump, submersible (electric)	CNP 283	Noise Barrier	-5
Portion IV Road P2 Underpass CH103.5 (Sheet Piling)	Piling, Vibration Hammer	CNP 172	Noise Barrier	-5
Portion VII U Trough A&B S200 CH890 - CH980 (Piling)	Drill Rig, Rotary Type (Diesel)	CNP 072	Noise Barrier	-5
Portion VII U Trough A&B S200 CH890 - CH980 (Sheet Piling)	Piling, Vibration Hammer	CNP 172	Noise Barrier	-5
Portion IX Dredging and Reclamation	Winch (Electric)	CNP 262	Noise Barrier	-5
	Breaker, excavator mounted (hydraulic)	CNP 028	Acoustic box / Noise Barrier (SilentUp)	-10 / -11.7
Portion IX (Marine Ground Treatment)	Band Drain Machine (hydraulic Vibratory lance starting up)	BS D4/107a	Noise Barrier	-5

Portion IX Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH821(Pilling)(Scenario 1-7)	Drill Rig, Rotary Type (Diesel)	CNP 072	Noise Barrier	-5
Portion IX Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH821(Installation of Dewatering System)	Drill Rig, Rotary Type (Diesel)	CNP 072	Noise Barrier	-5
Area A	Breaker, excavator mounted (hydraulic)	CNP 028	Acoustic box / Noise Barrier (SilentUp)	-10 / -11.7

4.2 Proposed Mitigation Strategy and Noise Assessment Results

The air-borne construction noise impacts for the construction activities under Contract NE/2015/02 have been assessed and summarised in Table 3.2.

The detail assessment result for NE/2015/02 is presented in Appendix C. The proposed mitigation measures described above are included in the assessment and, as such only the mitigation scenario has been presented.

The predicted cumulative noise levels and the exceedances of the daytime construction noise criteria are summarised in the following Table 3.2.

From the calculation of construction noise assessment of using the SilentUp barrier at Portion IV shown that there will be no exceedance of 75 dB(A) up to 39m of the NSR (CM6). For the level of above 39m of the NSR (CM6), the calculation of construction noise assessment without using the SilentUp barrier shown that there is also no exceedance of 75 dB(A) of the NSR(CM6).

Contractor will consider the mini – excavator for the future noise enhancement work when it is possible.

Given that the recent / upcoming population intake for the new development in the surrounding area, contractor will consider the nearest NSR in the noise assessment when it is necessary.

The predicted cumulative noise level at above 39m without SilentUp barrier at Portion IV demonstrated that there is the same result of the schematic diagram of Portion V (refer to Appendix D).

Table 3.2 Predicted mitigated cumulative noise levels summary

NSR ID EIA Report	NSR ID EM&A Report	Name of NSR	Noise Criteria, dB(A)	Predicted Mitigated Construction Noise Levels during Normal Daytime Working Hour (Leq_{30min}), dB(A))	Exceedance, dB(A)
N5012	CM6	Block 1, Ocean Shores	75	57 -75	No
N5072	CM7	Block 7, Ocean Shores	75	60 -69	No
N7603	CM8	Tower 6, Park Central	75	60 -71	No

A summary of the range of noise levels for both mitigated and unmitigated scenarios are presented Table 3.3.

Table 3.3 Summary table of noise levels during operation phase

Scenario	Operation Phase Traffic Noise Level Range dB(A)
Unmitigated	31 - 79
Mitigated	31 - 78

Direct mitigation measures should be considered or proposed on road project under the subject Designated Project (DP) such that the noise from the "new" road would be reduced to a level that fulfil the EIAO requirements. The proposed direct mitigation measures are summarized below with total length of the mitigation measures rounded off to the nearest 10m and show in Appendix C:

- Fully Enclosure 4 (FE4) about 200m of Landscape Deck provided on Road P2
- Low Noise Surfacing 1 about 190m of Low Noise Surfacing on North and South Bound P2 Road

Regarding the fixed plant noise sources, sound attenuators, noise barriers and acoustic enclosures can be installed to ensure the specified maximum SWLs in Table 2.2 are achieved.

4.3 Concurrent Project Assessment

Construction noise impacts from the NE/2015/03 Tseung Kwan O – Lam Tin Tunnel Northern Footbridge project has been incorporated in the noise assessment refer to the Appendix C. NMP will be regularly revised to assess the concurrent project's construction noise impacts on NSRs.

5.0 Conclusion

The noise mitigation plan summarized different construction work activities in different stage during the whole construction period. The potential construction noise impacted of various noise mitigation measures from the selected PME will be minimized the cumulative noise level to the NSRs practically. With the implementation of the proposed noise mitigation measures, updated construction programme and PME list Table 3.1, construction noise impacts at all identified NSRs would comply with the noise criteria of 75 dB(A) for residential premises.

With the proposed noise mitigation measures in PME list Table 3.1, the type of PME should be adopted with the noise enclosure or barrier for the relatively direct noise mitigation to minimize the construction noise to the NSRs.

Where necessary, further review and updated will be performed during the construction and operation phases and liaison with affected parties is recommended to minimize the construction and operation phases traffic noise impacts as far as practicable.

The proposed noise mitigation measures of the PME list in Table 3.1 will also apply to the other NSRs with the affected area. Since the NSR CM6, CM7 & CM8 have been represented the closest noise sensitive receiver of the construction site, the cumulative noise level of other NSRs would also comply with the noise criteria of 75 dB(A).

The traffic noise impact assessment is the same as that presented in the latest environmental permit (i.e. EP-458/2013/C) and there is no update/revision.

Appendix A

Site Layout and NSR Locations

HORIZONTAL DISTANCE FROM NSR (CM6, CM7 & CM8)

CM8

116

257

217

CM7

180

224

157

163

213

CM6

47

146

119

225

LEGEND

Prediction Area
CM6 - Location of Station CM6
CM7 - Location of Station CM7
CM8 - Location of Station CM8

Portion I
Access Date 29-Jul-16
Compietion Date 25-Mar-17

Portion II
Access Date 29-Jul-16
Compietion Date 26-Sep-20

Portion III
Access Date 29-Jul-16
Compietion Date 25-Mar-17

Portion IV
Access Date 29-Jul-16
Compietion Date 26-Sep-20

Portion V
Access Date 29-Jul-16
Compietion Date 26-Sep-20

Portion VI
Access Date 29-Jul-16
Compietion Date 26-Sep-20

Portion VII
Access Date 29-Jul-16
Compietion Date 26-Sep-20

Portion VII
Access Date 29-Jul-16
Compietion Date 26-Sep-20

Portion IX
Access Date 29-Jul-16
Compietion Date 26-Sep-20

Area A
Access Date 27-Aug-16
Compietion Date 31-Jul-18

Area Y
Access Date 10-Dec-16
Compietion Date 30-Nov-17

SLANT DISTANCE ABOVE 39M FROM NSR (CM6)

CM8

CM7

CM6

167

217

150

60

124

228

TSEUNG KWAN O

PO SHUN ROAD

PO YAP ROAD

TONG YIN STREET

CHI SHIN STREET

CHUI LING ROAD

KING LING ROAD

Proposed Sports Centre and Library in Area 74 in Tseung Kwan O

擬建將軍澳第74區體育館及圖書館

Hong Kong Institute of Vocational Education (Lee Wai Lee)

香港專業教育學院（李惠利）

Hong Kong Design Institute

香港設計學院

Chui Ling Road Substation

維景灣畔
OCEAN SHORES

調景灣
TIU KENG WAN

將軍澳
JUNK BAY
(TSEUNG KWAN O)

Tseung Kwan O Waterfront Park 將軍澳海濱公園

WIP Aug 2012

WIP May 2014

Cycling Track

Road

Ramp

Podium

Tennis Court

Jetty

Stream

HWM

CUL

Tai Mo Shan Tsuen Wan Tai Po Sha Tin Kowloon Hong Kong Island

LEGEND

Prediction Area (ABOVE 39m for CM6)
CM6 - Location of Station CM6
CM7 - Location of Station CM7
CM8 - Location of Station CM8

Portion I
Access Date 29-Jul-16
Compietion Date 25-Mar-17

Portion II
Access Date 29-Jul-16
Compietion Date 26-Sep-20

Portion III
Access Date 29-Jul-16
Compietion Date 25-Mar-17

Portion IV
Access Date 29-Jul-16
Compietion Date 26-Sep-20

Portion V
Access Date 29-Jul-16
Compietion Date 26-Sep-20

Portion VI
Access Date 29-Jul-16
Compietion Date 26-Sep-20

Portion VII
Access Date 29-Jul-16
Compietion Date 26-Sep-20

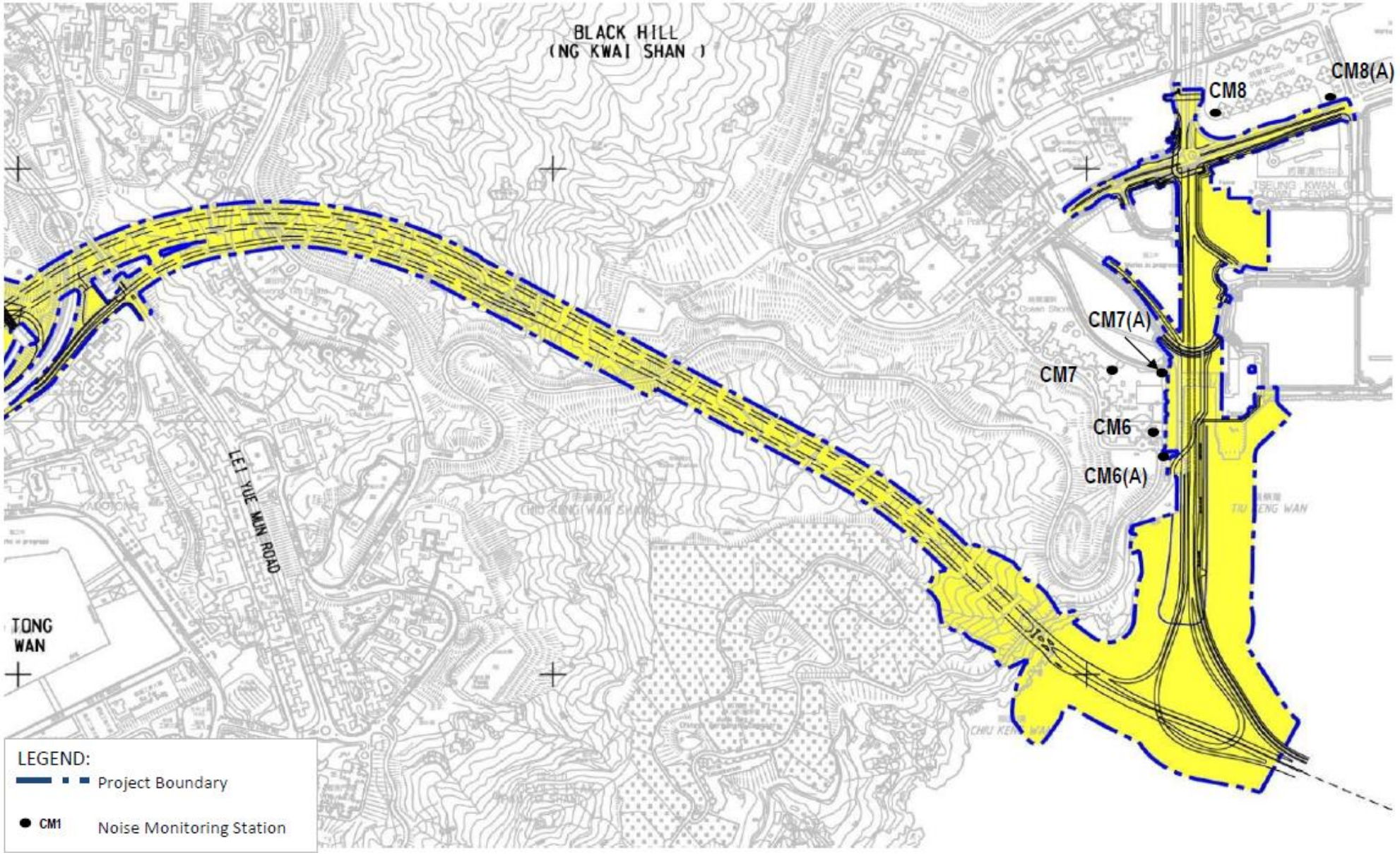
Portion VII
Access Date 29-Jul-16
Compietion Date 26-Sep-20

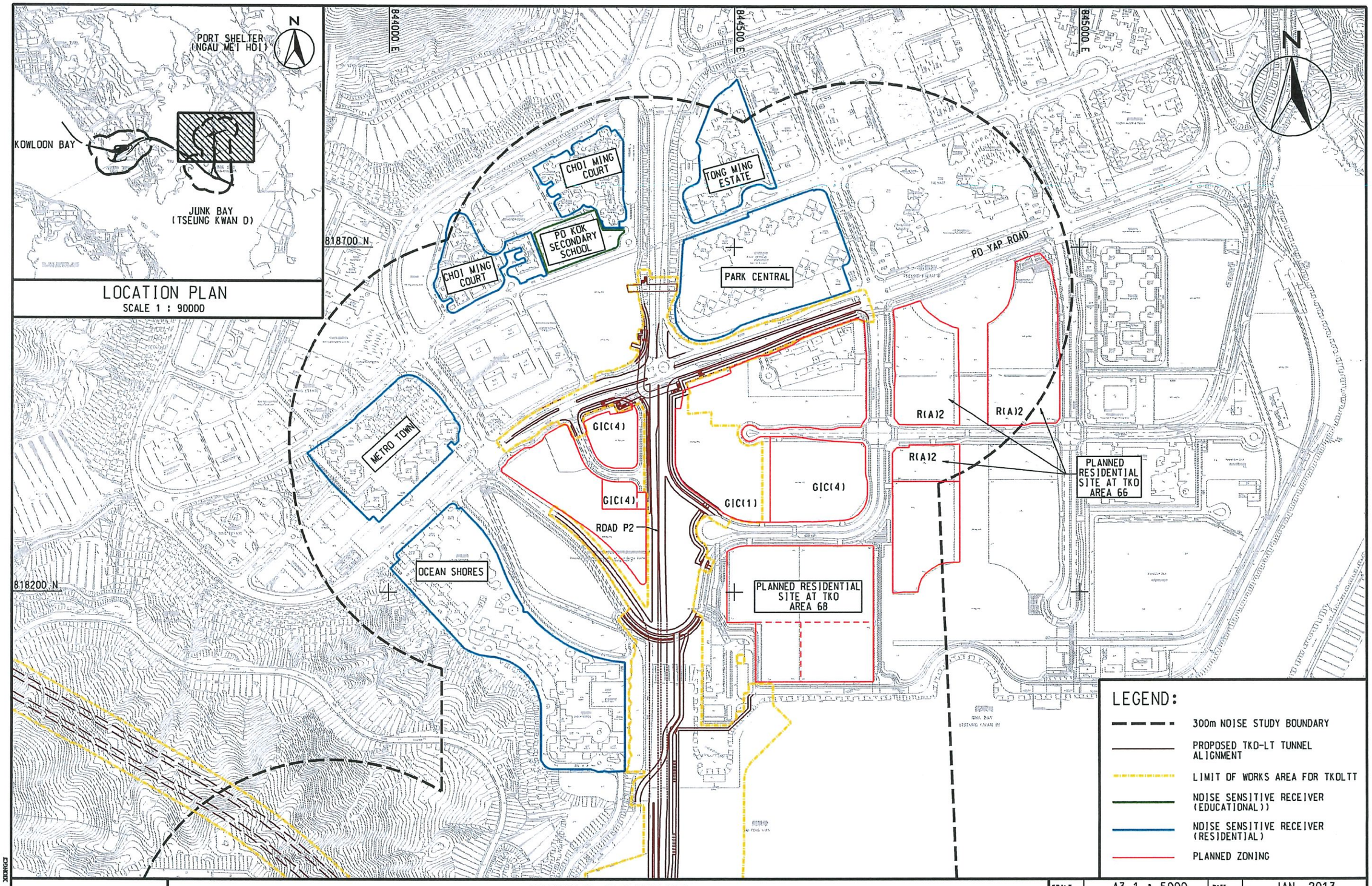
Portion IX
Access Date 29-Jul-16
Compietion Date 26-Sep-20

Area A
Access Date 27-Aug-16
Compietion Date 31-Jul-18

Area Y
Access Date 10-Dec-16
Compietion Date 30-Nov-17

Impact Monitoring Location





AECOM

AGREEMENT NO. CE 42/2008 (CE)
TSEUNG KWAN O - LAM TIN TUNNEL AND ASSOCIATED WORKS - INVESTIGATION

LOCATIONS OF NOISE SENSITIVE RECEIVERS

SHEET 4 OF 4

SCALE	A3 1 : 5000	DATE	JAN. 2013
CHECK	--	DRAWN	HLLS
JOB No.	60097677	DRAWING No.	FIGURE 4.1
		REV	--

Plot File by: 24/01/2013 XXXNGCI

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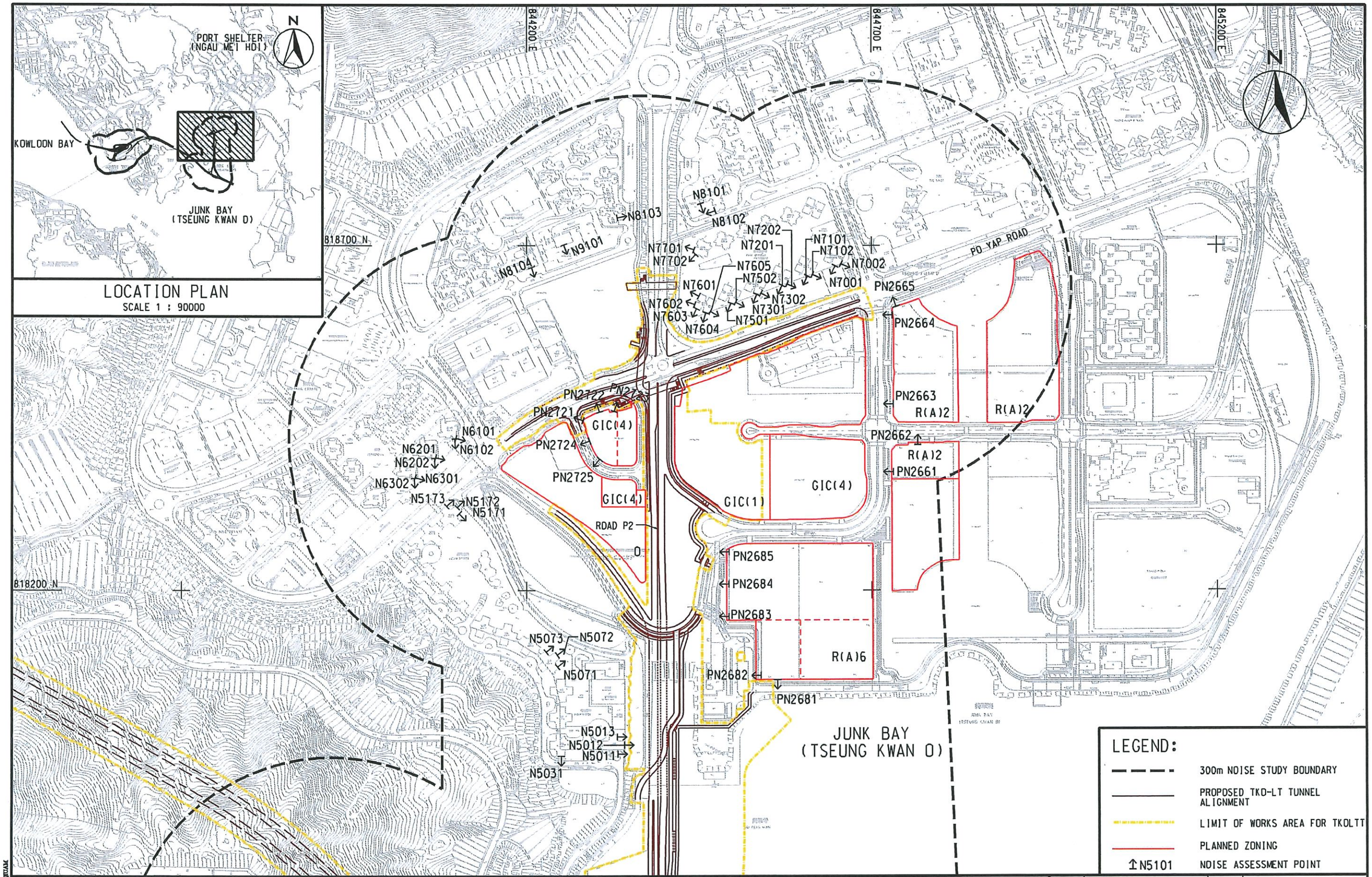

AECOM

AGREEMENT NO. CE 42/2008 (CE)
TSEUNG KWAN O - LAM TIN TUNNEL AND ASSOCIATED WORKS - INVESTIGATION

LOCATIONS OF NOISE ASSESSMENT POINTS

SHEET 4 OF 4

SCALE	A3 1 : 5000	DATE	JAN. 2013
CHECK	--	DRAWN	HLLS
JOB No.	60097677	DRAWING No.	FIGURE 4.2
		REV	--

Plot Date by: 1/28/2015 QUIAM

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Appendix B

Updated Preliminary Construction Programme

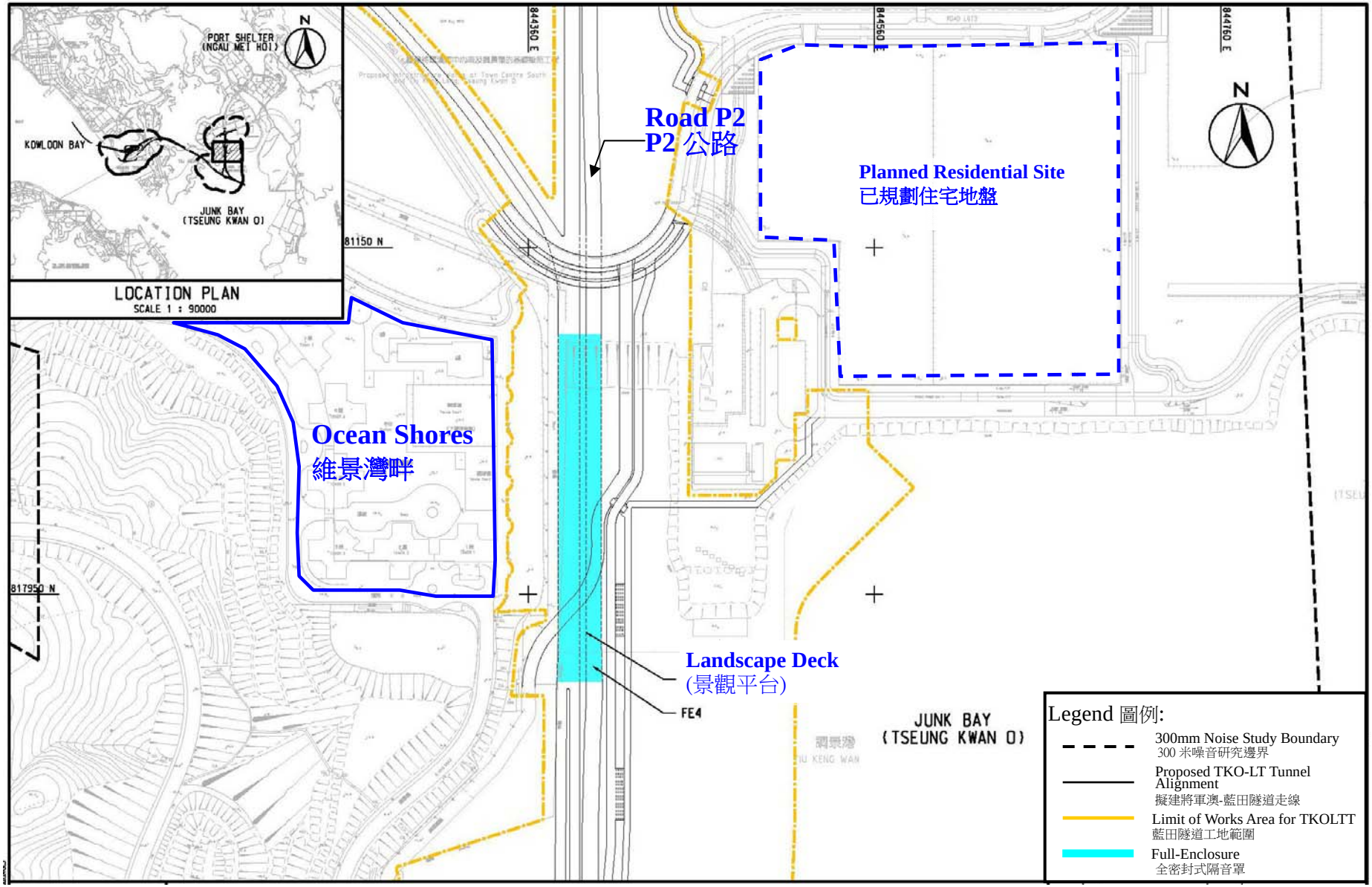
Activity ID	Activity Name	Start	Finish
NE/2015/02 Tseung Kwan O - Lam Tin Tunnel - Road P2 and Associated Works		7/11/2016	26/11/2021
Reprovisioning of DSD Transformer Room			
Portion I	Transformer Room	7/11/2016	6/11/2017
Portion III	Demolition of DSD Transformer Room	6/11/2017	30/12/2017
Land Works			
Portion II	Retaining Wall	31/07/2018	25/05/2020
Portion IV	DN2100 SMH9101 -9108 (Pre-boring) (Scenario 1) - 3 drill rig	25/05/2017	31/08/2018
Portion IV	DN2100 SMH9101 -9108 (Pre-boring) (Scenario 2) - 1 dill rig	1/09/2018	30/11/2018
Portion IV	DN2100 SMH9101 -9108 (Sheet Piling)	1/09/2018	31/12/2018
Portion IV	DN2100 SMH9101 -9108 (ELS)	1/09/2018	31/01/2019
Portion IV	Installation of DN2100 and Manhole Construction (Scenario 1)	1/10/2018	31/12/2018
Portion IV	Installation of DN2100 and Manhole Construction (Scenario 2)	1/01/2019	31/03/2019
Portion IV	Road P2 Underpass CH105-318, (Non Surcharge & On Top Surcharge)(Pre Drill) (Scenario 1)	1/12/2018	31/12/2018
Portion IV	Road P2 Underpass CH105-318, (Non Surcharge & On Top Surcharge)(Pre Drill) (Scenario 1)	1/02/2019	31/03/2019
Portion IV	Road P2 Underpass CH105-318, (Non Surcharge & On Top Surcharge)(Pre Drill) (Scenario 2)	1/01/2019	31/01/2019
Portion IV	Road P2 Underpass CH105-318, (Non Surcharge & On Top Surcharge)(Piling) (Scenario 1)	1/09/2019	31/10/2019
Portion IV	Road P2 Underpass CH105-318, (Non Surcharge & On Top Surcharge)(Piling) (Scenario 2)	1/03/2019	30/09/2019
Portion IV	Road P2 Underpass CH103.5 (Sheet Piling)	1/09/2019	31/10/2019
Portion IV	DN2100 SMH9101 -9103(Pre Drill & Sheetpiling works)	7/03/2020	30/06/2020
Portion V	Road P2 U-Trough B CH318-363 (Pre-boring) (Scenario 1)	1/08/2018	31/08/2018
Portion V	Road P2 U-Trough B CH318-363 (Pre-boring) (Scenario 2)	1/09/2018	30/11/2018
Portion V	Road P2 U-Trough B CH318-363 (Sheet Piling)	1/05/2018	31/01/2019
Portion V	Road P2 U-Trough B CH318-363 (ELS)	1/10/2018	31/12/2018
Portion V	Road P2 U-Trough B CH318-363 (Structure)	1/01/2019	30/09/2019
Portion V	Road P2 U-Trough B CH318-363 Road and Drainage Works	1/03/2019	30/09/2019
Portion V	Modification of Vertical Seawall	1/06/2019	31/12/2019
Portion VI	Road P2 U-Trough B CH318-363 (Removal of Existing Abandoned Box Culvert)	5/02/2018	30/04/2018
Portion VI	Road P2 U-Trough B CH318-363 (Installation of Dewatering System)	1/09/2018	31/01/2019
Portion VI	Road P2 U-Trough B CH318-363 (Preboring) (Scenario 1)	1/05/2018	31/08/2018
Portion VI	Road P2 U-Trough B CH318-363 (Preboring) (Scenario 2)	1/09/2018	30/09/2018
Portion VI	Road P2 U-Trough B CH318-363 (Sheet Piling)	1/09/2018	30/09/2018
Portion VI	Road P2 U-Trough B CH318-363 (ELS)	1/10/2018	31/12/2018
Portion VI	Road P2 U-Trough B CH318-363 (Sheet Piling)	1/09/2018	30/09/2018
Portion VI	Road P2 U-Trough B CH318-363 (ELS)	1/10/2018	31/12/2018
Portion VI	Road P2 U-Trough B CH318-363 (Structure)	1/01/2019	30/09/2019
Portion VI	Road P2 U-Trough B CH318-363 Road and Drainage Works	29/03/2019	30/09/2019
Portion VII	DN2100 SMH9108-Outfall (Pre-boring)	1/04/2018	31/08/2018
Portion VII	DN2100 SMH9108-Outfall (Sheet Piling)	1/04/2018	31/08/2018
Portion VII	Installation of DN2100 and Manhole Construction and Outfall Installation	1/05/2018	28/02/2019
Portion VII	U Trough A&B S200 CH890 - CH980 (Pre Drill)	1/08/2019	30/11/2019
Portion VII	U Trough A&B S200 CH890 - CH980 (Piling)	1/08/2019	31/12/2019
Portion VII	U Trough A&B S200 CH890 - CH980 (Sheet Piling)	1/10/2019	31/12/2019
Portion VIII	Road P2 Underpass (Piling) P2 CH411-500	3/02/2017	25/04/2017
Portion VIII	Road P2 Underpass (ELS) P2 CH411-500	20/02/2017	13/12/2017
Portion VIII	Road P2 Underpass, U-Trough (Structure) P2 CH411-500	7/10/2017	31/07/2018
Portion VIII	Road & Drainage Works P2 CH411-500	9/07/2018	6/12/2019
Portion VIII	Road P2 Underpass (Piling) SR2 CH170-250	25/04/2017	10/07/2017
Portion VIII	Road P2 Underpass (ELS) SR2 CH170-250	12/06/2017	14/10/2017
Portion VIII	Road P2 Underpass, U-Trough (Structure) SR2 CH170-250	23/10/2017	27/04/2018
Portion VIII	Road & Drainage Works SR2 CH170-250	2/06/2018	3/01/2020
Portion VIII	Road P2 Underpass (Piling) P2 CH363-411	30/08/2019	2/10/2019
Portion VIII	Road P2 Underpass (ELS) P2 CH363-411	3/10/2019	16/01/2020
Portion VIII	Road P2 Underpass, U-Trough (Structure) P2 CH363-411	17/01/2020	4/09/2020
Portion VIII	Road & Drainage Works P2 CH363-411	9/07/2020	12/10/2020
Portion VIII	Road P2 Underpass (Piling) SR2 CH110-170	24/08/2019	22/10/2019
Portion VIII	Road P2 Underpass (ELS) SR2 CH110-170	23/10/2019	7/01/2020
Portion VIII	Road P2 Underpass, U-Trough (Structure) SR2 CH110-170	8/01/2020	9/09/2020
Portion VIII	Road P2 Underpass, U-Trough (Backfilling)	1/08/2018	31/12/2018
Portion VIII	Road & Drainage Works SR2 CH110-170	14/07/2020	12/10/2020
Area A		27/08/2016	31/12/2019
Area Y		16/12/2016	30/11/2017
Marine Works			
Portion IX	Steel Cofferdam and Water Gate	7/11/2016	10/11/2017
Portion IX	Seawall Construction	11/11/2017	31/07/2020
Portion IX	Marine Ground Treatment	1/08/2018	28/02/2019
Portion IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH821 (Backfilling)	1/08/2018	28/02/2019
Portion IX	Road P2 Underpass CH105-318, (Removal of Temporary 1500 Drain)	15/04/2019	31/05/2019
Portion IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888(Pre Drill) (Scenario 1)	1/05/2019	31/05/2019
Portion IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888(Pre Drill) (Scenario 1)	1/08/2019	30/09/2019
Portion IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888(Pre Drill) (Scenario 1)	1/03/2020	31/07/2020
Portion IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888(Pre Drill) (Scenario 2)	1/03/2019	31/03/2019
Portion IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888(Pre Drill) (Scenario 2)	1/01/2020	28/02/2020
Portion IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888(Pre Drill) (Scenario 3)	1/01/2019	31/01/2019
Portion IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888(Pre Drill) (Scenario 4)	1/02/2019	28/02/2019
Portion IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888(Pre Drill) (Scenario 4)	1/07/2019	31/07/2019
Portion IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888(Pre Drill) (Scenario 4)	1/10/2019	31/12/2019
Portion IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 1)	1/01/2019	28/02/2019
Portion IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 2)	1/09/2019	31/10/2019
Portion IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 2)	1/05/2020	31/08/2020
Portion IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 3)	1/11/2019	28/02/2020
Portion IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 4)	1/07/2019	31/08/2019
Portion IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 5)	1/03/2020	31/07/2020
Portion IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 6)	1/05/2019	31/05/2019
Portion IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 7)	1/06/2019	30/06/2019
Portion IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Installation of Dewatering system)	1/07/2019	31/08/2019
Portion IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (ELS) (Sheet Piling) (Scenario 1)	1/03/2019	31/05/2019
Portion IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (ELS) (Sheet Piling) (Scenario 1)	1/08/2019	31/03/2020
Portion IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (ELS) (Sheet Piling) (Scenario 2)	1/04/2020	31/07/2020
Portion IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (ELS) (Welding & Excavation) (Scenario 1)	1/07/2019	31/12/2019
Portion IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (ELS) (Welding & Excavation) (Scenario 1)	1/03/2020	31/03/2020
Portion IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (ELS) (Welding & Excavation) (Scenario 2)	1/01/2020	28/02/2020
Portion IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Structure) (Scenario 1)	1/12/2020	31/12/2020
Portion IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Structure) (Scenario 2)	1/11/2020	30/11/2020
Portion IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Structure) (Scenario 3)	1/02/2020	30/04/2020
Portion IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Structure) (Scenario 3)	1/06/2020	31/10/2020
Portion IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Structure) (Scenario 4)	1/05/2020	30/05/2020
Portion IX	Road & Drainage Works	1/10/2020	30/04/2021

NE/2015/02 Tseung Kwan O - Lam Tin Tunnel - Road P2 and Associated Works

Executive Summary Programme

Appendix C

Proposed Mitigation Measures and Detailed Noise Assessment



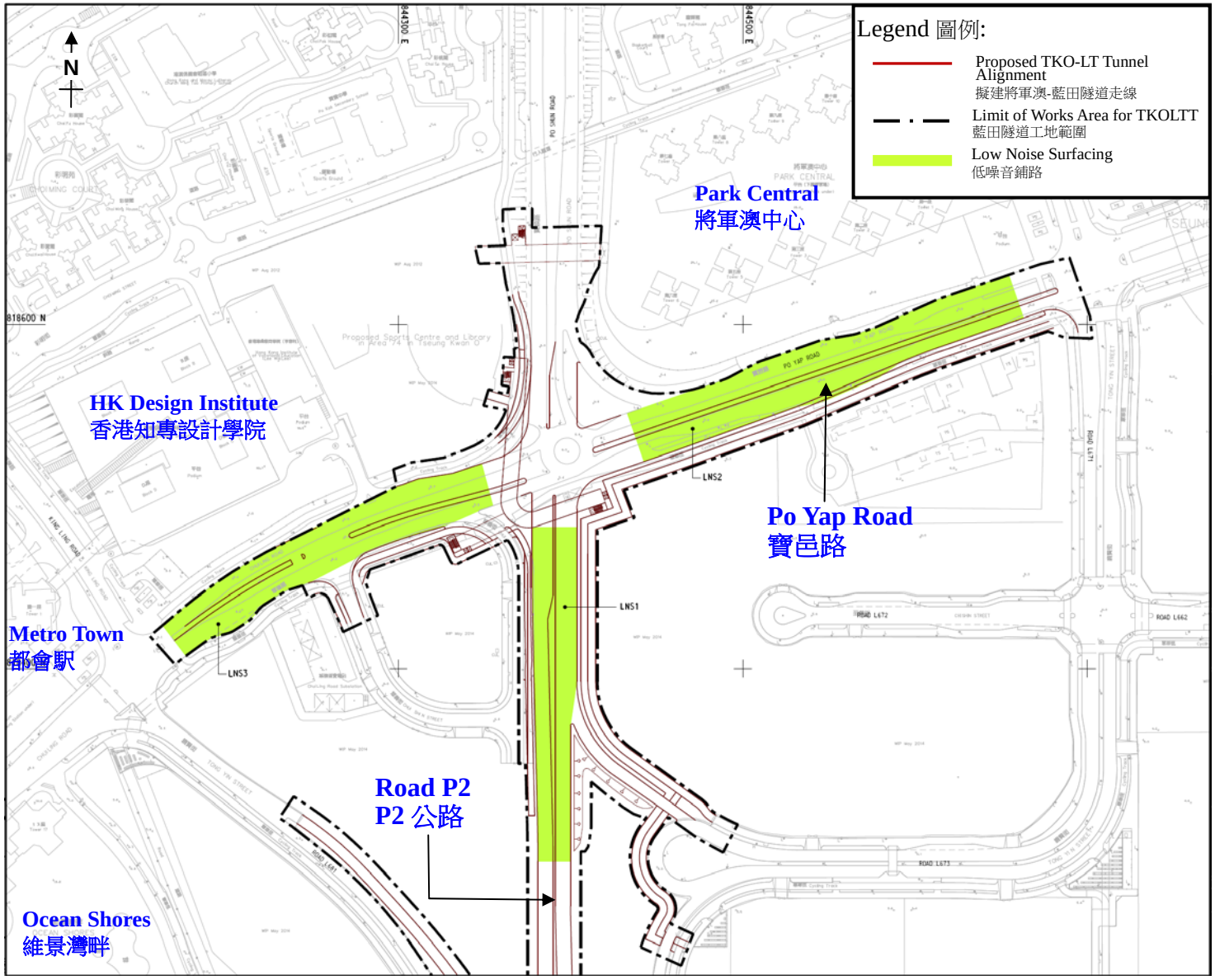
Project Title: Tseung Kwan O – Lam Tin Tunnel and Associated Works
工程項目名稱: 將 軍 澳 – 藍 田 隧 道 及 相 關 工 程
Noise Mitigation Measure at Road P2
P2公路的噪音緩解措施

(to be read in conjunction with the Noise Mitigation Plan for Road P2 and Associated Works submitted under Condition 2.5)
(要與根據條件 2.5 提交的 P2 路及相關工程的噪音影響緩解計劃一併閱讀)
(Plan originated from the Figure 4.6 (sheet 4 of 4) of approved EIA Report: AEIAR-173/2013)
(圖則源自已批准環評報告–AEIAR-173/2013 內的圖 4.6(版 4 of 4))

Environmental Protection Department
環境保護署

Environmental Permit No. EP-458/2013/C
環境許可證編號: EP-458/2013/C

Figure 3
圖三



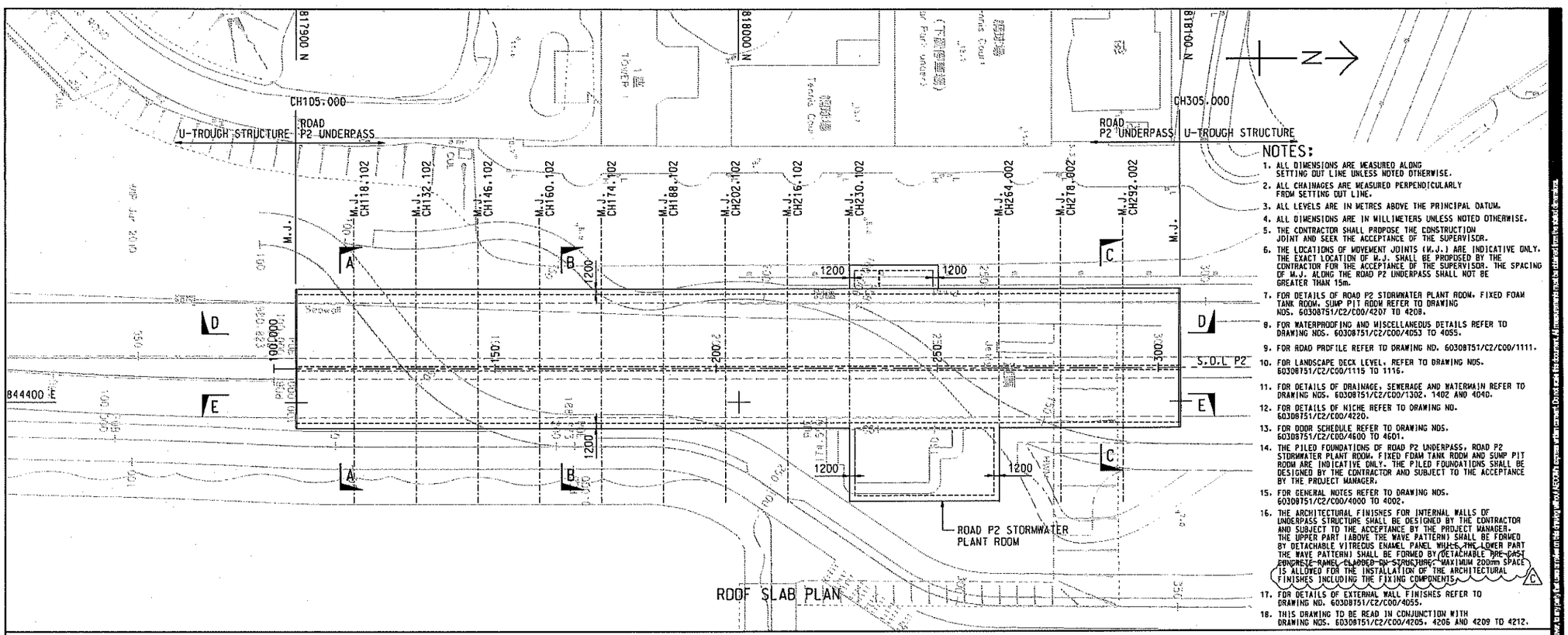
Project Title: Tseung Kwan O – Lam Tin Tunnel and Associated Works
工程項目名稱: 將 軍 澳 – 藍 田 隧 道 及 相 關 工 程
Noise Mitigation Measure at Road P2 and Po Yap Road
P2公路及寶邑路的噪音緩解措施

(to be read in conjunction with the Noise Mitigation Plan for Road P2/D4 and Associated Works and the Noise Mitigation Plan for Road P2 and Associated Works submitted under Condition 2.5)
(要與根據條件 2.5 提交的 P2/D4 路及相關工程的噪音影響緩解計劃及 P2 路及相關工程的噪音影響緩解計劃一併閱讀)
(This figure was prepared based on Figure 4 of the ER Report submitted under VEP Application (VEP-472/2015)
(本圖是根據更改環境許可証申請文件 – 申請書編號: VEP-472/2015 所提交的環境檢討報告圖 4 編制)

Environmental Protection Department
環境保護署

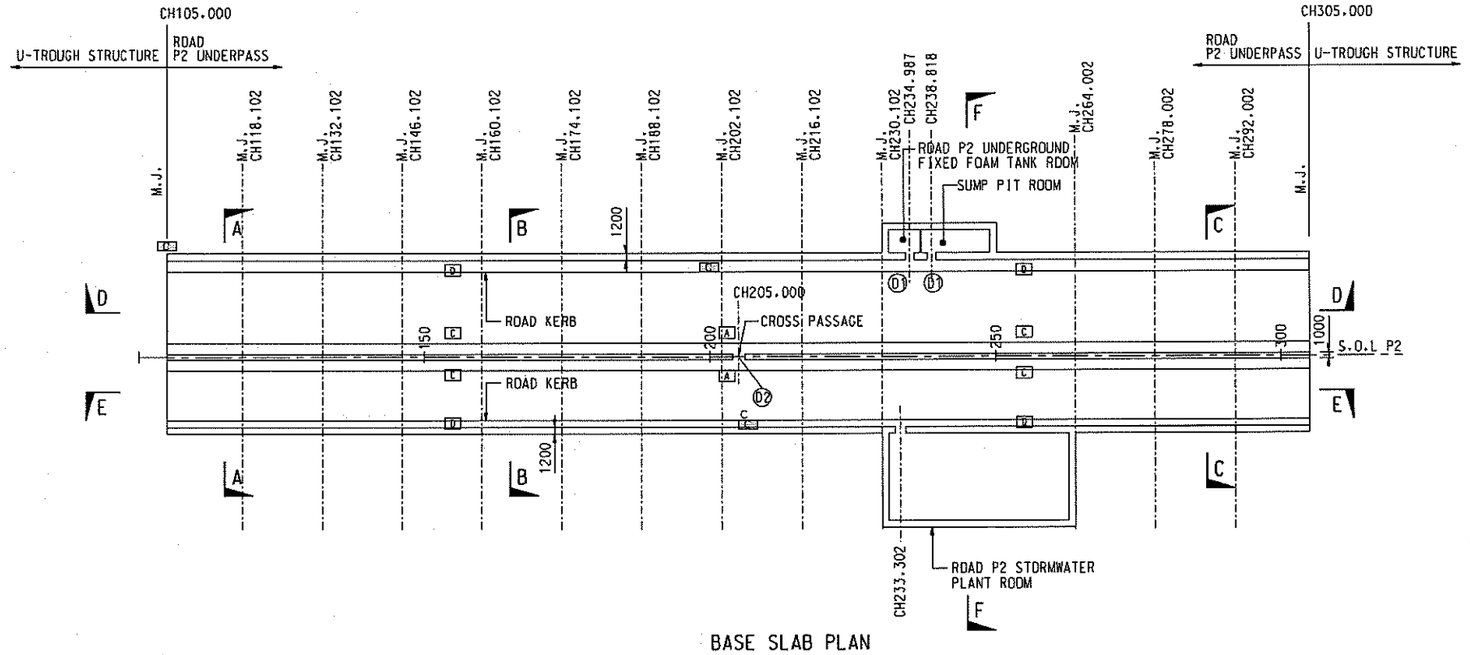
Environmental Permit No. EP-458/2013/C
環境許可證編號: EP-458/2013/C

Figure 4
圖四



NOTES:

1. ALL DIMENSIONS ARE MEASURED ALONG SETTING OUT LINE UNLESS NOTED OTHERWISE.
2. ALL CHAINAGES ARE MEASURED PERPENDICULARLY FROM SETTING OUT LINE.
3. ALL LEVELS ARE IN METRES ABOVE THE PRINCIPAL DATUM.
4. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
5. THE CONTRACTOR SHALL PROPOSE THE CONSTRUCTION JOINT AND SEEK THE ACCEPTANCE OF THE SUPERVISOR.
6. THE LOCATIONS OF MOVEMENT JOINTS (M.J.) ARE INDICATIVE ONLY. THE EXACT LOCATION OF M.J. SHALL BE PROPOSED BY THE CONTRACTOR FOR THE ACCEPTANCE OF THE SUPERVISOR. THE SPACING OF M.J. ALONG THE ROAD P2 UNDERPASS SHALL NOT BE GREATER THAN 15m.
7. FOR DETAILS OF ROAD P2 STORMWATER PLANT ROOM, FIXED FOAM TANK ROOM, SUMP PIT ROOM REFER TO DRAWING NOS. 60308751/C2/C00/4207 TO 4208.
8. FOR WATERPROOFING AND MISCELLANEOUS DETAILS REFER TO DRAWING NOS. 60308751/C2/C00/4053 TO 4055.
9. FOR ROAD PROFILE REFER TO DRAWING NO. 60308751/C2/C00/1111.
10. FOR LANDSCAPE DECK LEVEL, REFER TO DRAWING NOS. 60308751/C2/C00/1115 TO 1116.
11. FOR DETAILS OF DRAINAGE, SEWERAGE AND WATERMAIN REFER TO DRAWING NOS. 60308751/C2/C00/1302, 1402 AND 4040.
12. FOR DETAILS OF NICHE REFER TO DRAWING NO. 60308751/C2/C00/4220.
13. FOR DOOR SCHEDULE REFER TO DRAWING NOS. 60308751/C2/C00/4600 TO 4601.
14. THE PILED FOUNDATIONS OF ROAD P2 UNDERPASS, ROAD P2 STORMWATER PLANT ROOM, FIXED FOAM TANK ROOM AND SUMP PIT ROOM ARE INDICATIVE ONLY. THE PILED FOUNDATIONS SHALL BE DESIGNED BY THE CONTRACTOR AND SUBJECT TO THE ACCEPTANCE BY THE PROJECT MANAGER.
15. FOR GENERAL NOTES REFER TO DRAWING NOS. 60308751/C2/C00/4000 TO 4002.
16. THE ARCHITECTURAL FINISHES FOR INTERNAL WALLS OF UNDERPASS STRUCTURE SHALL BE DESIGNED BY THE CONTRACTOR AND SUBJECT TO THE ACCEPTANCE BY THE PROJECT MANAGER. THE UPPER PART (ABOVE THE WAVE PATTERN) SHALL BE FORMED BY DETACHABLE VITREOUS ENAMEL PANEL WHILE THE LOWER PART THE WAVE PATTERN) SHALL BE FORMED BY (DETACHABLE PRE-CAST CONCRETE PANEL CLADDED ON STRUCTURE. MAXIMUM 200mm SPACE IS ALLOWED FOR THE INSTALLATION OF THE ARCHITECTURAL FINISHES INCLUDING THE FIXING COMPONENTS. C
17. FOR DETAILS OF EXTERNAL WALL FINISHES REFER TO DRAWING NO. 60308751/C2/C00/4055.
18. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING NOS. 60308751/C2/C00/4205, 4206 AND 4209 TO 4212.



LEGEND:

A	TYPE A FS NICHE
B	TYPE B FS NICHE
C	TYPE C FS NICHE
D	TYPE D FS NICHE
D1	DOOR TYPE
TCSS	TCSS CABINETS

AECOM

PROJECT
TSEUNG KWAN O - LAM TIN TUNNEL

CONTRACT TITLE
TSEUNG KWAN O - LAM TIN TUNNEL ROAD P2 AND ASSOCIATED WORKS

CLIENT
土木工程拓展署
Civil Engineering and Development Department

CONSULTANT
AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS

ISSUE/REVISION

VR	DATE	DESCRIPTION	CHK
C	APR.18	TENDER ADDENDUM NO. 4	RPCM
B	APR.18	TENDER ADDENDUM NO. 3	RPCM
A	FEB.18	TENDER ADDENDUM NO. 1	RPCM
-	JAN.18	TENDER DRAWING	RPCM

STATUS

SCALE	DIMENSION UNIT
A1 1:500	MILLIMETRES

KEY PLAN

PROJECT NO.	CONTRACT NO.
60308751	NE/2015/02

SHEET TITLE
ROAD P2 UNDERPASS - ROOF AND BASE SLAB PLAN

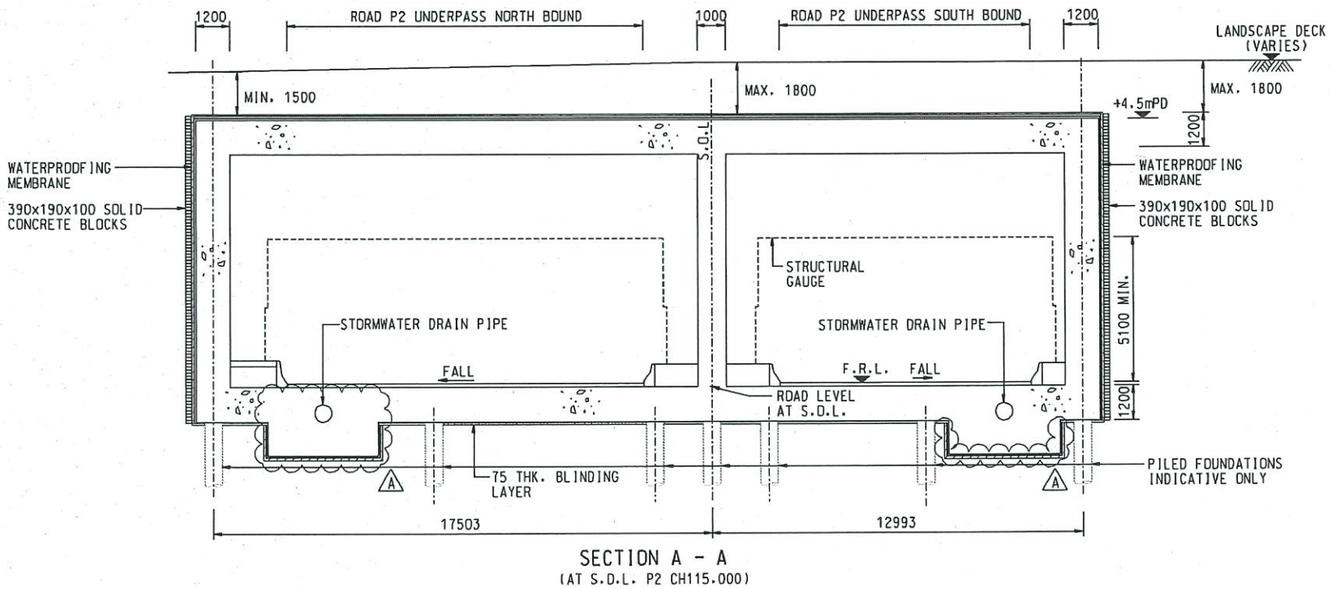
SHEET NUMBER
60308751/C2/C00/4201C

BSI A1 594mm x 841mm
CAD Approved: CWN
Checked: RPCM
Designed: ATPH
Project Management Initials:
Plot File by: HEDD 2018/4/18
PATH: P:\Projects\60308751\DRAWINGS\Contract\C2\4000\C2_C00_4201.dgn

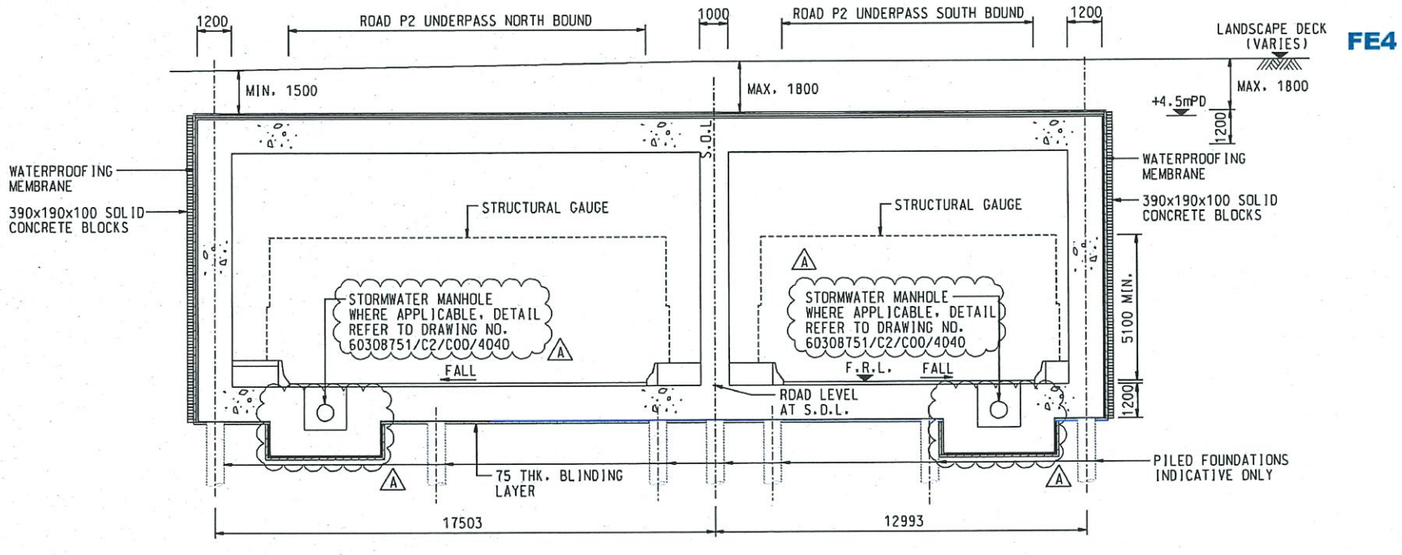
Project Management Initials: | Designer: ATHH | Checked: RPCM | Approved: CWN | ISO A1 594mm x 841mm

NOTES:

1. FOR NOTES, REFER TO DRAWING NO. 60308751/C2/C00/4201.
2. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING NO. 60308751/C2/C00/4201.



SECTION A - A
(AT S.O.L. P2 CH115.000)



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(AT S.O.L. P2 CH165.000)

Plot File by: WANGPY2 2016/2/28
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AECOM

PROJECT
TSEUNG KWAN O - LAM TIN TUNNEL

CONTRACT TITLE
TSEUNG KWAN O - LAM TIN TUNNEL ROAD P2 AND ASSOCIATED WORKS

CLIENT
土木工程拓展署 Civil Engineering and Development Department

CONSULTANT
AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS

ISSUE/REVISION

A	FEB.16	TENDER ADDENDUM NO.1	RPCM
-	JAN.16	TENDER DRAWING	RPCM
ITR	DATE	DESCRIPTION	CHK.

STATUS

SCALE: A1 1 : 100
DIMENSION UNIT: MILLIMETRES

KEY PLAN

PROJECT NO.: 60308751
CONTRACT NO.: NE/2015/02

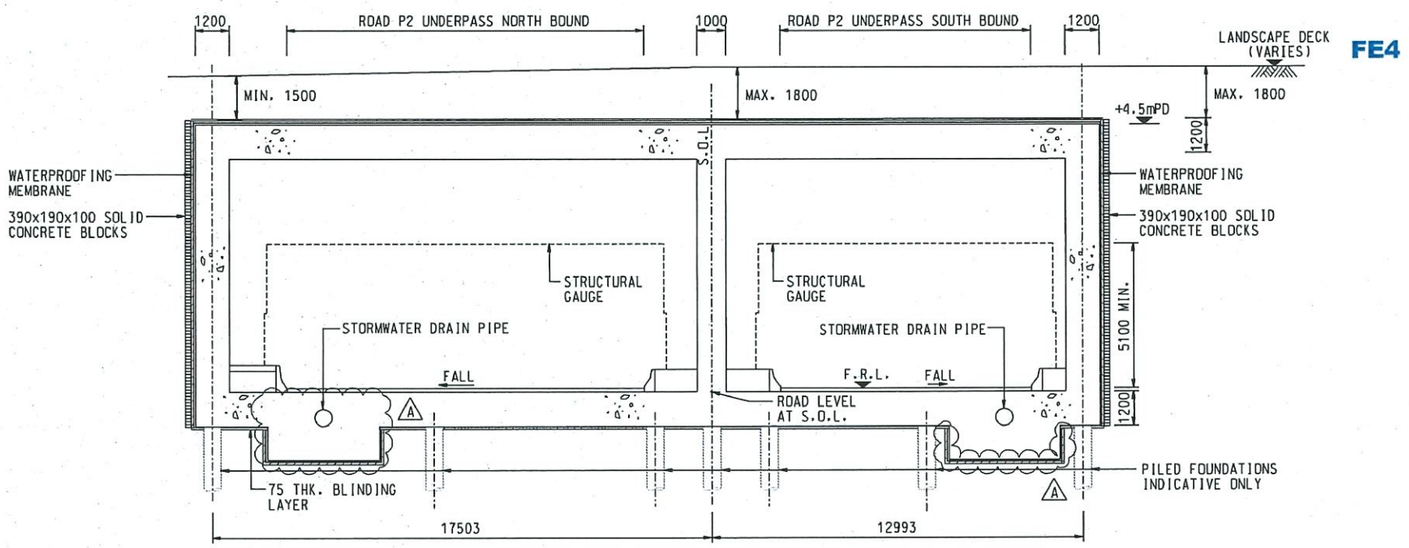
SHEET TITLE
ROAD P2 UNDERPASS - SECTION

SHEET 1 OF 2

SHEET NUMBER
60308751/C2/C00/4205A

NOTES:

1. FOR NOTES, REFER TO DRAWING NO. 60308751/C2/C00/4201.
2. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING NO. 60308751/C2/C00/4201.



SECTION C - C
(AT S.O.L. P2 CH287.000)

AECOM

PROJECT
TSEUNG KWAN O - LAM TIN TUNNEL

CONTRACT TITLE
TSEUNG KWAN O - LAM TIN TUNNEL ROAD P2 AND ASSOCIATED WORKS

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Civil Engineering and Development Department

CONSULTANT
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ISSUE/REVISION

VR	DATE	DESCRIPTION	CHK.
A	FEB.16	TENDER ADDENDUM NO.1	RPCM
-	JAN.16	TENDER DRAWING	RPCM

STATUS

SCALE A1 1 : 100
DIMENSION UNIT MILLIMETRES

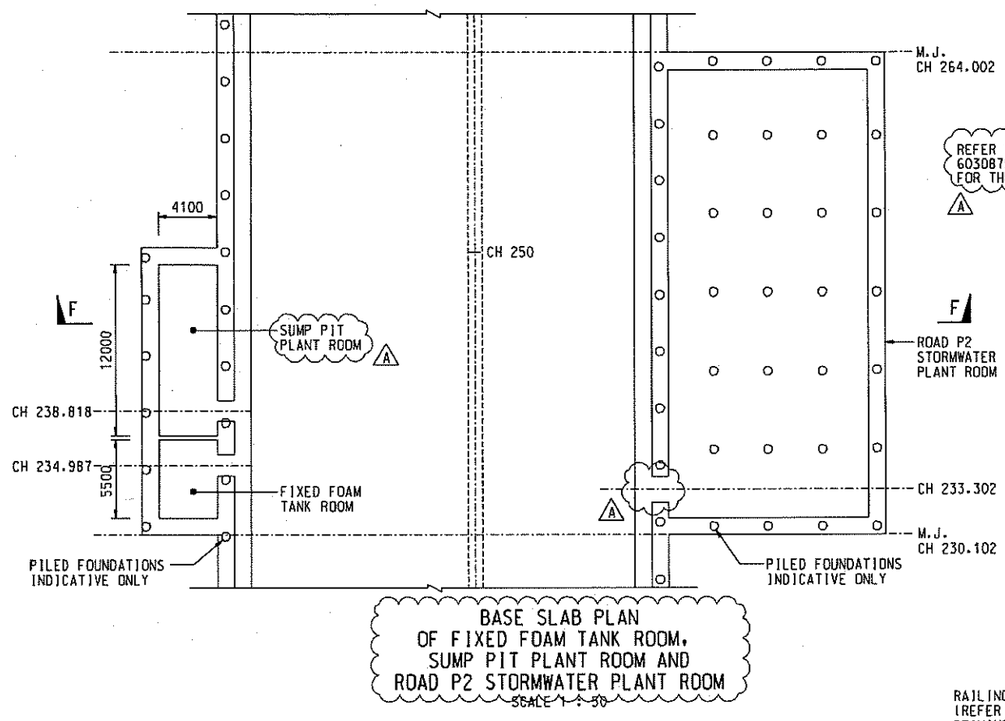
KEY PLAN

PROJECT NO. 60308751
CONTRACT NO. NE/2015/02

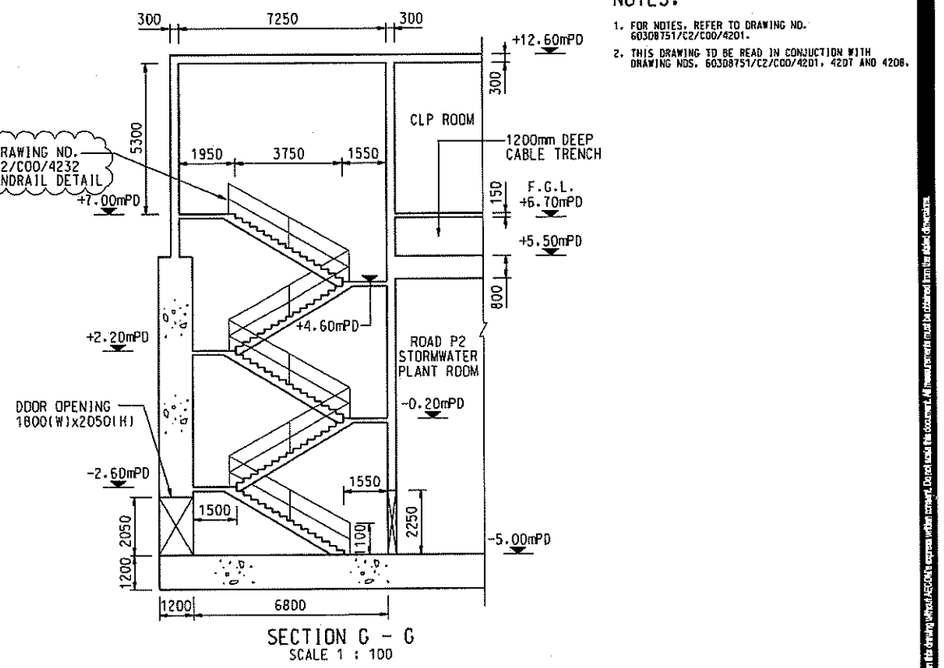
SHEET TITLE
ROAD P2 UNDERPASS - SECTION

SHEET 2 OF 2

SHEET NUMBER
60308751/C2/C00/4206A



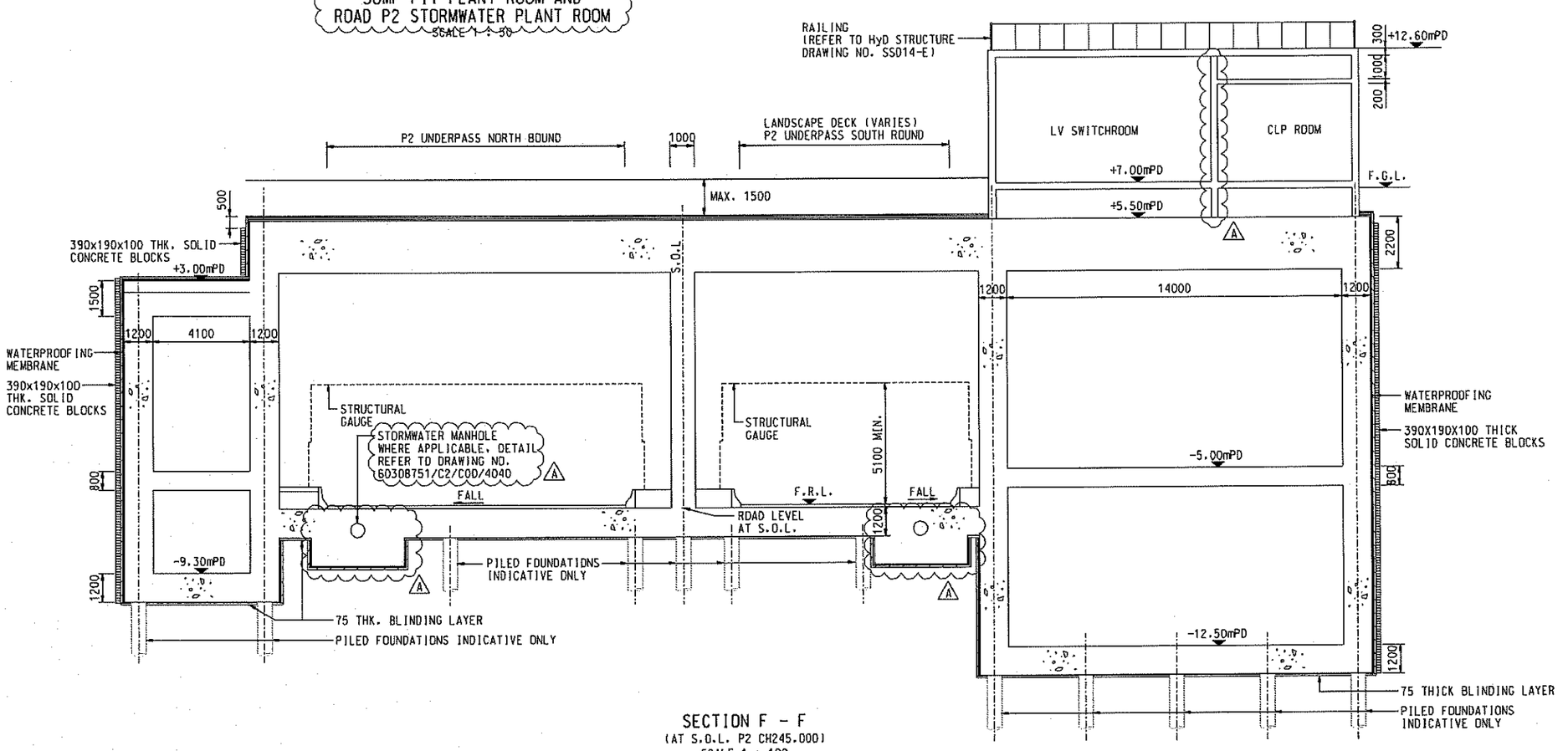
BASE SLAB PLAN
OF FIXED FOAM TANK ROOM,
SUMP PIT PLANT ROOM AND
ROAD P2 STORMWATER PLANT ROOM
SCALE 1 : 50



SECTION G - G
SCALE 1 : 100

NOTES:

1. FOR NOTES, REFER TO DRAWING NO. 60308751/C2/C00/4201.
2. THIS DRAWING TO BE READ IN CONJUCTION WITH DRAWING NOS. 60308751/C2/C00/4201, 4207 AND 4208.



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(AT S.O.L. P2 CH245.000)
SCALE 1 : 100

Project Management Initials: Designed: ATHH Checked: RPCM Approved: CWN Dwg ISO A1 594mm x 841mm

Plot File by: WANGFY2 2018/2/28
PATH: P:\Projects\60308751\Drawing\Contract\C2\4000\C2_C00_4208.dgn

AECOM

PROJECT
TSEUNG KWAN O - LAM TIN TUNNEL

CONTRACT TITLE
TSEUNG KWAN O - LAM TIN TUNNEL ROAD P2 AND ASSOCIATED WORKS

CLIENT
CEDD 土木工程拓展署 Civil Engineering and Development Department

CONSULTANT
AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS

ISSUE/REVISION

A	FEB.18	TENDER ADDENDUM NO.1	RPCM
-	JAN.18	TENDER DRAWING	RPCM

STATUS

SCALE: A1 AS SHOWN
DIMENSION UNIT: MILLIMETRES

KEY PLAN

PROJECT NO.: 60308751
CONTRACT NO.: NE/2015/02

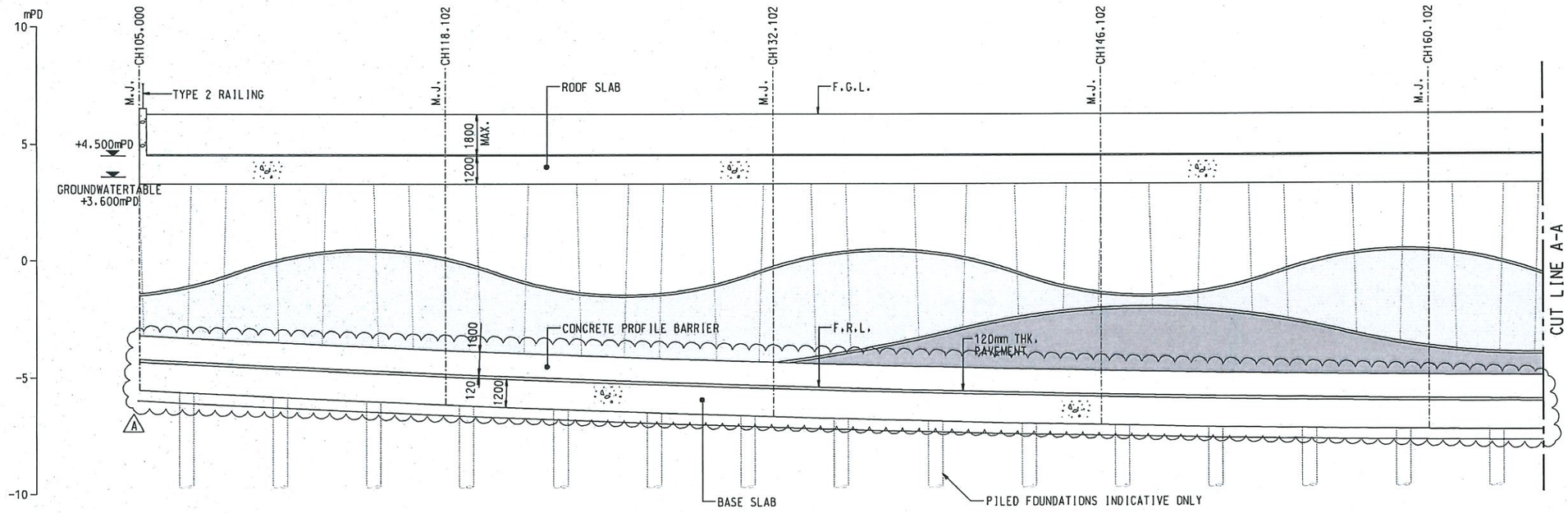
SHEET TITLE
ROAD P2 STORMWATER PLANTROOM - SECTIONS

SHEET NUMBER
60308751/C2/C00/4208A

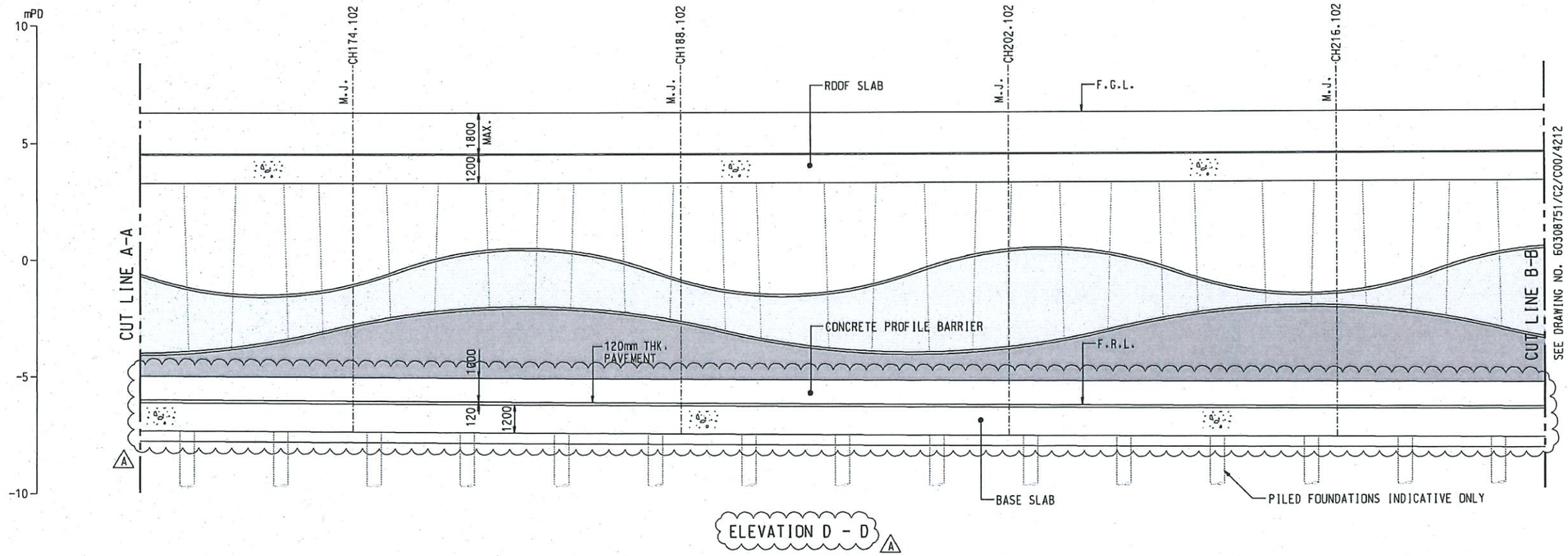
Project Management Initials: | Designer: ATHH | Checked: RPCM | Approved: CWN | ISO A1 594mm x 841mm

NOTES:

1. FOR NOTES AND LEGEND, REFER TO DRAWING NO. 60308751/C2/C00/4201.
2. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING NOS. 60308751/C2/C00/4201 AND 4210.



ELEVATION D - D (A)



ELEVATION D - D (A)

Plot File by: WANGGLW 2016/02/29
PATH: P:\Projects\60308751\DRAWING\Contract\C2\4000\C2_C00_4209.dgn

AECOM

PROJECT
TSEUNG KWAN O - LAM TIN TUNNEL

CONTRACT TITLE
TSEUNG KWAN O - LAM TIN TUNNEL ROAD P2 AND ASSOCIATED WORKS

CLIENT
土木工程拓展署
Civil Engineering and Development Department

CONSULTANT
AECOM Asia Company Ltd.
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ISSUE/REVISION

VR	DATE	DESCRIPTION	CHK
A	FEB.16	TENDER ADDENDUM NO.1	RPCM
-	JAN.16	TENDER DRAWING	RPCM

STATUS

SCALE: A1 1 : 100
DIMENSION UNIT: MILLIMETRES

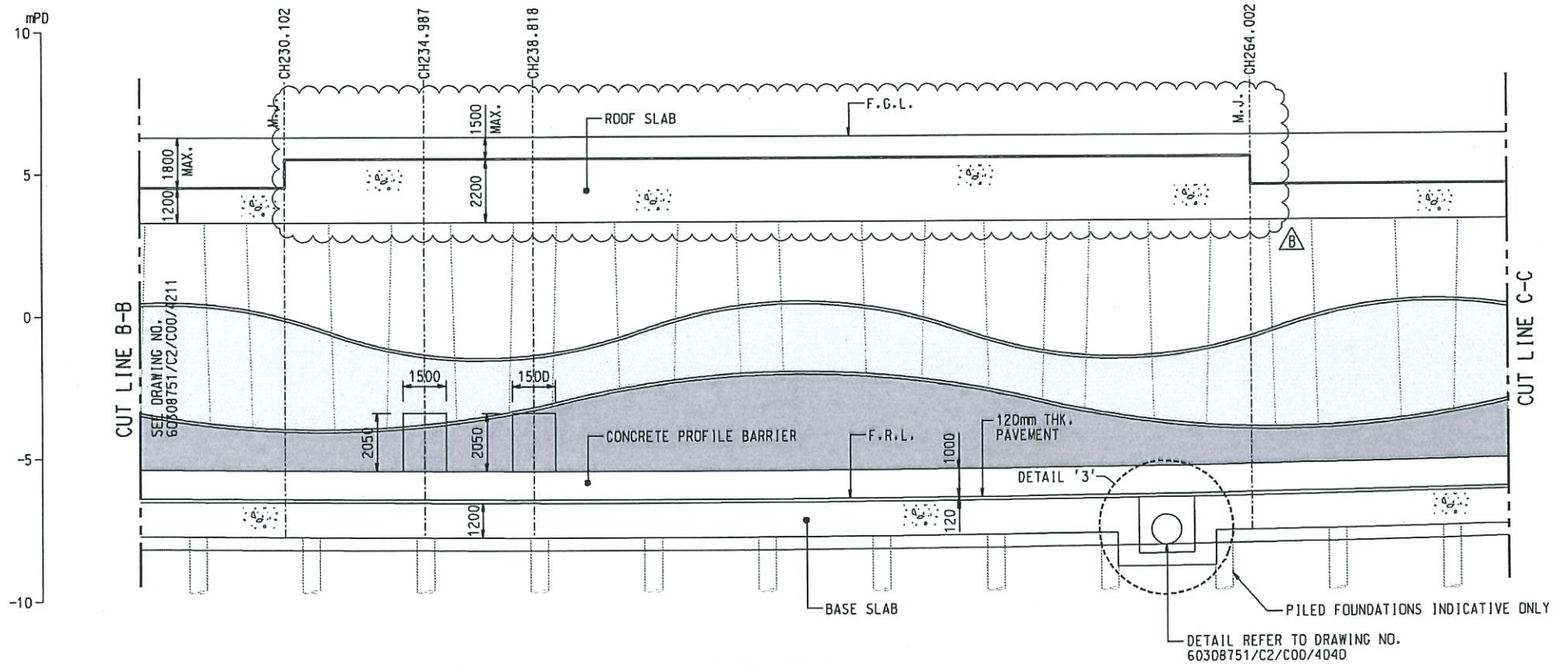
KEY PLAN

PROJECT NO.: 60308751
CONTRACT NO.: NE/2015/02

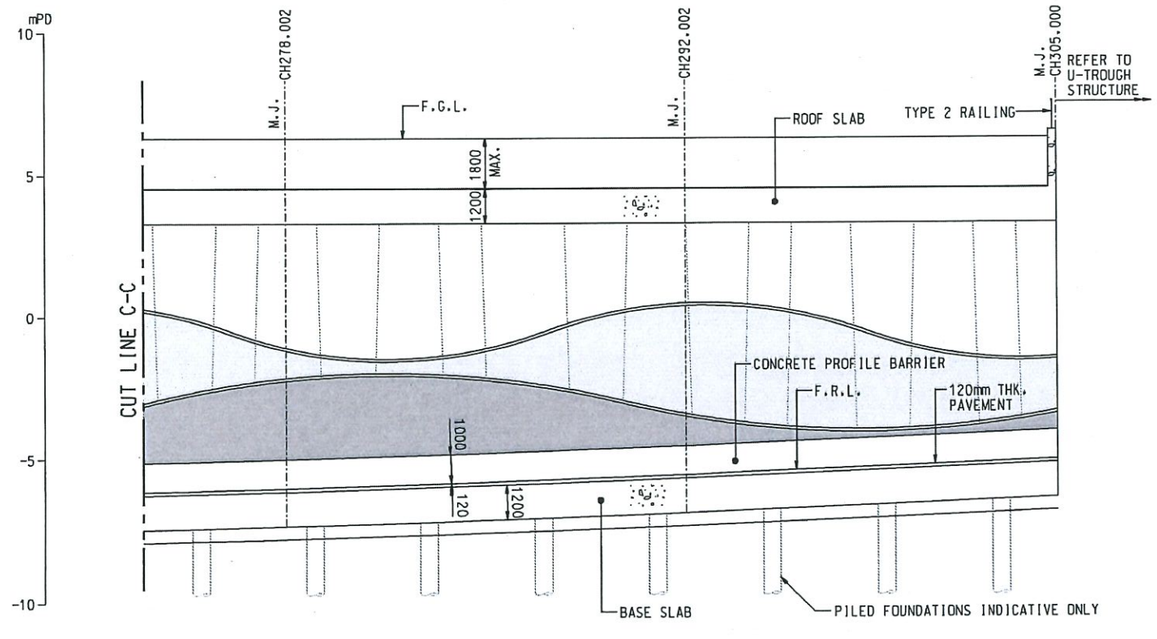
SHEET TITLE
ROAD P2 UNDERPASS - NORTHBOUND ELEVATION

SHEET 1 OF 2

SHEET NUMBER
60308751/C2/C00/4209A



ELEVATION D - D



ELEVATION D - D

NOTES:

1. FOR NOTES AND LEGEND, REFER TO DRAWING NO. 60308751/C2/C00/4201.
2. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING NOS. 60308751/C2/C00/4201 AND 4209.

AECOM

PROJECT
TSEUNG KWAN O - LAM TIN TUNNEL

CONTRACT TITLE
TSEUNG KWAN O - LAM TIN TUNNEL ROAD P2 AND ASSOCIATED WORKS

CLIENT
土木工程拓展署 Civil Engineering and Development Department

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ISSUE/REVISION

B	MAR.16	TENDER ADDENDUM NO. 2	RPCM
A	FEB.16	TENDER ADDENDUM NO. 1	RPCM
-	JAN.16	TENDER DRAWING	RPCM
VR	DATE	DESCRIPTION	CHK.

STATUS

SCALE: A1 1 : 100
DIMENSION UNIT: MILLIMETRES

KEY PLAN

PROJECT NO.: 60308751
CONTRACT NO.: NE/2015/02

SHEET TITLE
ROAD P2 UNDERPASS - NORTHBOUND ELEVATION

SHEET 2 OF 2

SHEET NUMBER
60308751/C2/C00/4210B

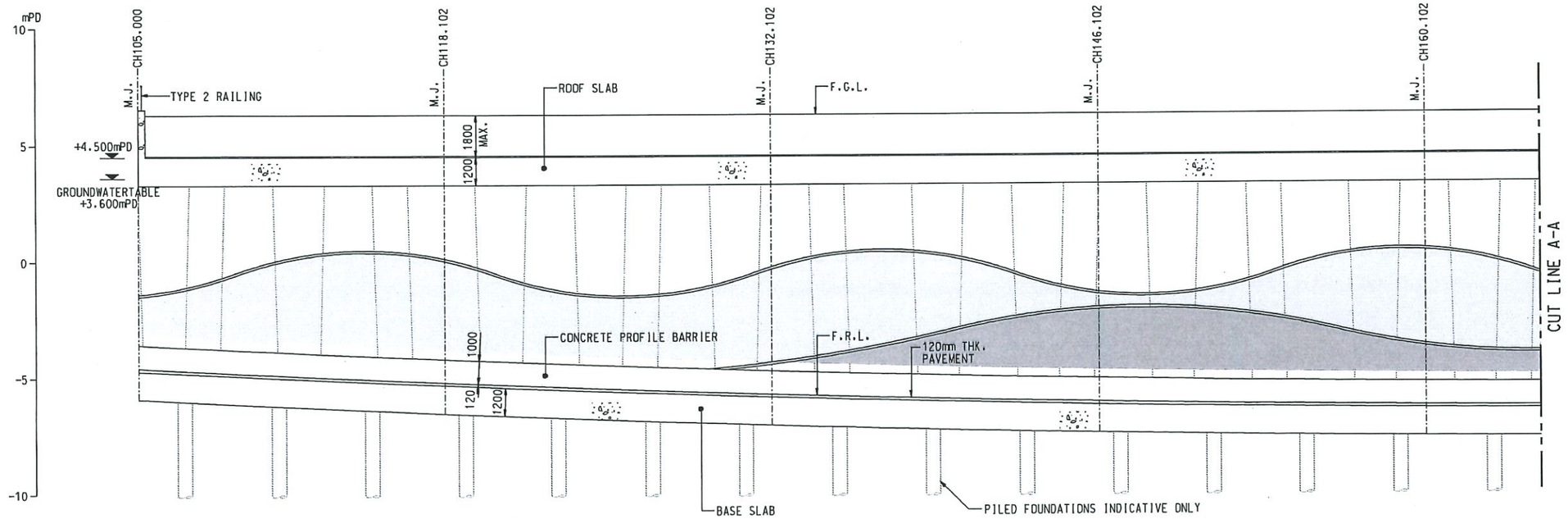
Project Management Initials: Designer: ATHH Checked: RPCM Approved: CWN Sig'y ISO A1 594mm x 841mm

Plot File by: WANGPY2 2016/03/18
PATH: P:\Projects\60308751\DRAWINGS\Contract\C2\4000\C2_C00_4210.dgn

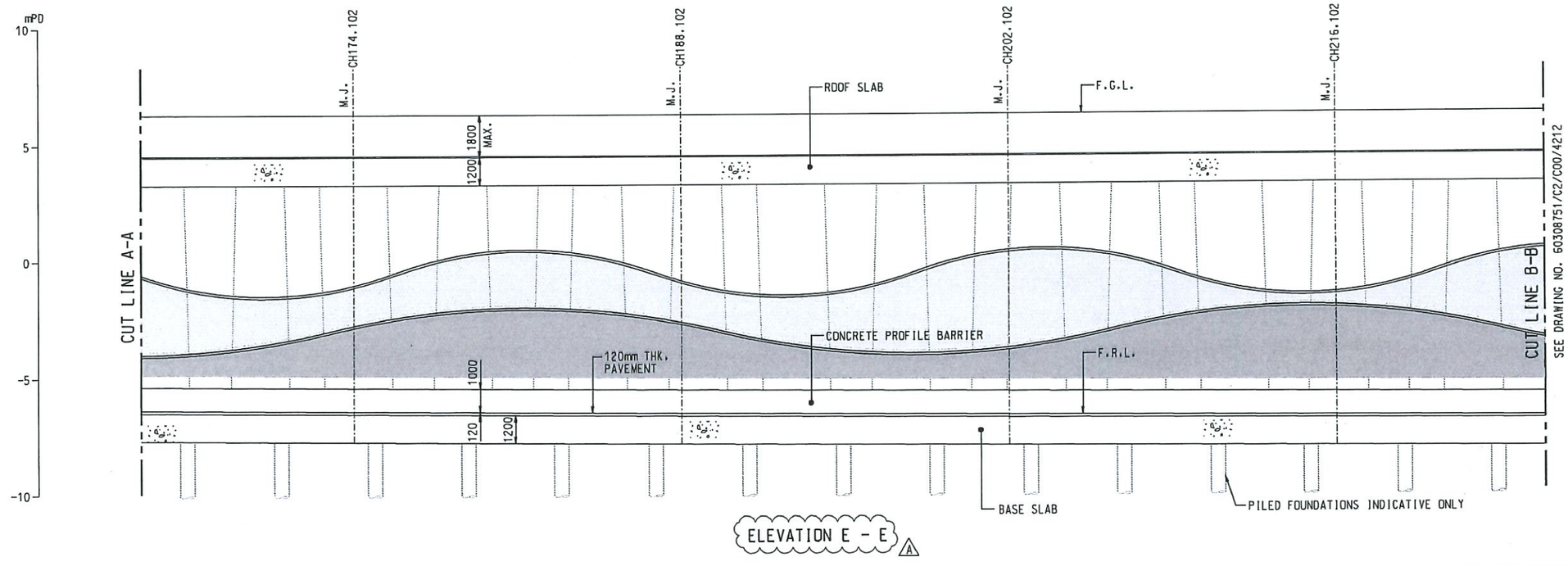
Project Management Initials: Designer: ATHH Checked: RPCM Approved: CWN ISO A1 594mm x 841mm

NOTES:

1. FOR NOTES AND LEGEND, REFER TO DRAWING NO. 60308751/C2/C00/4201.
2. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING NOS. 60308751/C2/C00/4201 AND 4212.



ELEVATION E - E (A)



ELEVATION E - E (A)

Plot File by: WANGSLW 2016/2/28
PATH: P:\Projects\60308751\DRAWING\Contract\C2\4000\C2_C00_4211.dgn

AECOM

PROJECT
TSEUNG KWAN O - LAM TIN TUNNEL

CONTRACT TITLE
TSEUNG KWAN O - LAM TIN TUNNEL ROAD P2 AND ASSOCIATED WORKS

CLIENT
土木工程拓展署 Civil Engineering and Development Department

CONSULTANT
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ISSUE/REVISION

YR	DATE	DESCRIPTION	CHK.
A	FEB.16	TENDER ADDENDUM NO.1	RPCM
-	JAN.16	TENDER DRAWING	RPCM

STATUS

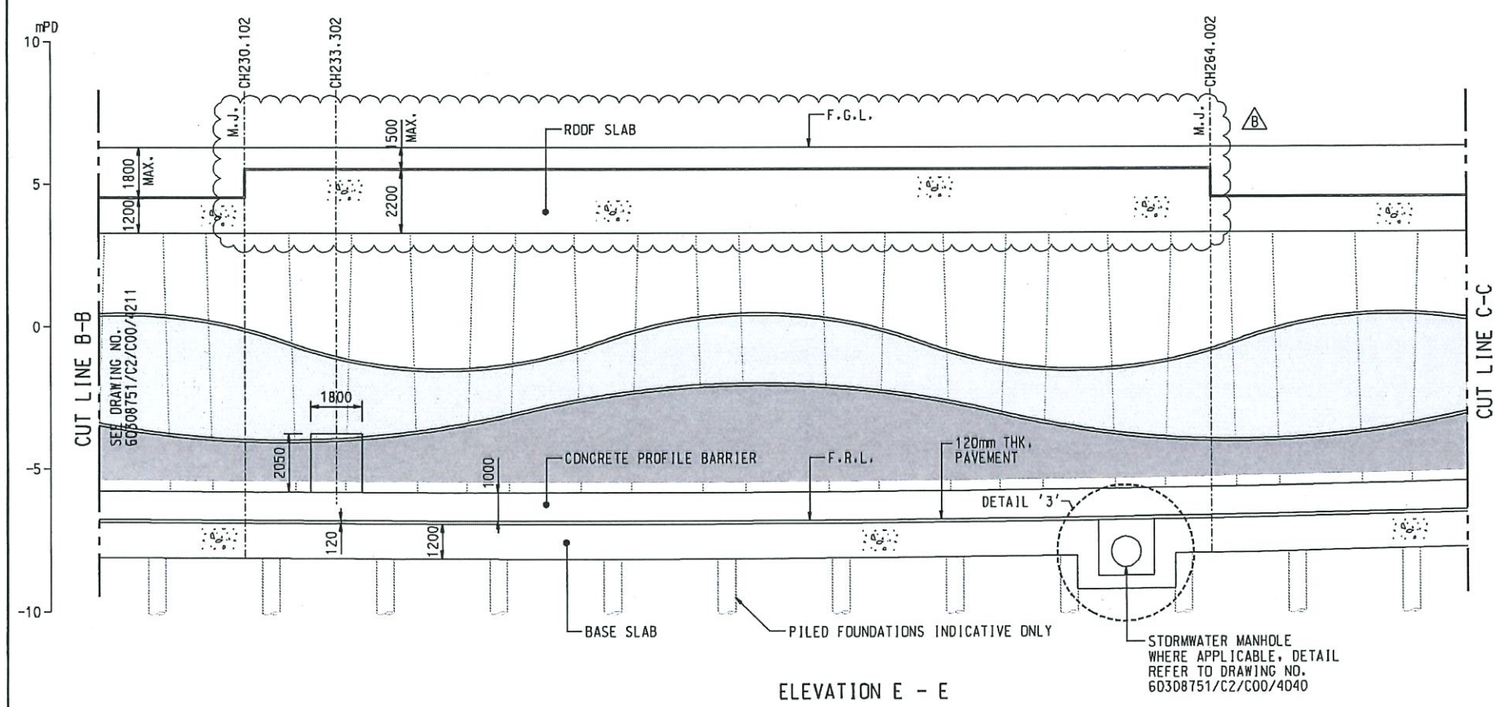
SCALE: A1 1 : 100
DIMENSION UNIT: MILLIMETRES

KEY PLAN

PROJECT NO.: 60308751
CONTRACT NO.: NE/2015/02

SHEET TITLE
ROAD P2 UNDERPASS - SOUTHBOUND AND CROSS PASSAGE ELEVATION
SHEET 1 OF 2

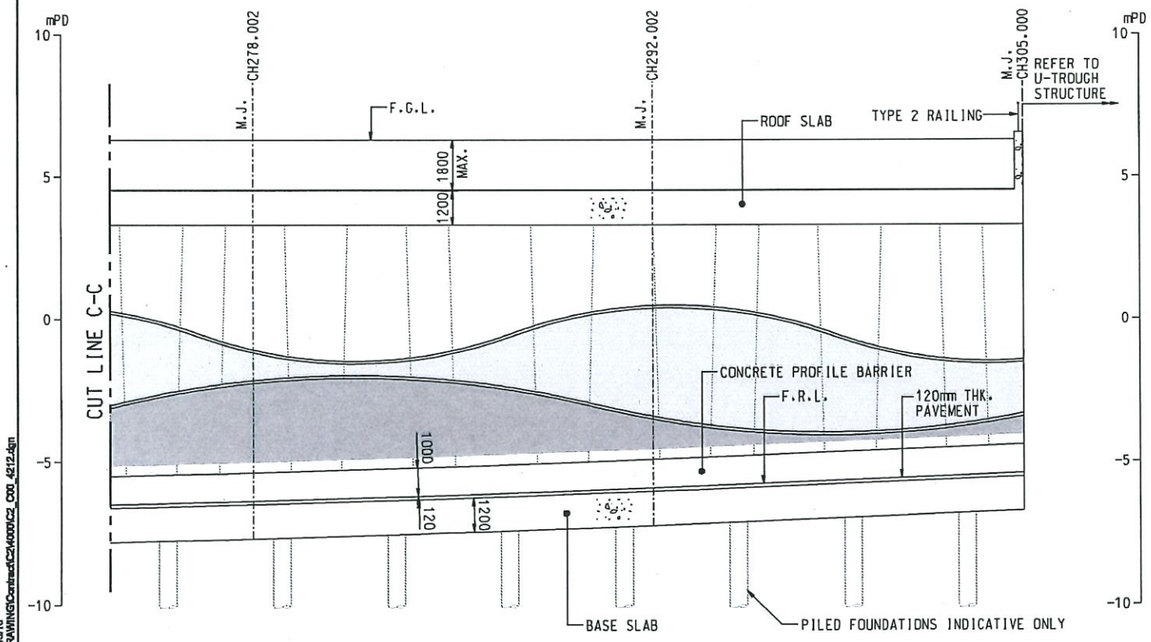
SHEET NUMBER
60308751/C2/C00/4211A



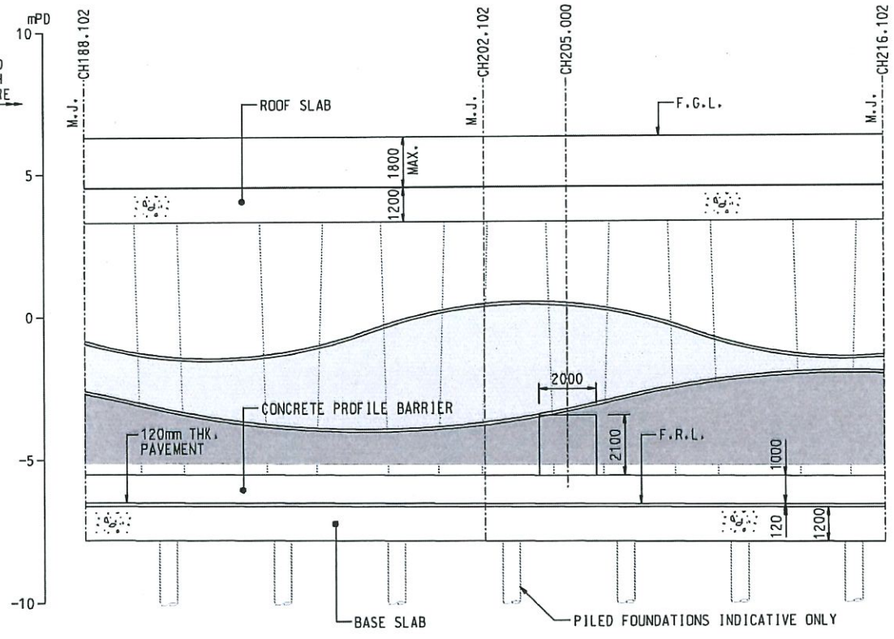
ELEVATION E - E

NOTES:

1. FOR NOTES AND LEGEND, REFER TO DRAWING NO. 60308751/C2/C00/4201.
2. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING NOS. 60308751/C2/C00/4201 AND 4211.



ELEVATION E - E



ELEVATION FOR CROSS PASSAGE
(AT S.O.L ROAD P2 UNDERPASS CH 205.00)

AECOM

PROJECT
TSEUNG KWAN O - LAM TIN TUNNEL

CONTRACT TITLE
TSEUNG KWAN O - LAM TIN TUNNEL ROAD P2 AND ASSOCIATED WORKS

CLIENT
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VR	DATE	DESCRIPTION	CHK.
B	MAR.16	TENDER ADDENDUM NO. 2	RPCM
A	FEB.16	TENDER ADDENDUM NO. 1	RPCM
-	JAN.16	TENDER DRAWING	RPCM

STATUS

SCALE: A1 1 : 100
DIMENSION UNIT: MILLIMETRES

KEY PLAN

PROJECT NO.: 60308751
CONTRACT NO.: NE/2015/02

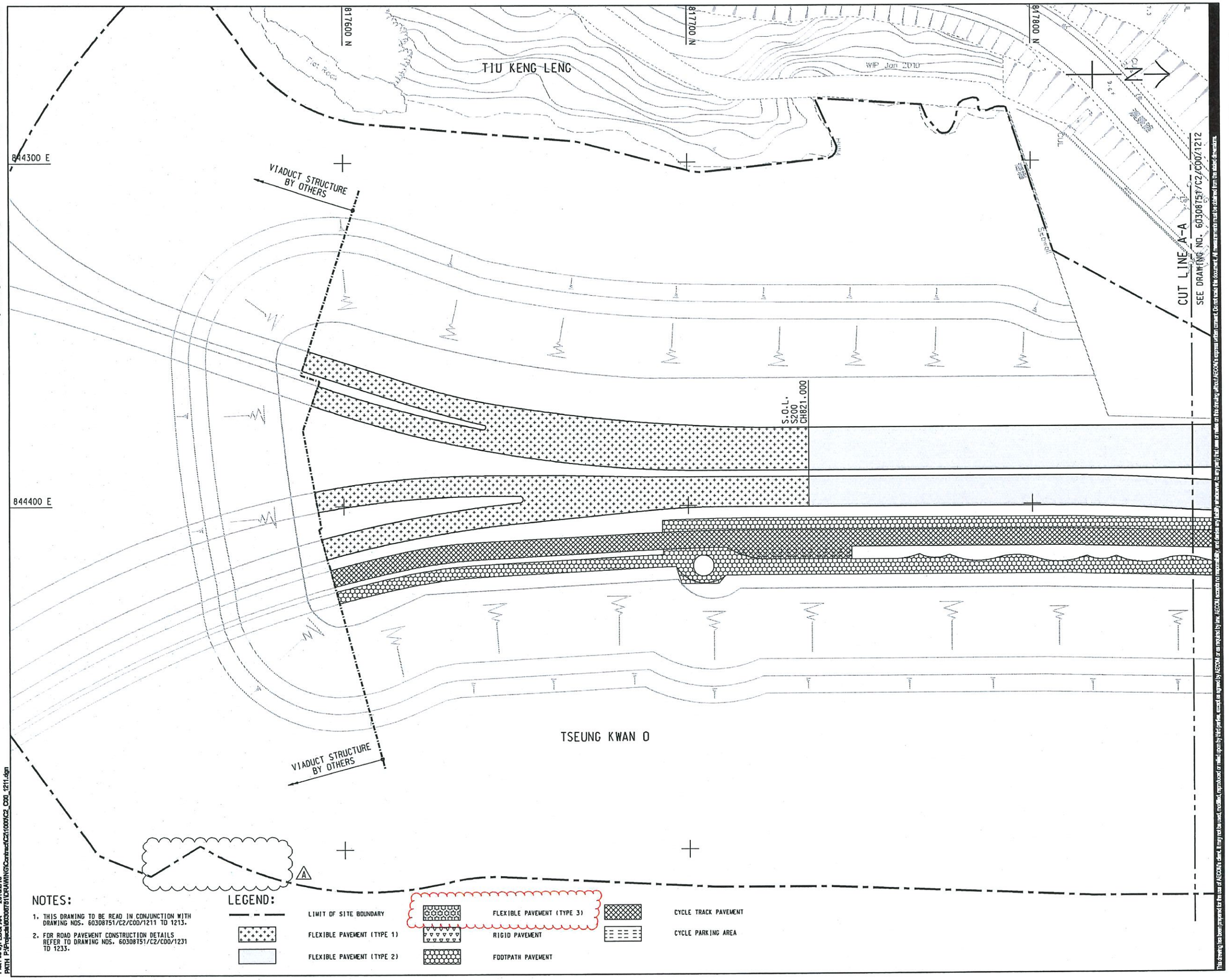
SHEET TITLE
ROAD P2 UNDERPASS - SOUTHBOUND AND CROSS PASSAGE ELEVATION
SHEET 2 OF 2

SHEET NUMBER
60308751/C2/C00/4212B

Project Management Initials: Designer: ATTH Checked: RPCM Approved: CWM ISO A1 594mm x 841mm

Plot File by: WANGFY2 2016/5/16
PATH: P:\Projects\60308751\DRAWING\Contract\C2\4000\C2_C00_4212.dgn

Project Management Initials: | Designer: ATHH | Checked: RPCM | Approved: CWN | ISO A1 594mm x 841mm



Plot File by: LUOFXA 2016/2/18
PATH: P:\Projects\60308751\DRAWING\Contract\C2\1000\C2_C00_1211.dgn

AECOM

PROJECT
TSEUNG KWAN O - LAM TIN TUNNEL

CONTRACT TITLE
TSEUNG KWAN O - LAM TIN TUNNEL ROAD P2 AND ASSOCIATED WORKS

CLIENT
土木工程拓展署 Civil Engineering and Development Department

CONSULTANT
AECOM Asia Company Ltd.
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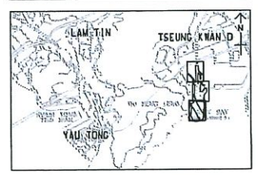
ISSUE/REVISION

VR	DATE	DESCRIPTION	CHK.
A	FEB.16	TENDER ADDENDUM NO. 1	RPCM
-	JAN.16	TENDER DRAWING	RPCM

STATUS

SCALE: A1 1 : 500
DIMENSION UNIT: METRES

KEY PLAN A1 1 : 50000

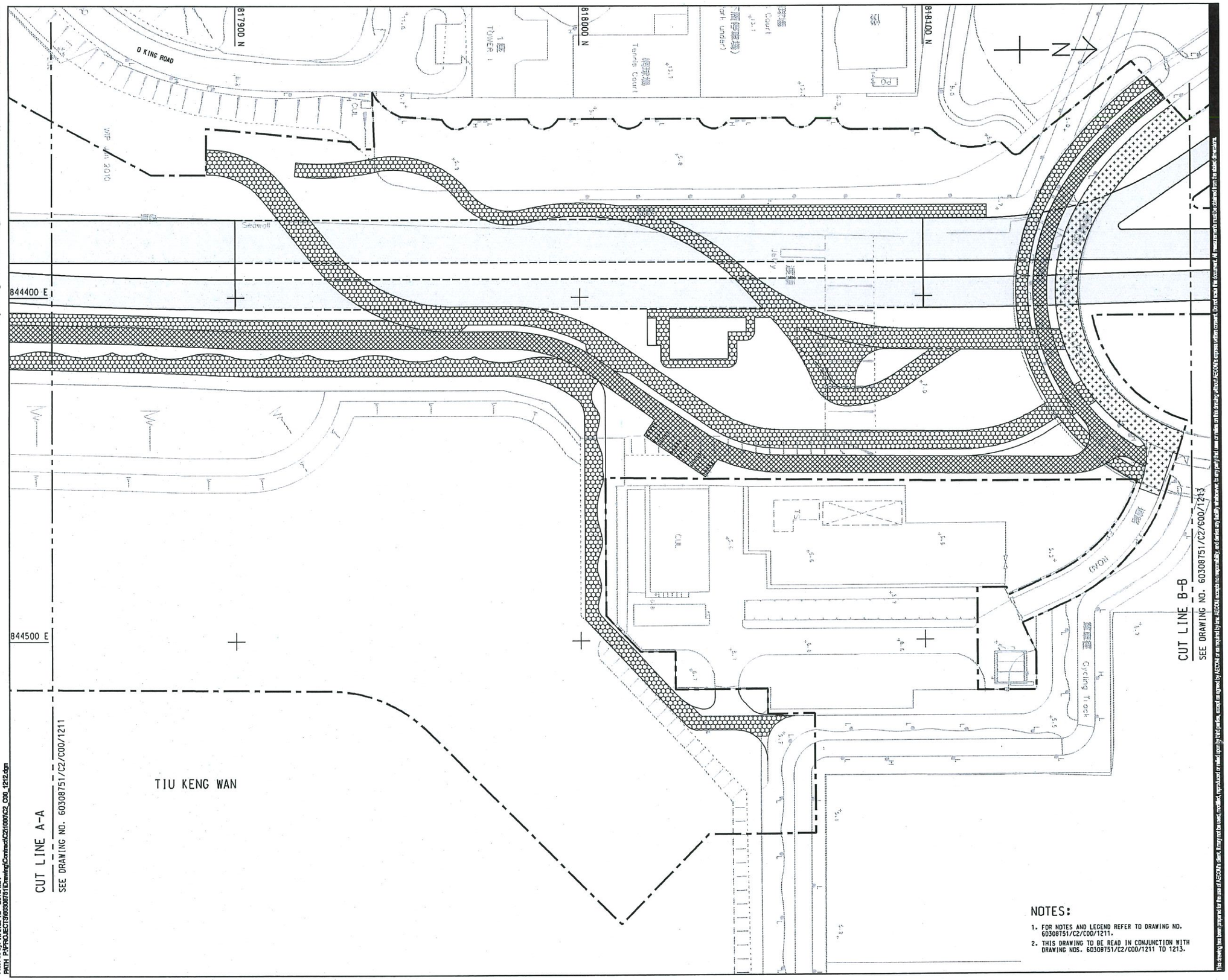


PROJECT NO.: 60308751
CONTRACT NO.: NE/2015/02

SHEET TITLE
ROAD PAVEMENT LAYOUT

SHEET 1 OF 3

SHEET NUMBER
60308751/C2/C00/1211A



NOTES:

1. FOR NOTES AND LEGEND REFER TO DRAWING NO. 60308751/C2/C00/1211.
2. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING NOS. 60308751/C2/C00/1211 TO 1213.

Project Management Initials: Designer: ATHH Checked: RPCM Approved: CWN ISO A1 594mm x 841mm

Plot File by: WANGFY2 2016/1/24
PATH: P:\PROJECTS\60308751\Drawing\Contract\C2\1000\C2_C00_1212.dgn

AECOM

PROJECT
TSEUNG KWAN O - LAM TIN TUNNEL

CONTRACT TITLE
TSEUNG KWAN O - LAM TIN TUNNEL ROAD P2 AND ASSOCIATED WORKS

CLIENT
CEDD 土木工程拓展署 Civil Engineering and Development Department

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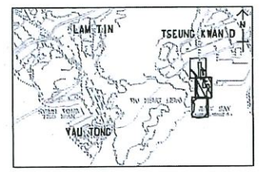
VR	DATE	DESCRIPTION	CHK
-	JAN.16	TENDER DRAWING	RPCM

STATUS

SCALE: A1 1 : 500
DIMENSION UNIT: METRES

KEY PLAN A1 1 : 50000



PROJECT NO.: 60308751
CONTRACT NO.: NE/2015/02

SHEET TITLE
ROAD PAVEMENT LAYOUT

SHEET 2 OF 3

SHEET NUMBER
60308751/C2/C00/1212

Project Management Initials: | Designer: ATHH | Checked: RPCM | Approved: CWN | ISO A1 594mm x 841mm

818200 N
818300 N
818400 N
844300 E
844400 E
844500 E

S.O.L. P2 CH250.000
S.O.L. P2 CH500.000

LNS1

CUT LINE B-B
SEE DRAWING NO. 60308751/C2/C00/1212

BY CONTRACT NO. NE/2015/02
BY OTHERS

Cycling Track
Chui Ling Road Substation
CHUI LING ROAD
CHUI TIN STREET
CHUI SHUN STREET
WIP May 2014

NOTES:

1. FOR NOTES AND LEGEND REFER TO DRAWING NO. 60308751/C2/C00/1211.
2. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING NOS. 60308751/C2/C00/1211 TO 1213.

AECOM

PROJECT
TSEUNG KWAN O - LAM TIN TUNNEL

CONTRACT TITLE
TSEUNG KWAN O - LAM TIN TUNNEL ROAD P2 AND ASSOCIATED WORKS

CLIENT
土木工程拓展署 Civil Engineering and Development Department

CONSULTANT
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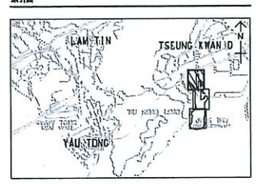
ISSUE/REVISION

VR	DATE	DESCRIPTION	CHK
-	JAN.15	TENDER DRAWING	RPCM

STATUS

SCALE: A1 1 : 500
DIMENSION UNIT

KEY PLAN A1 1 : 50000



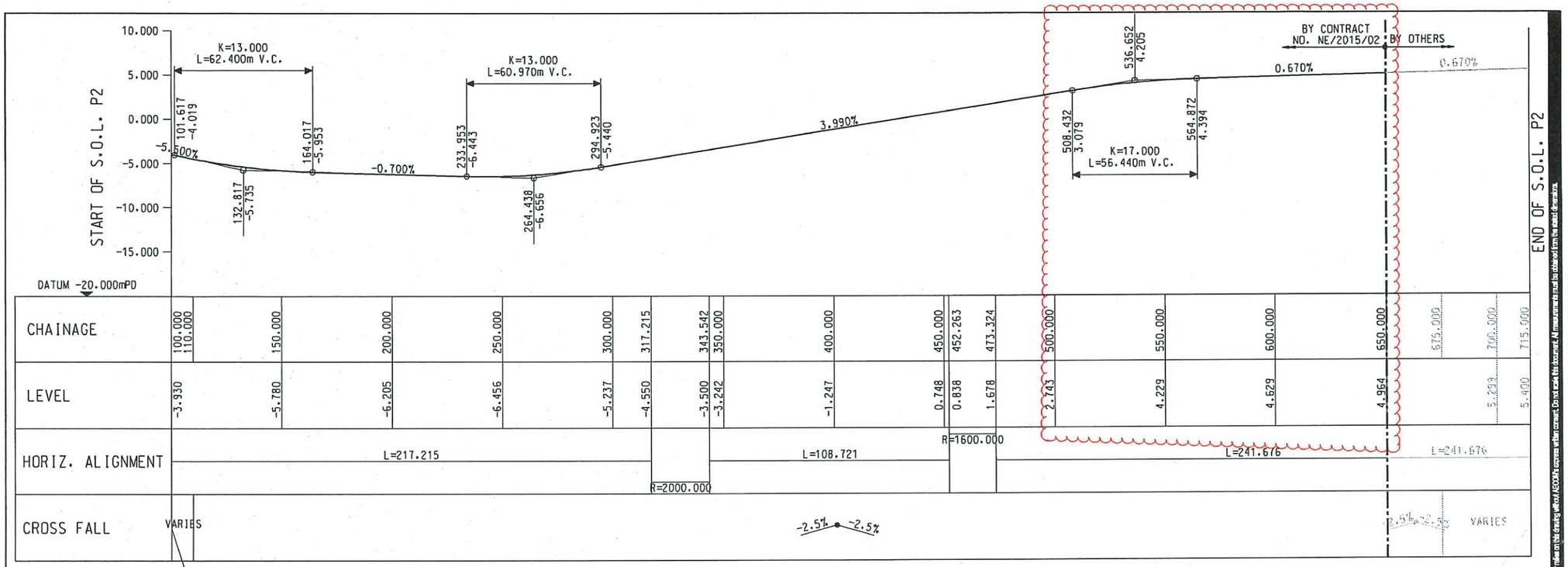
PROJECT NO. 60308751
CONTRACT NO. NE/2015/02

SHEET TITLE
ROAD PAVEMENT LAYOUT

SHEET 3 OF 3

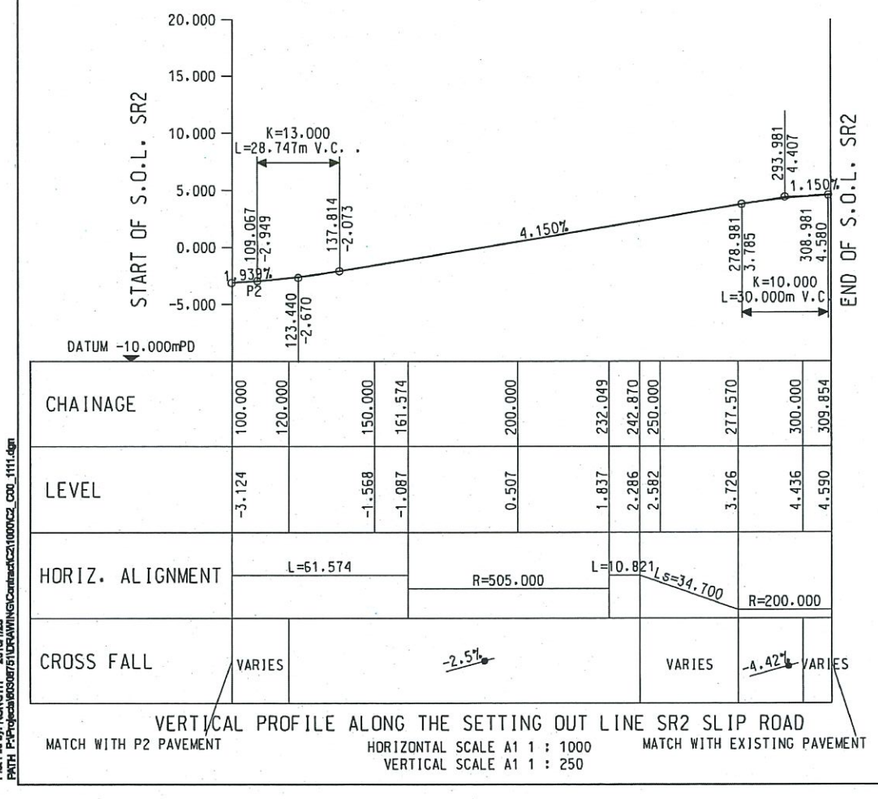
SHEET NUMBER
60308751/C2/C00/1213

Plot File by: DUW 2015/1/28
PATH: P:\Projects\60308751\DRAWING\Contract\C2\1\000\C2_C00_1213.dgn



VERTICAL PROFILE ALONG THE SETTING OUT LINE P2

HORIZONTAL SCALE A1 1 : 1000
VERTICAL SCALE A1 1 : 250

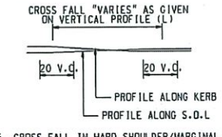


VERTICAL PROFILE ALONG THE SETTING OUT LINE SR2 SLIP ROAD

HORIZONTAL SCALE A1 1 : 1000
VERTICAL SCALE A1 1 : 250

NOTES:

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH THE SETTING OUT PLAN. DRAWING NOS. 60308751/C2/C00/1101 TO 1103.
2. ALL LEVELS SHOWN ON THE VERTICAL PROFILE ARE IN METRES ABOVE PRINCIPAL DATUM AND REFER TO THE FINISHED ROAD LEVEL ALONG SETTING OUT LINE.
3. CROSS FALL SHOWN IN THIS DRAWING IS TAKEN IN THE DIRECTION OF INCREASING CHAINAGES.
4. VERTICAL CURVE OF 20m LONG SHALL BE APPLIED AT ALL CHANGES OF GRADIENT ALONG THE CARRIAGEWAY KERB UNLESS L<20m, FOR CHANGES OF GRADIENT ALONG THE CARRIAGEWAY KERB WITH L<20m, THE VERTICAL CURVE SHALL BE L(m) LONG.



5. CROSS FALL IN HARD SHOULDER/MARGINAL STRIP SHALL BE THE SAME AS THAT OF THE ADJOINING CARRIAGEWAY UNLESS OTHERWISE SPECIFIED OR INSTRUCTED BY THE SUPERVISOR.

ABBREVIATION:

K	CONSTANT WHERE BY VERTICAL RADIUS=100 x K
R	RADIUS (METRES)
V.C.	VERTICAL CURVE (METRES)
LS	SPIRAL LENGTH (METRES)
L	STRAIGHT LINE (METRES)

AECOM

PROJECT
TSEUNG KWAN O - LAM TIN TUNNEL

CONTRACT TITLE
TSEUNG KWAN O - LAM TIN TUNNEL ROAD P2 AND ASSOCIATED WORKS

CLIENT
CEDD 土木工程拓展署 Civil Engineering and Development Department

CONSULTANT
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SUB-CONSULTANTS

ISSUE/REVISION

VR	DATE	DESCRIPTION	CHK
-	JAN.16	TENDER DRAWING	RPCM

STATUS

SCALE: A1 AS SHOWN
DIMENSION UNIT: METRES

KEY PLAN

PROJECT NO.: 60308751
CONTRACT NO.: NE/2015/02

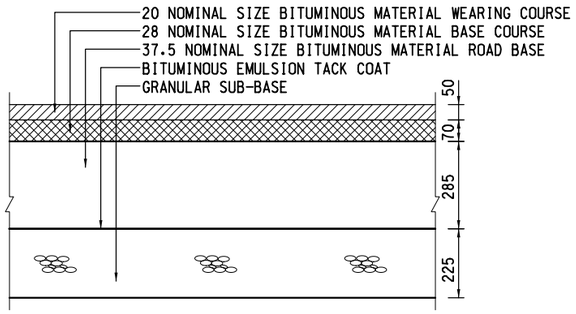
SHEET TITLE
ROAD WORKS - VERTICAL PROFILES

SHEET 1 OF 5

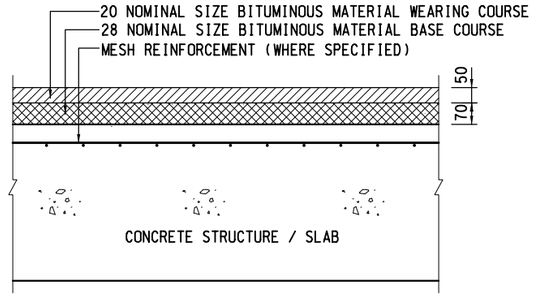
SHEET NUMBER
60308751/C2/C00/1111

Project Management Initials: Designer: ATHH Checked: RPCM Approved: CWN ISO A1 594mm x 841mm

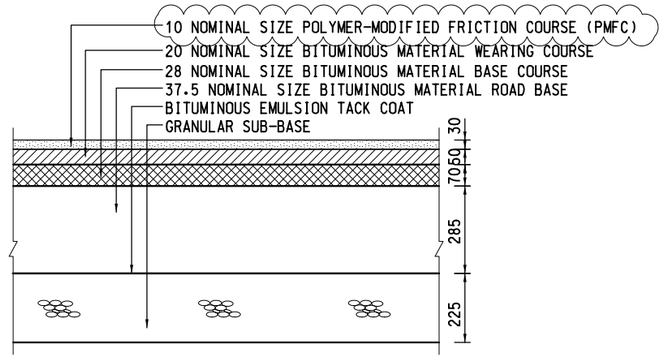
Plot File by: RONGYH 2016/1/29
PATH: P:\Projects\60308751\DRAWINGS\Contract\C2\1000\C2_C00_1111.dgn



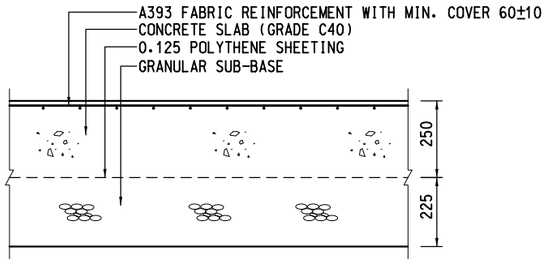
TYPICAL DETAILS FOR FLEXIBLE PAVEMENT (TYPE 1)



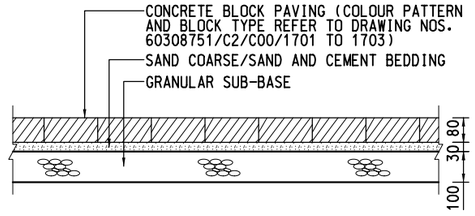
TYPICAL DETAILS FOR FLEXIBLE PAVEMENT (TYPE 2)



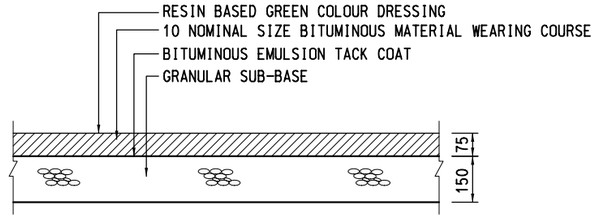
TYPICAL DETAILS FOR FLEXIBLE PAVEMENT (TYPE 3)



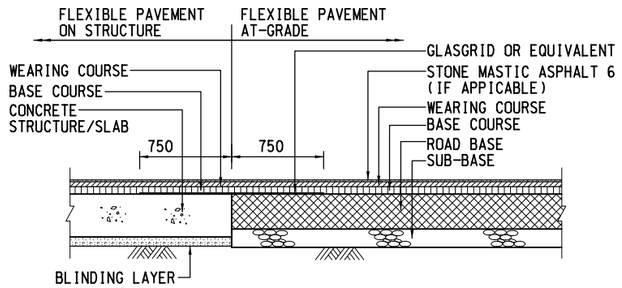
TYPICAL DETAILS FOR RIGID PAVEMENT



TYPICAL DETAILS FOR FOOTPATH PAVEMENT

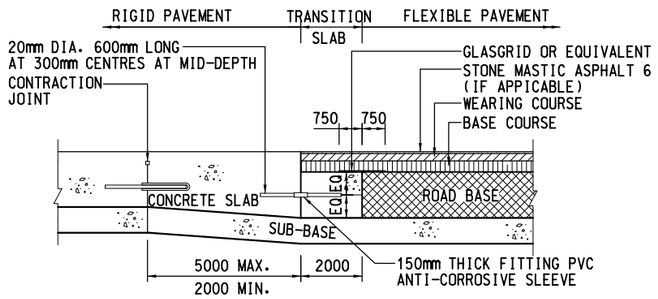


TYPICAL DETAILS FOR CYCLE TRACK PAVEMENT



TRANSITION DETAILS BETWEEN FLEXIBLE PAVEMENT ON STRUCTURE AND FLEXIBLE PAVEMENT AT-GRADE

N.T.S.



TRANSITION DETAILS BETWEEN RIGID PAVEMENT AND FLEXIBLE PAVEMENT

N.T.S.

NOTES:

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING NOS. 60308751/C2/C00/1231 TO 1233.
2. THIS DRAWING TO BE READ IN CONJUNCTION WITH THE LATEST REVISION OF HIGHWAYS DEPARTMENT STANDARD DRAWINGS INCLUDING BUT NOT LIMITED TO DRAWING NOS. H1101 TO H1134.
3. FOR MESH REINFORCEMENT DETAILS REFER TO HIGHWAYS DEPARTMENT STANDARD DRAWING NO. H1102.
4. WHERE A CAPPING LAYER IS REQUIRED, IT SHALL BE CONSTRUCTED TO GIVE A MINIMUM CBR VALUE OF 15%.
5. AT JOINTS, THE FIRST SLAB SHALL BE CAST BEFORE THE SECOND SLAB.
6. RESIN BASED COLOUR DRESSING APPROVED BY THE SUPERVISOR IN ACCORDANCE WITH PS SECTION 11 SHALL BE APPLIED ON CYCLE TRACK.
7. THE CONTRACTOR MAY SUBMIT ALTERNATIVE SUPPORT DETAILS FOR DOWEL AND TIE BARS FOR THE SUPERVISOR'S ACCEPTANCE.
8. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.

REV.	DATE	DESCRIPTION	DRAWN	PRE.	APP.
–	10-OCT-17	–	DKSS	JJL	YYL SHMY

AECOM

KEY PLAN

CONTRACT NO.
NE/2015/02

TSEUNG KWAN O – LAM TIN TUNNEL – ROAD P2 AND ASSOCIATED WORKS

ROAD WORKS DETAILS

SKETCH NO.
60308751/C2/SSK0256

REV.
–

EXTRACTED FROM DRG. NO.
60308751/C2/C00/1231

SCALE
1:20 (A3)

Plot File by : 27-Oct-17 9:03:27 AM

J:\C2\Site Sketch\SSK0256\SSK0256.dgn

CRBC - Build King Joint Venture

Construction Noise Assessment

Period: 0700 to 1900 (except general holidays)

Noise Sensitive Receiver: CM6(0-39m)

Noise Criteria: 75dB(A)

Mitigation Measures Scenario

Portion	Activity	PME	TM Ref. / other Ref.	No. of plants	SWL	Total SWL	On-time, %	Time Factor	Distance from Notional Sources, m	Distance Attenuation*, dB(A)	Barrier Correction, dB(A)	Façade Correction, dB(A)	Predicted Noise Level, dB(A)	Total Predicted Noise Level for each group, dB(A)
VI	Road P2 U-Trough B CH318-363 (Removal of Existing Abandoned Box Culvert)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	162	-52.22	0	3	50.77	
		Piling, large diameter bored, oscillator	CNP 165	1	115	115	30	-5	162	-52.22	0	3	62.77	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	162	-52.22	0	3	52.77	
		Water pump, subersible (electric)	CNP 283	2	85	88	50	-3	162	-52.22	0	3	35.78	63.44
VI	Road P2 U-Trough B CH318-363 (Installation of Dewatering System)	Air Compressor	CNP 002	3	102	107	50	-3	162	-52.22	0	3	54.54	
		Drill Rig, Rotary Type (Diesel)	CNP 072	3	110	115	50	-3	162	-52.22	-5	3	57.54	59.31
VI	Road P2 U-Trough B CH318-363 (Preboring) (Scenario 1)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	162	-52.22	0	3	50.77	
		Drill Rig, Rotary Type (Diesel)	CNP 072	1	110	110	50	-3	162	-52.22	0	3	57.77	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	162	-52.22	0	3	47.77	
		Air Compressor	CNP 002	2	102	105	50	-3	162	-52.22	0	3	52.78	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	162	-52.22	0	3	52.77	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	162	-52.22	0	3	43.77	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	162	-52.22	0	3	38.79	
		Welding Machine	CNP 107	4	99	105	50	-3	162	-52.22	0	3	52.79	61.4
VI	Road P2 U-Trough B CH318-363 (Preboring) (Scenario 2)	Crane (240 kw) (105T)	BS C4/52	2	103	106	50	-3	162	-52.22	0	3	53.78	
		Drill Rig, Rotary Type (Diesel)	CNP 072	2	110	113	50	-3	162	-52.22	0	3	53.57	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	162	-52.22	0	3	47.77	
		Air Compressor	CNP 002	4	102	108	50	-3	162	-52.22	0	3	53.58	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	162	-52.22	0	3	52.77	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	162	-52.22	0	3	43.77	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	162	-52.22	0	3	38.79	
		Welding Machine	CNP 107	4	99	105	50	-3	162	-52.22	0	3	52.79	60.66
VI	Road P2 U-Trough B CH318-363 (Sheet Piling)	Piling, Vibration Hammer	CNP 172	1	115	115	50	-3	162	-52.22	-5	3	57.77	
		Power pack (diesel)	CNP 174	1	100	100	50	-3	162	-52.22	-5	3	42.77	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	162	-52.22	0	3	38.79	
		Welding Machine	CNP 107	4	99	105	50	-3	162	-52.22	0	3	52.79	59.12
VI	Road P2 U-Trough B CH318-363 (ELS)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	162	-52.22	0	3	50.77	
		Excavator (223 kw) (40T)	BS C4/63	2	105	108	50	-3	162	-52.22	0	3	55.78	
		Dump Truck	CNP 068	1	105	105	50	-3	162	-52.22	0	3	52.77	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	162	-52.22	0	3	38.79	
		Welding Machine	CNP 107	4	99	105	50	-3	162	-52.22	0	3	52.79	59.47
VI	Road P2 U-Trough B CH318-363 (Structure)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	162	-52.22	0	3	50.77	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	162	-52.22	0	3	52.77	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	162	-52.22	0	3	50.78	
		Saw, Circular Wood	CNP 201	2	108	111	50	-3	162	-52.22	0	3	58.78	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	162	-52.22	0	3	43.77	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	162	-52.22	0	3	38.79	
		Welding Machine	CNP 107	4	99	105	50	-3	162	-52.22	0	3	52.79	61.48
VI	Road P2 U-Trough B CH318-363 Road and Drainage Works	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	162	-52.22	0	3	50.77	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	162	-52.22	0	3	52.77	
		Roller, Vibratory	BS D8/30	1	101	101	50	-3	162	-52.22	0	3	48.77	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	162	-52.22	0	3	43.77	
		Light goods vehicle, gross vehicle weight < 5.5 tonne	CNP 143	1	101	101	50	-3	162	-52.22	0	3	48.77	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	162	-52.22	0	3	38.79	
		Dump Truck	CNP 068	1	105	105	50	-3	162	-52.22	0	3	52.77	
		Road Roller	CNP 185	1	108	108	50	-3	162	-52.22	0	3	55.77	
		Welding Machine	CNP 107	4	99	105	50	-3	162	-52.22	0	3	52.79	60.96

Note: SPL = SWL + TF + DC + BC + FC, where

SPL = Predicted noise level in dB(A)

SWL = Sound Power Level in dB(A)

TF = Time factor in dB(A) = 10 log (P)

P = On-time percentage

DC = Distance attenuation correction in dB(A) = -(20 log D + 8)

D = Distance in m between the noise source and the receiver

BC = Barrier correction in dB(A)

FC = Façade correction in dB(A) = 3 dB(A)

CRBC - Build King Joint Venture

Construction Noise Assessment

Period: 0700 to 1900 (except general holidays)

Noise Sensitive Receiver: CM6(0-39m)

Noise Criteria: 75dB(A)

Mitigation Measures Scenario

Portion	Activity	PME	TM Ref. / other Ref.	No. of plants	SWL	Total SWL	On-time, %	Time Factor	Distance from Notional Sources, m	Distance Attenuation*, dB(A)	Barrier Correction, dB(A)	Façade Correction, dB(A)	Predicted Noise Level, dB(A)	Total Predicted Noise Level for each group, dB(A)
IV	DN2100 SMH9101 - 9108 (Pre-boring) (Scenario 1) - 3 drill rig	Crane (240 kw) (105T)	BS C4/52	3	103	108	50	-3	47	-41.39	-5	3	61.37	
		Drill Rig, Rotary Type (Diesel)	CNP 072	3	110	115	50	-3	178	-53.03	-11.7	3	59.46	
		Air Compressor	CNP 002	6	102	110	50	-3	47	-41.39	-5	3	61.17	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	47	-41.39	-5	3	49.60	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	47	-41.39	-5	3	44.62	
		Breaker, excavator mounted (hydraulic)	CNP 028	1	122	122	50	-3	47	-41.39	-10	3	70.60	71.81
IV	DN2100 SMH9101 - 9108 (Pre-boring) (Scenario 2) - 1 dill rig	Crane (240 kw) (105T)	BS C4/52	1	103	108	50	-3	47	-41.39	-5	3	56.60	
		Drill Rig, Rotary Type (Diesel)	CNP 072	1	110	115	50	-3	47	-41.39	-11.7	3	54.68	
		Air Compressor	CNP 002	2	102	110	50	-3	47	-41.39	-5	3	56.39	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	47	-41.39	-5	3	49.60	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	47	-41.39	-5	3	44.62	
		Breaker, excavator mounted (hydraulic)	CNP 028	1	122	122	50	-3	47	-41.39	-10	3	63.61	65.57
IV	DN2100 SMH9101 - 9108 (Sheet Piling)	Piling, Vibration Hammer	CNP 172	1	115	115	50	-3	47	-41.39	-5	3	66.38	
		Power pack (diesel)	CNP 174	1	100	100	50	-3	47	-41.39	-5	3	51.38	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	47	-41.39	-5	3	44.62	
		Excavator (223 kw) (40T)	BS C4/63	3	105	110	50	-3	47	-41.39	-5	3	63.37	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	47	-41.39	-5	3	56.61	
		Welding Machine	CNP 107	4	99	105	50	-3	47	-41.39	-5	3	58.62	68.96
IV	DN2100 SMH9101 - 9108 (ELS)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	47	-41.39	-5	3	56.60	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	47	-41.39	-5	3	44.62	
		Excavator (223 kw) (40T)	BS C4/63	3	105	110	50	-3	47	-41.39	-5	3	63.37	
		Dump Truck	CNP 068	2	105	108	50	-3	47	-41.39	-5	3	61.61	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	47	-41.39	-5	3	56.61	
		Welding Machine	CNP 107	4	99	105	50	-3	47	-41.39	-5	3	58.62	67.24
IV	Installation of DN2100 and Manhole Construction (Scenario 1)	Crane (240 kw) (105T)	BS C4/52	3	103	108	50	-3	47	-41.39	-5	3	61.37	
		Excavator (223 kw) (40T)	BS C4/63	3	105	110	50	-3	47	-41.39	-5	3	63.37	
		Dump Truck	CNP 068	2	105	108	50	-3	47	-41.39	-5	3	61.61	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	47	-41.39	-5	3	56.61	66.11
IV	Installation of DN2100 and Manhole Construction (Scenario 2)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	47	-41.39	-5	3	56.60	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	47	-41.39	-5	3	58.60	
		Roller, Vibratory	BS D8/30	1	101	101	50	-3	47	-41.39	-5	3	54.60	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	47	-41.39	-5	3	49.60	
		Light goods vehicle, gross vehicle weight < 5.5 tonne	CNP 143	1	101	101	50	-3	47	-41.39	-5	3	54.60	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	47	-41.39	-5	3	44.62	
		Dump Truck	CNP 068	1	105	105	50	-3	47	-41.39	-5	3	58.60	
		Road Roller	CNP 185	1	108	108	50	-3	47	-41.39	-5	3	61.60	66.08
IV	Road P2 Underpass CH105-318, (Non Surcharge & On Top Surcharge)(Pre Drill) (Scenario 1)	G.I. drilling rig	BS C2/43	2	102	105	50	-3	47	-41.39	-5	3	58.61	
		Drill Rig, Rotary Type (Diesel)	CNP 072	1	110	110	50	-3	47	-41.39	-5	3	63.60	
		Air Compressor	CNP 002	1	102	102	50	-3	47	-41.39	-5	3	55.60	65.29
IV	Road P2 Underpass CH105-318, (Non Surcharge & On Top Surcharge)(Pre Drill) (Scenario 2)	G.I. drilling rig	BS C2/43	4	102	108	50	-3	47	-41.39	-5	3	61.62	
		Drill Rig, Rotary Type (Diesel)	CNP 072	1	110	110	50	-3	47	-41.39	-5	3	63.60	
		Air Compressor	CNP 002	1	102	102	50	-3	47	-41.39	-5	3	55.60	66.14
IV	Road P2 Underpass CH105-318, (Non Surcharge & On Top Surcharge)(Piling) (Scenario 1)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	47	-41.39	-5	3	56.60	
		Drill Rig, Rotary Type (Diesel)	CNP 072	2	110	113	50	-3	47	-41.39	-11.7	3	59.91	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	47	-41.39	-5	3	53.60	
		Air Compressor	CNP 002	4	102	108	50	-3	47	-41.39	-5	3	61.62	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	47	-41.39	-5	3	58.60	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	47	-41.39	-5	3	49.60	
		Water pump, submersible (electric)	CNP 283	4	85	91	50	-3	47	-41.39	-5	3	44.62	65.98
IV	DN2100 SMH9101 -9103(Pre Drill & Sheetpiling works)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	47	-41.39	-5	3	56.60	
		Drill Rig, Rotary Type (Diesel)	CNP 072	1	110	110	50	-3	47	-41.39	-5	3	63.60	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	47	-41.39	-5	3	53.60	
		Air Compressor	CNP 002	1	102	102	50	-3	47	-41.39	-5	3	55.60	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	47	-41.39	-5	3	58.60	
		Piling, Vibration Hammer	CNP 172	1	115	115	50	-3	47	-41.39	-5	3	68.60	
		Power pack (diesel)	CNP 173	1	100	100	50	-3	47	-41.39	-5	3	53.60	
		Breaker, excavator mounted (hydraulic)	CNP 028	1	122	122	10	-10	47	-41.39	-10	3	63.61	71.41
IV	Road P2 Underpass CH103.5 (Sheet Piling)	Piling, Vibration Hammer	CNP 172	1	115	115	50	-3	47	-41.39	-5	3	68.60	
		Power pack (diesel)	CNP 174	1	100	100	50	-3	47	-41.39	0	3	58.60	
		Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	47	-41.39	0	3	61.60	69.74
IV	Road P2 Underpass CH105-318, (Non Surcharge & On Top Surcharge)(Piling) (Scenario 2)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	47	-41.39	-5	3	56.60	
		Drill Rig, Rotary Type (Diesel)	CNP 072	3	110	115	50	-3	47	-41.39	-11.7	3	61.67	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	47	-41.39	-5	3	53.60	
		Air Compressor	CNP 002	6	102	110	50	-3	47	-41.39	-5	3	63.38	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	47	-41.39	-5	3	58.60	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	47	-41.39	-5	3	49.60	
		Water pump, submersible (electric)	CNP 283	4	85	91	50	-3	47	-41.39	-5	3	44.62	67.14
V	Road P2 U-Trough B CH318-363 (Pre-boring) (Scenario 1)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	146	-51.26	0	3	51.73	
		Drill Rig, Rotary Type (Diesel)	CNP 072	1	110	110	50	-3	146	-51.26	-5	3	53.73	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	146	-51.26	0	3	48.73	
		Air Compressor	CNP 002	2	102	105	50	-3	146	-51.26	-5	3	48.74	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	146	-51.26	0	3	53.73	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	146	-51.26	0	3	44.73	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	146	-51.26	0	3	39.75	
		Breaker, excavator mounted (hydraulic)	CNP 028	1	122	122	50	-3	146	-51.26	-10	3	60.73	62.99
V	Road P2 U-Trough B CH318-363 (Pre-boring) (Scenario 2)	Crane (240 kw) (105T)	BS C4/52	2	103	106	50	-3	146	-51.26	0	3	54.74	
		Drill Rig, Rotary Type (Diesel)	CNP 072	2	110	113	50	-3	146	-51.26	-5	3	54.52	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	146	-51.26	0	3	48.73	
		Air Compressor	CNP 002	4	102	108	50	-3	146	-51.26	-5	3	49.53	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	146	-51.26	0	3	53.73	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	146	-51.26	0	3	44.73	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	146	-51.26	0	3	39.75	60.09
V	Road P2 U-Trough B CH318-363 (Sheet Piling)	Piling, Vibration Hammer	CNP 172	1	115	115	50	-3	146	-51.26	-5	3	58.73	
		Power pack (diesel)	CNP 174	1	100	100	50	-3	146	-51.26	-5	3	43.73	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	146	-51.26	0	3	39.75	58.92
V	Road P2 U-Trough B CH318-363 (ELS)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	146	-51.26	0	3	51.73	
		Excavator (223 kw) (40T)	BS C4/63	2	105	108	50	-3	146	-51.26	0	3	56.74	
		Dump Truck	CNP 068	1	105	105	50	-3	146	-51.26	0	3	53.73	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	146	-51.26	0	3	39.75	
		Welding Machine	CNP 107	4	99	105	50	-3	146	-51.26	0	3	53.75	60.43
V	Road P2 U-Trough B CH318-363 (Structure)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	146	-51.26	0	3	51.73	
		Excavator (223 kw) (40T)	BS C4/63	2	105	108	50	-3	146	-51.26	0	3	56.74	
		Dump Truck	CNP 068	1	105	105	50	-3	146	-51.26	0	3	53.73	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	146	-51.26	0	3	51.74	
		Saw, Circular Wood	CNP 201	2	108	111	50	-3	146	-51.26	0	3	59.74	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	146	-51.26	0	3	44.73	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	146	-51.26	0	3	39.75	
														62.98
V	Road P2 U-Trough B CH318-363 Road and Drainage Works	Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	146	-51.26	0	3	53.73	
		Roller, Vibratory	BS D8/30	1	101	101	50	-3	146	-51.26	0	3	49.73	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	146	-51.26	0	3	44.73	
		Light goods vehicle, gross vehicle weight < 5.5 tonne	CNP 143	1	101	101	50	-3	146	-51.26	0	3	49.73	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	146	-51.26	0	3	39.75	
		Dump Truck	CNP 068	1	105	105	50	-3	146	-51.26	0	3	53.73	
		Road Roller	CNP 185	1	108	108	50	-3	146	-51.26	0	3	56.73	60.68
V	Modification of Vertical Seawall	Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	146	-51.26	0	3	53.73	
		Drill Rig, Rotary Type (Diesel)	CNP 072	1	110	101	50	-3	146	-51.26	0	3	58.73	
		Derrick Barge	CNP 061	1	104	96	50	-3	146	-51.26	0	3	52.73	60.68
VII	DN2100 SMH9108-Outfall (Pre-boring)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	119	-49.49	0	3	53.50	
		Drill Rig, Rotary Type (Diesel)	CNP 072	1	110	110	50	-3	119	-49.49	0	3	60.50	
		Air Compressor	CNP 002	2	102	105	50	-3	119	-49.49	0	3	55.51	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	119	-49.49	0	3	55.50	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	119	-49.49	0	3	46.50	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	119	-49.49	0	3	41.52	63.26
VII	DN2100 SMH9108-Outfall (Sheet Piling)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	119	-49.49	0	3	53.50	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	119	-49.49	0	3	50.50	
		Breaker, excavator mounted (hydraulic)	CNP 028	1	122	122	50	-3	119	-49.49	0	3	72.50	
		Piling, Vibration Hammer	CNP 172	1	115	115	50	-3	119	-49.49	0	3	65.50	
		Power pack (diesel)	CNP 174	1	100	100	50	-3	119	-49.49	0	3	50.50	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	119	-49.49	0	3	55.50	
		Dump Truck	CNP 068	1	105	105	50	-3	119	-49.49	0	3	55.50	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	119	-49.49	0	3	41.52	75.53
VII	Installation of DN2100 and Manhole Construction and Outfall Installation	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	119	-49.49	0	3	53.50	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	119	-49.49	0	3	55.50	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	119	-49.49	0	3	46.50	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	119	-49.49	0	3	41.52	
		Road Roller	CNP 185	1	108	108	50	-3	119	-49.49	0	3	58.50	61.29
VII	U Trough A&B S200 CH890 - CH980 (Pre Drill)	G.I. drilling rig	BS C2/43	1	102	102	50	-3	119	-49.49	0	3	52.50	52.50
VII	U Trough A&B S200 CH890 - CH980 (Piling)	Drill Rig, Rotary Type (Diesel)	CNP 072	2	110	113	50	-3	119	-49.49	-5	3	58.51	
		Air Compressor	CNP 002	4	102	108	50	-3	119	-49.49	0	3	58.52	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	119	-49.49	0	3	55.50	62.5
VII	U Trough A&B S200 CH890 - CH980 (Sheet Piling)	Piling, Vibration Hammer	CNP 172	1	115	115	50	-3	119	-49.49	-5	3	60.50	
		Power pack (diesel)	CNP 174	1	100	100	50	-3	119	-49.49	0	3	50.50	
		Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	119	-49.49	0	3	53.50	61.64
IX	Seawall Construction	Dredger	CNP 070	2	103	106	50	-3	225	-55.06	0	3	50.94	
		Derrick Barge	CNP 061	4	104	110	50	-3	225	-55.06	0	3	54.95	
		Tug boat	CNP 221	2	110	113	50	-3	225	-55.06	0	3	57.94	
		Water pump, subersible (electric)	CNP 283	6	85	93	50	-3	225	-55.06	0	3	37.71	
		Dump Truck	CNP 068	1	105	105	50	-3	225	-55.06	0	3	49.93	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	225	-55.06	0	3	47.94	
		Winch (Electric)	CNP 262	4	95	101	50	-3	225	-55.06	-5	3	40.95	
		Excavator (223 kw) (40T)	BS C4/63	3	105	110	50	-3	225	-55.06	0	3	54.70	
		Vibration Hammer	CNP 172	1	115	115	50	-3	225	-55.06	0	3	59.93	
		Breaker, excavator mounted (hydraulic)	CNP 028	3	122	127	50	-3	225	-55.06	-10	3	61.70	
		Ro-Ro Barge	-	1	-	-	50	-3	225	-55.06	-	3	-	
		Hopper barge	-	6	-	-	50	-3	225	-55.06	0	3	-	66.02
IX	Steel Cofferdam and Water Gate Installation	Derrick Barge	CNP 061	3	104	109	50	-3	225	-55.06	0	3	60.19	
		Tug boat	CNP 221	2	110	113	50	-3	225	-55.06	0	3	64.43	65.82
IX	Marine Ground Treatment	Band Drain Machine (hydarulic Vibratory lance starting up)	BS D4/107a	2	113	116	50	-3	225	-55.06	-5	3	55.94	55.94

Note: SPL = SWL + TF + DC + BC + FC, where

SPL = Predicted noise level in dB(A)

SWL = Sound Power Level in dB(A)

TF = Time factor in dB(A) = 10 log (P)

P = On-time percentage

DC = Distance attenuation correction in dB(A) = -(20 log D + 8)

D = Distance in m between the noise source and the receiver

BC = Barrier correction in dB(A)

FC = Façade correction in dB(A) = 3 dB(A)

CRBC - Build King Joint Venture

Construction Noise Assessment

Period: 0700 to 1900 (except general holidays)

Noise Sensitive Receiver: CM6(0-39m)

Noise Criteria: 75dB(A)

Mitigation Measures Scenario

Portion	Activity	PME	TM Ref. / other Ref.	No. of plants	SWL	Total SWL	On-time, %	Time Factor	Distance from Notional Sources, m	Distance Attenuation*,dB(A)	Barrier Correction, dB(A)	Façade Correction, dB(A)	Predicted Noise Level, dB(A)	Total Predicted Noise Level for each group, dB(A)
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Backfilling)	Road Roller	CNP 185	1	108	108	50	-3	225	-55.06	0	3	52.93	
		Excavator (223 kw) (40T)	BS C4/63	2	105	108	50	-3	225	-55.06	0	3	52.94	55.95
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888(Pre Drill) (Scenario 1)	G.I. drilling rig	BS C2/43	2	102	105	50	-3	225	-55.06	0	3	49.94	49.94
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888(Pre Drill) (Scenario 2)	G.I. drilling rig	BS C2/43	3	102	107	50	-3	225	-55.06	0	3	51.70	51.70
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888(Pre Drill) (Scenario 3)	G.I. drilling rig	BS C2/43	4	102	108	50	-3	225	-55.06	0	3	52.95	52.95
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888(Pre Drill) (Scenario 4)	G.I. drilling rig	BS C2/43	5	102	109	50	-3	225	-55.06	0	3	53.92	53.92
IX	Road P2 Underpass CH105-318 (Removal of Temporary 1500 Drain)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	225	-55.06	0	3	47.92	
		Piling, large diameter bored, oscillator	CNP 165	1	115	115	50	-3	225	-55.06	0	3	59.92	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	225	-55.06	0	3	44.92	
		Water pump, subersible (electric)	CNP 283	2	85	88	50	-3	225	-55.06	0	3	32.93	60.32
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 1)	Crane (240 kw) (105T)	BS C4/52	2	103	106	50	-3	225	-55.06	0	3	50.94	
		Drill Rig, Rotary Type (Diesel)	CNP 072	2	110	113	50	-3	225	-55.06	-5	3	52.94	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	225	-55.06	0	3	47.94	
		Air Compressor	CNP 002	4	102	108	50	-3	225	-55.06	0	3	52.95	
		Excavator (223 kw) (40T)	BS C4/63	3	105	110	50	-3	225	-55.06	0	3	54.70	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	225	-55.06	0	3	40.93	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	225	-55.06	0	3	35.95	
		Dump Truck	CNP 068	1	105	105	50	-3	225	-55.06	0	3	49.93	
		Welding Machine	CNP 107	2	99	102	50	-3	225	-55.06	0	3	46.94	60.17
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 2)	Crane (240 kw) (105T)	BS C4/52	6	103	111	50	-3	225	-55.06	0	3	55.71	
		Drill Rig, Rotary Type (Diesel)	CNP 072	6	110	118	50	-3	225	-55.06	-5	3	57.71	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	6	100	108	50	-3	225	-55.06	0	3	52.71	
		Air Compressor	CNP 002	12	102	113	50	-3	225	-55.06	0	3	57.72	
		Excavator (223 kw) (40T)	BS C4/63	4	105	111	50	-3	225	-55.06	0	3	55.95	
		Concrete Lorry Mixer	BS D6/33	2	96	99	50	-3	225	-55.06	0	3	43.94	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	225	-55.06	0	3	35.95	
		Dump Truck	CNP 068	3	105	110	50	-3	225	-55.06	0	3	54.70	
		Welding Machine	CNP 107	4	99	105	50	-3	225	-55.06	0	3	49.95	64.08
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 3)	Crane (240 kw) (105T)	BS C4/52	7	103	111	50	-3	225	-55.06	0	3	56.38	
		Drill Rig, Rotary Type (Diesel)	CNP 072	7	110	118	50	-3	225	-55.06	-5	3	58.38	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	7	100	108	50	-3	225	-55.06	0	3	53.38	
		Air Compressor	CNP 002	14	102	113	50	-3	225	-55.06	0	3	58.39	
		Excavator (223 kw) (40T)	BS C4/63	4	105	111	50	-3	225	-55.06	0	3	55.95	
		Concrete Lorry Mixer	BS D6/33	4	96	102	50	-3	225	-55.06	0	3	46.95	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	225	-55.06	0	3	35.95	
		Dump Truck	CNP 068	4	105	111	50	-3	225	-55.06	0	3	55.95	
		Welding Machine	CNP 107	7	99	107	50	-3	225	-55.06	0	3	52.38	64.84
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 4)	Crane (240 kw) (105T)	BS C4/52	8	103	112	50	-3	225	-55.06	0	3	56.96	
		Drill Rig, Rotary Type (Diesel)	CNP 072	8	110	119	50	-3	225	-55.06	-5	3	58.96	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	8	100	109	50	-3	225	-55.06	0	3	53.96	
		Air Compressor	CNP 002	16	102	114	50	-3	225	-55.06	0	3	58.97	
		Excavator (223 kw) (40T)	BS C4/63	6	105	113	50	-3	225	-55.06	0	3	57.71	
		Concrete Lorry Mixer	BS D6/33	6	96	104	50	-3	225	-55.06	0	3	48.71	
		Water pump, subersible (electric)	CNP 283	8	85	94	50	-3	225	-55.06	0	3	38.96	
		Dump Truck	CNP 068	6	105	113	50	-3	225	-55.06	0	3	57.71	
		Welding Machine	CNP 107	8	99	108	50	-3	225	-55.06	0	3	52.96	65.78
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 5)	Crane (240 kw) (105T)	BS C4/52	9	103	113	50	-3	225	-55.06	0	3	57.48	
		Drill Rig, Rotary Type (Diesel)	CNP 072	9	110	120	50	-3	225	-55.06	-5	3	59.48	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	9	100	110	50	-3	225	-55.06	0	3	54.48	
		Air Compressor	CNP 002	18	102	115	50	-3	225	-55.06	0	3	59.49	
		Excavator (223 kw) (40T)	BS C4/63	6	105	113	50	-3	225	-55.06	0	3	57.71	
		Concrete Lorry Mixer	BS D6/33	6	96	104	50	-3	225	-55.06	0	3	48.71	
		Water pump, subersible (electric)	CNP 283	9	85	95	50	-3	225	-55.06	0	3	39.48	
		Dump Truck	CNP 068	6	105	113	50	-3	225	-55.06	0	3	57.71	
		Welding Machine	CNP 107	9	99	109	50	-3	225	-55.06	0	3	53.48	66.13
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 6)	Crane (240 kw) (105T)	BS C4/52	12	103	114	50	-3	225	-55.06	0	3	58.72	
		Drill Rig, Rotary Type (Diesel)	CNP 072	12	110	121	50	-3	225	-55.06	-5	3	60.72	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	8	100	109	50	-3	225	-55.06	0	3	53.96	
		Air Compressor	CNP 002	24	102	116	50	-3	225	-55.06	0	3	60.73	
		Excavator (223 kw) (40T)	BS C4/63	6	105	113	50	-3	225	-55.06	0	3	57.71	
		Concrete Lorry Mixer	BS D6/33	6	96	104	50	-3	225	-55.06	0	3	48.71	
		Water pump, subersible (electric)	CNP 283	8	85	94	50	-3	225	-55.06	0	3	38.96	
		Dump Truck	CNP 068	6	105	113	50	-3	225	-55.06	0	3	57.71	
		Welding Machine	CNP 107	8	99	108	50	-3	225	-55.06	0	3	52.96	66.83
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 7)	Crane (240 kw) (105T)	BS C4/52	15	103	115	50	-3	225	-55.06	0	3	59.69	
		Drill Rig, Rotary Type (Diesel)	CNP 072	15	110	122	50	-3	225	-55.06	-5	3	61.69	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	10	100	110	50	-3	225	-55.06	0	3	54.93	
		Air Compressor	CNP 002	30	102	117	50	-3	225	-55.06	0	3	61.70	
		Excavator (223 kw) (40T)	BS C4/63	10	105	115	50	-3	225	-55.06	0	3	59.93	
		Concrete Lorry Mixer	BS D6/33	8	96	105	50	-3	225	-55.06	0	3	49.96	
		Water pump, subersible (electric)	CNP 283	15	85	97	50	-3	225	-55.06	0	3	41.69	
		Dump Truck	CNP 068	8	105	114	50	-3	225	-55.06	0	3	58.96	
		Welding Machine	CNP 107	12	99	110	50	-3	225	-55.06	0	3	54.72	68.05
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Installation of Dewatering System)	Drill Rig, Rotary Type (Diesel)	CNP 072	2	110	113	50	-3	225	-55.06	-5	3	52.94	
		Air Compressor	CNP 002	2	102	105	50	-3	225	-55.06	0	3	49.94	54.71
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (ELS) (Sheet Piling) (Scenario 1)	Crane (240 kw) (105T)	BS C4/52	2	103	106	50	-3	225	-55.06	0	3	50.94	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	225	-55.06	0	3	47.94	
		Piling, Vibration Hammer	CNP 172	2	115	118	50	-3	225	-55.06	0	3	62.94	
		Power pack (diesel)	CNP 174	2	100	103	50	-3	225	-55.06	0	3	47.94	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	225	-55.06	0	3	35.95	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	225	-55.06	0	3	49.93	
		Welding Machine	CNP 107	4	99	105	50	-3	225	-55.06	0	3	49.95	63.84
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (ELS) (Sheet Piling) (Scenario 2)	Crane (240 kw) (105T)	BS C4/52	3	103	108	50	-3	225	-55.06	0	3	52.70	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	3	100	105	50	-3	225	-55.06	0	3	49.70	
		Piling, Vibration Hammer	CNP 172	3	115	120	50	-3	225	-55.06	0	3	64.70	
		Power pack (diesel)	CNP 174	3	100	105	50	-3	225	-55.06	0	3	49.70	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	225	-55.06	0	3	35.95	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	225	-55.06	0	3	49.93	
		Welding Machine	CNP 107	4	99	105	50	-3	225	-55.06	0	3	49.95	65.48
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (ELS) (Welding & Excavation) (Scenario 1)	Crane (240 kw) (105T)	BS C4/52	2	103	106	50	-3	225	-55.06	0	3	50.94	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	225	-55.06	0	3	47.94	
		Excavator (223 kw) (40T)	BS C4/63	2	105	108	50	-3	225	-55.06	0	3	52.94	
		Dump Truck	CNP 068	2	105	108	50	-3	225	-55.06	0	3	52.94	
		Water pump, subersible (electric)	CNP 283	5	85	92	50	-3	225	-55.06	0	3	36.92	
		Welding Machine	CNP 107	2	99	102	50	-3	225	-55.06	0	3	46.94	
		Derrick Barge	CNP 061	1	104	104	50	-3	225	-55.06	0	3	48.93	58.53
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (ELS) (Welding & Excavation) (Scenario 2)	Crane (240 kw) (105T)	BS C4/52	4	103	109	50	-3	225	-55.06	0	3	53.95	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	4	100	106	50	-3	225	-55.06	0	3	50.95	
		Excavator (223 kw) (40T)	BS C4/63	4	105	111	50	-3	225	-55.06	0	3	55.95	
		Dump Truck	CNP 068	2	105	108	50	-3	225	-55.06	0	3	52.94	
		Water pump, subersible (electric)	CNP 283	20	85	98	50	-3	225	-55.06	0	3	42.94	
		Welding Machine	CNP 107	4	99	105	50	-3	225	-55.06	0	3	49.95	
		Derrick Barge	CNP 061	2	104	107	50	-3	225	-55.06	0	3	51.94	60.93
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Structure) (Scenario 1)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	225	-55.06	0	3	47.93	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	225	-55.06	0	3	44.93	
		Air Blower	CNP 006	1	95	95	50	-3	225	-55.06	0	3	39.93	
		Saw, Circular Wood	CNP 201	1	108	108	50	-3	225	-55.06	0	3	52.93	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	225	-55.06	0	3	40.93	
		Concrete pump, stationary/lorry mounted	CNP 047	1	109	109	50	-3	225	-55.06	0	3	53.93	
		Poker, vibratory, hand-held	CNP 170	1	113	113	50	-3	225	-55.06	0	3	57.93	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	225	-55.06	0	3	35.95	60.74
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Structure) (Scenario 2)	Crane (240 kw) (105T)	BS C4/52	3	103	108	50	-3	225	-55.06	0	3	52.70	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	3	100	105	50	-3	225	-55.06	0	3	49.70	
		Air Blower	CNP 006	3	95	100	50	-3	225	-55.06	0	3	44.70	
		Saw, Circular Wood	CNP 201	3	108	113	50	-3	225	-55.06	0	3	57.70	
		Concrete Lorry Mixer	BS D6/33	3	96	101	50	-3	225	-55.06	0	3	45.70	
		Concrete pump, stationary/lorry mounted	CNP 047	3	109	114	50	-3	225	-55.06	0	3	58.70	
		Poker, vibratory, hand-held	CNP 170	3	113	118	50	-3	225	-55.06	0	3	62.70	
		Water pump, subersible (electric)	CNP 283	6	85	93	50	-3	225	-55.06	0	3	37.71	65.50
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Structure) (Scenario 3)	Crane (240 kw) (105T)	BS C4/52	5	103	110	50	-3	225	-55.06	0	3	54.92	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	5	100	107	50	-3	225	-55.06	0	3	51.92	
		Air Blower	CNP 006	5	95	102	50	-3	225	-55.06	0	3	46.92	
		Saw, Circular Wood	CNP 201	5	108	115	50	-3	225	-55.06	0	3	59.92	
		Concrete Lorry Mixer	BS D6/33	5	96	103	50	-3	225	-55.06	0	3	47.92	
		Concrete pump, stationary/lorry mounted	CNP 047	5	109	116	50	-3	225	-55.06	0	3	60.92	
		Poker, vibratory, hand-held	CNP 170	5	113	120	50	-3	225	-55.06	0	3	64.92	
		Water pump, subersible (electric)	CNP 283	6	85	93	50	-3	225	-55.06	0	3	37.71	67.71
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Structure) (Scenario 4)	Crane (240 kw) (105T)	BS C4/52	6	103	111	50	-3	225	-55.06	0	3	55.71	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	6	100	108	50	-3	225	-55.06	0	3	52.71	
		Air Blower	CNP 006	6	95	103	50	-3	225	-55.06	0	3	47.71	
		Saw, Circular Wood	CNP 201	6	108	116	50	-3	225	-55.06	0	3	60.71	
		Concrete Lorry Mixer	BS D6/33	6	96	104	50	-3	225	-55.06	0	3	48.71	
		Concrete pump, stationary/lorry mounted	CNP 047	6	109	117	50	-3	225	-55.06	0	3	61.71	
		Poker, vibratory, hand-held	CNP 170	6	113	121	50	-3	225	-55.06	0	3	65.71	
		Water pump, subersible (electric)	CNP 283	6	85	93	50	-3	225	-55.06	0	3	37.71	68.51
IX	U - Trough (Road and Drainage Works)	Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	225	-55.06	0	3	49.93	
		Roller, Vibratory	BS D8/30	1	101	101	50	-3	225	-55.06	0	3	45.93	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	225	-55.06	0	3	40.93	
		Light goods vehicle, gross vehicle weight < 5.5 tonne	CNP 143	1	101	101	50	-3	225	-55.06	0	3	45.93	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	225	-55.06	0	3	35.95	
		Dump Truck	CNP 068	1	105	105	50	-3	225	-55.06	0	3	49.93	
		Road Roller	CNP 185	1	108	108	50	-3	225	-55.06	0	3	52.93	56.89

Note: SPL = SWL + TF + DC + BC + FC, where

SPL = Predicted noise level in dB(A)

SWL = Sound Power Level in dB(A)

TF = Time factor in dB(A) = 10 log (P)

P = On-time percentage

DC = Distance attenuation correction in dB(A) = -(20 log D + 8)

D = Distance in m between the noise source and the receiver

BC = Barrier correction in dB(A)

FC = Façade correction in dB(A) = 3 dB(A)

CRBC - Build King Joint Venture

Construction Noise Assessment

Period: 0700 to 1900 (except general holidays)

Noise Sensitive Receiver: CM7(0-39m)

Noise Criteria: 75dB(A)

Mitigation Measures Scenario

Portion	Activity	PME	TM Ref. / other Ref.	No. of plants	SWL	Total SWL	On-time, %	Time Factor	Distance from Notional Sources, m	Distance Attenuation*, dB(A)	Barrier Correction, dB(A)	Façade Correction, dB(A)	Predicted Noise Level, dB(A)	Total Predicted Noise Level for each group, dB(A)
VI	Road P2 U-Trough B CH318-363 (Removal of Existing Abandoned Box Culvert)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	157	-51.95	0	3	51.04	
		Piling, large diameter bored, oscillator	CNP 165	1	115	115	30	-5	157	-51.95	0	3	60.83	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	157	-51.95	0	3	53.04	
		Water pump, subersible (electric)	CNP 283	2	85	88	50	-3	157	-51.95	0	3	36.05	61.88
VI	Road P2 U-Trough B CH318-363 (Installation of Dewatering System)	Air Compressor	CNP 002	3	102	107	50	-3	157	-51.95	0	3	54.82	
		Drill Rig, Rotary Type (Diesel)	CNP 072	3	110	115	50	-3	157	-51.95	-5	3	57.82	59.58
VI	Road P2 U-Trough B CH318-363 (Preboring) (Scenario 1)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	157	-51.95	0	3	51.04	
		Drill Rig, Rotary Type (Diesel)	CNP 072	1	110	110	50	-3	157	-51.95	0	3	58.04	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	157	-51.95	0	3	48.04	
		Air Compressor	CNP 002	2	102	105	50	-3	157	-51.95	0	3	53.05	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	157	-51.95	0	3	53.04	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	157	-51.95	0	3	44.04	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	157	-51.95	0	3	39.06	
		Welding Machine	CNP 107	4	99	105	50	-3	157	-51.95	0	3	53.06	61.67
VI	Road P2 U-Trough B CH318-363 (Preboring) (Scenario 2)	Crane (240 kw) (105T)	BS C4/52	2	103	106	50	-3	157	-51.95	0	3	54.05	
		Drill Rig, Rotary Type (Diesel)	CNP 072	2	110	113	50	-3	157	-51.95	0	3	53.84	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	157	-51.95	0	3	48.04	
		Air Compressor	CNP 002	4	102	108	50	-3	157	-51.95	0	3	53.85	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	157	-51.95	0	3	53.04	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	157	-51.95	0	3	44.04	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	157	-51.95	0	3	39.06	
		Welding Machine	CNP 107	4	99	105	50	-3	157	-51.95	0	3	53.06	60.93
VI	Road P2 U-Trough B CH318-363 (Sheet Piling)	Piling, Vibration Hammer	CNP 172	1	115	115	50	-3	157	-51.95	-5	3	58.04	
		Power pack (diesel)	CNP 174	1	100	100	50	-3	157	-51.95	-5	3	43.04	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	157	-51.95	0	3	39.06	
		Welding Machine	CNP 107	4	99	105	50	-3	157	-51.95	0	3	53.06	59.39
VI	Road P2 U-Trough B CH318-363 (ELS)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	157	-51.95	0	3	51.04	
		Excavator (223 kw) (40T)	BS C4/63	2	105	108	50	-3	157	-51.95	0	3	56.05	
		Dump Truck	CNP 068	1	105	105	50	-3	157	-51.95	0	3	53.04	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	157	-51.95	0	3	39.06	
		Welding Machine	CNP 107	4	99	105	50	-3	157	-51.95	0	3	53.06	59.74
VI	Road P2 U-Trough B CH318-363 (Structure)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	157	-51.95	0	3	51.04	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	157	-51.95	0	3	53.04	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	157	-51.95	0	3	51.05	
		Saw, Circular Wood	CNP 201	2	108	111	50	-3	157	-51.95	0	3	59.05	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	157	-51.95	0	3	44.04	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	157	-51.95	0	3	39.06	
		Welding Machine	CNP 107	4	99	105	50	-3	157	-51.95	0	3	53.06	61.75
VI	Road P2 U-Trough B CH318-363 Road and Drainage Works	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	157	-51.95	0	3	51.04	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	157	-51.95	0	3	53.04	
		Roller, Vibratory	BS D8/30	1	101	101	50	-3	157	-51.95	0	3	49.04	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	157	-51.95	0	3	44.04	
		Light goods vehicle, gross vehicle weight < 5.5 tonne	CNP 143	1	101	101	50	-3	157	-51.95	0	3	49.04	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	157	-51.95	0	3	39.06	
		Dump Truck	CNP 068	1	105	105	50	-3	157	-51.95	0	3	53.04	
		Road Roller	CNP 185	1	108	108	50	-3	157	-51.95	0	3	56.04	
		Welding Machine	CNP 107	4	99	105	50	-3	157	-51.95	0	3	53.06	61.24
VIII	Road P2 U-Trough A&B CH363-411 & Road SR2 U-Trough B CH110-170 (Pre-boring)	Crane (240 kw) (105T)	BS C4/52	2	103	106	50	-3	224	-55.02	0	3	50.98	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	4	100	106	50	-3	224	-55.02	0	3	50.99	
		Air Compressor	CNP 002	4	102	108	50	-3	224	-55.02	0	3	52.99	
		Drill Rig, Rotary Type (Diesel)	CNP 072	2	110	113	50	-3	224	-55.02	-5	3	52.98	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	224	-55.02	0	3	49.97	
		Concrete Lorry Mixer	BS D6/33	2	96	99	50	-3	224	-55.02	0	3	43.98	
		Piling, Vibration Hammer	CNP 172	1	115	115	50	-3	224	-55.02	0	3	59.97	
		Power pack (diesel)	CNP 174	1	100	100	50	-3	224	-55.02	0	3	44.97	
		Water pump, subersible (electric)	CNP 283	2	85	88	50	-3	224	-55.02	0	3	32.98	62.55
VIII	Road P2 U-Trough A&B CH363-411 & Road SR2 U-Trough B CH110-170 (ELS)	Crane (240 kw) (105T)	BS C4/52	2	103	106	50	-3	224	-55.02	0	3	50.98	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	4	100	106	50	-3	224	-55.02	0	3	50.99	
		Air Compressor	CNP 002	4	102	108	50	-3	224	-55.02	0	3	52.99	
		Piling, Vibration Hammer	CNP 172	2	115	118	50	-3	224	-55.02	0	3	62.98	
		Power pack (diesel)	CNP 174	2	100	103	50	-3	224	-55.02	0	3	47.98	
		Excavator (223 kw) (40T)	BS C4/63	4	105	111	50	-3	224	-55.02	0	3	55.99	
		Breaker, excavator mounted (hydraulic)	CNP 028	1	122	122	50	-3	224	-55.02	-10	3	56.97	
		Dump Truck	CNP 068	2	105	108	50	-3	224	-55.02	0	3	52.98	
		Water pump, subersible (electric)	CNP 283	16	85	97	50	-3	224	-55.02	0	3	42.01	65.57
VIII	Road P2 U-Trough A&B CH363-411 & Road SR2 U-Trough B CH110-170(Backfilling)	Piling, Vibration Hammer	CNP 172	2	115	118	50	-3	224	-55.02	0	3	62.98	
		Excavator (223 kw) (40T)	BS C4/63	4	105	111	50	-3	224	-55.02	0	3	55.99	
		Roller, Vibratory	BS D8/30	2	101	104	50	-3	224	-55.02	0	3	48.98	
		Breaker, excavator mounted (hydraulic)	CNP 028	1	122	122	50	-3	224	-55.02	0	3	56.97	
		Dump Truck	CNP 068	2	105	108	50	-3	224	-55.02	0	3	52.98	
		Water pump, subersible (electric)	CNP 283	16	85	97	50	-3	224	-55.02	0	3	42.01	65.02
VIII	Road P2 U-Trough B CH318-363 (Installation of Dewatering System)	Air Compressor	CNP 002	3	102	107	50	-3	224	-55.02	-5	3	46.74	
		Drill Rig, Rotary Type (Diesel)	CNP 072	3	110	115	50	-3	224	-55.02	-5	3	54.74	55.38
VIII	Road P2 U-Trough A&B CH363-411 & Road SR2 U-Trough B CH110-170 (Structure)	Crane (240 kw) (105T)	BS C4/52	2	103	106	50	-3	224	-55.02	0	3	50.98	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	224	-55.02	0	3	47.98	
		Air Compressor	CNP 002	2	102	105	50	-3	224	-55.02	0	3	49.98	
		Saw, Circular Wood	CNP 201	2	108	111	50	-3	224	-55.02	0	3	55.98	
		Concrete Lorry Mixer	BS D6/33	2	96	99	50	-3	224	-55.02	0	3	43.98	
		Poker, Vibratory, Handheld	CNP 170	2	113	116	50	-3	224	-55.02	0	3	60.98	
		Concrete Pump	CNP 047	2	109	112	50	-3	224	-55.02	0	3	56.98	
		Water pump, subersible (electric)	CNP 283	16	85	97	50	-3	224	-55.02	0	3	42.01	63.94
VIII	Road P2 U-Trough A&B CH363-411 & Road SR2 U-Trough B CH110-170 Road and Drainage Works	Excavator (223 kw) (40T)	BS C4/63	2	105	108	50	-3	224	-55.02	0	3	52.98	
		Roller, Vibratory	BS D8/30	2	101	104	50	-3	224	-55.02	0	3	48.98	
		Saw, Circular Wood	CNP 201	2	108	111	50	-3	224	-55.02	0	3	55.98	
		Asphalt Paver	BS DB/24	1	101	101	50	-3	224	-55.02	0	3	45.97	
		Dump Truck	CNP 068	2	105	108	50	-3	224	-55.02	0	3	52.98	
		Lorry	BS D8/25	2	96	99	50	-3	224	-55.02	0	3	43.98	
		Crane	BS D7/114	2	101	104	50	-3	224	-55.02	0	3	48.98	
		Concrete Pump	CNP 047	1	109	109	50	-3	224	-55.02	0	3	53.97	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	224	-55.02	0	3	40.97	
		Poker, Vibratory, Handheld	CNP 170	1	113	113	50	-3	224	-55.02	0	3	57.97	
		Power Rammer Petrol	CNP 169	1	108	108	50	-3	224	-55.02	0	3	52.97	
		Water pump, subersible (electric)	CNP 283	16	85	97	50	-3	224	-55.02	0	3	42.01	63.26

Note: SPL = SWL + TF + DC + BC + FC, where

SPL = Predicted noise level in dB(A)

SWL = Sound Power Level in dB(A)

TF = Time factor in dB(A) = 10 log (P)

P = On-time percentage

DC = Distance attenuation correction in dB(A) = -(20 log D + 8)

D = Distance in m between the noise source and the receiver

BC = Barrier correction in dB(A)

FC = Façade correction in dB(A) = 3 dB(A)

CRBC - Build King Joint Venture

Construction Noise Assessment

Period: 0700 to 1900 (except general holidays)

Noise Sensitive Receiver: CM8

Noise Criteria: 75dB(A)

Portion	Activity	PME	TM Ref. / other Ref.	No. of plants	SWL	Total SWL	On-time, %	Time Factor	Distance from Notional Sources, m	Distance Attenuation*,dB(A)	Barrier Correction, dB(A)	Façade Correction, dB(A)	Predicted Noise Level, dB(A)	Total Predicted Noise Level for each group, dB(A)	Total Predicted Noise Level Portion II dB(A)
III	Demolition of DSD Transformer Room	Breaker, excavator mounted (hydraulic)	CNP 028	1	122	122	50	-3	116	-49.29	-5	3	67.70		
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	116	-49.29	0	3	60.70		
		Lorry	BS D8/25	1	96	96	50	-3	116	-49.29	0	3	46.70		
		Water pump, subersible (electric)	CNP 283	2	85	88	50	-3	116	-49.29	0	3	38.71	68	68
II	Retaining Wall	Excavator (223 kw) (40T)	BS C4/63	2	105	108	50	-3	257	-56.20	0	3	51.80		
		Dump Truck	CNP 068	2	105	108	50	-3	257	-56.20	0	3	51.80		
		Saw, Circular Wood	CNP 201	4	108	114	50	-3	257	-56.20	0	3	57.81		
		Bar Bender and Cutter	CNP 021	4	90	96	50	-3	257	-56.20	0	3	39.81		
		Water pump, subersible (electric)	CNP 283	2	85	88	50	-3	257	-56.20	0	3	31.80		
		Concrete Lorry Mixer	BS D6/33	2	96	99	50	-3	257	-56.20	0	3	42.80		
		Roller, Vibratory	BS D8/30	1	101	101	50	-3	257	-56.20	0	3	44.79	59.86	59.86
	Area A	Excavator (223 kw) (40T)	BS C4/63	4	105	111	50	-3	217	-54.73	0	3	56.28		
		Dump Truck	CNP 068	1	105	105	50	-3	217	-54.73	0	3	50.26		
		Breaker, excavator mounted (hydraulic)	CNP 028	1	122	122	50	-3	217	-54.73	-10	3	57.26		
		Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	217	-54.73	0	3	48.26		
		Water pump, subersible (electric)	CNP 283	3	85	90	50	-3	217	-54.73	0	3	35.03	60.54	60.54
Construction of Northern Footbridge	Pre-drilling works (Near Tiu Keng Leng Sports Centre) Feb 17 to Mar, 17	Drill Rig	CNP 072	1	110	110	20	-7	60	-43.56	-5	3	57.45		
		Breaker, excavator mounted (hydraulic)	CNP 028	1	122	122	20	-7	60	-43.56	-5	3	69.45	69.71	69.71
Construction of Northern Footbridge	Construction of soldier wall (Near Tiu Keng Leng Sports Centre) Apr 17 to Oct 17	Air Compressor	CNP 002	1	102	102	20	-7	60	-43.56	-5	3	49.45		
		Crane	BS D7/114	1	101	101	20	-7	60	-43.56	0	3	53.45		
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	40	-4	60	-43.56	0	3	55.46		
		Concrete Lorry Mixer	BS D6/33	2	96	99	20	-7	60	-43.56	0	3	51.46		
		Piling, Vibration Hammer	CNP 172	1	115	115	20	-7	60	-43.56	-5	3	62.45		
		Water Pump, Submersible (electric)	CNP 283	1	85	85	10	-10	60	-43.56	0	3	34.44		
		Excavator	BS D8/13	1	110	110	20	-7	60	-43.56	0	3	62.45	66.35	
Construction of Northern Footbridge	Pre-drilling & Piling works (Near Park Central Block 6) Aug 17 to Oct, 17	Drill Rig	CNP 072	1	110	110	30	-5	93	-47.37	-5	3	55.40		
		Breaker, excavator mounted (hydraulic)	CNP 028	1	122	122	30	-5	93	-47.37	-5	3	67.40		
		Air Compressor	CNP 002	1	102	102	20	-7	93	-47.37	-5	3	45.64		
		Crane	BS D7/114	1	101	101	20	-7	93	-47.37	0	3	49.64		
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	40	-4	93	-47.37	0	3	51.65		
		Concrete Lorry Mixer	BS D6/33	2	96	99	20	-7	93	-47.37	0	3	47.65		
		Piling, Vibration Hammer	CNP 172	1	115	115	20	-7	93	-47.37	-5	3	58.64		
		Water Pump, Submersible (electric)	CNP 283	1	85	85	10	-10	93	-47.37	0	3	30.63		
		Excavator	BS D8/13	1	110	110	20	-7	93	-47.37	0	3	58.64	68.83	70.78
Construction of Northern Footbridge	Construction of Footbridge (Near Park Central Block 6) Nov 17 to Apr 19	Crane	BS D7/114	1	101	101	40	-4	60	-43.56	0	3	56.46		
		Dump Truck	BS D8/25	1	105	105	20	-7	60	-43.56	0	3	57.45		
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	70	-2	60	-43.56	0	3	57.89		
		Concrete Lorry Mixer	BS D6/33	2	96	99	30	-5	60	-43.56	0	3	53.22		
		Saw, Circular Wood	CNP 201	4	108	114	60	-2	60	-43.56	-5	3	66.22		
		Water Pump, Submersible (electric)	CNP 283	1	85	85	20	-7	60	-43.56	0	3	37.45	67.79	
Construction of Northern Footbridge	Construction of Footbridge (Near Tiu Keng Leng Sports Centre) Nov 17 to Apr 19	Crane	BS D7/114	1	101	101	40	-4	93	-47.37	0	3	52.65		
		Dump Truck	BS D8/25	1	105	105	20	-7	93	-47.37	0	3	53.64		
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	70	-2	93	-47.37	0	3	54.08		
		Concrete Lorry Mixer	BS D6/33	2	96	99	30	-5	93	-47.37	0	3	49.41		
		Saw, Circular Wood	CNP 201	4	108	114	60	-2	93	-47.37	-5	3	62.41		
		Water Pump, Submersible (electric)	CNP 283	1	85	85	20	-7	93	-47.37	0	3	33.64	63.99	69.30

Note: SPL = SWL + TF + DC + BC + FC, where

SPL = Predicted noise level in dB(A)

SWL = Sound Power Level in dB(A)

TF = Time factor in dB(A) = 10 log (P)

P = On-time percentage

DC = Distance attenuation correction in dB(A) = -(20 log D + 8)

D = Distance in m between the noise source and the receiver

BC = Barrier correction in dB(A)

FC = Façade correction in dB(A) = 3 dB(A)

NE/2015/02

Associated Cumulative Noise Levels

NSR CM6 (0-39m)

Portion	Activity	2018				2019												2020												2021			
		Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
I	DSD Transformer Room																																
IV	DN2100 SMH9101 - 9108 (Pre-boring) (Scenario 1) - 3 drill rig																																
IV	DN2100 SMH9101 - 9108 (Pre-boring) (Scenario 2) - 1 dill rig	65.6	65.6	65.6																													
IV	DN2100 SMH9101 - 9108 (Sheet Piling)	69.0	69.0	69.0	69.0																												
IV	DN2100 SMH9101 - 9108 (ELS)	67.2	67.2	67.2	67.2	67.2																											
IV	Installation of DN2100 and Manhole Construction (Scenario 1)	66.1	66.1	66.1	66.1																												
IV	Installation of DN2100 and Manhole Construction (Scenario 2)					66.1	66.1	66.1																									
IV	Road P2 Underpass CH105-318, (Non Surcharge & On Top Surcharge) (Pre Drill) (Scenario 1) - 2 G.I. Rig				65.3		65.3	65.3																									
IV	Road P2 Underpass CH105-318, (Non Surcharge & On Top Surcharge) (Pre Drill) (Scenario 2) - 4 G.I. Rig					66.1																											
IV	Road P2 Underpass CH105-318, (Non Surcharge & On Top Surcharge) (Piling) (Scenario 1) - 2 Drill Rig													66.0	66.0																		
IV	Road P2 Underpass CH105-318, (Non Surcharge & On Top Surcharge) (Piling) (Scenario 2) - 3 Drill Rig							67.1	67.1	67.1	67.1	67.1	67.1																				
IV	Road P2 Underpass CH103.5 (Sheet Piling)													69.7	69.7																		
IV	DN2100 SMH9101 -9103(Pre Drill & Sheetpiling works)																			71.4	71.4	71.4	71.4										
V	Road P2 U-Trough B CH318-363 (Pre-boring) (Scenario 1) - Drill Rig																																
V	Road P2 U-Trough B CH318-363 (Pre-boring) (Scenario 2) - 2 Drill Rig	60.1	60.1	60.1																													
V	Road P2 U-Trough B CH318-363 (Sheet Piling)	58.9	58.9	58.9	58.9	58.9																											
V	Road P2 U-Trough B CH318-363 (ELS)		60.4	60.4	60.4																												
V	Road P2 U-Trough B CH318-363 (Structure)					63.0	63.0	63.0	63.0	63.0	63.0	63.0	63.0	63.0																				
V	Road P2 U-Trough B CH318-363 Road and Drainage Works							60.7	60.7	60.7	60.7	60.7	60.7	60.7																				
V	Modification of Vertical Seawall										60.7	60.7	60.7	60.7	60.7	60.7	60.7																
VI	Road P2 U-Trough B CH318-363 (Removal of Existing Abandoned Box Culvert)																																
VI	Road P2 U-Trough B CH318-363 (Installation of Dewatering System)	59.3	59.3	59.3	59.3	59.3																											
VI	Road P2 U-Trough B CH318-363 (Preboring) (Scenario 1)																																
VI	Road P2 U-Trough B CH318-363 (Preboring) (Scenario 2)	60.7																															
VI	Road P2 U-Trough B CH318-363 (Sheet Piling)	59.1																															
VI	Road P2 U-Trough B CH318-363 (ELS)		59.5	59.5	59.5																												
VI	Road P2 U-Trough B CH318-363 (Structure)					61.5	61.5	61.5	61.5	61.5	61.5	61.5	61.5	61.5																				
VI	Road P2 U-Trough B CH318-363 Road and Drainage Works							61.0	61.0	61.0	61.0	61.0	61.0	61.0																				
VII	DN2100 SMH9108-Outfall (Pre-boring)																																
VII	DN2100 SMH9108-Outfall (Sheet Piling)																																
VII	Installation of DN2100 and Manhole Construction and Outfall Installation	61.3	61.3	61.3	61.3	61.3	61.3																										
VII	U Trough A&B S200 CH890 - CH980 (Pre Drill)												52.5	52.5	52.5	52.5																	
VII	U Trough A&B S200 CH890 - CH980 (Piling)												62.5	62.5	62.5	62.5	62.5																
VII	U Trough A&B S200 CH890 - CH980 (Sheet Piling)														61.6	61.6	61.6																
IX	Steel Cofferdam & Water Gate Installation																																
IX	Seawall Construction	66.0	66.0	66.0	66.0	66.0	66.0	66.0	66.0	66.0	66.0	66.0	66.0	66.0	66.0	66.0	66.0	66.0	66.0	66.0	66.0	66.0	66.0	66.0									
IX	Marine Ground Treatment	55.9	55.9	55.9	55.9	55.9	55.9																										
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Backfilling)	56.0	56.0	56.0	56.0	56.0	56.0																										
IX	Road P2 Underpass CH105-318, (Removal of Temporary 1500 Drain)								60.3	60.3																							
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888(Pre Drill) (Scenario 1) - 2 G.I Rig									49.9			49.9	49.9						49.9	49.9	49.9	49.9	49.9									
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888(Pre Drill) (Scenario 2) - 3 G.I. Rig							51.7										51.7	51.7														
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888(Pre Drill) (Scenario 3) - 4 G.I. Rig					53.0																											
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888(Pre Drill) (Scenario 4) - 5 G.I. Rig						53.9					53.9			53.9	53.9	53.9																
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 1) - 2 Drill Rig					60.2	60.2																										
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 2) - 6 Drill Rig													64.1	64.1						64.1	64.1	64.1	64.1									
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 3) - 7 Drill Rig															64.8	64.8	64.8	64.8														
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 4) - 8 Drill Rig											65.8	65.8																				
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 5) - 9 Drill Rig																			66.1	66.1												
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 6) - 12 Drill Rig									66.8																							
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 7) - 15 Drill Rig										68.1																						
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Installation of Dewatering System)											54.7	54.7																				
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (ELS) (Sheet Piling) (Scenario 1) - 2 Vibration hammer							63.8	63.8	63.8			63.8	63.8	63.8	63.8	63.8	63.8	63.8	63.8													
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (ELS) (Sheet Piling) (Scenario 2) - 3 Vibration hammer																				65.8	65.8	65.8	65.8									
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (ELS) (Welding & Excavation) (Scenario 1)											58.5	58.5	58.5	58.5	58.5	58.5			58.5													
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (ELS) (Welding & Excavation) (Scenario 2)																	60.9	60.9														
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Structure) (Scenario 1) - 1 Set																													60.7			
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Structure) (Scenario 2) - 3 Set																											65.5					
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Structure) (Scenario 3) - 5 Set																	67.7	67.7	67.7		67.7	67.7	67.7	67.7	67.7							
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Structure) (Scenario 4) - 6 Set																					68.5											
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888Road and Drainage Works																										56.9	56.9	56.9	56.9	56.9	56.9	56.9
	Cumulative Noise / dB(A)	75	75	75	75	74	73	74	73	74	74	73	74	75	74	72	72	70	72	75	75	75	75	72	69	68	68	66	62	57	57	57	57
		Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
		2018				2019												2020												2021			

NSR CM7

Portion	Activity	2018				2019												2020											
		Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
VI	Road P2 U-Trough B CH318-363 (Removal of Existing Abandoned Box Culvert)																												
VI	Road P2 U-Trough B CH318-363 (Installation of Dewatering System)	59.6	59.6																										
VI	Road P2 U-Trough B CH318-363 (Preboring) (Scenario 1)																												
VI	Road P2 U-Trough B CH318-363 (Preboring) (Scenario 2)	60.9																											
VI	Road P2 U-Trough B CH318-363 (Sheet Piling)	59.4																											
VI	Road P2 U-Trough B CH318-363 (ELS)		59.7	59.7	59.7																								
VI	Road P2 U-Trough B CH318-363 (Structure)					61.8	61.8	61.8	61.8	61.8	61.8	61.8	61.8	61.8															
VI	Road P2 U-Trough B CH318-363 Road and Drainage Works							61.2	61.2	61.2	61.2	61.2	61.2	61.2															
VIII	Road P2 U-Trough A&B CH363-411 & Road SR2 U-Trough B CH110-170 (Pre-boring)																												
VIII	Road P2 U-Trough A&B CH363-411 & Road SR2 U-Trough B CH110-170 (ELS)															65.6	65.6	65.6	65.6										
VIII	Road P2 U-Trough A&B CH363-411 & Road SR2 U-Trough B CH110-170 (Installation of Dewatering system)																55.4	55.4											
VIII	Road P2 U-Trough A&B CH363-411 & Road SR2 U-Trough B CH110-170(Backfilling)																								65.0	65.0	65.0		
VIII	Road P2 U-Trough A&B CH363-411 & Road SR2 U-Trough B CH110-170 (Structure)																								63.9	63.9	63.9		
VIII	Road P2 U-Trough A&B CH363-411 & Road SR2 U-Trough B CH110-170 Road and Drainage Works															63.3	63.3	63.3	63.3	63.3	63.3	63.3	63.3	63.3	63.3	63.3	63.3	63.3	63.3
	Cumulative Noise / dB(A)	65	63	60	60	62	62	65	65	65	65	65	65	65	0	68	68	68	68	63	63	63	63	63	69	69	69	63	63
		Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		2018				2019												2020											

NSR CM8

Portion	Activity	2018				2019												2020				
		Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
III	Demolition of DSD Transformer Room																					
II	Retaining Wall					59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9
Area A		63.6	63.6	63.6	63.6	63.6	63.6	63.6	63.6	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5					
Construction of Northern Footbridge	Pre-drilling works (Near Tiu Keng Leng Sports Centre)																					
Construction of Northern Footbridge	Construction of soldier wall (Near Tiu Keng Leng Sports Centre)																					
Construction of Northern Footbridge	Pre-drilling & Piling works (Near Park Central Block 6)																					
Construction of Northern Footbridge	Construction of Footbridge (Near Park Central Block 6)	67.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8													
Construction of Northern Footbridge	Construction of Footbridge (Near Tiu Keng Leng Sports Centre)	64.0	64.0	64.0	64.0	64.0	64.0	64.0	64.0													
	Cumulative Noise / dB(A)	70	70	70	70	71	71	71	71	63	63	63	63	63	63	63	63	60	60	60	60	60
		Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
		2018				2019												2020				

CRBC - Build King Joint Venture

Construction Noise Assessment

Period: 0700 to 1900 (except general holidays)

Noise Sensitive Receiver: CM6(Above 39m)

Noise Criteria: 75dB(A)

Mitigation Measures Scenario

Portion	Activity	PME	TM Ref. / other Ref.	No. of plants	SWL	Total SWL	On-time, %	Time Factor	Distance from Notional Sources, m	Distance Attenuation*, dB(A)	Barrier Correction, dB(A)	Façade Correction, dB(A)	Predicted Noise Level, dB(A)	Total Predicted Noise Level for each group, dB(A)
VI	Road P2 U-Trough B CH318-363 (Removal of Existing Abandoned Box Culvert)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	167	-52.43	0	3	50.55	
		Piling, large diameter bored, oscillator	CNP 165	1	115	115	30	-5	167	-52.43	0	3	62.55	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	167	-52.43	0	3	52.55	
		Water pump, subersible (electric)	CNP 283	2	85	88	50	-3	167	-52.43	0	3	35.57	63.22
VI	Road P2 U-Trough B CH318-363 (Installation of Dewatering System)	Air Compressor	CNP 002	3	102	107	50	-3	167	-52.43	0	3	54.33	
		Drill Rig, Rotary Type (Diesel)	CNP 072	3	110	115	50	-3	167	-52.43	-5	3	57.33	59.09
VI	Road P2 U-Trough B CH318-363 (Preboring) (Scenario 1)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	167	-52.43	0	3	50.55	
		Drill Rig, Rotary Type (Diesel)	CNP 072	1	110	110	50	-3	167	-52.43	0	3	57.55	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	167	-52.43	0	3	47.55	
		Air Compressor	CNP 002	2	102	105	50	-3	167	-52.43	0	3	52.57	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	167	-52.43	0	3	52.55	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	167	-52.43	0	3	43.55	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	167	-52.43	0	3	38.58	
		Welding Machine	CNP 107	4	99	105	50	-3	167	-52.43	0	3	52.58	61.18
VI	Road P2 U-Trough B CH318-363 (Preboring) (Scenario 2)	Crane (240 kw) (105T)	BS C4/52	2	103	106	50	-3	167	-52.43	0	3	53.57	
		Drill Rig, Rotary Type (Diesel)	CNP 072	2	110	113	50	-3	167	-52.43	0	3	53.35	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	167	-52.43	0	3	47.55	
		Air Compressor	CNP 002	4	102	108	50	-3	167	-52.43	0	3	53.36	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	167	-52.43	0	3	52.55	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	167	-52.43	0	3	43.55	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	167	-52.43	0	3	38.58	
		Welding Machine	CNP 107	4	99	105	50	-3	167	-52.43	0	3	52.58	60.44
VI	Road P2 U-Trough B CH318-363 (Sheet Piling)	Piling, Vibration Hammer	CNP 172	1	115	115	50	-3	167	-52.43	-5	3	57.55	
		Power pack (diesel)	CNP 174	1	100	100	50	-3	167	-52.43	-5	3	42.55	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	167	-52.43	0	3	38.58	
		Welding Machine	CNP 107	4	99	105	50	-3	167	-52.43	0	3	52.58	58.9
VI	Road P2 U-Trough B CH318-363 (ELS)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	167	-52.43	0	3	50.55	
		Excavator (223 kw) (40T)	BS C4/63	2	105	108	50	-3	167	-52.43	0	3	55.57	
		Dump Truck	CNP 068	1	105	105	50	-3	167	-52.43	0	3	52.55	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	167	-52.43	0	3	38.58	
		Welding Machine	CNP 107	4	99	105	50	-3	167	-52.43	0	3	52.58	59.25
VI	Road P2 U-Trough B CH318-363 (Structure)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	167	-52.43	0	3	50.55	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	167	-52.43	0	3	52.55	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	167	-52.43	0	3	50.57	
		Saw, Circular Wood	CNP 201	2	108	111	50	-3	167	-52.43	0	3	58.57	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	167	-52.43	0	3	43.55	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	167	-52.43	0	3	38.58	
		Welding Machine	CNP 107	4	99	105	50	-3	167	-52.43	0	3	52.58	61.26
VI	Road P2 U-Trough B CH318-363 Road and Drainage Works	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	167	-52.43	0	3	50.55	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	167	-52.43	0	3	52.55	
		Roller, Vibratory	BS D8/30	1	101	101	50	-3	167	-52.43	0	3	48.55	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	167	-52.43	0	3	43.55	
		Light goods vehicle, gross vehicle weight < 5.5 tonne	CNP 143	1	101	101	50	-3	167	-52.43	0	3	48.55	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	167	-52.43	0	3	38.58	
		Dump Truck	CNP 068	1	105	105	50	-3	167	-52.43	0	3	52.55	
		Road Roller	CNP 185	1	108	108	50	-3	167	-52.43	0	3	55.55	
		Welding Machine	CNP 107	4	99	105	50	-3	167	-52.43	0	3	52.58	60.75

Note: SPL = SWL + TF + DC + BC + FC, where

SPL = Predicted noise level in dB(A)

SWL = Sound Power Level in dB(A)

TF = Time factor in dB(A) = 10 log (P)

P = On-time percentage

DC = Distance attenuation correction in dB(A) = -(20 log D + 8)

D = Distance in m between the noise source and the receiver

BC = Barrier correction in dB(A)

FC = Façade correction in dB(A) = 3 dB(A)

CRBC - Build King Joint Venture

Construction Noise Assessment

Period: 0700 to 1900 (except general holidays)

Noise Sensitive Receiver: CM6(Above 39m)

Noise Criteria: 75dB(A)

Mitigation Measures Scenario

Portion	Activity	PME	TM Ref. / other Ref.	No. of plants	SWL	Total SWL	On-time, %	Time Factor	Distance from Notional Sources, m	Distance Attenuation*, dB(A)	Barrier Correction, dB(A)	Façade Correction, dB(A)	Predicted Noise Level, dB(A)	Total Predicted Noise Level for each group, dB(A)
IV	DN2100 SMH9101 - 9108 (Pre-boring) (Scenario 1) - 3 drill rig	Crane (240 kw) (105T)	BS C4/52	3	103	108	50	-3	60	-43.50	-5	3	59.26	
		Drill Rig, Rotary Type (Diesel)	CNP 072	3	110	115	50	-3	60	-43.50	0	3	69.05	
		Air Compressor	CNP 002	6	102	110	50	-3	60	-43.50	-5	3	59.06	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	60	-43.50	-5	3	47.49	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	60	-43.50	-5	3	42.51	
		Breaker, excavator mounted (hydraulic)	CNP 028	1	122	122	50	-3	60	-43.50	-10	3	68.49	72.26
IV	DN2100 SMH9101 - 9108 (Pre-boring) (Scenario 2) - 1 dill rig	Crane (240 kw) (105T)	BS C4/52	1	103	108	50	-3	60	-43.50	-5	3	54.49	
		Drill Rig, Rotary Type (Diesel)	CNP 072	1	110	115	50	-3	60	-43.50	0	3	64.27	
		Air Compressor	CNP 002	2	102	110	50	-3	60	-43.50	-5	3	54.28	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	60	-43.50	-5	3	47.49	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	60	-43.50	-5	3	42.51	
		Breaker, excavator mounted (hydraulic)	CNP 028	1	122	122	50	-3	60	-43.50	-10	3	61.50	66.73
IV	DN2100 SMH9101 - 9108 (Sheet Piling)	Piling, Vibration Hammer	CNP 172	1	115	115	50	-3	60	-43.50	-5	3	64.27	
		Power pack (diesel)	CNP 174	1	100	100	50	-3	60	-43.50	-5	3	49.27	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	60	-43.50	-5	3	42.51	
		Excavator (223 kw) (40T)	BS C4/63	3	105	110	50	-3	60	-43.50	-5	3	61.26	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	60	-43.50	-5	3	56.61	
		Welding Machine	CNP 107	4	99	105	50	-3	60	-43.50	-5	3	56.51	67.01
IV	DN2100 SMH9101 - 9108 (ELS)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	60	-43.50	-5	3	54.49	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	60	-43.50	-5	3	42.51	
		Excavator (223 kw) (40T)	BS C4/63	3	105	110	50	-3	60	-43.50	-5	3	61.26	
		Dump Truck	CNP 068	2	105	108	50	-3	60	-43.50	-5	3	59.50	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	60	-43.50	-5	3	56.61	
		Welding Machine	CNP 107	4	99	105	50	-3	60	-43.50	-5	3	56.51	65.36
IV	Installation of DN2100 and Manhole Construction (Scenario 1)	Crane (240 kw) (105T)	BS C4/52	3	103	108	50	-3	60	-43.50	-5	3	59.26	
		Excavator (223 kw) (40T)	BS C4/63	3	105	110	50	-3	60	-43.50	-5	3	61.26	
		Dump Truck	CNP 068	2	105	108	50	-3	60	-43.50	-5	3	59.50	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	60	-43.50	-5	3	54.50	64.00
IV	Installation of DN2100 and Manhole Construction (Scenario 2)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	60	-43.50	-5	3	54.49	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	60	-43.50	-5	3	56.49	
		Roller, Vibratory	BS D8/30	1	101	101	50	-3	60	-43.50	-5	3	52.49	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	60	-43.50	-5	3	47.49	
		Light goods vehicle, gross vehicle weight < 5.5 tonne	CNP 143	1	101	101	50	-3	60	-43.50	-5	3	52.49	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	60	-43.50	-5	3	42.51	
		Dump Truck	CNP 068	1	105	105	50	-3	60	-43.50	-5	3	56.49	
		Road Roller	CNP 185	1	108	108	50	-3	60	-43.50	-5	3	59.49	63.97
IV	Road P2 Underpass CH105-318, (Non Surcharge & On Top Surcharge)(Pre Drill) (Scenario 1)	G.I. drilling rig	BS C2/43	2	102	105	50	-3	60	-43.50	-5	3	56.50	
		Drill Rig, Rotary Type (Diesel)	CNP 072	1	110	110	50	-3	60	-43.50	-5	3	61.49	
		Air Compressor	CNP 002	1	102	102	50	-3	60	-43.50	-5	3	53.49	63.18
IV	Road P2 Underpass CH105-318, (Non Surcharge & On Top Surcharge)(Pre Drill) (Scenario 2)	G.I. drilling rig	BS C2/43	4	102	108	50	-3	60	-43.50	-5	3	59.51	
		Drill Rig, Rotary Type (Diesel)	CNP 072	1	110	110	50	-3	60	-43.50	-5	3	61.49	
		Air Compressor	CNP 002	1	102	102	50	-3	60	-43.50	-5	3	53.49	64.03
IV	Road P2 Underpass CH105-318, (Non Surcharge & On Top Surcharge)(Piling) (Scenario 1)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	60	-43.50	-5	3	54.49	
		Drill Rig, Rotary Type (Diesel)	CNP 072	2	110	113	50	-3	60	-43.50	0	3	69.50	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	60	-43.50	-5	3	51.49	
		Air Compressor	CNP 002	4	102	108	50	-3	60	-43.50	-5	3	59.51	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	60	-43.50	-5	3	56.49	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	60	-43.50	-5	3	47.49	
		Water pump, submersible (electric)	CNP 283	4	85	91	50	-3	60	-43.50	-5	3	42.51	70.32
IV	Road P2 Underpass CH105-318, (Non Surcharge & On Top Surcharge)(Piling) (Scenario 2)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	60	-43.50	-5	3	54.49	
		Drill Rig, Rotary Type (Diesel)	CNP 072	3	110	115	50	-3	60	-43.50	0	3	71.26	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	60	-43.50	-5	3	51.49	
		Air Compressor	CNP 002	6	102	110	50	-3	60	-43.50	-5	3	61.27	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	60	-43.50	-5	3	56.49	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	60	-43.50	-5	3	47.49	
		Water pump, submersible (electric)	CNP 283	4	85	91	50	-3	60	-43.50	-5	3	42.51	71.95
IV	DN2100 SMH9101 -9103(Pre Drill & Sheetpiling works)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	60	-43.50	-5	3	54.49	
		Drill Rig, Rotary Type (Diesel)	CNP 072	1	110	110	50	-3	60	-43.50	-5	3	61.49	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	60	-43.50	-5	3	51.49	
		Air Compressor	CNP 002	1	102	102	50	-3	60	-43.50	-5	3	53.49	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	60	-43.50	-5	3	56.49	
		Piling, Vibration Hammer	CNP 172	1	115	115	50	-3	60	-43.50	-5	3	66.49	
		Power pack (diesel)	CNP 173	1	100	100	50	-3	60	-43.50	-5	3	51.49	
		Breaker, excavator mounted (hydraulic)	CNP 028	1	122	122	10	-10	60	-43.50	-10	3	61.50	69.3
IV	Road P2 Underpass CH103.5 (Sheet Piling)	Piling, Vibration Hammer	CNP 172	1	115	115	50	-3	60	-43.50	-5	3	66.49	
		Power pack (diesel)	CNP 174	1	100	100	50	-3	60	-43.50	0	3	56.49	
		Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	60	-43.50	0	3	59.49	67.63
V	Road P2 U-Trough B CH318-363 (Pre-boring) (Scenario 1)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	150	-51.53	0	3	51.73	
		Drill Rig, Rotary Type (Diesel)	CNP 072	1	110	110	50	-3	150	-51.53	-5	3	53.73	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	150	-51.53	0	3	48.73	
		Air Compressor	CNP 002	2	102	105	50	-3	150	-51.53	-5	3	48.74	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	150	-51.53	0	3	53.73	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	150	-51.53	0	3	44.73	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	150	-51.53	0	3	39.75	
		Breaker, excavator mounted (hydraulic)	CNP 028	1	122	122	50	-3	150	-51.53	-10	3	60.73	62.99
V	Road P2 U-Trough B CH318-363 (Pre-boring) (Scenario 2)	Crane (240 kw) (105T)	BS C4/52	2	103	106	50	-3	150	-51.53	0	3	54.74	
		Drill Rig, Rotary Type (Diesel)	CNP 072	2	110	113	50	-3	150	-51.53	-5	3	54.52	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	150	-51.53	0	3	48.73	
		Air Compressor	CNP 002	4	102	108	50	-3	150	-51.53	-5	3	49.53	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	150	-51.53	0	3	53.73	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	150	-51.53	0	3	44.73	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	150	-51.53	0	3	39.75	60.09
V	Road P2 U-Trough B CH318-363 (Sheet Piling)	Piling, Vibration Hammer	CNP 172	1	115	115	50	-3	150	-51.53	-5	3	58.73	
		Power pack (diesel)	CNP 174	1	100	100	50	-3	150	-51.53	-5	3	43.73	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	150	-51.53	0	3	39.75	58.92
V	Road P2 U-Trough B CH318-363 (ELS)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	150	-51.53	0	3	51.73	
		Excavator (223 kw) (40T)	BS C4/63	2	105	108	50	-3	150	-51.53	0	3	56.74	
		Dump Truck	CNP 068	1	105	105	50	-3	150	-51.53	0	3	53.73	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	150	-51.53	0	3	39.75	
		Welding Machine	CNP 107	4	99	105	50	-3	150	-51.53	0	3	53.75	60.43
V	Road P2 U-Trough B CH318-363 (Structure)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	150	-51.53	0	3	51.73	
		Excavator (223 kw) (40T)	BS C4/63	2	105	108	50	-3	150	-51.53	0	3	56.74	
		Dump Truck	CNP 068	1	105	105	50	-3	150	-51.53	0	3	53.73	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	150	-51.53	0	3	51.74	
		Saw, Circular Wood	CNP 201	2	108	111	50	-3	150	-51.53	0	3	59.74	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	150	-51.53	0	3	44.73	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	150	-51.53	0	3	39.75	
														62.98
V	Road P2 U-Trough B CH318-363 Road and Drainage Works	Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	150	-51.53	0	3	53.73	
		Roller, Vibratory	BS D8/30	1	101	101	50	-3	150	-51.53	0	3	49.73	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	150	-51.53	0	3	44.73	
		Light goods vehicle, gross vehicle weight < 5.5 tonne	CNP 143	1	101	101	50	-3	150	-51.53	0	3	49.73	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	150	-51.53	0	3	39.75	
		Dump Truck	CNP 068	1	105	105	50	-3	150	-51.53	0	3	53.73	
		Road Roller	CNP 185	1	108	108	50	-3	150	-51.53	0	3	56.73	60.68
V	Modification of Vertical Seawall	Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	150	-51.53	0	3	53.46	
		Drill Rig, Rotary Type (Diesel)	CNP 072	1	110	101	50	-3	150	-51.53	0	3	58.46	
		Derrick Barge	CNP 061	1	104	96	50	-3	150	-51.53	0	3	52.46	60.41
VII	DN2100 SMH9108-Outfall (Pre-boring)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	124	-49.89	0	3	53.10	
		Drill Rig, Rotary Type (Diesel)	CNP 072	1	110	110	50	-3	124	-49.89	0	3	60.10	
		Air Compressor	CNP 002	2	102	105	50	-3	124	-49.89	0	3	55.11	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	124	-49.89	0	3	55.10	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	124	-49.89	0	3	46.10	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	124	-49.89	0	3	41.12	62.86
VII	DN2100 SMH9108-Outfall (Sheet Piling)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	124	-49.89	0	3	53.10	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	124	-49.89	0	3	50.10	
		Breaker, excavator mounted (hydraulic)	CNP 028	1	122	122	50	-3	124	-49.89	0	3	72.10	
		Piling, Vibration Hammer	CNP 172	1	115	115	50	-3	124	-49.89	0	3	65.10	
		Power pack (diesel)	CNP 174	1	100	100	50	-3	124	-49.89	0	3	50.10	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	124	-49.89	0	3	55.10	
		Dump Truck	CNP 068	1	105	105	50	-3	124	-49.89	0	3	55.10	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	124	-49.89	0	3	41.12	73.12
VII	Installation of DN2100 and Manhole Construction and Outfall Installation	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	124	-49.89	0	3	53.10	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	124	-49.89	0	3	55.10	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	124	-49.89	0	3	46.10	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	124	-49.89	0	3	41.12	
		Road Roller	CNP 185	1	108	108	50	-3	124	-49.89	0	3	58.10	60.89
VII	U Trough A&B S200 CH890 - CH980 (Pre Drill)	G.I. drilling rig	BS C2/43	1	102	102	50	-3	124	-49.89	0	3	52.10	52.10
VII	U Trough A&B S200 CH890 - CH980 (Piling)	Drill Rig, Rotary Type (Diesel)	CNP 072	2	110	113	50	-3	124	-49.89	-5	3	58.11	
		Air Compressor	CNP 002	4	102	108	50	-3	124	-49.89	0	3	58.12	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	124	-49.89	0	3	55.10	62.1
VII	U Trough A&B S200 CH890 - CH980 (Sheet Piling)	Piling, Vibration Hammer	CNP 172	1	115	115	50	-3	124	-49.89	-5	3	60.10	
		Power pack (diesel)	CNP 174	1	100	100	50	-3	124	-49.89	0	3	50.10	
		Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	124	-49.89	0	3	53.10	61.24
IX	Seawall Construction	Dredger	CNP 070	2	103	106	50	-3	228	-55.17	0	3	50.83	
		Derrick Barge	CNP 061	4	104	110	50	-3	228	-55.17	0	3	54.84	
		Tug boat	CNP 221	2	110	113	50	-3	228	-55.17	0	3	57.83	
		Water pump, subersible (electric)	CNP 283	6	85	93	50	-3	228	-55.17	0	3	37.60	
		Dump Truck	CNP 068	1	105	105	50	-3	228	-55.17	0	3	49.82	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	228	-55.17	0	3	47.83	
		Winch (Electric)	CNP 262	4	95	101	50	-3	228	-55.17	-5	3	40.84	
		Excavator (223 kw) (40T)	BS C4/63	3	105	110	50	-3	228	-55.17	0	3	54.59	
		Vibration Hammer	CNP 172	1	115	115	50	-3	228	-55.17	0	3	59.82	
		Breaker, excavator mounted (hydraulic)	CNP 028	3	122	127	50	-3	228	-55.17	-10	3	61.59	
		Ro-Ro Barge	-	1	-	-	50	-3	228	-55.17	-	3	-	
		Hopper barge	-	6	-	-	50	-3	228	-55.17	0	3	-	65.9
IX	Steel Cofferdam and Water Gate Installation	Derrick Barge	CNP 061	3	104	109	50	-3	228	-55.17	0	3	60.19	
		Tug boat	CNP 221	2	110	113	50	-3	228	-55.17	0	3	64.43	65.82
IX	Marine Ground Treatment	Band Drain Machine (hydarulic Vibratory lance starting up)	BS D4/107a	2	113	116	50	-3	228	-55.17	-5	3	55.83	55.83

Note: SPL = SWL + TF + DC + BC + FC, where

SPL = Predicted noise level in dB(A)

SWL = Sound Power Level in dB(A)

TF = Time factor in dB(A) = 10 log (P)

P = On-time percentage

DC = Distance attenuation correction in dB(A) = -(20 log D + 8)

D = Distance in m between the noise source and the receiver

BC = Barrier correction in dB(A)

FC = Façade correction in dB(A) = 3 dB(A)

CRBC - Build King Joint Venture

Construction Noise Assessment

Period: 0700 to 1900 (except general holidays)

Noise Sensitive Receiver: CM6(Above 39m)

Noise Criteria: 75dB(A)

Mitigation Measures Scenario

Portion	Activity	PME	TM Ref. / other Ref.	No. of plants	SWL	Total SWL	On-time, %	Time Factor	Distance from Notional Sources, m	Distance Attenuation*,dB(A)	Barrier Correction, dB(A)	Façade Correction, dB(A)	Predicted Noise Level, dB(A)	Total Predicted Noise Level for each group, dB(A)
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Backfilling)	Road Roller	CNP 185	1	108	108	50	-3	228	-55.17	0	3	52.82	
		Excavator (223 kw) (40T)	BS C4/63	2	105	108	50	-3	228	-55.17	0	3	52.83	55.83
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888(Pre Drill) (Scenario 1)	G.I. drilling rig	BS C2/43	2	102	105	50	-3	228	-55.17	0	3	49.83	49.83
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888(Pre Drill) (Scenario 2)	G.I. drilling rig	BS C2/43	3	102	107	50	-3	228	-55.17	0	3	51.59	51.59
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888(Pre Drill) (Scenario 3)	G.I. drilling rig	BS C2/43	4	102	108	50	-3	228	-55.17	0	3	52.84	52.84
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888(Pre Drill) (Scenario 4)	G.I. drilling rig	BS C2/43	5	102	109	50	-3	228	-55.17	0	3	53.81	53.81
IX	Road P2 Underpass CH105-318 (Removal of Temporary 1500 Drain)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	228	-55.17	0	3	47.81	
		Piling, large diameter bored, oscillator	CNP 165	1	115	115	50	-3	228	-55.17	0	3	59.81	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	228	-55.17	0	3	44.81	
		Water pump, subersible (electric)	CNP 283	2	85	88	50	-3	228	-55.17	0	3	32.82	60.21
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 1)	Crane (240 kw) (105T)	BS C4/52	2	103	106	50	-3	228	-55.17	0	3	50.83	
		Drill Rig, Rotary Type (Diesel)	CNP 072	2	110	113	50	-3	228	-55.17	-5	3	52.83	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	228	-55.17	0	3	47.83	
		Air Compressor	CNP 002	4	102	108	50	-3	228	-55.17	0	3	52.84	
		Excavator (223 kw) (40T)	BS C4/63	3	105	110	50	-3	228	-55.17	0	3	54.59	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	228	-55.17	0	3	40.82	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	228	-55.17	0	3	35.84	
		Dump Truck	CNP 068	1	105	105	50	-3	228	-55.17	0	3	49.82	
		Welding Machine	CNP 107	2	99	102	50	-3	228	-55.17	0	3	46.83	60.06
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 2)	Crane (240 kw) (105T)	BS C4/52	6	103	111	50	-3	228	-55.17	0	3	55.60	
		Drill Rig, Rotary Type (Diesel)	CNP 072	6	110	118	50	-3	228	-55.17	-5	3	57.60	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	6	100	108	50	-3	228	-55.17	0	3	52.60	
		Air Compressor	CNP 002	12	102	113	50	-3	228	-55.17	0	3	57.61	
		Excavator (223 kw) (40T)	BS C4/63	4	105	111	50	-3	228	-55.17	0	3	55.84	
		Concrete Lorry Mixer	BS D6/33	2	96	99	50	-3	228	-55.17	0	3	43.83	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	228	-55.17	0	3	35.84	
		Dump Truck	CNP 068	3	105	110	50	-3	228	-55.17	0	3	54.59	
		Welding Machine	CNP 107	4	99	105	50	-3	228	-55.17	0	3	49.84	63.97
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 3)	Crane (240 kw) (105T)	BS C4/52	7	103	111	50	-3	228	-55.17	0	3	56.27	
		Drill Rig, Rotary Type (Diesel)	CNP 072	7	110	118	50	-3	228	-55.17	-5	3	58.27	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	7	100	108	50	-3	228	-55.17	0	3	53.27	
		Air Compressor	CNP 002	14	102	113	50	-3	228	-55.17	0	3	58.28	
		Excavator (223 kw) (40T)	BS C4/63	4	105	111	50	-3	228	-55.17	0	3	55.84	
		Concrete Lorry Mixer	BS D6/33	4	96	102	50	-3	228	-55.17	0	3	46.84	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	228	-55.17	0	3	35.84	
		Dump Truck	CNP 068	4	105	111	50	-3	228	-55.17	0	3	55.84	
		Welding Machine	CNP 107	7	99	107	50	-3	228	-55.17	0	3	52.27	64.72
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 4)	Crane (240 kw) (105T)	BS C4/52	8	103	112	50	-3	228	-55.17	0	3	56.85	
		Drill Rig, Rotary Type (Diesel)	CNP 072	8	110	119	50	-3	228	-55.17	-5	3	58.85	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	8	100	109	50	-3	228	-55.17	0	3	53.85	
		Air Compressor	CNP 002	16	102	114	50	-3	228	-55.17	0	3	58.86	
		Excavator (223 kw) (40T)	BS C4/63	6	105	113	50	-3	228	-55.17	0	3	57.60	
		Concrete Lorry Mixer	BS D6/33	6	96	104	50	-3	228	-55.17	0	3	48.60	
		Water pump, subersible (electric)	CNP 283	8	85	94	50	-3	228	-55.17	0	3	38.85	
		Dump Truck	CNP 068	6	105	113	50	-3	228	-55.17	0	3	57.60	
		Welding Machine	CNP 107	8	99	108	50	-3	228	-55.17	0	3	52.85	65.67
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 5)	Crane (240 kw) (105T)	BS C4/52	9	103	113	50	-3	228	-55.17	0	3	57.36	
		Drill Rig, Rotary Type (Diesel)	CNP 072	9	110	120	50	-3	228	-55.17	-5	3	59.36	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	9	100	110	50	-3	228	-55.17	0	3	54.36	
		Air Compressor	CNP 002	18	102	115	50	-3	228	-55.17	0	3	59.37	
		Excavator (223 kw) (40T)	BS C4/63	6	105	113	50	-3	228	-55.17	0	3	57.60	
		Concrete Lorry Mixer	BS D6/33	6	96	104	50	-3	228	-55.17	0	3	48.60	
		Water pump, subersible (electric)	CNP 283	9	85	95	50	-3	228	-55.17	0	3	39.36	
		Dump Truck	CNP 068	6	105	113	50	-3	228	-55.17	0	3	57.60	
		Welding Machine	CNP 107	9	99	109	50	-3	228	-55.17	0	3	53.36	66.01
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 6)	Crane (240 kw) (105T)	BS C4/52	12	103	114	50	-3	228	-55.17	0	3	58.61	
		Drill Rig, Rotary Type (Diesel)	CNP 072	12	110	121	50	-3	228	-55.17	-5	3	60.61	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	8	100	109	50	-3	228	-55.17	0	3	53.85	
		Air Compressor	CNP 002	24	102	116	50	-3	228	-55.17	0	3	60.62	
		Excavator (223 kw) (40T)	BS C4/63	6	105	113	50	-3	228	-55.17	0	3	57.60	
		Concrete Lorry Mixer	BS D6/33	6	96	104	50	-3	228	-55.17	0	3	48.60	
		Water pump, subersible (electric)	CNP 283	8	85	94	50	-3	228	-55.17	0	3	38.85	
		Dump Truck	CNP 068	6	105	113	50	-3	228	-55.17	0	3	57.60	
		Welding Machine	CNP 107	8	99	108	50	-3	228	-55.17	0	3	52.85	66.72
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 7)	Crane (240 kw) (105T)	BS C4/52	15	103	115	50	-3	228	-55.17	0	3	59.58	
		Drill Rig, Rotary Type (Diesel)	CNP 072	15	110	122	50	-3	228	-55.17	-5	3	61.58	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	10	100	110	50	-3	228	-55.17	0	3	54.82	
		Air Compressor	CNP 002	30	102	117	50	-3	228	-55.17	0	3	61.59	
		Excavator (223 kw) (40T)	BS C4/63	10	105	115	50	-3	228	-55.17	0	3	59.82	
		Concrete Lorry Mixer	BS D6/33	8	96	105	50	-3	228	-55.17	0	3	49.85	
		Water pump, subersible (electric)	CNP 283	15	85	97	50	-3	228	-55.17	0	3	41.58	
		Dump Truck	CNP 068	8	105	114	50	-3	228	-55.17	0	3	58.85	
		Welding Machine	CNP 107	12	99	110	50	-3	228	-55.17	0	3	54.61	67.94
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Installation of Dewatering System)	Drill Rig, Rotary Type (Diesel)	CNP 072	2	110	113	50	-3	228	-55.17	-5	3	52.83	
		Air Compressor	CNP 002	2	102	105	50	-3	228	-55.17	0	3	49.83	54.59
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (ELS) (Sheet Piling) (Scenario 1)	Crane (240 kw) (105T)	BS C4/52	2	103	106	50	-3	228	-55.17	0	3	50.83	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	228	-55.17	0	3	47.83	
		Piling, Vibration Hammer	CNP 172	2	115	118	50	-3	228	-55.17	0	3	62.83	
		Power pack (diesel)	CNP 174	2	100	103	50	-3	228	-55.17	0	3	47.83	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	228	-55.17	0	3	35.84	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	228	-55.17	0	3	49.82	
		Welding Machine	CNP 107	4	99	105	50	-3	228	-55.17	0	3	49.84	63.72
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (ELS) (Sheet Piling) (Scenario 2)	Crane (240 kw) (105T)	BS C4/52	3	103	108	50	-3	228	-55.17	0	3	52.59	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	3	100	105	50	-3	228	-55.17	0	3	49.59	
		Piling, Vibration Hammer	CNP 172	3	115	120	50	-3	228	-55.17	0	3	64.59	
		Power pack (diesel)	CNP 174	3	100	105	50	-3	228	-55.17	0	3	49.59	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	228	-55.17	0	3	35.84	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	228	-55.17	0	3	49.82	
		Welding Machine	CNP 107	4	99	105	50	-3	228	-55.17	0	3	49.84	65.36
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (ELS) (Welding & Excavation) (Scenario 1)	Crane (240 kw) (105T)	BS C4/52	2	103	106	50	-3	228	-55.17	0	3	50.83	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	228	-55.17	0	3	47.83	
		Excavator (223 kw) (40T)	BS C4/63	2	105	108	50	-3	228	-55.17	0	3	52.83	
		Dump Truck	CNP 068	2	105	108	50	-3	228	-55.17	0	3	52.83	
		Water pump, subersible (electric)	CNP 283	5	85	92	50	-3	228	-55.17	0	3	36.81	
		Welding Machine	CNP 107	2	99	102	50	-3	228	-55.17	0	3	46.83	
		Derrick Barge	CNP 061	1	104	104	50	-3	228	-55.17	0	3	48.82	58.42
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (ELS) (Welding & Excavation) (Scenario 2)	Crane (240 kw) (105T)	BS C4/52	4	103	109	50	-3	228	-55.17	0	3	53.84	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	4	100	106	50	-3	228	-55.17	0	3	50.84	
		Excavator (223 kw) (40T)	BS C4/63	4	105	111	50	-3	228	-55.17	0	3	55.84	
		Dump Truck	CNP 068	2	105	108	50	-3	228	-55.17	0	3	52.83	
		Water pump, subersible (electric)	CNP 283	20	85	98	50	-3	228	-55.17	0	3	42.83	
		Welding Machine	CNP 107	4	99	105	50	-3	228	-55.17	0	3	49.84	
		Derrick Barge	CNP 061	2	104	107	50	-3	228	-55.17	0	3	51.83	60.82
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Structure) (Scenario 1)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	228	-55.17	0	3	47.82	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	228	-55.17	0	3	44.82	
		Air Blower	CNP 006	1	95	95	50	-3	228	-55.17	0	3	39.82	
		Saw, Circular Wood	CNP 201	1	108	108	50	-3	228	-55.17	0	3	52.82	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	228	-55.17	0	3	40.82	
		Concrete pump, stationary/lorry mounted	CNP 047	1	109	109	50	-3	228	-55.17	0	3	53.82	
		Poker, vibratory, hand-held	CNP 170	1	113	113	50	-3	228	-55.17	0	3	57.82	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	228	-55.17	0	3	35.84	60.62
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Structure) (Scenario 2)	Crane (240 kw) (105T)	BS C4/52	3	103	108	50	-3	228	-55.17	0	3	52.59	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	3	100	105	50	-3	228	-55.17	0	3	49.59	
		Air Blower	CNP 006	3	95	100	50	-3	228	-55.17	0	3	44.59	
		Saw, Circular Wood	CNP 201	3	108	113	50	-3	228	-55.17	0	3	57.59	
		Concrete Lorry Mixer	BS D6/33	3	96	101	50	-3	228	-55.17	0	3	45.59	
		Concrete pump, stationary/lorry mounted	CNP 047	3	109	114	50	-3	228	-55.17	0	3	58.59	
		Poker, vibratory, hand-held	CNP 170	3	113	118	50	-3	228	-55.17	0	3	62.59	
		Water pump, subersible (electric)	CNP 283	6	85	93	50	-3	228	-55.17	0	3	37.60	65.38
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Structure) (Scenario 3)	Crane (240 kw) (105T)	BS C4/52	5	103	110	50	-3	228	-55.17	0	3	54.81	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	5	100	107	50	-3	228	-55.17	0	3	51.81	
		Air Blower	CNP 006	5	95	102	50	-3	228	-55.17	0	3	46.81	
		Saw, Circular Wood	CNP 201	5	108	115	50	-3	228	-55.17	0	3	59.81	
		Concrete Lorry Mixer	BS D6/33	5	96	103	50	-3	228	-55.17	0	3	47.81	
		Concrete pump, stationary/lorry mounted	CNP 047	5	109	116	50	-3	228	-55.17	0	3	60.81	
		Poker, vibratory, hand-held	CNP 170	5	113	120	50	-3	228	-55.17	0	3	64.81	
		Water pump, subersible (electric)	CNP 283	6	85	93	50	-3	228	-55.17	0	3	37.60	67.6
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Structure) (Scenario 4)	Crane (240 kw) (105T)	BS C4/52	6	103	111	50	-3	228	-55.17	0	3	55.60	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	6	100	108	50	-3	228	-55.17	0	3	52.60	
		Air Blower	CNP 006	6	95	103	50	-3	228	-55.17	0	3	47.60	
		Saw, Circular Wood	CNP 201	6	108	116	50	-3	228	-55.17	0	3	60.60	
		Concrete Lorry Mixer	BS D6/33	6	96	104	50	-3	228	-55.17	0	3	48.60	
		Concrete pump, stationary/lorry mounted	CNP 047	6	109	117	50	-3	228	-55.17	0	3	61.60	
		Poker, vibratory, hand-held	CNP 170	6	113	121	50	-3	228	-55.17	0	3	65.60	
		Water pump, subersible (electric)	CNP 283	6	85	93	50	-3	228	-55.17	0	3	37.60	68.39
IX	U - Trough (Road and Drainage Works)	Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	228	-55.17	0	3	49.82	
		Roller, Vibratory	BS D8/30	1	101	101	50	-3	228	-55.17	0	3	45.82	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	228	-55.17	0	3	40.82	
		Light goods vehicle, gross vehicle weight < 5.5 tonne	CNP 143	1	101	101	50	-3	228	-55.17	0	3	45.82	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	228	-55.17	0	3	35.84	
		Dump Truck	CNP 068	1	105	105	50	-3	228	-55.17	0	3	49.82	
		Road Roller	CNP 185	1	108	108	50	-3	228	-55.17	0	3	52.82	56.77

Note: SPL = SWL + TF + DC + BC + FC, where

SPL = Predicted noise level in dB(A)

SWL = Sound Power Level in dB(A)

TF = Time factor in dB(A) = 10 log (P)

P = On-time percentage

DC = Distance attenuation correction in dB(A) = -(20 log D + 8)

D = Distance in m between the noise source and the receiver

BC = Barrier correction in dB(A)

FC = Façade correction in dB(A) = 3 dB(A)

NE/2015/02

Associated Cumulative Noise Levels

NSR CM6 (Above 39m)

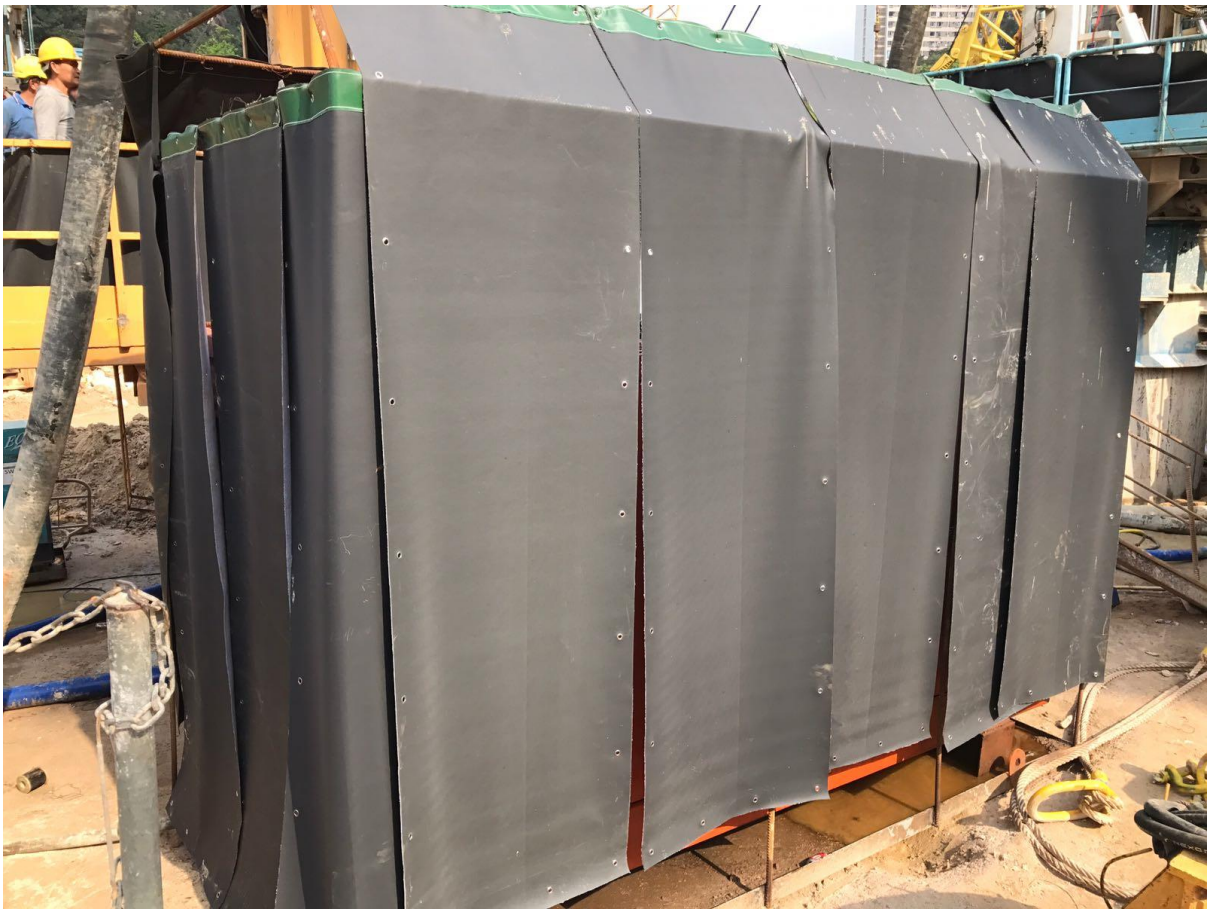
Portion	Activity	2018				2019												2020												2021			
		Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
I	DSD Transformer Room																																
IV	DN2100 SMH9101 - 9108 (Pre-boring) (Scenario 1) - 3 drill rig																																
IV	DN2100 SMH9101 - 9108 (Pre-boring) (Scenario 2) - 1 dill rig	66.7	66.7	66.7																													
IV	DN2100 SMH9101 - 9108 (Sheet Piling)	67.0	67.0	67.0	67.0																												
IV	DN2100 SMH9101 - 9108 (ELS)	65.4	65.4	65.4	65.4	65.4																											
IV	Installation of DN2100 and Manhole Construction (Scenario 1)	64.0	64.0	64.0	64.0																												
IV	Installation of DN2100 and Manhole Construction (Scenario 2)					64.0	64.0	64.0																									
IV	Road P2 Underpass CH105-318, (Non Surcharge & On Top Surcharge) (Pre Drill) (Scenario 1) - 2 G.I. Rig				63.2		63.2	63.2																									
IV	Road P2 Underpass CH105-318, (Non Surcharge & On Top Surcharge) (Pre Drill) (Scenario 2) - 4 G.I. Rig					64.0																											
IV	Road P2 Underpass CH105-318, (Non Surcharge & On Top Surcharge) (Piling) (Scenario 1) - 2 Drill Rig													70.3	70.3																		
IV	Road P2 Underpass CH105-318, (Non Surcharge & On Top Surcharge) (Piling) (Scenario 2) - 3 Drill Rig							72.0	72.0	72.0	72.0	72.0	72.0																				
IV	Road P2 Underpass CH103.5 (Sheet Piling)													67.6	67.6																		
IV	DN2100 SMH9101 -9103(Pre Drill & Sheetpiling works)																			69.3	69.3	69.3	69.3										
V	Road P2 U-Trough B CH318-363 (Pre-boring) (Scenario 1) - Drill Rig																																
V	Road P2 U-Trough B CH318-363 (Pre-boring) (Scenario 2) - 2 Drill Rig	59.8	59.8	59.8																													
V	Road P2 U-Trough B CH318-363 (Sheet Piling)	58.7	58.7	58.7	58.7	58.7																											
V	Road P2 U-Trough B CH318-363 (ELS)		60.2	60.2	60.2																												
V	Road P2 U-Trough B CH318-363 (Structure)					62.7	62.7	62.7	62.7	62.7	62.7	62.7	62.7	62.7																				
V	Road P2 U-Trough B CH318-363 Road and Drainage Works							60.4	60.4	60.4	60.4	60.4	60.4	60.4																				
V	Modification of Vertical Seawall										60.4	60.4	60.4	60.4	60.4	60.4	60.4																
VI	Road P2 U-Trough B CH318-363 (Removal of Existing Abandoned Box Culvert)																																
VI	Road P2 U-Trough B CH318-363 (Installation of Dewatering System)	59.1	59.1	59.1	59.1	59.1																											
VI	Road P2 U-Trough B CH318-363 (Preboring) (Scenario 1)																																
VI	Road P2 U-Trough B CH318-363 (Preboring) (Scenario 2)	60.4																															
VI	Road P2 U-Trough B CH318-363 (Sheet Piling)	58.9																															
VI	Road P2 U-Trough B CH318-363 (ELS)		59.3	59.3	59.3																												
VI	Road P2 U-Trough B CH318-363 (Structure)					61.3	61.3	61.3	61.3	61.3	61.3	61.3	61.3	61.3																				
VI	Road P2 U-Trough B CH318-363 Road and Drainage Works							60.8	60.8	60.8	60.8	60.8	60.8	60.8																				
VII	DN2100 SMH9108-Outfall (Pre-boring)																																
VII	DN2100 SMH9108-Outfall (Sheet Piling)																																
VII	Installation of DN2100 and Manhole Construction and Outfall Installation	60.9	60.9	60.9	60.9	60.9	60.9																										
VII	U Trough A&B S200 CH890 - CH980 (Pre Drill)												52.1	52.1	52.1	52.1																	
VII	U Trough A&B S200 CH890 - CH980 (Piling)												62.1	62.1	62.1	62.1	62.1																
VII	Road P2 Underpass CH103.5 (Sheet Piling)														61.2	61.2	61.2																
IX	Steel Cofferdam & Water Gate Installation																																
IX	Seawall Construction	65.9	65.9	65.9	65.9	65.9	65.9	65.9	65.9	65.9	65.9	65.9	65.9	65.9	65.9	65.9	65.9	65.9	65.9	65.9	65.9	65.9	65.9	65.9									
IX	Marine Ground Treatment	55.8	55.8	55.8	55.8	55.8	55.8																										
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Backfilling)	55.8	55.8	55.8	55.8	55.8	55.8																										
IX	Road P2 Underpass CH105-318, (Removal of Temporary 1500 Drain)								60.2	60.2																							
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888(Pre Drill) (Scenario 1) - 2 G.I Rig									49.8			49.8	49.8						49.8	49.8	49.8	49.8	49.8									
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888(Pre Drill) (Scenario 2) - 3 G.I. Rig							51.6										51.6	51.6														
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888(Pre Drill) (Scenario 3) - 4 G.I. Rig					52.8																											
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888(Pre Drill) (Scenario 4) - 5 G.I. Rig						53.8					53.8			53.8	53.8	53.8																
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 1) - 2 Drill Rig					60.1	60.1																										
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 2) - 6 Drill Rig													64.0	64.0							64.0	64.0	64.0	64.0								
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 3) - 7 Drill Rig															64.7	64.7	64.7	64.7														
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 4) - 8 Drill Rig											65.7	65.7																				
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 5) - 9 Drill Rig																			66.0	66.0												
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 6) - 12 Drill Rig									66.7																							
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Piling) (Scenario 7) - 15 Drill Rig										67.9																						
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Installation of Dewatering System)											54.6	54.6																				
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (ELS) (Sheet Piling) (Scenario 1) - 2 Vibration hammer							63.7	63.7	63.7			63.7	63.7	63.7	63.7	63.7	63.7	63.7	63.7													
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (ELS) (Sheet Piling) (Scenario 2) - 3 Vibration hammer																				65.4	65.4	65.4	65.4									
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (ELS) (Welding & Excavation) (Scenario 1)											58.4	58.4	58.4	58.4	58.4	58.4			58.4													
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (ELS) (Welding & Excavation) (Scenario 2)																	60.8	60.8														
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Structure) (Scenario 1) - 1 Set																												60.6				
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Structure) (Scenario 2) - 3 Set																											65.4					
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Structure) (Scenario 3) - 5 Set																	67.6	67.6	67.6		67.6	67.6	67.6	67.6	67.6							
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888 (Structure) (Scenario 4) - 6 Set																				68.4												
IX	Road P2 Underpass CH105-318, U Trough A&B P2 CH105-S200 CH888Road and Drainage Works																										56.8	56.8	56.8	56.8	56.8	56.8	56.8
	Cumulative Noise / dB(A)	74	74	74	73	73	72	75	75	75	75	75	75	75	75	72	72	70	72	74	74	74	74	72	69	68	68	66	62	57	57	57	57
		Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
		2018				2019												2020												2021			

Note: Regarding to the noise assessment before Sept 2018 (Refer to previous revision for the details of noise assessment)

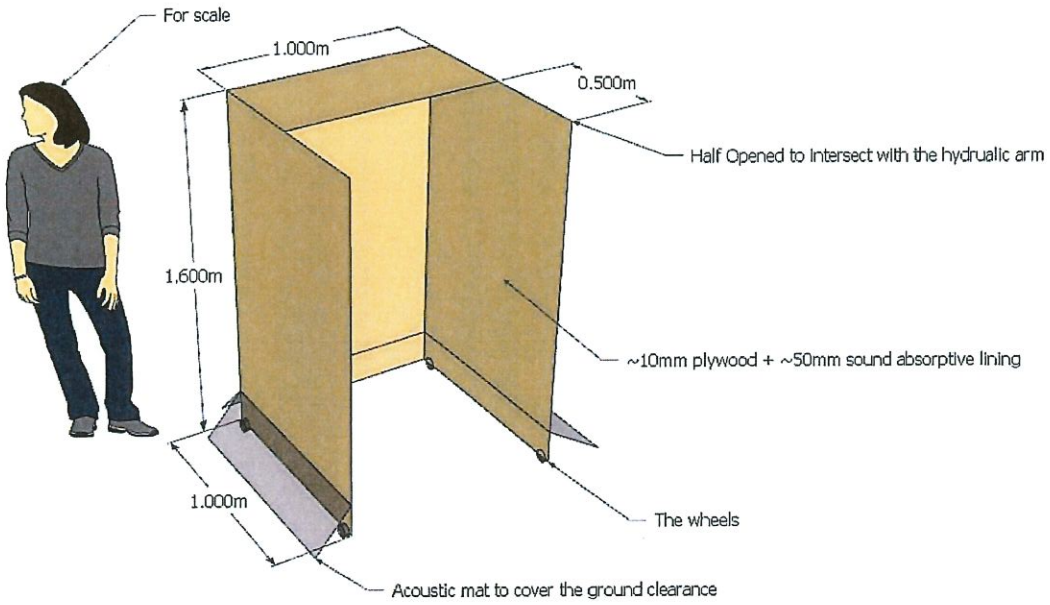
Appendix D

Sample of Movable Noise Barriers, Acoustic Mat and Enclosure

Noise Enclosure for generator & air compressor



Acoustic Box



Noise Barrier (3.5 m)

Acoustic Mat 3.5m

CHEUNG KEE CANVAS LTD.
G/F, 352, RECLAMATION ST, KLN. HK

The following sample(s) was / were submitted and identified on behalf of the client as:

Sample Description	: PVC TARPAULIN
Item	: CK 2009 SOUND PROOF CANVAS(1.6M)
Sample Receiving Date	: Aug.13, 2014
Test Performing Date	: Aug.13, 2014 to Aug.19, 2014
Test Required	: In accordance with ISO 10140-2-2010 Acoustics -- Laboratory measurement of sound insulation of building elements -- Part 2: Measurement of airborne sound insulation
Test Result(s)	: For further details, please refer to the following page(s)

Signed for and on behalf of
SGS-CSTC Co., Ltd.

Irvette Zhang
Approved signatory

1/F,1st Building,European Industrial Park,No.1 Shunhenan Road,Wusha Section,Daliang Town,Shunde,Foshan,Guangdong,China 528333 t (86-757)22805888 f (86-757)22805888 www.sgsgroup.com.cn
中国·广东·佛山市顺德区大良街道办事处五沙顺和南路1号欧洲工业园一号厂房首层 邮编: 528333 t (86-757)22805888 f (86-757)22805888 e sgs.china@sgs.com

I. Test conducted

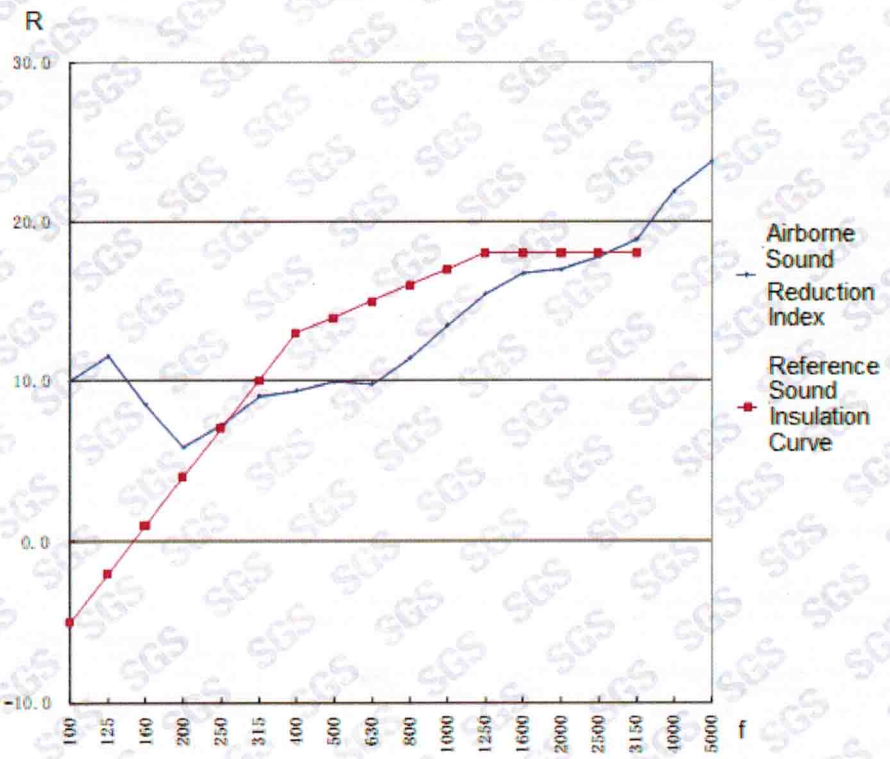
The test is performed in accordance with ISO 10140-2-2010 Acoustics -- Laboratory measurement of sound insulation of building elements -- Part 2: Measurement of airborne sound insulation
The evaluation of the single-number rating from the results in one-third octave bands is done in accordance with ISO 717-1:1996 Acoustics - Rating of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation

II. Sample Description and Conditioning

Sample name(provided by sponsor):	PVC Tarpaulin
Color:	Gray
Mass per unit area :	958 g/m^2
Area, S, of test element :	3.8 m^2
Air temp. in the test rooms :	27°C
Relative humidity in the test rooms :	58%
Receiving room volume :	67.9 m^3

III. Test results

f Hz	R dB
100	10.1
125	11.6
160	8.6
200	5.9
250	7.3
315	9.1
400	9.4
500	10.0
630	9.9
800	11.5
1000	13.5
1250	15.5
1600	16.7
2000	17.0
2500	17.8
3150	18.9
4000	21.9
5000	23.9
Rw (C;Ctr)	**14(-1;-2)**



Key
R-- sound reduction index, in dB
f--frequency, in Hz

To be continued...

SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch Testing Center
1/F,1st Building,European Industrial Park,No.1 Shunhenan Road,Wusha Section,Dailang Town,Shunde,Foshan,Guangdong,China 528333 t (86-757)22805888 f (86-757)22805858 www.sgsgroup.com.cn
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STATEMENTS:

For laboratory measurements using sound pressure, the sound reduction index is calculated using:

$$R = L_1 - L_2 + 10\lg\frac{S}{A}(dB)$$

where

L_1 is the energy average sound pressure level in the source room, in decibels;

L_2 is the energy average sound pressure level in the receiving room, in decibels;

S is the area of the free test opening in which the test element is installed, in square metres;

A is the equivalent sound absorption area in the receiving room, in square metres.

Photo Appendix:

Remark: This test was subcontracted to qualified subcontractor.

End of Report

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Wilson Acoustics Limited

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Web: www.wal.hk

CEDD Contract No. NE/2015/02

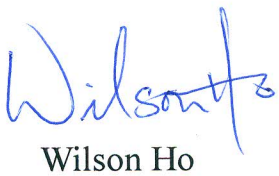
Tseung Kwan O - Lam Tin Tunnel Road P2 and Associated Works

Insertion Loss (IL) Measurement Report of Movable Noise Barrier for Drilling Rig

Report No.: 17351-3

For
CRBC-Build King JV

Approved by:



Wilson Ho
MIOA, MHKIOA, MHKIEIA, AFCHKRI, PMHKIQEP
Prepared by: MY

26 October 2017

Table of Content

List of Appendices

1. Measurement Date, Personnel and Standard

Date	:	24 October 2017 10:30-15:30 hours
Personnel	:	Conducted by Joanne Shi and Chris Ng, supervised by Wilson Ho of Wilson Acoustics Limited (WAL), assisted by Karen Chiu of CRBC-Build King JV.
Site	:	Construction site of Tseung Kwan O - Lam Tin Tunnel near the junction of O King Road and Tong Yin St.
Standard	:	*ISO 10847:1997 - In-situ determination of insertion loss of outdoor noise barriers of all types.*

2. Introduction

A 5m (H) x 7m (W) U-shape movable noise barrier (total length of 10m, **Photo 1, Appendix A**) is used to provide barrier effect for drilling rig towards nearby NSRs. Drilling rig are used for retaining wall construction during daytime (0700-1900 hours) at the construction site (**Figure 1**) near Ocean Shores of the subjected project. Ocean Shores Tower 1 is identified as the critical NSR. The movable noise barrier will be always facing the NSRs and the drilling rig will be placed 1.5m away from the barrier (**Figure 1**).

Wilson Acoustics Limited is commissioned by CRBC-Build King JV to conduct an Insertion Loss (IL) measurement for the movable noise barrier. This document presents the measurement results of the IL measurement at the worst-case location.

Photo 1. Noise Barrier (front view)

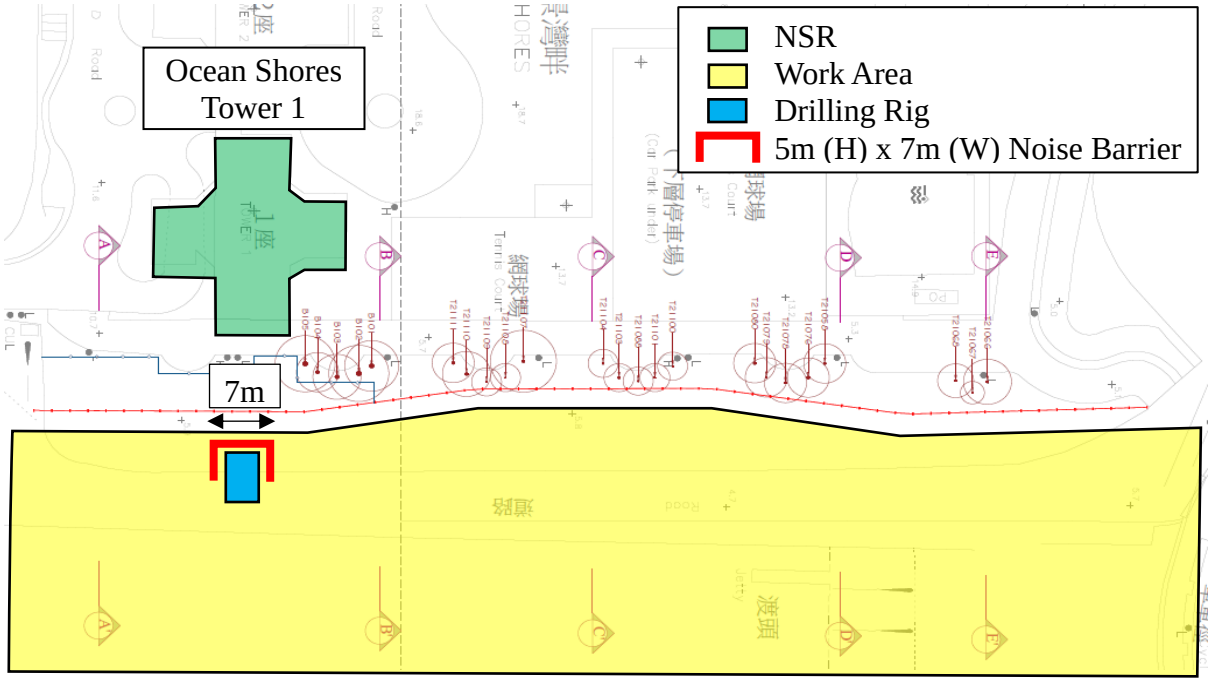


Figure 1. Site Plan with NSR of Noise Barrier Worst-case Location (Top View)

3. Instrumentation

Field calibration of sound level meter was conducted using an acoustic calibrator before and after measurements (**Table 1**). The field calibration confirmed that there was no shift on the sensitivity of the sound level meters at the calibration frequency.

Table 1: Measurement Equipment

Equipment	Brand Name & Model No.	Serial No.	Calibration Expiry
Sound level meter	Svantek - SVAN958	20890	22 Jun 2019
Sound level meter	Svantek - SVAN958	23412	12 Mar 2019
Acoustics calibrator	Svantek - SV30A	10814	14 Jun 2018
Loudspeaker	QSC – K12	GDD541208	N/A

4. Insertion Loss (IL) Testing Methodology

4.1 Testing Standard and Calculation of Insertion Loss (IL)

ISO 10847- In-situ determination of insertion loss of outdoor noise barriers of all types was used. The IL of the noise barrier was determined by comparison of the measured noise levels with and without the noise barrier. Based on the measured noise levels at the receiver and reference microphone (1m from loudspeakers) locations, the IL is given by:

IL = L (with) - L (without)

Where L (with) = L (ref, with) – L (rec, with)

L (without) = L (ref, without) – L (rec, without)

L (ref, with) is the noise level of reference microphone with noise barrier installed between the drilling rig and the receiver.
L (rec, with) is the noise level of receiver microphone with noise barrier installed between the drilling rig and the receiver.
L (ref, without) is the noise level of reference microphone without noise barrier.
L (rec, without) is the noise level of receiver microphone without noise barrier.

4.2 Loudspeaker and Receiver Microphone Locations

As the NSR, Ocean Shores Tower 1, is not accessible, noise measurement was conducted next to the NSR. The measurement results would not be affected due to the similar measurement conditions.

A schematic concept of measurement methodology is presented in **Figure 2** and **3**. A loudspeaker was located at ground level (major noise source of drilling rig, the drilling interfaces between the ground and pipe pile, is at ground level) in the site area with horizontal distance of ~23m from the receiver microphone. The receiver microphone was located 2m above the ground level of that location (there is a level difference of ~6m between the ground level of site area and ground level of receiver microphone).

For the ‘with noise barrier’ scenario, a noise barrier was placed at the closest to the receiver microphone. The loudspeaker is placed 1.5m from the noise barrier.

The noise barrier was removed for measurement of the ‘without noise barrier’ scenario. The distance between the loudspeaker and receiver microphone location was remain unchanged for both scenarios.

4.3 Playback of Drilling Rig Noise

Drilling rig noise, major noise source, was recorded and played back by loudspeaker to simulate real operation. The loudspeaker provided steady continuous noise source for accurate measurement. Reference noise measurement was conducted 1m from the loudspeaker throughout the measurement to monitor the loudspeaker output variation.

4.4 Site Conditions

During the noise measurement, all other noisy activities were stopped.

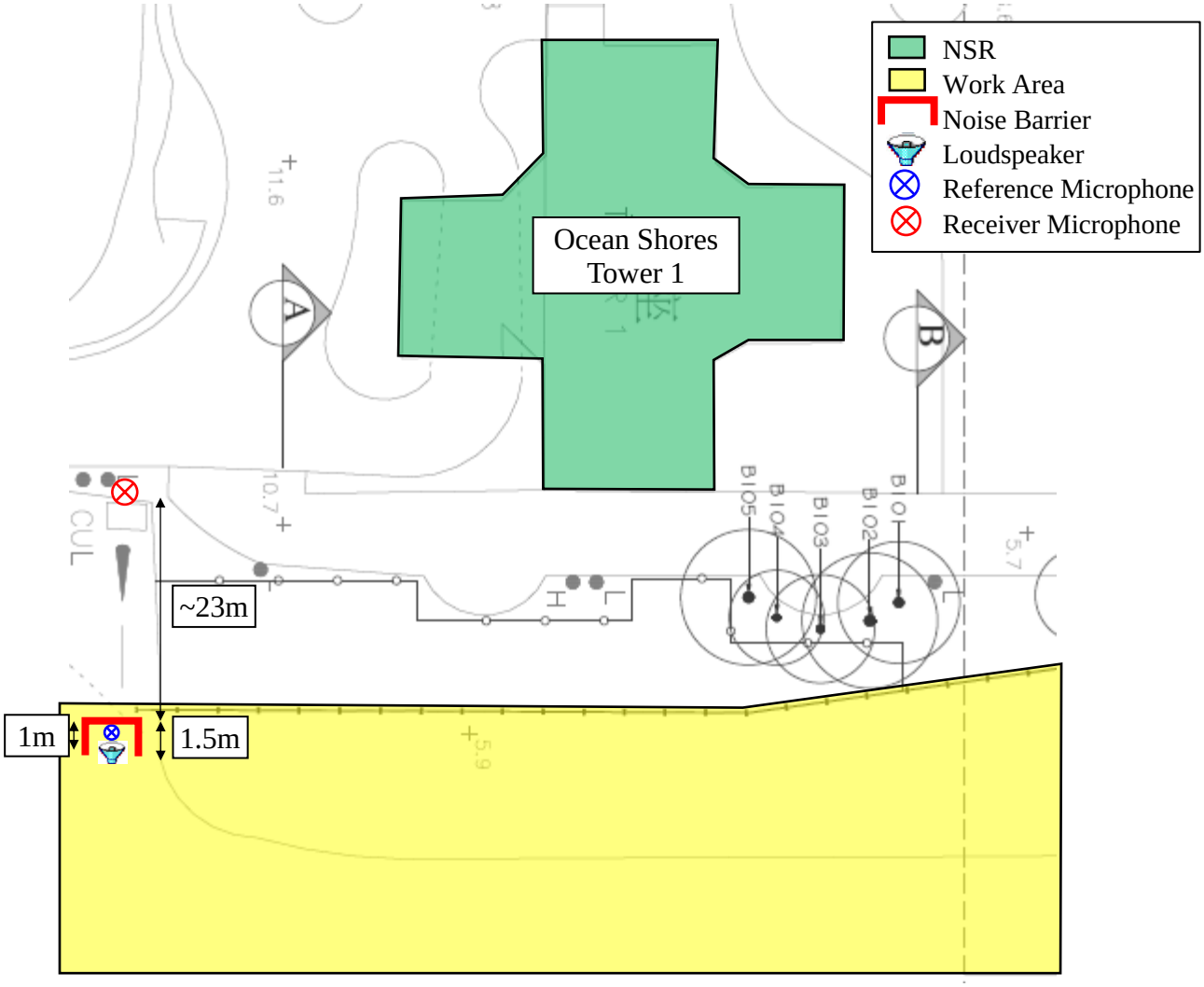


Figure 2. Schematic Concept of IL Measurement (Plan View)

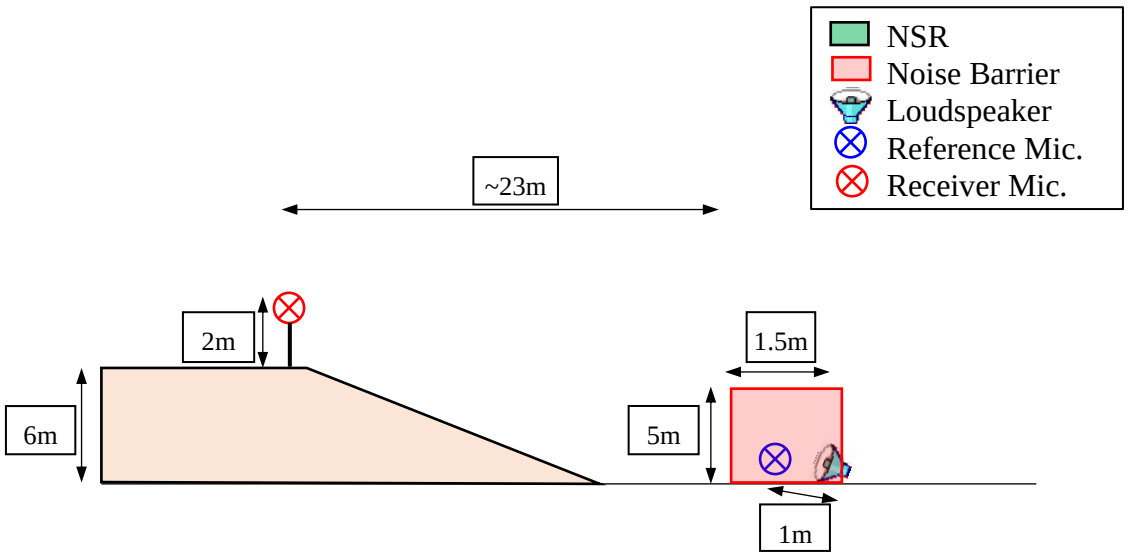


Figure 3. Schematic Concept of IL Measurement (Side View)

5. Measurement Results

5.1 Background Noise Measurement Results

Background noise measurements were conducted when all PMEs were switched off. For conservative approach, background noise correction was conducted with the minimum background $L_{eq,15s}$ (**Table 2**).

Table 2: Background (B/G) Noise Measurement Results, $L_{eq,15s}$, dB(A)

B/G Noise, $L_{eq,30s}$, dB(A)				**Minimum B/G, dB(A)**
58.0	57.6	**57.0**	57.4	**57.0**

5.2 Insertion Loss Measurement Results

The IL measurement results of the noise barrier were measured to be **11.7dB(A)** for drilling rig noise as shown in **Table 3**. Measurement photos are shown in **Appendix A.**

Table 3: IL Measurement Results for the Noise Barrier

Receiver Mic. Location	**Loudspeaker without Noise Bariier**				**Loudspeaker with Noise Barrier**				**IL, dB(A)**
	Ref. Mic. Noise Level	**Receiver Mic. Noise Level**			**Ref. Mic. Noise Level**	**Receiver Mic. Noise Level**			
		$L_{eq,30s}$	**B/G**	**B/G Corrected**		**$L_{eq,30s}$**	**B/G**	**B/G Corrected**	
R1	111.6	78.0	57.0	78.0	112.8	67.8	57.0	67.4	
	111.7	78.2	57.0	78.2	112.7	67.8	57.0	67.4	
	111.9	78.2	57.0	78.2	112.7	67.7	57.0	67.3	
	111.7	78.0	57.0	78.0	112.6	67.7	57.0	67.3	
Average	**111.7**			**78.1**	**112.7**			**67.4**	
								IL =	**11.7**

6. Conclusion

The Insertion loss measurement for the Movable Noise Barrier was conducted according to *ISO 10847:1997* for Drilling Rig noise. Insertion loss was measured to be 11.7dB(A). IL of **12dB(A)** is proposed for the Movable Noise Barrier for Drilling Rig.

Appendix A: Measurement Photos

Photo A1. *Receiver Microphone*

Photo A2. *Loudspeaker, Reference Microphone and Enclosure for with Noise Barrier Scenario*

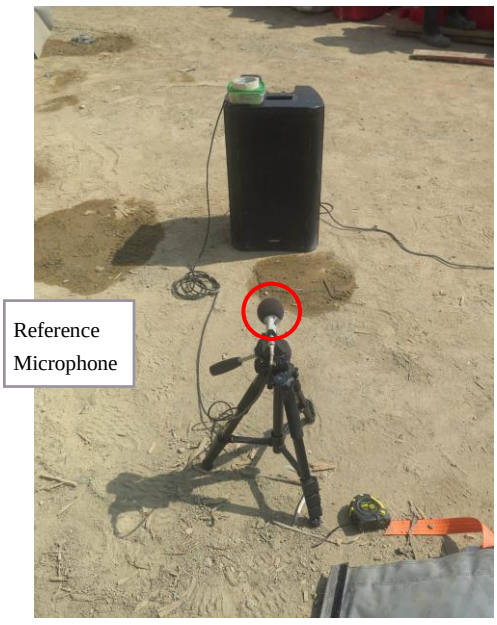


Photo A3. *Loudspeaker and Reference Microphone for without Noise Barrier Scenario*

Appendix B: Noise Spectrum

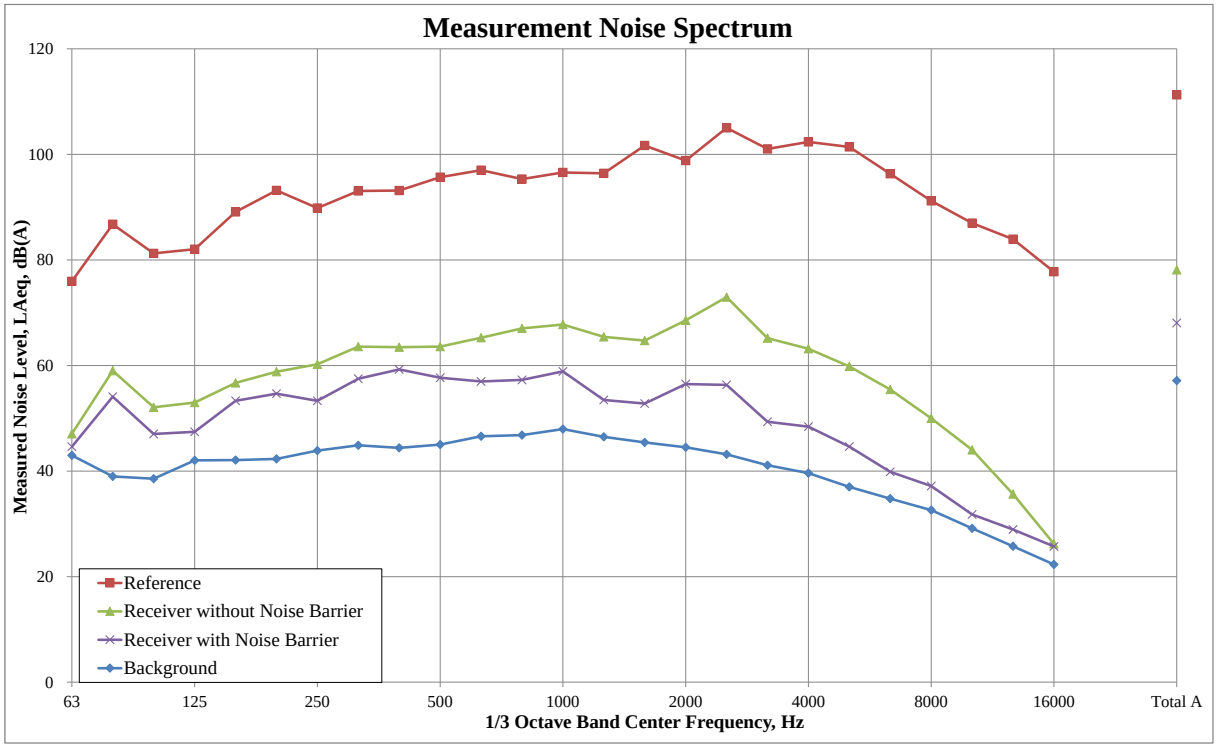


Figure B1: Measurement Noise Spectrum

Appendix C: Equipment Calibration Certificate

Figure C1: SVAN 958 (20890) Calibration Certificate, Page 1

MAXLAB

CALIBRATION CERTIFICATE

Certificate Information			
Date of Issue	23-Jun-2017	**Certificate Number**	MLCN171137S

Customer Information	
Company Name	Wilson Accoustics Limited
Address	Unit 601, Block A, Shatin Industrial Centre, Yuen Shun Circuit, Shatin, N. T., Hong Kong

Equipment-under-Test (EUT)	
Description	Sound & Vibration Analyser
Manufacturer	Svantek
Model Number	SVAN 958
Serial Number	20890
Equipment Number	--

Calibration Particular			
Date of Calibration	23-Jun-2017		
Calibration Equipment	4231(MLTE008) / PA160059 / 20-May-2018		
Calibration Procedure	MLCG00, MLCG15		
Calibration Conditions	Laboratory	Temperature	23 °C ± 5 °C
		Relative Humidity	55% ± 25%
	EUT	Stabilizing Time	Over 3 hours
		Warm-up Time	10 minutes
		Power Supply	Internal battery
Calibration Results	Calibration data were detailed in the continuation pages.		

Approved By & Date		
	K.O. Lo	23-Jun-2017

Statements

* Calibration equipment used for this calibration are traceable to national / international standards.
* The results on this Calibration Certificate only relate to the values measured at the time of the calibration and the uncertainties quoted will not include allowance for the EUT long term drift, variation with environmental changes, vibration and shock during transportation, overloading, mishandling, misuse, and the capacity of any other laboratory to repeat the measurement.
* MaxLab Calibration Centre Limited shall not be liable for any loss or damage resulting from the use of the EUT.
* The copy of this Certificate is owned by MaxLab Calibration Centre Limited. No part of this Certificate may be reproduced without the prior written approval of MaxLab Calibration Centre Limited.

Page 1 of 2

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MaxLab Calibration Centre Limited
香港新界葵涌華星街 16-18 號保盈工業大廈 9 樓 B2 室
Unit B2, 9/F., Boldwin Industrial Bldg., 16-18 Wah Sing Street, Kwai Chung, N.T., Hong Kong Tel: (852) 2116 1380 Fax: (852) 2264 6480 Email: info@maxlab.com.hk

Figure C2: SVAN 958 (20890) Calibration Certificate, Page 2

MAXLAB

Certificate No.MLCN171137S

Calibration Data

Channel / Mode	Filter / Detector	Range	EUT Reading	Standard Reading	EUT Error	Calibration Uncertainty
CH4 / Sound	A / FAST (1 kHz Input)	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
		130 dB	94.1 dB	94.0 dB	0.1 dB	0.2 dB
			114.1 dB	114.0 dB	0.1 dB	0.2 dB
	C / FAST (1 kHz Input)	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
		130 dB	94.1 dB	94.0 dB	0.1 dB	0.2 dB
			114.1 dB	114.0 dB	0.1 dB	0.2 dB
	LIN / FAST (1 kHz Input)	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
		130 dB	94.1 dB	94.0 dB	0.1 dB	0.2 dB
			114.1 dB	114.0 dB	0.1 dB	0.2 dB
	A / SLOW (1 kHz Input)	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
		130 dB	114.1 dB	114.0 dB	0.1 dB	0.2 dB
	C / SLOW (1 kHz Input)	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
		130 dB	114.1 dB	114.0 dB	0.1 dB	0.2 dB
	LIN / SLOW (1 kHz Input)	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
		130 dB	114.1 dB	114.0 dB	0.1 dB	0.2 dB
	A / IMPULSE (1 kHz Input)	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
		130 dB	114.1 dB	114.0 dB	0.1 dB	0.2 dB
	C / IMPULSE (1 kHz Input)	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
		130 dB	114.1 dB	114.0 dB	0.1 dB	0.2 dB
	LIN / IMPULSE (1 kHz Input)	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
		130 dB	114.1 dB	114.0 dB	0.1 dB	0.2 dB

- END -

Calibrated By : Patrick
Date : 23-Jun-2017

Checked By : K.O. Lo
Date : 23-Jun-2017

Page 2 of 2

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MaxLab Calibration Centre Limited
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Unit B2, 9/F., Boldwin Industrial Bldg., 16-18 Wah Sing Street, Kwai Chung, N.T., Hong Kong Tel: (852) 2116 1380 Fax: (852) 2264 6480 Email: info@maxlab.com.hk

Figure C3: SVAN 958 (23412) Calibration Certificate, Page 1

MAXLAB

CALIBRATION CERTIFICATE

Certificate Information			
Date of Issue	13-Mar-2017	**Certificate Number**	MLCN170405S

Customer Information	
Company Name	Wilson Accoustics Limited
Address	Unit 601, Block A, Shatin Industrial Centre, Yuen Shun Circuit, Shatin, N. T., Hong Kong

Equipment-under-Test (EUT)	
Description	Sound & Vibration Analyser
Manufacturer	Svantek
Model Number	SVAN 958
Serial Number	23412
Equipment Number	--

Calibration Particular			
Date of Calibration	13-Mar-2017		
Calibration Equipment	4231(MLTE008) / PA160059 / 20-May-2018		
Calibration Procedure	MLCG00, MLCG15		
Calibration Conditions	Laboratory	Temperature	23 °C ± 5 °C
		Relative Humidity	55% ± 25%
	EUT	Stabilizing Time	Over 3 hours
		Warm-up Time	10 minutes
		Power Supply	Internal battery
Calibration Results	Calibration data were detailed in the continuation pages.		

Approved By & Date		
	K.O. Lo	13-Mar-2017

Statements

* Calibration equipment used for this calibration are traceable to national / international standards.
* The results on this Calibration Certificate only relate to the values measured at the time of the calibration and the uncertainties quoted will not include allowance for the EUT long term drift, variation with environmental changes, vibration and shock during transportation, overloading, mishandling, misuse, and the capacity of any other laboratory to repeat the measurement.
* MaxLab Calibration Centre Limited shall not be liable for any loss or damage resulting from the use of the EUT.
* The copy of this Certificate is owned by MaxLab Calibration Centre Limited. No part of this Certificate may be reproduced without the prior written approval of MaxLab Calibration Centre Limited.

Page 1 of 2

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Unit B2, 9/F., Boldwin Industrial Bldg., 16-18 Wah Sing Street, Kwai Chung, N.T., Hong Kong Tel: (852) 2116 1380 Fax: (852) 2264 6480 Email: info@maxlab.com.hk

Figure C4: SVAN 958 (23412) Calibration Certificate, Page 2

MAXLAB

Certificate No MLCN170405S

Calibration Data

Channel / Mode	Filter / Detector	Range	EUT Reading	Standard Reading	EUT Error	Calibration Uncertainty
CH4 / Sound	A / FAST (1 kHz Input)	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
		130 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
			114.0 dB	114.0 dB	0.0 dB	0.2 dB
	C / FAST (1 kHz Input)	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
		130 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
			114.0 dB	114.0 dB	0.0 dB	0.2 dB
	LIN / FAST (1 kHz Input)	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
		130 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
			114.0 dB	114.0 dB	0.0 dB	0.2 dB
	A / SLOW (1 kHz Input)	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
		130 dB	114.0 dB	114.0 dB	0.0 dB	0.2 dB
	C / SLOW (1 kHz Input)	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
		130 dB	114.0 dB	114.0 dB	0.0 dB	0.2 dB
	LIN / SLOW (1 kHz Input)	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
		130 dB	114.0 dB	114.0 dB	0.0 dB	0.2 dB
	A / IMPULSE (1 kHz Input)	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
		130 dB	114.0 dB	114.0 dB	0.0 dB	0.2 dB
	C / IMPULSE (1 kHz Input)	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
		130 dB	114.0 dB	114.0 dB	0.0 dB	0.2 dB
	LIN / IMPULSE (1 kHz Input)	105 dB	94.0 dB	94.0 dB	0.0 dB	0.2 dB
		130 dB	114.0 dB	114.0 dB	0.0 dB	0.2 dB

- END -

Calibrated By : Patrick **Checked By :** K.O. Lo
Date : 13-Mar-2017 **Date :** 13-Mar-2017

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Figure C5: Acoustics Calibrator (10814) Calibration Certificate, Page 1

MAXLAB

CALIBRATION CERTIFICATE

Certificate Information

Date of Issue	15-Jun-2017	**Certificate Number**	MLCN171088S

Customer Information

Company Name	Wilson Accoustics Limited
Address	Unit 601, Block A, Shatin Industrial Centre, Yuen Shun Circuit, Shatin, N. T., Hong Kong

Equipment-under-Test (EUT)

Description	Acoustic Calibrator
Manufacturer	Svantek
Model Number	SV 30A
Serial Number	10814
Equipment Number	--

Calibration Particular

Date of Calibration	15-Jun-2017		
Calibration Equipment	4231(MLTE008) / PA160059 / 20-May-18 1351(MLTE049) / MLEC17/06/02 / 6-Jun-18		
Calibration Procedure	MLCG00, MLCG15		
Calibration Conditions	Laboratory	Temperature	23 °C ± 5 °C
		Relative Humidity	55% ± 25%
	EUT	Stabilizing Time	Over 3 hours
		Warm-up Time	Not applicable
		Power Supply	Internal battery
Calibration Results	Calibration data were detailed in the continuation pages. All calibration results were within EUT specification.		

Approved By & Date

K.O. Lo 15-Jun-2017

Statements

* Calibration equipment used for this calibration are traceable to national / international standards.
* The results on this Calibration Certificate only relate to the values measured at the time of the calibration and the uncertainties quoted will not include allowance for the EUT long term drift, variation with environmental changes, vibration and shock during transportation, overloading, mishandling, misuse, and the capacity of any other laboratory to repeat the measurement.
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Page 1 of 2

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Figure C6: Acoustics Calibrator (10814) Calibration Certificate, Page 2

MAXLAB

Certificate No. MLCN171088S

Calibration Data

EUT Setting	Standard Reading	EUT Error	Calibration Uncertainty	EUT Specification
94 dB	94.0 dB	0.0 dB	0.15 dB	± 0.3 dB
114 dB	113.9 dB	0.1 dB	0.15 dB	± 0.3 dB

- END -

Calibrated By : Patrick
Date : 15-Jun-17

Checked By : K.O. Lo
Date : 15-Jun-17

Page 2 of 2

Acoustics Innovation

SilentUP®
Retractable Noise Barrier

aihk.hk
info@aihk.hk
(852) 2702-2007

R&D Division of
Wilson Acoustics Limited

Acoustics Innovation

SilentUP®

Product Description

SilentUP® is a patented retractable noise barrier for construction works and outdoor music events. It can be easily installed and mobilized by people without using any machines. No concrete foundation is required and the installation process is quiet enough to be conducted even at night time. The panels are installed upwards from ground level and connected by magnetic gap sealing.

Our product has been widely used in Hong Kong. Visit our website for the job references aihk.hk/SilentUP/reference.

Benefits

- Quiet and manual installation
- Flexible construction site planning
- Facilitate Construction Noise Permit (CNP) application process
- Minimize noise complaints
- No concrete foundation required

Technical Information

SilentUP® noise barrier material conforms to the flammability requirement specifications.

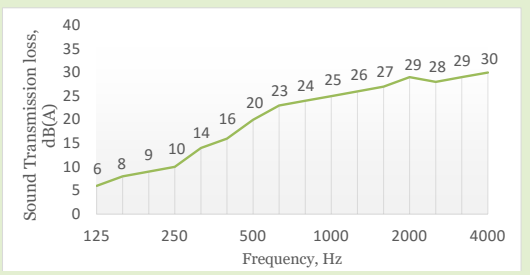
BS EN ISO 15025:2002 6 TYPE B
GB8624-1997 TYPE B

Product Specification

Modular Size	1m(H) x1.35m(W)
Modular Weight	6kg
Maximum Height	10m
Insertion Loss*	26 dB(A)
STC	23
Standard Colour	Grey
Panel Thickness	100mm on edges

* Tested with white noise source

Sound Transmission Loss



Testing method in accordance with BS EN ISO 10140-2: 2010

Client Feedback

"Some of our contractors have used the retractable noise barriers to facilitate CNP application. They have found this innovative product useful - lightweight, easy to manoeuvre, and fit for purpose."

Richard Kwan
Environment Manager
MTR Corporation Ltd

"We are impressed by SilentUP's quick installation and relocation, it is definitely one of the best innovations and practicable approaches for the noise mitigation measures for the construction activities."

Lighting Chan
Environmental Compliance Support Manager,
Leighton Asia Ltd

"We are happy with Acoustics Innovation's professional service (SilentUP Noise Barrier) in helping us achieve our noise mitigation goals."

Ronald Fung
Project QA & Environmental Manager
Kier - Laing O'Rourke - Kaden Joint Venture

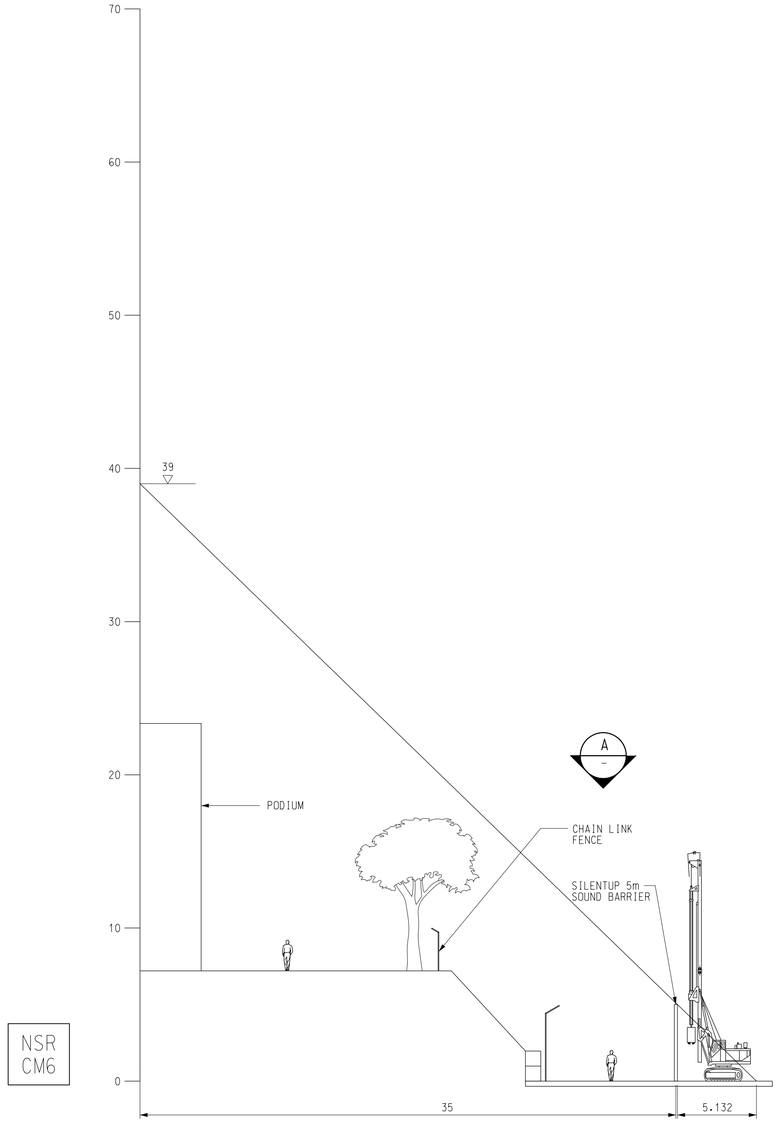
"SilentUP is definitely a useful tool to minimize the noise pollution. We successfully obtained a CNP and most importantly no complaint has been received from the NSRs."

Clarence Yeung
Environmental Officer
Chun Wo Construction and Engineering Co. Ltd

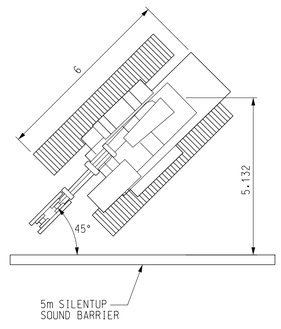
Installation videos available at aihk.hk/youtube

aihk.hk info@aihk.hk (852) 2702-2007

R&D Division of
Wilson Acoustics Limited



DETAIL
SCALE 1:200



VIEW A
SCALE 1:100

0 1 2 3 4 5
METRES
1 : 100

0 2 4 6 8 10
METRES
1 : 200

Rev. 修訂	Description 內容摘要	By 設計	Date 日期

PM
CEDD 土木工程拓展署 Civil Engineering and Development Department

Supervisor
AECOM Asia Co. Ltd.

Contractor
中國路橋 CRBC Build King
CRBC-Build King Joint Venture

Project title 工程名稱

Contract No. NE/2015/02

Tseung Kwan O - Lam Tin Tunnel Road P2 and Associated Works

Drawing title 圖紙名稱

PORTION IV 35m FROM NSR CM6
SCHEMATIC DIAGRAMS

Drawing no. 圖紙編號	NE/2015/02/SK/0084	Rev. 修訂	–
Drawn By 繪圖	AL	Checked By 覆核	Approved By 批准人
Scale 比例	AS SHOWN @ A1	Status 階段	

Printed by : 5/12/2017
Filename : Z:\Survey\TKOLTT\JOB\JOB0128_NOISE CONTROL_GRAY FUNG_20171117_NE201502SK0084 AND 0085\NE_2015_02_SK_0084.dgn

Appendix E

Catalogues of On-site Plant

Hydraulic Crawler Crane

CKS

900

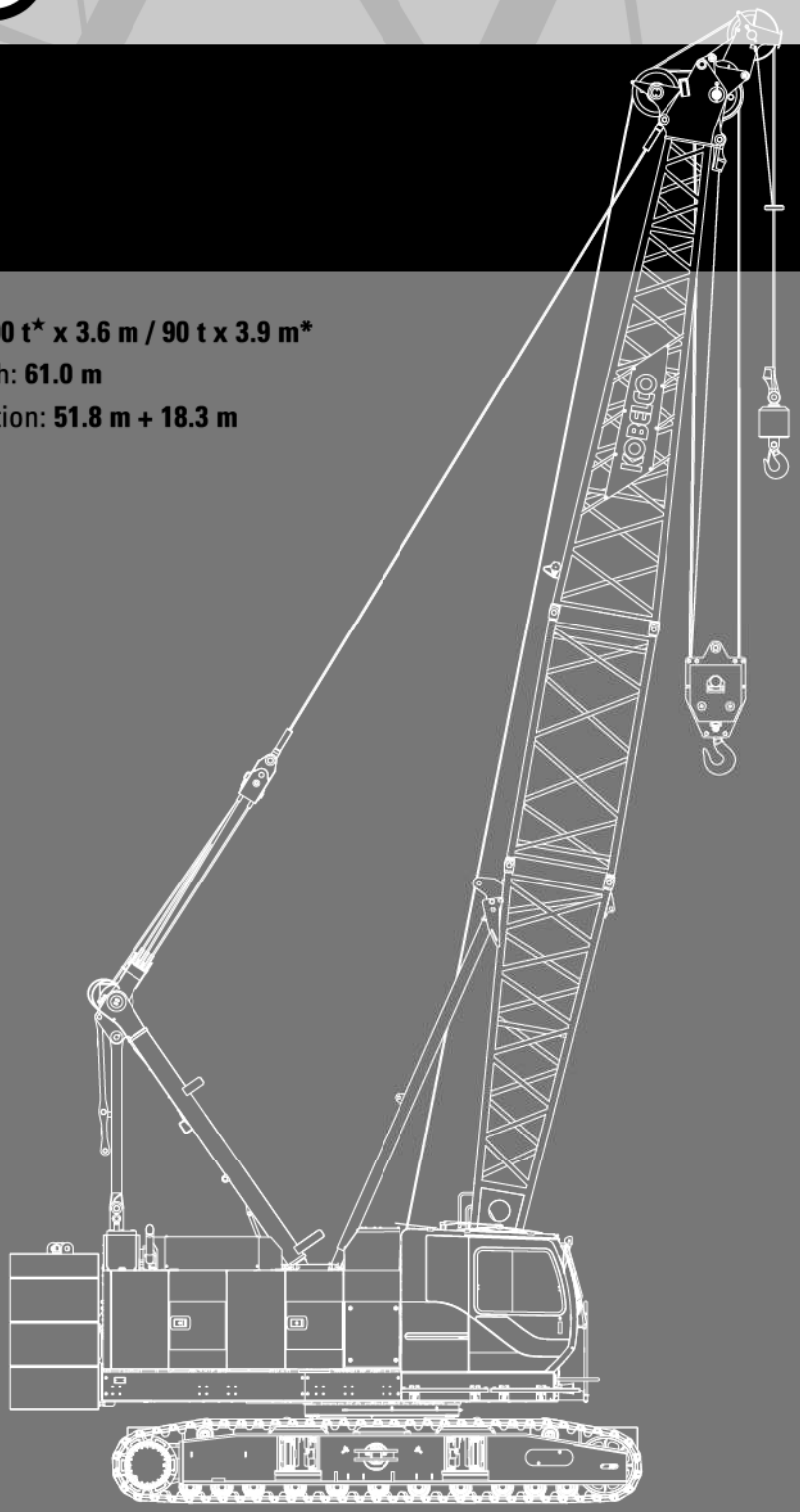
Model : CKS900

Max. Lifting Capacity: **100 t* x 3.6 m / 90 t x 3.9 m***

Max. Crane Boom Length: **61.0 m**

Max. Fixed Jib Combination: **51.8 m + 18.3 m**

* The value are theorical result.
* Auxiliary sheave is necessary.



KOBELCO

CKS900
CONTENTS

SPECIFICATIONS

Power Plant

Model: HINO J08E-VM
Type: 4 cycle, water-cooled, vertical in-line 6, direct injection, turbo-charger, intercooler
Displacement: 7,684 liters
Rated power: 213 kW/2,100 min^{-1}
Max. Torque: 1,017 N·m/1,600 min^{-1}
Cooling System: Water-cooled
Starter: 24V-5kW
Radiator: Corrugated type core, thermostatically controlled
Air cleaner: Dry type with replaceable paper element
Throttle: Twist grip type hand throttle, electrically actuated
Fuel filter: Replaceable paper element
Batteries: Two 12V x 136 Ah/5HR capacity batteries, series connected
Fuel tank capacity: 400 liters

Hydraulic System

Main pumps: 3 variable displacement piston pumps
Control: Full-flow hydraulic control system for infinitely variable pressure to all winches, propel and swing. Controls respond instantly to the touch, delivering smooth function operation.
Cooling: Oil-to-air heat exchanger (plate-fin type)
Filtration: Full-flow and bypass type with replaceable element
Max. relief valve pressure:
Load hoist, boom hoist and propel system: 31.9 MPa
Swing system: 27.5 MPa
Control system: 5.4 MPa
Hydraulic Tank Capacity: 440 liters

Boom Hoisting System

Powered by a hydraulic motor through a planetary reducer.
Brake: A spring-set, hydraulically released multiple-disc brake is mounted on the boom hoist motor and operated through a counter-balance valve.
Drum Lock: External ratchet for locking drum
Drum: Single drum, grooved for 16mm dia. wire rope
Line Speed: Single line on first drum layer
Hoisting/Lowering: 70 to 2 m/min
Boom hoisting/lowering: 16 mm x 150 m
Boom guy line: 30 mm
Boom backstops: Required for all boom length

Load Hoisting System

Front and rear drums for load hoist powered by a hydraulic variable plunger motors, driven through planetary reducers.
Negative Brake: A spring-set, hydraulically released multiple-disc brake is mounted on the hoist motor and operated through a counter-balance valve. (Positive free fall brake is optional)
Drum Lock: External ratchet for locking drum
Drums:
Front Drums:
614 mm P.C.D x 617 mm wide drum, grooved for 26 mm wire rope. Rope capacity is 240 m working length and 360 m storage length.
Rear Drum: 614 mm P.C.D x 617 mm, grooved for 26 mm wire rope. Rope capacity is 165 m working length and 360 m storage length.
Diameter of wire rope
Main winch: 26 mm x 240 m
Aux. winch: 26 mm x 165 m
Third winch: 22 mm x 145 m
Line Speed*:
Hoisting/lowering: 120 to 3 m/min
Line Pull:
Max. Line Pull*: 208 kN {21.2 ft}
(Referential performance)
Rated Line Pull: 112 kN {11.4 ft}
*Single line on first drum layer

Swing System

Swing unit is powered by hydraulic motor driving spur gears through planetary reducer, the swing system provides 360° rotation.
Swing parking brakes: A spring-set, hydraulically released multiple-disc brake is mounted on swing motor.
Swing circle: Single-row ball bearing with an integral internally cut swing gear.
Swing lock: Manually, four position lock for transportation
Swing Speed: 4.0 min^{-1}

Upper Structure

Torsion-free precision machined upper frame. All components are located clearly and service friendly. Engine will with low noise level.
Counterweight: 31.9 ton

Cab & Control

Totally enclosed, full vision cab with safety glass, fully adjustable, high backed seat with a headrest and armrests, and intermittent wiper and window washer (skylight and front window).
Cab fittings:
Air conditioner, convenient compartment (for tool), cup holder, cigarette lighter, sun visor, roof blind, tinted glass, floor mat, footrest, and shoe tray

Lower Structure

Steel-welded carbody with axles. Crawler assemblies can be hydraulically extended for wide-track operation or retracted for transportation. Crawler belt tension is maintained by hydraulic jack force on the track-adjusting bearing block.

Carbodyweight: 14.4 ton

Crawler drive: Independent hydraulic propel drive is built into each crawler side frame. Each drive consists of a hydraulic motor propelling a driving tumbler through a planetary gear box. Hydraulic motor and gear box are built into the crawler side frame within the shoe width.

Crawler brakes: Spring-set, hydraulically released parking brakes are built into each propel drive.

Steering mechanism: A hydraulic propel system provides both skid steering (driving one track only) and counter-rotating steering (driving each track in opposite directions).

Track rollers: Sealed track rollers for maintenance-free operation.

Shoe (flat): 800 mm wide each crawler

Max. gradeability: 40%

Weight

Including upper and lower machine, 31.9 ton counterweight and 14.4 ton carbody weight, basic boom (or basic boom + basic jib), hook, and other accessories.

Weight: 90.1 ton

Ground pressure: 101 kPa

Attachment

Boom & Jib:

Welded lattice construction using tubular, high-tensile steel chords with pin connection between sections.

Boom and Jib length

	Min. Length (Min. combination)	Max. Length (Max. combination)
Crane Boom	12.2 m	61.0 m
Fixed Jib	24.4 m + 9.1 m	51.8 m + 18.3 m

Main Specifications (Model: CKS900)

Crane Boom	
Max. Lifting Capacity	100 t * x 3.6 m / 90 t x 3.9 m *3
Max. Length	61.0 m
Fixed Jib	
Max. Lifting Capacity	10.9 t x 18.0 m
Max . Combination	51.8 m + 18.3 m
Main & Aux. Winch	
Max. Line Speed (1st layer)	120 m/min
Rated Line Pull (Single line)	112 kN {11.4 tf}
Wire Rope Diameter	26 mm
Wire Rope Length	240 m (Main), 165 m (Aux)
Brake Type (free fall)	Wet-type multiple disc brake (Optional)
Working Speed	
Swing Speed	4.0 min^{-1}{rpm}
Travel Speed	1.7/1.1 km/h
Power Plant	
Model	HINO J08E-VM
Engine Output	213 kW/2100min^{-1}
Fuel Tank	400 liters

Hydraulic System	
Main Pumps	3 variable displacement
Max. Pressure	31.9 MPa {325 kgf/cm^2}
Hydraulic Tank Capacity	440 liters
Self-Removal Device	
	Counterweight/self-removal device (Option)
Weight	
Operating Weight	90.1 t *1
Ground Pressure	101 kPa
Counterweight	31,900 kg
Transport Weight	41,360 kg *2

Units are SI units. { } indicates conventional units.
Line speeds in table are for light loads. Line speed varies with load.

*1 Including upper and lower machine, 31.9 ton counterweight, 14.4 ton carbody weight, basic boom, hook, and other accessories.

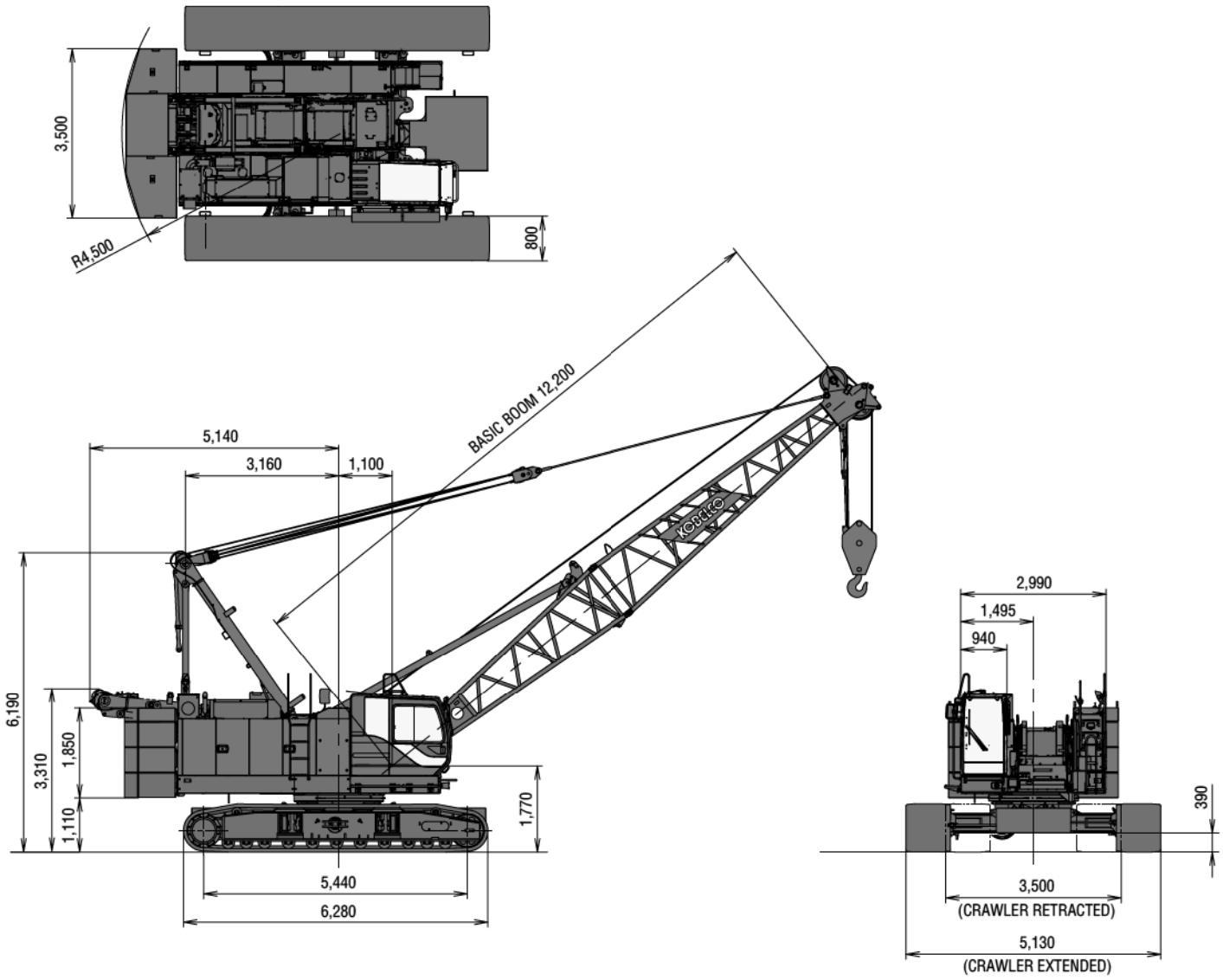
*2 Base machine with boom base, gantry, crawlers, and wire ropes (front/boom hoist)

*3 Auxiliary sheave is must.

* The value are theorical result.

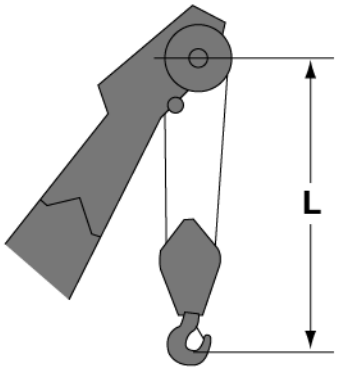
GENERAL DIMENSIONS

(Unit: mm)

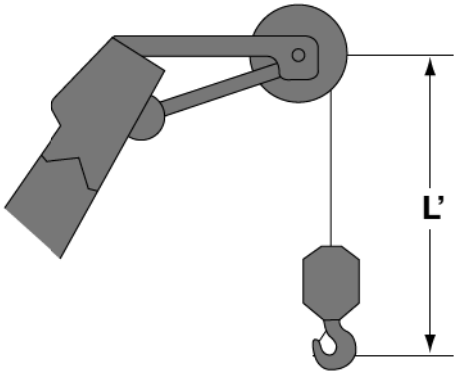


This catalog may contain photographs of machines with specifications, attachments and optional equipment.

Limit of Hook Lifting



Hook	L
90 t hook	4.1 m
70 t hook	4.1 m
50 t hook	4.0 m
35 t hook	3.9 m



Hook	L'
Ball hook	3.5 m

SUPPLEMENTAL DATA FOR REDUCED WEIGHTS RATING CHART

- Ratings according to EN13000.
- Operating radius is the horizontal distance from centerline of rotation to a vertical line through the center of gravity of the load.
- Deduct weight of hook block(s), slings and all other load handling accessories from main boom ratings shown.
- Ratings shown are based on freely suspended loads and make no allowance for such factors as wind effect on lifted load, ground conditions, out-of-level, operating speeds or any other condition that could be detrimental to the safe operation of this equipment. The operator, therefore, has the responsibility to judge the existing conditions and reduce lifted loads and operating speeds accordingly.
- Ratings are for operation on a firm and level surface, up to 1% gradient.
- At radii and boom lengths where no ratings are shown on chart, operation is not intended nor approved.
- Boom inserts and guy lines must be arranged as shown in the "operator's manual".
- Boom hoist reeving is 12 part line.
- Gantry must be in raised position for all conditions.
- Boom backstops are required for all boom lengths.
- The boom should be erected over the front of the crawlers, not laterally.
- Ratings inside of boxes ☐ are limited by strength of materials.
- The minimum rated load is 1.4(Ton).
- Crawler frames must be fully extended for all crane operations.

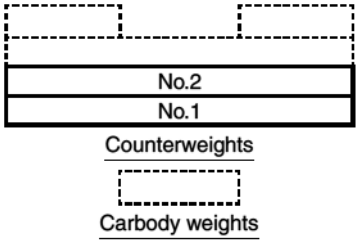
(Crane boom lifting)

- The total load that can be lifted is the value for weight of hook block, slings, and all other load handling accessories deducted from main boom ratings shown.

Counterweight	Carbody weight	Boom lenght	
		Without aux.	With aux.
20.5 ton	Without	12.2 m ~ 57.9 m	12.2 m ~ 54.9 m
19.8 ton	Without	12.2 m ~ 57.9 m	12.2 m ~ 54.9 m

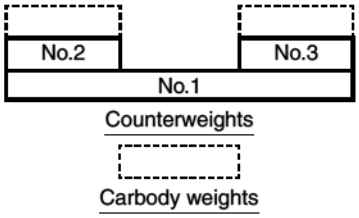
Assembling the counterweight

20.5 ton counterweight
without carbody weight
(Standard type)



Assembling the counterweight

(Equipped with self removal device)
19.8 ton counterweight
without carbody weight
(Optinal type)



- The lifting capacity does not change due to the type of counterweights. (Standard or optinal)

<Reference Information>

Main hoist loads

No. of Parts of Line	1	2	3	4	5
Maximum Loads (kN)	112	224	335	447	559
Maximum Loads (t)	11.4	22.8	34.2	45.6	57.0

No. of Parts of Line	6	7	8
Maximum Loads (kN)	671	779	883
Maximum Loads (t)	68.4	79.4	90.0

Auxiliary hoist loads

No. of Parts of Line	1
Maximum Loads (kN)	108
Maximum Loads (t)	11.0

Weight of hook block					
Hook Block	90 t	70 t	50 t	35 t	Ball Hook
Weight (t)	1.3	0.9	0.85	0.7	0.3

Operation of this equipment in excess of rated loads
or disregard of instruction voids the warranty.

Manitowoc 11000-1

Product Guide

ASME B30.5
Metric / Imperial

Features

- 100 t (110 USt) capacity
- 61,0 m (200 ft) heavy-lift boom
- Max boom + jib combination:
  57,9 m (190 ft) + 18,3 m (60 ft)
- 213 kW (285 HP) engine
- 163 m/min (535 fpm) maximum line speed
- 113 kN (25,200 lb) rated line pull

Features

Energy saving systems
Green-Engine mode conserves fuel during full speed drum operation under load, at a lower engine RPM. Other available options include Green-Winch Mode and Auto Idling Stop Mode.

Self-erecting counterweight
Eliminates the need for an assist crane, and also allows for reduced counterweight chart operation.

Retractable crawlers
Crawlers can be extended and retracted for better jobsite maneuverability. On some models, these crawlers can also ship attached for easier transport and quicker setup.

Contents

Specifications

Upperworks

Engine

HINO J08E-UV, 6 cylinder, water-cooled diesel, direct fuel injection with turbocharger, 213 kW (285 HP) at 2100 high-idle RPM. Maximum torque 1017 N•m (750 lb•ft) net at 1,600 rpm; Interim Tier 4/ Stage IIIB (Required for sale in the US/Canada/ Europe; requires "Ultra Low Sulfur Diesel")

HINO J08E-VM, 6 cylinder, water-cooled diesel, direct fuel injection with turbocharger, 213 kW (285 HP) at 2100 high-idle RPM. Maximum torque 1017 N•m (750 lb•ft) net at 1,600 rpm; Tier 3 (Required for sale outside the US/Canada/Europe)

One diesel fuel tank, 400 liters (105 gallons) capacity.

Two 12 volt 136 AH capacity batteries, 24 volt system and 90 amp alternator.

All wiring harnesses and connectors are numbered for easier servicing. Machine is equipped with individual fused branch circuits.

Controls

Full-flow hydraulic control system for constant variable pressure to front and rear drums, boom hoist brakes and clutches. Controls respond instantly to the touch, delivering smooth function operation.

Hydraulic system

All three variable displacement piston-type pumps are driven by a heavy-duty pump drive. One of these pumps is used in the left propel circuit and hook hoist circuit, and can accommodate an optional third circuit. Another is used in the right propel circuit, boom hoist circuit and hook hoist circuit. The third variable displacement pump is used in the swing circuit. In addition, two gear pumps are used in the control system and auxiliary equipment, and two gear pumps serve the brake cooling system.

Maximum pressure rating . . . . .31.9 MPa (4,630 psi)

Load hoist, boom hoist and propel . . 2 Piston pumps
Swing . . . . . 1 Piston pump
Control system and auxiliary . . . . . .2 Gear pumps
Brake cooling system . . . . . 2 Gear pumps

Reservoir capacity: . . . . . 440 liter (116 US gallon)
Cooling: . . . . . oil-to-air heat exchanger
Filtration: full-flow and bypass type with replaceable paper elements.

Drums

Front and rear drums for load hoist powered by variable displacement piston-type motors, driven through planetary reducers. Powered hoisting/ lowering and free-fall operation is standard. Drum turn indicators for front and rear drums are also standard.

Drums: (front and rear) 614 mm (24.2") P.C.D. x 617 mm (24.3") wide drums, grooved for 26.0 mm wire rope.

Brakes: Counterbalance valve and spring set hydraulically released multiple disk brake mounted on hoist motor. External ratchet is fitted for locking drum.

Wire rope capacity:
Front drum . . . . . .235 m (771 ft) working length
Rear drum . . . . . .160 m (525 ft) working length

Line speed: Single line on the first drum layer
Hoisting: . . . . . 120m/min (390 ft/min)
Lowering: . . . . . 120m/min (390 ft/min)

Optional third drum: grooved for 22 mm wire rope; free-fall is optional.
Wire rope working length . . . . . 145m (476').

Swing system

Swing unit: Powered by a hydraulic piston-type motor driving spur gears through planetary reducers, the swing system provides 360° rotation.

Swing brake: A spring-set, hydraulically released multiple-disc brake is mounted on swing motor.

Swing lock: 4-Position lock for transportation.

Rotating bed turntable: Single-row ball bearing with an integral internally cut swing gear.

Swing speed: 4.0 rpm

Boom support system

Single drum powered by a hydraulic axial piston motor through a planetary reducer.

Brake: A spring-set, hydraulically released multiple-disc brake is mounted on the boom hoist motor. An external ratchet is fitted for locking the drum.

Drum: Single drum, grooved for 16 mm diameter wire rope. Boom hoist reeving is 12-part line.

Wire Rope Capacity:
Drum 150 m (492 ft) working length.

Specifications

Line speed: Single line on first drum layer.

Hoisting . . . . . 70m/min (230 ft/min)
Lowering. . . . . 70m/min (230 ft/min)

Gantry

This high folding type gantry is fitted with a sheave frame for boom hoist reeving. It provides full up, full down positions.

Counterweight

Upper weight (5 pieces): 31,300 kg (69,000 kg)
Carbody weight (2 pieces): 14,400 kg (31,750 lb)

Operator's cab

Totally enclosed, full vision cab fitted with tinted safety glass and opening front window. A fully adjustable, highbacked seat with arm rests. Short handle control levers; electronic twist grip hand throttle. An air conditioner, a signal horn and windshield wiper are standard.

Lights:
2 - Front flood lights
1 - Cab inside light

Safety device
New easy to read at a glance LMI and maintenance display.

Lowerworks

Carbody

The durable carbody features steel welded construction with extendible axles.

Crawlers

Crawler assemblies can be hydraulically extended for wide-track operation or retracted for transportation.

Crawler belt tension adjusted with hydraulic jack and maintained by shims between idler block and frame.

The independent hydraulic propel drive is built into each crawler side frame. Each drive consists of a hydraulic motor propelling a driving tumber through a planetary gearbox. Hydraulic motor and gear box are built into the crawler side frame within the shoe width. The track rollers are sealed for maintenance-free operation.

Crawler brakes: multiple disk type, spring set hydraulically released parking brakes are built into each propel drive.

Crawler shoes
914 mm (36") wide crawler.

Travel speed
(High/Low) 1.73/1.2 km/h (1.07/0.71 mph)

Attachments

Boom

Welded lattice construction using tubular, high-tensile steel chords with pin connections between sections.

Two idler sheaves and three point sheaves are standard.

Basic boom length 12,2 m (40'). Basic boom consists of the boom butt 5,8 m (19') and boom top 6,39 m (21').

Optional boom inserts are welded lattice construction with tubular, high-tensile steel chords and pin connections on each one of 3,0 m (10'), 6,1 m (20') and 12,2 m (40') inserts.

Maximum total length of boom 61,0 m (200').

Fixed jib

The optional fixed jib employs welded lattice construction with tubular, high-tensile steel chords with pin connections between sections.

Basic jib length 9,14 m (30'). Basic jib length consists of jib butt section 4,57 m (15') and jib top 4,57 m (15').

Optional jib boom inserts of 3,0 m (10'), 6,1 m (20') are available for extension capabilities up to 18 m (60').

Maximum total length of boom and jib 57,9 m (190') + 18 m (60') is 76,2 m (250').

Tool and accessories

A set of tools and accessories are furnished.

Optional Equipment

Optional: Blocks and hooks each with roller bearing sheaves grooved for 26.0 mm diameter wire rope, and roller bearing swivel with hook latch.

Specifications

- 11.3 t swivel hook and weight ball, 460 kg (15 USt ball hook, 1,310 lb wedge socket for 26 mm wire rope.)
- 35 t hook block, 700 kg with one 617 mm Nominal O.D. roller bearing sheave. (40 USt hook block, 2,311 lb with three 24" Nominal O.D. roller bearing sheaves.)
- 70 t hook block, 900 kg, three 617 mm Nominal O.D. roller bearing bearing sheaves. (75 USt hook block, 3,820 lb, with four 24" Nominal O.D. roller bearing sheaves.)
- 90 t hook block, 1 300 kg, with four 617 mm Nominal O.D. roller bearing sheaves. (110 USt hook block, 2,946 lb with four 24" Nominal O.D. roller bearing sheaves.)
- Optional: Detachable upper boom point with one 575 mm Nominal outer diameter roller bearing steel sheave grooved for 26mm rope for liftcrane.
- Machine inclination sensor.
- Swing angle detection and angle limiter.
- Counterweight detection.
- Hydraulic tagline.
- External lamp for overload alarm.

Working weight

Approximately 90,000 kg (198,500 lb) including upperworks and lowerworks, full upper counterweights, full carbody counterweights, and 12,2 m (40') basic boom.

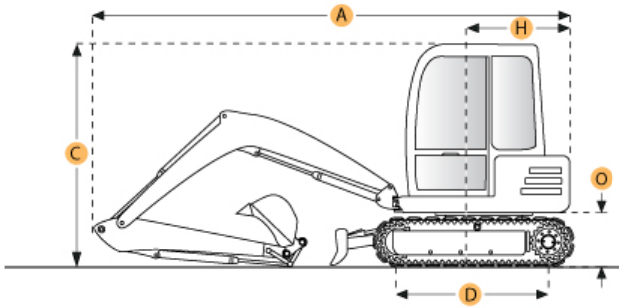
Ground pressure

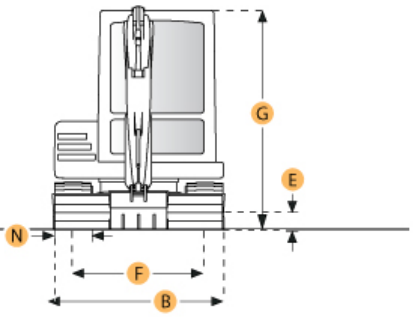
Approximately 88.8 kPa (12.9 psi) with basic boom and no load.

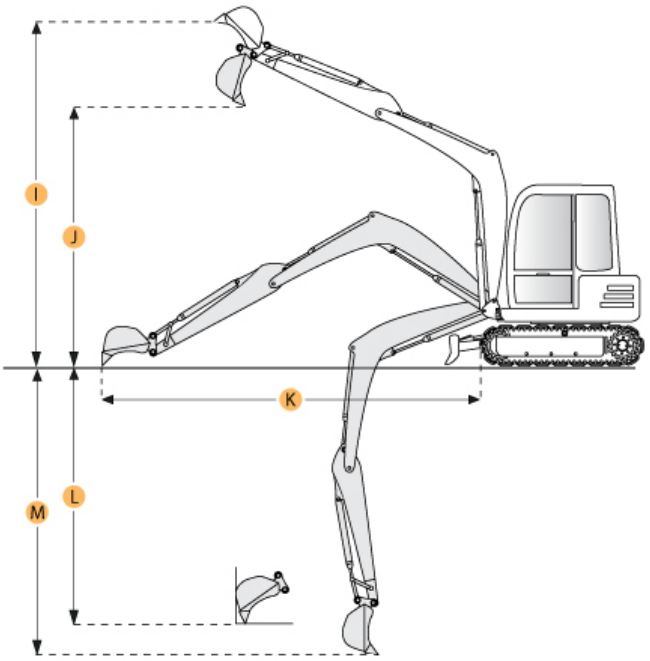
Gradeability

With basic boom: 40%.

SUMITOMO SH75U MIDI EXCAVATOR







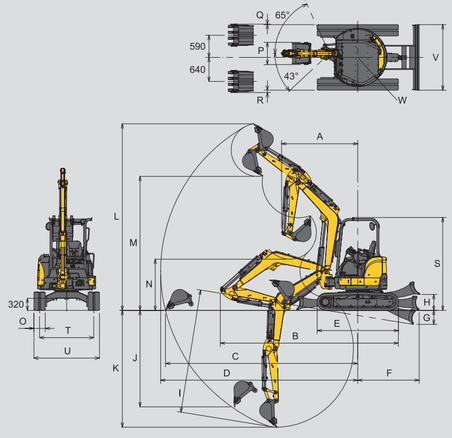
Selected Dimensions

Boom/Stick Option (HEX) 1		
A. SHIPPING LENGTH OF UNIT	20.4 ft in	6230 mm
C. SHIPPING HEIGHT OF UNIT	15.9 ft in	4840 mm
I. MAX CUTTING HEIGHT	24 ft in	7300 mm
J. MAX LOADING HEIGHT	17.2 ft in	5230 mm
K. MAX REACH ALONG GROUND	21.2 ft in	6455 mm
L. MAX VERTICAL WALL DIGGING DEPTH	10.2 ft in	3100 mm
M. MAX DIGGING DEPTH	13.8 ft in	4200 mm
Dimensions		
B. WIDTH TO OUTSIDE OF TRACKS	7.6 ft in	2320 mm
G. HEIGHT TO TOP OF CAB	8.8 ft in	2695 mm
H. TAIL SWING RADIUS	3.8 ft in	1150 mm
Undercarriage		
N. SHOE SIZE	17.7 in	450 mm

Specification

Engine		
NUMBER OF CYLINDERS	4	
MAKE	2353	
MODEL	4JB1	
NET POWER	49 hp	36.5 kw
POWER MEASURED @	2000 rpm	
DISPLACEMENT	169.1 cu in	2.8 L
MAX TORQUE	130.2 lb ft	176.5 Nm
TORQUE MEASURED @	1800 rpm	
Operational		
OPERATING WEIGHT	17460.6 lb	7920 kg
HYDRAULIC SYSTEM RELIEF VALVE PRESSURE	3982.5 psi	27458.6 kPa
HYDRAULIC PUMP FLOW CAPACITY	34.9 gal/min	132 L/min
Swing Mechanism		
SWING SPEED	12 rpm	
Undercarriage		
SHOE SIZE	17.7 in	450 mm
GROUND PRESSURE	5 psi	34.3 kPa
MAX TRAVEL SPEED	2.7 mph	4.4 km/h
Buckets		
REFERENCE BUCKET CAPACITY	0.37 yd3	0.28 m3
MINIMUM BUCKET CAPACITY	0.14 yd3	0.11 m3
MAXIMUM BUCKET CAPACITY	0.37 yd3	0.28 m3

Boom/Stick Option (HEX) 1		
BOOM/STICK OPTION (HEX) 1	Boom 3700mm / Stick 1740mm	
SHIPPING HEIGHT OF UNIT	15.9 ft in	4840 mm
SHIPPING LENGTH OF UNIT	20.4 ft in	6230 mm
MAX DIGGING DEPTH	13.8 ft in	4200 mm
MAX REACH ALONG GROUND	21.2 ft in	6455 mm
MAX CUTTING HEIGHT	24 ft in	7300 mm
MAX LOADING HEIGHT	17.2 ft in	5230 mm
MAX VERTICAL WALL DIGGING DEPTH	10.2 ft in	3100 mm
Dimensions		
WIDTH TO OUTSIDE OF TRACKS	7.6 ft in	2320 mm
HEIGHT TO TOP OF CAB	8.8 ft in	2695 mm
REMOVAL COUNTERWEIGHT CLEARANCE	2.5 ft in	765 mm
TAIL SWING RADIUS	3.8 ft in	1150 mm



Dimensions

Unit : mm (ft-in)

	ViO30-6B		ViO35-6B	
	Canopy spec / Cabin spec			
	Quick Coupler	without Quick Coupler	Quick Coupler	without Quick Coupler
A	2200 (7'3") Swing 1980 (6'6")	2050 (6'9") Swing 1840 (6'0")	2170 (7'1") Swing 1950 (6'5")	2020 (6'8") Swing 1810 (5'11")
B	4520 (14'10")	4470 (14'8")	4770 (15'8")	4730 (15'6")
C	4890 (16'1")	4730 (15'6")	5270 (17'3")	5110 (16'9")
D	5020 (16'6")	4870 (16'0")	5390 (17'8")	5230 (17'2")
E	2160 (7'1")			
F	1480 (4'10")		1630 (5'4")	
G	325 (1'1")		370 (1'3")	
H	375 (1'3")		425 (1'5")	
I	3110 (10'2")	2950 (9'8")	3440 (11'3")	3290 (10'10")
J	2160 (7'1")	2290 (7'6")	2410 (7'11")	2560 (8'5")
K	2970 (9'9")	2820 (9'3")	3250 (10'8")	3100 (10'2")
L	4710 (15'5")	4550 (14'11")	5110 (16'9")	4960 (16'3")
M	3010 (9'11")	3160 (10'4")	3410 (11'2")	3560 (11'8")
N	1110 (3'8")	1230 (4'0")	1240 (4'1")	1360 (4'6")
O	300 (1'0")			
P	540 (1'9")		590 (1'11")	
Q	85 (0'3")		15 (0'1")	
R	135 (0'5")		65 (0'3")	
S	2460 (8'1")		2470 (8'1")	
T	1250 (4'1")		1440 (4'9")	
U	1550 (5'1")		1740 (5'9")	
V	1550 (5'1")		1740 (5'9")	
W	775 (2'7")			

Specifications

Model			ViO30-6B				ViO35-6B			
Spec			Canopy		Cabin		Canopy		Cabin	
Type			Quick Coupler	without Quick Coupler	Quick Coupler	without Quick Coupler	Quick Coupler	without Quick Coupler	Quick Coupler	without Quick Coupler
Operating Weight	Rubber track	kg (lbs)	3175 (7000)	3125 (6890)	3315 (7308)	3265 (7198)	3585 (7905)	3535 (7795)	3725 (8214)	3675 (8103)
	Steel track	kg (lbs)	3275 (7220)	3225 (7110)	3415 (7529)	3365 (7419)	3685 (8125)	3635 (8015)	3825 (8434)	3775 (8324)
Engine	Type	-	Water-cooled 4-cycle diesel							
	Model	-	YANMAR 3TNV88-ZSBV							
	Rated Output	kW (hp) / rpm	20.4 (27.3) / 2200 [Gross]							
Performance	Bucket capacity, standard (ISO heaped)	cu.m (cu.ft)	0.10 (3.53)				0.11 (3.88)			
	Max Digging Force Bucket	kN (lbf)	23.5 (5283)	29.9 (6722)	23.5 (5283)	29.9 (6722)	25.1 (5643)	32.1 (7216)	25.1 (5643)	32.1 (7216)
	Max Digging Force Arm	kN (lbf)	16.7 (3754)	18.1 (4069)	16.7 (3754)	18.1 (4069)	18.8 (4226)	20.4 (4586)	18.8 (4226)	20.4 (4586)
	Traveling Speed, High / Low	km / h (MPH)	4.5 (2.7) / 2.7 (1.6)							
	Swing Speed	rpm	10.5				9.5			
	Boom Swing Angle, (L / R)	degrees	43 / 65							
Ground Contact Pressure	Rubber track	kPa (PSI)	29.3 (4.25)	28.9 (4.19)	30.6 (4.44)	30.1 (4.37)	33.1 (4.80)	32.7 (4.74)	34.3 (4.97)	33.9 (4.92)
	Steel track	kPa (PSI)	30.2 (4.38)	29.8 (4.32)	31.4 (4.55)	31.0 (4.50)	34.0 (4.93)	33.6 (4.87)	35.2 (5.10)	34.8 (5.05)
Hydraulic System	Pump Capacity	L / min (GPM)	37.4 (9.9) x 2 [Variable displacement pump] 20.9 (5.5) x 1, 9.9 (2.6) x 1 [Gear pump]				37.0 (9.8) x 2 [Variable displacement pump] 26.2 (6.9) x 1, 10.8 (2.9) x 1 [Gear pump]			
	Main Relief Set Pressure	MPa (PSI)	20.6 (2988) x 2 19.6 (2843) x 1				22.1 (3205) x 2 21.1 (3059) x 1			
Blade Dimensions	Width	mm (ft-in)	1550 (5'1")				1740 (5'8")			
	Stroke, Raise / Lower from G.L.	mm (ft-in)	375 (1'3") / 325 (1'1")				425 (1'5") / 370 (1'3")			
Fuel tank capacity		L (Gals)	41 (10.8)							

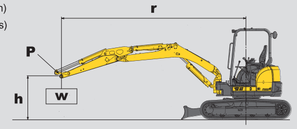
Hydraulic PTO

Model		ViO30-6B			ViO35-6B		
Specification \ Output	MPa (PSI)	L / min (GPM)			MPa (PSI)	L / min (GPM)	
		2200RPM	1100RPM			2200RPM	1100RPM
Combined Flow, Double Actions	19.6 (2842)	58.3 (15.4)	29.15 (7.7)		22.1 (3204)	63.2 (16.7)	31.6 (8.35)

Lifting capacity

Excavator equipped with ROPS/FOPS and rubber tracks (without quick coupler and without bucket)

r : Reach from swing center line : mm (in)
h : Lift point height : mm (in)
w : Lifting capacity : kg (lbs)
P : Lift point
: Rated over front
: Rated over side



1. The rated lifting capacities that are indicated below are based on ISO 10567 and do not exceed 87% of the excavator's hydraulic lifting capacity or 75% of its static tilt load (tipping load) capacity.
2. The following operating criteria are also applicable to the calculation of these maximum loads;
   a) The "Lift point" is the location of the front point on the arm
   b) The three indicated machine position are :
      (i) arm over the front end (blade down),
      (ii) arm over the front end (blade up), and
      (iii) arm over the side (blade up).
3. The weight of the excavator's bucket, hook, sling and other lifting accessories have been taken into consideration when calculating these maximum loads.

ViO30-6B

LIFT POINT HEIGHT	r : REACH mm (in)											
	RATED LIFT CAPACITY OVER END BLADE DOWN kg (lbs)				RATED LIFT CAPACITY OVER END BLADE UP kg (lbs)				RATED LIFT CAPACITY OVER SIDE BLADE UP kg (lbs)			
h : mm (in)	MAX	3000 (118,1)	2500 (98,5)	2000 (78,7)	MAX	3000 (118,1)	2500 (98,5)	2000 (78,7)	MAX	3000 (118,1)	2500 (98,5)	2000 (78,7)
3000 (118,1)	✻ 760 (1675)	✻ 600 (1322)			510 (1124)	✻ 600 (1322)			390 (859)	✻ 600 (1322)		
2500 (98,5)	✻ 760 (1675)	✻ 710 (1565)			430 (947)	✻ 710 (1565)			330 (727)	540 (1190)		
2000 (78,7)	✻ 780 (1719)	✻ 850 (1873)	✻ 900 (1984)		390 (859)	660 (1455)	✻ 900 (1984)		280 (617)	490 (1080)	700 (1543)	
1000 (39,4)	✻ 830 (1829)	✻ 1180 (2601)	✻ 1530 (3373)		360 (793)	610 (1344)	820 (1807)		250 (551)	430 (947)	580 (1278)	
0 (Ground)	✻ 870 (1918)	✻ 1300 (2866)	✻ 1680 (3703)	✻ 2170 (4784)	360 (793)	570 (1256)	750 (1653)	1120 (2469)	270 (595)	400 (881)	520 (1146)	760 (1675)
-1000 (-39,4)	✻ 950 (2094)	✻ 1180 (2601)	✻ 1560 (3439)	✻ 1870 (4122)	460 (1014)	550 (1212)	750 (1653)	1060 (2336)	330 (727)	400 (881)	540 (1190)	730 (1609)
-1500 (-59,1)	✻ 930 (2050)		✻ 1250 (2755)	✻ 1690 (3725)	610 (1344)		780 (1719)	1080 (2380)	450 (992)		570 (1256)	780 (1719)

ViO35-6B

LIFT POINT HEIGHT	r : REACH mm (in)											
	RATED LIFT CAPACITY OVER END BLADE DOWN kg (lbs)				RATED LIFT CAPACITY OVER END BLADE UP kg (lbs)				RATED LIFT CAPACITY OVER SIDE BLADE UP kg (lbs)			
h : mm (in)	MAX	3500 (137,8)	3000 (118,1)	2500 (98,5)	MAX	3500 (137,8)	3000 (118,1)	2500 (98,5)	MAX	3500 (137,8)	3000 (118,1)	2500 (98,5)
3000 (118,1)	✻ 780 (1719)	✻ 740 (1631)	✻ 730 (1609)		480 (1058)	600 (1322)	✻ 710 (1565)		450 (992)	580 (1278)	✻ 710 (1565)	
2000 (78,7)	✻ 800 (1763)	✻ 870 (1918)	✻ 970 (2138)	✻ 1130 (2491)	410 (903)	580 (1278)	750 (1653)	✻ 1110 (2447)	370 (815)	570 (1256)	700 (1543)	✻ 1110 (2447)
1000 (39,4)	✻ 820 (1807)	✻ 1060 (2336)	✻ 1310 (2888)	✻ 1730 (3813)	360 (793)	540 (1190)	690 (1521)	900 (1984)	340 (340)	510 (1124)	640 (1410)	820 (1807)
0 (Ground)	✻ 850 (1873)	✻ 1180 (2601)	✻ 1460 (3218)	✻ 1820 (4012)	370 (815)	510 (1124)	640 (1410)	850 (1873)	360 (793)	480 (1058)	600 (1322)	780 (1719)
-1000 (-39,4)	✻ 880 (1940)	✻ 1090 (2403)	✻ 1340 (2954)	✻ 1680 (3703)	420 (925)	490 (1080)	630 (1388)	840 (1851)	400 (881)	460 (1014)	600 (1322)	760 (1675)
-1500 (-59,1)	✻ 870 (1918)	✻ 930 (2050)	✻ 1170 (2579)	✻ 1420 (3130)	510 (1124)	490 (1080)	640 (1410)	840 (1851)	480 (1058)	480 (1058)	610 (1344)	760 (1675)
-2000 (-78,7)	✻ 840 (1851)				670 (1477)				640 (1410)			

Note : The maximum loads marked with an asterrisk (✻) were limited by the Excavator's hydraulic lifting capacity rather than by its static tilt load (tipping load) capacity.

Standard Equipment

- Blade
- Boom swing function
- Cylinder cover (boom,arm,bucket,blade)
- Rubber or Steel tracks
- Back mirror
- ROPS / FOPS Canopy, Cabin
- Work light on canopy
- Windshield washer (cabin)
- LCD monitor
- Joystick pilot controls
- Arm rests
- Suspension and reclining seat
- Seat belt
- P.T.O switch
- Travel dual speed switch
- Auto deceleration
- Eco mode
- Engine stop switch
- Air conditioner
- External power socket (12V)
- Cup holder
- Floor mats
- Evacuation hammer (cabin)

Please note that the standard equipment may vary from this list. Consult your Yanmar dealer for confirmation

YANMAR CONSTRUCTION EQUIPMENT CO.,LTD.
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All data subject to change without notice.

Printed in Japan
031D0-G00970 1706Ⓝ

YANMAR

TRUE ZERO TAIL SWING MINI EXCAVATOR

ViO30-6B / ViO35-6B

[Gross] 20.4kW | [Gross] 20.4kW

Designed for Operators and the Environment

CLEAN DIESEL ENGINE

Allowing reduced emissions and stubborn strength

[Features our next-generation electronically controlled engine]

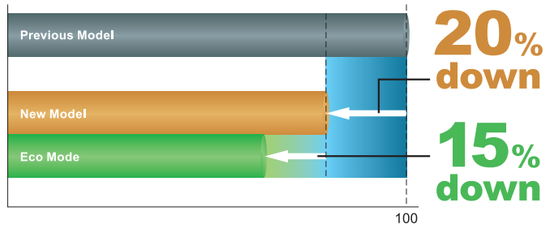
With plenty of power on tap, Yanmar's TNV direct injection diesel engines are the result of our single-minded pursuit of advanced technologies, such as our improved fuel injection system, that allow even cleaner emissions and reduced noise. This lets us contribute to a work environment that is kind to both people and the globe.

Improved fuel combustion efficiency

You will see 20% fuel savings against previous models, thanks to our new hydraulic system that increases hydraulic circuit efficiency and the energy savings from our electronically controlled engines.

Electronically controlled engine + **More efficient hydraulics**

20% better fuel economy over previous models



[Eco Mode]

Switching to this controls the engine speed for efficiency and greatly reduces fuel consumption.

[Auto Deceleration]

Switching the operating levers to neutral automatically drops the engine rpm and reduces on both fuel consumption and noise.

Achieving even greater fuel savings

TRUE ZERO SWING TAIL

Swivel without worrying about what's behind you

The rear remains within the vehicle width, operating near walls is easy, pleasant, and goes smoothly.

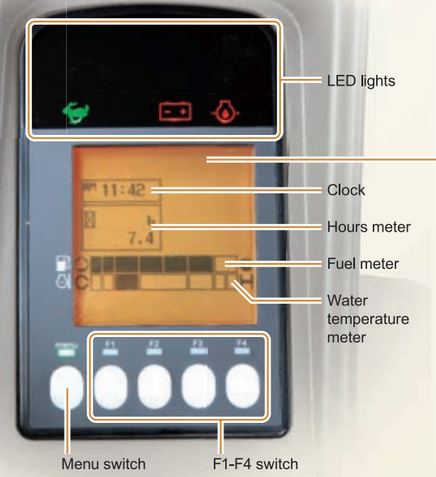
UNIVERSAL DESIGN

A wider range of people can operate the machinery easily and enjoyably

Easily check all sorts of important information even at night

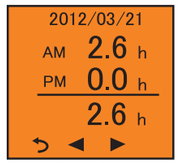
[Back light large-screen LCD monitor]

Important information such as operating status and problems are shown using lights and buzzers on and an easy-to-read monitor.



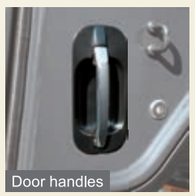
LCD monitor display examples

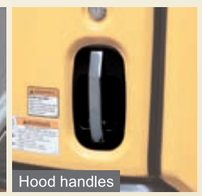
Hours of operation over a month



Hours of operation in a day

Easy to grasp and open with either hand


Door handles


Hood handles

Opening the cab turns the interior light on for a few seconds, improving safety

Easy to grip making it easy to climb up or down

The seat adjusts to suit operator size and position

Easy and simple to operate

Safe, Simple, Stable Operability

Compliant with ROPS / FOPS standards [Cabin, canopy]

Durable [Steel plate hood]

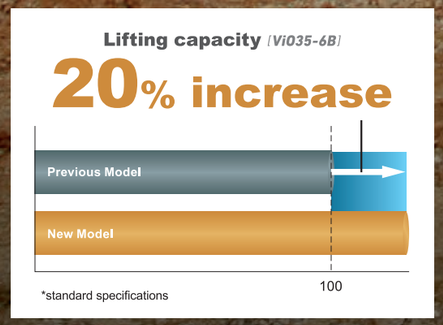
1740mm (ViO35-6B) (5'9")

Than previous models 12% increase

Allows for increased lifting capacity and stable, efficient operation.

[Optimum machine balance through a wider track]

Attaching the optional counterweights lets you increase the lifting capacity even further.



We also supply tough steel tracks. (Steel track specifications)

[Spring steel cylinder guards protect the cylinder rods]

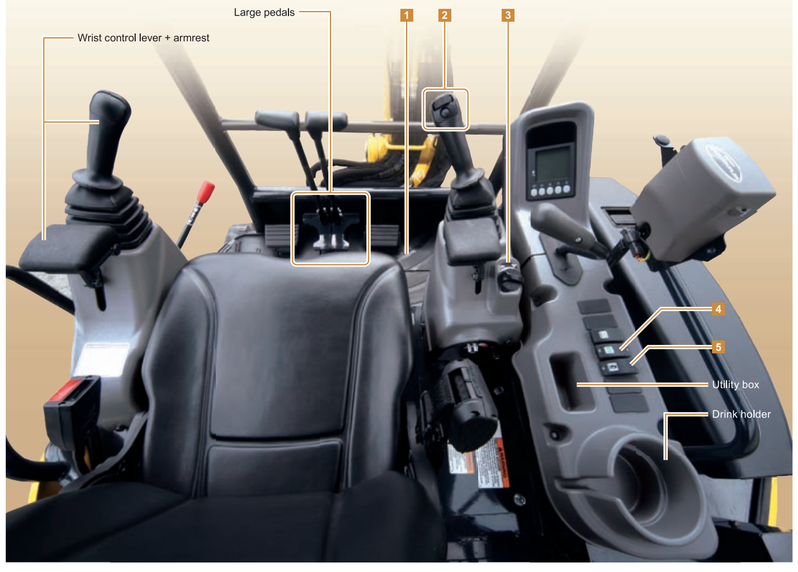
Guarded from damage [Boom-mounted light]

[Engine stop switch]

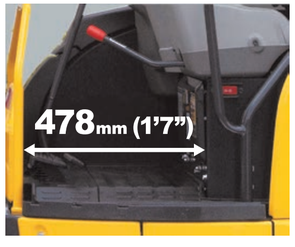
A Pleasant Operating Environment

Remain alert and relaxed even after hours of work

[Generous operating space]



1 Plenty of foot room to keep you comfortable [Full-flat floor]



2 [PTO proportional dial]

3 You can easily control engine speed at your fingertips [Dial-type accelerator knob]

4 [Eco Mode switch]

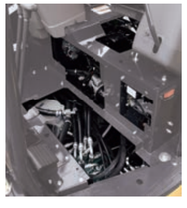
5 [Auto Deceleration switch]

[External power socket (12V)]

[Slim satchel space behind the seat]

More Efficient Maintenance

6 [Open around the operator's seat]



7 [Rear hood, right hood open without tools]

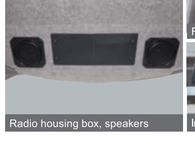
8 [Right upper opens without tools]

9 [Toolbox]

10 [Fuel tank drain cock]

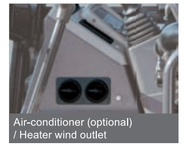
Options

CABIN SPEC



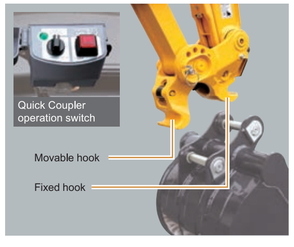
[Air-conditioner condenser]

The air-conditioner condenser is built into the cabin rear. Hood open without tools.



Quick Coupler

Simple and easy replacement of attachments



Bucket Removal

Place the bucket on the ground | Pull out the safety lock pin | Turn the switch to RELEASE | Raise the arm to detach

Bucket Attachment

Apply the fixed hook | Make the bucket level | Turn the switch to HOLD | Insert the safety lock pin and fasten

AP300

Asphalt Paver

Cat® 3054C DINA	
Gross Power (SAE J1995) at 2200 rpm	52 kW/71 hp
Net Power (ISO 9249) at 2200 rpm	47.4 kW/64.5 hp
Operating Weight with	
AS3173 Screed	7300 kg

Hopper Capacity	3.8 m^3
Standard Paving Range	
AS3173 Screed	1700-3200 mm
Maximum Paving Width	
AS3173 Screed	4000 mm
Minimum Paving Width	
AS3173 Screed	650 mm

AP300 Asphalt Paver: Productivity and Reliability in a Durable Package

The AP300 offers superior performance, high transfer speed, optimum maneuverability, easy transportability and job versatility to maximize productivity.

Cat® 3054C DINA Engine

The four cylinder, liquid-cooled diesel engine incorporates the proven technology from medium and large bore engines providing quiet performance, high reliability and easy servicing. The engine also meets European EU Stage II emission regulations. The high capacity cooling system provides cool intake air in order to maximize fuel efficiency and minimize emissions. **pg. 4**

Hydrostatic Drive System

A closed-loop hydrostatic propel system provides accurate control of propulsion. The propel pump provides optimum displacement enhancing servicing. The optional front wheel assist increases rimpull power providing enhanced traction. **pg. 4**

Suspension System

The AP300 is equipped with two large tread drive tyres and four front solid-rubber steering bogie wheels providing optimum ground contact and smooth operation. **pg. 6**

Operator's Station

The AP300 includes dual operator's station with sliding control console. The operator's stations can be positioned beyond the machine frame for greater visibility when precise paving control is required. **pg. 5**

Cat® Asphalt Pavers continue to lead the industry and meet your demanding job requirements.

Many easy-to-use features and technologies have been developed in order to guide your crew in producing high quality mats time and time again. Contact your Caterpillar® Dealer today for more information.

Versatility Defines the AP300

The AP300 excels in a wide range of applications where maximum flexibility is required ranging from new construction, resurfacing and maintenance works.

Material Handling System

The AP300 provides precise mix delivery with minimal operator monitoring. The independent operation of the augers and conveyors reduces component wear and minimizes the potential for mix segregation. Reversible augers and conveyors assist the crew by reducing handwork and clean-up. **pg. 7**

Generator System

The optional generator provides continuous and simple control in paving operations for ground crew usage. This integrated generator supplies simultaneous power to the electric screed heating elements, electric utility power supply and night lighting system providing high reliability. **pg. 6**

Screed

The AP300 is available with the AS3173 hydraulic power extendible asphalt screed, available with variable frequency vibrating system and with LPG or electric heating system. The AS3173 screed lays material to the desired width and depth while providing a smooth finish with initial compaction. **pg. 9**

Serviceability

The AP300 ensures excellent access to all machine parts requiring scheduled maintenance. Large service doors ensure quick and easy inspection of the main parts. The low transversely mounted engine provides optimum access to the hydraulic pumps. Wiring for the electrical system is numbered and labeled with component identifiers to simplify troubleshooting. **pg. 8**

Caterpillar® Diesel Engine

Model 3054C DINA is a four cylinder liquid-cooled diesel engine designed to provide quiet performance, high reliability, easy servicing and fuel economy.

Cat 3054C DINA Engine. The 3054C engine provides a full-rated gross power (SAE J1995) of 52 kW (71 hp) at 2200 rpm. Meets European EU Stage II engine emission regulations.

Low Transverse Engine Mounting. The low transversely mounted engine provides superior cooling performance and easy accessibility for service. Large service doors ensure easy servicing operations and access to the hydraulic pumps and external engine components.

Cooling System. The high capacity cooling system provides cool intake air in order to maximize fuel efficiency and minimize emissions. The system promotes operator comfort by drawing ambient air through the engine compartment and exhausting it on the right side of the machine, away from the operator.

Hydrostatic Drive System

Efficient hydraulic drive system eliminates chains and other mechanical linkages between diesel engine and final drive components.

Closed-loop Hydrostatic Propel System. Provides accurate control of propulsion and low-maintenance operation.

Hydrostatic Pump. The propel system of AP300 drives the rear wheels with a variable displacement pump and dual displacement axial piston motor directly splined to a servo-assisted two-speed gearbox. On demand 100% lockable differential system prevents slippage in any grade condition.

Optional Front Wheel Assist. The system adds hydrostatic propel power to two of the front bogie wheels. The front wheel assist increases rimpull power, providing enhanced traction.

Speed Control. Infinite speed selection within four propel ranges: two in paving mode and two in travel mode, to select the best speed range according to operating modes.

Propulsion Control. An electro-proportional servo-control provides machine starting and stopping (for asphalt supply, etc.) with no pre-set working speed variation.

Operator's Station

The dual operator's station with sliding control console promotes optimum comfort, visibility and ease of use.

Dual Operator's Station. The ergonomic dual operator's station incorporates a sliding control console and two adjustable suspension seats fitted on mechanically sliding semi-platforms.

Operator Visibility. The operator seats can be slid side-to-side and front-to-back on the pedestal frame, enhancing visibility and ergonomics. The stations can extend beyond the machine frame for good visibility when paving applications require precise control. With the engine mounted forward and low in frame, the operator has excellent visibility into the hopper. The operator is also positioned away from engine heat and exhaust.

Sliding Control Console. Full instrumentation package of the sliding control console allows operator to control all major systems easily. A lockable vandal cover protects console controls.

Canopy option. Two optional canopies are available: manually folding canopy or hydraulically folding canopy. Both canopies provide full width with two side extending wings for optimum comfort and protection. Canopies can be lowered for easy transportation.

Suspension System

The wheel-type asphalt paver provides optimum weight distribution, tractive effort assuring great performance.

Wheel-type Tractor. The AP300 incorporates two large tread drive tyres for propelling the machine and four bogied front steering wheels. The four front solid-rubber steering bogie wheels are mounted to the front oscillating axle rocker arms for maximum ground contact and smooth operation over high and low spots.

Wheel base. The long wheel base provides enhanced tractive effort and stability on soft base materials.

Two-speed Planetary Drive. A dual displacement motor drives two-speed planetary drive gearbox in order to provide infinitely variable speed selection.

Optional Generator System

Continuous-duty integrated design ensures peak performance and high reliability.

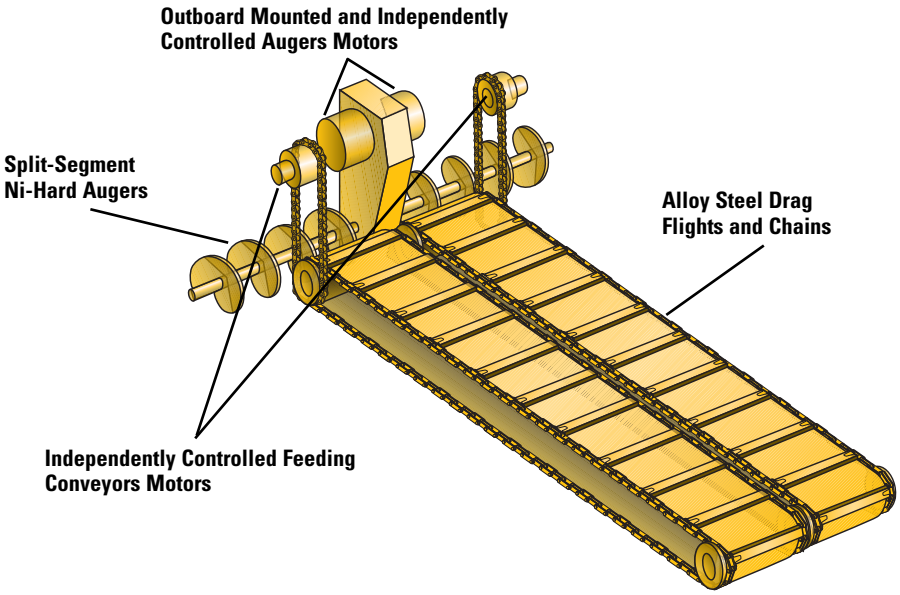
Industrial, Single-Phase A.C. Generator. The optional onboard generator provides simultaneous power to the electric screed heating elements, auxiliary lights and job site tools. The generator provides 12 kW output to power screed heating, 220 V for night lighting system and 1.5 kW electric utility power supply.

Single Control Switch. A single control switch located on the tractor's control console activates the generator.

Circuit Breaker Protection. Extend service life and internal electronic voltage regulation system provide reliability.

Material Handling System

Precise mix delivery and productivity through an advanced material handling system promote hands-free operation.



Optimum Productivity. The material handling system allows the operator to maintain an uninterrupted flow of material from the hoppers to the screed. The system is responsible for maintaining the proper head of material - the volume of asphalt in front of and across the length of the screed.

Hoppers. The independent movement of the two hoppers is provided by means of two hydraulic cylinders assuring efficient material flow. Wear-resisting steel provides conveyors and hopper bottom plate for long wear life.

Feeding Conveyors. Two feeding conveyors are independently controlled and driven by two paddle sensors. Conveyor rotation can also be inverted from either control console panel or from rear screed control boxes. Conveyors have drive chains to maximize the live conveyor area and reduce center line segregation. This design also provides greater ease of servicing the conveyor drive system. In order to control mix delivery, the operator sets a speed rate for each conveyor that will maintain the desired mix level in the left and right auger chambers.

Auger Assembly. Two independently controlled augers spread the material conveyed to both sides. Auger rotation speed can be varied automatically to ensure a homogeneous distribution of material before the screed.
Two paddle wave detectors control augers movement and can be adjusted from the screed control boxes.
Conveyors and augers design eliminate voids under chain case to minimize segregation.
Augers have outboard mounted motors for easy serviceability.

Adjustable Push Rollers. The two adjustable push rollers provide a contact point between the paver and the truck to center the load and assist steering while unloading.

Adjustable Height Auger Assembly. Augers are reversible and hydraulically adjustable in height providing benefits to mat quality and better distribution of material in front of the screed.
The ability to raise the auger assembly simplifies loading and unloading from a transport vehicle. Also, when working with larger stone mixes, segregation can often be eliminated or minimized by raising the augers to allow mix to flow unrestricted under auger assembly.

Reliability and Serviceability

Simplified service means more time spent paving and less time spent on maintenance.

The AP300 asphalt paver has been designed for easy service and maintenance with special attention given to component access.

Large Access Doors and Panels. Ensure quick and easy inspection of the main parts. The service doors and panels also provide optimum ground level serviceability and easy access to the hydraulic pumps and external engine components.

Low Transversely Mounted Engine. Provides optimum access to the hydraulic pumps mounted to the right side of the engine. The front service panel features a single wide hinged door that provides easy filter and traction valves serviceability.

Propel Pump Servicing. The optimum displacement of the propel pump provide enhanced servicing.

Ergonomic Operator's Station. The dual swing-out operator's station with sliding control console and adjustable suspension seats provide optimum comfort, all-around visibility and easy control during machine operations.

Hydraulic Motors Servicing. Hydraulic motors for augers are fitted outboard for improved accessibility and serviceability. The auxiliary and front power-assist drive solenoid valves blocks have been conveniently fitted centrally simplifying checking and adjustments.

Hydraulic Hoses and Electrical Wiring Harnesses. Cleanly routed and clamped to reduce wear and provide easy service.

Exposed Hoses. Provided with nylon sleeve protection to reduce abrasion.

Vibrator System Hydraulic Lines. Cat XT™ hoses provide optimum durability and resistance to damage.

Integrity of the Electrical System. Is ensured with the use of high-quality components.

The Caterpillar Electrical Standards. Enhance reliability and durability, feature numbered and color-coded wires. Nylon-braided wrap efficiently protects the electrical wires.

AS3173 Screed

Single width, power extending screed with LPG or electric heating system increases productivity and lowers operating costs.

The AS3173 screed paves from 1700 mm to 3200 mm. With mechanical extensions added to both sides, maximum paving width is 4000 mm.

AS3173 Screed. The hydraulic power extendible asphalt screed is available with variable frequency vibrating system and with LPG or electric heating system. The screed control panels include material feeding controls for easy ground crew usage.

Vibrating System. Automatically operated when the AP300 advances following a preset ramp. The AS3173 screed is equipped with electronic ignition, automatic and independent adjustment of the smoothing plate temperature for central and each mobil plate.

LPG Heating System. The system provides high efficiency burners and optimum thermostatic temperature control.

Electric Heating System. The system provides a tractor-mounted generator, replaceable heating elements and operator friendly controls providing a cleaner environment. Feature & benefits include simple operation, fast heat-up time, multi-zone heating elements and thermostatic control of all screed plates. Heavy-duty, user-friendly screed heating control unit with self-diagnostic control is positioned at the rear of the machine for easy ground crew usage.

Screed Assist. The AS3173 is equipped with the screed assist, an electro-hydraulic device maintaining a constant screed pressure on the bituminous mix, independently from the mix bearing capacity and the paving width.

Optional Equipment

Caterpillar offers many options that allow the paver and screed to be configured to your specific application. Contact your dealer for more details.

Tractor Options
- Augers Sonic Sensors Proportional
- CE Certificate
- Ecological Washdown System
- Front Wheel Assist
- Generator System
- Hydraulically Folding Operator's Station Canopy
- Italian Road Homologation
- LPG System
- Manually Folding Operator's Station Canopy
- Warning Beacon

Controls and Grade References
- Automatic Grade and Slope Control
- Non-Contacting Grade Sensor
- Contacting Grade Sensor
- Rigid Ski, 6 m
- Autoleveling Ski, 6 m

Screed Options
- Paving Width Reduction to 0.65 m
- Extensions for: 3.60 m – 4.00 m

Engine

Four cylinder Caterpillar® 3054C DINA liquid-cooled diesel engine. Meets European EU Stage II engine emission regulations.

Gross Power	2200 rpm
SAE J1995	52 kW/71 hp
Net Power	2200 rpm
ISO 9249	47.4 kW/64.5 hp
EEC 80/1269	47.4 kW/64.5 hp
Bore	105 mm
Stroke	127 mm
Displacement	4.4 liters

- All engine horsepowers are metric including front cover.
- Net power ratings are tested at the reference conditions for the specified standard.
- Net power advertised is the power available at the flywheel when the engine is equipped with alternator, air cleaner, muffler and fan.

Transmission

The drive system utilizes a closed-loop hydrostatic propel system. The system drives the rear wheels through a variable displacement pump and dual axial piston motor directly splined to a servo-assisted two-speed gearbox.

Features

- The propel pump is infinitely variable and electronically controlled with adjustable starting and stopping ramps.
- The optional front wheel assist increases rimpull power by two of the front steering bogie wheels.
- Self-locking differential (on demand 100% lockable differential system) and wet final reduction gears provide efficient, low-maintenance operation.

Four Speed Ranges (forward and reverse)

Paving (1st gear)	0-40 mpm
Paving (2nd gear)	0-85 mpm
Travel (3rd gear)	0-10 km/h
Travel (4th gear)	0-16 km/h

Steering

Hydraulic power-assist steering system provides smooth, low effort steering by means of a steering wheel on the control console panel.

Features

- An automotive-type steering wheel is used to control direction. The steering wheel controls the four front wheels by a modulated hydraulic cylinder.
- The four front steering wheels are mounted in pairs of oscillating bogies, providing maximum ground contact and smooth operation even on irregular terrain.
- The wide tread section of the rear tyres assures optimum maneuverability and high tractive performance on all types of terrains and slopes.

Turning Radius

Minimum	3000 mm

Suspension

Four front steering bogie wheels, two per side, are mounted in tandem on bogie axles, equalizing ground pressure.

Drive Tyres (sand rib, hydroflated)	2x 365/80 R20
Steering Wheels (solid rubber)	4x 455 mm x 260 mm
Wheel base	1615 mm

Brakes

Primary Brake Features

- A closed-loop hydrostatic system provides dynamic braking during normal operation.

Parking Brake Features

- The hydrostatic drive acts as the service brake and is hydraulically and proportionally applied via a brake pedal besides the operator's station control console.
- Safety and parking brakes are mechanical multi-disk spring-applied brakes.
- Parking brake is automatically applied with the machine in “stand-by” mode.
- When required the brakes can be released manually.

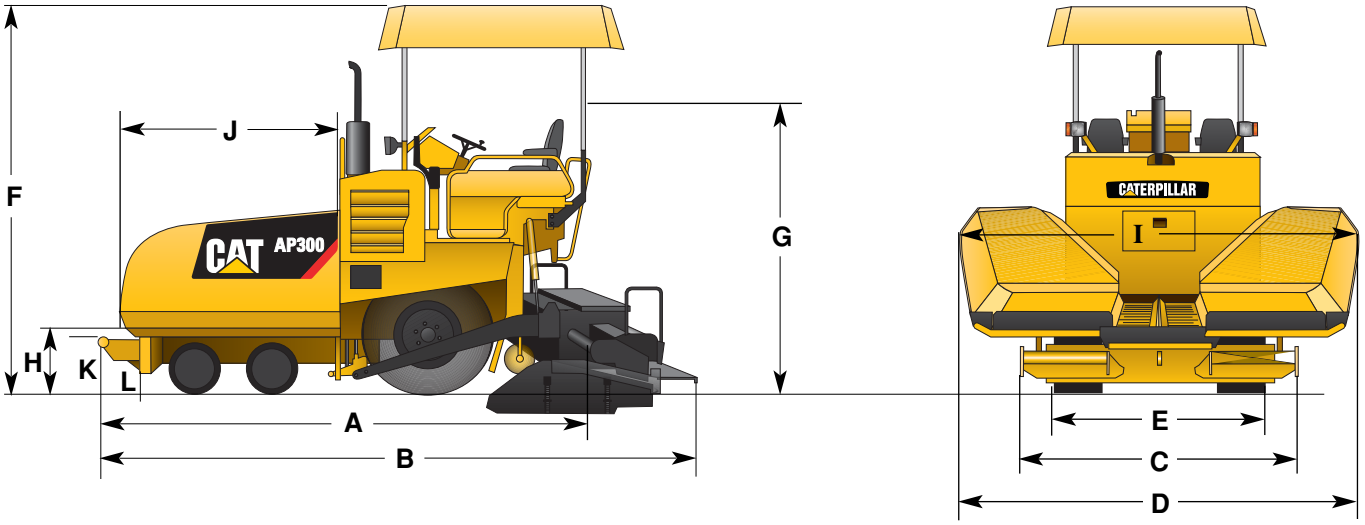
Electrical System

The 12-volt DC electrical system is designed for improved durability, reliability and ease of service. A 12-volt battery and a 14-volt, 75-amp alternator are used in the system.

Features

- Wires are loomed with vinyl-coated nylon braid to improve the overall integrity of the electrical system and to protect against abrasion.
- An optional onboard generator is fitted when the AP300 is equipped with the AS3173 electric screed. The generator provides 12 kW output to power screed heating, 220 V for night lighting system and 1.5 kW electric utility power supply.

Dimensions



	mm
A Tractor length with push roller	4200
B Length with push roller and screed	4820
C Transport width with screed end gates (hopper raised)	1730
Transport width without screed end gates (hopper raised)	1670
D Tractor operating width (hopper lowered)	3180
E Track gauge width	1620
F Operating height with canopy	3340
G Transport height with canopy and fumes stack lowered	2960

	mm
H Truck dump height (at hoppers)	570
I Truck entry width (at hoppers)	3200
J Hopper length	1700
K Push roller height	500
L Clearance	200
Hopper capacity (with conveyor tunnels) – m^3	3.8
Discharge height at center	480
Augers diameter	260

Service Refill Capacities

	Liters
Fuel tank	79.5
Cooling system (total)	15
Engine oil w/filter	8.5
Hydraulic oil tank	85
Washdown spray system	32

Weights

Operating Weights*	kg
AP300 with AS3173	7300
Shipping Weights**	
Tractor only	5800
Tractor with screed	7100

Weights shown are approximate and include:

* 75 kg operator, with canopy, fuel tank 50%, leveling system, standard width screed (1.70-3.20 m).

** base machine, canopy lowered, fuel tank 10%, standard screed end gates.

AP300 Asphalt Paver

For more complete information on Cat products, dealer services, and industry solutions, visit us on the web at www.cat.com

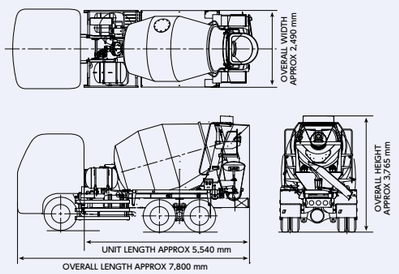
Materials and specifications are subject to change without notice. Featured machines in photos may include additional equipment. See your Caterpillar dealer for available options.

HEHG3660 (01/2008) hr

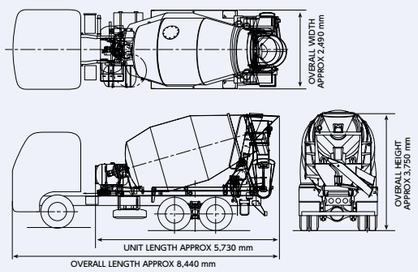
CATERPILLAR®

■ Outside Dimensions (Reference)

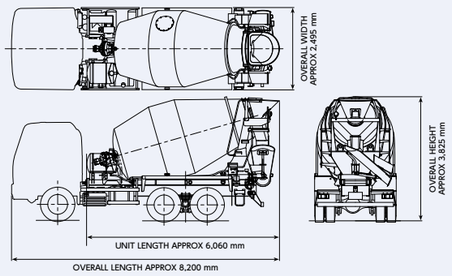
EA089-30[6m³]



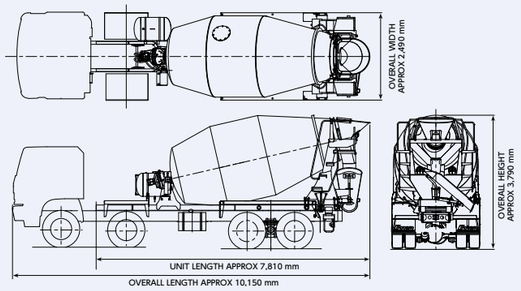
EA106-30[7m³]



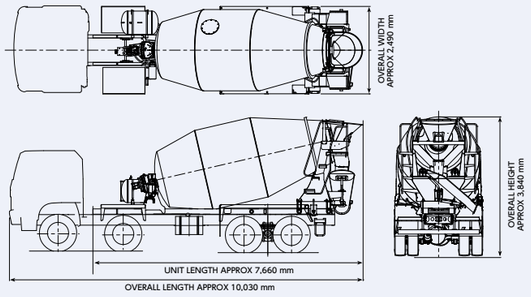
EA122-30[8m³]



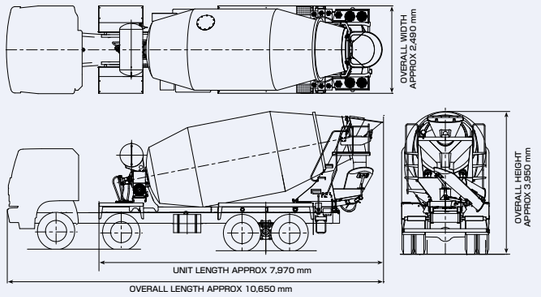
EA148-30[9m³]



EA158-30[10m³]



EA186-30[12m³]



Note Specifications and the other contents on this catalogue are subject to change without prior notice due to design change.
Product photos on this catalogue might have optional devices.
Colors of the products on this catalogue may appear different from actual colors due to the condition of photo shooting and printing ink.
This product is as of January 2015.

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NO.HC1470EA-011530A IP

PRINTED IN JAPAN

NO.1470

KYOKUTO

Concrete Mixer Truck

Series Catalogue

6m³ • 7m³ • 8m³ • 9m³ • 10m³ • 12m³

Meet your needs with excellent performance and fulfilling variations.

Improved efficiency with the high performance to meet the needs in the field.

A wide product line-up to meet your needs: Kyokuto Kaihatsu's Concrete mixer truck series.

6m³ 7m³ 8m³ 9m³ 10m³ 12m³

Reduction Gear

Highly reliable and durable reduction gearbox fully developed by Kyokuto Kaihatsu, which have been supplied over 30 years in worldwide market.

Using the planetary differential mechanism, this product's simple structure achieves high efficiency and reduction ratio. Moreover, the gear coupling mechanisms linked to the mixer drum are fitted to the outside of the reduction gearbox, thereby reducing the load acting on its inside and ensuring high durability. In addition, a water tank can be equipped on top of the model VB99-19 reduction gearbox.

■Specifications

Model		VB99-11G	VB99-17	VB99-19
Maximum Output Torque		50,000Nm	60,000Nm	72,000Nm
Reduction Ratio		-1/132	-1/132	-1/132
Maximum Revolution	Output	Approx18rpm	Approx18rpm	Approx18rpm
Weight(Dry)		230kg	300kg	350kg
Lubrication Oil		7ℓ	8.5ℓ	8.5ℓ
Maximum Oscillation angle		±3°	±5°	±5°
Agitating Capacity		6～8m³	9～10m³	12m³

8m³ EA122-30A

9m³ EA148-30A

10m³ EA158-30A

■Standard Specifications

Model			EA089-30	EA106-30	EA122-30	EA148-30	EA158-30	EA186-30
Drum	Drum Capacity		8.9m³	10.6m³	12.2m³	14.8m³	15.8m³	18.6m³
	Max. Agitating Capacity		6m³	7m³	8m³	9m³	10m³	12m³
	Max. Mixing Capacity		5m³	6m³	7m³	8m³	9m³	11m³
Drum Revolution	Normal Rotation	Charging	0～15rpm	0～15rpm	0～15rpm	0～15rpm	0～15rpm	0～15rpm
		Mixing	0～15rpm	0～15rpm	0～15rpm	0～15rpm	0～15rpm	0～15rpm
	Reverse Rotation	Discharging	0～15rpm	0～15rpm	0～15rpm	0～15rpm	0～15rpm	0～15rpm
Normal Discharging Speed (at 6 - 8rpm drum revolution)			100～20s/m³ (at slump value between 5 and 20cm)	100～20s/m³ (at slump value between 5 and 20cm)	100～20s/m³ (at slump value between 5 and 20cm)	100～20s/m³ (at slump value between 5 and 20cm)	100～20s/m³ (at slump value between 5 and 20cm)	100～20s/m³ (at slump value between 5 and 20cm)
Hopper	Dimension		W1,000×L930mm	W1,000×L930mm	W1,000×L930mm	W1,000×L930mm	W1,000×L930mm	W1,000×L930mm
Chute Length	Main		1,800mm	1,800mm	1,800mm	1,800mm	1,800mm	1,800mm
	Sub		680mm	680mm	680mm	680mm	680mm	680mm
Water Tank※			300ℓ	300ℓ	200ℓ	200ℓ	300ℓ	450ℓ

※Please contact our sales representative about optional equipment.

(https://dynapac.com/en/)

COMPACTION

CC142 *DOUBLE DRUM VIBRATORY ROLLERS*

0

MY COMPARISON (/EN/PRODUCTS/COMPARE)

PICTURES DIMENSIONS

(http://pdf.dynapac.com/user_files/images/Products/Rollers/CC/Full/CC142_full.jpg)

PRODUCT INFORMATION

The CC142 is a typical ”town roller” for compacting asphalt compounds on streets, parking lots and industrial sites. The capacity for this type of work is adequate for following a smaller-size surface

finisher.

(https://dynapac.com/en/)

TECHNICAL DATA ×

Masses	
Max. operating mass	4030 kg
Operating mass (incl. ROPS)	3900 kg
Module mass (front/rear)	1900 kg/ 2000 kg
Traction	
Speed range (Dual/TC/AS)	0-10
Vertical oscillation	±10°
Theor. gradeability	41 %
Compaction	
Centrifugal force	33 kN
Nominal amplitude	0.5 mm
Static linear load (front/rear)	14.5/ 15.4 kg/cm
Vibration frequency	52 Hz
Water tank volume	200
Engine	
Manufacturer/Model	Deutz D2011 L03 I
Type	Air cooled diesel
Rated power, SAE J1995	34 kW (45.0 hp) @ 2600 rpm
Fuel tank capacity	50 l
Alternative Engine	
Manufacturer/Model	
Alternative Engine	
Manufacturer/Model	
Hydraulic system	
Driving	Axial piston pump with variable displacement and servo. 2 radial piston motors with constant displacement.

Vibration	Gear pump/motors with constant displacement.
Steering	Gear pump with constant displacement.
Service brake	Hydrostatic in forward and reverse lever.
Parking/ Emergency brake	Failsafe brake in both drums.

(https://dynapac.com/en/)

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Dando Drilling International

Dando Terrier

The compact, versatile Dando Terrier rig has been designed specifically for sampling and testing for geotechnical and environmental analysis. Crawler mounted for easy site access in difficult conditions, the Terrier is simple to operate and maintain, extremely reliable and competitively priced.

Energold

Made in England since 1867

Dando Terrier Features

Compact manoeuvrable crawler-mounted design ideally suited for long wheel-base transit type vans for fast mobilisation to site and secure storage of all equipment.

2-piece drop hammer for sampling and testing incorporated in mast assembly for recovery of casing and sampling tools. Mast assembly can be detached for remote operation.

Hydraulic tilting undercarriage allows operation on inclined slopes up to 30 degrees from horizontal. Deck area with storage capacity for all required drilling tools.

Rotary concrete coring head available as an option. Useful when concrete and tarmac overlie the area to be sampled.

Made in England since 1867

Dando Drilling International Limited
www.dando.co.uk
info@dando.co.uk
tel: +44 (0) 1903 731312

Dando Terrier Specification

Chassis	A fabricated box section sub-frame incorporating drop hammer support, controls, engine mounting and tool storage.
Drop Hammer	A two-piece drop hammer runs on two guide bars. The weight is fully guarded and can be quickly changed for either SPT or dynamic probing standards.
	Next to the front mounted drilling controls a blow counter is installed which is illuminated with large digits for easy reading and an extension loom is provided when operating the mast remotely. Attached to the mast is a 1m measurement scale for the easy monitoring of progress.
	Hammer Speed: 0-50 blows pm Hammer Drop: 500mm-750mm Hammer Weight: 50kg or 63.5 kg Drilling Depth Capacity: 30m
Drill Mast Assembly	A fabricated, welded steel box section construction, hinge pin mounted to main superstructure, hydraulically raised and lowered.
	Overall Height: 2.22m-2.85m Pulldown Capacity: 1000 kgf Pullback Capacity: 7000 kgf Width: 655mm (including wheels) 1166m (jacks out)
	The entire mast assembly with wheels can be detached from the main superstructure for operation in areas of restricted access.
Carrier	A purpose built crawler chassis with rubber tracks fitted with tilt mechanism, allowing rig to operate vertically on slopes inclined up to 30 degrees from horizontal.
	Crawler Width: 800mm Overall Length (Mast Down): 2.70m Overall Height (Mast Down): 1.48m Total Weight: 1126 kg
Engine & Hydraulic PTO	Hydraulic system, powered by a 16.8HP water-cooled diesel engine, provides power for drilling, rigging and tracking Flow for PTO: 38.88 l/min Max. Working Pressure: 152 bar
Quick Connect Circuit	A quick connect auxiliary circuit is fitted as standard to the Terrier hydraulic system which runs the Terrier sampling hammer as well as other equipment, including sand guzzlers and casing jacks. The circuit is protected by a separate pressure relief valve and has a variable flow control valve fitted to the control panel for fine control.
Options	- Rotary concrete coring head - Remote drilling kit- the whole control panel and mast can be removed and operated up to 30m away from the main base unit - Casing extractor - Expanded tracks

Made in England since 1867

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HITACHI

ZAXIS 110

- **Engine Rated Power** : 63 kW (85 PS)
- **Operating Weight** ZAXIS110 : 10 700 kg
  ZAXIS110M : 12 800 kg
- **Backhoe Bucket**
  SAE, PCSA Heaped : 0.19 - 0.59 m^3
  CECE Heaped : 0.17 - 0.50 m^3

ZAXIS

on the

Zaxis blends the latest in information and heavy equipment technologies to provide the performance and operating efficiency for lower total costs. It is ready to meet the challenges and the changes facing the construction industry of today and tomorrow.

ZAXIS

&

Powerful yet Efficient Engine

Direct-Feel Control From a Refined Hydraulic System

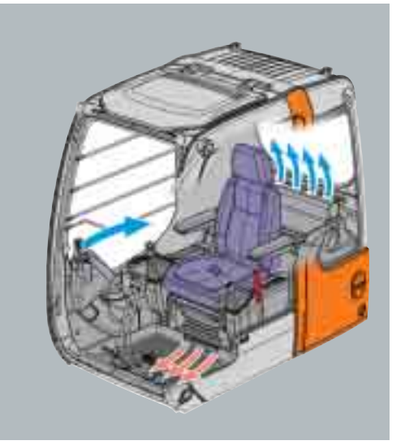
Power to Master Tough Excavating Jobs

Dependable Travel and Swing Torque

Auto Accelerator Control Cuts Fuel Consumption

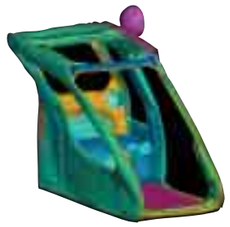
All Excavating Operations in a Single Mode

Easy-to-Monitor Instruments



Easy-to-Reach Switches

Auto Control Air Conditioner (Option)



Z A X I S

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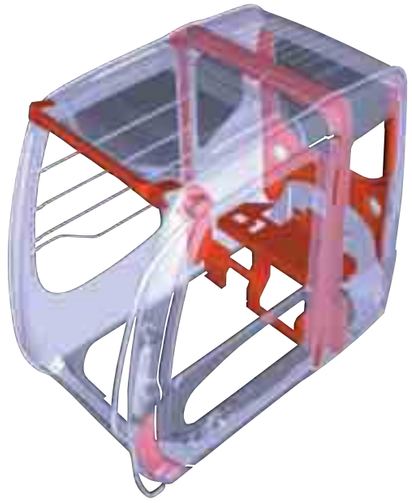

CRES (Center pillar Reinforced Structure)

Z A X I S

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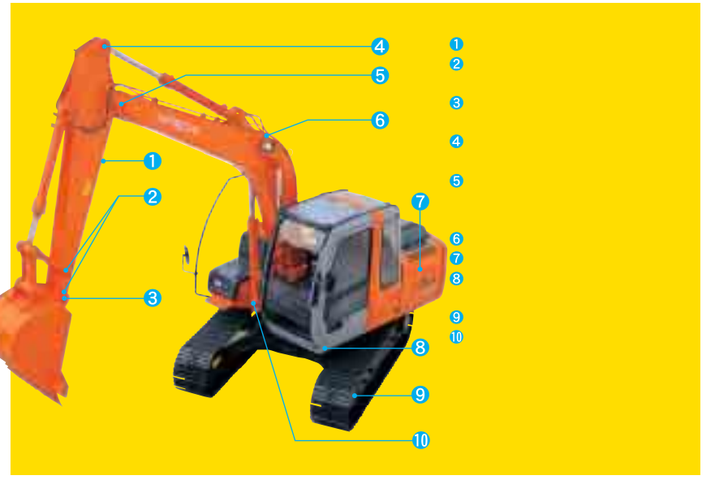
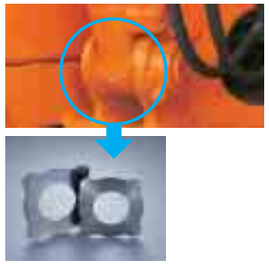


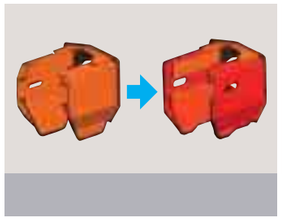
New HN Bushing



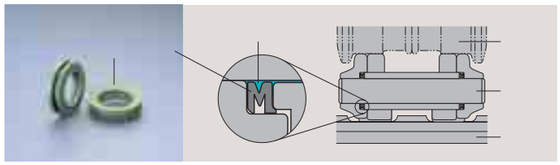
Reinforced Resin Thrust Plates

WC Thermal Spraying (Tungsten Carbide)

Used at arm end and bucket connection to increase wear resistance and reduce jerking.



Rigid Undercarriage



Strengthened Swing Circle

M-Shaped Track Link Seals Provide High Grease Retention

Z A X I S

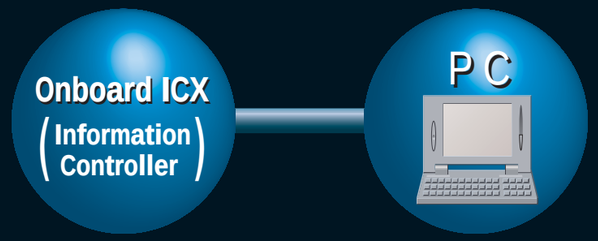
Front and Bucket Components Only Need Lubrication Every 500 Hours

Hydraulic Oil Filter Only Needs Replacement Every 1000 Hours

Engine Oil Filter and Water Separator Positioned for Easy Checking from Ground

Undercarriage Designed for Easy Mud Removal

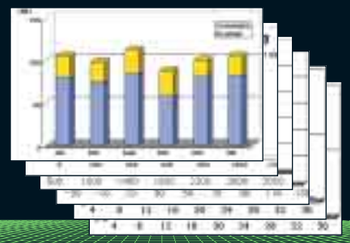
■ Equipment Operation Status Report

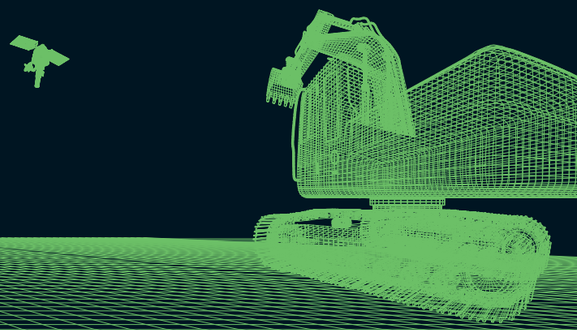


Z A X I S

Providing the data for making the right decisions.

Information Services for Equipment



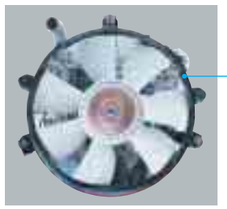


Low Noise Operation

Z A X I S

Emissions Control Engine

II



Labeled Plastic Parts

Lead-Free Wiring and

Aluminium Radiator and Oil Cooler

ZAXIS 110M

Muddy Terrain Version M-Series (ZAXIS110M)

ENGINE

Model ..... Isuzu BB-4BG1T
Type ..... 4-cycle water-cooled, direct injection
Aspiration ..... Turbocharged
No. of cylinders 4
Rated power
DIN 6271, net ..... H/P mode : 63 kW (85 PS) at 2 150 min^{-1} (rpm)
P mode : 59 kW (80 PS) at 1 950 min^{-1} (rpm)
SAE J1349, net ..... H/P mode : 61 kW (83 hp) at 2 150 min^{-1} (rpm)
P mode : 58 kW (79 hp) at 1 950 min^{-1} (rpm)
Maximum torque ..... 340 N·m (35 kgf·m, 253 lbf·ft) at 1 600 min^{-1} (rpm)
Piston Displacement ..... 4.329 L (264 in^3)
Bore and stroke ..... 105 mm x 125 mm (4.13" x 4.92")
Batteries ..... 2 x 12 V / 55 AH
Governor ..... Mechanical speed control with stepping motor

HYDRAULIC SYSTEM

- Work mode selector
  Digging mode / Attachment mode
- Engine speed sensing system

Main pumps ..... 2 variable displacement axial piston pumps
Maximum oil flow ..... 2 x 100 L/min (26.4 US gpm, 22.0 Imp gpm)
Pilot pump ..... 1 gear pump
Max. oil flow ..... 33 L/min. (8.7 US gpm, 7.3 Imp gpm)

Hydraulic Motors

Travel ..... 2 variable displacement axial piston motors
Swing ..... 1 axial piston motor

Relief Valve Settings

Implement circuit ..... 34.3 MPa (350 kgf/cm^2, 4 980 psi)
Swing circuit ..... 31.4 MPa (320 kgf/cm^2, 4 550 psi)
Travel circuit ..... 34.3 MPa (350 kgf/cm^2, 4 980 psi)
Pilot circuit ..... 3.9 MPa (40 kgf/cm^2, 570 psi)

Hydraulic Cylinders

High-strength piston rods and tubes. Cylinder cushion mechanisms provided in boom and arm cylinders to absorb shock at stroke ends.

Dimensions

	2	95 mm (3.74")	70 mm (2.76")
	1	105 mm (4.13")	75 mm (2.95")
	1	95 mm (3.74")	65 mm (2.56")

Hydraulic Filters

Hydraulic circuits use high-quality hydraulic filters. A suction filter is incorporated in the suction line, and full-flow filters in the return line and swing/travel motor drain lines.

CONTROLS

Pilot controls. Hitachi's original shockless valve and quick warm-up system built in the pilot circuit.
Implement levers 2
Travel levers with pedals 2

UPPERSTRUCTURE

Revolving Frame

Welded sturdy box construction, using heavy-gauge steel plates for ruggedness. D-section frame for resistance to deformation.

Swing Device

Axial piston motor with planetary reduction gear is bathed in oil. Swing circle is single-row, shear-type ball bearing with induction-hardened internal gear. Internal gear and pinion gear are immersed in lubricant. Swing parking brake is spring-set/hydraulic-released disc type.
Swing speed..... 13.9 min^{-1} (rpm)

Operator's Cab

Independent roomy cab, 1 005 mm (40") wide by 1 675 mm (66") high, conforming to ISO* Standards. Reinforced glass windows on 4 sides for visibility. Openable front windows (upper and lower). Adjustable, reclining seat with armrests; movable with or without control levers.

* International Standardization Organization

UNDERCARRIAGE

Tracks

Tractor-type undercarriage. Welded track frame using selected materials. Side frame welded to track frame. Lubricated track rollers, idlers, and sprockets with floating seals.
Track shoes with triple grousers made of induction-hardened rolled alloy. Flat and triangular shoes are also available. Heat-treated connecting pins with dirt seals. Hydraulic (grease) track adjusters with shock-absorbing recoil springs.

Numbers of Rollers and Shoes on Each Side

Upper rollers 1: ZAXIS110
2: ZAXIS110M
Lower rollers ..... 6: ZAXIS110 / 110M
Track shoes 41: ZAXIS110
42: ZAXIS110M
Track guard 1: ZAXIS110M

Travel Device

Each track driven by 2-speed axial piston motor through planetary reduction gear for counterrotation of the tracks. Sprockets are replaceable. Parking brake is spring-set/hydraulic-released disc type. Travel shockless relief valve built in travel motor absorbs shocks when stopping travel.
Automatic transmission system: High-Low.
Travel speeds
ZAXIS110..... High : 0 to 5.5 km/h (3.4 mph)
Low : 0 to 3.6 km/h (2.2 mph)
ZAXIS110M..... High : 0 to 4.2 km/h (2.7 mph)
Low : 0 to 2.4 km/h (1.7 mph)
Maximum traction force
ZAXIS110..... 91 kN (9 300 kgf, 20 500 lbf)
ZAXIS110M ..... 130 kN (13 300 kgf, 29 200 lbf)
Gradeability ..... 35° (70%) continuous

WEIGHTS AND GROUND PRESSURE

Equipped with 4.27 m (14'0") boom, 2.26 m (7'5") arm and 0.45 m³ (0.59 yd³: SAE, PCSA heaped) bucket.

ZAXIS110

Triple grouser	500 mm (20")	10 700 kg (23 600 lb)	36 kPa (0.37 kgf/cm², 5.26 psi)
	600 mm (24")	11 000 kg (24 300 lb)	31 kPa (0.32 kgf/cm², 4.55 psi)
	700 mm (28")	11 200 kg (24 700 lb)	27 kPa (0.28 kgf/cm², 3.98 psi)
Rubber	500 mm (20")	10 800 kg (23 800 lb)	36 kPa (0.37 kgf/cm², 5.26 psi)
Flat	510 mm (20")	11 200 kg (24 700 lb)	37 kPa (0.38 kgf/cm², 5.40 psi)
Triangular	700 mm (28")	11 000 kg (24 300 lb)	26 kPa (0.27 kgf/cm², 3.98 psi)

ZAXIS110M

Triple grouser	700 mm (28")	12 800 kg (28 200 lb)	27 kPa (0.28 kgf/cm², 3.98 psi)
Single high grouser	960 mm (38")	13 700 kg (30 200 lb)	22 kPa (0.22 kgf/cm², 3.13 psi)
Triangular	760 mm (30")	13 700 kg (30 200 lb)	27 kPa (0.28 kgf/cm², 3.98 psi)
	900 mm (35")	13 400 kg (29 500 lb)	23 kPa (0.23 kgf/cm², 3.27 psi)

Weights of the basic machines [including 1 800 kg (3 970 lb), counterweight and triple grouser shoes, excluding front-end attachment, fuel, hydraulic oil, engine oil and coolant etc.] are:

ZAXIS110..... 8 250 kg (18 200 lb) with 500 mm (20") shoes
ZAXIS110M.....10 300 kg (22 700 lb) with 700 mm (28") shoes

Buckets

0.19 m³ (0.25 yd³)	0.17 m³	450 mm (18")	550 mm (22")	3	260 kg (570 lb)	◎	◎	◎	◎	◎	◎
0.30 m³ (0.39 yd³)	0.25 m³	580 mm (23")	700 mm (28")	3	290 kg (640 lb)	◎	◎	◎	◎	◎	◎
0.40 m³ (0.52 yd³)	0.33 m³	680 mm (27")	800 mm (31")	4	340 kg (750 lb)	◎	◎	◎	◎	◎	◎
0.45 m³ (0.59 yd³)	0.40 m³	850 mm (33")	970 mm (38")	5	400 kg (800 lb)	◎	◎	○*	◎	◎	◎
0.50 m³ (0.65 yd³)	0.45 m³	890 mm (35")	1 010 mm (40")	5	410 kg (900 lb)	◎	○	–	◎	○	○
0.59 m³ (0.77 yd³)	0.50 m³	950 mm (37")	1 070 mm (42")	5	430 kg (950 lb)	○	□	–	○	□	–
*1 0.45 m³ (0.59 yd³)	0.40 m³	850 mm (33")	970 mm (38")	5	450 kg (990 lb)	◎	◎	○*	◎	◎	◎
*2 0.50 m³ (0.65 yd³)	0.45 m³	890 mm (35")	1 010 mm (40")	5	500 kg (1 100 lb)	○	–	–	○	–	–
*3 0.50 m³ (0.65 yd³)	0.45 m³	890 mm (35")	1 010 mm (40")	5	480 kg (1 060 lb)	○	–	–	○	–	–
V-type bucket: 0.35 m³ (0.46 yd³: CECE heaped)				3	370 kg (820 lb)	○	○	○	○	○	○
One-point ripper				1	320 kg (710 lb)	●	●	–	–	–	–
Clamshell bucket: 0.30 m³ (0.39 yd³: CECE heaped), Width 560 mm (22")				6	690 kg (1 520 lb)	◎	◎	–	◎	◎	–
Slope-finishing blade: Width 1 000 mm (39"), length 1 600 mm (63")					430 kg (950 lb)	◇	◇	◇	◇	◇	◇

* With 700 mm (28") shoes only
*1 Reinforced bucket
*2 Level-pin-type reinforced bucket
*3 H-bucket

◎ Suitable for materials with density of 1 800 kg/m³ (3 030 lb/yd³) or less
○ Suitable for materials with density of 1 600 kg/m³ (2 700 lb/yd³) or less
□ Suitable for materials with density of 1 100 kg/m³ (1 850 lb/yd³) or less
● Heavy-duty service
◇ Slope-finishing service
– Not applicable

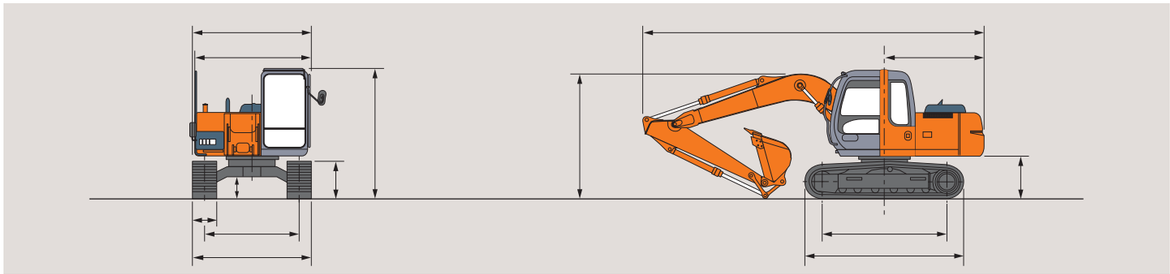
SERVICE REFILL CAPACITIES

		liters	US gal	Imp gal
Fuel tank		250.0	66.1	55.0
Engine coolant		19.0	5.0	4.2
Engine oil		15.8	4.2	3.5
Swing device		3.2	0.8	0.7
Travel device (each side)	ZAXIS110	4.0	1.1	0.9
	ZAXIS110M	3.5	0.9	0.8
Hydraulic system		130.0	34.3	28.6
Hydraulic oil tank		69.0	18.2	15.2

BACKHOE ATTACHMENTS

Boom and arms are of welded, box-section design. 4.27 m (14'0") boom, and 1.96 m (6'5"), 2.26 m (7'5") and 2.81 m (9'3")* arms are available. Bucket is of welded steel structure. Side clearance adjust mechanism provided on the bucket joint bracket.

DIMENSIONS

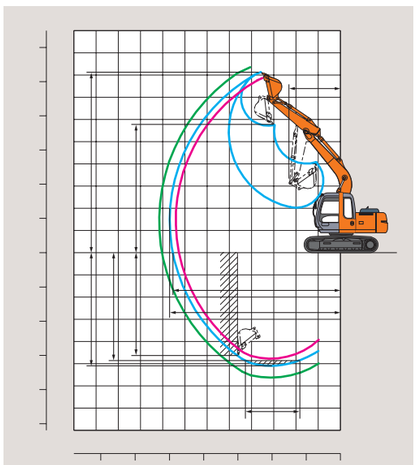


Unit: mm (ft in)

A	Distance between tumbles	2 620 (8'7")				2 990 (9'10")		
B	Undercarriage length	3 340 (10'11")				3 790 (12'5")		
*C	Counterweight clearance	890 (2'11")				1 100 (3'7")		
D	Rear-end swing radius	2 130 (7'0")				2 130 (7'0")		
D'	Rear-end length	2 130 (7'0")				2 130 (7'0")		
E	Overall width of upperstructure	2 460 (8'1")				2 460 (8'1")		
F	Overall height of cab	2 740 (9'0")				2 950 (9'8")		
*G	Min. ground clearance	440 (1'5")				595 (1'11")		
H	Track gauge	1 990 (6'6")				2 040 (6'8")		
I	Track shoe width	G 500 (20")	G 600 (24")	G 700 (28")	F 510 (20")	G 700 (28")	T 760 (30")	H 960 (38")
J	Undercarriage width	2 490 (8'2")	2 590 (8'6")	2 690 (8'10")	2 500 (8'2")	2 740 (9'0")	2 800 (9'2")	3 000 (9'10")
K	Overall width	2 500 (8'2")	2 590 (8'6")	2 690 (8'10")	2 500 (8'2")	2 740 (9'0")	2 800 (9'2")	3 000 (9'10")
L	Overall length							
	With 1.96 m (6'5") arm	7 220 (23'8")				7 220 (23'8")		
	With 2.26 m (7'5") arm	7 220 (23'8")				7 220 (23'8")		
	With 2.81 m (9'3") arm	7 240 (23'9")				7 220 (23'8")		
M	Overall height of boom							
	With 1.96 m (6'5") arm	2 600 (8'6")				2 670 (8'9")		
	With 2.26 m (7'5") arm	2 680 (8'10")				2 740 (9'0")		
	With 2.81 m (9'3") arm	**2 680 (8'10")				**2 690 (8'10")		
N	Track height							
	With triple grouser shoes	790 (2'7")				940 (3'1")		

* Excluding track shoe lug
** The dimension is shown in the transportation hole position of the arm
G : Triple grouser shoe
T : Triangular shoe
F : Flat shoe
H : Triple high grouser shoe

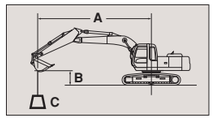
WORKING RANGES



Unit: mm (ft in)

A	Max. digging reach	7 430 (24'5")	7 700 (25'3")	8 180 (26'10")	7 430 (24'5")	7 700 (25'3")	8 180 (26'10")
A'	Max. digging reach (on ground)	7 290 (23'11")	7 570 (24'10")	8 060 (26'5")	7 250 (23'9")	7 530 (24'8")	8 020 (26'4")
B	Max. digging depth	4 780 (15'8")	5 080 (16'8")	5 630 (18'6")	4 580 (15'0")	4 880 (16'0")	5 430 (17'10")
B'	Max. digging depth (8' level)	4 520 (14'10")	4 850 (15'11")	5 430 (17'10")	4 320 (14'2")	4 650 (15'3")	5 220 (17'2")
C	Max. cutting height	7 940 (26'0")	8 110 (26'7")	8 360 (27'5")	8 140 (26'8")	8 320 (27'4")	8 570 (28'1")
D	Max. dumping height	5 530 (18'2")	5 700 (18'8")	5 960 (19'7")	5 730 (18'10")	5 910 (19'5")	6 170 (20'3")
E	Min. swing radius	2 310 (7'7")	2 340 (7'8")	2 600 (8'6")	2 300 (7'7")	2 330 (7'8")	2 590 (8'6")
F	Max. vertical wall	4 320 (14'2")	4 620 (15'2")	5 140 (16'10")	4 120 (13'6")	4 420 (14'6")	4 940 (16'2")
Bucket digging force	ISO	90 kN (9 200 kgf , 20 300 lbf)					
	SAE, PCSA	78 kN (8 000 kgf , 17 600 lbf)					
Arm crowd force	ISO	60 kN (6 100 kgf, 13 400 lbf)	55 kN (5 600 kgf, 12 300 lbf)	48 kN (4 900 kgf, 10 800 lbf)	60 kN (6 100 kgf, 13 400 lbf)	55 kN (5 600 kgf, 12 300 lbf)	48 kN (4 900 kgf, 10 800 lbf)
	SAE, PCSA	57 kN (5 900 kgf, 13 000 lbf)	52 kN (5 300 kgf, 11 700 lbf)	47 kN (4 800 kgf, 10 600 lbf)	57 kN (5 900 kgf, 13 000 lbf)	52 kN (5 300 kgf, 11 700 lbf)	47 kN (4 800 kgf, 10 600 lbf)

*Excluding track shoe lug



A: Load radius
B: Load point height
C: Lifting capacity

METRIC MEASURE

ZAXIS110

Rating over-side or 360 degrees — Rating over-front — Unit: 1 000 kg

Boom 4.27 m
Arm 1.96 m
Bucket
SAE, PCSA : 0.45 m³
CECE : 0.40 m³
Shoe 500 mm

	5 m					*2.40	*2.40	*2.10	*2.10					*1.16	*1.16	6.19
	4 m					*2.63	*2.63	2.22	*2.57					*1.13	*1.13	6.69
	3 m			*3.96	*3.96	3.15	*3.20	2.15	*2.83	1.54	2.11			*1.14	*1.14	6.98
	2 m					2.96	*3.96	2.06	2.81	1.50	2.06			1.10	*1.18	7.10
	1 m					2.79	3.89	1.96	2.71	1.45	2.01			1.09	*1.26	7.05
	0 (Ground)					2.68	3.77	1.90	2.64	1.41	1.97			1.14	*1.38	6.82
	−1 m			4.25	4.25	2.64	3.73	1.86	2.60	1.39	1.95			1.27	*1.58	6.41
	−2 m	*6.03	*6.03	4.29	4.29	2.65	3.73	1.86	2.60					1.53	*1.91	5.76
	−3 m	*5.80	*5.80	4.37	4.37	2.69	3.79							2.15	*2.42	4.74

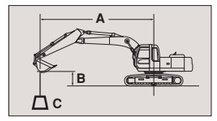
Boom 4.27 m
Arm 2.26 m
Bucket
SAE, PCSA : 0.45 m³
CECE : 0.40 m³
Shoe 500 mm

	5 m							*2.14	*2.14					*0.98	*0.98	6.50
	4 m					*2.36	*2.36	2.24	*2.36	1.58	*1.75			*0.96	*0.96	6.98
	3 m			*3.07	*3.07	*2.92	*2.92	2.17	*2.64	1.55	2.12			*0.97	*0.97	7.26
	2 m			4.66	*5.06	3.00	*3.69	2.07	2.83	1.50	2.07			*1.00	*1.00	7.37
	1 m					2.81	3.92	1.97	2.72	1.45	2.01			1.00	*1.07	7.32
	0 (Ground)			4.25	*4.62	2.69	3.78	1.89	2.64	1.40	1.96			1.05	*1.18	7.11
	−1 m			4.22	6.19	2.63	3.72	1.85	2.59	1.37	1.93			1.15	*1.35	6.72
	−2 m	*5.63	*5.63	4.25	6.21	2.62	3.71	1.83	2.57	1.38	1.93			1.37	*1.64	6.10
	−3 m			4.31	*5.58	2.65	3.75	1.86	2.61							
	−4 m			*4.17	*4.17	2.75	*3.14									

Boom 4.27 m
Arm 2.81 m
Bucket
SAE, PCSA : 0.40 m³
CECE : 0.33 m³
Shoe 500 mm

	6 m							*1.59	*1.59					*0.92	*0.92	6.40
	5 m							*1.85	*1.85	*1.36	*1.36			*0.87	*0.87	7.05
	4 m							*1.97	*1.97	*1.87	*1.87			*0.85	*0.85	7.48
	3 m					*2.23	*2.23	2.21	*2.27	1.57	2.14	1.14	*1.32	*0.87	*0.87	7.74
	2 m			*4.13	*4.13	3.08	*3.17	2.10	*2.70	1.51	2.08	1.11	1.56	0.88	*0.90	7.85
	1 m					2.86	3.98	1.99	2.74	1.45	2.01	1.08	1.53	0.87	*0.97	7.80
	0 (Ground)			4.27	6.25	2.70	3.80	1.89	2.64	1.39	1.95	1.05	1.49	0.90	*1.07	7.60
	−1 m	*2.99	*2.99	4.17	6.13	2.60	3.69	1.82	2.56	1.35	1.91	1.03	1.47	0.97	*1.22	7.24
	−2 m	*5.01	*5.01	4.16	6.12	2.57	3.65	1.79	2.53	1.33	1.89			1.13	*1.46	6.69
	−3 m	*6.93	*6.93	4.20	*6.12	2.58	3.67	1.80	2.54					1.43	*1.90	5.87
	−4 m	*6.82	*6.82	4.30	*5.06	2.64	3.73	1.86	2.60							

Notes: 1. Ratings are based on SAE J1097.
2. Lifting capacity of the ZAXIS Series does not exceed 75% of tipping load with the machine on firm level ground, or 87% full hydraulic capacity.
3. The load point is a hook (not standard equipment) located on the back of the bucket.
4. *Indicates load limited by hydraulic capacity.



A: Load radius
B: Load point height
C: Lifting capacity

METRIC MEASURE

ZAXIS110M

Rating over-side or 360 degrees — Rating over-front — Unit: 1 000 kg

Boom 4.27 m
Arm 1.96 m
Bucket
SAE, PCSA : 0.45 m³
CECE : 0.40 m³
Shoe 700 mm

	5 m					*2.42	*2.42	*2.35	*2.35					*1.15	*1.15	6.31
	4 m					*2.72	*2.72	*2.61	*2.61	*1.51	*1.51			*1.13	*1.13	6.76
	3 m			*4.30	*4.30	*3.34	*3.34	2.68	*2.90	1.96	*2.62			*1.15	*1.15	7.02
	2 m					3.66	*4.11	2.58	*3.29	1.92	*2.86			*1.19	*1.19	7.10
	1 m					3.50	*4.74	2.49	*3.65	1.87	*3.04			*1.28	*1.28	7.01
	0 (Ground)					3.41	*5.03	2.43	*3.87	1.83	3.02			*1.41	*1.41	6.76
	−1 m			5.43	*5.44	3.38	*5.00	2.40	*3.89	1.82	*3.01			*1.63	*1.63	6.30
	−2 m	*6.21	*6.21	5.47	*5.98	3.39	*4.65	2.41	*3.62					*2.01	*2.01	5.59
	−3 m			*4.95	*4.95	3.45	*3.88									

Boom 4.27 m
Arm 2.26 m
Bucket
SAE, PCSA : 0.45 m³
CECE : 0.40 m³
Shoe 700 mm

	5 m							*2.24	*2.24					*0.97	*0.97	6.62
	4 m					*2.45	*2.45	*2.41	*2.41	*1.93	*1.93			*0.96	*0.96	7.05
	3 m			*3.67	*3.67	*3.07	*3.07	2.70	*2.71	1.97	*2.52			*0.97	*0.97	7.30
	2 m					3.70	*3.86	2.59	*3.13	1.92	*2.74			*1.01	*1.01	7.37
	1 m					3.52	*4.55	2.50	*3.52	1.87	*2.95			*1.09	*1.09	7.29
	0 (Ground)			*4.96	*4.96	3.41	*4.95	2.42	*3.80	1.82	3.01			*1.21	*1.21	7.04
	−1 m	*3.21	*3.21	5.39	*6.75	3.36	*5.02	2.38	*3.88	1.80	2.99			*1.40	*1.40	6.61
	−2 m	*5.65	*5.65	5.42	*6.26	3.36	*4.77	2.38	*3.72							
	−3 m	*6.84	*6.84	*5.36	*5.36	3.41	*4.15									

Boom 4.27 m
Arm 2.81 m
Bucket
SAE, PCSA : 0.40 m³
CECE : 0.33 m³
Shoe 700 mm

	6 m							*1.72	*1.72					*0.91	*0.91	6.53
	5 m							*1.86	*1.86	*1.52	*1.52			*0.86	*0.86	7.15
	4 m							*2.01	*2.01	*1.93	*1.93			*0.85	*0.85	7.55
	3 m					*2.38	*2.38	*2.35	*2.35	1.99	*2.24			*0.87	*0.87	7.78
	2 m			*4.50	*4.50	*3.34	*3.34	2.63	*2.79	1.93	*2.49			1.18	0.91	7.85
	1 m					3.57	*4.14	2.51	*3.25	1.86	*2.75			*0.98	*0.98	7.77
	0 (Ground)			5.41	*6.20	3.42	*4.71	2.42	*3.61	1.81	*2.97			*1.09	*1.09	7.55
	−1 m	*3.32	*3.32	5.33	*6.90	3.33	*4.96	2.36	*3.81	1.77	2.96			*1.26	*1.26	7.15
	−2 m	*5.48	*5.48	5.33	*6.61	3.31	*4.89	2.33	*3.79	1.76	2.94			*1.53	*1.53	6.54
	−3 m	*7.25	*7.25	5.38	*5.95	3.33	*4.50	2.35	*3.48					2.00	*2.04	5.65
	−4 m	*6.36	*6.36	*4.77	*4.77	3.40	*3.62									

Notes: 1. Ratings are based on SAE J1097.
2. Lifting capacity of the ZAXIS Series does not exceed 75% of tipping load with the machine on firm level ground, or 87% full hydraulic capacity.
3. The load point is a hook (not standard equipment) located on the back of the bucket.
4. *Indicates load limited by hydraulic capacity.

STANDARD EQUIPMENT

Standard equipment may vary by country, so please consult your Hitachi dealer for details.

ENGINE
- H/P mode control
- E mode control
- 50 A alternator
- Cartrige-type engine oil filter
- Cartrige-type fuel filter
- Air cleaner double filters
- Radiator and oil cooler with dust protective net
- Radiator reserve tank
- Fan guard
- Isolation-mounted engine
- Auto-idle system
- Auto acceleration system

HYDRAULIC SYSTEM
- Work mode selector
- Engine speed sensing system
- E-P control system
- Quick warm-up system for pilot circuit
- Shockless valve in pilot circuit
- Boom-arm anti-drift valve
- Control valve with main relief valve
- Extra port for control valve
- Suction filter
- Full-flow filter
- Pilot filter

CAB
CRES (Center pillar Reinforced Structure) cab
- OPG top guard fitted level I (ISO) compliant cab
- All-weather sound-suppressed steel cab
- Equipped with reinforced, tinted grass windows
- 4 fluid-filled elastic mounts
- Openable windows-upper and lower front, and lower left side
- Intermittent windshield retractable wipers
- Front window washer
- Adjustable reclining seat with adjustable armrests
- Footrest
- Electric double horn
- AM - FM radio with digital clock
- Auto-idle / acceleration selector
- Seat belt
- Drink holder
- Cigar lighter
- Ashtray
- Storage box
- Glove compart-ment
- Floor mat
- Heater
- Pilot control shut-off lever
- Engine stop knob

MONITOR SYSTEM
- Meters:
  Hourmeter and trip-meter, engine coolant temperature gauge and fuel gauge
- Warning lamps:
  Alternator charge, engine oil pressure, engine overheat, air filter restriction and minimum fuel level
- Pilot lamps:
  Engine preheat, work light, auto-idle, auto-acceleration, digging mode and attachment mode
- Alarm buzzers:
  Engine oil pressure and engine overheat

LIGHTS
- 2 working lights

UPPERSTRUCTURE
- Undercover
- 1 800 kg (3 970 lb) counterweight
- Fuel level float
- Hydraulic oil level gauge
- Tool box
- Rearview mirror (right & left side)
- Swing parking brake

UNDERCARRIAGE
- Travel parking brake
- Travel motor covers
- Track guards and hydraulic track adjuster
- Bolt-on sprocket
- Upper rollers and lower rollers
- Reinforced track links with pin seals
- 500 mm (20") triple grouser shoes (ZAXIS110)
- 700 mm (28") triple grouser shoes (ZAXIS110M)

FRONT ATTACHMENTS
- HN bushing
- WC thermal spraying
- Reinforced resin thrust plate
- Flanged pin
- Bucket clearance adjust mechanism
- Monolithically cast bucket link A
- Centralized lubrication system
- Dirt seal on all bucket pins
- 2.26 m (7'5") arm
- 0.45 m^3 (0.59 yd^3 : SAE, PCSA heaped) bucket

MISCELLANEOUS
- Standard tool kit
- Lockable machine covers
- Lockable fuel filling cap
- Skid-resistant tapes, plates and handrails
- Travel direction mark on track frame

OPTIONAL EQUIPMENT

Optional equipment may vary by country, so please consult your Hitachi dealer for details.

- Auto control air conditioner
- Suspension seat
- Hose rupture valves
- Electric fuel refilling pump
- Swing motion alarm device with lamps
- Travel motion alarm device
- Additional pump
- Auto-lubrication system
- Pre-cleaner
- Fuel double filters
- Tropical cover
- Large-capacity battery
- Attachment basic piping
- Accessories for breaker
- Accessories for breaker & crusher
- Accessories for 2 speed selector
- 200 kg (440 lb) added heavier counterweight
- Front glass lower guard
- Front glass upper guard
- Full track guard

Hitachi Construction Machinery Co., Ltd.

Head Office :

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Facsimile :
URL :

KS-E342Q

Band Drain Machine is modified by the excavator

APPENDIX T
CULTURAL HERITAGE MONITORING RESULTS

Appendix T – Cultural Heritage Monitoring Results

Date	Tilting				Settlement (mm)			Vibration (mm/s)		
								Measurement Direction		
	THT-TM-01	THT-TM-02	THT-TM-03	THT-TM-04	THT-BSP-1	THT-BSP-2	THT-BSP-3	Tran	Vertical	Longitudinal
2-Mar-20	1 : 8999	1 : 9183	1 : 3982	Obstructed by materials of stakeholder	+6	Stop monitoring	Stop monitoring	0.142	0.142	0.134
3-Mar-20	1 : 9574	1 : 8181	1 : 3879		+5	Stop monitoring	Stop monitoring	0.150	0.260	0.158
4-Mar-20	1 : 8035	1 : 7758	1 : 3688		+5	Stop monitoring	Stop monitoring	0.150	0.181	0.142
5-Mar-20	1 : 6923	1 : 7377	1 : 3285		+6	Stop monitoring	Stop monitoring	0.189	0.197	0.197
6-Mar-20	1 : 6338	1 : 6716	1 : 3020		+5	Stop monitoring	Stop monitoring	0.134	0.158	0.142
7-Mar-20	1 : 6617	1 : 6164	1 : 3147		+6	Stop monitoring	Stop monitoring	0.158	0.126	0.126
9-Mar-20	1 : 4455	1 : 8181	1 : 2744		+6	Stop monitoring	Stop monitoring	0.134	0.150	0.142
10-Mar-20	1 : 4891	1 : 9782	1 : 2601		+1	Stop monitoring	Stop monitoring	0.142	0.134	0.126
11-Mar-20	1 : 4736	1 : 11250	1 : 2557		+1	Stop monitoring	Stop monitoring	0.134	0.173	0.150
12-Mar-20	1 : 5056	1 : 13235	1 : 2432		+2	Stop monitoring	Stop monitoring	0.134	0.166	0.126
13-Mar-20	1 : 5421	1 : 14516	1 : 2472		+2	Stop monitoring	Stop monitoring	0.134	0.166	0.134
14-Mar-20	1 : 4891	1 : 17999	1 : 2432		+2	Stop monitoring	Stop monitoring	0.166	0.205	0.150
16-Mar-20	1 : 4736	1 : 23683	1 : 2356		+1	Stop monitoring	Stop monitoring	0.134	0.150	0.134
17-Mar-20	1 : 4327	1 : 16071	1 : 2320		+3	Stop monitoring	Stop monitoring	0.126	0.126	0.087
18-Mar-20	1 : 4455	1 : 17999	1 : 2647		+3	Stop monitoring	Stop monitoring	0.134	0.134	0.087
19-Mar-20	1 : 4736	1 : 28124	1 : 2744		+3	Stop monitoring	Stop monitoring	0.173	0.142	0.126
20-Mar-20	1 : 5421	1 : 44998	1 : 2557		+5	Stop monitoring	Stop monitoring	0.158	0.158	0.166

Date	Tilting				Settlement (mm)			Vibration (mm/s)		
								Measurement Direction		
	THT-TM-01	THT-TM-02	THT-TM-03	THT-TM-04	THT-BSP-1	THT-BSP-2	THT-BSP-3	Tran	Vertical	Longitudinal
21-Mar-20	1 : 5232	1 : 64283	1 : 2848	Obstructed by materials of stakeholder	+2	Stop monitoring	Stop monitoring	0.158	0.126	0.142
23-Mar-20	1 : 6923	-1 : 40907	1 : 2744		+2	Stop monitoring	Stop monitoring	0.181	0.244	0.150
24-Mar-20	1 : 7627	-1 : 56248	1 : 2960		+2	Stop monitoring	Stop monitoring	0.158	0.126	0.142
25-Mar-20	1 : 8999	-1 : 32142	1 : 3020		+3	Stop monitoring	Stop monitoring	0.134	0.181	0.095
26-Mar-20	1 : 10975	-1 : 89996	1 : 3147		+2	Stop monitoring	Stop monitoring	0.126	0.189	0.095
27-Mar-20	1 : 11841	1 : 112495	1 : 3435		+2	Stop monitoring	Stop monitoring	0.126	0.142	0.087
28-Mar-20	1 : 15516	1 : 44998	1 : 3600		+3	Stop monitoring	Stop monitoring	0.134	0.189	0.087
30-Mar-20	1 : 19564	1 : 20454	1 : 3982		+2	Stop monitoring	Stop monitoring	0.142	0.189	0.102
31-Mar-20	1 : 17306	1 : 17999	1 : 4206		Bad Weather	Stop monitoring	Stop monitoring	0.166	0.166	0.110
Alert Level	1:2000				6			4.5		
Alarm Level	1:1500				8			4.8		
Action Level	1:1000				10			5		

Note:
Bold means Alert Level exceedance
Bold Italic means Alarm Level exceedance
Bold Italic with underline means Action Level exceedance

APPENDIX U
PIEZOMETER MONITORING RESULTS

Construction Phase Daily Piezometer Monitoring Results in March 2020

Date	Daily Piezometer Monitoring	
	38568-LDH1 (P)	**TKO-LBH907**
2-Mar-20	87.65	n.a.
3-Mar-20	n.a.	n.a.
4-Mar-20	n.a.	n.a.
5-Mar-20	n.a.	n.a.
6-Mar-20	n.a.	n.a.
7-Mar-20	n.a.	n.a.
6-Mar-20	n.a.	n.a.
10-Mar-20	n.a.	n.a.
11-Mar-20	n.a.	n.a.
12-Mar-20	n.a.	n.a.
13-Mar-20	n.a.	n.a.
14-Mar-20	n.a.	n.a.
16-Mar-20	No data due to unsafe access	n.a.
17-Mar-20	n.a.	n.a.
18-Mar-20	n.a.	n.a.
19-Mar-20	n.a.	n.a.
20-Mar-20	n.a.	n.a.
21-Mar-20	n.a.	n.a.
23-Mar-20	n.a.	n.a.
24-Mar-20	n.a.	n.a.
25-Mar-20	n.a.	n.a.
26-Mar-20	n.a.	n.a.
27-Mar-20	n.a.	n.a.
28-Mar-20	n.a.	n.a.
30-Mar-20	n.a.	n.a.
Action Level (mPD)	+74.65	+17.59

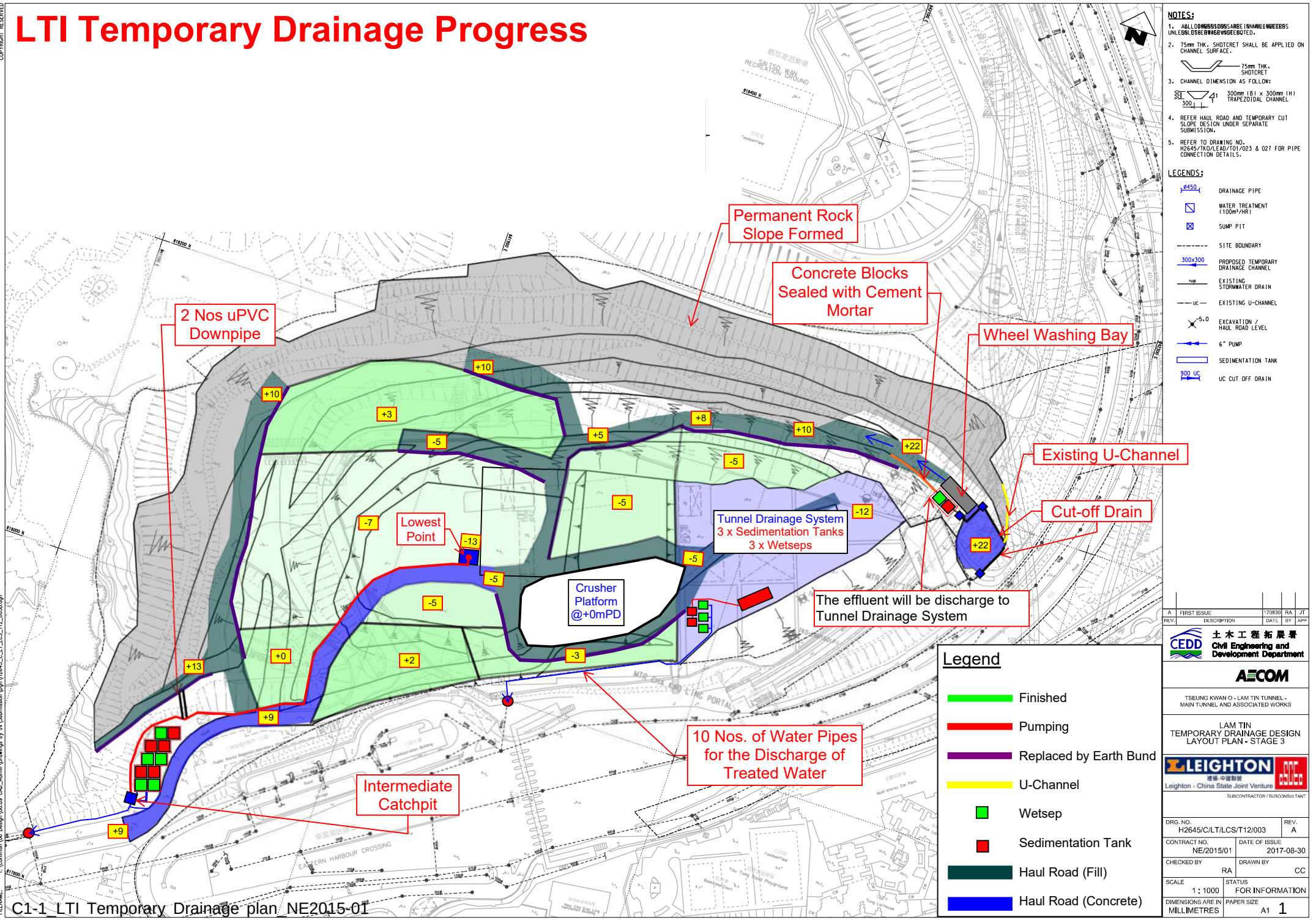
Note:
Bold Italic with underline means Action Level exceedance
n.a – The daily ground water level monitoring was not required as the tunnel construction activities were conducted out of +/- 50m of the piezometer gate.

Remark:
The piezometer gate TKO-LBH907 (P) had been found dry since 6 November 2019. According to the Construction Impact Assessment (CIA), TKO-LBH907 (P) was classified as Category 2, for which monitoring was no longer required when measured dry. Therefore, no further monitoring was required for this instrument and hence this instrument could be abandoned.

APPENDIX V
SURFACE RUNOFF MANAGEMENT PLAN

Contract No. NE/2015/01

LTI Temporary Drainage Progress



NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED.
2. 75mm THK. SHOTCRET SHALL BE APPLIED ON CHANNEL SURFACE.
3. CHANNEL DIMENSION AS FOLLOW:
4. REFER HAUL ROAD AND TEMPORARY CUT SLOPE DESIGN UNDER SEPARATE SUBMISSION.
5. REFER TO DRAWING NO. H2645/TKO/LEAD/T01/023 & 027 FOR PIPE CONNECTION DETAILS.

75mm THK. SHOTCRET

300mm (B) x 300mm (H) TRAPEZOIDAL CHANNEL

LEGENDS:

- DRAINAGE PIPE
- WATER TREATMENT (100m³/HR)
- SUMP PIT
- SITE BOUNDARY
- PROPOSED TEMPORARY DRAINAGE CHANNEL
- EXISTING STORMWATER DRAIN
- EXISTING U-CHANNEL
- EXCAVATION / HAUL ROAD LEVEL
- 6" PUMP
- SEDIMENTATION TANK
- UC CUT OFF DRAIN

Legend

- Finished
- Pumping
- Replaced by Earth Bund
- U-Channel
- Wetsep
- Sedimentation Tank
- Haul Road (Fill)
- Haul Road (Concrete)

REV.	DESCRIPTION	DATE	BY	APP
A	FIRST ISSUE	170830	RA	JT

CEDD 土木工程拓展署 Civil Engineering and Development Department

AECOM

TSEUNG KWAN O - LAM TIN TUNNEL - MAIN TUNNEL AND ASSOCIATED WORKS

LAM TIN TEMPORARY DRAINAGE DESIGN LAYOUT PLAN - STAGE 3

LEIGHTON 禮頓-中建聯營 Leighton - China State Joint Venture

SUBCONTRACTOR / SUBCONSULTANT

DRG. NO. H2645/C/LT/LCS/T12/003	REV. A
CONTRACT NO. NE/2015/01	DATE OF ISSUE 2017-08-30
CHECKED BY RA	DRAWN BY CC
SCALE 1 : 1000	STATUS FOR INFORMATION
DIMENSIONS ARE IN MILLIMETRES	PAPER SIZE A1

1

PLOT DRV: T:\Common\06 Design\06.89 CAD_Admin\Plot drive\PDF COLOUR-ATKINS.plt
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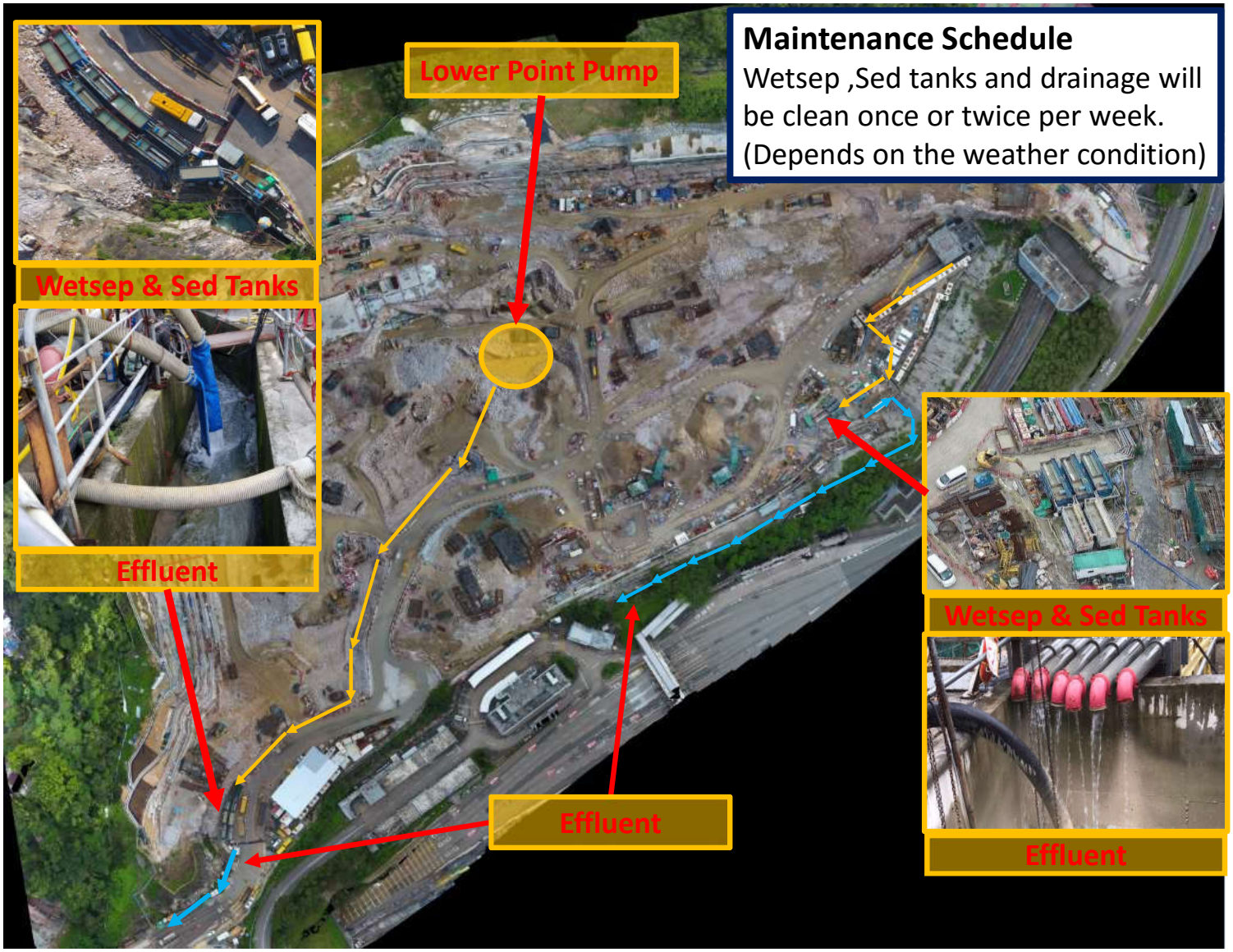
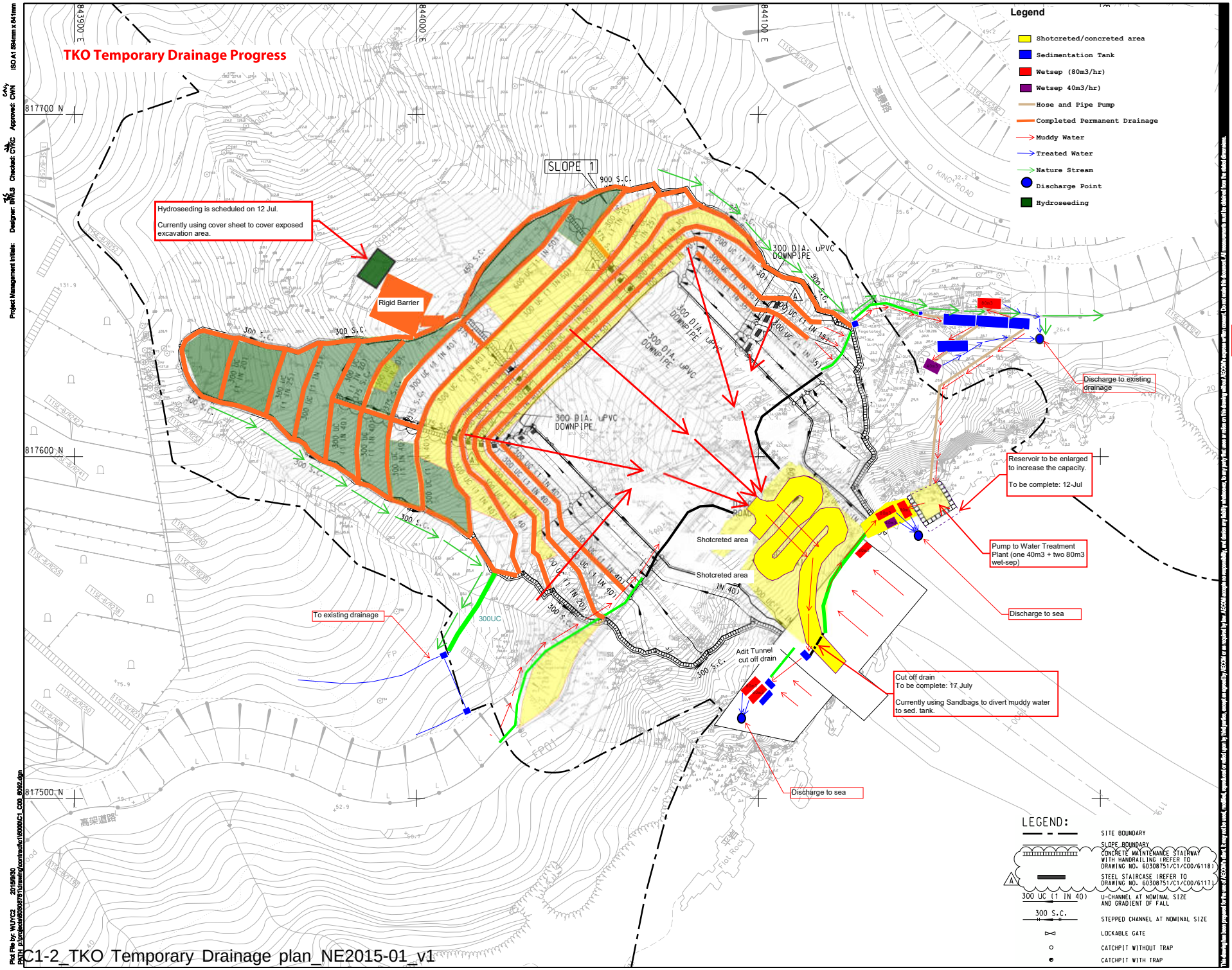
C1-1_LTI Temporary Drainage plan_NE2015-01


Lower Point Pump
Maintenance Schedule
Wetsep ,Sed tanks and drainage will be clean once or twice per week.
(Depends on the weather condition)
Wetsep & Sed Tanks
Effluent
Wetsep & Sed Tanks
Effluent
Effluent



AECOM

PROJECT
TSEUNG KWAN O - LAM TIN TUNNEL

CONTRACT TITLE
TSEUNG KWAN O - LAM TIN TUNNEL MAIN TUNNEL AND ASSOCIATED WORKS

CLIENT
CEDD 土木工程拓展署 Civil Engineering and Development Department

CONSULTANT
AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS

FOR CONSTRUCTION

ISSUE/REVISION

B	JUL. 16	WORKING DRAWING	ALC
A	OCT.15	TENDER ADDENDUM NO.1	CYKC
-	AUG.15	TENDER DRAWING	CYKC
DR.	DATE	DESCRIPTION	CHK.

STATUS
WORKING DRAWING

SCALE
A1 1:500

DIMENSION UNIT
METRES

KEY PLAN

PROJECT NO.
60308751

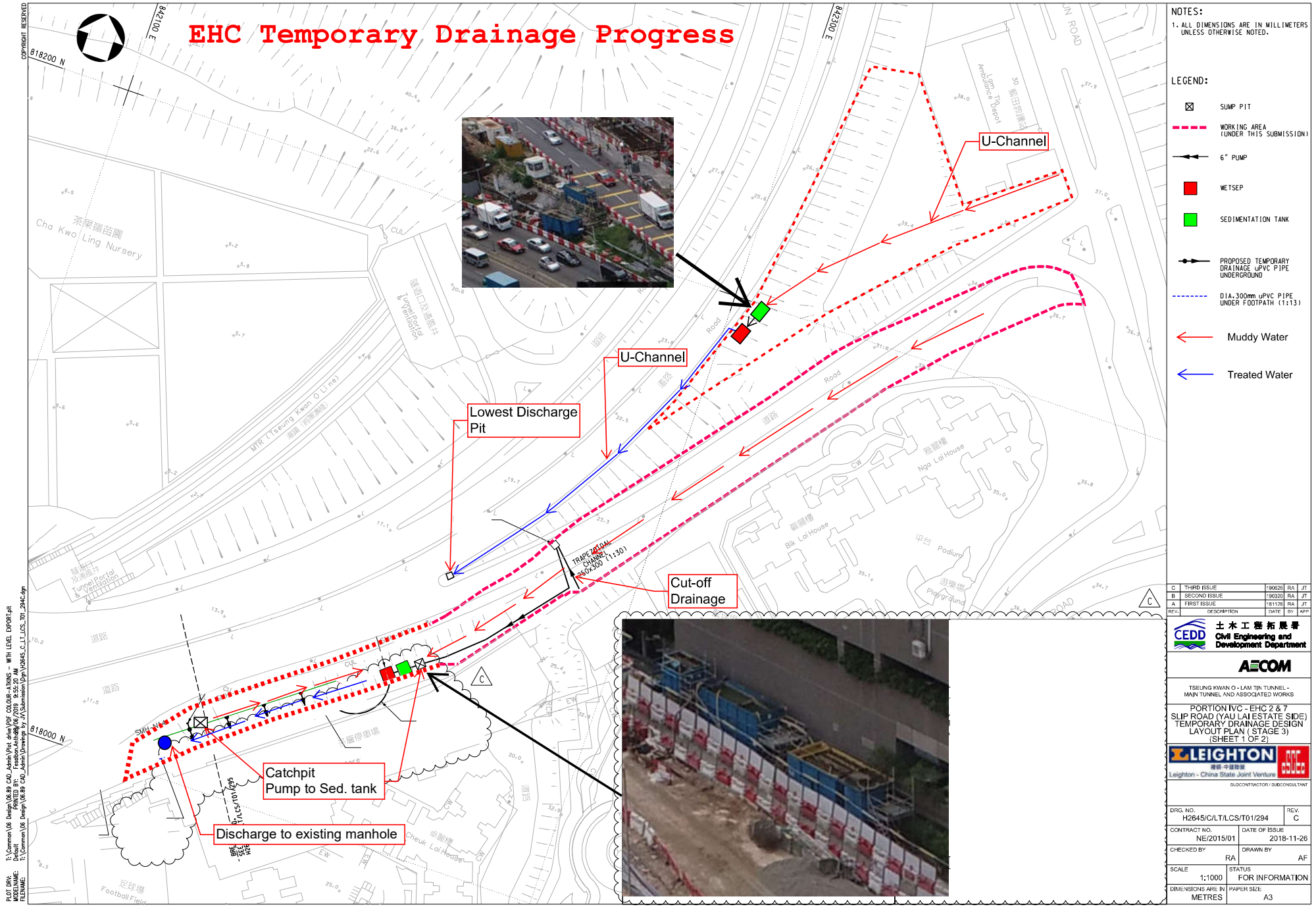
CONTRACT NO.
NE/2015/01

SHEET TITLE
TSEUNG KWAN O PORTAL
SITE FORMATION
DRAINAGE LAYOUT PLAN

SHEET NUMBER
60308751/C1/C00/6092B

Designer: BWLS Checked: CYKC Approved: CWN
Project Management Initials:
ISO A1 594mm x 841mm
Plot File by: WUYC2 2016/9/30
PATH: p:\projects\60308751\drawing\contract\c1\60000\C1_C00_6092.dgn


Maintenance Schedule
Wetsep ,Sed tanks and drainage will be clean once or twice per week.
(Depends on the weather condition)
Sed tanks
Site Clearance & provide cover to exposed excavation area
Contract Number NE/2015/01
Wetsep
Effluent
Extension of Sed tanks


EHC Temporary Drainage Progress
U-Channel
U-Channel
Lowest Discharge Pit
Cut-off Drainage
Catchpit
Pump to Sed. tank
Discharge to existing manhole
NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.
LEGEND:
SUMP PIT
WORKING AREA (UNDER THIS SUBMISSION)
6" PUMP
WETSEP
SEDIMENTATION TANK
PROPOSED TEMPORARY DRAINAGE uPVC PIPE UNDERGROUND
DIA.300mm uPVC PIPE UNDER FOOTPATH (1:13)
Muddy Water
Treated Water
TSEUNG KWAN O - LAM TIN TUNNEL - MAIN TUNNEL AND ASSOCIATED WORKS
PORTION IVC - EHC 2 & 7
SLIP ROAD (YAU LAI ESTATE SIDE)
TEMPORARY DRAINAGE DESIGN
LAYOUT PLAN (STAGE 3)
(SHEET 1 OF 2)
DRG. NO. H2645/C/LT/LCS/T01/294
REV. C
CONTRACT NO. NE/2015/01
DATE OF ISSUE 2018-11-26
CHECKED BY RA
DRAWN BY AF
SCALE 1:1000
STATUS FOR INFORMATION
DIMENSIONS ARE IN METRES
PAPER SIZE A3

LEGEND

FLOW PATH

SEDIMENTATION/ DESILTING TANK AND WETSEP (80m3/hr)

TEMPORARY CONCRETE BLOCK WALL

APPROVED DISCHARGE POINT (MANHOLE OF DN2100 DRAIN)

APPROVED DISCHARGE POINT (MANHOLE OF DN2100 DRAIN)

APPROVED DISCHARGE POINT (AREA Z)

TEMPORARY STEEL COFFERDAM

AREA 6
AREA 5
AREA 4
AREA 3
AREA 2b2
AREA 2b1
AREA 2a2
AREA 2a1
AREA 1a
AREA 1b

OCEAN SHORES
TOWER 1
TOWER 2
TOWER 3
TOWER 5
TOWER 6
TOWER 7
TOWER 8
TOWER 9
TOWER 10
Podium
Road
Tennis Court
Cycling Track

TIU KENG WAN
JUNK BAY
(TSEUNG KWAN O)
TONG IN STREET
O KING ROAD
WIP Jan 2010
WIP May 2014

Temporary Works Design Drawings
in compliance with Contract No. **NE/2015/02**

09/05/2019

Chengrui Hu MSc, CEng, MICE, MHKIE, RPE
Independent Checking Engineer
on behalf of: Hewson Consulting Limited,
Unit 1101, 11/F, 9 Chong Yip Street,
Kwun Tong, Kowloon, Hong Kong

Rev. 修訂	Description 內容摘要	By 設計	Date 日期

PM
CEDD 土木工程拓展署
Civil Engineering and Development Department

Supervisor
AECOM Asia Co. Ltd.

Contractor
CRBC-Build King Joint Venture

Project title 工程名稱

Contract No. NE/2015/02

Tseung Kwan O - Lam Tin Tunnel Road P2 and Associated Works

Drawing title 圖紙名稱

TEMPORARY DRAINAGE MANAGEMENT PLAN AT PORTION V, VI, IX AND AREA Z PRIOR TO REMOVAL OF TEMPORARY STEEL COFFERDAM

Drawing no. 圖紙編號	NE/2015/02/SK/0321	Rev. 修訂	-
Drawn By 繪圖	AL	Checked By 複核	Approved By 批准人
Scale 比例	1:600 @ A1	Status 階段	

Printed by : $DATE$
Filename : $FILE$

LEGEND

FLOW PATH

SEDIMENTATION/ DESILTING TANK AND WETSEP (80m3/hr)

TEMPORARY CONCRETE BLOCK WALL

APPROVED DISCHARGE POINT (MANHOLE OF DN2100 DRAIN)

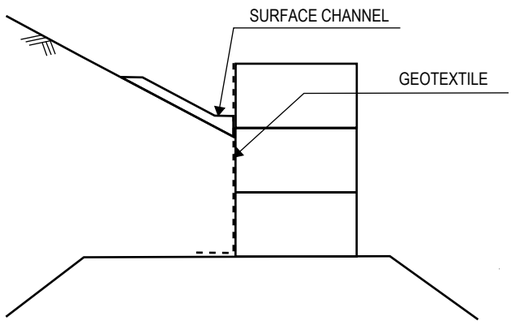
APPROVED DISCHARGE POINT (MANHOLE OF DN2100 DRAIN)

APPROVED DISCHARGE POINT

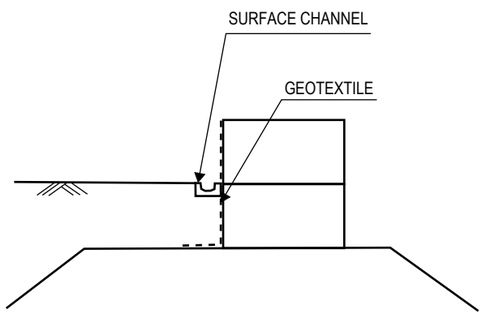
APPROVED DISCHARGE POINT

APPROVED DISCHARGE POINT

APPROVED DISCHARGE POINT (AREA Z)



TYPICAL SECTION OF TEMPORARY CONCRETE BLOCK WALL DURING PRELOADING SURCHARGE



TYPICAL SECTION OF TEMPORARY CONCRETE BLOCK WALL AFTER REMOVAL OF PRELOADING SURCHARGE

Temporary Works Design Drawings
in compliance with Contract No. **NE/2015/02**

22/05/2019

Chengrui Hu MSc, CEng, MICE, MHKIE, RPE Date
Independent Checking Engineer
on behalf of: Hewson Consulting Limited,
Unit 1101, 11/F, 9 Chong Yip Street,
Kwun Tong, Kowloon, Hong Kong

Rev. 修訂	Description 內容摘要	By 設計	Date 日期

PM
CEDD 土木工程拓展署 Civil Engineering and Development Department

Supervisor
AECOM Asia Co. Ltd.

Contractor
CRBC-Build King Joint Venture

Project title 工程名稱

Contract No. NE/2015/02

Tseung Kwan O - Lam Tin Tunnel Road P2 and Associated Works

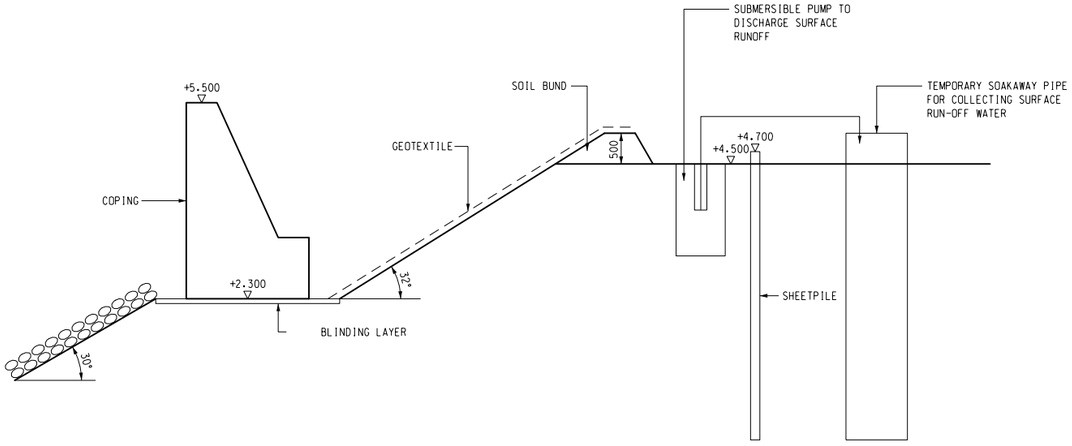
Drawing title 圖紙名稱

TEMPORARY DRAINAGE MANAGEMENT PLAN AT PORTION V, VI, IX AND AREA Z AFTER THE REMOVAL OF TEMPORARY STEEL COFFERDAM

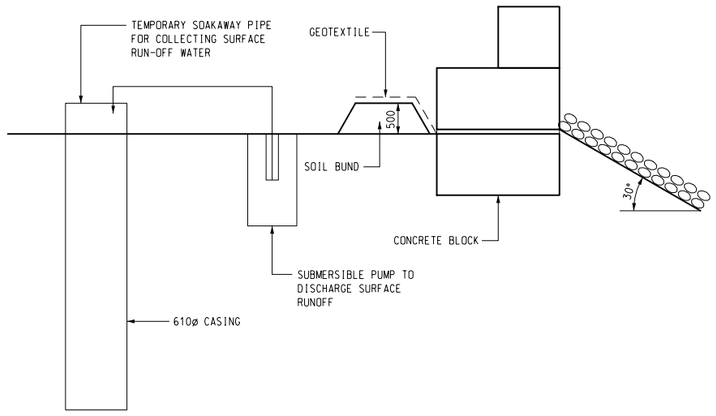
Drawing no. 圖紙編號	NE/2015/02/SK/1321	Rev. 修訂	-
Drawn By 繪圖	AL	Checked By 複核	Approved By 批准人
Scale 比例	1:600 @ A1	Status 階段	

Printed by : $DATE$
Filename : $FILE$

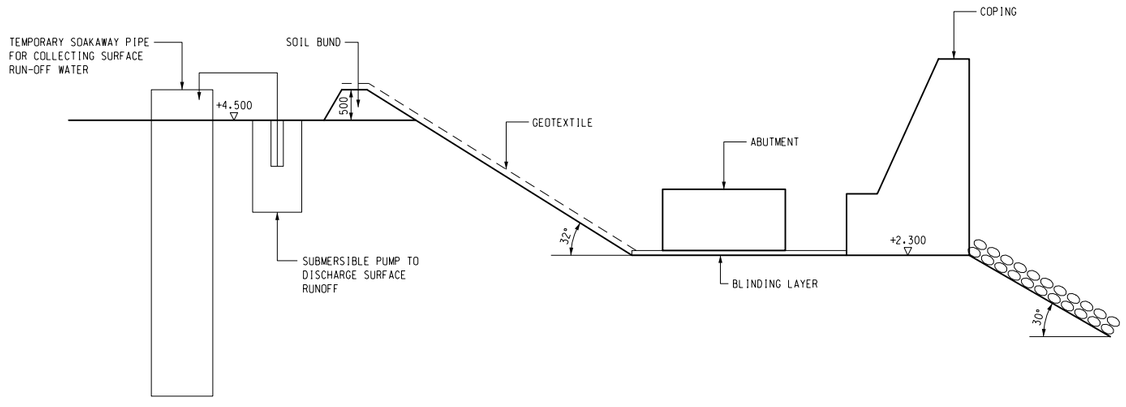
C2_SiteDrainagePlan_Dry_All



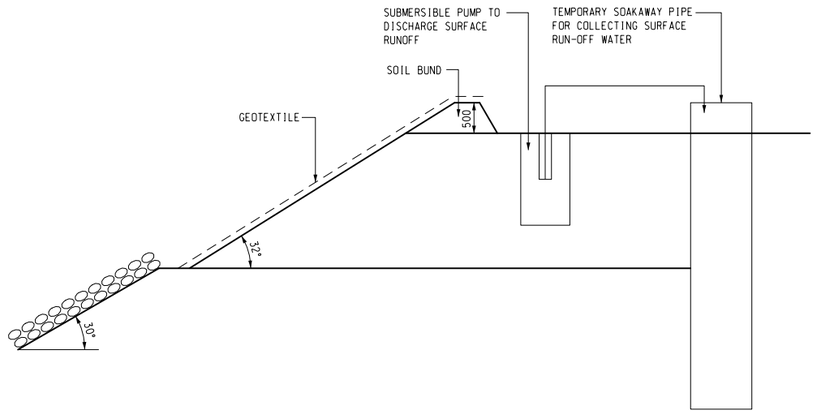
A **WEST SIDE**



B **EAST SIDE**



C **SOUTH SIDE**



D **TYPICAL SECTION**

Rev. 修訂	Description 內容摘要	By 設計	Date 日期

PM

土木工程拓展署
Civil Engineering and Development Department

Supervisor

AECOM Asia Co. Ltd.

Contractor

CRBC-Build King Joint Venture

Project title 工程名稱

Contract No. NE/2015/02

Tseung Kwan O - Lam Tin Tunnel Road P2 and Associated Works

Drawing title 圖紙名稱

SEAWALL SECTION AND DETAILS

Drawing no. 圖紙編號	Rev. 修訂
NE/2015/02/SK/0465	–

Drawn By 繪圖	Checked By 覆核	Approved By 批准人
AL		

Scale 比例	Status 階段
1:50 @ A1	

Printed by : 31/3/2020
Filename : Z:\Survey\TKOLTT\JOB\JOB0522_SEAWALL SECTION AND DETAILS_GARY FUNG_20200313_NE_2015_02_SK_0465\NE_2015_02_SK_0465.dgn

Surface Runoff Assessment for Portion IX (inc. surcharge area)			
Portion IX Surface area :		19683.57	m^2
Design rainfall Assuming 1 hour of heavy rainfall has occurred :		70	mm/h
Design flow Rate (Qp):	Qp= = =	C i A 0.18 x 70 x 19683.5 248	 m^3/h
Water Treatment Facility			
Capacity of water treatment plan	=	80	m^3/h
Number of water treatment plant*	= =	248 /80 3	

Thus, 3 nos of water treatment plant are required.In addition, 2 others are provided on site for emergency use

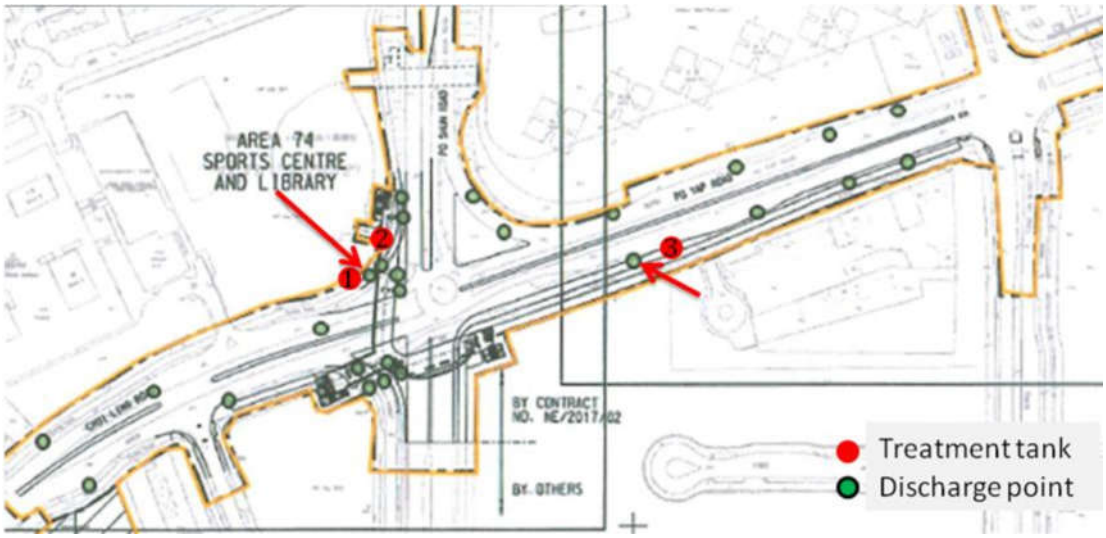
*Treatment of stormwater within the worst affected hour is assumed

Contract No.: NE/2017/02

Contract Title: Tseung Kwan O – Lam Tin Tunnel – Road P2/D4 and Associated Works

Flooding Mitigation Plan

Treatment facility
   

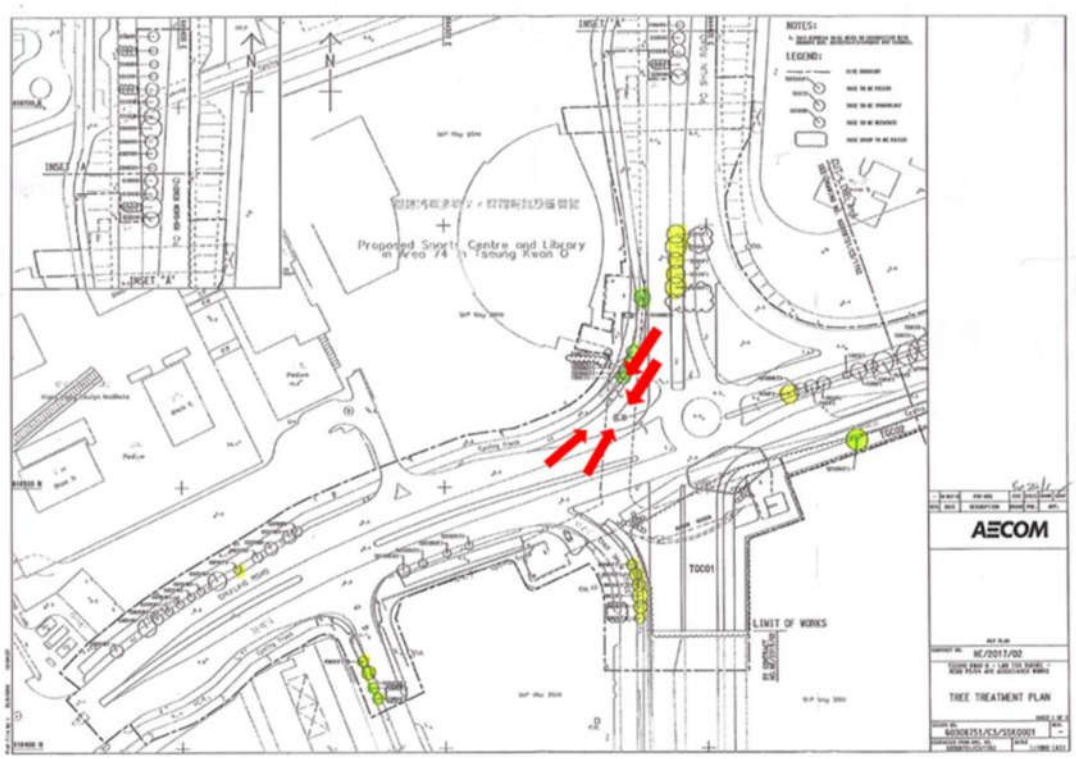


Three treatment facilities are provided on-site.

Bunding

Bunding is provided to prevent the surface runoff.

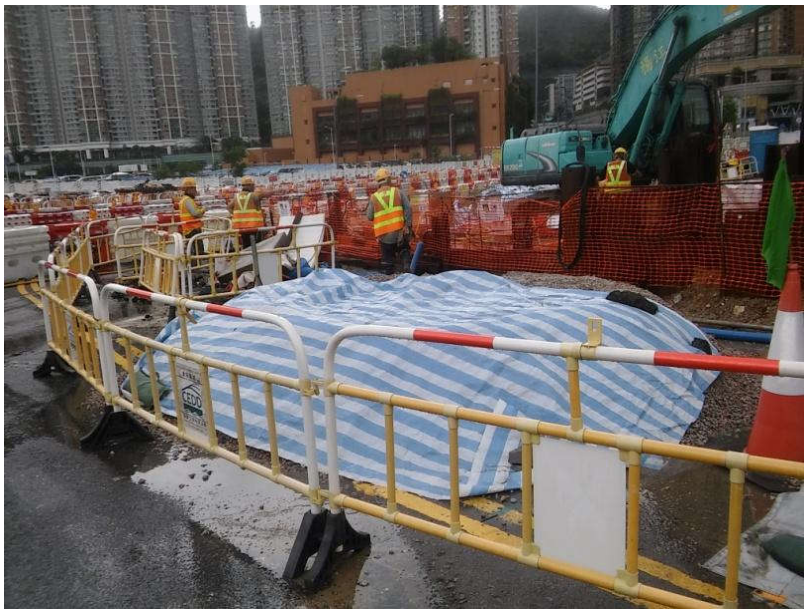
Surface runoff collection



Height difference between the road and site area to form a natural flow. Sump pit was provided for wastewater collection.

Gully Protection
 
Gully were protected and covered by geotextile.

Stockpile Cover



Stockpile Should be proper cover with tarpaulin.

CATCHPIT SCHEDULE

U/S ID	D/S ID	U/S G.L. (mPD)	D/S G.L. (mPD)	LENGTH (m)	GRADIENT 1 IN	U/S I.L. (mPD)	D/S I.L. (mPD)	UC SIZE (mm)	U/S ID TYPE	UC MATERIAL	BEDDING
CP01	CP02	6.50	6.50	6	100	6.275	6.219	225	CATCHPIT	CONCRETE	B
CP03	CP04	8.00	5.60	6	2	7.775	5.342	225	CATCHPIT	CONCRETE	B

Water Flow
Precautionary measures
Silt Measurement
Sedimentation tank
Sampling Point

Geotextiles are on the top of gully cover along the site as a filter to avoid any muddy water discharge directly into the drainage system.

Works Area B

Sedimentation tank

Sampling & Discharge Point

CONNECTED FROM LIFT SHAFT DRAINAGE SYSTEM (DRAWING NO. 60308751/C5/M00/8101 AND 8120 REFER)

DOWN PIPE FROM DECK CONNECT TO 300 U

DOWN PIPE FROM DECK

Sedimentation tank

Sampling & Discharge Point

DOWN PIPE FROM DECK

FOOTBRIDGE NOT SHOWN FOR CLARITY

AREA 74 SPORTS CENTRE AND LIBRARY

PARK CENTRAL

818650 N

818600 N

PO SHUN ROAD

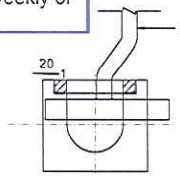
Exposed slope is covered by taupaulin

Sandbag is placed along the water barrier boundary to avoid the surface runoff.

Manhole Inspection for Silt measurement,we have regular cleaning the channel weekly or in an emergency

Manhole Inspection for Silt measurement,we have regular cleaning the channel weekly or in an emergency

DN400 to [illegible] culvert



DOWN PIPE

DETAILS CONNECTION OF DOWNPIPE TO U-CHANNEL WITH GRATING

WIP May 2014

AECOM

PROJECT
TSEUNG KWAN O - LAM TIN TUNNEL

CONTRACT TITLE
TSEUNG KWAN O - LAM TIN TUNNEL NORTHERN FOOTBRIDGE

CLIENT
CEDD 土木工程拓展署 Civil Engineering and Development Department

CONSULTANT
AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS

ISSUE/REVISION

-	AUG.16	TENDER DRAWING	AH(L)
VER	DATE	DESCRIPTION	CHK

STATUS

SCALE: A1 1 : 250
DIMENSION UNIT: METRES

KEY PLAN

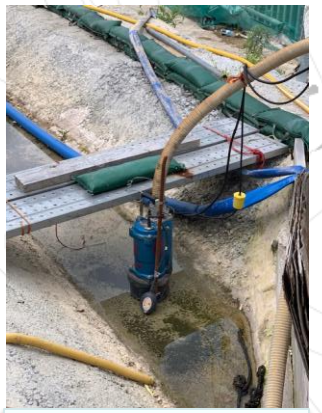
PROJECT NO.: 60308751
CONTRACT NO.: NE/2015/03

SHEET TITLE
DRAINAGE LAYOUT

SHEET NUMBER
60308751/C5/C00/1301

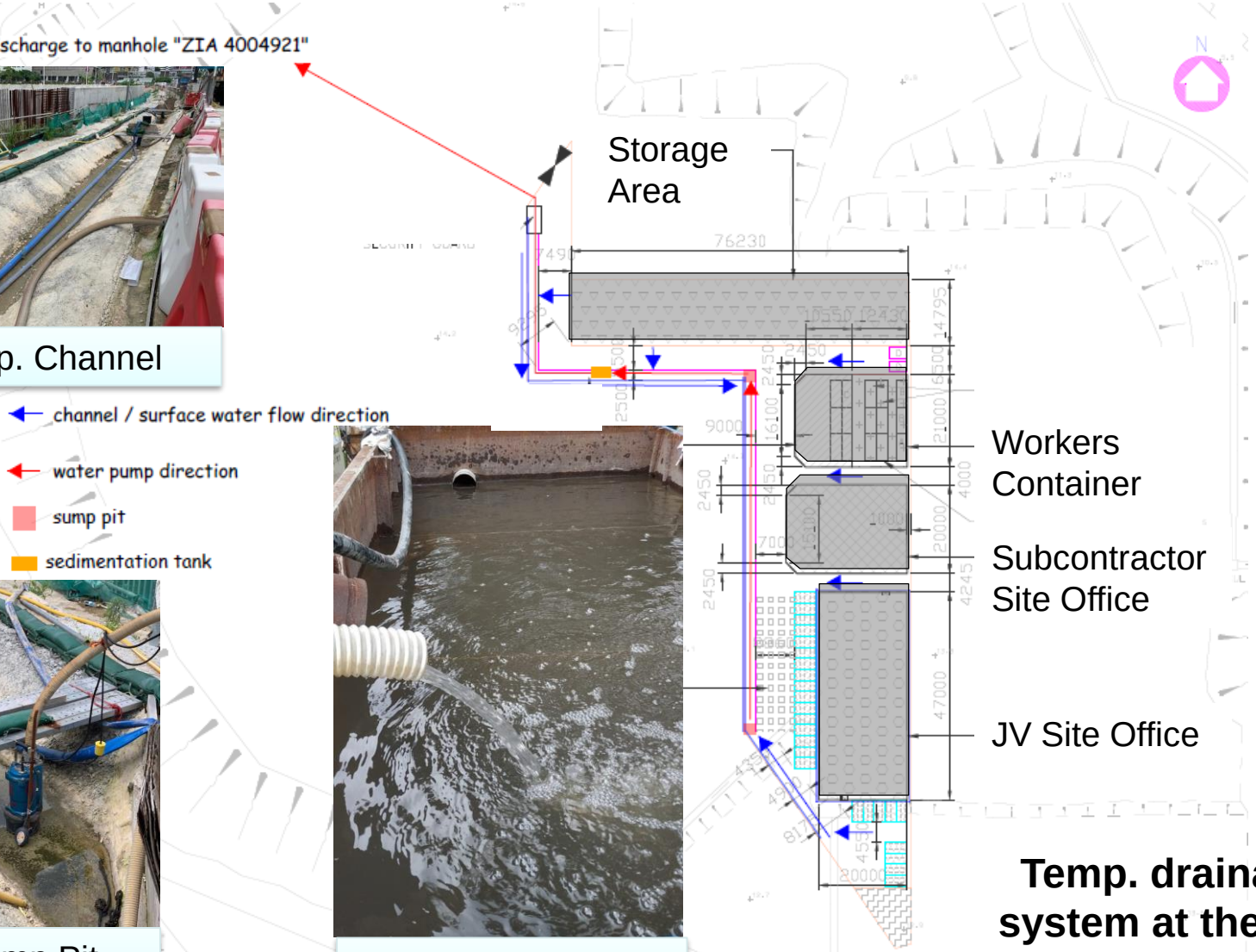
Site Surface Runoff Measures

Temp. Channel



Sump Pit

Sedimentation Tank



Temp. drainage system at the site office area