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 September 2018

(version 1.0)

Approved By

(Dr. Priscilla Choy,
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 23rd 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 September 2018.

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/2017/07 – Cross Bay Link, Tseun 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	9	10	0	0	Refer to Appendix K & O
Groundwater Quality	0	7	0	0	Refer to Appendix K
Marine Water Quality	0	0	0	0	N/A
Groundwater Level Monitoring (Piezometer Monitoring)	0	N/A[2]	0	N/A[2]	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) Environmental complaints received in July 2018 are still under investigation.
(2) No Limit Level for Groundwater Level Monitoring (Piezometer Monitoring).

*Action Taken by the Contractor after received the complaint (Details of the complaints are shown in **Appendix O**)*

- Additional water filter tank was adopted to deck of derrick barge to reduce emission of dark smoke and exhaust
- Stockpile in Work Area A was covered except the operating area
- Air blowers were provided at the location where welding works to be carried out to dilute the smell
- Frequent water spraying along the slope area at Lam Tin Interchange
- Tarpaulin sheets were provided along the slope adjacent to the tennis court during preparation of surface blasting
- 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
- Powered mechanical equipment (PME) for rock breaking were equipped with TMD and SilentMat
- Replaced and fixed the uneven metal plate on Lei Yue Mun Road near ambulance depot
- Rubber pad was placed between the vibration hammer and sheetpile to reduce the impact noise
- Quiet powered mechanical equipment was used on site as far as practicable to minimize the noise impact from the PME
- 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

Air Quality Monitoring

5. All 1-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

6. All 24-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

Construction Noise Monitoring

7. All noise monitoring was conducted as scheduled in the reporting month. Six (6) Action Level exceedances were recorded due to the documented complaints received in this reporting month. Ten (10) Limit Level exceedances were recorded in the reporting month.

Water Quality Monitoring

8. Groundwater quality monitoring was conducted as scheduled in the reporting month. Seven (7) Limit Level exceedances were recorded in the reporting month.

9. All marine water monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

10. Construction phase daily piezometer monitoring by the Contractor commenced in September 2018. No Action Level exceedance was recorded in the reporting month.

Ecological Monitoring

11. 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

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

Landscape and Visual Monitoring and Audit

13. 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

14. 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

15. 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 26, 12, 12, 26 and 12 September 2018 respectively. Details of the audit findings and implementation status are presented in Section 10.

Waste Management

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

Key Information in the Reporting Month

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

Table II Summary Table for Key Information in the Reporting Month

Event	Event Details		Action Taken	Status
	Number	Nature		
Complaint received by Project Team / Complaint referred by EPD (September 2018)	11	Noise nuisance/ Dark smoke/ Oil leakage	Under investigation	On-going
Complaint received by Project Team / Complaint referred by EPD (August 2018)	12	Construction dust/ Noise nuisance/ Water Quality	Details refer to App O	Closed
Complaint received by Project Team / Complaint referred by EPD (July 2018)	9	Construction dust/ Noise nuisance/ Water Quality	Details refer to App O	Closed
Notifications of any summons & prosecutions received	0	---	N/A	N/A

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

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

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

Contract No.	Project Title	Site Activities (September 2018)	
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 and Area 5
		Main Tunnel	1) Main tunnel Excavation
		TKO Interchange	1) Haul Road Construction, Site Formation and Slope Works 2) Steel Platform for Bridge Construction
NE/2015/02	Tseung Kwan O – Lam Tin Tunnel – Road P2 and Associated Works	1) Operation of Double Watergate 2) Backfilling at Portion VIII 3) Construction of retaining wall at Portion VIII 4) Construction of U-trough structure at Portion VIII 5) Lower ground works at Portion V 6) Cable diversion works at Portion IV and V	

		7) Pre-bore and sheetpile works for 2100 pipe at Portion IV and VII 8) Sheetpile and Pre-bore works for decked U-trough at Portion VI 9) ELS works in Portion VIII 10) Retaining wall works at Portion VIII 11) Construction of desilting opening at Portion VIII 12) Treatment works of S/S Treatment Facility at Area A 13) Dredging works and reclamation works at Portion IX 14) Rock filling works at Portion IX
NE/2015/03	Tseung Kwan O – Lam Tin Tunnel – Northern Footbridge	1) Construction of Main deck 2) Construction of lift shaft
NE/2017/01	Tseung Kwan O – Lam Tin Tunnel – Tseung Kwan O Interchange and Associated Works	1) Erection of Temporary Platform 2) Pre-drilling 3) Bored Piling
NE/2017/02	Tseung Kwan O – Lam Tin Tunnel – Road P2/D4 and Associated Works	1) Trial pit 2) Underground utilities detection 3) Temporary traffic arrangement Setup 4) Piling Works 5) Communication Liaison Center erection 6) Modification of traffic island 7) Fencing erection 8) Predrilling 9) Construction of Temporary cycle track 10) Construction of drainage and watermain

Future Key Issues

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

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

Contract No. and Project Title	Site Activities (October 2018)		Key environmental issues *
NE/2015/01 - Tseung Kwan O – Lam Tin Tunnel – Main Tunnel and Associated Works	Lam Tin Interchange	1) EHC2 U-Trough 2) Site Formation – Area 1G1, Area 1G2, Area 2, Area 3, Area 4 & Area 5	(A)/ (B) / (C) / (D) / (E) (G)
	Main Tunnel	1) Main Tunnel Excavation	(B)
	TKO Interchange	1) Haul Road Construction and Site Formation & Slope Works 2) Main Tunnel Lining Works 3) Steel Platform for Bridge Construction	(A) / (C) / (D) / (E) / (F) / (I)

		4) Cavern Excavation	
NE/2015/02 - Tseung Kwan O – Lam Tin Tunnel – Road P2 and Associated Works	1) Relocation WSD flowmeter chamber 2) Backfilling in Portion VIII 3) Construction of U-trough structure in Portion VIII 4) Lower ground works at Portion V 5) Cable diversion works at Portion IV 6) Pre-bore and sheetpile works for 2100 pipe at Portion IV and VII 7) Pre-bore works for decked U-trough at Portion VI 8) Sheet pile works for decked U-troughat PortionVI 9) ELS works in Portion IV, VIII and VII 10) Retaining wall works at VIII 11) Construction of desilting opening for existing box culvert in Portion VIII 12) Operation of double Watergate 13) Treatment works of S/S Treatment Facility at Area A 14) Dredging works and reclamation works at Portion IX 15) Rock filling works at Portion IX		(A) / (B) / (C) / (D) / (E) / (G) / (I)
NE/2015/03 - Tseung Kwan O – Lam Tin Tunnel – Northern Footbridge	1) Bearing installation at Tiu Keng Leung Sport Centre 2) Construction of Main deck 3) Construction of lift shaft		(A) / (B) / (C) / (D) / (E)
NE/2017/01 – Tseung Kwan O Interchange and Associated Works	1) Erection of Temporary Platform 2) Pre-drilling 3) Bored piling		(A) / (B) / (E) / (F) / (G)
NE/2017/02 – Tseung Kwan O - Lam Tin Tunnel - Road P2/D4 and Associated Works	1) Trial pit 2) Underground utilities detection 3) Temporary traffic arrangement Setup 4) Piling Works 5) Communication Liaison Center erection 6) Modification of traffic island 7) Fencing erection 8) Predrilling 9) Construction of Temporary cycle track 10) Construction of drainage and watermain		(A) / (B) / (E) / (F) / (G)

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 22nd Monthly EM&A report summarizing the EM&A works for the Project in September 2018.

Purpose of the Report

1.2 This is the 23rd Monthly EM&A Report which summarises the impact monitoring results and audit findings for the EM&A programme during the reporting period in September 2018.

Structure of the Report

1.3 The structure of the report is as follows:

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

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

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

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

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

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

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

Section 8: **Landscape and Visual Monitoring Requirements** – summarises the

requirements of landscape and visual monitoring

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

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

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

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

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

Section 14: **Conclusions and Recommendation**

2. PROJECT INFORMATION

Background

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

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

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

2.4 The commencement dates of construction of this Project is:

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

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. Chiang Nin Tat, Eric	2301 1384	2739 0076
AECOM	Engineer's Representative	Mr. KY Chan	3922 9000	2759 1698
Cinotech	Environmental Team	Dr. Priscilla Choy	2151 2089	3107 1388
		Ms. Ivy Tam	2151 2090	
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 (September 2018)	
NE/2015/01	Tseung Kwan O – Lam Tin Tunnel – Main Tunnel and Associated Works	Lam Tin Interchange	3) EHC2 U-Trough 4) Site Formation – Area 1G1, Area 1G2, Area 2 , Area 3, Area 4 and Area 5
		Main Tunnel	2) Main tunnel Excavation
		TKO Interchange	3) Haul Road Construction, Site Formation and Slope Works 4) Steel Platform for Bridge Construction
NE/2015/02	Tseung Kwan O – Lam Tin Tunnel – Road P2 and Associated Works	15) Operation of Double Watergate 16) Backfilling at Portion VIII 17) Construction of retaining wall at Portion VIII 18) Construction of U-trough structure at Portion VIII 19) Lower ground works at Portion V 20) Cable diversion works at Portion IV and V 21) Pre-bore and sheetpile works for 2100 pipe at Portion IV and VII 22) Sheetpile and Pre-bore works for decked U-trough at Portion VI 23) ELS works in Portion VIII 24) Retaining wall works at Portion VIII 25) Construction of desilting opening at Portion VIII 26) Treatment works of S/S Treatment Facility at Area A 27) Dredging works and reclamation works at Portion IX 28) Rock filling works at Portion IX	
NE/2015/03	Tseung Kwan O – Lam Tin Tunnel – Northern Footbridge	3) Construction of Main deck 4) Construction of lift shaft	
NE/2017/01	Tseung Kwan O – Lam Tin Tunnel – Tseung Kwan O Interchange and Associated Works	4) Erection of Temporary Platform 5) Pre-drilling 6) Bored Piling	
NE/2017/02	Tseung Kwan O – Lam Tin Tunnel – Road P2/D4 and Associated Works	11) Trial pit 12) Underground utilities detection 13) Temporary traffic arrangement Setup 14) Piling Works 15) Communication Liaison Center erection	

		16) Modification of traffic island 17) Fencing erection 18) Predrilling 19) Construction of Temporary cycle track 20) Construction of drainage and watermain

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	N/A	Valid
NE/2015/02	Account No. 7025654	16/08/2016	N/A	Valid
NE/2015/03	Account No. 7026805	30/12/2016	N/A	Valid
NE/2017/02	Account No. 7029651	22/12/2017	N/A	Valid

Contract No.	Permit / License No.	Valid Period		Status
		From	To	
NE/2017/01	Account No. 7029994	01/02/2018	N/A	Valid
Vessel Billing Account under construction waste disposal charging scheme				
NE/2015/01	Account No. 7027764	11/5/2018	10/10/2018	Valid
Registration of Chemical Waste Producer				
NE/2015/01	Waste Producer No. 5218-290-L2881-02	22/08/2016	N/A	Valid
	Waste Producer No. 5213-833-L2532-03	22/08/2016	N/A	Valid
NE/2015/02	Waste Producer No. 5213-838-C4094-01	23/08/2016	N/A	Valid
NE/2015/03	Waste Producer No. 5213-265-W3435-04	19/07/2017	N/A	Valid
NE/2017/02	Waste Producer No. 5213-833-Z4004-04	01/02/2018	N/A	Valid
NE/2017/01	Waste Producer No. 5213-833-C4262-01	12/02/2018	N/A	Valid
Effluent Discharge License under Water Pollution Control Ordinance				
NE/2015/01	WT00025806-2016	18/07/2018	30/11/2021	Valid
	WT00026212-2016	16/05/2017	30/11/2021	Valid
	WT00027354-2017	22/03/2017	31/03/2022	Valid
	WT00027405-2017	22/03/2017	31/03/2022	Valid
	WT-00028495-2017	11/08/2017	31/08/2022	Valid
NE/2015/02	WT00026386-2016	15/12/2016	31/12/2021	Valid
	WT00027226-2017	23/02/2017	28/02/2022	Valid
NE/2015/03	WT00027295-2017	20/03/2017	18/04/2019	Valid
	WT00027266-2017	08/03/2017	18/04/2019	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-RE0140-18	06/03/2018	05/09/2018	Expired on 5 September 2018
	GW-RE0371-18	05/06/2018	04/09/2018	Expired on 4 September 2018
	GW-RE0373-18	01/06/2018	30/09/2018	Expired on 30 September 2018
	GW-RE0418-18	23/06/2018	22/12/2018	Valid
	GW-RE0539-18	23/08/2018	22/10/2018	Valid
	GW-RE0524-18	02/08/2018	01/10/2018	Valid
	GW-RE0630-18	01/10/2018	30/12/2018	Valid
	GW-RE0644-18	01/10/2018	30/11/2018	Valid
	GW-RE0598-18	05/9/2018	04/12/2018	Valid

Contract No.	Permit / License No.	Valid Period		Status
		From	To	
NE/2015/02	GW-RE0353-18	16/05/2018	15/11/2018	Valid
	GW-RE0243-18	01/05/2018	31/10/2018	Valid
	GW-RE0241-18	11/04/2018	10/10/2018	Valid
	GW-RE0384-18	02/06/2018	01/12/2018	Valid
	GW-RE0434-18	16/06/2018	15/01/2019	Valid
NE/2017/01	GW-RE0442-18	21/06/2018	02/11/2018	Valid
Marine Dumping Permit				
NE/2015/02	EP/MD/18-129	16/03/2018	15/09/2018	Expired on 15 September 2018
	EP/MD/18-139	15/05/2018	14/11/2018	Valid
NE/2017/01	EP/MD/19-003	13/08/2018	30/11/2018	Valid
	EP/MD/19-025	02/10/2018	01/11/2018	Valid
Specified Process (SP) License				
NE/2015/01	L-11-053	09/03/2018	08/03/2021	Valid

Summary of EM&A Requirements

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

- All monitoring parameters;
- Action and Limit levels for all environmental parameters;
- Event Action Plans;
- Environmental mitigation measures, as recommended in the Project EIA Report.

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

2.12 This report presents the monitoring results, observations, locations, equipment, period, methodology and QA/QC procedures of the monitoring parameters of the required environmental monitoring works and audit works for the Project in September 2018.

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-3 / LD-3B	0
	Met One Instruments Model No.: AEROCET-531	0
	Handheld Particle Counter Hal-HPC300 / Hal-HPC301	6
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 day
AM1, AM2, AM3, AM4(A), AM5(A) and AM6(A)	24-hour TSP	Once per 6 days

Monitoring Methodology

1-hour TSP Monitoring

Measuring Procedures

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

(Model LD3 / LD3B)

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

(AEROCET-531)

- The 1-hour dust meter is placed at least 1.3 meters above ground.
- Remove the red rubber cap from the AEROCET-531 inlet nozzle.

- Turn on the power switch that is located on the right side of the AEROCET-531.
- On power up the product intro screen is displayed for 3 seconds. The intro screen displays the product name and firmware version.
- Then the main counter screen will be displayed.
- Press the START button. Internal vacuum pump start running. After 1 minute the pump will stop and the 0.5µm 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 centered with the stamped number upwards, on a supporting screen.

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

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

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

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

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

Maintenance/Calibration

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

- The high volume motors and their accessories will be properly maintained. Appropriate maintenance such as routine motor brushes replacement and electrical wiring checking will be made to ensure that the equipment and necessary power supply are in good working condition.

- High volume samplers will be calibrated at bi-monthly intervals using TE-5025A Calibration Kit throughout all stages of the air quality monitoring.

Results and Observations

3.21 All 1-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

3.22 All 24-hour TSP monitoring was conducted as scheduled in the reporting month. The 24-hour TSP monitoring at AM6(A) Park Central, L1/F Open Space Area on 19 and24 September 2018 was cancelled due to power failure. One additional monitoring was conducted on 27 September 2018. No Action/Limit Level exceedance was recorded.

3.23 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**.

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

3.25 The summary of exceedance record in reporting month is shown in **Appendix K**. No exceedance was recorded for the air quality monitoring.

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

Table 3.4 Major Dust Source during Air Quality Monitoring

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

4. NOISE

Monitoring Requirements

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

Monitoring Locations

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

Table 4.1 Noise Monitoring Stations

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

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

Monitoring Equipment

4.3 Integrating Sound Level Meter was used for impact noise monitoring. The meters are Type 1 sound level meter capable of giving a continuous readout of the noise level readings including equivalent continuous sound pressure level (L_{eq}) and percentile sound pressure level (L_x) that also complied with International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1) specifications. **Table 4.2** summarizes the noise monitoring equipment being used. Copies of calibration certificates are attached in **Appendix B**.

Table 4.2 Noise Monitoring Equipment

Equipment	Model and Make	Quantity
Integrating Sound Level Meter	SVAN 955/ 957 / 977	5
	BSWA 801	2
Calibrator	SV30A	2
	Brüel & Kjær 4231	2

4.4 **Table 4.3** summarizes the monitoring parameters, frequency and total duration of monitoring. The noise monitoring schedule is shown in **Appendix D**. Additional weekly impact monitoring are carried out for evening time (1900 – 2300 hours) , night-time (2300 – 0700 hours) and daytime (0700- 1900 hours) during general holidays including Sundays for monitoring stations CM1, CM2, CM3 and CM4.

Table 4.3 Frequency and Parameters of Noise Monitoring

Monitoring Stations	Parameter	Period	Frequency	Measurement
CM1	L_{10}(30 min) dB(A) L_{90}(30 min) dB(A) L_{eq}(30 min) dB(A)	0700-1900 hrs on normal weekdays	Once per week	Façade
CM2				Façade
CM3				Façade
CM4				Façade
CM5				Façade
CM6(A)				Free Field
CM7(A)				Free Field
CM8(A)				Façade
CM1	L_{10}(5 min) dB(A) L_{90}(5 min) dB(A) L_{eq}(5 min) dB(A)	1900 – 2300 hrs on normal weekdays/ 0700 to 1900 hours on any day being a Sunday or general holiday / 2300-0700 on all day		Façade
CM2				Façade
CM3				Façade
CM4				Façade

Monitoring Methodology and QA/QC Procedure

4.5 The monitoring procedures are as follows:

- The monitoring station was normally be at a point 1m from the exterior of the sensitive receivers building façade and be at a position 1.2m above the ground.
- For free field measurement, the meter was positioned away from any nearby reflective surfaces. All records for free field noise levels was adjusted with a correction of +3 dB(A).
- The battery condition was checked to ensure the correct functioning of the meter.
- Parameters such as frequency weighting, the time weighting and the measurement time was set as follows:
  - frequency weighting : A
  - time weighting : Fast
  - measurement time : 30 minutes
- Prior to and after each noise measurement, the meter was calibrated using a Calibrator for 94.0 dB at 1000 Hz. If the difference in the calibration level before and after measurement will be more than 1.0 dB, the measurement would be considered invalid and repeat of noise measurement would be required after re-calibration or repair of the equipment.
- At the end of the monitoring period, the L_{eq}, L_{90} and L_{10} was recorded. In addition, noise sources was recorded on a standard record sheet.
- Noise monitoring will be cancelled in the presence of fog, rain, and wind with a steady speed exceeding 5 m/s, or wind with gusts exceeding 10 m/s. Supplementary monitoring was provided to ensure sufficient data would be

obtained.

Maintenance and Calibration

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

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

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

Results and Observations

4.9 The daytime noise monitoring at all stations was cancelled on 16 September 2018 due to Hurricane Signal No. 10. Nine (9) Action Level exceedance was recorded due to the documented complaints received in this reporting month. Ten (10) Limit Level exceedance for night-time construction noise monitoring was recorded in the reporting month and they were considered due to the road Traffic near Eastern Cross Harbour Tunnel Toll Plaza, therefore non-Project related.

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

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

Table 4.4 Major Noise Source during Noise Monitoring

Monitoring Stations	Locations	Major Noise Source
CM1	Nga Lai House, Yau Lai Estate Phase 1, Yau Tong	Road Traffic near Eastern Cross Harbour Tunnel Toll Plaza
CM2	Bik Lai House, Yau Lai Estate Phase 1, Yau Tong	Road Traffic near Eastern Cross Harbour Tunnel Toll Plaza
CM3	Block S, Yau Lai Estate Phase 5, Yau Tong	Road Traffic near Eastern Cross Harbour Tunnel Toll Plaza
CM4	Tin Hau Temple, Cha Kwo Ling	Road Traffic at Cha Kwo Ling Road
CM5	CCC Kei Faat Primary School, Yau Tong	Road Traffic at Yau Tong Road
CM6(A)	Site Boundary of Contract No. NE/2015/02 near Tower 1, Ocean Shores	Road Traffic at O King Road near Ocean Shores
CM7(A)	Site Boundary of Contract No. NE/2015/02 near Tower 7, Ocean Shores	Road Traffic at Tong Yin Street
CM8(A)	Park Central, L1/F Open Space Area	Road Traffic at Po Yap Road

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

4.5, 4.6 and 4.7.

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

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

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

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

Station	Baseline Noise Level, dB (A) (Evening time on all days (1900-2300 hrs) and Holidays (including Sundays) during daytime (0700-1900 hrs))	Noise Limit Level, dB (A) (Evening time on all days (1900-2300 hrs) and Holidays (including Sundays) during daytime (0700-1900 hrs))
CM1	64.4	70
CM2	62.2	
CM3	64.7	
CM4	57.0	

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	60.5	55
CM2	58.0	
CM3	60.2	
CM4	55.8	

Updated Construction Noise Assessment

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

4.13 Proposed noise mitigation measure and plant list for individual construction activities for Contract No. NE/2015/02 has been updated. Updated plant list and proposed mitigation measure are shown in Appendix S and highlighted in yellow.

4.14 No update of Construction Noise Assessment for the other contracts in the reporting period. Noise mitigation plan and their corresponding updated construction noise assessment can be found at the following address:

http://cinotech.hk/projects/TseungKwanOLamTinTunnel/ep-submissions/

Current Tunnel Blasting Arrangement

4.15 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.

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

5. WATER QUALITY

Monitoring Requirements

Groundwater Quality

5.1 Groundwater quality monitoring shall be conducted as identified in the EIA report (locations refer to **Figure 4**, Stream 1 to 3). According to the EM&A Manual, dissolved oxygen (DO), pH, temperature, turbidity, suspended solids (SS), 5-day biochemical oxygen demand (BOD_5), Total organic carbon (TOC), Total Nitrogen, Ammonia-N and Total Phosphate are the parameters for the monitoring. **Appendix A** shows the established Action and Limit Levels.

5.2 As stated in the Baseline Environmental Monitoring Plan submitted to EPD in September 2016, Groundwater quality monitoring could not be conducted at the other identified monitoring station in the EIA Report, Stream 4, as it was found to be not accessible due to safety reason. EPD has no further comment on the Plan in October 2016.

Marine Water Quality

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

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

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

Groundwater Level Monitoring (Piezometer Monitoring)

5.6 Daily piezometer monitoring at any time of the day shall be carried throughout the whole period when any tunnel construction activities are carried out within +/- 50m of the piezometer gate in plan. The monitoring is commenced in June 2018.

Monitoring Locations

Groundwater Quality

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

Table 5.1 Groundwater Quality Monitoring Stations

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

Marine Water Quality

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

Table 5.2 Marine Quality Monitoring Stations

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

Monitoring Equipments

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

Dissolved Oxygen (DO) and Temperature Measuring Equipment

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

- a dissolved oxygen level in the range of 0-20 mg/L and 0-200% saturation; and

- a temperature of 0-45 degree Celsius.

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

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

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

Turbidity

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

pH

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

Water Depth Detector

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

Water Sampler

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

Sample Container and Storage

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

Calibration of In-Situ Instruments

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

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

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

5.22 Sufficient stocks of spare parts were maintained for replacements when necessary. Backup monitoring equipment was also made available so that monitoring can proceed

uninterrupted even when some equipment is under maintenance, calibration, etc.

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

Table 5.3 Water Quality Monitoring Equipment

Equipment	Model and Make	Qty.
Water Sampler	Kahlsico Water-Bottle Model 135DW 150	1
Multi-parameter Water Quality System	YSI 6820-C-M	0
	Aquaread AP-2000-D	0
	YSI EXO1 Multiparameter Sondes	6
Monitoring Position	"Magellan" Handheld GPS Model GPS-320	1
Water Depth Detector	Fishfinder 140	1

Monitoring Parameters and Frequency

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

Table 5.4 Water Quality Monitoring Parameters and Frequency

Monitoring Stations	Parameters, unit	Depth	Frequency
Groundwater Quality			
Stream 1-Stream 3	• DO, mg/L • DO Saturation, % • pH • Water Temperature (°C) • Turbidity, NTU • SS, mg/L • BOD_5, mg O_2/L • TOC, mg-TOC/L • Total Nitrogen, mg/L • Ammonia-N, mg NH_3-N/L • Total Phosphate, mg-P/L	Mid-depth	Biweekly (When the tunnel construction works are found within 50m of the location, weekly.)
Marine Water Quality			
M1 M2 M3 M4 M5 M6 C1 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	3 days per week / 2 per monitoring day (1 for mid-ebb and 1 for mid-flood)

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

Monitoring Methodology

Groundwater Quality

5.25 At each monitoring location, two consecutive in-situ measurements for DO concentration, DO saturation, pH, temperature and turbidity were taken for water samples on site. The probes were retrieved out of the water after the first measurement and then re-deployed for the second measurement. Where the difference in the value between the first and second readings of each set was more than 25% of the value of the first reading, the reading was discarded and further readings were taken.

5.26 For SS, BOD_5, TOC, Total Nitrogen, Ammonia-N and Total Phosphate, measurement and grab samples of surface water was collected. Water samples of about adequate volume was collected and stored in high density polythene bottles. Following collection, water samples was stored in high density polythene bottles. Preservation H_2SO_4 was appropriately added for water samples for TOC, Total Nitrogen, Ammonia-N and Total Phosphate testing. Water samples was packed in ice and cooled to 4°C (without being frozen), delivered to the HOKLAS accredited laboratory, Wellab Limited and analyzed.

Marine Water Quality

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

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

Laboratory Analytical Methods

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

Table 5.5 Methods for Laboratory Analysis for Water Samples

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

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

QA/QC Requirements

Decontamination Procedures

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

Sampling Management and Supervision

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

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

Results and Observations

Groundwater Quality Monitoring

5.33 All groundwater quality monitoring was conducted as scheduled in the reporting month. Summary of groundwater quality monitoring results is shown in **Table 5.6**. Groundwater quality monitoring results, graphical presentations and laboratory testing reports are shown in **Appendix H**.

5.34 Other relevant data was also recorded, such as monitoring location / position, time, sampling depth, weather conditions and any special phenomena or work underway nearby.

5.35 Action and Limit Level for groundwater quality monitoring has been reviewed with consideration of monitoring results obtained from November 2016 to June 2017, as there was no tunnel boring or tunnel construction works from November 2016 to June 2017. A "Review Report for Action and Limit Levels of Groundwater Quality Monitoring" was submitted to EPD in August 2017. EPD has no further comment on the report and the updated Action and Limit Level is shown in **Appendix A**.

Table 5.6 Summary of Groundwater Quality Monitoring Results

Date	Location	Parameters (unit)								
		pH	Dissolved Oxygen (mg/L)	Turbidity (NTU)	SS (mg/L)	BOD_5 (mg O_2/L)	TOC (mg-TOC/L)	Total Nitrogen (mg/L)	NH_3-N (mg NH_3-N/L)	Total Phosphorus (mg-P/L)
13 September 2018	Stream 1	7.7	***7.5***	1.3	<2.5	<2	7	<0.6	***0.67***	<0.05
	Stream 2	7.8	***7.5***	1.1	<2.5	<2	6	<0.6	***1.3***	<0.05
	Stream 3	7.8	***7.5***	0.8	<2.5	<2	***7***	<0.6	***1.2***	<0.05
27 September 2018	Stream 1	8.2	7.6	1.3	<2.5	<2	6	<0.6	<0.05	<0.05
	Stream 2	8	7.6	0.3	<2.5	<2	5	<0.6	<0.05	<0.05
	Stream 3	8	7.6	0.7	<2.5	<2	5	<0.6	<0.05	<0.05
No. of Exceedance	Action Level	0	0	0	0	0	0	0	0	0
	Limit Level	0	3	0	0	0	1	0	3	0

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

5.36 All groundwater quality monitoring was conducted as scheduled in the reporting month. Seven (7) Limit Level exceedances were recorded in the reporting month. The exceedances are considered due to rainfall and human activities, therefore non-Project related. Details of the investigation are presented in **Appendix K**.

Marine Water Quality Monitoring

5.37 All marine water quality monitoring was conducted as scheduled in the reporting month. Marine water monitoring results and graphical presentations are shown in **Appendix I**. Other relevant data was also recorded, such as monitoring location / position, time, sampling depth, weather conditions and any special phenomena or work underway nearby.

5.38 Calculated Action and Limit Levels for Marine Water Quality is presented in **Appendix I**. No Action/Limit Level exceedance was recorded in the reporting period.

Groundwater Level Monitoring (Piezometer Monitoring)

5.39 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.

5.40 Tunnel construction activities are within +/- 50m of the piezometer gate in plan. Construction phase daily piezometer monitoring by the Contractor commenced in June 2018. No Action Level exceedance was recorded in the reporting month. Details of the result are presented in **Appendix U**.

6. ECOLOGY

Post-Translocation Coral Monitoring

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

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

6.3 The post-translocation coral monitoring shall be conducted once every 3 months after completion for a period of 12 months. The fourth post-translocation coral monitoring was carried out on 07 November 2017.

6.4 Location of post-translocation coral monitoring is shown in **Figure 7**.

Event and Action Plan

6.5 The post-translocation monitoring result was evaluated against Action and Limit Levels presented in **Appendix A**. Evaluation was based on recorded changes in percentage of partial mortality of the corals.

6.6 If the defined Action Level or Limit Level for coral monitoring is exceeded, the actions as set out in **Appendix M** will be implemented.

6.7 If observations of any die-off / abnormal conditions of the translocated corals are made during the post-translocation monitoring, the ET shall inform the Contractor, IEC and AFCD, and liaise with AFCD to investigate any mitigation measures needed.

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 aplied on the Cha Kwo Ling Tin Hau Temple. Construction works less than 100m from the Cha Kwo Ling Tin Hau temple commenced on 8 April 2017.

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

Monitoring Locations

7.3 One vibration monitoring point and three building settlement monitoring points are proposed for monitoring of the cultural heritage. The building settlement markers are 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 Serial No.: 701133	1
iCivil-1011 Inclinometer for building settlement	iCivil-1011 Inclinometer Serial No.: HK110118 / HK110120	2
Vibrographs for vibration monitoring	MiniMate Plus manufactured by Instantel Model No.: 716A0403 / 721A2501	7

Monitoring Methodology

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

Alert, Alarm and Action Levels

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

Table 7.2 AAA Levels for Monitoring for Cultural Heritage

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

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

Results

7.9 In the reporting month, cultural heritage monitoring was carried out by the Contractor at the aforesaid location on 25 occasions. No AAA Level exceedance was recorded in the reporting month. The monitoring results are presented in **Appendix T**.

Mitigation Measures for Cultural Heritage

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

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

8. LANDSCAPE AND VISUAL IMPACT REQUIREMENTS

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

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

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

9. LANDFILL GAS MONITORING

Monitoring Requirement

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

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

Monitoring Parameters and Frequency

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

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

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

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

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

Monitoring Locations

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

Monitoring Equipment

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

Table 9.1 Landfill Gas Monitoring Equipment

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

Results and Observations

9.7 In the reporting month, landfill gas monitoring was carried out by the Contractor at the aforesaid locations on 50 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: 5, 12, 19 and 26 September 2018
- Contract No. NE/2015/02: 5, 12, 19 and 26 September 2018
- Contract No. NE/2015/03: 5, 12, 19 and 26 September 2018
- Contract No. NE/2017/01: 5, 12, 18 and 26 September 2018
- Contract No. NE/2017/02: 5, 12, 19 and 26 September 2018

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 26, 12, 12, 26 and 12 September 2018 respectively.

Implementation Status of Environmental Mitigation Measures

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

10.4 During site inspections in the reporting month, one non-compliance was recorded on 26 September 2018 for Contract No. NE/2015/01. 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 Six (6) Action Level exceedances were recorded due to the documented complaints received in the reporting month and Ten (10) Limit Level exceedances for night-time construction noise monitoring were recorded in the reporting month. The Limit Level exceedances were considered due to road traffic near the Eastern Cross Harbour Tunnel Toll Plaza, therefore non-Project related.

12.2 Seven (7) Limit Level exceedances for groundwater quality monitoring were recorded in the reporting month. The Limit Level exceedances were considered due to rainfall and human activities, therefore non-Project related.

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 environmental non-compliance was recorded in the 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 (October 2018)		Key environmental issues *
NE/2015/01 - Tseung Kwan O – Lam Tin Tunnel – Main Tunnel and Associated Works	Lam Tin Interchange	3) EHC2 U-Trough 4) Site Formation – Area 1G1, Area 1G2, Area 2, Area 3, Area 4 & Area 5	(B) / (B) / (C) / (D) / (E) (G)
	Main Tunnel	2) Main Tunnel Excavation	(B)
	TKO Interchange	5) Haul Road Construction and Site Formation & Slope Works 6) Main Tunnel Lining Works 7) Steel Platform for Bridge Construction 8) Cavern Excavation	(A) / (C) / (D) / (E) / (F) / (I)
NE/2015/02 - Tseung Kwan O – Lam Tin Tunnel – Road P2 and Associated Works	16) Relocation WSD flowmeter chamber 17) Backfilling in Portion VIII 18) Construction of U-trough structure in Portion VIII 19) Lower ground works at Portion V 20) Cable diversion works at Portion IV 21) Pre-bore and sheetpile works for 2100 pipe at Portion IV and VII 22) Pre-bore works for decked U-trough at Portion VI 23) Sheet pile works for decked U-troughat PortionVI 24) ELS works in Portion IV, VIII and VII 25) Retaining wall works at VIII 26) Construction of desilting opening for existing box culvert in Portion VIII 27) Operation of double Watergate 28) Treatment works of S/S Treatment Facility at Area A 29) Dredging works and reclamation works at Portion IX 30) Rock filling works at Portion IX		(A) / (B) / (C) / (D) / (E) / (G) / (I)
NE/2015/03 - Tseung Kwan O – Lam Tin Tunnel – Northern	4) Bearing installation at Tiu Keng Leung Sport Centre 5) Construction of Main deck 6) Construction of lift shaft		(A) / (B) / (C) / (D) / (E)

Footbridge		
NE/2017/01 – Tseung Kwan O Interchange and Associated Works	4) Erection of Temporary Platform 5) Pre-drilling 6) Bored piling	(A) / (B) / (E) / (F) / (G)
NE/2017/02 – Tseung Kwan O - Lam Tin Tunnel - Road P2/D4 and Associated Works	11) Trial pit 12) Underground utilities detection 13) Temporary traffic arrangement Setup 14) Piling Works 15) Communication Liaison Center erection 16) Modification of traffic island 17) Fencing erection 18) Predrilling 19) Construction of Temporary cycle track 20) Construction of drainage and watermain	(A) / (B) / (E) / (F) / (G)

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.

Monitoring Schedule for the Next Month

13.4 The tentative environmental monitoring schedules for the next month are shown in **Appendix D**.

14. CONCLUSIONS AND RECOMMENDATIONS

Conclusions

14.1 This is the 23rd Environmental Monitoring and Audit (EM&A) Report which presents the EM&A works undertaken during the period in September 2018 in accordance with EM&A Manual and the requirement under EP.

Air Quality Monitoring

14.2 All 1-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

14.3 All 24-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

Construction Noise Monitoring

14.4 All noise monitoring was conducted as scheduled in the reporting month. Six (6) Action Level exceedances were recorded due to the documented complaints received in this reporting month and Ten (10) Limit Level exceedances were recorded for nighttime construction noise in the reporting month. The exceedances recorded during night-time were considered due to road traffic near the Eastern Cross Harbour Tunnel Toll Plaza, therefore non-Project related.

Water Quality Monitoring

14.5 Groundwater quality monitoring was conducted as scheduled in the reporting month. Seven (7) Limit Level exceedances were recorded in the reporting month. The exceedances were considered due to rainfall and human activities, therefore non-Project related.

14.6 Tunnel construction activities are within +/- 50m of the piezometer gate in plan. Construction phase daily piezometer monitoring by the Contractor commenced in June 2018. No Action Level exceedance was recorded in the reporting month.

14.7 All marine water monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

Ecological Monitoring

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

Monitoring on Cultural Heritage

14.9 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

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

Landfill Gas Monitoring

14.11 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

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

Complaint, Prosecution and Notification of Summons

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

Recommendations

14.14 The following recommendations were made to the Contractor for the reporting month:

Air Quality Impact
- To implement dust suppression measures such as water spray on all haul roads, stockpiles, dry surfaces and open slopes.
- To cover stockpile of dusty material by impervious material.
- To avoid dark smoke emitted from the generator.

Construction Noise
- To provide noise mitigation measures (e.g. Temporary noise barrier or Full enclosure) to PME as proposed in the approved Noise Mitigation Plan.
- To repair the gaps between the noise barriers.

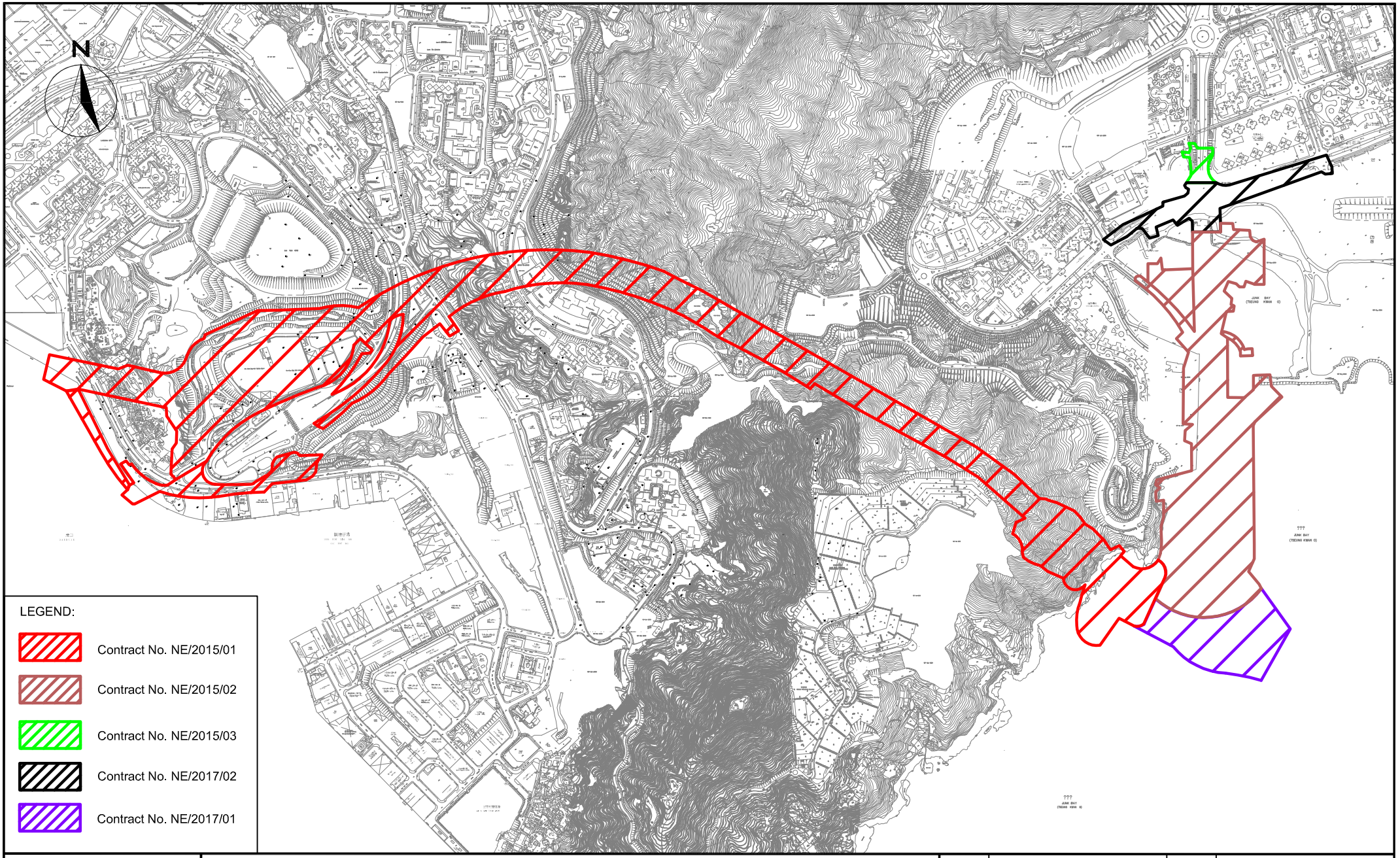
Water Quality Impact
- To provide and repair the silt curtain to fully enclose the site and prevent any gap between the silt curtains.
- To review and implement temporary drainage system.
- To clear the litter, debris, silt and sediment in drainage or catchpits.
- To remove the sand or dusty material deposited near the seafront.
- To provide bund or covers to gullies and stockpile storage area on site to avoid leakage of surface runoff.
- To divert all the water generated from construction site to de-silting facilities with enough handling capacity before discharge.
- To maintain the sedimentation tank more frequently to ensure proper wastewater treatment before discharge.

Waste/Chemical Management
- To remove construction waste regularly.
- To avoid any discharge or accidental spillage of chemical waste or oil directly from the equipment.
- To provide drip tray to chemical containers to avoid any chemical leakage.
- To remove the oil stain and disposed of as chemical waste.
- To remove the stagnant water regularly found inside the drip tray.

Landscape and Visual
- To set up proper tree protection area.

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

FIGURES



CINOTECH
Cinotech Consultants Limited

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

Site Layout Plan

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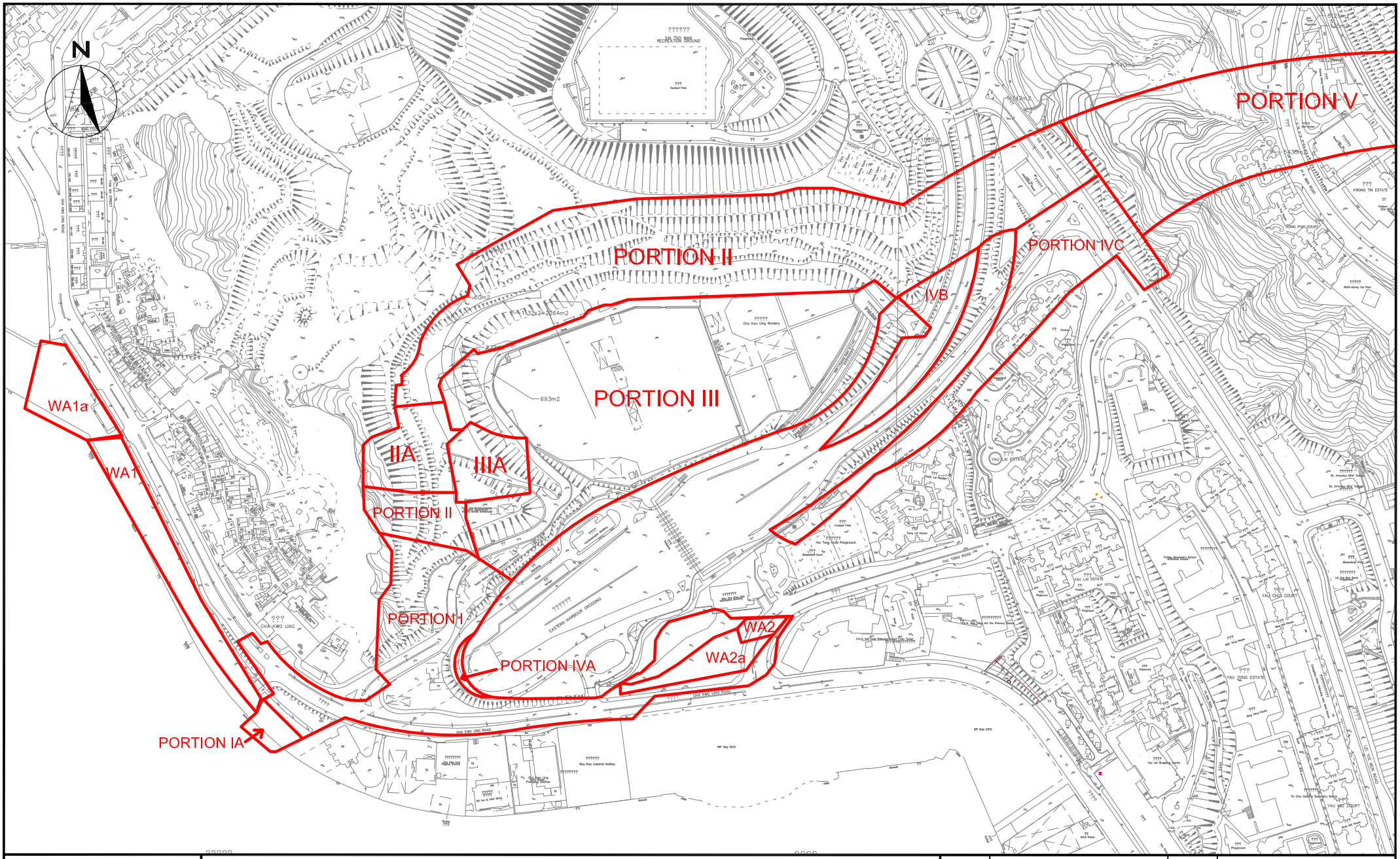

CINOTECH
Cinotech Consultants Limited

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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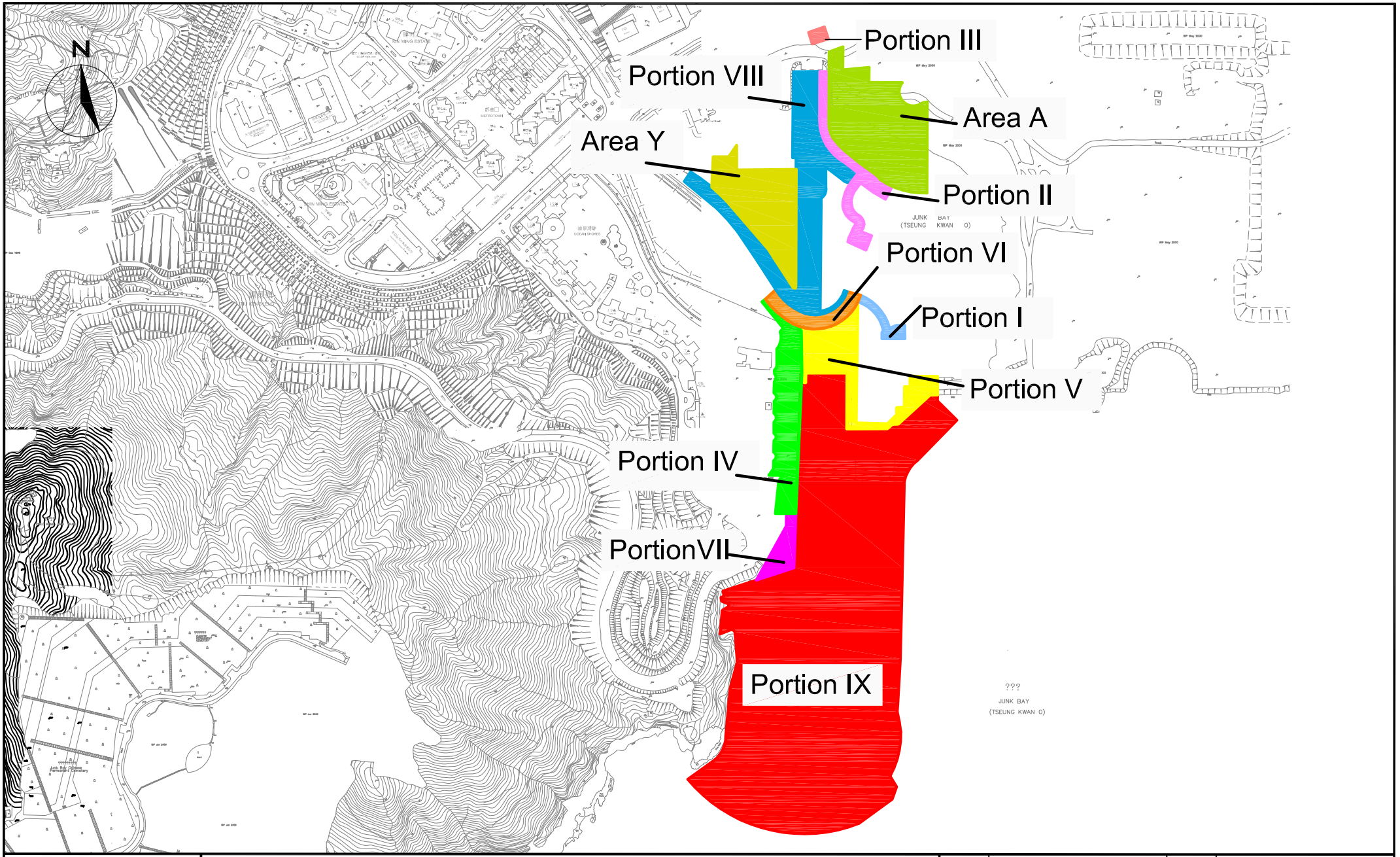

CINOTECH
Cinotech Consultants Limited

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

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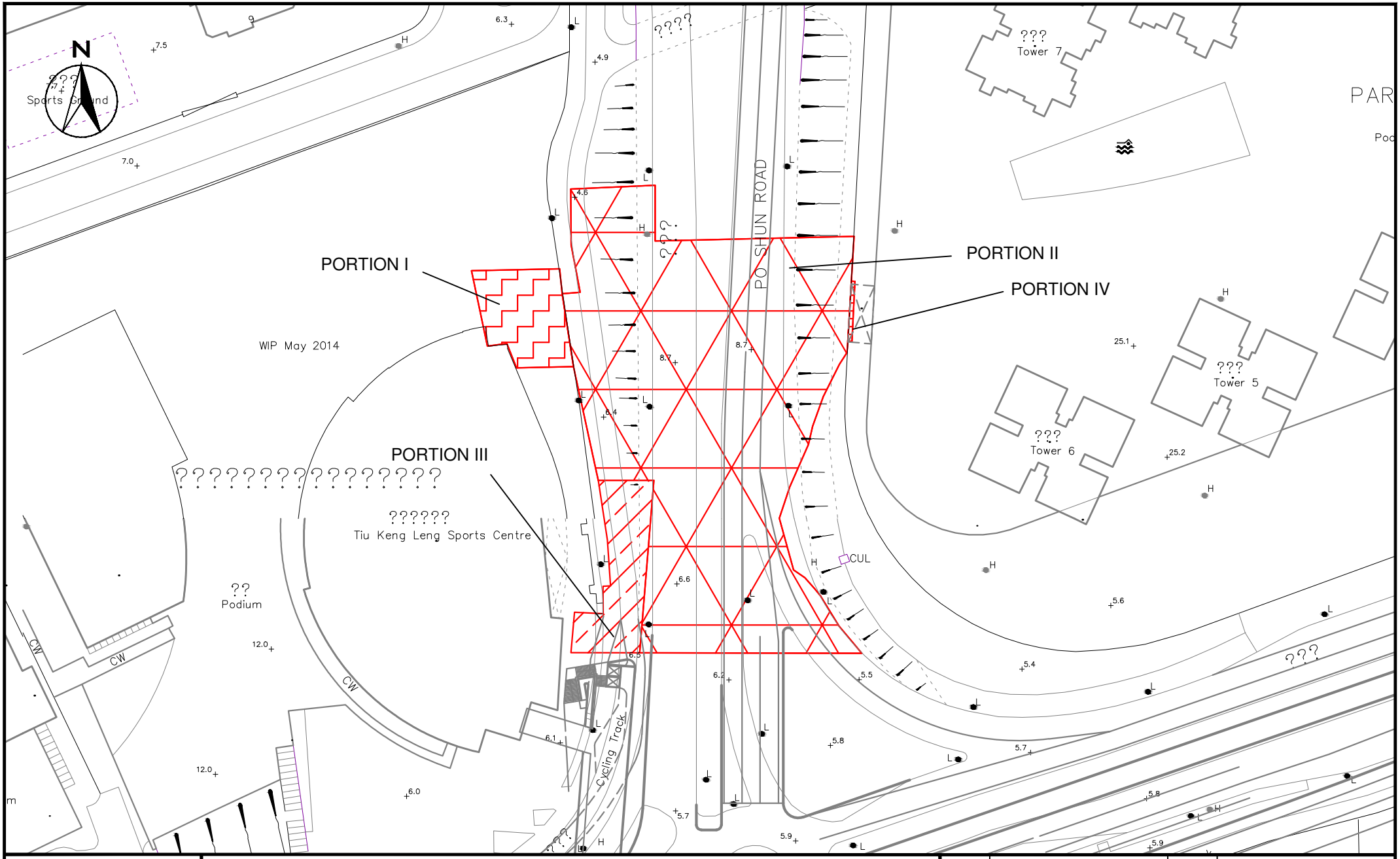

CINOTECH
Cinotech Consultants Limited

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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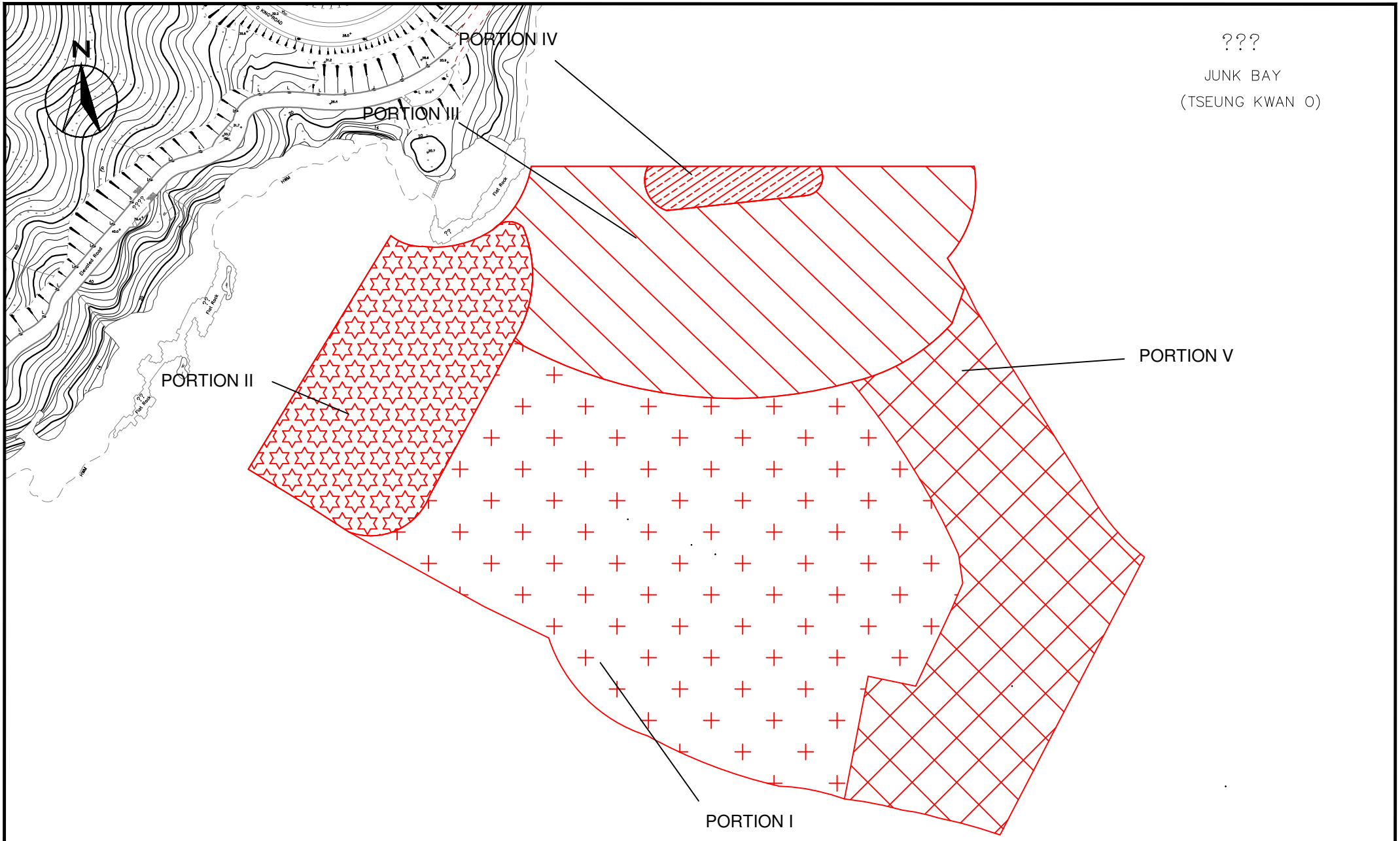

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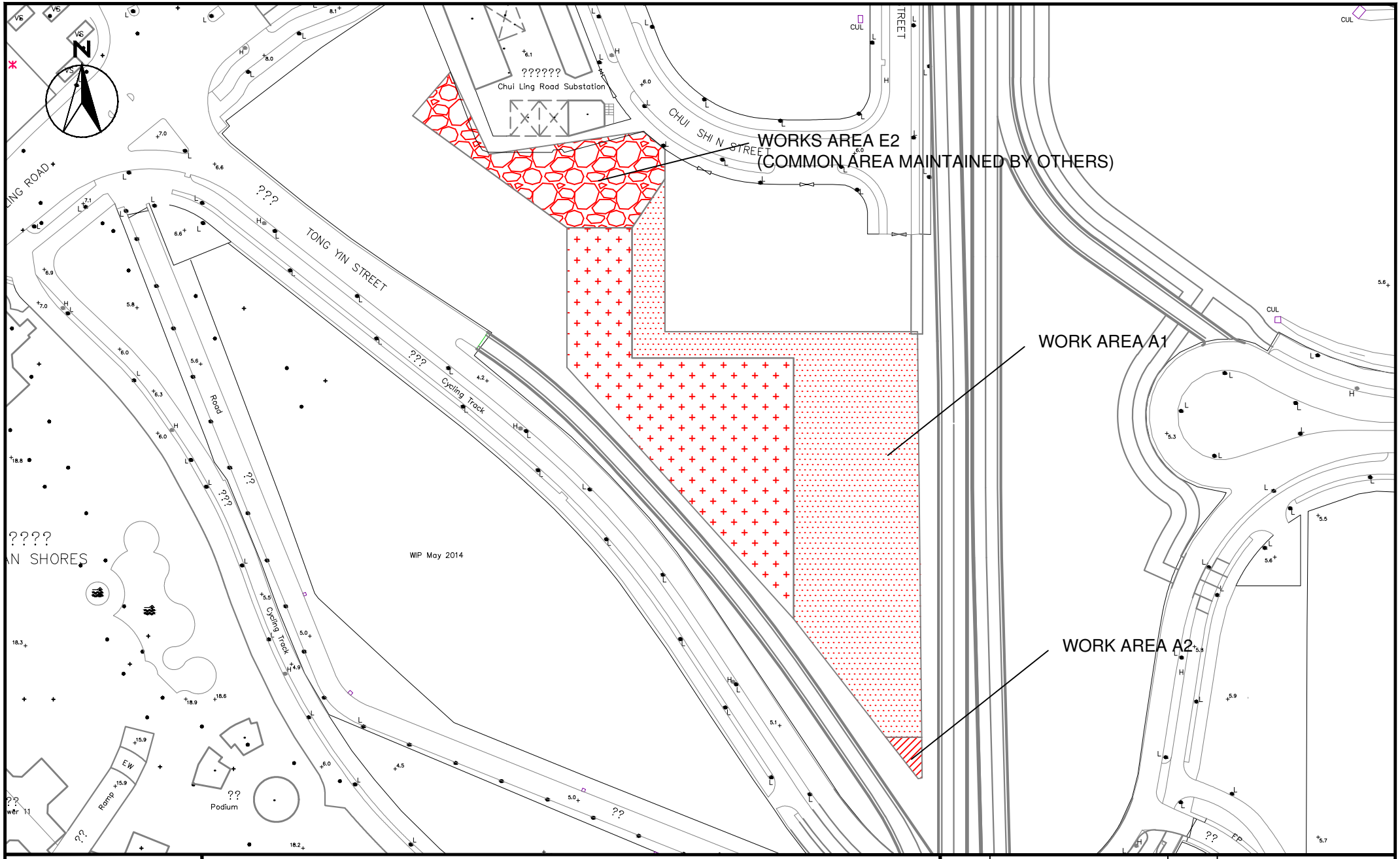
Cinotech Consultants Limited

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

SCALE	1:2500 @ A4	DATE	AUG 2018
CHECK	VC	DRAWN	AC
JOB No.	MA16034	FIGURE NO. 1e	REV -



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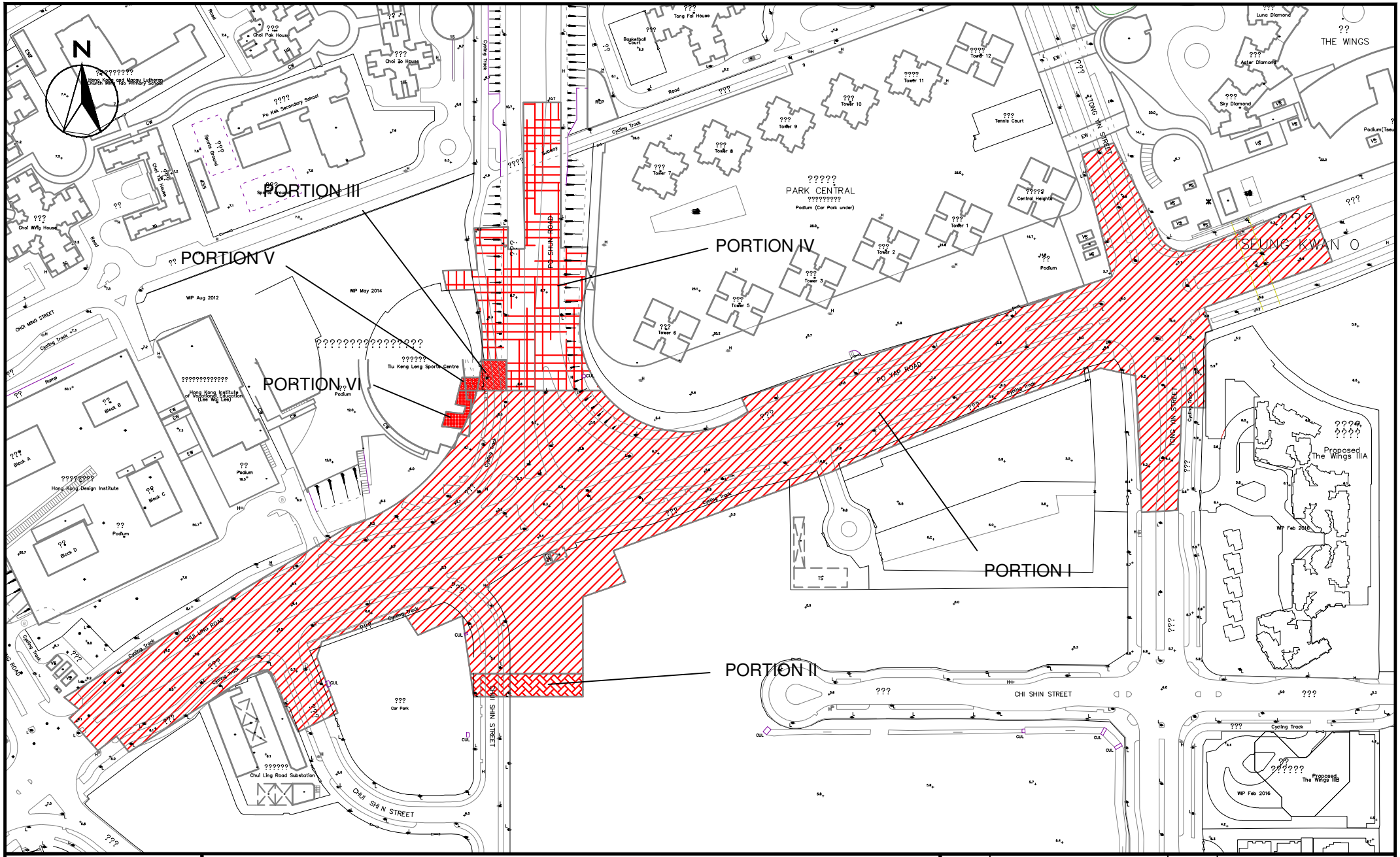
Agreement No. CE/59/2015 (EP)
Environmental Team for Tseung Kwan O - Lam Tin Tunnel
- Design and Construction

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

SCALE	1:1500 @ A4	DATE	AUG 2018
CHECK	VC	DRAWN	AC
JOB No.	MA16034	FIGURE NO. 1f	REV -

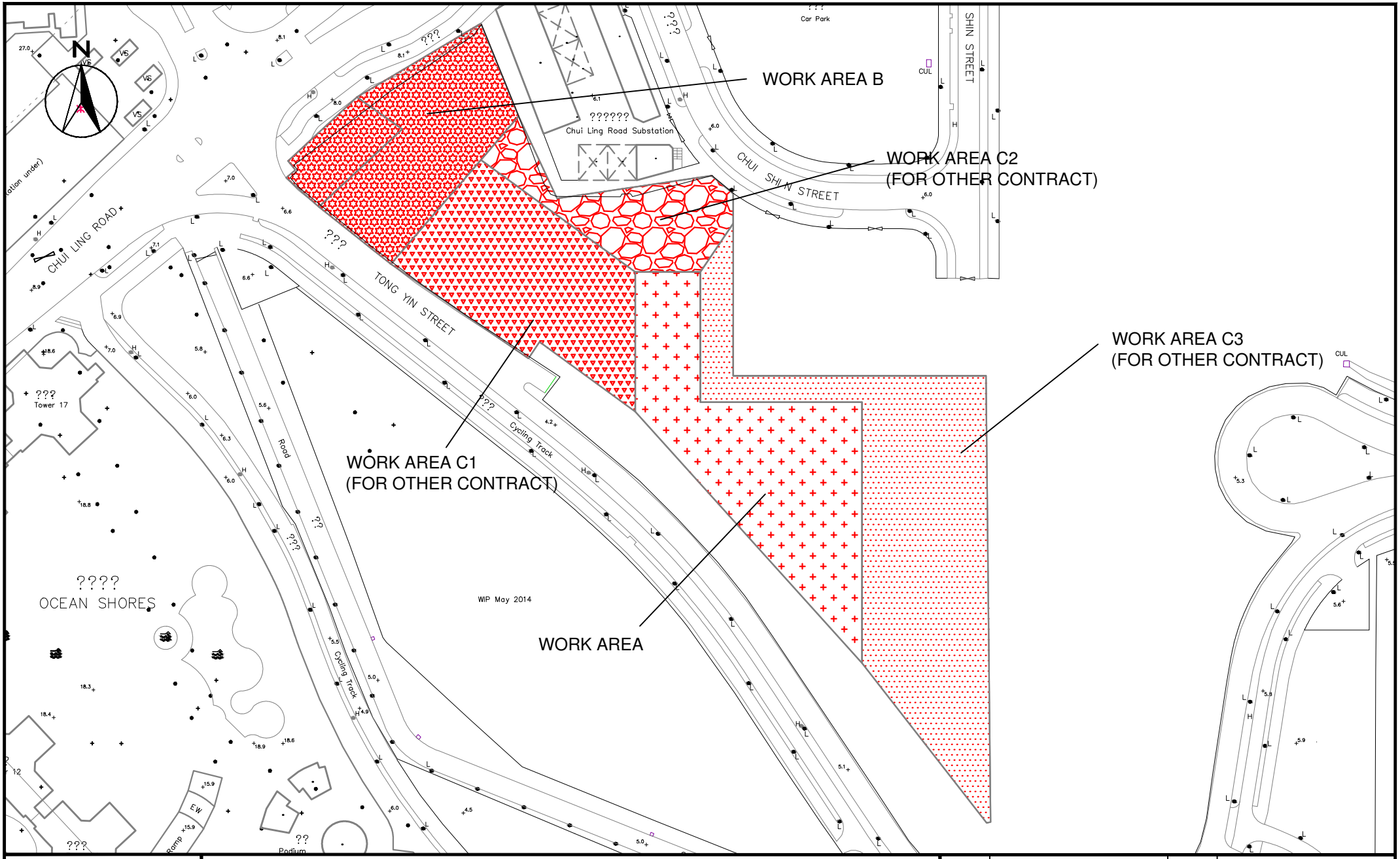


CINOTECH
Cinotech Consultants Limited

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	1:2500 @ A4	DATE	AUG 2018
CHECK	VC	DRAWN	AC
JOB No.	MA16034	FIGURE NO. 1g	REV -



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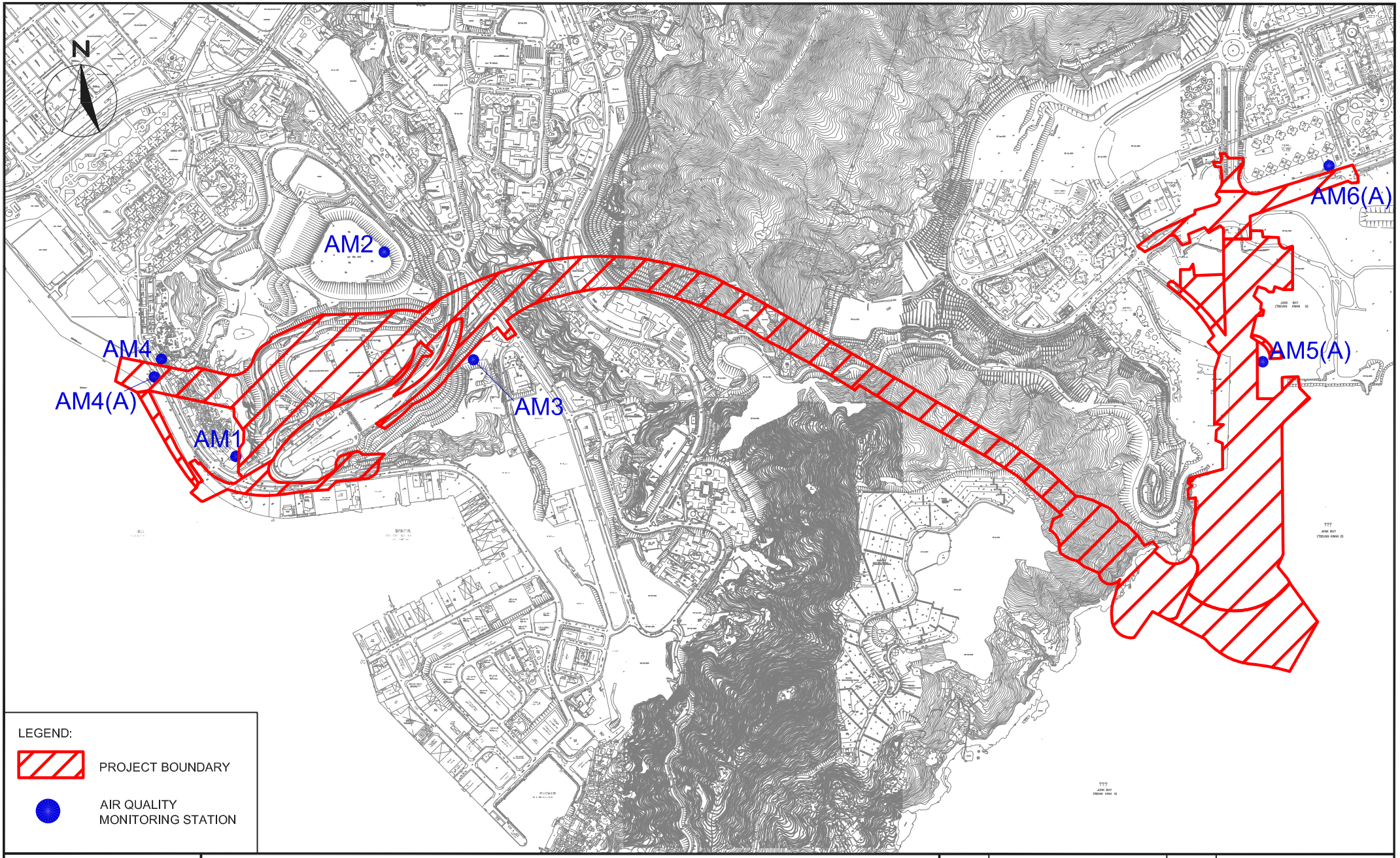
Cinotech Consultants Limited

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
JOB No.	MA16034	FIGURE NO. 1h	REV -



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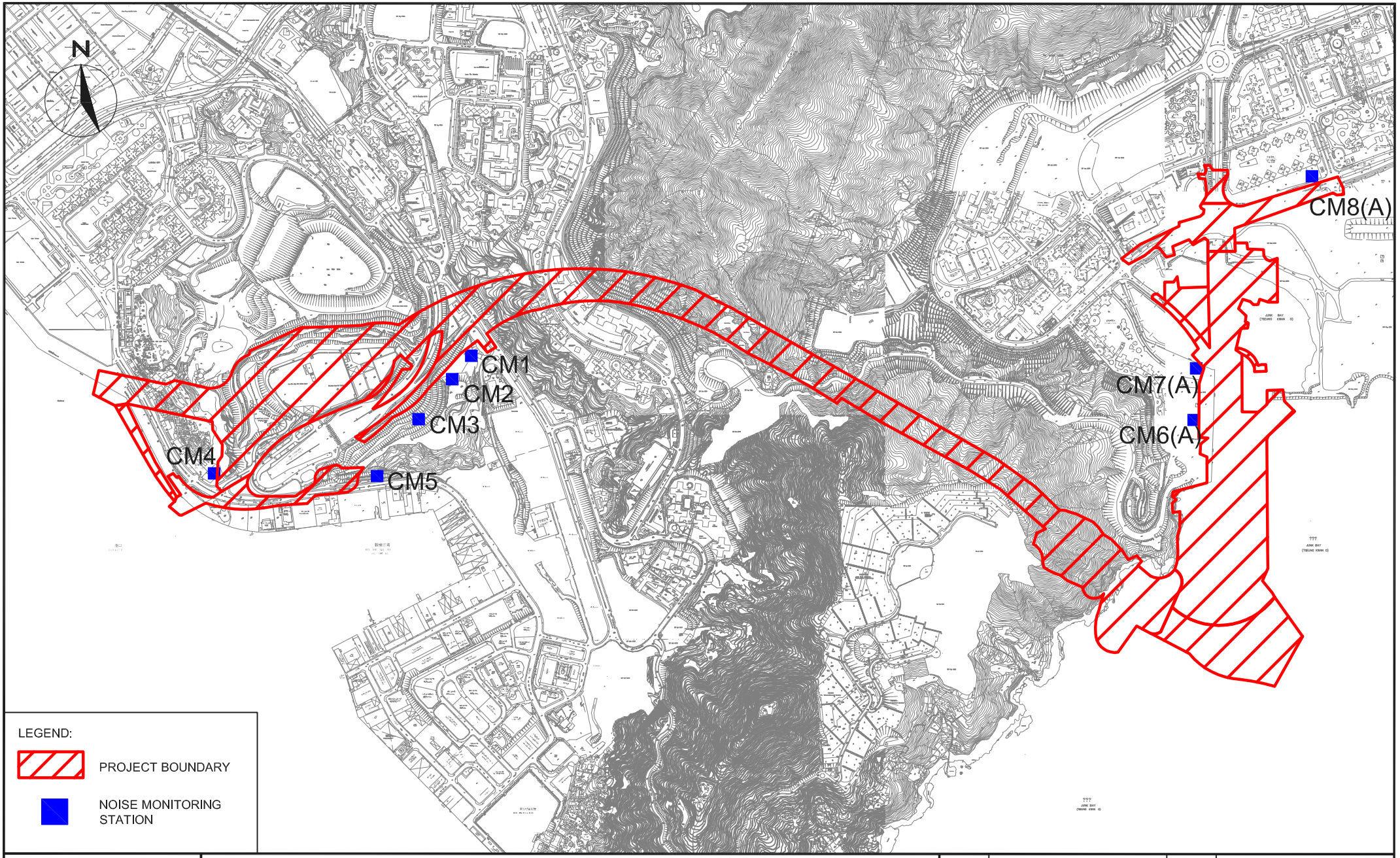
Agreement No. CE/59/2015 (EP)
Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction
Air Quality Monitoring Stations

SCALE	1:15000 @ A4	DATE	JAN 2018
CHECK	JF	DRAWN	JW
JOB No.	MA16034	FIGURE NO. 2	REV -



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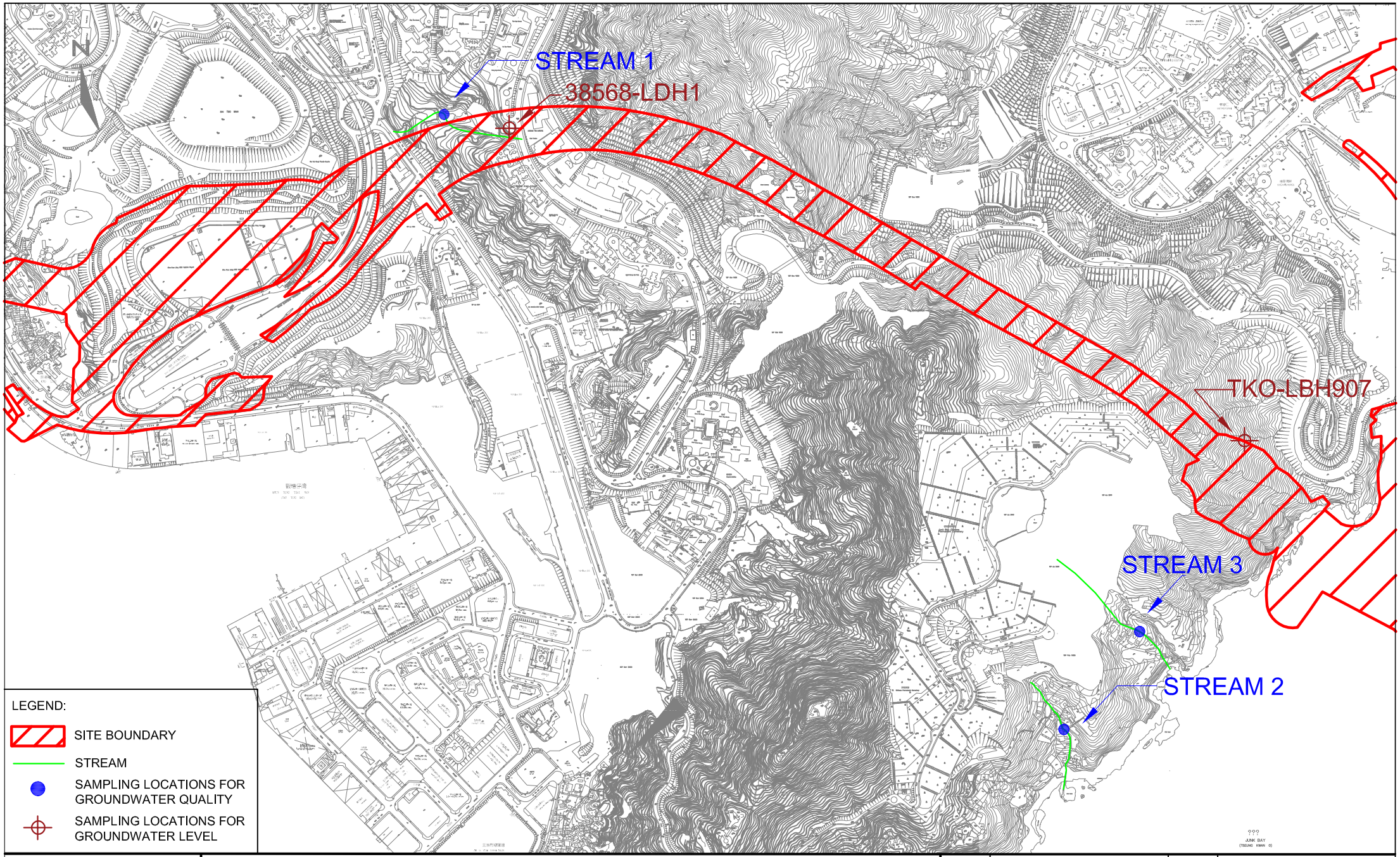
Agreement No. CE/59/2015 (EP)
Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction
Noise Monitoring Stations

SCALE	1:15000 @ A4	DATE	JAN 2018
CHECK	JF	DRAWN	JW
JOB No.	MA16034	FIGURE NO. 3	REV -



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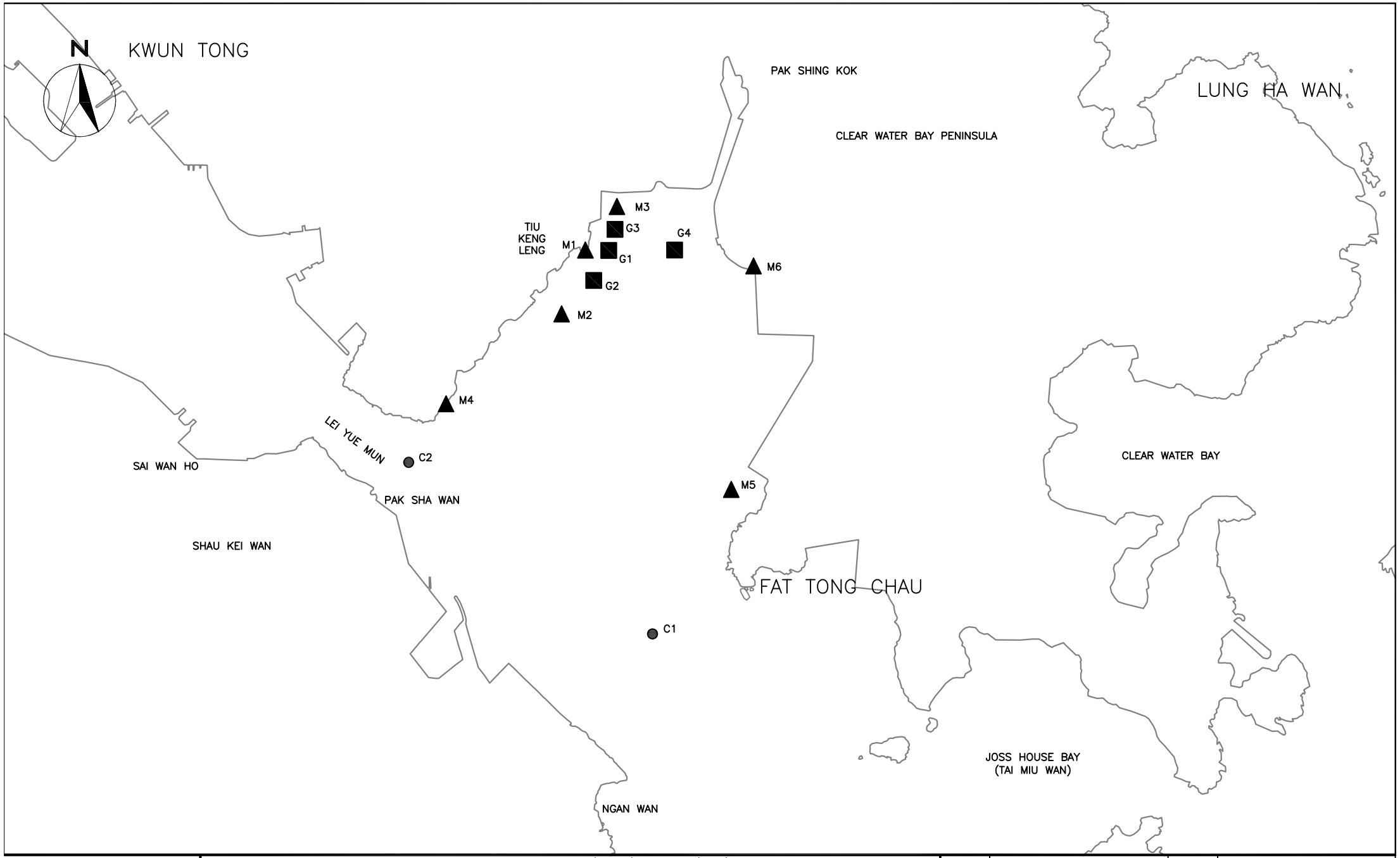
Agreement No. CE/59/2015 (EP)
Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction
Location of Streams for Groundwater Quality and Groundwater Level Monitoring

SCALE	1:10000 @ A4	DATE	APR 2017
CHECK	JF	DRAWN	JW
JOB No.	MA16034	FIGURE NO. 4	REV -



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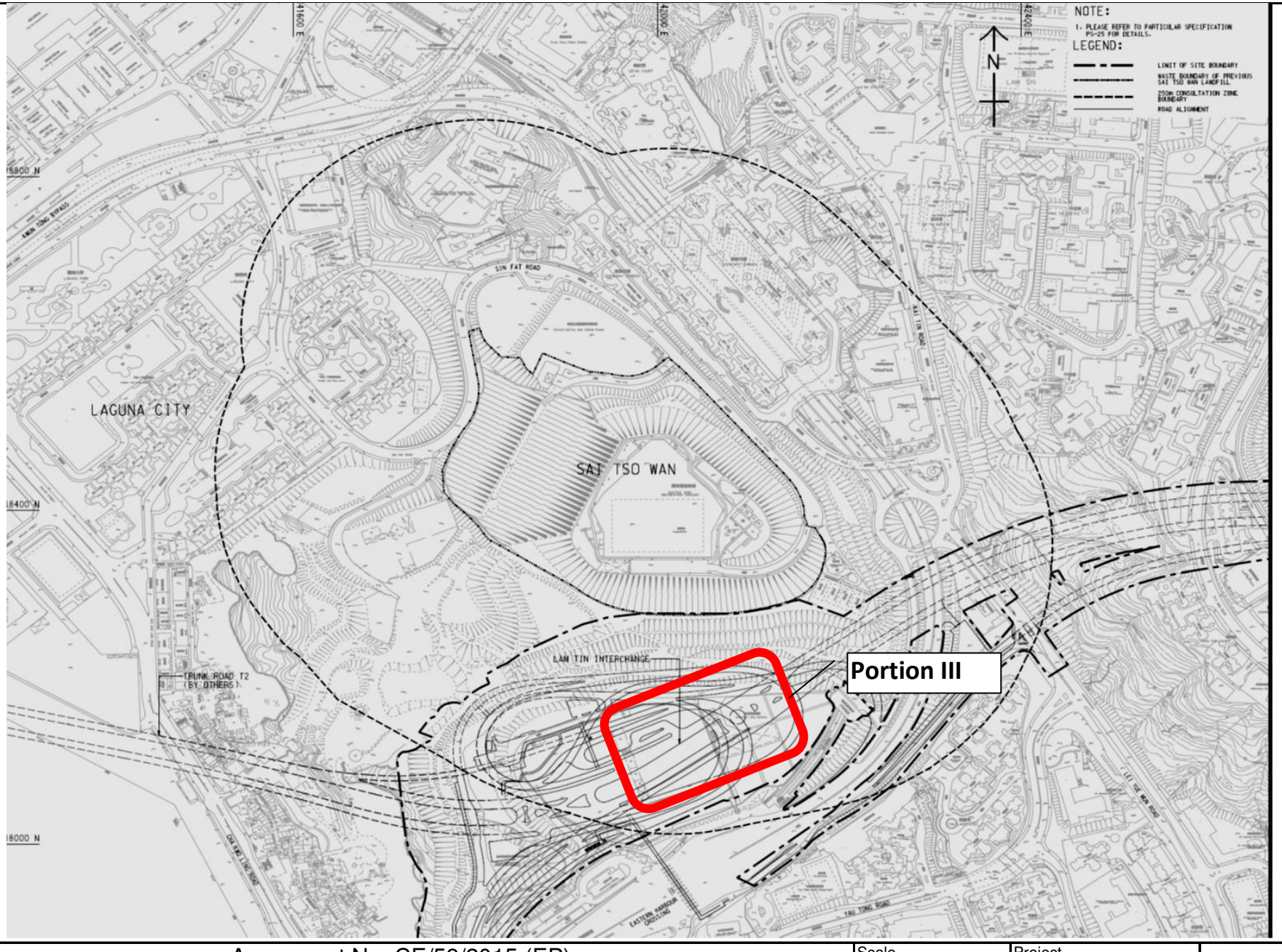
Agreement No. CE/59/2015 (EP)
Environmental Team for Tseung Kwan O – Lam Tin Tunnel – Design and Construction

Locations of Water Quality Monitoring Stations

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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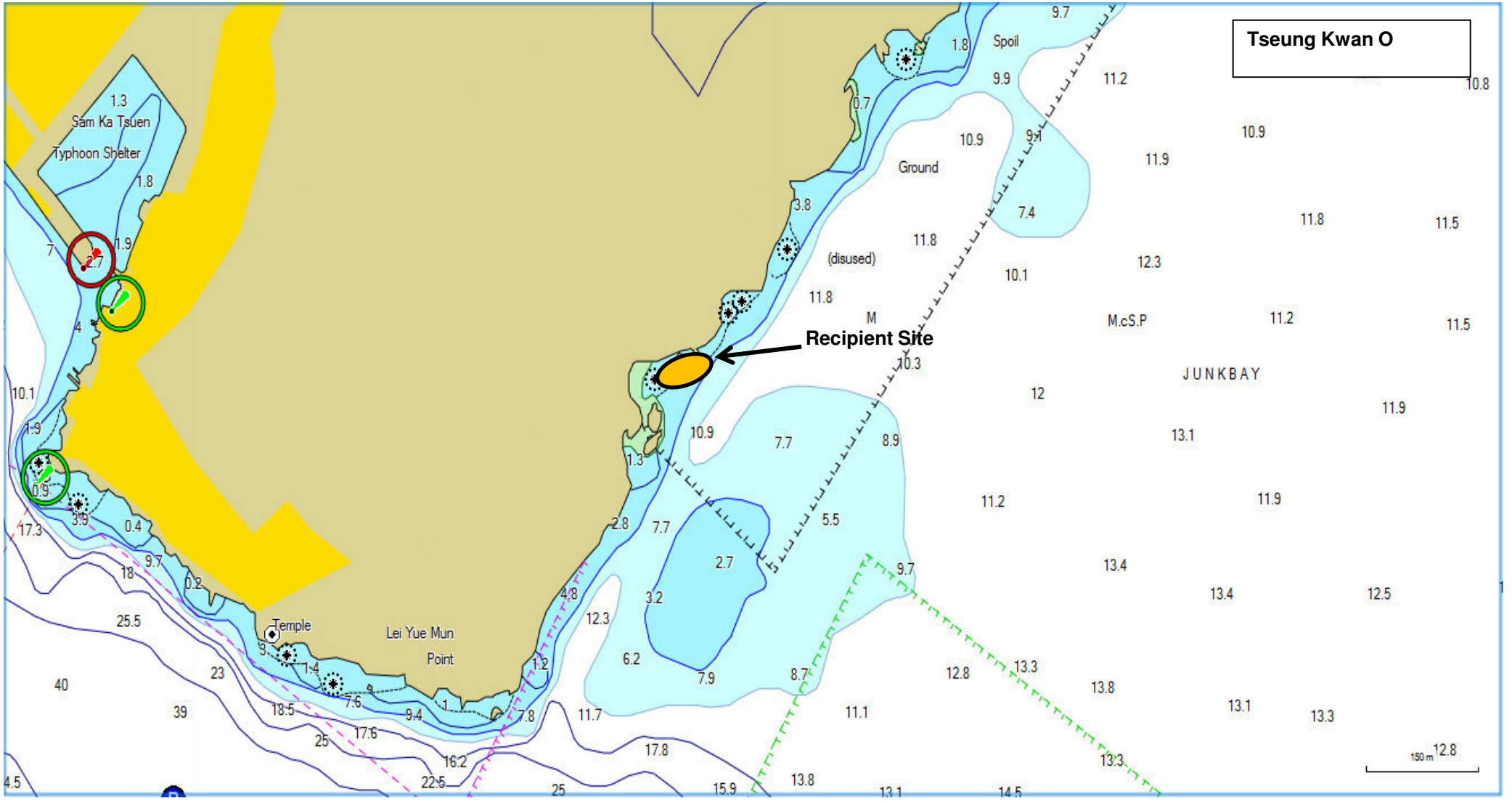
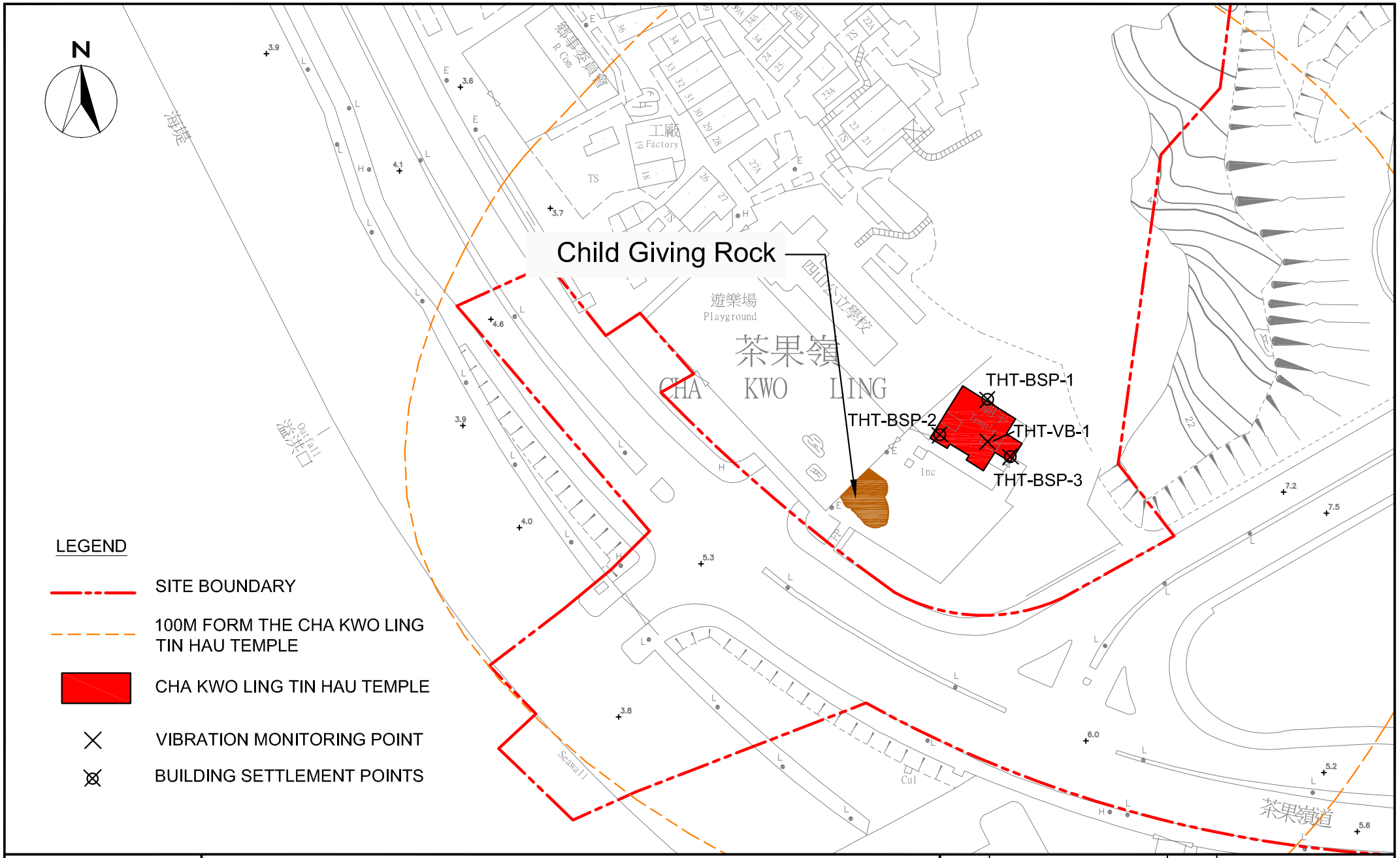


Title	Agreement No. CE/59/2015 (EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Location of Post-translocation Coral Monitoring	Scale: N.T.S Date: Mar-17	Project No.: MA16034 Figure: 7

CINOTECH



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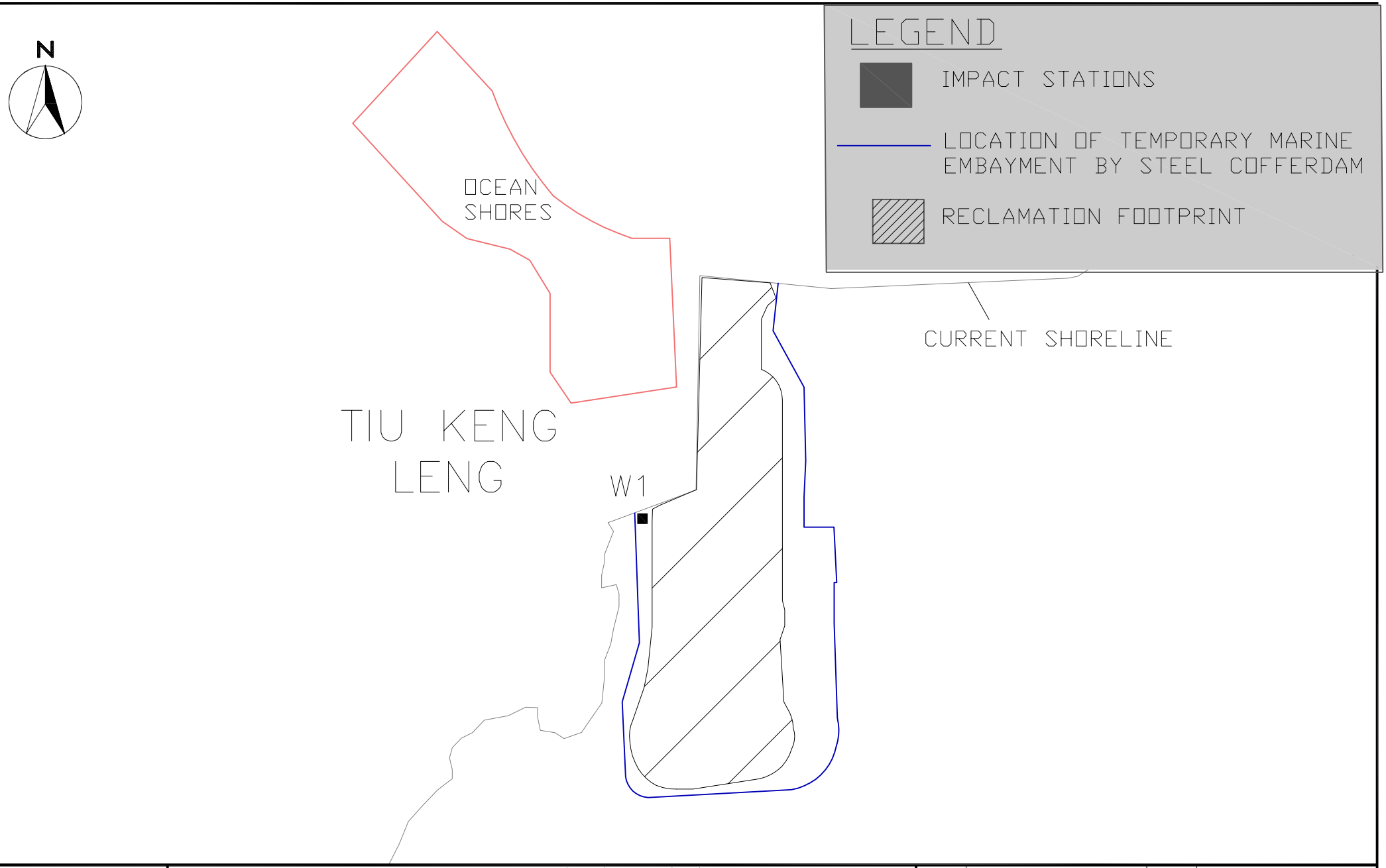
Agreement No. CE/59/2015 (EP)
Environmental Team for Tsueng Kwan O - Lam Tin Tunnel - Design and Construction

Locations of Monitirong for Cultural Heritage

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



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

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

APPENDIX A
ACTION AND LIMIT LEVELS

APPENDIX A – Action and Limit Levels

Air Quality

1-hr TSP

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

24-hr TSP

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

Noise

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

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

Water Quality

Groundwater

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

Notes:

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

Groundwater Level Monitoring

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

Marine Water Quality

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

Notes:

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

Water Quality Monitoring in Temporary Marine Embayment

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

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

Ecology

Post-translocation Coral Monitoring

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

Landfill Gas Monitoring

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

Alert, Alarm, Action Levels for Built Heritage Monitoring

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

APPENDIX B
COPIES OF CALIBRATION CERTIFICATES

WELLAB 匯力 Testing & Research

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.:	29669
Date of Issue:	2018-08-18
Date Received:	2018-08-16
Date Tested:	2018-08-16
Date Completed:	2018-08-18
Next Due Date:	2018-10-17

ATTN: **Mr. W. K. Tang**

Page: 1 of 1

Certificate of Calibration

Item for Calibration:

Description	: Handheld Particle Counter
Manufacturer	: Hal Technology
Model No.	: Hal-HPC300
Serial No.	: 3020409
Flow rate	: 0.1 cfm
Zero Count Test	: 0 count per 5 minutes
Equipment No.	: A-26-02

Test Conditions:

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

Test Specifications & Methodology:

1. Instruction and Operation Manual High Volume Sampler, Andersen Samplers, Inc.
2. In-house method in according to the instruction manual: The Dust Monitor was compared with a calibrated High Volume Sampler and the result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

Results:

Correlation Factor (CF)	1.147

****

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

PATRICK TSE
Laboratory Manager

WELLAB 匯力 Testing & Research

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.:	29661
Date of Issue:	2018-08-13
Date Received:	2018-08-11
Date Tested:	2018-08-11
Date Completed:	2018-08-13
Next Due Date:	2018-10-12

ATTN: **Mr. W. K. Tang**

Page: 1 of 1

Certificate of Calibration

Item for Calibration:

Description	: Handheld Particle Counter
Manufacturer	: Hal Technology
Model No.	: Hal-HPC301
Serial No.	: 3011701019
Flow rate	: 0.1 cfm
Zero Count Test	: 0 count per 5 minutes
Equipment No.	: A-27-01

Test Conditions:

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

Test Specifications & Methodology:

1. Instruction and Operation Manual High Volume Sampler, Andersen Samplers, Inc.
2. In-house method in according to the instruction manual: The Dust Monitor was compared with a calibrated High Volume Sampler and the result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

Results:

Correlation Factor (CF)	1.177

****

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

PATRICK TSE
Laboratory Manager

WELLAB LIMITED
Rms 1214, 1502, 1516, 1701 & 1716,
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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.:	29662
Date of Issue:	2018-08-13
Date Received:	2018-08-11
Date Tested:	2018-08-11
Date Completed:	2018-08-13
Next Due Date:	2018-10-12

ATTN: **Mr. W. K. Tang**

Page: 1 of 1

Certificate of Calibration

Item for Calibration:

Description	: Handheld Particle Counter
Manufacturer	: Hal Technology
Model No.	: Hal-HPC301
Serial No.	: 3011701016
Flow rate	: 0.1 cfm
Zero Count Test	: 0 count per 5 minutes
Equipment No.	: A-27-03

Test Conditions:

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

Test Specifications & Methodology:

1. Instruction and Operation Manual High Volume Sampler, Andersen Samplers, Inc.
2. In-house method in according to the instruction manual: The Dust Monitor was compared with a calibrated High Volume Sampler and the result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

Results:

Correlation Factor (CF)	1.149

****

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

PATRICK TSE
Laboratory Manager

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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.:	29664
Date of Issue:	2018-08-13
Date Received:	2018-08-11
Date Tested:	2018-08-11
Date Completed:	2018-08-13
Next Due Date:	2018-10-12

ATTN: **Mr. W. K. Tang** Page: 1 of 1

Certificate of Calibration

Item for Calibration:

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

Test Conditions:

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

Test Specifications & Methodology:

1. Instruction and Operation Manual High Volume Sampler, Andersen Samplers, Inc.
2. In-house method in according to the instruction manual: The Dust Monitor was compared with a calibrated High Volume Sampler and the result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

Results:

Correlation Factor (CF)	1.161

****

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

PATRICK TSE
Laboratory Manager

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Rms 1214, 1502, 1516, 1701 & 1716,
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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.:	29665
Date of Issue:	2018-08-13
Date Received:	2018-08-11
Date Tested:	2018-08-11
Date Completed:	2018-08-13
Next Due Date:	2018-10-12

ATTN: **Mr. W. K. Tang**

Page: 1 of 1

Certificate of Calibration

Item for Calibration:

Description	: Handheld Particle Counter
Manufacturer	: Hal Technology
Model No.	: Hal-HPC301
Serial No.	: 3011701013
Flow rate	: 0.1 cfm
Zero Count Test	: 0 count per 5 minutes
Equipment No.	: A-27-08

Test Conditions:

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

Test Specifications & Methodology:

1. Instruction and Operation Manual High Volume Sampler, Andersen Samplers, Inc.
2. In-house method in according to the instruction manual: The Dust Monitor was compared with a calibrated High Volume Sampler and the result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

Results:

Correlation Factor (CF)	1.162

****

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

PATRICK TSE
Laboratory Manager

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Testing & Research

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Technology Park, 18 On Lai Street,
Shatin, N.T., Hong Kong.
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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.:	29667
Date of Issue:	2018-08-13
Date Received:	2018-08-11
Date Tested:	2018-08-11
Date Completed:	2018-08-13
Next Due Date:	2018-10-12

ATTN: **Mr. W. K. Tang**

Page: 1 of 1

Certificate of Calibration

Item for Calibration:

Description	: Handheld Particle Counter
Manufacturer	: Hal Technology
Model No.	: Hal-HPC301
Serial No.	: 3011701010
Flow rate	: 0.1 cfm
Zero Count Test	: 0 count per 5 minutes
Equipment No.	: A-27-10

Test Conditions:

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

Test Specifications & Methodology:

1. Instruction and Operation Manual High Volume Sampler, Andersen Samplers, Inc.
2. In-house method in according to the instruction manual: The Dust Monitor was compared with a calibrated High Volume Sampler and the result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

Results:

Correlation Factor (CF)	1.133

****

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

PATRICK TSE
Laboratory Manager

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18 On Lai Street, Shatin, N.T., Hong Kong.
Tel: 2898 7388 Fax: 2898 7076
Website: www.wellab.com.hk

TEST REPORT

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

Test Report No.:	C/N/170915A
Date of Issue:	2017-09-18
Date Received:	2017-09-15
Date Tested:	2017-09-15
Date Completed:	2017-09-18
Next Due Date:	2018-09-17

ATTN: **Mr. W.K. Tang**

Page: 1 of 1

Certificate of Calibration

Item for calibration:

Description	: 'SVANTEK' Integrating Sound Level Meter
Manufacturer	: SVANTEK
Model No.	: SVAN 955
Serial No.	: 12563
Microphone No.	: 34377
Equipment No.	: N-08-03

Test conditions:

Room Temperatre	: 22 degree Celsius
Relative Humidity	: 60%

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

PATRICK TSE
Laboratory Manager

WELLAB 匯力 Testing & Research

WELLAB LIMITED
Rms 1214, 1502, 1516, 1701 & 1716,
Technology Park, 18 On Lai Street,
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TEST REPORT

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

Test Report No.:	29813
Date of Issue:	2018-09-15
Date Received:	2018-09-14
Date Tested:	2018-09-14
Date Completed:	2018-09-15
Next Due Date:	2019-09-14

ATTN: **Mr. W.K. Tang**

Page: 1 of 1

Certificate of Calibration

Item for calibration:

Description	: 'SVANTEK' Integrating Sound Level Meter
Manufacturer	: SVANTEK
Model No.	: SVAN 955
Serial No.	: 12563
Microphone No.	: 34377
Equipment No.	: N-08-03

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

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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.:	29501
Date of Issue:	2018-08-27
Date Received:	2018-08-24
Date Tested:	2018-08-24
Date Completed:	2018-08-27
Next Due Date:	2019-08-26

ATTN: **Mr. W.K. Tang**

Page: 1 of 1

Certificate of Calibration

Item for calibration:

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

Test conditions:

Room 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

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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.:	29499
Date of Issue:	2018-08-13
Date Received:	2018-08-11
Date Tested:	2018-08-11
Date Completed:	2018-08-13
Next Due Date:	2019-08-12

ATTN: **Mr. W.K. Tang**

Page: 1 of 1

Certificate of Calibration

Item for calibration:

Description	: 'SVANTEK' Integrating Sound Level Meter
Manufacturer	: SVANTEK
Model No.	: SVAN 957
Serial No.	: 21459
Microphone No.	: 43676
Equipment No.	: N-08-08

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

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Website: www.wellab.com.hk

TEST REPORT

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

ATTN: **Mr. W.K. Tang**

Test Report No.:	29500
Date of Issue:	2018-08-13
Date Received:	2018-08-11
Date Tested:	2018-08-11
Date Completed:	2018-08-13
Next Due Date:	2019-08-12
Page:	1 of 1

Certificate of Calibration

Item for calibration:

Description	: 'SVANTEK' Integrating Sound Level Meter
Manufacturer	: SVANTEK
Model No.	: SVAN 957
Serial No.	: 21460
Microphone No.	: 43679
Equipment No.	: N-08-09

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
PATRICK TSE
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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.:	29815
Date of Issue:	2018-09-15
Date Received:	2018-09-14
Date Tested:	2018-09-14
Date Completed:	2018-09-15
Next Due Date:	2019-09-14

ATTN: **Mr. W.K. Tang**

Page: 1 of 1

Certificate of Calibration

Item for calibration:

Description	: 'SVANTEK' Integrating Sound Level Meter
Manufacturer	: SVANTEK
Model No.	: SVAN 977
Serial No.	: 45482
Microphone No.	: 63626
Equipment No.	: N-08-14

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

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TEST REPORT

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

Test Report No.:	C/N/171215A
Date of Issue:	2017-12-18
Date Received:	2017-12-15
Date Tested:	2017-12-15
Date Completed:	2017-12-18
Next Due Date:	2018-12-17

ATTN: **Mr. W.K. Tang**

Page: 1 of 1

Certificate of Calibration

Item for calibration:

Description	: Sound & Vibration Analyser
Manufacturer	: BSWA
Model No.	: BSWA 801
Serial No.	: 35921
Equipment No.	: N-13-02

Test conditions:

Room Temperatre	: 20 degree Celsius
Relative Humidity	: 64%

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
PATRICK TSE
Laboratory Manager

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Website: www.wellab.com.hk

TEST REPORT

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

ATTN: **Mr. W.K. Tang**

Test Report No.:	C/N/171215B
Date of Issue:	2017-12-18
Date Received:	2017-12-15
Date Tested:	2017-12-15
Date Completed:	2017-12-18
Next Due Date:	2018-12-17
Page:	1 of 1

Certificate of Calibration

Item for calibration:

Description	: Sound & Vibration Analyser
Manufacturer	: BSWA
Model No.	: BSWA 801
Serial No.	: 35927
Equipment No.	: N-13-03

Test conditions:

Room Temperatre	: 20 degree Celsius
Relative Humidity	: 64%

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
PATRICK TSE
Laboratory Manager

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TEST REPORT

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

Test Report No.:	C/N/170929
Date of Issue:	2017-09-30
Date Received:	2017-09-29
Date Tested:	2017-09-29
Date Completed:	2017-09-30
Next Due Date:	2018-09-29

ATTN: **Mr. W.K. Tang** Page: 1 of 1

Item for calibration:

Description	: Acoustical Calibrator
Manufacturer	: SVANTEK
Model No.	: SV30A
Serial No.	: 24803
Equipment No.	: N-09-03

Test conditions:

Room Temperatre	: 21 degree Celsius
Relative Humidity	: 60 %

Methodology:

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

Results:

Sound Pressure Level (1kHz)	Measured SPL	Tolerance
At 94 dB SPL	94.0	94.0 ± 0.1 dB
At 114 dB SPL	114.0	114.0 ± 0.1 dB

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

PATRICK TSE
Laboratory Manager

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TEST REPORT

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

Test Report No.:	C/N/170929B
Date of Issue:	2017-09-30
Date Received:	2017-09-29
Date Tested:	2017-09-29
Date Completed:	2017-09-30
Next Due Date:	2018-09-29

ATTN: **Mr. W.K. Tang**

Page: 1 of 1

Item for calibration:

Description	: Acoustical Calibrator
Manufacturer	: SVANTEK
Model No.	: SV30A
Serial No.	: 24780
Equipment No.	: N-09-05

Test conditions:

Room Temperatre	: 21 degree Celsius
Relative Humidity	: 60 %

Methodology:

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

Results:

Sound Pressure Level (1kHz)	Measured SPL	Tolerance
At 94 dB SPL	94.0	94.0 ± 0.1 dB
At 114 dB SPL	114.0	114.0 ± 0.1 dB

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

Patrick Tse
PATRICK TSE
Laboratory Manager

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Website: www.wellab.com.hk

TEST REPORT

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

Test Report No.:	C/N/171103
Date of Issue:	2017-11-06
Date Received:	2017-11-03
Date Tested:	2017-11-03
Date Completed:	2017-11-06
Next Due Date:	2018-11-05
Page:	1 of 1

ATTN: **Mr. W.K. Tang**

Item for calibration:

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

Test conditions:

Room Temperatre	: 21 degree Celsius
Relative Humidity	: 64 %

Methodology:

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

Results:

Sound Pressure Level (1kHz)	Measured SPL	Tolerance
At 94 dB SPL	94.0	94.0 ± 0.1 dB
At 114 dB SPL	114.0	114.0 ± 0.1 dB

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

PATRICK TSE
Laboratory Manager

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TEST REPORT

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

ATTN: **Mr. W.K. Tang**

Test Report No.:	29683
Date of Issue:	2018-08-20
Date Received:	2018-08-17
Date Tested:	2018-08-17
Date Completed:	2018-08-20
Next Due Date:	2019-08-19
Page:	1 of 1

Item for calibration:

Description	: Acoustical Calibrator
Manufacturer	: Brüel & Kjær
Model No.	: 4231
Serial No.	: 2412367
Equipment No.	: N-02-03

Test conditions:

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

Methodology:

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

Results:

Sound Pressure Level (1kHz)	Measured SPL	Tolerance
At 94 dB SPL	94.0	94.0 ± 0.1 dB
At 114 dB SPL	114.0	114.0 ± 0.1 dB

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

PATRICK TSE
Laboratory Manager

High-Volume TSP Sampler
5-POINT CALIBRATION DATA SHEET

CINOTECH

File No. MA16034/05/0013

Project No. AM1 - Tin Hau Temple

Date: 23-Aug-18 Next Due Date: 22-Oct-18 Operator: MH

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

Ambient Condition			
Temperature, Ta (K)	303	Pressure, Pa (mmHg)	754.7

Orifice Transfer Standard Information					
Serial No.	2896	Slope, mc	0.0585	Intercept, bc	-0.00045
Last Calibration Date:	13-Feb-18	**mc x Qstd + bc = $[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$**			
Next Calibration Date:	13-Feb-19	**Qstd = $\{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$ -bc} / mc**			

Calibration of TSP Sampler					
Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) **X - axis**	ΔW (HVS), in. of water	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ **Y-axis**
1	13.2	3.59	61.35	7.8	2.76
2	9.8	3.09	52.87	5.4	2.30
3	8.1	2.81	48.06	4.7	2.14
4	5.4	2.30	39.24	3.2	1.77
5	3.3	1.80	30.68	1.9	1.36

By Linear Regression of Y on X

Slope , mw = **0.0445** **Intercept, bw =** **0.0004**

Correlation coefficient* = **0.9980**

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

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

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

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

Therefore, Set Point; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ **3.75**

Remarks:

Conducted by: Ng Man Hei Signature: Date: 23/8/2018

Checked by: Wk Tang Signature: Date: 23/8/2018

High-Volume TSP Sampler
5-POINT CALIBRATION DATA SHEET

CINOTECH

File No. MA16034/08/0013

Project No. AM2 - Sai Tso Wan Recreation Ground

Date: 23-Aug-18 Next Due Date: 22-Oct-18 Operator: MH

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

Ambient Condition			
Temperature, Ta (K)	300	Pressure, Pa (mmHg)	753.8

Orifice Transfer Standard Information					
Serial No.	2896	Slope, mc	0.0585	Intercept, bc	-0.00045
Last Calibration Date:	13-Feb-18	**mc x Qstd + bc = $[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$**			
Next Calibration Date:	13-Feb-19	**Qstd = $\{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$ -bc} / mc**			

Calibration of TSP Sampler

Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) **X - axis**	ΔW (HVS), in. of water	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ **Y-axis**
1	13.6	3.66	62.55	8.1	2.82
2	10.2	3.17	54.17	6.2	2.47
3	8.6	2.91	49.74	5.4	2.31
4	5.4	2.31	39.42	3.3	1.80
5	3.3	1.80	30.81	2.0	1.40

By Linear Regression of Y on X

Slope , mw = **0.0451** **Intercept, bw =** **0.0290**

Correlation coefficient* = **0.9992**

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

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

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

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

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

Remarks:

Conducted by: LEE MAN HEI Signature: Hei Date: 23/8/2018

Checked by: W.K. Tang Signature: Kwon Date: 23/8/2018

High-Volume TSP Sampler
5-POINT CALIBRATION DATA SHEET

CINOTECH

File No. MA16034/03/0011

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

Date: 23-Aug-18 Next Due Date: 22-Oct-18 Operator: MH

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

Ambient Condition			
Temperature, Ta (K)	301.9	Pressure, Pa (mmHg)	754.6

Orifice Transfer Standard Information					
Serial No.	2896	Slope, mc	0.0585	Intercept, bc	-0.00045
Last Calibration Date:	13-Feb-18	**mc x Qstd + bc = $[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$**			
Next Calibration Date:	13-Feb-19	**Qstd = $\{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$ -bc} / mc**			

Calibration of TSP Sampler

Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) **X - axis**	ΔW (HVS), in. of water	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ **Y-axis**
1	12.4	3.49	59.57	7.6	2.73
2	10.8	3.25	55.59	6.4	2.50
3	7.5	2.71	46.33	4.5	2.10
4	5.1	2.24	38.21	3.2	1.77
5	3.3	1.80	30.73	2.0	1.40

By Linear Regression of Y on X

Slope , mw = **0.0450** **Intercept, bw =** **0.0257**

Correlation coefficient* = **0.9992**

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

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

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

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

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

Remarks:

Conducted by: LEE MAN HEI Signature: Lei Date: 23/8/2018

Checked by: WK Tang Signature: Kwok Date: 23/8/2018

High-Volume TSP Sampler
5-POINT CALIBRATION DATA SHEET

CINOTECH

File No. MA16034/54/0013

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

Date: 23-Aug-18 Next Due Date: 22-Oct-18 Operator: MH

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

Ambient Condition			
Temperature, Ta (K)	304.2	Pressure, Pa (mmHg)	753.6

Orifice Transfer Standard Information					
Serial No.	2896	Slope, mc	0.0585	Intercept, bc	-0.00045
Last Calibration Date:	13-Feb-18	**mc x Qstd + bc = $[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$**			
Next Calibration Date:	13-Feb-19	**Qstd = $\{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$ -bc} / mc**			

Calibration of TSP Sampler

Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) **X - axis**	ΔW (HVS), in. of water	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ **Y-axis**
1	16.6	4.02	68.62	9.6	3.05
2	12.5	3.48	59.54	7.4	2.68
3	10.7	3.22	55.09	6.5	2.51
4	6.8	2.57	43.92	4.1	2.00
5	4.3	2.04	34.93	2.8	1.65

By Linear Regression of Y on X

Slope , mw = **0.0422** **Intercept, bw =** **0.1674**

Correlation coefficient* = **0.9995**

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

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

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

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

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

Remarks:

Conducted by: LEE MAN HEI Signature: Lei Date: 23/8/2018

Checked by: WK Tang Signature: Kwai Date: 23/8/2018

High-Volume TSP Sampler
5-POINT CALIBRATION DATA SHEET

CINOTECH

File No. MA16034/37/0013

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

Date: 24-Aug-18 Next Due Date: 23-Oct-18 Operator: MH

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

Ambient Condition			
Temperature, Ta (K)	303.3	Pressure, Pa (mmHg)	754.6

Orifice Transfer Standard Information					
Serial No.	2896	Slope, mc	0.0585	Intercept, bc	-0.00045
Last Calibration Date:	13-Feb-18	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	13-Feb-19	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler

Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) **X - axis**	ΔW (HVS), in. of water	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ **Y-axis**
1	16.6	4.02	68.76	9.4	3.03
2	13.1	3.57	61.09	7.6	2.72
3	9.5	3.04	52.02	5.8	2.38
4	6.9	2.59	44.34	4.1	2.00
5	4.3	2.05	35.00	2.7	1.62

By Linear Regression of Y on X

Slope , mw = 0.0419 **Intercept, bw =** 0.1609

Correlation coefficient* = 0.9992

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

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

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

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

Therefore, Set Point; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ **3.95**

Remarks:

Conducted by: LEE MAN HEI Signature: hei Date: 24/8/2018

Checked by: W.K. Tang Signature: Kwoi Date: 24/8/2018

High-Volume TSP Sampler
5-POINT CALIBRATION DATA SHEET

CINOTECH

File No. MA16034/07/0012

Station: AM6 - Park Central

Date: 23-Jul-18 Next Due Date: 22-Sep-18 Operator: MH

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

Ambient Condition			
Temperature, Ta (K)	300.7	Pressure, Pa (mmHg)	753

Orifice Transfer Standard Information					
Serial No.	2896	Slope, mc	0.0585	Intercept, bc	-0.00045
Last Calibration Date:	13-Feb-18	**mc x Qstd + bc = $[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$**			
Next Calibration Date:	13-Feb-19	**Qstd = $\{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$**			

Calibration of TSP Sampler

Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) **X - axis**	ΔW (HVS), in. of water	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ **Y-axis**
1	11.6	3.37	57.67	7.2	2.66
2	9.7	3.09	52.74	6.3	2.49
3	7.5	2.71	46.37	4.9	2.19
4	5.3	2.28	38.98	3.4	1.83
5	3.3	1.80	30.76	2.1	1.44

By Linear Regression of Y on X

Slope , mw = 0.0462 **Intercept, bw =** 0.0289

Correlation coefficient* = 0.9988

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

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

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

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

Therefore, Set Point; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ **4.13**

Remarks:

Conducted by: Lee MAN HEE Signature: Lee Date: 23/7/2018

Checked by: WK Tang Signature: Kwan Date: 23/7/2018

High-Volume TSP Sampler
5-POINT CALIBRATION DATA SHEET

CINOTECH

File No. MA16034/07/0013

Station: AM6 - Park Central

Date: 27-Sep-18 | Next Due Date: 26-Nov-18 | Operator: MH

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

Ambient Condition			
Temperature, Ta (K)	300.9	Pressure, Pa (mmHg)	760.8

Orifice Transfer Standard Information					
Serial No.	2896	Slope, mc	0.0585	Intercept, bc	-0.00045
Last Calibration Date:	13-Feb-18	**mc x Qstd + bc = $[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$**			
Next Calibration Date:	13-Feb-19	**Qstd = $\{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$ -bc} / mc**			

Calibration of TSP Sampler

Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) **X - axis**	ΔW (HVS), in. of water	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ **Y-axis**
1	11.8	3.42	58.45	7.4	2.71
2	9.6	3.09	52.72	6.1	2.46
3	7.4	2.71	46.28	4.9	2.20
4	5.3	2.29	39.17	3.3	1.81
5	3.3	1.81	30.91	2.1	1.44

By Linear Regression of Y on X

Slope , mw = 0.0465 **Intercept, bw =** 0.0107

Correlation coefficient* = 0.9987

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

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

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

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

Therefore, Set Point; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ **4.07**

Remarks:

Conducted by: LEE MAN HEI Signature: Date: 27/9/2018

Checked by: W.K. Tang Signature: Date: 27/9/2018

TISCH Environmental

RECALIBRATION DUE DATE:
February 13, 2019

Certificate of Calibration

Calibration Certification Information					
Cal. Date:	February 13, 2018	**Rootsmeter S/N:** 438320	**Ta:** 293	°K	
Operator:	Jim Tisch		**Pa:** 763.3	mm Hg	
Calibration Model #:	TE-5025A	**Calibrator S/N:** **2896**			

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4670	3.2	2.00
2	3	4	1	1.0380	6.4	4.00
3	5	6	1	0.9220	8.0	5.00
4	7	8	1	0.8840	8.8	5.50
5	9	10	1	0.7250	12.8	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)
1.0172	0.6934	1.4293	0.9958	0.6788	0.8762
1.0129	0.9758	2.0213	0.9916	0.9553	1.2392
1.0107	1.0962	2.2599	0.9895	1.0732	1.3854
1.0097	1.1422	2.3702	0.9885	1.1182	1.4530
1.0043	1.3853	2.8586	0.9832	1.3562	1.7524
QSTD	**m=**	**2.06726**	**QA**	**m=**	**1.29448**
	b=	**-0.00045**		**b=**	**-0.00028**
	r=	**0.99992**		**r=**	**0.99992**

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

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TOLL FREE: (877)263-7610
FAX: (513)467-9009

WELLAB 匯力 Testing & Research

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Website: www.wellab.com.hk

TEST REPORT

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

Test Report No.:	C/W/180329
Date of Issue:	2018-04-03
Date Received:	2018-03-29
Date Tested:	2018-03-29
Date Completed:	2018-04-03
Next Due Date:	2018-10-02

ATTN: **Miss Mei Ling Tang**

Certificate of Calibration

Item for calibration:

Description	: Weather Monitor II
Manufacturer	: Davis Instruments
Model No.	: 7440
Serial No.	: MC20813A11

Test conditions:

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

Test Specifications:

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

Methodology:

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

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

Patrick Tse

PATRICK TSE
Laboratory Manager

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Website: www.wellab.com.hk

TEST REPORT

Test Report No.:	C/W/180329
Date of Issue:	2018-04-03
Date Received:	2018-03-29
Date Tested:	2018-03-29
Date Completed:	2018-04-03
Next Due Date:	2018-10-02

Results:

1. Performance check of anemometer

Air Velocity, m/s		Difference D (m/s)
Instrument Reading (V1)	Reference Value (V1)	D = V1 – V2
2.00	2.00	0.00

2. Performance check of wind direction sensor

Wind Direction (°)		Difference D (°)
Instrument Reading (W1)	Reference Value (W2)	D = W1 - W2
0	0	0
45	45	0
90.1	90	0.1
135.3	135	0.3
180	180	0
225.2	225	0.2
270.1	270	0.1
315.3	315	0.3
360	360	0

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

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TEST REPORT

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

Test Report No.:	29671
Date of Issue:	2018-08-25
Date Received:	2018-08-25
Date Tested:	2018-08-25
Date Completed:	2018-08-25
Next Due Date:	2018-11-24

ATTN: **Miss Mei Ling Tang**

Certificate of Calibration

Item for calibration:

YSI EXO1 Multiparameter Sondes	Equipment No.: SW-08-03	
Manufacturer:	YSI Incorporated, a Xylem brand	
Description:	Model No.	Serial No.
- EXO Optical DO Sensor, Ti	599100-01	16H102982
- EXO conductivity/Temperature Sensor, Ti	599870	16G102304
- EXO Turbuduty Sensor, Ti	599101-01	16H102460
- EXO pH Sensor Assembly, Guarded, Ti	599701	17K103110

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

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

PATRICK TSE
Laboratory Manager

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Website: www.wellab.com.hk

TEST REPORT

Test Report No.:	29671
Date of Issue:	2018-08-25
Date Received:	2018-08-25
Date Tested:	2018-08-25
Date Completed:	2018-08-25
Next Due Date:	2018-11-24

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	6.84	6.86 ± 0.10	Pass
pH QC buffer 9.18	9.16	9.18 ± 0.10	Pass

D.O. performance checking

	Instrument Readings (mg/L)	Accetance Criteria	Comment
Zero DO soultion	0.05	<0.1mg/L	Pass

Winkler Titration value (mg/L)	Instrument Readings (mg/L)	Accetance Criteria	Comment
8.02	8.05	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	10.06	9.0-11.0	Pass
50 NTU	50.02	45.0-55.0	Pass
100 NTU	100.3	90.0-110.0	Pass

Depth performance checking

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

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

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TEST REPORT

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

Test Report No.:	29673
Date of Issue:	2018-08-25
Date Received:	2018-08-25
Date Tested:	2018-08-25
Date Completed:	2018-08-25
Next Due Date:	2018-11-24

ATTN: **Miss Mei Ling Tang**

Certificate of Calibration

Item for calibration:

YSI EXO1 Multiparameter Sondes	Equipment No.: SW-08-09	
Manufacturer:	YSI Incorporated, a Xylem brand	
Description:	Model No.	Serial No.
- EXO Optical DO Sensor, Ti	599100-01	16H102988
- EXO conductivity/Temperature Sensor, Ti	599870	16G102310
- EXO Turbuduty Sensor, Ti	599101-01	16H102467
- EXO pH Sensor Assembly, Guarded, Ti	599701	16J100419

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
Laboratory Manager

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TEST REPORT

Test Report No.:	29673
Date of Issue:	2018-08-25
Date Received:	2018-08-25
Date Tested:	2018-08-25
Date Completed:	2018-08-25
Next Due Date:	2018-11-24
Page:	2 of 2

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	20.002	-0.002	N/A

pH performance checking

	Instrument Readings (pH unit)	Accetance Criteria	Comment
pH QC buffer 4.00	4.01	4.00 ± 0.10	Pass
pH QC buffer 6.86	6.88	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	0.05	<0.1mg/L	Pass

Winkler Titration value (mg/L)	Instrument Readings (mg/L)	Accetance Criteria	Comment
8.02	8.06	Difference between Titration value and instrument reading <0.2mg/L	Pass

Turbidity performance checking

Turbidity stock solution	Instrument Readings (NTU)	Accetance Criteria	Comment
10 NTU	10.02	9.0-11.0	Pass
50 NTU	50.08	45.0-55.0	Pass
100 NTU	100.0	90.0-110.0	Pass

Depth performance checking

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

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

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TEST REPORT

APPLICANT: **Cinotech Consultants Limited**
RM 1710, Technology Park,
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Test Report No.:	29675
Date of Issue:	2018-08-25
Date Received:	2018-08-25
Date Tested:	2018-08-25
Date Completed:	2018-08-25
Next Due Date:	2018-11-24

ATTN: **Miss Mei Ling Tang**

Certificate of Calibration

Item for calibration:

YSI EXO1 Multiparameter Sondes	Equipment No.: SW-08-20	
Manufacturer:	YSI Incorporated, a Xylem brand	
Description:	Model No.	Serial No.
- EXO Optical DO Sensor, Ti	599100-01	16J100944
- EXO conductivity/Temperature Sensor, Ti	599870	16H100178
- EXO Turbuduty Sensor, Ti	599101-01	16J101097
- EXO pH Sensor Assembly, Guarded, Ti	599701	17K103109

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
PATRICK TSE
Laboratory Manager

WELLAB 匯力 Testing & Research

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TEST REPORT

Test Report No.:	29675
Date of Issue:	2018-08-25
Date Received:	2018-08-25
Date Tested:	2018-08-25
Date Completed:	2018-08-25
Next Due Date:	2018-11-24

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	20.002	-0.002	N/A

pH performance checking

	Instrument Readings (pH unit)	Accetance Criteria	Comment
pH QC buffer 4.00	4.01	4.00 ± 0.10	Pass
pH QC buffer 6.86	6.86	6.86 ± 0.10	Pass
pH QC buffer 9.18	9.17	9.18 ± 0.10	Pass

D.O. performance checking

	Instrument Readings (mg/L)	Accetance Criteria	Comment
Zero DO soultion	0.05	<0.1mg/L	Pass

Winkler Titration value (mg/L)	Instrument Readings (mg/L)	Accetance Criteria	Comment
8.02	8.03	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	10.04	9.0-11.0	Pass
50 NTU	50.13	45.0-55.0	Pass
100 NTU	100.3	90.0-110.0	Pass

Depth performance checking

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

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

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TEST REPORT

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

ATTN: **Miss Mei Ling Tang**

Test Report No.:	29677
Date of Issue:	2018-08-25
Date Received:	2018-08-25
Date Tested:	2018-08-25
Date Completed:	2018-08-25
Next Due Date:	2018-11-24
Page:	1 of 2

Certificate of Calibration

Item for calibration:

YSI EXO1 Multiparameter Sondes	Equipment No.:	SW-08-132
Manufacturer:	YSI Incorporated, a Xylem brand	
Description:	Model No.	Serial No.
- EXO Optical DO Sensor, Ti	599100-01	17B102219
- EXO conductivity/Temperature Sensor, Ti	599870	17B100807
- EXO Turbuduty Sensor, Ti	599101-01	17B102262
- EXO pH Sensor Assembly, Guarded, Ti	599795-01	16J101314

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
Laboratory Manager

WELLAB 匯力 Testing & Research

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TEST REPORT

Test Report No.:	29677
Date of Issue:	2018-08-25
Date Received:	2018-08-25
Date Tested:	2018-08-25
Date Completed:	2018-08-25
Next Due Date:	2018-11-24
Page:	2 of 2

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	4.01	4.00 ± 0.10	Pass
pH QC buffer 6.86	6.86	6.86 ± 0.10	Pass
pH QC buffer 9.18	9.20	9.18 ± 0.10	Pass

D.O. performance checking

	Instrument Readings (mg/L)	Accetance Criteria	Comment
Zero DO soultion	0.05	<0.1mg/L	Pass

Winkler Titration value (mg/L)	Instrument Readings (mg/L)	Accetance Criteria	Comment
8.02	8.06	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	10.09	9.0-11.0	Pass
50 NTU	50.05	45.0-55.0	Pass
100 NTU	100.0	90.0-110.0	Pass

Depth performance checking

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

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

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TEST REPORT

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

ATTN: **Miss Mei Ling Tang**

Test Report No.:	29679
Date of Issue:	2018-08-25
Date Received:	2018-08-25
Date Tested:	2018-08-25
Date Completed:	2018-08-25
Next Due Date:	2018-11-24
Page:	1 of 2

Certificate of Calibration

Item for calibration:

YSI EXO1 Multiparameter Sondes	Equipment No.:	SW-08-159
Manufacturer:	YSI Incorporated, a Xylem brand	
Description:	Model No.	Serial No.
- EXO Optical DO Sensor, Ti	599100-01	17K100317
- EXO conductivity/Temperature Sensor, Ti	599870	17H103441
- EXO Turbuduty Sensor, Ti	599101-01	17K100325
- EXO pH Sensor Assembly, Guarded, Ti	599795-01	17K103094

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
Laboratory Manager

WELLAB 匯力 Testing & Research

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

Test Report No.:	29678
Date of Issue:	2018-08-25
Date Received:	2018-08-25
Date Tested:	2018-08-25
Date Completed:	2018-08-25
Next Due Date:	2018-11-24

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	4.05	4.00 ± 0.10	Pass
pH QC buffer 6.86	6.87	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	0.05	<0.1mg/L	Pass

Winkler Titration value (mg/L)	Instrument Readings (mg/L)	Accetance Criteria	Comment
8.02	8.06	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	10.07	9.0-11.0	Pass
50 NTU	50.10	45.0-55.0	Pass
100 NTU	100.1	90.0-110.0	Pass

Depth performance checking

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

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

WELLAB 匯力 Testing & Research

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TEST REPORT

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

ATTN: **Miss Mei Ling Tang**

Test Report No.:	29678
Date of Issue:	2018-08-25
Date Received:	2018-08-25
Date Tested:	2018-08-25
Date Completed:	2018-08-25
Next Due Date:	2018-11-24
Page:	1 of 2

Certificate of Calibration

Item for calibration:

YSI EXO1 Multiparameter Sondes	Equipment No.: SW-08-164	
Manufacturer:	YSI Incorporated, a Xylem brand	
Description:	Model No.	Serial No.
- EXO Optical DO Sensor, Ti	599100-01	17K101623
- EXO conductivity/Temperature Sensor, Ti	599870	17H103446
- EXO Turbuduty Sensor, Ti	599101-01	17K100331
- EXO pH Sensor Assembly, Guarded, Ti	599795-01	17K103099

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

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

PATRICK TSE
Laboratory Manager

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TEST REPORT

Test Report No.:	29678
Date of Issue:	2018-08-25
Date Received:	2018-08-25
Date Tested:	2018-08-25
Date Completed:	2018-08-25
Next Due Date:	2018-11-24

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	4.03	4.00 ± 0.10	Pass
pH QC buffer 6.86	6.89	6.86 ± 0.10	Pass
pH QC buffer 9.18	9.22	9.18 ± 0.10	Pass

D.O. performance checking

	Instrument Readings (mg/L)	Accetance Criteria	Comment
Zero DO soultion	0.05	<0.1mg/L	Pass

Winkler Titration value (mg/L)	Instrument Readings (mg/L)	Accetance Criteria	Comment
8.02	8.06	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	10.04	9.0-11.0	Pass
50 NTU	50.01	45.0-55.0	Pass
100 NTU	100.2	90.0-110.0	Pass

Depth performance checking

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

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

CALIBRATION CERTIFICATE

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

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: 11 April 2018

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

ALTAIR5X
CERTIFICATE OF CALIBRATION

Serial Number: 137333
Part Number: A-ALT5X-A-N-K-D-1-0-0-T-0-0-0

Factory Calibration Date: 06/18/18

Set Points

	METHANE 0-100.00 %LEL	O2 0-30.00 %VOL	CO 0-2000.00 PPM	H2S 0-200.00 PPM	NH3 0-100.00 PPM	
↓ (Low)	10.00 %LEL	19.50 %VOL	25.00 PPM	10.00 PPM	25.00 PPM	
↑ (High)	20.00 %LEL	23.00 %VOL	100.00 PPM	15.00 PPM	50.00 PPM	
STEL			100.00 PPM	15.00 PPM	35.00 PPM	
TWA			25.00 PPM	10.00 PPM	25.00 PPM	
Calibrated Value	Methane 1.452 %VOL	O2 15.07 %VOL	CO 60.41 PPM	H2S 19.29 PPM	NH3 25 PPM	
Cylinder Lot #	122-401120204-1	122-401120204-1	122-401120204-1	122-401120204-1	216662	

Calibration Certification
All applicable inspections, testing, and calibrations were performed using NIST traceable equipment, where available, in accordance with MSA's ISO 9001 Certified Quality System. Each material, component, and/or instrument must be installed, operated and maintained in strict accordance with its labels, cautions, warnings, instructions, and within the limitations stated in the supplied instruction manual. Routine calibration checks, equipment inspections, and applicable preventative maintenance measures must be performed to verify that the materials, components, and/or instruments are operating properly. Failure to perform these tasks on a routine basis, or suggested intervals, with specified equipment or methods, may result in inaccurate readings.

Conformance Statement
MSA certifies that the materials, components, and/or instruments delivered in this shipment conform to all applicable specifications. The items delivered have been processed through the appropriate approved document controlled procedures for Receiving, Manufacturing and Inspection. The materials, components, and/or instruments were inspected, tested, and calibrated, as applicable, per the associated drawings, standards requirements, and/or specifications, and were deemed acceptable by appropriate authorized personnel.

Process Certified By:

Jim Hoffman

JIM HOFFMAN
QUALITY ENGINEER

Calibrated By: S.Key

APPENDIX C
WEATHER INFORMATION

APPENDIX C –
WEATHER CONDITIONS DURING THE MONITORING PERIOD

I. General Information

Date	Mean Air Temperature (°C)	Mean Relative Humidity (%)	Precipitation (mm)
1 September 2018	25 - 27.9	93–	32
2 September 2018	24.6 - 29.9	88	9.8
3 September 2018	25.6 - 30.5	82	0.3
4 September 2018	27 - 32	80	-
5 September 2018	27.9 - 33.1	79	0.1
6 September 2018	28.2 - 31.8	82	-
7 September 2018	28 - 31.2	80	Trace
8 September 2018	25.6 - 29.6	81	24.6
9 September 2018	24.6 - 30.5	76	16.7
10 September 2018	24.3 - 28.3	80	0.2
11 September 2018	25.2 - 32.7	65	-
12 September 2018	26.9 - 28.7	78	Trace
13 September 2018	26.3 - 30.3	84	2.5
14 September 2018	26.7 - 31.7	78	-
15 September 2018	26.8 - 35.1	65	Trace
16 September 2018	23.6 - 31.8	86	167.5
17 September 2018	25.8 - 30.4	89	12
18 September 2018	26.5 - 31.8	85	1.2
19 September 2018	26.2 - 31.4	77	-

APPENDIX C –
WEATHER CONDITIONS DURING THE MONITORING PERIOD

I. General Information

Date	Mean Air Temperature (°C)	Mean Relative Humidity (%)	Precipitation (mm)
20 September 2018	27 - 31.9	77	-
21 September 2018	27.4 - 31.9	71	-
22 September 2018	27 - 33.2	76	-
23 September 2018	27.6 - 32.4	78	Trace
24 September 2018	24.8 - 29.6	88	72.2
25 September 2018	24.8 - 30.2	80	34.5
26 September 2018	25.1 - 28.6	81	9.7
27 September 2018	26 - 30.2	77	Trace
28 September 2018	25.8 - 31.3	70	-
29 September 2018	24.3 - 31.3	60	-
30 September 2018	25 - 30.6	60	-

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

** Trace means rainfall less than 0.05 mm

APPENDIX C –
WEATHER CONDITIONS DURING THE MONITORING PERIOD

II. Mean Wind Speed and Wind Direction

Date	Time	Wind Speed m/s	Direction
1-Sep-2018	00:00	1.5	SW
1-Sep-2018	01:00	1.5	SW
1-Sep-2018	02:00	1.4	W
1-Sep-2018	03:00	1.4	SW
1-Sep-2018	04:00	1.4	SSW
1-Sep-2018	05:00	1.5	NE
1-Sep-2018	06:00	1.4	N
1-Sep-2018	07:00	1.8	W
1-Sep-2018	08:00	2.0	SW
1-Sep-2018	09:00	2.3	SSW
1-Sep-2018	10:00	2.3	S
1-Sep-2018	11:00	2.7	NE
1-Sep-2018	12:00	3.3	NE
1-Sep-2018	13:00	3.1	ENE
1-Sep-2018	14:00	2.8	ENE
1-Sep-2018	15:00	2.6	W
1-Sep-2018	16:00	2.6	WSW
1-Sep-2018	17:00	2.1	W
1-Sep-2018	18:00	1.7	W
1-Sep-2018	19:00	1.2	W
1-Sep-2018	20:00	1.1	W
1-Sep-2018	21:00	1.1	W
1-Sep-2018	22:00	1.2	W
1-Sep-2018	23:00	1.2	W
2-Sep-2018	00:00	1.2	W
2-Sep-2018	01:00	1.3	NNW
2-Sep-2018	02:00	1.5	WSW
2-Sep-2018	03:00	1.3	WSW
2-Sep-2018	04:00	1.3	WSW
2-Sep-2018	05:00	1.2	WSW
2-Sep-2018	06:00	1.2	WSW
2-Sep-2018	07:00	1.2	WSW
2-Sep-2018	08:00	1.1	WSW
2-Sep-2018	09:00	1.7	WSW
2-Sep-2018	10:00	1.9	WSW
2-Sep-2018	11:00	2.3	WSW
2-Sep-2018	12:00	2.7	WSW

II. Mean Wind Speed and Wind Direction

2-Sep-2018	13:00	2.6	W
2-Sep-2018	14:00	2.4	WNW
2-Sep-2018	15:00	2.1	W
2-Sep-2018	16:00	2.3	W
2-Sep-2018	17:00	2.3	SW
2-Sep-2018	18:00	1.9	SW
2-Sep-2018	19:00	1.4	SSW
2-Sep-2018	20:00	1.3	WSW
2-Sep-2018	21:00	1.3	W
2-Sep-2018	22:00	1.6	NE
2-Sep-2018	23:00	1.4	E
3-Sep-2018	00:00	1.4	WSW
3-Sep-2018	01:00	1.4	SW
3-Sep-2018	02:00	1.6	SW
3-Sep-2018	03:00	1.7	SW
3-Sep-2018	04:00	1.9	WSW
3-Sep-2018	05:00	1.7	SW
3-Sep-2018	06:00	1.7	SW
3-Sep-2018	07:00	1.5	SW
3-Sep-2018	08:00	1.6	SW
3-Sep-2018	09:00	1.9	SW
3-Sep-2018	10:00	2.3	W
3-Sep-2018	11:00	2.6	WNW
3-Sep-2018	12:00	2.3	WNW
3-Sep-2018	13:00	2.3	WNW
3-Sep-2018	14:00	2.4	W
3-Sep-2018	15:00	2.5	W
3-Sep-2018	16:00	2.3	W
3-Sep-2018	17:00	1.7	WNW
3-Sep-2018	18:00	1.6	W
3-Sep-2018	19:00	1.5	W
3-Sep-2018	20:00	1.1	W
3-Sep-2018	21:00	0.9	WNW
3-Sep-2018	22:00	1.1	W
3-Sep-2018	23:00	1.1	W
4-Sep-2018	00:00	1.5	W
4-Sep-2018	01:00	1.4	W
4-Sep-2018	02:00	1.7	WNW

II. Mean Wind Speed and Wind Direction

4-Sep-2018	03:00	1.7	WNW
4-Sep-2018	04:00	1.8	WNW
4-Sep-2018	05:00	2.2	W
4-Sep-2018	06:00	2.1	WNW
4-Sep-2018	07:00	2.2	WNW
4-Sep-2018	08:00	2.3	WNW
4-Sep-2018	09:00	2.8	WNW
4-Sep-2018	10:00	3.0	WNW
4-Sep-2018	11:00	3.2	WNW
4-Sep-2018	12:00	3.3	W
4-Sep-2018	13:00	3.2	WNW
4-Sep-2018	14:00	3.1	WNW
4-Sep-2018	15:00	2.9	WNW
4-Sep-2018	16:00	2.7	WNW
4-Sep-2018	17:00	2.7	WNW
4-Sep-2018	18:00	2.3	WNW
4-Sep-2018	19:00	2.0	WNW
4-Sep-2018	20:00	1.7	W
4-Sep-2018	21:00	1.7	WSW
4-Sep-2018	22:00	2.0	WSW
4-Sep-2018	23:00	1.9	W
5-Sep-2018	00:00	2.2	W
5-Sep-2018	01:00	2.0	NW
5-Sep-2018	02:00	1.8	NNW
5-Sep-2018	03:00	2.1	W
5-Sep-2018	04:00	2.0	NE
5-Sep-2018	05:00	2.3	W
5-Sep-2018	06:00	2.0	ENE
5-Sep-2018	07:00	2.0	NE
5-Sep-2018	08:00	2.5	ENE
5-Sep-2018	09:00	2.8	ENE
5-Sep-2018	10:00	2.7	E
5-Sep-2018	11:00	2.8	E
5-Sep-2018	12:00	2.9	E
5-Sep-2018	13:00	3.1	E
5-Sep-2018	14:00	3.2	S
5-Sep-2018	15:00	3.4	E
5-Sep-2018	16:00	3.1	NNE

II. Mean Wind Speed and Wind Direction

5-Sep-2018	17:00	2.7	ENE
5-Sep-2018	18:00	2.7	SW
5-Sep-2018	19:00	2.0	ENE
5-Sep-2018	20:00	2.0	SW
5-Sep-2018	21:00	1.8	WSW
5-Sep-2018	22:00	2.2	SSW
5-Sep-2018	23:00	2.1	SW
6-Sep-2018	00:00	2.8	SW
6-Sep-2018	01:00	2.5	SW
6-Sep-2018	02:00	2.3	SSW
6-Sep-2018	03:00	2.6	WSW
6-Sep-2018	04:00	2.6	WSW
6-Sep-2018	05:00	2.9	SW
6-Sep-2018	06:00	3.1	SW
6-Sep-2018	07:00	2.9	SW
6-Sep-2018	08:00	3.4	SW
6-Sep-2018	09:00	3.2	SW
6-Sep-2018	10:00	3.5	WSW
6-Sep-2018	11:00	4.0	WSW
6-Sep-2018	12:00	4.2	WSW
6-Sep-2018	13:00	3.3	W
6-Sep-2018	14:00	3.7	WNW
6-Sep-2018	15:00	3.6	W
6-Sep-2018	16:00	4.2	WNW
6-Sep-2018	17:00	3.6	SSW
6-Sep-2018	18:00	3.6	SW
6-Sep-2018	19:00	3.3	WSW
6-Sep-2018	20:00	3.5	WSW
6-Sep-2018	21:00	3.2	SW
6-Sep-2018	22:00	3.6	WSW
6-Sep-2018	23:00	4.6	WSW
7-Sep-2018	00:00	5.5	SW
7-Sep-2018	01:00	4.7	SW
7-Sep-2018	02:00	4.7	SSW
7-Sep-2018	03:00	4.0	W
7-Sep-2018	04:00	4.2	W
7-Sep-2018	05:00	4.2	W
7-Sep-2018	06:00	4.8	W

II. Mean Wind Speed and Wind Direction

7-Sep-2018	07:00	4.2	W
7-Sep-2018	08:00	4.1	W
7-Sep-2018	09:00	4.1	SW
7-Sep-2018	10:00	4.4	WSW
7-Sep-2018	11:00	4.4	SW
7-Sep-2018	12:00	4.2	SW
7-Sep-2018	13:00	4.6	SW
7-Sep-2018	14:00	4.4	W
7-Sep-2018	15:00	4.6	W
7-Sep-2018	16:00	4.5	WNW
7-Sep-2018	17:00	4.2	W
7-Sep-2018	18:00	4.1	W
7-Sep-2018	19:00	3.6	WSW
7-Sep-2018	20:00	4.0	W
7-Sep-2018	21:00	3.6	WSW
7-Sep-2018	22:00	3.8	SW
7-Sep-2018	23:00	3.7	SW
8-Sep-2018	00:00	3.2	WSW
8-Sep-2018	01:00	3.6	WNW
8-Sep-2018	02:00	3.8	WNW
8-Sep-2018	03:00	3.4	WSW
8-Sep-2018	04:00	4.4	SW
8-Sep-2018	05:00	4.0	SW
8-Sep-2018	06:00	4.8	SW
8-Sep-2018	07:00	4.2	SW
8-Sep-2018	08:00	4.1	SW
8-Sep-2018	09:00	4.0	SW
8-Sep-2018	10:00	4.3	WNW
8-Sep-2018	11:00	4.7	W
8-Sep-2018	12:00	4.4	WNW
8-Sep-2018	13:00	4.8	W
8-Sep-2018	14:00	4.4	W
8-Sep-2018	15:00	4.6	W
8-Sep-2018	16:00	4.3	W
8-Sep-2018	17:00	4.2	W
8-Sep-2018	18:00	3.9	WNW
8-Sep-2018	19:00	3.8	W
8-Sep-2018	20:00	3.3	W

II. Mean Wind Speed and Wind Direction

8-Sep-2018	21:00	3.4	WNW
8-Sep-2018	22:00	3.9	W
8-Sep-2018	23:00	3.5	SSW
9-Sep-2018	00:00	3.6	WSW
9-Sep-2018	01:00	3.4	WSW
9-Sep-2018	02:00	3.7	WSW
9-Sep-2018	03:00	3.8	SW
9-Sep-2018	04:00	3.7	SW
9-Sep-2018	05:00	3.1	SW
9-Sep-2018	06:00	2.9	SW
9-Sep-2018	07:00	3.3	W
9-Sep-2018	08:00	3.3	W
9-Sep-2018	09:00	3.5	WSW
9-Sep-2018	10:00	3.7	WSW
9-Sep-2018	11:00	3.4	SW
9-Sep-2018	12:00	3.0	SW
9-Sep-2018	13:00	2.9	WSW
9-Sep-2018	14:00	1.9	W
9-Sep-2018	15:00	2.5	W
9-Sep-2018	16:00	2.6	W
9-Sep-2018	17:00	2.8	WNW
9-Sep-2018	18:00	1.5	WSW
9-Sep-2018	19:00	0.6	W
9-Sep-2018	20:00	0.5	SW
9-Sep-2018	21:00	0.6	SW
9-Sep-2018	22:00	0.6	WSW
9-Sep-2018	23:00	0.6	WSW
10-Sep-2018	00:00	0.6	SW
10-Sep-2018	01:00	0.4	WSW
10-Sep-2018	02:00	0.4	SW
10-Sep-2018	03:00	0.3	WSW
10-Sep-2018	04:00	0.3	SW
10-Sep-2018	05:00	0.3	WNW
10-Sep-2018	06:00	0.3	SW
10-Sep-2018	07:00	0.4	SW
10-Sep-2018	08:00	0.4	WSW
10-Sep-2018	09:00	0.6	SW
10-Sep-2018	10:00	1.5	SSW

II. Mean Wind Speed and Wind Direction

10-Sep-2018	11:00	2.2	SSW
10-Sep-2018	12:00	2.5	SSW
10-Sep-2018	13:00	2.3	WSW
10-Sep-2018	14:00	1.9	SW
10-Sep-2018	15:00	1.3	SW
10-Sep-2018	16:00	1.5	SW
10-Sep-2018	17:00	1.8	SW
10-Sep-2018	18:00	0.9	SW
10-Sep-2018	19:00	0.7	W
10-Sep-2018	20:00	1.0	WNW
10-Sep-2018	21:00	1.3	SW
10-Sep-2018	22:00	1.9	SW
10-Sep-2018	23:00	2.0	SW
11-Sep-2018	00:00	1.5	SW
11-Sep-2018	01:00	1.6	WNW
11-Sep-2018	02:00	1.2	W
11-Sep-2018	03:00	1.0	WNW
11-Sep-2018	04:00	1.2	W
11-Sep-2018	05:00	1.4	W
11-Sep-2018	06:00	1.5	W
11-Sep-2018	07:00	1.5	SW
11-Sep-2018	08:00	1.4	SW
11-Sep-2018	09:00	1.5	W
11-Sep-2018	10:00	2.5	WSW
11-Sep-2018	11:00	3.7	WSW
11-Sep-2018	12:00	3.2	W
11-Sep-2018	13:00	3.2	W
11-Sep-2018	14:00	2.9	WNW
11-Sep-2018	15:00	3.9	WNW
11-Sep-2018	16:00	3.9	WSW
11-Sep-2018	17:00	2.2	WNW
11-Sep-2018	18:00	1.5	WNW
11-Sep-2018	19:00	1.4	SW
11-Sep-2018	20:00	2.0	WSW
11-Sep-2018	21:00	2.0	WSW
11-Sep-2018	22:00	2.0	W
11-Sep-2018	23:00	2.4	SW
12-Sep-2018	00:00	3.2	WSW

II. Mean Wind Speed and Wind Direction

12-Sep-2018	01:00	1.9	WSW
12-Sep-2018	02:00	1.2	WNW
12-Sep-2018	03:00	1.4	SW
12-Sep-2018	04:00	1.4	WNW
12-Sep-2018	05:00	1.2	W
12-Sep-2018	06:00	1.0	ESE
12-Sep-2018	07:00	1.9	SE
12-Sep-2018	08:00	1.7	SE
12-Sep-2018	09:00	3.0	E
12-Sep-2018	10:00	3.9	NW
12-Sep-2018	11:00	3.9	W
12-Sep-2018	12:00	3.4	SSW
12-Sep-2018	13:00	3.4	SSW
12-Sep-2018	14:00	3.2	SE
12-Sep-2018	15:00	3.2	ESE
12-Sep-2018	16:00	3.9	ESE
12-Sep-2018	17:00	2.4	ESE
12-Sep-2018	18:00	2.0	ESE
12-Sep-2018	19:00	3.0	SE
12-Sep-2018	20:00	3.4	SE
12-Sep-2018	21:00	3.7	ESE
12-Sep-2018	22:00	4.1	SSE
12-Sep-2018	23:00	2.4	SSE
13-Sep-2018	00:00	1.7	S
13-Sep-2018	01:00	1.7	WSW
13-Sep-2018	02:00	1.4	SW
13-Sep-2018	03:00	1.4	N
13-Sep-2018	04:00	1.7	N
13-Sep-2018	05:00	1.7	NE
13-Sep-2018	06:00	1.7	E
13-Sep-2018	07:00	1.5	S
13-Sep-2018	08:00	1.5	SE
13-Sep-2018	09:00	1.4	SE
13-Sep-2018	10:00	1.4	SE
13-Sep-2018	11:00	2.3	SE
13-Sep-2018	12:00	2.2	SE
13-Sep-2018	13:00	2.6	SE
13-Sep-2018	14:00	2.1	SE

II. Mean Wind Speed and Wind Direction

13-Sep-2018	15:00	2.5	SE
13-Sep-2018	16:00	2.8	SE
13-Sep-2018	17:00	2.6	SE
13-Sep-2018	18:00	3.0	SSW
13-Sep-2018	19:00	2.5	SSW
13-Sep-2018	20:00	2.6	S
13-Sep-2018	21:00	1.7	SSE
13-Sep-2018	22:00	1.8	S
13-Sep-2018	23:00	2.6	S
14-Sep-2018	00:00	3.0	SE
14-Sep-2018	01:00	2.8	SSE
14-Sep-2018	02:00	2.8	SSE
14-Sep-2018	03:00	3.6	SE
14-Sep-2018	04:00	2.8	NE
14-Sep-2018	05:00	2.5	N
14-Sep-2018	06:00	2.2	N
14-Sep-2018	07:00	3.6	SE
14-Sep-2018	08:00	4.5	S
14-Sep-2018	09:00	4.6	SSE
14-Sep-2018	10:00	3.5	SE
14-Sep-2018	11:00	3.2	SE
14-Sep-2018	12:00	3.5	SE
14-Sep-2018	13:00	4.6	SE
14-Sep-2018	14:00	4.0	SE
14-Sep-2018	15:00	3.6	SE
14-Sep-2018	16:00	3.9	SE
14-Sep-2018	17:00	3.9	SE
14-Sep-2018	18:00	2.8	SE
14-Sep-2018	19:00	2.1	SE
14-Sep-2018	20:00	2.0	SE
14-Sep-2018	21:00	1.3	SE
14-Sep-2018	22:00	1.2	SSW
14-Sep-2018	23:00	1.8	SSE
15-Sep-2018	00:00	1.8	NE
15-Sep-2018	01:00	2.3	SSE
15-Sep-2018	02:00	2.6	SE
15-Sep-2018	03:00	3.2	SE
15-Sep-2018	04:00	2.9	NE

II. Mean Wind Speed and Wind Direction

15-Sep-2018	05:00	3.3	ENE
15-Sep-2018	06:00	3.3	E
15-Sep-2018	07:00	2.9	W
15-Sep-2018	08:00	2.9	W
15-Sep-2018	09:00	3.5	SE
15-Sep-2018	10:00	4.0	SE
15-Sep-2018	11:00	4.7	E
15-Sep-2018	12:00	4.6	NNE
15-Sep-2018	13:00	4.1	ENE
15-Sep-2018	14:00	4.6	N
15-Sep-2018	15:00	4.3	NNE
15-Sep-2018	16:00	4.1	NE
15-Sep-2018	17:00	2.5	ESE
15-Sep-2018	18:00	3.7	ESE
15-Sep-2018	19:00	2.4	N
15-Sep-2018	20:00	2.5	NE
15-Sep-2018	21:00	2.1	NE
15-Sep-2018	22:00	2.5	E
15-Sep-2018	23:00	2.5	NE
16-Sep-2018	00:00	3.2	NE
16-Sep-2018	01:00	3.9	NE
16-Sep-2018	02:00	4.1	NE
16-Sep-2018	03:00	4.3	NE
16-Sep-2018	04:00	4.3	E
16-Sep-2018	05:00	8.1	ESE
16-Sep-2018	06:00	5.4	E
16-Sep-2018	07:00	5.4	ESE
16-Sep-2018	08:00	5.7	SE
16-Sep-2018	09:00	8.4	SE
16-Sep-2018	10:00	9.9	NNE
16-Sep-2018	11:00	9.9	E
16-Sep-2018	12:00	11.4	E
16-Sep-2018	13:00	12.6	ESE
16-Sep-2018	14:00	10.8	ESE
16-Sep-2018	15:00	8.4	SE
16-Sep-2018	16:00	8.1	ESE
16-Sep-2018	17:00	9.9	E
16-Sep-2018	18:00	6.3	SSW

II. Mean Wind Speed and Wind Direction

16-Sep-2018	19:00	4.8	WNW
16-Sep-2018	20:00	3.3	W
16-Sep-2018	21:00	6.3	NNE
16-Sep-2018	22:00	4.5	NE
16-Sep-2018	23:00	5.7	E
17-Sep-2018	00:00	5.2	E
17-Sep-2018	01:00	5.5	SE
17-Sep-2018	02:00	4.8	SE
17-Sep-2018	03:00	5.9	E
17-Sep-2018	04:00	4.8	ENE
17-Sep-2018	05:00	5.2	ENE
17-Sep-2018	06:00	4.1	ENE
17-Sep-2018	07:00	5.9	E
17-Sep-2018	08:00	8.4	ESE
17-Sep-2018	09:00	6.1	E
17-Sep-2018	10:00	4.2	E
17-Sep-2018	11:00	4.5	N
17-Sep-2018	12:00	4.7	E
17-Sep-2018	13:00	4.7	SE
17-Sep-2018	14:00	4.2	ESE
17-Sep-2018	15:00	4.2	E
17-Sep-2018	16:00	3.8	E
17-Sep-2018	17:00	3.8	ESE
17-Sep-2018	18:00	3.2	E
17-Sep-2018	19:00	2.4	NE
17-Sep-2018	20:00	2.3	SE
17-Sep-2018	21:00	1.6	SE
17-Sep-2018	22:00	1.8	SE
17-Sep-2018	23:00	1.8	N
18-Sep-2018	00:00	1.6	W
18-Sep-2018	01:00	1.7	SW
18-Sep-2018	02:00	2.3	W
18-Sep-2018	03:00	3.3	SSW
18-Sep-2018	04:00	3.3	SE
18-Sep-2018	05:00	3.9	NNE
18-Sep-2018	06:00	3.4	NE
18-Sep-2018	07:00	2.1	NE
18-Sep-2018	08:00	2.8	ESE

II. Mean Wind Speed and Wind Direction

18-Sep-2018	09:00	3.5	SE
18-Sep-2018	10:00	4.2	SSW
18-Sep-2018	11:00	4.7	SSW
18-Sep-2018	12:00	4.6	SSW
18-Sep-2018	13:00	4.1	S
18-Sep-2018	14:00	4.1	SSW
18-Sep-2018	15:00	4.2	ENE
18-Sep-2018	16:00	4.4	SE
18-Sep-2018	17:00	4.5	ESE
18-Sep-2018	18:00	4.3	NE
18-Sep-2018	19:00	3.0	NE
18-Sep-2018	20:00	3.6	ESE
18-Sep-2018	21:00	2.7	S
18-Sep-2018	22:00	1.5	SE
18-Sep-2018	23:00	1.9	S
19-Sep-2018	00:00	2.9	SSW
19-Sep-2018	01:00	3.6	SSW
19-Sep-2018	02:00	2.7	SSW
19-Sep-2018	03:00	3.0	SSW
19-Sep-2018	04:00	2.0	S
19-Sep-2018	05:00	1.7	W
19-Sep-2018	06:00	1.3	NE
19-Sep-2018	07:00	1.9	W
19-Sep-2018	08:00	3.6	WNW
19-Sep-2018	09:00	3.3	W
19-Sep-2018	10:00	3.9	WNW
19-Sep-2018	11:00	4.1	SSW
19-Sep-2018	12:00	4.6	SSW
19-Sep-2018	13:00	4.2	WSW
19-Sep-2018	14:00	4.0	SW
19-Sep-2018	15:00	3.8	W
19-Sep-2018	16:00	3.0	NW
19-Sep-2018	17:00	2.9	W
19-Sep-2018	18:00	1.7	NNE
19-Sep-2018	19:00	1.2	NNE
19-Sep-2018	20:00	0.7	SSW
19-Sep-2018	21:00	1.1	SW
19-Sep-2018	22:00	2.1	SW

II. Mean Wind Speed and Wind Direction

19-Sep-2018	23:00	1.6	W
20-Sep-2018	00:00	1.9	W
20-Sep-2018	01:00	1.3	SSW
20-Sep-2018	02:00	1.1	W
20-Sep-2018	03:00	1.7	WNW
20-Sep-2018	04:00	2.1	W
20-Sep-2018	05:00	2.7	W
20-Sep-2018	06:00	2.1	W
20-Sep-2018	07:00	2.5	W
20-Sep-2018	08:00	3.3	SW
20-Sep-2018	09:00	3.6	WNW
20-Sep-2018	10:00	4.5	NE
20-Sep-2018	11:00	4.7	ENE
20-Sep-2018	12:00	4.4	N
20-Sep-2018	13:00	3.7	W
20-Sep-2018	14:00	3.9	WSW
20-Sep-2018	15:00	3.4	ENE
20-Sep-2018	16:00	3.6	ENE
20-Sep-2018	17:00	3.3	N
20-Sep-2018	18:00	2.7	N
20-Sep-2018	19:00	2.1	SSW
20-Sep-2018	20:00	1.4	WSW
20-Sep-2018	21:00	2.2	WNW
20-Sep-2018	22:00	3.3	S
20-Sep-2018	23:00	3.3	W
21-Sep-2018	00:00	3.0	NE
21-Sep-2018	01:00	2.4	NNE
21-Sep-2018	02:00	1.6	N
21-Sep-2018	03:00	2.0	ENE
21-Sep-2018	04:00	2.5	NW
21-Sep-2018	05:00	2.5	WSW
21-Sep-2018	06:00	2.6	SW
21-Sep-2018	07:00	2.9	WSW
21-Sep-2018	08:00	3.2	SSW
21-Sep-2018	09:00	3.8	ENE
21-Sep-2018	10:00	4.7	ENE
21-Sep-2018	11:00	3.9	ENE
21-Sep-2018	12:00	4.4	N

II. Mean Wind Speed and Wind Direction

21-Sep-2018	13:00	3.8	ENE
21-Sep-2018	14:00	3.8	NE
21-Sep-2018	15:00	3.1	NNE
21-Sep-2018	16:00	2.5	NE
21-Sep-2018	17:00	2.7	ENE
21-Sep-2018	18:00	1.8	NE
21-Sep-2018	19:00	1.7	NNE
21-Sep-2018	20:00	1.4	NNE
21-Sep-2018	21:00	2.1	W
21-Sep-2018	22:00	2.3	W
21-Sep-2018	23:00	1.9	W
22-Sep-2018	00:00	2.1	SW
22-Sep-2018	01:00	2.6	SW
22-Sep-2018	02:00	3.0	NNE
22-Sep-2018	03:00	2.6	ENE
22-Sep-2018	04:00	1.9	NNE
22-Sep-2018	05:00	2.6	E
22-Sep-2018	06:00	2.6	E
22-Sep-2018	07:00	1.9	ENE
22-Sep-2018	08:00	2.5	NNW
22-Sep-2018	09:00	3.5	W
22-Sep-2018	10:00	4.1	WNW
22-Sep-2018	11:00	4.3	NNE
22-Sep-2018	12:00	4.3	NW
22-Sep-2018	13:00	3.9	SSW
22-Sep-2018	14:00	2.9	S
22-Sep-2018	15:00	3.2	W
22-Sep-2018	16:00	2.9	W
22-Sep-2018	17:00	2.5	W
22-Sep-2018	18:00	1.6	SSE
22-Sep-2018	19:00	1.2	WSW
22-Sep-2018	20:00	1.2	S
22-Sep-2018	21:00	1.1	NW
22-Sep-2018	22:00	0.9	SW
22-Sep-2018	23:00	1.2	ESE
23-Sep-2018	00:00	1.1	SSW
23-Sep-2018	01:00	1.1	SE
23-Sep-2018	02:00	1.1	ESE

II. Mean Wind Speed and Wind Direction

23-Sep-2018	03:00	1.2	ENE
23-Sep-2018	04:00	1.1	ESE
23-Sep-2018	05:00	1.9	ESE
23-Sep-2018	06:00	2.3	SSE
23-Sep-2018	07:00	3.3	ESE
23-Sep-2018	08:00	3.0	WNW
23-Sep-2018	09:00	3.7	E
23-Sep-2018	10:00	3.4	NNE
23-Sep-2018	11:00	3.2	SSE
23-Sep-2018	12:00	2.5	NE
23-Sep-2018	13:00	3.6	ESE
23-Sep-2018	14:00	3.5	SW
23-Sep-2018	15:00	3.1	W
23-Sep-2018	16:00	2.7	NE
23-Sep-2018	17:00	2.2	NE
23-Sep-2018	18:00	2.0	ENE
23-Sep-2018	19:00	1.8	SW
23-Sep-2018	20:00	1.8	SSW
23-Sep-2018	21:00	1.8	SE
23-Sep-2018	22:00	1.9	ESE
23-Sep-2018	23:00	2.0	ESE
24-Sep-2018	00:00	2.0	ESE
24-Sep-2018	01:00	2.0	SE
24-Sep-2018	02:00	2.1	SSE
24-Sep-2018	03:00	2.0	SE
24-Sep-2018	04:00	2.0	ESE
24-Sep-2018	05:00	1.9	ESE
24-Sep-2018	06:00	1.5	E
24-Sep-2018	07:00	1.3	ESE
24-Sep-2018	08:00	3.1	NNE
24-Sep-2018	09:00	4.1	ENE
24-Sep-2018	10:00	4.6	NE
24-Sep-2018	11:00	4.2	ENE
24-Sep-2018	12:00	4.3	NNE
24-Sep-2018	13:00	4.7	NE
24-Sep-2018	14:00	4.3	SE
24-Sep-2018	15:00	4.5	SSE
24-Sep-2018	16:00	3.8	WNW

II. Mean Wind Speed and Wind Direction

24-Sep-2018	17:00	2.8	W
24-Sep-2018	18:00	2.9	WSW
24-Sep-2018	19:00	2.3	ENE
24-Sep-2018	20:00	1.8	E
24-Sep-2018	21:00	1.9	SE
24-Sep-2018	22:00	1.8	W
24-Sep-2018	23:00	2.2	WSW
25-Sep-2018	00:00	1.9	WSW
25-Sep-2018	01:00	1.7	ESE
25-Sep-2018	02:00	1.8	WNW
25-Sep-2018	03:00	1.5	WNW
25-Sep-2018	04:00	1.6	N
25-Sep-2018	05:00	1.6	NE
25-Sep-2018	06:00	1.6	SSE
25-Sep-2018	07:00	1.6	SSE
25-Sep-2018	08:00	1.6	ENE
25-Sep-2018	09:00	2.4	NE
25-Sep-2018	10:00	4.0	WSW
25-Sep-2018	11:00	4.5	NE
25-Sep-2018	12:00	4.3	NE
25-Sep-2018	13:00	3.4	ENE
25-Sep-2018	14:00	3.9	ENE
25-Sep-2018	15:00	3.4	SSE
25-Sep-2018	16:00	4.1	ENE
25-Sep-2018	17:00	3.2	NNE
25-Sep-2018	18:00	3.4	ENE
25-Sep-2018	19:00	2.6	NNE
25-Sep-2018	20:00	1.9	SSW
25-Sep-2018	21:00	1.0	SSW
25-Sep-2018	22:00	1.1	SSE
25-Sep-2018	23:00	1.2	SE
26-Sep-2018	00:00	3.2	SE
26-Sep-2018	01:00	3.4	ENE
26-Sep-2018	02:00	3.5	ESE
26-Sep-2018	03:00	2.8	ESE
26-Sep-2018	04:00	2.2	SSE
26-Sep-2018	05:00	2.6	SSE
26-Sep-2018	06:00	2.7	SE

II. Mean Wind Speed and Wind Direction

26-Sep-2018	07:00	2.6	NE
26-Sep-2018	08:00	2.9	ESE
26-Sep-2018	09:00	3.0	ESE
26-Sep-2018	10:00	2.6	WNW
26-Sep-2018	11:00	2.8	NW
26-Sep-2018	12:00	3.6	W
26-Sep-2018	13:00	3.9	SW
26-Sep-2018	14:00	4.1	W
26-Sep-2018	15:00	4.0	ENE
26-Sep-2018	16:00	4.2	SSW
26-Sep-2018	17:00	4.0	NE
26-Sep-2018	18:00	2.7	NNE
26-Sep-2018	19:00	2.3	SE
26-Sep-2018	20:00	2.1	ESE
26-Sep-2018	21:00	1.7	SSE
26-Sep-2018	22:00	1.6	ESE
26-Sep-2018	23:00	1.2	ENE
27-Sep-2018	00:00	1.2	NW
27-Sep-2018	01:00	1.1	NE
27-Sep-2018	02:00	1.1	NE
27-Sep-2018	03:00	1.3	ESE
27-Sep-2018	04:00	1.1	NE
27-Sep-2018	05:00	1.2	NE
27-Sep-2018	06:00	0.9	NNE
27-Sep-2018	07:00	1.2	E
27-Sep-2018	08:00	1.5	S
27-Sep-2018	09:00	2.5	WNW
27-Sep-2018	10:00	2.9	WNW
27-Sep-2018	11:00	3.0	WNW
27-Sep-2018	12:00	3.1	S
27-Sep-2018	13:00	2.7	SW
27-Sep-2018	14:00	2.6	NNE
27-Sep-2018	15:00	3.1	NNE
27-Sep-2018	16:00	2.7	ENE
27-Sep-2018	17:00	1.6	ESE
27-Sep-2018	18:00	1.1	NE
27-Sep-2018	19:00	1.0	N
27-Sep-2018	20:00	0.9	NE

II. Mean Wind Speed and Wind Direction

27-Sep-2018	21:00	1.3	NE
27-Sep-2018	22:00	1.0	SE
27-Sep-2018	23:00	1.1	ENE
28-Sep-2018	00:00	1.1	ESE
28-Sep-2018	01:00	1.1	NE
28-Sep-2018	02:00	1.6	NNE
28-Sep-2018	03:00	1.1	NE
28-Sep-2018	04:00	1.1	NE
28-Sep-2018	05:00	1.1	SSW
28-Sep-2018	06:00	1.2	NNE
28-Sep-2018	07:00	1.3	NNE
28-Sep-2018	08:00	1.5	NNE
28-Sep-2018	09:00	2.5	N
28-Sep-2018	10:00	3.1	SE
28-Sep-2018	11:00	3.6	ESE
28-Sep-2018	12:00	3.3	E
28-Sep-2018	13:00	2.9	ENE
28-Sep-2018	14:00	2.1	NNE
28-Sep-2018	15:00	3.0	ENE
28-Sep-2018	16:00	2.8	W
28-Sep-2018	17:00	2.9	WNW
28-Sep-2018	18:00	2.3	WNW
28-Sep-2018	19:00	2.2	SW
28-Sep-2018	20:00	3.0	W
28-Sep-2018	21:00	3.3	SW
28-Sep-2018	22:00	3.2	SW
28-Sep-2018	23:00	3.4	W
29-Sep-2018	00:00	3.6	WNW
29-Sep-2018	01:00	3.8	WSW
29-Sep-2018	02:00	3.8	WNW
29-Sep-2018	03:00	3.9	SW
29-Sep-2018	04:00	4.3	WNW
29-Sep-2018	05:00	4.2	WNW
29-Sep-2018	06:00	3.3	WNW
29-Sep-2018	07:00	3.3	SSW
29-Sep-2018	08:00	3.6	SSW
29-Sep-2018	09:00	3.6	WSW
29-Sep-2018	10:00	4.6	SW

II. Mean Wind Speed and Wind Direction

29-Sep-2018	11:00	4.7	WNW
29-Sep-2018	12:00	4.3	WSW
29-Sep-2018	13:00	4.4	SSW
29-Sep-2018	14:00	3.6	WNW
29-Sep-2018	15:00	3.4	WSW
29-Sep-2018	16:00	3.9	WSW
29-Sep-2018	17:00	3.6	WSW
29-Sep-2018	18:00	3.4	WSW
29-Sep-2018	19:00	2.8	SW
29-Sep-2018	20:00	3.3	NW
29-Sep-2018	21:00	2.5	WSW
29-Sep-2018	22:00	2.1	WSW
29-Sep-2018	23:00	2.7	SSW
30-Sep-2018	00:00	3.0	SSW
30-Sep-2018	01:00	2.7	SW
30-Sep-2018	02:00	2.6	W
30-Sep-2018	03:00	3.7	WSW
30-Sep-2018	04:00	2.8	SSW
30-Sep-2018	05:00	2.6	WSW
30-Sep-2018	06:00	2.1	WSW
30-Sep-2018	07:00	1.8	WSW
30-Sep-2018	08:00	1.4	SW
30-Sep-2018	09:00	3.0	WSW
30-Sep-2018	10:00	3.3	SW
30-Sep-2018	11:00	4.3	SW
30-Sep-2018	12:00	4.2	SSW
30-Sep-2018	13:00	4.1	W
30-Sep-2018	14:00	4.1	WSW
30-Sep-2018	15:00	2.5	N
30-Sep-2018	16:00	2.0	WNW
30-Sep-2018	17:00	1.3	WNW
30-Sep-2018	18:00	1.3	WNW
30-Sep-2018	19:00	1.2	SSW
30-Sep-2018	20:00	1.3	W
30-Sep-2018	21:00	1.2	W
30-Sep-2018	22:00	1.7	WSW
30-Sep-2018	23:00	1.2	SSW

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 (September 2018)

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

Remark: Daytime noise monitoring on 16 Sep was cancelled due to Hurricane Signal No.10

Air Quality Monitoring Station

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

Noise Monitoring Station

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

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

Agreement No. CE/59/2015 (EP)
Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction
Impact Water Quality Monitoring Schedule (September 2018)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1-Sep
2-Sep	3-Sep	4-Sep	5-Sep	6-Sep	7-Sep	8-Sep
		Mid-Ebb 07:09 Mid-Flood 14:09		Mid-Ebb 09:24 Mid-Flood 16:45		Mid-Ebb 11:11 Mid-Flood 18:07
9-Sep	10-Sep	11-Sep	12-Sep	13-Sep	14-Sep	15-Sep
	Mid-Ebb 12:45 Mid-Flood 19:15		Mid-Flood 07:49		Mid-Flood 09:26 Mid-Ebb 15:32	
16-Sep	17-Sep	18-Sep	19-Sep	20-Sep	21-Sep	22-Sep
		Mid-Ebb 07:27 Mid-Flood 19:57		Mid-Ebb 09:14 Mid-Flood 17:06		Mid-Ebb 10:42 Mid-Flood 17:56
23-Sep	24-Sep	**25-Sep**	26-Sep	27-Sep	28-Sep	29-Sep
	Mid-Ebb 11:54 Mid-Flood 18:35		Mid-Ebb 13:04 Mid-Flood 19:20		Mid-Flood 08:17 Mid-Ebb 14:18	

Remarks: Due to Typhoon Signal No.3, the monitoring during Mid-Ebb was cancelled on 12 Sep.

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

Agreement No. CE/59/2015 (EP)
Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction
Impact Water Quality Monitoring Schedule in Temporary Marine Embayment (September 2018)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1-Sep
2-Sep	3-Sep	4-Sep	5-Sep	6-Sep	7-Sep	8-Sep
			Mid-Ebb 08:21 Mid-Flood 15:46			
9-Sep	10-Sep	11-Sep	12-Sep	13-Sep	14-Sep	15-Sep
				Mid-Flood 08:37 Mid-Ebb 14:50		
16-Sep	17-Sep	18-Sep	19-Sep	20-Sep	21-Sep	22-Sep
					Mid-Ebb 10:00 Mid-Flood 17:31	
23-Sep	24-Sep	**25-Sep**	26-Sep	27-Sep	28-Sep	29-Sep
				Mid-Flood 07:33 Mid-Ebb 13:41		
30-Sep						

Monitoring Station:
W1

Agreement No. CE/59/2015 (EP)
Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction
Impact Groundwater Quality Monitoring Schedule (September 2018)

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

Monitoring Location:
Stream 1, Stream 2, Stream 3

Agreement No. CE/59/2015 (EP)
Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction
Tentative Impact Air Quality and Noise Monitoring Schedule (October 2018)

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

The schedule may be changed due to unforeseen circumstances

Air Quality Monitoring Station

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

Noise Monitoring Station

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

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

Agreement No. CE/59/2015 (EP)
Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction
Tentative Impact Water Quality Monitoring Schedule (October 2018)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1-Oct	2-Oct	3-Oct	4-Oct	5-Oct	6-Oct
		Mid-Flood 12:34 Mid-Ebb 17:33		Mid-Ebb 07:58 Mid-Flood 15:37		Mid-Ebb 10:03 Mid-Flood 16:58
7-Oct	8-Oct	9-Oct	10-Oct	11-Oct	12-Oct	13-Oct
	Mid-Ebb 11:40 Mid-Flood 18:02		Mid-Ebb 13:06 Mid-Flood 19:04		Mid-Flood 08:27 Mid-Ebb 14:25	
14-Oct	15-Oct	16-Oct	**17-Oct**	18-Oct	19-Oct	20-Oct
	Mid-Ebb **03:55** Cancelled Mid-Flood 11:25			Mid-Ebb 07:27 Mid-Flood 16:01		Mid-Ebb 09:14 Mid-Flood 16:46
21-Oct	22-Oct	23-Oct	24-Oct	25-Oct	26-Oct	27-Oct
	Mid-Ebb 10:42 Mid-Flood 17:26		Mid-Ebb 12:01 Mid-Flood 18:08		Mid-Ebb 13:17 Mid-Flood 19:06	
28-Oct	29-Oct	30-Oct	31-Oct			
	Mid-Flood 09:58 Mid-Ebb 15:19		Mid-Flood 12:32 Mid-Ebb 17:06			

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

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

Agreement No. CE/59/2015 (EP)
Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction
Tentative Impact Water Quality Monitoring Schedule in Temporary Marine Embayment (October 2018)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1-Oct	2-Oct	3-Oct	4-Oct	5-Oct	6-Oct
					Mid-Ebb 09:06 Mid-Flood 16:21	
7-Oct	8-Oct	9-Oct	10-Oct	11-Oct	12-Oct	13-Oct
				Mid-Flood 07:41 Mid-Ebb 13:46		
14-Oct	15-Oct	16-Oct	**17-Oct**	18-Oct	19-Oct	20-Oct
					Mid-Ebb 08:25 Mid-Flood 16:22	
21-Oct	22-Oct	23-Oct	24-Oct	25-Oct	26-Oct	27-Oct
			Mid-Ebb 12:01 Mid-Flood 18:08			
28-Oct	29-Oct	30-Oct	31-Oct			
		Mid-Flood 11:09 Mid-Ebb 16:10				

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

Monitoring Station:
W1

Agreement No. CE/59/2015 (EP)
Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction
Tentative Impact Groundwater Quality Monitoring Schedule (October 2018)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1-Oct	2-Oct	3-Oct	4-Oct	5-Oct	6-Oct
7-Oct	8-Oct	9-Oct	10-Oct	11-Oct	12-Oct	13-Oct
				Groundwater Quality Monitoring		
14-Oct	15-Oct	16-Oct	**17-Oct**	18-Oct	19-Oct	20-Oct
21-Oct	22-Oct	23-Oct	24-Oct	25-Oct	26-Oct	27-Oct
			Groundwater Quality Monitoring			
28-Oct	29-Oct	30-Oct	31-Oct			

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

Monitoring Location:
Stream 1, Stream 2, Stream 3

APPENDIX E
1-HOUR TSP MONITORING RESULTS AND GRAPHICAL PRESENTATIONS

Appendix E - 1-hour TSP Monitoring Results

Location AM1 - Tin Hau Temple			
Date	Time	Weather	Particulate Concentration ($\mu g/m^3$)
4-Sep-18	9:00	Sunny	58.6
4-Sep-18	10:00	Sunny	60.9
4-Sep-18	11:00	Sunny	68.0
10-Sep-18	9:00	Cloudy	24.1
10-Sep-18	10:00	Cloudy	24.1
10-Sep-18	11:00	Cloudy	22.9
14-Sep-18	13:00	Cloudy	72.6
14-Sep-18	14:00	Cloudy	77.3
14-Sep-18	15:00	Cloudy	80.7
20-Sep-18	13:00	Sunny	75.5
20-Sep-18	14:00	Sunny	77.4
20-Sep-18	15:00	Sunny	85.5
26-Sep-18	9:00	Fine	177.3
26-Sep-18	10:00	Fine	173.2
26-Sep-18	11:00	Fine	168.7
		Average	83.1
		Maximum	177.3
		Minimum	22.9

Location AM2 - Sai Tso Wan Recreation Ground			
Date	Time	Weather	Particulate Concentration ($\mu g/m^3$)
4-Sep-18	13:00	Sunny	50.7
4-Sep-18	14:00	Sunny	54.0
4-Sep-18	15:00	Sunny	57.3
10-Sep-18	14:00	Cloudy	25.1
10-Sep-18	15:00	Cloudy	30.4
10-Sep-18	16:00	Cloudy	34.8
14-Sep-18	9:00	Cloudy	65.6
14-Sep-18	10:00	Cloudy	69.8
14-Sep-18	11:00	Cloudy	71.4
20-Sep-18	9:00	Sunny	57.4
20-Sep-18	10:00	Sunny	59.5
20-Sep-18	11:00	Sunny	66.1
26-Sep-18	13:00	Fine	128.6
26-Sep-18	14:00	Fine	140.1
26-Sep-18	15:00	Fine	139.7
		Average	70.0
		Maximum	140.1
		Minimum	25.1

Appendix E - 1-hour TSP Monitoring Results

Location AM3 - Yau Lai Estate Bik Lai House			
Date	Time	Weather	Particulate Concentration ($\mu g/m^3$)
4-Sep-18	9:00	Sunny	48.4
4-Sep-18	10:00	Sunny	55.6
4-Sep-18	11:00	Sunny	56.6
10-Sep-18	14:00	Cloudy	50.7
10-Sep-18	15:00	Cloudy	56.2
10-Sep-18	16:00	Cloudy	47.8
14-Sep-18	13:00	Cloudy	93.9
14-Sep-18	14:00	Cloudy	94.6
14-Sep-18	15:00	Cloudy	98.6
20-Sep-18	9:00	Sunny	90.9
20-Sep-18	10:00	Sunny	84.1
20-Sep-18	11:00	Sunny	92.9
26-Sep-18	13:00	Fine	160.0
26-Sep-18	14:00	Fine	168.5
26-Sep-18	15:00	Fine	165.7
		Average	91.0
		Maximum	168.5
		Minimum	47.8

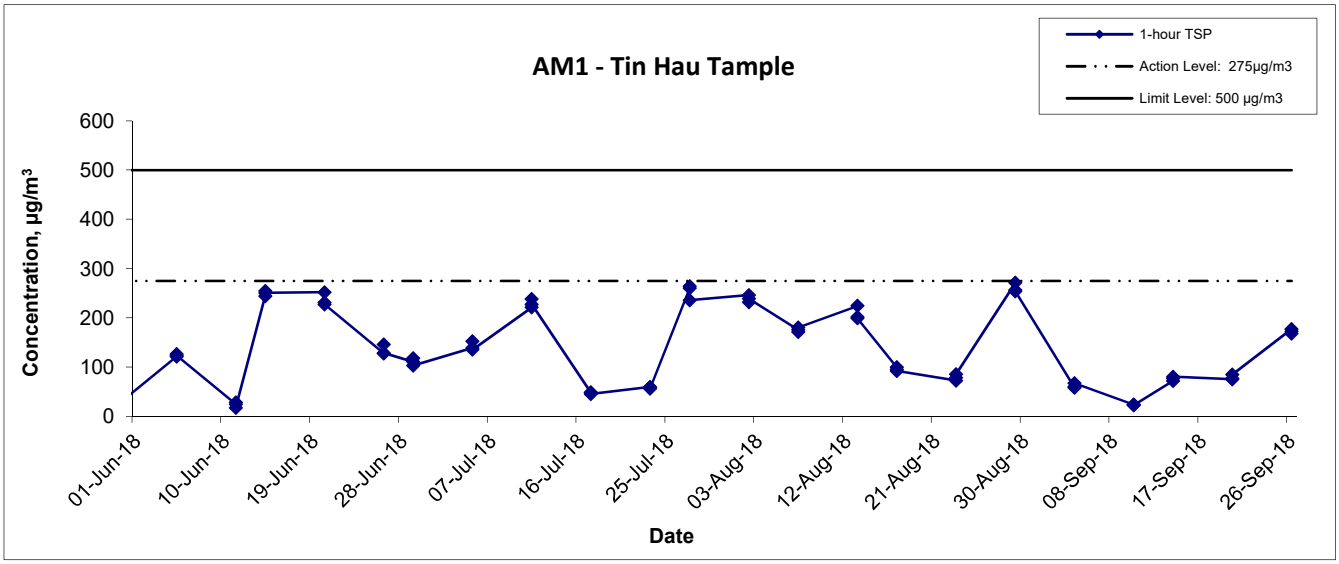
Location AM4 - Sitting-out Area at Cha Kwo Ling Village			
Date	Time	Weather	Particulate Concentration ($\mu g/m^3$)
4-Sep-18	14:20	Sunny	65.9
4-Sep-18	15:20	Sunny	74.3
4-Sep-18	16:20	Sunny	82.0
10-Sep-18	13:00	Cloudy	26.4
10-Sep-18	14:00	Cloudy	26.4
10-Sep-18	15:00	Cloudy	24.1
14-Sep-18	9:00	Cloudy	87.6
14-Sep-18	10:00	Cloudy	92.4
14-Sep-18	11:00	Cloudy	94.7
20-Sep-18	13:20	Sunny	98.3
20-Sep-18	14:20	Sunny	104.0
20-Sep-18	15:20	Sunny	103.0
26-Sep-18	9:00	Fine	148.9
26-Sep-18	10:00	Fine	145.5
26-Sep-18	11:00	Fine	146.6
		Average	88.0
		Maximum	148.9
		Minimum	24.1

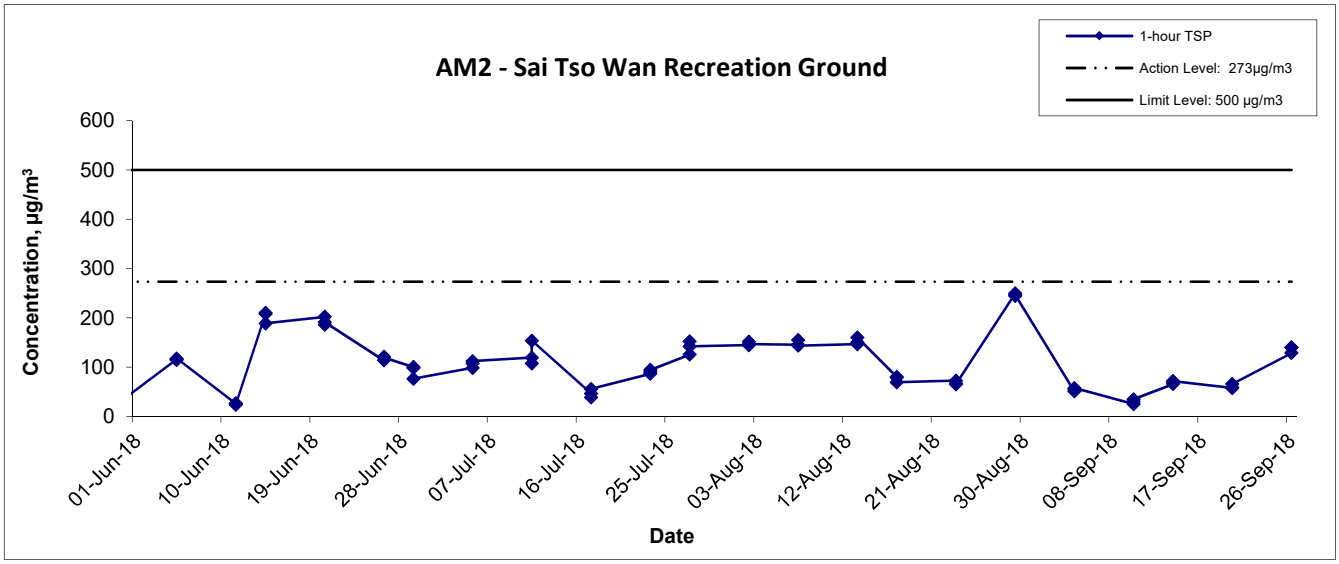
Appendix E - 1-hour TSP Monitoring Results

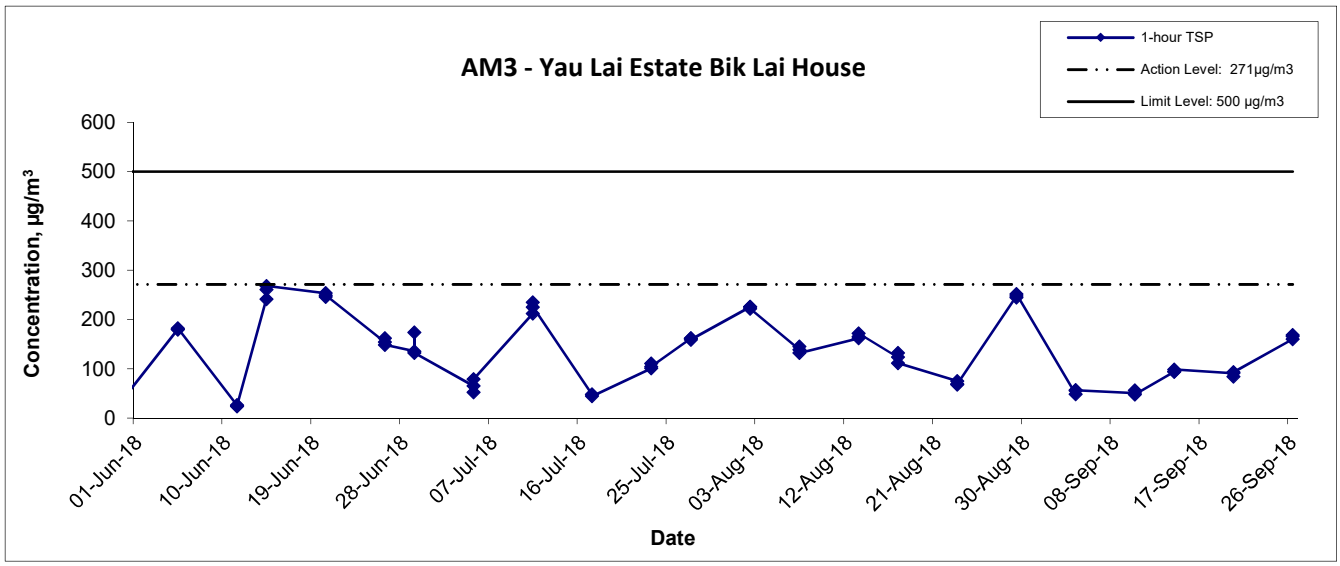
Location AM5(A) - Tseung Kwan O DSD Desilting Compound			
Date	Time	Weather	Particulate Concentration ($\mu g/m^3$)
5-Sep-18	13:15	Sunny	106.7
5-Sep-18	14:15	Sunny	109.3
5-Sep-18	15:15	Sunny	113.4
11-Sep-18	13:00	Sunny	60.0
11-Sep-18	14:00	Sunny	69.1
11-Sep-18	15:00	Sunny	66.8
17-Sep-18	13:00	Cloudy	46.8
17-Sep-18	14:00	Cloudy	51.3
17-Sep-18	15:00	Cloudy	49.3
21-Sep-18	13:00	Sunny	208.7
21-Sep-18	14:00	Sunny	213.6
21-Sep-18	15:00	Sunny	218.6
27-Sep-18	9:00	Sunny	102.2
27-Sep-18	10:00	Sunny	99.1
27-Sep-18	11:00	Sunny	107.6
		Average	108.2
		Maximum	218.6
		Minimum	46.8

Location AM6(A) - Park Central, L1/F Open Space Area			
Date	Time	Weather	Particulate Concentration ($\mu g/m^3$)
5-Sep-18	8:50	Sunny	144.7
5-Sep-18	9:50	Sunny	159.2
5-Sep-18	10:50	Sunny	150.5
11-Sep-18	9:00	Sunny	72.6
11-Sep-18	10:00	Sunny	77.3
11-Sep-18	11:00	Sunny	86.1
17-Sep-18	9:00	Cloudy	81.9
17-Sep-18	10:00	Cloudy	88.5
17-Sep-18	11:00	Cloudy	94.0
21-Sep-18	13:00	Sunny	165.1
21-Sep-18	14:00	Sunny	168.8
21-Sep-18	15:00	Sunny	183.2
27-Sep-18	13:00	Sunny	82.3
27-Sep-18	14:00	Sunny	98.0
27-Sep-18	15:00	Sunny	103.2
		Average	117.0
		Maximum	183.2
		Minimum	72.6

1-hr TSP Concentration Levels

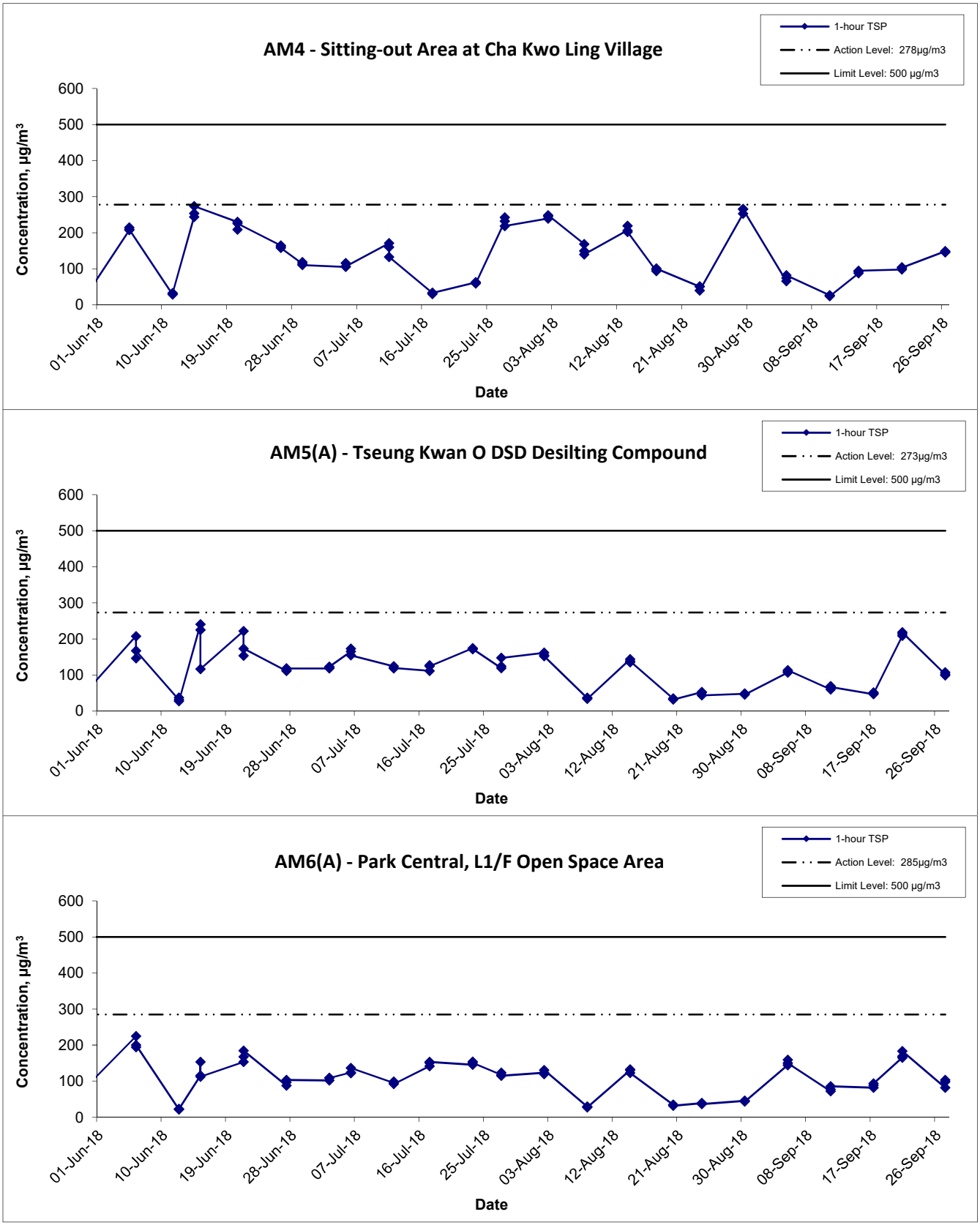






Title: Agreement No. CE/59/2015 (EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Graphical Presentation of 1-hour TSP Monitoring Results	Scale: N.T.S	Project No.: MA16034	CINOTECH
	Date: Sep 18	Appendix: E	

1-hr TSP Concentration Levels



Title: Agreement No. CE/59/2015 (EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Graphical Presentation of 1-hour TSP Monitoring Results	Scale: N.T.S	Project No.: MA16034	CINOTECH
	Date: Sep 18	Appendix: E	

APPENDIX F
24-HOUR TSP MONITORING RESULTS AND GRAPHICAL PRESENTATIONS

Appendix F - 24-hour TSP Monitoring Results

Location AM1 - Tin Hau Temple

Start Date	Weather Condition	Air Temp. (K)	Atmospheric Pressure, Pa (mmHg)	Filter Weight (g)		Particulate Weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m^3/min.)		Av. flow (m^3/min)	Total vol. (m^3)	Conc. ($\mu g/m^3$)
				Initial	Final		Initial	Final		Initial	Final			
3-Sep-18	Sunny	300.7	758.8	3.2529	3.3650	0.1121	4154.4	4178.4	24.0	1.23	1.23	1.23	1775.4	63.1
7-Sep-18	Cloudy	304.1	757.6	3.6333	3.7633	0.1300	4178.4	4202.4	24.0	1.23	1.22	1.23	1764.0	73.7
13-Sep-18	Cloudy	299.5	760.5	3.2668	3.3883	0.1215	4202.4	4226.4	24.0	1.24	1.24	1.24	1780.9	68.2
19-Sep-18	Cloudy	303.1	763.1	3.6369	3.8288	0.1919	4226.4	4250.4	24.0	1.23	1.23	1.23	1773.3	108.2
24-Sep-18	Sunny	302.2	761.6	2.9783	3.0803	0.1020	4274.5	4298.5	24.0	1.23	1.23	1.23	1774.2	57.5
28-Sep-18	Sunny	300.4	760.9	3.2563	3.3405	0.0842	4298.5	4322.5	24.0	1.24	1.23	1.24	1778.7	47.3
													Min	47.3
													Max	108.2
													Average	69.7

Location AM2 - Sai Tso Wan Recreation Ground

Start Date	Weather Condition	Air Temp. (K)	Atmospheric Pressure, Pa (mmHg)	Filter Weight (g)		Particulate Weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m^3/min.)		Av. flow (m^3/min)	Total vol. (m^3)	Conc. ($\mu g/m^3$)
				Initial	Final		Initial	Final		Initial	Final			
3-Sep-18	Sunny	300.6	758.3	3.6348	3.6790	0.0442	25103.1	25127.1	24.0	1.21	1.21	1.21	1748.5	25.3
7-Sep-18	Cloudy	304.6	757.5	3.2609	3.3070	0.0461	25127.1	25151.1	24.0	1.21	1.21	1.21	1735.9	26.6
13-Sep-18	Cloudy	299.8	760.0	3.2475	3.2919	0.0444	25151.1	25175.1	24.0	1.22	1.22	1.22	1752.9	25.3
19-Sep-18	Sunny	303.5	763.2	3.6313	3.7098	0.0785	25175.1	25199.1	24.0	1.21	1.21	1.21	1745.7	45.0
24-Sep-18	Sunny	302.6	761.7	3.6284	3.6909	0.0625	25199.1	25223.1	24.0	1.21	1.21	1.21	1746.6	35.8
28-Sep-18	Sunny	300.3	761.4	3.2806	3.3145	0.0339	25223.1	25247.1	24.0	1.22	1.22	1.22	1753.0	19.3
													Min	19.3
													Max	45.0
													Average	29.5

Location AM3 - Yau Lai Estate, Bik Lai House

Start Date	Weather Condition	Air Temp. (K)	Atmospheric Pressure, Pa (mmHg)	Filter Weight (g)		Particulate Weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m^3/min.)		Av. flow (m^3/min)	Total vol. (m^3)	Conc. ($\mu g/m^3$)
				Initial	Final		Initial	Final		Initial	Final			
3-Sep-18	Sunny	300.8	758.6	3.6383	3.6844	0.0461	13526.7	13550.7	24.0	1.22	1.22	1.22	1755.2	26.3
7-Sep-18	Cloudy	304.7	757.8	3.2514	3.3052	0.0538	13550.7	13574.7	24.0	1.21	1.21	1.21	1742.8	30.9
13-Sep-18	Cloudy	299.4	760.1	3.2330	3.2820	0.0490	13574.7	13598.7	24.0	1.22	1.22	1.22	1761.1	27.8
19-Sep-18	Sunny	303.5	763.5	3.6287	3.7365	0.1078	13598.7	13622.7	24.0	1.22	1.22	1.22	1752.9	61.5
24-Sep-18	Sunny	302.3	761.2	3.6344	3.6798	0.0454	13622.7	13646.7	24.0	1.22	1.22	1.22	1753.8	25.9
28-Sep-18	Sunny	300.7	760.6	3.2558	3.3206	0.0648	13646.7	13670.7	24.0	1.22	1.22	1.22	1757.8	36.9
													Min	25.9
													Max	61.5
													Average	34.9

Appendix F - 24-hour TSP Monitoring Results

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

Start Date	Weather Condition	Air Temp. (K)	Atmospheric Pressure, Pa (mmHg)	Filter Weight (g)		Particulate Weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m^3/min.)		Av. flow (m^3/min)	Total vol. (m^3)	Conc. ($\mu g/m^3$)
				Initial	Final		Initial	Final		Initial	Final			
3-Sep-18	Sunny	300.4	758.1	3.6385	3.7903	0.1518	10513.2	10537.2	24.0	1.22	1.22	1.22	1759.6	86.3
7-Sep-18	Sunny	304.0	757.2	3.2481	3.5141	0.2660	10537.2	10561.2	24.0	1.21	1.21	1.21	1747.0	152.3
13-Sep-18	Cloudy	299.7	760.8	3.2412	3.3895	0.1483	10561.2	10585.2	24.0	1.23	1.23	1.23	1765.2	84.0
19-Sep-18	Sunny	303.5	763.0	3.6326	3.9043	0.2717	10585.2	10609.2	24.0	1.22	1.22	1.22	1755.9	154.7
24-Sep-18	Sunny	302.7	761.1	3.6302	3.7675	0.1373	10609.2	10633.2	24.0	1.22	1.22	1.22	1756.1	78.2
28-Sep-18	Sunny	300.6	760.1	3.2547	3.5271	0.2724	10633.2	10657.2	24.0	1.22	1.22	1.22	1761.5	154.6
													Min	78.2
													Max	154.7
													Average	118.4

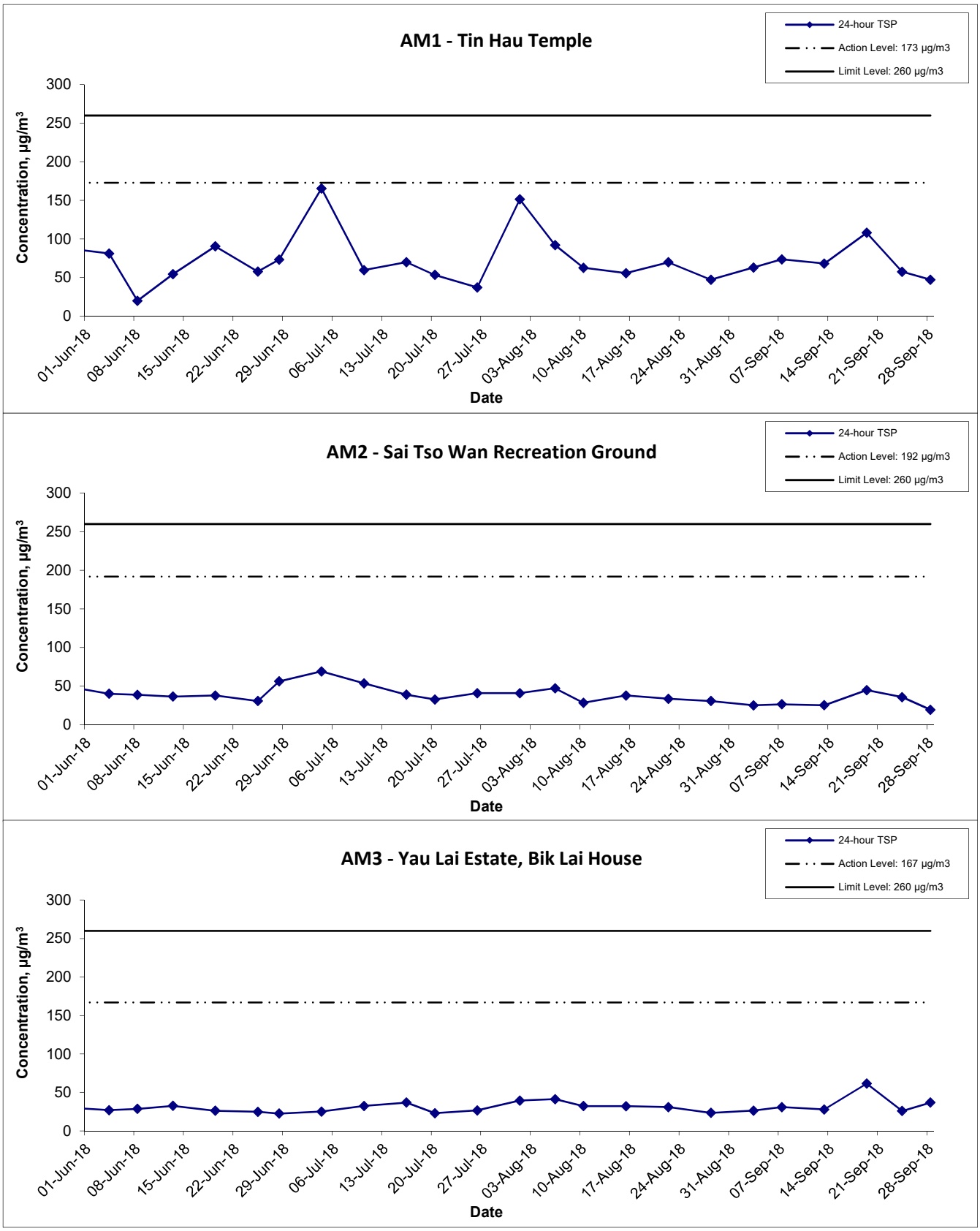
Location AM5(A) - Tseung Kwan O DSD Desilting Compound

Start Date	Weather Condition	Air Temp. (K)	Atmospheric Pressure, Pa (mmHg)	Filter Weight (g)		Particulate Weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m^3/min.)		Av. flow (m^3/min)	Total vol. (m^3)	Conc. ($\mu g/m^3$)
				Initial	Final		Initial	Final		Initial	Final			
3-Sep-18	Sunny	301.1	758.2	3.6302	3.7004	0.0702	26848.3	26872.3	24.0	1.23	1.23	1.23	1776.4	39.5
7-Sep-18	Cloudy	302.4	757.6	3.2453	3.2887	0.0434	26872.3	26896.3	24.0	1.23	1.23	1.23	1771.5	24.5
13-Sep-18	Sunny	300.6	760.4	3.2317	3.2955	0.0638	26896.3	26920.3	24.0	1.24	1.24	1.24	1780.8	35.8
19-Sep-18	Sunny	303.2	763.0	3.6107	3.7113	0.1006	26920.3	26944.3	24.0	1.23	1.23	1.23	1775.8	56.7
24-Sep-18	Sunny	301.9	761.4	3.2424	3.3010	0.0586	26944.3	26968.3	24.0	1.23	1.23	1.23	1777.9	33.0
28-Sep-18	Sunny	302.5	759.9	2.9622	3.0902	0.1280	26968.3	26992.3	24.0	1.23	1.23	1.23	1774.1	72.2
													Min	24.5
													Max	72.2
													Average	43.6

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

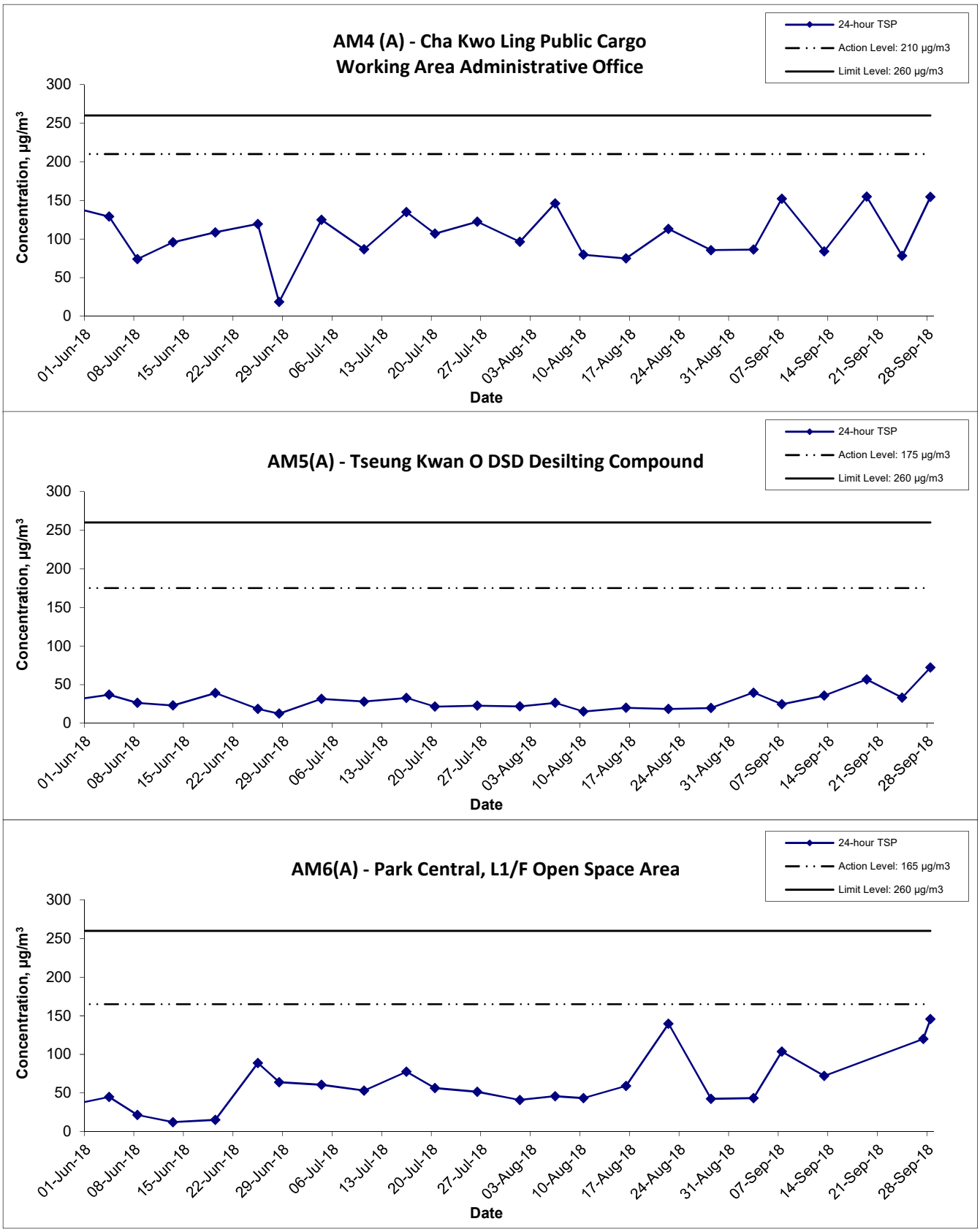
Start Date	Weather Condition	Air Temp. (K)	Atmospheric Pressure, Pa (mmHg)	Filter Weight (g)		Particulate Weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m^3/min.)		Av. flow (m^3/min)	Total vol. (m^3)	Conc. ($\mu g/m^3$)
				Initial	Final		Initial	Final		Initial	Final			
3-Sep-18	Sunny	301.7	758.5	3.6196	3.6952	0.0756	17315.8	17339.8	24.0	1.21	1.21	1.21	1747.8	43.3
7-Sep-18	Cloudy	302.9	757.8	3.2419	3.4225	0.1806	17339.8	17363.8	24.0	1.21	1.21	1.21	1743.5	103.6
13-Sep-18	Sunny	300.5	760.0	3.2248	3.3512	0.1264	17363.8	17387.8	24.0	1.22	1.22	1.22	1753.1	72.1
27-Sep-18	Sunny	301.1	760.5	3.6485	3.8594	0.2109	17387.8	17411.8	24.0	1.22	1.22	1.22	1756.6	120.1
28-Sep-18	Cloudy	303.0	759.4	3.6284	3.8835	0.2551	17411.8	17435.8	24.0	1.22	1.21	1.22	1749.8	145.8
													Min	43.3
													Max	145.8
													Average	97.0

24-hr TSP Concentration Levels



Title	Agreement No. CE/59/2015 (EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Graphical Presentation of 24-hour TSP Monitoring Results	Scale N.T.S	Project No. MA16034	CINOTECH
		Date Sep 18	Appendix F	

24-hr TSP Concentration Levels



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		Date Sep 18	Appendix F	

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-Sep-18	13:20	Sunny	74.0	75.8	71.2	65.5	73.3
14-Sep-18	16:05	Sunny	73.9	75.5	72.1		73.2
20-Sep-18	8:20	Sunny	73.7	75.6	72.0		73.0
26-Sep-18	10:00	Cloudy	69.5	71.3	65.0		67.3

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-Sep-18	10:10	Sunny	74.8	77.2	71.3	63.6	74.5
14-Sep-18	15:00	Cloudy	74.2	76.8	70.6		73.8
20-Sep-18	9:15	Sunny	74.2	75.9	72.4		73.8
26-Sep-18	9:10	Cloudy	69.8	71.3	64.8		68.6

Location CM3 - Block S, Yau Lai Estate Phase 5, Yau Tong							
Date	Time	Weather	Unit: dB (A) (30-min)				
			Measured Noise Level			Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}
5-Sep-18	15:00	Cloudy	74.6	76.1	72.2	65.6	74.0
13-Sep-18	15:50	Cloudy	73.9	76.6	71.2		73.2
21-Sep-18	10:30	Sunny	74.1	75.9	70.2		73.4
27-Sep-18	16:00	Sunny	75.2	77.6	72.1		74.7

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-Sep-18	11:30	Cloudy	66.9	69.6	58.7	62.0	65.2
14-Sep-18	13:05	Cloudy	69.4	71.5	66.2		68.5
20-Sep-18	13:05	Sunny	70.1	71.2	67.3		69.4
26-Sep-18	13:30	Cloudy	63.1	65.1	57.9		56.6

Location CM5 - CCC Kei Faat Primary School, Yau Tong							
Date	Time	Weather	Unit: dB (A) (30-min)				
			Measured Noise Level			Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}
5-Sep-18	15:00	Sunny	70.0	72.4	66.5	68.2	65.3
13-Sep-18	15:00	Cloudy	68.2	69.8	65.2		68.2 Measured $\leqq$ Baseline
21-Sep-18	11:30	Sunny	68.5	70.4	65.4		56.7
27-Sep-18	15:30	Sunny	69.7	72.1	66.2		64.4

Appendix G - Noise Monitoring Results

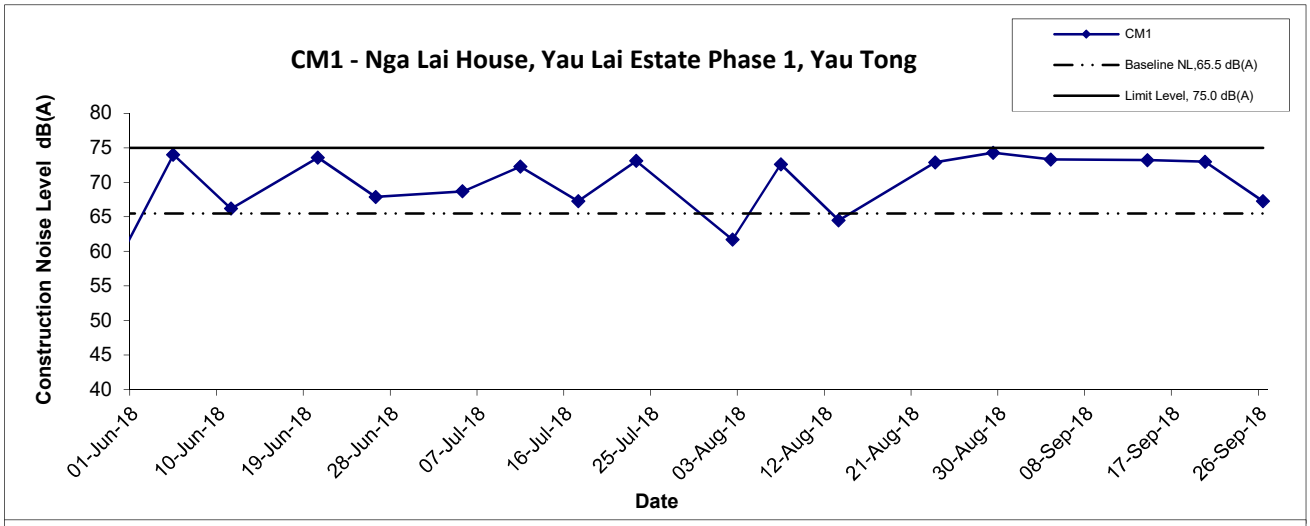
(0700-1900 hrs on Normal Weekdays)

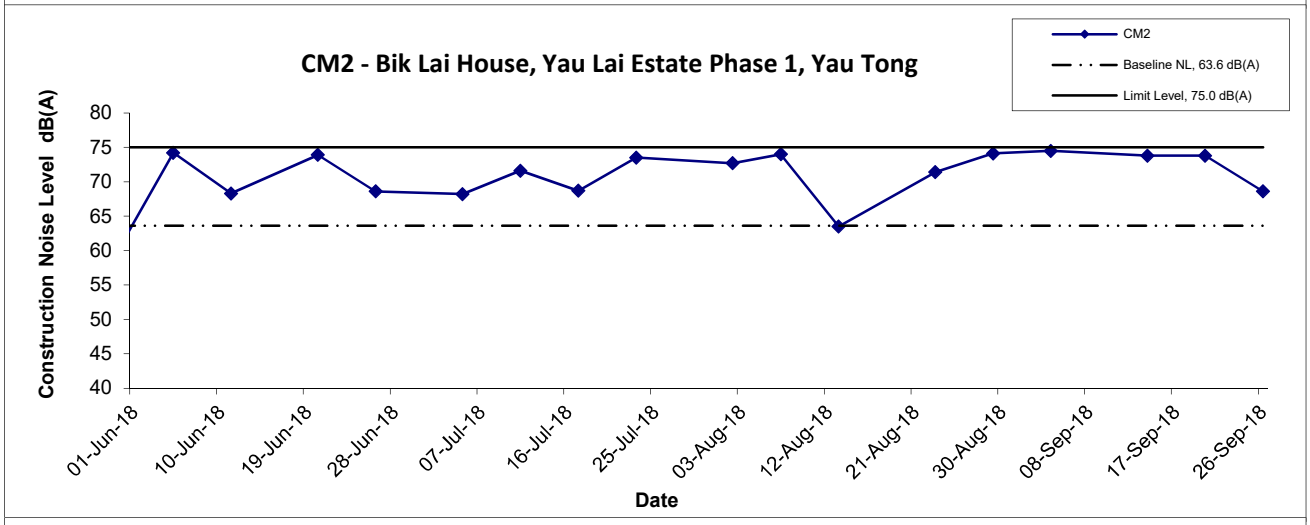
Location CM6(A) - Site Boundary of Contract No. NE/2015/02 near Tower 1, Ocean Shores							
Date	Time	Weather	Unit: dB (A) (30-min)				
			Measured Noise Level			Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}
5-Sep-18	13:30	Sunny	74.8	76.9	71.3	61.9	74.6
11-Sep-18	13:30	Cloudy	65.8	66.9	60.1		63.5
21-Sep-18	14:00	Sunny	69.4	71.4	62.0		68.5
27-Sep-18	13:00	Cloudy	63.9	65.6	60.5		59.6

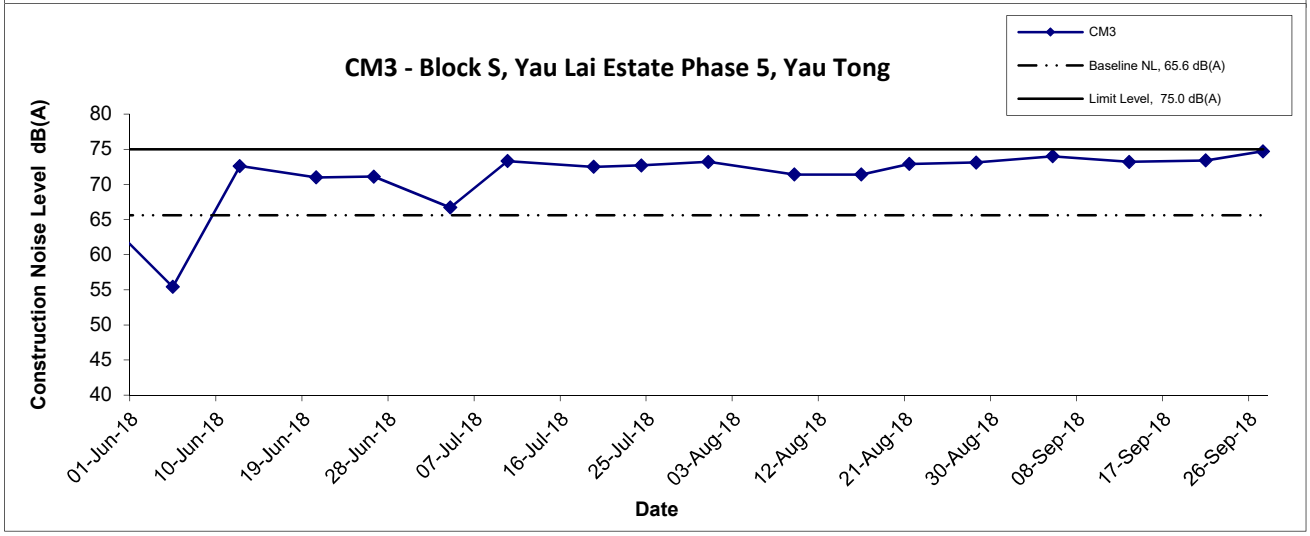
Location CM7(A) - Site Boundary of Contract No. NE/2015/02 near Tower 7, Ocean Shores							
Date	Time	Weather	Unit: dB (A) (30-min)				
			Measured Noise Level			Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}
5-Sep-18	15:00	Sunny	72.6	75.5	70.1	58.3	72.4
11-Sep-18	14:20	Cloudy	65.6	66.8	60.3		64.7
21-Sep-18	13:15	Sunny	72.0	74.3	70.1		71.8
27-Sep-18	14:30	Cloudy	65.6	66.4	60.9		64.7

Location CM8(A) - Park Central, L1/F Open Space Area							
Date	Time	Weather	Unit: dB (A) (30-min)				
			Measured Noise Level			Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	L_{eq}	L_{eq}
5-Sep-18	9:40	Sunny	63.8	65.7	60.2	69.1	63.8 Measured $\leqq$ Baseline
11-Sep-18	9:00	Cloudy	66.9	67.5	61.0		66.9 Measured $\leqq$ Baseline
21-Sep-18	13:05	Sunny	64.9	66.7	61.3		64.9 Measured $\leqq$ Baseline
27-Sep-18	10:00	Cloudy	63.8	65.4	60.6		63.8 Measured $\leqq$ Baseline

Noise Levels







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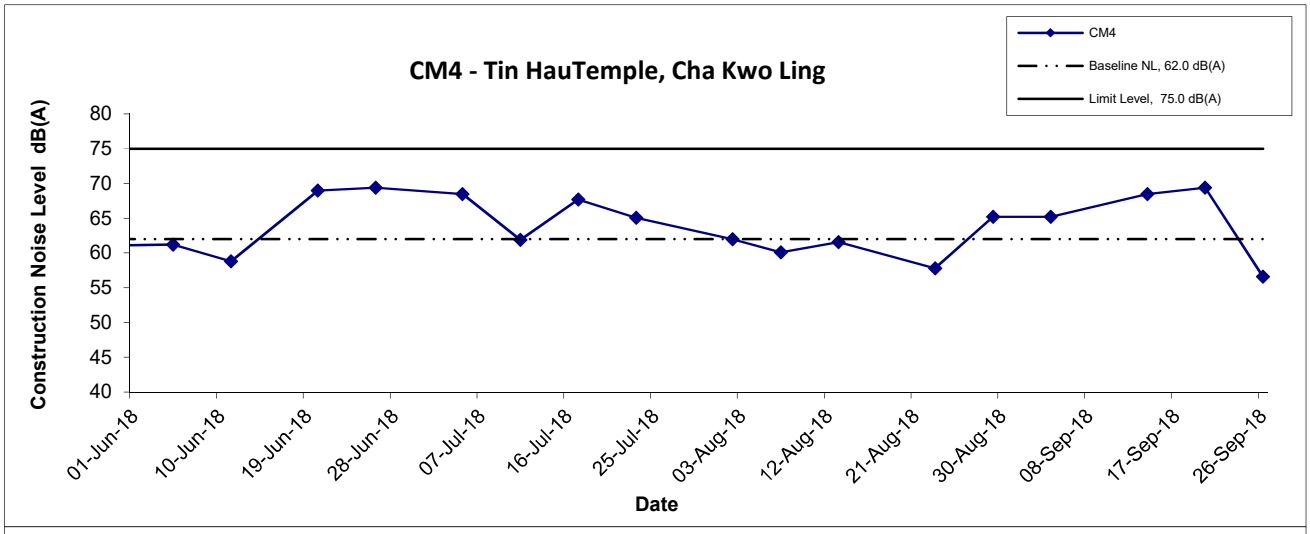
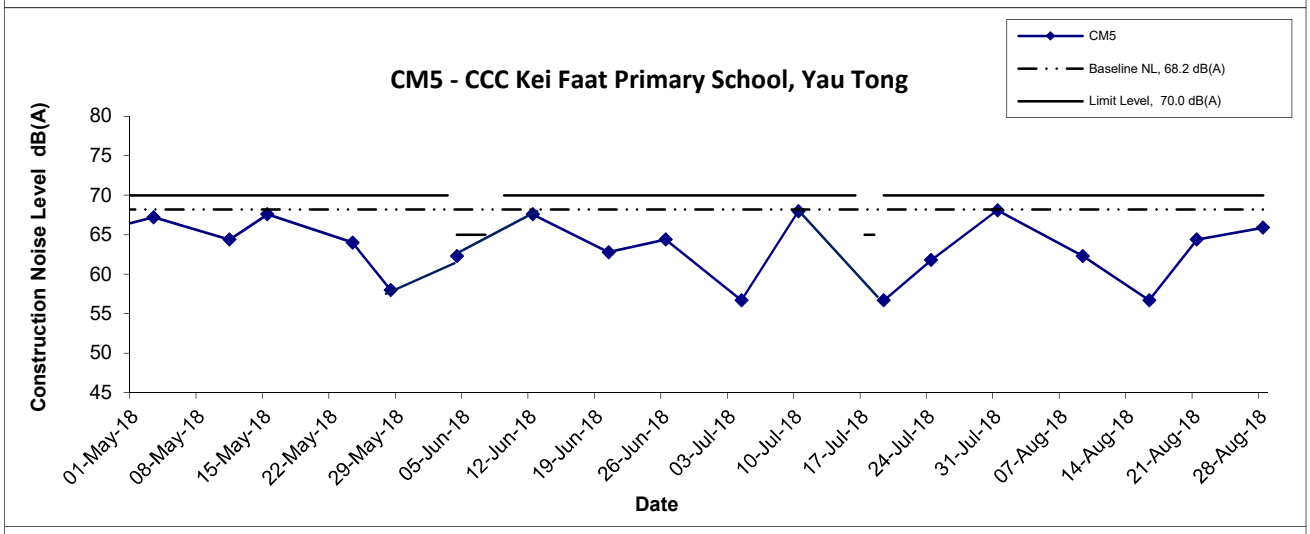
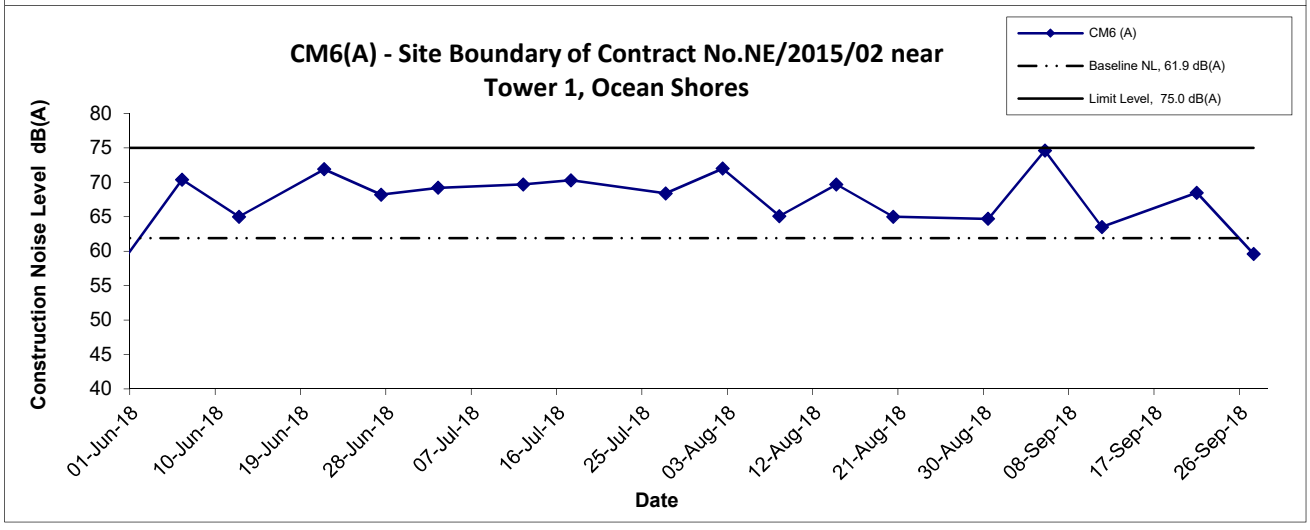
Noise Levels







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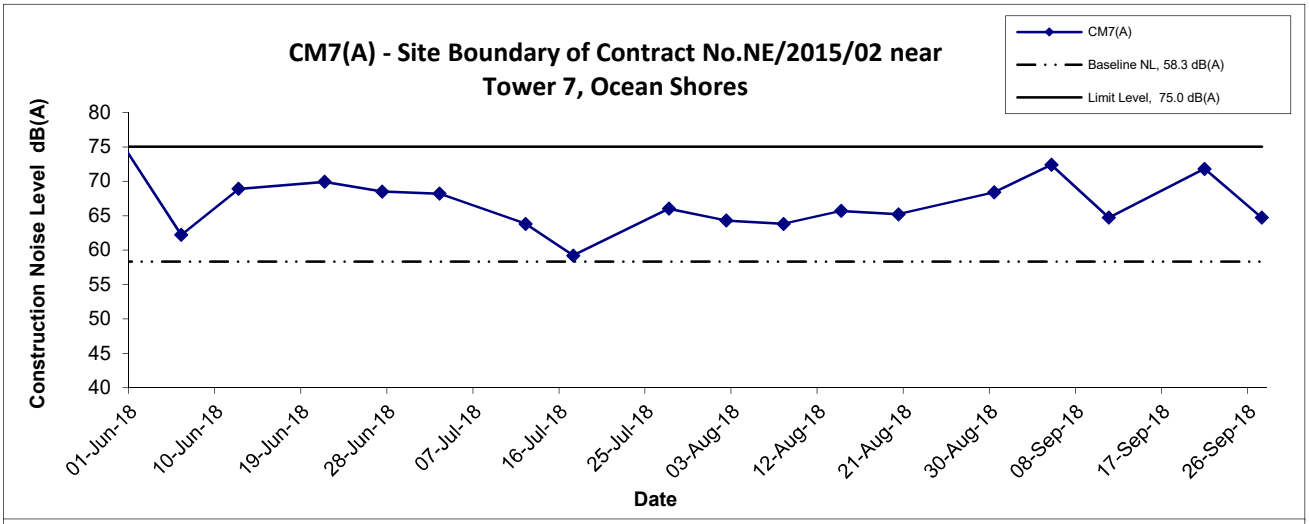
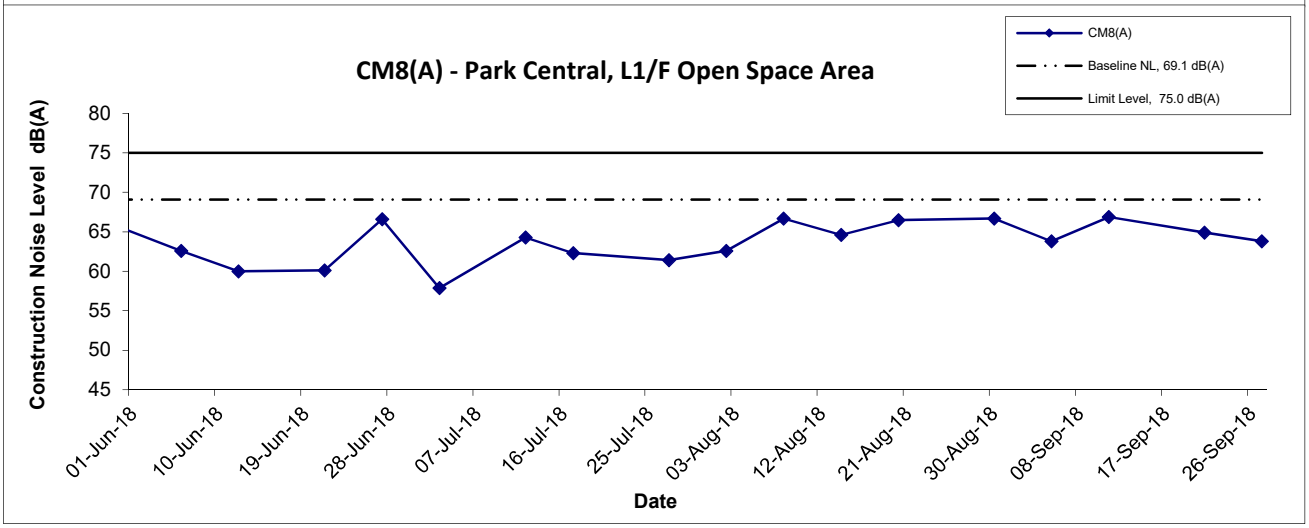
Noise Levels





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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}
2-Sep-18	14:20	Cloudy	62.3	67.7	64.3	65.0	64.4	56.1
	14:25		66.2	67.5	64.7			
	14:30		65.6	66.6	64.4			
7-Sep-18	22:40	Fine	65.3	66.6	63.6	65.4		58.5
	22:45		65.9	66.4	63.3			
	22:50		65.1	66.2	63.6			
9-Sep-18	14:30	Sunny	66.9	67.6	64.2	66.4		62.1
	14:35		66.5	67.4	64.2			
	14:40		65.8	67.3	63.9			
14-Sep-18	22:45	Fine	64.2	65.2	63.6	64.3		64.3 Measured ≦ Baseline
	22:50		64.3	65.5	63.5			
	22:55		64.5	65.6	63.6			
21-Sep-18	22:45	Fine	66.5	67.8	65.1	66.5		62.3
	22:50		66.6	67.9	64.6			
	22:55		66.5	67.6	65.1			
23-Sep-18	8:45	Sunny	64.5	66.0	62.5	63.8		63.8 Measured ≦ Baseline
	8:50		63.5	64.7	62.2			
	8:55		63.4	64.8	61.7			
28-Sep-18	22:40	Fine	65.2	66.6	63.8	65.4		58.5
	22:45		65.4	66.7	64.0			
	22:50		65.6	66.9	64.1			
30-Sep-18	11:40	Sunny	66.2	67.5	65.0	66.3		61.8
	11:45		66.3	67.5	65.1			
	11:50		66.5	67.6	65.2			

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}
2-Sep-18	13:55	Cloudy	66.6	67.7	65.2	66.9	64.2	63.6
	14:00		67.1	67.9	66.0			
	14:05		66.9	67.8	66.0			
7-Sep-18	22:15	Fine	65.2	66.4	64.1	65.1		57.8
	22:20		65.6	67.2	63.2			
	22:25		64.9	65.9	63.5			
9-Sep-18	15:10	Sunny	66.2	67.3	64.7	67.3		64.4
	15:15		68.8	71.4	64.7			
	15:20		66.3	67.8	64.1			
14-Sep-18	22:15	Sunny	65.4	66.6	63.7	65.5		59.6
	22:20		65.7	66.9	63.8			
	22:25		65.3	66.8	63.6			
21-Sep-18	22:20	Fine	65.6	66.9	64.2	65.3		58.8
	22:25		65.4	66.7	63.8			
	22:30		65.0	65.9	64.0			
23-Sep-18	9:15	Sunny	66.7	67.8	64.7	65.8		60.7
	9:20		65.4	65.8	64.4			
	9:25		65.1	65.8	64.2			
28-Sep-18	22:20	Fine	65.1	66.3	63.9	65.2		58.3
	22:25		65.6	66.9	63.9			
	22:30		65.0	66.3	63.5			
30-Sep-18	11:10	Sunny	67.1	69.2	64.5	66.4		62.4
	11:15		66.0	67.3	64.5			
	11:20		65.9	67.8	63.9			

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}
2-Sep-18	13:30	Cloudy	63.5	64.9	61.4	64.1	64.7	64.1 Measured ≦ Baseline
	13:35		64.4	66.2	62.4			
	13:40		64.3	65.9	62.3			
7-Sep-18	21:45	Fine	64.6	65.7	63.2	65.0		53.2
	21:50		65.4	65.9	63.5			
	21:55		65.0	66.3	63.3			
9-Sep-18	13:35	Sunny	65.0	67.1	62.5	64.9		51.4
	13:40		64.3	66.2	62.5			
	13:45		65.3	65.9	62.9			
14-Sep-18	21:40	Fine	65.7	69.9	64.1	65.6		58.3
	21:45		65.9	67.0	64.3			
	21:50		65.1	66.4	64.0			
21-Sep-18	21:50	Fine	64.9	65.8	63.2	65.3		56.4
	21:55		65.4	66.4	63.5			
	22:00		65.5	66.8	63.7			
23-Sep-18	9:05	Sunny	65.5	67.1	63.7	65.9		59.7
	9:10		66.3	66.8	64.0			
	9:15		65.8	67.4	63.0			
28-Sep-18	21:50	Fine	64.7	66.3	62.5	65.7		58.8
	21:55		66.9	67.3	63.7			
	22:00		65.1	66.6	63.2			
30-Sep-18	10:00	Sunny	66.1	67.8	54.1	64.5		64.5 Measured ≦ Baseline
	10:05		65.6	67.7	55.4			
	10:10		59.0	60.8	55.4			

Appendix G - Noise Monitoring Results

Location CM4 - Tin Hau Temple, Cha Kwo Ling								
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}
2-Sep-18	13:00	Cloudy	58.2	61.5	47.9	58.9	57.0	54.4
	13:05		60.4	65.1	48.2			
	13:10		57.5	61.6	46.2			
7-Sep-18	21:00	Fine	52.1	54.3	46.9	52.8		52.8 Measured ≦ Baseline
	21:05		53.4	56.8	48.1			
	21:10		52.8	54.7	47.2			
9-Sep-18	13:00	Sunny	59.0	62.7	48.0	60.5		57.9
	13:05		60.4	64.0	46.1			
	13:10		61.7	65.4	49.7			
14-Sep-18	21:05	Fine	54.6	55.7	48.2	54.7		54.7 Measured ≦ Baseline
	21:10		54.9	55.9	47.9			
	21:15		54.7	56.1	47.8			
21-Sep-18	21:20	Fine	52.9	54.6	46.1	53.2		53.2 Measured ≦ Baseline
	21:25		53.4	55.0	46.5			
	21:30		53.2	55.2	46.8			
23-Sep-18	9:50	Sunny	60.3	64.2	49.5	57.5		47.9
	9:55		54.3	57.4	47.5			
	10:00		55.5	58.4	47.4			
28-Sep-18	21:20	Fine	51.8	55.3	46.9	52.6		52.6 Measured ≦ Baseline
	21:25		53.1	55.8	47.8			
	21:30		52.8	55.1	47.0			
30-Sep-18	9:30	Sunny	58.6	60.0	54.1	58.8		54.1
	9:35		58.7	59.8	54.5			
	9:40		59.1	61.7	54.1			

Appendix G - Noise Monitoring Results

(Restricted Hours - 2300-0700 on all days)

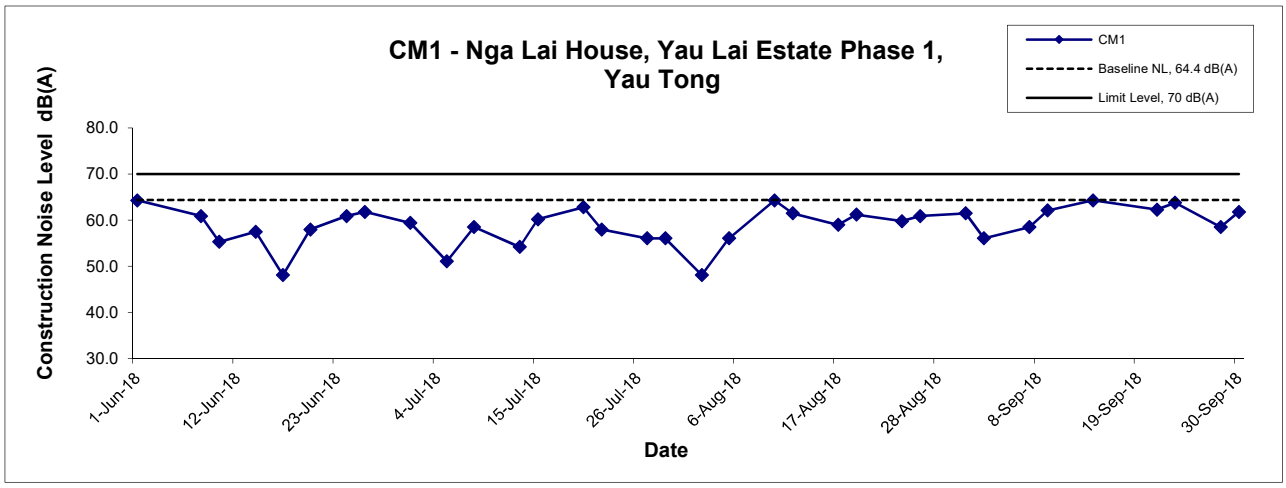
Location CM1 - Nga Lai House, Yau Lai Estate Phase 1, Yau Tong								
Date	Time	Weather	dB (A) (5-min)				Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	Average L_{eq}	L_{eq}	L_{eq}
7-Sep-18	23:00	Fine	64.7	66.0	62.4	65.1	60.5	63.3
	23:05		65.1	66.2	62.5			
	23:10		65.4	66.7	63.2			
14-Sep-18	23:00	Fine	65.4	66.9	64.1	65.5		63.8
	23:05		65.6	66.9	63.8			
	23:10		65.4	66.6	64.0			
21-Sep-18	23:00	Fine	66.2	67.3	65.0	66.1		64.7
	23:05		66.3	67.6	64.4			
	23:10		65.9	66.9	64.7			
28-Sep-18	1:30	Fine	59.9	61.4	58.1	61.2		52.9
	1:35		61.8	63.5	59.4			
	1:40		61.7	63.2	59.4			

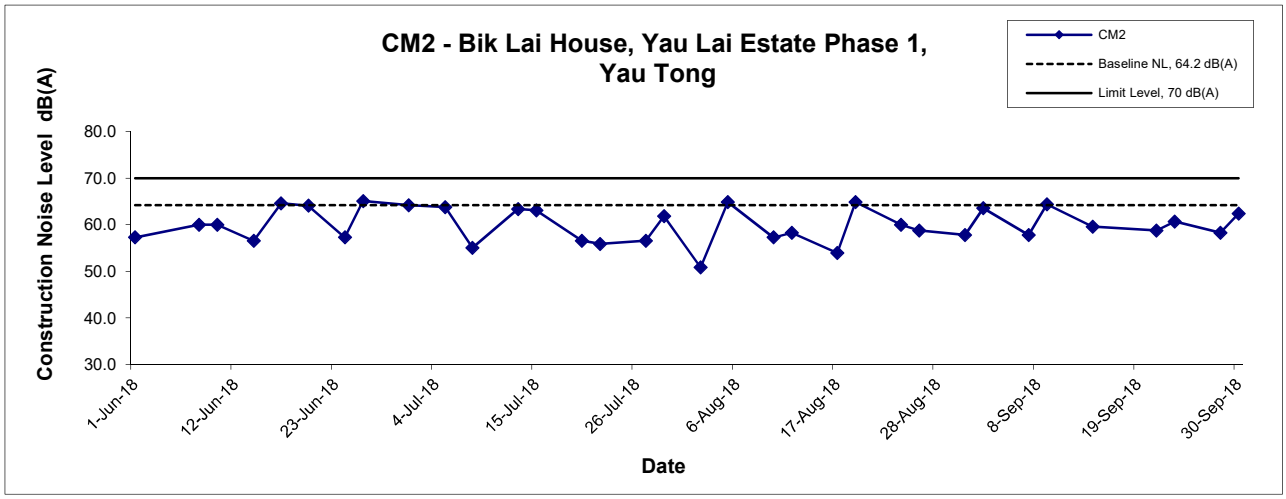
Location CM2 - Bik Lai House, Yau Lai Estate Phase 1, Yau Tong								
Date	Time	Weather	dB (A) (5-min)				Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	Average L_{eq}	L_{eq}	L_{eq}
7-Sep-18	23:35	Fine	64.3	65.4	62.0	64.1	58.0	62.9
	23:40		63.8	65.2	61.8			
	23:45		64.1	65.3	61.7			
14-Sep-18	23:30	Fine	65.2	66.5	63.9	65.0		64.0
	23:35		65.0	66.0	64.0			
	23:40		64.8	66.0	63.8			
21-Sep-18	23:25	Fine	64.7	66.3	63.8	64.9		63.9
	23:30		64.9	66.5	64.0			
	23:35		65.2	66.2	64.1			
28-Sep-18	0:30	Fine	62.1	64.4	58.5	61.9		59.6
	0:35		62.1	63.9	59.3			
	0:40		61.5	63.1	59.5			

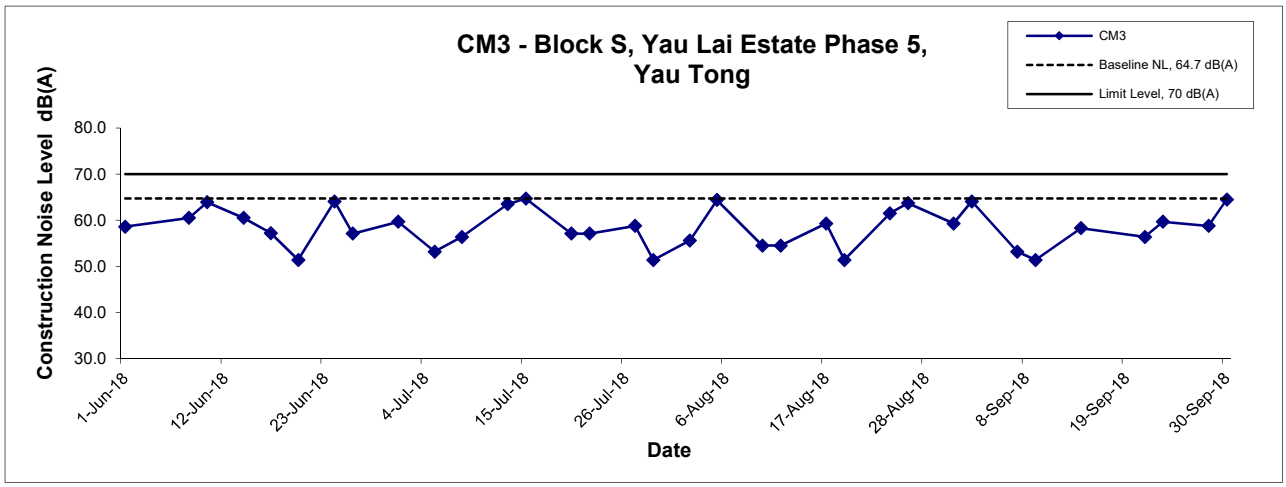
Location CM3 - Block S, Yau Lai Estate Phase 5, Yau Tong								
Date	Time	Weather	dB (A) (5-min)				Baseline Level	Construction Noise Level
			L_{eq}	L_{10}	L_{90}	Average L_{eq}	L_{eq}	L_{eq}
7-Sep-18	0:10	Fine	63.8	65.9	62.1	64.0	60.2	61.7
	0:15		64.3	66.0	62.2			
	0:20		63.9	65.7	61.8			
14-Sep-18	0:10	Fine	61.2	62.4	60.0	60.9		52.6
	0:15		60.7	62.2	59.7			
	0:20		60.9	62.3	59.5			
21-Sep-18	23:55	Fine	64.2	65.5	62.3	63.7		61.1
	0:00		63.2	64.5	61.5			
	0:05		63.6	64.7	62.0			
28-Sep-18	0:00	Fine	63.0	64.2	61.0	63.4		60.6
	0:05		64.6	66.3	58.2			
	0:10		62.3	63.9	60.2			

Location CM4 - Tin Hau Temple, Cha Kwo Ling								
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}
7-Sep-18	0:40	Fine	50.3	51.6	45.7	50.6	55.8	50.6 Measured ≦ Baseline
	0:45		51.1	51.9	46.4			
	0:50		50.2	51.5	45.8			
14-Sep-18	0:45	Fine	50.2	52.3	45.8	49.8		49.8 Measured ≦ Baseline
	0:50		49.3	51.7	45.2			
	0:55		49.8	52.0	45.1			
21-Sep-18	0:25	Fine	49.3	51.6	45.2	49.7		49.7 Measured ≦ Baseline
	0:30		49.5	52.0	45.5			
	0:35		50.2	53.0	45.9			
28-Sep-18	23:30	Fine	51.4	53.8	46.9	51.6		51.6 Measured ≦ Baseline
	23:35		50.4	53.3	47.2			
	23:40		52.7	56.3	47.3			

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

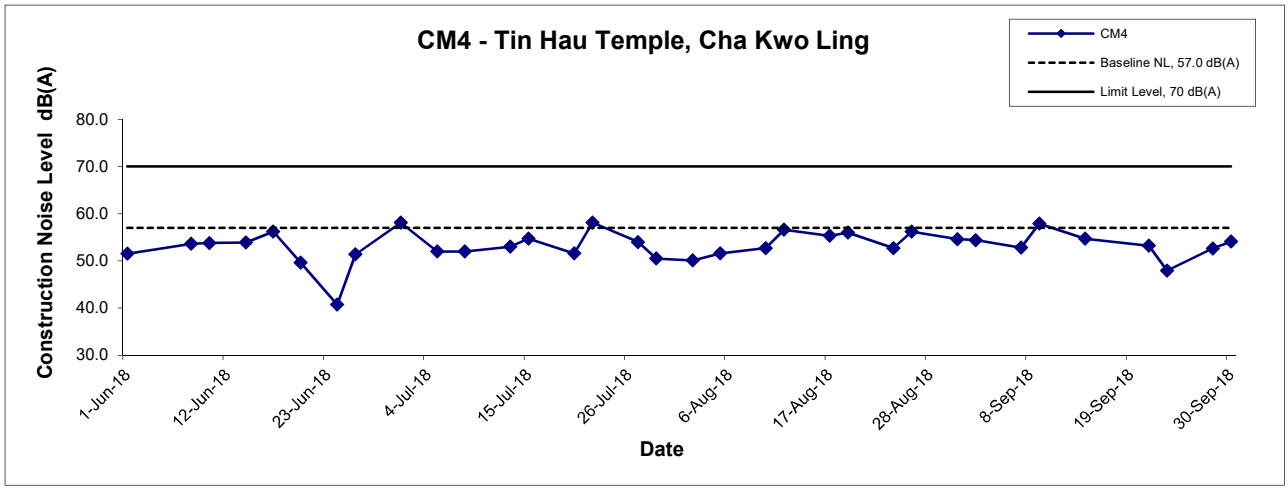






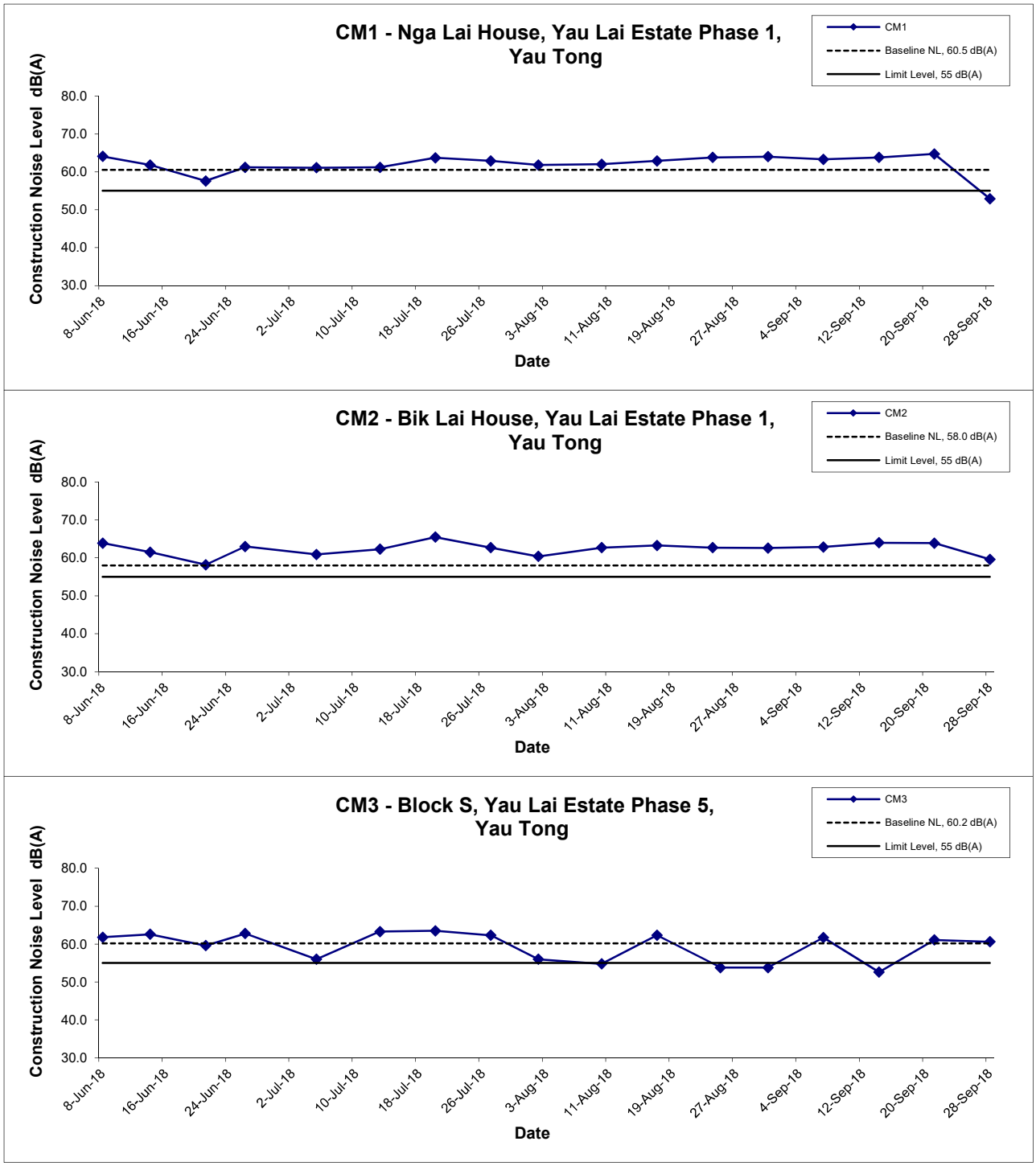
Title	Agreement No. CE/59/2015 (EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Graphical Presentation of Restricted Noise Monitoring Results	Scale N.T.S Date Sep 18	Project No. MA16034 Appendix G	CINOTECH

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



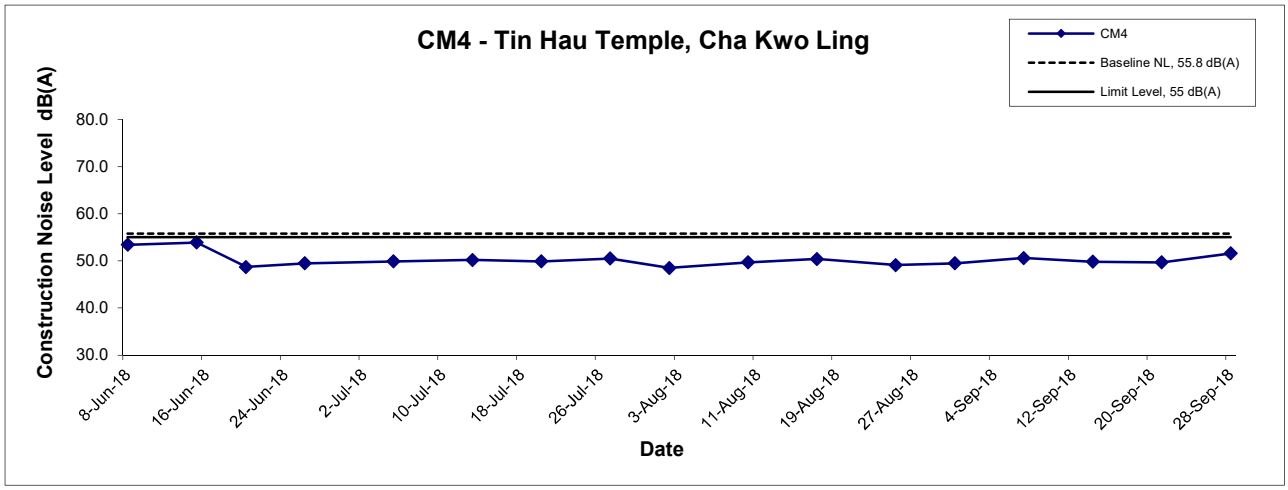
Title	Agreement No. CE/59/2015 (EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Graphical Presentation of Restricted Noise Monitoring Results	Scale: N.T.S Date: Sep 18	Project No.: MA16034 Appendix: G	CINOTECH

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



Title	Agreement No. CE/59/2015 (EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Graphical Presentation of Restricted Noise Monitoring Results	Scale N.T.S	Project No. MA16034	CINOTECH
		Date Sep 18	Appendix G	

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



Title	Agreement No. CE/59/2015 (EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Graphical Presentation of Restricted Noise Monitoring Results	Scale N.T.S	Project No. MA16034	CINOTECH
		Date Sep 18	Appendix G	

APPENDIX H
GROUNDWATER QUALITY MONITORING RESULTS AND GRAPHICAL PRESENTATIONS

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

Groundwater Quality Monitoring Results at Stream 1

Date	Weather Condition	Sampling Time	Depth (m)	Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)		Turbidity(NTU)	
				Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average
13-Sep-18	Cloudy	11:05	Middle	28.9 28.9	28.9	7.7 7.7	7.7	0.6 0.6	0.6	100.9 101.1	101.0	7.5 7.5	7.5	1.3 1.3	1.3
27-Sep-18	Cloudy	11:30	Middle	26.0 26.0	26.0	8.2 8.2	8.2	0.01 0.01	0.01	100.8 100.8	100.8	7.6 7.6	7.6	1.3 1.3	1.3

Groundwater Quality Monitoring Results at Stream 2

Date	Weather Condition	Sampling Time	Depth (m)	Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)		Turbidity(NTU)	
				Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average
13-Sep-18	Cloudy	11:30	Middle	28.1 28.1	28.1	7.8 7.7	7.8	0.2 0.2	0.2	99.2 99.1	99.2	7.5 7.5	7.5	1.1 1.1	1.1
27-Sep-18	Cloudy	12:06	Middle	26.8 26.8	26.8	8.0 8.0	8.0	0.2 0.2	0.2	101.0 101.0	101.0	7.6 7.6	7.6	0.3 0.3	0.3

Groundwater Quality Monitoring Results at Stream 3

Date	Weather Condition	Sampling Time	Depth (m)	Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)		Turbidity(NTU)	
				Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	Value	Average
13-Sep-18	Cloudy	11:47	Middle	28.6 28.6	28.6	7.8 7.8	7.8	0.1 0.1	0.1	100.3 100.1	100.2	7.5 7.5	7.5	0.8 0.8	0.8
27-Sep-18	Cloudy	12:15	Middle	27.0 26.9	27.0	8.0 8.0	8.0	0.1 0.1	0.1	101.1 101.1	101.1	7.6 7.6	7.6	0.7 0.7	0.7

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

Summary of Groundwater Quality Monitoring Results

Location	Date	Parameters (unit)								
		pH	Dissolved Oxygen (mg/L)	Turbidity (NTU)	SS (mg/L)	BOD_5 (mg O_2/L)	TOC (mg-TOC/L)	Total Nitrogen (mg/L)	NH_3-N (mg NH_3-N/L)	Total Phosphorus (mg-P/L)
13-Sep-18	Stream 1	7.7	**7.5**	1.3	<2.5	<2	7	<0.6	**0.67**	<0.05
	Stream 2	7.8	**7.5**	1.1	<2.5	<2	6	<0.6	**1.3**	<0.05
	Stream 3	7.8	**7.5**	0.8	<2.5	<2	**7**	<0.6	**1.2**	<0.05
27-Sep-18	Stream 1	8.2	7.6	1.3	<2.5	<2	6	<0.6	<0.05	<0.05
	Stream 2	8	7.6	0.3	<2.5	<2	5	<0.6	<0.05	<0.05
	Stream 3	8	7.6	0.7	<2.5	<2	5	<0.6	<0.05	<0.05

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Technology Park, 18 On Lai Street,
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TEST REPORT

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

ATTN: **Ms. Mei Ling Tang**

Report No.:	29716
Date of Issue:	2018-09-24
Date Received:	2018-09-13
Date Tested:	2018-09-13
Date Completed:	2018-09-24
Page:	1 of 1

Sample Description : 3 liquid samples as received from client said to be groundwater
Laboratory No. : 29716
Project No. : MA16034 (Groundwater)
Project Name : Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O – Lam Tin Tunnel – Design and Construction
Custody No. : MA16034(Groundwater)/20180913
Sampling Date : 2018-09-13

Tests Requested & Methodology:

Item	Parameters	Ref. Method	Limit of reporting
1	Total Suspended Solids	APHA 17ed 2540 D	*0.5 mg/L
2	Biochemical Oxygen Demand	APHA 19ed 5210B	2 mg O_2/L
3	Total Organic Carbon	In-house method SOP020 (Wet Oxidation)	1 mg-TOC/L
4	Nitrogen (Total Kjeldahl + nitrate + nitrite)	In-house method SOP063 (FIA)	0.6 mg N/L
5	Ammonia	In-house method SOP057 (FIA)	0.05 mg NH_3-N/L
6	Total Phosphorus	In-house method SOP055 (FIA)	0.05 mg-P/L

Results:

Sample ID	Stream 1	Stream 2	Stream 3
Sampling Depth	S	S	S
Sample No.	29716-1	29716-2	29716-3
Total Suspended Solids (mg/L)	<2.5	<2.5	<2.5
Biochemical Oxygen Demand (mg O_2/L)	<2	<2	<2
Total Organic Carbon (mg-TOC/L)	7	6	7
Nitrogen (Total Kjeldahl + nitrate + nitrite) (mg N/L)	<0.6	<0.6	<0.6
Ammonia (mg NH_3-N/L)	.67	1.3	1.2
Total Phosphorus (mg-P/L)	<0.05	<0.05	<0.05

emarks: 1) < = less than
2) S = Surface, M = Middle, B = Bottom
3) * Limit of Reporting is reported as Detection Limit

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

PREPARED AND CHECKED BY:

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

PATRICK TSE
Laboratory Manager

WELLAB 匯力 Testing & Research

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Rms 1502, 1516, 1701-1702 & 1713-1716,
Technology Park, 18 On Lai Street,
Shatin, N.T., Hong Kong.
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Website: www.wellab.com.hk

TEST REPORT

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

ATTN: **Ms. Mei Ling Tang**

Report No.:	29808
Date of Issue:	2018-10-08
Date Received:	2018-09-27
Date Tested:	2018-09-27
Date Completed:	2018-10-08
Page:	1 of 1

Sample Description : 3 liquid samples as received from client said to be groundwater
Laboratory No. : 29808
Project No. : MA16034 (Groundwater)
Project Name : Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O – Lam Tin Tunnel – Design and Construction
Custody No. : MA16034(Groundwater)/20180927
Sampling Date : 2018-09-27

Tests Requested & Methodology:

Item	Parameters	Ref. Method	Limit of reporting
1	Total Suspended Solids	APHA 17ed 2540 D	*0.5 mg/L
2	Biochemical Oxygen Demand	APHA 19ed 5210B	2 mg O_2/L
3	Total Organic Carbon	In-house method SOP020 (Wet Oxidation)	1 mg-TOC/L
4	Nitrogen (Total Kjeldahl + nitrate + nitrite)	In-house method SOP063 (FIA)	0.6 mg N/L
5	Ammonia	In-house method SOP057 (FIA)	0.05 mg NH_3-N/L
6	Total Phosphorus	In-house method SOP055 (FIA)	0.05 mg-P/L

Results:

Sample ID	Stream 1	Stream 2	Stream 3
Sampling Depth	S	S	S
Sample No.	29808-1	29808-2	29808-3
Total Suspended Solids (mg/L)	<2.5	<2.5	<2.5
Biochemical Oxygen Demand (mg O_2/L)	<2	<2	<2
Total Organic Carbon (mg-TOC/L)	6	5	5
Nitrogen (Total Kjeldahl + nitrate + nitrite) (mg N/L)	<0.6	<0.6	<0.6
Ammonia (mg NH_3-N/L)	<0.05	<0.05	<0.05
Total Phosphorus (mg-P/L)	<0.05	<0.05	<0.05

Remarks: 1) < = less than
2) S = Surface, M = Middle, B = Bottom
3) * Limit of Reporting is reported as Detection Limit

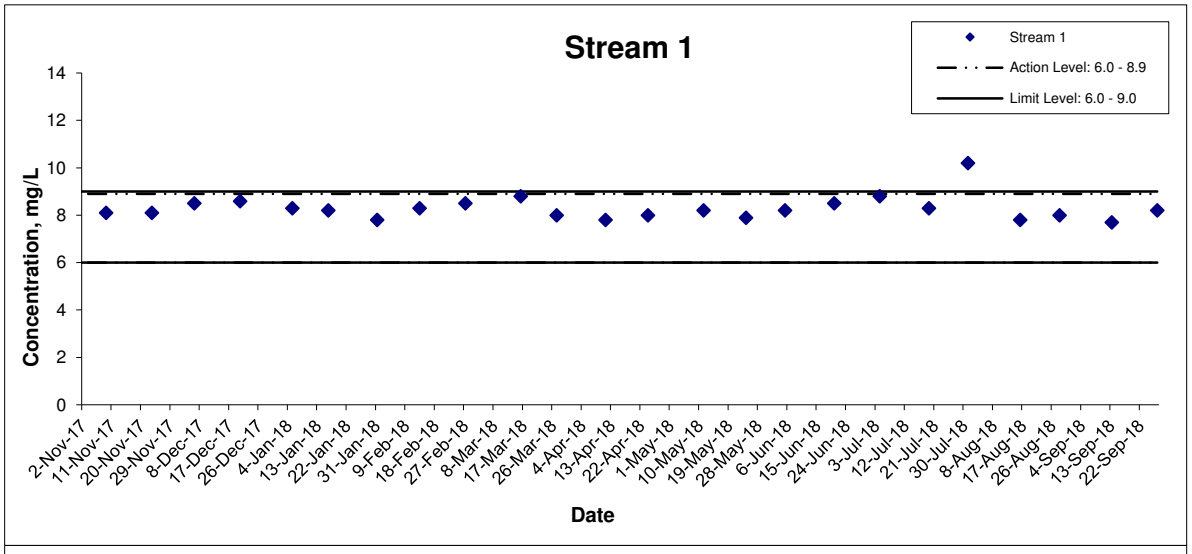
**********END OF REPORT**********

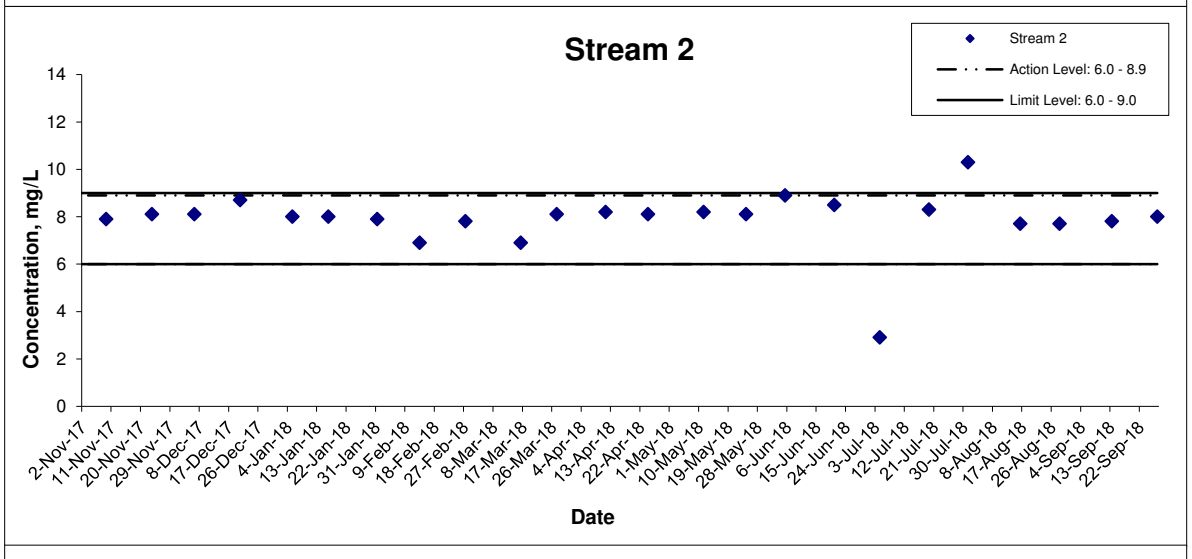
PREPARED AND CHECKED BY:

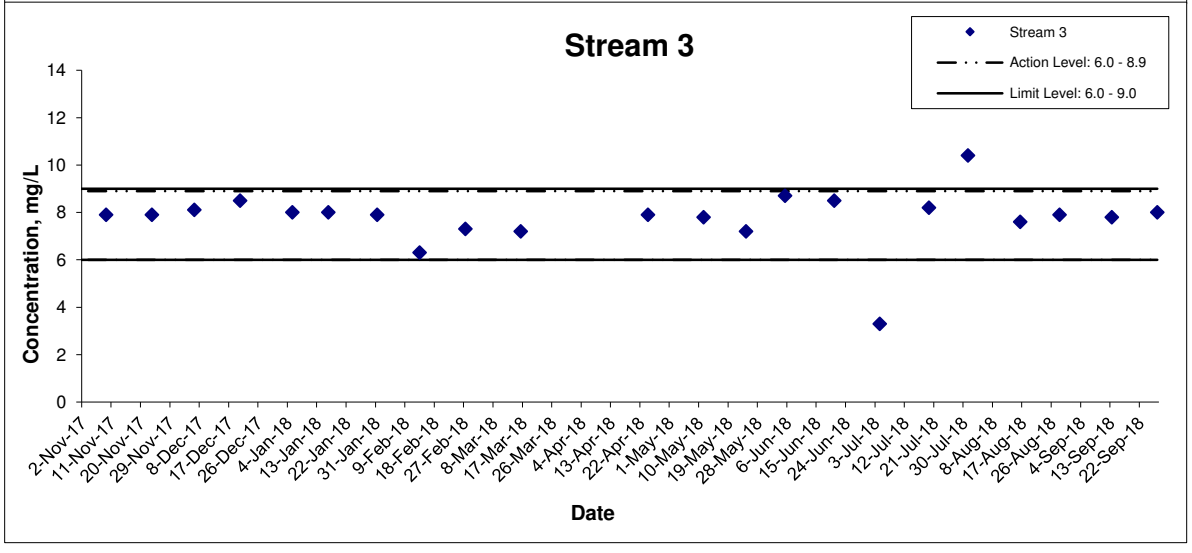
For and On Behalf of **WELLAB Ltd.**

PATRICK TSE
Laboratory Manager

pH

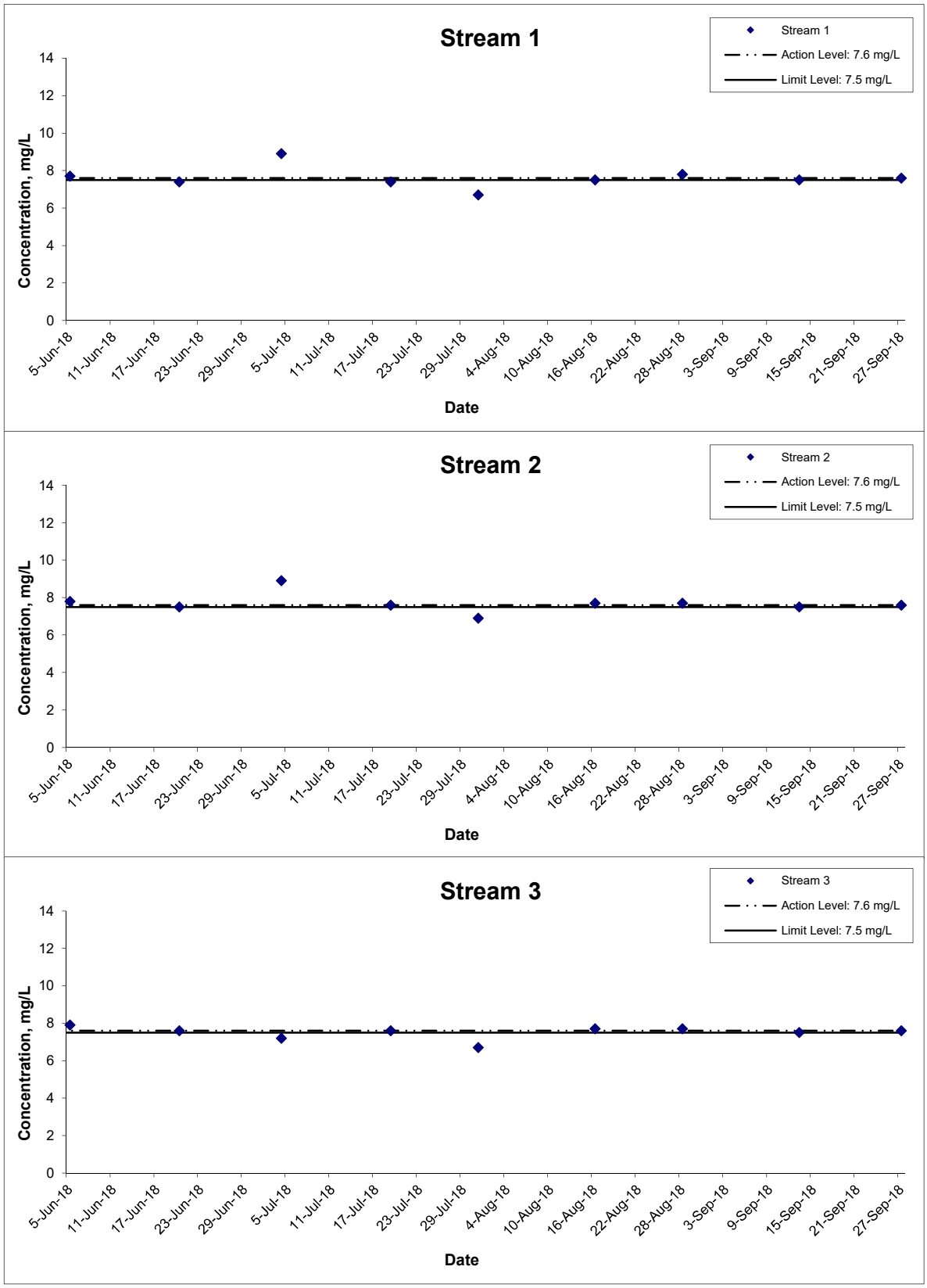






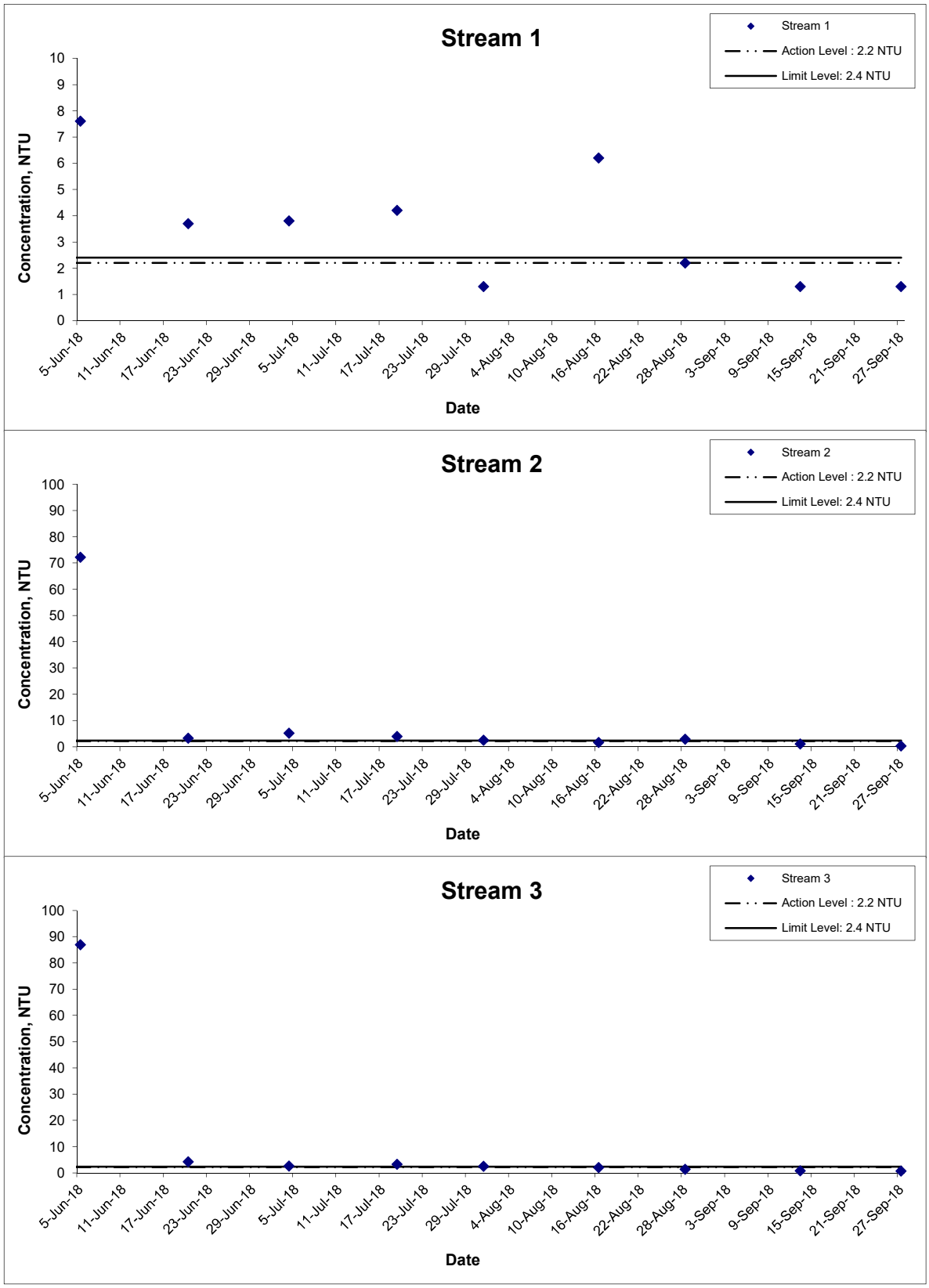
Title	Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction Graphical Presentation of Groundwater Quality Monitoring Result	Scale: N.T.S	Project No.: MA16034	CINOTECH
		Date: Aug 18	Appendix: H	

Dissolved Oxygen



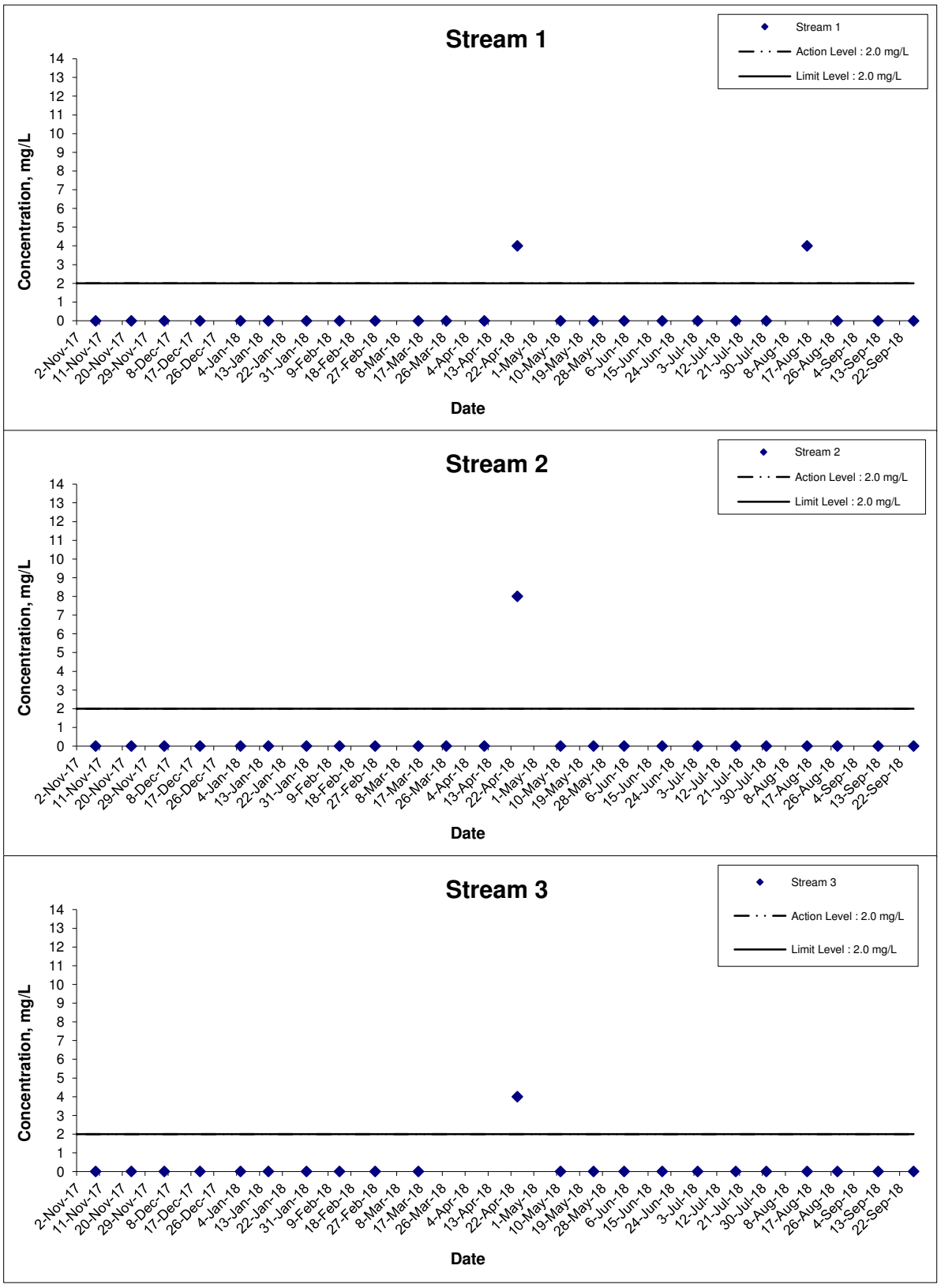
Title	Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction Graphical Presentation of Groundwater Quality Monitoring Result	Scale: N.T.S	Project No.: MA16034	CINOTECH
		Date: Sep 18	Appendix: H	

Turbidity



Title	Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction Graphical Presentation of Groundwater Quality Monitoring Result	Scale: N.T.S	Project No.: MA16034	CINOTECH
		Date: Sep-18	Appendix: H	

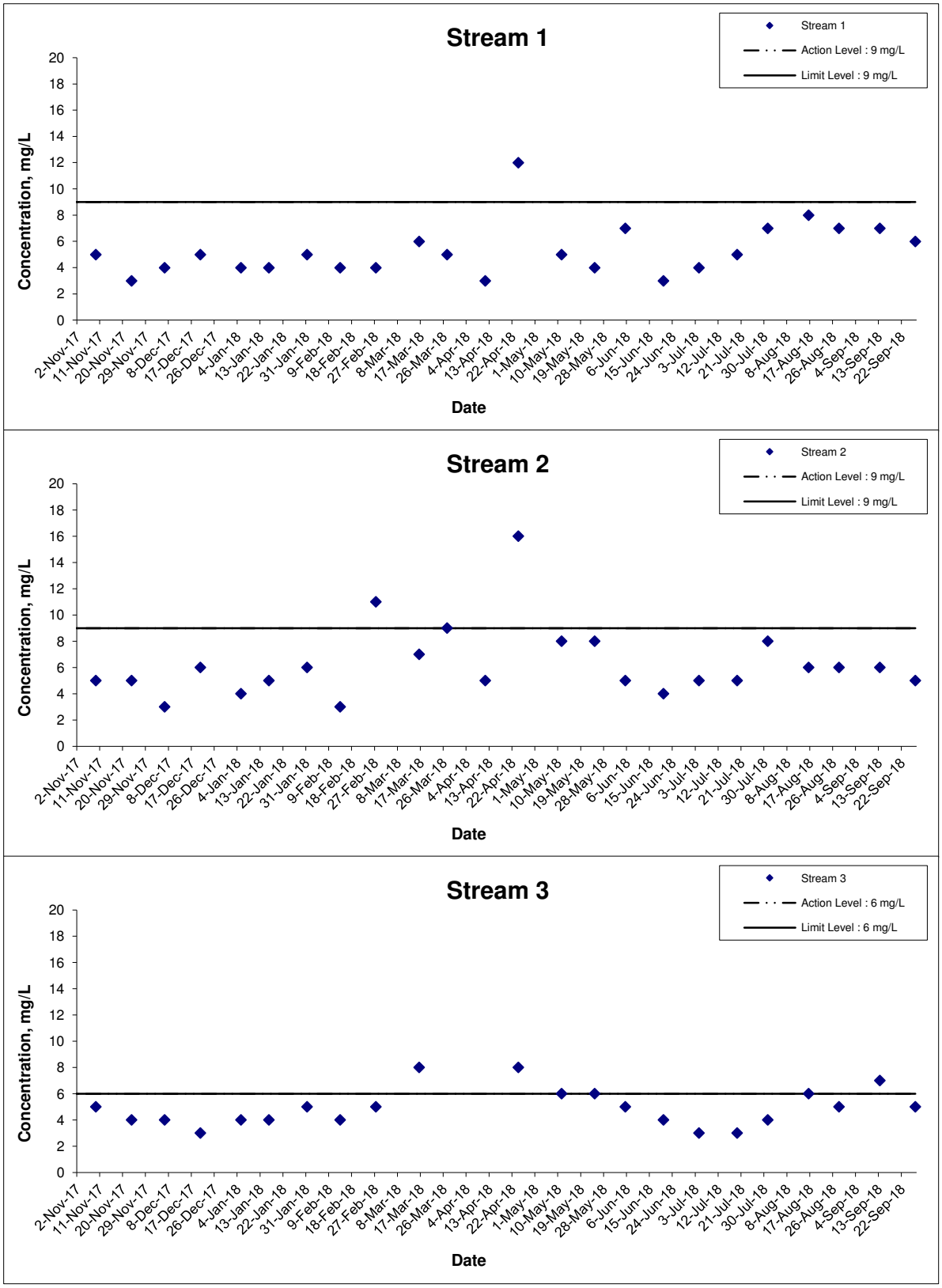
5-day Biochemical Oxygen Demand (BOD_5)



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

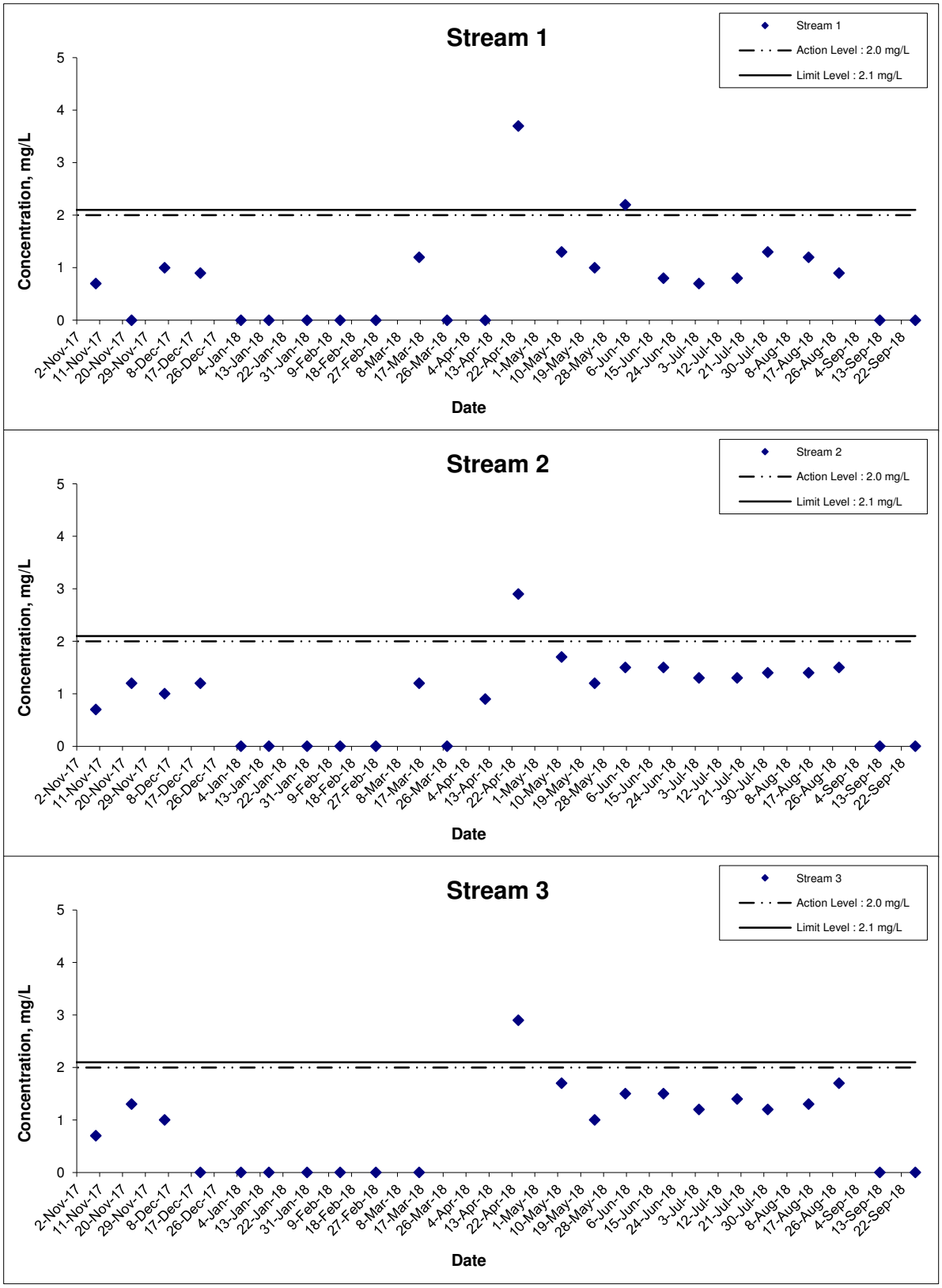
Title	Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction Graphical Presentation of Groundwater Quality Monitoring Result	Scale: N.T.S	Project No.: MA16034	CINOTECH
		Date: Aug 18	Appendix: H	

Total Organic Carbon (TOC)



Title	Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction Graphical Presentation of Groundwater Quality Monitoring Result	Scale: N.T.S Date: Aug 18	Project No.: MA16034 Appendix: H	CINOTECH

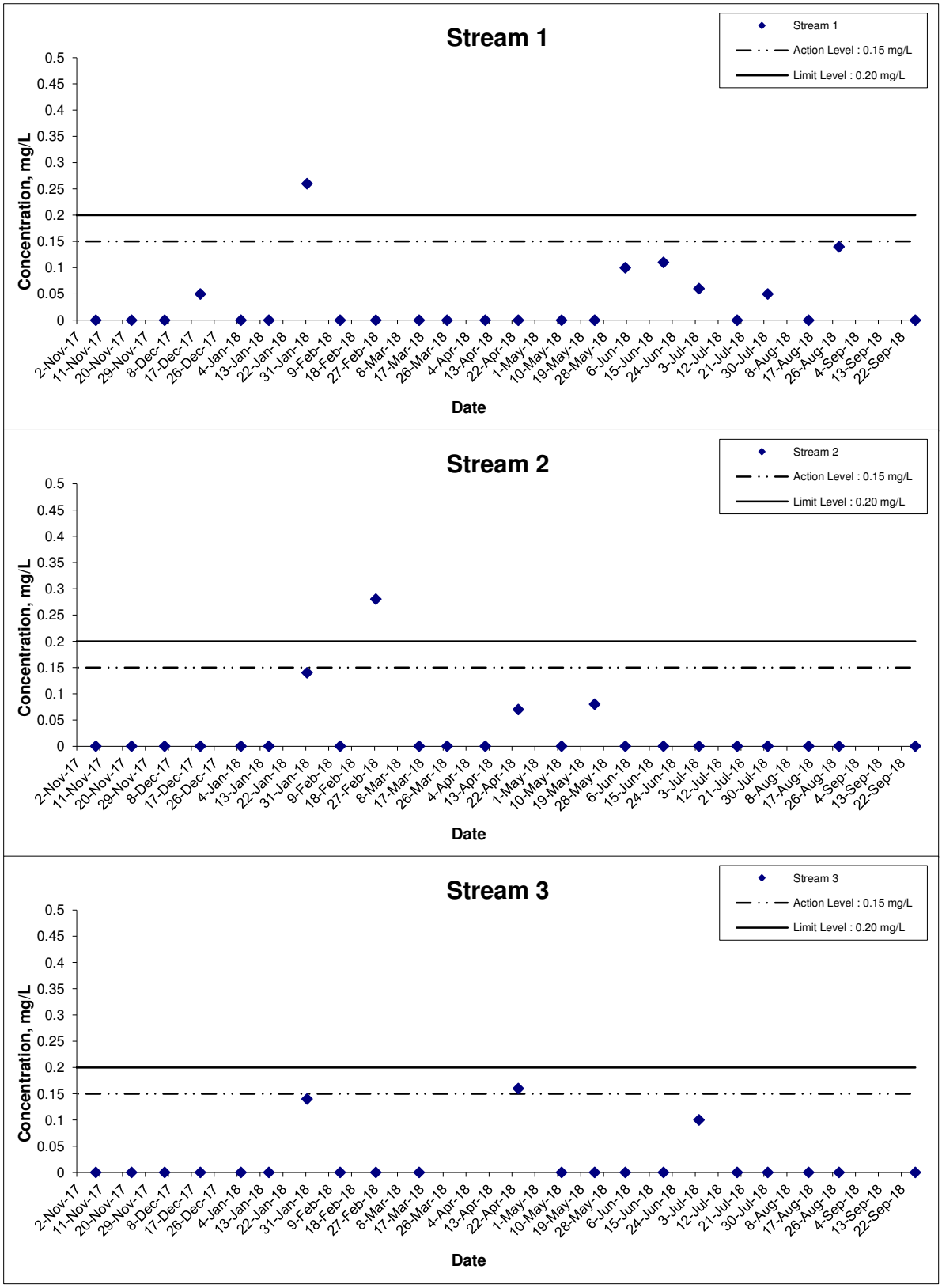
Total Nitrogen



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

Title	Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction Graphical Presentation of Groundwater Quality Monitoring Result	Scale: N.T.S Date: Aug 18	Project No.: MA16034 Appendix: H	CINOTECH

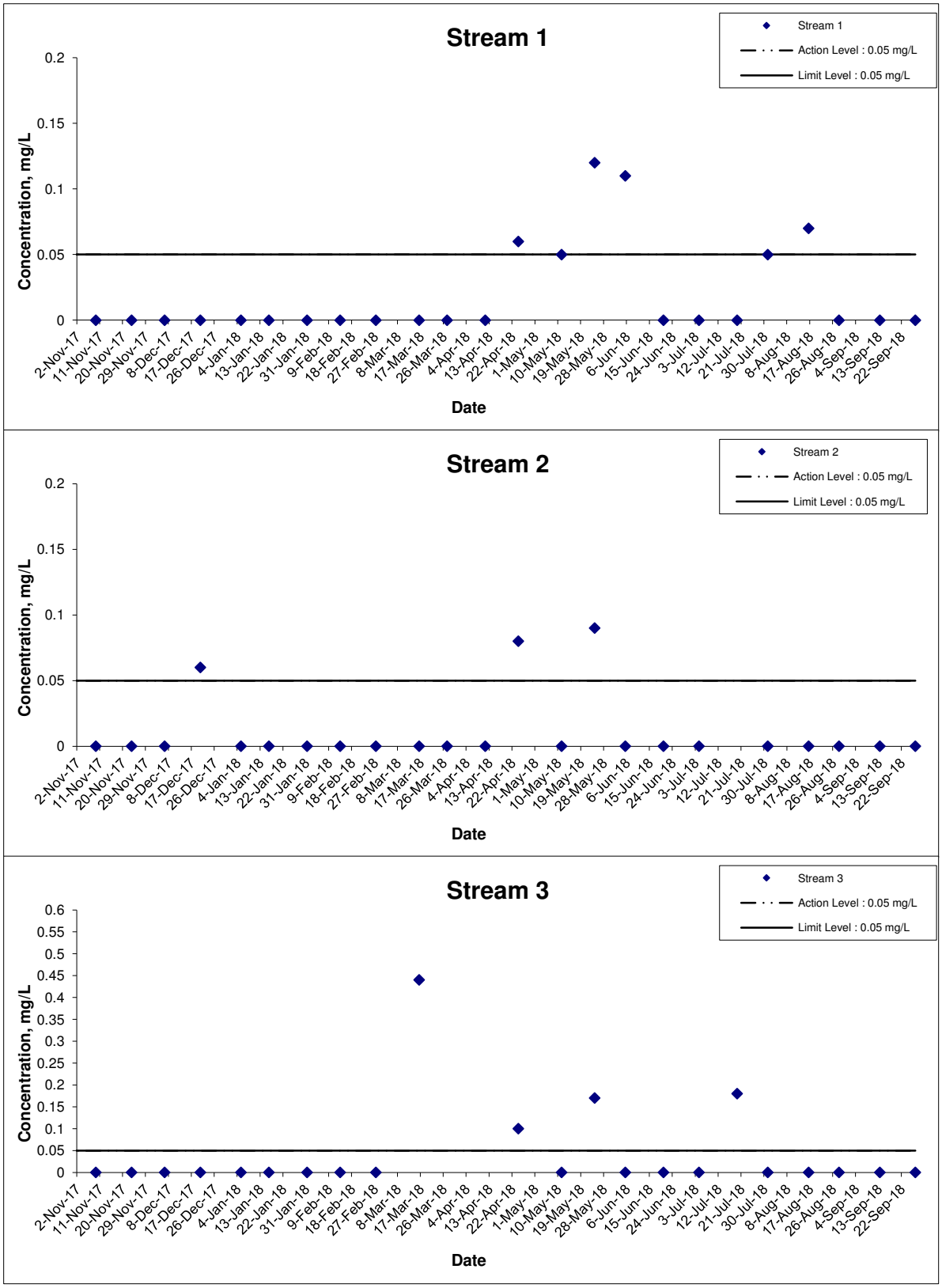
Ammonia-Nitrogen



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

Title	Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction Graphical Presentation of Groundwater Quality Monitoring Result	Scale: N.T.S	Project No.: MA16034	CINOTECH
		Date: Aug 18	Appendix: H	

Total Phosphate



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

Title	Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction Graphical Presentation of Groundwater Quality Monitoring Result	Scale: N.T.S Date: Aug 18	Project No.: MA16034 Appendix: H	CINOTECH

APPENDIX I
MARINE WATER QUALITY MONITORING RESULTS AND GRAPHICAL PRESENTATIONS

Appendix I - Action and Limit Levels for Marine Water Quality on 4 September 2018 (Mid-Ebb Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU*** or 120% of upstream control station's Turbidity at the same tide of the same day ***C2: 5.8 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C2: 6.2 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 6.5 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 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 ***C2: 6.5 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 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 ***C2: 7.9 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 8.6 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 04 September 2018

(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	08:07	Surface	1	25.0 25.0	25.0	7.7 7.7	7.7	32.6 32.5	32.6	77.7 76.1	76.9	5.3 5.2	5.3	5.2	1.5 1.4	1.5	2.2	3.5 3.4	3.5	4.3
				Middle	9	24.1 24.0	24.1	7.8 7.8	7.8	34.1 34.4	34.3	72.5 72.0	72.3	5.0 5.0	5.0		2.1 2.3	2.2		3.6 3.7	3.7	
				Bottom	17	23.2 23.1	23.2	7.8 7.8	7.8	35.6 35.8	35.7	70.4 70.5	70.5	4.9 4.9	4.9	4.9	2.9 3.0	3.0		5.7 5.7	5.7	
C2	Sunny	Calm	07:01	Surface	1	26.3 26.1	26.2	7.7 7.7	7.7	29.8 30.3	30.1	84.4 80.0	82.2	5.8 5.5	5.7	5.3	0.2 0.2	0.2	3.1	5.4 5.4	5.4	5.7
				Middle	16.5	23.0 22.9	23.0	7.8 7.8	7.8	35.9 36.2	36.1	69.7 69.8	69.8	4.9 4.9	4.9		4.2 4.2	4.2		5.0 5.1	5.1	
				Bottom	32	22.9 22.9	22.9	7.8 7.8	7.8	36.1 36.1	36.1	69.8 69.8	69.8	4.9 4.9	4.9	4.9	4.8 4.8	4.8		6.6 6.5	6.6	
G1	Sunny	Calm	07:30	Surface	1	25.8 25.8	25.8	7.8 7.7	7.8	32.1 32.0	32.1	84.1 84.1	84.1	5.7 5.7	5.7	5.5	0.2 0.2	0.2	0.8	4.4 4.4	4.4	5.2
				Middle	4	25.2 25.0	25.1	7.8 7.8	7.8	32.8 33.1	33.0	77.8 74.8	76.3	5.3 5.1	5.2		0.3 0.3	0.3		5.6 5.9	5.8	
				Bottom	7	23.8 23.7	23.8	7.8 7.8	7.8	35.0 35.1	35.1	66.6 65.2	65.9	4.6 4.5	4.6	4.6	1.8 2.0	1.9		5.4 5.4	5.4	
G2	Sunny	Calm	07:20	Surface	1	25.6 25.7	25.7	7.8 7.8	7.8	32.2 32.1	32.2	89.0 89.2	89.1	6.1 6.1	6.1	5.8	0.5 0.4	0.5	2.5	3.2 3.1	3.2	3.6
				Middle	5	24.7 24.7	24.7	7.8 7.8	7.8	33.5 33.6	33.6	78.5 76.9	77.7	5.4 5.3	5.4		1.3 1.3	1.3		4.0 4.2	4.1	
				Bottom	9	23.2 23.2	23.2	7.8 7.8	7.8	35.8 35.8	35.8	63.7 63.9	63.8	4.4 4.4	4.4	4.4	5.7 5.6	5.7		3.4 3.5	3.5	
G3	Sunny	Calm	07:37	Surface	1	25.6 25.5	25.6	7.8 7.8	7.8	31.9 32.0	32.0	83.3 82.7	83.0	5.7 5.7	5.7	5.5	0.2 0.2	0.2	1.4	3.9 4.0	4.0	4.2
				Middle	4	24.8 25.3	25.1	7.8 7.8	7.8	33.4 32.7	33.1	72.5 77.7	75.1	5.0 5.3	5.2		1.0 1.0	1.0		4.2 4.2	4.2	
				Bottom	7	23.5 23.7	23.6	7.8 7.8	7.8	35.4 35.2	35.3	65.5 65.0	65.3	4.5 4.5	4.5	4.5	2.8 2.9	2.9		4.5 4.4	4.5	
G4	Sunny	Calm	07:49	Surface	1	25.8 25.9	25.9	7.8 7.8	7.8	31.9 31.9	31.9	93.6 91.8	92.7	6.4 6.2	6.3	6.0	0.6 0.5	0.6	0.9	5.6 5.5	5.6	6.6
				Middle	4	25.2 25.1	25.2	7.8 7.8	7.8	32.8 32.9	32.9	81.6 81.3	81.5	5.6 5.6	5.6		0.1 0.1	0.1		7.3 7.4	7.4	
				Bottom	7	23.6 23.6	23.6	7.8 7.8	7.8	35.2 35.3	35.3	66.7 64.7	65.7	4.6 4.5	4.6	4.6	2.0 2.2	2.1		6.7 6.7	6.7	
M1	Sunny	Calm	07:25	Surface	1	25.7 25.7	25.7	7.8 7.7	7.8	32.1 32.1	32.1	86.8 81.2	84.0	5.9 5.5	5.7	5.7	0.6 0.6	0.6	0.9	5.5 5.4	5.5	4.2
				Middle	3	25.3 25.5	25.4	7.8 7.7	7.8	32.6 32.3	32.5	83.2 80.1	81.7	5.7 5.5	5.6		0.9 0.9	0.9		2.9 3.0	3.0	
				Bottom	5	24.7 24.9	24.8	7.8 7.8	7.8	33.6 33.2	33.4	75.4 74.1	74.8	5.2 5.1	5.2	5.2	1.2 1.2	1.2		4.0 4.2	4.1	
M2	Sunny	Calm	07:15	Surface	1	25.5 25.5	25.5	7.8 7.8	7.8	32.3 32.3	32.3	88.6 85.9	87.3	6.0 5.9	6.0	5.5	0.5 0.6	0.6	2.6	5.4 5.6	5.5	4.5
				Middle	5.5	23.7 23.9	23.8	7.8 7.8	7.8	35.1 34.7	34.9	69.9 71.2	70.6	4.8 4.9	4.9		2.3 2.1	2.2		3.3 3.3	3.3	
				Bottom	10	23.0 23.0	23.0	7.8 7.8	7.8	36.1 36.1	36.1	66.1 65.4	65.8	4.6 4.6	4.6	4.6	5.0 4.9	5.0		4.7 4.8	4.8	
M3	Sunny	Calm	07:43	Surface	1	25.6 25.6	25.6	7.8 7.8	7.8	31.7 31.7	31.7	81.7 83.3	82.5	5.6 5.7	5.7	5.5	0.5 0.4	0.5	1.3	4.0 3.9	4.0	4.5
				Middle	4	25.2 25.2	25.2	7.8 7.8	7.8	32.7 32.7	32.7	78.8 76.3	77.6	5.4 5.2	5.3		1.0 1.1	1.1		4.4 4.4	4.4	
				Bottom	7	23.8 23.8	23.8	7.8 7.8	7.8	35.1 34.9	35.0	67.4 67.4	67.4	4.7 4.7	4.7	4.7	2.4 2.2	2.3		5.0 5.2	5.1	
M4	Sunny	Calm	07:09	Surface	1	25.2 25.2	25.2	7.7 7.7	7.7	32.6 32.5	32.6	81.8 79.0	80.4	5.6 5.4	5.5	5.3	0.6 0.6	0.6	1.0	5.2 5.2	5.2	5.1
				Middle	5	23.9 24.1	24.0	7.8 7.8	7.8	34.7 34.3	34.5	73.2 74.2	73.7	5.1 5.1	5.1		0.8 0.8	0.8		4.1 4.1	4.1	
				Bottom	9	23.4 23.3	23.4	7.8 7.8	7.8	35.4 35.6	35.5	69.3 68.8	69.1	4.8 4.8	4.8	4.8	1.6 1.7	1.7		5.9 6.0	6.0	
M5	Sunny	Calm	08:00	Surface	1	25.8 25.7	25.8	7.8 7.8	7.8	31.9 32.1	32.0	92.0 88.1	90.1	6.3 6.0	6.2	5.7	0.4 0.4	0.4	1.7	5.5 5.6	5.6	5.8
				Middle	5.5	23.6 23.5	23.6	7.8 7.8	7.8	35.1 35.2	35.2	73.7 72.6	73.2	5.1 5.0	5.1		1.6 1.7	1.7		5.8 5.6	5.7	
				Bottom	10	22.8 22.8	22.8	7.8 7.8	7.8	36.4 36.4	36.4	72.3 72.0	72.2	5.1 5.0	5.1	5.1	2.7 3.0	2.9		6.1 6.3	6.2	
M6	Sunny	Calm	07:55	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	5.2	- -	-	0.3	- -	-	5.6
				Middle	2.1	25.8 25.8	25.8	7.8 7.8	7.8	32.2 32.2	32.2	76.1 76.0	76.1	5.2 5.2	5.2		0.3 0.3	0.3		5.6 5.6	5.6	
				Bottom	-	- -	-	- -	-	- -	-	- -	-	- -	-	-	- -	-		- -	-	

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

Appendix I - Action and Limit Levels for Marine Water Quality on 4 September 2018 (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: 8.9 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C1: 9.6 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: 6.6 mg/L***	***6.9 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*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 6.6 mg/L***	***7.4 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*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 7.4 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 8.1 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.

2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.

3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.

4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 04 September 2018

(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	14:07	Surface	1	27.2 27.1	27.2	7.9 7.9	7.9	32.0 31.9	32.0	106.9 105.0	106.0	7.1 7.0	7.1	6.0	0.6 0.6	0.6	3.1	5.6 5.4	5.5	5.9
				Middle	9	23.5 23.5	23.5	7.8 7.8	7.8	35.3 35.3	35.3	71.1 71.2	71.2	4.9 4.9	4.9		1.1 1.2	1.2		6.0 6.0	6.0	
				Bottom	17	22.7 22.7	22.7	7.9 7.9	7.9	36.5 36.5	36.5	61.4 61.2	61.3	4.3 4.3	4.3	4.3	7.4 7.4	7.4		6.1 6.2	6.2	
C2	Sunny	Calm	12:55	Surface	1	26.2 26.2	26.2	7.7 7.8	7.8	31.8 31.9	31.9	86.1 87.7	86.9	5.8 5.9	5.9	5.5	0.6 0.6	0.6	2.6	4.1 4.3	4.2	5.0
				Middle	16.5	23.1 23.2	23.2	7.8 7.8	7.8	35.6 35.6	35.6	70.8 72.0	71.4	4.9 5.0	5.0		2.1 2.3	2.2		5.2 5.2	5.2	
				Bottom	32	22.9 23.0	23.0	7.8 7.8	7.8	36.0 36.0	36.0	70.8 70.7	70.8	4.9 4.9	4.9	4.9	4.9 4.9	4.9		5.7 5.6	5.7	
G1	Sunny	Calm	13:33	Surface	1	25.3 25.6	25.5	7.8 7.8	7.8	32.9 32.6	32.8	79.8 83.1	81.5	5.4 5.7	5.6	5.2	0.2 0.2	0.2	3.9	4.3 4.4	4.4	4.9
				Middle	4	23.5 24.2	23.9	7.8 7.8	7.8	35.5 34.6	35.1	66.7 70.0	68.4	4.6 4.8	4.7		3.8 3.4	3.6		4.2 4.4	4.3	
				Bottom	7	22.9 22.9	22.9	7.8 7.8	7.8	36.2 36.2	36.2	64.4 64.7	64.6	4.5 4.5	4.5	4.5	8.0 7.7	7.9		5.8 5.9	5.9	
G2	Sunny	Calm	13:22	Surface	1	26.3 25.9	26.1	7.8 7.8	7.8	31.9 32.2	32.1	90.7 87.0	88.9	6.1 5.9	6.0	5.4	0.5 0.5	0.5	3.9	5.3 5.4	5.4	5.9
				Middle	5	23.2 23.2	23.2	7.8 7.8	7.8	35.9 35.9	35.9	71.5 66.4	69.0	5.0 4.6	4.8		4.1 4.3	4.2		5.6 5.4	5.5	
				Bottom	9	22.9 22.9	22.9	7.8 7.8	7.8	36.2 36.3	36.3	67.1 65.1	66.1	4.7 4.5	4.6	4.6	6.8 7.0	6.9		6.7 6.7	6.7	
G3	Sunny	Calm	13:38	Surface	1	26.2 26.0	26.1	7.9 7.9	7.9	31.8 32.1	32.0	100.2 97.0	98.6	6.8 6.6	6.7	5.7	0.1 0.1	0.1	3.6	3.4 3.3	3.4	4.9
				Middle	4	23.4 23.4	23.4	7.8 7.8	7.8	35.7 35.7	35.7	65.4 68.2	66.8	4.5 4.7	4.6		3.5 3.1	3.3		5.8 5.8	5.8	
				Bottom	7	23.0 23.0	23.0	7.8 7.8	7.8	36.1 36.1	36.1	61.5 61.6	61.6	4.3 4.3	4.3	4.3	7.2 7.3	7.3		5.5 5.4	5.5	
G4	Sunny	Calm	13:50	Surface	1	25.6 25.9	25.8	7.8 7.9	7.9	32.6 32.3	32.5	84.0 91.2	87.6	5.7 6.2	6.0	5.5	0.3 0.3	0.3	3.4	5.0 5.1	5.1	4.5
				Middle	4	23.7 23.8	23.8	7.8 7.8	7.8	35.2 35.1	35.2	71.9 70.2	71.1	5.0 4.9	5.0		1.5 1.5	1.5		3.3 3.4	3.4	
				Bottom	7	23.0 23.1	23.1	7.8 7.8	7.8	36.1 36.1	36.1	66.1 65.8	66.0	4.6 4.6	4.6	4.6	8.7 8.3	8.5		4.9 5.1	5.0	
M1	Sunny	Calm	13:28	Surface	1	26.0 26.1	26.1	7.8 7.8	7.8	32.2 32.1	32.2	82.9 83.5	83.2	5.6 5.6	5.6	5.4	0.6 0.5	0.6	3.4	4.6 4.6	4.6	5.0
				Middle	3	24.6 24.4	24.5	7.8 7.8	7.8	34.0 34.3	34.2	75.1 72.9	74.0	5.2 5.0	5.1		2.0 1.8	1.9		4.4 4.2	4.3	
				Bottom	5	23.2 23.2	23.2	7.8 7.8	7.8	35.9 35.9	35.9	63.0 62.4	62.7	4.4 4.3	4.4	4.4	7.5 7.6	7.6		5.9 6.0	6.0	
M2	Sunny	Calm	13:16	Surface	1	26.3 26.2	26.3	7.8 7.8	7.8	32.1 32.1	32.1	89.4 87.6	88.5	6.0 5.9	6.0	5.5	0.4 0.4	0.4	3.4	4.8 5.0	4.9	5.3
				Middle	5.5	23.0 23.0	23.0	7.8 7.8	7.8	36.1 36.1	36.1	72.0 71.3	71.7	5.0 5.0	5.0		2.5 2.4	2.5		5.3 5.1	5.2	
				Bottom	10	22.8 22.8	22.8	7.8 7.8	7.8	36.4 36.3	36.4	70.9 69.8	70.4	5.0 4.9	5.0	5.0	6.8 7.7	7.3		5.9 5.8	5.9	
M3	Sunny	Calm	13:43	Surface	1	26.2 26.0	26.1	7.9 7.9	7.9	31.7 31.9	31.8	96.7 96.7	96.7	6.5 6.6	6.6	5.7	0.2 0.2	0.2	4.6	5.2 5.0	5.1	5.0
				Middle	4	23.3 23.3	23.3	7.8 7.8	7.8	35.8 35.8	35.8	66.7 67.1	66.9	4.6 4.7	4.7		4.6 4.9	4.8		4.0 4.1	4.1	
				Bottom	7	23.1 23.1	23.1	7.8 7.8	7.8	36.0 36.0	36.0	63.8 63.8	63.8	4.4 4.4	4.4	4.4	9.0 8.3	8.7		5.9 5.6	5.8	
M4	Sunny	Calm	13:04	Surface	1	26.1 26.1	26.1	7.8 7.8	7.8	32.2 32.2	32.2	94.7 91.9	93.3	6.4 6.2	6.3	6.1	0.4 0.4	0.4	1.0	5.4 5.6	5.5	4.8
				Middle	5	25.2 25.0	25.1	7.8 7.8	7.8	33.0 33.3	33.2	86.3 82.4	84.4	5.9 5.6	5.8		0.4 0.4	0.4		4.3 4.4	4.4	
				Bottom	9	23.6 23.5	23.6	7.8 7.8	7.8	35.2 35.4	35.3	65.4 66.8	66.1	4.5 4.6	4.6	4.6	2.1 2.1	2.1		4.4 4.7	4.6	
M5	Sunny	Calm	13:59	Surface	1	26.7 26.7	26.7	7.8 7.8	7.8	32.1 32.0	32.1	84.3 83.9	84.1	5.6 5.6	5.6	5.2	0.1 0.1	0.1	1.6	4.5 4.4	4.5	4.0
				Middle	5.5	24.0 24.0	24.0	7.8 7.8	7.8	34.7 34.7	34.7	68.9 68.2	68.6	4.8 4.7	4.8		1.6 1.8	1.7		3.7 3.6	3.7	
				Bottom	10	23.1 23.1	23.1	7.8 7.8	7.8	35.9 35.9	35.9	64.7 64.1	64.4	4.5 4.5	4.5	4.5	3.0 3.1	3.1		3.9 3.8	3.9	
M6	Sunny	Calm	13:55	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	5.1	- -	-	0.7	- -	-	3.0
				Middle	2	24.5 24.5	24.5	7.8 7.8	7.8	34.0 34.0	34.0	74.1 73.6	73.9	5.1 5.1	5.1		0.7 0.7	0.7		3.0 2.9	3.0	
				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 6 September 2018 (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: 7.6 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C2: 8.19 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 5.2 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 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 ***C2: 5.2 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 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 ***C2: 6.8 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 7.4 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 06 September 2018

(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	10:38	Surface	1	25.5 25.9	25.7	7.7 7.8	7.8	30.7 30.2	30.5	80.8 82.6	81.7	5.6 5.7	5.7	5.1	1.8 1.8	1.8	3.5	5.1 5.0	5.1	5.3
				Middle	9	23.1 23.4	23.3	7.7 7.7	7.7	34.3 33.9	34.1	63.8 64.2	64.0	4.5 4.5	4.5		3.1 2.9	3.0		5.9 5.3	5.6	
				Bottom	17	22.7 22.8	22.8	7.7 7.7	7.7	34.9 34.8	34.9	61.6 61.9	61.8	4.3 4.4	4.4	4.4	5.8 5.7	5.8		5.2 5.3	5.3	
C2	Sunny	Calm	09:06	Surface	1	26.4 26.3	26.4	7.7 7.7	7.7	29.2 29.2	29.2	89.7 84.5	87.1	6.1 5.8	6.0	5.2	1.0 1.1	1.1	4.6	4.4 4.4	4.4	4.9
				Middle	16	22.9 22.9	22.9	7.7 7.7	7.7	34.6 34.6	34.6	60.6 61.7	61.2	4.3 4.3	4.3		6.7 6.1	6.4		4.6 4.6	4.6	
				Bottom	31	22.9 22.9	22.9	7.7 7.7	7.7	34.6 34.6	34.6	60.5 60.8	60.7	4.3 4.3	4.3	4.3	6.5 6.0	6.3		5.7 5.6	5.7	
G1	Sunny	Calm	09:52	Surface	1	25.3 25.3	25.3	7.9 7.8	7.9	31.8 31.7	31.8	98.4 93.9	96.2	6.8 6.4	6.6	5.9	1.2 1.2	1.2	1.4	5.0 5.1	5.1	4.8
				Middle	4	24.2 24.4	24.3	7.8 7.8	7.8	33.0 32.7	32.9	73.1 72.3	72.7	5.1 5.0	5.1		1.3 1.3	1.3		4.9 4.9	4.9	
				Bottom	7	23.6 23.3	23.5	7.8 7.7	7.8	33.7 34.2	34.0	63.4 60.9	62.2	4.4 4.3	4.4	4.4	1.7 1.8	1.8		4.3 4.4	4.4	
G2	Sunny	Calm	09:35	Surface	1	26.0 26.1	26.1	8.0 8.0	8.0	31.0 30.9	31.0	141.1 146.7	143.9	9.6 10.0	9.8	7.6	1.1 1.0	1.1	2.0	3.0 2.9	3.0	4.2
				Middle	5	24.1 24.2	24.2	7.7 7.8	7.8	33.1 32.5	32.8	74.7 76.4	75.6	5.2 5.3	5.3		1.1 1.2	1.2		3.7 3.8	3.8	
				Bottom	9	22.9 22.9	22.9	7.7 7.7	7.7	34.7 34.6	34.7	63.6 62.7	63.2	4.5 4.4	4.5	4.5	3.4 3.8	3.6		5.7 5.7	5.7	
G3	Sunny	Calm	09:58	Surface	1	25.6 25.3	25.5	7.9 7.8	7.9	31.5 31.7	31.6	119.4 119.7	119.6	8.2 8.2	8.2	6.8	1.2 1.2	1.2	2.1	4.3 4.3	4.3	4.9
				Middle	4	24.5 24.5	24.5	7.7 7.8	7.8	32.7 32.7	32.7	78.3 73.1	75.7	5.4 5.1	5.3		1.6 1.5	1.6		5.3 5.2	5.3	
				Bottom	7	23.1 23.0	23.1	7.7 7.7	7.7	34.5 34.6	34.6	63.7 61.1	62.4	4.5 4.3	4.4	4.4	3.5 3.7	3.6		5.1 5.3	5.2	
G4	Sunny	Calm	10:13	Surface	1	25.5 25.8	25.7	7.9 7.9	7.9	31.3 31.1	31.2	124.9 137.8	131.4	8.6 9.4	9.0	7.3	1.2 1.3	1.3	3.2	3.5 3.6	3.6	4.3
				Middle	4	24.3 24.3	24.3	7.8 7.8	7.8	32.9 32.9	32.9	78.9 80.7	79.8	5.5 5.6	5.6		1.2 1.1	1.2		5.0 5.0	5.0	
				Bottom	7	23.1 23.1	23.1	7.7 7.7	7.7	34.5 34.5	34.5	61.7 62.2	62.0	4.3 4.4	4.4	4.4	7.1 7.0	7.1		4.2 4.1	4.2	
M1	Sunny	Calm	09:43	Surface	1	26.4 26.5	26.5	7.9 7.8	7.9	31.0 30.9	31.0	95.4 96.0	95.7	6.5 6.5	6.5	6.8	1.8 1.8	1.8	1.7	4.6 4.7	4.7	5.3
				Middle	3	25.4 25.3	25.4	7.8 7.8	7.8	31.6 31.7	31.7	100.5 101.6	101.1	6.9 7.0	7.0		1.1 1.0	1.1		5.5 5.3	5.4	
				Bottom	5	23.9 23.9	23.9	7.7 7.7	7.7	33.4 33.4	33.4	65.2 64.9	65.1	4.5 4.5	4.5	4.5	2.2 2.3	2.3		5.9 5.9	5.9	
M2	Sunny	Calm	09:27	Surface	1	26.2 26.0	26.1	8.0 8.0	8.0	30.6 30.8	30.7	137.4 141.0	139.2	9.4 9.6	9.5	7.5	1.1 1.1	1.1	3.0	4.9 4.6	4.8	5.0
				Middle	6	23.8 23.7	23.8	7.7 7.7	7.7	33.2 32.7	33.0	72.3 79.5	75.9	5.1 5.6	5.4		1.1 1.1	1.1		5.3 5.1	5.2	
				Bottom	11	22.8 22.8	22.8	7.7 7.7	7.7	34.8 34.8	34.8	60.8 60.6	60.7	4.3 4.3	4.3	4.3	6.7 6.9	6.8		5.0 4.8	4.9	
M3	Sunny	Calm	10:05	Surface	1	25.8 25.9	25.9	7.9 7.9	7.9	30.9 30.4	30.7	126.3 122.9	124.6	8.6 8.4	8.5	6.8	1.4 1.5	1.5	2.1	4.9 5.0	5.0	5.4
				Middle	4	24.2 24.3	24.3	7.7 7.7	7.7	33.0 32.7	32.9	68.9 73.4	71.2	4.8 5.1	5.0		1.2 1.2	1.2		5.4 5.9	5.7	
				Bottom	7	23.1 23.0	23.1	7.7 7.7	7.7	34.5 34.6	34.6	61.7 62.5	62.1	4.3 4.4	4.4	4.4	3.3 3.6	3.5		5.4 5.6	5.5	
M4	Sunny	Calm	09:18	Surface	1	26.6 26.5	26.6	8.1 8.1	8.1	30.6 30.6	30.6	163.8 166.6	165.2	11.1 11.3	11.2	8.5	1.1 1.1	1.1	1.5	3.8 4.4	4.1	4.1
				Middle	6	24.3 24.3	24.3	7.8 7.8	7.8	32.8 32.7	32.8	79.3 88.0	83.7	5.5 6.1	5.8		1.0 1.0	1.0		4.1 4.3	4.2	
				Bottom	11	23.2 23.2	23.2	7.7 7.7	7.7	34.3 34.3	34.3	64.3 62.7	63.5	4.5 4.4	4.5	4.5	2.4 2.5	2.5		4.0 4.0	4.0	
M5	Sunny	Calm	10:27	Surface	1	26.5 26.4	26.5	8.0 7.9	8.0	30.4 30.4	30.4	129.5 119.9	124.7	8.8 8.1	8.5	7.8	1.2 1.2	1.2	2.4	3.6 3.5	3.6	4.6
				Middle	5.5	25.9 25.7	25.8	7.9 7.8	7.9	30.7 30.8	30.8	103.2 100.4	101.8	7.1 6.9	7.0		1.3 1.3	1.3		4.6 4.8	4.7	
				Bottom	10	22.9 22.9	22.9	7.7 7.7	7.7	34.8 34.8	34.8	65.8 64.4	65.1	4.6 4.5	4.6	4.6	5.0 4.6	4.8		5.5 5.6	5.6	
M6	Sunny	Calm	10:21	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	12.0	- -	-	1.1	- -	-	3.4
				Middle	2.2	26.9 26.9	26.9	8.1 8.1	8.1	30.4 30.4	30.4	176.7 178.0	177.4	11.9 12.0	12.0		1.1 1.1	1.1		3.4 3.4	3.4	
				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 6 September 2018 (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: 6.8 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C1: 7.4 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 5.6 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 6.1 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 5.6 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 6.1 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 6.5 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 7.0 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 06 September 2018

(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	17:01	Surface	1	27.2 27.1	27.2	8.1 8.1	8.1	30.6 30.5	30.6	178.3 173.1	175.7	11.9 11.6	11.8	8.3	1.4 1.4	1.4	2.9	4.7 4.6	4.7	4.2
				Middle	9	23.3 23.3	23.3	7.8 7.7	7.8	34.3 34.2	34.3	68.8 68.5	68.7	4.8 4.8	4.8		1.8 1.6	1.7		2.5 2.5	2.5	
				Bottom	17	22.7 22.7	22.7	7.8 7.7	7.8	34.9 34.9	34.9	61.8 61.5	61.7	4.4 4.3	4.4	4.4	6.0 5.4	5.7		5.3 5.4	5.4	
C2	Sunny	Calm	15:21	Surface	1	27.6 26.9	27.3	8.1 8.0	8.1	30.6 30.7	30.7	197.1 171.4	184.3	13.1 11.5	12.3	8.5	1.3 1.4	1.4	3.1	4.7 4.6	4.7	5.1
				Middle	16	23.3 23.2	23.3	7.7 7.7	7.7	34.1 34.2	34.2	67.0 65.7	66.4	4.7 4.6	4.7		3.3 3.3	3.3		4.3 4.2	4.3	
				Bottom	31	23.0 23.0	23.0	7.7 7.7	7.7	34.5 34.5	34.5	65.6 65.6	65.6	4.6 4.6	4.6	4.6	4.5 4.7	4.6		6.4 6.4	6.4	
G1	Sunny	Calm	16:09	Surface	1	26.0 25.8	25.9	8.0 8.0	8.0	31.2 31.3	31.3	146.4 134.5	140.5	10.0 9.2	9.6	8.1	1.8 1.6	1.7	1.8	5.0 4.9	5.0	5.2
				Middle	4	24.4 24.5	24.5	7.8 7.8	7.8	32.5 32.6	32.6	96.2 89.6	92.9	6.7 6.2	6.5		1.7 1.6	1.7		5.1 5.1	5.1	
				Bottom	7	23.9 23.9	23.9	7.7 7.7	7.7	33.4 33.5	33.5	71.2 70.5	70.9	5.0 4.9	5.0	5.0	1.8 1.9	1.9		5.5 5.6	5.6	
G2	Sunny	Calm	15:53	Surface	1	26.2 26.2	26.2	8.1 8.1	8.1	31.0 31.0	31.0	178.8 185.5	182.2	12.2 12.6	12.4	8.7	1.4 1.4	1.4	2.3	3.5 3.5	3.5	4.5
				Middle	5	23.8 23.8	23.8	7.7 7.7	7.7	33.0 33.6	33.3	67.4 73.9	70.7	4.7 5.2	5.0		1.5 1.7	1.6		5.0 5.0	5.0	
				Bottom	9	23.0 23.0	23.0	7.7 7.7	7.7	34.6 34.5	34.6	62.0 61.3	61.7	4.4 4.3	4.4	4.4	3.8 4.2	4.0		4.8 4.9	4.9	
G3	Sunny	Calm	16:18	Surface	1	26.6 26.9	26.8	8.0 8.2	8.1	30.5 30.2	30.4	180.3 196.3	188.3	12.2 13.2	12.7	8.8	1.2 1.2	1.2	3.3	3.6 3.7	3.7	3.6
				Middle	4	23.6 23.6	23.6	7.7 7.7	7.7	33.9 33.9	33.9	67.7 69.6	68.7	4.7 4.9	4.8		3.5 3.4	3.5		3.6 3.9	3.8	
				Bottom	7	23.2 23.2	23.2	7.7 7.7	7.7	34.4 34.4	34.4	61.7 62.8	62.3	4.3 4.4	4.4	4.4	5.2 5.1	5.2		3.3 3.4	3.4	
G4	Sunny	Calm	16:37	Surface	1	26.7 26.0	26.4	8.1 8.0	8.1	30.6 31.0	30.8	163.0 149.9	156.5	11.0 10.2	10.6	8.8	1.2 1.4	1.3	2.3	5.3 5.4	5.4	4.9
				Middle	4	24.8 24.7	24.8	7.8 7.8	7.8	32.3 32.4	32.4	103.1 98.8	101.0	7.1 6.8	7.0		1.9 1.7	1.8		4.3 4.7	4.5	
				Bottom	7	23.5 23.4	23.5	7.7 7.7	7.7	33.9 34.1	34.0	68.9 63.7	66.3	4.8 4.5	4.7	4.7	3.5 3.9	3.7		4.9 4.8	4.9	
M1	Sunny	Calm	16:02	Surface	1	26.4 26.3	26.4	8.1 8.0	8.1	31.0 31.0	31.0	169.8 157.2	163.5	11.5 10.7	11.1	9.0	1.6 1.6	1.6	1.9	4.3 4.4	4.4	3.7
				Middle	3	24.7 24.9	24.8	7.8 7.8	7.8	32.4 32.3	32.4	96.9 100.0	98.5	6.7 6.9	6.8		1.5 1.8	1.7		3.2 3.3	3.3	
				Bottom	5	24.4 24.5	24.5	7.8 7.8	7.8	32.8 32.7	32.8	81.3 84.5	82.9	5.6 5.9	5.8	5.8	2.3 2.2	2.3		3.2 3.6	3.4	
M2	Sunny	Calm	15:44	Surface	1	26.5 26.5	26.5	8.1 8.1	8.1	30.7 30.8	30.8	179.0 175.6	177.3	12.1 11.9	12.0	8.3	1.3 1.4	1.4	3.1	4.8 4.6	4.7	4.8
				Middle	5.5	23.2 23.5	23.4	7.7 7.7	7.7	34.3 34.0	34.2	64.0 64.9	64.5	4.5 4.5	4.5		2.2 2.1	2.2		5.4 5.3	5.4	
				Bottom	10	22.8 22.9	22.9	7.7 7.7	7.7	34.7 34.7	34.7	61.9 62.2	62.1	4.4 4.4	4.4	4.4	5.9 5.6	5.8		4.2 4.3	4.3	
M3	Sunny	Calm	16:27	Surface	1	26.3 26.3	26.3	8.1 8.1	8.1	30.8 30.7	30.8	189.9 177.9	183.9	12.9 12.1	12.5	8.8	1.4 1.4	1.4	3.6	5.2 5.1	5.2	5.0
				Middle	4	23.8 23.7	23.8	7.7 7.7	7.7	33.7 33.7	33.7	71.8 73.7	72.8	5.0 5.1	5.1		2.9 2.9	2.9		6.0 5.9	6.0	
				Bottom	7	23.1 23.2	23.2	7.7 7.7	7.7	34.4 34.4	34.4	61.3 60.7	61.0	4.3 4.3	4.3	4.3	6.4 6.8	6.6		3.7 3.8	3.8	
M4	Sunny	Calm	15:33	Surface	1	27.5 26.9	27.2	8.2 8.1	8.2	30.4 30.6	30.5	156.3 158.2	157.3	10.4 10.6	10.5	8.9	1.4 1.5	1.5	1.8	3.5 3.8	3.7	4.9
				Middle	6	25.5 25.1	25.3	7.9 7.8	7.9	31.5 31.8	31.7	102.5 109.9	106.2	7.0 7.6	7.3		1.6 1.7	1.7		4.6 4.8	4.7	
				Bottom	11	24.6 24.5	24.6	7.8 7.8	7.8	32.5 32.5	32.5	88.8 90.4	89.6	6.2 6.3	6.3	6.3	2.2 2.4	2.3		6.3 6.5	6.4	
M5	Sunny	Calm	16:51	Surface	1	26.9 26.9	26.9	8.1 8.1	8.1	30.7 30.6	30.7	181.5 181.5	181.5	12.2 12.2	12.2	8.6	1.4 1.5	1.5	3.2	5.2 5.2	5.2	3.6
				Middle	5.5	23.8 23.8	23.8	7.8 7.7	7.8	33.5 33.5	33.5	74.5 69.1	71.8	5.2 4.8	5.0		2.5 2.6	2.6		2.8 2.8	2.8	
				Bottom	10	23.0 23.0	23.0	7.7 7.7	7.7	34.6 34.6	34.6	62.4 61.3	61.9	4.4 4.3	4.4	4.4	5.7 5.5	5.6		2.7 2.7	2.7	
M6	Sunny	Calm	16:46	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	8.1	- -	-	1.4	- -	-	3.4
				Middle	2.3	25.3 25.3	25.3	7.9 7.9	7.9	31.6 31.7	31.7	118.1 116.3	117.2	8.1 8.0	8.1		1.4 1.3	1.4		3.3 3.4	3.4	
				Bottom	-	- -	-	- -	-	- -	-	- -	-	- -	-	-	- -	-		- -	-	

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

Appendix I - Action and Limit Levels for Marine Water Quality on 8 September 2018 (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: 12.0 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C2: 13.0 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: 6.4 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 6.9 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: 6.4 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 6.9 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: 7.6 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 8.2 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 08 September 2018

(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	12:16	Surface	1	25.1 25.0	25.1	8.0 8.0	8.0	31.5 31.4	31.5	78.5 78.6	78.6	5.4 5.4	5.4	5.3	1.5 1.5	1.5	3.4	3.5 3.4	3.5	4.2
				Middle	9	24.1 24.3	24.2	8.0 8.0	8.0	32.8 32.5	32.7	71.5 73.1	72.3	5.0 5.1	5.1		2.1 1.9	2.0		5.4 5.7	5.6	
				Bottom	17	23.3 23.0	23.2	7.9 7.9	7.9	33.8 34.1	34.0	63.3 61.4	62.4	4.4 4.3	4.4	4.4	6.5 6.9	6.7		3.5 3.5	3.5	
C2	Cloudy	Moderate	10:48	Surface	1	26.0 25.7	25.9	7.7 8.0	7.9	30.3 30.5	30.4	87.9 84.7	86.3	6.0 5.8	5.9	5.2	0.7 0.8	0.8	6.5	5.2 5.3	5.3	4.9
				Middle	16.5	23.2 23.2	23.2	7.9 7.9	7.9	33.9 33.9	33.9	63.2 65.3	64.3	4.4 4.6	4.5		8.4 8.9	8.7		3.1 3.1	3.1	
				Bottom	32	23.2 23.2	23.2	7.9 7.9	7.9	33.9 33.9	33.9	62.7 62.9	62.8	4.4 4.4	4.4	4.4	10.0 10.0	10.0		6.3 6.3	6.3	
G1	Cloudy	Moderate	11:34	Surface	1	26.0 26.0	26.0	8.1 8.1	8.1	31.0 31.0	31.0	101.1 100.6	100.9	6.9 6.9	6.9	6.6	0.4 0.4	0.4	1.9	4.5 4.5	4.5	4.7
				Middle	4	24.8 25.3	25.1	8.0 8.0	8.0	32.2 31.7	32.0	86.9 94.8	90.9	6.0 6.5	6.3		0.7 0.7	0.7		3.2 3.1	3.2	
				Bottom	7	23.4 23.5	23.5	7.9 7.9	7.9	33.7 33.6	33.7	65.9 67.4	66.7	4.6 4.7	4.7	4.7	4.6 4.7	4.7		6.6 6.4	6.5	
G2	Cloudy	Moderate	11:21	Surface	1	25.9 25.9	25.9	8.1 8.1	8.1	31.1 31.1	31.1	103.1 101.3	102.2	7.0 6.9	7.0	6.6	0.4 0.4	0.4	2.2	2.9 3.0	3.0	4.0
				Middle	5	24.9 24.9	24.9	8.0 8.0	8.0	32.1 32.1	32.1	90.0 90.5	90.3	6.2 6.2	6.2		0.6 0.7	0.7		5.7 5.8	5.8	
				Bottom	9	23.0 23.0	23.0	7.9 7.9	7.9	34.2 34.2	34.2	61.6 60.5	61.1	4.3 4.3	4.3	4.3	5.6 5.4	5.5		3.2 3.2	3.2	
G3	Cloudy	Moderate	11:40	Surface	1	25.9 25.7	25.8	8.0 8.0	8.0	30.4 31.2	30.8	97.2 95.0	96.1	6.7 6.5	6.6	6.0	1.1 1.0	1.1	3.3	3.7 3.6	3.7	4.7
				Middle	4	24.7 24.8	24.8	8.0 8.0	8.0	32.3 32.2	32.3	75.5 76.2	75.9	5.2 5.3	5.3		2.9 2.8	2.9		4.4 4.4	4.4	
				Bottom	7	23.5 23.4	23.5	7.9 7.9	7.9	33.7 33.8	33.8	65.6 63.6	64.6	4.6 4.5	4.6	4.6	6.0 6.0	6.0		5.8 6.1	6.0	
G4	Cloudy	Moderate	11:51	Surface	1	26.0 25.7	25.9	8.1 8.1	8.1	31.0 31.3	31.2	100.7 99.7	100.2	6.9 6.8	6.9	6.3	1.1 1.2	1.2	1.5	2.7 2.6	2.7	3.1
				Middle	4	24.6 24.7	24.7	8.0 8.0	8.0	32.5 32.4	32.5	80.7 82.7	81.7	5.6 5.7	5.7		1.2 1.2	1.2		3.4 3.4	3.4	
				Bottom	7	23.4 23.6	23.5	7.9 7.9	7.9	33.8 33.6	33.7	65.7 68.0	66.9	4.6 4.8	4.7	4.7	2.1 2.1	2.1		3.1 3.1	3.1	
M1	Cloudy	Moderate	11:27	Surface	1	26.2 26.0	26.1	8.0 8.0	8.0	30.9 31.1	31.0	90.6 91.7	91.2	6.2 6.3	6.3	6.4	1.1 1.0	1.1	1.2	2.7 2.8	2.8	3.2
				Middle	3	25.7 25.5	25.6	8.0 8.0	8.0	31.3 31.5	31.4	94.7 95.3	95.0	6.5 6.5	6.5		0.7 0.7	0.7		2.8 2.8	2.8	
				Bottom	5	25.0 24.9	25.0	8.0 8.0	8.0	32.0 32.0	32.0	87.0 84.1	85.6	6.0 5.8	5.9	5.9	1.7 1.6	1.7		3.8 3.9	3.9	
M2	Cloudy	Moderate	11:14	Surface	1	26.1 26.2	26.2	8.1 8.1	8.1	31.0 31.0	31.0	105.6 105.6	105.6	7.2 7.2	7.2	6.5	0.3 0.3	0.3	2.4	4.2 4.1	4.2	3.8
				Middle	5.5	24.5 24.5	24.5	8.0 8.0	8.0	32.5 32.5	32.5	82.1 81.8	82.0	5.7 5.7	5.7		0.8 0.8	0.8		4.0 4.1	4.1	
				Bottom	10	23.0 23.0	23.0	7.9 7.9	7.9	34.2 34.2	34.2	60.2 60.6	60.4	4.2 4.3	4.3	4.3	6.1 5.8	6.0		3.0 2.9	3.0	
M3	Cloudy	Moderate	11:45	Surface	1	25.8 25.6	25.7	8.0 8.0	8.0	30.6 31.2	30.9	98.7 97.5	98.1	6.8 6.7	6.8	6.2	1.0 0.9	1.0	2.5	2.1 2.2	2.2	3.8
				Middle	4	24.8 24.5	24.7	8.0 8.0	8.0	32.1 32.5	32.3	82.7 78.7	80.7	5.7 5.5	5.6		1.6 1.7	1.7		4.5 4.4	4.5	
				Bottom	7	23.4 23.4	23.4	7.9 7.9	7.9	33.7 33.7	33.7	60.9 61.2	61.1	4.3 4.3	4.3	4.3	4.6 4.7	4.7		4.6 4.6	4.6	
M4	Cloudy	Moderate	11:04	Surface	1	26.6 26.4	26.5	8.1 8.1	8.1	30.7 30.9	30.8	109.9 108.5	109.2	7.4 7.4	7.4	7.1	0.2 0.2	0.2	0.8	2.1 2.2	2.2	2.1
				Middle	5	25.5 25.6	25.6	8.1 8.1	8.1	31.4 31.3	31.4	96.2 97.6	96.9	6.6 6.7	6.7		0.7 0.7	0.7		2.3 2.3	2.3	
				Bottom	9	24.2 24.4	24.3	8.0 8.0	8.0	32.9 32.7	32.8	76.2 81.2	78.7	5.3 5.6	5.5	5.5	1.6 1.4	1.5		1.8 1.7	1.8	
M5	Cloudy	Moderate	12:08	Surface	1	25.9 25.8	25.9	8.1 8.1	8.1	31.5 31.5	31.5	100.9 100.3	100.6	6.9 6.8	6.9	6.8	0.4 0.4	0.4	1.1	2.8 2.8	2.8	3.1
				Middle	6	25.5 25.5	25.5	8.1 8.1	8.1	31.7 31.7	31.7	96.4 95.3	95.9	6.6 6.5	6.6		0.6 0.6	0.6		2.6 2.7	2.7	
				Bottom	11	24.0 23.8	23.9	8.0 8.0	8.0	33.1 33.3	33.2	73.3 72.6	73.0	5.1 5.1	5.1	5.1	2.2 2.2	2.2		3.8 3.9	3.9	
M6	Cloudy	Moderate	11:58	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	6.6	- -	-	0.5	- -	-	5.0
				Middle	2	25.2 25.2	25.2	8.0 8.0	8.0	31.9 31.9	31.9	95.3 95.2	95.3	6.6 6.5	6.6		0.4 0.5	0.5		5.0 4.9	5.0	
				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 8 September 2018 (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: 6.6 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C1: 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 ***C1: 5.4 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 5.9 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 ***C1: 5.4 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 5.9 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 ***C1: 6.0 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 6.5 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 08 September 2018

(Mid-Flood Tide)

Location	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
C1	Cloudy	Moderate	18:07	Surface	1	25.6 25.6	25.6	8.0 8.0	8.0	31.1 31.0	31.1	85.6 85.0	85.3	5.9 5.8	5.9	5.5	1.2 1.2	1.2	2.8	4.5 4.4	4.5	4.5
				Middle	9	24.0 24.2	24.1	7.9 7.9	7.9	32.9 32.7	32.8	71.3 72.4	71.9	5.0 5.0	5.0		1.6 1.6	1.6		4.1 4.0	4.1	
				Bottom	17	23.1 23.1	23.1	7.9 7.9	7.9	34.1 34.0	34.1	60.8 61.1	61.0	4.3 4.3	4.3	4.3	5.6 5.3	5.5		5.0 5.0	5.0	
C2	Cloudy	Moderate	16:40	Surface	1	26.1 26.1	26.1	8.0 8.1	8.1	31.0 31.0	31.0	105.6 104.5	105.1	7.2 7.1	7.2	6.7	0.4 0.4	0.4	2.4	2.4 2.4	2.4	3.3
				Middle	16	25.0 25.2	25.1	8.0 8.0	8.0	32.0 31.8	31.9	87.6 92.8	90.2	6.0 6.4	6.2		0.9 0.8	0.9		3.7 3.7	3.7	
				Bottom	31	23.2 23.4	23.3	7.9 7.9	7.9	33.9 33.6	33.8	61.6 61.9	61.8	4.3 4.3	4.3	4.3	5.9 5.8	5.9		3.6 3.8	3.7	
G1	Cloudy	Moderate	17:22	Surface	1	25.3 25.2	25.3	8.0 8.0	8.0	31.7 31.7	31.7	93.0 90.6	91.8	6.4 6.2	6.3	5.7	1.0 0.9	1.0	2.1	5.0 5.0	5.0	4.1
				Middle	4	24.3 23.9	24.1	7.9 8.0	8.0	32.6 33.1	32.9	73.0 69.4	71.2	5.1 4.8	5.0		1.5 1.7	1.6		2.3 2.3	2.3	
				Bottom	7	23.6 23.5	23.6	7.9 7.9	7.9	33.5 33.6	33.6	64.4 61.2	62.8	4.5 4.3	4.4	4.4	3.5 3.6	3.6		5.1 5.1	5.1	
G2	Cloudy	Moderate	17:09	Surface	1	24.9 24.9	24.9	8.0 8.0	8.0	32.0 31.9	32.0	81.8 79.8	80.8	5.7 5.5	5.6	5.1	1.4 1.3	1.4	3.1	4.9 4.9	4.9	5.4
				Middle	5	23.8 23.8	23.8	7.9 7.9	7.9	33.3 33.3	33.3	66.0 65.6	65.8	4.6 4.6	4.6		3.6 3.2	3.4		5.5 5.4	5.5	
				Bottom	9	23.2 23.2	23.2	7.9 7.9	7.9	33.9 33.9	33.9	61.4 61.9	61.7	4.3 4.4	4.4	4.4	4.7 4.5	4.6		5.5 5.8	5.7	
G3	Cloudy	Moderate	17:30	Surface	1	24.9 24.8	24.9	8.0 8.0	8.0	32.0 32.1	32.1	83.9 80.8	82.4	5.8 5.6	5.7	5.3	1.6 1.5	1.6	3.6	4.5 4.6	4.6	5.3
				Middle	4	24.1 24.2	24.2	7.9 7.9	7.9	32.9 32.8	32.9	69.5 70.4	70.0	4.8 4.9	4.9		2.7 2.9	2.8		5.3 5.6	5.5	
				Bottom	7	23.7 23.7	23.7	7.9 7.9	7.9	33.4 33.3	33.4	63.8 63.8	63.8	4.5 4.5	4.5	4.5	6.2 6.3	6.3		5.7 5.8	5.8	
G4	Cloudy	Moderate	17:44	Surface	1	25.4 25.3	25.4	8.0 8.0	8.0	31.5 31.7	31.6	94.9 92.4	93.7	6.5 6.4	6.5	5.7	0.6 0.6	0.6	2.8	3.5 3.4	3.5	4.5
				Middle	4	24.1 24.1	24.1	7.9 7.9	7.9	32.7 32.8	32.8	69.4 69.3	69.4	4.8 4.8	4.8		3.5 3.2	3.4		4.0 4.2	4.1	
				Bottom	7	23.5 23.5	23.5	7.9 7.9	7.9	33.5 33.5	33.5	62.7 62.7	62.7	4.4 4.4	4.4	4.4	4.2 4.4	4.3		5.9 5.6	5.8	
M1	Cloudy	Moderate	17:16	Surface	1	25.5 25.3	25.4	8.0 8.0	8.0	31.6 31.7	31.7	96.8 93.1	95.0	6.6 6.4	6.5	6.0	1.1 1.2	1.2	3.6	5.0 4.8	4.9	4.2
				Middle	3	24.8 24.6	24.7	8.0 8.0	8.0	32.2 32.4	32.3	78.9 75.0	77.0	5.5 5.2	5.4		3.8 4.1	4.0		3.6 3.6	3.6	
				Bottom	5	23.8 23.8	23.8	7.9 7.9	7.9	33.4 33.3	33.4	64.0 63.4	63.7	4.5 4.4	4.5	4.5	5.6 5.4	5.5		4.0 4.1	4.1	
M2	Cloudy	Moderate	17:01	Surface	1	25.4 25.4	25.4	8.0 8.0	8.0	31.6 31.6	31.6	92.3 89.0	90.7	6.3 6.1	6.2	5.5	1.1 1.0	1.1	2.9	2.5 2.5	2.5	2.7
				Middle	5.5	23.8 23.9	23.9	7.9 7.9	7.9	33.2 33.1	33.2	67.1 68.5	67.8	4.7 4.8	4.8		2.3 2.6	2.5		3.1 3.2	3.2	
				Bottom	10	23.1 23.1	23.1	7.9 7.9	7.9	34.0 34.0	34.0	60.4 60.5	60.5	4.3 4.3	4.3	4.3	5.0 5.1	5.1		2.5 2.5	2.5	
M3	Cloudy	Moderate	17:35	Surface	1	24.7 24.7	24.7	8.0 8.0	8.0	32.3 32.3	32.3	80.7 78.4	79.6	5.6 5.4	5.5	5.2	1.4 1.3	1.4	3.5	3.3 3.3	3.3	4.2
				Middle	4	24.0 24.0	24.0	7.9 7.9	7.9	33.0 32.9	33.0	68.7 69.3	69.0	4.8 4.8	4.8		3.0 3.3	3.2		4.6 4.7	4.7	
				Bottom	7	23.8 23.8	23.8	7.9 7.9	7.9	33.3 33.3	33.3	64.0 63.6	63.8	4.5 4.4	4.5	4.5	5.9 6.0	6.0		4.5 4.5	4.5	
M4	Cloudy	Moderate	16:51	Surface	1	25.5 25.5	25.5	8.0 8.0	8.0	31.4 31.4	31.4	92.8 91.5	92.2	6.4 6.3	6.4	5.7	0.9 0.8	0.9	2.7	2.9 2.9	2.9	4.3
				Middle	5	24.1 24.8	24.5	7.9 8.0	8.0	32.9 32.2	32.6	70.5 74.3	72.4	4.9 5.1	5.0		2.7 2.4	2.6		5.3 5.2	5.3	
				Bottom	9	23.7 23.8	23.8	7.9 7.9	7.9	33.4 33.2	33.3	64.6 65.8	65.2	4.5 4.6	4.6	4.6	4.6 4.8	4.7		4.5 4.8	4.7	
M5	Cloudy	Moderate	17:59	Surface	1	25.5 25.5	25.5	8.0 8.0	8.0	31.4 31.4	31.4	95.0 91.9	93.5	6.5 6.3	6.4	6.2	0.6 0.7	0.7	2.6	2.6 2.5	2.6	3.8
				Middle	5.5	25.2 25.3	25.3	8.0 8.0	8.0	31.7 31.7	31.7	86.0 88.6	87.3	5.9 6.1	6.0		1.1 1.0	1.1		4.2 4.1	4.2	
				Bottom	10	23.1 23.2	23.2	7.9 7.9	7.9	34.0 34.0	34.0	60.6 61.1	60.9	4.3 4.3	4.3	4.3	6.1 6.1	6.1		4.7 4.7	4.7	
M6	Cloudy	Moderate	17:50	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	5.9	- -	-	1.2	- -	-	7.5
				Middle	2	25.0 25.0	25.0	8.0 8.0	8.0	32.0 32.0	32.0	85.5 85.8	85.7	5.9 5.9	5.9		1.2 1.2	1.2		7.3 7.6	7.5	
				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 10 September 2018 (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: 10.6 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C2: 11.44 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: 4.9 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 5.33 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: 4.9 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 5.33 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 6.0 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 6.5 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 10 September 2018

(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	12:58	Surface	1	26.6 26.7	26.7	7.8 7.8	7.8	29.9 29.8	29.9	100.4 99.3	99.9	6.8 6.7	6.8	6.1	1.1 1.0	1.1	6.0	2.7 2.6	2.7	4.0
				Middle	9.5	25.0 25.0	25.0	7.7 7.7	7.7	31.2 31.2	31.2	78.1 77.9	78.0	5.4 5.4	5.4		6.6 7.3	7.0		4.7 4.5	4.6	
				Bottom	18	24.6 24.7	24.7	7.7 7.7	7.7	31.6 31.6	31.6	73.9 73.2	73.6	5.1 5.1	5.1	5.1	10.2 9.6	9.9		4.8 4.5	4.7	
C2	Cloudy	Moderate	11:19	Surface	1	26.1 26.1	26.1	7.9 7.8	7.9	30.3 30.3	30.3	92.5 91.4	92.0	6.3 6.2	6.3	5.8	1.0 1.0	1.0	5.4	4.1 4.1	4.1	4.7
				Middle	16.5	25.0 24.7	24.9	7.8 7.7	7.8	31.3 31.5	31.4	78.1 75.2	76.7	5.4 5.2	5.3		6.1 6.9	6.5		4.9 4.9	4.9	
				Bottom	32	24.4 24.4	24.4	7.7 7.7	7.7	31.8 31.8	31.8	72.4 71.3	71.9	5.0 5.0	5.0	5.0	8.7 8.8	8.8		5.0 5.0	5.0	
G1	Cloudy	Moderate	12:20	Surface	1	27.1 27.0	27.1	7.9 7.9	7.9	29.4 29.5	29.5	104.9 104.1	104.5	7.1 7.0	7.1	7.1	1.5 1.5	1.5	1.8	4.8 4.7	4.8	4.2
				Middle	4	26.8 26.8	26.8	7.9 7.9	7.9	29.6 29.6	29.6	103.3 102.4	102.9	7.0 6.9	7.0		1.7 1.7	1.7		4.7 5.0	4.9	
				Bottom	7	26.7 26.7	26.7	7.9 7.9	7.9	29.7 29.7	29.7	99.3 101.5	100.4	6.7 6.9	6.8	6.8	2.3 2.0	2.2		2.8 2.8	2.8	
G2	Cloudy	Moderate	12:03	Surface	1	27.4 27.6	27.5	7.9 7.9	7.9	29.1 29.1	29.1	105.6 104.8	105.2	7.1 7.0	7.1	7.0	1.2 1.1	1.2	2.3	4.3 4.3	4.3	4.5
				Middle	6	26.8 26.8	26.8	7.9 7.9	7.9	29.6 29.6	29.6	99.9 100.8	100.4	6.8 6.8	6.8		1.2 1.1	1.2		3.4 3.4	3.4	
				Bottom	11	25.5 25.5	25.5	7.8 7.8	7.8	31.0 30.9	31.0	82.0 82.1	82.1	5.6 5.6	5.6	5.6	4.3 4.7	4.5		5.7 5.7	5.7	
G3	Cloudy	Moderate	12:28	Surface	1	27.1 27.0	27.1	7.9 7.9	7.9	29.3 29.4	29.4	103.4 103.9	103.7	7.0 7.0	7.0	7.0	1.4 1.5	1.5	2.2	3.4 3.5	3.5	3.2
				Middle	4	27.0 27.1	27.1	7.9 7.9	7.9	29.5 29.3	29.4	104.0 104.2	104.1	7.0 7.0	7.0		1.6 1.4	1.5		4.2 4.1	4.2	
				Bottom	7	26.9 26.9	26.9	7.9 7.9	7.9	29.5 29.5	29.5	103.2 103.2	103.2	7.0 7.0	7.0	7.0	3.7 3.6	3.7		1.9 1.8	1.9	
G4	Cloudy	Moderate	12:39	Surface	1	27.2 27.2	27.2	7.9 7.9	7.9	29.3 29.3	29.3	105.7 104.4	105.1	7.1 7.0	7.1	7.0	0.4 0.4	0.4	3.2	2.6 2.7	2.7	3.2
				Middle	4	26.8 26.8	26.8	7.9 7.9	7.9	29.6 29.6	29.6	101.1 101.8	101.5	6.9 6.9	6.9		0.9 0.9	0.9		2.4 2.4	2.4	
				Bottom	7	26.3 26.2	26.3	7.8 7.8	7.8	30.1 30.2	30.2	88.3 87.0	87.7	6.0 5.9	6.0	6.0	8.0 8.4	8.2		4.4 4.6	4.5	
M1	Cloudy	Moderate	12:10	Surface	1	27.5 27.5	27.5	7.9 7.9	7.9	29.1 29.1	29.1	104.3 102.9	103.6	7.0 6.9	7.0	7.0	1.3 1.2	1.3	1.8	3.2 3.2	3.2	5.4
				Middle	3	27.3 27.4	27.4	7.9 7.9	7.9	29.2 29.1	29.2	104.6 104.2	104.4	7.0 7.0	7.0		1.6 1.5	1.6		7.8 8.0	7.9	
				Bottom	5	26.6 26.5	26.6	7.8 7.8	7.8	29.6 29.6	29.6	93.9 94.9	94.4	6.4 6.5	6.5	6.5	2.5 2.7	2.6		5.2 5.0	5.1	
M2	Cloudy	Moderate	11:53	Surface	1	27.6 27.7	27.7	8.0 7.9	8.0	29.1 29.0	29.1	106.3 105.6	106.0	7.1 7.1	7.1	7.1	1.1 1.2	1.2	2.0	3.8 3.6	3.7	3.9
				Middle	5	27.1 27.0	27.1	8.0 7.9	8.0	29.5 29.5	29.5	103.8 102.7	103.3	7.0 6.9	7.0		2.3 2.4	2.4		3.6 3.3	3.5	
				Bottom	9	26.0 26.0	26.0	7.9 7.9	7.9	30.6 30.5	30.6	90.9 91.5	91.2	6.2 6.2	6.2	6.2	2.6 2.3	2.5		4.6 4.6	4.6	
M3	Cloudy	Moderate	12:33	Surface	1	27.1 27.1	27.1	7.9 7.9	7.9	29.4 29.4	29.4	104.6 104.4	104.5	7.1 7.0	7.1	7.1	1.5 1.4	1.5	1.9	3.2 3.2	3.2	4.7
				Middle	4	27.0 27.0	27.0	7.9 7.9	7.9	29.5 29.5	29.5	104.0 104.1	104.1	7.0 7.0	7.0		1.5 1.5	1.5		5.2 5.2	5.2	
				Bottom	7	26.9 26.9	26.9	7.9 7.9	7.9	29.5 29.5	29.5	102.0 102.5	102.3	6.9 6.9	6.9	6.9	2.6 2.6	2.6		5.6 5.6	5.6	
M4	Cloudy	Moderate	11:32	Surface	1	27.6 27.5	27.6	7.9 7.9	7.9	29.1 29.1	29.1	104.9 105.3	105.1	7.0 7.1	7.1	7.1	0.3 0.3	0.3	1.7	3.3 3.5	3.4	3.0
				Middle	5	27.2 27.2	27.2	7.9 7.9	7.9	29.3 29.3	29.3	104.4 104.3	104.4	7.0 7.0	7.0		2.1 2.2	2.2		2.8 2.7	2.8	
				Bottom	9	25.9 25.9	25.9	7.8 7.8	7.8	30.6 30.6	30.6	89.2 89.4	89.3	6.1 6.1	6.1	6.1	2.5 2.4	2.5		2.8 2.9	2.9	
M5	Cloudy	Moderate	12:52	Surface	1	26.7 27.0	26.9	7.9 7.8	7.9	29.8 29.7	29.8	100.4 100.8	100.6	6.8 6.8	6.8	6.5	1.7 1.9	1.8	3.0	4.9 4.8	4.9	6.0
				Middle	5	25.9 25.9	25.9	7.8 7.8	7.8	30.6 30.5	30.6	90.2 91.1	90.7	6.2 6.2	6.2		2.6 2.5	2.6		7.4 7.4	7.4	
				Bottom	9	25.3 25.3	25.3	7.8 7.8	7.8	31.1 31.1	31.1	81.8 83.4	82.6	5.6 5.8	5.7	5.7	4.7 4.6	4.7		5.6 5.5	5.6	
M6	Cloudy	Moderate	12:47	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	7.1	- -	-	0.8	- -	-	6.5
				Middle	2.3	27.1 27.1	27.1	7.9 7.9	7.9	29.4 29.4	29.4	104.6 104.1	104.4	7.1 7.0	7.1		0.8 0.8	0.8		6.4 6.6	6.5	
				Bottom	-	- -	-	- -	-	- -	-	- -	-	- -	-	-	- -	-		- -	-	

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

Appendix I - Action and Limit Levels for Marine Water Quality on 10 2018 (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: 11.0 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C1: 12.0 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 ***C1: 5.6 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 6.1 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 5.6 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 6.1 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 6.5 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 7.0 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 10 September 2018

(Mid-Flood Tide)

Location	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
C1	Cloudy	Moderate	18:57	Surface	1	27.3 27.2	27.3	7.9 7.8	7.9	29.5 29.6	29.6	106.2 100.6	103.4	7.1 6.8	7.0	6.2	1.2 1.0	1.1	4.5	4.6 4.8	4.7	5.3
				Middle	9.5	25.1 25.2	25.2	7.8 7.7	7.8	31.3 31.1	31.2	78.8 76.5	77.7	5.4 5.3	5.4		3.4 2.9	3.2		5.7 5.9	5.8	
				Bottom	18	23.4 23.4	23.4	7.6 7.6	7.6	32.9 32.9	32.9	61.1 61.0	61.1	4.3 4.3	4.3	4.3	9.0 9.3	9.2		5.3 5.4	5.4	
C2	Cloudy	Moderate	17:49	Surface	1	26.8 26.8	26.8	7.7 7.8	7.8	29.6 29.5	29.6	102.6 102.1	102.4	7.0 6.9	7.0	6.2	0.4 0.4	0.4	4.8	4.9 4.8	4.9	4.8
				Middle	16.5	25.1 25.6	25.4	7.6 7.7	7.7	30.9 30.7	30.8	74.3 82.1	78.2	5.1 5.6	5.4		6.1 5.9	6.0		4.8 4.7	4.8	
				Bottom	32	24.9 24.9	24.9	7.6 7.6	7.6	31.1 31.1	31.1	71.5 71.5	71.5	5.0 5.0	5.0	5.0	7.9 7.8	7.9		4.8 4.8	4.8	
G1	Cloudy	Moderate	18:21	Surface	1	26.5 26.6	26.6	7.8 7.8	7.8	29.9 29.8	29.9	94.9 94.5	94.7	6.5 6.4	6.5	6.3	1.3 1.2	1.3	2.5	4.2 4.2	4.2	4.8
				Middle	4	25.8 25.9	25.9	7.8 7.8	7.8	30.6 30.5	30.6	87.5 89.3	88.4	6.0 6.1	6.1		1.7 1.4	1.6		4.1 4.1	4.1	
				Bottom	7	25.7 25.7	25.7	7.8 7.8	7.8	30.8 30.8	30.8	83.3 83.6	83.5	5.7 5.7	5.7	5.7	4.6 4.6	4.6		6.1 6.1	6.1	
G2	Cloudy	Moderate	18:08	Surface	1	26.2 26.2	26.2	7.8 7.8	7.8	30.2 30.2	30.2	93.6 92.8	93.2	6.4 6.3	6.4	6.2	1.4 1.2	1.3	2.4	3.4 3.3	3.4	4.0
				Middle	5	25.7 25.6	25.7	7.7 7.7	7.7	30.6 30.7	30.7	86.5 85.1	85.8	5.9 5.9	5.9		1.8 2.1	2.0		3.7 3.6	3.7	
				Bottom	9	25.4 25.3	25.4	7.7 7.7	7.7	31.0 31.0	31.0	80.5 80.8	80.7	5.5 5.6	5.6	5.6	3.8 3.7	3.8		4.9 4.8	4.9	
G3	Cloudy	Moderate	18:27	Surface	1	26.4 26.3	26.4	7.8 7.8	7.8	30.0 30.0	30.0	92.3 91.2	91.8	6.3 6.2	6.3	6.1	1.8 1.9	1.9	3.8	4.4 4.3	4.4	5.5
				Middle	4	25.8 25.8	25.8	7.8 7.8	7.8	30.6 30.6	30.6	85.0 84.7	84.9	5.8 5.8	5.8		4.5 4.2	4.4		6.7 6.9	6.8	
				Bottom	7	25.7 25.7	25.7	7.8 7.8	7.8	30.8 30.7	30.8	83.2 83.3	83.3	5.7 5.7	5.7	5.7	5.1 5.1	5.1		5.1 5.2	5.2	
G4	Cloudy	Moderate	18:38	Surface	1	26.2 26.3	26.3	7.8 7.8	7.8	30.2 30.0	30.1	92.1 89.7	90.9	6.3 6.1	6.2	6.1	2.2 2.0	2.1	4.0	3.8 3.8	3.8	5.1
				Middle	4	25.8 25.8	25.8	7.7 7.8	7.8	30.6 30.5	30.6	86.6 88.0	87.3	5.9 6.0	6.0		1.9 1.7	1.8		5.5 5.4	5.5	
				Bottom	7	25.6 25.6	25.6	7.7 7.7	7.7	30.9 30.8	30.9	79.1 80.5	79.8	5.4 5.5	5.5	5.5	8.4 7.9	8.2		6.1 5.9	6.0	
M1	Cloudy	Moderate	18:15	Surface	1	26.5 26.5	26.5	7.8 7.8	7.8	29.8 29.8	29.8	94.7 93.2	94.0	6.4 6.3	6.4	6.2	1.0 1.0	1.0	2.9	3.9 3.8	3.9	5.0
				Middle	3	26.0 26.0	26.0	7.8 7.8	7.8	30.4 30.5	30.5	87.6 86.9	87.3	6.0 5.9	6.0		2.5 2.5	2.5		5.4 5.5	5.5	
				Bottom	5	25.7 25.6	25.7	7.7 7.7	7.7	30.7 30.8	30.8	81.6 81.3	81.5	5.6 5.6	5.6	5.6	5.0 5.4	5.2		5.6 5.5	5.6	
M2	Cloudy	Moderate	18:03	Surface	1	26.1 26.1	26.1	7.8 7.7	7.8	30.3 30.3	30.3	93.5 90.2	91.9	6.4 6.2	6.3	6.0	1.4 1.3	1.4	2.8	4.4 4.6	4.5	4.9
				Middle	6	25.5 25.4	25.5	7.7 7.7	7.7	30.8 30.8	30.8	83.4 82.6	83.0	5.7 5.7	5.7		2.6 2.8	2.7		5.2 5.1	5.2	
				Bottom	11	25.1 25.1	25.1	7.7 7.7	7.7	31.1 31.1	31.1	77.4 77.1	77.3	5.4 5.3	5.4	5.4	4.5 4.3	4.4		5.1 5.1	5.1	
M3	Cloudy	Moderate	18:32	Surface	1	26.2 26.2	26.2	7.8 7.8	7.8	30.3 30.3	30.3	89.7 87.1	88.4	6.1 5.9	6.0	6.0	2.8 2.9	2.9	4.2	2.9 2.8	2.9	4.6
				Middle	4	25.9 25.9	25.9	7.8 7.8	7.8	30.6 30.6	30.6	85.6 86.1	85.9	5.9 5.9	5.9		3.4 2.8	3.1		4.6 4.8	4.7	
				Bottom	7	25.7 25.6	25.7	7.7 7.7	7.7	30.8 30.8	30.8	80.0 79.3	79.7	5.5 5.4	5.5	5.5	6.1 6.8	6.5		6.2 6.2	6.2	
M4	Cloudy	Moderate	17:56	Surface	1	26.4 26.3	26.4	7.8 7.8	7.8	30.1 30.1	30.1	96.7 94.8	95.8	6.6 6.5	6.6	6.3	1.0 0.9	1.0	2.2	4.5 4.7	4.6	4.6
				Middle	4.5	25.5 25.9	25.7	7.7 7.7	7.7	30.8 30.4	30.6	83.3 88.2	85.8	5.7 6.0	5.9		2.4 2.3	2.4		3.5 3.5	3.5	
				Bottom	8	25.3 25.5	25.4	7.7 7.7	7.7	31.0 30.8	30.9	79.4 83.3	81.4	5.5 5.7	5.6	5.6	3.1 3.2	3.2		5.6 5.7	5.7	
M5	Cloudy	Moderate	18:49	Surface	1	26.5 26.6	26.6	7.8 7.8	7.8	29.9 29.8	29.9	96.6 97.0	96.8	6.6 6.6	6.6	6.3	1.1 1.1	1.1	3.6	3.5 3.5	3.5	4.9
				Middle	5	25.6 25.8	25.7	7.7 7.7	7.7	30.7 30.6	30.7	84.6 86.0	85.3	5.8 5.9	5.9		2.3 2.2	2.3		5.0 5.1	5.1	
				Bottom	9	25.0 25.0	25.0	7.7 7.7	7.7	31.2 31.2	31.2	74.9 75.3	75.1	5.2 5.2	5.2	5.2	7.6 6.9	7.3		6.1 6.1	6.1	
M6	Cloudy	Moderate	18:44	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	6.1	- -	-	2.6	- -	-	5.9
				Middle	2.2	26.0 26.0	26.0	7.8 7.8	7.8	30.4 30.4	30.4	88.8 88.6	88.7	6.1 6.1	6.1		2.6 2.5	2.6		5.9 5.9	5.9	
				Bottom	-	- -	-	- -	-	- -	-	- -	-	- -	-	-	- -	-		- -	-	

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

Appendix I - Action and Limit Levels for Marine Water Quality on 12 September 2018 (Mid-Ebb Tide)

Parameter (unit)	**Depth**	**Action Level**	**Limit Level**
DO in mg/L (See Note 1 and 4)	**Stations G1-G4, M1-M5**		
	Depth Average	***4.9 mg/L***	***4.6 mg/L***
	Bottom	***4.2 mg/L***	***3.6 mg/L***
	Station M6		
	Intake Level	***5.0 mg/L***	***4.7 mg/L***
Turbidity in NTU (See Note 2 and 4)	**Stations G1-G4, M1-M5**		
	Bottom	***19.3 NTU*** or 120% of upstream control station's Turbidity at the same tide of the same day ***C2: 5.4 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C2: 5.9 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 ***C2: 5.8 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 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 ***C2: 5.8 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 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 ***C2: 6.2 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 6.8 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.

2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.

3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.

4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 12 September 2018

(Mid-Flood Tide)

Location	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C) Value	Temperature (°C) Average	pH Value	pH Average	Salinity ppt Value	Salinity ppt Average	DO Saturation (%) Value	DO Saturation (%) Average	Dissolved Oxygen (mg/L) Value	Dissolved Oxygen (mg/L) Average	Dissolved Oxygen (mg/L) DA*	Turbidity(NTU) Value	Turbidity(NTU) Average	Turbidity(NTU) DA*	Suspended Solids (mg/L) Value	Suspended Solids (mg/L) Average	Suspended Solids (mg/L) DA*
C1	Cloudy	Moderate	09:02	Surface	1	26.7 26.6	26.7	7.9 7.8	7.9	30.4 30.4	30.4	97.8 95.8	96.8	6.6 6.5	6.6	6.1	1.3 1.2	1.3	2.5	4.9 4.6	4.8	5.1
				Middle	9.5	25.3 25.3	25.3	7.8 7.8	7.8	31.0 31.1	31.1	80.4 81.6	81.0	5.5 5.6	5.6		1.6 1.5	1.6		5.2 5.6	5.4	
				Bottom	18	24.5 24.2	24.4	7.7 7.7	7.7	31.9 32.3	32.1	68.6 66.1	67.4	4.8 4.6	4.7	4.7	4.6 4.4	4.5		5.3 5.0	5.2	
C2	Cloudy	Moderate	07:38	Surface	1	26.4 26.2	26.3	7.8 7.8	7.8	30.5 30.6	30.6	97.6 92.2	94.9	6.6 6.3	6.5	6.3	1.1 1.2	1.2	1.6	4.3 4.4	4.4	4.4
				Middle	16	25.9 25.8	25.9	7.8 7.8	7.8	30.7 30.7	30.7	85.8 87.0	86.4	5.9 6.0	6.0		1.7 1.6	1.7		3.6 3.5	3.6	
				Bottom	31	25.8 25.9	25.9	7.7 7.8	7.8	30.7 30.7	30.7	84.3 84.8	84.6	5.8 5.8	5.8	5.8	1.8 1.7	1.8		5.1 5.5	5.3	
G1	Cloudy	Moderate	08:28	Surface	1	26.1 26.2	26.2	7.8 7.8	7.8	30.5 30.5	30.5	92.0 93.2	92.6	6.3 6.4	6.4	6.2	1.2 1.0	1.1	1.6	2.9 2.9	2.9	3.8
				Middle	4	26.0 25.8	25.9	7.8 7.7	7.8	30.5 30.7	30.6	90.8 85.1	88.0	6.2 5.8	6.0		1.4 1.4	1.4		3.7 3.8	3.8	
				Bottom	7	25.6 25.6	25.6	7.7 7.7	7.7	30.9 30.9	30.9	77.0 76.9	77.0	5.3 5.3	5.3	5.3	2.3 2.2	2.3		4.5 4.8	4.7	
G2	Cloudy	Moderate	08:11	Surface	1	26.2 26.1	26.2	7.8 7.8	7.8	30.4 30.5	30.5	95.7 91.8	93.8	6.5 6.3	6.4	6.3	1.1 1.2	1.2	1.5	5.0 5.1	5.1	4.2
				Middle	5	25.9 25.9	25.9	7.8 7.8	7.8	30.6 30.6	30.6	89.6 88.5	89.1	6.1 6.1	6.1		1.4 1.5	1.5		2.5 2.5	2.5	
				Bottom	9	25.9 25.9	25.9	7.8 7.8	7.8	30.7 30.7	30.7	84.9 85.5	85.2	5.8 5.9	5.9	5.9	1.8 1.7	1.8		4.9 5.1	5.0	
G3	Cloudy	Moderate	08:33	Surface	1	25.8 25.9	25.9	7.7 7.8	7.8	30.1 30.5	30.3	82.3 82.2	82.3	5.7 5.6	5.7	5.7	1.1 1.2	1.2	2.1	4.5 4.4	4.5	4.6
				Middle	4	25.8 25.8	25.8	7.7 7.7	7.7	30.7 30.6	30.7	82.6 81.7	82.2	5.7 5.6	5.7		1.8 1.6	1.7		3.1 3.2	3.2	
				Bottom	7	25.4 25.4	25.4	7.7 7.7	7.7	31.0 31.0	31.0	71.9 71.1	71.5	5.0 4.9	5.0	5.0	3.3 3.3	3.3		6.0 6.2	6.1	
G4	Cloudy	Moderate	08:45	Surface	1	25.9 25.9	25.9	7.8 7.8	7.8	30.6 30.6	30.6	87.0 86.6	86.8	6.0 5.9	6.0	5.9	1.4 1.2	1.3	1.7	4.2 4.1	4.2	4.9
				Middle	4	25.8 25.6	25.7	7.8 7.7	7.8	30.7 30.9	30.8	86.0 82.8	84.4	5.9 5.7	5.8		1.7 1.4	1.6		4.6 4.7	4.7	
				Bottom	7	25.5 25.5	25.5	7.7 7.7	7.7	31.0 31.0	31.0	77.2 76.8	77.0	5.3 5.3	5.3	5.3	2.0 2.3	2.2		5.9 5.8	5.9	
M1	Cloudy	Moderate	08:21	Surface	1	25.9 26.0	26.0	7.8 7.8	7.8	30.6 30.6	30.6	86.3 84.4	85.4	5.9 5.8	5.9	5.9	1.7 1.7	1.7	1.7	3.1 3.2	3.2	3.5
				Middle	3	25.9 25.9	25.9	7.8 7.8	7.8	30.6 30.7	30.7	86.2 85.3	85.8	5.9 5.8	5.9		1.7 1.6	1.7		3.5 3.6	3.6	
				Bottom	5	25.9 25.9	25.9	7.8 7.8	7.8	30.7 30.7	30.7	86.0 85.4	85.7	5.9 5.8	5.9	5.9	1.7 1.8	1.8		3.6 3.6	3.6	
M2	Cloudy	Moderate	08:05	Surface	1	26.2 26.2	26.2	7.8 7.8	7.8	30.5 30.5	30.5	93.4 93.4	93.4	6.4 6.4	6.4	6.3	1.1 1.2	1.2	1.4	3.8 3.9	3.9	3.6
				Middle	5	26.0 26.0	26.0	7.8 7.8	7.8	30.6 30.6	30.6	89.6 90.1	89.9	6.1 6.2	6.2		1.4 1.3	1.4		3.4 3.3	3.4	
				Bottom	9	25.9 25.9	25.9	7.8 7.8	7.8	30.7 30.7	30.7	87.0 86.9	87.0	6.0 5.9	6.0	6.0	1.6 1.6	1.6		3.6 3.6	3.6	
M3	Cloudy	Moderate	08:39	Surface	1	26.0 26.0	26.0	7.8 7.8	7.8	30.5 30.5	30.5	86.8 84.3	85.6	5.9 5.8	5.9	5.6	1.7 1.7	1.7	2.2	4.7 4.7	4.7	5.2
				Middle	4	25.7 25.7	25.7	7.7 7.7	7.7	30.7 30.7	30.7	77.3 76.8	77.1	5.3 5.3	5.3		1.9 1.9	1.9		4.9 5.1	5.0	
				Bottom	7	25.4 25.4	25.4	7.7 7.7	7.7	30.9 31.0	31.0	69.9 69.6	69.8	4.8 4.8	4.8	4.8	3.0 3.0	3.0		5.8 6.1	6.0	
M4	Cloudy	Moderate	07:56	Surface	1	26.2 26.2	26.2	7.8 7.8	7.8	30.6 30.6	30.6	93.6 92.4	93.0	6.4 6.3	6.4	6.4	1.3 1.3	1.3	1.5	3.4 3.4	3.4	3.1
				Middle	6	26.1 26.2	26.2	7.8 7.8	7.8	30.6 30.5	30.6	91.9 92.7	92.3	6.3 6.3	6.3		1.1 1.2	1.2		2.2 2.2	2.2	
				Bottom	11	25.7 25.8	25.8	7.8 7.8	7.8	30.8 30.8	30.8	83.3 85.2	84.3	5.7 5.8	5.8	5.8	2.0 2.0	2.0		3.8 3.8	3.8	
M5	Cloudy	Moderate	08:56	Surface	1	25.8 25.8	25.8	7.8 7.8	7.8	30.7 30.7	30.7	86.5 84.7	85.6	5.9 5.8	5.9	5.8	1.3 1.3	1.3	2.7	4.7 4.9	4.8	5.4
				Middle	5.5	25.7 25.7	25.7	7.8 7.8	7.8	30.7 30.8	30.8	85.2 81.9	83.6	5.8 5.6	5.7		1.8 1.6	1.7		6.4 6.3	6.4	
				Bottom	10	25.3 25.3	25.3	7.7 7.7	7.7	31.1 31.1	31.1	76.3 75.5	75.9	5.3 5.2	5.3	5.3	5.0 5.1	5.1		4.9 5.2	5.1	
M6	Cloudy	Moderate	08:51	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	6.3	- -	-	2.2	- -	-	5.6
				Middle	1.2	26.0 26.0	26.0	7.8 7.8	7.8	30.5 30.6	30.6	91.6 90.9	91.3	6.3 6.2	6.3		2.1 2.3	2.2		5.6 5.5	5.6	
				Bottom	-	- -	-	- -	-	- -	-	- -	-	- -	-	-	- -	-		- -	-	

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

Appendix I - Action and Limit Levels for Marine Water Quality on 14 September 2018 (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: 6.6 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: 5.5 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 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 ***C2: 5.5 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 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 ***C2: 8.2 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 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 14 September 2018

(Mid-Ebb Tide)

Location	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
C1	Sunny	Moderate	15:01	Surface	1	27.9 27.9	27.9	8.0 8.0	8.0	33.2 33.2	33.2	91.5 90.6	91.1	6.0 5.9	6.0	5.9	1.3 1.4	1.4	2.9	4.0 3.8	3.9	4.9
				Middle	9	26.8 26.9	26.9	8.0 8.0	8.0	33.3 33.3	33.3	86.1 85.4	85.8	5.7 5.7	5.7		1.5 1.7	1.6		4.3 4.5	4.4	
				Bottom	17	26.9 26.9	26.9	8.0 8.0	8.0	33.9 33.8	33.9	84.7 85.4	85.1	5.6 5.6	5.6	5.6	5.7 5.6	5.7		6.5 6.5	6.5	
C2	Sunny	Moderate	14:10	Surface	1	27.1 27.1	27.1	7.9 7.9	7.9	32.9 33.0	33.0	83.9 83.5	83.7	5.6 5.5	5.6	5.5	1.9 1.9	1.9	3.2	4.6 4.6	4.6	5.1
				Middle	16.5	26.7 26.7	26.7	7.9 8.0	8.0	33.1 33.2	33.2	80.9 80.8	80.9	5.4 5.4	5.4		2.4 2.2	2.3		4.0 4.0	4.0	
				Bottom	32	26.8 26.8	26.8	8.0 8.0	8.0	33.3 33.3	33.3	82.4 82.3	82.4	5.5 5.5	5.5	5.5	5.6 5.3	5.5		6.8 6.8	6.8	
G1	Sunny	Moderate	14:35	Surface	1	27.3 27.1	27.2	8.0 8.0	8.0	33.0 33.1	33.1	87.6 84.4	86.0	5.8 5.6	5.7	5.6	1.7 1.7	1.7	2.7	4.0 4.0	4.0	5.5
				Middle	4	26.7 26.9	26.8	8.0 8.0	8.0	33.1 33.1	33.1	82.8 82.2	82.5	5.5 5.5	5.5		3.0 2.9	3.0		7.1 7.0	7.1	
				Bottom	7	26.6 26.6	26.6	8.0 8.0	8.0	33.2 33.2	33.2	81.8 81.5	81.7	5.5 5.4	5.5	5.5	3.0 3.6	3.3		5.4 5.5	5.5	
G2	Sunny	Moderate	14:27	Surface	1	27.4 27.5	27.5	8.0 8.0	8.0	33.1 33.1	33.1	87.9 88.0	88.0	5.8 5.8	5.8	5.7	1.9 1.9	1.9	3.3	5.1 5.2	5.2	6.1
				Middle	5	26.7 26.7	26.7	8.0 8.0	8.0	33.2 33.2	33.2	83.1 82.7	82.9	5.5 5.5	5.5		3.8 3.2	3.5		7.7 7.8	7.8	
				Bottom	9	26.9 26.9	26.9	8.0 8.0	8.0	33.4 33.4	33.4	84.5 84.9	84.7	5.6 5.6	5.6	5.6	4.7 4.5	4.6		5.2 5.3	5.3	
G3	Sunny	Moderate	14:39	Surface	1	27.1 26.8	27.0	8.0 8.0	8.0	32.9 33.0	33.0	84.1 81.6	82.9	5.6 5.4	5.5	5.5	1.9 1.8	1.9	2.6	5.3 5.3	5.3	4.9
				Middle	4	26.8 26.8	26.8	8.0 8.0	8.0	33.1 33.1	33.1	82.3 81.7	82.0	5.5 5.4	5.5		2.1 2.0	2.1		5.2 5.2	5.2	
				Bottom	7	26.7 26.7	26.7	8.0 8.0	8.0	33.1 33.2	33.2	81.3 80.8	81.1	5.4 5.4	5.4	5.4	3.6 3.8	3.7		4.3 4.3	4.3	
G4	Sunny	Moderate	14:46	Surface	1	27.3 27.4	27.4	8.0 8.0	8.0	33.1 33.1	33.1	89.0 88.0	88.5	5.9 5.8	5.9	5.8	1.9 1.9	1.9	2.6	5.0 5.3	5.2	4.4
				Middle	4	26.7 26.7	26.7	8.0 8.0	8.0	33.1 33.1	33.1	84.5 84.5	84.5	5.6 5.6	5.6		2.4 2.9	2.7		3.8 3.8	3.8	
				Bottom	7	26.7 26.7	26.7	8.0 8.0	8.0	33.1 33.2	33.2	78.6 79.2	78.9	5.2 5.3	5.3	5.3	3.1 3.2	3.2		4.3 4.3	4.3	
M1	Sunny	Moderate	14:32	Surface	1	27.2 27.2	27.2	8.0 7.9	8.0	32.9 32.9	32.9	82.6 83.1	82.9	5.5 5.5	5.5	5.5	1.5 1.5	1.5	2.1	4.5 4.9	4.7	4.6
				Middle	3	26.8 27.0	26.9	8.0 8.0	8.0	33.1 33.0	33.1	81.8 81.1	81.5	5.4 5.4	5.4		1.2 1.1	1.2		4.3 4.3	4.3	
				Bottom	5	26.7 26.8	26.8	8.0 8.0	8.0	33.1 33.1	33.1	81.6 81.3	81.5	5.4 5.4	5.4	5.4	3.7 3.7	3.7		4.8 4.9	4.9	
M2	Sunny	Moderate	14:23	Surface	1	27.5 27.1	27.3	8.0 8.0	8.0	33.1 33.1	33.1	90.4 87.8	89.1	5.9 5.8	5.9	5.8	1.4 1.3	1.4	2.9	3.4 3.4	3.4	5.2
				Middle	6	26.9 26.9	26.9	8.0 8.0	8.0	33.3 33.3	33.3	85.4 85.5	85.5	5.7 5.7	5.7		2.1 2.1	2.1		7.5 7.6	7.6	
				Bottom	11	26.9 26.9	26.9	8.0 8.0	8.0	33.5 33.5	33.5	83.7 83.4	83.6	5.5 5.5	5.5	5.5	5.1 5.1	5.1		4.7 4.7	4.7	
M3	Sunny	Moderate	14:42	Surface	1	26.9 26.8	26.9	8.0 8.0	8.0	32.5 32.8	32.7	83.7 82.1	82.9	5.6 5.5	5.6	5.6	2.4 2.5	2.5	3.6	4.0 4.2	4.1	4.3
				Middle	4	26.7 26.8	26.8	8.0 8.0	8.0	33.1 33.1	33.1	82.0 81.9	82.0	5.5 5.4	5.5		3.7 3.6	3.7		5.1 4.8	5.0	
				Bottom	7	26.7 26.7	26.7	8.0 8.0	8.0	33.1 33.1	33.1	80.4 80.5	80.5	5.4 5.4	5.4	5.4	4.2 4.9	4.6		3.7 3.7	3.7	
M4	Sunny	Moderate	14:16	Surface	1	26.8 26.8	26.8	8.0 8.0	8.0	33.1 33.1	33.1	84.2 82.8	83.5	5.6 5.5	5.6	5.6	1.2 1.1	1.2	2.4	5.2 5.3	5.3	5.8
				Middle	6	26.8 26.8	26.8	8.0 8.0	8.0	33.3 33.3	33.3	83.3 83.4	83.4	5.5 5.5	5.5		2.6 2.6	2.6		5.7 5.7	5.7	
				Bottom	11	26.8 26.9	26.9	8.0 8.0	8.0	33.4 33.5	33.5	83.7 84.7	84.2	5.6 5.6	5.6	5.6	3.2 3.3	3.3		6.5 6.5	6.5	
M5	Sunny	Moderate	14:55	Surface	1	27.0 27.0	27.0	8.0 8.0	8.0	33.1 33.1	33.1	87.1 84.9	86.0	5.8 5.6	5.7	5.6	1.8 1.9	1.9	4.1	3.1 3.3	3.2	4.2
				Middle	5	26.6 26.6	26.6	8.0 8.0	8.0	33.2 33.2	33.2	81.7 80.6	81.2	5.4 5.4	5.4		4.5 4.8	4.7		4.6 4.5	4.6	
				Bottom	9	26.7 26.8	26.8	8.0 8.0	8.0	33.3 33.4	33.4	81.1 81.7	81.4	5.4 5.4	5.4	5.4	5.7 5.6	5.7		4.9 4.9	4.9	
M6	Sunny	Moderate	14:50	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	5.7	- -	-	1.7	- -	-	4.7
				Middle	2.3	26.9 26.9	26.9	8.0 8.0	8.0	33.1 33.1	33.1	86.4 86.2	86.3	5.7 5.7	5.7		1.7 1.7	1.7		4.7 4.7	4.7	
				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 14 September 2018 (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: 6.4 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C1: 6.6 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: 6.1 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 6.6 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 6.1 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 6.6 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 6.7 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 7.3 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.

2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.

3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.

4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 14 September 2018

(Mid-Flood Tide)

Location	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
C1	Sunny	Moderate	10:13	Surface	1	27.1 26.8	27.0	8.0 8.0	8.0	33.0 33.1	33.1	86.7 83.6	85.2	5.7 5.6	5.7	5.7	1.8 1.7	1.8	3.2	5.1 5.0	5.1	5.2
				Middle	9	26.9 26.8	26.9	8.0 8.0	8.0	33.4 33.4	33.4	85.4 85.3	85.4	5.7 5.7	5.7		2.3 2.4	2.4		4.9 4.9	4.9	
				Bottom	17	26.9 26.9	26.9	8.1 8.1	8.1	34.0 34.0	34.0	85.6 86.1	85.9	5.7 5.7	5.7	5.7	5.3 5.3	5.3		5.6 5.5	5.6	
C2	Sunny	Moderate	09:24	Surface	1	26.8 26.8	26.8	7.9 8.0	8.0	33.0 33.0	33.0	84.0 83.9	84.0	5.6 5.6	5.6	5.6	1.8 1.8	1.8	2.8	4.7 4.9	4.8	5.6
				Middle	16.5	26.7 26.7	26.7	8.0 8.0	8.0	33.2 33.2	33.2	83.8 83.5	83.7	5.6 5.6	5.6		2.3 2.5	2.4		6.0 6.0	6.0	
				Bottom	32	26.8 26.8	26.8	8.0 8.0	8.0	33.4 33.4	33.4	84.3 84.5	84.4	5.6 5.6	5.6	5.6	4.1 4.3	4.2		6.0 6.0	6.0	
G1	Sunny	Moderate	09:46	Surface	1	26.8 26.8	26.8	8.0 8.0	8.0	33.1 33.0	33.1	84.8 83.8	84.3	5.6 5.6	5.6	5.6	1.5 1.8	1.7	2.0	3.8 3.5	3.7	4.9
				Middle	4	26.7 26.7	26.7	8.0 8.0	8.0	33.1 33.1	33.1	83.1 82.6	82.9	5.5 5.5	5.5		2.1 2.1	2.1		5.6 5.5	5.6	
				Bottom	7	26.7 26.6	26.7	8.0 8.0	8.0	33.1 33.1	33.1	83.1 83.2	83.2	5.5 5.5	5.5	5.5	2.4 2.1	2.3		5.3 5.3	5.3	
G2	Sunny	Moderate	09:39	Surface	1	26.8 26.8	26.8	8.0 8.0	8.0	33.1 33.1	33.1	86.1 83.6	84.9	5.7 5.6	5.7	5.6	1.7 1.6	1.7	3.1	4.9 4.9	4.9	4.6
				Middle	5	26.6 26.7	26.7	8.0 8.0	8.0	33.1 33.1	33.1	82.4 82.6	82.5	5.5 5.5	5.5		3.3 3.6	3.5		6.6 6.6	6.6	
				Bottom	9	26.6 26.6	26.6	8.0 8.0	8.0	33.1 33.1	33.1	81.0 80.9	81.0	5.4 5.4	5.4	5.4	3.9 4.2	4.1		2.3 2.3	2.3	
G3	Sunny	Moderate	09:50	Surface	1	26.8 26.8	26.8	8.0 8.0	8.0	33.0 33.0	33.0	84.4 83.5	84.0	5.6 5.6	5.6	5.6	1.0 1.0	1.0	1.7	2.9 3.0	3.0	5.3
				Middle	4	26.7 26.7	26.7	8.0 8.0	8.0	33.1 33.1	33.1	83.7 83.3	83.5	5.6 5.5	5.6		1.9 1.8	1.9		6.1 6.2	6.2	
				Bottom	7	26.6 26.6	26.6	8.0 8.0	8.0	33.1 33.1	33.1	82.5 82.5	82.5	5.5 5.5	5.5	5.5	2.1 2.2	2.2		6.7 6.5	6.6	
G4	Sunny	Moderate	09:58	Surface	1	26.8 26.8	26.8	8.0 8.0	8.0	33.1 33.1	33.1	85.5 84.0	84.8	5.7 5.6	5.7	5.6	1.5 1.7	1.6	2.5	4.5 4.8	4.7	4.8
				Middle	4	26.7 26.7	26.7	8.0 8.0	8.0	33.1 33.1	33.1	82.6 83.1	82.9	5.5 5.5	5.5		2.6 2.4	2.5		4.5 4.9	4.7	
				Bottom	7	26.6 26.6	26.6	8.0 8.0	8.0	33.1 33.1	33.1	82.3 81.2	81.8	5.5 5.4	5.5	5.5	3.1 3.5	3.3		4.9 5.1	5.0	
M1	Sunny	Moderate	09:43	Surface	1	26.7 26.7	26.7	8.0 8.0	8.0	33.1 33.1	33.1	84.0 81.1	82.6	5.6 5.4	5.5	5.5	2.0 2.3	2.2	2.8	4.0 4.0	4.0	5.4
				Middle	3	26.6 26.7	26.7	8.0 8.0	8.0	33.1 33.1	33.1	81.1 80.6	80.9	5.4 5.4	5.4		3.1 2.6	2.9		6.0 6.0	6.0	
				Bottom	5	26.6 26.7	26.7	8.0 8.0	8.0	33.1 33.1	33.1	79.9 80.1	80.0	5.3 5.3	5.3	5.3	3.4 3.4	3.4		6.3 6.1	6.2	
M2	Sunny	Moderate	09:35	Surface	1	26.9 26.8	26.9	8.0 8.0	8.0	33.1 33.1	33.1	87.6 84.2	85.9	5.8 5.6	5.7	5.7	1.9 1.8	1.9	3.4	4.5 4.8	4.7	5.1
				Middle	6	26.6 26.7	26.7	8.0 8.0	8.0	33.1 33.1	33.1	82.6 83.5	83.1	5.5 5.6	5.6		3.5 2.9	3.2		4.6 4.7	4.7	
				Bottom	11	26.6 26.6	26.6	8.0 8.0	8.0	33.2 33.2	33.2	78.2 78.3	78.3	5.2 5.2	5.2	5.2	5.3 5.0	5.2		5.9 6.0	6.0	
M3	Sunny	Moderate	09:54	Surface	1	27.1 26.9	27.0	7.9 8.0	8.0	32.4 32.8	32.6	84.0 83.4	83.7	5.6 5.5	5.6	5.5	1.1 1.2	1.2	1.8	1.6 1.6	1.6	3.9
				Middle	4	26.7 26.7	26.7	8.0 8.0	8.0	33.1 33.1	33.1	81.0 81.6	81.3	5.4 5.4	5.4		1.3 1.3	1.3		4.2 4.1	4.2	
				Bottom	7	26.6 26.6	26.6	8.0 8.0	8.0	33.2 33.1	33.2	79.8 81.1	80.5	5.3 5.4	5.4	5.4	2.9 3.1	3.0		5.8 5.7	5.8	
M4	Sunny	Moderate	09:30	Surface	1	26.7 26.7	26.7	8.0 8.0	8.0	33.1 33.1	33.1	83.1 82.5	82.8	5.5 5.5	5.5	5.5	1.1 1.3	1.2	2.6	5.8 6.1	6.0	4.8
				Middle	6	26.7 26.7	26.7	8.0 8.0	8.0	33.2 33.2	33.2	82.4 81.9	82.2	5.5 5.5	5.5		2.9 2.8	2.9		3.5 3.4	3.5	
				Bottom	11	26.8 26.7	26.8	8.0 8.0	8.0	33.4 33.4	33.4	82.7 82.3	82.5	5.5 5.5	5.5	5.5	3.5 3.7	3.6		4.8 5.0	4.9	
M5	Sunny	Moderate	10:08	Surface	1	26.9 26.8	26.9	8.0 8.0	8.0	33.1 33.1	33.1	84.8 83.6	84.2	5.6 5.6	5.6	5.6	2.7 2.3	2.5	3.6	3.9 3.9	3.9	4.8
				Middle	5	26.6 26.6	26.6	8.0 8.0	8.0	33.1 33.1	33.1	82.1 82.0	82.1	5.5 5.5	5.5		3.5 3.7	3.6		4.3 4.3	4.3	
				Bottom	9	26.7 26.8	26.8	8.0 8.0	8.0	33.2 33.3	33.3	82.4 83.8	83.1	5.5 5.6	5.6	5.6	4.9 4.5	4.7		6.1 6.0	6.1	
M6	Sunny	Moderate	10:03	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	5.6	- -	-	1.7	- -	-	4.3
				Middle	2.3	26.8 26.8	26.8	8.0 8.0	8.0	33.1 33.1	33.1	84.0 84.0	84.0	5.6 5.6	5.6		1.7 1.6	1.7		4.3 4.3	4.3	
				Bottom	-	- -	-	- -	-	- -	-	- -	-	- -	-	-	- -	-		- -	-	

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

Appendix I - Action and Limit Levels for Marine Water Quality on 18 September 2018 (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: 12.8 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C2: 13.9 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 ***C2: 5.9 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 6.4 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 5.9 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 6.4 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 6.0 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 6.0 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 18 September 2018

(Mid-Ebb Tide)

Location	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
C1	Fine	Calm	08:48	Surface	1	26.9 26.9	26.9	8.1 8.1	8.1	29.9 29.9	29.9	89.0 88.5	88.8	6.0 6.0	6.0	6.0	3.0 3.3	3.2	5.4	3.0 3.0	3.0	4.0
				Middle	9	27.0 27.0	27.0	8.1 8.1	8.1	30.7 30.7	30.7	87.1 87.0	87.1	5.9 5.8	5.9		6.5 6.1	6.3		3.9 3.6	3.8	
				Bottom	17	27.0 27.0	27.0	8.1 8.1	8.1	30.8 30.8	30.8	86.8 87.0	86.9	5.8 5.8	5.8	5.8	6.8 6.7	6.8		5.1 5.4	5.3	
C2	Fine	Calm	07:32	Surface	1	26.9 26.9	26.9	7.9 8.0	8.0	30.0 30.0	30.0	89.7 89.3	89.5	6.1 6.0	6.1	6.0	3.7 3.7	3.7	6.9	4.9 4.9	4.9	5.0
				Middle	16	26.9 26.9	26.9	8.0 8.0	8.0	30.3 30.3	30.3	87.1 86.5	86.8	5.9 5.8	5.9		6.2 6.1	6.2		5.2 5.1	5.2	
				Bottom	31	26.9 26.9	26.9	8.0 8.0	8.0	30.4 30.4	30.4	86.4 86.2	86.3	5.8 5.8	5.8	5.8	10.6 10.8	10.7		5.0 4.9	5.0	
G1	Fine	Calm	08:09	Surface	1	26.9 26.9	26.9	8.1 8.1	8.1	29.7 29.7	29.7	87.1 86.6	86.9	5.9 5.9	5.9	6.0	3.0 3.0	3.0	4.1	5.1 5.0	5.1	4.7
				Middle	4	26.9 26.9	26.9	8.1 8.1	8.1	30.5 30.6	30.6	89.1 88.1	88.6	6.0 5.9	6.0		3.5 4.1	3.8		4.6 4.6	4.6	
				Bottom	7	26.9 26.9	26.9	8.1 8.1	8.1	30.6 30.7	30.7	86.5 86.7	86.6	5.8 5.8	5.8	5.8	5.6 5.5	5.6		4.3 4.4	4.4	
G2	Fine	Calm	07:54	Surface	1	26.9 26.9	26.9	8.1 8.1	8.1	30.2 30.1	30.2	90.2 90.0	90.1	6.1 6.1	6.1	6.1	2.8 2.8	2.8	3.3	5.3 5.4	5.4	4.5
				Middle	5.5	26.9 26.9	26.9	8.1 8.1	8.1	30.4 30.4	30.4	90.5 90.3	90.4	6.1 6.1	6.1		3.2 3.1	3.2		3.1 3.2	3.2	
				Bottom	10	26.9 27.0	27.0	8.1 8.1	8.1	30.5 30.7	30.6	88.7 88.8	88.8	6.0 6.0	6.0	6.0	3.7 4.0	3.9		4.8 4.7	4.8	
G3	Fine	Calm	08:14	Surface	1	26.8 26.8	26.8	8.0 8.1	8.1	29.3 29.4	29.4	84.8 84.8	84.8	5.8 5.8	5.8	5.8	2.4 2.6	2.5	4.7	2.9 2.8	2.9	3.7
				Middle	4	26.9 26.9	26.9	8.1 8.1	8.1	30.6 30.5	30.6	84.3 85.0	84.7	5.7 5.7	5.7		5.0 4.9	5.0		4.1 4.0	4.1	
				Bottom	7	26.9 26.9	26.9	8.1 8.1	8.1	30.7 30.7	30.7	86.3 86.5	86.4	5.8 5.8	5.8	5.8	6.7 6.6	6.7		4.1 4.1	4.1	
G4	Fine	Calm	08:29	Surface	1	26.9 26.9	26.9	8.1 8.1	8.1	29.9 29.8	29.9	86.5 85.9	86.2	5.8 5.8	5.8	5.9	2.5 2.5	2.5	3.4	4.2 4.2	4.2	3.9
				Middle	4	26.9 26.9	26.9	8.1 8.1	8.1	30.5 30.5	30.5	88.1 88.1	88.1	5.9 5.9	5.9		3.4 3.4	3.4		3.5 3.5	3.5	
				Bottom	7	27.0 27.0	27.0	8.1 8.1	8.1	30.7 30.7	30.7	89.4 89.2	89.3	6.0 6.0	6.0	6.0	4.2 4.1	4.2		3.8 3.9	3.9	
M1	Fine	Calm	08:01	Surface	1	26.9 26.9	26.9	8.1 8.1	8.1	29.9 29.9	29.9	89.6 88.9	89.3	6.1 6.0	6.1	6.0	3.0 3.0	3.0	4.0	2.2 2.1	2.2	3.1
				Middle	3	26.9 26.9	26.9	8.1 8.1	8.1	30.4 30.4	30.4	87.5 86.1	86.8	5.9 5.8	5.9		3.6 3.3	3.5		3.2 3.2	3.2	
				Bottom	5	26.9 26.9	26.9	8.1 8.1	8.1	30.6 30.6	30.6	85.7 85.1	85.4	5.8 5.7	5.8	5.8	5.1 5.6	5.4		3.9 3.9	3.9	
M2	Fine	Calm	07:47	Surface	1	26.9 26.9	26.9	8.1 8.1	8.1	30.1 30.1	30.1	90.2 90.3	90.3	6.1 6.1	6.1	6.1	2.6 2.8	2.7	3.5	2.7 2.7	2.7	3.8
				Middle	6	26.9 26.9	26.9	8.1 8.1	8.1	30.4 30.5	30.5	90.7 90.5	90.6	6.1 6.1	6.1		3.1 3.1	3.1		3.2 3.1	3.2	
				Bottom	11	27.0 27.0	27.0	8.1 8.1	8.1	30.8 30.8	30.8	89.3 89.2	89.3	6.0 6.0	6.0	6.0	4.6 4.8	4.7		5.3 5.4	5.4	
M3	Fine	Calm	08:20	Surface	1	26.8 26.8	26.8	8.0 8.0	8.0	29.1 29.0	29.1	86.7 85.4	86.1	5.9 5.8	5.9	5.9	2.1 2.0	2.1	4.8	3.1 3.1	3.1	3.5
				Middle	4	26.9 26.9	26.9	8.1 8.1	8.1	30.6 30.6	30.6	86.6 85.2	85.9	5.8 5.7	5.8		5.4 5.2	5.3		3.4 3.4	3.4	
				Bottom	7	26.9 26.9	26.9	8.1 8.1	8.1	30.8 30.7	30.8	86.8 85.1	86.0	5.8 5.7	5.8	5.8	7.1 7.0	7.1		4.0 4.0	4.0	
M4	Fine	Calm	07:40	Surface	1	26.8 26.8	26.8	8.1 8.1	8.1	29.6 29.6	29.6	92.9 92.8	92.9	6.3 6.3	6.3	6.2	2.9 2.9	2.9	3.3	4.9 4.9	4.9	4.2
				Middle	6	26.9 26.9	26.9	8.1 8.1	8.1	30.3 30.2	30.3	89.9 90.2	90.1	6.1 6.1	6.1		3.4 3.2	3.3		3.0 3.0	3.0	
				Bottom	11	26.9 26.9	26.9	8.1 8.1	8.1	30.3 30.3	30.3	89.2 89.3	89.3	6.0 6.0	6.0	6.0	3.7 3.6	3.7		4.7 4.8	4.8	
M5	Fine	Calm	08:40	Surface	1	26.9 27.0	27.0	8.1 8.1	8.1	30.5 30.5	30.5	90.0 89.7	89.9	6.1 6.0	6.1	6.1	4.7 4.6	4.7	4.8	4.6 4.9	4.8	4.7
				Middle	5.5	26.9 26.9	26.9	8.1 8.1	8.1	30.5 30.5	30.5	89.3 89.2	89.3	6.0 6.0	6.0		4.6 4.6	4.6		4.4 4.6	4.5	
				Bottom	10	26.9 26.9	26.9	8.1 8.1	8.1	30.6 30.6	30.6	88.7 88.8	88.8	6.0 6.0	6.0	6.0	5.0 4.9	5.0		4.9 4.9	4.9	
M6	Fine	Calm	08:35	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	5.9	- -	-	3.7	- -	-	3.7
				Middle	2.2	26.9 26.9	26.9	8.1 8.1	8.1	30.5 30.5	30.5	87.2 87.4	87.3	5.9 5.9	5.9		3.7 3.6	3.7		3.6 3.7	3.7	
				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 18 September 2018 (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: 7.1 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C1: 7.7 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 4.3 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 4.7 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 4.3 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 4.7 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 4.8 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 5.2 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 18 September 2018

(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	20:34	Surface	1	27.3 27.3	27.3	8.1 8.1	8.1	30.1 30.1	30.1	93.4 92.5	93.0	6.3 6.2	6.3	6.1	2.5 2.5	2.5	3.8	3.6 3.6	3.6	4.1
				Middle	9	27.0 27.0	27.0	8.1 8.1	8.1	30.4 30.4	30.4	86.9 86.8	86.9	5.9 5.8	5.9		3.0 2.9	3.0		4.6 4.6	4.6	
				Bottom	17	27.1 27.1	27.1	8.1 8.1	8.1	31.0 31.0	31.0	88.4 88.3	88.4	5.9 5.9	5.9	5.9	5.9 5.8	5.9		4.0 4.0	4.0	
C2	Cloudy	Moderate	19:22	Surface	1	27.6 27.6	27.6	7.9 7.9	7.9	30.1 30.1	30.1	94.7 94.0	94.4	6.3 6.3	6.3	6.2	2.9 3.1	3.0	4.0	3.5 3.6	3.6	3.4
				Middle	16	27.0 27.0	27.0	7.9 8.0	8.0	30.5 30.5	30.5	89.6 89.7	89.7	6.0 6.0	6.0		3.9 3.6	3.8		3.2 3.1	3.2	
				Bottom	31	27.0 27.0	27.0	7.9 8.0	8.0	30.8 30.8	30.8	84.8 85.5	85.2	5.7 5.7	5.7	5.7	5.4 5.1	5.3		3.3 3.3	3.3	
G1	Cloudy	Moderate	19:51	Surface	1	27.6 27.5	27.6	8.1 8.1	8.1	30.1 30.1	30.1	92.3 91.4	91.9	6.2 6.1	6.2	6.2	2.5 2.6	2.6	3.6	3.2 3.2	3.2	3.1
				Middle	4	27.3 27.3	27.3	8.1 8.1	8.1	30.2 30.3	30.3	90.9 90.7	90.8	6.1 6.1	6.1		2.4 2.5	2.5		2.8 2.7	2.8	
				Bottom	7	26.9 27.0	27.0	8.1 8.1	8.1	30.7 30.7	30.7	84.5 85.0	84.8	5.7 5.7	5.7	5.7	6.0 5.4	5.7		3.2 3.3	3.3	
G2	Cloudy	Moderate	19:41	Surface	1	27.4 27.4	27.4	8.0 8.0	8.0	29.9 29.9	29.9	93.2 92.4	92.8	6.2 6.2	6.2	6.1	3.4 3.3	3.4	4.8	3.4 3.3	3.4	3.7
				Middle	5	27.1 27.2	27.2	8.0 8.0	8.0	30.4 30.3	30.4	89.8 90.0	89.9	6.0 6.0	6.0		4.5 4.7	4.6		3.7 3.8	3.8	
				Bottom	9	27.0 27.0	27.0	8.0 8.0	8.0	30.7 30.6	30.7	85.0 86.5	85.8	5.7 5.8	5.8	5.8	6.4 6.4	6.4		4.0 3.9	4.0	
G3	Cloudy	Moderate	20:01	Surface	1	27.4 27.4	27.4	8.1 8.1	8.1	30.1 30.1	30.1	88.9 88.9	88.9	6.0 6.0	6.0	6.0	3.5 3.5	3.5	4.0	3.2 3.2	3.2	3.0
				Middle	4	27.1 27.1	27.1	8.1 8.1	8.1	30.4 30.4	30.4	88.3 88.4	88.4	5.9 5.9	5.9		4.1 4.1	4.1		2.5 2.4	2.5	
				Bottom	7	27.0 27.0	27.0	8.1 8.1	8.1	30.5 30.5	30.5	86.9 86.4	86.7	5.8 5.8	5.8	5.8	4.4 4.4	4.4		3.4 3.3	3.4	
G4	Cloudy	Moderate	20:14	Surface	1	27.3 27.5	27.4	8.1 8.1	8.1	30.2 30.1	30.2	90.5 89.4	90.0	6.1 6.0	6.1	6.0	2.6 2.7	2.7	4.0	3.2 3.3	3.3	3.4
				Middle	4	27.0 27.0	27.0	8.1 8.1	8.1	30.4 30.4	30.4	85.9 85.7	85.8	5.8 5.8	5.8		3.7 3.7	3.7		2.9 2.9	2.9	
				Bottom	7	27.0 27.0	27.0	8.1 8.1	8.1	30.6 30.5	30.6	81.9 82.9	82.4	5.5 5.6	5.6	5.6	5.5 5.5	5.5		4.1 4.0	4.1	
M1	Cloudy	Moderate	19:46	Surface	1	27.4 27.5	27.5	8.0 8.0	8.0	30.0 29.7	29.9	92.6 92.2	92.4	6.2 6.2	6.2	6.1	2.0 1.6	1.8	2.8	3.3 3.4	3.4	3.0
				Middle	3.5	27.2 27.2	27.2	8.0 8.1	8.1	30.2 30.3	30.3	90.0 89.5	89.8	6.0 6.0	6.0		2.8 2.9	2.9		3.3 3.2	3.3	
				Bottom	6	27.1 27.0	27.1	8.0 8.1	8.1	30.4 30.5	30.5	87.6 87.7	87.7	5.9 5.9	5.9	5.9	3.5 3.6	3.6		2.2 2.2	2.2	
M2	Cloudy	Moderate	19:36	Surface	1	27.5 27.5	27.5	8.0 8.0	8.0	29.9 29.9	29.9	94.6 94.1	94.4	6.3 6.3	6.3	6.3	2.3 2.1	2.2	3.1	4.0 4.1	4.1	3.4
				Middle	6	27.4 27.4	27.4	8.0 8.0	8.0	30.2 30.2	30.2	93.3 93.1	93.2	6.2 6.2	6.2		2.8 2.7	2.8		3.0 3.0	3.0	
				Bottom	11	27.0 27.0	27.0	8.0 8.0	8.0	30.6 30.7	30.7	88.4 87.4	87.9	5.9 5.9	5.9	5.9	4.3 4.2	4.3		2.9 3.0	3.0	
M3	Cloudy	Moderate	20:08	Surface	1	27.3 27.4	27.4	8.1 8.1	8.1	30.3 30.2	30.3	88.2 89.2	88.7	5.9 6.0	6.0	6.0	3.1 3.3	3.2	3.6	3.6 3.8	3.7	3.8
				Middle	4	27.1 27.1	27.1	8.1 8.1	8.1	30.4 30.4	30.4	88.1 88.0	88.1	5.9 5.9	5.9		3.0 3.1	3.1		4.4 4.4	4.4	
				Bottom	7	27.0 27.0	27.0	8.1 8.1	8.1	30.6 30.6	30.6	85.1 84.5	84.8	5.7 5.7	5.7	5.7	4.4 4.5	4.5		3.3 3.3	3.3	
M4	Cloudy	Moderate	19:31	Surface	1	27.7 27.7	27.7	8.0 8.0	8.0	30.1 30.0	30.1	94.7 94.2	94.5	6.3 6.3	6.3	6.3	3.5 3.2	3.4	3.7	3.3 3.2	3.3	2.8
				Middle	6	27.3 27.5	27.4	8.0 8.0	8.0	30.3 30.2	30.3	92.4 92.5	92.5	6.2 6.2	6.2		3.5 3.8	3.7		2.6 2.6	2.6	
				Bottom	11	27.0 27.0	27.0	8.0 8.0	8.0	30.5 30.5	30.5	88.7 88.6	88.7	6.0 6.0	6.0	6.0	3.8 4.0	3.9		2.6 2.6	2.6	
M5	Cloudy	Moderate	20:26	Surface	1	27.1 27.1	27.1	8.1 8.1	8.1	30.2 30.2	30.2	88.8 89.1	89.0	6.0 6.0	6.0	6.0	3.3 3.1	3.2	3.9	2.6 2.6	2.6	3.5
				Middle	5.5	27.0 27.0	27.0	8.1 8.1	8.1	30.4 30.4	30.4	87.5 87.2	87.4	5.9 5.9	5.9		3.9 4.0	4.0		3.4 3.5	3.5	
				Bottom	10	27.0 27.0	27.0	8.1 8.1	8.1	30.5 30.5	30.5	87.3 87.2	87.3	5.9 5.9	5.9	5.9	4.2 4.6	4.4		4.3 4.3	4.3	
M6	Cloudy	Moderate	20:20	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	5.6	- -	-	3.1	- -	-	2.1
				Middle	2.3	27.2 27.2	27.2	8.1 8.0	8.1	30.3 30.3	30.3	83.3 83.1	83.2	5.6 5.6	5.6		3.1 3.1	3.1		2.1 2.1	2.1	
				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 September 2018 (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: 7.7 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C2: 8.3 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 6.4 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 6.9 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: 6.4 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 6.9 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: 7.0 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 7.5 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 20 September 2018

(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	10:33	Surface	1	27.4 27.6	27.5	8.0 8.0	8.0	31.0 30.7	30.9	79.9 83.2	81.6	5.3 5.5	5.4	5.4	2.9 2.8	2.9	4.2	5.2 5.0	5.1	4.2
				Middle	9	27.2 27.2	27.2	8.0 8.0	8.0	31.9 31.9	31.9	81.4 81.5	81.5	5.4 5.4	5.4		3.5 3.2	3.4		4.3 4.4	4.4	
				Bottom	17	26.9 26.9	26.9	8.1 8.1	8.1	32.6 32.6	32.6	78.5 78.5	78.5	5.2 5.2	5.2	5.2	6.3 6.3	6.3		3.1 3.0	3.1	
C2	Sunny	Calm	09:16	Surface	1	27.6 27.6	27.6	8.0 8.0	8.0	30.5 30.5	30.5	81.8 80.1	81.0	5.4 5.3	5.4	5.4	2.4 2.3	2.4	4.9	5.2 5.3	5.3	5.3
				Middle	16	27.2 27.1	27.2	8.1 8.1	8.1	32.0 32.2	32.1	80.0 79.6	79.8	5.3 5.3	5.3		5.9 6.1	6.0		4.6 4.8	4.7	
				Bottom	31	27.0 27.1	27.1	8.1 8.1	8.1	32.4 32.3	32.4	78.8 78.7	78.8	5.2 5.2	5.2	5.2	6.5 6.2	6.4		5.8 5.7	5.8	
G1	Sunny	Calm	09:59	Surface	1	27.6 27.7	27.7	8.1 8.1	8.1	31.4 31.4	31.4	89.4 91.3	90.4	5.9 6.0	6.0	5.8	1.8 2.0	1.9	2.5	2.5 2.6	2.6	3.1
				Middle	4	27.4 27.3	27.4	8.1 8.0	8.1	31.6 31.6	31.6	84.5 83.4	84.0	5.6 5.5	5.6		2.3 2.4	2.4		2.6 2.6	2.6	
				Bottom	7	27.1 27.1	27.1	8.0 8.0	8.0	31.9 31.9	31.9	79.7 80.5	80.1	5.3 5.4	5.4	5.4	3.2 3.3	3.3		4.1 4.2	4.2	
G2	Sunny	Calm	09:44	Surface	1	27.8 27.6	27.7	8.1 8.1	8.1	31.2 31.4	31.3	99.0 91.9	95.5	6.5 6.1	6.3	5.9	2.0 2.1	2.1	2.8	4.3 4.4	4.4	3.8
				Middle	5	27.2 27.2	27.2	8.1 8.1	8.1	31.8 31.8	31.8	82.4 81.1	81.8	5.5 5.4	5.5		2.9 2.9	2.9		4.6 4.8	4.7	
				Bottom	9	27.1 27.1	27.1	8.1 8.1	8.1	32.2 32.2	32.2	81.1 81.0	81.1	5.4 5.4	5.4	5.4	3.2 3.3	3.3		2.3 2.3	2.3	
G3	Sunny	Calm	10:04	Surface	1	27.8 27.8	27.8	8.0 8.0	8.0	31.0 31.1	31.1	89.2 83.9	86.6	5.9 5.6	5.8	5.7	1.2 1.3	1.3	2.4	4.1 4.2	4.2	5.0
				Middle	4	27.4 27.3	27.4	8.1 8.0	8.1	31.6 31.6	31.6	82.9 80.5	81.7	5.5 5.4	5.5		2.2 2.3	2.3		4.9 5.1	5.0	
				Bottom	7	27.1 27.1	27.1	8.1 8.0	8.1	32.0 32.0	32.0	79.9 79.6	79.8	5.3 5.3	5.3	5.3	3.7 3.4	3.6		5.8 5.9	5.9	
G4	Sunny	Calm	10:15	Surface	1	28.2 28.1	28.2	8.1 8.1	8.1	30.9 31.0	31.0	109.0 108.6	108.8	7.2 7.1	7.2	6.5	1.6 1.7	1.7	2.6	4.1 4.1	4.1	5.0
				Middle	4	27.4 27.5	27.5	8.1 8.0	8.1	31.6 31.5	31.6	86.5 86.8	86.7	5.7 5.8	5.8		2.1 2.1	2.1		4.5 4.5	4.5	
				Bottom	7	27.2 27.1	27.2	8.0 8.0	8.0	32.0 32.0	32.0	78.2 76.9	77.6	5.2 5.1	5.2	5.2	3.7 4.3	4.0		6.4 6.3	6.4	
M1	Sunny	Calm	09:50	Surface	1	27.8 27.7	27.8	8.1 8.0	8.1	31.2 31.3	31.3	89.5 87.2	88.4	5.9 5.8	5.9	5.8	1.6 1.7	1.7	2.0	5.1 5.2	5.2	5.0
				Middle	3	27.4 27.4	27.4	8.0 8.0	8.0	31.6 31.6	31.6	83.9 83.7	83.8	5.6 5.6	5.6		2.0 2.1	2.1		5.3 5.5	5.4	
				Bottom	5	27.3 27.3	27.3	8.0 8.0	8.0	31.7 31.7	31.7	81.7 77.4	79.6	5.4 5.1	5.3	5.3	2.1 2.1	2.1		4.4 4.4	4.4	
M2	Sunny	Calm	09:35	Surface	1	27.6 27.7	27.7	8.1 8.1	8.1	31.2 31.2	31.2	95.4 95.7	95.6	6.3 6.3	6.3	6.0	2.1 2.1	2.1	2.6	4.3 4.2	4.3	3.7
				Middle	5.5	27.2 27.3	27.3	8.1 8.1	8.1	32.0 31.8	31.9	85.0 85.7	85.4	5.7 5.7	5.7		2.4 2.3	2.4		4.0 3.9	4.0	
				Bottom	10	27.1 27.1	27.1	8.1 8.1	8.1	32.3 32.2	32.3	81.8 80.0	80.9	5.4 5.3	5.4	5.4	3.3 3.4	3.4		2.9 2.9	2.9	
M3	Sunny	Calm	10:09	Surface	1	28.0 28.0	28.0	8.1 8.1	8.1	31.0 31.0	31.0	105.6 102.4	104.0	7.0 6.8	6.9	6.2	2.0 2.0	2.0	3.0	4.7 4.6	4.7	4.1
				Middle	4	27.3 27.4	27.4	8.0 8.0	8.0	31.7 31.6	31.7	81.2 82.1	81.7	5.4 5.5	5.5		2.6 2.5	2.6		4.5 4.6	4.6	
				Bottom	7	27.1 27.1	27.1	8.0 8.0	8.0	32.0 32.0	32.0	75.7 76.3	76.0	5.0 5.1	5.1	5.1	4.2 4.6	4.4		2.9 2.9	2.9	
M4	Sunny	Calm	09:27	Surface	1	27.8 27.8	27.8	8.1 8.1	8.1	31.1 31.1	31.1	99.3 99.0	99.2	6.6 6.5	6.6	6.3	2.1 2.0	2.1	2.5	4.6 4.6	4.6	3.8
				Middle	5	27.5 27.4	27.5	8.1 8.1	8.1	31.5 31.5	31.5	88.6 87.7	88.2	5.9 5.8	5.9		2.0 2.1	2.1		2.5 2.5	2.5	
				Bottom	9	27.2 27.2	27.2	8.1 8.1	8.1	31.9 31.9	31.9	80.9 80.6	80.8	5.4 5.4	5.4	5.4	3.4 3.3	3.4		4.4 4.4	4.4	
M5	Sunny	Calm	10:26	Surface	1	27.6 27.7	27.7	8.0 8.0	8.0	31.2 31.2	31.2	89.7 87.4	88.6	5.9 5.8	5.9	5.8	2.5 2.4	2.5	3.2	4.3 4.5	4.4	4.9
				Middle	5.5	27.5 27.4	27.5	8.0 8.0	8.0	31.3 31.4	31.4	85.8 83.7	84.8	5.7 5.6	5.7		2.7 2.8	2.8		4.2 4.0	4.1	
				Bottom	10	27.2 27.3	27.3	8.0 8.0	8.0	32.1 31.8	32.0	82.1 82.7	82.4	5.5 5.5	5.5	5.5	4.2 4.3	4.3		6.1 6.1	6.1	
M6	Sunny	Calm	10:21	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	6.5	- -	-	2.1	- -	-	6.1
				Middle	2.3	27.7 27.7	27.7	8.1 8.1	8.1	31.3 31.2	31.3	98.3 98.1	98.2	6.5 6.4	6.5		2.1 2.1	2.1		6.1 6.0	6.1	
				Bottom	-	- -	-	- -	-	- -	-	- -	-	- -	-	-	- -	-		- -	-	

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

Appendix I - Action and Limit Levels for Marine Water Quality on 20 September 2018 (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: 11.6 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C1: 12.6 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: 5.4 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 5.9 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 ***C1: 5.4 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 5.9 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 ***C1: 6.8 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 7.4 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 20 September 2018

(Mid-Flood Tide)

Location	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
C1	Sunny	Calm	16:57	Surface	1	27.9 27.9	27.9	8.2 8.2	8.2	31.5 31.5	31.5	110.5 108.9	109.7	7.3 7.2	7.3	6.6	2.6 2.4	2.5	4.9	4.5 4.5	4.5	5.1
				Middle	9	27.4 27.2	27.3	8.1 8.1	8.1	31.9 32.2	32.1	88.5 84.8	86.7	5.9 5.6	5.8		2.4 2.3	2.4		5.0 5.0	5.0	
				Bottom	17	26.6 26.6	26.6	8.1 8.1	8.1	33.0 32.9	33.0	81.6 81.6	81.6	5.5 5.5	5.5	5.5	9.4 9.9	9.7		5.7 5.7	5.7	
C2	Sunny	Calm	15:38	Surface	1	27.9 28.3	28.1	11.9 8.3	10.1	31.4 31.2	31.3	110.1 131.9	121.0	7.3 8.6	8.0	6.9	2.1 2.1	2.1	3.7	3.7 3.7	3.7	5.1
				Middle	16	27.2 27.3	27.3	8.3 8.2	8.3	32.0 31.9	32.0	82.4 87.5	85.0	5.5 5.8	5.7		2.8 2.6	2.7		5.8 5.8	5.8	
				Bottom	31	27.0 27.1	27.1	8.2 8.2	8.2	32.2 32.2	32.2	79.6 79.7	79.7	5.3 5.3	5.3	5.3	6.1 6.2	6.2		5.7 5.6	5.7	
G1	Sunny	Calm	16:11	Surface	1	28.7 28.7	28.7	8.3 8.3	8.3	31.0 30.9	31.0	143.5 153.0	148.3	9.4 10.0	9.7	8.2	2.2 2.2	2.2	4.3	4.5 4.9	4.7	5.0
				Middle	4	28.1 27.8	28.0	8.1 8.1	8.1	31.3 31.4	31.4	104.3 94.9	99.6	6.9 6.3	6.6		2.5 2.4	2.5		5.8 5.4	5.6	
				Bottom	7	27.2 27.2	27.2	8.1 8.1	8.1	32.0 32.0	32.0	80.0 79.8	79.9	5.3 5.3	5.3	5.3	8.2 8.2	8.2		4.8 4.8	4.8	
G2	Sunny	Calm	16:01	Surface	1	28.3 28.2	28.3	8.3 8.2	8.3	31.1 31.2	31.2	131.8 121.1	126.5	8.6 8.0	8.3	7.2	2.2 2.3	2.3	4.0	5.2 5.5	5.4	5.4
				Middle	5	27.6 27.7	27.7	8.1 8.1	8.1	31.4 31.4	31.4	90.1 93.3	91.7	6.0 6.2	6.1		2.5 2.5	2.5		5.1 5.0	5.1	
				Bottom	9	27.1 27.1	27.1	8.1 8.1	8.1	32.2 32.2	32.2	78.4 77.6	78.0	5.2 5.2	5.2	5.2	6.9 7.2	7.1		5.5 5.6	5.6	
G3	Sunny	Calm	16:17	Surface	1	28.6 28.6	28.6	8.4 8.4	8.4	30.8 30.9	30.9	169.7 184.2	177.0	11.1 12.0	11.6	9.2	2.0 2.0	2.0	2.1	5.2 5.3	5.3	5.0
				Middle	4	28.0 27.9	28.0	8.1 8.1	8.1	31.3 31.3	31.3	100.7 106.5	103.6	6.6 7.0	6.8		2.3 2.3	2.3		5.3 5.6	5.5	
				Bottom	7	27.8 27.8	27.8	8.1 8.1	8.1	31.3 31.3	31.3	100.6 100.4	100.5	6.6 6.6	6.6	6.6	2.0 2.0	2.0		4.3 4.3	4.3	
G4	Sunny	Calm	16:29	Surface	1	28.6 28.6	28.6	8.3 8.3	8.3	30.8 30.7	30.8	158.5 159.8	159.2	10.4 10.4	10.4	8.6	2.1 2.2	2.2	2.6	4.7 4.5	4.6	5.2
				Middle	4	27.8 27.9	27.9	8.1 8.1	8.1	31.3 31.3	31.3	99.8 101.5	100.7	6.6 6.7	6.7		2.4 2.8	2.6		4.7 4.4	4.6	
				Bottom	7	27.7 27.7	27.7	8.1 8.1	8.1	31.3 31.3	31.3	88.9 89.4	89.2	5.9 5.9	5.9	5.9	2.9 2.9	2.9		6.4 6.5	6.5	
M1	Sunny	Calm	16:07	Surface	1	28.6 28.5	28.6	8.3 8.3	8.3	31.0 31.0	31.0	140.8 134.3	137.6	9.2 8.8	9.0	8.1	2.0 2.0	2.0	2.5	3.2 3.3	3.3	5.4
				Middle	3	28.0 27.9	28.0	8.2 8.2	8.2	31.3 31.3	31.3	109.2 106.0	107.6	7.2 7.0	7.1		2.3 2.3	2.3		6.1 6.3	6.2	
				Bottom	5	27.6 27.5	27.6	8.1 8.1	8.1	31.5 31.5	31.5	91.2 88.2	89.7	6.0 5.8	5.9	5.9	3.2 3.0	3.1		6.4 6.7	6.6	
M2	Sunny	Calm	15:54	Surface	1	28.6 28.6	28.6	8.3 8.4	8.4	31.1 31.1	31.1	159.9 159.1	159.5	10.4 10.4	10.4	8.3	2.3 2.5	2.4	2.8	5.2 5.1	5.2	4.9
				Middle	5.5	27.5 27.5	27.5	8.1 8.1	8.1	31.6 31.5	31.6	92.7 91.8	92.3	6.1 6.1	6.1		2.4 2.4	2.4		5.0 5.3	5.2	
				Bottom	10	27.0 27.0	27.0	8.1 8.1	8.1	32.3 32.3	32.3	82.5 82.0	82.3	5.5 5.5	5.5	5.5	3.4 3.5	3.5		4.2 4.4	4.3	
M3	Sunny	Calm	16:22	Surface	1	28.4 28.3	28.4	8.4 8.3	8.4	31.0 30.8	30.9	166.3 153.4	159.9	10.9 10.1	10.5	9.4	1.9 2.0	2.0	2.1	3.2 3.2	3.2	3.1
				Middle	4	28.0 28.0	28.0	8.2 8.2	8.2	31.2 31.2	31.2	124.4 126.9	125.7	8.2 8.4	8.3		2.0 2.0	2.0		2.8 2.8	2.8	
				Bottom	7	27.8 27.8	27.8	8.2 8.2	8.2	31.3 31.3	31.3	111.1 113.9	112.5	7.3 7.5	7.4	7.4	2.4 2.2	2.3		3.3 3.3	3.3	
M4	Sunny	Calm	15:46	Surface	1	28.7 28.6	28.7	8.4 8.4	8.4	31.1 31.1	31.1	162.5 147.0	154.8	10.6 9.6	10.1	8.2	2.3 2.2	2.3	2.7	4.7 4.7	4.7	4.6
				Middle	5	27.6 27.3	27.5	8.2 8.1	8.2	31.6 31.8	31.7	97.8 87.9	92.9	6.5 5.8	6.2		2.5 2.2	2.4		4.4 4.5	4.5	
				Bottom	9	27.2 27.2	27.2	8.2 8.1	8.2	32.0 32.0	32.0	81.8 81.0	81.4	5.4 5.4	5.4	5.4	3.4 3.4	3.4		4.6 4.4	4.5	
M5	Sunny	Calm	16:46	Surface	1	27.9 27.9	27.9	8.1 8.1	8.1	31.2 31.2	31.2	87.5 86.4	87.0	5.8 5.7	5.8	5.8	2.7 2.7	2.7	3.9	2.7 2.6	2.7	3.6
				Middle	5.5	27.6 27.5	27.6	8.1 8.1	8.1	31.4 31.4	31.4	84.5 87.2	85.9	5.6 5.8	5.7		2.7 2.5	2.6		3.2 3.1	3.2	
				Bottom	10	27.0 27.0	27.0	8.1 8.1	8.1	32.3 32.3	32.3	80.1 80.4	80.3	5.3 5.4	5.4	5.4	6.3 6.2	6.3		4.8 4.8	4.8	
M6	Sunny	Calm	16:36	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	6.8	- -	-	2.6	- -	-	4.7
				Middle	2.3	27.7 27.7	27.7	8.1 8.1	8.1	31.4 31.4	31.4	102.6 100.7	101.7	6.8 6.7	6.8		2.6 2.5	2.6		4.6 4.8	4.7	
				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 22 September 2018 (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: 11.0 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C2: 12.0 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: 5.4 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 5.9 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: 5.4 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 5.9 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: 5.8 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 6.2 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 22 September 2018

(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	11:48	Surface	1	28.4 28.6	28.5	8.3 8.3	8.3	31.4 31.3	31.4	152.8 157.3	155.1	10.0 10.2	10.1	7.9	2.3 2.2	2.3	3.2	3.1 3.0	3.1	3.5
				Middle	9	26.9 26.9	26.9	8.0 8.0	8.0	32.4 32.5	32.5	85.5 84.6	85.1	5.7 5.6	5.7		2.9 3.0	3.0		3.4 3.3	3.4	
				Bottom	17	26.7 26.7	26.7	8.0 8.0	8.0	32.8 32.8	32.8	78.3 78.0	78.2	5.2 5.2	5.2	5.2	4.5 4.3	4.4		3.9 3.9	3.9	
C2	Sunny	Calm	10:36	Surface	1	27.8 27.8	27.8	8.0 8.0	8.0	30.5 30.7	30.6	80.4 79.9	80.2	5.3 5.3	5.3	5.3	3.3 3.3	3.3	7.5	4.5 4.5	4.5	4.7
				Middle	17	27.0 26.9	27.0	8.1 8.0	8.1	32.2 32.4	32.3	78.5 78.7	78.6	5.2 5.2	5.2		10.2 9.5	9.9		4.8 4.7	4.8	
				Bottom	33	26.6 26.7	26.7	8.1 8.1	8.1	32.8 32.7	32.8	78.4 78.4	78.4	5.2 5.2	5.2	5.2	9.1 9.2	9.2		4.7 4.8	4.8	
G1	Sunny	Calm	11:14	Surface	1	28.6 28.6	28.6	8.3 8.3	8.3	31.3 31.3	31.3	156.0 155.5	155.8	10.2 10.1	10.2	9.4	2.1 2.1	2.1	2.4	5.1 5.0	5.1	5.4
				Middle	4	28.4 27.8	28.1	8.3 8.2	8.3	31.4 31.6	31.5	140.6 119.6	130.1	9.2 7.9	8.6		2.5 2.4	2.5		6.5 6.4	6.5	
				Bottom	7	27.4 27.1	27.3	8.1 8.1	8.1	31.9 32.2	32.1	93.4 83.1	88.3	6.2 5.5	5.9	5.9	2.3 2.7	2.5		4.5 4.5	4.5	
G2	Sunny	Calm	11:01	Surface	1	28.6 28.7	28.7	8.3 8.3	8.3	31.3 31.3	31.3	145.1 150.9	148.0	9.4 9.8	9.6	8.2	2.1 2.2	2.2	2.5	3.2 3.3	3.3	3.5
				Middle	5	27.8 27.5	27.7	8.1 8.1	8.1	31.6 31.8	31.7	101.2 99.7	100.5	6.7 6.6	6.7		2.2 2.3	2.3		3.1 3.0	3.1	
				Bottom	9	26.9 26.9	26.9	8.1 8.1	8.1	32.5 32.5	32.5	81.9 80.0	81.0	5.5 5.3	5.4	5.4	2.9 2.9	2.9		4.3 4.1	4.2	
G3	Sunny	Calm	11:19	Surface	1	28.7 28.6	28.7	8.3 8.3	8.3	31.3 31.3	31.3	152.2 154.1	153.2	9.9 10.0	10.0	9.3	2.1 2.1	2.1	2.3	4.8 4.9	4.9	4.2
				Middle	4	28.1 27.9	28.0	8.2 8.2	8.2	31.5 31.5	31.5	131.5 128.2	129.9	8.6 8.4	8.5		2.3 2.4	2.4		3.8 3.9	3.9	
				Bottom	7	27.4 27.6	27.5	8.0 8.1	8.1	32.0 31.8	31.9	89.4 95.1	92.3	5.9 6.3	6.1	6.1	2.4 2.5	2.5		3.6 3.7	3.7	
G4	Sunny	Calm	11:30	Surface	1	28.6 28.7	28.7	8.3 8.3	8.3	31.3 31.3	31.3	157.3 156.6	157.0	10.2 10.2	10.2	9.2	2.1 2.1	2.1	2.3	3.1 3.1	3.1	3.0
				Middle	4	28.0 27.8	27.9	8.1 8.1	8.1	31.5 31.6	31.6	125.8 119.5	122.7	8.3 7.9	8.1		2.3 2.3	2.3		2.5 2.4	2.5	
				Bottom	7	27.1 27.4	27.3	8.1 8.1	8.1	32.2 31.9	32.1	86.4 86.8	86.6	5.7 5.8	5.8	5.8	2.4 2.4	2.4		3.3 3.4	3.4	
M1	Sunny	Calm	11:07	Surface	1	28.6 28.7	28.7	8.3 8.3	8.3	31.3 31.3	31.3	154.8 155.5	155.2	10.1 10.1	10.1	9.9	2.1 2.1	2.1	2.2	3.3 3.3	3.3	3.6
				Middle	3	28.4 28.5	28.5	8.3 8.3	8.3	31.4 31.3	31.4	146.9 148.0	147.5	9.6 9.7	9.7		2.2 2.1	2.2		3.8 4.1	4.0	
				Bottom	5	27.8 27.8	27.8	8.2 8.2	8.2	31.6 31.6	31.6	118.3 118.5	118.4	7.8 7.8	7.8	7.8	2.3 2.3	2.3		3.5 3.6	3.6	
M2	Sunny	Calm	10:52	Surface	1	28.5 28.6	28.6	8.3 8.3	8.3	31.3 31.3	31.3	144.7 149.5	147.1	9.4 9.7	9.6	7.8	2.2 2.1	2.2	2.7	3.6 3.4	3.5	3.8
				Middle	6	27.2 27.2	27.2	8.1 8.1	8.1	32.1 32.0	32.1	90.0 89.9	90.0	6.0 6.0	6.0		2.5 2.4	2.5		3.1 3.0	3.1	
				Bottom	11	26.7 26.6	26.7	8.1 8.1	8.1	32.8 32.9	32.9	78.7 79.2	79.0	5.3 5.3	5.3	5.3	3.5 3.5	3.5		4.8 5.0	4.9	
M3	Sunny	Calm	11:24	Surface	1	28.7 28.7	28.7	8.3 8.3	8.3	31.3 31.3	31.3	154.2 153.5	153.9	10.0 10.0	10.0	9.3	2.1 2.1	2.1	2.3	3.6 3.6	3.6	4.4
				Middle	4	28.1 28.1	28.1	8.2 8.2	8.2	31.5 31.5	31.5	129.3 132.4	130.9	8.5 8.7	8.6		2.3 2.3	2.3		4.4 4.5	4.5	
				Bottom	7	27.1 27.1	27.1	8.0 8.0	8.0	32.3 32.2	32.3	84.6 87.8	86.2	5.6 5.8	5.7	5.7	2.6 2.6	2.6		5.2 5.2	5.2	
M4	Sunny	Calm	10:47	Surface	1	28.1 28.2	28.2	8.1 8.2	8.2	31.3 31.3	31.3	125.3 128.6	127.0	8.2 8.4	8.3	7.9	2.5 2.3	2.4	2.6	4.6 4.7	4.7	4.4
				Middle	5.5	27.9 27.7	27.8	8.1 8.1	8.1	31.4 31.5	31.5	111.8 109.9	110.9	7.4 7.3	7.4		2.7 2.7	2.7		3.0 3.0	3.0	
				Bottom	10	27.5 27.6	27.6	8.1 8.1	8.1	31.6 31.6	31.6	102.9 99.2	101.1	6.8 6.6	6.7	6.7	2.7 2.9	2.8		5.4 5.5	5.5	
M5	Sunny	Calm	11:41	Surface	1	28.5 28.5	28.5	8.3 8.3	8.3	31.3 31.3	31.3	153.1 152.4	152.8	10.0 9.9	10.0	8.3	2.2 2.2	2.2	2.7	4.2 4.4	4.3	4.6
				Middle	5.5	27.6 27.5	27.6	8.1 8.1	8.1	31.7 31.8	31.8	102.4 96.5	99.5	6.8 6.4	6.6		2.3 2.2	2.3		4.3 4.2	4.3	
				Bottom	10	26.8 26.8	26.8	8.0 8.0	8.0	32.6 32.6	32.6	79.7 79.2	79.5	5.3 5.3	5.3	5.3	3.6 3.7	3.7		5.0 5.2	5.1	
M6	Sunny	Calm	11:36	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	9.8	- -	-	2.2	- -	-	3.3
				Middle	2.1	28.5 28.5	28.5	8.3 8.2	8.3	31.3 31.4	31.4	150.0 148.7	149.4	9.8 9.7	9.8		2.1 2.2	2.2		3.2 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 22 September 2018 (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: 11.0 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C1: 12.0 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 ***C1: 5.4 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 5.9 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 ***C1: 5.4 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 5.9 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 ***C1: 5.8 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 6.2 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.

2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.

3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.

4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 22 September 2018

(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	18:17	Surface	1	27.5 27.8	27.7	8.0 8.0	8.0	31.7 31.2	31.5	89.6 90.5	90.1	5.9 6.0	6.0	6.0	1.9 2.0	2.0	3.5	4.2 4.2	4.2	4.3
				Middle	9	26.9 27.4	27.2	8.1 8.1	8.1	32.5 31.9	32.2	88.0 88.7	88.4	5.9 5.9	5.9		2.7 2.4	2.6		4.1 4.0	4.1	
				Bottom	17	26.3 26.4	26.4	8.1 8.1	8.1	33.2 33.1	33.2	79.3 79.9	79.6	5.3 5.3	5.3	5.3	5.8 5.9	5.9		4.5 4.5	4.5	
C2	Sunny	Calm	17:11	Surface	1	28.7 28.6	28.7	8.3 8.3	8.3	31.4 31.2	31.3	149.5 150.5	150.0	9.7 9.8	9.8	7.8	1.8 1.9	1.9	3.9	3.4 3.5	3.5	3.3
				Middle	16.5	27.3 27.3	27.3	8.1 8.1	8.1	31.8 31.9	31.9	86.3 84.6	85.5	5.7 5.6	5.7		3.3 3.4	3.4		2.3 2.4	2.4	
				Bottom	32	27.0 27.0	27.0	8.1 8.1	8.1	32.3 32.3	32.3	79.1 78.9	79.0	5.3 5.3	5.3	5.3	6.4 6.4	6.4		3.9 4.1	4.0	
G1	Sunny	Calm	17:43	Surface	1	28.3 28.3	28.3	8.2 8.2	8.2	31.4 31.4	31.4	123.7 122.8	123.3	8.1 8.0	8.1	7.2	2.0 2.2	2.1	3.4	4.1 4.1	4.1	4.1
				Middle	4	27.7 27.7	27.7	8.1 8.1	8.1	31.5 31.5	31.5	95.8 95.9	95.9	6.3 6.3	6.3		2.6 2.6	2.6		3.6 3.6	3.6	
				Bottom	7	27.1 27.1	27.1	8.1 8.1	8.1	32.2 32.2	32.2	79.6 80.3	80.0	5.3 5.3	5.3	5.3	5.3 5.4	5.4		4.7 4.6	4.7	
G2	Sunny	Calm	18:27	Surface	1	28.2 28.2	28.2	8.2 8.2	8.2	31.4 31.4	31.4	117.7 114.7	116.2	7.7 7.5	7.6	6.5	1.8 1.8	1.8	4.4	3.9 3.9	3.9	3.1
				Middle	5	27.2 27.1	27.2	8.0 8.0	8.0	32.1 32.1	32.1	81.8 81.4	81.6	5.4 5.4	5.4		4.5 4.8	4.7		2.2 2.3	2.3	
				Bottom	9	26.9 26.8	26.9	8.0 8.0	8.0	32.5 32.5	32.5	76.6 77.6	77.1	5.1 5.2	5.2	5.2	6.9 6.7	6.8		2.9 3.0	3.0	
G3	Sunny	Calm	17:49	Surface	1	28.6 28.6	28.6	8.3 8.3	8.3	30.2 31.0	30.6	146.6 141.2	143.9	9.6 9.2	9.4	8.1	1.7 1.8	1.8	2.5	4.3 4.1	4.2	2.9
				Middle	4	27.8 27.9	27.9	8.1 8.1	8.1	31.6 31.5	31.6	98.8 105.8	102.3	6.5 7.0	6.8		2.5 2.4	2.5		2.3 2.3	2.3	
				Bottom	7	27.6 27.6	27.6	8.1 8.1	8.1	31.7 31.7	31.7	94.0 97.8	95.9	6.2 6.5	6.4	6.4	3.4 3.2	3.3		2.1 2.1	2.1	
G4	Sunny	Calm	18:00	Surface	1	28.5 28.4	28.5	8.3 8.2	8.3	31.1 31.1	31.1	152.4 144.2	148.3	10.0 9.4	9.7	8.1	1.7 1.7	1.7	2.9	3.0 3.2	3.1	2.9
				Middle	4	27.8 27.7	27.8	8.1 8.1	8.1	31.6 31.6	31.6	96.7 99.0	97.9	6.4 6.5	6.5		2.4 2.4	2.4		2.8 2.9	2.9	
				Bottom	7	27.4 27.4	27.4	8.0 8.0	8.0	31.9 31.9	31.9	83.9 84.0	84.0	5.6 5.6	5.6	5.6	4.7 4.4	4.6		2.7 2.7	2.7	
M1	Sunny	Calm	17:38	Surface	1	28.1 28.2	28.2	8.2 8.2	8.2	31.5 31.4	31.5	116.1 123.1	119.6	7.6 8.1	7.9	7.9	2.2 2.1	2.2	2.7	2.7 2.7	2.7	2.9
				Middle	3	28.1 28.1	28.1	8.2 8.2	8.2	31.5 31.5	31.5	117.8 118.3	118.1	7.7 7.8	7.8		2.1 2.0	2.1		3.2 3.2	3.2	
				Bottom	5	27.7 27.7	27.7	8.1 8.1	8.1	31.6 31.7	31.7	96.3 94.1	95.2	6.4 6.2	6.3	6.3	3.9 3.6	3.8		2.6 2.7	2.7	
M2	Sunny	Calm	17:31	Surface	1	28.0 28.1	28.1	8.1 8.1	8.1	31.5 31.5	31.5	107.2 115.6	111.4	7.0 7.6	7.3	6.4	2.6 2.4	2.5	4.3	5.0 4.8	4.9	4.7
				Middle	5.5	27.0 27.1	27.1	8.1 8.1	8.1	32.2 32.2	32.2	80.4 80.6	80.5	5.3 5.4	5.4		4.4 4.7	4.6		4.5 4.5	4.5	
				Bottom	10	26.8 26.8	26.8	8.1 8.1	8.1	32.6 32.6	32.6	77.4 77.4	77.4	5.2 5.2	5.2	5.2	5.6 5.7	5.7		4.9 4.7	4.8	
M3	Sunny	Calm	17:54	Surface	1	28.2 28.1	28.2	8.2 8.2	8.2	31.1 31.2	31.2	130.0 132.9	131.5	8.5 8.7	8.6	7.8	1.8 1.8	1.8	2.5	1.5 1.5	1.5	2.6
				Middle	4	27.8 27.9	27.9	8.2 8.1	8.2	31.5 31.5	31.5	104.0 105.0	104.5	6.9 6.9	6.9		2.5 2.5	2.5		1.9 1.9	1.9	
				Bottom	7	27.8 27.8	27.8	8.1 8.1	8.1	31.6 31.6	31.6	104.9 103.1	104.0	6.9 6.8	6.9	6.9	3.3 3.2	3.3		4.2 4.3	4.3	
M4	Sunny	Calm	17:23	Surface	1	28.0 28.2	28.1	8.1 8.2	8.2	31.6 31.5	31.6	109.0 124.4	116.7	7.2 8.2	7.7	6.8	2.1 1.9	2.0	3.4	3.7 3.9	3.8	4.2
				Middle	5	27.3 27.4	27.4	8.1 8.1	8.1	32.0 31.9	32.0	86.0 92.4	89.2	5.7 6.1	5.9		3.1 3.4	3.3		4.1 4.2	4.2	
				Bottom	9	27.1 27.1	27.1	8.1 8.1	8.1	32.2 32.2	32.2	81.5 82.3	81.9	5.4 5.5	5.5	5.5	4.8 5.0	4.9		4.4 4.5	4.5	
M5	Sunny	Calm	18:11	Surface	1	27.9 27.9	27.9	8.0 8.0	8.0	31.1 31.1	31.1	86.1 85.6	85.9	5.7 5.6	5.7	5.6	2.3 2.4	2.4	4.6	4.1 4.1	4.1	4.0
				Middle	5.5	27.3 27.2	27.3	8.0 8.0	8.0	31.9 32.0	32.0	83.2 82.3	82.8	5.5 5.5	5.5		4.6 4.9	4.8		4.0 4.1	4.1	
				Bottom	10	26.7 26.7	26.7	8.0 8.1	8.1	32.7 32.7	32.7	77.9 78.0	78.0	5.2 5.2	5.2	5.2	6.5 6.6	6.6		3.7 3.6	3.7	
M6	Sunny	Calm	18:05	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	8.2	- -	-	1.8	- -	-	2.5
				Middle	2.1	28.0 28.1	28.1	8.2 8.2	8.2	31.5 31.5	31.5	117.7 130.9	124.3	7.7 8.6	8.2		1.8 1.7	1.8		2.4 2.5	2.5	
				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 24 September 2018 (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: 8.9 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C2: 9.6 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 6.0 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 6.5 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 6.0 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 6.5 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 7.1 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 7.7 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.

2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.

3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.

4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 24 September 2018

(Mid-Ebb Tide)

Location	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
C1	Fine	Calm	13:04	Surface	1	27.5 27.5	27.5	8.0 8.0	8.0	31.9 31.9	31.9	84.7 86.7	85.7	5.6 5.7	5.7	5.7	2.3 2.4	2.4	3.7	4.0 4.3	4.2	4.6
				Middle	9.5	27.3 27.4	27.4	8.0 8.0	8.0	32.2 32.2	32.2	84.2 83.5	83.9	5.6 5.5	5.6		2.1 2.2	2.2		4.3 4.4	4.4	
				Bottom	18	27.3 27.4	27.4	8.0 8.0	8.0	32.5 32.5	32.5	82.8 82.3	82.6	5.5 5.4	5.5	5.5	6.3 6.6	6.5		5.0 5.4	5.2	
C2	Fine	Calm	12:03	Surface	1	27.7 27.7	27.7	8.0 8.0	8.0	29.7 30.2	30.0	80.8 78.0	79.4	5.4 5.2	5.3	5.2	1.9 2.1	2.0	5.6	4.8 5.1	5.0	5.2
				Middle	16.5	27.1 27.0	27.1	8.0 8.0	8.0	32.2 32.3	32.3	76.4 76.4	76.4	5.1 5.1	5.1		7.5 7.3	7.4		4.6 4.6	4.6	
				Bottom	32	27.0 27.0	27.0	8.0 8.0	8.0	32.2 32.2	32.2	76.5 76.7	76.6	5.1 5.1	5.1	5.1	7.4 7.4	7.4		5.7 6.0	5.9	
G1	Fine	Calm	12:36	Surface	1	27.9 27.9	27.9	8.0 8.0	8.0	30.2 30.3	30.3	94.2 97.0	95.6	6.3 6.4	6.4	6.0	1.8 1.7	1.8	1.8	5.1 5.4	5.3	4.2
				Middle	4	27.6 27.6	27.6	8.0 8.0	8.0	31.6 31.6	31.6	84.7 85.3	85.0	5.6 5.6	5.6		1.5 1.4	1.5		4.4 4.3	4.4	
				Bottom	7	27.4 27.3	27.4	8.0 8.0	8.0	31.9 31.9	31.9	79.6 79.1	79.4	5.3 5.2	5.3	5.3	2.2 2.2	2.2		2.9 2.9	2.9	
G2	Fine	Calm	12:26	Surface	1	27.8 27.7	27.8	8.0 8.0	8.0	31.4 31.5	31.5	92.1 89.7	90.9	6.1 5.9	6.0	5.8	1.6 1.5	1.6	2.4	3.9 4.1	4.0	4.7
				Middle	5	27.5 27.5	27.5	8.0 8.0	8.0	31.8 31.8	31.8	83.5 83.4	83.5	5.5 5.5	5.5		1.7 1.7	1.7		5.1 5.1	5.1	
				Bottom	9	26.9 26.9	26.9	8.0 8.0	8.0	32.5 32.5	32.5	76.1 76.0	76.1	5.1 5.1	5.1	5.1	3.9 4.1	4.0		5.1 5.1	5.1	
G3	Fine	Calm	12:40	Surface	1	27.8 27.8	27.8	8.0 8.0	8.0	30.6 30.5	30.6	92.5 91.8	92.2	6.1 6.1	6.1	5.9	1.6 1.6	1.6	2.5	5.6 5.8	5.7	5.3
				Middle	4	27.5 27.5	27.5	8.0 8.0	8.0	31.7 31.6	31.7	82.8 84.0	83.4	5.5 5.6	5.6		1.7 1.5	1.6		5.2 5.0	5.1	
				Bottom	7	27.1 27.2	27.2	8.0 8.0	8.0	32.2 32.1	32.2	71.5 71.0	71.3	4.8 4.7	4.8	4.8	4.5 4.0	4.3		5.2 5.2	5.2	
G4	Fine	Calm	12:49	Surface	1	27.7 27.7	27.7	8.0 8.0	8.0	30.5 30.2	30.4	96.7 97.6	97.2	6.4 6.5	6.5	6.0	1.1 1.2	1.2	1.8	4.4 4.6	4.5	5.1
				Middle	4	27.5 27.5	27.5	8.0 8.0	8.0	31.6 31.7	31.7	83.0 82.5	82.8	5.5 5.5	5.5		1.2 1.2	1.2		4.4 4.6	4.5	
				Bottom	7	27.3 27.4	27.4	8.0 8.0	8.0	32.0 31.9	32.0	75.5 77.0	76.3	5.0 5.1	5.1	5.1	3.2 2.9	3.1		6.4 6.4	6.4	
M1	Fine	Calm	12:32	Surface	1	27.7 27.7	27.7	8.0 8.0	8.0	31.6 31.6	31.6	91.2 91.5	91.4	6.0 6.0	6.0	5.9	1.2 1.2	1.2	1.8	4.9 5.1	5.0	5.7
				Middle	3	27.6 27.6	27.6	8.0 8.0	8.0	31.7 31.7	31.7	87.0 89.5	88.3	5.7 5.9	5.8		1.5 1.4	1.5		5.5 5.6	5.6	
				Bottom	5	27.3 27.4	27.4	8.0 8.0	8.0	32.1 31.9	32.0	76.1 79.9	78.0	5.1 5.3	5.2	5.2	2.8 2.7	2.8		6.3 6.5	6.4	
M2	Fine	Calm	12:21	Surface	1	27.7 27.7	27.7	8.0 8.0	8.0	31.4 31.3	31.4	90.4 89.9	90.2	6.0 5.9	6.0	5.8	1.3 1.2	1.3	2.7	5.8 5.9	5.9	5.6
				Middle	6	27.3 27.3	27.3	8.0 8.0	8.0	31.9 31.9	31.9	82.5 82.4	82.5	5.5 5.5	5.5		1.8 1.7	1.8		5.7 5.8	5.8	
				Bottom	11	26.8 26.9	26.9	8.0 8.0	8.0	32.6 32.6	32.6	75.5 75.5	75.5	5.0 5.0	5.0	5.0	4.9 4.9	4.9		4.9 5.0	5.0	
M3	Fine	Calm	12:44	Surface	1	27.7 27.8	27.8	8.0 8.0	8.0	30.9 30.7	30.8	95.7 95.6	95.7	6.3 6.3	6.3	6.1	1.5 1.4	1.5	2.2	5.5 5.2	5.4	5.6
				Middle	4	27.6 27.6	27.6	8.0 8.0	8.0	31.6 31.6	31.6	86.9 85.6	86.3	5.8 5.7	5.8		1.3 1.4	1.4		5.8 5.8	5.8	
				Bottom	7	27.2 27.2	27.2	7.9 8.0	8.0	32.2 32.1	32.2	68.1 72.2	70.2	4.5 4.8	4.7	4.7	3.6 3.7	3.7		5.6 5.6	5.6	
M4	Fine	Calm	12:15	Surface	1	27.6 27.5	27.6	8.0 8.0	8.0	30.9 31.1	31.0	85.7 86.0	85.9	5.7 5.7	5.7	5.7	3.5 3.4	3.5	3.2	4.5 4.6	4.6	5.3
				Middle	5	27.6 27.6	27.6	8.0 8.0	8.0	31.5 31.6	31.6	84.8 86.1	85.5	5.6 5.7	5.7		2.3 2.5	2.4		5.7 5.5	5.6	
				Bottom	9	27.6 27.3	27.5	8.0 8.0	8.0	31.6 32.0	31.8	84.7 80.6	82.7	5.6 5.3	5.5	5.5	3.6 3.8	3.7		5.7 5.5	5.6	
M5	Fine	Calm	12:58	Surface	1	27.5 27.5	27.5	8.0 8.0	8.0	31.2 31.5	31.4	84.2 84.0	84.1	5.6 5.6	5.6	5.6	2.4 2.2	2.3	3.3	4.0 3.8	3.9	4.2
				Middle	6	27.5 27.5	27.5	8.0 8.0	8.0	31.2 31.5	31.4	82.1 81.3	81.7	5.5 5.4	5.5		2.8 2.7	2.8		4.6 4.4	4.5	
				Bottom	11	26.9 26.9	26.9	8.0 8.0	8.0	32.5 32.8	32.7	77.3 78.1	77.7	5.1 5.2	5.2	5.2	4.9 4.4	4.7		4.2 4.0	4.1	
M6	Fine	Calm	12:54	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	5.6	- -	-	1.3	- -	-	3.6
				Middle	2	27.5 27.5	27.5	8.0 8.0	8.0	31.6 31.6	31.6	84.1 84.1	84.1	5.6 5.6	5.6		1.3 1.2	1.3		3.6 3.6	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 26 September 2018 (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 ***C1: 6.5 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C1: 7.0 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 ***C1:7.1 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 7.7 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: 7.1 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 7.7 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 7.4 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 8.1 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.

2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.

3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.

4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction
Water Quality Monitoring Results on 24 September 2018

(Mid-Flood Tide)

Location	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)			Turbidity(NTU)			Suspended Solids (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*	Value	Average	DA*	Value	Average	DA*
C1	Fine	Calm	18:48	Surface	1	27.6 27.6	27.6	8.0 8.0	8.0	31.7 31.9	31.8	84.7 83.3	84.0	5.6 5.5	5.6	5.6	2.1 2.3	2.2	3.2	5.8 5.9	5.9	6.3
				Middle	9	27.4 27.4	27.4	8.0 8.0	8.0	32.1 32.1	32.1	84.2 84.0	84.1	5.6 5.6	5.6		2.0 2.1	2.1		6.6 6.8	6.7	
				Bottom	17	27.3 27.3	27.3	7.9 7.9	7.9	32.5 32.5	32.5	82.8 82.3	82.6	5.5 5.4	5.5	5.5	5.3 5.4	5.4		6.1 6.2	6.2	
C2	Fine	Calm	17:46	Surface	1	27.7 27.7	27.7	8.0 8.0	8.0	29.7 30.2	30.0	80.8 78.1	79.5	5.4 5.2	5.3	5.2	2.3 2.2	2.3	3.3	6.0 5.8	5.9	5.3
				Middle	16	27.1 27.0	27.1	8.0 8.0	8.0	32.2 32.2	32.2	76.4 76.4	76.4	5.1 5.1	5.1		3.2 3.2	3.2		5.4 5.1	5.3	
				Bottom	31	27.0 27.0	27.0	8.0 8.0	8.0	32.2 32.2	32.2	76.4 76.4	76.4	5.1 5.1	5.1	5.1	4.4 4.4	4.4		4.7 4.7	4.7	
G1	Fine	Calm	18:17	Surface	1	27.9 27.9	27.9	8.0 8.0	8.0	30.2 30.3	30.3	94.5 96.9	95.7	6.3 6.4	6.4	6.0	1.8 1.7	1.8	1.9	5.9 5.9	5.9	4.9
				Middle	4	27.6 27.6	27.6	8.0 8.0	8.0	31.6 31.6	31.6	84.7 85.3	85.0	5.6 5.6	5.6		1.5 1.4	1.5		4.3 4.1	4.2	
				Bottom	7	27.4 27.3	27.4	8.0 8.0	8.0	31.9 31.9	31.9	79.4 79.0	79.2	5.3 5.2	5.3	5.3	2.3 2.2	2.3		4.7 4.7	4.7	
G2	Fine	Calm	18:08	Surface	1	27.7 27.7	27.7	8.0 8.0	8.0	31.5 31.5	31.5	89.7 89.7	89.7	5.9 5.9	5.9	5.8	1.5 1.5	1.5	2.1	4.3 4.4	4.4	4.0
				Middle	5	27.5 27.5	27.5	8.0 8.0	8.0	31.7 31.7	31.7	85.2 85.2	85.2	5.6 5.6	5.6		1.7 1.8	1.8		2.9 2.7	2.8	
				Bottom	9	27.2 27.1	27.2	8.0 8.0	8.0	32.2 32.3	32.3	77.5 77.1	77.3	5.1 5.1	5.1	5.1	3.0 3.2	3.1		4.7 4.6	4.7	
G3	Fine	Calm	18:21	Surface	1	27.8 27.8	27.8	8.0 8.0	8.0	30.7 30.6	30.7	92.2 91.8	92.0	6.1 6.1	6.1	5.8	1.7 1.6	1.7	2.5	5.1 5.2	5.2	5.7
				Middle	4	27.5 27.5	27.5	8.0 8.0	8.0	31.7 31.6	31.7	82.9 83.8	83.4	5.5 5.5	5.5		1.6 1.5	1.6		6.7 6.7	6.7	
				Bottom	7	27.1 27.2	27.2	8.0 8.0	8.0	32.2 32.1	32.2	71.2 71.0	71.1	4.7 4.7	4.7	4.7	4.5 3.9	4.2		5.2 5.3	5.3	
G4	Fine	Calm	18:31	Surface	1	27.7 27.7	27.7	8.0 8.0	8.0	30.5 30.3	30.4	96.7 97.5	97.1	6.4 6.5	6.5	6.0	1.1 1.2	1.2	1.8	4.2 4.3	4.3	4.9
				Middle	4	27.5 27.5	27.5	8.0 8.0	8.0	31.6 31.7	31.7	82.9 82.7	82.8	5.5 5.5	5.5		1.2 1.4	1.3		4.1 4.1	4.1	
				Bottom	7	27.3 27.3	27.3	8.0 8.0	8.0	32.0 31.9	32.0	75.1 76.8	76.0	5.0 5.1	5.1	5.1	3.2 2.8	3.0		6.3 6.3	6.3	
M1	Fine	Calm	18:13	Surface	1	27.7 27.7	27.7	8.0 8.0	8.0	31.6 31.6	31.6	91.2 91.5	91.4	6.0 6.0	6.0	6.0	1.3 1.2	1.3	1.9	4.1 4.4	4.3	5.0
				Middle	3	27.6 27.6	27.6	8.0 8.0	8.0	31.7 31.7	31.7	87.4 89.1	88.3	5.8 5.9	5.9		1.5 1.4	1.5		4.6 4.8	4.7	
				Bottom	5	27.3 27.4	27.4	8.0 8.0	8.0	32.1 31.9	32.0	75.9 79.7	77.8	5.0 5.3	5.2	5.2	2.9 2.6	2.8		6.0 6.0	6.0	
M2	Fine	Calm	17:58	Surface	1	27.8 27.8	27.8	8.0 8.0	8.0	31.3 31.3	31.3	90.7 90.7	90.7	6.0 6.0	6.0	5.8	1.3 1.2	1.3	2.9	4.4 4.6	4.5	5.4
				Middle	6	27.5 27.5	27.5	8.0 8.0	8.0	31.7 31.7	31.7	84.5 84.4	84.5	5.6 5.6	5.6		1.5 1.5	1.5		5.1 5.2	5.2	
				Bottom	11	26.8 26.8	26.8	8.0 8.0	8.0	32.7 32.7	32.7	74.9 74.8	74.9	5.0 5.0	5.0	5.0	5.8 5.7	5.8		6.5 6.7	6.6	
M3	Fine	Calm	18:26	Surface	1	27.7 27.8	27.8	8.0 8.0	8.0	30.9 30.7	30.8	95.6 95.6	95.6	6.3 6.3	6.3	6.0	1.5 1.4	1.5	2.2	3.9 3.8	3.9	3.1
				Middle	4	27.6 27.6	27.6	8.0 8.0	8.0	31.6 31.6	31.6	86.8 85.2	86.0	5.7 5.6	5.7		1.3 1.2	1.3		2.9 3.0	3.0	
				Bottom	7	27.2 27.2	27.2	7.9 8.0	8.0	32.2 32.1	32.2	68.0 71.9	70.0	4.5 4.8	4.7	4.7	3.6 3.7	3.7		2.3 2.4	2.4	
M4	Fine	Calm	17:53	Surface	1	27.5 27.6	27.6	8.0 8.0	8.0	31.1 31.1	31.1	85.6 84.9	85.3	5.7 5.6	5.7	5.7	3.4 2.9	3.2	2.7	4.7 4.4	4.6	4.7
				Middle	5	27.6 27.6	27.6	8.0 8.0	8.0	31.5 31.6	31.6	84.9 85.8	85.4	5.6 5.7	5.7		2.3 2.3	2.3		2.9 2.8	2.9	
				Bottom	9	27.3 27.4	27.4	8.0 8.0	8.0	32.0 31.9	32.0	82.4 83.0	82.7	5.5 5.5	5.5	5.5	2.6 2.5	2.6		6.4 6.7	6.6	
M5	Fine	Calm	18:41	Surface	1	27.5 27.5	27.5	8.0 8.0	8.0	31.2 31.5	31.4	84.2 83.8	84.0	5.6 5.6	5.6	5.6	2.4 2.3	2.4	3.3	5.6 5.6	5.6	5.5
				Middle	6	27.5 27.5	27.5	8.0 8.0	8.0	31.2 31.2	31.2	82.2 82.2	82.2	5.5 5.5	5.5		2.7 2.8	2.8		5.2 5.2	5.2	
				Bottom	11	26.9 26.9	26.9	8.0 8.0	8.0	32.5 32.2	32.4	77.3 77.4	77.4	5.1 5.2	5.2	5.2	4.8 4.6	4.7		5.6 5.9	5.8	
M6	Fine	Calm	18:35	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	5.6	- -	-	1.4	- -	-	8.0
				Middle	2	27.5 27.5	27.5	8.0 8.0	8.0	31.6 31.6	31.6	84.0 83.7	83.9	5.6 5.5	5.6		1.3 1.4	1.4		7.9 8.1	8.0	
				Bottom	-	- -	-	- -	-	- -	-	- -	-	- -	-	-	- -	-		- -	-	

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

Appendix I - Action and Limit Levels for Marine Water Quality on 26 September 2018 (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: 10.4 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C2: 11.3 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 5.9 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 6.4 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 5.9 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 6.4 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C2: 6.8 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 7.4 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 26 September 2018

(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	13:27	Surface	1	27.7 27.7	27.7	8.1 8.1	8.1	30.8 30.9	30.9	103.1 100.1	101.6	6.8 6.6	6.7	6.1	2.0 2.0	2.0	5.0	3.8 3.7	3.8	4.7
				Middle	9	27.1 27.1	27.1	8.1 8.1	8.1	31.9 31.9	31.9	82.5 82.1	82.3	5.5 5.5	5.5		5.3 5.2	5.3		4.1 4.1	4.1	
				Bottom	17	27.0 27.0	27.0	8.0 8.0	8.0	32.2 32.2	32.2	76.8 77.1	77.0	5.1 5.1	5.1	5.1	7.1 8.5	7.8		6.2 6.2	6.2	
C2	Cloudy	Calm	12:24	Surface	1	27.7 27.7	27.7	8.0 8.3	8.2	30.6 30.7	30.7	95.7 93.2	94.5	6.4 6.2	6.3	5.7	1.5 1.6	1.6	6.0	4.8 4.9	4.9	5.1
				Middle	16.5	27.0 27.0	27.0	8.0 8.2	8.1	32.0 32.1	32.1	77.1 75.7	76.4	5.1 5.0	5.1		7.6 7.7	7.7		4.6 4.6	4.6	
				Bottom	32	26.8 26.7	26.8	8.5 8.1	8.3	32.4 32.6	32.5	74.2 72.1	73.2	4.9 4.8	4.9	4.9	8.8 8.5	8.7		5.5 5.8	5.7	
G1	Cloudy	Calm	12:54	Surface	1	27.9 27.9	27.9	8.2 8.2	8.2	30.0 29.9	30.0	115.4 114.7	115.1	7.7 7.6	7.7	7.3	0.7 0.7	0.7	1.0	2.5 2.5	2.5	2.3
				Middle	4	27.7 27.8	27.8	8.2 8.2	8.2	30.7 30.7	30.7	102.1 104.8	103.5	6.8 7.0	6.9		1.2 1.1	1.2		2.0 2.0	2.0	
				Bottom	7	27.6 27.7	27.7	8.1 8.1	8.1	31.0 31.0	31.0	96.5 98.1	97.3	6.4 6.5	6.5	6.5	1.2 1.1	1.2		2.4 2.4	2.4	
G2	Cloudy	Calm	12:43	Surface	1	28.2 28.2	28.2	8.3 8.3	8.3	30.2 30.2	30.2	117.8 118.1	118.0	7.8 7.8	7.8	7.2	2.9 2.9	2.9	2.4	1.8 1.8	1.8	2.7
				Middle	5	27.6 27.6	27.6	8.2 8.1	8.2	30.9 30.9	30.9	99.3 100.1	99.7	6.6 6.6	6.6		1.1 1.2	1.2		2.5 2.5	2.5	
				Bottom	9	27.4 27.4	27.4	8.0 8.1	8.1	31.4 31.5	31.5	81.3 79.3	80.3	5.4 5.3	5.4	5.4	3.0 3.1	3.1		3.9 3.9	3.9	
G3	Cloudy	Calm	12:59	Surface	1	27.9 27.9	27.9	8.2 8.2	8.2	30.1 30.1	30.1	113.2 113.4	113.3	7.5 7.5	7.5	7.5	1.0 1.0	1.0	1.1	5.3 5.5	5.4	3.5
				Middle	4	27.8 27.8	27.8	8.2 8.2	8.2	30.5 30.6	30.6	111.5 110.9	111.2	7.4 7.3	7.4		0.9 1.1	1.0		3.2 3.3	3.3	
				Bottom	7	27.7 27.7	27.7	8.1 8.2	8.2	30.9 30.8	30.9	99.2 100.1	99.7	6.6 6.6	6.6	6.6	1.4 1.2	1.3		1.6 1.7	1.7	
G4	Cloudy	Calm	13:07	Surface	1	28.0 28.0	28.0	8.2 8.2	8.2	29.1 28.9	29.0	111.1 108.8	110.0	7.4 7.3	7.4	7.3	1.2 1.2	1.2	1.3	2.0 2.1	2.1	3.0
				Middle	4	27.8 27.7	27.8	8.2 8.2	8.2	30.3 30.7	30.5	109.1 108.5	108.8	7.2 7.2	7.2		1.0 0.9	1.0		3.3 3.4	3.4	
				Bottom	7	27.7 27.7	27.7	8.2 8.2	8.2	30.9 30.9	30.9	100.6 100.3	100.5	6.7 6.7	6.7	6.7	1.6 1.7	1.7		3.4 3.3	3.4	
M1	Cloudy	Calm	12:49	Surface	1	27.9 27.9	27.9	8.2 8.2	8.2	30.1 30.2	30.2	108.8 106.2	107.5	7.2 7.1	7.2	7.1	0.9 1.0	1.0	1.0	1.6 1.6	1.6	2.7
				Middle	3	27.7 27.7	27.7	8.2 8.2	8.2	30.5 30.6	30.6	104.8 104.2	104.5	7.0 6.9	7.0		1.1 1.0	1.1		2.6 2.5	2.6	
				Bottom	5	27.7 27.7	27.7	8.2 8.1	8.2	30.8 30.8	30.8	99.9 99.9	99.9	6.6 6.6	6.6	6.6	1.0 0.9	1.0		4.1 3.9	4.0	
M2	Cloudy	Calm	12:38	Surface	1	28.0 28.0	28.0	8.3 8.3	8.3	30.4 30.5	30.5	120.8 119.6	120.2	8.0 7.9	8.0	7.5	0.5 0.5	0.5	1.7	2.5 2.6	2.6	3.1
				Middle	5.5	27.7 27.7	27.7	8.2 8.2	8.2	30.9 30.8	30.9	103.3 104.7	104.0	6.9 6.9	6.9		1.3 1.4	1.4		3.1 3.0	3.1	
				Bottom	10	27.1 27.2	27.2	8.1 8.1	8.1	31.8 31.7	31.8	81.9 82.6	82.3	5.5 5.5	5.5	5.5	3.6 3.0	3.3		3.6 3.6	3.6	
M3	Cloudy	Calm	13:02	Surface	1	27.9 27.9	27.9	8.2 8.2	8.2	30.0 29.9	30.0	114.2 111.0	112.6	7.6 7.4	7.5	7.4	1.0 1.1	1.1	1.2	3.7 3.6	3.7	4.2
				Middle	4	27.8 27.8	27.8	8.2 8.2	8.2	30.7 30.5	30.6	107.3 110.9	109.1	7.1 7.4	7.3		1.0 1.1	1.1		4.0 4.0	4.0	
				Bottom	7	27.7 27.7	27.7	8.1 8.2	8.2	30.8 30.8	30.8	99.5 101.3	100.4	6.6 6.7	6.7	6.7	1.3 1.3	1.3		4.9 5.0	5.0	
M4	Cloudy	Calm	12:32	Surface	1	28.0 28.0	28.0	8.3 8.3	8.3	30.6 30.5	30.6	111.9 110.3	111.1	7.4 7.3	7.4	6.8	0.8 0.9	0.9	2.3	5.3 5.2	5.3	4.0
				Middle	5	27.6 27.6	27.6	8.1 8.1	8.1	30.9 30.9	30.9	93.1 92.1	92.6	6.2 6.1	6.2		1.9 2.1	2.0		2.6 2.7	2.7	
				Bottom	9	27.3 27.3	27.3	8.1 8.1	8.1	31.6 31.5	31.6	84.9 84.8	84.9	5.7 5.6	5.7	5.7	4.1 4.1	4.1		4.1 4.1	4.1	
M5	Cloudy	Calm	13:17	Surface	1	27.6 27.6	27.6	8.1 8.1	8.1	30.8 30.8	30.8	98.9 97.9	98.4	6.6 6.5	6.6	6.4	1.5 1.5	1.5	3.9	4.1 4.2	4.2	3.5
				Middle	5.5	27.5 27.5	27.5	8.1 8.1	8.1	31.2 31.2	31.2	92.4 91.8	92.1	6.1 6.1	6.1		2.2 1.9	2.1		2.2 2.3	2.3	
				Bottom	10	27.3 27.3	27.3	8.1 8.1	8.1	31.6 31.6	31.6	83.5 82.9	83.2	5.6 5.5	5.6	5.6	7.7 8.4	8.1		3.9 3.8	3.9	
M6	Cloudy	Calm	13:11	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	7.6	- -	-	0.7	- -	-	2.6
				Middle	2.4	27.8 27.7	27.8	8.2 8.2	8.2	30.5 30.5	30.5	113.6 114.1	113.9	7.5 7.6	7.6		0.7 0.7	0.7		2.6 2.6	2.6	
				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 28 September 2018 (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 ***C1: 15.8 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C1: 16.5 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: 5.5 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: 6.2 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 6.8 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 26 September 2018

(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	19:11	Surface	1	27.7 27.7	27.7	8.1 8.2	8.2	30.8 30.8	30.8	103.3 101.1	102.2	6.8 6.7	6.8	6.0	1.9 2.0	2.0	7.0	4.5 4.6	4.6	4.6
				Middle	9	26.9 27.2	27.1	8.0 8.1	8.1	32.4 31.8	32.1	74.2 80.5	77.4	4.9 5.4	5.2		6.6 6.0	6.3		4.0 4.0	4.0	
				Bottom	17	26.8 26.8	26.8	8.0 8.0	8.0	32.5 32.5	32.5	71.7 72.8	72.3	4.8 4.9	4.9	4.9	13.0 12.3	12.7		5.1 5.3	5.2	
C2	Cloudy	Calm	18:14	Surface	1	27.8 27.8	27.8	8.2 8.1	8.2	30.5 30.6	30.6	115.8 113.8	114.8	7.7 7.5	7.6	6.7	0.6 0.7	0.7	3.8	2.9 2.9	2.9	3.1
				Middle	16.5	27.4 27.5	27.5	8.0 8.1	8.1	31.2 31.0	31.1	84.4 89.5	87.0	5.6 5.9	5.8		3.6 3.3	3.5		2.6 2.6	2.6	
				Bottom	32	27.1 27.1	27.1	8.0 8.0	8.0	31.9 31.8	31.9	76.5 77.1	76.8	5.1 5.1	5.1	5.1	7.6 6.7	7.2		3.8 3.8	3.8	
G1	Cloudy	Calm	18:41	Surface	1	27.8 27.8	27.8	8.2 8.2	8.2	30.1 30.5	30.3	105.1 104.7	104.9	7.0 7.0	7.0	7.0	1.4 1.4	1.4	1.5	4.8 4.9	4.9	3.8
				Middle	4	27.7 27.7	27.7	8.1 8.1	8.1	30.9 30.9	30.9	103.4 102.3	102.9	6.9 6.8	6.9		1.1 1.2	1.2		3.5 3.6	3.6	
				Bottom	7	27.5 27.5	27.5	8.1 8.1	8.1	31.2 31.2	31.2	94.4 94.8	94.6	6.3 6.3	6.3	6.3	1.9 2.0	2.0		2.7 2.8	2.8	
G2	Cloudy	Calm	18:31	Surface	1	27.8 27.8	27.8	8.2 8.2	8.2	30.5 30.4	30.5	111.1 109.4	110.3	7.4 7.3	7.4	7.1	0.9 1.0	1.0	2.2	2.8 2.8	2.8	2.5
				Middle	5	27.6 27.7	27.7	8.1 8.2	8.2	31.0 30.9	31.0	100.7 101.9	101.3	6.7 6.8	6.8		1.5 1.5	1.5		2.2 2.2	2.2	
				Bottom	9	27.3 27.3	27.3	8.1 8.1	8.1	31.6 31.6	31.6	84.6 86.0	85.3	5.6 5.7	5.7	5.7	3.8 4.1	4.0		2.5 2.5	2.5	
G3	Cloudy	Calm	18:45	Surface	1	27.7 27.7	27.7	8.1 8.1	8.1	28.4 29.4	28.9	101.4 100.8	101.1	6.8 6.7	6.8	6.5	1.5 1.7	1.6	3.3	3.0 3.0	3.0	3.7
				Middle	4	27.6 27.6	27.6	8.1 8.1	8.1	30.9 30.9	30.9	91.7 92.5	92.1	6.1 6.1	6.1		2.3 2.6	2.5		5.1 5.2	5.2	
				Bottom	7	27.4 27.4	27.4	8.0 8.1	8.1	31.4 31.4	31.4	79.7 80.1	79.9	5.3 5.3	5.3	5.3	5.9 5.8	5.9		2.9 2.9	2.9	
G4	Cloudy	Calm	18:56	Surface	1	27.8 27.8	27.8	8.2 8.1	8.2	29.8 29.5	29.7	106.5 106.7	106.6	7.1 7.1	7.1	7.0	1.1 1.1	1.1	1.5	4.1 4.1	4.1	3.4
				Middle	4	27.7 27.7	27.7	8.1 8.1	8.1	30.9 30.9	30.9	103.2 102.4	102.8	6.8 6.8	6.8		1.3 1.4	1.4		2.4 2.5	2.5	
				Bottom	7	27.6 27.6	27.6	8.1 8.1	8.1	31.0 31.0	31.0	96.5 96.6	96.6	6.4 6.4	6.4	6.4	1.7 2.0	1.9		3.4 3.5	3.5	
M1	Cloudy	Calm	18:36	Surface	1	27.8 27.8	27.8	8.1 8.1	8.1	29.9 30.2	30.1	103.6 102.0	102.8	6.9 6.8	6.9	6.6	2.1 2.2	2.2	2.8	4.5 4.7	4.6	4.1
				Middle	3	27.7 27.7	27.7	8.1 8.1	8.1	30.8 30.8	30.8	93.8 93.6	93.7	6.2 6.2	6.2		2.9 2.8	2.9		3.6 3.5	3.6	
				Bottom	5	27.6 27.6	27.6	8.1 8.1	8.1	31.0 31.0	31.0	91.3 91.6	91.5	6.1 6.1	6.1	6.1	3.2 3.5	3.4		4.1 4.2	4.2	
M2	Cloudy	Calm	18:27	Surface	1	27.8 27.7	27.8	8.2 8.2	8.2	30.7 30.7	30.7	110.2 106.9	108.6	7.3 7.1	7.2	6.7	1.3 1.2	1.3	3.1	4.6 4.7	4.7	4.3
				Middle	5.5	27.4 27.2	27.3	8.1 8.0	8.1	31.4 31.7	31.6	95.9 86.7	91.3	6.4 5.8	6.1		1.8 1.8	1.8		4.2 4.2	4.2	
				Bottom	10	27.1 27.1	27.1	8.1 8.0	8.1	31.8 31.8	31.8	81.7 79.8	80.8	5.4 5.3	5.4	5.4	6.2 6.4	6.3		4.0 4.1	4.1	
M3	Cloudy	Calm	18:50	Surface	1	27.6 27.7	27.7	8.1 8.1	8.1	27.3 28.8	28.1	94.7 95.5	95.1	6.4 6.4	6.4	6.2	1.3 1.3	1.3	3.8	1.7 1.7	1.7	2.9
				Middle	4	27.6 27.7	27.7	8.1 8.1	8.1	31.0 30.9	31.0	86.9 94.0	90.5	5.8 6.2	6.0		2.1 2.2	2.2		4.4 4.4	4.4	
				Bottom	7	27.4 27.4	27.4	8.0 8.0	8.0	31.5 31.5	31.5	74.8 72.8	73.8	5.0 4.8	4.9	4.9	7.7 8.1	7.9		2.4 2.5	2.5	
M4	Cloudy	Calm	18:22	Surface	1	27.6 27.6	27.6	8.1 8.1	8.1	31.0 31.0	31.0	99.7 98.1	98.9	6.6 6.5	6.6	6.0	1.0 0.9	1.0	6.8	1.9 1.9	1.9	3.5
				Middle	5	27.2 27.1	27.2	8.1 8.0	8.1	31.8 31.9	31.9	81.6 80.6	81.1	5.4 5.4	5.4		6.8 8.4	7.6		2.8 2.7	2.8	
				Bottom	9	27.1 27.1	27.1	8.0 8.0	8.0	31.9 31.9	31.9	78.5 77.7	78.1	5.2 5.2	5.2	5.2	12.2 11.2	11.7		5.8 5.8	5.8	
M5	Cloudy	Calm	19:05	Surface	1	27.6 27.6	27.6	8.1 8.1	8.1	31.0 31.0	31.0	100.0 99.6	99.8	6.6 6.6	6.6	6.6	2.2 1.9	2.1	2.6	2.5 2.4	2.5	3.6
				Middle	5.5	27.6 27.6	27.6	8.1 8.1	8.1	31.0 31.0	31.0	99.2 99.6	99.4	6.6 6.6	6.6		2.0 1.9	2.0		5.2 5.5	5.4	
				Bottom	10	27.5 27.5	27.5	8.1 8.1	8.1	31.2 31.2	31.2	91.7 92.5	92.1	6.1 6.1	6.1	6.1	3.7 3.7	3.7		2.9 2.9	2.9	
M6	Cloudy	Calm	19:00	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	6.9	- -	-	1.0	- -	-	3.7
				Middle	2.3	27.7 27.7	27.7	8.1 8.1	8.1	30.9 30.9	30.9	103.5 103.4	103.5	6.9 6.9	6.9		1.0 1.0	1.0		3.7 3.6	3.7	
				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 28 September 2018 (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: 9.4 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C2: 10.1 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 ***C2: 7.1 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 7.7 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: 7.1 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 7.7 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: 7.4 mg/L***	***7.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C2: 8.1 mg/L***
	Station M6		
	Intake Level	***8.3 mg/L***	***8.6 mg/L***

Notes:

1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.

2. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.

3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.

4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

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Water Quality Monitoring Results on 28 September 2018

(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	15:19	Surface	1	27.5 27.5	27.5	8.0 8.0	8.0	31.4 31.5	31.5	85.7 80.4	83.1	5.7 5.3	5.5	5.4	3.5 3.7	3.6	4.4	2.7 2.8	2.8	4.6
				Middle	9	27.3 27.4	27.4	8.0 8.0	8.0	31.8 31.7	31.8	79.3 78.9	79.1	5.3 5.2	5.3		4.9 4.4	4.7		7.1 6.9	7.0	
				Bottom	17	27.3 27.3	27.3	8.0 8.0	8.0	31.8 31.8	31.8	78.3 78.4	78.4	5.2 5.2	5.2	5.2	4.9 4.8	4.9		4.0 3.9	4.0	
C2	Sunny	Calm	14:03	Surface	1	27.7 27.6	27.7	8.0 8.1	8.1	31.4 31.4	31.4	82.1 81.0	81.6	5.4 5.4	5.4	5.2	3.2 3.3	3.3	5.9	5.8 5.9	5.9	5.9
				Middle	16.5	27.2 27.1	27.2	8.0 8.1	8.1	31.8 32.1	32.0	76.4 74.1	75.3	5.1 4.9	5.0		6.3 7.0	6.7		5.4 5.5	5.5	
				Bottom	32	27.0 27.0	27.0	8.0 8.0	8.0	32.3 32.2	32.3	72.0 73.0	72.5	4.8 4.9	4.9	4.9	8.6 7.0	7.8		6.2 6.2	6.2	
G1	Sunny	Calm	14:38	Surface	1	27.9 28.0	28.0	8.1 8.1	8.1	31.3 31.3	31.3	88.1 86.0	87.1	5.8 5.7	5.8	5.6	2.0 2.0	2.0	3.0	5.0 5.0	5.0	4.5
				Middle	4	27.4 27.4	27.4	8.1 8.1	8.1	31.6 31.6	31.6	81.1 80.5	80.8	5.4 5.3	5.4		3.6 3.8	3.7		3.5 3.5	3.5	
				Bottom	7	27.3 27.3	27.3	8.1 8.1	8.1	31.6 31.6	31.6	79.3 79.2	79.3	5.3 5.3	5.3	5.3	3.3 3.4	3.4		5.0 5.0	5.0	
G2	Sunny	Calm	14:28	Surface	1	27.8 27.8	27.8	8.1 8.1	8.1	31.4 31.4	31.4	91.4 89.4	90.4	6.0 5.9	6.0	6.0	1.1 1.1	1.1	1.3	4.6 4.6	4.6	4.1
				Middle	5	27.7 27.7	27.7	8.1 8.1	8.1	31.4 31.4	31.4	89.1 88.8	89.0	5.9 5.9	5.9		1.1 1.2	1.2		3.7 3.8	3.8	
				Bottom	9	27.4 27.4	27.4	8.1 8.1	8.1	31.8 31.7	31.8	84.6 84.5	84.6	5.6 5.6	5.6	5.6	1.7 1.6	1.7		3.9 4.0	4.0	
G3	Sunny	Calm	14:49	Surface	1	27.6 27.7	27.7	8.0 8.1	8.1	31.4 31.3	31.4	86.0 82.1	84.1	5.7 5.4	5.6	5.5	2.3 2.6	2.5	3.9	4.1 4.2	4.2	4.3
				Middle	4	27.4 27.4	27.4	8.1 8.1	8.1	31.5 31.6	31.6	79.8 78.5	79.2	5.3 5.2	5.3		3.5 4.2	3.9		3.2 3.3	3.3	
				Bottom	7	27.3 27.3	27.3	8.0 8.0	8.0	31.6 31.6	31.6	78.0 77.1	77.6	5.2 5.1	5.2	5.2	5.0 5.4	5.2		5.2 5.3	5.3	
G4	Sunny	Calm	15:01	Surface	1	27.8 27.8	27.8	8.1 8.1	8.1	31.3 31.3	31.3	89.4 84.3	86.9	5.9 5.6	5.8	5.7	1.8 1.9	1.9	4.1	3.8 3.9	3.9	4.8
				Middle	4	27.5 27.5	27.5	8.1 8.1	8.1	31.5 31.5	31.5	83.0 83.3	83.2	5.5 5.5	5.5		2.9 2.8	2.9		4.9 5.0	5.0	
				Bottom	7	27.3 27.3	27.3	8.0 8.0	8.0	31.7 31.7	31.7	77.0 77.5	77.3	5.1 5.2	5.2	5.2	8.0 6.8	7.4		5.5 5.6	5.6	
M1	Sunny	Calm	14:34	Surface	1	27.8 27.7	27.8	8.1 8.1	8.1	31.4 31.4	31.4	88.3 82.5	85.4	5.8 5.4	5.6	5.5	3.3 3.0	3.2	4.7	5.9 6.1	6.0	6.1
				Middle	3	27.5 27.6	27.6	8.1 8.1	8.1	31.5 31.5	31.5	81.8 81.5	81.7	5.4 5.4	5.4		4.4 4.0	4.2		6.0 5.9	6.0	
				Bottom	5	27.4 27.4	27.4	8.0 8.1	8.1	31.6 31.6	31.6	78.3 78.0	78.2	5.2 5.2	5.2	5.2	7.0 6.4	6.7		6.2 6.2	6.2	
M2	Sunny	Calm	14:23	Surface	1	27.9 27.9	27.9	8.1 8.1	8.1	31.4 31.4	31.4	93.7 91.0	92.4	6.2 6.0	6.1	5.8	0.8 0.8	0.8	2.1	3.3 3.4	3.4	3.5
				Middle	5.5	27.4 27.5	27.5	8.1 8.1	8.1	31.6 31.5	31.6	81.1 83.7	82.4	5.4 5.5	5.5		3.2 3.2	3.2		3.0 3.2	3.1	
				Bottom	10	27.4 27.4	27.4	8.1 8.1	8.1	31.8 31.8	31.8	83.2 83.7	83.5	5.5 5.5	5.5	5.5	2.3 2.4	2.4		3.8 4.0	3.9	
M3	Sunny	Calm	14:55	Surface	1	27.7 27.7	27.7	8.0 8.1	8.1	31.1 31.3	31.2	81.5 82.1	81.8	5.4 5.4	5.4	5.5	2.7 2.9	2.8	3.7	3.7 3.6	3.7	5.1
				Middle	4	27.6 27.6	27.6	8.1 8.1	8.1	31.5 31.5	31.5	82.7 82.0	82.4	5.5 5.4	5.5		3.1 2.9	3.0		5.6 5.7	5.7	
				Bottom	7	27.3 27.4	27.4	8.0 8.1	8.1	31.6 31.6	31.6	76.0 77.1	76.6	5.1 5.1	5.1	5.1	5.2 5.2	5.2		5.8 5.7	5.8	
M4	Sunny	Calm	14:17	Surface	1	27.5 27.6	27.6	8.1 8.1	8.1	31.6 31.5	31.6	83.2 84.2	83.7	5.5 5.6	5.6	5.4	2.6 2.1	2.4	4.0	4.8 4.8	4.8	4.8
				Middle	5	27.2 27.2	27.2	8.1 8.1	8.1	31.9 31.9	31.9	78.1 77.7	77.9	5.2 5.2	5.2		4.7 4.7	4.7		6.0 6.1	6.1	
				Bottom	9	27.2 27.2	27.2	8.0 8.1	8.1	32.0 31.9	32.0	76.3 77.1	76.7	5.1 5.1	5.1	5.1	5.0 4.6	4.8		3.5 3.5	3.5	
M5	Sunny	Calm	15:11	Surface	1	27.8 27.8	27.8	8.1 8.1	8.1	31.4 31.4	31.4	91.9 89.2	90.6	6.1 5.9	6.0	6.0	1.1 1.2	1.2	1.5	4.1 4.2	4.2	6.4
				Middle	5.5	27.8 27.8	27.8	8.1 8.1	8.1	31.4 31.4	31.4	89.5 89.1	89.3	5.9 5.9	5.9		1.2 1.3	1.3		10.4 10.8	10.6	
				Bottom	10	27.5 27.6	27.6	8.1 8.1	8.1	31.5 31.5	31.5	84.3 84.8	84.6	5.6 5.6	5.6	5.6	2.1 2.1	2.1		4.3 4.2	4.3	
M6	Sunny	Calm	15:07	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	5.5	- -	-	2.0	- -	-	6.4
				Middle	2.2	27.5 27.5	27.5	8.0 8.0	8.0	31.5 31.5	31.5	82.9 83.2	83.1	5.5 5.5	5.5		2.0 1.9	2.0		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 26 September 2018 (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: 10.6 NTU***	***22.2 NTU*** or 130% of upstream control station's Turbidity at the same tide of the same day ***C1: 11.4 NTU***
	Station M6		
	Intake Level	***19.0 NTU***	***19.4 NTU***
SS in mg/L (See Note 2 and 4)	**Stations G1-G4**		
	Surface	***6.0 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 6.0 mg/L***	***6.9 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 6.5 mg/L***
	Stations M1-M5		
	Surface	***6.2 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 6.0 mg/L***	***7.4 mg/L*** or 130% of upstream control station's SS at the same tide of the same day ***C1: 6.5 mg/L***
	Stations G1-G4, M1-M5		
	Bottom	***6.9 mg/L*** or 120% of upstream control station's SS at the same tide of the same day ***C1: 7.8 mg/L***	***7.9 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.

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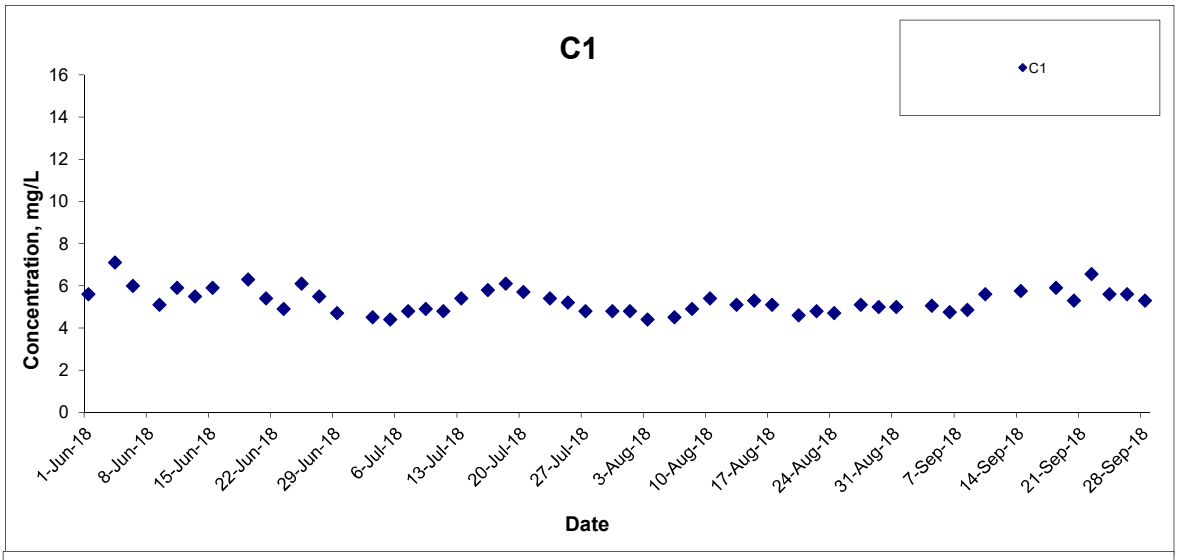
Water Quality Monitoring Results on 28 September 2018

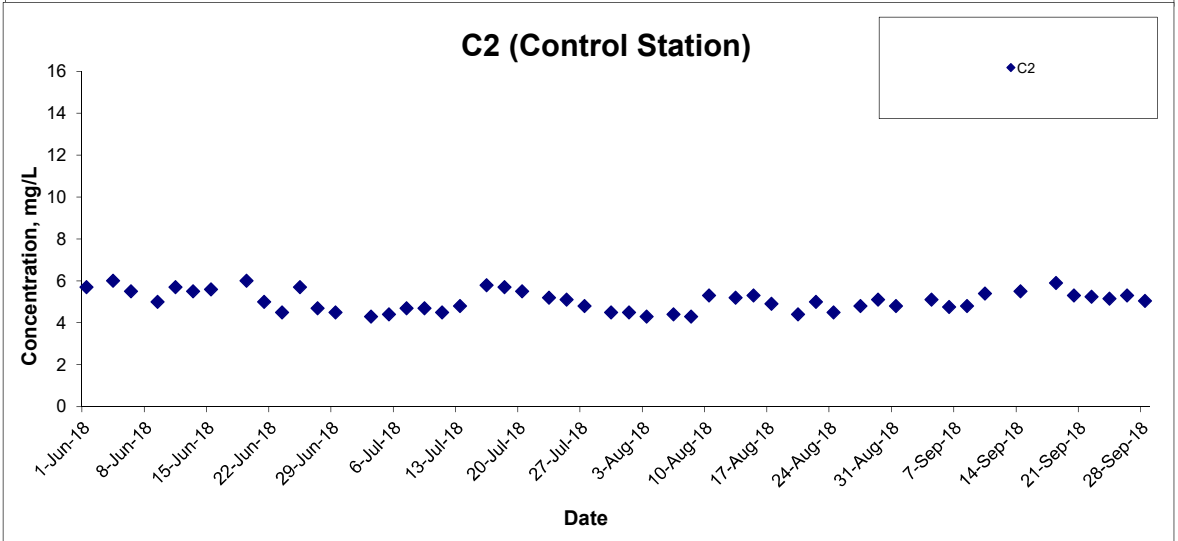
(Mid-Flood Tide)

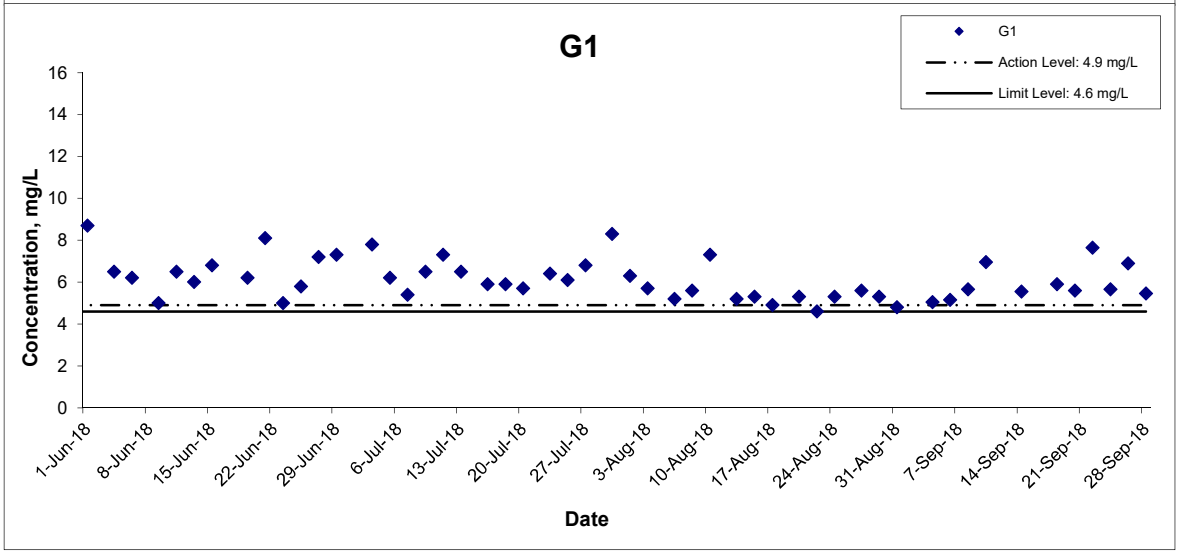
Location	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C) Value	Temperature (°C) Average	pH Value	pH Average	Salinity ppt Value	Salinity ppt Average	DO Saturation (%) Value	DO Saturation (%) Average	Dissolved Oxygen (mg/L) Value	Dissolved Oxygen (mg/L) Average	Dissolved Oxygen (mg/L) DA*	Turbidity(NTU) Value	Turbidity(NTU) Average	Turbidity(NTU) DA*	Suspended Solids (mg/L) Value	Suspended Solids (mg/L) Average	Suspended Solids (mg/L) DA*
C1	Sunny	Calm	08:29	Surface	1	27.6 27.6	27.6	8.1 8.1	8.1	31.3 31.3	31.3	91.0 89.6	90.3	6.0 5.9	6.0	5.8	1.1 1.0	1.1	4.1	4.9 5.0	5.0	5.6
				Middle	9	27.4 27.4	27.4	8.1 8.1	8.1	31.7 31.7	31.7	84.2 83.3	83.8	5.6 5.5	5.6		2.4 2.1	2.3		5.3 5.4	5.4	
				Bottom	17	26.9 26.9	26.9	8.0 8.0	8.0	32.5 32.5	32.5	75.2 74.8	75.0	5.0 5.0	5.0	5.0	8.8 8.8	8.8		6.1 6.8	6.5	
C2	Sunny	Calm	07:19	Surface	1	27.4 27.5	27.5	7.9 8.1	8.0	31.3 31.4	31.4	87.9 88.4	88.2	5.8 5.9	5.9	5.8	1.5 1.5	1.5	2.1	3.5 3.2	3.4	5.1
				Middle	16	27.3 27.4	27.4	8.0 8.1	8.1	31.6 31.5	31.6	82.3 85.6	84.0	5.5 5.7	5.6		2.5 2.4	2.5		5.4 5.2	5.3	
				Bottom	31	27.3 27.4	27.4	8.0 8.1	8.1	31.6 31.5	31.6	81.5 85.1	83.3	5.4 5.7	5.6	5.6	2.4 2.2	2.3		6.5 6.6	6.6	
G1	Sunny	Calm	07:55	Surface	1	27.5 27.6	27.6	8.1 8.1	8.1	31.0 31.3	31.2	88.1 85.9	87.0	5.9 5.7	5.8	5.7	1.4 1.4	1.4	2.0	4.1 4.0	4.1	4.6
				Middle	4	27.4 27.4	27.4	8.1 8.1	8.1	31.5 31.5	31.5	85.0 83.5	84.3	5.6 5.6	5.6		2.1 2.1	2.1		4.0 4.1	4.1	
				Bottom	7	27.3 27.3	27.3	8.1 8.1	8.1	31.6 31.6	31.6	82.0 80.4	81.2	5.5 5.3	5.4	5.4	2.5 2.7	2.6		5.6 5.5	5.6	
G2	Sunny	Calm	07:43	Surface	1	27.5 27.5	27.5	8.1 8.1	8.1	31.3 31.3	31.3	86.9 85.3	86.1	5.8 5.7	5.8	5.7	1.9 1.7	1.8	2.6	4.6 4.3	4.5	4.2
				Middle	5	27.3 27.4	27.4	8.1 8.1	8.1	31.4 31.4	31.4	83.3 84.7	84.0	5.5 5.6	5.6		2.0 1.8	1.9		2.9 2.9	2.9	
				Bottom	9	27.2 27.2	27.2	8.0 8.1	8.1	31.8 31.7	31.8	77.8 78.6	78.2	5.2 5.2	5.2	5.2	4.2 3.9	4.1		5.3 5.3	5.3	
G3	Sunny	Calm	08:00	Surface	1	27.6 27.6	27.6	8.1 8.1	8.1	31.1 31.1	31.1	86.5 85.5	86.0	5.7 5.7	5.7	5.7	1.0 0.9	1.0	3.6	5.2 5.1	5.2	5.1
				Middle	4	27.5 27.5	27.5	8.1 8.1	8.1	31.3 31.3	31.3	85.3 84.2	84.8	5.7 5.6	5.7		2.4 2.3	2.4		4.7 4.6	4.7	
				Bottom	7	27.4 27.4	27.4	8.1 8.1	8.1	31.5 31.5	31.5	81.3 79.5	80.4	5.4 5.3	5.4	5.4	7.3 7.3	7.3		5.5 5.3	5.4	
G4	Sunny	Calm	08:09	Surface	1	27.6 27.6	27.6	8.1 8.1	8.1	31.1 31.1	31.1	93.2 89.6	91.4	6.2 5.9	6.1	5.9	0.7 0.7	0.7	1.9	4.1 3.9	4.0	4.7
				Middle	4	27.6 27.5	27.6	8.1 8.1	8.1	31.3 31.4	31.4	86.0 84.6	85.3	5.7 5.6	5.7		1.8 2.1	2.0		5.5 5.4	5.5	
				Bottom	7	27.4 27.3	27.4	8.1 8.1	8.1	31.5 31.6	31.6	80.8 80.7	80.8	5.4 5.4	5.4	5.4	3.1 3.1	3.1		4.5 4.6	4.6	
M1	Sunny	Calm	07:49	Surface	1	27.5 27.5	27.5	8.0 8.1	8.1	31.4 31.4	31.4	81.9 81.1	81.5	5.4 5.4	5.4	5.4	4.6 4.0	4.3	5.7	5.4 5.5	5.5	5.9
				Middle	3	27.4 27.5	27.5	8.0 8.1	8.1	31.5 31.4	31.5	80.2 80.2	80.2	5.3 5.3	5.3		5.0 4.8	4.9		6.1 6.0	6.1	
				Bottom	5	27.4 27.4	27.4	8.0 8.1	8.1	31.6 31.5	31.6	78.7 79.7	79.2	5.2 5.3	5.3	5.3	8.0 8.0	8.0		6.0 6.3	6.2	
M2	Sunny	Calm	07:36	Surface	1	27.4 27.4	27.4	8.1 8.1	8.1	31.3 31.3	31.3	88.1 86.8	87.5	5.9 5.8	5.9	5.8	1.4 1.3	1.4	1.8	3.4 3.5	3.5	4.2
				Middle	5	27.4 27.4	27.4	8.1 8.1	8.1	31.4 31.4	31.4	85.8 86.0	85.9	5.7 5.7	5.7		1.7 1.6	1.7		3.2 3.3	3.3	
				Bottom	9	27.3 27.3	27.3	8.1 8.1	8.1	31.5 31.4	31.5	82.2 83.5	82.9	5.5 5.6	5.6	5.6	2.3 2.1	2.2		5.7 5.8	5.8	
M3	Sunny	Calm	08:04	Surface	1	27.5 27.5	27.5	8.1 8.1	8.1	31.3 31.4	31.4	83.1 81.0	82.1	5.5 5.4	5.5	5.5	3.7 3.5	3.6	5.0	2.7 2.6	2.7	5.3
				Middle	4	27.4 27.4	27.4	8.1 8.1	8.1	31.5 31.5	31.5	81.5 81.1	81.3	5.4 5.4	5.4		3.3 3.5	3.4		6.6 6.4	6.5	
				Bottom	7	27.3 27.4	27.4	8.1 8.1	8.1	31.6 31.6	31.6	79.1 79.3	79.2	5.3 5.3	5.3	5.3	8.4 7.6	8.0		6.6 6.9	6.8	
M4	Sunny	Calm	07:30	Surface	1	27.4 27.4	27.4	8.1 8.1	8.1	31.5 31.3	31.4	85.0 87.6	86.3	5.7 5.8	5.8	5.7	2.1 2.2	2.2	2.7	4.6 4.6	4.6	5.9
				Middle	5.5	27.3 27.4	27.4	8.0 8.1	8.1	31.6 31.3	31.5	80.9 87.7	84.3	5.4 5.8	5.6		3.7 3.5	3.6		9.2 9.5	9.4	
				Bottom	10	27.4 27.4	27.4	8.1 8.1	8.1	31.5 31.5	31.5	83.4 84.6	84.0	5.5 5.6	5.6	5.6	2.4 2.4	2.4		3.7 3.7	3.7	
M5	Sunny	Calm	08:19	Surface	1	27.4 27.4	27.4	8.1 8.1	8.1	31.3 31.3	31.3	86.9 84.8	85.9	5.8 5.6	5.7	5.6	1.6 1.6	1.6	4.8	4.4 4.6	4.5	3.7
				Middle	6	27.4 27.4	27.4	8.1 8.0	8.1	31.4 31.4	31.4	82.4 81.8	82.1	5.5 5.4	5.5		2.2 2.3	2.3		3.4 3.5	3.5	
				Bottom	11	27.3 27.3	27.3	8.0 8.0	8.0	31.5 31.4	31.5	80.1 79.5	79.8	5.3 5.3	5.3	5.3	9.6 11.2	10.4		3.2 3.2	3.2	
M6	Sunny	Calm	08:15	Surface	-	- -	-	- -	-	- -	-	- -	-	- -	-	5.2	- -	-	5.6	- -	-	6.5
				Middle	2.3	27.4 27.4	27.4	8.0 8.0	8.0	31.4 31.4	31.4	78.9 79.0	79.0	5.2 5.2	5.2		5.2 5.9	5.6		6.4 6.6	6.5	
				Bottom	-	- -	-	- -	-	- -	-	- -	-	- -	-	-	- -	-		- -	-	

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

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







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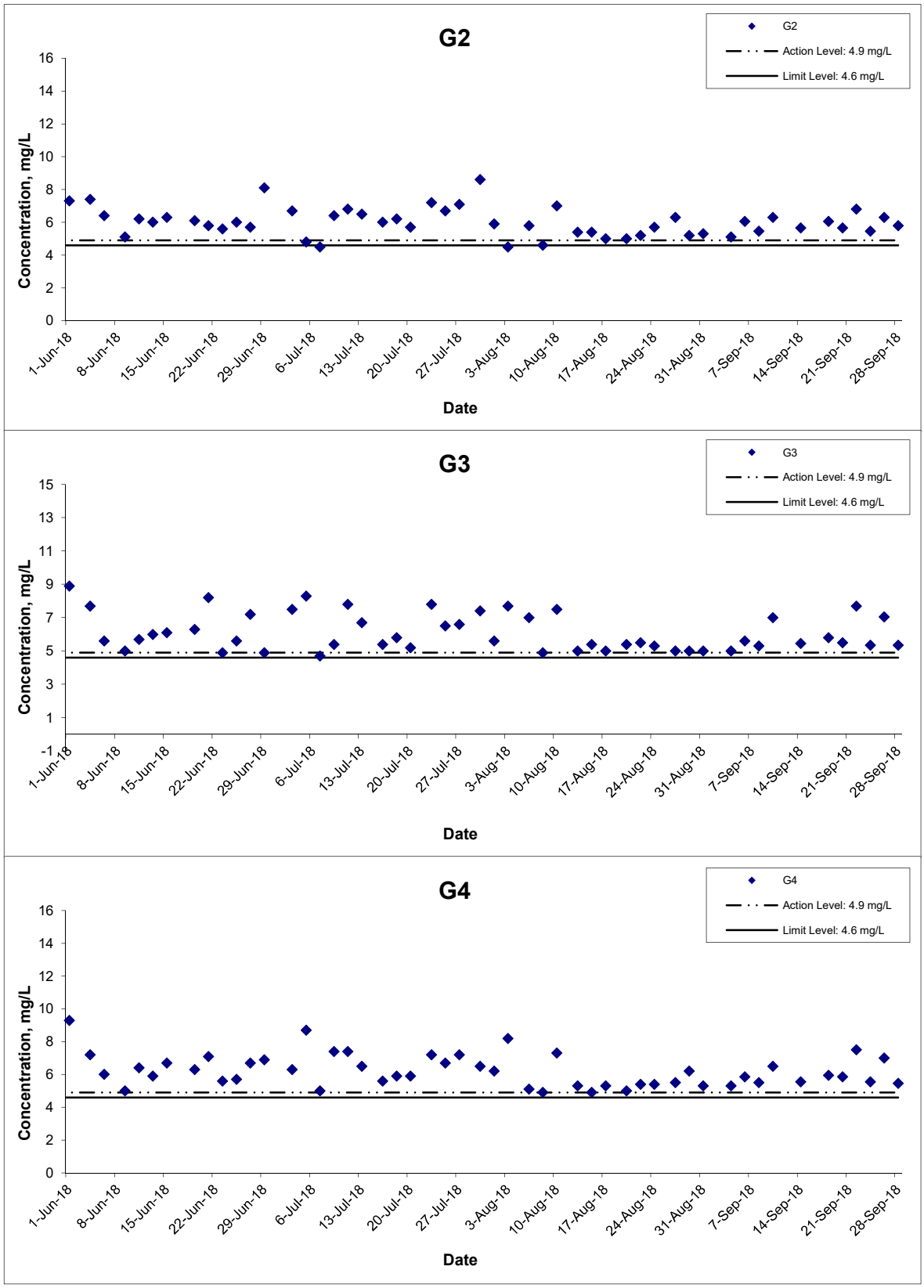
Dissolved Oxygen (Depth-averaged) at Mid-Ebb Tide



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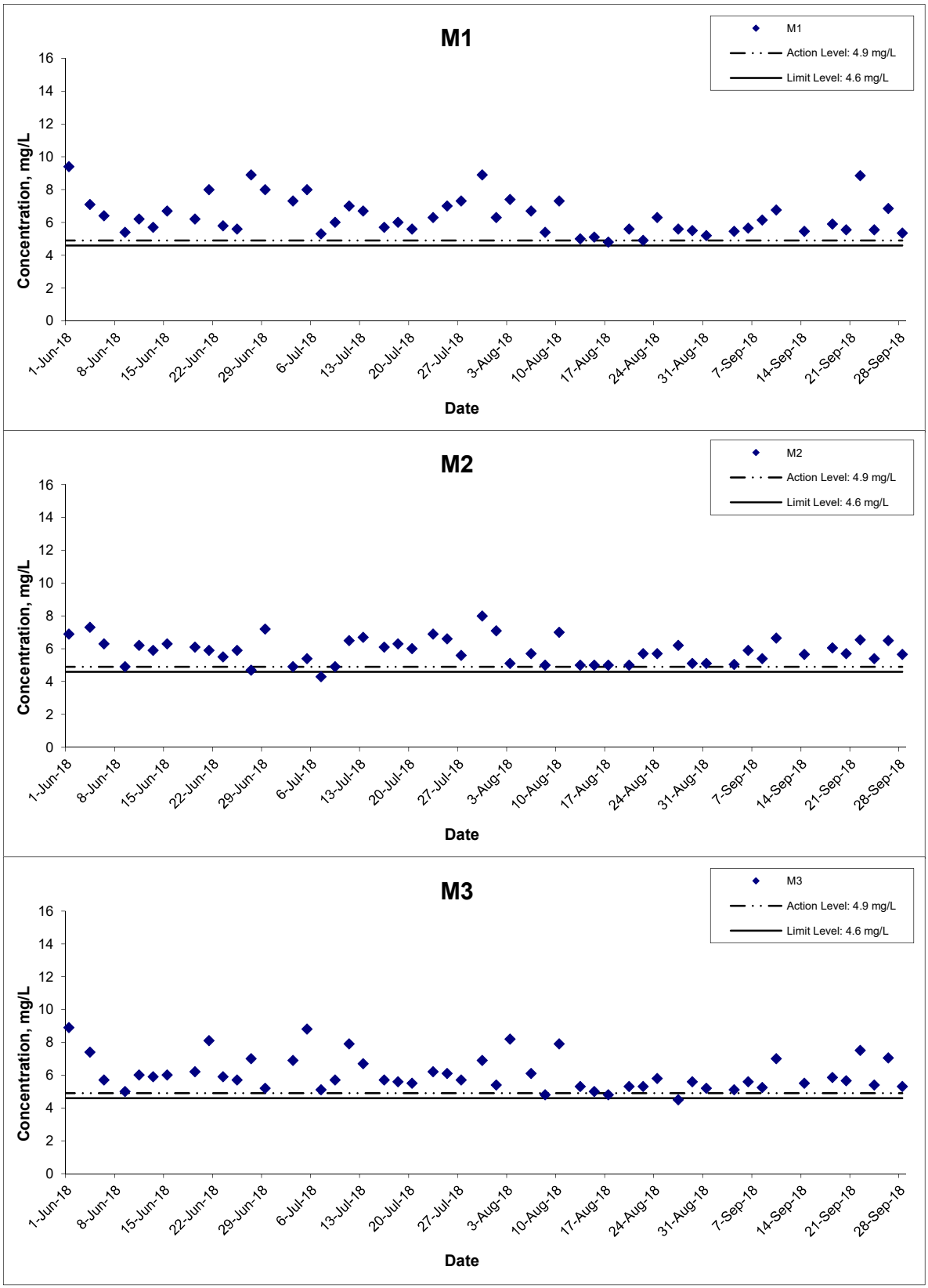
Dissolved Oxygen (Depth-averaged) at Mid-Ebb Tide



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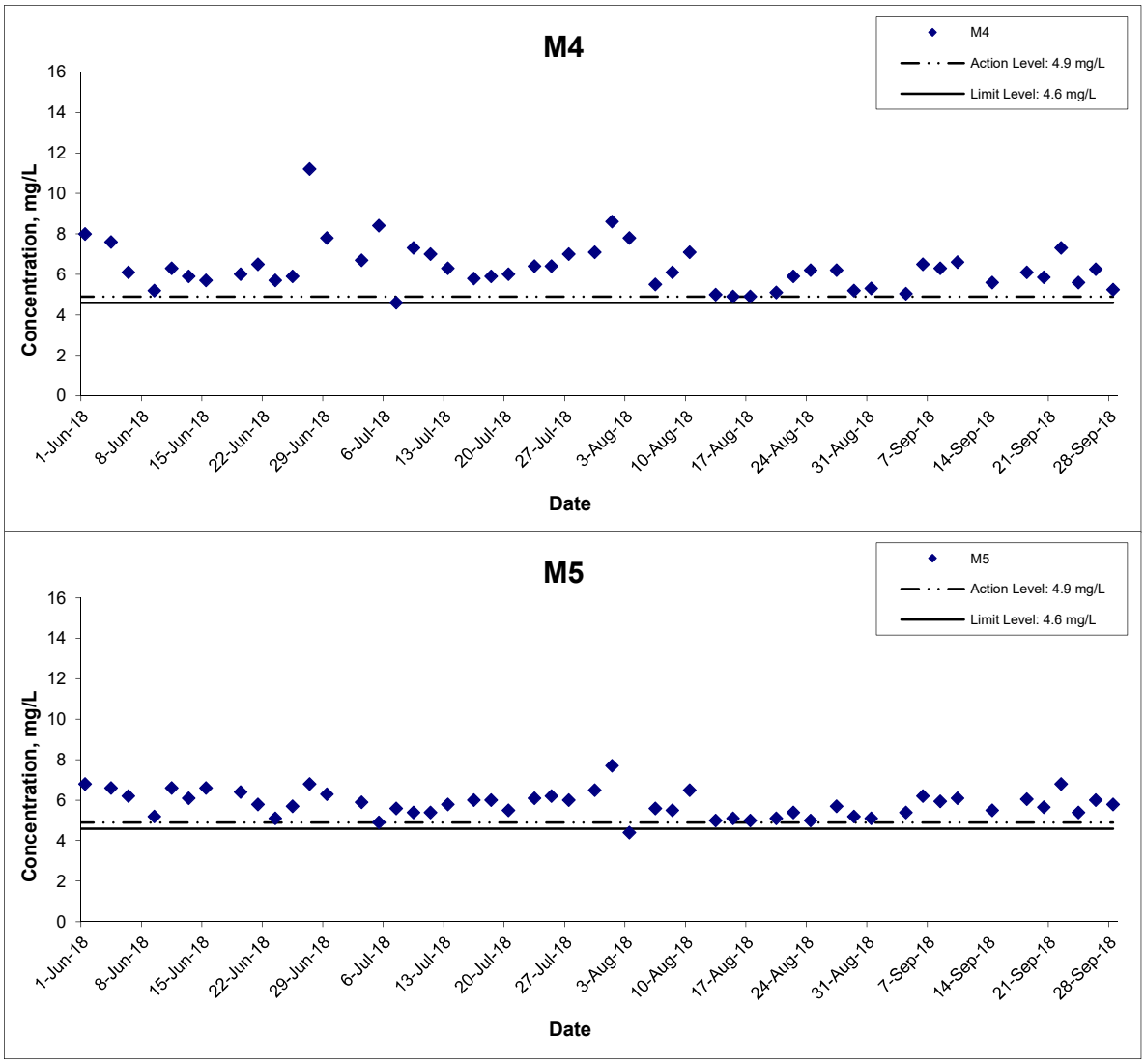
Dissolved Oxygen (Depth-averaged) at Mid-Ebb Tide



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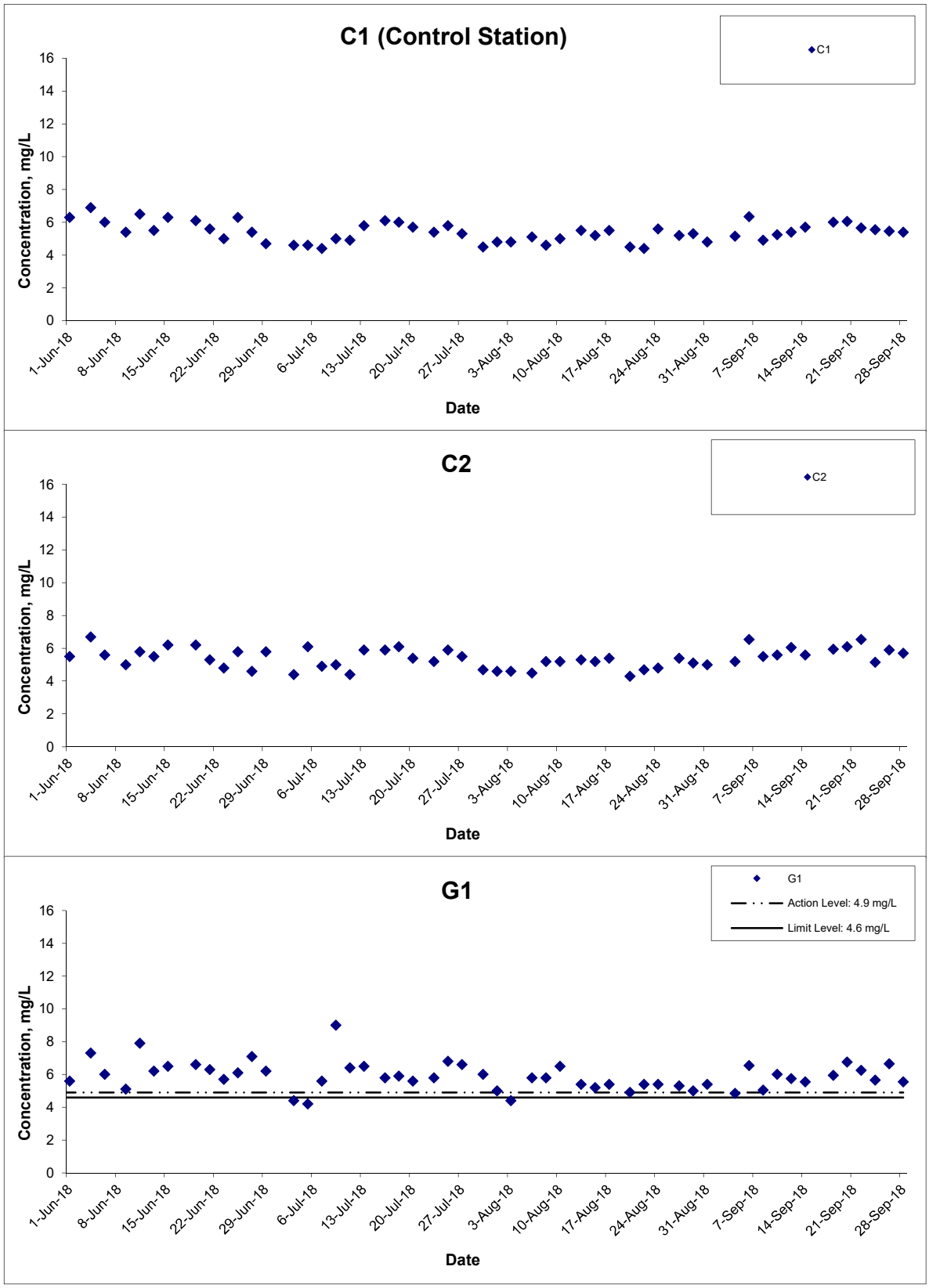
Dissolved Oxygen (Depth-averaged) at Mid-Flood Tide



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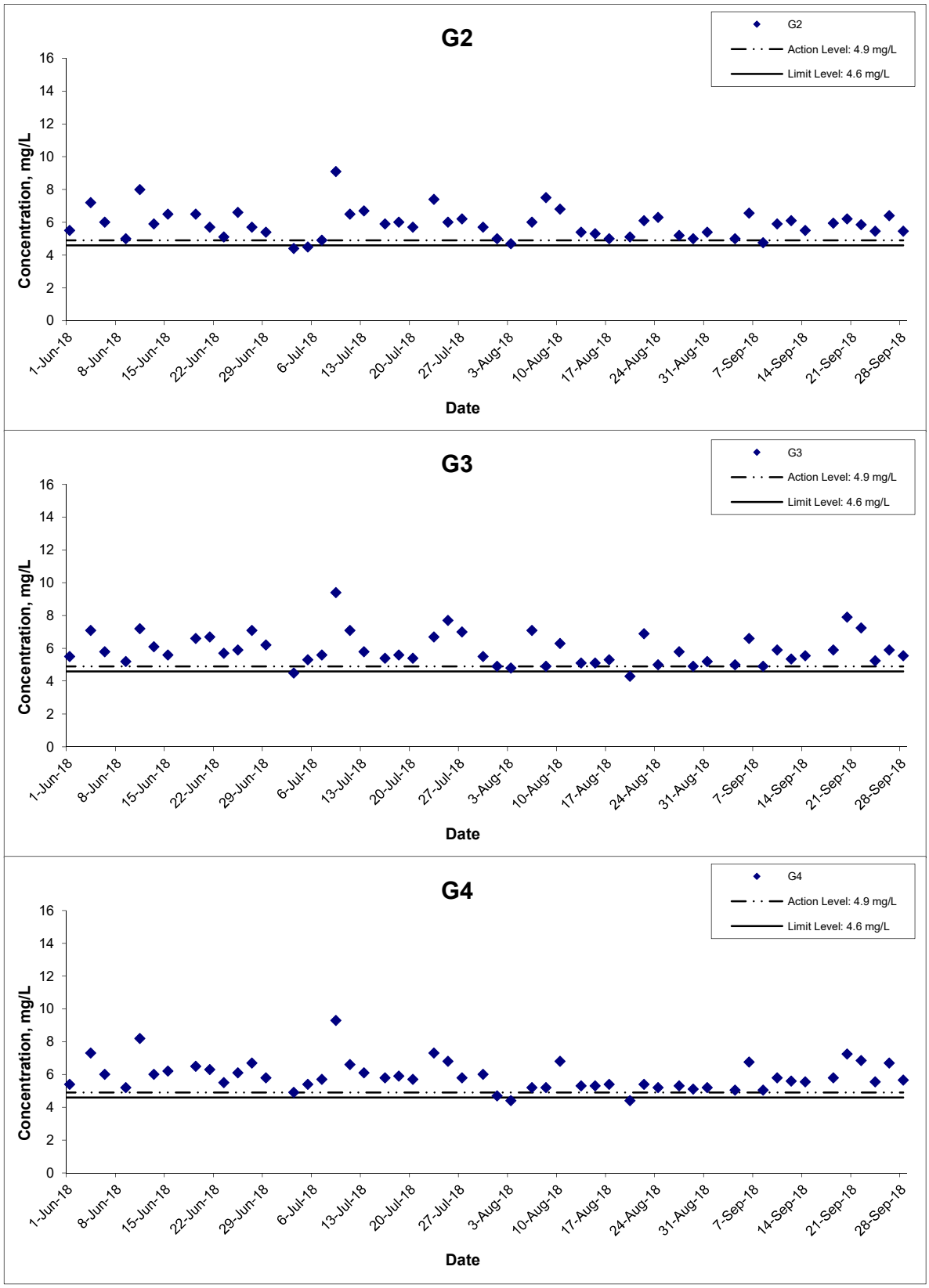
Dissolved Oxygen (Depth-averaged) at Mid-Flood Tide



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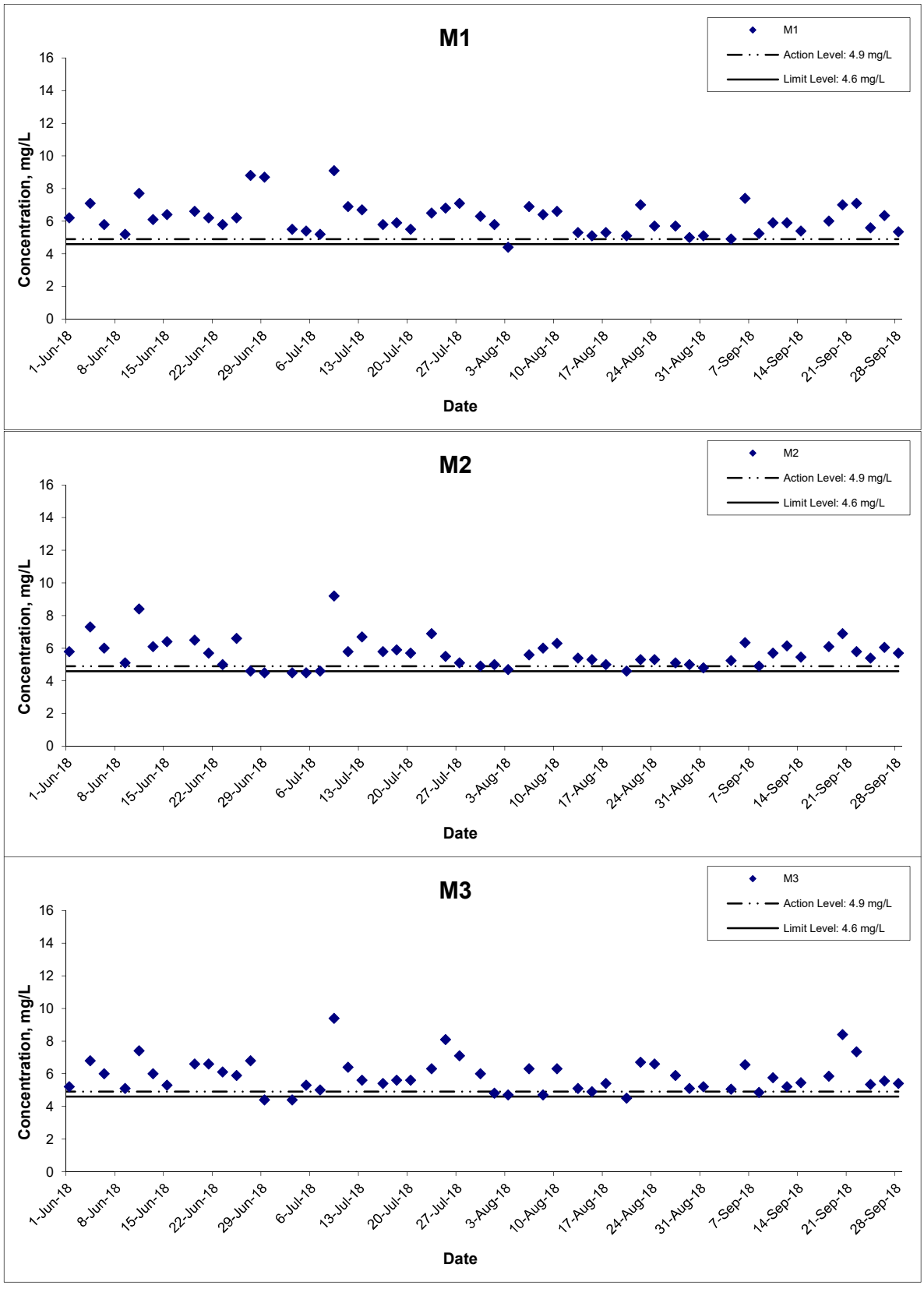
Dissolved Oxygen (Depth-averaged) at Mid-Flood Tide



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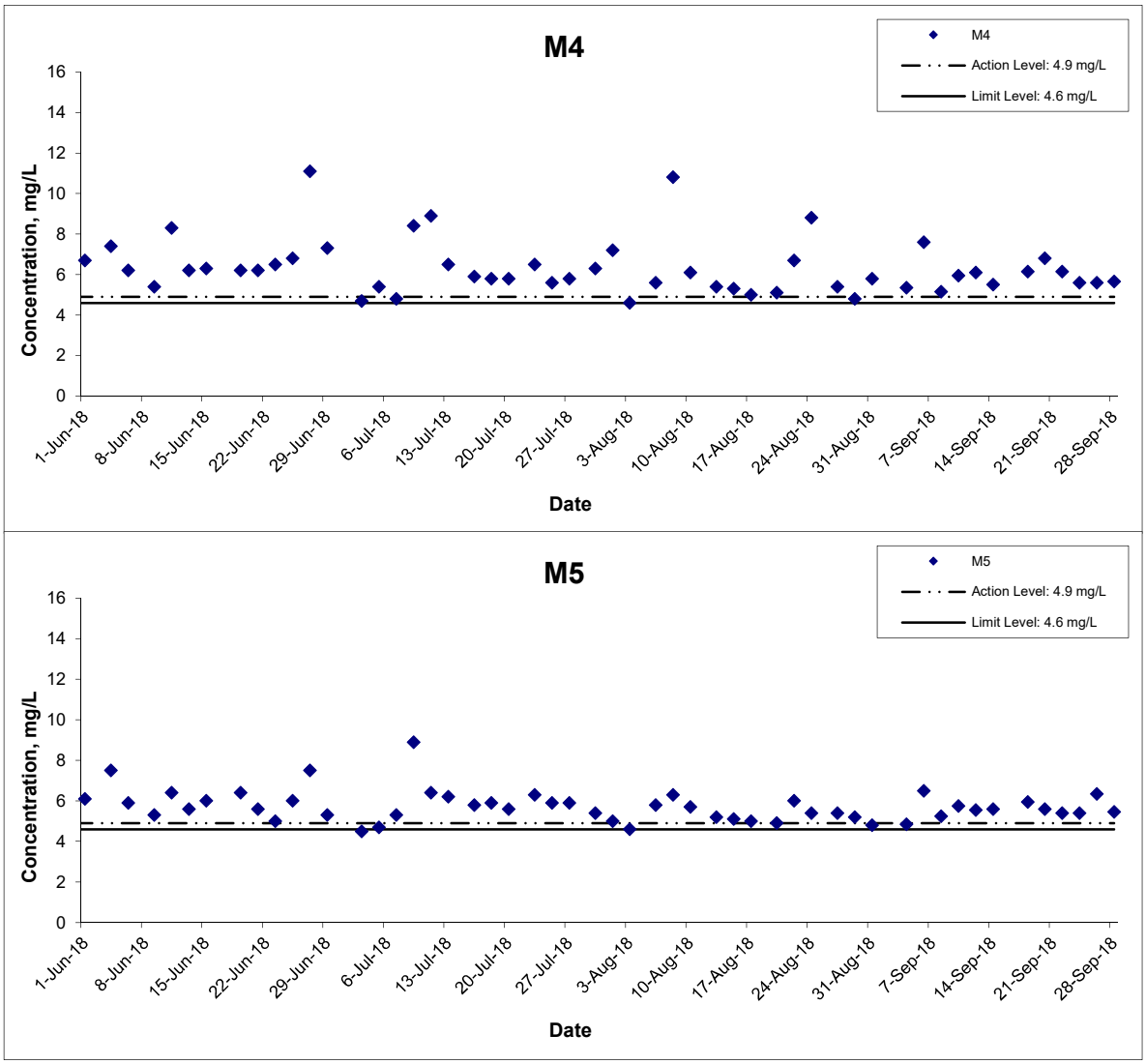
Dissolved Oxygen (Depth-averaged) at Mid-Flood Tide



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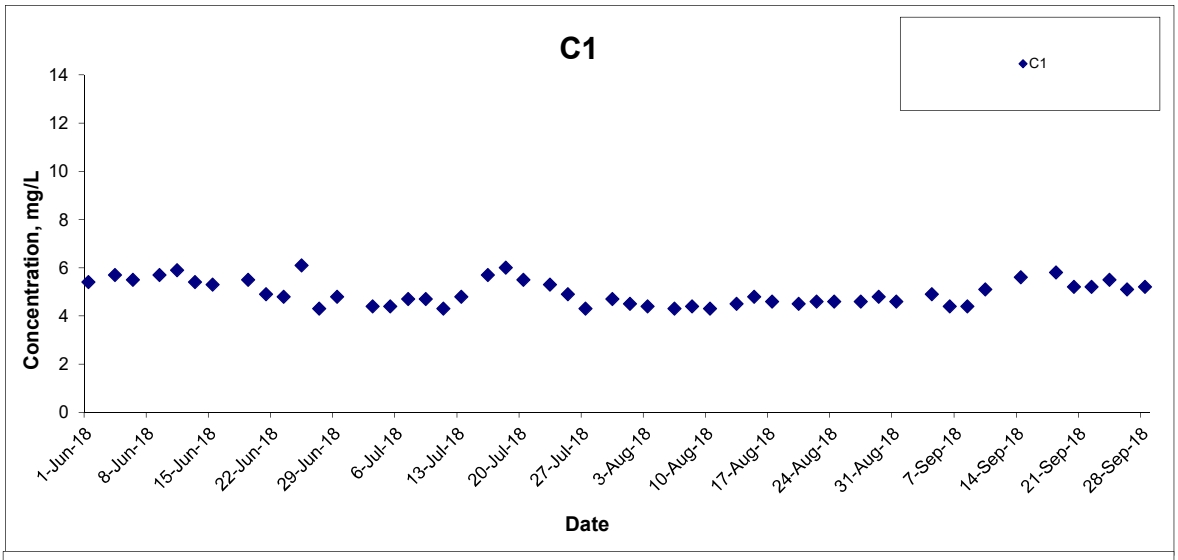
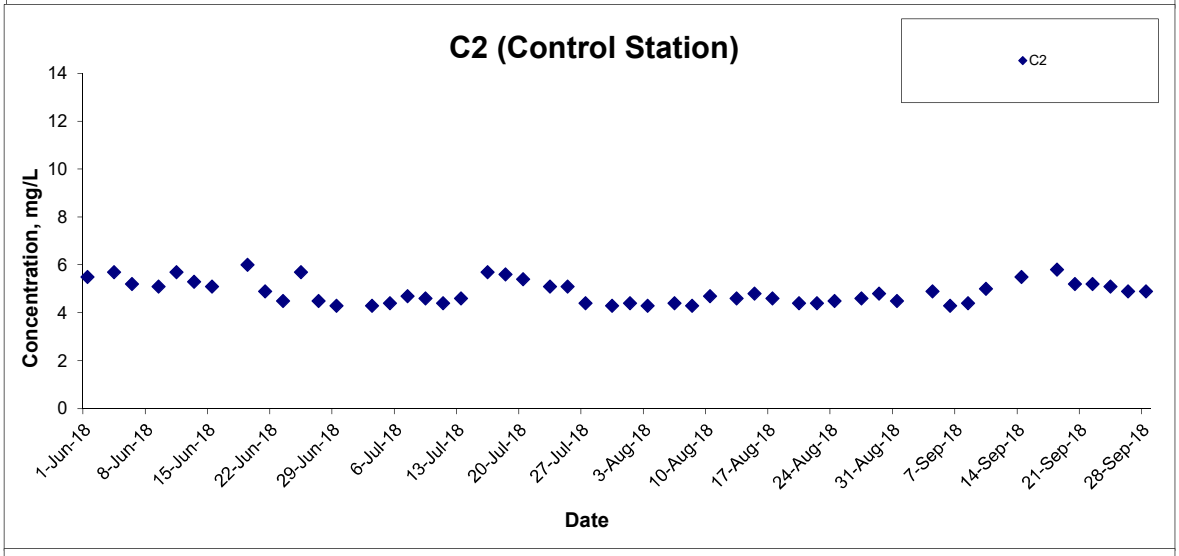
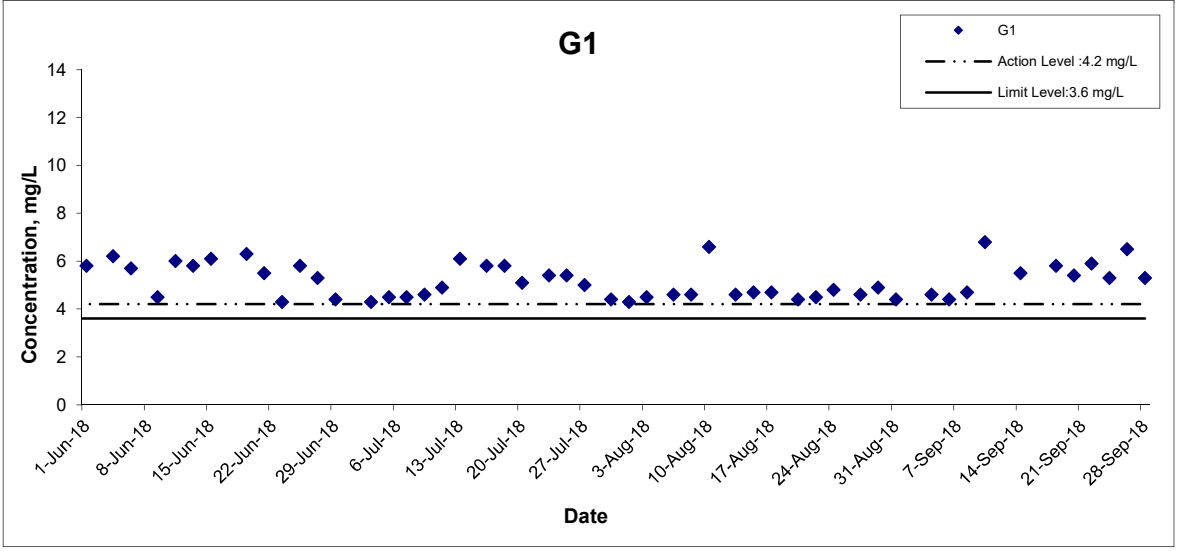
Dissolved Oxygen (Bottom) at Mid-Ebb Tide







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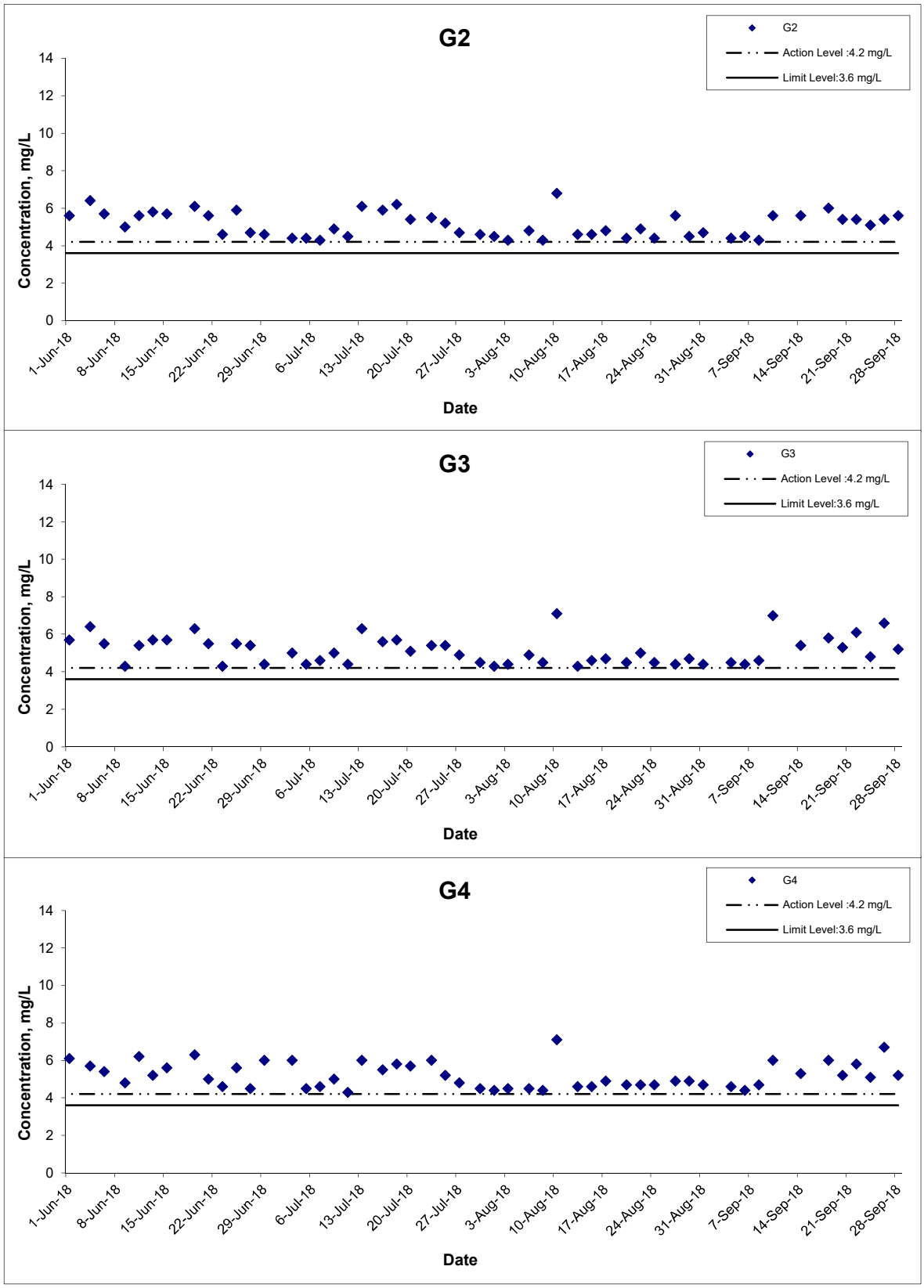
Dissolved Oxygen (Bottom) at Mid-Ebb Tide



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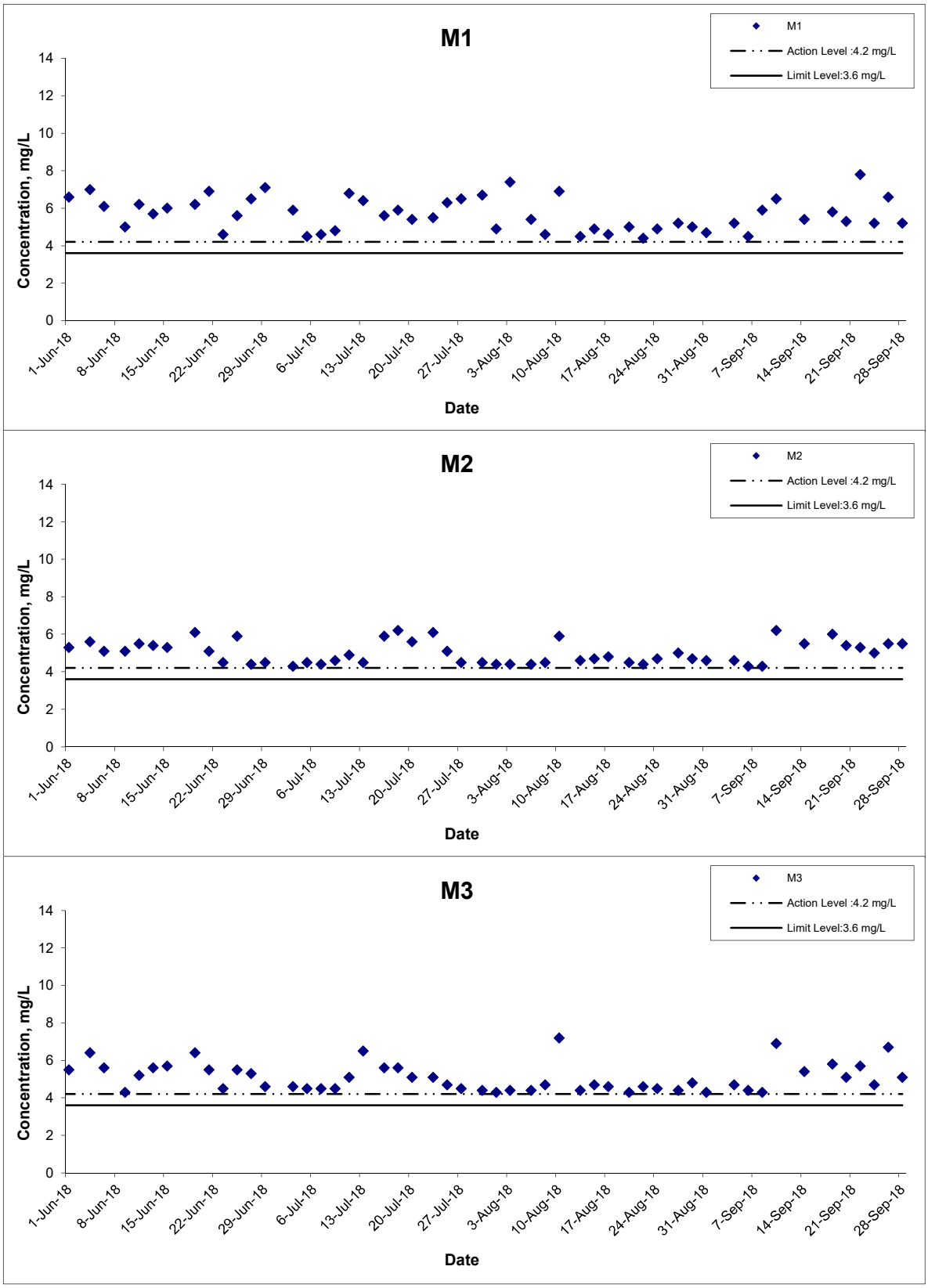
Dissolved Oxygen (Bottom) at Mid-Ebb Tide



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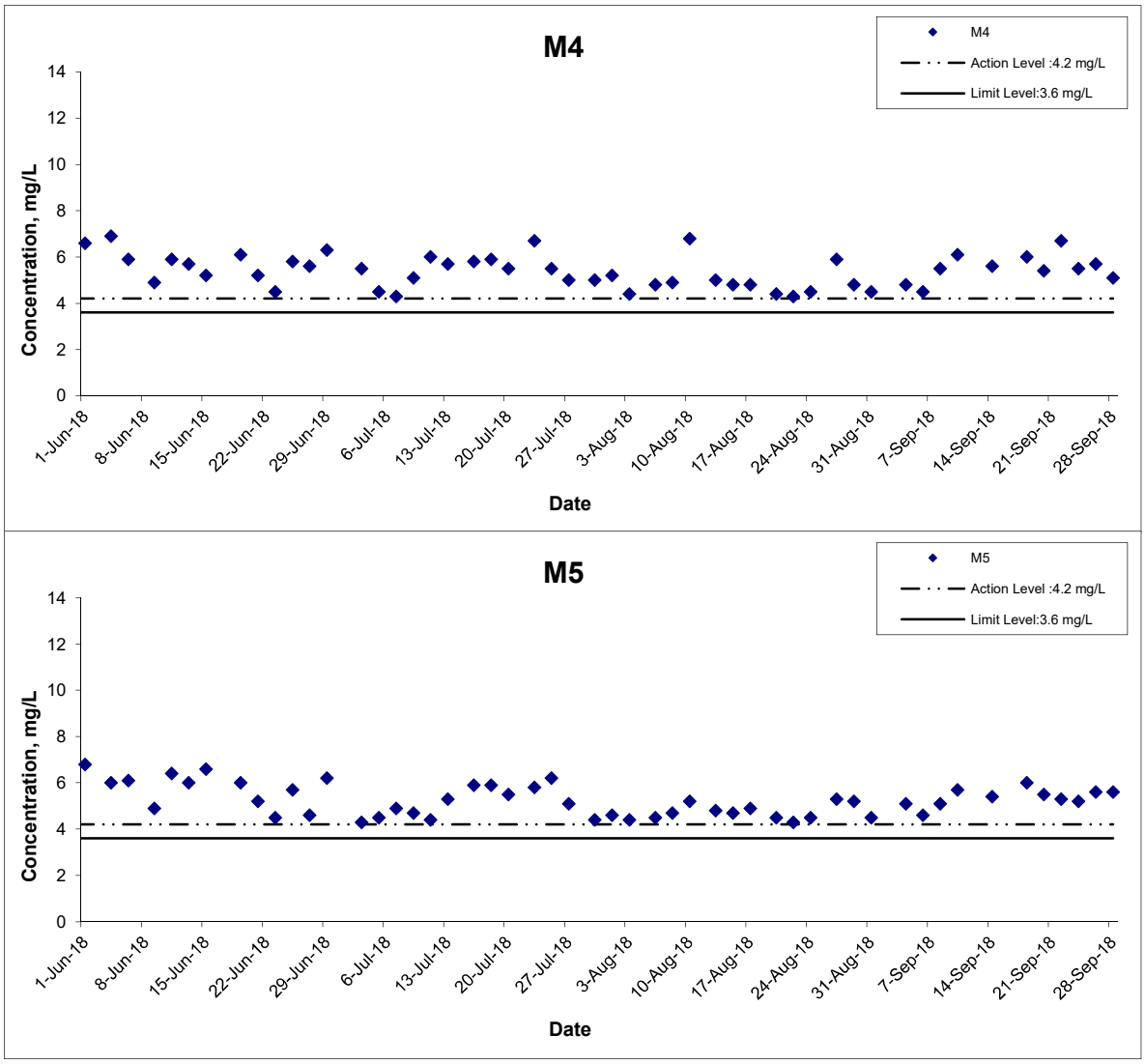
Dissolved Oxygen (Bottom) at Mid-Ebb Tide



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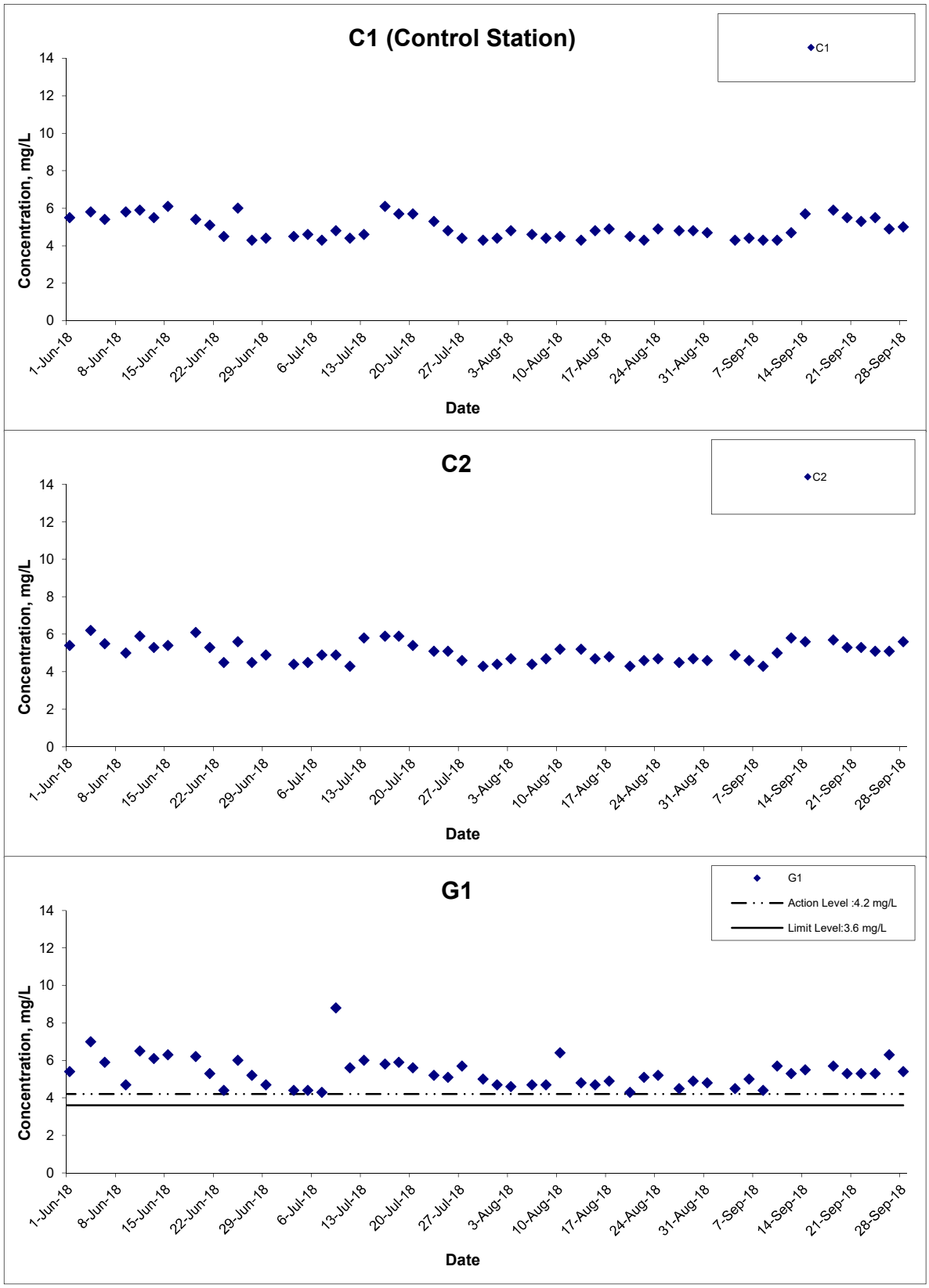
Dissolved Oxygen (Bottom) at Mid-Flood Tide



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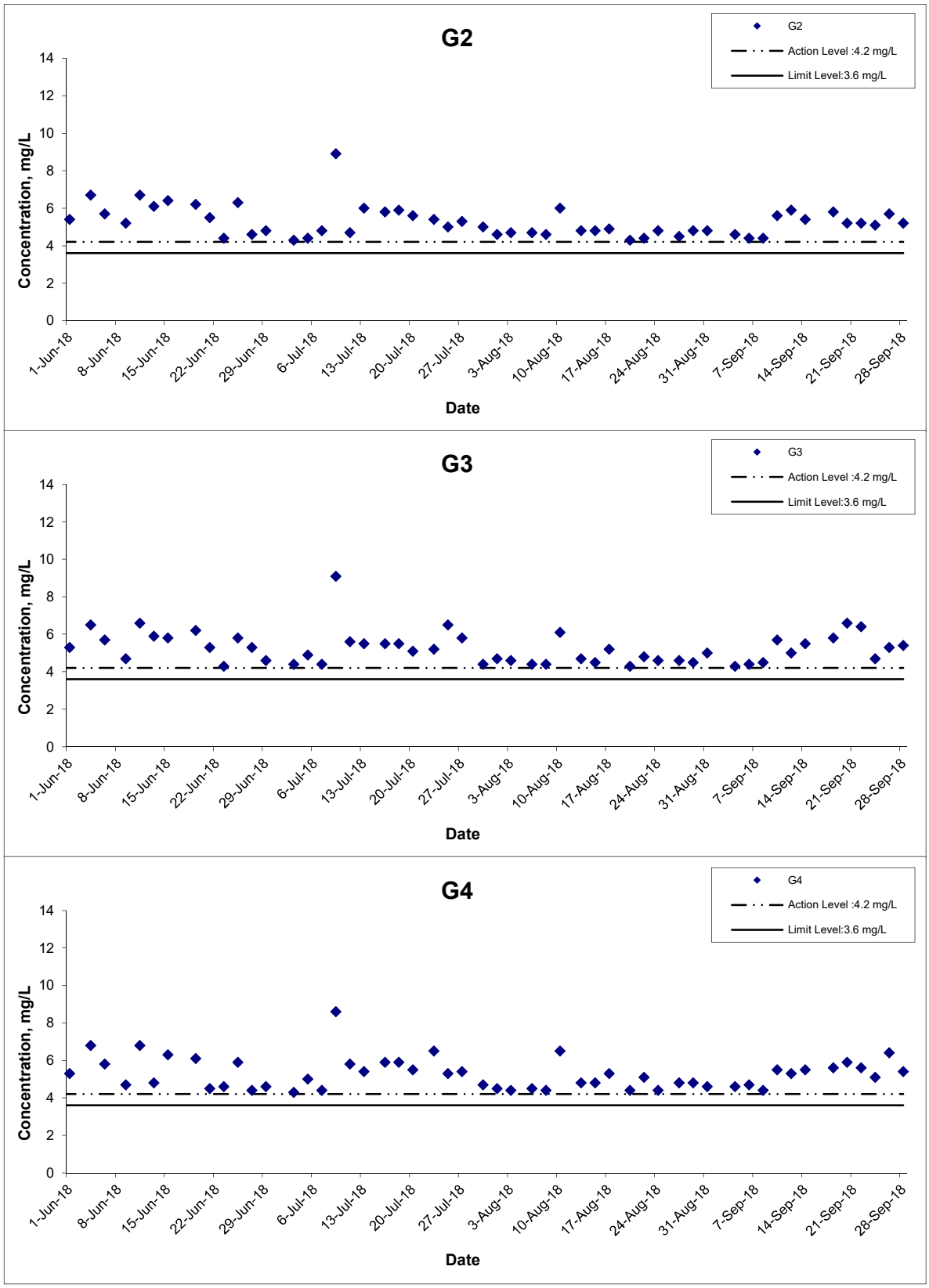
Dissolved Oxygen (Bottom) at Mid-Flood Tide



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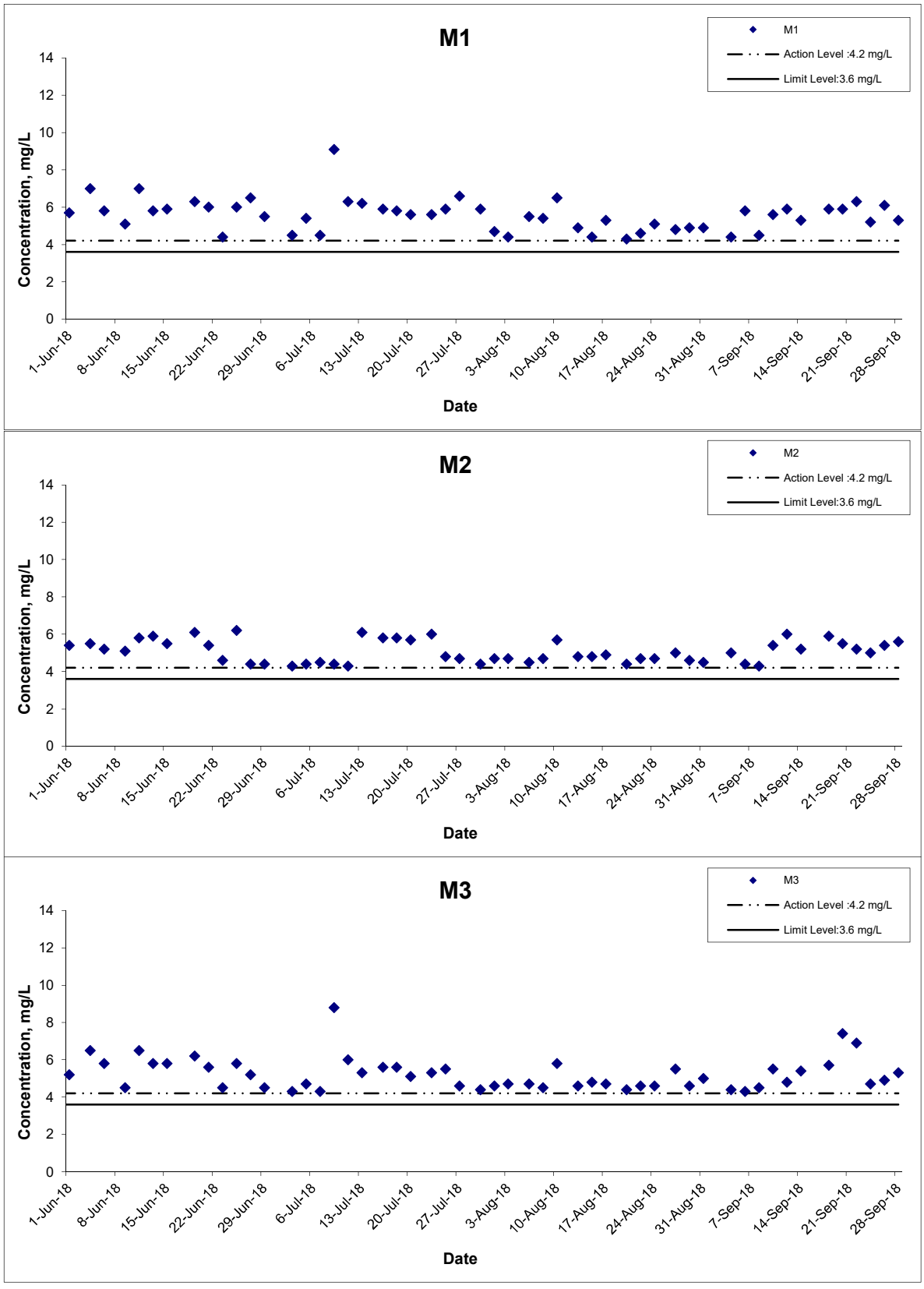
Dissolved Oxygen (Bottom) at Mid-Flood Tide



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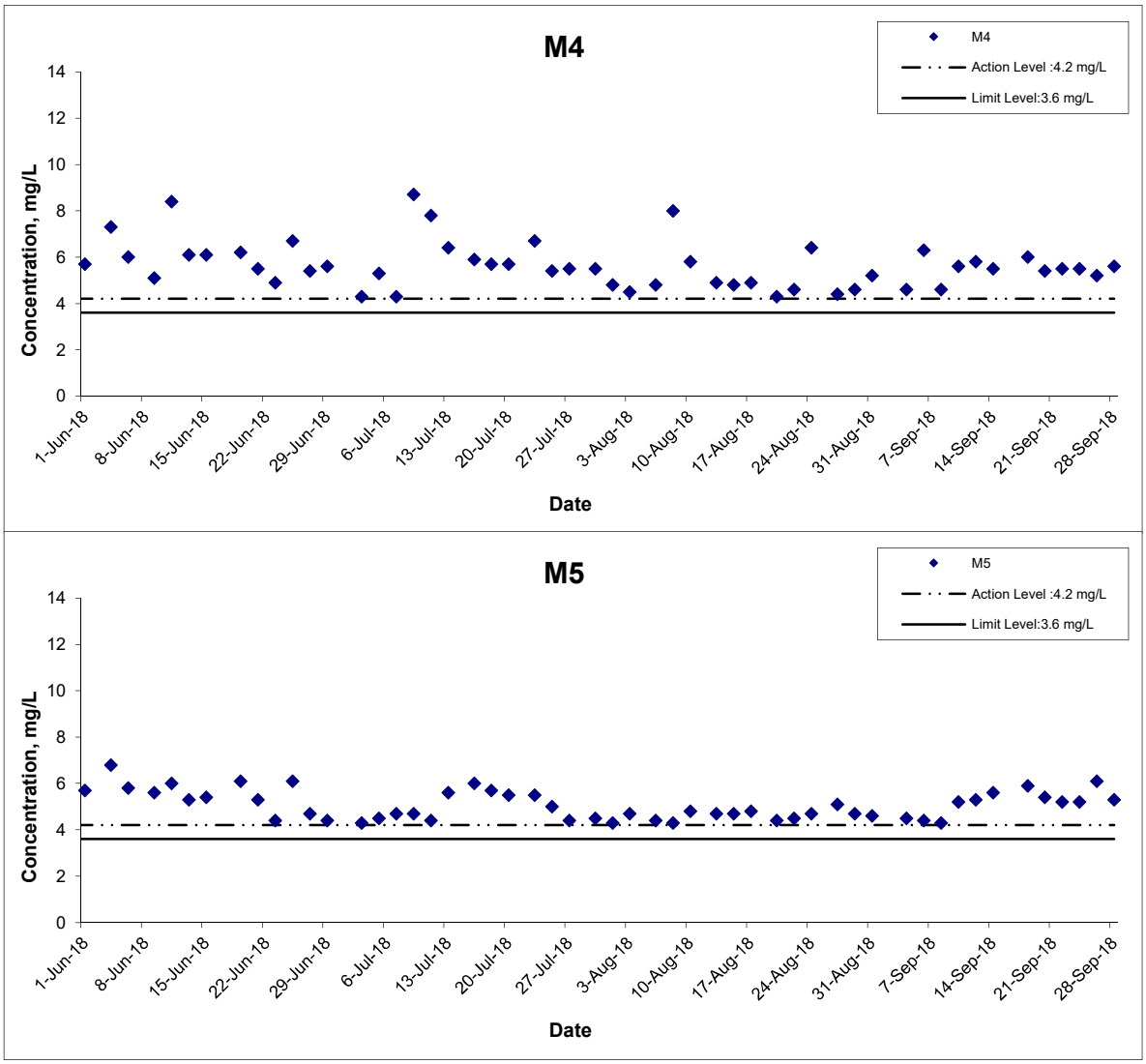
Dissolved Oxygen (Bottom) at Mid-Flood Tide



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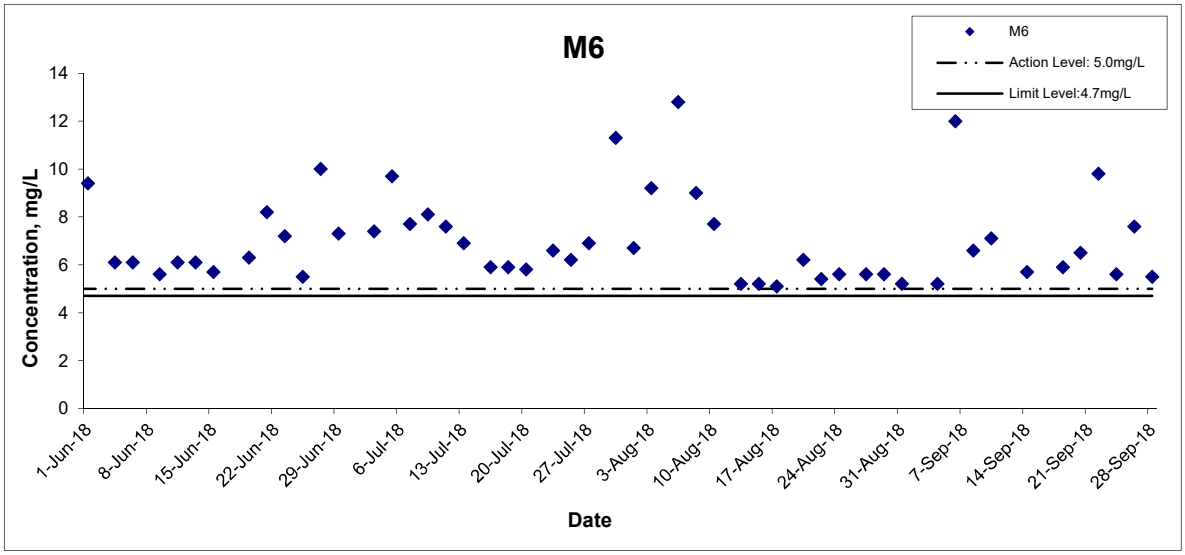
Dissolved Oxygen (Intake Level of WSD Salt Water Intake) at Mid-Ebb Tide



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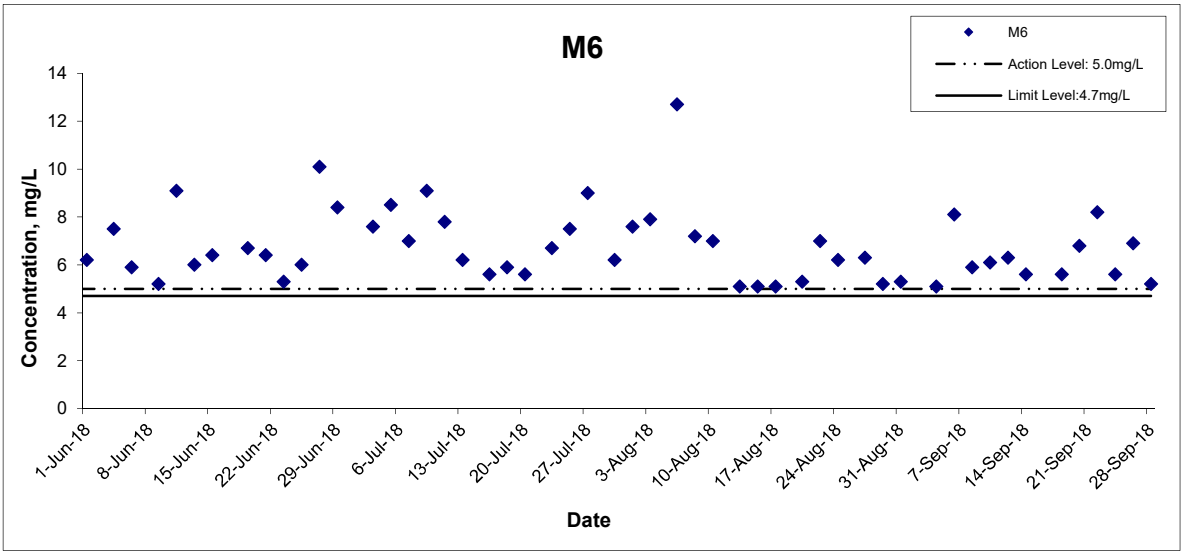
Dissolved Oxygen (Intake Level of WSD Salt Water Intake) at Mid-Flood Tide



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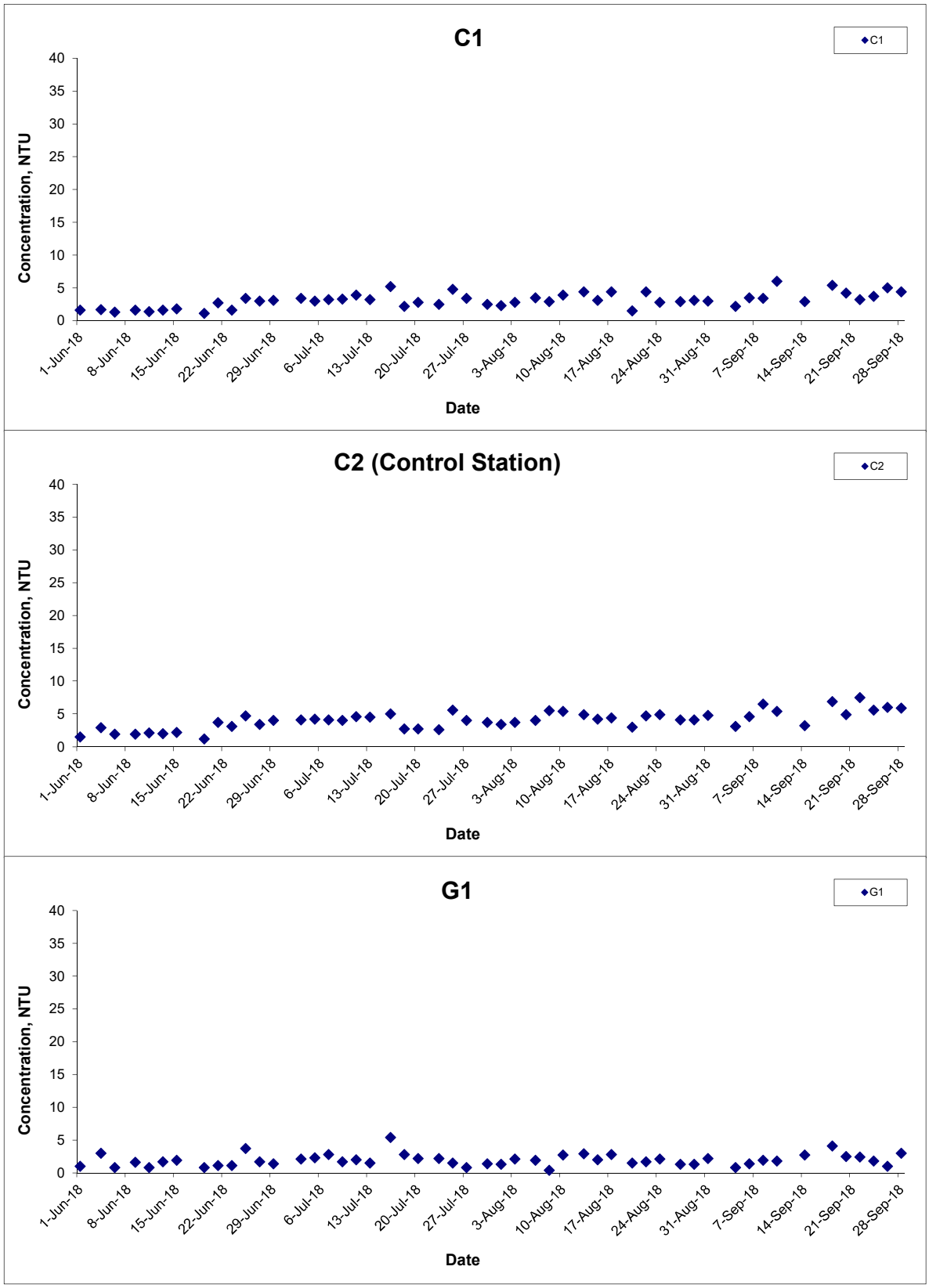
Turbidity (Depth-averaged) at Mid-Ebb Tide



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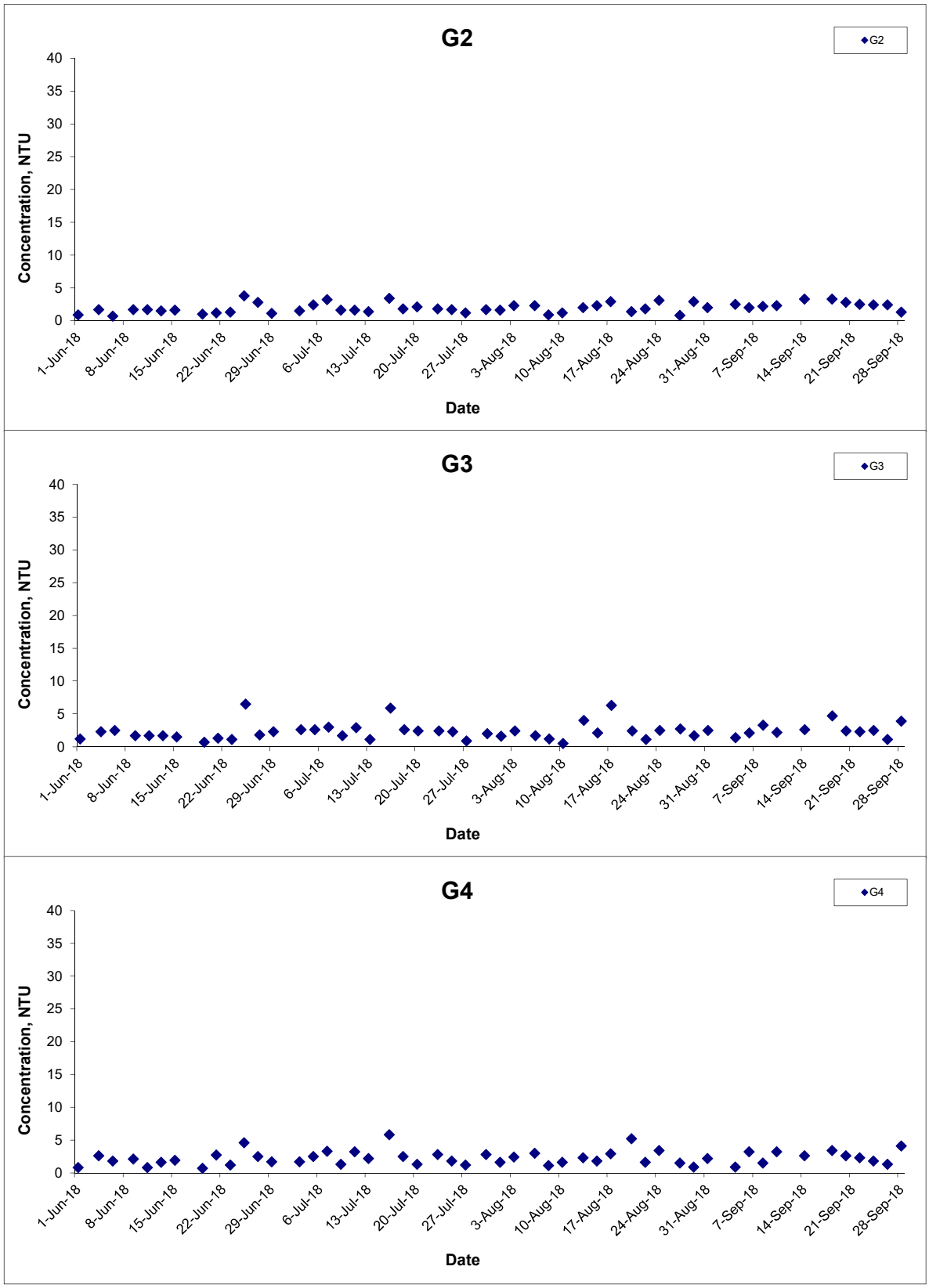

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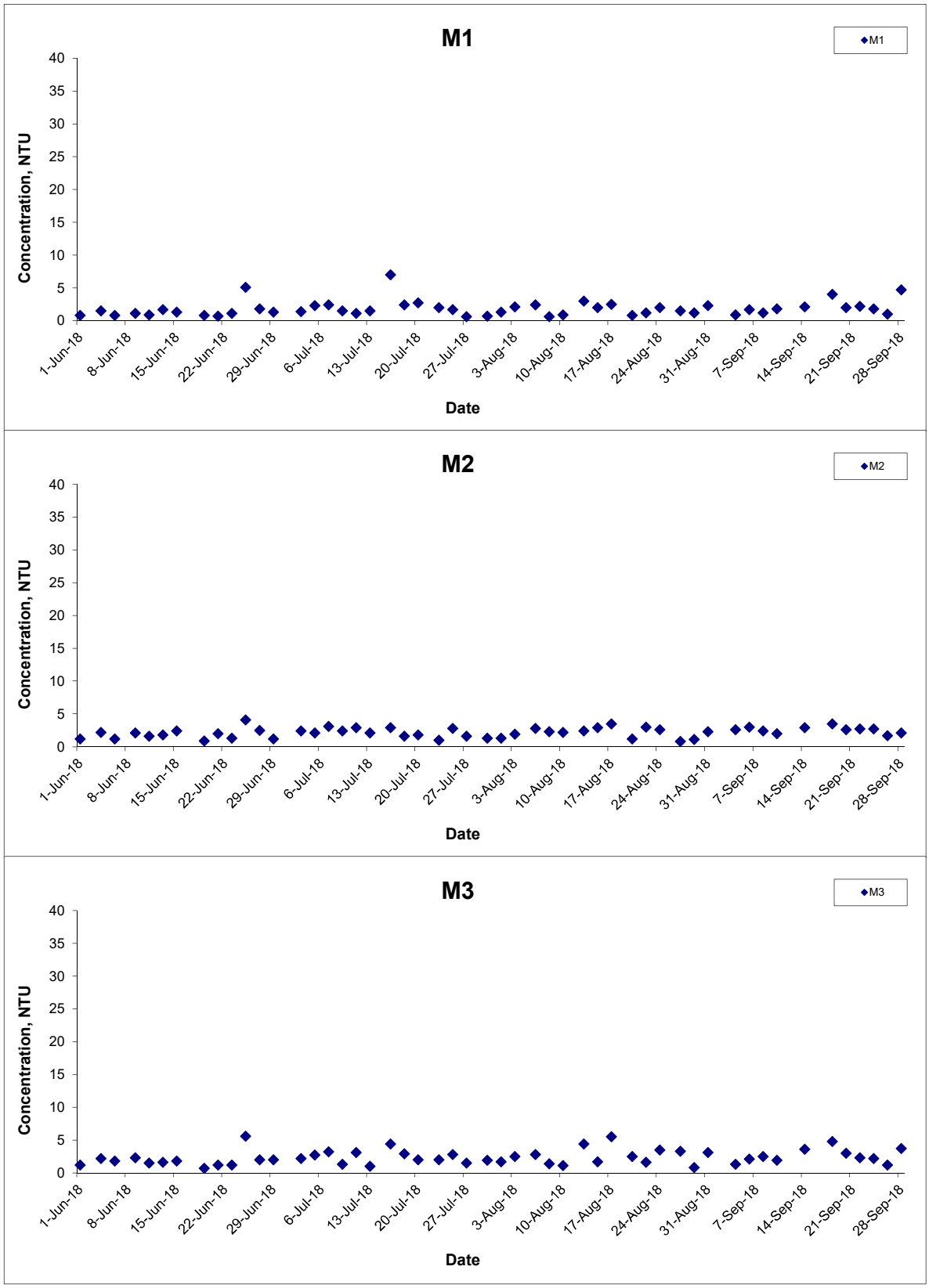
Turbidity (Depth-averaged) at Mid-Ebb Tide



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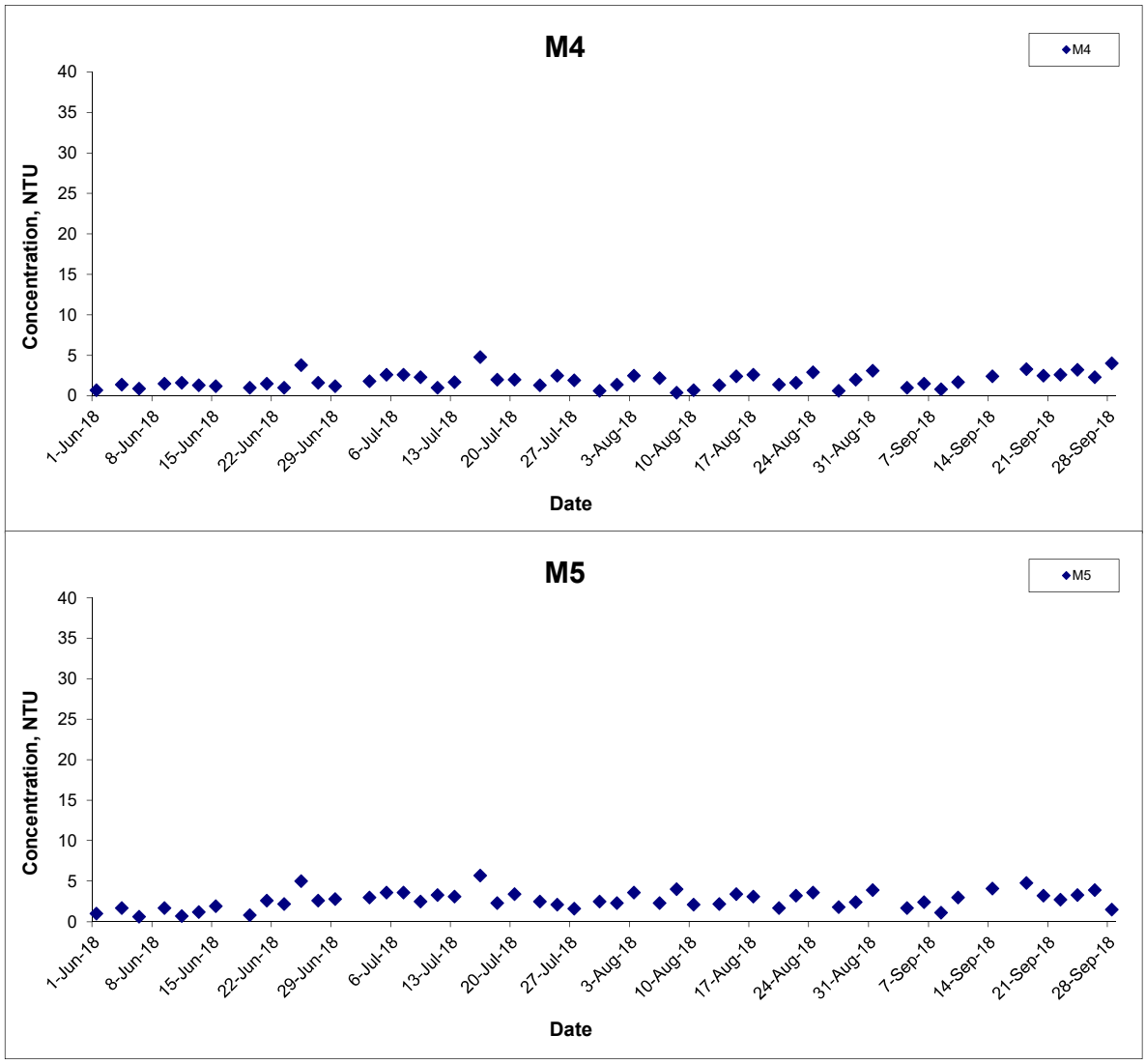
Turbidity (Depth-averaged) at Mid-Ebb Tide



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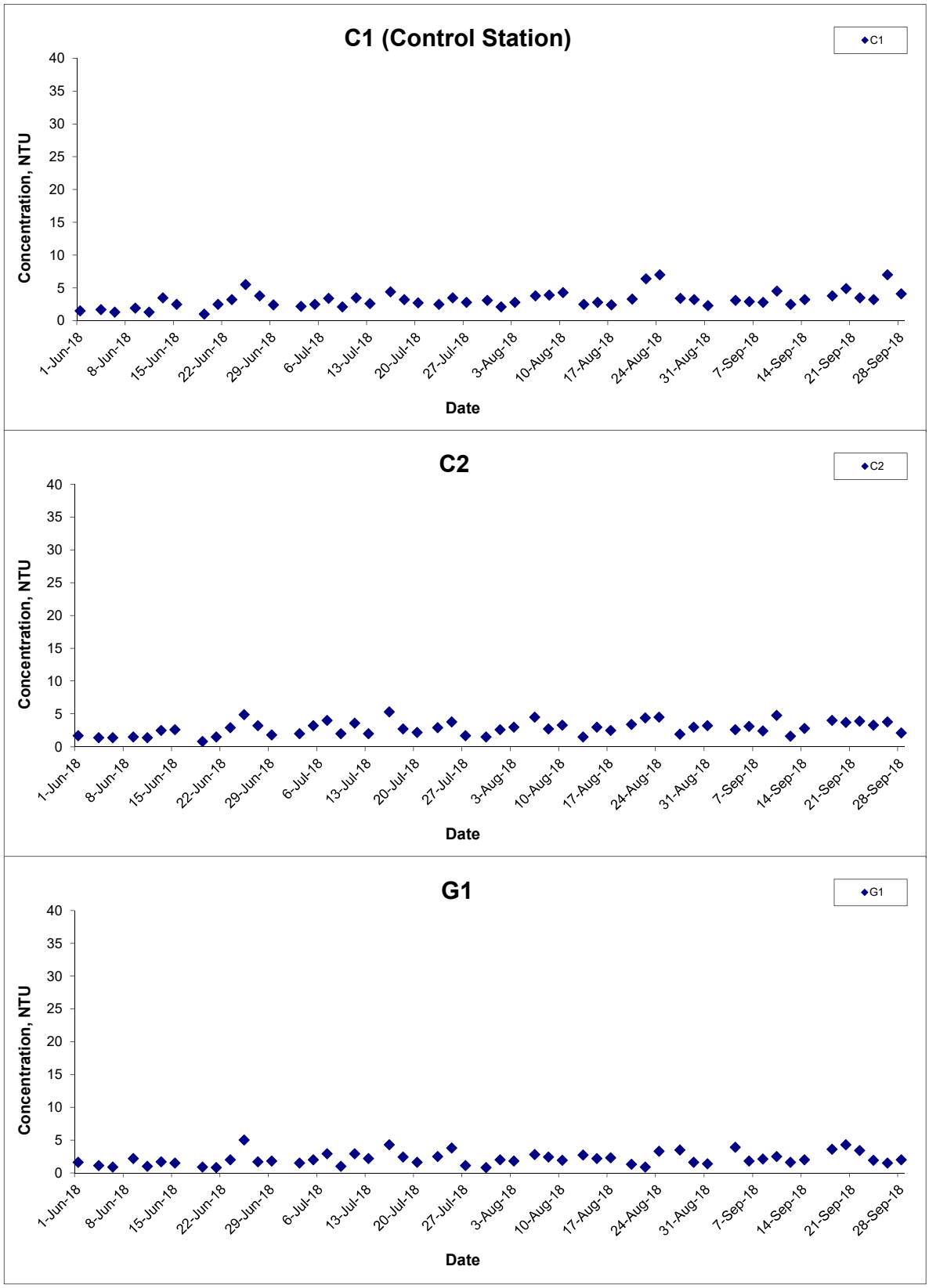
Turbidity (Depth-averaged) at Mid-Flood Tide



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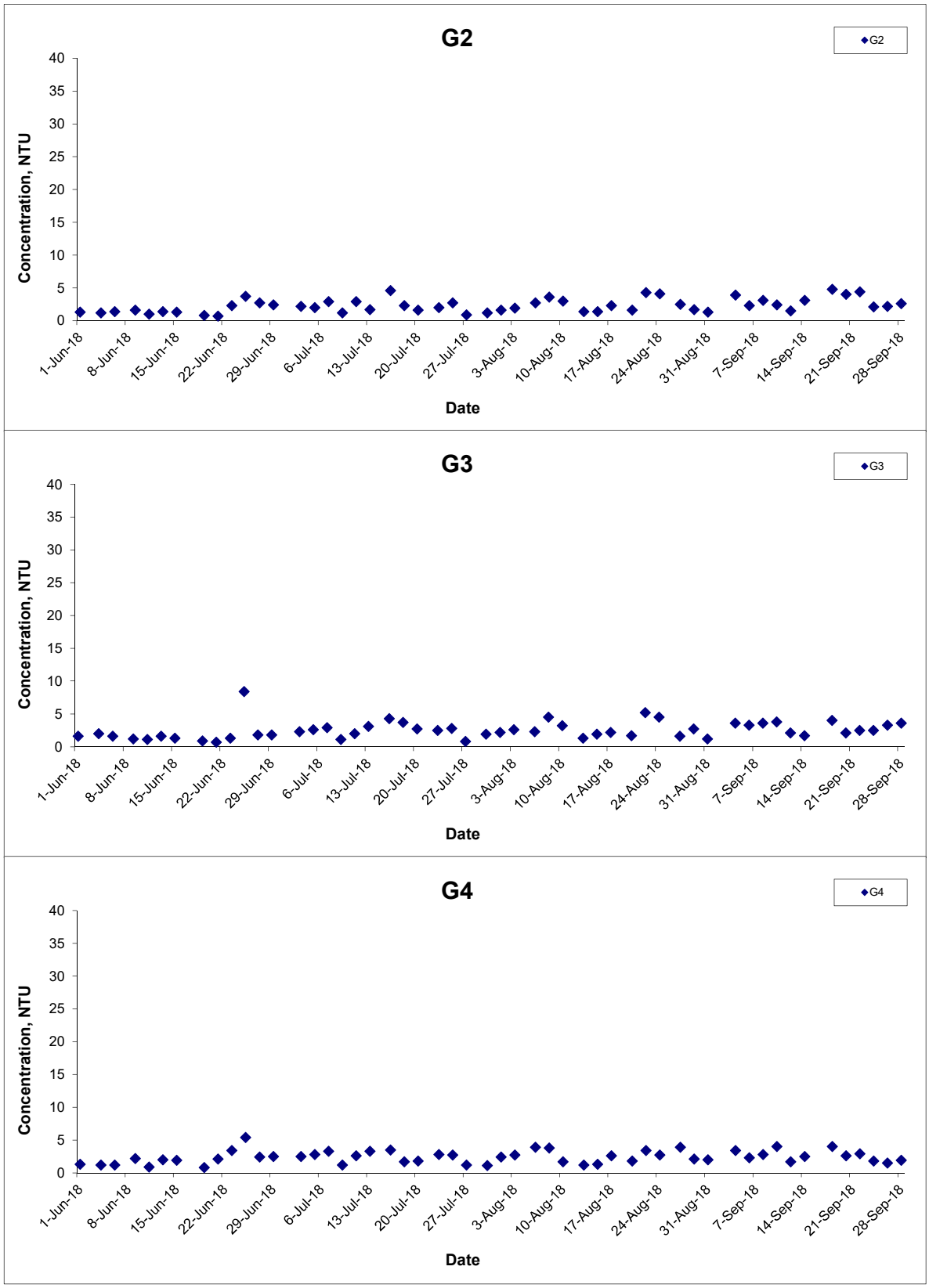
Turbidity (Depth-averaged) at Mid-Flood Tide



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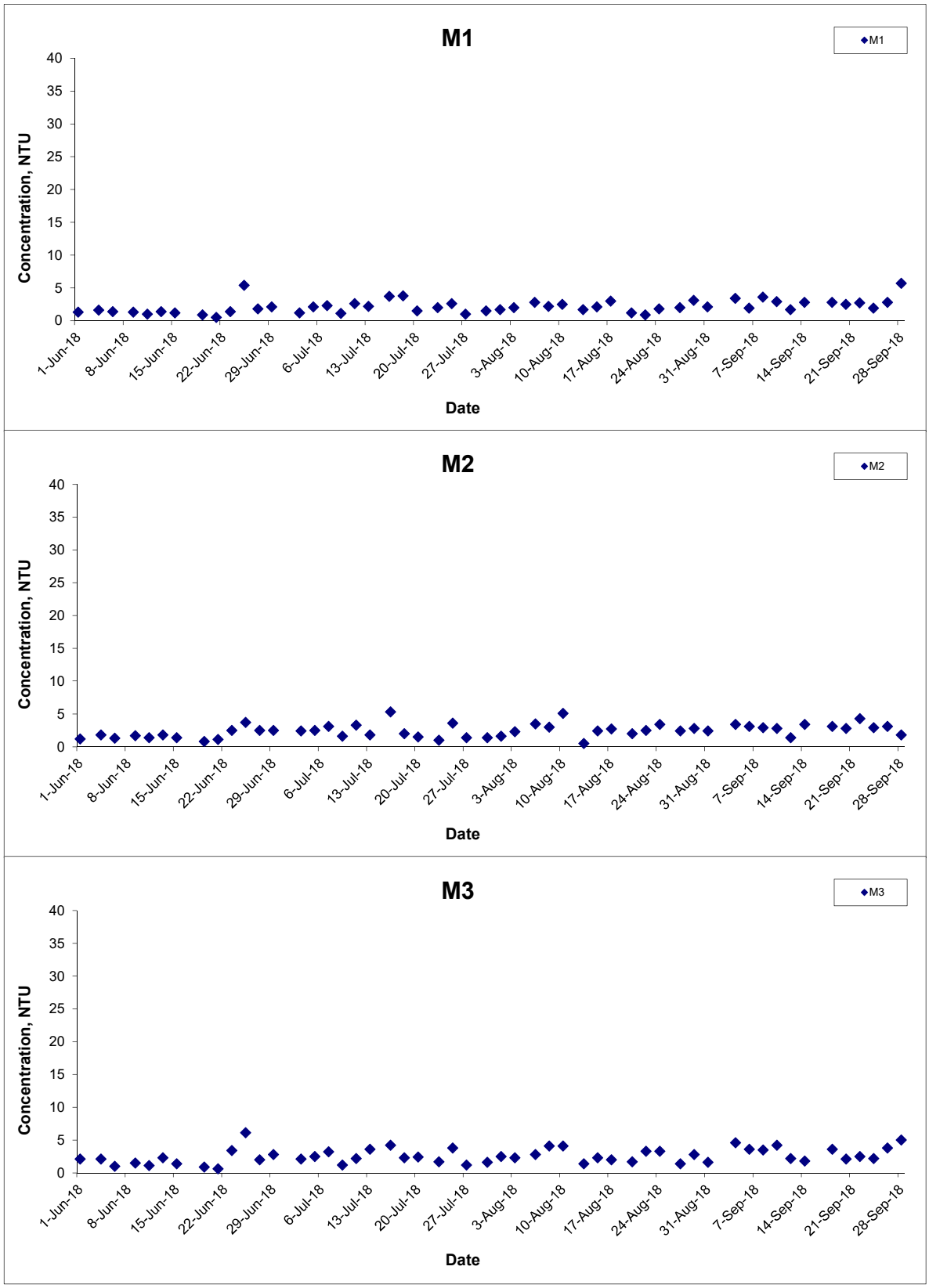
Turbidity (Depth-averaged) at Mid-Flood Tide



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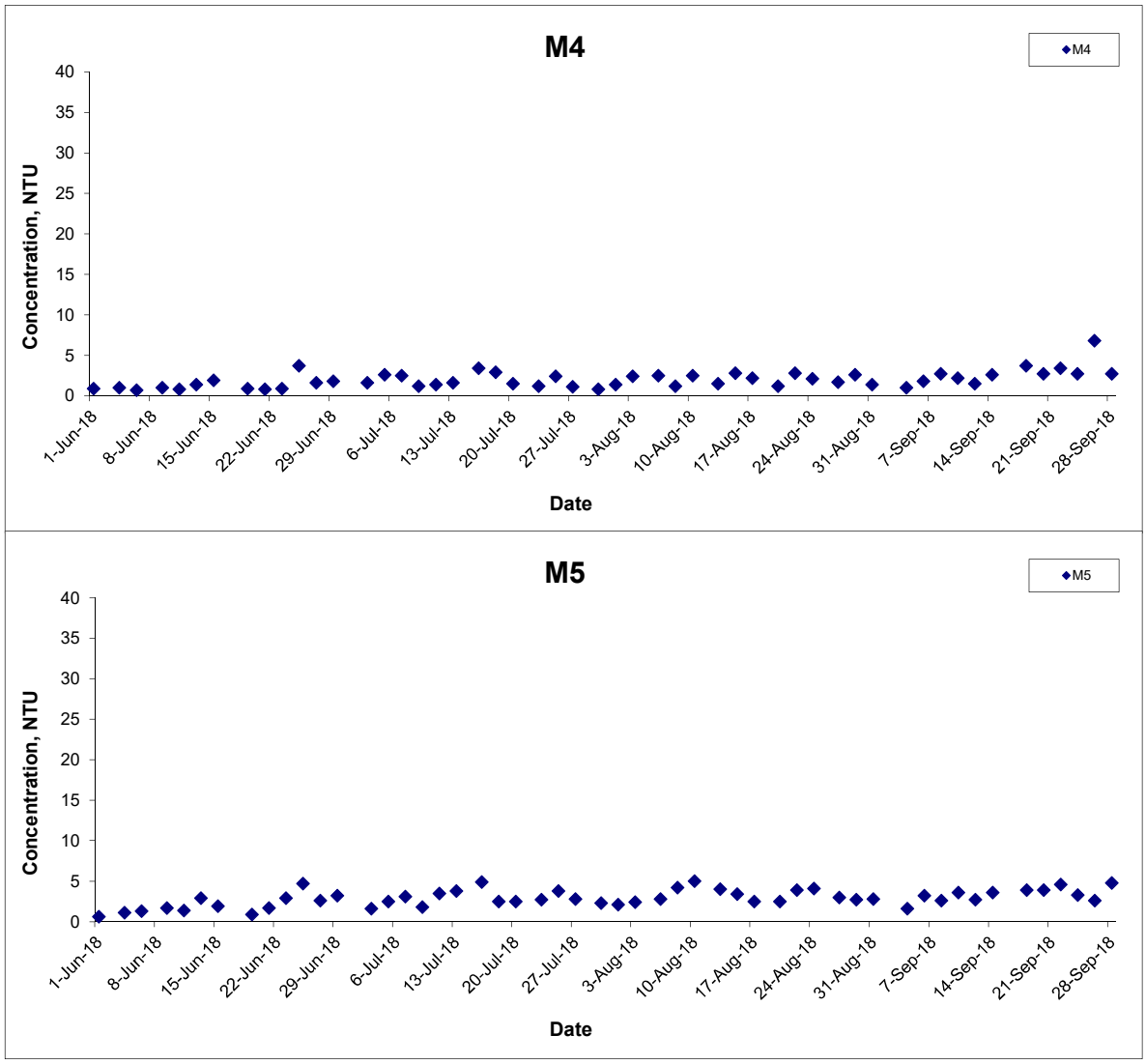
Turbidity (Depth-averaged) at Mid-Flood Tide



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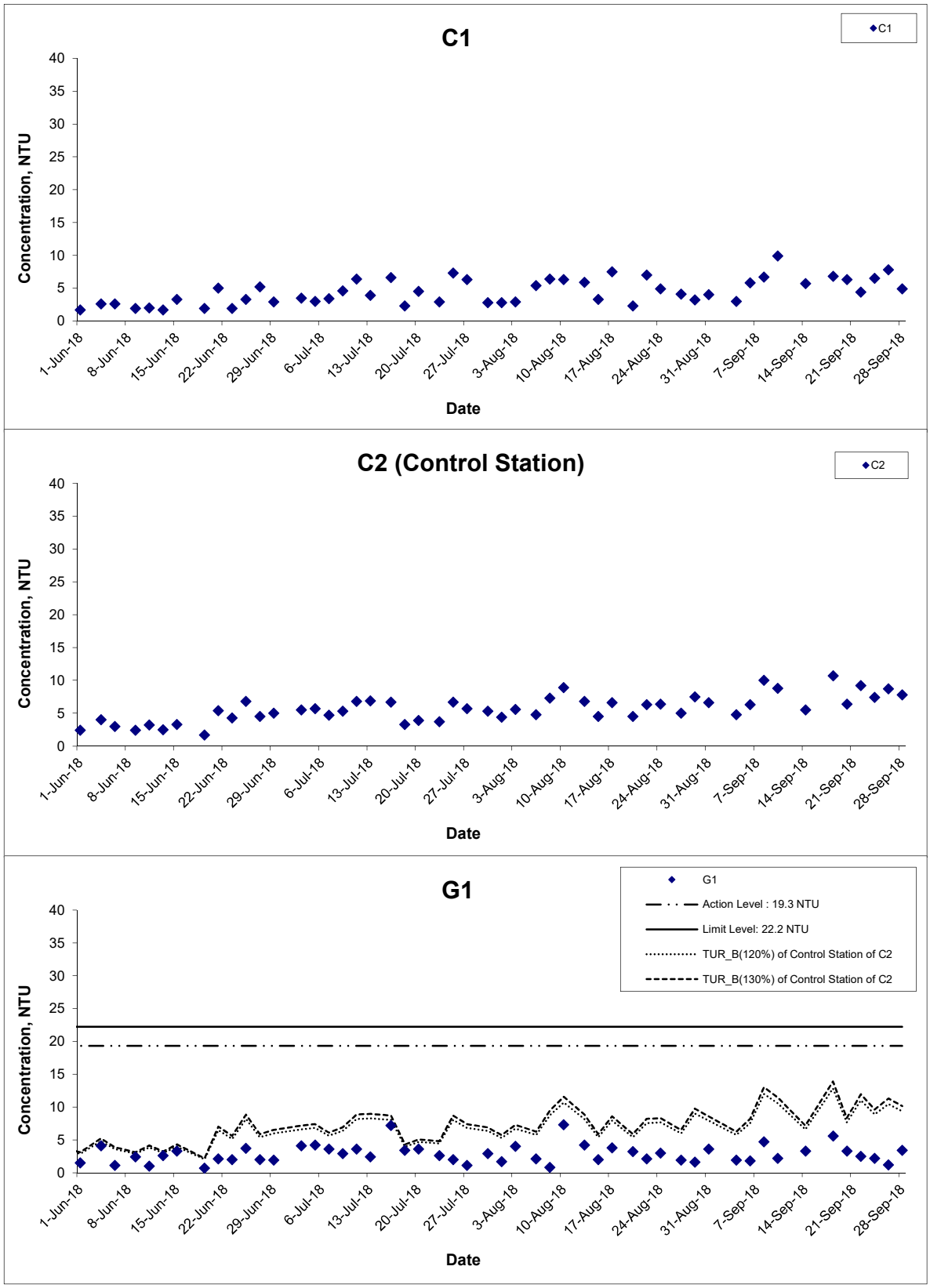
Turbidity (Bottom) at Mid-Ebb Tide



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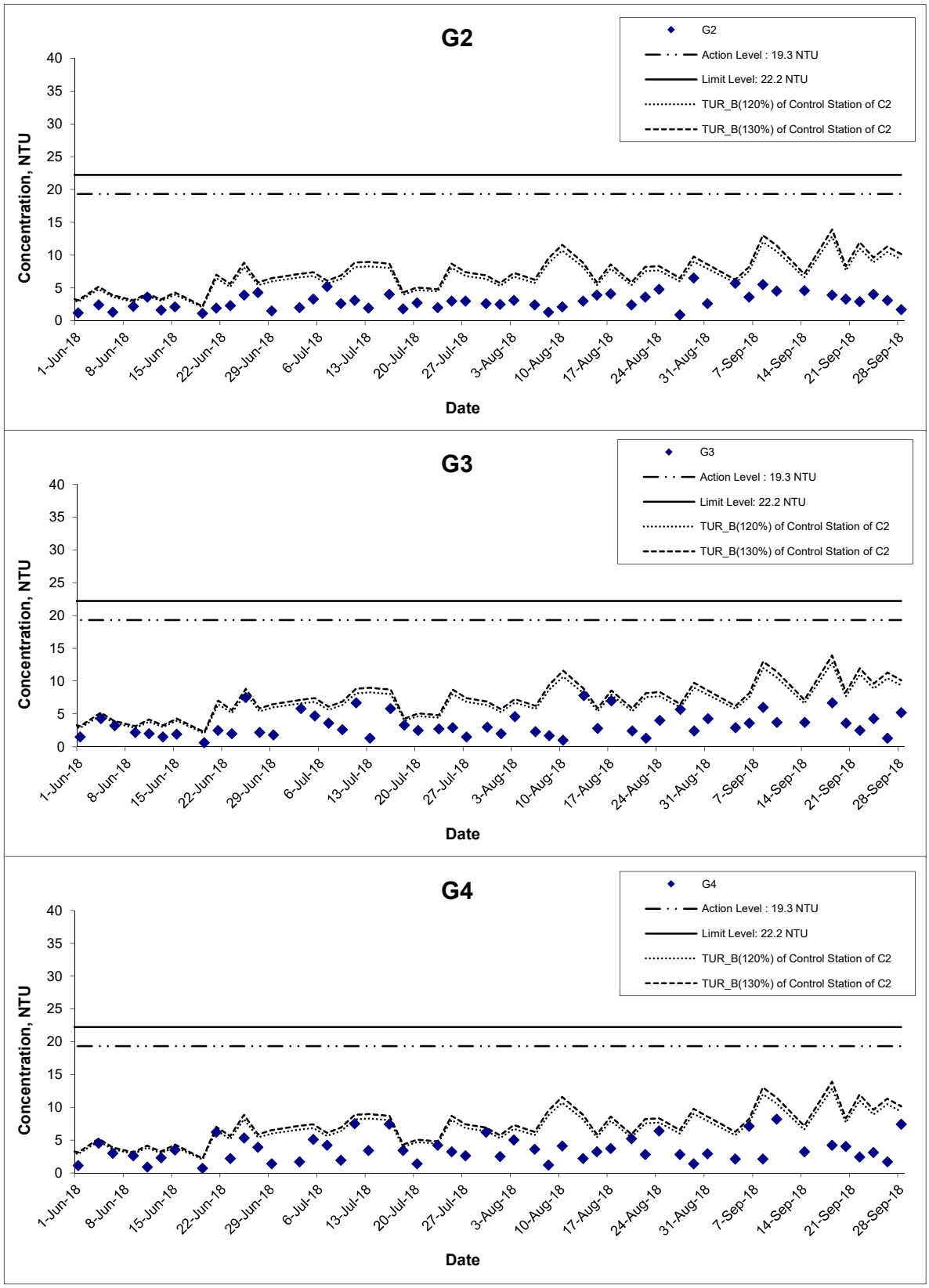
Turbidity (Bottom) at Mid-Ebb Tide



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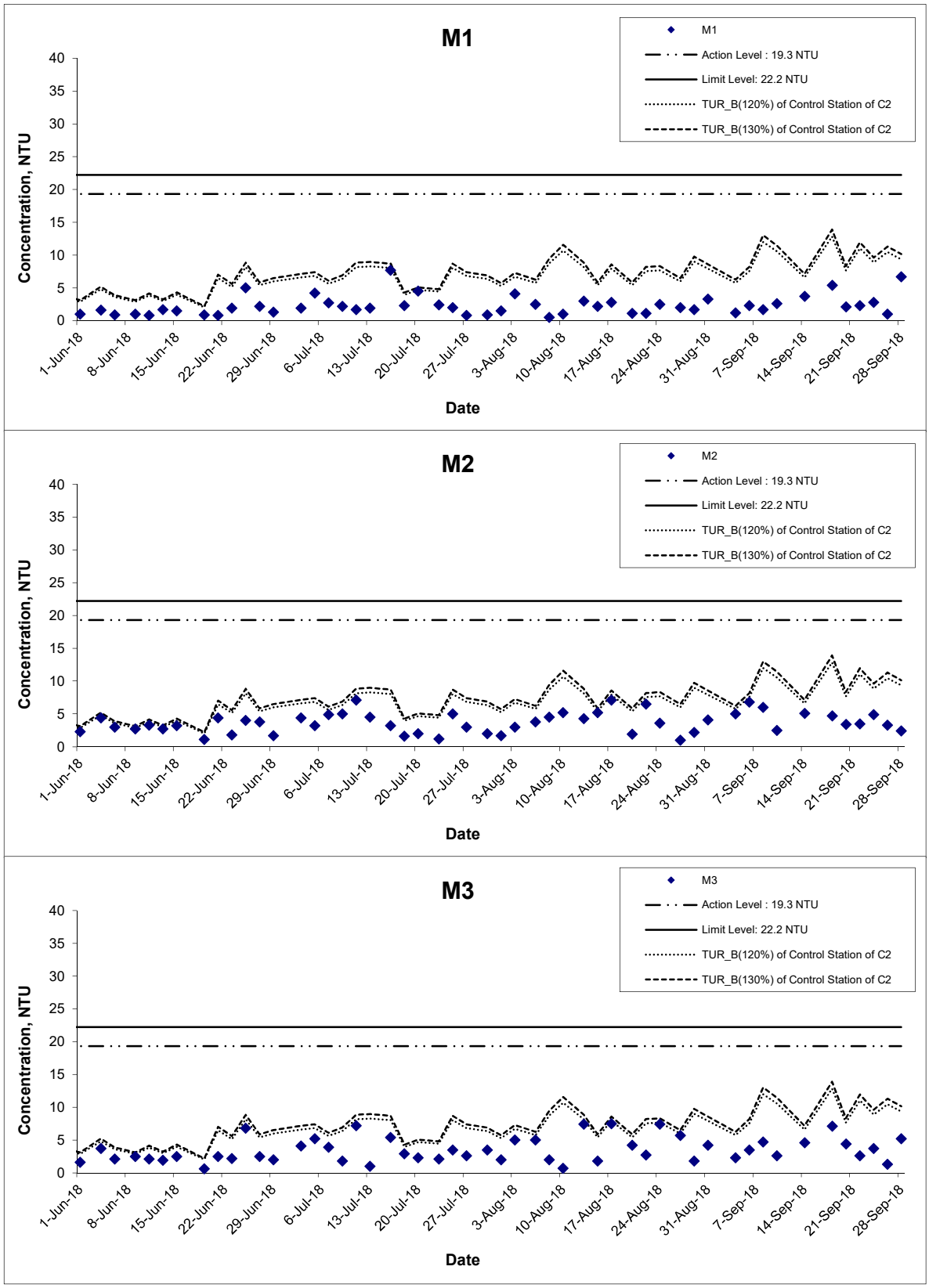
Turbidity (Bottom) at Mid-Ebb Tide



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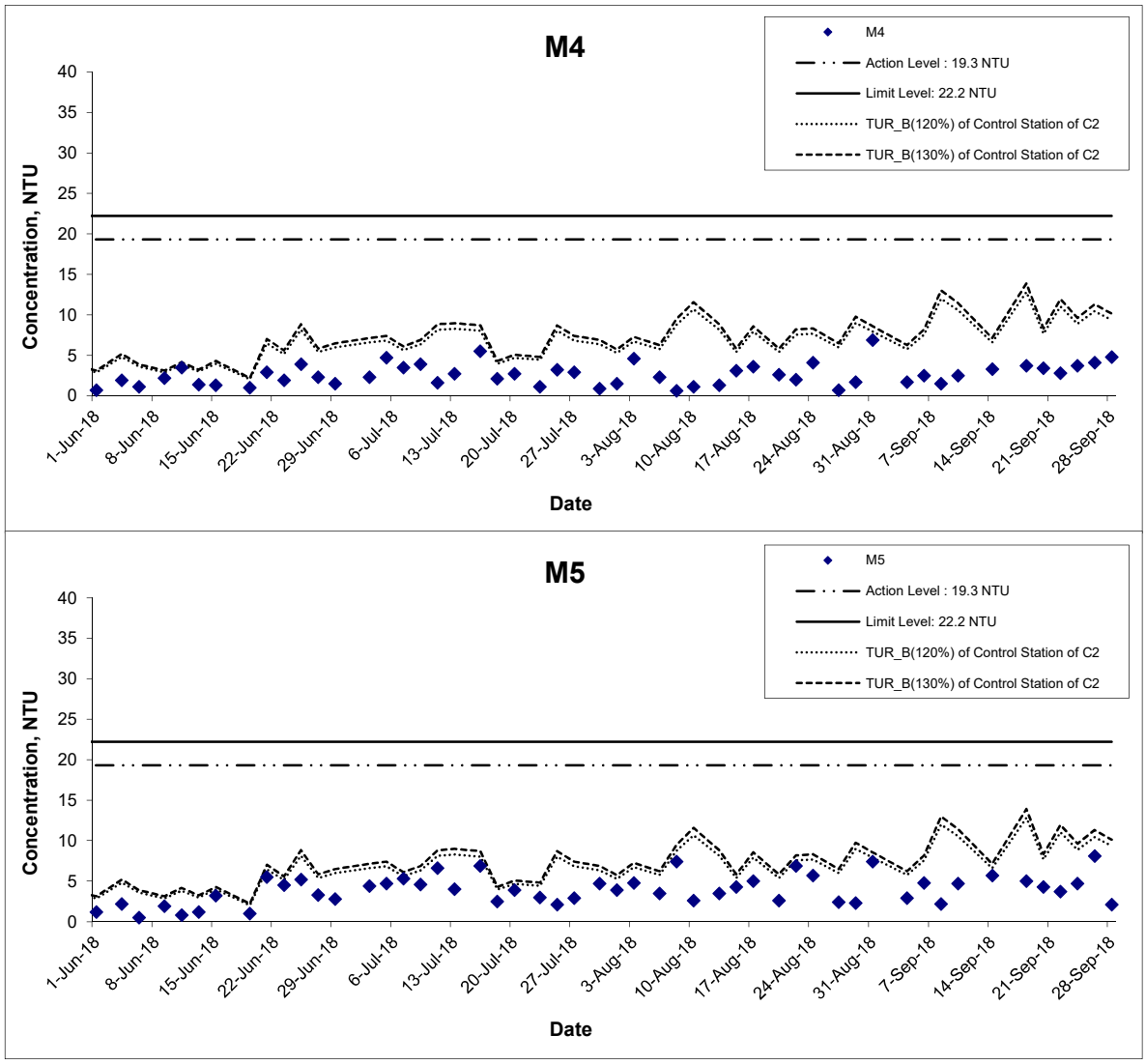

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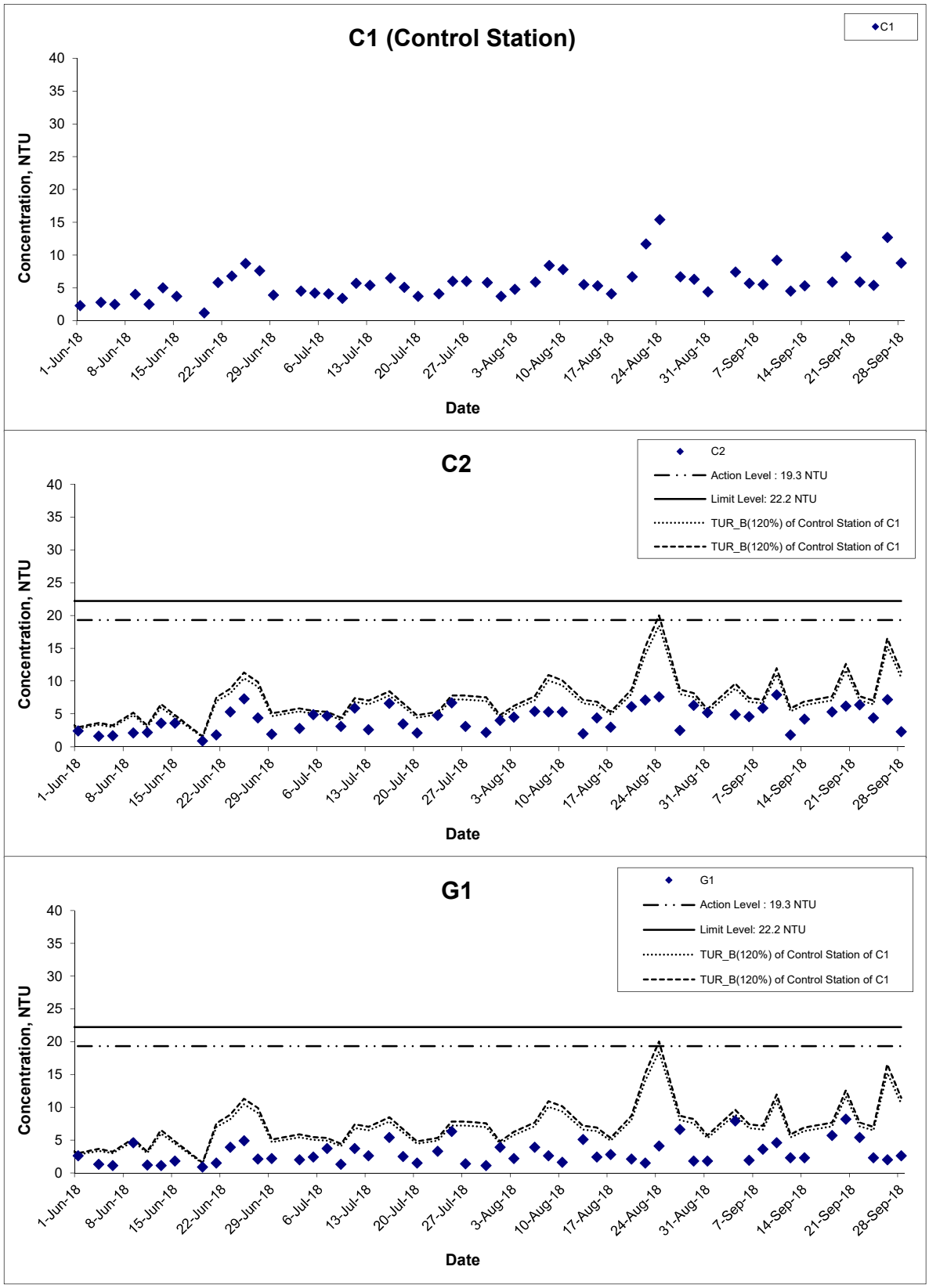
Turbidity (Bottom) at Mid-Flood Tide



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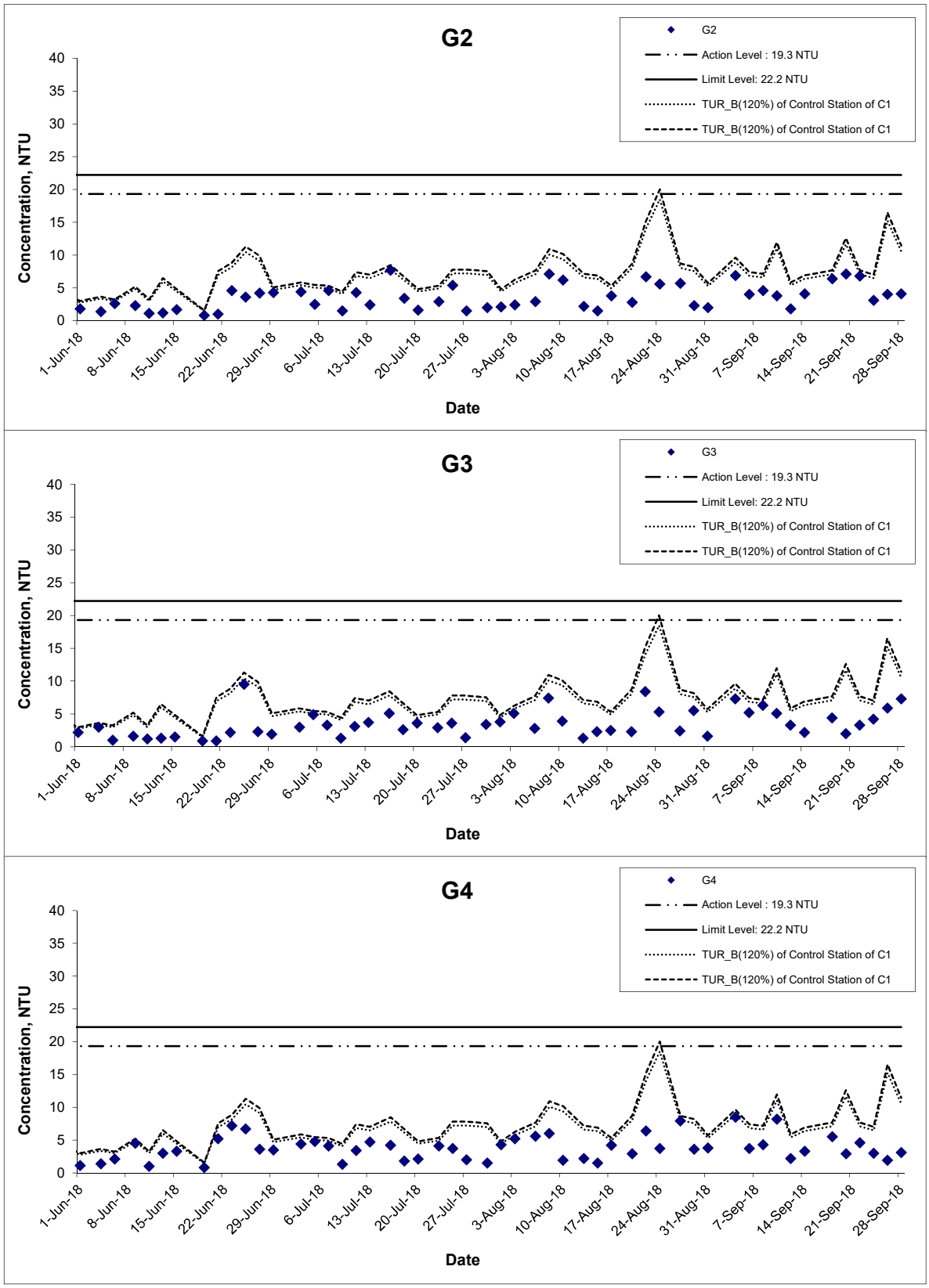
Turbidity (Bottom) at Mid-Flood Tide



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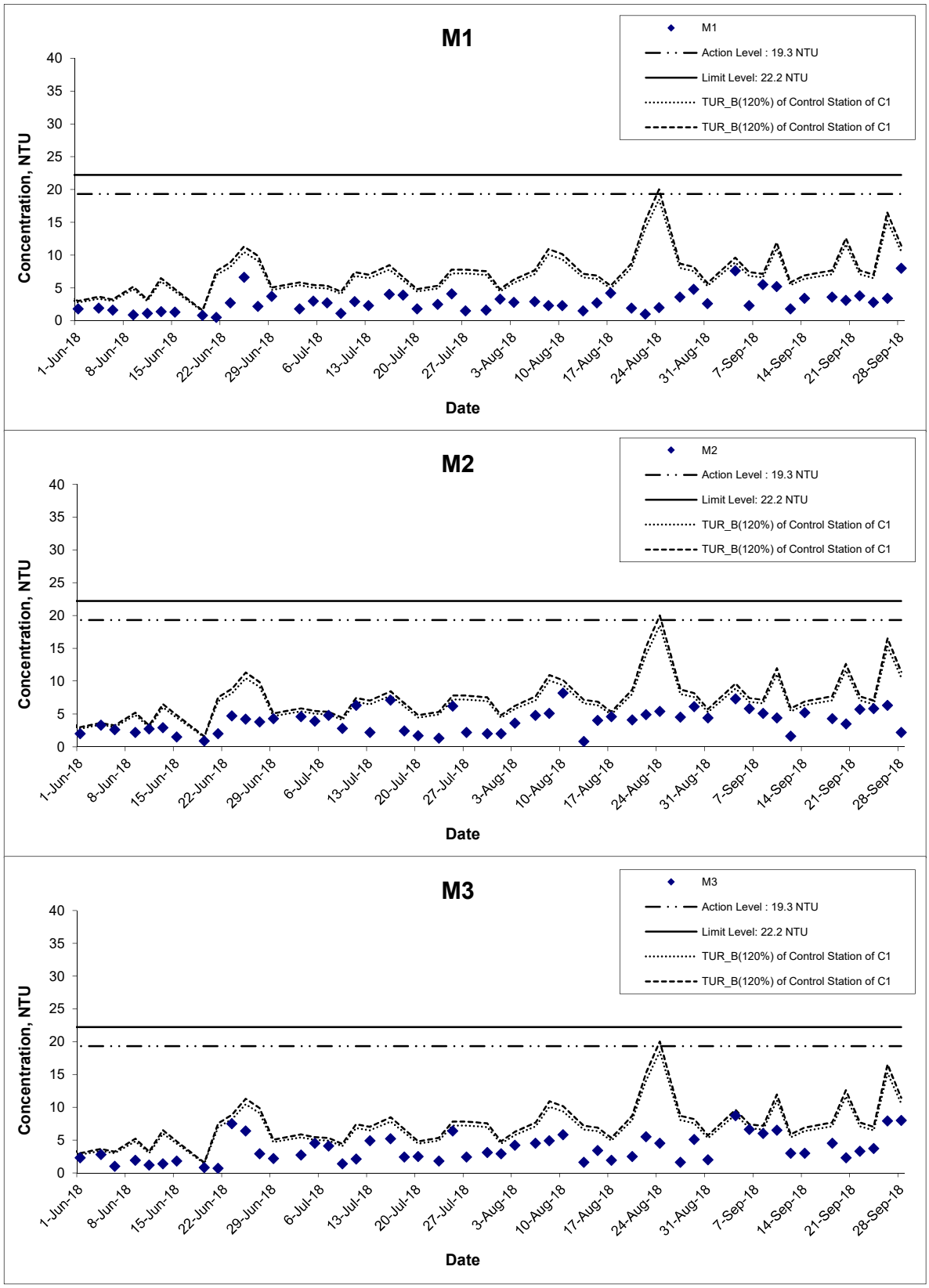

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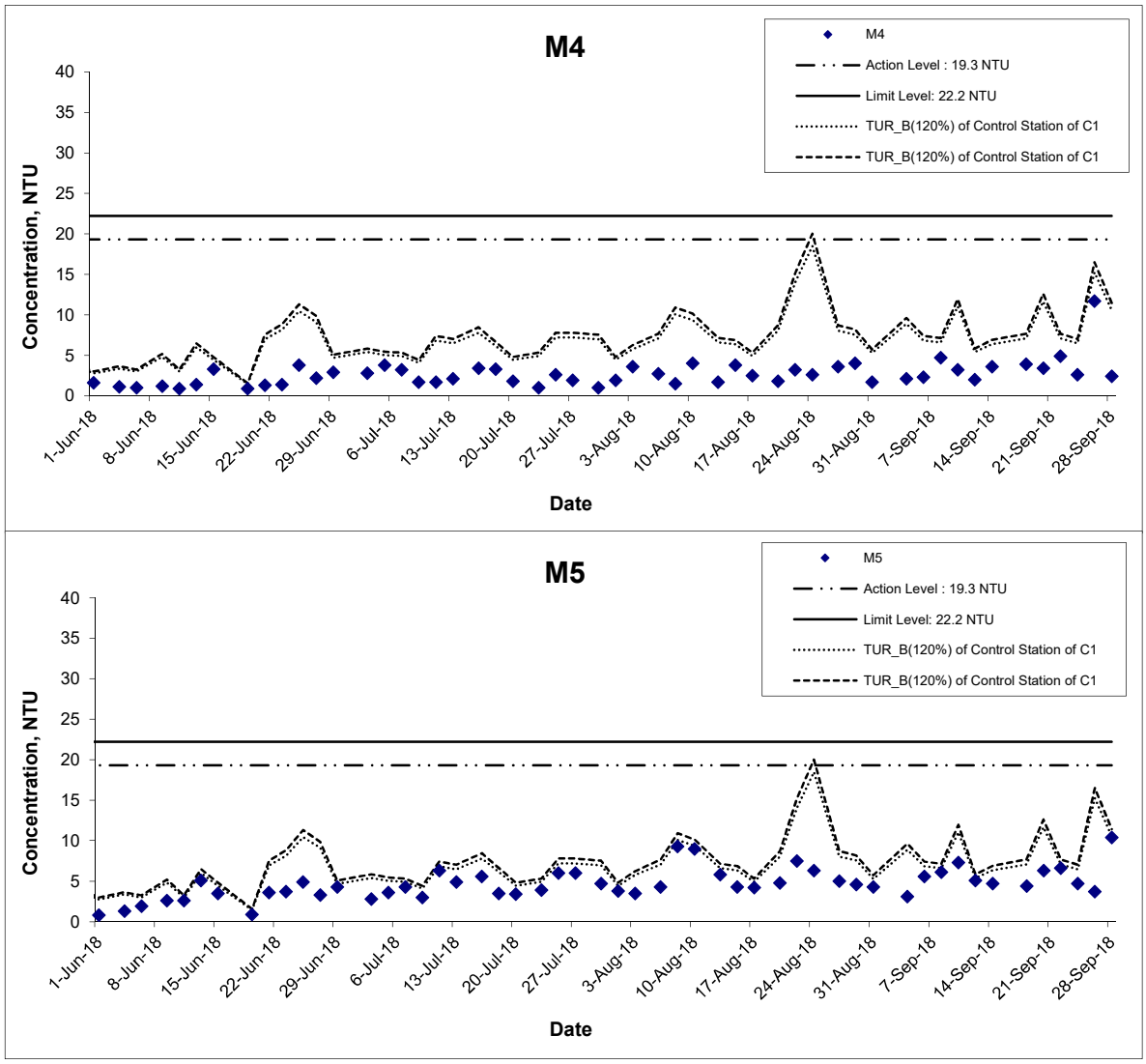
Turbidity (Bottom) at Mid-Flood Tide



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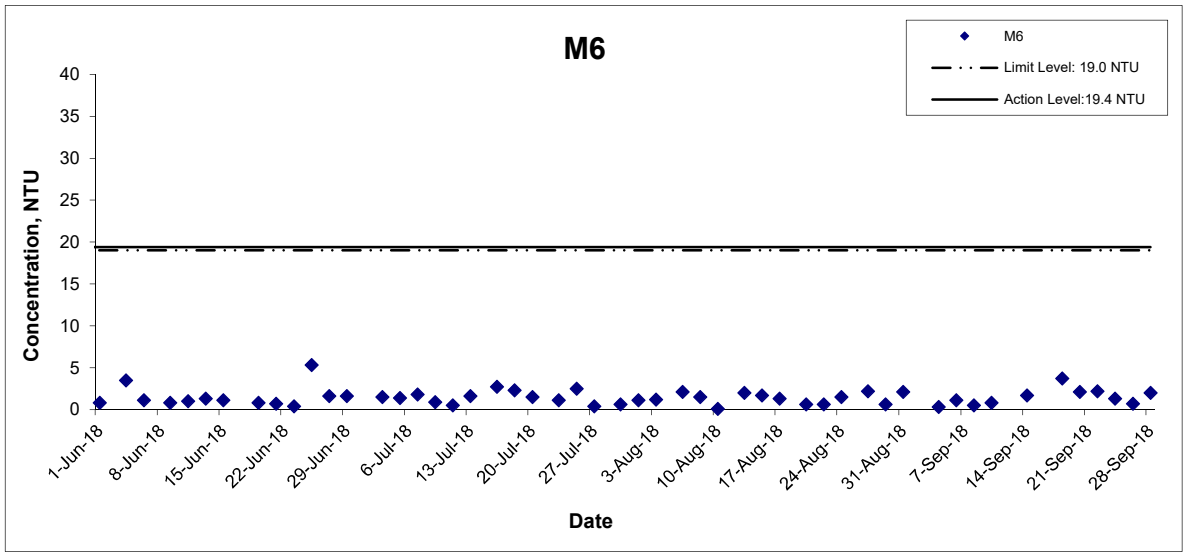
Turbidity (Intake Level of WSD Salt Water Intake) at Mid-Ebb Tide



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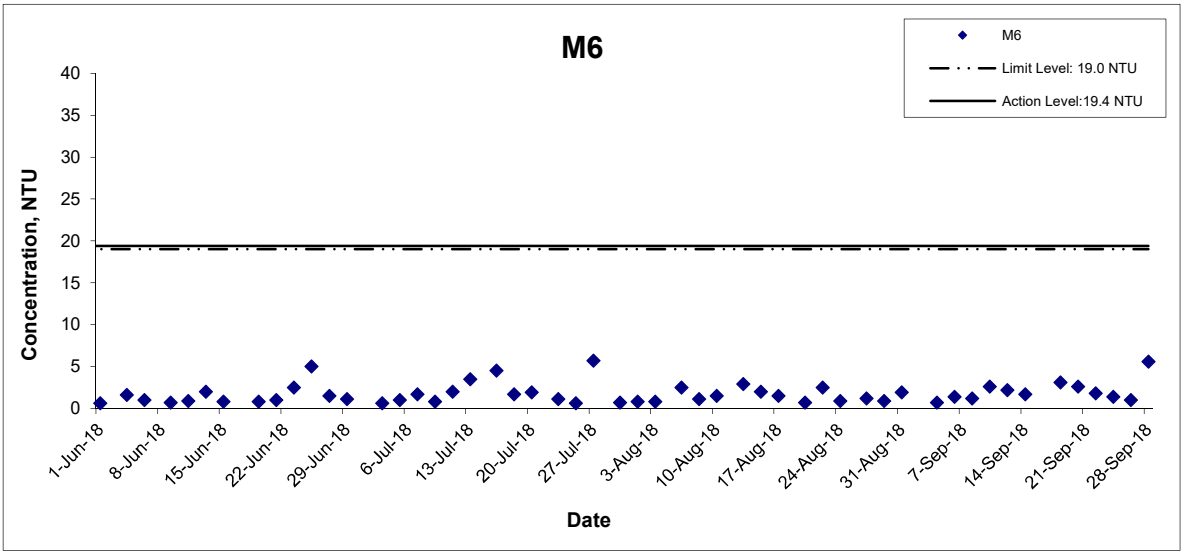
Turbidity (Intake Level of WSD Salt Water Intake) at Mid-Flood Tide



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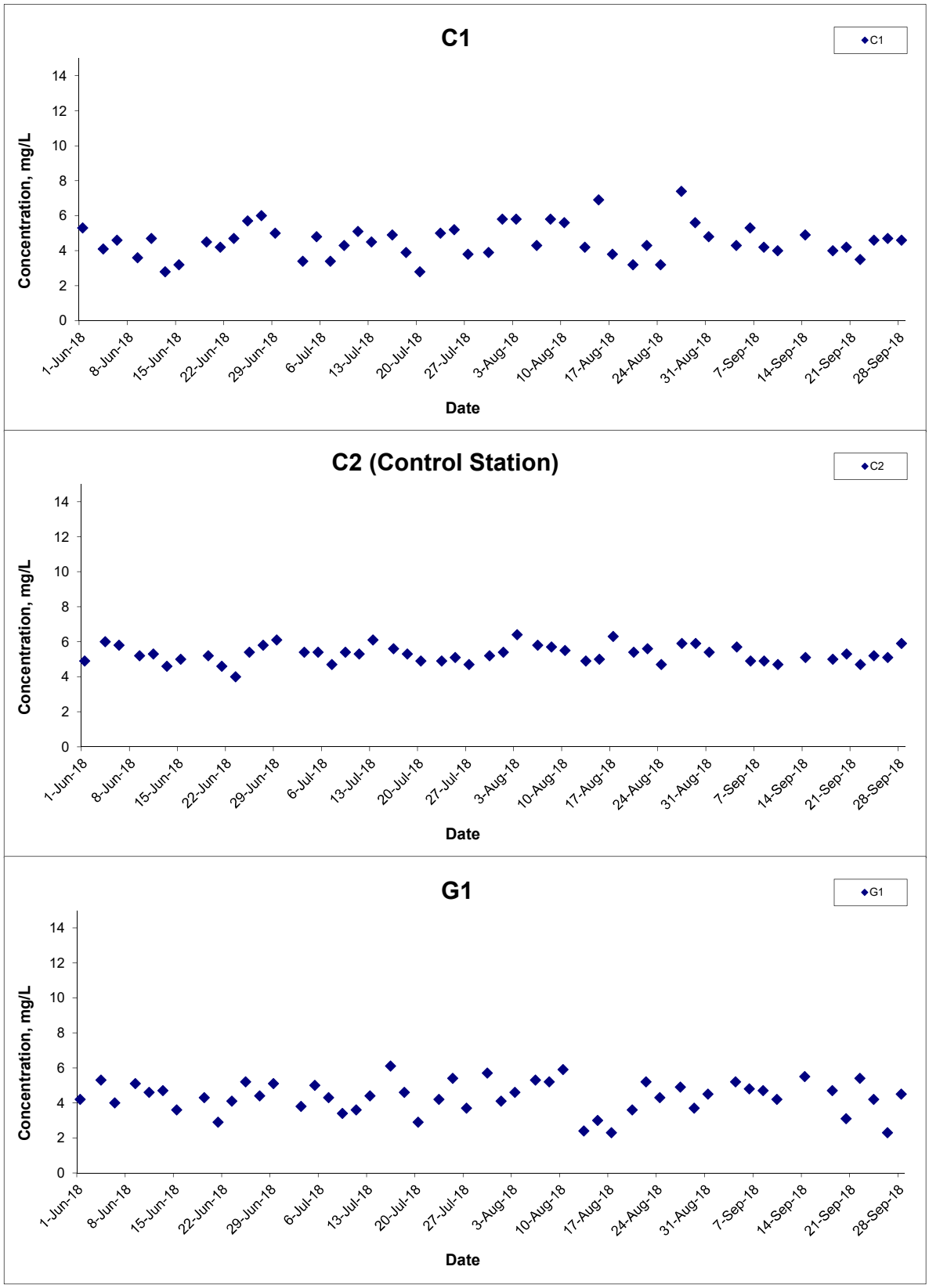
Suspended Solids (Depth-averaged) at Mid-Ebb Tide



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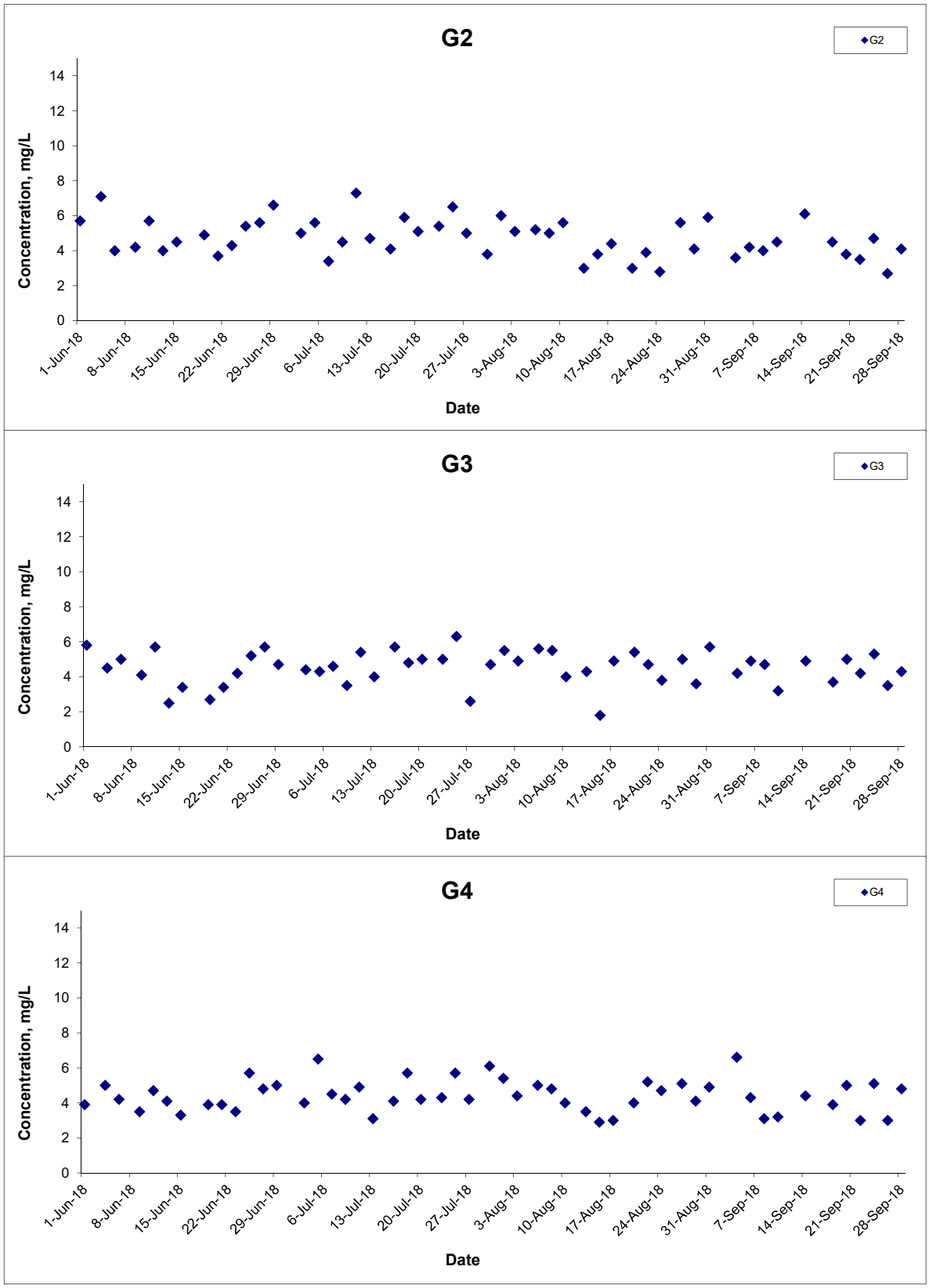

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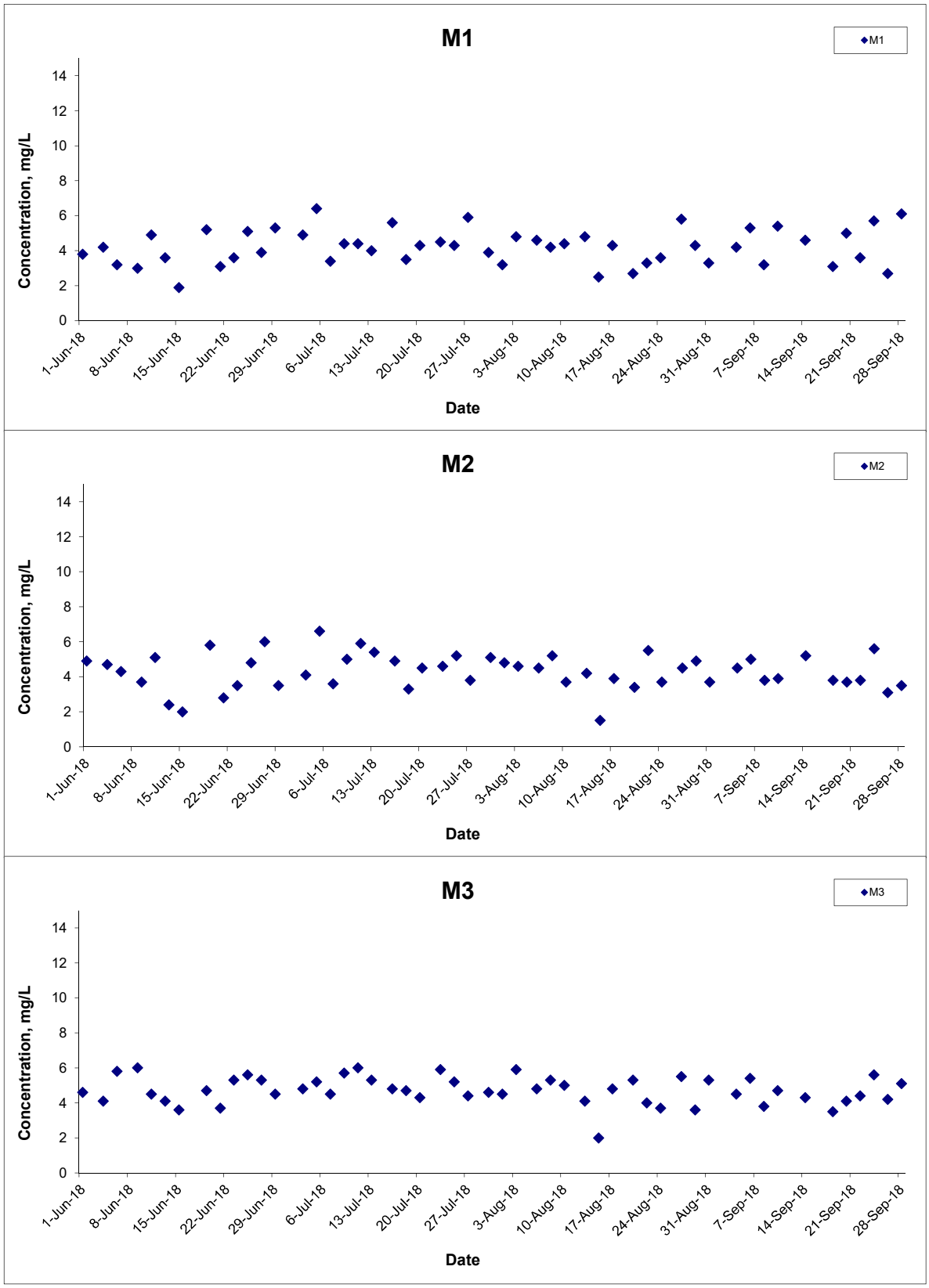

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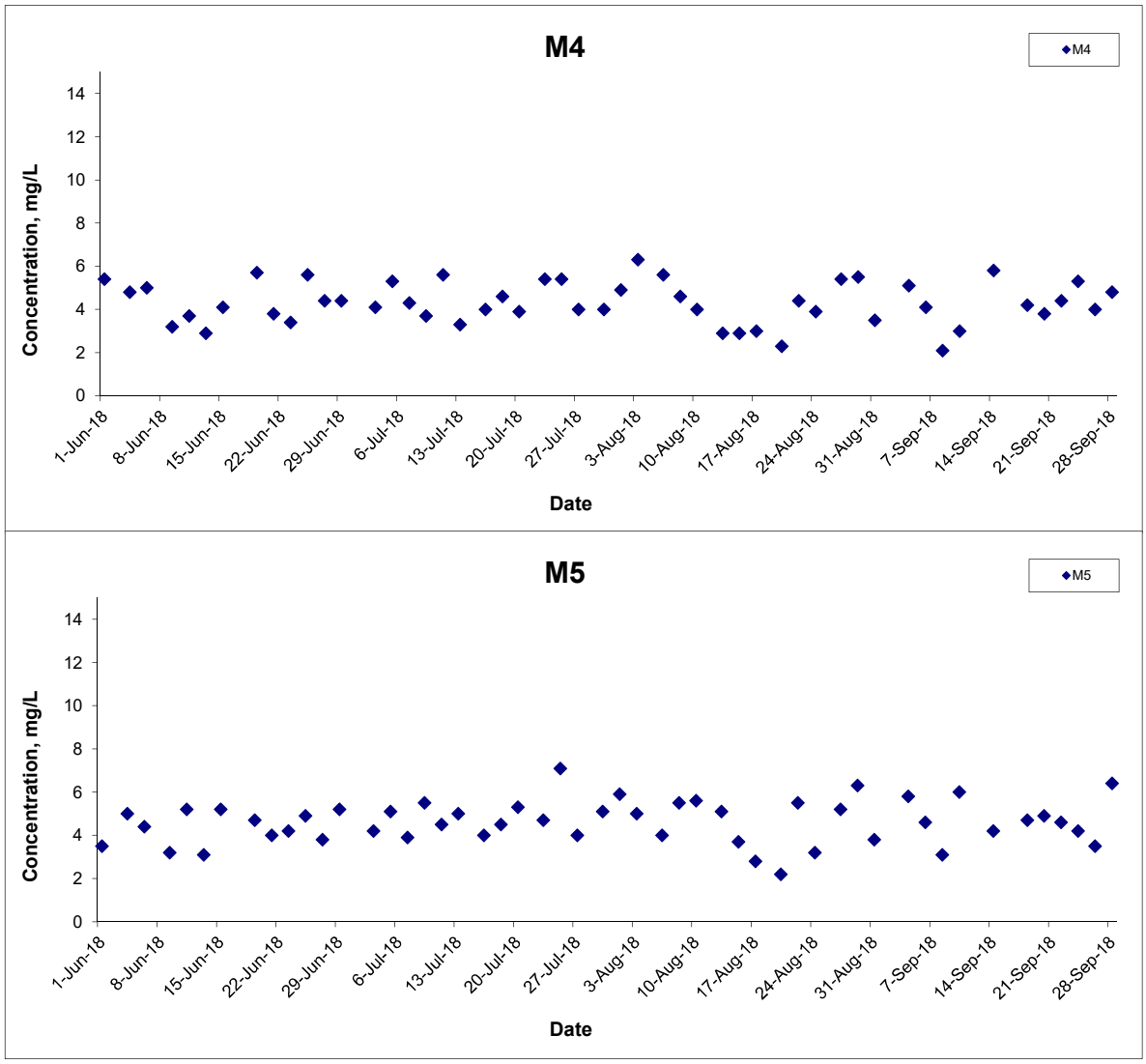

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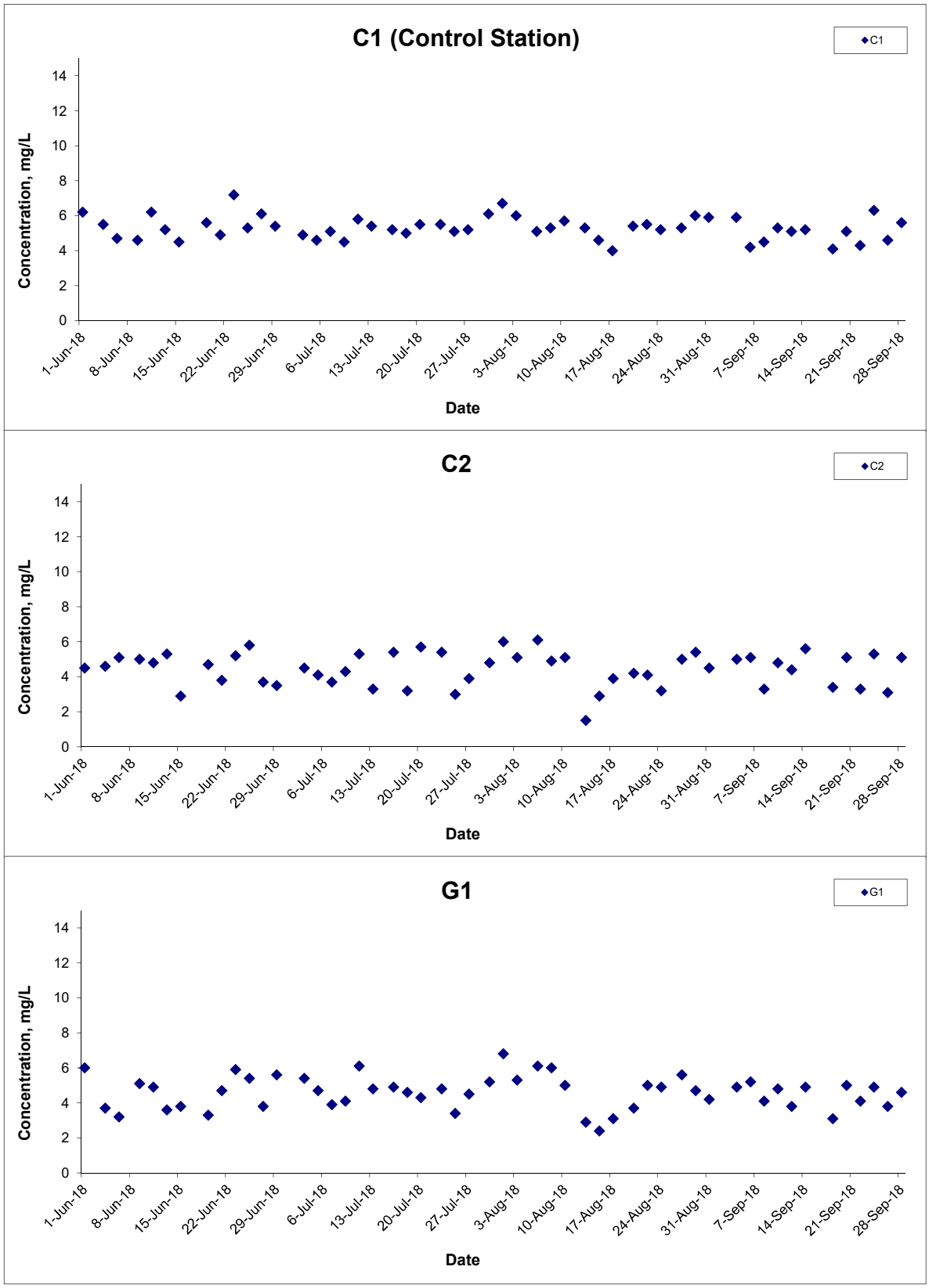

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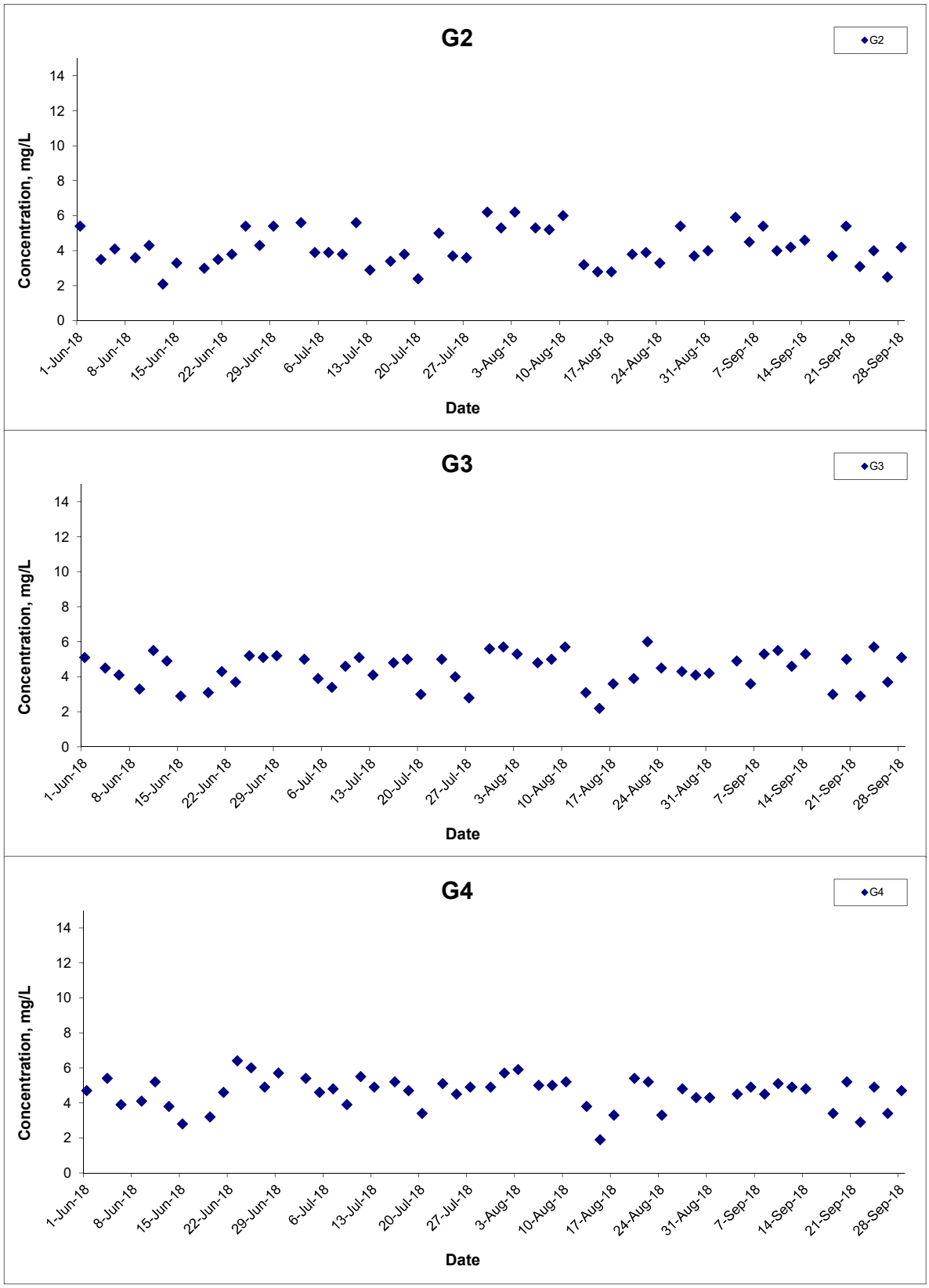

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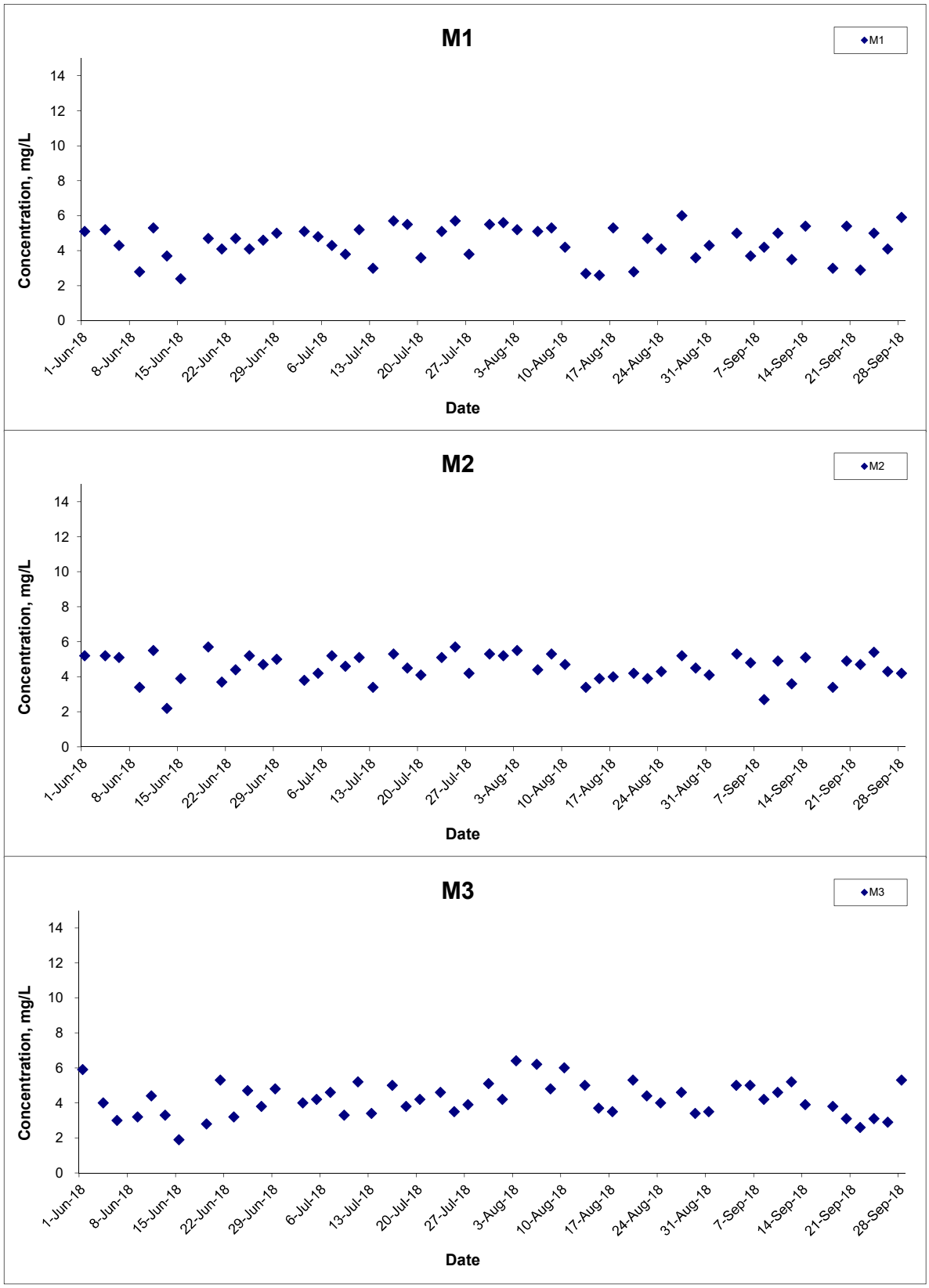

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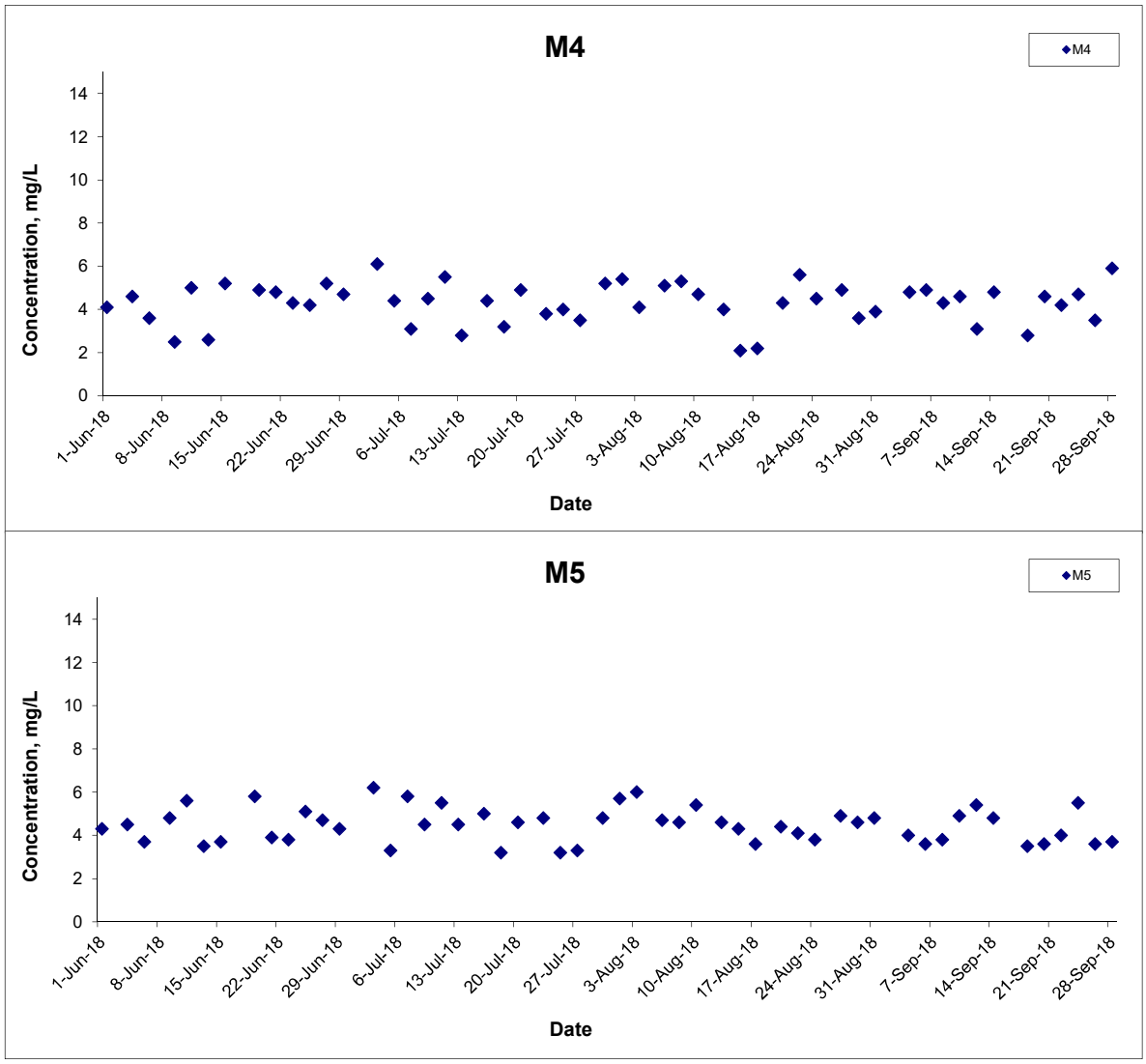

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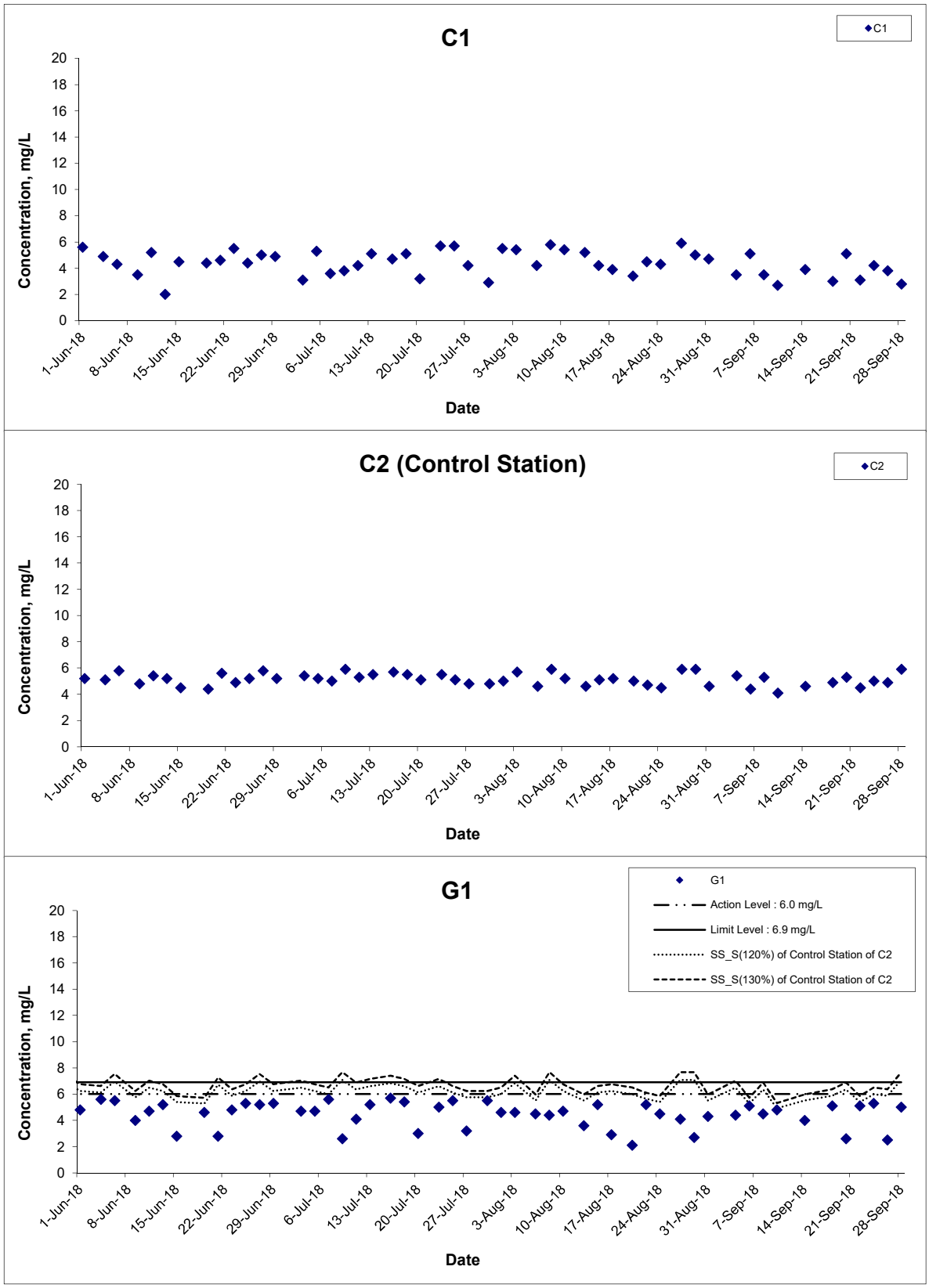
Suspended Solids (Surface) at Mid-Ebb Tide



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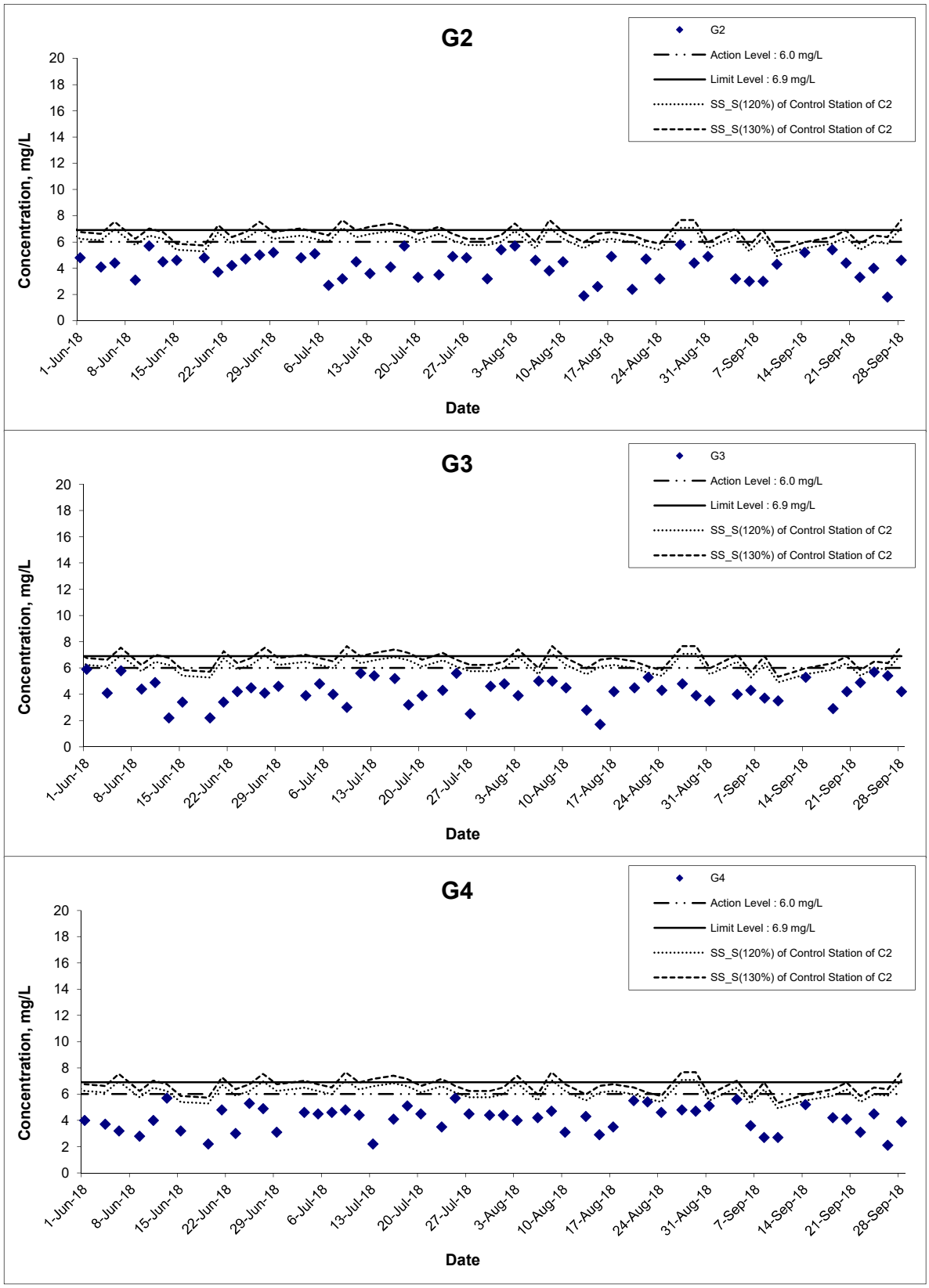
Suspended Solids (Surface) at Mid-Ebb Tide



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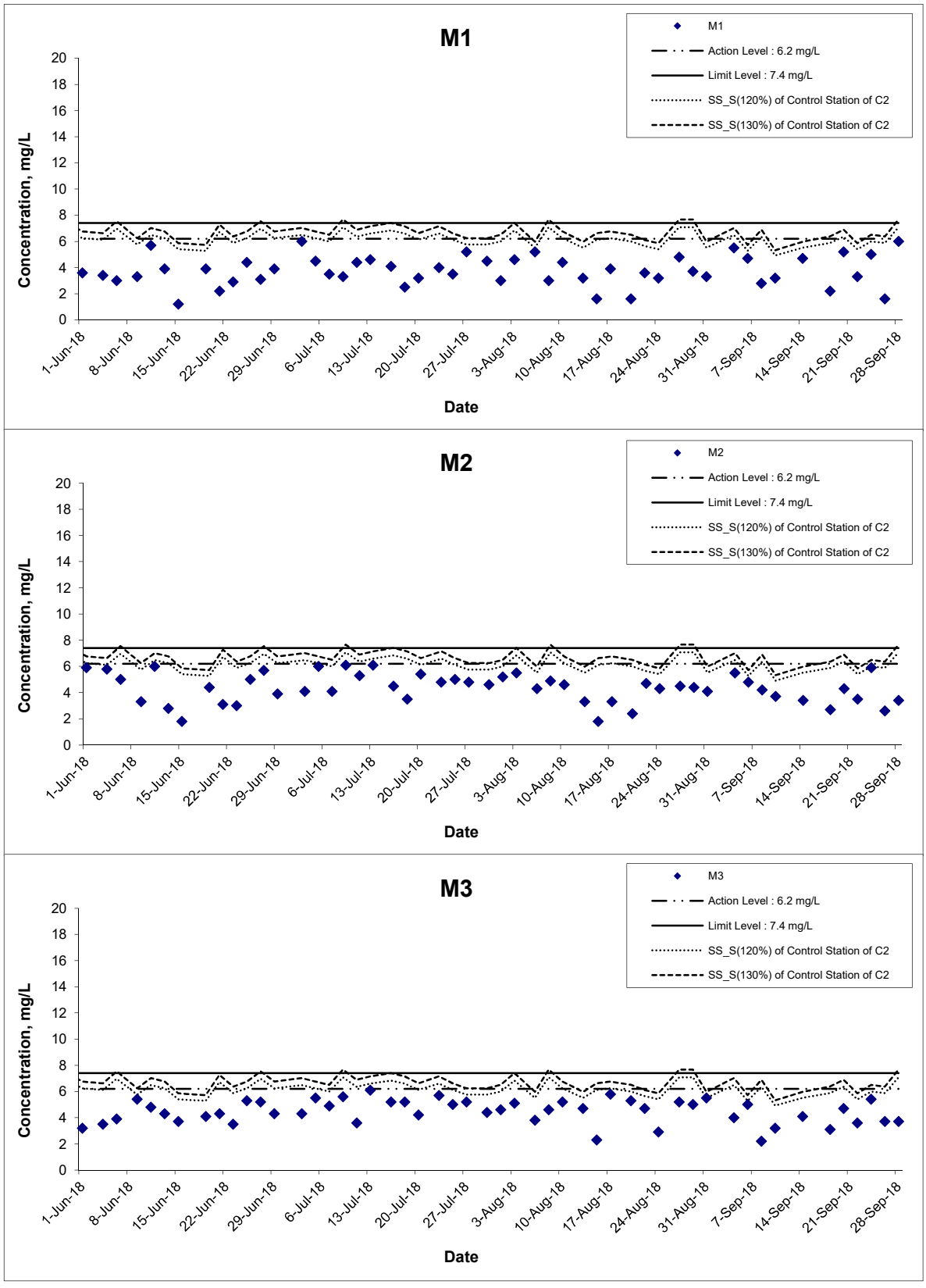
Suspended Solids (Surface) at Mid-Ebb Tide



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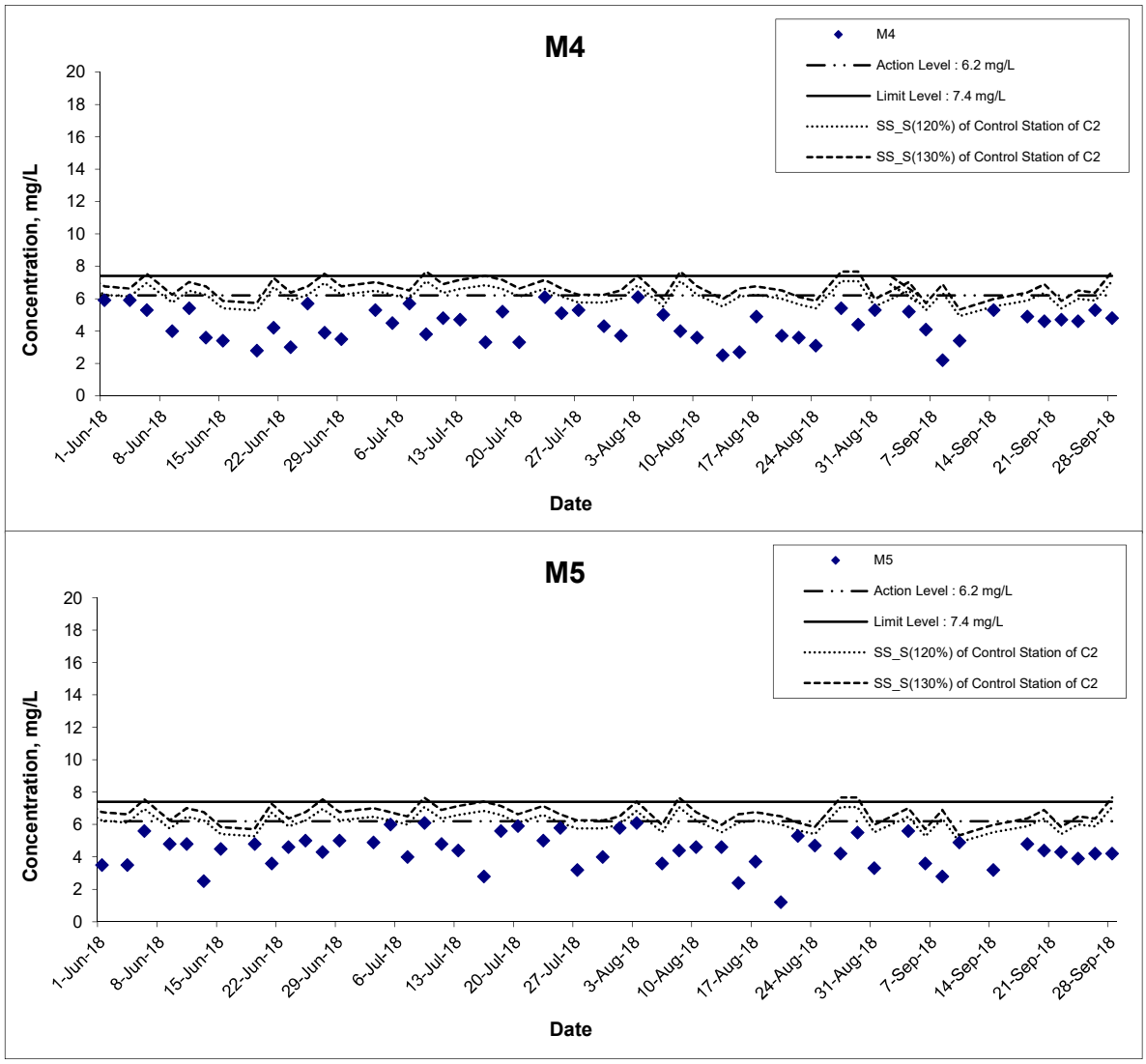

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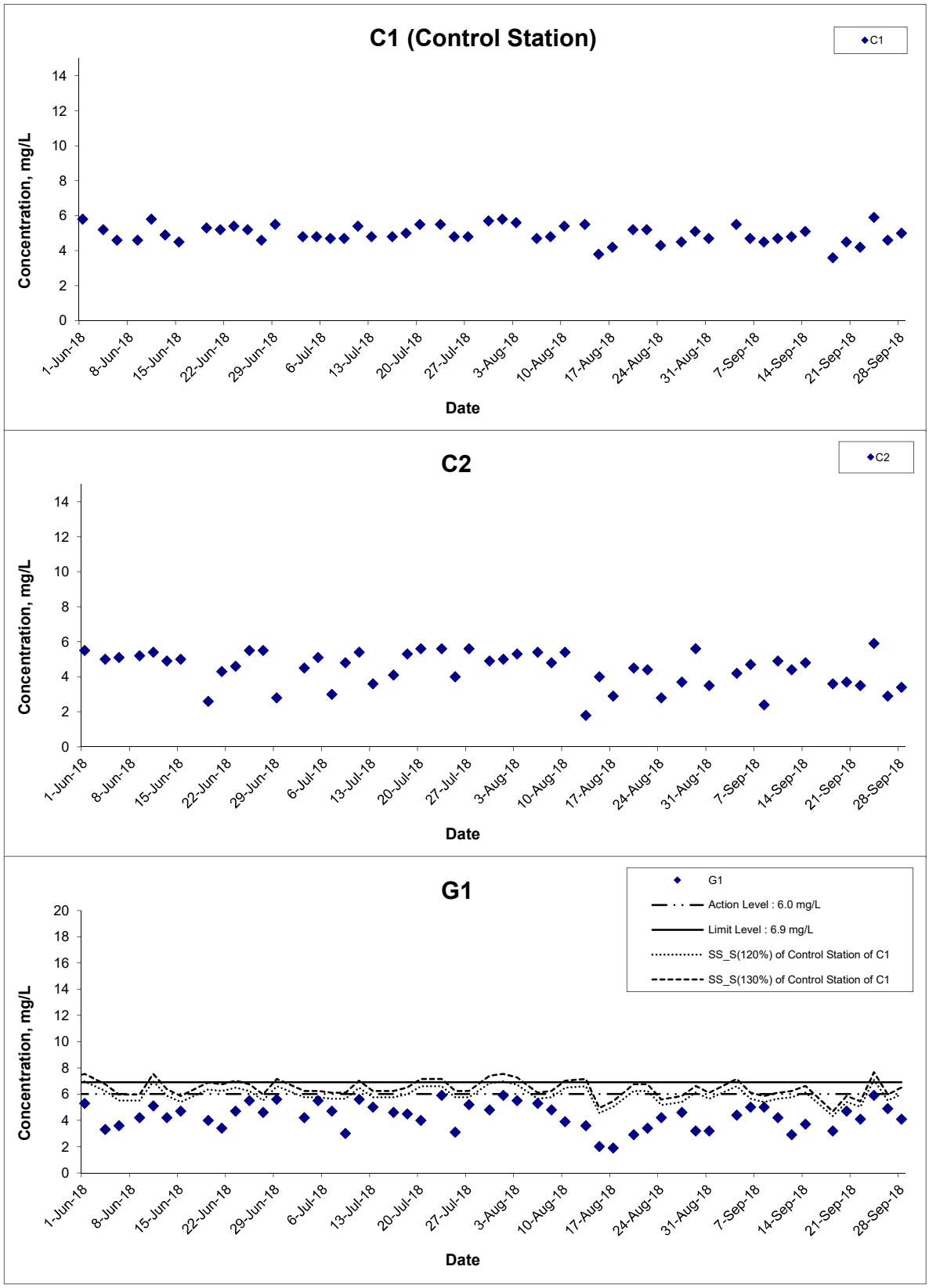
Suspended Solids (Surface) at Mid-Flood Tide



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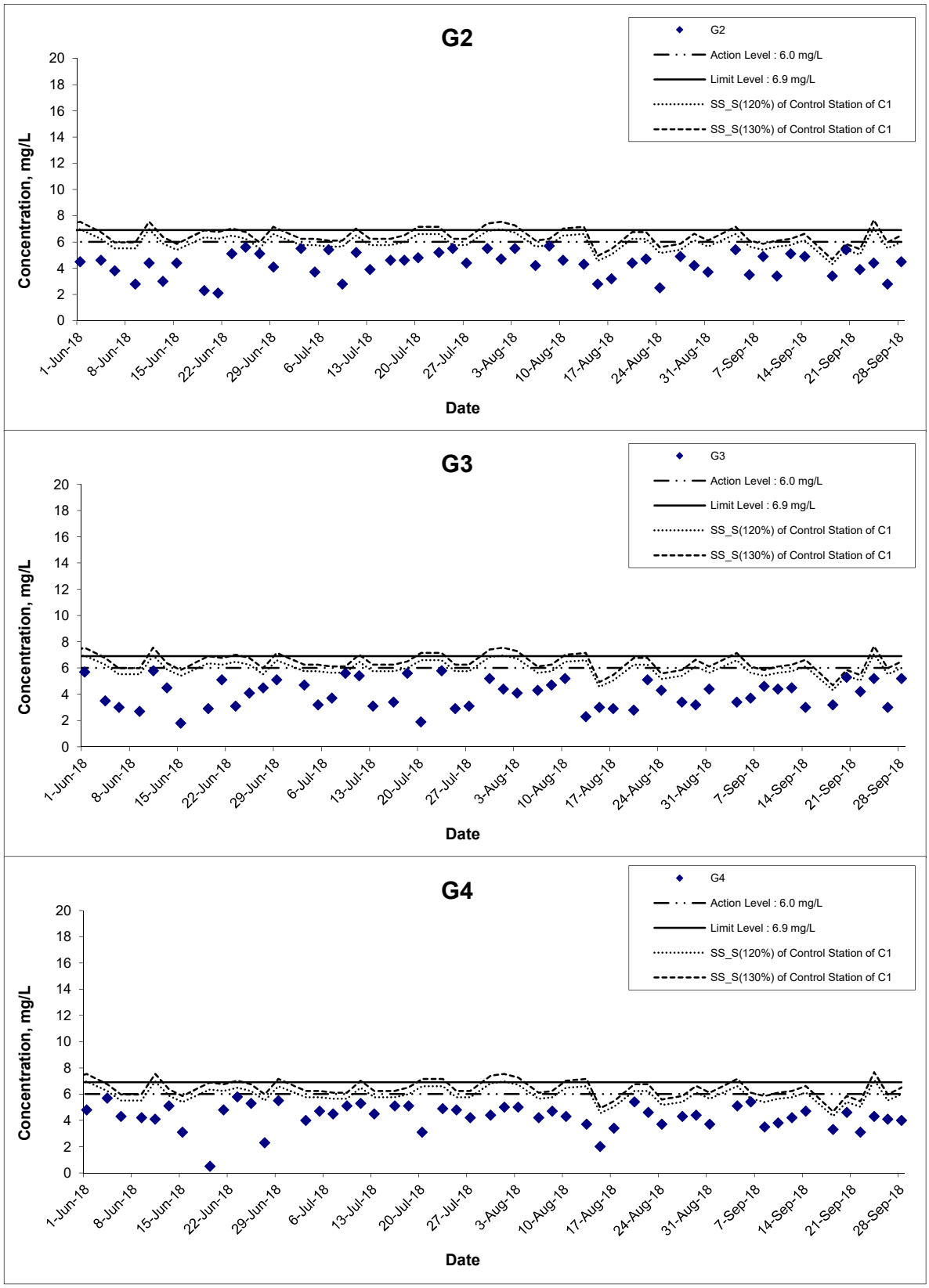

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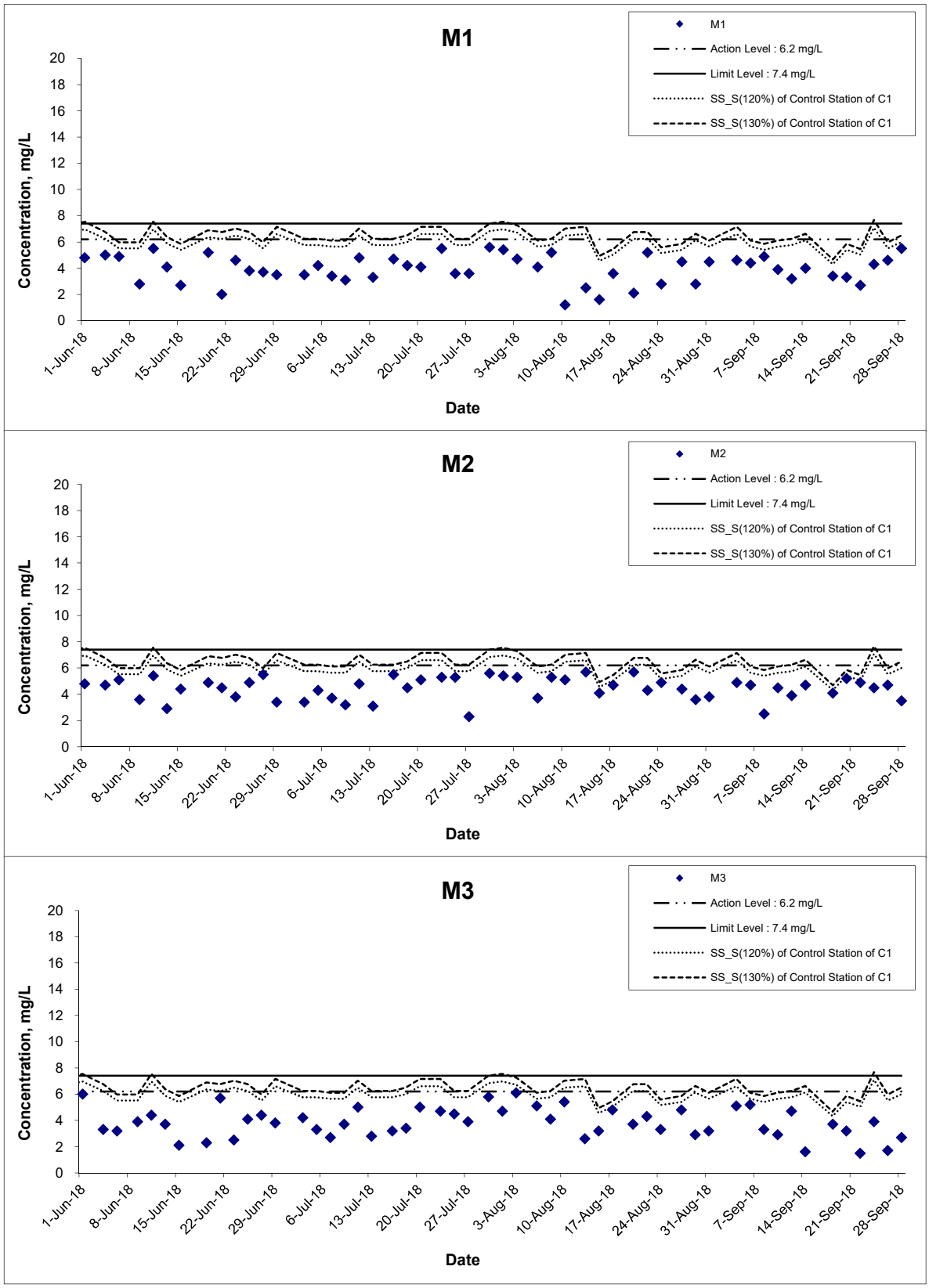
Suspended Solids (Surface) at Mid-Flood Tide



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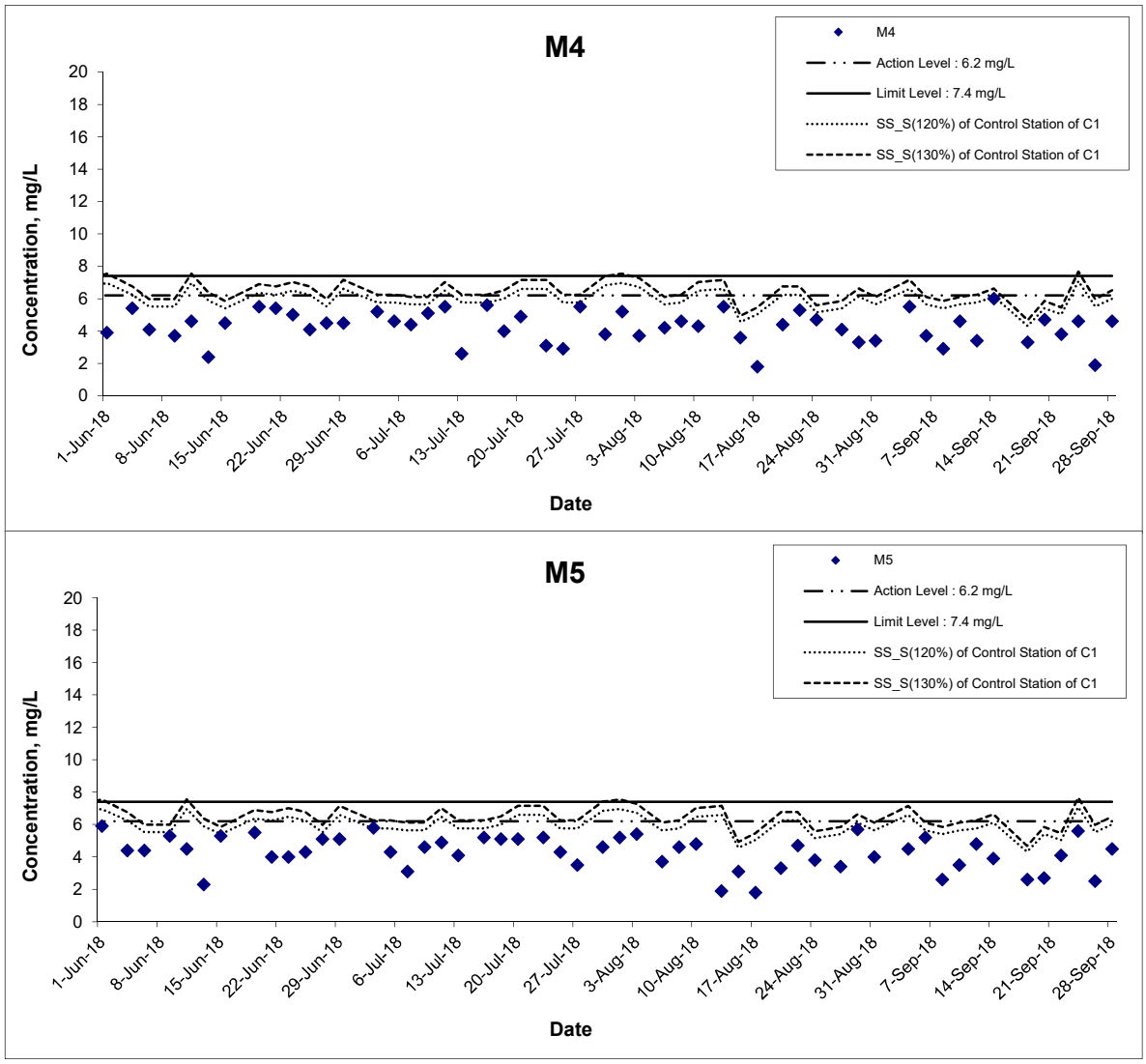
Suspended Solids (Surface) at Mid-Flood Tide



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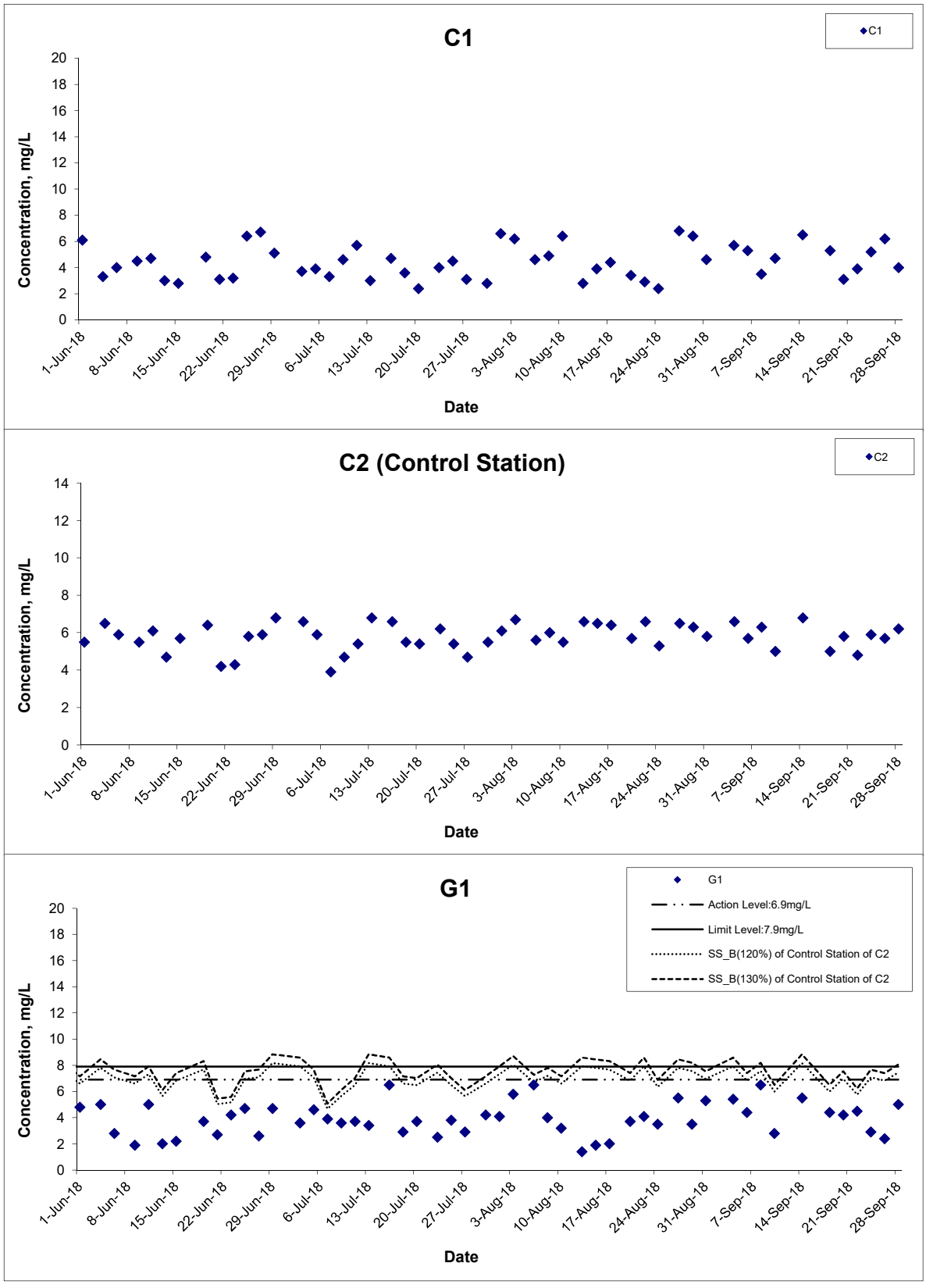
Suspended Solids (Bottom) at Mid-Ebb Tide



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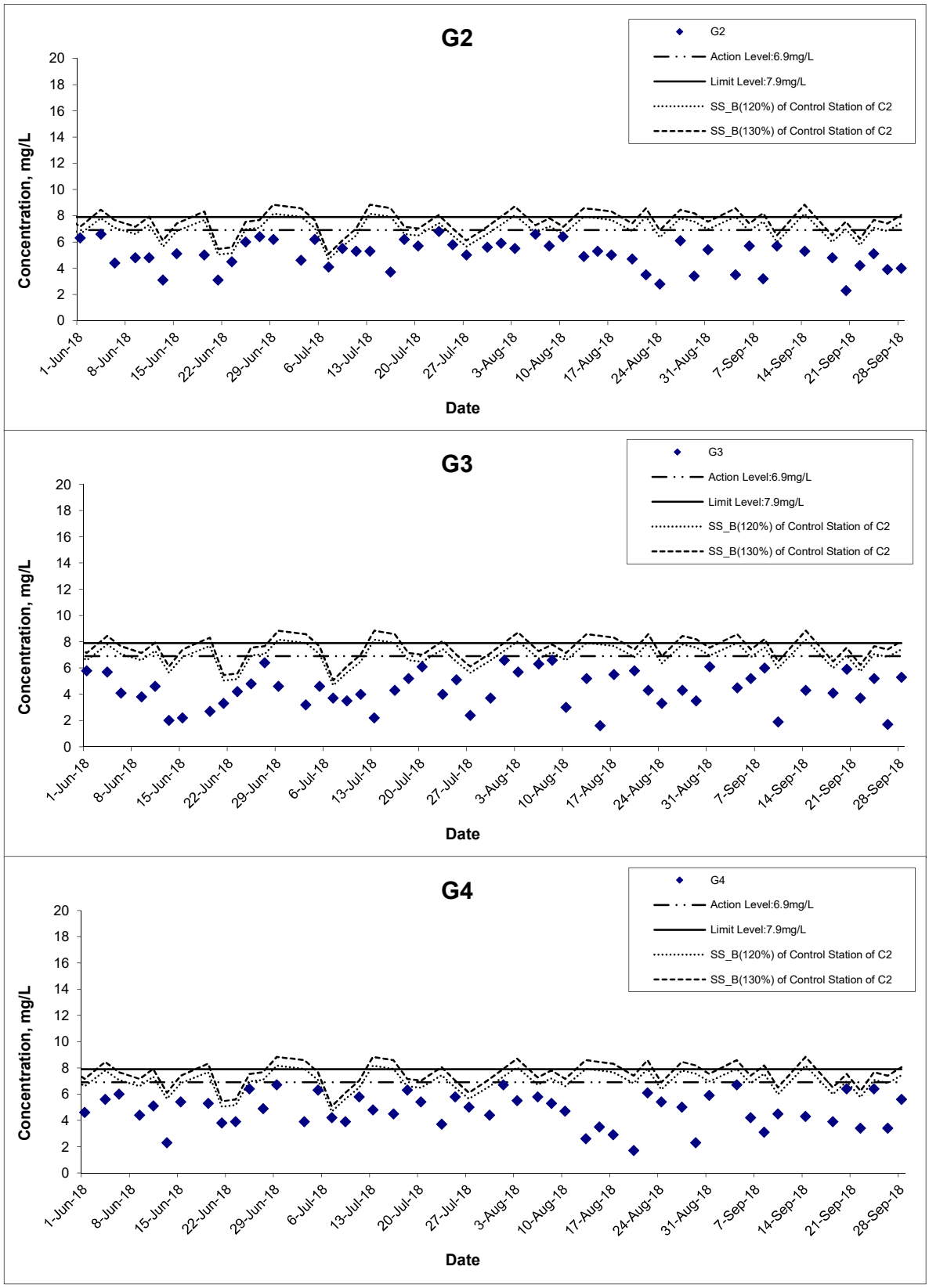
Suspended Solids (Bottom) at Mid-Ebb Tide



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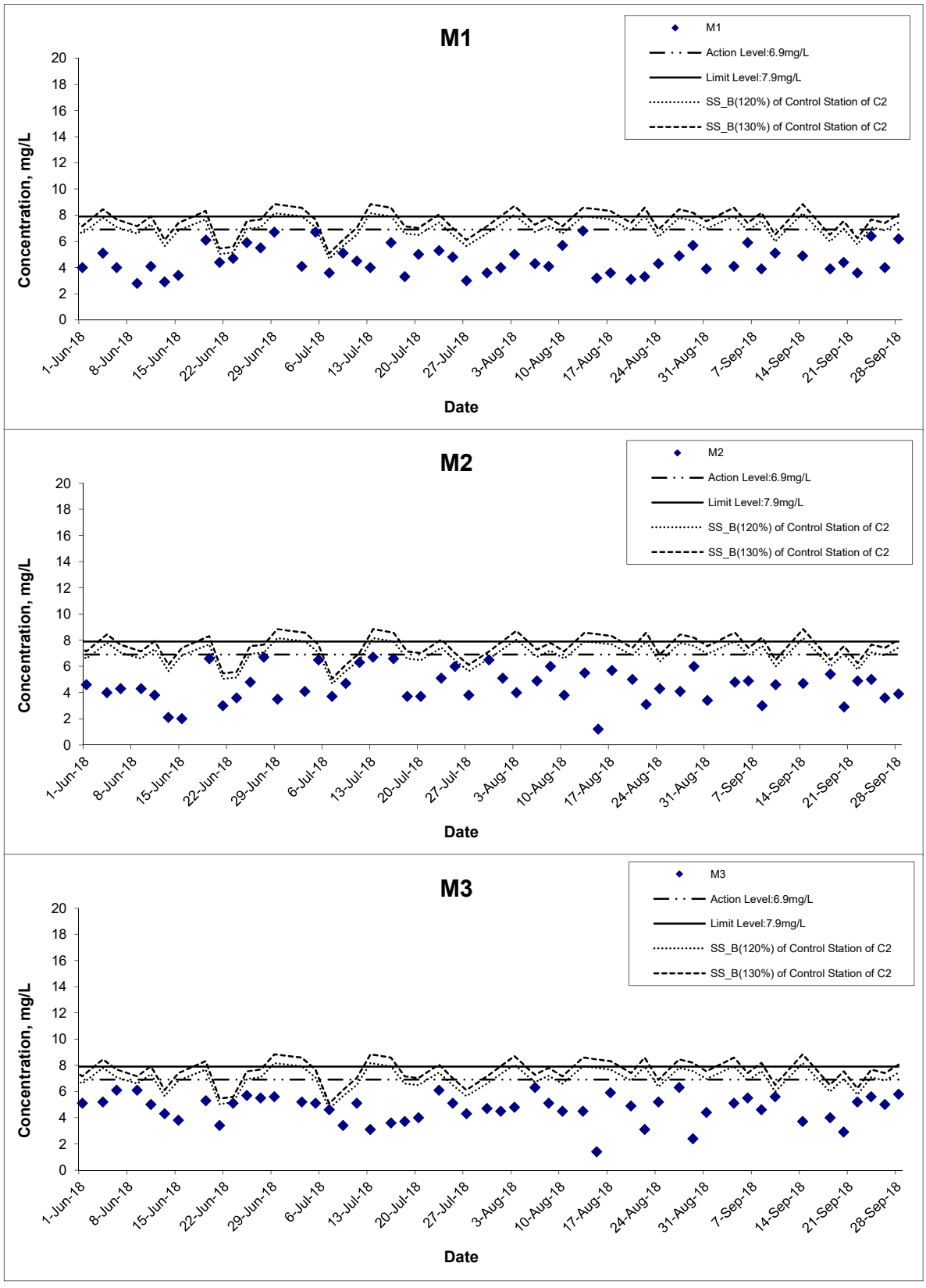
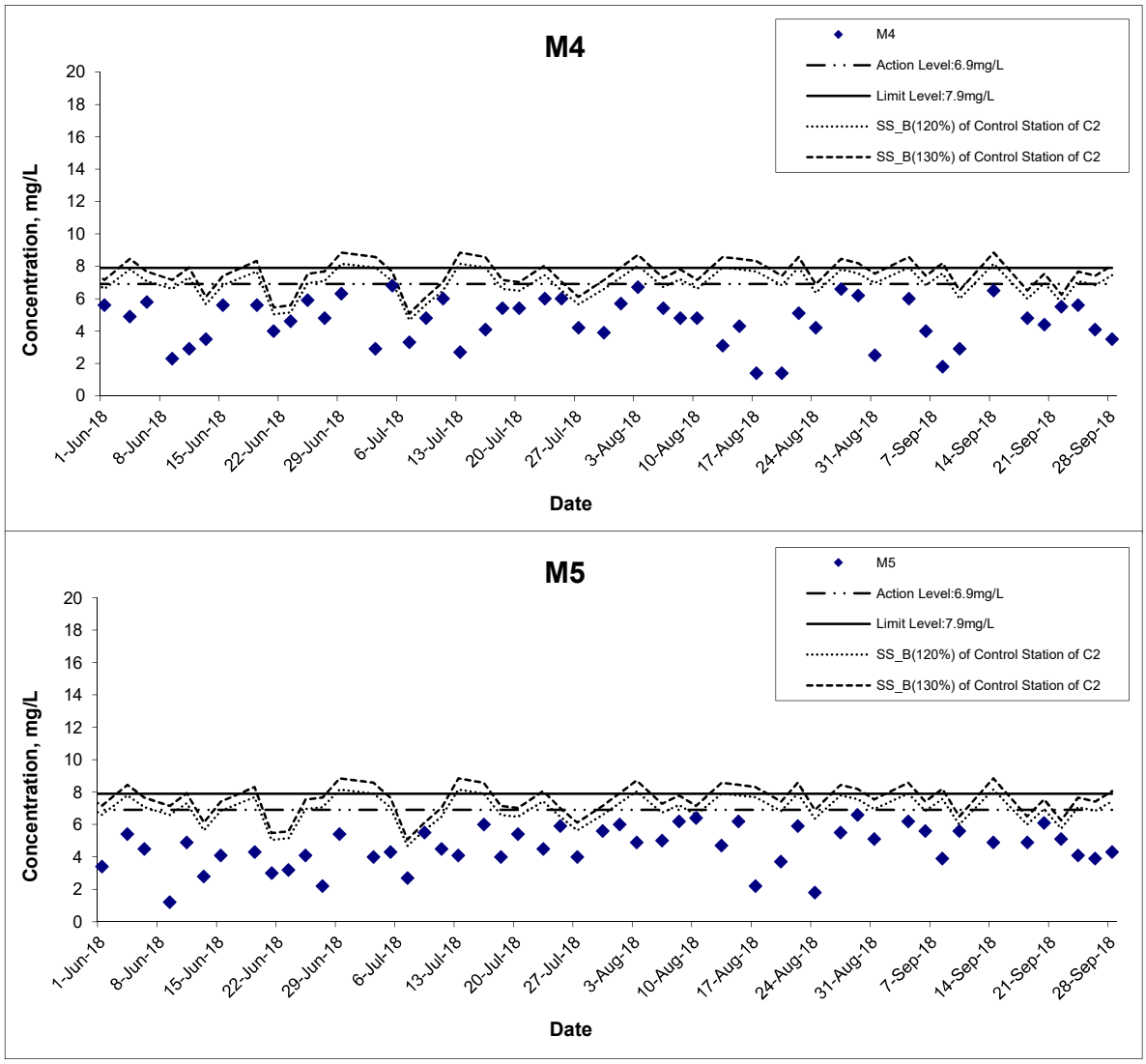
Suspended Solids (Bottom) at Mid-Ebb Tide



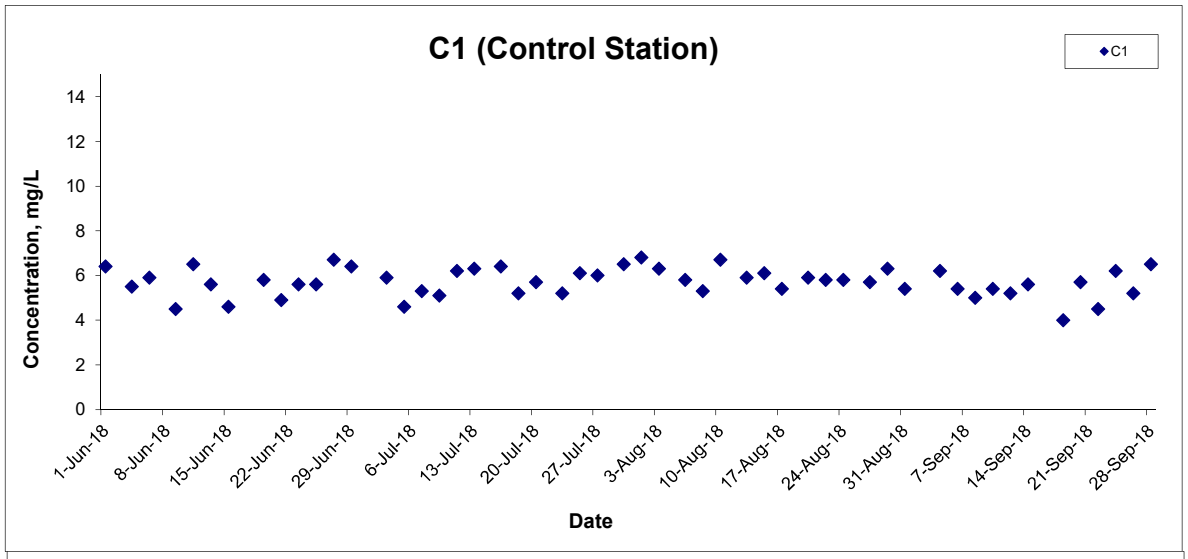
Title: Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA16034	CINOTECH
	Date: Sep 18	Appendix: I	

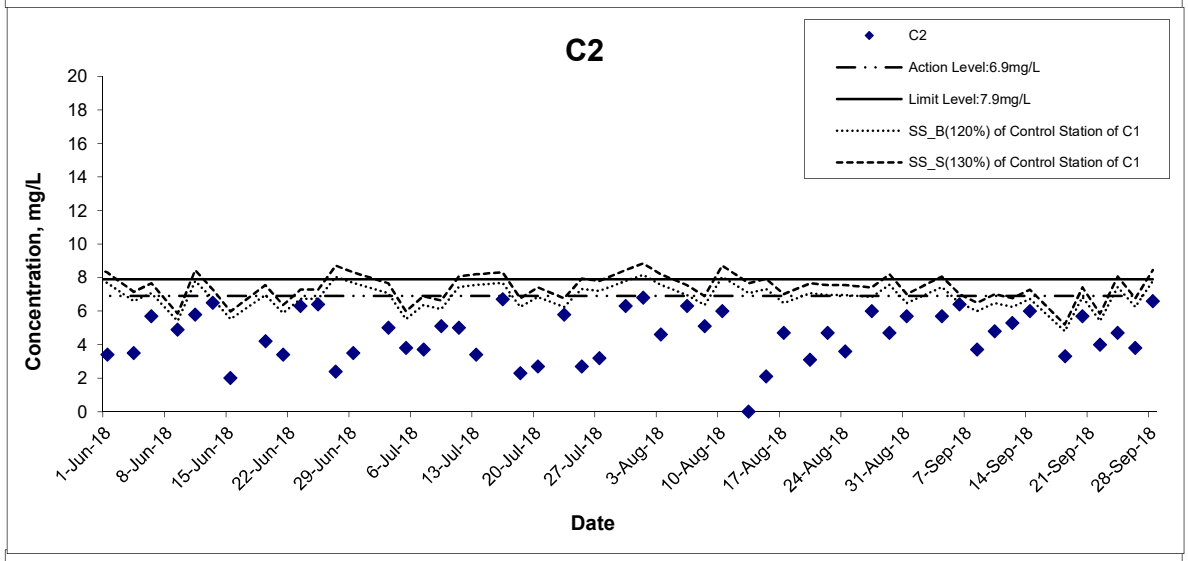
Suspended Solids (Bottom) at Mid-Ebb Tide

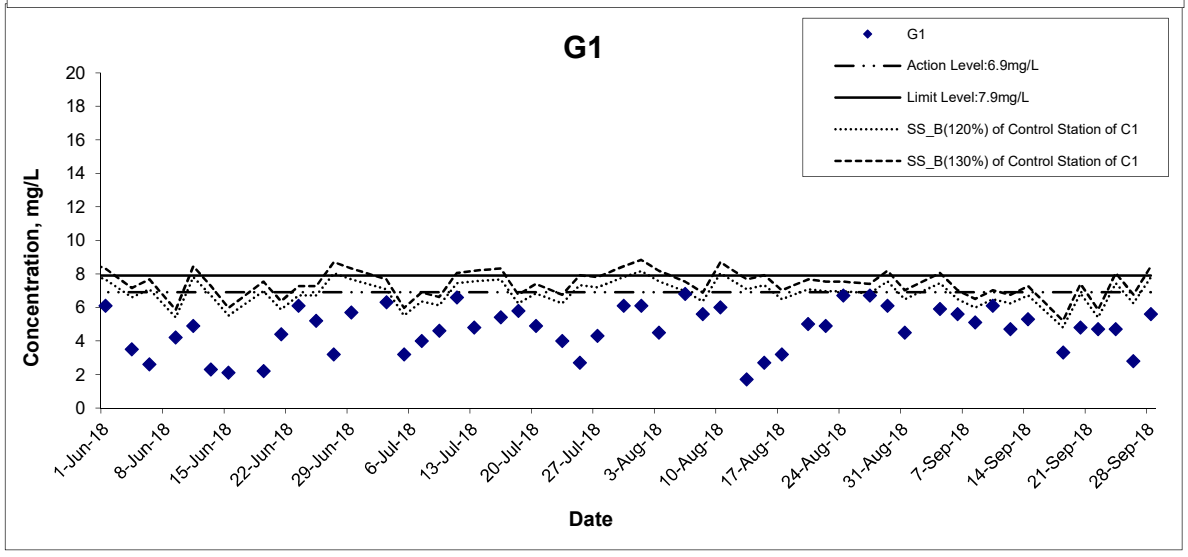


Title: Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA16034	CINOTECH
	Date: Sep 18	Appendix: I	

Suspended Solids (Bottom) at Mid-Flood Tide

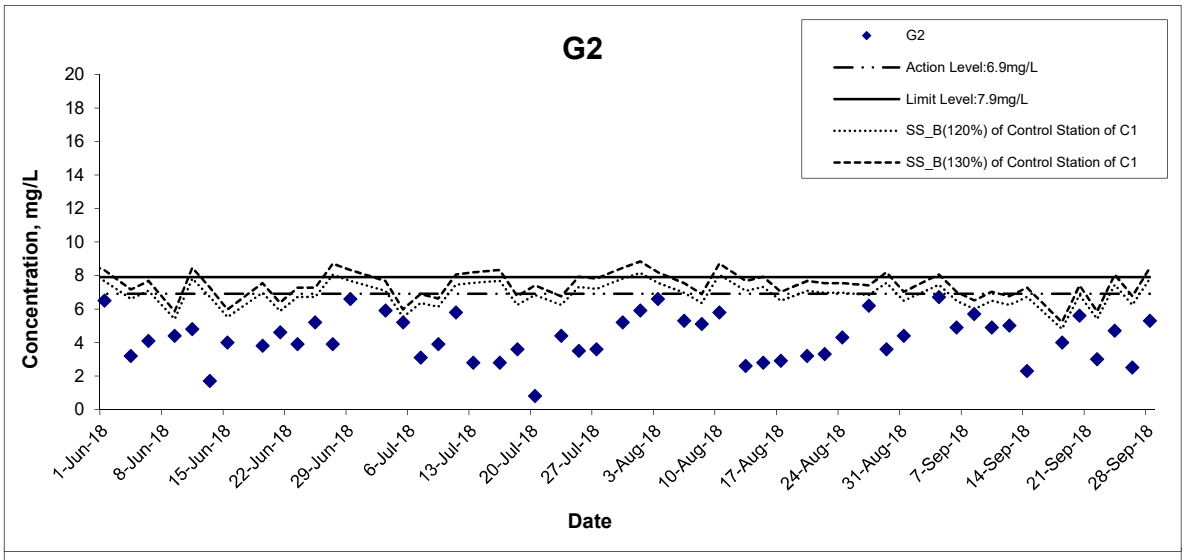


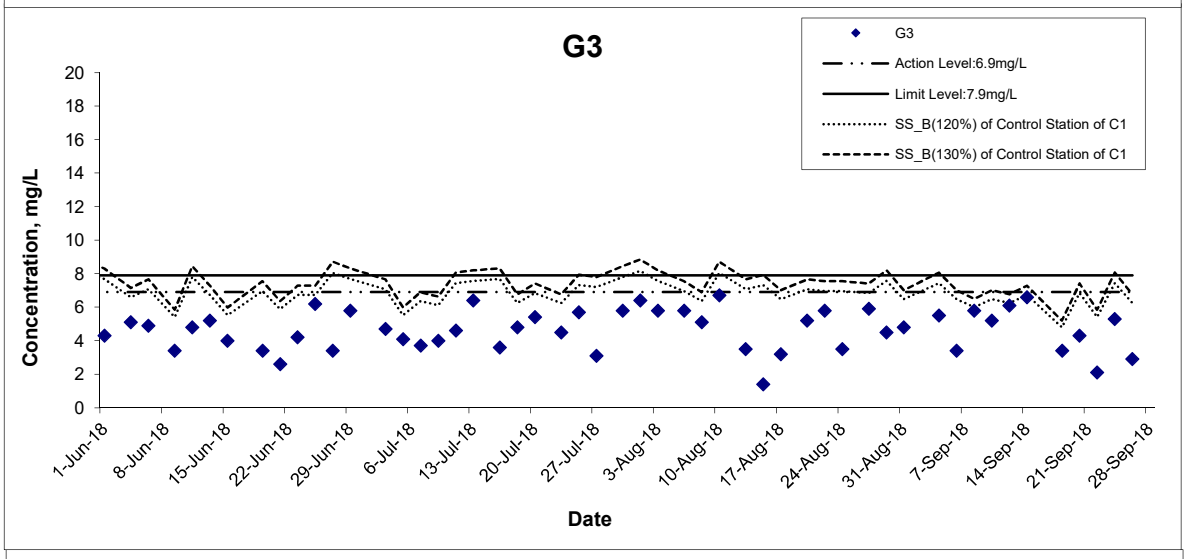


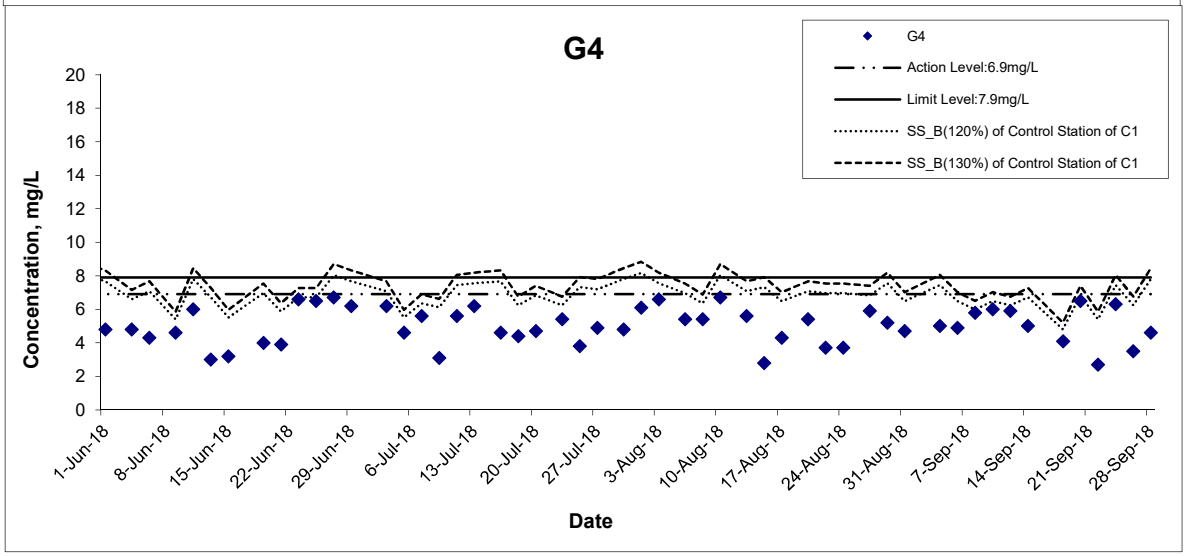


Title: Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA16034	CINOTECH
	Date: Sep 18	Appendix: I	

Suspended Solids (Bottom) at Mid-Flood Tide

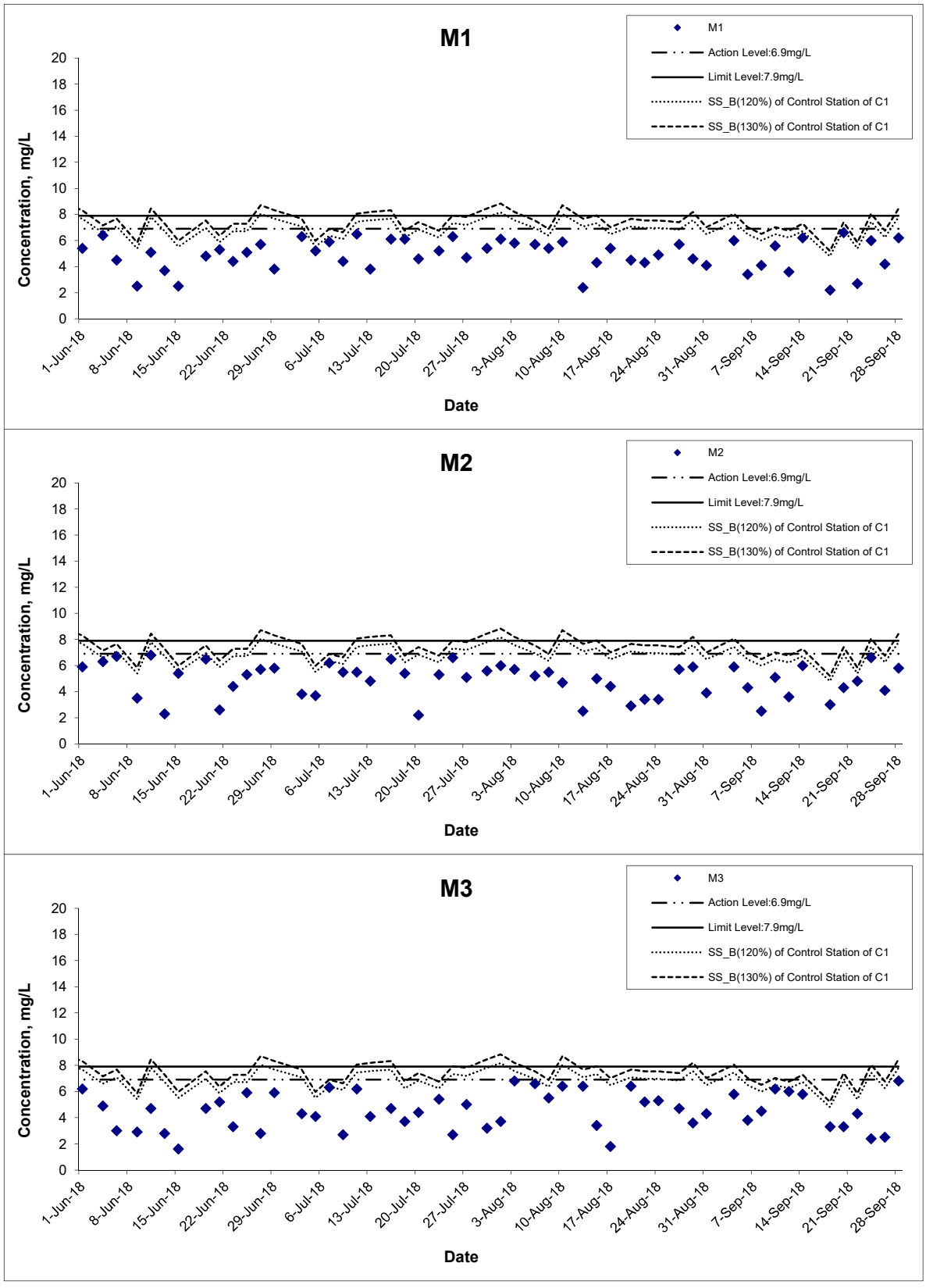






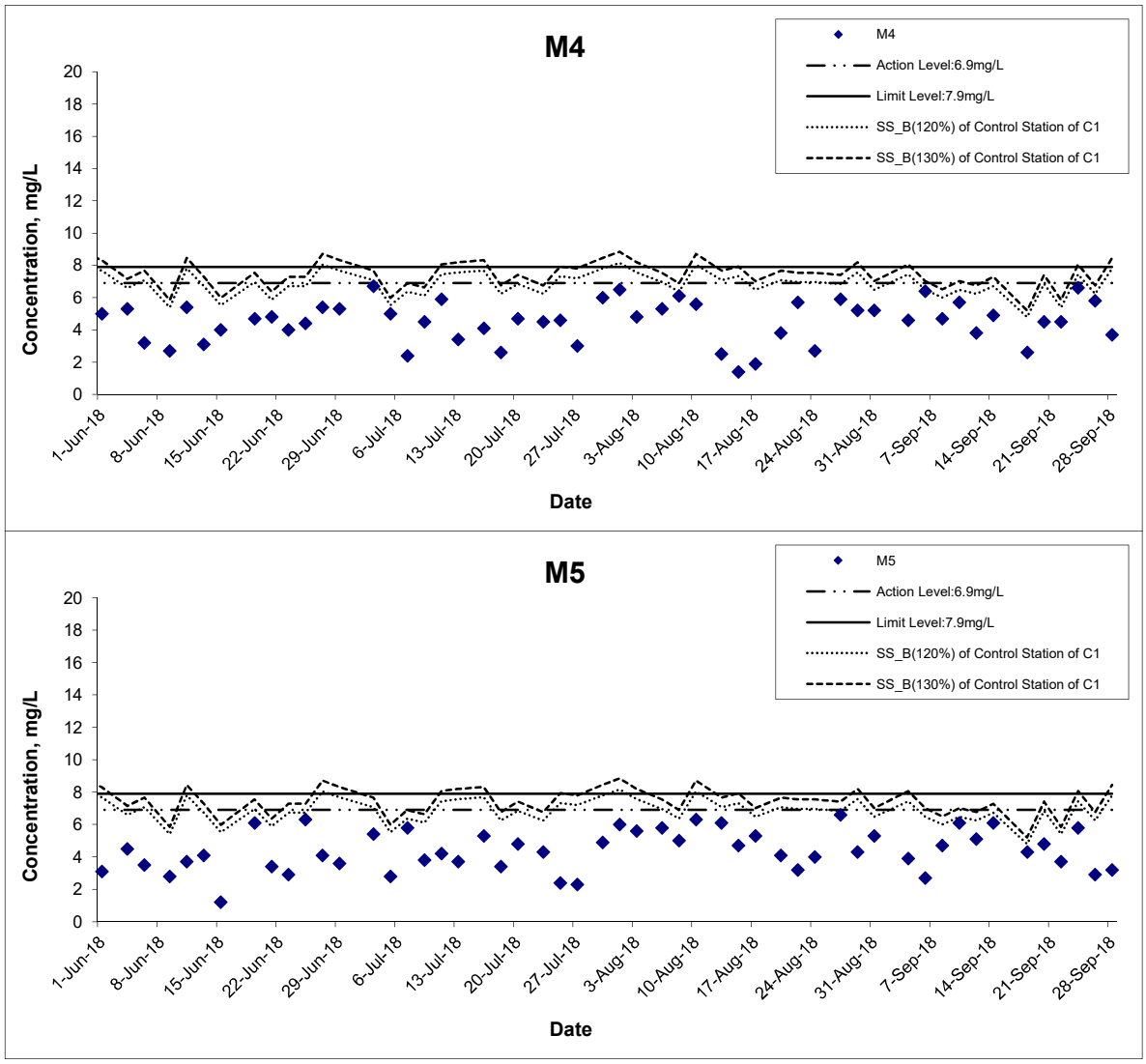
Title: Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA16034	CINOTECH
	Date: Sep 18	Appendix: I	

Suspended Solids (Bottom) at Mid-Flood Tide



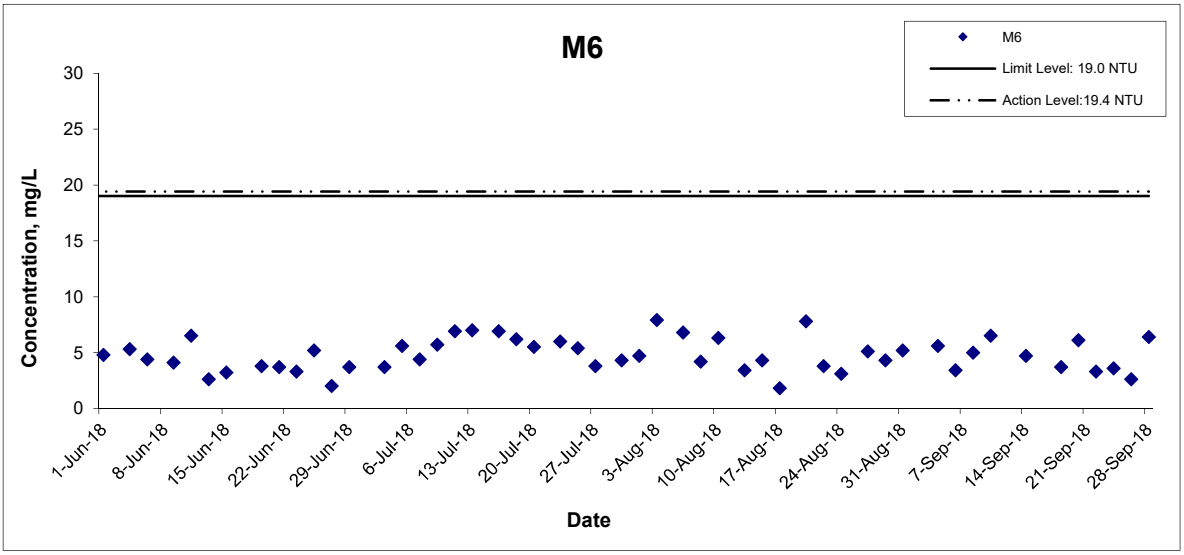
Title: Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA16034	CINOTECH
	Date: Sep 18	Appendix: I	

Suspended Solids (Bottom) at Mid-Flood Tide



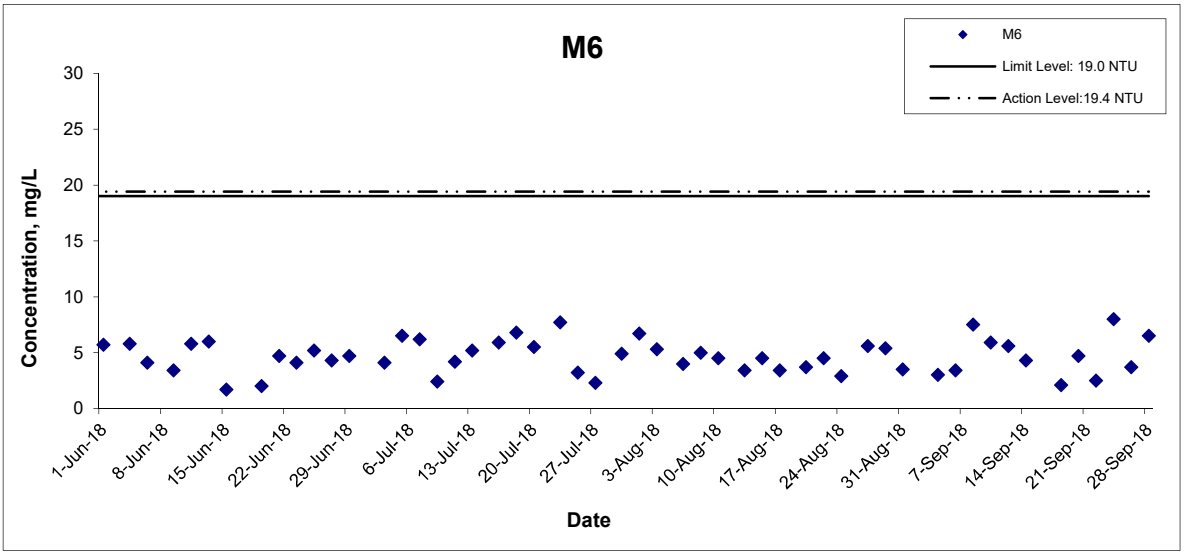
Title: Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA16034	CINOTECH
	Date: Sep 18	Appendix: I	

Suspended Solids (Intake Level of WSD Salt Water Intake) at Mid-Ebb Tide



Title	Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S Date Sep 18	Project No. MA16034 Appendix I	CINOTECH

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



Title	Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA16034	CINOTECH
		Date Sep 18	Appendix I	

Water Quality Monitoring Results at W1 - Mid-Ebb Tide

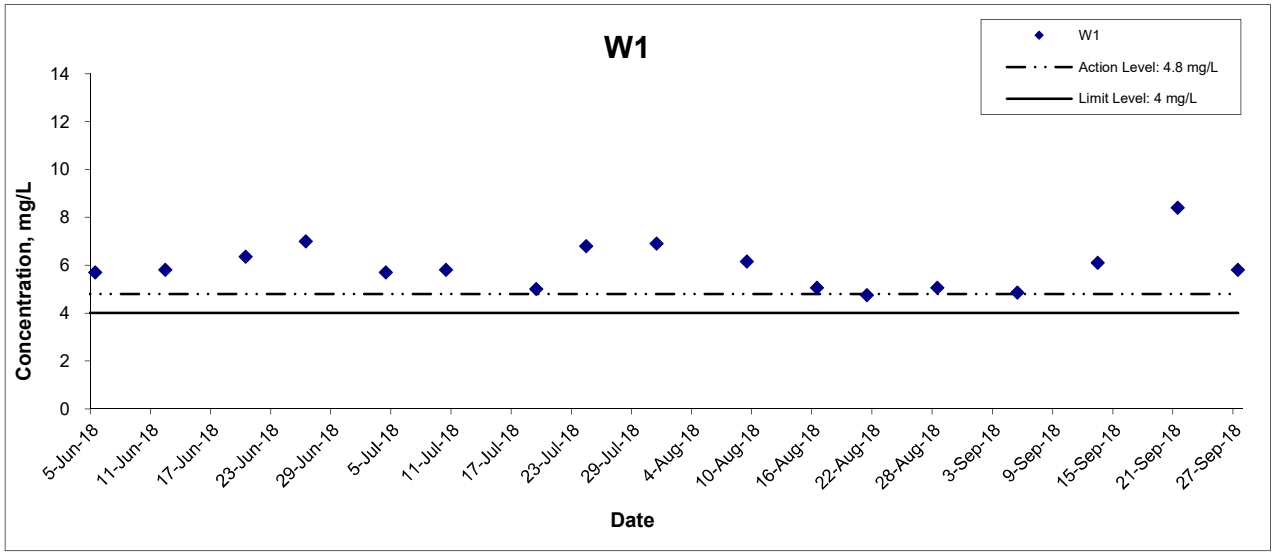
Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*
5-Sep-18	Sunny	Calm	09:08	Surface	1	26.2 26.2	26.2	8.3 8.4	8.4	31.1 31.0	31.1	75.9 75.1	75.5	5.2 5.1	5.2	5.2
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-	
				Bottom	3.4	25.8 25.8	25.8	8.4 8.4	8.4	31.5 31.5	31.5	66.0 63.9	65.0	4.5 4.4	4.5	4.5
13-Sep-18	Cloudy	Calm	13:45	Surface	1	26.7 26.7	26.7	7.9 7.9	7.9	32.3 32.3	32.3	92.6 92.4	92.5	6.2 6.2	6.2	6.2
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-	
				Bottom	4	26.7 26.7	26.7	7.9 7.9	7.9	32.4 32.4	32.4	89.2 89.1	89.2	6.0 6.0	6.0	6.0
21-Sep-18	Sunny	Calm	10:08	Surface	1	28.7 28.7	28.7	8.8 8.8	8.8	31.6 31.6	31.6	135.7 136.0	135.9	8.8 8.8	8.8	8.8
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-	
				Bottom	3.5	28.2 28.2	28.2	8.8 8.8	8.8	31.8 31.8	31.8	122.9 122.5	122.7	8.0 8.0	8.0	8.0
27-Sep-18	Cloudy	Calm	12:32	Surface	1	27.3 27.3	27.3	7.9 7.9	7.9	29.7 29.8	29.8	88.9 88.7	88.8	6.0 6.0	6.0	6.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-	
				Bottom	3.6	27.2 27.2	27.2	8.1 8.1	8.1	29.9 30.0	30.0	82.9 82.2	82.6	5.6 5.5	5.6	5.6

Water Quality Monitoring Results at W1 - Mid-Flood Tide

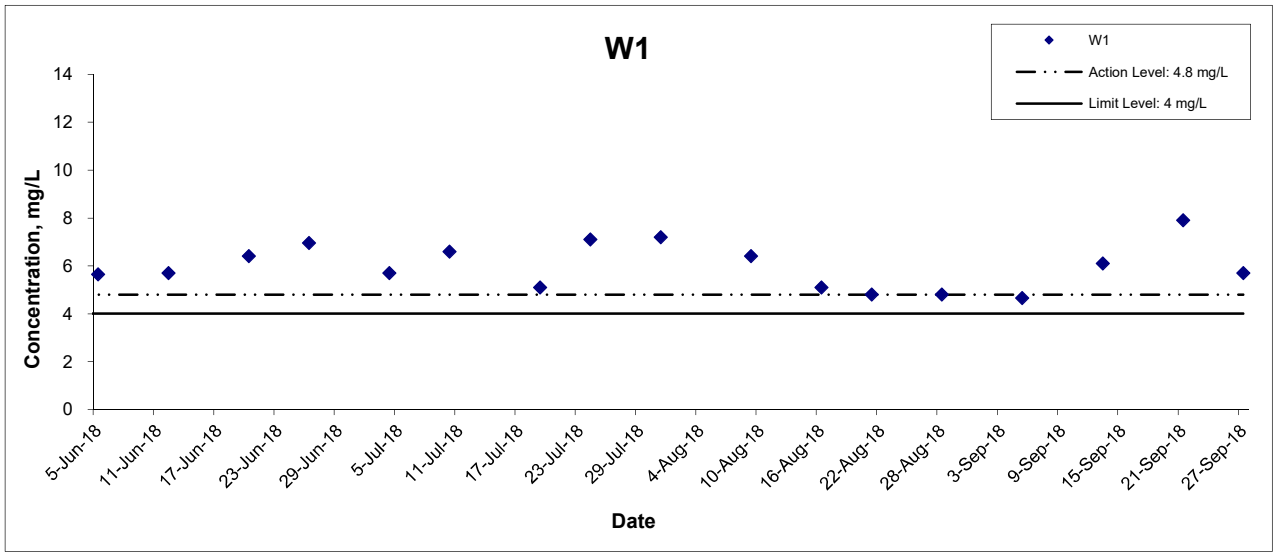
Date	Weather Condition	Sea Condition**	Sampling Time	Depth (m)		Temperature (°C)		pH		Salinity ppt		DO Saturation (%)		Dissolved Oxygen (mg/L)		
						Value	Average	Value	Average	Value	Average	Value	Average	Value	Average	DA*
5-Sep-18	Sunny	Calm	14:48	Surface	1	26.2 26.1	26.2	8.3 8.3	8.3	31.1 31.1	31.1	72.9 71.6	72.3	5.0 4.9	5.0	5.0
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-	
				Bottom	3.3	25.7 25.7	25.7	8.3 8.3	8.3	31.5 31.5	31.5	62.3 62.3	62.3	4.3 4.3	4.3	4.3
13-Sep-18	Cloudy	Calm	09:01	Surface	1	26.7 26.7	26.7	7.9 7.9	7.9	32.2 32.3	32.3	92.5 92.7	92.6	6.2 6.2	6.2	6.2
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-	
				Bottom	3	26.6 26.6	26.6	7.9 7.9	7.9	32.4 32.4	32.4	89.1 89.0	89.1	6.0 6.0	6.0	6.0
21-Sep-18	Sunny	Calm	16:08	Surface	1	28.3 28.4	28.4	8.7 8.7	8.7	31.7 31.6	31.7	132.4 133.5	133.0	8.7 8.7	8.7	8.7
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-	
				Bottom	3.1	27.9 27.8	27.9	8.6 8.6	8.6	31.9 31.9	31.9	109.3 106.6	108.0	7.2 7.0	7.1	7.1
27-Sep-18	Cloudy	Calm	08:12	Surface	1	27.2 27.3	27.3	8.2 8.1	8.2	29.9 29.8	29.9	86.8 87.5	87.2	5.8 5.9	5.9	5.9
				Middle	-	- -	-	- -	-	- -	-	- -	-	- -	-	
				Bottom	3	27.1 27.1	27.1	8.2 8.2	8.2	30.0 30.1	30.1	82.3 82.1	82.2	5.5 5.5	5.5	5.5

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

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

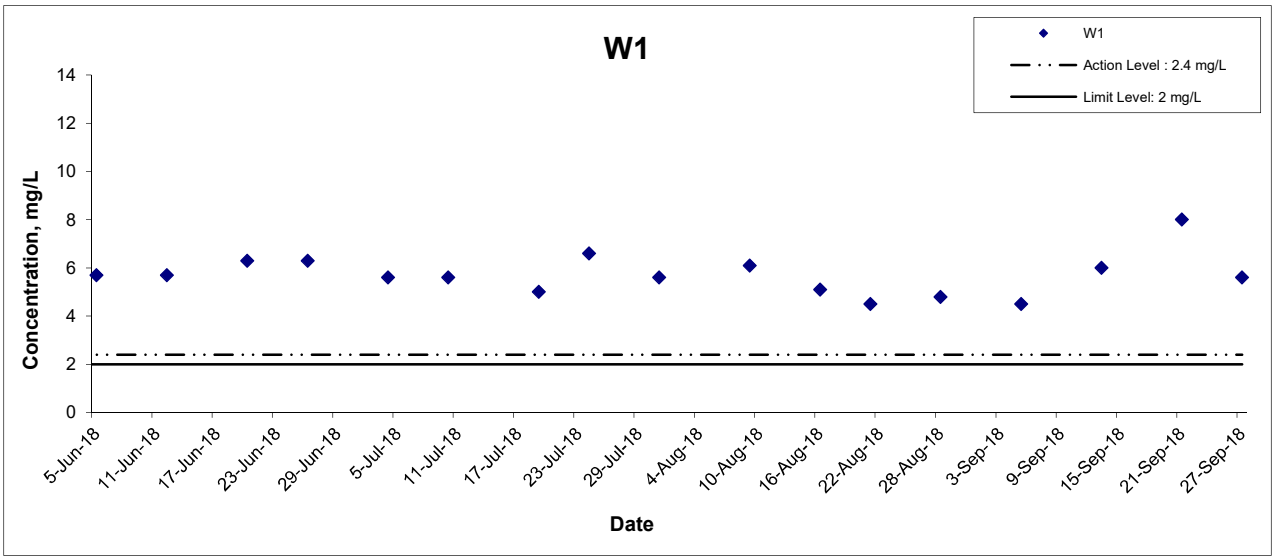


Dissolved Oxygen (Depth-Averaged) at Mid-Flood Tide

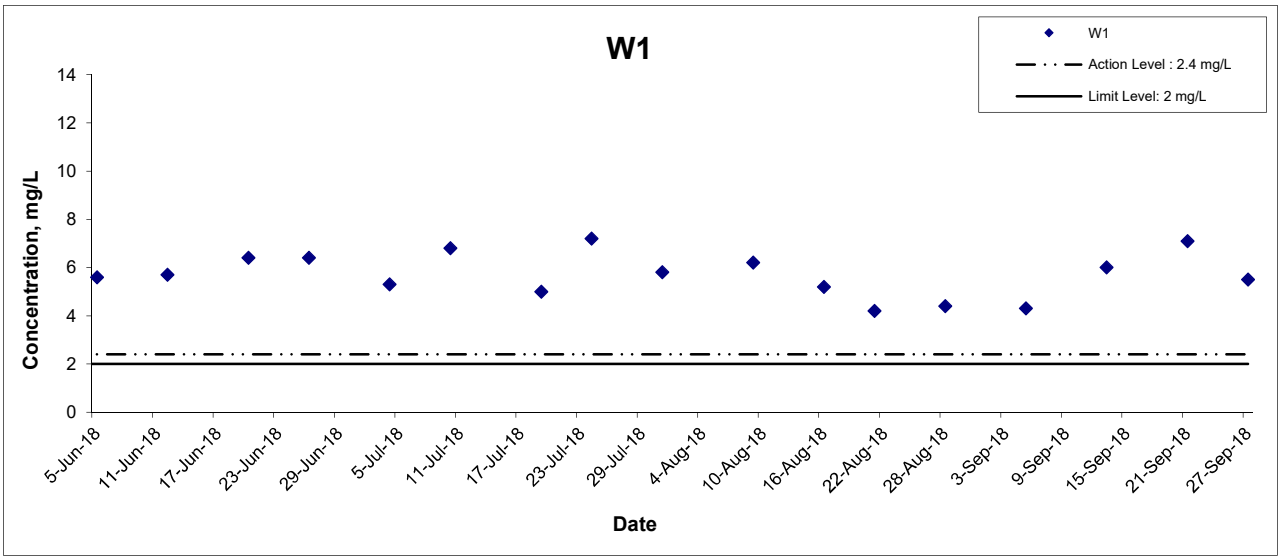


Title	Scale	Project No.
Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction Graphical Presentation of Additional Water Quality Monitoring Results	N.T.S	MA16034
	Date: Sep 18	Appendix: I

Dissolved Oxygen (Bottom) at Mid-Ebb Tide



Dissolved Oxygen (Bottom) at Mid-Flood Tide



Title	Scale	Project No.
Agreement No. CE 59/2015(EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel Design and Construction Graphical Presentation of AddititionalWater Quality Monitoring Results	N.T.S	MA16034
	Date: Sep 18	Appendix: I

APPENDIX J
QUALITY CONTROL REPORTS FOR LABORATORY ANALYSIS

WELLAB LIMITED
Rms 1502, 1516, 1701-1702 & 1713-1716,
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**
1710, Technology Park,
18 On Lai Street,
Shatin, N.T.

ATTN: **Ms. Mei Ling Tang**

QC report:

Report No.:	QC29716
Date of Issue:	2018-09-24
Date Received:	2018-09-13
Date Tested:	2018-09-13
Date Completed:	2018-09-24
Page:	1 of 2

Method Blank

Parameter	MB 1	Acceptance
Suspended Solids (SS) (mg/L)	<0.5	<0.5
Biochemical Oxygen Demand	N/A	N/A
Total Organic Carbon (mg-TOC/L)	<0.2	<0.2
Nitrogen (Total Kjeldahl + nitrate + nitrite)	N/A	N/A
Ammonia (mg NH_3-N/L)	<0.01	<0.01
Total Phosphorus (mg-P/L)	<0.01	<0.01

Method QC

Parameter	MQC1	Acceptance
Suspended Solids (SS) (%)	101	80-120
Biochemical Oxygen Demand (mg O_2/L)	174	170-220
Total Organic Carbon (%)	100	80-120
Nitrogen (Total Kjeldahl + nitrate + nitrite)	N/A	N/A
Ammonia (%)	96	80-120
Total Phosphorus (%)	97	80-120

Remarks: 1) < = less than
2) N/A = Not applicable
3) This report is the summary of quality control data for report number 29716.

****

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

PATRICK TSE
Laboratory Manager

WELLAB 匯力 Testing & Research

WELLAB LIMITED
Rms 1502, 1516, 1701-1702 & 1713-1716,
Technology Park, 18 On Lai Street,
Shatin, N.T., Hong Kong.
Tel: 2898 7388 Fax: 2898 7076
Website: www.wellab.com.hk

TEST REPORT

Report No.:	QC29716
Date of Issue:	2018-09-24
Date Received:	2018-09-13
Date Tested:	2018-09-13
Date Completed:	2018-09-24

QC report:

Sample Duplicate

Parameter	29716-3 chk	Acceptance
Suspended Solids (SS) (%)	N/A	RPD≤20%
Biochemical Oxygen Demand (%)	N/A	RPD≤20%
Total Organic Carbon (%)	4	RPD≤20%
Nitrogen (Total Kjeldahl + nitrate + nitrite)	N/A	N/A
Ammonia (%)	1.2	RPD≤20%
Total Phosphorus (%)	N/A	RPD≤20%

Sample Spike

Parameter	29716-3 spk	Acceptance
Suspended Solids (SS) (%)	N/A	N/A
Biochemical Oxygen Demand (%)	N/A	N/A
Total Organic Carbon (%)	109	80-120
Nitrogen (Total Kjeldahl + nitrate + nitrite)	N/A	N/A
Ammonia (%)	98	80-120
Total Phosphorus (%)	96	80-120

Remarks: 1) < = less than

2) N/A = Not applicable

3) This report is the summary of quality control data for report number 29716.

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

WELLAB LIMITED
Rms 1502, 1516, 1701-1702 & 1713-1716,
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**
1710, Technology Park,
18 On Lai Street,
Shatin, N.T.

ATTN: **Ms. Mei Ling Tang**

Report No.:	QC29808
Date of Issue:	2018-10-08
Date Received:	2018-09-27
Date Tested:	2018-09-27
Date Completed:	2018-10-08
Page:	1 of 2

QC report:

Method Blank

Parameter	MB 1	Acceptance
Suspended Solids (SS) (mg/L)	<0.5	<0.5
Biochemical Oxygen Demand	N/A	N/A
Total Organic Carbon (mg-TOC/L)	<0.2	<0.2
Nitrogen (Total Kjeldahl + nitrate + nitrite)	N/A	N/A
Ammonia (mg NH_3-N/L)	<0.01	<0.01
Total Phosphorus (mg-P/L)	<0.01	<0.01

Method QC

Parameter	MQC1	Acceptance
Suspended Solids (SS) (%)	98	80-120
Biochemical Oxygen Demand (mg O_2/L)	190	170-220
Total Organic Carbon (%)	100	80-120
Nitrogen (Total Kjeldahl + nitrate + nitrite)	N/A	N/A
Ammonia (%)	96	80-120
Total Phosphorus (%)	91	80-120

Remarks: 1) < = less than
2) N/A = Not applicable
3) This report is the summary of quality control data for report number 29808.

****

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

PATRICK TSE
Laboratory Manager

WELLAB LIMITED
Rms 1502, 1516, 1701-1702 & 1713-1716,
Technology Park, 18 On Lai Street,
Shatin, N.T., Hong Kong.
Tel: 2898 7388 Fax: 2898 7076
Website: www.wellab.com.hk

TEST REPORT

Report No.:	QC29808
Date of Issue:	2018-10-08
Date Received:	2018-09-27
Date Tested:	2018-09-27
Date Completed:	2018-10-08

QC report:

Sample Duplicate

Parameter	29808-3 chk	Acceptance
Suspended Solids (SS) (%)	N/A	RPD≤20%
Biochemical Oxygen Demand (%)	N/A	RPD≤20%
Total Organic Carbon (%)	4	RPD≤20%
Nitrogen (Total Kjeldahl + nitrate + nitrite)	N/A	N/A
Ammonia (%)	N/A	RPD≤20%
Total Phosphorus (%)	N/A	RPD≤20%

Sample Spike

Parameter	29808-3 spk	Acceptance
Suspended Solids (SS) (%)	N/A	N/A
Biochemical Oxygen Demand (%)	N/A	N/A
Total Organic Carbon (%)	96	80-120
Nitrogen (Total Kjeldahl + nitrate + nitrite)	N/A	N/A
Ammonia (%)	98	80-120
Total Phosphorus (%)	103	80-120

Remarks: 1) < = less than

2) N/A = Not applicable

3) This report is the summary of quality control data for report number 29808.

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

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

QC REPORT

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

Report No.:	29618
Date of Issue:	2018/9/5
Date Received:	2018/9/4
Date Tested:	2018/9/4
Date Completed:	2018/9/5
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Enviromental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Agreement No. CE/59/2015 (EP)
Project No.: MA16034
Sampling Date: 2018/9/4
Number of Sample: 136
Custody No.: MA16034-CE/59/2015(EP)180904

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
M4se	5.2	5.2	1	96

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

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

PATRICK TSE
Laboratory Manager

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

QC REPORT

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

Report No.:	29638
Date of Issue:	2018/9/7
Date Received:	2018/9/6
Date Tested:	2018/9/6
Date Completed:	2018/9/7
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Enviromental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Agreement No. CE/59/2015 (EP)
Project No.: MA16034
Sampling Date: 2018/9/6
Number of Sample: 136
Custody No.: MA16034-CE/59/2015(EP)180906

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
M4se	3.8	4.4	14	104

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

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

PATRICK TSE
Laboratory Manager

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

QC REPORT

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

Report No.:	29652
Date of Issue:	2018/9/10
Date Received:	2018/9/8
Date Tested:	2018/9/8
Date Completed:	2018/9/10
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Enviromental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Agreement No. CE/59/2015 (EP)
Project No.: MA16034
Sampling Date: 2018/9/8
Number of Sample: 136
Custody No.: MA16034-CE/59/2015(EP)180908

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
M4se	2.1	2.2	5	107

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

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

Patrick Tse

PATRICK TSE
Laboratory Manager

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

QC REPORT

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

Report No.:	29656
Date of Issue:	2018/9/11
Date Received:	2018/9/10
Date Tested:	2018/9/10
Date Completed:	2018/9/11
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Enviromental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Agreement No. CE/59/2015 (EP)
Project No.: MA16034
Sampling Date: 2018/9/10
Number of Sample: 136
Custody No.: MA16034-CE/59/2015(EP)180910

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
M4se	3.3	3.5	3	98

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

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

PATRICK TSE
Laboratory Manager

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

TEST REPORT

QC REPORT

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

Report No.:	29692
Date of Issue:	2018/9/13
Date Received:	2018/9/12
Date Tested:	2018/9/12
Date Completed:	2018/9/13
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Enviromental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Agreement No. CE/59/2015 (EP)
Project No.: MA16034
Sampling Date: 2018/9/12
Number of Sample: 68
Custody No.: MA16034-CE/59/2015(EP)180912

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
M4sf	3.4	3.4	2	100

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

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

PATRICK TSE
Laboratory Manager

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Rms 1214, 1502, 1516, 1701 & 1716,
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TEST REPORT

QC REPORT

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

Report No.:	29711
Date of Issue:	2018/9/17
Date Received:	2018/9/14
Date Tested:	2018/9/14
Date Completed:	2018/9/17
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Enviromental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Agreement No. CE/59/2015 (EP)
Project No.: MA16034
Sampling Date: 2018/9/14
Number of Sample: 136
Custody No.: MA16034-CE/59/2015(EP)180914

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
M4se	5.2	5.3	2	111

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

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

PATRICK TSE
Laboratory Manager

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Website: www.wellab.com.hk

TEST REPORT

QC REPORT

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

Report No.:	29729
Date of Issue:	2018/9/19
Date Received:	2018/9/18
Date Tested:	2018/9/18
Date Completed:	2018/9/19
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Enviromental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Agreement No. CE/59/2015 (EP)
Project No.: MA16034
Sampling Date: 2018/9/18
Number of Sample: 136
Custody No.: MA16034-CE/59/2015(EP)180918

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
M4se	4.9	4.9	1	100

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

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

PATRICK TSE
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Shatin, N.T., Hong Kong.
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Website: www.wellab.com.hk

TEST REPORT

QC REPORT

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

Report No.:	29749
Date of Issue:	2018/9/21
Date Received:	2018/9/20
Date Tested:	2018/9/20
Date Completed:	2018/9/21
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Enviromental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Agreement No. CE/59/2015 (EP)
Project No.: MA16034
Sampling Date: 2018/9/20
Number of Sample: 136
Custody No.: MA16034-CE/59/2015(EP)180920

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
M4se	4.6	4.6	0	104

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

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

PATRICK TSE
Laboratory Manager

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Website: www.wellab.com.hk

TEST REPORT

QC REPORT

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

Report No.:	29764
Date of Issue:	2018/9/24
Date Received:	2018/9/22
Date Tested:	2018/9/22
Date Completed:	2018/9/24
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Enviromental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Agreement No. CE/59/2015 (EP)
Project No.: MA16034
Sampling Date: 2018/9/22
Number of Sample: 136
Custody No.: MA16034-CE/59/2015(EP)180922

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
M4se	4.6	4.7	1	97

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

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

PATRICK TSE
Laboratory Manager

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

QC REPORT

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

Report No.:	29770
Date of Issue:	2018/9/26
Date Received:	2018/9/24
Date Tested:	2018/9/24
Date Completed:	2018/9/26
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Enviromental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Agreement No. CE/59/2015 (EP)
Project No.: MA16034
Sampling Date: 2018/9/24
Number of Sample: 136
Custody No.: MA16034-CE/59/2015(EP)180924

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
M4se	4.5	4.7	3	101

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

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

PATRICK TSE
Laboratory Manager

WELLAB LIMITED
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Website: www.wellab.com.hk

TEST REPORT

QC REPORT

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

Report No.:	29782
Date of Issue:	2018/9/27
Date Received:	2018/9/26
Date Tested:	2018/9/26
Date Completed:	2018/9/27
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Enviromental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Agreement No. CE/59/2015 (EP)
Project No.: MA16034
Sampling Date: 2018/9/26
Number of Sample: 136
Custody No.: MA16034-CE/59/2015(EP)180926

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
M4se	5.3	5.2	0	99

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

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

PATRICK TSE
Laboratory Manager

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

QC REPORT

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

Report No.:	29800
Date of Issue:	2018/10/2
Date Received:	2018/9/28
Date Tested:	2018/9/28
Date Completed:	2018/10/2
Page:	1 of 1

ATTN: Ms. Mei Ling Tang

Project Name: Enviromental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Agreement No. CE/59/2015 (EP)
Project No.: MA16034
Sampling Date: 2018/9/28
Number of Sample: 136
Custody No.: MA16034-CE/59/2015(EP)180928

****

Total Suspended Solids	Duplicate Analysis			QC Recovery, %
Sampling Point	Trial 1, mg/L	Trial 2, mg/L	Difference, %	
M4se	4.8	4.7	3	96

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

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

PATRICK TSE
Laboratory Manager

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: September 2018

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

(B) Exceedance Report for Construction Noise

Action Level for Construction Noise
(Nine (9) Action Level exceedances were recorded due to the documented complaints received in this reporting month.)

Limit Level for Construction Noise
(Ten (10) Limit Level exceedances for nighttime construction noise monitoring were recorded in the reporting month. The limit level exceedances were considered non-Project related)

Date	Monitoring Location	Measured Level (L_{eq} dB(A))	Baseline Noise Level (L_{eq} dB(A))	Construction Noise Level (L_{eq} dB(A))	Limit Level
7 September 2018	CM1	65.1	60.5 (54.4 – 69.8)	***63.3***	55
14 September 2018		65.5		***63.8***	
21 September 2018		66.1		***64.7***	
7 September 2018	CM2	64.1	58.0 (50.8 – 66.8)	***62.9***	
14 September 2018		65.0		***64.0***	
21 September 2018		64.9		***63.9***	
28 September 2018		61.9		***59.6***	
7 September 2018	CM3	64.0	60.2 (53.0 – 67.4)	***61.7***	
21 September 2018		63.7		***61.1***	
28 September 2018		63.4		***60.6***	

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

Appendix K – Summary of Exceedance

(C) Exceedance Report for Water Quality
(No exceedance for marine water quality monitoring in the reporting month)

Seven (7) Limit Level exceedances in groundwater quality monitoring as followed:

Date	Monitoring Location	Monitoring Parameter	Monitoring Results	Action Level	Limit Level
13 September 2018	Stream 1	Dissolved Oxygen	***7.5***	7.6	7.6
		Ammonia-N	***1.2***	0.15	0.20
	Stream 2	Dissolved Oxygen	***7.5***	7.6	7.6
		Ammonia-N	***1.3***	0.15	0.20
	Stream 3	Dissolved Oxygen	***7.5***	7.6	7.6
		Ammonia-N	***1.2***	0.15	0.20
		Total Organic Carbon	***7***	6	6

(D) Exceedance Report for Ecology
(NIL in the reporting month)

(E) Exceedance Report for Cultural Heritage
(NIL in the reporting month)

(F) Exceedance Report for Landfill Gas
(NIL in the reporting month)

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

NOE No. 180907_noise (CM1-CM3) **Exceedance Level**: Limit

Time of Measurement: 23:00-00:25

Date of Noise Monitoring: 7 September 2018 –8 September 2018

Part A – Exceedance Summary Tables

Table I: Parameter(s) – Construction Noise

Station	Location	Time	Measured Level (L_{eq} dB(A))	Baseline Noise Level (L_{eq} dB(A))	Construction Noise Level (L_{eq} dB(A))	Action Level	Limit Level (L_{eq} dB(A))	Level exceeded
CM1	Nga Lai House, Yau Lai Estate Phase 1, Yau Tong	23:00-23:15	65.1	60.5 (54.4 – 69.8)	***63.3***	When one documented complaint is received.	**55.0**	Limit
CM2	Bik Lai House, Yau Lai Estate Phase 1, Yau Tong	23:35-23:50	64.1	58.0 (50.8 – 66.8)	***62.9***			
CM3	Block S, Yau Lai Estate Phase 5, Yau Tong	00:10-00:25	64.0	60.2 (53.0 – 67.4)	***61.7***			

Field Observation(s) and Conclusion

(a) Statement of exceedance(s)

Construction noise measured at CM1, CM2 & CM3 exceeded the construction noise (night time) limit level.

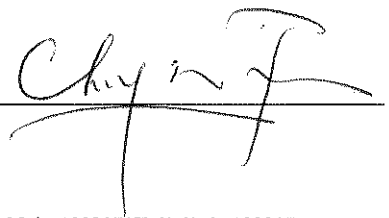
(b) Cause of exceedance(s)

The exceedance was not considered related to the Project works:

- According to our field observation, road traffic noise was identified as the dominant noise source. No noticeable noise from blasting / associated works was identified.
- No major construction activity was observed in Lam Tin Interchange during monitoring.

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

Part C – Recommendation: No further action is required.

ETL Signature:  Date: 17 September, 2018

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

NOE No. 180914_noise (CM1-CM2) **Exceedance Level:** Limit

Time of Measurement: 23:00-23:45

Date of Noise Monitoring: 14 September 2018

Part A – Exceedance Summary Tables

Table I: Parameter(s) – Construction Noise

Station	Location	Time	Measured Level (L_{eq} dB(A))	Baseline Noise Level (L_{eq} dB(A))	Construction Noise Level (L_{eq} dB(A))	Action Level	Limit Level (L_{eq} dB(A))	Level exceeded
CM1	Nga Lai House, Yau Lai Estate Phase 1, Yau Tong	23:00-23:15	65.5	60.5 (54.4 – 69.8)	***63.8***	When one documented complaint is received.	**55.0**	Limit
CM2	Bik Lai House, Yau Lai Estate Phase 1, Yau Tong	23:30-23:45	65.0	58.0 (50.8 – 66.8)	***64.0***			

Field Observation(s) and Conclusion

(a) Statement of exceedance(s)

Construction noise measured at CM1 & CM2 exceeded the construction noise (night time) limit level.

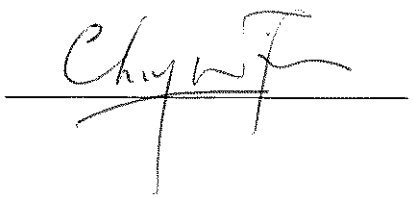
(b) Cause of exceedance(s)

The exceedance was not considered related to the Project works:

- According to our field observation, road traffic noise was identified as the dominant noise source. No noticeable noise from blasting / associated works was identified.
- No major construction activity was observed in Lam Tin Interchange during monitoring.

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

Part C – Recommendation: No further action is required.

ETL Signature: 

Date: 27 September, 2018

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

NOE No. 180921_noise (CM1-CM3) **Exceedance Level**: Limit

Time of Measurement: 23:00-00:10

Date of Noise Monitoring: 21 September 2018 –22 September 2018

Part A – Exceedance Summary Tables

Table I: Parameter(s) – Construction Noise

Station	Location	Time	Measured Level (L_{eq} dB(A))	Baseline Noise Level (L_{eq} dB(A))	Construction Noise Level (L_{eq} dB(A))	Action Level	Limit Level (L_{eq} dB(A))	Level exceeded
CM1	Nga Lai House, Yau Lai Estate Phase 1, Yau Tong	23:00-23:15	66.1	60.5 (54.4 – 69.8)	***64.7***	When one documented complaint is received.	**55.0**	Limit
CM2	Bik Lai House, Yau Lai Estate Phase 1, Yau Tong	23:25-23:40	64.9	58.0 (50.8 – 66.8)	***63.9***			
CM3	Block S, Yau Lai Estate Phase 5, Yau Tong	23:55-00:10	63.7	60.2 (53.0 – 67.4)	***61.1***			

Field Observation(s) and Conclusion

(a) Statement of exceedance(s)

Construction noise measured at CM1, CM2 & CM3 exceeded the construction noise (night time) limit level.

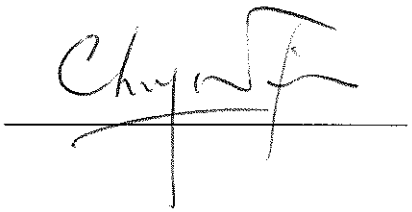
(b) Cause of exceedance(s)

The exceedance was not considered related to the Project works:

- According to our field observation, road traffic noise was identified as the dominant noise source. No noticeable noise from blasting / associated works was identified.
- No major construction activity was observed in Lam Tin Interchange during monitoring.

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

Part C – Recommendation: No further action is required.

ETL Signature: 

Date: 28 September, 2018

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

NOE No. 180928_noise (CM2-CM3) **Exceedance Level:** Limit

Time of Measurement: 00:00-00:45

Date of Noise Monitoring: 28 September 2018 –29 September 2018

Part A – Exceedance Summary Tables

Table I: Parameter(s) – Construction Noise

Station	Location	Time	Measured Level (L_{eq} dB(A))	Baseline Noise Level (L_{eq} dB(A))	Construction Noise Level (L_{eq} dB(A))	Action Level	Limit Level (L_{eq} dB(A))	Level exceeded
CM2	Bik Lai House, Yau Lai Estate Phase 1, Yau Tong	00:30-00:45	61.9	58.0 (50.8 – 66.8)	***59.6***	When one documented complaint is received.	**55.0**	Limit
CM3	Block S, Yau Lai Estate Phase 5, Yau Tong	00:00-00:15	63.4	60.2 (53.0 – 67.4)	***60.6***			

Field Observation(s) and Conclusion

(a) Statement of exceedance(s)

Construction noise measured at CM2 & CM3 exceeded the construction noise (night time) limit level.

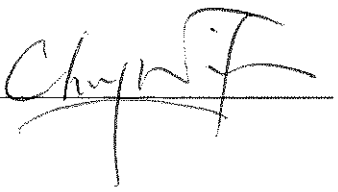
(b) Cause of exceedance(s)

The exceedance was not considered related to the Project works:

- According to our field observation, road traffic noise was identified as the dominant noise source. No noticeable noise from blasting / associated works was identified.
- No major construction activity was observed in Lam Tin Interchange during monitoring.

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

Part C – Recommendation: No further action is required.

ETL Signature:  Date: 2 October, 2018

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

- Notification and Investigation Report for Environmental Quality Action & Limit Exceedances

Monitoring Parameter: Groundwater Quality

Date of Monitoring: 13 September 2018

Part A – Summary of Exceedance Records

Date	Monitoring Parameter	Monitoring Location	Monitoring Results	Action Level	Limit Level	Justification*	Exceedance due to the Project
13 September 2018	Total Organic Carbon	Stream 3	***7***	6	6	(1), (3)	No
	Ammonia-N	Stream 1	***0.67***	0.15	0.20	(2), (3)	No
		Stream 2	***1.3***			(1), (3)	
		Stream 3	***1.2***			(1), (3)	

Note: For Dissolved Oxygen, non-compliance of the water quality limits occurs when monitoring result is lower than the Action/Limit Level.
Bold Italic means Action Level exceedance
Bold Italic with underline means Limit Level exceedance

*Remarks
(1) –The distance between the tunnel construction activities and monitoring stations of stream 2 and 3 are about 1000 meters.
(2) –The vertical distance between Stream 1 and the tunnel construction site is more than 44 meters. Therefore, Stream 1 will not affected by any tunnel construction works as its elevation is above the tunnel construction site (**Figure 1 & 2**).
(3) –Other(s): Based on the information from HKO, rainfall was recorded on 13 September 2018 (Ref: Daily Rainfall Distribution extracted from HKO).

Part B – Conclusions:

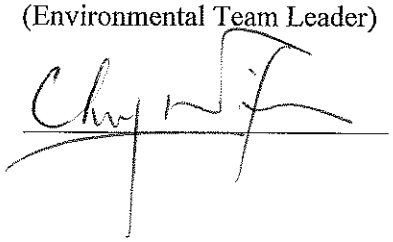
1. Based on the justifications in the above table, there is no direct evidence showing that the exceedances were due to Project. The exceedances are considered properly due to non-project related factor, such as, the degradation of naturally occurring organic matter or manmade sources, rainfall or domestic sewage (as observed and reported in the EIA report).
2. No increase in monitoring frequency for groundwater quality monitoring and no further action are required.

Part C – Recommendations

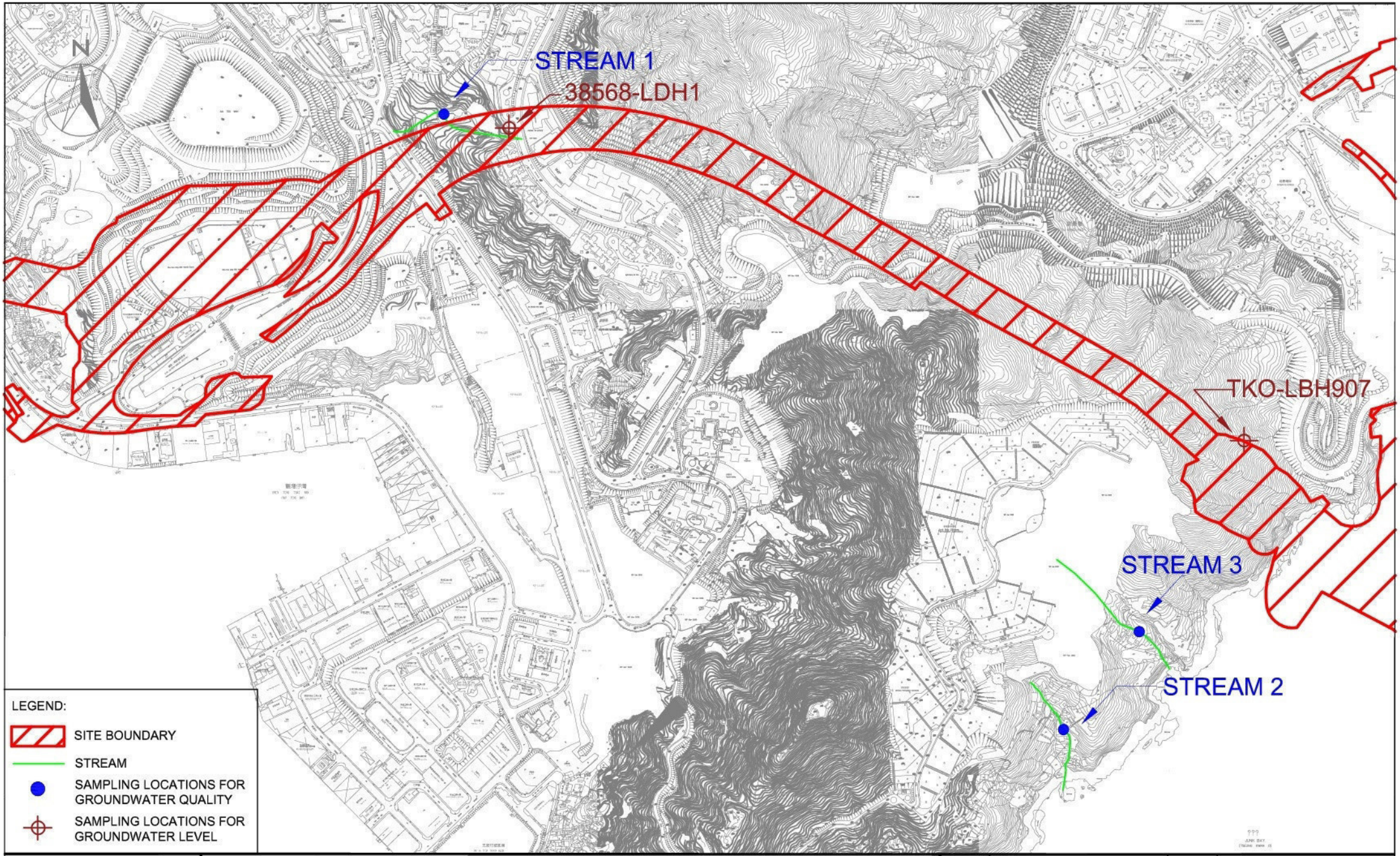
The monitoring of stream water is considered not representative to monitor the potential impacts on groundwater due to the Project after consideration of the location & elevation of the stream(s) and the non-project related factors (e.g. human activities etc.).

Therefore, ET recommend to suspend the water quality monitoring for the streams in accordance with the EM&A Manual, Section 4. For the details, please refer to the separate proposal for suspension of stream water monitoring.

Reviewed by: Dr. Priscilla Choy (Environmental Team Leader) Date: 28 September, 2018

Signature: 

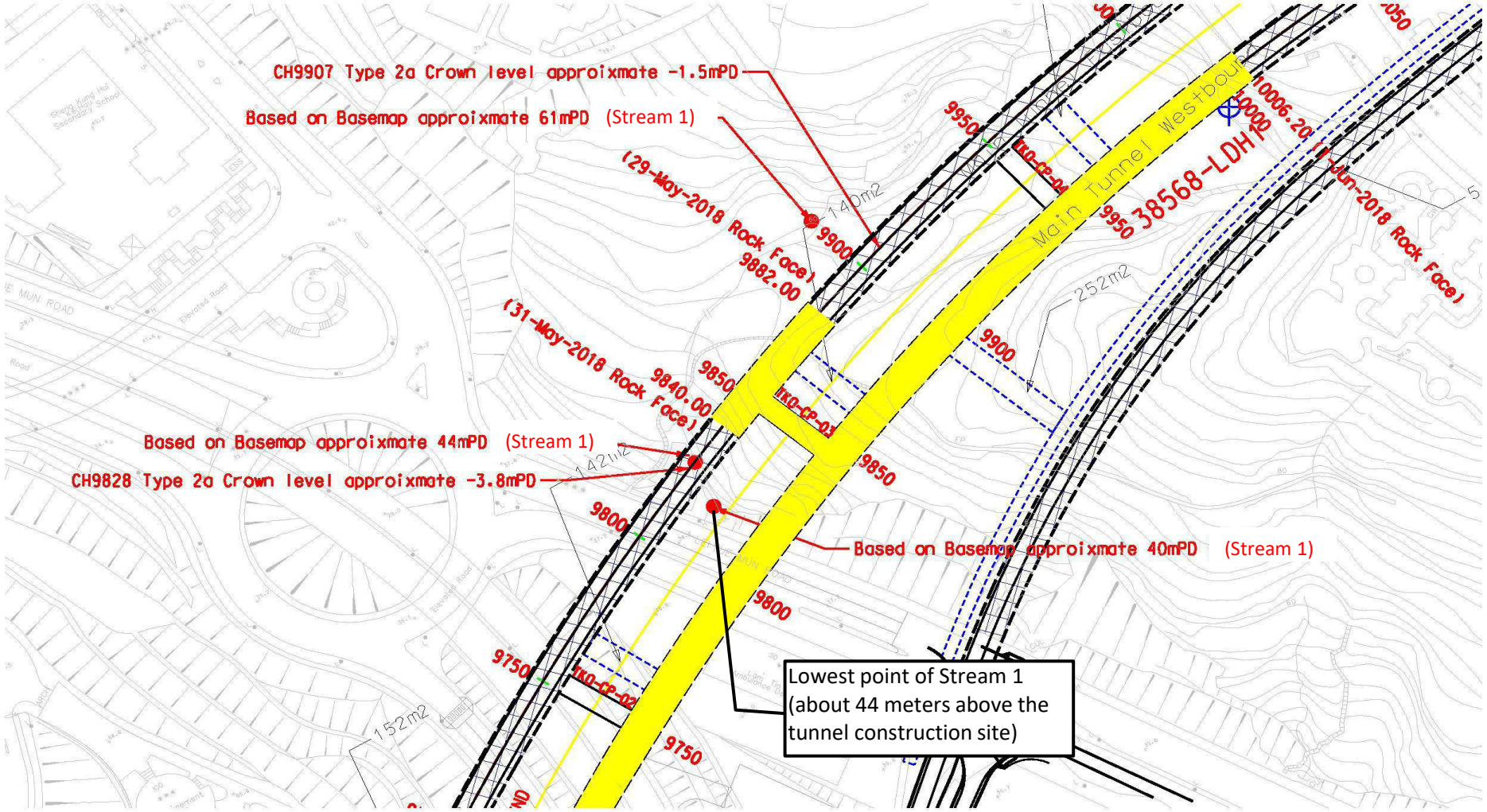
FIGURE



CINOTECH
Cinotech Consultants Limited

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

SCALE	1:10000 @ A4	DATE	APR 2017
CHECK	JF	DRAWN	JW
JOB No.	MA16034	FIGURE NO.	1
		REV	-

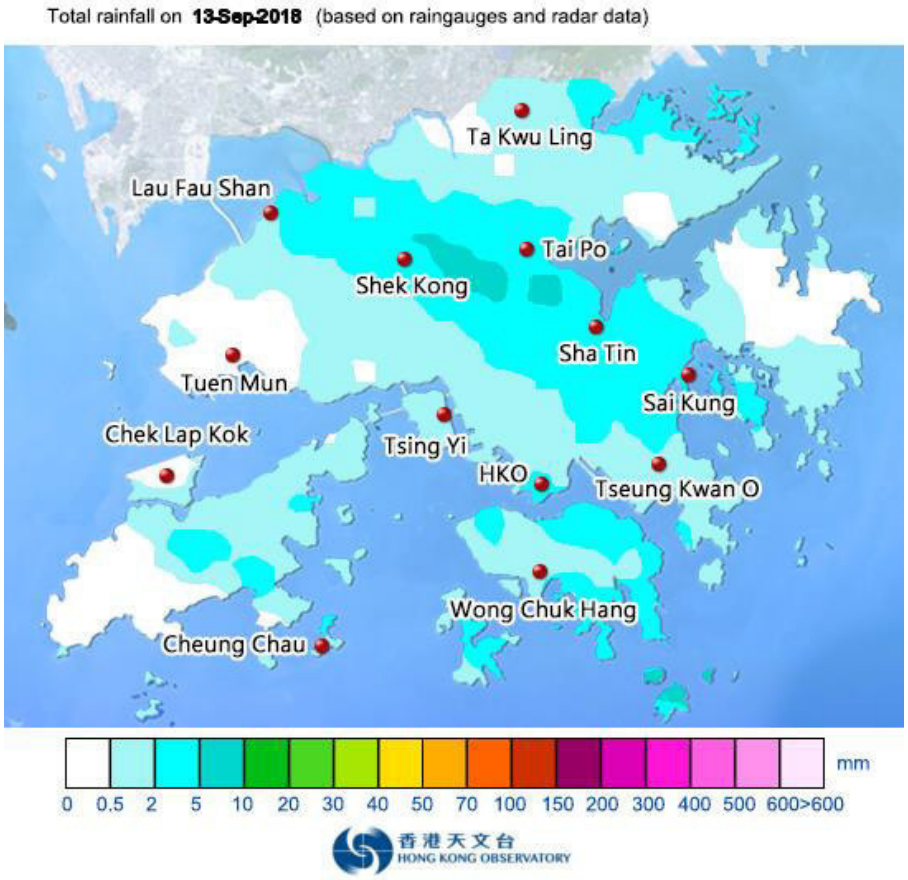


Title: Agreement No. CE/59/2015 (EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Location of Stream 1 and the Main Tunnel Construction	Scale: N.T.S	Project No.: MA16034	CINOTECH
	Date: May-18	Figure: 2	

APPENDIX A
DAILY RAINFALL DISTRIBUTION
EXTRACTED FROM HKO

Agreement No. CE 59/2015 (EP)
Environmental Team for Tseung Kwan O – Lam Tin Tunnel
Design and Construction - Investigation Report for Environmental Quality Action & Limit Exceedances

Daily Rainfall Distribution:



	Rainfall recorded in Sai Kung region on **13 September 2018**			
Time	Rainfall (mm)	Standby Signal No. 1	Strong Wind Signal No. 3	Thunderstorm Warning
23:45-00:45	-	-	Yes	-
00:45-01:45	-	-	Yes	-
01:45-02:45	-	-	Yes	-
02:45-03:45	-	-	Yes	-
03:45-04:45	-	Yes	Yes	-
04:45-05:45	-	Yes	-	-
05:45-06:45	-	Yes	-	-
06:45-07:45	0-1mm	Yes	-	-
07:45-08:45	0-1mm	-	-	-
08:45-09:45	0-1mm	-	-	-
09:45-10:45	-	-	-	-
10:45-11:45	-	-	-	-
11:45-12:45	-	-	-	-
12:45-13:45	-	-	-	-
13:45-14:45	-	-	-	-
14:45-15:45	-	-	-	-
15:45-16:45	-	-	-	-
16:45-17:45	-	-	-	-
17:45-18:45	-	-	-	-
18:45-19:45	-	-	-	-
19:45-20:45	-	-	-	-
20:45-21:45	-	-	-	-
21:45-22:45	-	-	-	-
22:45-23:45	-	-	-	-

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

- Notification and Investigation Report for Environmental Quality Action & Limit Exceedances

Monitoring Parameter: Groundwater Quality

Date of Monitoring: 13 September 2018

Part A – Summary of Exceedance Records

Date	Monitoring Parameter	Monitoring Location	Monitoring Results	Action Level	Limit Level	Justification*	Exceedance due to the Project
13 September 2018	Dissolved Oxygen	Stream 1	***7.5***	7.6	7.6	(2), (3)	No
		Stream 2	***7.5***			(1), (3)	
		Stream 3	***7.5***			(1), (3)	
	Total Organic Carbon	Stream 3	***7***	6	6	(1), (3)	No
	Ammonia-N	Stream 1	***0.67***	0.15	0.20	(2), (3)	No
		Stream 2	***1.3***			(1), (3)	
		Stream 3	***1.2***			(1), (3)	

Note: For Dissolved Oxygen, non-compliance of the water quality limits occurs when monitoring result is lower than the Action/Limit Level.
Bold Italic means Action Level exceedance
Bold Italic with underline means Limit Level exceedance

*Remarks
(1) –The distance between the tunnel construction activities and monitoring stations of stream 2 and 3 are about 1000 meters.
(2) –The vertical distance between Stream 1 and the tunnel construction site is more than 44 meters. Therefore, Stream 1 will not affected by any tunnel construction works as its elevation is above the tunnel construction site (**Figure 1 & 2**).
(3) –Other(s): Based on the information from HKO, rainfall was recorded on 13 September 2018 (Ref: Daily Rainfall Distribution extracted from HKO).

Part B – Conclusions:

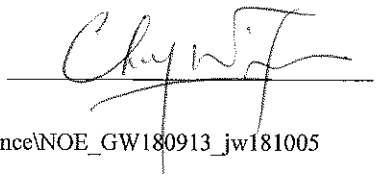
1. Based on the justifications in the above table, there is no direct evidence showing that the exceedances were due to Project. The exceedances are considered properly due to non-project related factor, such as, the degradation of naturally occurring organic matter or manmade sources, rainfall or domestic sewage (as observed and reported in the EIA report).
2. No increase in monitoring frequency for groundwater quality monitoring and no further action are required.

Part C – Recommendations

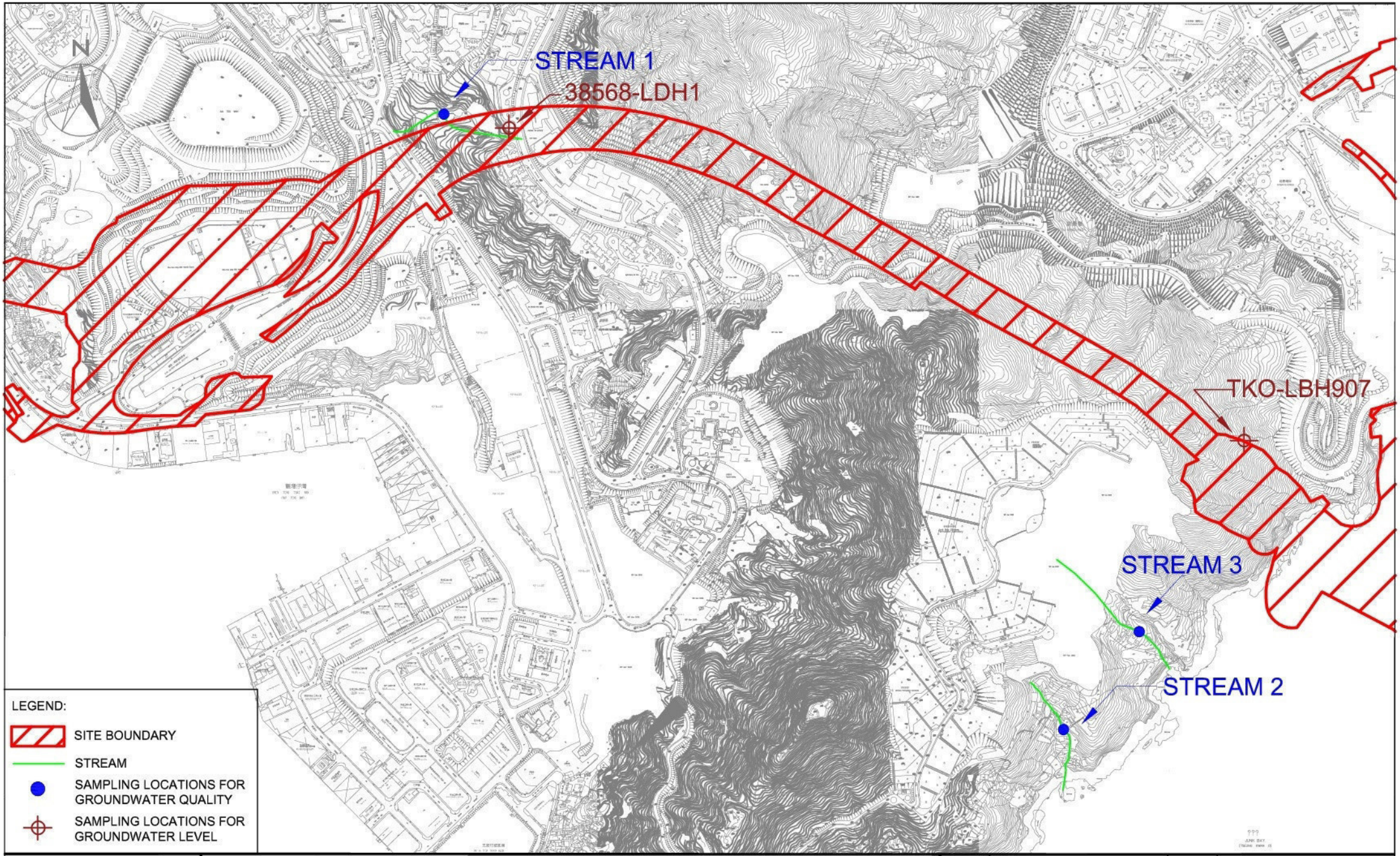
The monitoring of stream water is considered not representative to monitor the potential impacts on groundwater due to the Project after consideration of the location & elevation of the stream(s) and the non-project related factors (e.g. human activities etc.).

Therefore, ET recommend to suspend the water quality monitoring for the streams in accordance with the EM&A Manual, Section 4. For the details, please refer to the separate proposal for suspension of stream water monitoring.

Reviewed by: Dr. Priscilla Choy (Environmental Team Leader) Date: 5 October, 2018

Signature: 

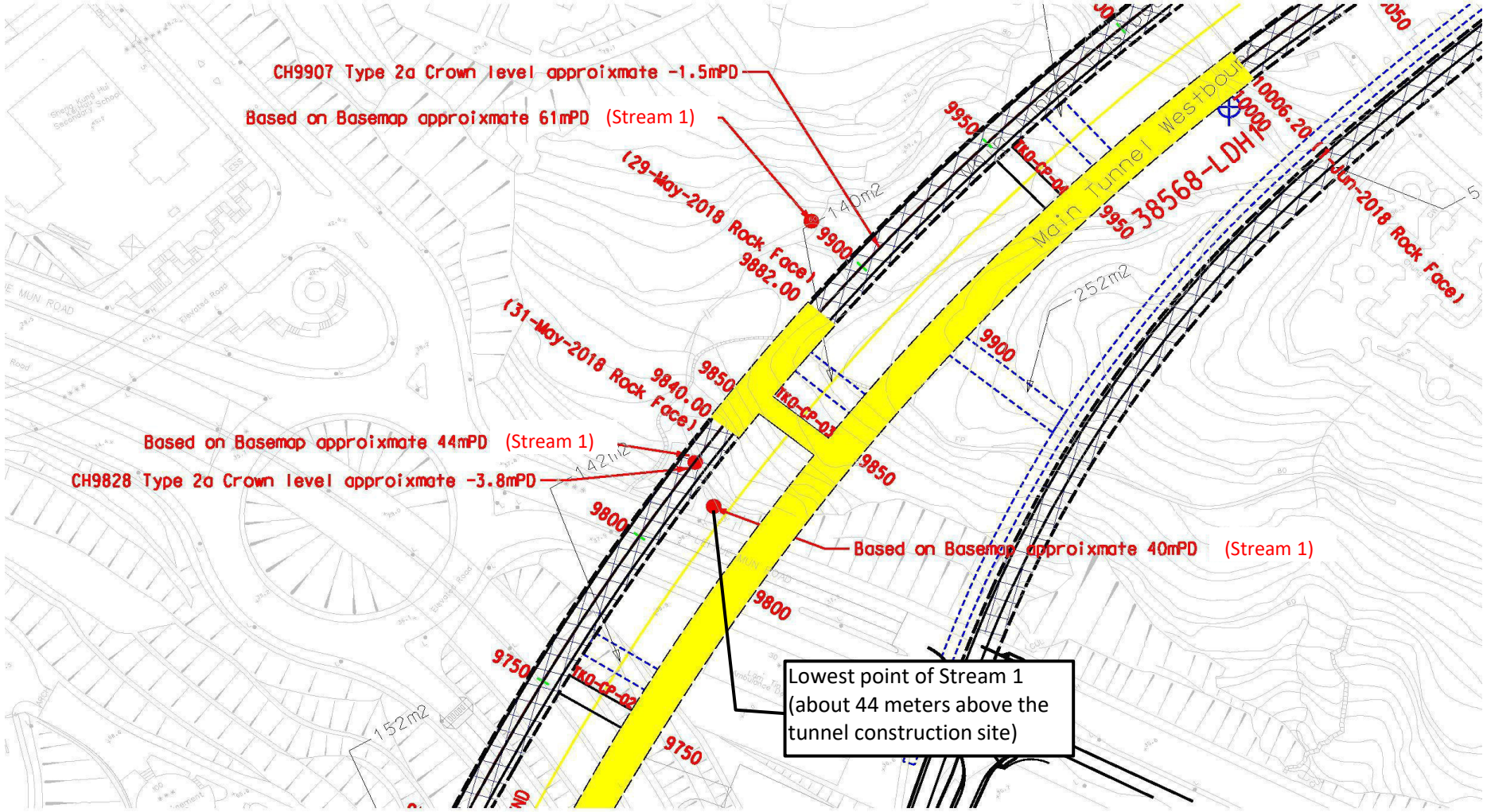
FIGURE



CINOTECH
Cinotech Consultants Limited

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

SCALE	1:10000 @ A4	DATE	APR 2017
CHECK	JF	DRAWN	JW
JOB No.	MA16034	FIGURE NO.	1
		REV	-

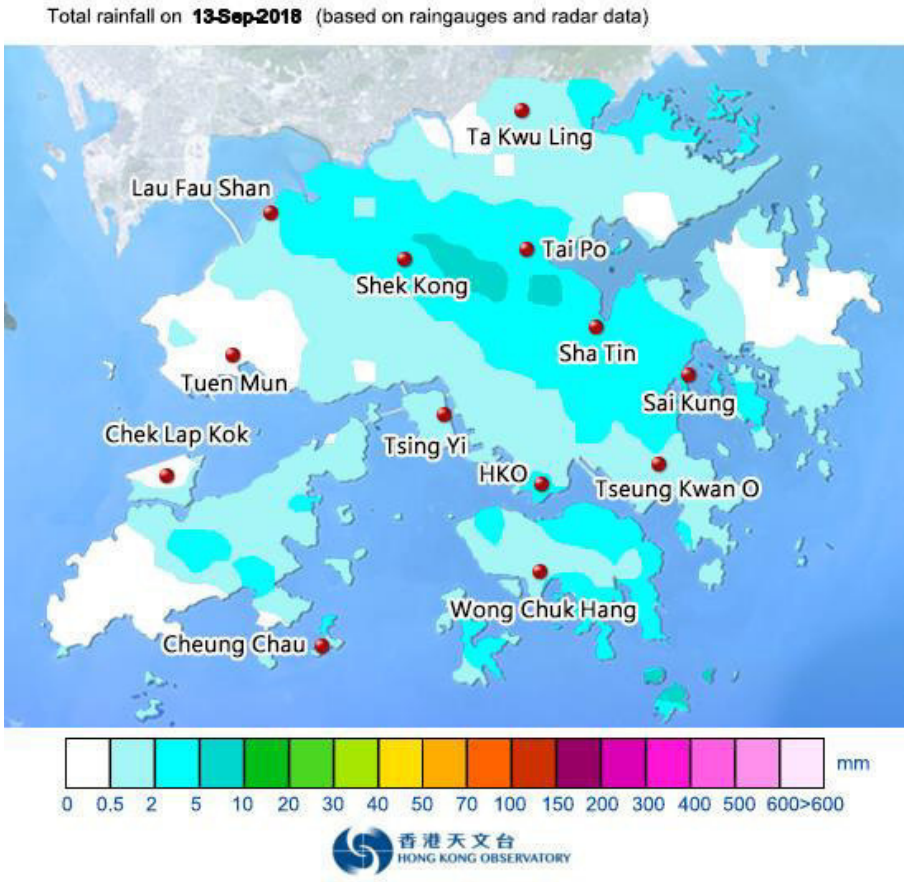


Title: Agreement No. CE/59/2015 (EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel - Design and Construction Location of Stream 1 and the Main Tunnel Construction	Scale: N.T.S	Project No.: MA16034	CINOTECH
	Date: May-18	Figure: 2	

APPENDIX A
DAILY RAINFALL DISTRIBUTION
EXTRACTED FROM HKO

Agreement No. CE 59/2015 (EP)
Environmental Team for Tseung Kwan O – Lam Tin Tunnel
Design and Construction - Investigation Report for Environmental Quality Action & Limit Exceedances

Daily Rainfall Distribution:



	Rainfall recorded in Sai Kung region on **13 September 2018**			
Time	Rainfall (mm)	Standby Signal No. 1	Strong Wind Signal No. 3	Thunderstorm Warning
23:45-00:45	-	-	Yes	-
00:45-01:45	-	-	Yes	-
01:45-02:45	-	-	Yes	-
02:45-03:45	-	-	Yes	-
03:45-04:45	-	Yes	Yes	-
04:45-05:45	-	Yes	-	-
05:45-06:45	-	Yes	-	-
06:45-07:45	0-1mm	Yes	-	-
07:45-08:45	0-1mm	-	-	-
08:45-09:45	0-1mm	-	-	-
09:45-10:45	-	-	-	-
10:45-11:45	-	-	-	-
11:45-12:45	-	-	-	-
12:45-13:45	-	-	-	-
13:45-14:45	-	-	-	-
14:45-15:45	-	-	-	-
15:45-16:45	-	-	-	-
16:45-17:45	-	-	-	-
17:45-18:45	-	-	-	-
18:45-19:45	-	-	-	-
19:45-20:45	-	-	-	-
20:45-21:45	-	-	-	-
21:45-22:45	-	-	-	-
22:45-23:45	-	-	-	-

APPENDIX L
SITE AUDIT SUMMARY

Appendix L - Site Audit Summary (September 2018)

Contract No. NE/2015/01
Tseung Kwan O - Lam Tin Tunnel - Main Tunnel and Associated Works

Items	Date	Status*	Follow up Action
Water Quality			
Beside the site office, the water drainage was seen clogged. Contractor should ensure the water drainage function properly to prevent flooding during rainy season.	29 August 2018	✕	Follow up action will be reported in the next reporting month
	5 September 2018	✓	Improved/rectified on 5 September 2018.
Contractor was reminded to collect and remove the floating refuse regularly near TKO site.	5 September 2018	✓	Improved/rectified on 12 September 2018.
Muddy water was observed inside tunnel. Contractor was reminded to collect and ensure the muddy water will be treated before discharging.	12 September 2018	✓	Improved/rectified on 19 September 2018.
No silt curtain was observed surrounded the site area near TKO side. Contractor was reminded to set up the silt curtain along the work area properly before the commencement of construction works approximated to sea front.	19 September 2018	✕	Item remarked on 26 September 2018
	26 September 2018	#	Follow up action will be reported in the next reporting month
Muddy ponding water was observed at Portion WA1A. Contractor was reminded to collect and provide waste water treatment before discharging.	19 September 2018	✓	Improved/rectified on 26 September 2018.
Silty surface runoff was observed. Contractor was reminded to provide sufficient wastewater treatments after rain event.	26 September 2018	#	Follow up action will be reported in the next reporting month
Noise			
--	--	--	--
Landscape and Visual			
--	--	--	--
Air Quality			
Contractor was reminded to provide frequent water spray for dust suppression during construction works. (i.e crushers)	5 September 2018	✓	Improved/rectified on 12 September 2018.
Blue NRMM label was observed displayed on the PME at Portion 4C. Contractor was reminded to replace and recolor the NRMM label.	19 September 2018	✓	Improved/rectified on 26 September 2018.
Waste / Chemical Management			
On the platform of TKO side, stagnant water was observed in the drip tray of chemical containers, Contractor was reminded to clear it and ensure no overflow stagnant water.	29 August 2018	✕	Follow up action will be reported in the next reporting month
	5 September 2018	✓	Improved/rectified on 5 September 2018.
Chemical container should be stored in trap tray/ designated area properly to prevent spillage near TKO site.	5 September 2018	✓	Improved/rectified on 12 September 2018.
C&D waste was observed accumulated near Lam Tin side. Contractor was reminded to sort and dispose the waste regularly.	12 September 2018	✓	Improved/rectified on 19 September 2018.
Construction waste was observed accumulated in sea front near TKO side. Contractor was reminded to collect and dispose properly.	19 September 2018	✕	Item remarked on 26 September 2018
	26 September 2018	#	Follow up action will be reported in the next reporting month

Appendix L - Site Audit Summary (September 2018)

Items	Date	Status*	Follow up Action
General refuse was observed placed on the ground at Portion WA1A. Contractor was reminded to store the general refuse inside the waste skip properly.	19 September 2018	✓	Improved/rectified on 26 September 2018.
Silty surface runoff was observed. Contractor was reminded to provide sufficient wastewater treatments after rain event.	26 September 2018	#	Follow up action will be reported in the next reporting month
Impact on Cultural Heritage			
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Permits / Licenses			
--	--	--	--

✓ Observation/reminder was made during site audit but improved/rectified by the contractor in the next site audit
✕ Observation/reminder was made during site audit but not yet improved/rectified by the contractor in the next site audit
\# Follow up action will be reported in next reporting month
∗ Non-compliance of mitigation measure
• Non-compliance but improved by the contractor

Appendix L - Site Audit Summary (September 2018)

Contract No. NE/2015/02

Tseung Kwan O - Lam Tin Tunnel - Road P2 and Associated Works

Items	Date	Status*	Follow up Action
Water Quality			
Silt curtains near DSD Desilting Compound was damaged and improperly deployed. The Contractor should ensure its integrity at all time.	29 August 2018	✕	Follow up action will be reported in the next reporting month
	5 September 2018	✓	Improved/rectified on 5 September 2018.
Due to adverse weather, partial of the cofferdam and silt curtain were damaged. There was no marine construction works undergoing and Contractor was reminded to repair them before commencement of work.	19 September 2018	✕	Item remarked on 26 September 2018.
	26 September 2018	#	Follow up action will be reported in the next reporting month.
Noise			
Acoustic material on the vibration hammer in Portion 4 was observed damaged. The Contractor should maintain and ensure the integrity of acoustic material at all time.	5 September 2018	✓	Improved/rectified on 12 September 2018.
Landscape and Visual			
--	--	--	--
Air Quality			
--	--	--	--
Waste / Chemical Management			
Accumulation of refuse on water and ground were found. Cleaning progress was ongoing and Contractor should ensure the refuse will be cleared.	26 September 2018	#	Follow up action will be reported in the next reporting month.
Impact on Cultural Heritage			
--	--	--	--
Permits / Licenses			
--	--	--	--

✓ Observation/reminder was made during site audit but improved/rectified by the contractor in the next site audit
✕ Observation/reminder was made during site audit but not yet improved/rectified by the contractor in the next site audit
\# Follow up action will be reported in next reporting month
∗ Non-compliance of mitigation measure
• Non-compliance but rectified by the contractor

Appendix L - Site Audit Summary (September 2018)

Contract No. NE/2015/03
Tseung Kwan O - Lam Tin Tunnel - Northern Footbridge

Items	Date	Status*	Follow up Action
Water Quality			
Geotextile should be properly set up with sandbag along the site boundary to avoid any muddy water discharge outside the site.	12 September 2018	✓	Improved/rectified on 19 September 2018.
The geotextile that was attached to the site boundary was seen partially detached, the Contractor was reminded to reattach properly to ensure the effectiveness of mitigation measure.	26 September 2018	#	Follow up action will be reported in the next reporting month.
Noise			
--	--	--	--
Landscape and Visual			
--	--	--	--
Air Quality			
--	--	--	--
Waste / Chemical Management			
--	--	--	--
Impact on Cultural Heritage			
--	--	--	--
Permits / Licenses			
--	--	--	--

✓ Observation/reminder was made during site audit but improved/rectified by the contractor in the next site audit
✕ Observation/reminder was made during site audit but not yet improved/rectified by the contractor in the next site audit
\# Follow up action will be reported in next reporting month

∗ Non-compliance of mitigation measure
• Non-compliance but rectified by the contractor

Appendix L - Site Audit Summary (September 2018)

Contract No. NE/2017/01

Tseung Kwan O - Lam Tin Tunnel – Tsueng Kwan O Interchange and Associated Works

Items	Date	Status*	Follow up Action
Water Quality			
--	--	--	--
Noise			
--	--	--	--
Landscape and Visual			
--	--	--	--
Air Quality			
Contractor was reminded to replace a new NRMM label instead of faded label.	5 September 2018	--	Improved/rectified on 12 September 2018.
Waste / Chemical Management			
Impact on Cultural Heritage			
--	--	--	--
Permits / Licenses			

✓ Observation/reminder was made during site audit but improved/rectified by the contractor in the next site audit
✕ Observation/reminder was made during site audit but not yet improved/rectified by the contractor in the next site audit
\# Follow up action will be reported in next reporting month

∗ Non-compliance of mitigation measure
• Non-compliance but rectified by the contractor

Appendix L - Site Audit Summary (September 2018)

Contract No. NE/2017/02
Tseung Kwan O – Lam Tin Tunnel – Road P2/D4 and Associated Works

Items	Date	Status*	Follow up Action
Water Quality			
Ponding water was observed in Portion 1. The Contractor should avoid ponding water as far as possible.	29 August 2018	✕	Follow up action will be reported in the next reporting month.
	5 September 2018	✓	Improved/rectified on 5 September 2018.
Noise			
--	--	--	--
Landscape and Visual			
--	--	--	--
Air Quality			
Stockpile should be covered properly with impervious material to prevent dust resuspension.	12 September 2018	✓	Improved/rectified on 19 September 2018.
Stockpile should be covered properly with impervious material to prevent dust resuspension.	26 September 2018	#	Follow up action will be reported in the next reporting month.
Waste / Chemical Management			
--	--	--	--
Impact on Cultural Heritage			
--	--	--	--
Permits / Licenses			

✓ Observation/reminder was made during site audit but improved/rectified by the contractor in the next site audit
✕ Observation/reminder was made during site audit but not yet improved/rectified by the contractor in the next site audit
\# Follow up action will be reported in next reporting month

∗ Non-compliance of mitigation measure
• Non-compliance but rectified by the contractor

APPENDIX M
EVENT AND ACTION PLANS

Event and Action Plan for Air Quality (Dust)

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Action level being exceeded by one sampling	1. Identify source, investigate the causes of complaint and propose remedial measures; 2. Inform IEC and ER; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method.	1. Notify Contractor.	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
Action level being exceeded by two or more consecutive sampling	1. Identify source; 2. Inform IEC and ER; 3. Advise the ER on the effectiveness of the proposed remedial measures; 4. Repeat measurements to confirm findings; 5. Increase monitoring frequency to daily; 6. Discuss with IEC and Contractor on remedial actions required; 7. If exceedance continues, arrange meeting with IEC and ER;	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ET on the effectiveness of the proposed remedial measures; 5. Supervise Implementation of remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Submit proposals for remedial actions to IEC within three working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.

EVENT	ACTION			
	ET	**IEC**	**ER**	**CONTRACTOR**
	8. If exceedance stops, cease additional monitoring.			
Limit level being exceeded by one sampling	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform Contractor ,IEC, ER, and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within three working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.
Limit level being exceeded by two or more consecutive sampling	1. Notify IEC, ER, Contractor and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily;	1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly;	1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented;	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within three working days of notification; 3. Implement the agreed proposals;

EVENT	ACTION			
	ET	**IEC**	**ER**	**CONTRACTOR**
	5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Arrange meeting with IEC and ER to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring.	3. Supervise the implementation of remedial measures.	4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Event and Action Plan for Construction Noise

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Action Level	1. Notify IEC and Contractor; 2. Carry out investigation; 3. Report the results of investigation to the IEC, ER and Contractor; 4. Discuss with the Contractor and formulate remedial measures; 5. Increase monitoring frequency to check mitigation effectiveness.	1. Review the analysed results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures are properly implemented.	1. Submit noise mitigation proposals to IEC; 2. Implement noise mitigation proposals.
Limit Level	1. Identify source; 2. Inform IEC, ER, EPD and Contractor; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Inform IEC, ER and EPD the causes and actions taken for the exceedances;	1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractors remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

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

Event and Action Plan for Marine Water Quality

Event	Action			
	ET	**IEC**	**ER**	**CONTRACTOR**
Action level being exceeded by one sampling day at water sensitive receiver(s)	• Identify the source(s) of impact by comparing the results with those collected at the control stations as appropriate; • If exceedance is found to be caused by the reclamation activities, repeat *in-situ* measurement to confirm findings; • Inform IEC and contractor; • Check monitoring data, all plant, equipment and Contractor's working methods; • If exceedance occurs at WSD salt water intake, inform WSD; • Discuss mitigation measures with IEC and Contractor; • Repeat measurement on next day of exceedance.	• Discuss with ET and Contractor on the mitigation measures; • Review proposal on mitigation measures submitted by Contractor and advise the ER accordingly; • Assess the effectiveness of the implemented mitigation measures.	• Discuss with IEC on the proposed mitigation measures; • Make agreement on the mitigation proposal.	• Inform the ER and confirm notification of the non-compliance in writing; • Rectify unacceptable practice; • Check all plant and equipment; • Amend working methods if appropriate; • Discuss with ET and IEC and propose mitigation measures to IEC and ER; • Implement the agree mitigation measures.
Action level being exceeded by two or more consecutive	• Identify the source(s) of impact by comparing the results with those collected at the control stations as appropriate;	• Discuss with ET and Contractor on the mitigation measures;	• Discuss with IEC on the proposed mitigation measures; • Make agreement on the mitigation proposal;	• Inform the Engineer and confirm notification of the non-compliance in writing; • Rectify unacceptable practice;

Event	Action			
	ET	**IEC**	**ER**	**CONTRACTOR**
sampling days at water sensitive receiver(s)	• If exceedance is found to be caused by the reclamation activities, repeat in-situ measurement to confirm findings; • Inform IEC and contractor; • Check monitoring data, all plant, equipment and Contractor's working methods; • Discuss mitigation measures with IEC and Contractor; • Ensure mitigation measures are implemented; • Prepare to increase the monitoring frequency to daily; • If exceedance occurs at WSD salt water intake, inform WSD; • Repeat measurement on next day of exceedance.	• Review proposal on mitigation measures submitted by Contractor and advise the ER accordingly; • Assess the effectiveness of the implemented mitigation measures.	• Assess the effectiveness of the implemented mitigation measures.	• Check all plant and equipment and consider changes of working methods; • Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within 3 working days; • Implement the agreed mitigation measures.
Limit level being exceeded by one sampling day at water sensitive receiver(s)	• Identify the source(s) of impact by comparing the results with those collected at the control stations as appropriate;	• Discuss with ET and Contractor on the mitigation measures; • Review proposal on mitigation measures submitted by Contractor and advise the ER accordingly;	• Discuss with IEC, ET and Contractor on the proposed mitigation measures; • Request Contractor to critically review the working methods;	• Inform the ER and confirm notification of the non-compliance in writing; • Rectify unacceptable practice;

Event	Action			
	ET	**IEC**	**ER**	**CONTRACTOR**
	• If exceedance is found to be caused by the reclamation activities, repeat *in-situ* measurement to confirm findings; • Inform IEC, contractor, AFCD and EPD • Check monitoring data, all plant, equipment and Contractor's working methods; • Discuss mitigation measures with IEC, ER and Contractor; • Ensure mitigation measures are implemented; • Increase the monitoring frequency to daily until no exceedance of Limit level; • If exceedance occurs at WSD salt water intake, inform WSD.	• Assess the effectiveness of the implemented mitigation measures.	• Make agreement on the mitigation measures to be implemented; • Assess the effectiveness of the implemented mitigation measures.	• Check all plant and equipment and consider changes of working methods; • Discuss with ET, IEC and ER and submit proposal of mitigation measures to IEC and ER within 3 working days of notification; • Implement the agreed mitigation measures.
Limit level being exceeded by two or more consecutive sampling days at	• Identify the source(s) of impact by comparing the results with those collected at the control stations as appropriate;	• Discuss with ET and Contractor on the mitigation measures; • Review proposal on mitigation measures submitted by Contractor and advise the ER accordingly;	• Discuss with IC(E), ET and Contractor on the proposed mitigation measures; • Request Contractor to critically review the working methods;	• Inform the ER and confirm notification of the non-compliance in writing; • Rectify unacceptable practice;

Event	Action			
	ET	**IEC**	**ER**	**CONTRACTOR**
water sensitive receiver(s)	• If exceedance is found to be caused by the reclamation activities, repeat in-situ measurement to confirm findings; • Inform IC(E), AFCD, contractor and EPD; • Check monitoring data, all plant, equipment and Contractor's working methods; • Discuss mitigation measures with IC(E), ER and Contractor; • Ensure mitigation measures are implemented; • Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days; • If exceedance occurs at WSD salt water intake, inform WSD.	• Assess the effectiveness of the implemented mitigation measures.	• Make agreement on the mitigation measures to be implemented; • Assess the effectiveness of the implemented mitigation measures; • Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the marine work until no exceedance of Limit level.	• Check all plant and equipment and consider changes of working methods; • Discuss with ET, IC(E) and ER and submit proposal of mitigation measures to IC(E) and ER within 3 working days of notification; • Implement the agreed mitigation measures; • As directed by the Engineer, to slow down or to stop all or part of the construction activities.

Limit Levels and Action Plan for Landfill Gas

Parameter	Limit Level	Action
Oxygen	<19%	• Ventilate to restore oxygen to >19%
	<18%	• Stop works • Evacuate personnel/prohibit entry • Increase ventilation to restore oxygen to >19%
Methane	>10% LEL (i.e. > 0.5% by volume)	• Prohibit hot works • Ventilate to restore methane to <10% LEL
	>20% LEL (i.e. > 1% by volume)	• Stop works • Evacuate personnel / prohibit entry • Increase ventilation to restore methane to <10% LEL
Carbon Dioxide	>0.5%	• Ventilate to restore carbon dioxide to < 0.5%
	>1.5%	• Stop works • Evacuate personnel / prohibit entry • Increase ventilation to restore carbon dioxide to < 0.5%

Event and Action Plan for Coral Post-Translocation Monitoring

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Action Level Exceedance	1. Check monitoring data; 2. Inform the IEC, ER and Contractor of the findings; 3. Increase the monitoring to at least once a month to confirm findings; 4. Propose mitigation measures for consideration	1.Discuss monitoring with the ET and the Contractor; 2. Review proposals for additional Monitoring and any other measures submitted by the Contractor and advise the ER accordingly.	1. Discuss with the IEC additional monitoring requirements and any other measures proposed by the ET; 2. Make agreement on the measures to be implemented.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Discuss with the ET and the IEC and propose measures to the IEC and the ER; 3. Implement the agreed measures.
Limit Level Exceedance	Undertake Steps 1-4 as in the Action Level Exceedance. If further exceedance of Limit Level, suspend construction works until an effective solution is identified.	1.Discuss monitoring with the ET and the Contractor; 2. Review proposals for additional Monitoring and any other measures submitted by the Contractor and advise the ER accordingly.	1. Discuss with the IEC additional monitoring requirements and any other measures proposed by the ET; 2. Make agreement on the measures to be implemented.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Discuss with the ET and the IEC and propose measures to the IEC and the ER; 3. Implement the agreed measures.

Mitigation Measures for Vibration Monitoring

Level	Contingency Action
Alert Level	● The Engineer shall be informed immediately. ● The Contractor shall submit an investigation report to describe works being undertaken. To review the instrument responses and to study the cause of undue response. ● The Contractor shall review and increase the instrumentation monitoring and reporting frequency, if applicable. ● The Contractor shall submit a detailed plan of action describing the measures to be taken should the concerned instrument reach the action level to the Engineer for approval.
Alarm Level	● The Engineer shall be informed immediately. ● The active construction works may require to be suspended subject to the Engineer's review of monitoring data. ● The Contractor shall immediately implement the measures as defined in the detailed plan of action to prevent further ground movement and groundwater drawdown etc. ● The Contractor shall prepare a detailed investigation report to study the cause of the exceedance ● The Contractor shall propose a contingency plan for the Engineer's approval in the event that alarm value is reached or exceeded ● The Contractor shall develop an emergency plan for the Engineer's approval in the event the applied contingency measures cannot control the situation. ● The Contractor shall meet the Engineer to discuss the instrument response and review the effectiveness of the implemented measures. ● The Contractor shall carry out design review of the works

Action Level	● Consideration shall be given to suspend all active construction works and the Engineer shall be informed immediately ● The Contractor shall immediately implement the measures defined in the contingency plan ● The Contractor shall implement the measures defined in the emergency plan in the event that the applied contingency measures are found inadequate ● The Contractor shall provide a complete report to examine the construction method and review the response of the instruments with full history of the monitoring data and construction activities and necessary design update ● To resume the suspended activities, the Contractor shall demonstrate to the Engineer's satisfaction that it is safe to do so with approval from the Engineer.

APPENDIX N
ENVIRONMENTAL MITIGATION
IMPLEMENTATION SCHEDULE (EMIS)

Table I – Recommended Mitigation Measures stipulated in EM&A Manual of the Project

(Further information on observations/reminders/non-compliance made during site audit should refer to Table II)

Key:
^ Mitigation measure was fully implemented.
* Observation/reminder was made during site audit but improved/rectified by the contractor.
\# Observation/reminder was made during site audit but not yet improved/rectified by the contractor.
X Non-compliance of mitigation measure
• Non-compliance but rectified by the contractor
N/A Not Applicable

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
S3.8.1	Watering eight times a day on active works areas, exposed areas and paved haul roads	To minimize the dust impact	Contractor	All Active Work Sites	Construction phase	APCO	^
S3.8.1	Enclosing the unloading process at barging point by a 3-sided screen with top tipping hall / mixing area in Work Area A, provision of water spraying and flexible dust curtains	To minimize the dust impact	Contractor	Barging Points	Construction phase	APCO	^
S3.8.7	Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices: - Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather. - Use of frequent watering for particularly dusty construction areas and areas close to ASRs. - Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage,	To minimize the dust impact	Contractor	All Construction Work Sites	Construction phase	APCO and Air Pollution Control (Construction Dust) Regulation	*(1) ^ ^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	watering shall be applied to aggregate fines.						
	- Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs.						#(1)
	- Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations.						^
	- Establishment and use of vehicle wheel and body washing facilities at the exit points of the site.						N/A
	- Provision of wind shield and dust extraction units or similar dust mitigation measures at the loading area of barging point, and use of water sprinklers at the loading area where dust generation is likely during the loading process of loose material, particularly in dry seasons/ periods.						^
	- Provision of not less than 2.4m high hoarding from ground level along site boundary where adjoins a road, streets or other accessible to the public except for a site entrance or exit.						^
	- Imposition of speed controls for vehicles on site haul roads.						^
	- Where possible, routing of vehicles and positioning of construction plant should be at the maximum possible distance from ASRs						^
	- Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides.						^
	- Instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if						^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	dusty conditions arise.						
/	Emission from Vehicles and Plants • All vehicles shall be shut down in intermittent use. • Only well-maintained plant should be operated on-site and plant should be serviced regularly to avoid emission of black smoke. • All diesel fuelled construction plant within the works areas shall be powered by ultra low sulphur diesel fuel (ULSD)	Reduce air pollution emission from construction vehicles and plants	Contractor	All construction sites	Construction stage	• APCO	^ ^ ^
/	Valid No-road Mobile Machinery (NRMM) labels should be provided to regulated machines	Reduce air pollution emission from construction vehicles and plants	Contractor	All construction sites	Construction stage	• APCO	*(2)
Sediment Management Plan	- Tarpaulin sheets will be provided to cover dredged materials during transportation offsite. - Water Sprinklers will be installed along outer steel frame. Dusty materials will be dampened by spraying water to suppress dust generation during mixing operation - Subject to the odour intensity and instruction by the *Supervisor*, odour suppressant will be applied over the marine sediments via water blaster to minimize the impact.	Control potential impacts from Cement s/s process	Contractor	NE/2015/02	Construction stage	EIAO, APCO	^ ^ ^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	- The unloading / loading areas of the marine sediments will be barricaded with minimum 3.5m high barrier facing the nearest resident to minimize the dust impact. The mixing area and curing area will be enclosed with 3-sides and roof to minimize the dust impact. - The mixing area will be established with retractable roof on top and with corrugated steel sheet at side enclosure by 5.4m high concrete block walls to prevent spread of dust during the mixing process with cement. - Handling and mixing of cement will follow the Air Pollution Control (Construction Dust) Regulation to avoid fugitive dust emissions. - The discharge of cement from silo hopper to the concrete mixer truck will be 4-side enclosed by Tarpaulin to minimize the dust emission. - The mixing of cement and water will be confined in the concrete mixer truck until the pre-mixing completed. The hydrated cement will then be unloaded to the mixing area to mix with the sediment. - Treated marine sediments in the stockpiling area shall be covered by tarpaulin sheets or similar material except the operating earthwork front. - The soil filled platform is covered by a layer of sand fill material, and frequent water spray will be carried out on the sand surface for dust control. - Any excessive air emissions will be inspected and recorded. - Sediment height of treated marine sediment being kept 0.9 m below the top level of concrete block wall during rainy season.						^ ^ ^ ^ ^ ^ ^ ^ ^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
Noise Impact (Construction Phase)							
S4.8	- Use of quiet PME. Use of movable noise barriers for Excavator, Lorry, Dump Truck, Mobile Crane, Compactor, Concrete Mixer Truck, Concrete Lorry Mixer, Breaker, Mobile Crusher, Backhoe, Vibratory Poker, Saw, Asphalt Paver, Vibratory Roller, Vibrolance, Hydraulic Vibratory Lance and Piling (Vibration Hammer). Use of full enclosure for Air Compressor, Compressor, Bar Bender, Generator, Drilling Rig, Chisel, Large Diameter Bore Piling, Grout Mixer & Pump and Concrete Pump.	To minimize construction noise impact arising from the Project at the affected NSRs	Contractor	Work Sites	Construction phase	EIAO-TM, NCO	^
Noise Mitigation Plan	Use of Temporary Noise Barriers (i.e Acoustic box, SilentUp and etc.) or Full Enclosure for PME according to the approved Noise Mitigation Plan	To minimize construction noise impact arising from the Project at the affected NSRs	Contractor	Work Sites	Construction phase	EIAO-TM, NCO	*(3)
S4.9	Good Site Practice - Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program - Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction program. - Mobile plant, if any, should be sited as far away from NSRs as possible. - Machines and plant (such as trucks) that may be in intermittent use should be shut down between works periods or should be throttled down to a minimum.	To minimize construction noise impact arising from the Project at the affected NSRs	Project Proponent	Work sites	Construction Period	EIAO-TM, NCO	^ ^ ^ ^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	- Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs. - Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities.						^ ^
S4.9	Scheduling of Construction Works during School Examination Period	To minimize construction noise impact arising from the Project at the affected NSRs	Contractor	Work site near school	Construction phase	EIAO-TM, NCO	N/A
Water Quality Impact (Construction Phase)							
S5.6.24	The dry density of filling material for the TKO-LT Tunnel reclamation should be 1,900kg/m^3, with fine content of 25% or less	Control potential impacts from filling activities	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO	N/A
S5.8.1	Non-dredged method by constructing steel cellular caisson structure with stone column shall be adopted for construction of seawall foundation. During the stone column installation (also including the installation of steel cellular caisson), silt curtain shall be employed around the active stone column installation points.	Control potential impacts from filling activities	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO	N/A
S5.8.2	Formation of seawall enclosing the reclamation for Road P2 (notwithstanding an opening of about 50m for marine access) shall be completed prior to the filling activities. The seawall opening of about 50m wide for marine access shall be selected at a location as indicatively shown in Appendix 5.10. No more than 3 filling	Control potential impacts from filling activities	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO	N/A

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	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.						
Silt Curtain Deployment Plan	- Silt curtains should be deployed properly to surround the works area. - Maintenance of silt curtain should be provided. - Sufficient stock of silt curtain should be provided on site.	Control potential impacts from marine woroks	Contractor	NE/2015/01, NE/2015/02, NE/2017/01	Construction stage	EIAO	*(4) / #(4) / ●(4)
Sediment Management Plan	- Loading of barges and hoppers will be controlled to prevent splashing of dredged materials into the surrounding water. Barges or hoppers will not be filled to a level that will cause the overflow of materials or pollute water during loading or transportation. - Bottom opening of barges shall be fitted with tight fitting seals to prevent leakage of material. Excess material shall be cleaned from the decks and exposed fittings of barges and hopper dredgers before the vessel is moved. - Monitoring of the barge loading shall be conducted to ensure that loss of material does not take during transportation. - Transport barges or vessels shall be equipped with automatic self-monitoring devices. - Vehicles containing any untreated / treated marine sediments will be suitably covered to limit potential dust emissions or potential contaminated wastewater	Control potential impacts from Cement s/s process	Contractor	NE/2015/02	Construction stage	EIAO, WPCO	^ ^ ^ ^ ^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	run-off, and truck bodies and tailgates will be sealed to prevent any discharge during transport or wet conditions. - The leachate from the untreated marine sediment will be collected and treated in the mixing pool for cement s/s treatment. - A 300mm diameter U-channel will be constructed along the perimeter of the cement s/s treatment facility to collect the run-off, if any, shall be collected and discharged according to the Water Pollution Control Ordinance (WPCO). Cleaning for the u-channel and desilting pits shall be conducted on weekly basic. - The stockpile area of treated marine sediment will be surrounded by the perimeter concrete block walls with geotextile membranes installed at the inner face of the concrete block walls. The types of perimeter wall can be used interchangeably. The Structural Feasibility of the perimeter wall for the changes of height of the stockpile had been checked and certified by ICE. - The mixing areas will be completely paved or covered by linings in order to avoid contamination to underlying soil or groundwater and will be confined by partition concrete block walls for carrying out the mixing and temporary stockpile of treated sediment.						^ ^ ^ ^
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;	Control potential impacts from filling activities and marine-based	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?	Status
	- all vessels should be sized so that adequate clearance is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash; - all hopper barges should be fitted with tight fitting seals to their bottom openings to prevent leakage of material; - excess material shall be cleaned from the decks and exposed fittings of barges before the vessel is moved; - adequate freeboard shall be maintained on barges to reduce the likelihood of decks being washed by wave action; - loading of barges and hoppers should be controlled to prevent splashing of filling material into the surrounding water. Barges or hoppers should not be filled to a level that will cause the overflow of materials or polluted water during loading or transportation; - any pipe leakages shall be repaired quickly. Plant should not be operated with leaking pipes; - construction activities should not cause foam, oil, grease, scum, litter or other objectionable matter to be present on the water within the site or dumping grounds; and - before commencement of the reclamation works, the holder of Environmental Permit has to submit plans showing the phased construction of the reclamation, design and operation of the silt curtain.	construction					^ ^ ^ ^ ^ ^ ^ ^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
S5.8.4	Site specific mitigation plan for reclamation areas using public fill materials should be submitted for EPD agreement before commencement of construction phase with due consideration of good site practices.	Control potential impacts from filling activities and marine based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A
ERR S5.6.1	To minimize water quality impact arising from the dredging and filling works for Reclamation for Road P2, the following mitigation measures shall be implemented: - Before carrying out any dredging and underwater filling works, a temporary barrier shall first be constructed to a height above the high water mark to completely enclose the works site (without any opening at the barrier wall) - The temporary barrier fully enclosing the dredging and underwater filling works site shall not be removed before completion of all dredging and underwater filling works. - Water quality sampling and testing shall be carried out to demonstrate that the water quality inside the enclosed barrier is comparable to the ambient or baseline levels prior to the removal of the fully enclosed barrier. - Silt curtains shall be deployed for the installation and removal of the temporary barrier and at the double water gates marine access opening during its operation.	Control potential impacts from dredging and filling works for Reclamation for Road P2	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^ ^ N/A ^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
S5.8.5	It is important that appropriate measures are implemented to control runoff and drainage and prevent high loading of SS from entering the marine environment. Proper site management is essential to minimise surface water runoff, soil erosion and sewage effluents.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	*(5)
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	*(6)

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
S5.8.8	Exposed soil areas should be minimised to reduce the potential for increased siltation, contamination of runoff, and erosion. Construction runoff related impacts associated with the above ground construction activities can be readily controlled through the use of appropriate mitigation measures which include: - use of sediment traps; and - adequate maintenance of drainage systems to prevent flooding and overflow.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^ N/A *(7)
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?	Status
S5.8.11	Sedimentation tanks of sufficient capacity, constructed from pre-formed individual cells of approximately 6 to 8m^3 capacity, are recommended as a general mitigation measure which can be used for settling surface runoff prior to disposal. The system capacity is flexible and able to handle multiple inputs from a variety of sources and particularly suited to applications where the influent is pumped.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO S5	^
S5.8.12	Earthworks final surfaces should be well compacted and the subsequent permanent work or surface protection should be carried out immediately after the final surfaces are formed to prevent erosion caused by rainstorms. Appropriate drainage like intercepting channels should be provided where necessary.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO S5	^
S5.8.13	Measures should be taken to minimize the ingress of rainwater into trenches. If excavation of trenches in wet seasons is necessary, they should be dug and backfilled in short sections. Rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO S5	^
S5.8.14	Open stockpiles of construction materials (for examples, aggregates, sand and fill material) of more than 50m^3 should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system.	Control potential impacts from construction site runoff and land-	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
		based construction					
S5.8.15	Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and storm runoff being directed into foul sewers. Discharge of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul sewerage system.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.16	Precautions to be taken at any time of year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecast, and actions to be taken during or after rainstorms are summarised in Appendix A2 of ProPECC PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events, especially for areas located near steep slopes.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.17	Oil interceptors should be provided in the drainage system and regularly cleaned to prevent the release of oils and grease into the storm water drainage system after accidental spillages. The interceptor should have a bypass to prevent flushing during periods of heavy rain.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
S5.8.18	All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and located wheel washing bay should be provided at every site exit, and washwater should have sand and silt settled out and removed at least on a weekly basis to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheelwash bay to the public road should be paved with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.19	Silt removal facilities, channels and manholes should be maintained and the deposited silt and grit should be removed regularly, at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.20	It is recommended that on-site drainage system should be installed prior to the commencement of other construction activities. Sediment traps should be installed in order to minimise the sediment loading of the effluent prior to discharge into foul sewers. There shall be no direct discharge of effluent from the site into the sea.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^

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S5.8.21	All temporary and permanent drainage pipes and culverts provided to facilitate runoff discharge should be adequately designed for the controlled release of storm flows. All sediment control measures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly following rain storms. The temporarily diverted drainage should be reinstated to its original condition when the construction work has finished or the temporary diversion is no longer required.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.22	All fuel tanks and storage areas should be provided with locks and be located on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank, to prevent spilled fuel oils from reaching the coastal waters.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.23	Minimum distances of 100m shall be maintained between the existing or planned stormwater discharges and the existing or planned seawater intakes during construction and operational phases	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO, TMDSS	^
S5.8.24	Under normal circumstances, groundwater pumped out of wells, etc. for the lowering of ground water level in basement or foundation construction, and groundwater seepage pumped out of tunnels or caverns under construction should be discharged into storm drains after the removal of silt in silt removal facilities.	Control potential impacts from construction site runoff and land-	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
		based construction					
S5.8.25 - S5.8.27 & Table 5.18	Grouting would be adopted as measure to reduce the groundwater inflow into the tunnel. During the tunnel excavation, the inflow rate of groundwater into the tunnel will be measured during the excavation. The groundwater levels above the tunnel will also be monitored by piezometers. If the inflow rate exceeds the pre-determined groundwater control criteria or the groundwater drawdown exceeds the required limit, pre-excavation grouting will be required to reduce the groundwater inflow. No significant change of groundwater levels would therefore be expected. Any chemicals/ foaming agents which would be entrained to the groundwater should be biodegradable and non-toxic throughout the tunnel construction. Potential groundwater quality impact would be minimal as the used material is non-toxic and biodegradable. No adverse groundwater quality would therefore be expected. Prescriptive measures in the form of an Action Plan with pre-emptive and re-active to preserve the groundwater levels at all times during the tunnel construction are set out in Table 5.18.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO, Buildings Ordinance	N/A
S5.8.28	Water used in ground boring and drilling for site investigation or rock / soil anchoring should as far as practicable be recirculated after sedimentation. When there is a need for final disposal, the wastewater should be discharged into storm drains via silt removal facilities.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Design Stage and Construction Phas	ProPECC PN 1/94, EIAOTM, WPCO	N/A

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S5.8.29 - S5.8.31	Wastewater generated from the washing down of mixing trucks and drum mixers and similar equipment should whenever practicable be recycled. The discharge of wastewater should be kept to a minimum. To prevent pollution from wastewater overflow, the pump sump of any water recycling system should be provided with an online standby pump of adequate capacity and with automatic alternating devices. Under normal circumstances, surplus wastewater may be discharged into foul sewers after treatment in silt removal and pH adjustment facilities (to within the pH range of 6 to 10). Disposal of wastewater into storm drains will require more elaborate treatment.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.32	All vehicles and plant should be cleaned before they leave a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. A wheel washing bay should be provided at every site exit if practicable and wash-water should have sand and silt settled out or removed before discharging into storm drains. The section of construction road between the wheel washing bay and the public road should be paved with backfall to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.33	Bentonite slurries used in diaphragm wall and borepile construction should be reconditioned and reused wherever practicable. If the disposal of a certain residual quantity cannot be avoided, the used slurry may be disposed of at the marine spoil grounds subject to obtaining a marine dumping licence from EPD on a case-by-case basis.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A

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S5.8.34	If the used bentonite slurry is intended to be disposed of through the public drainage system, it should be treated to the respective effluent standards applicable to foul sewer, storm drains or the receiving waters as set out in the WPCO Technical Memorandum on Effluent Standards.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A
S5.8.35	Water used in water testing to check leakage of structures and pipes should be reused for other purposes as far as practicable. Surplus unpolluted water could be discharged into storm drains.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A
S5.8.36	Sterilization is commonly accomplished by chlorination. Specific advice from EPD should be sought during the design stage of the works with regard to the disposal of the sterilizing water. The sterilizing water should be reused wherever practicable.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Design Stage and Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A
S5.8.37	Before commencing any demolition works, all sewer and drainage connections should be sealed to prevent building debris, soil, sand etc. from entering public sewers/drains.	Control potential impacts from construction site runoff and land-	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A

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		based construction					
S5.8.38	Wastewater generated from building construction activities including concreting, plastering, internal decoration, cleaning of works and similar activities should not be discharged into the stormwater drainage system. If the wastewater is to be discharged into foul sewers, it should undergo the removal of settleable solids in a silt removal facility, and pH adjustment as necessary	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.39	Acidic wastewater generated from acid cleaning, etching, pickling and similar activities should be neutralized to within the pH range of 6 to 10 before discharging into foul sewers. If there is no public foul sewer in the vicinity, the neutralized wastewater should be tinkered off site for disposal into foul sewers or treated to a standard acceptable to storm drains and the receiving waters	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.40	Wastewater collected from canteen kitchens, including that from basins, sinks and floor drains, should be discharged into foul sewer via grease traps capable of providing at least 20 minutes retention during peak flow.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	N/A

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S5.8.41	Drainage serving an open oil filling point should be connected to storm drains via a petrol interceptor with peak storm bypass.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.42	Vehicle and plant servicing areas, vehicle wash bays and lubrication bays should as far as possible be located within roofed areas. The drainage in these covered areas should be connected to foul sewers via a petrol interceptor. Oil leakage or spillage should be contained and cleaned up immediately. Waste oil should be collected and stored for recycling or disposal in accordance with the Waste Disposal Ordinance.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.43	Construction work force sewage discharges on site are expected to be connected to the existing trunk sewer or sewage treatment facilities. The construction sewage may need to be handled by portable chemical toilets prior to the commission of the on-site sewer system. Appropriate numbers of portable toilets shall be provided by a licensed contractor to serve the large number of construction workers over the construction site. The Contractor shall also be responsible for waste disposal and maintenance practices.	Control potential impacts from construction site runoff and land-based construction	CEDD's Contractors	Work site	Construction Phase	ProPECC PN 1/94, EIAOTM, WPCO	^
S5.8.44	Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste)	Control potential impacts from accidental	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO, WDO	^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	(General) Regulation should be observed and complied with for control of chemical wastes.	spillage of chemicals					
S5.8.45	Any service shop and maintenance facilities should be located on hard standings within a bunded area, and sumps and oil interceptors should be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage should only be undertaken within the areas appropriately equipped to control these discharges.	Control potential impacts from accidental spillage of chemicals	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO	^
S5.8.46	Disposal of chemical wastes should be carried out in compliance with the Waste Disposal Ordinance. The "Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes" published under the Waste Disposal Ordinance details the requirements to deal with chemical wastes. General requirements are given as follows: - suitable containers should be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport; - chemical waste containers should be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents; and - storage area should be selected at a safe location on site and adequate space should be allocated to the storage area.	Control potential impacts from accidental spillage of chemicals	CEDD's Contractors	Work site	Construction Phase	EIAO-TM, WPCO, WDO	^ ^ *(8)
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,	*(9) / #(9)

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Ecological Impact							
S6.8.4	***Measures to Minimize Disturbance*** - Use of Quiet Mechanical Plant during the construction phase should be adopted wherever possible. - Hoarding or fencing should be erected around the works area boundaries during the construction phase. The hoarding would screen adjacent habitats from construction phase activities, reduce noise disturbance to these habitats and also to restrict access to habitats adjacent to works areas by site workers; - Regular spraying of haul roads to minimize impacts of dust deposition on adjacent vegetation and habitats during the construction activities	Minimize noise, human and traffic disturbance to terrestrial habitat and wildlife; and reduce dust generation	Design Team / Contractor	Land-based works are	Construction Phase	N/A	^ ^ ^
S6.8.5	***Standard Good Site Practice*** - Placement of equipment or stockpile in designated works areas and access routes selected on existing disturbed land to minimise disturbance to natural habitats. - Construction activities should be restricted to works areas that should be clearly demarcated. The works areas should be reinstated after completion of the works. - Waste skips should be provided to collect general refuse and construction wastes. The wastes should be properly disposed off-site in a timely manner. - General drainage arrangements should include sediment and oil traps to collect and control construction site run-off. - Open burning on works sites is illegal, and should be strictly prohibited. - Measures should also be put into place so that litter, fuel and solvents do not enter	Reduce disturbance to surrounding habitats	Contractor	Land-based works are	Construction Phase	N/A	^ ^ *(10) #(10) ^ ^

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	the nearby watercourses.						
S6.8.6	***Measure to Minimize Groundwater Inflow*** - The drained tunnel construction method with groundwater inflow control measures would generally be adopted. - During the tunnel excavation, pre-excavation grouting could be adopted to reduce the groundwater inflow and ensure that the tunnel would meet the long term water tightness requirements.	Minimize groundwater inflow	Contractor	Tunnel	Construction Phase	N/A	N/A N/A
S6.8.8	***Measure to Minimize Impact on Corals*** <u>Coral translocation</u> - It is recommended to translocate the affected coral colonies, except the locally common *Oulastrea crispata*, within the reclamation area and bridge footprint to the other suitable locations as far as practicable. - The coral translocation should be conducted during the winter months (November-March) in order to avoid disturbance during their spawning period (i.e. July to October). - A detailed coral translocation plan with a description on the methodology for pretranslocation coral survey, translocation methodology, identification/proposal of coral recipient site, monitoring methodology for posttranslocation should be prepared during the detailed design stage.	Minimize loss of coral	Design team, contractor, project operator	Within reclamation areas and pier footprint	Prior construction	N/A	^ ^ ^ ^

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	- The coral translocation plan should be subject to approval by relevant authorities (e.g. EPD and AFCD) before commencement of the coral translocation. All the translocation exercises should be conducted by experienced marine ecologist(s) who is/are approved by AFCD prior to commencement of coral translocation. <u>Post translocation Monitoring</u> - A coral monitoring programme is recommended to assess any adverse and unacceptable impacts to the translocated coral communities - Information gathered during each posttranslocation monitoring survey should include observations on the presence, survival, health condition and growth of the translocated coral colonies. These parameters should then be compared with the baseline results collected from the pre-translocation survey.						^ ^
S6.8.9 S6.8.10	***Measure to Control Water Quality Impact*** - Deployment of silt curtains around the active stone column installation points, opening of newly installed seawall and marine works area. - Diverting of the site runoff to silt trap facilities before discharging into storm drain; - Proper waste and dumping management; and - Standard good-site practice for land-based construction.	Control water quality impact, especially on suspended solid level; minimize the contamination of wastewater discharge, accidental chemical	Design Team, contractor	Marine and landbased works area	Construction phase	WQO	N/A ^ ^ ^

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		spillage and construction site runoff to the receiving water bodies					
S6.8.11	***Compensation for Vegetation Loss*** - Felling of mature trees should be compensated by planting of standard or heavy standard trees within or in vicinity of the affected area as far as practicable. Such compensatory planting for trees should be provided with at least a 1:1 ratio. In addition, vegetation at the temporarily affected area should be reinstated with species similar to the existing condition.	Compensate for the vegetation loss	Design Team, contractor	Land-based works area	Construction phase	N/A	^
Fisheries Impact							
S7.7.3	***Measure to Control Water Quality Impact*** - Deployment of silt curtains around the active stone column installation points, opening of newly installed seawall and marine works area.	Control water quality impact, especially on suspended solid level	Design Team / Contractor	Marine work area	Construction phase	WQO	^
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;	To reduce waste management impacts	Contractor	All work sites	Construction Phase	Waste Disposal Ordinance (Cap. 354)	^

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	- 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.					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	To achieve waste reduction	Contractor	All work sites	Construction Phase	ETWB TCW No. 19/2005	^

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	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.						
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	-	^ ^ ^ ^
S8.6.8/	***Storage, Collection and Transportation of Waste (con't)***	To minimize	Contractor	All work	Construction		

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Waste Management Plan	- Remove waste in timely manner; - Waste collectors should only collect wastes prescribed by their permits; - Impacts during transportation, such as dust and odour, should be mitigated by the use of covered trucks or in enclosed containers; - Obtain relevant waste disposal permits from the appropriate authorities, in accordance with the Waste Disposal Ordinance (Cap. 354), Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 345) and the Land (Miscellaneous Provisions) Ordinance (Cap. 28); - Waste should be disposed of at licensed waste disposal facilities/ alternative disposal ground approved by RE and DEP; and - Maintain records of quantities of waste generated, recycled and disposed.	potential adverse environmental impacts arising from waste collection and disposal		sites	Phase		^ ^ ^ ^ ^ ^
S8.6.9/ Waste Management Plan	***Storage, Collection and Transportation of Waste (con't)*** - Implementation of trip ticket system with reference to DEVB TC(W) No. 6/2010, Trip Ticket System for Disposal of Construction & Demolition Materials, to monitor disposal of waste and to control fly-tipping at PFRFs or landfills. A recording system for the amount of waste generated, recycled and disposed (including disposal sites) should be proposed.	To minimize potential adverse environmental impacts arising from waste collection and disposal	Contractor	All work sites	Construction Phase	DEVB TCW No. 6/2010	^
S8.6.11 - S8.6.13/	***Sorting of C&D Materials*** - Sorting to be performed to recover the inert materials, reusable and recyclable	To minimize potential	Contractor	All work sites	Construction Phase	DEVB TCW No. 6/2010	^

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Waste Management Plan	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	adverse environmental				ETWB TCW No. 33/2002 ETWB TCW No. 19/2005	^ ^
S8.6.15 – S8.6.16/ Waste Management Plan	***Sediments*** - Sediment encountered may be reused as filling material on-site after cement stabilization. Cement-stabilization process is undertaken by mixing sediment and cement and will convert sediment to earth filling material. The treated sediment has to comply with Risk-Based Remediation Goals (RBRGs) before being reused in order not to raise any land contamination issue. The adoption of RBRGs to assess stabilized sediment has been proposed in the current C&DMMP. MFC has no adverse comment on the current C&DMMP. The sediment quality indicates that all sediments comply with most stringent RBRGs except for one sediment sample (TKO-EBH501 3-3.95m) with lead exceeding the RBRG. Except for the sediment sample (TKO-EBH501 3-3.95m), the chemical screening results do not indicate sediment as contaminated soil. It is anticipated that reuse of sediment except sediment sample (TKO-EBH501 3-3.95m) will not lead to land contamination.	To ensure the sediment to be disposed of in an authorized and least impacted way	NE/2015/02, NE/2017/01	All works areas with sediments concern	Construction Phase	RBRG	N/A

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	- Despite exceedance of RBRG, onsite reuse of sediment under sample (TKO-EBH501 33.95m) as filling material after cement stabilization is also a suitable treatment. Sediment quality indicates the sediment sample (TKO-EBH501 3-3.95m) exceed RBRG for lead. While cement stabilization will immobilize metal contaminants, it is capable to treat the exceedance on lead. The stabilized material should comply with UTS of Lead and UCS. If the treated material do not comply with UTS or UCS, re-stabilization have to be undertaken to meet compliance of UTS and UCS before reusing the treated sediment as filling material. However, further agreement on final disposal/treatment on sediment under sample (TKO-EBH501 3-3.95m) has to be sought from DEP						N/A
S8.6.17 – S8.6.20	***Sediments (con't)*** - Requirements of the Air Pollution Control (Construction Dust) Regulation, where relevant, shall be adhered to during boring, excavation, transportation and disposal of sediments or cement stabilization of sediment. - A treatment area should be confined for carrying out the cement stabilization mixing and temporary stockpile. The area should be designed to prevent leachate from entering the ground. Leachate, if any, should be collected and 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	To determine the best handling and treatment of sediment	Contractor	All works areas with sediments concern	Construction Phase		^ ^ ^

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	should be controlled to avoid splashing and overflowing of the sediment slurry to the surrounding water. - In order to minimise the exposure to contaminated materials, workers should, when necessary, wear appropriate personal protective equipments (PPE) when handling contaminated sediments. Adequate washing and cleaning facilities should also be provided on site.						N/A
S8.6.21/ Waste Management Plan	***Sediments (con't)*** - Alternatively, excavated sediment can be treated with marine disposal. The basic requirements and procedures for excavated sediment disposal specified under ETWB TC(W) No. 34/2002 shall be followed. MFC is responsible for the provision and management of disposal capacity and facilities for the excavated sediment, while the permit of marine dumping is required under the Dumping at Sea Ordinance and is the responsibility of the DEP.	To ensure the sediment to be disposed of in an authorized and least impacted way	NE/2015/02, NE/2017/01	All works areas with sediments concern	Construction Phase	ETWB TC(W) No. 34/2002 & Dumping at Sea Ordinance	N/A
S8.6.23	***Sediments (con't)*** - For allocation of sediment disposal sites and application of marine dumping permit, separate SSTP has to be submitted to EPD for agreement under DASO. Additional site investigation, based on the SSTP, maybe carried out in order to confirm the disposal arrangements for the proposed sediments removal. A Sediment Quality Report (SQR) shall then be required for EPD agreement under DASO prior to the tendering of the construction contract, discussing in details the site investigation, testing results as well as the delineation of each of the categories of excavated materials and the corresponding types of disposal.	To determine the best handling and disposal option of sediment	Contractor	All works areas with sediments concern	Construction Phase	ETWB TC(W) No. 34/2002 & Dumping at Sea Ordinance	N/A

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S8.6.24 - S8.6.28/ Waste Management Plan	***Sediments (con't)*** - The excavated sediments is expected to be loaded onto the barge and transported to the designated disposal sites allocated by the MFC. The excaveted sediment would be disposed of according to its determined disposal options and ETWB TC(W) No. 34/2002. - Stockpiling of contaminated sediments should be avoided as far as possible. If temporary stockpiling of contaminated sediments is necessary, the excavated sediment should be covered by tarpaulin and the area should be placed within earth bunds or sand bags to prevent leachate from entering the ground, nearby drains and surrounding water bodies. The stockpiling areas should be completely paved or covered by linings in order to avoid contamination to underlying soil or groundwater. Separate and clearly defined areas should be provided for stockpiling of contaminated and uncontaminated materials. Leachate, if any, should be collected and discharged according to the Water Pollution Control Ordinance (WPCO). - In order to minimise the potential odour / dust emissions during boring and transportation of the sediment, the excavated sediments should be kept wet 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	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	^ ^ ^ ^

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	level that would cause overflow of materials or laden water during loading or transportation. In addition, monitoring of the barge loading shall be conducted to ensure that loss of material does not take place during transportation. Transport barges or vessels shall be equipped with automatic self-monitoring devices as specified by the DEP. - In order to minimise the exposure to contaminated materials, workers should, when necessary, wear appropriate personal protective equipments (PPE) when handling contaminated sediments. Adequate washing and cleaning facilities should also be provided on site. - Another possible arrangement for Type 3 disposal is by geosynthetic containment. A geosynthetic containment method is a method whereby the sediments are sealed in geosynthetic containers and, at the disposal site, the containers would be dropped into the designated contaminated mud pit where they would be covered by further mud disposal and later by the mud pit capping, thereby meeting the requirements for fully confined mud disposal.						N/A N/A
S8.6.26/ Waste 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	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	^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. The Contractor shall use a licensed collector to transport and dispose of the chemical wastes, to either the Chemical Waste Treatment Centre at Tsing Yi, or other licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.					(Chemical Waste) (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)	To prevent indirect vibration	Contractors	Work areas	Construction Phase	Vibration Limits on Heritage Buildings	^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	limit of 5mm/s measured inside the historical buildings; - Monitoring of vibration should be carried out during construction phase. - Tilting and settlement monitoring should will be applied on the Cha Kwo Ling Tin Hau Temple as well. - A proposal with details for the mitigation measures and monitoring of impacts on built heritage shall be submitted to AMO for comments before commencement of work.	impact				by CEDD; GCHIA; AMO.	^ ^ ^
Built Heritage Mitigation Plan	- Established Alert, Alarm and Action Level for the monitoring parameters. - To increase the instrumentation monitoring and reporting frequency. - To propose detailed action plan or contingency plan for the Engineer's approval when AAA Level is reached or exceeded.	To prevent vibration impacts	NE/2015/01	Tin Hau Temple	Construction Phase	Vibration Limits on Heritage Buildings by CEDD; GCHIA; AMO.	^ ^ ^
Landscape and Visual Impact (Construction Phase)							
Table 10.8.1/ Landscape Mitigation Plan	CM1 - Construction area and contractor's temporary works areas to be minimised to avoid impacts on adjacent landscape.	Avoid impact on adjacent landscape areas	CEDD (via Contractor)	General	Construction planning and during construction period	N/A	^
Table 10.8.1/ Landsca	CM2 - Reduction of construction period to practical minimum.	Minimise duration of impact	CEDD (via Contractor)	N/A	Construction planning	N/A	^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
pe Mitigation Plan							
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	^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
Table 10.8.1/ Landscape Mitigation Plan	CM6 - Advance screen planting of fast growing tree and shrub species to noise barriers and hoardings. Trees shall be capable of reaching a height >10m within 10 years.	To maximize screening of the works	CEDD (via Contractor)	At Lam Tin Interchange and edge of Road P2 landscape deck, TKO	Beginning of construction period	N/A	^
Table 10.8.1/ Landscape Mitigation Plan	CM7 - Hydroseeding or sheeting of soil stockpiles with visually unobtrusive material	To reduce visual intrusion	CEDD (via Contractor)	General	Throughout construction period	As per Particular Specification	N/A
Table 10.8.1/ Landscape Mitigation Plan	CM8 - Control of night-time lighting by hooding all lights and through minimisation of night working periods.	To reduce visual intrusion	CEDD (via Contractor)	General	Throughout construction period	N/A	^
Table 10.8.1/ Landscape	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	^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
Mitigation Plan							
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	Construction planning and reclamation stages	N/A	N/A

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
				reclamation for TKO Interchange slip roads and Road P2			
Landfill Gas Hazard (Design and Construction Phase)							
S11.5.9	A Safety Officer, trained in the use of gas detection equipment and landfill gas-related hazards, should be present on site throughout the groundworks phase. The Safety Officer should be provided with an intrinsically safe portable instrument, which is appropriately calibrated and able to measure the following gases in the ranges indicated below: Methane 0-100% LEL and 0100% v/v Carbon dioxide 0-100% Oxygen 0-21%	Protect the workers from landfill gas hazards	Contractor	Project sites within the Sai Tso Wan Landfill Consultation Zone	Construction phase	EPD's Landfill Gas Hazard Assessment Guidance Note	^
S11.5.10 S11.5.25	***Safety Measures*** - For staff who work in, or have responsibility for "at risk" area, such as all excavation workers, supervisors and engineers working within the Consultation Zone, should receive appropriate training on working in areas susceptible to landfill gas, fire and explosion hazards. - An excavation procedure or code of practice to minimize landfill gas related risk	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	^ ^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	should be 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.					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?	Status
	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.						^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	- 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	Protect the workers from landfill gas	Contractor	Project sites within the Sai Tso Wan	Construction phase	EPD's Landfill Gas Hazard Assessment	^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	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	hazards		Landfill Consultation Zone		Guidance Note	^ ^ ^ ^ ^

EIA Ref. / EP Submission	Recommended Mitigation Measures	Objectives of the recommended Measures & Main Concerns to address	Who to implement the measures?	Location of the measures	When to Implement the measures?	What requirements or standards for the measures to achieve?	Status
	day. Measurements shall be recorded and kept as a record of safe working conditions with copies of the site diary and submitted to the Engineer for approval. The Contractor may elect to carry out monitoring via an automated monitoring system.						
S11.5.32	The hazards from landfill gas during the construction stage within the Sai Tso Wan Landfill Consultation Zone should be minimized by suitable precautionary measures recommended in Chapter 8 of the Landfill Gas Hazard Assessment Guidance Note.	construction stage within the Sai Tso Wan Protect the workers from landfill gas hazards	Contractor	Project sites within the Sai Tso Wan Landfill Consultation Zone	Construction phase	EPD's Landfill Gas Hazard Assessment Guidance Note	N/A

Table II - Observations/reminders/non-compliance made during Site Audit

Key:
- * Observation/reminder was made during site audit but improved/rectified by the contractor.
- # Observation/reminder was made during site audit but not yet improved/rectified by the contractor.
- X Non-compliance of mitigation measure
- • Non-compliance but rectified by the contractor

Status / Remark	EIA Ref.	Recommended Mitigation Measures	Contract No.	Work Sites	Details of Observation/Reminder
Air Quality Impact					
* (1) / #(1)	S3.8.7 / Sediment Management Plan	Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices: - Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs. - Use of frequent watering for particularly dusty construction areas and areas close to ASRs.	NE/2015/02	Construction of Lam Tin Interchange	Contractor was reminded to provide frequent water spray for dust suppression during construction works. (i.e crushers)
			NE/2017/02	Construction of Road P2/D4	Stockpile should be covered properly with impervious material to prevent dust resuspension.
*(2)	/	- Valid No-road Mobile Machinery (NRMM) labels should be provided to regulated machines	NE/2015/01	Construction of Lam Tin Interchange	Blue NRMM label was observed displayed on the PME at Portion 4C. Contractor was reminded to replace and recolor the NRMM label.
			NE/2017/01	Construction of TKO Interchange	Contractor was reminded to replace a new NRMM label instead of faded label.
Noise Impact (Construction Phase)					

* (3)	Noise Mitigation Plan	Use of Temporary Noise Barriers (i.e Acoustic box, Silent Up, and etc) or Full Enclosure for PME according to the approved Noise Mitigation Plan	NE/2015/02	Construction of Road P2	Acoustic material on the vibration hammer in Portion 4 was observed damaged. The Contractor should maintain and ensure the integrity of acoustic material at all time.
Water Quality Impact (Construction Phase)					
*(4) / #(4) / ●(4)	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.	NE/2015/01	Construction of TKO Portal	No silt curtain was observed surrounded the site area near TKO side. Contractor was reminded to set up the silt curtain along the work area properly before the commencement of construction works approximated to sea front.
			NE/2015/02	Construction of Road P2	Silt curtains near DSD Desilting Compound was damaged and improperly deployed. The Contractor should ensure its integrity at all time.
			NE/2015/02	Construction of Road P2	Due to adverse weather, partial of the cofferdam and silt curtain were damaged. There was no marine construction works undergoing and Contractor was reminded to repair them before commencement of work.
*(5)	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.	NE/2015/01	Construction of TKO Portal	Silty surface runoff was observed. Contractor was reminded to provide sufficient wastewater treatments after rain event
			NE/2015/01	Construction of TKO Portal	Silty surface runoff was observed. Contractor was reminded to provide sufficient wastewater treatments after rain event.

*(6)	S5.8.7	Construction site runoff and drainage should be prevented or minimised in accordance with the guidelines stipulated in the EPD's Practice Note for Professional Persons, Construction Site Drainage (ProPECC PN 1/94). Good housekeeping and stormwater best management practices, as detailed in below, should be implemented to ensure that all construction runoff complies with WPCO standards and no unacceptable impact on the WSRs arises due to construction of the TKO-LT Tunnel. All discharges from the construction site should be controlled to comply with the standards for effluents discharged into the corresponding WCZ under the TM-DSS.	NE/2015/01	Construction of Lam Tin Interchange	Muddy water was observed inside tunnel. Contractor was reminded to collect and ensure the muddy water will be treated before discharging.
			NE/2015/01	Construction of Lam Tin Interchange	Muddy ponding water was observed at Portion WA1A. Contractor was reminded to collect and provide waste water treatment before discharging.
			NE/2015/01	Construction of Lam Tin Interchange	Beside the site office, the water drainage was seen clogged. Contractor should ensure the water drainage function properly to prevent flooding during rainy season.
*(7)	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: - adequate maintenance of drainage systems to prevent flooding and overflow.	NE/2015/01	Construction of Lam Tin Interchange	Beside the site office, the water drainage was seen clogged. Contractor should ensure the water drainage function properly to prevent flooding during rainy season.
Waste/ Chemical Management					
*(8)	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: - storage area should be selected at a safe location on site and adequate space should be allocated to the storage area.	NE/2015/01	Construction of TKO Portal	On the platform of TKO side, stagnant water was observed in the drip tray of chemical containers, Contractor was reminded to clear it and ensure no overflow stagnant water.
			NE/2015/01	Construction of TKO Portal	Chemical container should be stored in trap tray/ designated area properly to prevent spillage near TKO site.
*(9) / #(9)	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.	NE/2015/01	Construction of TKO Portal	Contractor was reminded to collect and remove the floating refuse regularly near TKO site.
			NE/2015/01	Construction of TKO Portal	Construction waste was observed accumulated in sea front near TKO side. Contractor was reminded to collect and dispose properly.

			NE/2015/02	Construction of Road P2	Accumulation of refuse on water and ground were found. Cleaning progress was ongoing and Contractor should ensure the refuse will be cleared.
*(10) / #(10)	S6.8.5	***Standard Good Site Practice*** - 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.	NE/2015/01	Construction of Lam Tin Interchange	General refuse was observed placed on the ground at Portion WA1A. Contractor was reminded to store the general refuse inside the waste skip properly.
			NE/2015/01	Construction of Lam Tin Interchange	C&D waste was observed accumulated near Lam Tin side. Contractor was reminded to sort and dispose the waste regularly.
			NE/2015/03	Construction of Northern Footbridge	Geotextile should be properly set up with sandbag along the site boundary to avoid any muddy water discharge outside the site.
			NE/2015/03	Construction of Northern Footbridge	The geotextile that was attached to the site boundary was seen partially detached, the Contractor was reminded to reattach properly to ensure the effectiveness of mitigation measure.

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
226	28th September 2018	28th September 2018/ Construction of Road P2	Resident of Ocean Shores	Noise	Complained about noise nuisance from portion IV	Y	Under Investigation	On-going
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	Under Investigation	On-going
224	18th September 2018	18th September 2018/ Construction of Road P2	Public	Noise	Complained about noise nuisance from derrick barge	Y	Under Investigation	On-going
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	Under Investigation	On-going
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	Under Investigation	On-going
221	11th September 2018	9th September 2018/ Construction of Portion VII on TKO side	Public	Noise	Complained about the noise from excavators	Y	Under Investigation	On-going
220	11th September 2018	26th September 2018/ Lam Tin Interchange	Public	Noise	Complained about the construction noise	Y	Under Investigation	On-going

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
219	7th September 2018	7th September 2018/ Construction of Road P2	Resident of Ocean Shores	Noise	Complained about the noise from sheet piling	Y	Under Investigation	On-going
218	6th September 2018	6th September 2018/ Construction in LTI	Public	Noise	Complained about noise nuisance in LTI	Y	Under Investigation	On-going
217	5th September 2018	5th September 2018/ Construction of Road P2	Public	Air Quality	Complained about dark smoke emission from derrick barges.	N	Under Investigation	On-going
216	5th September 2018	5th September 2018/ Construction of Road P2	Public	Air Quality	Complained about dark smoke emission from derrick barges.	N	Under Investigation	On-going
215	5th September 2018	5th September 2018/ Construction of Road P2	Public	Water Quality	Complained about the oil leakage within the cofferdam	N	Under Investigation	On-going
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	Under Investigation	On-going
213	31st August 2018	31st August 2018/ Construction of Lam Tin Interchange	Public	Air Quality	The complainant complained about the dust nuisance at LTI.	N	See Investigation / Mitigation Measures for Complaint No. 207	Closed
212	27th August 2018	27th August 2018/ Construction of Road P2	Resident of Yau Lai Estate	Noise	The complainant complained about the noise nuisance from breaker and excavator in LTI.	Y	See Investigation / Mitigation Measures for Complaint No. 203	Closed
211	22nd August 2018	22nd August 2018/ Construction of Road P2	Public	Air Quality	The complainant complained about the dark smoke emitted from derrick barge outside Ocean Shores.	N	See Investigation / Mitigation Measures for Complaint No. 209	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
210	21st August 2018	21st August 2018/ Construction of Road P2	Public	Air Quality	The complainant complained about the dark smoke emitted from derrick barge outside Ocean Shores.	N	See Investigation / Mitigation Measures for Complaint No. 209	Closed
209	21st August 2018	20th & 21st August 2018/ Construction of Road P2	DC Member	Air Quality	The complainant complained about the dark smoke emitted from derrick barge outside Ocean Shores on 20 and 21 of August.	N	The Contractors had implemented environmental mitigation measures to reduce dark smoke nuisance from construction barges to the nearby sensitive receivers as follows: ➢ Additional water filter tank was adopted on deck level of derrick barges to reduce emission of dark smoke and exhaust smell ➢ There were five derrick barges operating on 20 & 22 of August and four of them had water filter installed. The one without water filter was demobilized away from the site on 22 August.	Closed
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
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;	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
							CM3 - Block S, Yau Lai Estate Phase 5, Yau Tong. There was no exceedance recorded in the above station during daytime in August.	
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
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:	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
							➢ 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	
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
	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
199	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
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	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
							➢ 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	
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
196	20th July 2018	Not specified / Construction of Lam Tin Interchange	Property Management Office of Hong Pak	Air Quality	The complainant complained about the dust problem after blasting work in the	N	The Contractor had implemented environmental mitigation measures in accordance with the "Implementation Schedule of Proposed Mitigation Measures" of EM&A Manual as follows:	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
			Court		afternoon.		➢ Blasting cage were surrounded with impervious material during surface blasting ➢ Water spraying was provided at the blasting cage to enhance dust suppression	
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
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:	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
							➢ Covered the stockpile of treated marine sediment with tarpaulin sheets	
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
	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		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
191	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	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	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
							deck level of derrick barges to reduce emission of dark smoke and exhaust smell	
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
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:	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
							➢ Powered mechanical equipment (PME) for rock breaking were equipped with TMD and SilentMat	
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: <u>*Odour Emission from Exhausted Gas:*</u> ➢ 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
185	6th June 2018	30th May and 30th September 2017/ Construction of Road P2	SKDC member	Noise	The complainant complained about the noise affecting nearby resident in early morning near Ocean Shores.	Y	See Investigation / Mitigation Measures for Complaint No. 50 and 81.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
184	6th June 2018	Not specified / Construction of Road P2	SKDC member	Landscape	The complainant complained about excessive tree felling near Ocean Shores.	N	According to the information provided and confirmed by the Engineer, tree removal application for the concerned area has granted approval from District Lands Office (DLO) on 1 August 2017 and 18 April 2018 together with the tree compensatory plans. The felling of a total of 85 trees at the concerned area were in accordance with the approved tree removal application by the DLO. None of them are registered Old and Valuable Tree and neither of them are rare nor endangered species. The number of retained trees at the concerned location complies with the latest tree removal application. The Contractor had taken initiatives to minimize nuisance from construction works to the nearby sensitive receivers as follows: ➢ Tree protection zones were established and surrounded by fences to protect retained trees adjacent to the construction area. ➢ Tree protection zone were free of machinery and material that are likely to be injurious to the tree. ➢ Regular tree assessments were conducted by qualified Arborist to monitor the condition of retained trees.	Closed
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

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
181	29th May 2018	Not specified/ Construction of Road P2	Public	Air Quality	The complainant complained about the black smoke emission from the construction vessel.	N	According to the information provided and confirmed by the Engineer, dredging and placing rock fill material were conducted during the time of complaint. The Contractors had implemented environmental mitigation measures to reduce construction nuisance from construction activities to the nearby sensitive receivers as follows: <u>Air Quality:</u> ➢ As confirmed by the Engineer, the concerned barge was removed off site for further maintenance; ➢ Additional water filter tank was adopted to reduce emission of dark smoke and exhaust. The Engineer and the Environmental Team have reminded the Contractor to properly implement mitigation measures to effectively minimize construction nuisance caused by the construction works to the nearby residents.	Closed
180	25th May 2018	24th May 2018/ Construction of Road P2	SKDC member Mr. Cheung Chin Pang	Odour	The complainant complained about smell of exhaust gas affecting high level residents (60/F and above) of Metrotown Tower 10.	N	According to the information provided and confirmed by the Engineer, modification of temporary marine platform and welding works were conducted during the time of complaint. The Contractors had implemented environmental mitigation measures to reduce construction nuisance from construction activities to the nearby sensitive receivers as follows: <u>Air Quality:</u> ➢ Additional water filter tank was adopted to reduce emission of dark smoke and exhaust. The Engineer and the Environmental Team have reminded the Contractor to properly implement mitigation measures to effectively minimize construction nuisance caused by the construction works to the nearby residents.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
179	24th May 2018	24th May 2018/ Construction of Northern footbridge , Road P2/D4 and Road P2	Public	Air Quality	The complainant complained construction dust generated from the CEDD construction works site between Tong Yin Street and Tiu Keng Leng Sport Centre (Po Yap Road) as a result of insufficient dust suppression measures	N	According to the information provided and confirmed by the Engineer, construction works including steel bar fixing, scaffolding, trimming formation level, compaction, removal of road marking and handling of treated sediment were conducted during the time of complaint. As shown in the Air Quality Monitoring Results**,** no Action/ Limit Level Exceedance was recorded at Station AM5(A) and AM6(A) in May 2018. It is considered that no adverse construction dust impact was brought to the nearby sensitive receivers during the construction period of this Project The Contractors had implemented environmental mitigation measures to reduce construction nuisance from construction activities to the nearby sensitive receivers as follows: ➢ Water spraying was provided at least 8 times a day; ➢ Surface near public access was hard paved; ➢ Stockpile in Work Area A was covered except the operating area The Engineer and the Environmental Team have reminded the Contractor to properly implement mitigation measures to effectively minimize construction nuisance caused by the construction works to the nearby residents.	Closed
178	23rd May 2018	22nd May 2018/ Construction of TKO Portal	Public	N/A	The complainant complained construction works was carried out on 22 May (which was a public holiday) around 1500 hour at the sea area near Ocean shore Block 2.	N	According to the information provided and confirmed by the Engineer, modification of temporary marine platform and welding works were conducted during the time of complaint. One valid Construction Nosie Permit (CNP) (No. GE-RE0309-18) was granted to the Contractor (Leighton – China State Joint Venture) (Contract No. NE/2015/01) for the marine construction site near Ocean Shores. According to the CNP, Group O to T of the PME listed in condition 3.a. are allowed to operate during general holiday (including Sunday) from 0900 – 2300 hours.	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
							As confirmed by the Engineer, only a group of PME (listed in Group Q) was operated during the time of complaint. No welding machine was operated in Zone A. No derrick barge and flat top barge were operated beyond Zone C. The Contractors had implemented environmental mitigation measures to reduce construction nuisance from construction activities to the nearby sensitive receivers as follows: <u>Noise:</u> ➢ Preinstalled speaker was used on derrick barge to minimize the noise disturbance from on-site communication. The Engineer and the Environmental Team have reminded the Contractor to properly implement mitigation measures to effectively minimize construction nuisance caused by the construction works to the nearby residents.	
177	22nd May 2018	Not specified/ Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Air Quality & Noise	The complainant complained about the dust nuisance and construction noise at Lam Tin Interchange	Y	According to the Engineer's Site Diaries, the major construction activities performed in May 2018 included rock breaking, drilling and excavation at Lam Tin Interchange. Construction works for night-time included blasting and excavation. According to the EM&A Manual of this Project, regular air quality monitoring has been carried out at Station AM2 – Sai Tso Wan Recreation Ground and AM3 – Yau Lai Estate, Bik Lai House. Based on the Air Quality Monitoring Results which conducted by ET**,** no Action or Limit Level Exceedance was recorded at Station AM2 and AM3. It is considered that no adverse air quality impact was brought to the nearby sensitive receivers during the time of complaint. The Contractor had implemented environmental mitigation measures in accordance with the "Implementation Schedule of	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
							Proposed Mitigation Measures" of EM&A Manual as follows: Air Quality: ➢ Frequent water spraying on unpaved area and haul roads at Lam Tin Interchange Noise: ➢ Ensured blasting doors were closed while blasting associated works was undertaken in the tunnel ➢ Installed steel-type blasting door mounted with sound absorptive lining to absorb construction noise in the tunnel ➢ Erected movable cantilever noise barriers and the breaker head was wrapped with Silent Mat and TMD; ➢ Powered mechanical equipment (PME) for rock breaking were equipped with TMD and SilentMat ➢ Drill rig was covered with Silent Mat and TMR The environmental conditions of the site and the control of works will be continuously reviewed and monitored by the Engineer and the Environmental Team.	
176	21st May 2018	21st May 2018/ Construction of Road P2	Public	Air Quality	The complainant complained about dust/dirt being brought onto Tong Yin Street by the vehicles travelling to and from TKO-LTT construction site, causing dust problem and air nuisance.	N	According to the information confirmed by the Engineer, all dump trucks were covered and wheel washed before leaving the works site on 21 May 2018. As shown in the Air Quality Monitoring Results, no Action/ Limit Level Exceedance was recorded at Station AM5(A) and AM6(A) in May 2018. It is considered that no adverse construction dust impact was brought to the nearby sensitive receivers during the construction period of this Project The Contractors had implemented environmental mitigation	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
							measures to minimize the noise nuisance to the nearby noise sensitive receivers as follows: ➢ Water spraying was provided at least 8 times a day. ➢ Street washing truck would be provided once a week to clean the dust on the public street. ➢ Additional notice would be set up to remind the truck driver to perform wheel-washing properly before leaving site. ➢ Deployed staff at the access to check the dump trucks to ensure the dump truck are properly covered and wheel-washed before leaving site. The Engineer and the Environmental Team have reminded the Contractor to properly implement mitigation measures to effectively minimize construction nuisance caused by the construction works to the nearby residents.	
175	19th May 2018	Not specified/ Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	The complainant complained the noise nuisance due to the construction work at Lam Tin Interchange during nighttime.	Y	See Investigation / Mitigation Measures for Complaint No. 160.	Closed
174	19th May 2018	Not specified/ Construction of Lam Tin Interchange	Resident of Hong Pak Court	Noise	The complainant complained the noise nuisance due to the construction work at Lam Tin Interchange during nighttime.	Y	See Investigation / Mitigation Measures for Complaint No. 160.	Closed
173	16th May 2018	Not specified/ Construction of Lam Tin Interchange	Resident of Hong Nga Court,	Noise	The complainant complained the noise nuisance due to the construction work at Lam Tin Interchange during night-time.	Y	See Investigation / Mitigation Measures for Complaint No. 160.	Closed
172	15th May 2018	Not specified/ Construction of Lam Tin Interchange	Resident of Hong Pak Court	Noise	The complainant complained the noise nuisance during night time blasting works at	Y	See Investigation / Mitigation Measures for Complaint No. 165.	Closed

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
					the Lam Tin Interchange.			
171	15th May 2018	Not specified/ Construction of Lam Tin Interchange	Resident of Yau Lai Estate, Bik Lai Estate	Noise	The complainant complained the noise nuisance during night time blasting works at the Lam Tin Interchange.	Y	See Investigation / Mitigation Measures for Complaint No. 165.	Closed
170	15th May 2018	Not specified/ Construction site near Cha Kwo Ling Tsuen	Anonymous	Noise	The complainant complained the noise nuisance due to the construction work near Cha Kwo Ling Tsuen during night-time.	Y	See Investigation / Mitigation Measures for Complaint No. 165.	Closed
169	14th May 2018	Not specified/ Construction of Lam Tin Interchange	Kowloon East District Council Member Mr. Tam Man Ho	Noise	The complainant complained the noise nuisance due to the construction work and night time blasting works at the Lam Tin Interchange.	Y	According to the latest CNMP of this Contract, the subgroups of work activities undertaken near noise sensitive receivers in the reporting period: The construction activities of Lam Tin Interchange (Work site No.101) on 14th of May 2018 possessed of 6 no. of breakers, excavator mounted which were consistent with the quantities of breaker in the Construction Noise Mitigation Plan (Construction Activity Group1.1) <u>Noise:</u> ➢ Installed steel-type blasting door mounted with sound absorptive lining to absorb construction noise in the tunnel; ➢ Erected movable cantilever noise barriers and the breaker head was wrapped with Silent Mat and TMD; ➢ Powered mechanical equipment (PME) for rock breaking were equipped with TMD and SilentMat; As shown by the Noise Monitoring Results conducted by ET, no Limit Level Exceedance was recorded at Station CM1, CM2,	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
							CM3 and CM4. The summary of noise monitoring results which conducted by ETL in May 2018 at Station CM1, CM2, CM3 and CM4. The environmental conditions of the site and the control of works will be continuously reviewed and monitored by the Engineer and the Environmental Team.	
168	14th May 2018	Not specified/ Construction of Lam Tin Interchange	Resident of Yau Lai Estate, Yung Lai House	Noise	The complainant complained the noise nuisance due to the construction work at Lam Tin Interchange during night-time.	Y	See Investigation / Mitigation Measures for Complaint No. 165.	Closed
167	13th May 2018	Not specified/ Construction of Lam Tin Interchange	Resident of Hong Nga Court, Chung Pak House	Noise	The complainant complained the noise nuisance due to the construction work on Sunday morning and night time blasting works at the Lam Tin Interchange.	Y	See Investigation / Mitigation Measures for Complaint No. 165.	Closed
166	13th May 2018	Not specified/ Construction of Lam Tin Interchange	Resident of Hong Pak Court	Noise	The complainant complained the noise nuisance due to the construction work at around 5:00 am and night time blasting works at the Lam Tin Interchange.	Y	See Investigation / Mitigation Measures for Complaint No. 165.	Closed
165	13th May 2018	13th May 2018/ Construction of Lam Tin Interchange	Property Management Office of Hong Nga Court	Noise	The complainant complained the noise nuisance due to the construction work at Lam Tin Interchange on 13th May 2018 (Sunday morning).	Y	A valid Construction Noise Permit (CNP) (No. GW-RE0278-18) was granted to the Contractor for the construction site at Lam Tin Interchange (location of construction site is shown in Figure 1). According to the conditions in the CNP, only one group among Group A to R of the powered mechanical equipment is allowed to be operated during 0800-2300 hours on general holidays (including Sundays); and 1900-2300 hours on any day not being a general holiday. The number of excavators, dump trucks, craned lorry and breakers that were used on 13th, 14th, 15th & 22nd of	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
							May were covered by the CNP. Other good site practices recommended in the "Implementation Schedule of Proposed Mitigation Measures" of EM&A Manual and the Noise Mitigation Plan of this Contract had been implemented by the Contractor, including the following: • Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program; • Mobile plant, if any, should be sited as far away from NSRs as possible; • Plants known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs As shown by the Noise Monitoring Results conducted by ET, no Limit Level Exceedance was recorded at Station CM1, CM2, CM3 and CM4. The summary of noise monitoring results which conducted by ETL in May 2018 at Station CM1, CM2, CM3 and CM4.	
164	12th May 2018	12th May 2018/ Construction of Lam Tin Interchange	Resident of Hong Nga Court	Noise	The complainant complained the noise nuisance during night time blasting works at the Lam Tin Interchange.	Y	See Investigation / Mitigation Measures for Complaint No. 160.	Closed
163	12th May 2018	Not specified/ Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	The complainant complained the noise nuisance due to the construction work at Lam Tin Interchange.	Y	See Investigation / Mitigation Measures for Complaint No. 160.	Closed
162	11th May 2018	Not specified/ Construction of Lam Tin	Resident of Lung Pak House	Noise	The complainant complained the noise nuisance during night	Y	See Investigation / Mitigation Measures for Complaint No. 160.	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
		Interchange			time blasting works at the Lam Tin Interchange.			
161	9th May 2018	9th May 2018 / Construction of Road P2	Resident of Ocean Shore	Air Quality	The complainant complained about dark smoke emission from a barge working at the sea area under TKO-LTT project near Block 2 of Ocean Shore.	N	According to the information provided and confirmed by the Engineer, loading and unloading of marine sediment was conducted during the time of complaint The Contractors had implemented environmental mitigation measures to reduce construction nuisance from construction activities to the nearby sensitive receivers as follows: ➢ Additional water filter tank was adopted to reduce emission of dark smoke and exhaust smell. The Engineer and the Environmental Team have reminded the Contractor to properly implement mitigation measures to effectively minimize construction nuisance caused by the construction works to the nearby residents.	Closed
160	4th May 2018	Not specified/ Construction of Lam Tin Interchange	Public	Noise	The complainant complained the noise nuisance during night time blasting works at the Lam Tin Interchange.	Y	According to the Engineer's Site Diaries, the major construction activities performed in May 2018 included rock breaking, drilling and excavation at Lam Tin Interchange. Construction works for night-time included blasting and excavation. A valid Construction Noise Permit (CNP) (No. GW-RE0278-18) was granted to the Contractor for the construction site at Lam Tin Interchange. According to the conditions in the CNP, only one group among Group A to R of the powered mechanical equipment is allowed to be operated during 0800-2300 hours on general holidays (including Sundays); and 1900-2300 hours on any day not being a general holiday. The number of excavators, dump trucks, craned lorry and breaker that were used during the day of complaint was covered by the CNP. In addition, Group T to X of the powered mechanical equipment is allowed to be operated during 2300-0700 hours on any day. The operation of charging unit during the time of complaint was	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
							covered by the CNP. Therefore, no violation of CNP (No. GW-RE0278-18) conditions was observed during the time of complaint. The Contractor had implemented environmental mitigation measures in accordance with the "Implementation Schedule of Proposed Mitigation Measures" of EM&A Manual as follows: <u>Air Quality:</u> ➢ Frequent water spraying on unpaved area and haul roads at Lam Tin; <u>Noise:</u> ➢ Ensured blasting doors were closed while blasting associated works was undertaken in the tunnel; ➢ Installed steel-type blasting door mounted with sound absorptive lining to absorb construction noise in the tunnel; ➢ Erected movable cantilever noise barriers and the breaker head was wrapped with Silent Mat and TMD; ➢ Powered mechanical equipment (PME) for rock breaking were equipped with TMD and SilentMat; ➢ Drill rig was covered with Silent Mat and TMR. As shown by the Noise Monitoring Results conducted by ET, no Limit Level Exceedance was recorded at Station CM1, CM2, CM3 and CM4. The summary of noise monitoring results which conducted by ETL in May 2018 at Station CM1, CM2, CM3 and CM4. With the implementation of environmental mitigation measures by Contractors on site, it is considered that air quality and noise nuisance by the works has been brought to a minimum level and no adverse impact was brought to the nearby sensitive receivers during the construction of Lam Tin Interchange under this	

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
							Project. The environmental conditions of the site and the control of works will be continuously reviewed and monitored by the Engineer and the Environmental Team.	
159	3rd May 2018	2nd and 3rd May 2018 / Construction of Road P2	Public	Odour	The complainant complained the odour nuisance from the construction vessel.	N	According to the information provided and confirmed by the Engineer, major construction activity including dredging, loading and unloading of marine sediment was conducted during the time of complaint The use of dredger and derrick barge conformed to the proposed quantity and type of PME stated in the updated Construction Noise Assessment of CNMP. Based on the noise monitoring results in April and May 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> ➢ Noise source on the barge was covered with acoustic materials. ➢ Additional sound absorptive blankets were used to reduce the nuisance from the engine of the barge. ➢ Nylon rope was used instead of wire rope to reduce friction secure the barge in place. ➢ Maintenance of barge including lubrication of moving parts was performed to minimized noise from worn or loose parts.	Closed
	30th April 2018	Not specified / Construction of Road P2	Public	Noise & Odour	The complainant complained the construction noise and odour nuisance from the construction vessel.	Y		

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
							Air Quality: ➢ Additional water filter tank was adopted to reduce emission of dark smoke and exhaust smell. The Engineer and the Environmental Team have reminded the Contractor to properly implement mitigation measures to effectively minimize construction nuisance caused by the construction works to the nearby residents.	
158	30th April 2018	Not specified/ Construction of Lam Tin Interchange	Property Management Office of Kwong Tin Estate	Noise	The complainant complained the noise nuisance due to the breaking work at Lam Tin Interchange.	Y	See Investigation / Mitigation Measures for Complaint No. 145.	Closed
157	26th April 2018	26th April 2018 / Construction of TKO portal	Resident of Laguna City	Light	The complainant complained that two spotlights were used during daytime and nighttime causing light nuisance to the residents. She requested to direct the strong lighting toward the sea.	N	According to the information provided and confirmed by the Engineer, no major construction activity was conducted at the location of complaint on 26 April 2018. Upon the receipt of the complaint, as confirmed by the Engineer, the Contractor had taken initiatives to maintain the environmental conditions in the works area as shown below: ➢ The spotlights at the Cha Kwo Ling Public Cargo Working Administrative Office were switched off during daytime; and ➢ The illumination angle of spotlights was turned facing downwards to avoid light overspill The Engineer and the Environmental Team have reminded the Contractor to properly implement mitigation measures to effectively minimize construction nuisance caused by the construction works to the nearby residents.	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
156	25th April 2018	Not specified/ Construction of Lam Tin Interchange	Resident of Yau Lai Estate, Yau Lai Estate	Noise	The complainant complained the noise nuisance due to the breaking work at Lam Tin Interchange.	Y	See Investigation / Mitigation Measures for Complaint No. 145.	Closed
155	23th April 2018	23th April 2018 / Construction of Road P2	Public	Noise	The complainant complained about noise from construction activities at the sea area near Ocean Shore Block 6 starting 8:30-8:45am on 23 April 2018. She suspected the noise is from drilling/breaking works.	Y	According to the information provided and confirmed by the Engineer, construction works including excavation and pre-boring works in Portion IV were conducted on 23 April 2018. One unit of excavator and two units of mini backhoe were in operation for excavation works while two units of drill rigs were in operation for the pre-boring works in Portion IV. As confirmed by the Engineer, no breaking works were carried out during the time of complaint in Portion IV. Therefore, pre-boring works at Portion IV is regarded the source of noise nuisance. The Contractor had implemented environmental mitigation measures to minimize the noise nuisance to the nearby noise sensitive receivers as follows: ➢ Acoustics barriers were provided to the drill rigs for pre-boring works (see photo 1). ➢ Maintenance was provided to the rotary head of the drill rig to minimize noise nuisance from worn or loose parts. ➢ 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. ➢ Acoustic box was utilized for breaking works to minimize noise nuisance The Engineer and the Environmental Team have reminded the Contractor to properly implement mitigation measures to effectively minimize construction nuisance caused by the construction works to the nearby residents.	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
							The use of excavator did not conform the proposed quantity of powered mechanical equipment stated in the CNMP. Therefore, it is regarded as a non-compliance.	
154	23th April 2018	Not specified/ Construction of Lam Tin Interchange	Kwun Tong District Council Member Mr. Lai Shu Ho	Noise	The complainant complained the noise nuisance during night time blasting works at the Lam Tin Interchange.	Y	See Investigation / Mitigation Measures for Complaint No. 145.	Closed
153	23th April 2018	Not specified/ Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	The complainant complained the noisy breaking work from two breakers at Lam Tin Interchange. He requested the Contractor to review the noise mitigation measures on site.	Y	See Investigation / Mitigation Measures for Complaint No. 145.	Closed
152	20th April 2018	Not specified/ Construction of Lam Tin Interchange	Resident of Nga Lai Estate, Yau Lai Estate	Noise	The complainant complained the noise nuisance during night time blasting works at the Lam Tin Interchange.	Y	See Investigation / Mitigation Measures for Complaint No. 145.	Closed
151	17th April 2018	Not specified/ Construction of Lam Tin Interchange	Property Management Office of Yau Lai Estate	Noise	The complainant complained the noise nuisance due to the construction work at Lam Tin Interchange.	Y	See Investigation / Mitigation Measures for Complaint No. 145.	Closed
150	17th April 2018	Not specified/ Construction of Lam Tin Interchange	Sham Shui Po District Council Member Mr. Ho Kai Ming	Noise	The complainant complained the noise nuisance during night time blasting works at the Lam Tin Interchange.	Y	See Investigation / Mitigation Measures for Complaint No. 145.	Closed
149	16th April 2018	Not specified / Construction of Road P2	Resident of Ocean Shore	Noise	The complaint is about the noise generated from a poorly maintained excavator.	Y	According to the information provided and confirmed by the Engineer, two units of excavators were in operation for excavation works in Portion VI on 16 and 18 April 2018. Excessive sound from movement of the poorly maintained excavator is considered source of noise nuisance.	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
	18th April 2018	Not specified / Construction of Road P2	Resident of Ocean Shore	Noise	The complaint is about the noise generated from a poorly maintained excavator.	Y	The Contractor had implemented environmental mitigation measures to minimize the noise nuisance to the nearby noise sensitive receivers as follows: ➢ As confirmed by the Engineer, the use of concerned excavator was stopped and it was replaced with a new excavator. ➢ Regular site checking would be performed to ensure the type and quantity of PME are in order with the updated Construction Noise Assessment The Engineer and the Environmental Team have reminded the Contractor to properly implement mitigation measures to effectively minimize construction nuisance caused by the construction works to the nearby residents. The use of excavator did not conform the proposed quantity of powered mechanical equipment stated in the CNMP. Therefore, it is regarded as a non-compliance.	Closed
148	15th April 2018	Not specified/ Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	The complainant complained the noisy construction work at Lam Tin Interchange.	Y	According to the Engineer's Site Diary, the major construction activities performed in the reporting period included rock breaking and excavation at Lam Tin Interchange. According to the latest CNMP of this Contract, the subgroups of work activities undertaken near noise sensitive receivers in the reporting period are as follows: - Construction of Lam Tin Interchange (LTI); The construction activities of Lam Tin Interchange (Work site No.101) on 17th, 23rd & 25th of April possessed of 7 no. of breakers, which were consistent with the quantities of breakers in	Closed
147	15th April 2018	Not specified/ Construction of Lam Tin Interchange	Resident of Yau Lai Estate	Noise	The complainant complained the noisy construction work at Lam Tin Interchange on public holiday.	Y		
145	2nd April 2018	Public holiday/ Construction Works near Eastern Harbour	Resident of Yau Lai Estate	Noise	The complainant complained the noise nuisance due to the construction work near Eastern Harbour Crossing tunnel portal on	Y		

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
		Crossing tunnel portal			public holiday. (started from 9:00 am)		the Construction Noise Mitigation Plan (Group 1.1.8) A valid Construction Noise Permit (CNP) (No. GW-RE0084-18) was granted to the Contractor for the construction site at Lam Tin Interchange. According to the conditions in the CNP, only one group among Group A to N of the powered mechanical equipment is allowed to be operated during 08:00 - 23:00 hours on general holiday (including Sunday). The operations on 2nd & 15th of April involved 1 no. of excavator, 2 no. of dump trucks, which were covered by the CNP. Therefore, no violation of CNP (No. GW-RE0084-18) condition was identified during the time of complaints. 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 at Slope H in Lam Tin Interchange; ➢ PMEs at Portion IVC were mounted and shielded with SilentMat; ➢ Noise barriers were placed next to the breaker at Slope H in Lam Tin Interchange to reduce the noise nuisance to nearby NSRs; ➢ Cantilevered noise barriers were erected next to breakers wrapped with TMD and SilentMat at Portion IVC; ➢ Ensured blasting doors were closed while mucking out in the tunnel was undertaken; and ➢ Installed steel-type blasting door mounted with sound absorptive lining to absorb noise due to construction works in the tunnel The Engineer and the Environmental Team have reminded the Contractor to properly implement mitigation measures to effectively minimize construction nuisance caused by the	

Complaint No.	Received Date	Date/Location of Complaint	Complainant	Nature	Details of Complaint	Noise Action Level Exceedance (Y/N)	Investigation/ Mitigation Action	File Closed
							construction works to the nearby residents.	

Cumulative Complaint Log since commencement of Project

Reporting Month	Number of Complaints in Reporting Month	Number of Summons in Reporting Month	Number of Prosecutions in Reporting Month
November 2016	0	0	0
December 2016	11	0	0
January 2017	15	0	0
February 2017	4	0	0
March 2017	6	0	0
April 2017	1	0	0
May 2017	10	0	0
June 2017	8	0	0
July 2017	3	0	0
August 2017	8	0	0
September 2017	14	0	0
October 2017	8	0	0
November 2017	12	0	0
December 2017	10	1	0
January 2018	11	0	0
February 2018	6	0	0
March 2018	17	0	0
April 2018	15	0	0
May 2018	22	0	0
June 2018	11	0	1
July 2018	9	0	0
August 2018	13	0	0
Total	**213**	**1**	**1**

Cumulative Log for Notifications of Summons

Contract No.	Log Ref.	Date/Location	Subject	Status	Total no. Received in this reporting month	Total no. Received since project commencement
NE/2015/01	--	--	--	--	--	--
NE/2015/02	KTS2 4138/ 2017	25 June 2017/ Marine construction site at Junk Bay	Contrary to: Sections 6 (1) (b) and 6 (5), Noise Control Ordinance, Cap.400	The Summon was issued on 22 Dec 2017 First hearing on 29 Mar 2018	0	1
NE/2015/03	--	--	--	--	--	--
NE/2017/01	--	--	--	--	--	--
NE/2017/02	--	--	--	--	--	--

Cumulative Log for Successful Prosecutions

Contract No.	Log Ref.	Date/Location	Subject	Status	Total no. Received in this reporting month	Total no. Received since project commencement
NE/2015/01	--	--	--	--	--	--
NE/2015/02	KTS2 4138/ 2017	25 June 2017/ Marine construction site at Junk Bay	Contrary to: Sections 6 (1) (b) and 6 (5), Noise Control Ordinance, Cap.400	Successful prosecution to the subcontractor on 27 June 2018	1	1
NE/2015/03	--	--	--	--	--	--
NE/2017/01	--	--	--	--	--	--
NE/2017/02	--	--	--	--	--	--

APPENDIX P
WASTE GENERATION IN THE REPORTING MONTH

Name of Department: Civil Engineering Development Department

Contract No.: NE/2015/01

Leighton - China State Joint Venture

Monthly Summary Waste Flow Table for 2018

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 (see Note 10)	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	118.887	44.216	25.727	60.437	32.723	0.000	0.000	0.308	0.000	1.200	0.094
February	76.419	34.880	8.626	54.212	13.581	0.000	0.000	0.000	0.000	0.800	0.046
March	140.974	31.352	57.578	49.166	34.230	0.000	0.000	0.020	0.000	0.000	0.052
April	123.925	30.310	57.340	42.266	24.319	0.000	0.000	0.368	0.000	1.200	0.058
May	113.094	32.375	0.000	70.782	42.312	0.000	0.000	0.294	0.000	1.000	0.034
June	134.902	48.193	0.000	117.435	17.467	0.000	0.000	0.437	0.000	1.322	0.096
Sub-total	708.201	221.326	149.271	394.298	164.632	0.000	0.000	1.427	0.000	5.522	0.380
July	117.365	54.326	0.000	112.069	5.296	0.000	0.000	0.000	0.000	0.000	0.083
August	114.745	56.904	2.877	105.498	6.370	0.000	0.000	0.525	0.000	0.960	0.073
September	101.494	46.489	0.000	88.147	13.347	0.000	0.000	0.000	0.000	0.000	0.050
October											
November											
December											
Total	1041.805	379.045	152.148	700.012	189.645	0.000	0.000	1.952	0.000	6.482	0.587

Total inert C&D waste generated = c+d+e

Total inert C&D waste recycled = c+d

% of recycled inert C&D waste = Total C&D waste recycled / Total C&D waste generated

Notes:
(1) The performance target are given in PS Clause 6(14)
(2) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site
(3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material
(4) The Contractor shall also submit the latest forecast of the amount of C&D materials expected to be generated from the Works, together with a break down of the nature where the total amount of C&D materials expected to be generated from the Works is equal to or exceeding 50,000m3. (PS Clause 1.105(4) refers)
(5) All recyclable materials, including metals, paper / cardboard packaging, plastics, etc. will be collected by registered collector for recycling.
(6) Conversion factors for reporting purpose:

in-situ: rock = 2.5 tonnes/m^3; soil = 2.0 tonnes/m^3

(7) excavated: rock = 2.0 tonnes/m^3; soil = 1.8 tonnes/m^3; broken concrete and bitumen = 2.4 tonnes/m^3, soil and rock = 1.9 tonnes/m^3
(8) C&D Waste = 0.9 tonnes/m^3; bentonite slurry = 2.8 tonnes/m^3

Diesel density: 0.8kg/l

Numbers are rounded off to the nearest three decimal places

The "Total Quantity Generated" equals to the sum of "Reuse in the Contract", "Reuse in Other Projects" and "Disposed as Public Fill"

Monthly Summary Waste Flow Table for 2018 Year

Contract No. : NE/2015/02

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	0.30510	0.00000	0.11060	0.00000	0.00850	0.18600	0.00000	0.00000	0.00000	0.00000	0.07544
Feb	1.12247	0.00000	0.01080	0.00000	1.08367	0.02800	32.04000	0.00000	0.00000	0.00000	0.05240
Mar	6.50826	0.00000	0.04500	0.00000	6.46326	0.00000	23.74000	0.00000	0.00000	0.00000	0.04520
Apr	3.82690	0.00000	0.00000	0.00000	3.82690	0.00000	26.37000	0.00000	0.00000	0.00000	0.03010
May	11.03519	0.00000	8.30510	0.00000	2.64644	0.08365	24.18000	0.00000	0.00000	0.00000	0.06998
June	2.50750	0.00000	0.00000	0.00000	1.58194	0.92556	11.32000	0.00000	0.00000	0.00000	0.06814
SUB-TOTAL	25.30542	0.00000	8.47150	0.00000	15.61071	1.22321	117.65000	0.00000	0.00000	0.00000	0.34126
Jul	6.86021	0.00000	5.62591	0.00000	1.00141	0.23290	6.81000	0.00000	0.00000	0.00000	0.06658
Aug	84.94282	0.00000	3.14738	0.00000	2.48573	79.30971	0.00000	0.00000	0.00000	0.00000	0.06072
Sep	11.12968	0.00000	0.00000	0.00000	1.82856	9.30112	0.00000	0.00000	0.00000	0.00000	0.28750
Oct											
Nov											
Dec											
TOTAL	128.23813	0.00000	17.24479	0.00000	20.92640	90.06694	124.46000	0.00000	0.00000	0.00000	0.75606

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

Name of Department : CEDD Contract No. : NE/2015/03

Monthly Summary Waste Flow Table for 2018 (year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock & Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemicals Waste	Others, e.g. general refuse
	(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 kg)	(in '000 kg)	(in '000 kg)	(in '000 kg)	(in '000 m^3)
Accumulated From 2017	0.84697	0	0.175365	0.290915	0.350135	0.03056	0	0	0	0	0.03079
Jan	0.2397525	0	0	0.0642025	0.17555	0	0	0	0	0	0.00614
Feb	0.0722875	0	0	0.0722875	0	0	0	0	0	0	0
Mar	0.05853	0	0	0	0.05853	0	0	0	0	0	0
Apr	0.007575	0	0	0	0.007575	0	0	0	0	0	0
May	0	0	0	0	0	0	0	0	0	0	0.001258
June	0	0	0	0	0	0	0	0	0	0	0
Sub-total											
July	0	0	0	0	0	0	0	0	0	0	0
Aug	0.00145	0	0	0	0	0	0	0	0	0	0
Sept	0.00168	0	0	0	0	0	0	0	0	0	0
Oct											
Nov											
Dec											
Total	1.228245	0	0.175365	0.427405	0.59179	0.03056	0	0	0	0	0.038188

Notes: (1) The performance targets are given in PS Clause 6.14.
(2) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
(3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging materials.
(4) The *Contractor* shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the *works*, together with a breakdown of the nature where the total amount of C&D materials expected to be generated from the *works* is equal to or exceeding 50,000 m3.

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 2018

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Feb	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mar	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Apr	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
May	0.0222	0.0060	0.0000	0.0000	0.0162	0.0000	0.0000	0.0000	0.0000	0.0000	0.0024
Jun	0.0078	0.0000	0.0000	0.0000	0.0078	0.0000	0.0000	0.0000	0.0000	0.0000	0.0055
Sub-total	0.0300	0.0060	0.0000	0.0000	0.0240	0.0000	0.0000	0.0000	0.0000	0.0000	0.0079
Jul	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0091
Aug	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0027
Sep	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0020
Oct											
Nov											
Dec											
Total	0.0300	0.0060	0.0000	0.0000	0.0240	0.0000	0.0000	0.0000	0.0000	0.0000	0.0217

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.

Monthly Summary of Waste Flow Table for 2018

Name of Person completing the Record: Ricky Hon

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	0	0	0	0	0	0	0	0	0
Feb	0	0	0	0	0	0	0	0	0	0.1430
Mar	0	0	0	0	0	0	0	0	0	0
Apr	0	0.0390	0	0	0	0	0	0	0	0.0585
May	0	0	0	0	0	0	0	0	0	0.0325
Jun	0	0.1519	0	0	1.3675	0	0	0	0	0.0455
Jul	0	0.2265	0	0	2.0387	0	0	0	0	0.0065
Aug	0	0.209625	0	0	1.886625	0	0	0	0	0.0325
Sub-total	0	0.6271	0	0	5.2928	0	0	0	0	0.3185
Sept	0	0.0544375	0	0	0.4899375	0	0	0	0	0.169
Oct										
Nov										
Dec										
Total	0	0.6815	0	0	5.7827	0	0	0	0	0.4875

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.

APPENDIX Q
TENTATIVE CONSTRUCTION PROGRAMME

High Level 3 Months Look Ahead Programme

Activities	Oct-18	Nov-18	Dec-18
Lam Tin Interchange			
EHC2 U-Trough			
Site Formation - Area 1G1 & 1G2 &5			
Site Formation - Area 2			
Site Formation - Area 3			
Site Formation - Area 4			
Main Tunnel			
MT Excavation			
MT Lining Works			
TKO Interchange			
Haul Road Construction, Site Formation & Slope Works			
Steel Platform for Bridge Construction			
Cavern Excavation			

Activity ID	Activity Name	Calendar	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 (Sep-18)			1563	1006	12-Jan-17 A	21-Jun-21	-137			-59
Preliminaries, Submission, Contractor's Design Submission and Approval		P2-Cal.A	1015	488	20-Jan-17 A	20-Jan-20	276			-81
General Submission and Acceptance		P2-Cal.A	30	20	21-Aug-17 A	09-Oct-18	744			-385
S10240	Prepare/Submit the Weather Protection Scheme	P2-Cal.A	30	20	21-Aug-17 A	09-Oct-18	744	33.33%		-385
Contractor's Design Submission and Acceptance		P2-Cal.A	576	98	07-Mar-17 A	26-Dec-18	172			-84
Foundation Design		P2-Cal.A	574	96	01-Jun-18 A	24-Dec-18	-190			367
AIP Submission for Foundation of Road P2 Structure (Reclaimed Section) Zone 1 CT01 CH366.059-201.44		P2-Cal.A	504	26	01-Jun-18 A	15-Oct-18	-190			367
S11260-03	3rd Resubmit AIP Submission for Foundation of Road P2 Structure (Reclaimed Section Zone 1)	P2-Cal.A	14	5	01-Jun-18 A	24-Sep-18	-190	64.29%		-102
S11260-04	Review and Accept AIP Submission for Foundation of Road P2 Structure (Reclaimed Section Zone 1)	P2-Cal.A	21	21	25-Sep-18	15-Oct-18	-190	0%		0
AIP Submission for Foundation of Road P2 Structure (Reclaimed Section) Zone 2 (S200 CH821 - P2 CH105		P2-Cal.A	118	26	09-Aug-18 A	15-Oct-18	-190			50
S11270-03	4th Resubmit AIP Submission for Foundation of Road P2 Structure (Reclaimed Section Zone 2)	P2-Cal.A	14	5	09-Aug-18 A	24-Sep-18	-190	64.29%		-33
S11270-04	Review and Accept AIP Submission for Foundation of Road P2 Structure (Reclaimed Section Zone 2)	P2-Cal.A	21	21	25-Sep-18	15-Oct-18	-190	0%		0
AIP Submission for Foundation of Road P2 Structure (Reclaimed Section) Zone 3 (P2 CH105 - CH305)		P2-Cal.A	21	19	13-Sep-18 A	08-Oct-18	-162			-5
S11279-04	Review and Accept AIP Submission for Foundation of Road P2 Structure (Reclaimed Section Zone 3)	P2-Cal.A	21	19	13-Sep-18 A	08-Oct-18	-162	9.52%		-5
DDA Submission for Foundation of Road P2 Structure (Reclaimed Section) Zone 1 CT01 CH366.059-201.44		P2-Cal.A	91	91	25-Sep-18	24-Dec-18	-190			0
S11360	Prepare and Submit DDA Submission for Foundation of Road P2 Structure (Reclaimed Section Zone 1)	P2-Cal.A	21	21	25-Sep-18	15-Oct-18	-190	0%		0
S11380	Review and Discuss DDA Submission for Foundation of Road P2 Structure (Reclaimed Section Zone 1)	P2-Cal.A	21	21	16-Oct-18	05-Nov-18	-190	0%		0
S11400	Resubmit DDA Submission for Foundation of Road P2 Structure (Reclaimed Section Zone 1)	P2-Cal.A	14	14	06-Nov-18	19-Nov-18	-190	0%		0
S11410	Review and comment by GEO	P2-Cal.A	14	14	20-Nov-18	03-Dec-18	-190	0%		0
S11420	Review and Accept DDA Submission for Foundation of Road P2 Structure (Reclaimed Section Zone 1)	P2-Cal.A	21	21	04-Dec-18	24-Dec-18	-190	0%		0
DDA Submission for Foundation of Road P2 Structure (Reclaimed Section) Zone 2 (S200 CH821 - P2 CH105		P2-Cal.A	91	91	25-Sep-18	24-Dec-18	-190			0
S11422	Prepare and Submit DDA Submission for Foundation of Road P2 Structure (Reclaimed Section Zone 2)	P2-Cal.A	21	21	25-Sep-18	15-Oct-18	-190	0%		0
S11424	Review and Discuss DDA Submission for Foundation of Road P2 Structure (Reclaimed Section Zone 2)	P2-Cal.A	21	21	16-Oct-18	05-Nov-18	-190	0%		0
S11426	Resubmit DDA Submission for Foundation of Road P2 Structure (Reclaimed Section Zone 2)	P2-Cal.A	14	14	06-Nov-18	19-Nov-18	-190	0%		0
S11428	Review and comment by GEO	P2-Cal.A	14	14	20-Nov-18	03-Dec-18	-190	0%		0
S11430	Review and Accept DDA Submission for Foundation of Road P2 Structure (Reclaimed Section Zone 2)	P2-Cal.A	21	21	04-Dec-18	24-Dec-18	-190	0%		0
DDA Submission for Foundation of Road P2 Structure (Reclaimed Section) Zone 3 (P2 CH105 - CH305)		P2-Cal.A	49	68	13-Sep-18 A	26-Nov-18	-162			-26
S11434	Review and Discuss DDA Submission for Foundation of Road P2 Structure (Reclaimed Section Zone 3)	P2-Cal.A	21	19	13-Sep-18 A	08-Oct-18	-162	9.52%		-5
S11436	Resubmit DDA Submission for Foundation of Road P2 Structure (Reclaimed Section Zone 3)	P2-Cal.A	14	14	09-Oct-18	22-Oct-18	-162	0%		0
S11438	Review and comment by GEO	P2-Cal.A	14	14	23-Oct-18	05-Nov-18	-162	0%		0
S11439	Review and Accept DDA Submission for Foundation of Road P2 Structure (Reclaimed Section Zone 3)	P2-Cal.A	21	21	06-Nov-18	26-Nov-18	-162	0%		0
E&M Design		P2-Cal.A	436	54	07-Mar-17 A	12-Nov-18	123			-180
Statutory Approval for E&M Works		P2-Cal.A	0	0	12-Nov-18	12-Nov-18	123			0
S11570-11	FSD Approval for Underpass GBP	P2-Cal.A	0	0		12-Nov-18	123	0%		0
S11570-12	FSD Approval for Plant room GBP	P2-Cal.A	0	0		12-Nov-18	123	0%		0
Detail Design for E&M Works (Tunnel and associated)		P2-Cal.A	421	39	07-Mar-17 A	28-Oct-18	138			-180
MVAC Detail Design		P2-Cal.A	135	15	28-Apr-18 A	04-Oct-18	162			-25
Plantroom		P2-Cal.A	135	15	04-May-18 A	04-Oct-18	162			-19
S11577	Formal Submission to Supervisor	P2-Cal.A	8	8	04-May-18 A	27-Sep-18	162	0%		-139
S11578	Accept detail design by the Supervisor	P2-Cal.A	7	7	28-Sep-18	04-Oct-18	162	0%		0
Underpass		P2-Cal.A	127	15	28-Apr-18 A	04-Oct-18	162			-33
S11630	Formal Submission to Supervisor	P2-Cal.A	8	8	28-Apr-18 A	27-Sep-18	162	0%		-145
S11640	Accept detail design by the Supervisor	P2-Cal.A	7	7	28-Sep-18	04-Oct-18	162	0%		0

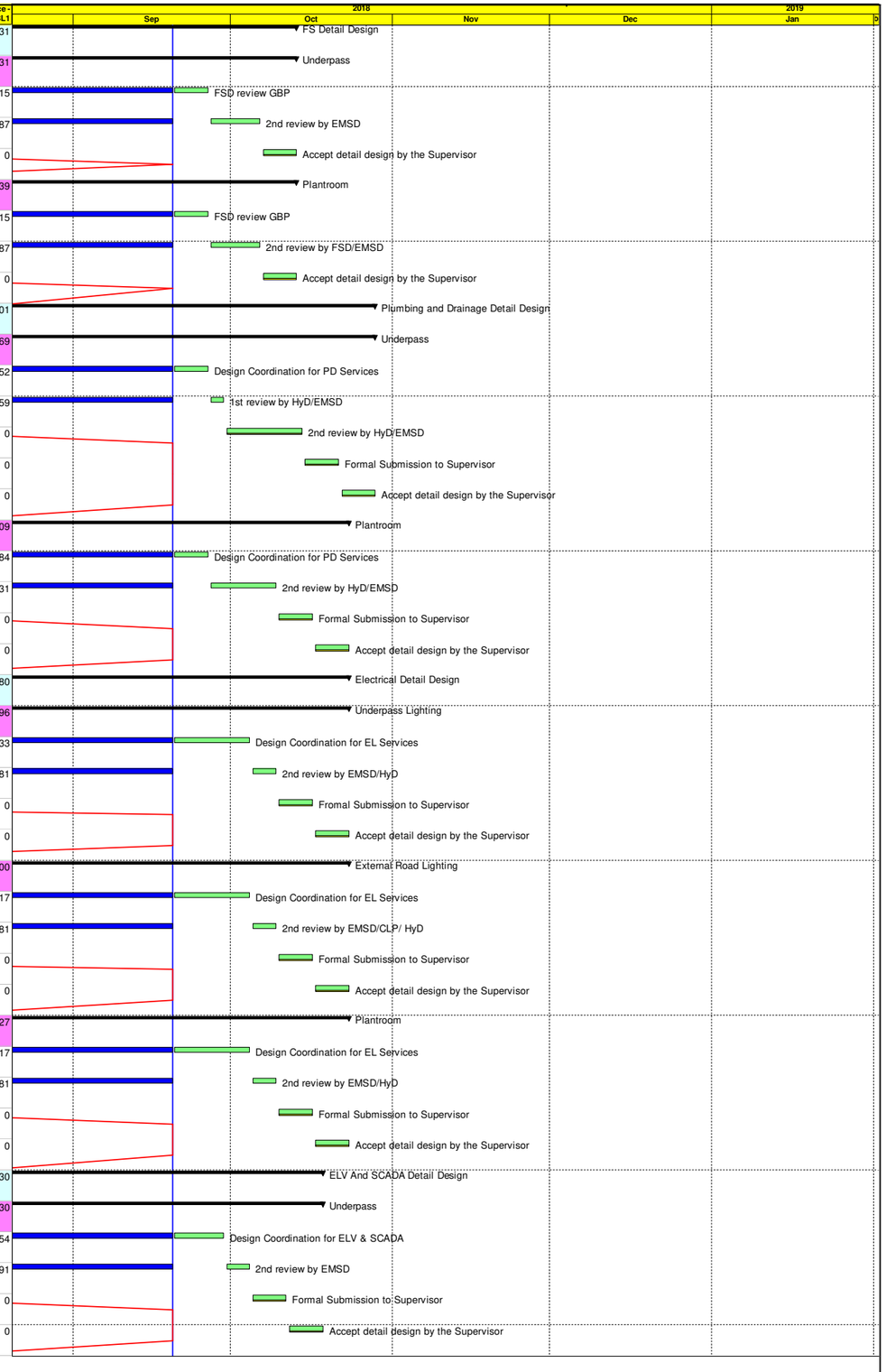
Primary Baseline
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

NE/2015/02 Tseung Kwan O - Lam Tin Tunnel-Road P2 and Associated Works (Sep-18)

3 Monthly Rolling Programme
(Data Date : 20-Sep-2018)

Date	Revision	Checked	Approved
20-Sep-18			

Activity ID	Activity Name	Calendar	Original Duration	Remaining Duration	Start	Finish	Total Float	Activity % Complete	TRA	Variance - BL1
FS Detail Design		P2-Cal.A	391	24	19-Oct-17 A	13-Oct-18	123			31
Underpass		P2-Cal.A	391	24	19-Oct-17 A	13-Oct-18	123			31
S11649	FSD review GBP	P2-Cal.A	28	7	19-Oct-17 A	26-Sep-18	123	75%		-315
S11650-01	2nd review by EMSD	P2-Cal.A	15	10	19-Mar-18 A	06-Oct-18	123	33.33%		-187
S11651	Accept detail design by the Supervisor	P2-Cal.A	7	7	07-Oct-18	13-Oct-18	123	0%		0
Plantroom		P2-Cal.A	321	24	19-Oct-17 A	13-Oct-18	123			-39
S11652-10	FSD review GBP	P2-Cal.A	28	7	19-Oct-17 A	26-Sep-18	123	75%		-315
S11652-21	2nd review by FSD/EMSD	P2-Cal.A	15	10	19-Mar-18 A	06-Oct-18	123	33.33%		-187
S11652-23	Accept detail design by the Supervisor	P2-Cal.A	7	7	07-Oct-18	13-Oct-18	123	0%		0
Plumbing and Drainage Detail Design		P2-Cal.A	275	39	01-Apr-17 A	28-Oct-18	138			-301
Underpass		P2-Cal.A	275	39	03-May-17 A	28-Oct-18	138			-269
S11656	Design Coordination for PD Services	P2-Cal.A	60	7	03-May-17 A	26-Sep-18	138	88.33%		-452
S11657	1st review by HyD/EMSD	P2-Cal.A	15	3	09-Apr-18 A	29-Sep-18	138	80%		-159
S11657-01	2nd review by HyD/EMSD	P2-Cal.A	15	15	30-Sep-18	14-Oct-18	138	0%		0
S11658	Formal Submission to Supervisor	P2-Cal.A	7	7	15-Oct-18	21-Oct-18	138	0%		0
S11659	Accept detail design by the Supervisor	P2-Cal.A	7	7	22-Oct-18	28-Oct-18	138	0%		0
Plantroom		P2-Cal.A	262	34	01-Apr-17 A	23-Oct-18	143			-309
S11660-07	Design Coordination for PD Services	P2-Cal.A	60	7	01-Apr-17 A	26-Sep-18	143	88.33%		-484
S11660-09	2nd review by HyD/EMSD	P2-Cal.A	15	13	17-May-18 A	09-Oct-18	143	13.33%		-131
S11660-10	Formal Submission to Supervisor	P2-Cal.A	7	7	10-Oct-18	16-Oct-18	143	0%		0
S11660-11	Accept detail design by the Supervisor	P2-Cal.A	7	7	17-Oct-18	23-Oct-18	143	0%		0
Electrical Detail Design		P2-Cal.A	416	34	07-Mar-17 A	23-Oct-18	143			-180
Underpass Lighting		P2-Cal.A	416	34	30-May-17 A	23-Oct-18	143			-96
S11660-15	Design Coordination for EL Services	P2-Cal.A	60	15	30-May-17 A	04-Oct-18	143	75%		-433
S11660-17	2nd review by EMSD/HyD	P2-Cal.A	15	5	06-Jul-18 A	09-Oct-18	143	66.67%		-81
S11660-19	Fromal Submission to Supervisor	P2-Cal.A	7	7	10-Oct-18	16-Oct-18	143	0%		0
S11660-20	Accept detail design by the Supervisor	P2-Cal.A	7	7	17-Oct-18	23-Oct-18	143	0%		0
External Road Lighting		P2-Cal.A	396	34	07-Mar-17 A	23-Oct-18	143			-200
S11660-23	Design Coordination for EL Services	P2-Cal.A	60	15	07-Mar-17 A	04-Oct-18	143	75%		-517
S11660-25	2nd review by EMSD/CLP/ HyD	P2-Cal.A	15	5	06-Jul-18 A	09-Oct-18	143	66.67%		-81
S11660-27	Formal Submission to Supervisor	P2-Cal.A	7	7	10-Oct-18	16-Oct-18	143	0%		0
S11660-28	Accept detail design by the Supervisor	P2-Cal.A	7	7	17-Oct-18	23-Oct-18	143	0%		0
Plantroom		P2-Cal.A	269	34	07-Mar-17 A	23-Oct-18	143			-327
S11664	Design Coordination for EL Services	P2-Cal.A	60	15	07-Mar-17 A	04-Oct-18	143	75%		-517
S11666	2nd review by EMSD/HyD	P2-Cal.A	15	5	06-Jul-18 A	09-Oct-18	143	66.67%		-81
S11667	Formal Submission to Supervisor	P2-Cal.A	7	7	10-Oct-18	16-Oct-18	143	0%		0
S11668	Accept detail design by the Supervisor	P2-Cal.A	7	7	17-Oct-18	23-Oct-18	143	0%		0
ELV And SCADA Detail Design		P2-Cal.A	303	29	12-Aug-17 A	18-Oct-18	148			-130
Underpass		P2-Cal.A	303	29	12-Aug-17 A	18-Oct-18	148			-130
S11669-10	Design Coordination for ELV & SCADA	P2-Cal.A	60	10	12-Aug-17 A	29-Sep-18	148	83.33%		-354
S11669-19	2nd review by EMSD	P2-Cal.A	15	5	21-Jun-18 A	04-Oct-18	148	66.67%		-91
S11669-29	Formal Submission to Supervisor	P2-Cal.A	7	7	05-Oct-18	11-Oct-18	148	0%		0
S11669-30	Accept detail design by the Supervisor	P2-Cal.A	7	7	12-Oct-18	18-Oct-18	148	0%		0



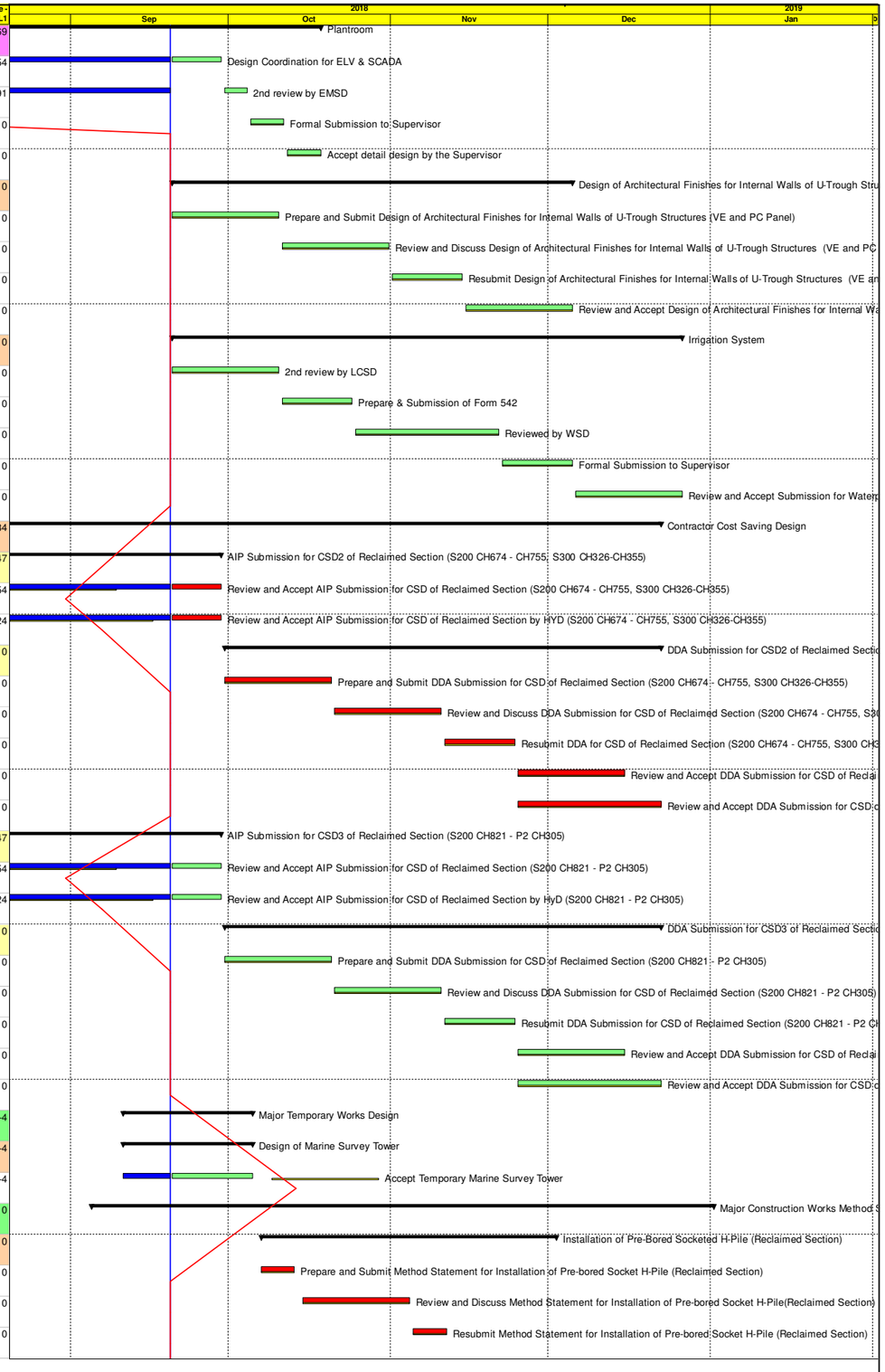
Primary Baseline
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

NE/2015/02 Tseung Kwan O - Lam Tin Tunnel-Road P2 and Associated Works (Sep-18)

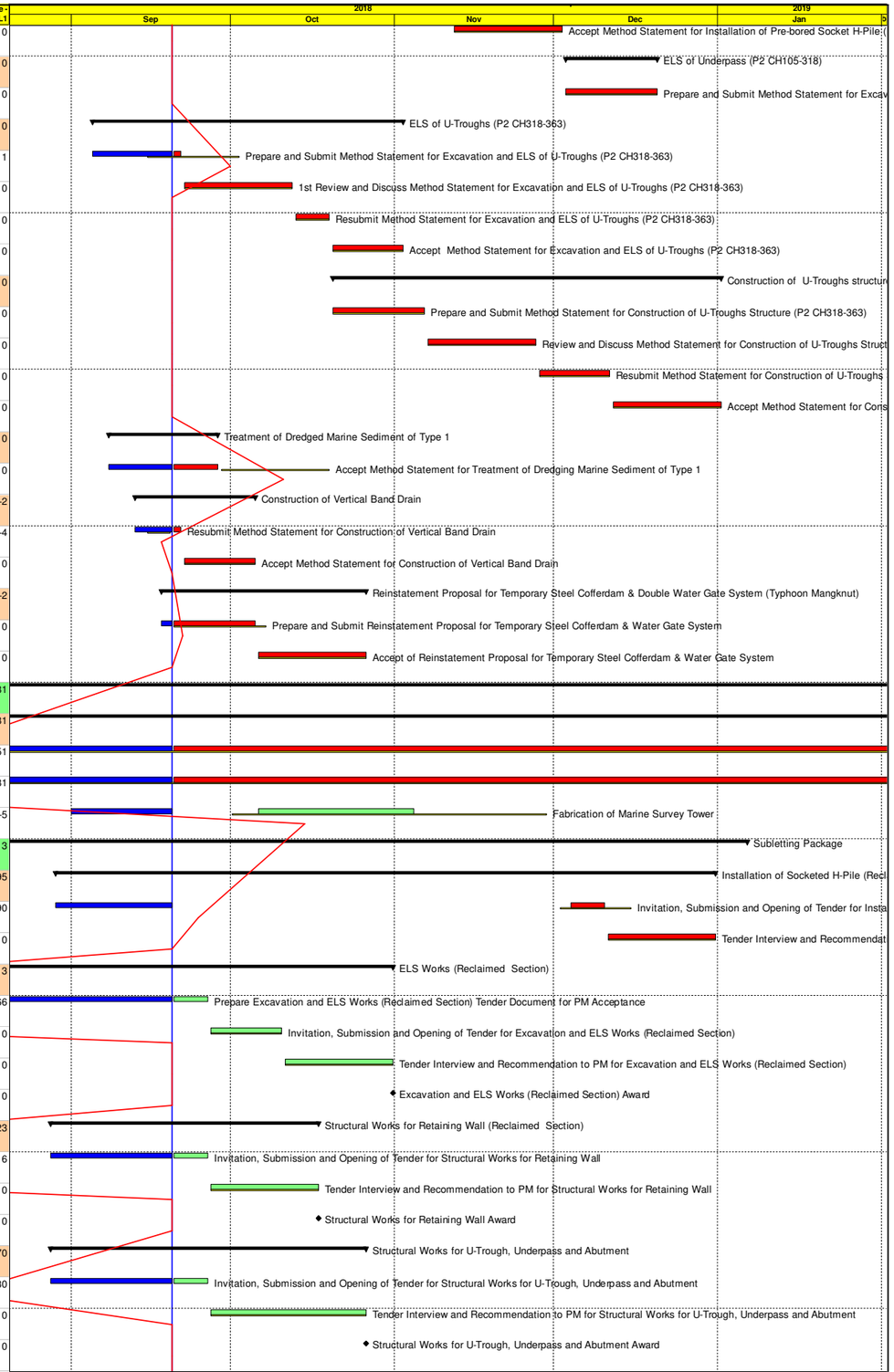
3 Monthly Rolling Programme
(Data Date : 20-Sep-2018)

Date	Revision	Checked	Approved
20-Sep-18			

Activity ID	Activity Name	Calendar	Original Duration	Remaining Duration	Start	Finish	Total Float	Activity % Complete	TRA	Variance - BL1
Plantroom		P2-Cal.A	264	29	12-Aug-17 A	18-Oct-18	148			-169
S11670-10	Design Coordination for ELV & SCADA	P2-Cal.A	60	10	12-Aug-17 A	29-Sep-18	148	83.33%		-354
S11670-19	2nd review by EMSD	P2-Cal.A	15	5	21-Jun-18 A	04-Oct-18	148	66.67%		-91
S11670-29	Formal Submission to Supervisor	P2-Cal.A	7	7	05-Oct-18	11-Oct-18	148	0%		0
S11670-30	Accept detail design by the Supervisor	P2-Cal.A	7	7	12-Oct-18	18-Oct-18	148	0%		0
Design of Architectural Finishes for Internal Walls of U-Trough Structures		P2-Cal.A	77	77	20-Sep-18	05-Dec-18	193			0
S11675	Prepare and Submit Design of Architectural Finishes for Internal Walls of U-Trough Structures (VE and PC Panel)	P2-Cal.A	21	21	20-Sep-18	10-Oct-18	193	0%		0
S11680	Review and Discuss Design of Architectural Finishes for Internal Walls of U-Trough Structures (VE and PC Panel)	P2-Cal.A	21	21	11-Oct-18	31-Oct-18	193	0%		0
S11700	Resubmit Design of Architectural Finishes for Internal Walls of U-Trough Structures (VE and PC Panel)	P2-Cal.A	14	14	01-Nov-18	14-Nov-18	193	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	21	15-Nov-18	05-Dec-18	193	0%		0
Irrigation System		P2-Cal.A	98	98	20-Sep-18	26-Dec-18	116			0
S11787-01	2nd review by LCSD	P2-Cal.A	21	21	20-Sep-18	10-Oct-18	116	0%		0
S11788	Prepare & Submission of Form 542	P2-Cal.A	14	14	11-Oct-18	24-Oct-18	116	0%		0
S11789	Reviewed by WSD	P2-Cal.A	28	28	25-Oct-18	21-Nov-18	116	0%		0
S11790	Formal Submission to Supervisor	P2-Cal.A	14	14	22-Nov-18	05-Dec-18	116	0%		0
S11800	Review and Accept Submission for Waterpoints and associated elements	P2-Cal.A	21	21	06-Dec-18	26-Dec-18	116	0%		0
Contractor Cost Saving Design		P2-Cal.A	125	94	17-Jul-18 A	22-Dec-18	87			-34
AIP Submission for CSD2 of Reclaimed Section (S200 CH674 - CH755, S300 CH326-CH355)		P2-Cal.A	28	10	17-Jul-18 A	29-Sep-18	-188			-47
S11959	Review and Accept AIP Submission for CSD of Reclaimed Section (S200 CH674 - CH755, S300 CH326-CH355)	P2-Cal.A	21	10	17-Jul-18 A	29-Sep-18	-188	52.38%		-54
S11960	Review and Accept AIP Submission for CSD of Reclaimed Section by HYD (S200 CH674 - CH755, S300 CH326-CH355)	P2-Cal.A	28	10	09-Aug-18 A	29-Sep-18	-188	64.29%		-24
DDA Submission for CSD2 of Reclaimed Section (S200 CH674 - CH755, S300 CH326-CH355)		P2-Cal.A	84	84	30-Sep-18	22-Dec-18	-188			0
S11962	Prepare and Submit DDA Submission for CSD of Reclaimed Section (S200 CH674 - CH755, S300 CH326-CH355)	P2-Cal.A	21	21	30-Sep-18	20-Oct-18	-188	0%		0
S11964	Review and Discuss DDA Submission for CSD of Reclaimed Section (S200 CH674 - CH755, S300 CH326-CH355)	P2-Cal.A	21	21	21-Oct-18	10-Nov-18	-188	0%		0
S11966	Resubmit DDA for CSD of Reclaimed Section (S200 CH674 - CH755, S300 CH326-CH355)	P2-Cal.A	14	14	11-Nov-18	24-Nov-18	-188	0%		0
S11967	Review and Accept DDA Submission for CSD of Reclaimed Section by CEDD (S200 CH674 - CH755, S300 CH326-CH355)	P2-Cal.A	21	21	25-Nov-18	15-Dec-18	-181	0%		0
S11968	Review and Accept DDA Submission for CSD of Reclaimed Section by HYD (S200 CH674 - CH755, S300 CH326-CH355)	P2-Cal.A	28	28	25-Nov-18	22-Dec-18	-188	0%		0
AIP Submission for CSD3 of Reclaimed Section (S200 CH821 - P2 CH305)		P2-Cal.A	28	10	17-Jul-18 A	29-Sep-18	87			-47
S11973	Review and Accept AIP Submission for CSD of Reclaimed Section (S200 CH821 - P2 CH305)	P2-Cal.A	21	10	17-Jul-18 A	29-Sep-18	87	52.38%		-54
S11974	Review and Accept AIP Submission for CSD of Reclaimed Section by HyD (S200 CH821 - P2 CH305)	P2-Cal.A	28	10	09-Aug-18 A	29-Sep-18	87	64.29%		-24
DDA Submission for CSD3 of Reclaimed Section (S200 CH821 - P2 CH305)		P2-Cal.A	84	84	30-Sep-18	22-Dec-18	87			0
S11975	Prepare and Submit DDA Submission for CSD of Reclaimed Section (S200 CH821 - P2 CH305)	P2-Cal.A	21	21	30-Sep-18	20-Oct-18	87	0%		0
S11976	Review and Discuss DDA Submission for CSD of Reclaimed Section (S200 CH821 - P2 CH305)	P2-Cal.A	21	21	21-Oct-18	10-Nov-18	87	0%		0
S11977	Resubmit DDA Submission for CSD of Reclaimed Section (S200 CH821 - P2 CH305)	P2-Cal.A	14	14	11-Nov-18	24-Nov-18	87	0%		0
S11978	Review and Accept DDA Submission for CSD of Reclaimed Section by CEDD (S200 CH821 - P2 CH305)	P2-Cal.A	21	21	25-Nov-18	15-Dec-18	94	0%		0
S11979	Review and Accept DDA Submission for CSD of Reclaimed Section by HyD (S200 CH821 - P2 CH305)	P2-Cal.A	28	28	25-Nov-18	22-Dec-18	87	0%		0
Major Temporary Works Design		P2-Cal.A	21	16	11-Sep-18 A	05-Oct-18	150			-4
Design of Marine Survey Tower		P2-Cal.A	21	16	11-Sep-18 A	05-Oct-18	150			-4
S13160	Accept Temporary Marine Survey Tower	P2-Cal.A	21	16	11-Sep-18 A	05-Oct-18	150	23.81%		-4
Major Construction Works Method Statement		P2-Cal.A	109	104	05-Sep-18 A	01-Jan-19	-46			-10
Installation of Pre-Bored Socketed H-Pile (Reclaimed Section)		P2-Cal.A	57	57	07-Oct-18	02-Dec-18	-34			0
S13970	Prepare and Submit Method Statement for Installation of Pre-bored Socket H-Pile (Reclaimed Section)	P2-Cal.A	7	7	07-Oct-18	13-Oct-18	-34	0%		0
S13971	Review and Discuss Method Statement for Installation of Pre-bored Socket H-Pile(Reclaimed Section)	P2-Cal.A	21	21	15-Oct-18	04-Nov-18	-34	0%		0
S13972	Resubmit Method Statement for Installation of Pre-bored Socket H-Pile (Reclaimed Section)	P2-Cal.A	7	7	05-Nov-18	11-Nov-18	-34	0%		0



Activity ID	Activity Name	Calendar	Original Duration	Remaining Duration	Start	Finish	Total Float	Activity % Complete	TRA	Variance - BL1
S13973	Accept Method Statement for Installation of Pre-bored Socket H-Pile (Reclaimed Section)	P2-Cal.A	21	21	12-Nov-18	02-Dec-18	-34	0%		0
ELS of Underpass (P2 CH105-318)		P2-Cal.A	18	18	03-Dec-18	20-Dec-18	-34			0
S14056	Prepare and Submit Method Statement for Excavation and ELS of Underpass (P2 CH105-318)	P2-Cal.A	18	18	03-Dec-18	20-Dec-18	-34	0%		0
ELS of U-Troughs (P2 CH318-363)		P2-Cal.A	49	44	05-Sep-18 A	02-Nov-18	-161			-10
S14060	Prepare and Submit Method Statement for Excavation and ELS of U-Troughs (P2 CH318-363)	P2-Cal.A	18	2	05-Sep-18 A	21-Sep-18	-161	88.89%		1
S14080	1st Review and Discuss Method Statement for Excavation and ELS of U-Troughs (P2 CH318-363)	P2-Cal.A	21	21	22-Sep-18	12-Oct-18	-161	0%		0
S14100	Resubmit Method Statement for Excavation and ELS of U-Troughs (P2 CH318-363)	P2-Cal.A	7	7	13-Oct-18	19-Oct-18	-161	0%		0
S14120-01	Accept Method Statement for Excavation and ELS of U-Troughs (P2 CH318-363)	P2-Cal.A	14	14	20-Oct-18	02-Nov-18	-161	0%		0
Construction of U-Troughs structure (P2 CH318-363)		P2-Cal.A	74	74	20-Oct-18	01-Jan-19	-131			0
S14122	Prepare and Submit Method Statement for Construction of U-Troughs Structure (P2 CH318-363)	P2-Cal.A	18	18	20-Oct-18	06-Nov-18	-131	0%		0
S14124	Review and Discuss Method Statement for Construction of U-Troughs Structure (P2 CH318-363)	P2-Cal.A	21	21	07-Nov-18	27-Nov-18	-131	0%		0
S14126	Resubmit Method Statement for Construction of U-Troughs Structure (P2 CH318-363)	P2-Cal.A	14	14	28-Nov-18	11-Dec-18	-131	0%		0
S14128	Accept Method Statement for Construction of U-Troughs Structure (P2 CH318-363)	P2-Cal.A	21	21	12-Dec-18	01-Jan-19	-131	0%		0
Treatment of Dredged Marine Sediment of Type 1		P2-Cal.A	21	9	08-Sep-18 A	28-Sep-18	-50			0
S14376	Accept Method Statement for Treatment of Dredging Marine Sediment of Type 1	P2-Cal.A	21	9	08-Sep-18 A	28-Sep-18	-50	57.14%		0
Construction of Vertical Band Drain		P2-Cal.A	21	16	13-Sep-18 A	05-Oct-18	-123			-2
S14947-03	Resubmit Method Statement for Construction of Vertical Band Drain	P2-Cal.A	5	2	13-Sep-18 A	21-Sep-18	-123	60%		-4
S14948	Accept Method Statement for Construction of Vertical Band Drain	P2-Cal.A	14	14	22-Sep-18	05-Oct-18	-123	0%		0
Reinstatement Proposal for Temporary Steel Cofferdam & Double Water Gate System (Typhoon Mangknut)		P2-Cal.A	37	37	18-Sep-18 A	26-Oct-18	-192			-2
S15005	Prepare and Submit Reinstatement Proposal for Temporary Steel Cofferdam & Water Gate System	P2-Cal.A	18	16	18-Sep-18 A	05-Oct-18	-192	11.11%		0
S15008	Accept of Reinstatement Proposal for Temporary Steel Cofferdam & Water Gate System	P2-Cal.A	21	21	06-Oct-18	26-Oct-18	-192	0%		0
Procurement of Major Material		P2-Cal.A	1015	488	20-Jan-17 A	20-Jan-20	-117			-81
Civil/Structural		P2-Cal.A	1015	488	20-Jan-17 A	20-Jan-20	-117			-81
S14981	Procurement and Delivery of Steel H-Pile	P2-Cal.A	800	254	31-Jan-17 A	31-May-19	-143	68.25%		-51
S14983	Procurement and Delivery of ELS Wailing & Struts Members	P2-Cal.A	1015	488	20-Jan-17 A	20-Jan-20	-117	51.92%		-81
S14995	Fabrication of Marine Survey Tower	P2-Cal.A	60	30	01-Sep-18 A	04-Nov-18	150	50%		-5
Subletting Package		P2-Cal.A	262	109	07-Apr-18 A	06-Jan-19	340			-13
Installation of Socketed H-Pile (Reclaimed Section)		P2-Cal.A	30	28	29-Aug-18 A	31-Dec-18	-8			-95
S16382	Invitation, Submission and Opening of Tender for Installation of Pre-bored Socketed H-Pile (Reclaimed Section)	P2-Cal.A	14	7	29-Aug-18 A	10-Dec-18	-8	50%		-90
S16383	Tender Interview and Recommendation to PM for Installation of Pre-bored Socketed H-Pile (Reclaimed Section)	P2-Cal.A	21	21	11-Dec-18	31-Dec-18	-8	0%		0
ELS Works (Reclaimed Section)		P2-Cal.A	195	42	07-Apr-18 A	31-Oct-18	308			-13
S16385	Prepare Excavation and ELS Works (Reclaimed Section) Tender Document for PM Acceptance	P2-Cal.A	7	7	07-Apr-18 A	26-Sep-18	308	0%		-166
S16386	Invitation, Submission and Opening of Tender for Excavation and ELS Works (Reclaimed Section)	P2-Cal.A	14	14	27-Sep-18	10-Oct-18	308	0%		0
S16387	Tender Interview and Recommendation to PM for Excavation and ELS Works (Reclaimed Section)	P2-Cal.A	21	21	11-Oct-18	31-Oct-18	308	0%		0
S16388	Excavation and ELS Works (Reclaimed Section) Award	P2-Cal.A	0	0		31-Oct-18	308	0%		0
Structural Works for Retaining Wall (Reclaimed Section)		P2-Cal.A	174	28	28-Aug-18 A	17-Oct-18	407			123
S16390	Invitation, Submission and Opening of Tender for Structural Works for Retaining Wall	P2-Cal.A	14	7	28-Aug-18 A	26-Sep-18	407	50%		-16
S16391	Tender Interview and Recommendation to PM for Structural Works for Retaining Wall	P2-Cal.A	21	21	27-Sep-18	17-Oct-18	407	0%		0
S16392	Structural Works for Retaining Wall Award	P2-Cal.A	0	0		17-Oct-18	407	0%		0
Structural Works for U-Trough, Underpass and Abutment		P2-Cal.A	130	37	28-Aug-18 A	26-Oct-18	366			70
S16420	Invitation, Submission and Opening of Tender for Structural Works for U-Trough, Underpass and Abutment	P2-Cal.A	60	7	28-Aug-18 A	26-Sep-18	366	88.33%		30
S16440	Tender Interview and Recommendation to PM for Structural Works for U-Trough, Underpass and Abutment	P2-Cal.A	30	30	27-Sep-18	26-Oct-18	366	0%		0
S16460	Structural Works for U-Trough, Underpass and Abutment Award	P2-Cal.A	0	0		26-Oct-18	366	0%		0



Primary Baseline
Actual Work
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Summary

NE/2015/02 Tseung Kwan O - Lam Tin Tunnel-Road P2 and Associated Works (Sep-18)

3 Monthly Rolling Programme
(Data Date : 20-Sep-2018)

Date	Revision	Checked	Approved
20-Sep-18			

Activity ID	Activity Name	Calendar	Original Duration	Remaining Duration	Start	Finish	Total Float	Activity % Complete	TRA	Variance - BL1
Drainage and Sewerage Works (Existing Land) (At Grade Section)		P2-Cal.A	63	63	20-Sep-18	21-Nov-18	289			0
S17104	Submission and Opening of Tender for Drainage and Sewerage Works	P2-Cal.A	42	42	20-Sep-18	31-Oct-18	289	0%		0
S17106	Tender Interview and Recommendation to PM for Drainage and Sewerage Works	P2-Cal.A	21	21	01-Nov-18	21-Nov-18	289	0%		0
S17108	Drainage and Sewerage Works Award	P2-Cal.A	0	0		21-Nov-18	289	0%		0
Water Works (To be Incorporated in Irrigation Package)		P2-Cal.A	21	21	20-Sep-18	10-Oct-18	428			0
S17160	Tender Interview and Recommendation to PM for Water Works	P2-Cal.A	21	21	20-Sep-18	10-Oct-18	428	0%		0
S17180	Water Works Award	P2-Cal.A	0	0		10-Oct-18	428	0%		0
Road Works		P2-Cal.A	42	42	26-Nov-18	06-Jan-19	226			0
S17200	Prepare Road Works Tender Document for PM Acceptance	P2-Cal.A	7	7	26-Nov-18	02-Dec-18	226	0%		0
S17220	Submission and Opening of Tender for Road Works	P2-Cal.A	14	14	03-Dec-18	16-Dec-18	226	0%		0
S17240	Tender Interview and Recommendation to PM for Road Works	P2-Cal.A	21	21	17-Dec-18	06-Jan-19	226	0%		0
Irrigation Works		P2-Cal.A	21	21	20-Sep-18	10-Oct-18	314			0
S17320	Tender Interview and Recommendation to PM for Irrigation Works	P2-Cal.A	21	21	20-Sep-18	10-Oct-18	314	0%		0
S17340	Irrigation Works Award	P2-Cal.A	0	0		10-Oct-18	314	0%		0
Section 3 of the Works All Works within Portion IV, V, VI, VII,VIII, and IX			394	210	06-Jan-18 A	17-Apr-19	293			-73
Existing Land Section			324	210	19-Mar-18 A	17-Apr-19	293			-71
Retaining Wall P2-A CH 500- 650			310	210	16-Apr-18 A	17-Apr-19	293			-57
LC11929-01	Relocation WSD flowmeter chamber(by others)(NCE-029&30) After CLP cable diversion	P2-Cal.A	14	12	06-Sep-18 A	01-Oct-18	183	14.29%		-12
LC11932	Removal of existing planter (NCE-019, EW-014, PMI-61 & CE-95)	P2-Cal.C	12	7	16-Apr-18 A	09-Oct-18	150	41.67%		-134
Bay 1-2		P2-Cal.C	93	93	20-Sep-18	12-Jan-19	312			0
LC11941	Laying Blinding	P2-Cal.C	3	3	20-Sep-18	22-Sep-18	312	0%		0
LC11942	Construction of Base Slab - Bay 1	P2-Cal.C	10	10	24-Sep-18	06-Oct-18	312	0%		0
LC11943	Construction of Base Slab - Bay 2	P2-Cal.C	10	10	08-Oct-18	19-Oct-18	312	0%		0
LC11944	Construction of Wall Stem - Bay 1	P2-Cal.C	10	10	20-Oct-18	31-Oct-18	312	0%		0
LC11945	Construction of Wall Stem - Bay 2	P2-Cal.C	10	10	01-Nov-18	12-Nov-18	312	0%		0
LC11946	Waterproofing coating Works RW P2-A (Bay 1 - 2)	P2-Cal.C	15	15	13-Nov-18	29-Nov-18	312	0%		0
LC11947	Backfilling Works RW P2-A Back Side (Bay 1 - 2) (Incl. soil test)	P2-Cal.C	35	35	30-Nov-18	12-Jan-19	312	0%	6	0
Bay 5-15		P2-Cal.C	253	170	26-Apr-18 A	17-Apr-19	175			-39
LC11961	ELS and Open Cut Excavation of Bay 5 - 8	P2-Cal.C	35	6	26-Apr-18 A	27-Sep-18	159	82.86%		-93
LC11962	Laying Blinding (Bay 5 - 8)	P2-Cal.C	7	4	28-May-18 A	03-Oct-18	170	42.86%		-100
LC11965	Construction of Base Slab - Bay 7	P2-Cal.C	10	10	04-Oct-18	15-Oct-18	170	0%		0
LC11965-01	Excavation of Desilting Opening (CE078)	P2-Cal.C	10	10	28-Sep-18	10-Oct-18	159	0%		0
LC11965-02	Construction of Desilting Opening (CE078)	P2-Cal.C	15	15	11-Oct-18	29-Oct-18	159	0%		0
LC11966	Construction of Base Slab - Bay 8	P2-Cal.C	10	10	30-Oct-18	09-Nov-18	159	0%		0
LC11969	Construction of Wall Stem - Bay 7	P2-Cal.C	10	10	16-Oct-18	27-Oct-18	240	0%		0
LC11970	Construction of Wall Stem - Bay 8	P2-Cal.C	10	10	10-Nov-18	21-Nov-18	159	0%		0
LC11971	ELS and Open Cut Excavation of Bay 9 - 15	P2-Cal.C	35	35	10-Oct-18	20-Nov-18	150	0%		0
LC11972	Laying Blinding (Bay 9 - 15)	P2-Cal.C	10	10	21-Nov-18	01-Dec-18	150	0%		0
LC11973	Construction of Base Slab - Bay 9	P2-Cal.C	10	10	03-Dec-18	13-Dec-18	150	0%		0
LC11974	Construction of Wall Stem - Bay 9	P2-Cal.C	10	10	14-Dec-18	27-Dec-18	190	0%		0
LC11974-01	Construction of CCTV High Mast Footing - Base Slab (PMI 090)	P2-Cal.C	10	10	14-Dec-18	27-Dec-18	150	0%		0
LC11987	Waterproofing coating Works RW P2-A (Bay 5 - 15)	P2-Cal.C	15	15	27-Jul-18 A	06-Mar-19	150	0%		-167
LC11988	Backfilling Works RW P2-A Back Side (Bay 5 - 15) (Incl. Soil Test)	P2-Cal.C	35	35	07-Aug-18 A	17-Apr-19	175	0%	12	-173

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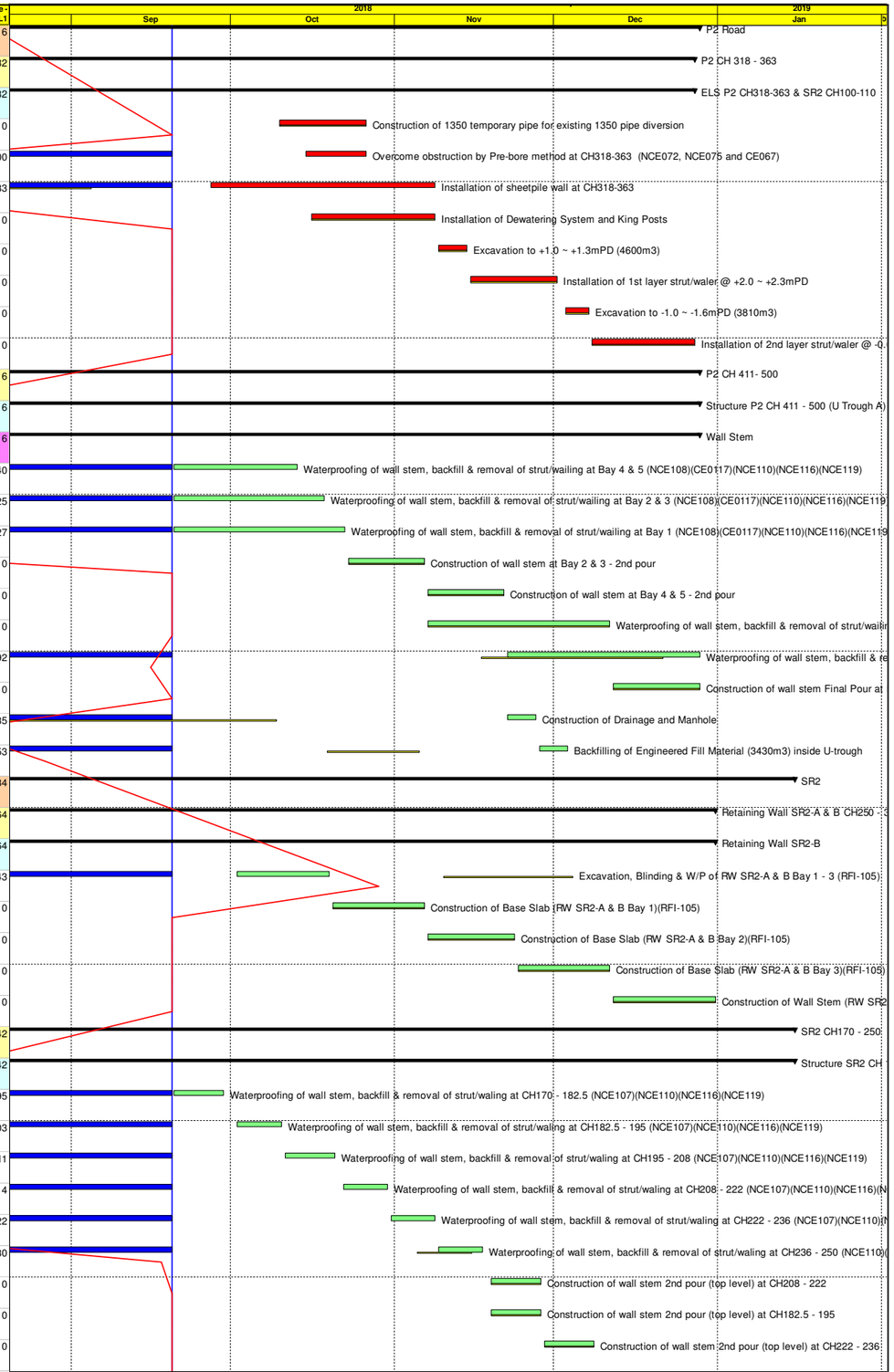
NE/2015/02 Tseung Kwan O - Lam Tin Tunnel-Road P2 and Associated Works (Sep-18)

3 Monthly Rolling Programme
(Data Date : 20-Sep-2018)

Date	Revision	Checked	Approved
20-Sep-18			

Activity ID	Activity Name	Calendar	Original Duration	Remaining Duration	Start	Finish	Total Float	Activity % Complete	TRA	Variance - BL1
P2 Road		P2-Cal.C	216	81	19-Mar-18 A	28-Dec-18	294			-16
P2 CH 318 - 363		P2-Cal.C	179	75	16-Apr-18 A	27-Dec-18	-138			-32
ELS P2 CH318-363 & SR2 CH100-110		P2-Cal.C	179	75	16-Apr-18 A	27-Dec-18	-138			-32
LC12950-01	Construction of 1350 temporary pipe for existing 1350 pipe diversion	P2-Cal.C	14	14	10-Oct-18	26-Oct-18	-138	0%		0
LC12951	Overcome obstruction by Pre-bore method at CH318-363 (NCE072, NCE075 and CE067)	P2-Cal.C	60	10	16-Apr-18 A	26-Oct-18	-138	83.33%		-100
LC12952	Installation of sheetpile wall at CH318-363	P2-Cal.C	60	35	19-May-18 A	08-Nov-18	-138	41.67%		-83
LC12953	Installation of Dewatering System and King Posts	P2-Cal.C	20	20	16-Oct-18	08-Nov-18	-138	0%		0
LC12956	Excavation to +1.0 ~ +1.3mPD (4600m3)	P2-Cal.C	5	5	09-Nov-18	14-Nov-18	-138	0%		0
LC12957	Installation of 1st layer strut/waler @ +2.0 ~ +2.3mPD	P2-Cal.C	15	15	15-Nov-18	01-Dec-18	-138	0%		0
LC12958	Excavation to -1.0 ~ -1.6mPD (3810m3)	P2-Cal.C	5	5	03-Dec-18	07-Dec-18	-138	0%		0
LC12959	Installation of 2nd layer strut/waler @ -0.6 ~ -1.0mPD	P2-Cal.C	15	15	08-Dec-18	27-Dec-18	-138	0%		0
P2 CH 411- 500		P2-Cal.C	216	81	19-Mar-18 A	28-Dec-18	294			-16
Structure P2 CH 411 - 500 (U Trough A)		P2-Cal.C	216	81	19-Mar-18 A	28-Dec-18	294			-16
Wall Stem		P2-Cal.C	216	81	19-Mar-18 A	28-Dec-18	294			-16
LC15120	Waterproofing of wall stem, backfill & removal of strut/wailing at Bay 4 & 5 (NCE108)(CE0117)(NCE110)(NCE116)(NCE119)	P2-Cal.C	30	19	19-Mar-18 A	13-Oct-18	246	36.67%		-140
LC15130	Waterproofing of wall stem, backfill & removal of strut/wailing at Bay 2 & 3 (NCE108)(CE0117)(NCE110)(NCE116)(NCE119)	P2-Cal.C	30	22	13-Apr-18 A	18-Oct-18	246	26.67%		-125
LC15140	Waterproofing of wall stem, backfill & removal of strut/wailing at Bay 1 (NCE108)(CE0117)(NCE110)(NCE116)(NCE119)	P2-Cal.C	30	25	14-Apr-18 A	22-Oct-18	246	16.67%		-127
LC15160	Construction of wall stem at Bay 2 & 3 - 2nd pour	P2-Cal.C	13	13	23-Oct-18	06-Nov-18	246	0%		0
LC15170	Construction of wall stem at Bay 4 & 5 - 2nd pour	P2-Cal.C	13	13	07-Nov-18	21-Nov-18	259	0%		0
LC15185	Waterproofing of wall stem, backfill & removal of strut/wailing at Bay 1 to 3	P2-Cal.C	30	30	07-Nov-18	11-Dec-18	246	0%		0
LC15190	Waterproofing of wall stem, backfill & removal of strut/wailing at Bay 4 to 7	P2-Cal.C	30	30	03-Aug-18 A	28-Dec-18	259	0%		-92
LC15230	Construction of wall stem Final Pour at Bay 1	P2-Cal.C	13	13	12-Dec-18	28-Dec-18	246	0%		0
LC15250	Construction of Drainage and Manhole	P2-Cal.C	60	5	06-Apr-18 A	27-Nov-18	314	91.67%		-135
LC15260	Backfilling of Engineered Fill Material (3430m3) inside U-trough	P2-Cal.C	15	5	15-May-18 A	03-Dec-18	314	66.67%		-153
SR2		P2-Cal.C	158	95	28-May-18 A	15-Jan-19	270			-34
Retaining Wall SR2-A & B CH250 - 310		P2-Cal.C	60	75	03-Aug-18 A	31-Dec-18	242			-64
Retaining Wall SR2-B		P2-Cal.C	60	75	03-Aug-18 A	31-Dec-18	242			-64
LC16593	Excavation, Blinding & W/P of RW SR2-A & B Bay 1 - 3 (RFI-105)	P2-Cal.C	21	15	03-Aug-18 A	19-Oct-18	242	28.57%		-43
LC16600	Construction of Base Slab (RW SR2-A & B Bay 1)(RFI-105)	P2-Cal.C	15	15	20-Oct-18	06-Nov-18	242	0%		0
LC16610	Construction of Base Slab (RW SR2-A & B Bay 2)(RFI-105)	P2-Cal.C	15	15	07-Nov-18	23-Nov-18	242	0%		0
LC16615	Construction of Base Slab (RW SR2-A & B Bay 3)(RFI-105)	P2-Cal.C	15	15	24-Nov-18	11-Dec-18	242	0%		0
LC16620	Construction of Wall Stem (RW SR2-A & B Bay 1)(RFI-105)	P2-Cal.C	15	15	12-Dec-18	31-Dec-18	242	0%		0
SR2 CH170 - 250		P2-Cal.C	150	95	28-May-18 A	15-Jan-19	270			-42
Structure SR2 CH 170 - 250 (U Trough A)		P2-Cal.C	150	95	28-May-18 A	15-Jan-19	270			-42
LC17340	Waterproofing of wall stem, backfill & removal of strut/waling at CH170 - 182.5 (NCE107)(NCE110)(NCE116)(NCE119)	P2-Cal.C	10	8	28-May-18 A	29-Sep-18	242	20%		-95
LC17345	Waterproofing of wall stem, backfill & removal of strut/waling at CH182.5 - 195 (NCE107)(NCE110)(NCE116)(NCE119)	P2-Cal.C	10	8	28-May-18 A	10-Oct-18	270	20%		-103
LC17350	Waterproofing of wall stem, backfill & removal of strut/waling at CH195 - 208 (NCE107)(NCE110)(NCE116)(NCE119)	P2-Cal.C	10	8	28-May-18 A	20-Oct-18	270	20%		-111
LC17355	Waterproofing of wall stem, backfill & removal of strut/waling at CH208 - 222 (NCE107)(NCE110)(NCE116)(NCE119)	P2-Cal.C	10	8	02-Jun-18 A	30-Oct-18	270	20%		-114
LC17360	Waterproofing of wall stem, backfill & removal of strut/waling at CH222 - 236 (NCE107)(NCE110)(NCE116)(NCE119)	P2-Cal.C	10	8	02-Jun-18 A	08-Nov-18	270	20%		-122
LC17365	Waterproofing of wall stem, backfill & removal of strut/waling at CH236 - 250 (NCE110)(NCE116)(NCE119)	P2-Cal.C	10	8	02-Jun-18 A	17-Nov-18	270	20%		-130
LC17370	Construction of wall stem 2nd pour (top level) at CH208 - 222	P2-Cal.C	9	9	19-Nov-18	28-Nov-18	270	0%		0
LC17375	Construction of wall stem 2nd pour (top level) at CH182.5 - 195	P2-Cal.C	9	9	19-Nov-18	28-Nov-18	270	0%		0
LC17385	Construction of wall stem 2nd pour (top level) at CH222 - 236	P2-Cal.C	9	9	29-Nov-18	08-Dec-18	270	0%		0



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NE/2015/02 Tseung Kwan O - Lam Tin Tunnel-Road P2 and Associated Works (Sep-18)

3 Monthly Rolling Programme
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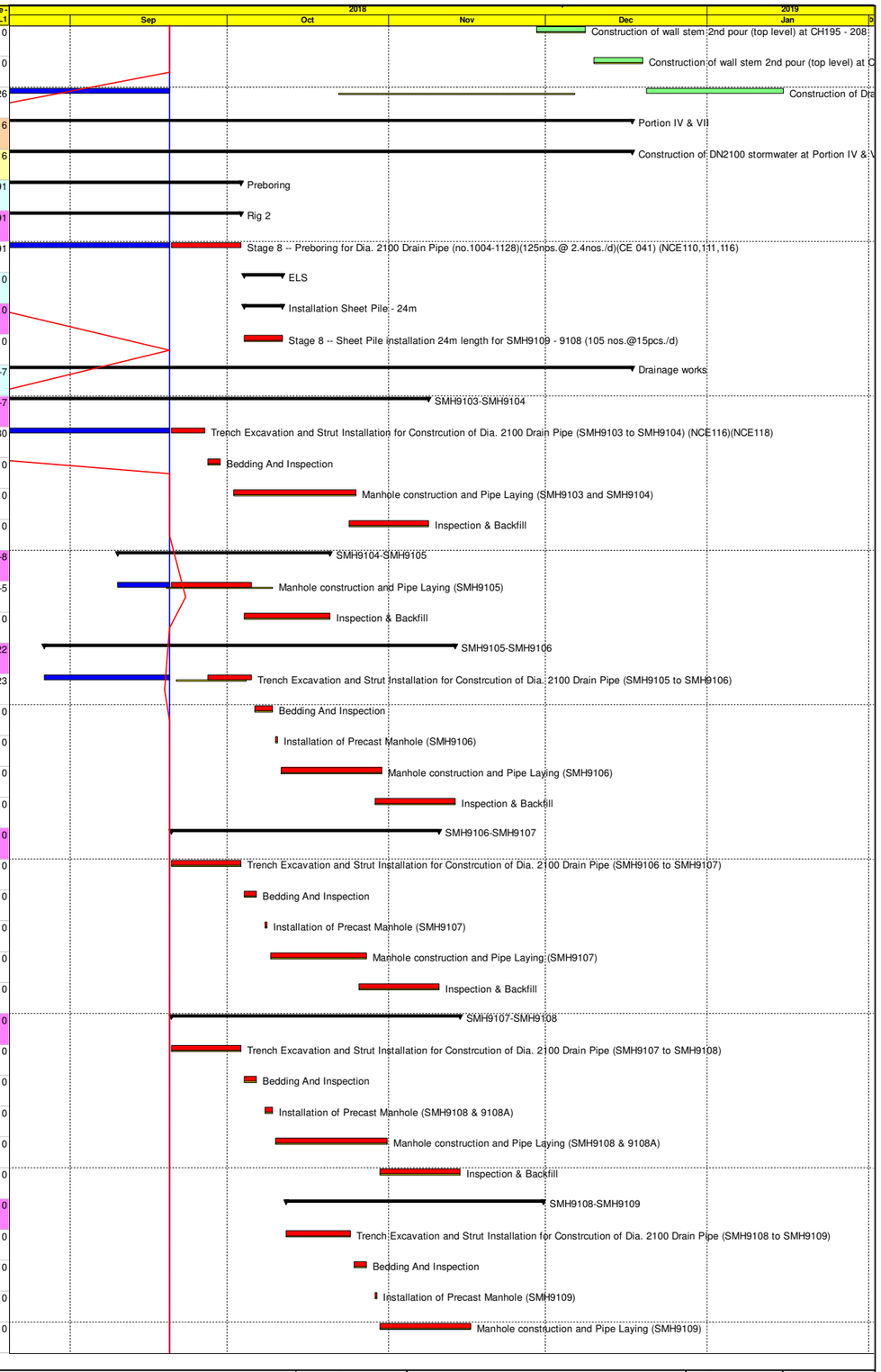
Activity ID	Activity Name	Calendar	Original Duration	Remaining Duration	Start	Finish	Total Float	Activity % Complete	TRA	Variance - BL1
LC17390	Construction of wall stem 2nd pour (top level) at CH195 - 208	P2-Cal.C	9	9	29-Nov-18	08-Dec-18	279	0%		0
LC17395	Construction of wall stem 2nd pour (top level) at CH170 - 182.5	P2-Cal.C	9	9	10-Dec-18	19-Dec-18	270	0%		0
LC17400	Construction of Drainage and Manhole Cover	P2-Cal.C	40	20	28-Jun-18 A	15-Jan-19	270	50%		-126
Portion IV & VII		P2-Cal.C	190	73	13-Apr-18 A	17-Dec-18	-44			-16
Construction of DN2100 stormwater at Portion IV & VII		P2-Cal.C	190	73	13-Apr-18 A	17-Dec-18	-44			-16
Preboring		P2-Cal.C	52	10	13-Apr-18 A	03-Oct-18	-138			-91
Rig 2		P2-Cal.C	52	10	13-Apr-18 A	03-Oct-18	-138			-91
LC17676	Stage 8 -- Preboring for Dia. 2100 Drain Pipe (no.1004-1128)(125nos.@ 2.4nos./d)(CE 041) (NCE110,111,116)	P2-Cal.C	52	10	13-Apr-18 A	03-Oct-18	-138	80.77%		-91
ELS		P2-Cal.C	7	7	04-Oct-18	11-Oct-18	-138			0
Installation Sheet Pile - 24m		P2-Cal.C	7	7	04-Oct-18	11-Oct-18	-138			0
LC17687-01	Stage 8 -- Sheet Pile installation 24m length for SMH9109 - 9108 (105 nos.@15pcs./d)	P2-Cal.C	7	7	04-Oct-18	11-Oct-18	-138	0%		0
Drainage works		P2-Cal.C	151	73	11-Jun-18 A	17-Dec-18	-44			-7
SMH9103-SMH9104		P2-Cal.C	118	40	11-Jun-18 A	08-Nov-18	-119			-7
LC17690	Trench Excavation and Strut Installation for Constrcution of Dia. 2100 Drain Pipe (SMH9103 to SMH9104) (NCE116)(NCE118)	P2-Cal.C	10	5	11-Jun-18 A	26-Sep-18	-138	50%		-80
LC17690-2	Bedding And Inspection	P2-Cal.C	3	3	27-Sep-18	29-Sep-18	-138	0%		0
LC17690-3	Manhole construction and Pipe Laying (SMH9103 and SMH9104)	P2-Cal.C	20	20	02-Oct-18	25-Oct-18	-138	0%		0
LC17690-5	Inspection & Backfill	P2-Cal.C	14	14	24-Oct-18	08-Nov-18	-119	0%		0
SMH9104-SMH9105		P2-Cal.C	25	24	10-Sep-18 A	20-Oct-18	-103			-8
LC17691-3	Manhole construction and Pipe Laying (SMH9105)	P2-Cal.C	16	12	10-Sep-18 A	05-Oct-18	-103	25%		-5
LC17691-5	Inspection & Backfill	P2-Cal.C	14	14	04-Oct-18	20-Oct-18	-103	0%		0
SMH9105-SMH9106		P2-Cal.C	43	39	27-Aug-18 A	13-Nov-18	-123			-22
LC17692	Trench Excavation and Strut Installation for Constrcution of Dia. 2100 Drain Pipe (SMH9105 to SMH9106)	P2-Cal.C	10	7	27-Aug-18 A	05-Oct-18	-129	30%		-23
LC17692-2	Bedding And Inspection	P2-Cal.C	3	3	06-Oct-18	09-Oct-18	-123	0%		0
LC17692-25	Installation of Precast Manhole (SMH9106)	P2-Cal.C	1	1	10-Oct-18	10-Oct-18	-123	0%		0
LC17692-3	Manhole construction and Pipe Laying (SMH9106)	P2-Cal.C	16	16	11-Oct-18	30-Oct-18	-123	0%		0
LC17692-5	Inspection & Backfill	P2-Cal.C	14	14	29-Oct-18	13-Nov-18	-123	0%		0
SMH9106-SMH9107		P2-Cal.C	42	42	20-Sep-18	10-Nov-18	-121			0
LC17693	Trench Excavation and Strut Installation for Constrcution of Dia. 2100 Drain Pipe (SMH9106 to SMH9107)	P2-Cal.C	10	10	20-Sep-18	03-Oct-18	-121	0%		0
LC17693-2	Bedding And Inspection	P2-Cal.C	3	3	04-Oct-18	06-Oct-18	-121	0%		0
LC17693-25	Installation of Precast Manhole (SMH9107)	P2-Cal.C	1	1	08-Oct-18	08-Oct-18	-121	0%		0
LC17693-3	Manhole construction and Pipe Laying (SMH9107)	P2-Cal.C	16	16	09-Oct-18	27-Oct-18	-121	0%		0
LC17693-5	Inspection & Backfill	P2-Cal.C	14	14	26-Oct-18	10-Nov-18	-121	0%		0
SMH9107-SMH9108		P2-Cal.C	45	45	20-Sep-18	14-Nov-18	-124			0
LC17694	Trench Excavation and Strut Installation for Constrcution of Dia. 2100 Drain Pipe (SMH9107 to SMH9108)	P2-Cal.C	10	10	20-Sep-18	03-Oct-18	-124	0%		0
LC17695	Bedding And Inspection	P2-Cal.C	3	3	04-Oct-18	06-Oct-18	-124	0%		0
LC17695-01	Installation of Precast Manhole (SMH9108 & 9108A)	P2-Cal.C	2	2	08-Oct-18	09-Oct-18	-124	0%		0
LC17696	Manhole construction and Pipe Laying (SMH9108 & 9108A)	P2-Cal.C	18	18	10-Oct-18	31-Oct-18	-124	0%		0
LC17698	Inspection & Backfill	P2-Cal.C	14	14	30-Oct-18	14-Nov-18	-124	0%		0
SMH9108-SMH9109		P2-Cal.C	42	42	12-Oct-18	30-Nov-18	-138			0
LC17699	Trench Excavation and Strut Installation for Constrcution of Dia. 2100 Drain Pipe (SMH9108 to SMH9109)	P2-Cal.C	10	10	12-Oct-18	24-Oct-18	-138	0%		0
LC17701	Bedding And Inspection	P2-Cal.C	3	3	25-Oct-18	27-Oct-18	-138	0%		0
LC17701-01	Installation of Precast Manhole (SMH9109)	P2-Cal.C	1	1	29-Oct-18	29-Oct-18	-138	0%		0
LC17702	Manhole construction and Pipe Laying (SMH9109)	P2-Cal.C	16	16	30-Oct-18	16-Nov-18	-138	0%		0



Primary Baseline
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NE/2015/02 Tseung Kwan O - Lam Tin Tunnel-Road P2 and Associated Works (Sep-18)

3 Monthly Rolling Programme
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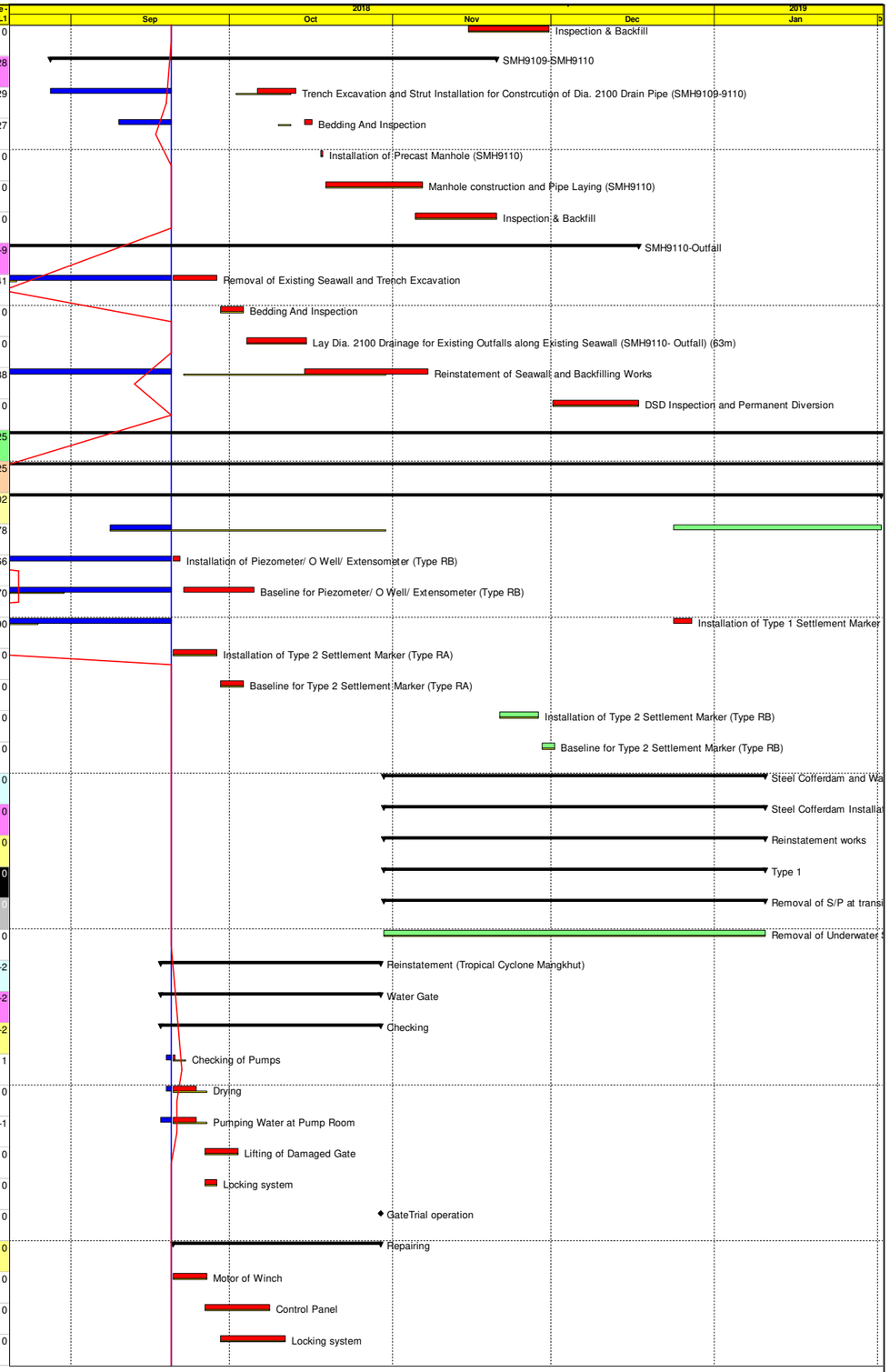
Activity ID	Activity Name	Calendar	Original Duration	Remaining Duration	Start	Finish	Total Float	Activity % Complete	TRA	Variance - BL1
LC17704	Inspection & Backfill	P2-Cal.C	14	14	15-Nov-18	30-Nov-18	-138	0%		0
SMH9109-SMH9110		P2-Cal.C	42	38	28-Aug-18 A	20-Nov-18	-129			-28
LC17705	Trench Excavation and Strut Installation for Constrcution of Dia. 2100 Drain Pipe (SMH9109-9110)	P2-Cal.C	10	7	28-Aug-18 A	13-Oct-18	-129	30%		-29
LC17707	Bedding And Inspection	P2-Cal.C	3	2	10-Sep-18 A	16-Oct-18	-129	33.33%		-27
LC17707-01	Installation of Precast Manhole (SMH9110)	P2-Cal.C	1	1	18-Oct-18	18-Oct-18	-129	0%		0
LC17708	Manhole construction and Pipe Laying (SMH9110)	P2-Cal.C	16	16	19-Oct-18	06-Nov-18	-129	0%		0
LC17710	Inspection & Backfill	P2-Cal.C	14	14	05-Nov-18	20-Nov-18	-129	0%		0
SMH9110-Outfall		P2-Cal.C	119	73	18-Jul-18 A	17-Dec-18	-44			-9
LC17712	Removal of Existing Seawall and Trench Excavation	P2-Cal.C	21	7	18-Jul-18 A	28-Sep-18	-24	66.67%		-41
LC17713	Bedding And Inspection	P2-Cal.C	3	3	29-Sep-18	03-Oct-18	-24	0%		0
LC17715	Lay Dia. 2100 Drainage for Existing Outfalls along Existing Seawall (SMH9110- Outfall) (63m)	P2-Cal.C	10	10	04-Oct-18	15-Oct-18	-24	0%		0
LC17716	Reinstatement of Seawall and Backfilling Works	P2-Cal.C	30	20	17-Aug-18 A	07-Nov-18	-24	33.33%		-38
LC17717	DSD Inspection and Permanent Diversion	P2-Cal.C	14	14	01-Dec-18	17-Dec-18	-44	0%		0
New Reclaimed Section			388	156	06-Jan-18 A	22-Feb-19	120			-25
Marine Works			388	156	06-Jan-18 A	22-Feb-19	120			-25
Initial Works		P2-Cal.C	125	110	03-May-18 A	01-Feb-19	81			-102
MC10050	Installation of Marine Survey Tower	P2-Cal.C	42	32	08-Sep-18 A	01-Feb-19	81	23.81%		-78
MC10060	Installation of Piezometer/ O Well/ Extensometer (Type RB)	P2-Cal.C	7	2	28-Jun-18 A	21-Sep-18	-16	71.43%		-66
MC10070	Baseline for Piezometer/ O Well/ Extensometer (Type RB)	P2-Cal.C	10	10	03-Jul-18 A	05-Oct-18	-16	0%		-70
MC10080	Installation of Type 1 Settlement Marker (Type RA/ RB)	P2-Cal.C	7	2	03-May-18 A	27-Dec-18	-120	71.43%		-190
MC10156	Installation of Type 2 Settlement Marker (Type RA)	P2-Cal.C	7	7	20-Sep-18	28-Sep-18	-44	0%		0
MC10160	Baseline for Type 2 Settlement Marker (Type RA)	P2-Cal.C	3	3	29-Sep-18	03-Oct-18	-44	0%		0
MC10170	Installation of Type 2 Settlement Marker (Type RB)	P2-Cal.C	7	7	21-Nov-18	28-Nov-18	6	0%		0
MC10175	Baseline for Type 2 Settlement Marker (Type RB)	P2-Cal.C	3	3	29-Nov-18	01-Dec-18	6	0%		0
Steel Cofferdam and Water Gate		P2-Cal.C	60	60	30-Oct-18	10-Jan-19	12			0
Steel Cofferdam Installation		P2-Cal.C	60	60	30-Oct-18	10-Jan-19	12			0
Reinstatement works		P2-Cal.C	60	60	30-Oct-18	10-Jan-19	12			0
Type 1		P2-Cal.C	60	60	30-Oct-18	10-Jan-19	12			0
Removal of S/P at transition zone		P2-Cal.C	60	60	30-Oct-18	10-Jan-19	12			0
MC10304-02	Removal of Underwater S/P	P2-Cal.C	60	60	30-Oct-18	10-Jan-19	12	0%		0
Reinstatement (Tropical Cyclone Mangkhut)		P2-Cal.C	31	31	18-Sep-18 A	29-Oct-18	-160			-2
Water Gate		P2-Cal.C	31	31	18-Sep-18 A	29-Oct-18	-160			-2
Checking		P2-Cal.C	31	31	18-Sep-18 A	29-Oct-18	-160			-2
MC10456	Checking of Pumps	P2-Cal.C	3	1	19-Sep-18 A	20-Sep-18	-160	66.67%		1
MC10457	Drying	P2-Cal.C	5	4	19-Sep-18 A	24-Sep-18	-146	20%		0
MC10458	Pumping Water at Pump Room	P2-Cal.C	5	4	18-Sep-18 A	24-Sep-18	-146	20%		-1
MC10459	Lifting of Damaged Gate	P2-Cal.C	5	5	26-Sep-18	02-Oct-18	-146	0%		0
MC10460	Locking system	P2-Cal.C	3	3	26-Sep-18	28-Sep-18	-146	0%		0
MC10461	GateTrial operation	P2-Cal.C	0	0		29-Oct-18	-160	0%		0
Repairing		P2-Cal.C	31	31	20-Sep-18	29-Oct-18	-160			0
MC10462	Motor of Winch	P2-Cal.C	5	5	20-Sep-18	26-Sep-18	-134	0%		0
MC10463	Control Panel	P2-Cal.C	10	10	26-Sep-18	08-Oct-18	-143	0%		0
MC10464	Locking system	P2-Cal.C	10	10	29-Sep-18	11-Oct-18	-146	0%		0



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MC10465	Generator	P2-Cal.C	28	28	20-Sep-18	25-Oct-18	-157	0%		0
MC10466	Water Pumps	P2-Cal.C	30	30	21-Sep-18	29-Oct-18	-160	0%		0
Type 1 Cofferdam		P2-Cal.C	31	31	18-Sep-18 A	29-Oct-18	-160			-2
MC10467	Diver Inspection	P2-Cal.C	4	2	18-Sep-18 A	21-Sep-18	-160	50%		0
MC10468	Material Ordering	P2-Cal.C	1	1	22-Sep-18	22-Sep-18	-160	0%		0
MC10469	Material Delivery	P2-Cal.C	3	3	24-Sep-18	27-Sep-18	-160	0%		0
MC10470	Removal of damaged Materials	P2-Cal.C	7	7	24-Sep-18	03-Oct-18	-160	0%		0
MC10471	Fabrication of S/P and 914 I Beam	P2-Cal.C	18	18	28-Sep-18	20-Oct-18	-158	0%		0
MC10472	Installation (72+96 = 168m)	P2-Cal.C	21	21	04-Oct-18	29-Oct-18	-160	0%		0
Type 2 Cofferdam		P2-Cal.C	20	20	22-Sep-18	18-Oct-18	-151			0
MC10473	Flexible Joint (43 nos)	P2-Cal.C	20	20	22-Sep-18	18-Oct-18	-151	0%		0
MC10474	Order Fill Material	P2-Cal.C	1	1	22-Sep-18	22-Sep-18	-142	0%		0
MC10475	Laying Fill Material 10ton in total (1no/day)	P2-Cal.C	10	10	24-Sep-18	06-Oct-18	-142	0%		0
Type 3 Cofferdam		P2-Cal.C	6	6	20-Sep-18	27-Sep-18	-135			0
MC10476	Western Portion	P2-Cal.C	3	3	20-Sep-18	22-Sep-18	-135	0%		0
MC10477	Eastern Portion	P2-Cal.C	3	3	24-Sep-18	27-Sep-18	-135	0%		0
Silt Curtain		P2-Cal.C	24	24	20-Sep-18	20-Oct-18	-153			0
MC10479	Delivery	P2-Cal.C	1	1	20-Sep-18	20-Sep-18	-153	0%		0
MC10480	Fabrication (1000m)	P2-Cal.C	18	18	21-Sep-18	13-Oct-18	-153	0%		0
MC10481	Installation of Silt Curtain	P2-Cal.C	21	21	24-Sep-18	20-Oct-18	-153	0%		0
Dredging Work		P2-Cal.C	80	45	08-Sep-18 A	20-Dec-18	-80			-6
MC10844	Dredge CH440-480 (Bottom) (14912m3)	P2-Cal.C	15	4	08-Sep-18 A	02-Nov-18	-119	73.33%		-30
MC10845	Dredge CH480-560 (+O/S 20 to 80) (Bottom) (2243m3)	P2-Cal.C	8	5	08-Sep-18 A	03-Nov-18	-114	37.5%		-38
MC10848	Dredge CH480-560 for treatment stage 1 (Bottom) (6000m3); 600m3/day	P2-Cal.C	10	10	05-Nov-18	15-Nov-18	-114	0%		0
MC10855	Dredge CH480-560 for treatment stage 2 (Bottom) (18000m3); 600m3/day	P2-Cal.C	30	30	16-Nov-18	20-Dec-18	-80	0%		0
Bathymetric and Seismic Survey		P2-Cal.C	13	13	03-Nov-18	17-Nov-18	-114			0
MC11015	Survey CH440-480	P2-Cal.C	2	2	03-Nov-18	05-Nov-18	-119	0%	0	0
MC11018	Survey CH480-560 (+O/S 20 to 80)	P2-Cal.C	2	2	05-Nov-18	06-Nov-18	-110	0%	0	0
MC11025	Survey CH480-560 - stage 1	P2-Cal.C	2	2	16-Nov-18	17-Nov-18	-114	0%	0	0
Filling of Recycle G400 Rock at Dredged Trench		P2-Cal.C	56	36	08-Sep-18 A	10-Dec-18	-119			-21
MC11185	Fill Recycle G400 at CH362-412 (25473m3)	P2-Cal.C	12	6	08-Sep-18 A	05-Nov-18	-122	50%	0	-35
MC11205	Fill Recycle G400 at CH412-442 (19909m3)	P2-Cal.C	10	10	06-Nov-18	16-Nov-18	-119	0%	0	0
MC11225	Fill Recycle G400 at CH442-512 (24332m3) (+O/S 20 to 80)	P2-Cal.C	14	14	24-Nov-18	10-Dec-18	-119	0%	0	0
MC11235	Fill Recycle G400 at CH442-512 (6000m3) - Stage 1 (West Side)	P2-Cal.C	6	6	17-Nov-18	23-Nov-18	-119	0%	0	0
Construction of Seawall Foundation (Dredged Area)		P2-Cal.C	122	42	12-Jul-18 A	17-Dec-18	-119			-11
Laying of Type A Rockfill (Base)		P2-Cal.C	38	38	30-Oct-18	12-Dec-18	-119			0
MC11275	Type A Rockfill CH250-312 (952m3)	P2-Cal.C	2	2	30-Oct-18	31-Oct-18	-137	0%	0	0
MC11285	Type A Rockfill CH312-362 (860m3)	P2-Cal.C	1	1	01-Nov-18	01-Nov-18	-133	0%	0	0
MC11295	Type A Rockfill CH362-412 (917m3)	P2-Cal.C	1	1	06-Nov-18	06-Nov-18	-122	0%	0	0
MC11305	Type A Rockfill CH412-442 (773m3)	P2-Cal.C	1	1	17-Nov-18	17-Nov-18	-117	0%	0	0
MC11315	Type A Rockfill CH442-500 (2222m3)	P2-Cal.C	2	2	11-Dec-18	12-Dec-18	-119	0%	0	0
Laying of Geotextile Type A (Base)		P2-Cal.C	74	40	12-Sep-18 A	14-Dec-18	-119			-4
MC11355	Geotextile Type A CH210-262 (929m2)	P2-Cal.C	1	1	12-Sep-18 A	30-Oct-18	-137	0%	0	-38

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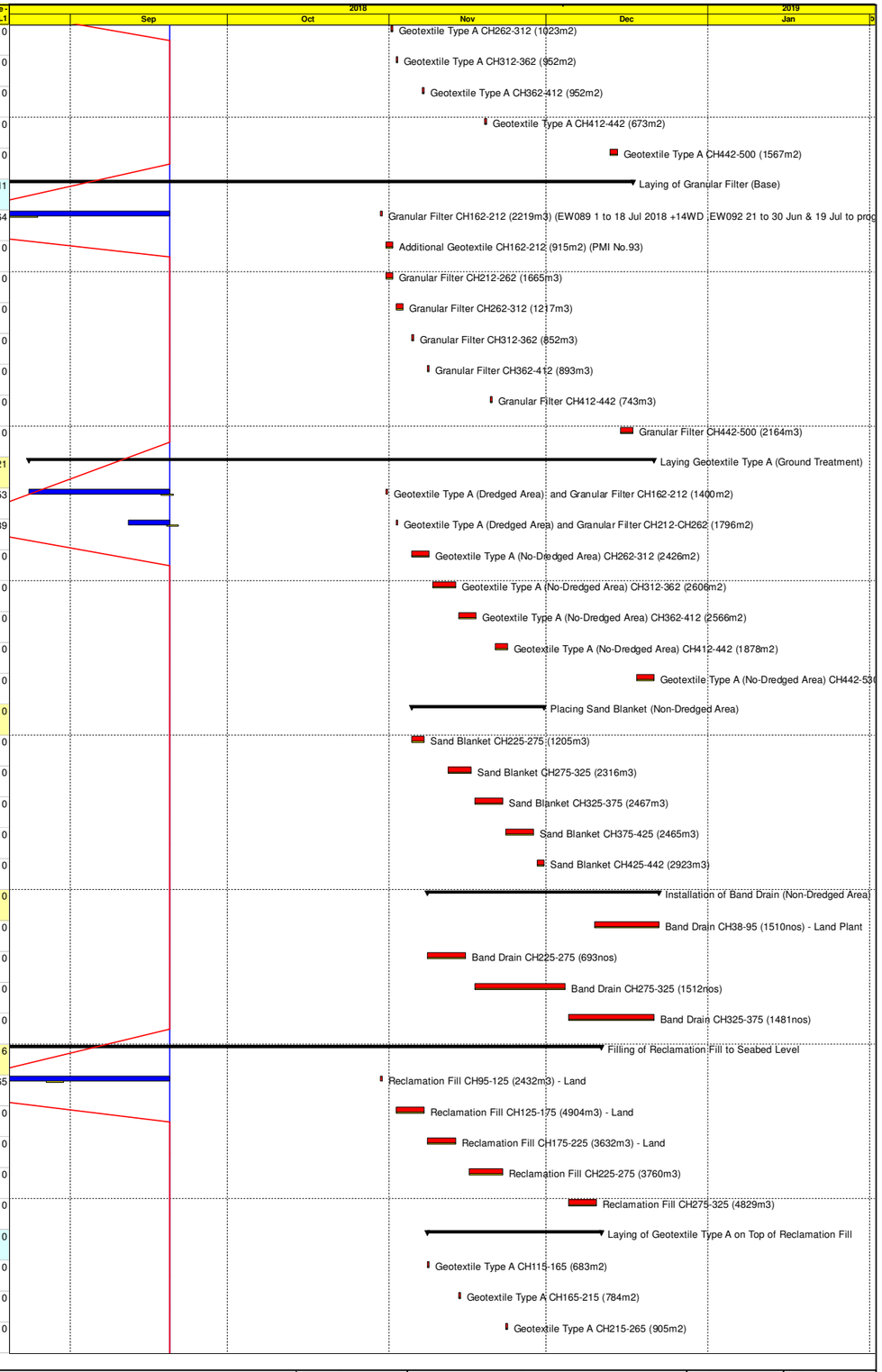
MC11365	Geotextile Type A CH262-312 (1023m2)	P2-Cal.C	1	1	01-Nov-18	01-Nov-18	-137	0%	0	0
MC11375	Geotextile Type A CH312-362 (952m2)	P2-Cal.C	1	1	02-Nov-18	02-Nov-18	-133	0%	0	0
MC11385	Geotextile Type A CH362-412 (952m2)	P2-Cal.C	1	1	07-Nov-18	07-Nov-18	-122	0%	0	0
MC11395	Geotextile Type A CH412-442 (673m2)	P2-Cal.C	1	1	19-Nov-18	19-Nov-18	-117	0%	0	0
MC11405	Geotextile Type A CH442-500 (1567m2)	P2-Cal.C	2	2	13-Dec-18	14-Dec-18	-119	0%	0	0
Laying of Granular Filter (Base)		P2-Cal.C	122	42	12-Jul-18 A	17-Dec-18	-119			-11
MC11435	Granular Filter CH162-212 (2219m3) (EW089 1 to 18 Jul 2018 +14WD ,EW092 21 to 30 Jun & 19 Jul to progress+ 9WD)	P2-Cal.C	28	1	12-Jul-18 A	30-Oct-18	-145	96.43%	0	-64
MC11439	Additional Geotextile CH162-212 (915m2) (PMI No.93)	P2-Cal.C	2	2	31-Oct-18	01-Nov-18	-145	0%	0	0
MC11445	Granular Filter CH212-262 (1665m3)	P2-Cal.C	2	2	31-Oct-18	01-Nov-18	-137	0%	0	0
MC11455	Granular Filter CH262-312 (1217m3)	P2-Cal.C	2	2	02-Nov-18	03-Nov-18	-137	0%	0	0
MC11465	Granular Filter CH312-362 (852m3)	P2-Cal.C	1	1	05-Nov-18	05-Nov-18	-134	0%	0	0
MC11475	Granular Filter CH362-412 (893m3)	P2-Cal.C	1	1	08-Nov-18	08-Nov-18	-122	0%	0	0
MC11485	Granular Filter CH412-442 (743m3)	P2-Cal.C	1	1	20-Nov-18	20-Nov-18	-117	0%	0	0
MC11495	Granular Filter CH442-500 (2164m3)	P2-Cal.C	2	2	15-Dec-18	17-Dec-18	-119	0%	0	0
Laying Geotextile Type A (Ground Treatment)		P2-Cal.C	79	45	24-Aug-18 A	21-Dec-18	-119			-21
MC12025	Geotextile Type A (Dredged Area) and Granular Filter CH162-212 (1400m2)	P2-Cal.C	3	1	24-Aug-18 A	31-Oct-18	-144	66.67%	0	-53
MC12035	Geotextile Type A (Dredged Area) and Granular Filter CH212-CH262 (1796m2)	P2-Cal.C	3	1	12-Sep-18 A	02-Nov-18	-136	66.67%	0	-39
MC12045	Geotextile Type A (No-Dredged Area) CH262-312 (2426m2)	P2-Cal.C	4	4	05-Nov-18	08-Nov-18	-137	0%	0	0
MC12055	Geotextile Type A (No-Dredged Area) CH312-362 (2606m2)	P2-Cal.C	4	4	09-Nov-18	13-Nov-18	-137	0%	0	0
MC12065	Geotextile Type A (No-Dredged Area) CH362-412 (2566m2)	P2-Cal.C	4	4	14-Nov-18	17-Nov-18	-126	0%	0	0
MC12075	Geotextile Type A (No-Dredged Area) CH412-442 (1878m2)	P2-Cal.C	3	3	21-Nov-18	23-Nov-18	-117	0%	0	0
MC12085	Geotextile Type A (No-Dredged Area) CH442-530 (2540m2)	P2-Cal.C	4	4	18-Dec-18	21-Dec-18	-119	0%	0	0
Placing Sand Blanket (Non-Dredged Area)		P2-Cal.C	23	23	05-Nov-18	30-Nov-18	-102			0
MC12105	Sand Blanket CH225-275 (1205m3)	P2-Cal.C	3	3	05-Nov-18	07-Nov-18	-136	0%	0	0
MC12115	Sand Blanket CH275-325 (2316m3)	P2-Cal.C	5	5	12-Nov-18	16-Nov-18	-137	0%	0	0
MC12125	Sand Blanket CH325-375 (2467m3)	P2-Cal.C	5	5	17-Nov-18	22-Nov-18	-127	0%	0	0
MC12135	Sand Blanket CH375-425 (2465m3)	P2-Cal.C	5	5	23-Nov-18	28-Nov-18	-117	0%	0	0
MC12145	Sand Blanket CH425-442 (2923m3)	P2-Cal.C	2	2	29-Nov-18	30-Nov-18	-102	0%	0	0
Installation of Band Drain (Non-Dredged Area)		P2-Cal.C	39	39	08-Nov-18	22-Dec-18	-138			0
MC12163	Band Drain CH38-95 (1510nos) - Land Plant	P2-Cal.C	12	12	10-Dec-18	22-Dec-18	-160	0%	0	0
MC12175	Band Drain CH225-275 (693nos)	P2-Cal.C	7	7	08-Nov-18	15-Nov-18	-136	0%	0	0
MC12185	Band Drain CH275-325 (1512nos)	P2-Cal.C	15	15	17-Nov-18	04-Dec-18	-137	0%	0	0
MC12195	Band Drain CH325-375 (1481nos)	P2-Cal.C	15	15	05-Dec-18	21-Dec-18	-137	0%	0	0
Filling of Reclamation Fill to Seabed Level		P2-Cal.C	89	37	08-Aug-18 A	11-Dec-18	-87			-16
MC12335	Reclamation Fill CH95-125 (2432m3) - Land	P2-Cal.C	4	1	08-Aug-18 A	30-Oct-18	-160	75%	0	-65
MC12345	Reclamation Fill CH125-175 (4904m3) - Land	P2-Cal.C	5	5	02-Nov-18	07-Nov-18	-145	0%	0	0
MC12355	Reclamation Fill CH175-225 (3632m3) - Land	P2-Cal.C	5	5	08-Nov-18	13-Nov-18	-129	0%	0	0
MC12365	Reclamation Fill CH225-275 (3760m3)	P2-Cal.C	6	6	16-Nov-18	22-Nov-18	-78	0%	0	0
MC12375	Reclamation Fill CH275-325 (4829m3)	P2-Cal.C	5	5	05-Dec-18	10-Dec-18	-87	0%	0	0
Laying of Geotextile Type A on Top of Reclamation Fill		P2-Cal.C	29	29	08-Nov-18	11-Dec-18	-87			0
MC12425	Geotextile Type A CH115-165 (683m2)	P2-Cal.C	1	1	08-Nov-18	08-Nov-18	-145	0%	0	0
MC12435	Geotextile Type A CH165-215 (784m2)	P2-Cal.C	1	1	14-Nov-18	14-Nov-18	-129	0%	0	0
MC12445	Geotextile Type A CH215-265 (905m2)	P2-Cal.C	1	1	23-Nov-18	23-Nov-18	-78	0%	0	0



Primary Baseline
Actual Work
Remaining Work
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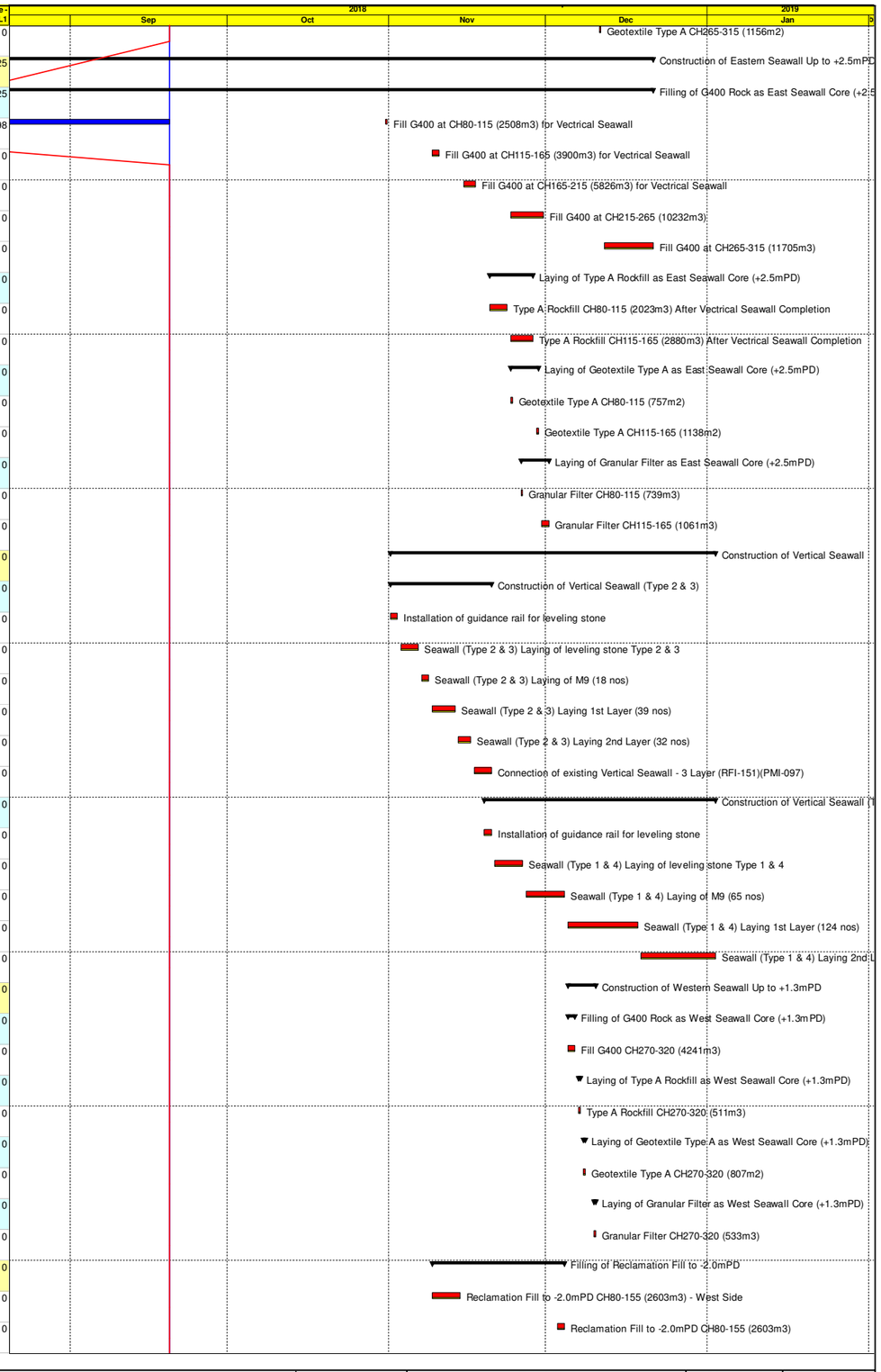
Milestone
Summary

NE/2015/02 Tseung Kwan O - Lam Tin Tunnel-Road P2 and Associated Works (Sep-18)

3 Monthly Rolling Programme
(Data Date : 20-Sep-2018)

Date	Revision	Checked	Approved
20-Sep-18			

Activity ID	Activity Name	Calendar	Original Duration	Remaining Duration	Start	Finish	Total Float	Activity % Complete	TRA	Variance - BL1
MC12455	Geotextile Type A CH265-315 (1156m2)	P2-Cal.C	1	1	11-Dec-18	11-Dec-18	-87	0%	0	0
Construction of Eastern Seawall Up to +2.5mPD		P2-Cal.C	119	45	04-Jul-18 A	21-Dec-18	-87			-25
Filling of G400 Rock as East Seawall Core (+2.5mPD)		P2-Cal.C	119	45	04-Jul-18 A	21-Dec-18	-87			-25
MC11505	Fill G400 at CH80-115 (2508m3) for Vectrical Seawall	P2-Cal.C	2	1	04-Jul-18 A	31-Oct-18	-160	50%	0	-98
MC11515	Fill G400 at CH115-165 (3900m3) for Vectrical Seawall	P2-Cal.C	2	2	09-Nov-18	10-Nov-18	-126	0%	0	0
MC11525	Fill G400 at CH165-215 (5826m3) for Vectrical Seawall	P2-Cal.C	3	3	15-Nov-18	17-Nov-18	-129	0%	0	0
MC11535	Fill G400 at CH215-265 (10232m3)	P2-Cal.C	6	6	24-Nov-18	30-Nov-18	-78	0%	0	0
MC11545	Fill G400 at CH265-315 (11705m3)	P2-Cal.C	9	9	12-Dec-18	21-Dec-18	-87	0%	0	0
Laying of Type A Rockfill as East Seawall Core (+2.5mPD)		P2-Cal.C	8	8	20-Nov-18	28-Nov-18	-160			0
MC11605	Type A Rockfill CH80-115 (2023m3) After Vectrical Seawall Completion	P2-Cal.C	4	4	20-Nov-18	23-Nov-18	-160	0%	0	0
MC11615	Type A Rockfill CH115-165 (2880m3) After Vectrical Seawall Completion	P2-Cal.C	4	4	24-Nov-18	28-Nov-18	-160	0%	0	0
Laying of Geotextile Type A as East Seawall Core (+2.5mPD)		P2-Cal.C	5	5	24-Nov-18	29-Nov-18	-160			0
MC11705	Geotextile Type A CH80-115 (757m2)	P2-Cal.C	1	1	24-Nov-18	24-Nov-18	-157	0%	0	0
MC11715	Geotextile Type A CH115-165 (1138m2)	P2-Cal.C	1	1	29-Nov-18	29-Nov-18	-160	0%	0	0
Laying of Granular Filter as East Seawall Core (+2.5mPD)		P2-Cal.C	6	6	26-Nov-18	01-Dec-18	-160			0
MC11805	Granular Filter CH80-115 (739m3)	P2-Cal.C	1	1	26-Nov-18	26-Nov-18	-157	0%	0	0
MC11815	Granular Filter CH115-165 (1061m3)	P2-Cal.C	2	2	30-Nov-18	01-Dec-18	-160	0%	0	0
Construction of Vertical Seawall		P2-Cal.C	51	51	01-Nov-18	02-Jan-19	-129			0
Construction of Vertical Seawall (Type 2 & 3)		P2-Cal.C	17	17	01-Nov-18	20-Nov-18	-160			0
MC11905	Installation of guidance rail for leveling stone	P2-Cal.C	2	2	01-Nov-18	02-Nov-18	-160	0%	0	0
MC11915	Seawall (Type 2 & 3) Laying of leveling stone Type 2 & 3	P2-Cal.C	3	3	03-Nov-18	06-Nov-18	-160	0%	0	0
MC11925	Seawall (Type 2 & 3) Laying of M9 (18 nos)	P2-Cal.C	2	2	07-Nov-18	08-Nov-18	-160	0%	0	0
MC11935	Seawall (Type 2 & 3) Laying 1st Layer (39 nos)	P2-Cal.C	4	4	09-Nov-18	13-Nov-18	-160	0%	0	0
MC11945	Seawall (Type 2 & 3) Laying 2nd Layer (32 nos)	P2-Cal.C	3	3	14-Nov-18	16-Nov-18	-160	0%	0	0
MC11950	Connection of existing Vertical Seawall - 3 Layer (RFI-151)(PMI-097)	P2-Cal.C	3	3	17-Nov-18	20-Nov-18	-160	0%	0	0
Construction of Vertical Seawall (Type 1 & 4)		P2-Cal.C	36	36	19-Nov-18	02-Jan-19	-129			0
MC11955	Installation of guidance rail for leveling stone	P2-Cal.C	2	2	19-Nov-18	20-Nov-18	-129	0%	0	0
MC11965	Seawall (Type 1 & 4) Laying of leveling stone Type 1 & 4	P2-Cal.C	5	5	21-Nov-18	26-Nov-18	-129	0%	0	0
MC11975	Seawall (Type 1 & 4) Laying of M9 (65 nos)	P2-Cal.C	7	7	27-Nov-18	04-Dec-18	-129	0%	0	0
MC11985	Seawall (Type 1 & 4) Laying 1st Layer (124 nos)	P2-Cal.C	12	12	05-Dec-18	18-Dec-18	-129	0%	0	0
MC11995	Seawall (Type 1 & 4) Laying 2nd Layer (105 nos)	P2-Cal.C	10	10	19-Dec-18	02-Jan-19	-129	0%	0	0
Construction of Western Seawall Up to +1.3mPD		P2-Cal.C	5	5	05-Dec-18	10-Dec-18	-71			0
Filling of G400 Rock as West Seawall Core (+1.3mPD)		P2-Cal.C	2	2	05-Dec-18	06-Dec-18	-71			0
MC12495	Fill G400 CH270-320 (4241m3)	P2-Cal.C	2	2	05-Dec-18	06-Dec-18	-71	0%	0	0
Laying of Type A Rockfill as West Seawall Core (+1.3mPD)		P2-Cal.C	1	1	07-Dec-18	07-Dec-18	-71			0
MC12535	Type A Rockfill CH270-320 (511m3)	P2-Cal.C	1	1	07-Dec-18	07-Dec-18	-71	0%	0	0
Laying of Geotextile Type A as West Seawall Core (+1.3mPD)		P2-Cal.C	1	1	08-Dec-18	08-Dec-18	-71			0
MC12575	Geotextile Type A CH270-320 (807m2)	P2-Cal.C	1	1	08-Dec-18	08-Dec-18	-71	0%	0	0
Laying of Granular Filter as West Seawall Core (+1.3mPD)		P2-Cal.C	1	1	10-Dec-18	10-Dec-18	-71			0
MC12615	Granular Filter CH270-320 (533m3)	P2-Cal.C	1	1	10-Dec-18	10-Dec-18	-71	0%	0	0
Filling of Reclamation Fill to -2.0mPD		P2-Cal.C	22	22	09-Nov-18	04-Dec-18	-100			0
MC12655-05	Reclamation Fill to -2.0mPD CH80-155 (2603m3) - West Side	P2-Cal.C	5	5	09-Nov-18	14-Nov-18	-145	0%	0	0
MC12665	Reclamation Fill to -2.0mPD CH80-155 (2603m3)	P2-Cal.C	2	2	03-Dec-18	04-Dec-18	-160	0%	0	0



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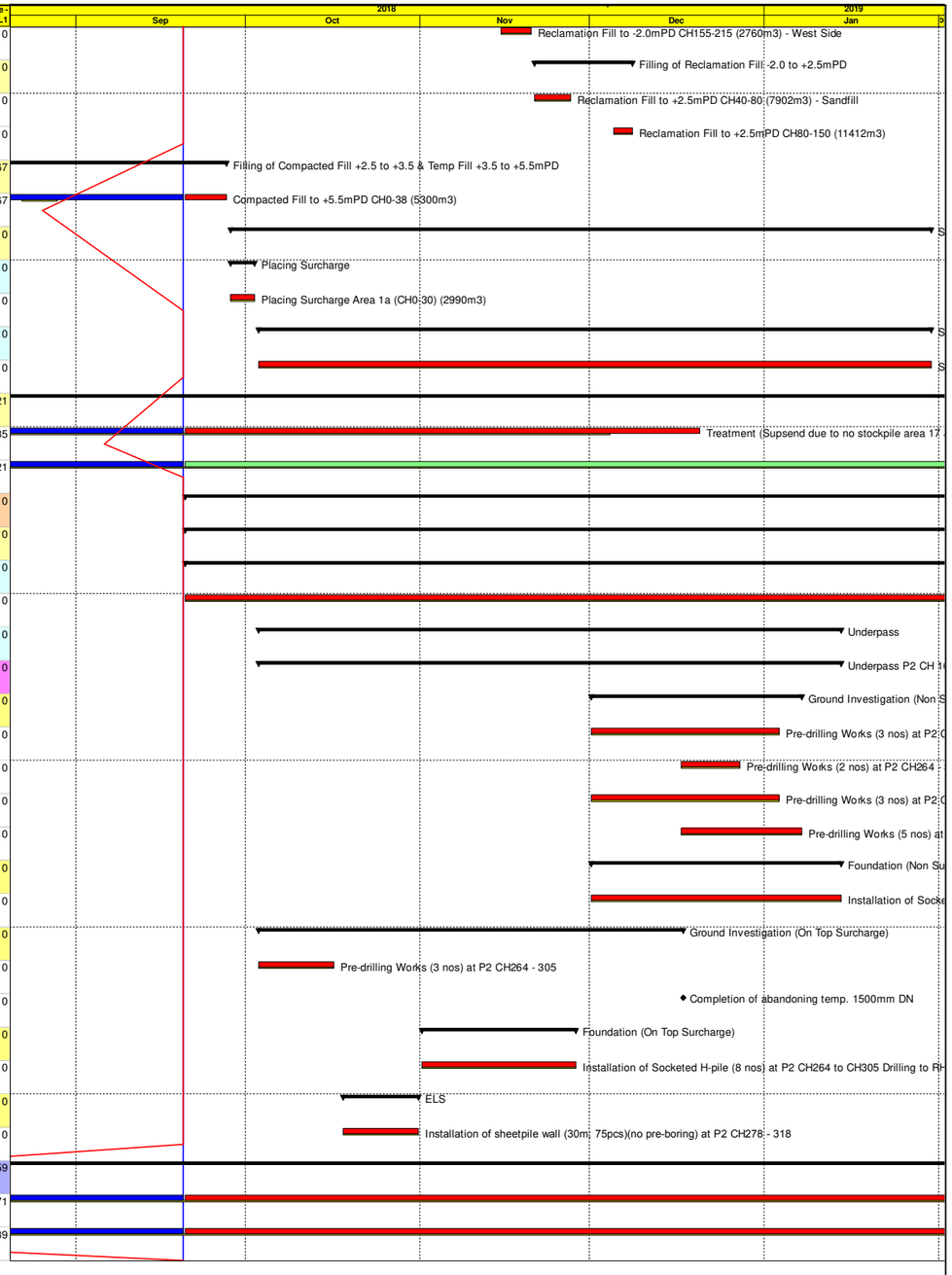
NE/2015/02 Tseung Kwan O - Lam Tin Tunnel-Road P2 and Associated Works (Sep-18)

3 Monthly Rolling Programme
(Data Date : 20-Sep-2018)

Date	Revision	Checked	Approved
20-Sep-18			

Activity ID	Activity Name	Calendar	Original Duration	Remaining Duration	Start	Finish	Total Float	Activity % Complete	TRA	Variance - BL1
MC12665-01	Reclamation Fill to -2.0mPD CH155-215 (2760m3) - West Side	P2-Cal.C	5	5	15-Nov-18	20-Nov-18	-88	0%	0	0
Filling of Reclamation Fill -2.0 to +2.5mPD		P2-Cal.C	16	16	21-Nov-18	08-Dec-18	-160			0
MC12885	Reclamation Fill to +2.5mPD CH40-80 (7902m3) - Sandfill	P2-Cal.C	6	6	21-Nov-18	27-Nov-18	-150	0%	0	0
MC12895	Reclamation Fill to +2.5mPD CH80-150 (11412m3)	P2-Cal.C	4	4	05-Dec-18	08-Dec-18	-160	0%	0	0
Filling of Compacted Fill +2.5 to +3.5 & Temp Fill +3.5 to +5.5mPD		P2-Cal.C	6	6	04-Jul-18 A	27-Sep-18	-88			-67
MC12950	Compacted Fill to +5.5mPD CH0-38 (5300m3)	P2-Cal.C	6	6	04-Jul-18 A	27-Sep-18	-88	0%	0	-67
Surcharge			125	125	28-Sep-18	30-Jan-19	-92			0
Placing Surcharge		P2-Cal.C	3	3	28-Sep-18	02-Oct-18	-77			0
MC13015	Placing Surcharge Area 1a (CH0-30) (2990m3)	P2-Cal.C	3	3	28-Sep-18	02-Oct-18	-77	0%		0
Surcharging		P2-Cal.A	120	120	03-Oct-18	30-Jan-19	-92			0
MC13155	Surcharge Area 1a (CH0-30) (2990m3)	P2-Cal.A	120	120	03-Oct-18	30-Jan-19	-92	0%		0
Full-scale Treatment of Cement S/S of Marine Sediment		P2-Cal.C	313	125	06-Jan-18 A	22-Feb-19	96			-21
MC14075	Treatment (Supsend due to no stockpile area 17 Jul 18 to 19 Sep 18)	P2-Cal.C	250	76	06-Jan-18 A	20-Dec-18	-111	69.6%		-35
MC14080	Curing, Stockpiling and Filling	P2-Cal.C	313	125	06-Jan-18 A	22-Feb-19	96	60.06%		-21
Land Works		P2-Cal.C	124	124	20-Sep-18	21-Feb-19	-31			0
Road P2 Underpass (CH105-CH318)		P2-Cal.C	124	124	20-Sep-18	21-Feb-19	-31			0
Instrumentation and Monitoring for Road P2 Structure Construction		P2-Cal.C	124	124	20-Sep-18	21-Feb-19	-31			0
LC17740	Installation of Instrumentation including observation well & piezometers, etc	P2-Cal.C	124	124	20-Sep-18	21-Feb-19	-31	0%		0
Underpass		P2-Cal.C	85	85	03-Oct-18	14-Jan-19	-41			0
Underpass P2 CH 105 - 318		P2-Cal.C	85	85	03-Oct-18	14-Jan-19	-41			0
Ground Investigation (Non Surcharge)		P2-Cal.C	29	29	01-Dec-18	07-Jan-19	-133			0
LC17762	Pre-drilling Works (3 nos) at P2 CH264 - 305 (completed 2100 drain pipe)(west side) 13d/nos - Rig1, 2	P2-Cal.C	26	26	01-Dec-18	03-Jan-19	-138	0%		0
LC17763	Pre-drilling Works (2 nos) at P2 CH264 - 305 - Rig2	P2-Cal.C	8	8	17-Dec-18	27-Dec-18	-138	0%		0
LC17764	Pre-drilling Works (3 nos) at P2 CH208 - 264 (west side) 13d/nos - Rig3, 4	P2-Cal.C	26	26	01-Dec-18	03-Jan-19	-133	0%		0
LC17765	Pre-drilling Works (5 nos) at P2 CH208 - 264 - Rig3, 4	P2-Cal.C	16	16	17-Dec-18	07-Jan-19	-133	0%		0
Foundation (Non Surcharge)		P2-Cal.C	35	35	01-Dec-18	14-Jan-19	-116			0
LC17768	Installation of Socketed H-pile (7 nos) at P2 CH292 to CH305 (north side) - (Rig x 1)	P2-Cal.C	35	35	01-Dec-18	14-Jan-19	-116	0%		0
Ground Investigation (On Top Surcharge)		P2-Cal.C	64	64	03-Oct-18	17-Dec-18	-44			0
LC17780	Pre-drilling Works (3 nos) at P2 CH264 - 305	P2-Cal.C	12	12	03-Oct-18	16-Oct-18	-6	0%		0
LC17783	Completion of abandoning temp. 1500mm DN	P2-Cal.C	0	0		17-Dec-18	-44	0%		0
Foundation (On Top Surcharge)		P2-Cal.C	24	24	01-Nov-18	28-Nov-18	-4			0
LC17805	Installation of Socketed H-pile (8 nos) at P2 CH264 to CH305 Drilling to RH - 3d/nos - (Rig x 1)	P2-Cal.C	24	24	01-Nov-18	28-Nov-18	-4	0%		0
ELS		P2-Cal.C	12	12	18-Oct-18	31-Oct-18	-6			0
LC17870	Installation of sheetpile wall (30m; 75pcs)(no pre-boring) at P2 CH278 - 318	P2-Cal.C	12	12	18-Oct-18	31-Oct-18	-6	0%		0
Section 4 of the Works - Preservation and Protection of Existing Trees		P2-Cal.A	1563	1006	12-Jan-17 A	21-Jun-21	-137			-59
LC25260	Preservation and Protection of Existing Trees	P2-Cal.A	1451	1006	12-Jan-17 A	21-Jun-21	-137	30.67%		-171
LC25280	Nursery Transplanted Trees at the Contractor's holding nursery	P2-Cal.A	1177	1006	28-Apr-17 A	21-Jun-21	-137	14.53%		-339



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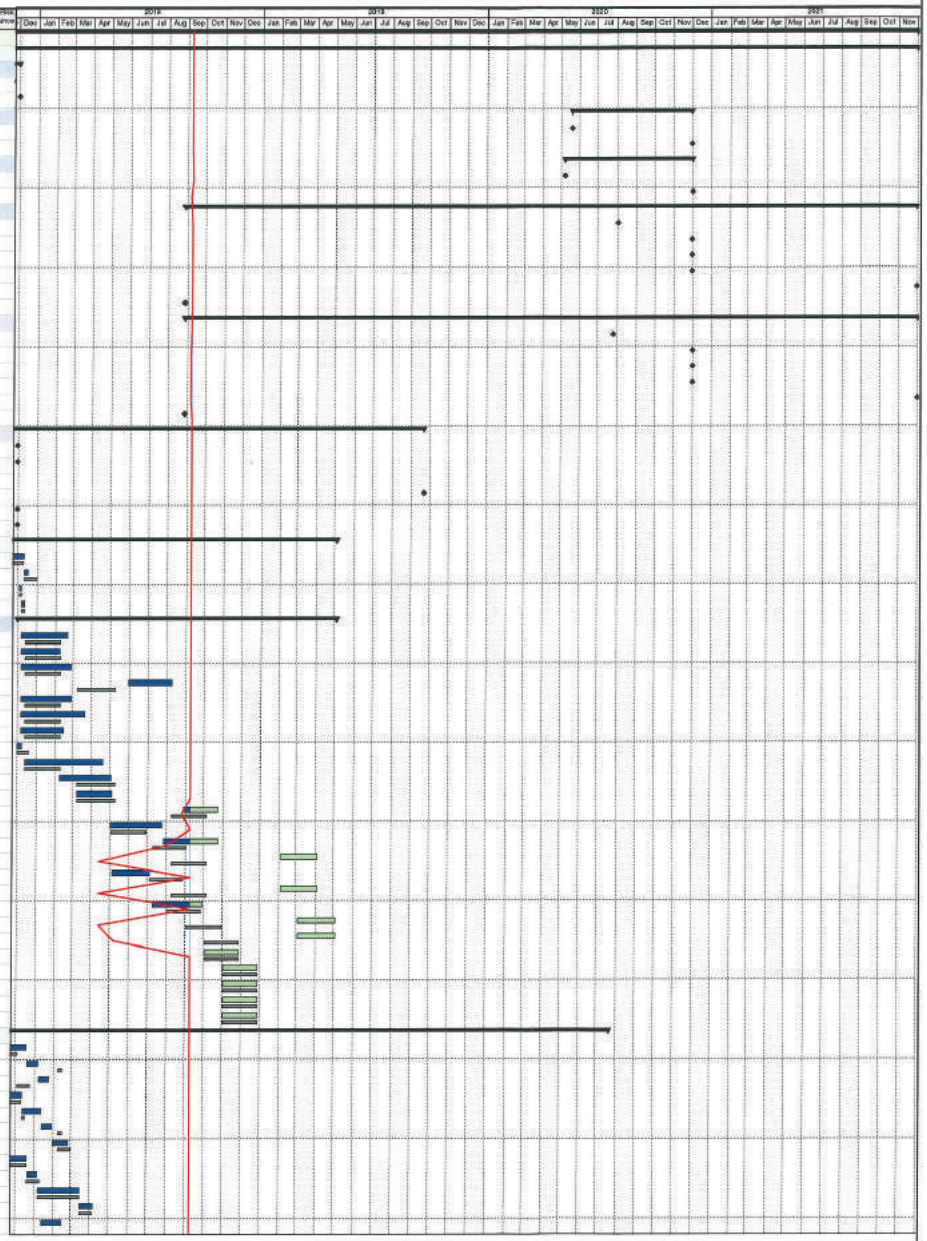
NE/2015/02 Tseung Kwan O - Lam Tin Tunnel-Road P2 and Associated Works (Sep-18)

3 Monthly Rolling Programme
(Data Date : 20-Sep-2018)

Date	Revision	Checked	Approved
20-Sep-18			

NE/2017/02 - Updated Programme (Sep 2018)

Activity ID	Activity Name	Original Duration	Calendar	Activity % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	Time Risk Allowance
NE/2017/02 - Updated Programme (Sep 2018)		1472			1180	17-Nov-17 A	30-Nov-21	07-Sep-18	29-Nov-21	-1	
Contractual Dates		1462			802	17-Nov-17 A	30-Nov-21	07-Sep-18	29-Nov-21	-1	
Commencement Date		0	7d		0	20-Nov-17 A	30-Nov-17 A	07-Sep-18	07-Sep-18		
K10000	Contract Date	0	7d	100%	0	20-Nov-17 A		07-Sep-18			
K10010	Starting Date	0	7d	100%	0	30-Nov-17 A		07-Sep-18			
Key Dates (contract)		195	7d		195	18-May-20	29-Nov-20	18-May-20	29-Nov-20	0	
K10020	Key Date 1 - Completion of works for the T&C of route-wide lighting, E&M and TCSS	0	7d	0%	0		18-May-20*		18-May-20	0	
K10030	Key Date 2 - Completion of works for the opening of Road P2	0	7d	0%	0		29-Nov-20*		29-Nov-20	0	
Key Dates (planned)		208	7d		208	06-May-20	30-Nov-20	18-May-20	29-Nov-20	-1	
K10040	Key Date 1 - Completion of works for the T&C of route-wide lighting, E&M and TCSS (plannec	0	7d	0%	0		06-May-20*		18-May-20	12	
K10050	Key Date 2 - Completion of works for the opening of Road P2 (planned)	0	7d	0%	0		30-Nov-20*		29-Nov-20	-1	
Completion Dates (contract)		1179	7d		485	27-Aug-18 A	29-Nov-21	01-Aug-20	29-Nov-21	0	
K10060	Section 1 - All works not covered by other Sections	0	7d	0%	0		01-Aug-20*		01-Aug-20	0	
K10070	Section 2 - Bridgeworks	0	7d	0%	0		29-Nov-20*		29-Nov-20	0	
K10080	Section 3 - Preservation and Protection of Existing Trees	0	7d	0%	0		29-Nov-20*		29-Nov-20	0	
K10090	Section 4 - Landscape Softworks	0	7d	0%	0		29-Nov-20*		29-Nov-20	0	
K10100	Section 5 - Establishment Works	0	7d	0%	0		29-Nov-21*		29-Nov-21	0	
K10110	Section 6 - Community Liaison Centre	0	7d	100%	0		27-Aug-18 A		29-Nov-21		
Completion Dates (planned)		1180	7d		493	27-Aug-18 A	30-Nov-21	01-Aug-20	29-Nov-21	-1	
K10120	Section 1 - All works not covered by other Sections (planned)	0	7d	0%	0		25-Jul-20*		01-Aug-20	7	
K10130	Section 2 - Bridgeworks (planned)	0	7d	0%	0		30-Nov-20*		29-Nov-20	-1	
K10140	Section 3 - Preservation and Protection of Existing Trees (planned)	0	7d	0%	0		30-Nov-20*		30-Nov-20	-1	
K10150	Section 4 - Landscape Softworks (planned)	0	7d	0%	0		30-Nov-20*		30-Nov-20	-1	
K10160	Section 5 - Establishment Works (planned)	0	7d	0%	0		30-Nov-21*		29-Nov-21	-1	
K10170	Section 6 - Community Liaison Centre (planned)	0	7d	100%	0		27-Aug-18 A		29-Nov-21		
Access Dates		477	6d		0	17-Nov-17 A	21-Sep-19	21-Sep-19	29-Nov-21	650	
K10180	Portion I	0	6d	100%	0	30-Nov-17 A		29-Nov-21			
K10190	Portion II	0	6d	100%	0	30-Nov-17 A		29-Nov-21			
K10200	Portion III	0	6d	100%	0	17-Nov-17 A		29-Nov-21			
K10210	Portion IV	0	6d	0%	0	21-Sep-19*		21-Sep-19		0	
K10220	Portion V	0	6d	100%	0	30-Nov-17 A		29-Nov-21			
K10230	Portion VI	0	6d	100%	0	30-Nov-17 A		29-Nov-21			
Subcontracting		530			238	20-Nov-17 A	03-May-19	07-Sep-18	29-Nov-21	941	
S10000	Proposal on competitive process for selection of suppliers of Plant and Materials, Equipment a	21	7d	100%	0	20-Nov-17 A	11-Dec-17 A	15-May-19	15-May-19		
S10010	Acceptance of proposal on competitive process	21	7d	100%	0	11-Dec-17 A	18-Dec-17 A	15-May-19	15-May-19		
S10020	Subcontracting procedure	3	6d	100%	0	04-Dec-17 A	06-Dec-17 A	07-Sep-18	07-Sep-18		
S10030	Acceptance of subcontracting procedure	6	7d	100%	0	07-Dec-17 A	12-Dec-17 A	07-Sep-18	07-Sep-18		
Subcontract Packages		418	6d		190	30-Nov-17 A	03-May-19	07-Sep-18	29-Nov-21	766	
S10040	SC003 - Community Liaison Centre subcontract	48	6d	100%	0	07-Dec-17 A	21-Feb-18 A	29-Nov-21	29-Nov-21		
S10050	SC004 - Contractor's site office subcontract	48	6d	100%	0	07-Dec-17 A	08-Feb-18 A	01-Aug-20	01-Aug-20		
S10060	SC002 - Pre-construction condition survey subcontract	48	6d	100%	0	07-Dec-17 A	27-Feb-18 A	07-Sep-18	07-Sep-18		
S10070	SC014 - Groundwater monitoring subcontract	48	6d	100%	0	31-May-18 A	09-Aug-18 A	14-Sep-18	14-Sep-18		
S10080	SC005 - Site security system subcontract	48	6d	100%	0	07-Dec-17 A	27-Feb-18 A	01-Aug-20	01-Aug-20		
S10090	SC006 - ICE for temporary works and Contractor's Design works	48	6d	100%	0	07-Dec-17 A	20-Mar-18 A	07-Sep-18	07-Sep-18		
S10100	SC028 - Landscaping subcontract	48	6d	100%	0	07-Dec-17 A	15-Feb-18 A	07-Sep-18	07-Sep-18		
S10110	Traffic consultant (1st stage)	17	6d	100%	0	30-Nov-17 A	08-Dec-17 A	07-Sep-18	07-Sep-18		
S10120	SC008 - Traffic consultant (2nd stage)	48	6d	100%	0	13-Dec-17 A	19-Apr-18 A	18-Sep-18	18-Sep-18		
S10130	SC013 - Road, Drainage, Watermain subcontract	48	6d	100%	0	08-Feb-18 A	03-May-18 A	07-Sep-18	07-Sep-18		
S10150	SC010 - Ground investigation subcontract	48	6d	100%	0	08-Mar-18 A	04-May-18 A	18-Sep-18	18-Sep-18		
S10160	SC018 - Bored pile subcontract	48	6d	25%	36	30-Aug-18 A	23-Oct-18	12-Oct-18	23-Nov-18	27	
S10170	SC019 - Socketted H-pile subcontract	48	6d	100%	0	02-May-18 A	24-Jul-18 A	25-Oct-18	25-Oct-18		
S10180	SC031 - Road lighting system and electrical system for footbridge subcontract	48	6d	25%	36	27-Jul-18 A	23-Oct-18	04-Oct-18	15-Nov-18	20	
S10190	SC017 - Fences, railing, parapets, crash gate and untensioned beam barriers	48	6d	0%	48	04-Feb-19*	03-Apr-19	04-Mar-19	03-May-19	21	
S10200	SC015 - Flexible surfacing, milling and resurfacing	48	6d	100%	0	05-May-18 A	03-Jul-18 A	27-Mar-19	27-Mar-19		
S10220	SC029 - Irrigation system subcontract	48	6d	0%	48	04-Feb-19*	03-Apr-19	25-Apr-19	22-Jun-19	62	
S10230	SC030 - Lift system subcontract	48	6d	63%	18	09-Jul-18 A	29-Sep-18	29-Apr-19	21-May-19	186	
S10240	SC022 - Footbridge waterproofing	48	6d	0%	48	04-Mar-19*	03-May-19	28-Mar-20	29-May-20	318	
S10250	SC025 - Glazing subcontract	48	6d	0%	48	04-Mar-19*	03-May-19	05-Jul-19	29-Aug-19	98	
S10260	SC032 - Canopy for footbridge and cladding of arch subcontract	48	6d	0%	48	02-Oct-18*	27-Nov-18	17-Jun-19	12-Aug-19	207	
S10270	SC020 - Footbridge RC works subcontract	48	6d	0%	48	01-Nov-18*	28-Dec-18	25-Jan-19	25-Mar-19	70	
S10280	SC021 - Prestressing, bearing and fabricated movement joint subcontract	48	6d	0%	48	01-Nov-18*	28-Dec-18	23-Jul-19	17-Sep-19	212	
S10290	SC023 - Footbridge steelworks (steel arch & lift beams)	48	6d	0%	48	01-Nov-18*	28-Dec-18	05-Nov-19	02-Jan-20	299	
S10300	SC026 - Footbridge finishing	48	6d	0%	48	01-Nov-18*	28-Dec-18	13-Jun-20	10-Aug-20	477	
General Submissions		974			682	20-Nov-17 A	20-Jul-20	07-Sep-18	28-Sep-20	70	
C10000	Draft Safety Plan (submission)	14	7d	100%	0	20-Nov-17 A	19-Dec-17 A	07-Sep-18	07-Sep-18		
C10010	Safety Plan (submission)	6	6d	100%	0	20-Dec-17 A	06-Jan-18 A	07-Sep-18	07-Sep-18		
C10020	Safety Plan (PM's acceptance)	21	7d	100%	0	07-Jan-18 A	24-Jan-18 A	07-Sep-18	07-Sep-18		
C10030	Environmental Management Plan (prepare & submit)	21	7d	100%	0	20-Nov-17 A	11-Dec-17 A	07-Sep-18	07-Sep-18		
C10040	Environmental Management Plan (review & discuss)	6	7d	100%	0	12-Dec-17 A	11-Jan-18 A	07-Sep-18	07-Sep-18		
C10050	Environmental Management Plan (resubmit)	6	6d	100%	0	12-Jan-18 A	30-Jan-18 A	07-Sep-18	07-Sep-18		
C10060	Environmental Management Plan (PM's acceptance)	21	7d	100%	0	31-Jan-18 A	25-Feb-18 A	07-Sep-18	07-Sep-18		
C10070	Subcontractor Management Plan (submission)	30	7d	100%	0	20-Nov-17 A	20-Dec-17 A	07-Sep-18	07-Sep-18		
C10080	Subcontractor Management Plan (PM's comments)	21	7d	100%	0	21-Dec-17 A	05-Jan-18 A	07-Sep-18	07-Sep-18		
C10090	Subcontractor Management Plan (resubmit)	56	8d	100%	0	06-Jan-18 A	15-Mar-18 A	07-Sep-18	07-Sep-18		
C10100	Subcontractor Management Plan (PM's acceptance)	21	7d	100%	0	16-Mar-18 A	06-Apr-18 A	07-Sep-18	07-Sep-18		
C10110	Noise Mitigation Plan (prepare & submit)	1	6d	100%	0	13-Jan-18 A	15-Feb-18 A	29-Sep-18	29-Sep-18		



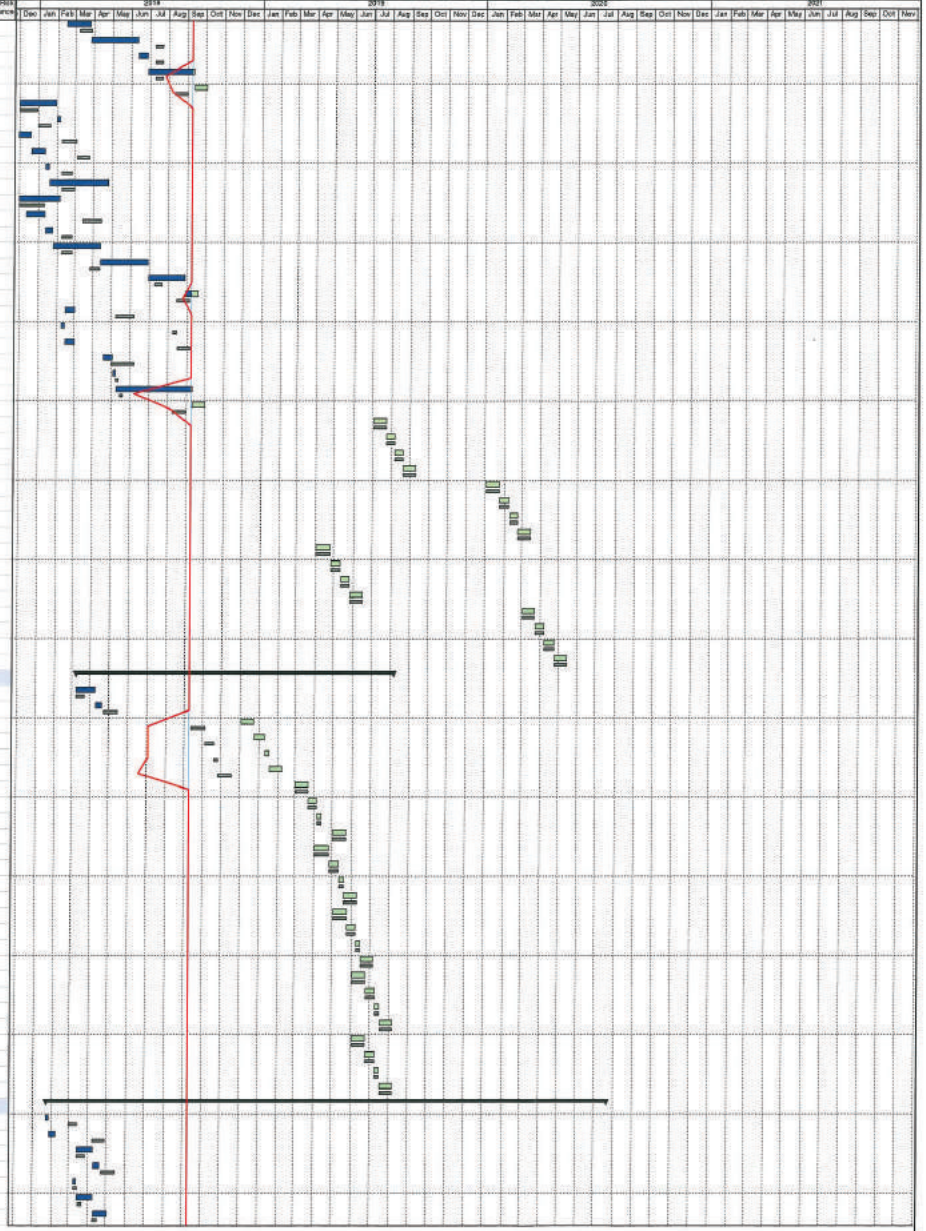
Baseline: Programme of August 2018
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

NE/2017/02 - Tseung Kwan O - Lam Tin Tunnel
Road P2/D4 and Associated Works
Updated Programme (September 2018)

Date	Revision	Checked	Approved
08-Sep-18	RWP-2018-09 (Data date 8-Sep-18)	TC	

NE/2017/02 - Updated Programme (Sep 2018)

Activity ID	Activity Name	Original Duration	Calendar	Activity % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	Free Float / Allowance
C10120	Noise Mitigation Plan (review & comment)	18	6d	100%	0	16-Feb-18 A	26-Mar-18 A	29-Sep-18	29-Sep-18		
C10121	Noise Mitigation Plan (resubmit)	12	6d	100%	0	27-Mar-18 A	11-Jun-18 A	29-Sep-18	29-Sep-18		
C10122	Noise Mitigation Plan (review & comment)	12	6d	100%	0	12-Jun-18 A	26-Jun-18 A	29-Sep-18	29-Sep-18		
C10123	Noise Mitigation Plan (resubmit)	12	6d	75%	3	27-Jun-18 A	11-Sep-18	29-Sep-18	03-Oct-18	17	
C10124	Noise Mitigation Plan (accept)	21	7d	0%	21	12-Sep-18	02-Oct-18	04-Oct-18	24-Oct-18	22	
C10130	Weather Protection Scheme (prepare & submit)	30	7d	100%	0	30-Nov-17 A	30-Jan-18 A	07-Sep-18	07-Sep-18		
C10140	Weather Protection Scheme (accept)	21	7d	100%	0	31-Jan-18 A	05-Feb-18 A	07-Sep-18	07-Sep-18		
C10150	Waste Management Plan (prepare & submit)	18	6d	100%	0	30-Nov-17 A	20-Dec-17 A	07-Sep-18	07-Sep-18		
C10160	Waste Management Plan (review & discuss)	18	6d	100%	0	21-Dec-17 A	11-Jan-18 A	07-Sep-18	07-Sep-18		
C10170	Waste Management Plan (resubmit)	12	6d	100%	0	12-Jan-18 A	18-Jan-18 A	07-Sep-18	07-Sep-18		
C10180	Waste Management Plan (accept)	21	7d	100%	0	19-Jan-18 A	25-Apr-18 A	07-Sep-18	07-Sep-18		
C10190	Site Traffic Safety Management Plan	42	7d	100%	0	30-Nov-17 A	05-Feb-18 A	07-Sep-18	07-Sep-18		
C10200	Construction Impact Assessment (prepare & submit - Issue 1)	24	6d	100%	0	12-Dec-17 A	11-Jan-18 A	14-Oct-18	14-Oct-18		
C10210	Construction Impact Assessment (review & discuss)	12	6d	100%	0	12-Jan-18 A	24-Jan-18 A	14-Oct-18	14-Oct-18		
C10220	Construction Impact Assessment (resubmit - Issue 2 and 3)	12	6d	100%	0	25-Jan-18 A	13-Apr-18 A	14-Oct-18	14-Oct-18		
C10230	Construction Impact Assessment (resubmit - Issue 4)	12	6d	100%	0	14-Apr-18 A	29-Jun-18 A	14-Oct-18	14-Oct-18		
C10231	Construction Impact Assessment (resubmit - Issue 5)	12	6d	100%	0	30-Jun-18 A	29-Aug-18 A	14-Oct-18	14-Oct-18		
C10232	Construction Impact Assessment (accept)	21	7d	50%	11	30-Aug-18 A	18-Sep-18	14-Oct-18	24-Oct-18	37	
C10240	Monitoring proposal for Geotechnical Monitoring	30	7d	100%	0	15-Feb-18 A	02-Mar-18 A	28-Sep-18	28-Sep-18		
C10250	Geotechnical Instrumentation programme (prepare & submit)	6	6d	100%	0	08-Feb-18 A	14-Feb-18 A	28-Sep-18	28-Sep-18		
C10260	Geotechnical Instrumentation programme (accept)	21	7d	100%	0	15-Feb-18 A	02-Mar-18 A	28-Sep-18	28-Sep-18		
C10270	Temporary Drainage Management Plan (prepare & submit)	30	6d	100%	0	19-Apr-18 A	03-May-18 A	10-Nov-18	10-Nov-18		
C10271	Temporary Drainage Management Plan (review & discuss)	5	6d	100%	0	04-May-18 A	08-May-18 A	10-Nov-18	10-Nov-18		
C10272	Temporary Drainage Management Plan (resubmit)	6	6d	80%	1	09-May-18 A	10-Sep-18	10-Nov-18	12-Nov-18	52	
C10273	Temporary Drainage Management Plan (accept)	21	7d	0%	21	10-Sep-18	01-Oct-18	13-Nov-18	03-Dec-18	64	
C10280	Fall Arrest System (prepare & submit)	18	6d	0%	18	02-Jul-19*	22-Jul-19	03-Jan-20	23-Jan-20	153	
C10290	Fall Arrest System (review & discuss)	12	6d	0%	12	23-Jul-19	05-Aug-19	24-Jan-20	10-Feb-20	153	
C10300	Fall Arrest System (resubmit)	12	6d	0%	12	06-Aug-19	19-Aug-19	11-Feb-20	24-Feb-20	153	
C10310	Fall Arrest System (accept)	21	7d	0%	21	20-Aug-19	09-Sep-19	25-Feb-20	16-Mar-20	189	
C10320	Bridge waterproofing system (prepare & submit)	18	6d	0%	18	02-Jan-20*	22-Jan-20	30-May-20	19-Jun-20	119	
C10330	Bridge waterproofing system (review & discuss)	12	6d	0%	12	23-Jan-20	08-Feb-20	20-Jun-20	06-Jul-20	119	
C10340	Bridge waterproofing system (resubmit)	12	6d	0%	12	10-Feb-20	22-Feb-20	07-Jul-20	20-Jul-20	119	
C10350	Bridge waterproofing system (accept)	21	7d	0%	21	23-Feb-20	14-Mar-20	21-Jul-20	10-Aug-20	149	
C10360	Particulars of bridge bearings (prepare & submit)	18	6d	0%	18	01-Apr-19*	25-Apr-19	18-Sep-19	10-Oct-19	137	
C10370	Particulars of bridge bearings (review & discuss)	12	6d	0%	12	26-Apr-19	10-May-19	11-Oct-19	24-Oct-19	137	
C10380	Particulars of bridge bearings (resubmit)	12	6d	0%	12	11-May-19	25-May-19	25-Oct-19	07-Nov-19	137	
C10390	Particulars of bridge bearings (accept)	21	7d	0%	21	26-May-19	15-Jun-19	08-Nov-19	28-Nov-19	166	
C10400	Pillar box arrangement (prepare & submit)	18	6d	0%	18	02-Mar-20*	21-Mar-20	02-Jun-20	22-Jun-20	73	
C10410	Pillar box arrangement (review & discuss)	12	6d	0%	12	23-Mar-20	06-Apr-20	23-Jun-20	08-Jul-20	73	
C10420	Pillar box arrangement (resubmit)	12	6d	0%	12	07-Apr-20	23-Apr-20	09-Jul-20	22-Jul-20	73	
C10430	Pillar box arrangement (accept)	21	7d	0%	21	24-Apr-20	14-May-20	23-Jul-20	12-Aug-20	90	
Temporary Works (TW) Design		516			246	08-Mar-18 A	05-Aug-19	07-Sep-18	01-Sep-19	27	
C10440	TW for trench excavation (prepare & submit)	12	6d	100%	0	08-Mar-18 A	09-Apr-18 A	07-Sep-18	07-Sep-18		
C10470	TW for trench excavation (accept)	21	7d	100%	0	10-Apr-18 A	20-Apr-18 A	07-Sep-18	07-Sep-18		
C10480	TW for socketted H-pile test (prepare & submit)	18	6d	0%	18	03-Dec-18*	22-Dec-18	08-Mar-19	28-Mar-19	76	
C10490	TW for socketted H-pile test (review & discuss)	12	6d	0%	12	24-Dec-18	09-Jan-19	29-Mar-19	12-Apr-19	76	
C10500	TW for socketted H-pile test (resubmit)	6	6d	0%	6	10-Jan-19	16-Jan-19	13-Apr-19	23-Apr-19	76	
C10510	TW for socketted H-pile test (accept)	21	7d	0%	21	17-Jan-19	08-Feb-19	24-Apr-19	14-May-19	97	
C10520	TW for construction of pile cap (prepare & submit)	18	6d	0%	18	01-Mar-19*	21-Mar-19	26-Mar-19	16-Apr-19	21	
C10530	TW for construction of pile cap (review & discuss)	12	6d	0%	12	22-Mar-19	04-Apr-19	17-Apr-19	04-May-19	21	
C10540	TW for construction of pile cap (resubmit)	6	6d	0%	6	08-Apr-19	12-Apr-19	06-May-19	11-May-19	21	
C10550	TW for construction of pile cap (accept)	21	7d	0%	21	01-May-19*	21-May-19	14-May-19	03-Jun-19	13	
C10560	TW for construction of pier/column (prepare & submit)	18	6d	0%	18	01-Apr-19*	25-Apr-19	15-Jun-19	05-Jul-19	58	
C10570	TW for construction of pier/column (review & discuss)	12	6d	0%	12	26-Apr-19	10-May-19	08-Jul-19	20-Jul-19	58	
C10580	TW for construction of pier/column (resubmit)	6	6d	0%	6	11-May-19	18-May-19	22-Jul-19	27-Jul-19	58	
C10590	TW for construction of pier/column (accept)	21	7d	0%	21	19-May-19	08-Jun-19	29-Jul-19	18-Aug-19	71	
C10600	TW for construction of bridge deck (prepare & submit)	18	6d	0%	18	02-May-19*	23-May-19	29-Jun-19	20-Jul-19	48	
C10610	TW for construction of bridge deck (review & discuss)	12	6d	0%	12	24-May-19	06-Jun-19	22-Jul-19	03-Aug-19	48	
C10620	TW for construction of bridge deck (resubmit)	6	6d	0%	6	08-Jun-19	14-Jun-19	05-Aug-19	10-Aug-19	48	
C10630	TW for construction of bridge deck (accept)	21	7d	0%	21	15-Jun-19	05-Jul-19	12-Aug-19	01-Sep-19	58	
C10640	TW for construction of lift shaft (prepare & submit)	18	6d	0%	18	01-Jun-19*	22-Jun-19	29-Jun-19	20-Jul-19	23	
C10650	TW for construction of lift shaft (review & discuss)	12	6d	0%	12	24-Jun-19	08-Jul-19	22-Jul-19	03-Aug-19	23	
C10660	TW for construction of lift shaft (resubmit)	6	6d	0%	6	09-Jul-19	15-Jul-19	05-Aug-19	10-Aug-19	23	
C10670	TW for construction of lift shaft (accept)	21	7d	0%	21	16-Jul-19	05-Aug-19	12-Aug-19	01-Sep-19	27	
C10680	TW for construction of staircase (prepare & submit)	18	6d	0%	18	01-Jun-19*	22-Jun-19	29-Jun-19	20-Jul-19	23	
C10690	TW for construction of staircase (review & discuss)	12	6d	0%	12	24-Jun-19	08-Jul-19	22-Jul-19	03-Aug-19	23	
C10700	TW for construction of staircase (resubmit)	6	6d	0%	6	09-Jul-19	15-Jul-19	05-Aug-19	10-Aug-19	23	
C10710	TW for construction of staircase (accept)	21	7d	0%	21	16-Jul-19	05-Aug-19	12-Aug-19	01-Sep-19	27	
Method Statements (MS)		894			682	22-Jan-18 A	20-Jul-20	07-Sep-18	28-Sep-20	70	
C10720	MS tree felling (prepare & submit)	12	6d	100%	0	22-Jan-18 A	26-Jan-18 A	07-Sep-18	07-Sep-18		
C10730	MS tree felling (accept)	21	7d	100%	0	27-Jan-18 A	07-Feb-18 A	07-Sep-18	07-Sep-18		
C10740	MS for trench excavation (prepare & submit)	12	6d	100%	0	13-Mar-18 A	09-Apr-18 A	07-Sep-18	07-Sep-18		
C10770	MS for trench excavation (accept)	21	7d	100%	0	10-Apr-18 A	20-Apr-18 A	07-Sep-18	07-Sep-18		
C10780	MS for Contractor's site office (prepare & submit)	6	6d	100%	0	08-Mar-18 A	12-Mar-18 A	01-Aug-20	01-Aug-20		
C10790	MS for Contractor's site office (review & discuss)	6	6d	100%	0	13-Mar-18 A	09-Apr-18 A	01-Aug-20	01-Aug-20		
C10800	MS for Contractor's site office (resubmit)	6	6d	100%	0	10-Apr-18 A	03-May-18 A	01-Aug-20	01-Aug-20		



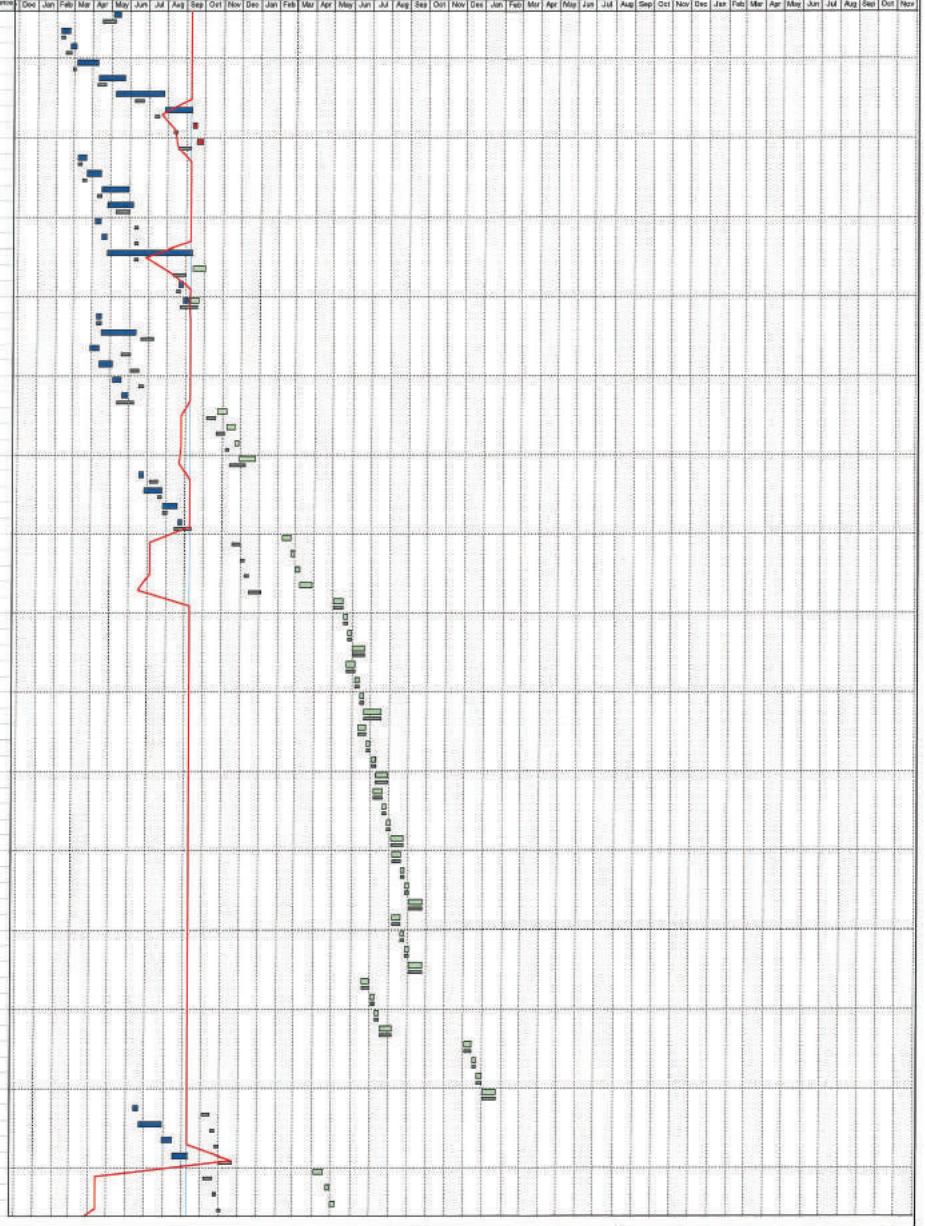
Baseline: Programme of August 2018
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

NE/2017/02 - Tseung Kwan O - Lam Tin Tunnel
Road P2/D4 and Associated Works
Updated Programme (September 2018)

Date	Revision	Checked	Approved
08-Sep-18	RWP-2018-09 (Data date 8-Sep-18)	TC	

NE/2017/02 - Updated Programme (Sep 2018)

Activity ID	Activity Name	Original Duration	Calendar	Activity % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	Time Risk Allowance
C10810	MS for Contractor's site office (accept)	21	7d	100%	0	04-May-18 A	16-May-18 A	01-Aug-20	01-Aug-20		
C10820	MS for temporary road construction (prepare & submit)	6	6d	100%	0	08-Feb-18 A	22-Feb-18 A	07-Sep-18	07-Sep-18		
C10830	MS for temporary road construction (review & discuss)	6	6d	100%	0	23-Feb-18 A	05-Mar-18 A	07-Sep-18	07-Sep-18		
C10840	MS for temporary road construction (resubmit)	6	6d	100%	0	06-Mar-18 A	10-Apr-18 A	07-Sep-18	07-Sep-18		
C10850	MS for temporary road construction (accept)	14	7d	100%	0	11-Apr-18 A	23-May-18 A	07-Sep-18	07-Sep-18		
C10860	MS for watermain (prepare & submit)	12	6d	100%	0	08-May-18 A	26-Jul-18 A	07-Sep-18	07-Sep-18		
C10870	MS for watermain (review & discuss)	6	6d	66.67%	2	27-Jul-18 A	10-Sep-18	07-Sep-18	08-Sep-18	-1	
C10880	MS for watermain (resubmit)	6	6d	0%	6	11-Sep-18	17-Sep-18	10-Sep-18	15-Sep-18	-1	
C10890	MS for watermain (accept)	11	7d	0%	11	18-Sep-18	28-Sep-18	17-Sep-18	27-Sep-18	-1	
C10900	MS for tree transplanting (prepare & submit)	6	6d	100%	0	08-Mar-18 A	22-Mar-18 A	08-Sep-18	08-Sep-18		
C10910	MS for tree transplanting (review & discuss)	6	6d	100%	0	23-Mar-18 A	16-Apr-18 A	08-Sep-18	08-Sep-18		
C10920	MS for tree transplanting (resubmit)	6	6d	100%	0	17-Apr-18 A	30-May-18 A	08-Sep-18	08-Sep-18		
C10930	MS for tree transplanting (accept)	21	7d	100%	0	26-Apr-18 A	06-Jun-18 A	08-Sep-18	08-Sep-18		
C10931	MS for tree protection (prepare & submit)	6	6d	100%	0	06-Apr-18 A	16-Apr-18 A	19-Dec-18	19-Dec-18		
C10932	MS for tree protection (review & discuss)	6	6d	100%	0	17-Apr-18 A	25-Apr-18 A	19-Dec-18	19-Dec-18		
C10933	MS for tree protection (resubmit)	6	6d	50%	3	26-Apr-18 A	11-Sep-18	19-Dec-18	22-Dec-18	84	
C10934	MS for tree protection (accept)	21	7d	0%	21	12-Sep-18	02-Oct-18	22-Dec-18	12-Jan-19	101	
C10940	MS for standpipe and piezometer (prepare & submit)	6	6d	100%	0	21-Aug-18 A	28-Aug-18 A	14-Sep-18	14-Sep-18		
C10970	MS for standpipe and piezometer (accept by PM & MTRCL)	28	7d	50%	14	29-Aug-18 A	21-Sep-18	14-Sep-18	28-Sep-18	7	
C10980	MS for drainage (prepare & submit)	6	6d	100%	0	09-Apr-18 A	16-Apr-18 A	07-Sep-18	07-Sep-18		
C11010	MS for drainage (accept)	21	7d	100%	0	17-Apr-18 A	11-Jun-18 A	07-Sep-18	07-Sep-18		
C11020	MS for ground investigation (prepare & submit)	12	6d	100%	0	29-Mar-18 A	13-Apr-18 A	18-Sep-18	18-Sep-18		
C11030	MS for ground investigation (review & discuss)	12	6d	100%	0	14-Apr-18 A	04-May-18 A	18-Sep-18	18-Sep-18		
C11040	MS for ground investigation (resubmit)	6	6d	100%	0	05-May-18 A	19-May-18 A	18-Sep-18	18-Sep-18		
C11050	MS for ground investigation (accept by PM & MTRCL)	28	7d	100%	0	20-May-18 A	29-May-18 A	18-Sep-18	18-Sep-18		
C11060	MS for bored pile (prepare & submit)	12	6d	0%	12	24-Oct-18*	06-Nov-18	24-Nov-18	07-Dec-18	27	
C11070	MS for bored pile (review & discuss)	12	6d	0%	12	07-Nov-18	20-Nov-18	08-Dec-18	21-Dec-18	27	
C11080	MS for bored pile (resubmit)	6	6d	0%	6	21-Nov-18	27-Nov-18	22-Dec-18	31-Dec-18	27	
C11090	MS for bored pile (accept by PM & MTRCL)	28	7d	0%	28	28-Nov-18	25-Dec-18	02-Jan-19	29-Jan-19	35	
C11100	MS for construction of socketted H-pile (prepare & submit)	12	6d	100%	0	18-Jun-18 A	25-Jun-18 A	25-Oct-18	25-Oct-18		
C11110	MS for construction of socketted H-pile (review & discuss)	6	6d	100%	0	26-Jun-18 A	25-Jul-18 A	25-Oct-18	25-Oct-18		
C11120	MS for construction of socketted H-pile (resubmit)	6	6d	100%	0	26-Jul-18 A	20-Aug-18 A	25-Oct-18	25-Oct-18		
C11130	MS for construction of socketted H-pile (accept by PM & MTRCL)	28	7d	100%	0	21-Aug-18 A	27-Aug-18 A	25-Oct-18	25-Oct-18		
C11140	MS for socketted H-pile testing (prepare & submit)	12	6d	0%	12	08-Feb-19	21-Feb-19	15-May-19	28-May-19	76	
C11150	MS for socketted H-pile testing (review & discuss)	6	6d	0%	6	22-Feb-19	28-Feb-19	29-May-19	04-Jun-19	76	
C11160	MS for socketted H-pile testing (resubmit)	6	6d	0%	6	01-Mar-19	07-Mar-19	05-Jun-19	12-Jun-19	76	
C11170	MS for socketted H-pile testing (accept)	21	7d	0%	21	08-Mar-19	28-Mar-19	13-Jun-19	03-Jul-19	97	
C11180	MS for bored pile testing (prepare & submit)	12	6d	0%	12	02-May-19*	16-May-19	13-Jul-19	26-Jul-19	59	
C11190	MS for bored pile testing (review & discuss)	6	6d	0%	6	17-May-19	23-May-19	27-Jul-19	02-Aug-19	59	
C11200	MS for bored pile testing (resubmit)	6	6d	0%	6	24-May-19	30-May-19	03-Aug-19	09-Aug-19	59	
C11210	MS for bored pile testing (accept)	21	7d	0%	21	31-May-19	20-Jun-19	10-Aug-19	30-Aug-19	71	
C11220	MS for construction of pile cap (prepare & submit)	12	6d	0%	12	22-May-19	04-Jun-19	04-Jun-19	18-Jun-19	11	
C11230	MS for construction of pile cap (review & discuss)	6	6d	0%	6	05-Jun-19	12-Jun-19	19-Jun-19	25-Jun-19	11	
C11240	MS for construction of pile cap (resubmit)	6	6d	0%	6	13-Jun-19	19-Jun-19	26-Jun-19	03-Jul-19	11	
C11250	MS for construction of pile cap (accept by PM & MTRCL)	28	7d	0%	28	20-Jun-19	17-Jul-19	04-Jul-19	31-Jul-19	14	
C11260	MS for construction of pier/column (prepare & submit)	12	6d	0%	12	10-Jun-19	22-Jun-19	19-Aug-19	31-Aug-19	59	
C11270	MS for construction of pier/column (review & discuss)	6	6d	0%	6	24-Jun-19	29-Jun-19	07-Sep-19	13-Sep-19	64	
C11280	MS for construction of pier/column (resubmit)	6	6d	0%	6	02-Jul-19	08-Jul-19	16-Sep-19	21-Sep-19	64	
C11290	MS for construction of pier/column (accept)	21	7d	0%	21	09-Jul-19	29-Jul-19	23-Sep-19	13-Oct-19	76	
C11300	MS for construction of bridge deck (prepare & submit)	12	6d	0%	12	06-Jul-19	19-Jul-19	02-Sep-19	16-Sep-19	49	
C11310	MS for construction of bridge deck (review & discuss)	6	6d	0%	6	20-Jul-19	26-Jul-19	05-Dec-19	11-Dec-19	115	
C11320	MS for construction of bridge deck (resubmit)	6	6d	0%	6	27-Jul-19	02-Aug-19	12-Dec-19	18-Dec-19	115	
C11330	MS for construction of bridge deck (accept)	21	7d	0%	21	03-Aug-19	23-Aug-19	19-Dec-19	08-Jan-20	138	
C11340	MS for construction of lift shaft (prepare & submit)	12	6d	0%	12	06-Aug-19	19-Aug-19	02-Sep-19	16-Sep-19	23	
C11350	MS for construction of lift shaft (review & discuss)	6	6d	0%	6	20-Aug-19	26-Aug-19	25-Nov-19	30-Nov-19	80	
C11360	MS for construction of lift shaft (resubmit)	6	6d	0%	6	27-Aug-19	02-Sep-19	02-Dec-19	07-Dec-19	80	
C11370	MS for construction of lift shaft (accept)	21	7d	0%	21	03-Sep-19	23-Sep-19	09-Dec-19	29-Dec-19	97	
C11380	MS for construction of staircase (prepare & submit)	12	6d	0%	12	06-Aug-19	19-Aug-19	02-Sep-19	16-Sep-19	23	
C11390	MS for construction of staircase (review & discuss)	6	6d	0%	6	20-Aug-19	26-Aug-19	17-Sep-19	23-Sep-19	23	
C11400	MS for construction of staircase (resubmit)	6	6d	0%	6	27-Aug-19	02-Sep-19	24-Sep-19	30-Sep-19	23	
C11410	MS for construction of staircase (accept)	21	7d	0%	21	03-Sep-19	23-Sep-19	02-Oct-19	22-Oct-19	29	
C11420	MS for installation of bearing and movement joints (prepare & submit)	12	6d	0%	12	17-Jun-19	29-Jun-19	29-Nov-19	12-Dec-19	138	
C11430	MS for installation of bearing and movement joints (review & discuss)	6	6d	0%	6	02-Jul-19	08-Jul-19	13-Dec-19	19-Dec-19	138	
C11440	MS for installation of bearing and movement joints (resubmit)	6	6d	0%	6	09-Jul-19	15-Jul-19	20-Dec-19	28-Dec-19	138	
C11450	MS for installation of bearing and movement joints (accept)	21	7d	0%	21	16-Jul-19	05-Aug-19	30-Dec-19	19-Jan-20	167	
C11460	MS for prestressing (prepare & submit)	12	6d	0%	12	02-Dec-19*	14-Dec-19	13-Feb-20	26-Feb-20	57	
C11470	MS for prestressing (review & discuss)	6	6d	0%	6	16-Dec-19	21-Dec-19	27-Feb-20	04-Mar-20	57	
C11480	MS for prestressing (resubmit)	6	6d	0%	6	23-Dec-19	31-Dec-19	05-Mar-20	11-Mar-20	57	
C11490	MS for prestressing (accept)	21	7d	0%	21	01-Jan-20	21-Jan-20	12-Mar-20	01-Apr-20	71	
C11500	MS for flexible pavement, kerb & road marking (prepare & submit)	12	6d	100%	0	14-Jun-18 A	21-Jun-18 A	27-Mar-19	27-Mar-19		
C11510	MS for flexible pavement, kerb & road marking (review & discuss)	6	6d	100%	0	22-Jun-18 A	30-Jul-18 A	27-Mar-19	27-Mar-19		
C11520	MS for flexible pavement, kerb & road marking (resubmit)	6	6d	100%	0	30-Jul-18 A	15-Aug-18 A	27-Mar-19	27-Mar-19		
C11530	MS for flexible pavement, kerb & road marking (accept)	21	7d	90%	2	17-Aug-18 A	10-Sep-18	27-Mar-19	29-Mar-19	201	
C11540	MS for fences, railing, parapets, crash gate and untensioned beam barriers (prepare & submi	12	6d	0%	12	04-Apr-19*	18-Apr-19	04-May-19	18-May-19	21	
C11550	MS for fences, railing, parapets, crash gate and untensioned beam barriers (review & discuss	6	6d	0%	6	23-Apr-19	29-Apr-19	20-May-19	25-May-19	21	
C11560	MS for fences, railing, parapets, crash gate and untensioned beam barriers (resubmit)	6	6d	0%	6	30-Apr-19	07-May-19	27-May-19	01-Jun-19	21	



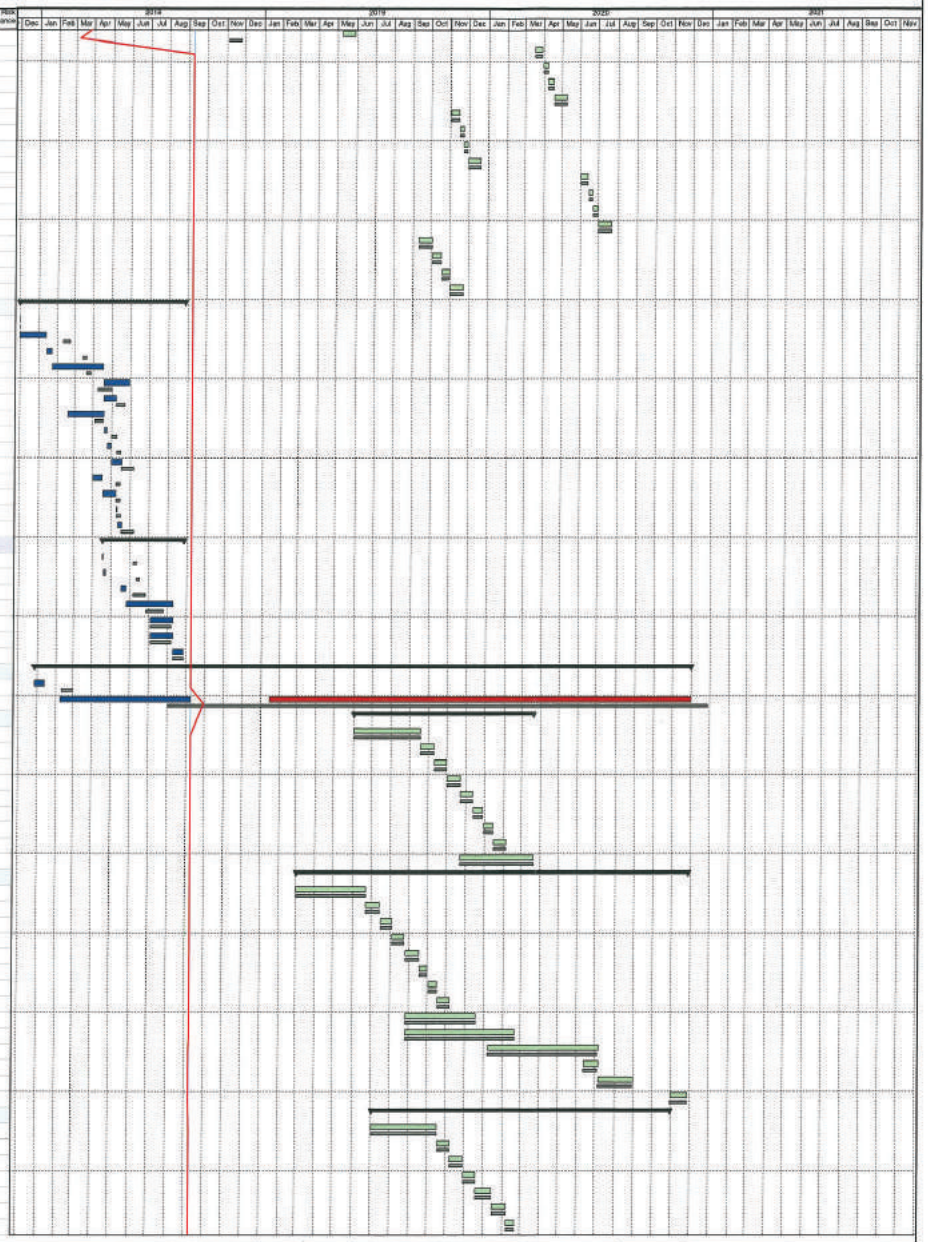
Baseline: Programme of August 2018
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

NE/2017/02 - Tseung Kwan O - Lam Tin Tunnel Road P2/D4 and Associated Works
Updated Programme (September 2018)

Date	Revision	Checked	Approved
08-Sep-18	RWP-2018-09 (Data date 8-Sep-18)	TC	

NE/2017/02 - Updated Programme (Sep 2018)

Activity ID	Activity Name	Original Duration	Calendar	Activity % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	Time Risk Allowance
C11570	MS for fences, railing, parapets, crash gate and untensioned beam barriers (accept)	21	7d	0%	21	08-May-19	28-May-19	03-Jun-19	23-Jun-19	26	
C11580	MS for footbridge waterproofing (prepare & submit)	12	6d	0%	12	16-Mar-20	28-Mar-20	11-Aug-20	24-Aug-20	119	
C11590	MS for footbridge waterproofing (review & discuss)	6	6d	0%	6	30-Mar-20	06-Apr-20	25-Aug-20	31-Aug-20	119	
C11600	MS for footbridge waterproofing (resubmit)	6	6d	0%	6	07-Apr-20	15-Apr-20	01-Sep-20	07-Sep-20	119	
C11610	MS for footbridge waterproofing (accept)	21	7d	0%	21	17-Apr-20	07-May-20	08-Sep-20	28-Sep-20	144	
C11620	MS for footbridge steelworks (steel arch & lift beams) (prepare & submit)	12	6d	0%	12	01-Nov-19*	14-Nov-19	03-Jan-20	16-Jan-20	51	
C11630	MS for footbridge steelworks (steel arch & lift beams) (review & discuss)	6	6d	0%	6	15-Nov-19	21-Nov-19	17-Jan-20	23-Jan-20	51	
C11640	MS for footbridge steelworks (steel arch & lift beams) (resubmit)	6	6d	0%	6	22-Nov-19	28-Nov-19	24-Jan-20	03-Feb-20	51	
C11650	MS for footbridge steelworks (steel arch & lift beams) (accept)	21	7d	0%	21	29-Nov-19	19-Dec-19	04-Feb-20	24-Feb-20	67	
C11660	MS for footbridge finishing (prepare & submit)	12	6d	0%	12	01-Jun-20*	13-Jun-20	11-Aug-20	24-Aug-20	59	
C11670	MS for footbridge finishing (review & discuss)	6	6d	0%	6	15-Jun-20	20-Jun-20	25-Aug-20	31-Aug-20	59	
C11680	MS for footbridge finishing (resubmit)	6	6d	0%	6	22-Jun-20	29-Jun-20	01-Sep-20	07-Sep-20	59	
C11690	MS for footbridge finishing (accept)	21	7d	0%	21	30-Jun-20	20-Jul-20	08-Sep-20	28-Sep-20	70	
C11700	MS for fall arrest system (prepare & submit)	18	6d	0%	18	10-Sep-19	02-Oct-19	17-Mar-20	07-Apr-20	153	
C11710	MS for fall arrest system (review & discuss)	12	6d	0%	12	03-Oct-19	17-Oct-19	08-Apr-20	24-Apr-20	153	
C11720	MS for fall arrest system (resubmit)	12	6d	0%	12	18-Oct-19	31-Oct-19	25-Apr-20	11-May-20	153	
C11730	MS for fall arrest system (accept)	21	7d	0%	21	01-Nov-19	21-Nov-19	12-May-20	01-Jun-20	193	
Community Liaison Centre (CLC)		271			0	30-Nov-17 A	27-Aug-18 A	29-Nov-21	29-Nov-21		
C11740	PM's written instruction	1	6d	100%	0	30-Nov-17 A	30-Nov-17 A	29-Nov-21	29-Nov-21		
C11750	Proposed layout (prepare & submit)	6	6d	100%	0	01-Dec-17 A	13-Jan-18 A	29-Nov-21	29-Nov-21		
C11760	Proposed layout (review & discuss)	6	6d	100%	0	14-Jan-18 A	22-Jan-18 A	29-Nov-21	29-Nov-21		
C11770	Proposed layout (resubmit)	6	6d	100%	0	23-Jan-18 A	18-Apr-18 A	29-Nov-21	29-Nov-21		
C11780	Proposed layout (accept)	21	7d	100%	0	19-Apr-18 A	29-May-18 A	29-Nov-21	29-Nov-21		
C11785	Design of CLC foundation (submit & accept)	12	6d	100%	0	19-Apr-18 A	08-May-18 A	29-Nov-21	29-Nov-21		
C11790	Design of CLC (prepare & submit)	12	6d	100%	0	18-Feb-18 A	19-Apr-18 A	29-Nov-21	29-Nov-21		
C11800	Design of CLC (review & discuss)	6	6d	100%	0	20-Apr-18 A	24-Apr-18 A	29-Nov-21	29-Nov-21		
C11810	Design of CLC (resubmit)	6	6d	100%	0	25-Apr-18 A	30-Apr-18 A	29-Nov-21	29-Nov-21		
C11820	Design of CLC (accept)	21	7d	100%	0	01-May-18 A	18-May-18 A	29-Nov-21	29-Nov-21		
C11821	MS for CLC (prepare & submit)	6	6d	100%	0	02-Apr-18 A	17-Apr-18 A	29-Nov-21	29-Nov-21		
C11822	MS for CLC (review & discuss)	6	6d	100%	0	18-Apr-18 A	08-May-18 A	29-Nov-21	29-Nov-21		
C11823	MS for CLC (resubmit)	6	6d	100%	0	09-May-18 A	10-May-18 A	29-Nov-21	29-Nov-21		
C11824	MS for CLC (accept)	21	7d	100%	0	11-May-18 A	18-May-18 A	29-Nov-21	29-Nov-21		
Construction of CLC		69	6d		0	18-Apr-18 A	27-Aug-18 A	29-Nov-21	29-Nov-21		
C11830-1	Site formation	5	6d	100%	0	18-Apr-18 A	19-Apr-18 A	29-Nov-21	29-Nov-21		
C11830-2	Concrete slab	5	6d	100%	0	20-Apr-18 A	23-Apr-18 A	29-Nov-21	29-Nov-21		
C11830-3	Steel frame	17	6d	100%	0	18-May-18 A	25-May-18 A	29-Nov-21	29-Nov-21		
C11830-4	Wall, ceiling, doors, windows	24	6d	100%	0	26-May-18 A	10-Aug-18 A	29-Nov-21	29-Nov-21		
C11830-5	Furnishing	30	6d	100%	0	03-Jul-18 A	10-Aug-18 A	29-Nov-21	29-Nov-21		
C11830-6	E&M	30	6d	100%	0	03-Jul-18 A	10-Aug-18 A	29-Nov-21	29-Nov-21		
C11830-7	T&C of CLC	14	6d	100%	0	10-Aug-18 A	27-Aug-18 A	29-Nov-21	29-Nov-21		
Preservation and Protection of Existing Trees		852	6d		558	27-Dec-17 A	30-Nov-20	07-Sep-18	28-Nov-20	-1	
C11840	Tree survey and tree report	12	6d	100%	0	27-Dec-17 A	13-Jan-18 A	07-Sep-18	07-Sep-18		
C11850	Preservation and protection of existing trees	715	6d	22%	558	08-Feb-18 A	30-Nov-20	12-Jan-19	28-Nov-20	-1	
Footbridge Canopy		293			293	01-Jun-19	19-Mar-20	13-Aug-19	01-Jun-20	74	
C11860	Design of steel canopy & cladding of arch (prepare & submit)	90	6d	0%	90	01-Jun-19*	17-Sep-19	13-Aug-19	28-Nov-19	60	
C11870	Design of steel canopy & cladding of arch (review & discuss)	18	6d	0%	18	18-Sep-19	10-Oct-19	29-Nov-19	19-Dec-19	60	
C11880	Design of steel canopy & cladding of arch (resubmit)	18	6d	0%	18	11-Oct-19	31-Oct-19	20-Dec-19	13-Jan-20	60	
C11890	Design of steel canopy & cladding of arch (accept)	21	7d	0%	21	01-Nov-19	21-Nov-19	14-Jan-20	03-Feb-20	74	
C11900	MS for steel canopy & cladding of arch (prepare & submit)	18	6d	0%	18	22-Nov-19	12-Dec-19	17-Mar-20	07-Apr-20	93	
C11910	MS for steel canopy & cladding of arch (review & discuss)	12	6d	0%	12	13-Dec-19	28-Dec-19	08-Apr-20	24-Apr-20	93	
C11920	MS for steel canopy & cladding of arch (resubmit)	12	6d	0%	12	30-Dec-19	13-Jan-20	25-Apr-20	11-May-20	93	
C11930	MS for steel canopy & cladding of arch (accept)	21	7d	0%	21	14-Jan-20	03-Feb-20	12-May-20	01-Jun-20	119	
C11940	Material order, fabrication and delivery of footbridge canopy & cladding of arch	96	6d	0%	96	22-Nov-19	19-Mar-20	04-Feb-20	01-Jun-20	57	
Lift System		638			638	01-Mar-19	27-Nov-20	22-May-19	28-Nov-20	1	
C11950	Design of lift system (prepare & submit)	90	6d	0%	90	01-Mar-19*	21-Jun-19	22-May-19	05-Sep-19	64	
C11960	Design of lift system (review & discuss)	18	6d	0%	18	22-Jun-19	13-Jul-19	06-Sep-19	27-Sep-19	64	
C11970	Design of lift system (resubmit)	18	6d	0%	18	15-Jul-19	03-Aug-19	28-Sep-19	21-Oct-19	64	
C11980	Design of lift system (accept)	21	7d	0%	21	04-Aug-19	24-Aug-19	22-Oct-19	11-Nov-19	79	
C11990	MS for lift installation (prepare & submit)	18	6d	0%	18	26-Aug-19	16-Sep-19	24-Dec-19	16-Jan-20	100	
C12000	MS for lift installation (review & discuss)	12	6d	0%	12	17-Sep-19	30-Sep-19	17-Jan-20	03-Feb-20	100	
C12010	MS for lift installation (resubmit)	12	6d	0%	12	02-Oct-19	16-Oct-19	04-Feb-20	17-Feb-20	100	
C12020	MS for lift installation (accept)	21	7d	0%	21	17-Oct-19	06-Nov-19	18-Feb-20	09-Mar-20	124	
C12030	Material order and delivery of lift system	96	6d	0%	96	26-Aug-19	18-Dec-19	12-Nov-19	09-Mar-20	64	
C12040	Application for electricity supply	144	6d	0%	144	26-Aug-19	19-Feb-20	10-Mar-20	02-Sep-20	160	
C12050	Install lift system	144	6d	0%	144	08-Jan-20	06-Jul-20	10-Mar-20	02-Sep-20	50	
C12060	Pillar box construction	18	6d	0%	18	13-Jun-20	06-Jul-20	13-Aug-20	02-Sep-20	50	
C12070	Testing and commissioning of lift system	48	6d	0%	48	07-Jul-20	31-Aug-20	03-Sep-20	31-Oct-20	50	
C12080	EMSD inspection	24	6d	0%	24	31-Oct-20	27-Nov-20	02-Nov-20	28-Nov-20	1	
Electrical System for Footbridge		487			487	02-Jul-19	30-Oct-20	06-Sep-19	31-Oct-20	1	
C12090	Design of electrical system for footbridge (prepare & submit)	90	6d	0%	90	02-Jul-19*	17-Oct-19	06-Sep-19	23-Dec-19	57	
C12100	Design of electrical system for footbridge (review & discuss)	18	6d	0%	18	18-Oct-19	07-Nov-19	24-Dec-19	16-Jan-20	57	
C12110	Design of electrical system for footbridge (resubmit)	18	6d	0%	18	08-Nov-19	28-Nov-19	17-Jan-20	10-Feb-20	57	
C12120	Design of electrical system for footbridge (accept)	21	7d	0%	21	29-Nov-19	19-Dec-19	11-Feb-20	02-Mar-20	74	
C12130	MS for electrical system (prepare & submit)	18	6d	0%	18	20-Dec-19	13-Jan-20	14-Apr-20	06-May-20	89	
C12140	MS for electrical system (review & discuss)	18	6d	0%	18	14-Jan-20	06-Feb-20	07-May-20	27-May-20	89	
C12150	MS for electrical system (resubmit)	12	6d	0%	12	07-Feb-20	20-Feb-20	28-May-20	10-Jun-20	89	



Baseline: Programme of August 2018
Actual Work
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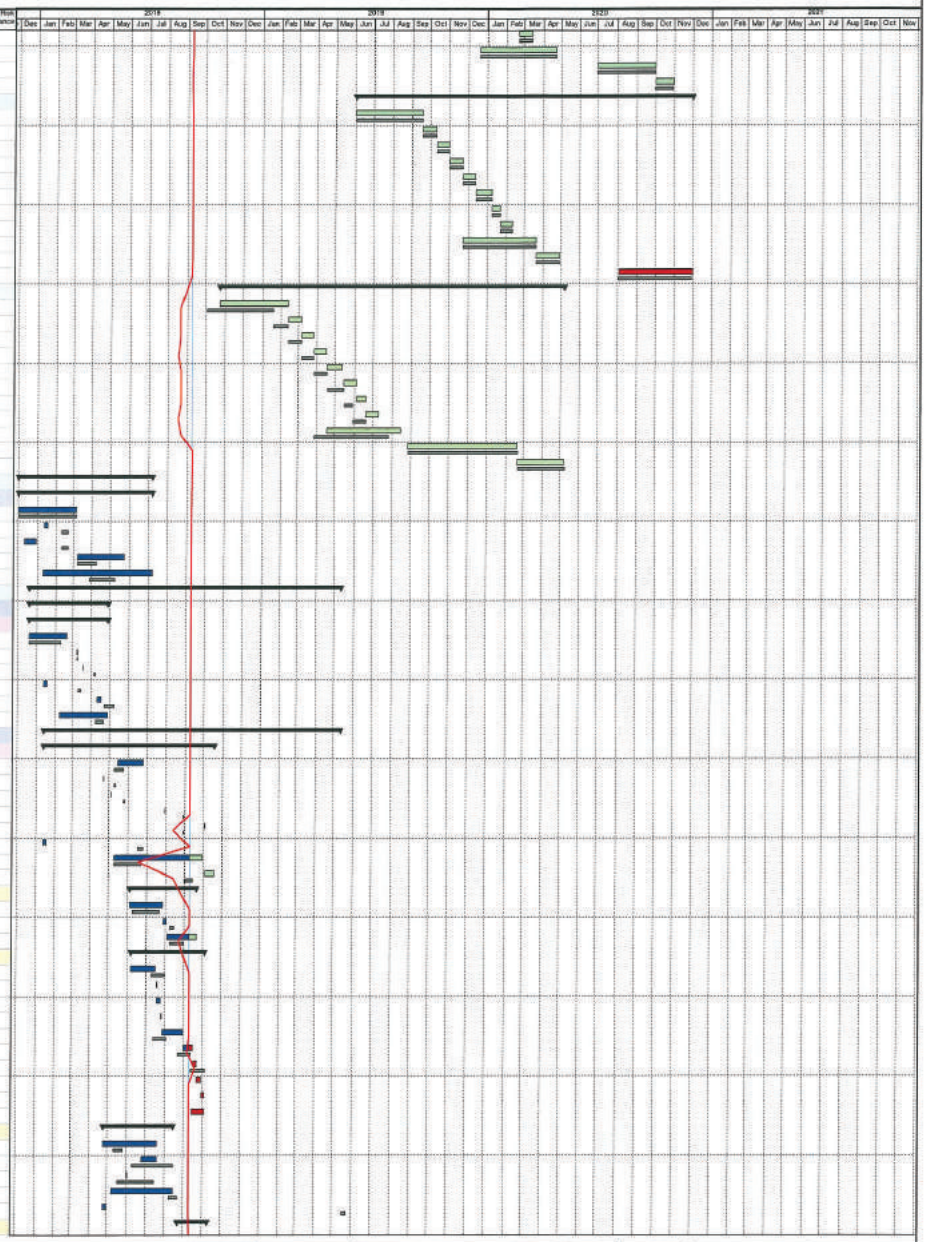
Critical Remaining Work
Milestone
Summary

NE/2017/02 - Tseung Kwan O - Lam Tin Tunnel
Road P2/D4 and Associated Works
Updated Programme (September 2018)

Date	Revision	Checked	Approved
08-Sep-18	RWP-2018-09 (Data date 8-Sep-18)	TC	

NE/2017/02 - Updated Programme (Sep 2018)

Activity ID	Activity Name	Original Duration	Calendar	Activity % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	Free Float Allowance
C12160	MS for electrical system (accept)	21	7d	0%	21	21-Feb-20	12-Mar-20	11-Jun-20	01-Jul-20	111	
C12170	Material order and delivery of footbridge electrical system	96	6d	0%	96	20-Dec-19	21-Apr-20	03-Mar-20	30-Jun-20	57	
C12180	Install electrical system for footbridge (incl. footbridge lighting system)	78	6d	0%	78	30-Jun-20	30-Sep-20	02-Jul-20	30-Sep-20	1	
C12190	Testing and commissioning of electrical system for footbridge	24	6d	0%	24	30-Sep-20	30-Oct-20	03-Oct-20	31-Oct-20	1	
Glazing System		549			549	01-Jun-19	30-Nov-20	30-Aug-19	28-Nov-20	-2	
C12200	Design of glazing system (prepare & submit)	90	6d	0%	90	01-Jun-19*	17-Sep-19	30-Aug-19	16-Dec-19	75	
C12210	Design of glazing system (review & discuss)	18	6d	0%	18	18-Sep-19	10-Oct-19	17-Dec-19	09-Jan-20	75	
C12220	Design of glazing system (resubmit)	18	6d	0%	18	11-Oct-19	31-Oct-19	10-Jan-20	03-Feb-20	75	
C12230	Design of glazing system (accept)	21	7d	0%	21	01-Nov-19	21-Nov-19	04-Feb-20	24-Feb-20	95	
C12240	MS for glazing system (prepare & submit)	18	6d	0%	18	22-Nov-19	12-Dec-19	31-Mar-20	24-Apr-20	105	
C12250	MS for glazing system (review & discuss)	18	6d	0%	18	13-Dec-19	06-Jan-20	25-Apr-20	18-May-20	105	
C12260	MS for glazing system (resubmit)	12	6d	0%	12	07-Jan-20	20-Jan-20	19-May-20	01-Jun-20	105	
C12270	MS for glazing system (accept)	21	7d	0%	21	21-Jan-20	10-Feb-20	02-Jun-20	22-Jun-20	133	
C12280	Material order and delivery of glazing system	96	6d	0%	96	22-Nov-19	19-Mar-20	25-Feb-20	22-Jun-20	75	
C12290	Install glazing system (lift)	30	6d	0%	30	20-Mar-20	28-Apr-20	23-Jun-20	29-Jul-20	75	
C12300	Install glazing system (canopy)	100	6d	0%	100	03-Aug-20	30-Nov-20	01-Aug-20	28-Nov-20	-1	
Road Lighting System		561			561	24-Oct-18	06-May-20	16-Nov-18	18-May-20	12	
C12310	Design of road lighting system (prepare & submit)	90	6d	0%	90	24-Oct-18*	12-Feb-19	16-Nov-18	07-Mar-19	20	
C12320	Design of road lighting system (review & discuss)	18	6d	0%	18	13-Feb-19	05-Mar-19	08-Mar-19	28-Mar-19	20	
C12330	Design of road lighting system (resubmit)	18	6d	0%	18	06-Mar-19	26-Mar-19	29-Mar-19	23-Apr-19	20	
C12340	Design of road lighting system (accept)	21	7d	0%	21	27-Mar-19	16-Apr-19	24-Apr-19	14-May-19	28	
C12350	MS for road lighting system (prepare & submit)	18	6d	0%	18	17-Apr-19	11-May-19	20-Jun-19	11-Jul-19	49	
C12360	MS for road lighting system (review & discuss)	18	6d	0%	18	14-May-19	03-Jun-19	12-Jul-19	01-Aug-19	49	
C12370	MS for road lighting system (resubmit)	12	6d	0%	12	04-Jun-19	18-Jun-19	02-Aug-19	15-Aug-19	49	
C12380	MS for road lighting system (accept)	21	7d	0%	21	19-Jun-19	09-Jul-19	16-Aug-19	05-Sep-19	58	
C12390	Material order and delivery of road lighting system	96	6d	0%	96	17-Apr-19	14-Aug-19	15-May-19	05-Sep-19	19	
C12400	Install road lighting system	144	6d	0%	144	26-Aug-19	19-Feb-20	06-Sep-19	02-Mar-20	10	
C12410	Testing and commissioning of road lighting system	60	6d	0%	60	20-Feb-20	06-May-20	03-Mar-20	18-May-20	10	
Stage 0 Works		124	6d		0	01-Dec-17 A	07-Jul-18 A	07-Sep-18	01-Aug-20		
Preliminary Works		124	6d		0	01-Dec-17 A	07-Jul-18 A	07-Sep-18	01-Aug-20		
C12420	Application of XP	75	6d	100%	0	01-Dec-17 A	05-Mar-18 A	07-Sep-18	07-Sep-18		
C12430	Utilities detection (Road P2 south of interchange)	6	6d	100%	0	13-Jan-18 A	18-Jan-18 A	07-Sep-18	07-Sep-18		
C12440	Initial site survey	5	6d	100%	0	11-Dec-17 A	30-Dec-17 A	07-Sep-18	07-Sep-18		
C12450	Pre-construction condition survey and manhole survey	24	6d	100%	0	08-Mar-18 A	23-May-18 A	07-Sep-18	07-Sep-18		
C12460	Contractor's site office	30	6d	100%	0	10-Jan-18 A	07-Jul-18 A	01-Aug-20	01-Aug-20		
Stage 1 Works		519			248	20-Dec-17 A	11-May-19	07-Sep-18	29-Nov-21	899	
TTA Stage 1A		109	6d		0	20-Dec-17 A	28-Apr-18 A	07-Sep-18	07-Sep-18		
TTA		109	6d		0	20-Dec-17 A	28-Apr-18 A	07-Sep-18	07-Sep-18		
C12470	Design and acceptance of TTA Drg. 001A / 007, 002A / 008, and 006A	42	6d	100%	0	20-Dec-17 A	20-Feb-18 A	07-Sep-18	07-Sep-18		
C12480	Implementation of TTA Stage 1A (trial pits) (TTA Drg. 006A)	2	6d	100%	0	08-Mar-18 A	09-Mar-18 A	07-Sep-18	07-Sep-18	1	
C12490	Implementation of TTA Stage 1A (roundsbout) (part of TTA Drg. 001A / 007)	2	6d	100%	0	19-Mar-18 A	19-Mar-18 A	07-Sep-18	07-Sep-18	1	
C12500	Utilities detection (Po Shun Road north of interchange)	4	6d	100%	0	13-Jan-18 A	18-Jan-18 A	07-Sep-18	07-Sep-18		
C12510	Modification of road layout at roundabout	12	6d	100%	0	11-Apr-18 A	18-Apr-18 A	07-Sep-18	07-Sep-18		
C12530	Tree felling (Road P2 south of interchange, TGC01 & TGC02)	12	6d	100%	0	08-Feb-18 A	28-Apr-18 A	07-Sep-18	07-Sep-18		
TTA Stage 1B-1, 1B-2 & 1B-3		379			248	13-Jan-18 A	11-May-19	07-Sep-18	29-Nov-21	899	
TTA		379			41	13-Jan-18 A	18-Oct-18	07-Sep-18	29-Nov-21	899	
C12520	Temporary footpath & cycle track at south of Chui Ling Road / Po Yap Road (for TTA Stage 1E	12	6d	100%	0	14-May-18 A	25-Jun-18 A	07-Sep-18	07-Sep-18		
C12550	Implementation of TTA Stage 1B-1 (part of TTA Drg. 002A / 008)	2	6d	100%	0	23-Apr-18 A	23-Apr-18 A	07-Sep-18	07-Sep-18	1	
C12560	Implementation of TTA Stage 1B-2 (TTA Drg. 002A / 008, 030A & 031A)	2	6d	100%	0	04-May-18 A	04-May-18 A	07-Sep-18	07-Sep-18	1	
C12561	Implementation of TTA Stage 1B-3 (TTA Drg. 002A, 027B, 030A & 031A)	2	6d	100%	0	31-Jul-18 A	31-Jul-18 A	05-Dec-18	05-Dec-18	1	
C12562	Implementation of TTA Stage 1B-4 (TTA Drg. 038C)	2	6d	0%	2	02-Oct-18	03-Oct-18	05-Dec-18	06-Dec-18	54	1
C12570	Utilities detection (Chui Ling Road south - existing cycle track)	6	6d	100%	0	13-Jan-18 A	18-Jan-18 A	07-Sep-18	07-Sep-18		
C12600	Modify north-east island at roundabout (affected by supply of aggregate NCE No.8)	36	6d	50%	18	09-May-18 A	29-Sep-18	14-Nov-18	04-Dec-18	54	
C12605	Modify central median (Po Shun Road) and roundabout island (TTA Drg. 038C)	12	6d	0%	12	04-Oct-18	18-Oct-18	07-Dec-18	20-Dec-18	54	
Modify central median (Po Yap Road)		85			13	04-Jun-18 A	20-Sep-18	22-Nov-18	04-Dec-18	76	
C12600-2	Modify central median (Po Yap Road)	36	6d	100%	0	04-Jun-18 A	27-Jul-18 A	22-Nov-18	22-Nov-18		
C12600-3	Arrangement of SRT (NCE No.13)	7	7d	100%	0	28-Jul-18 A	03-Aug-18 A	22-Nov-18	22-Nov-18		
C12600-4	Modify central median (Po Yap Road)	21	6d	50%	11	04-Aug-18 A	20-Sep-18	22-Nov-18	04-Dec-18	82	
Modify central median (Chui Ling Road)		87			26	06-Jun-18 A	03-Oct-18	07-Sep-18	02-Oct-18	-1	
C12650-1	Modify east portion of central median (Chui Ling Road) (TTA Drg. 029B) - Excavation	18	6d	100%	0	06-Jun-18 A	16-Jul-18 A	07-Sep-18	07-Sep-18		
C12650-1.1	Preparation work for TTA Stage 2.2	2	6d	100%	0	17-Jul-18 A	18-Jul-18 A	07-Sep-18	07-Sep-18		
C12650-1.2	WSD emergency works Chiu Ling Road (NCE No.11)	6	7d	100%	0	17-Jul-18 A	24-Jul-18 A	07-Sep-18	07-Sep-18		
C12650-1.3	Arrange subcontractor for implementation of TTA Stage 2.2	2	6d	100%	0	25-Jul-18 A	26-Jul-18 A	07-Sep-18	07-Sep-18		
C12650-3	Mid portion of South central median (TTA Drg. 030A) - Excavation	18	6d	100%	0	27-Jul-18 A	31-Aug-18 A	07-Sep-18	07-Sep-18		
C12650-4	East portion & mid portion of central median (TTA Drg. 029B, 030A, 031A) - Gullies	12	6d	50%	6	01-Sep-18 A	14-Sep-18	07-Sep-18	13-Sep-18	-1	
C12650-5	East portion & mid portion of central median (TTA Drg. 029B, 030A, 031A) - Formation	5	6d	0%	5	15-Sep-18	20-Sep-18	14-Sep-18	19-Sep-18	-1	
C12650-6	East portion & mid portion of central median (TTA Drg. 029B, 030A, 031A) - Sub-base	6	6d	0%	6	21-Sep-18	28-Sep-18	20-Sep-18	27-Sep-18	-1	
C12650-7	East portion & mid portion of central median (TTA Drg. 029B, 030A, 031A) - Road paving	3	6d	0%	3	29-Sep-18	03-Oct-18	28-Sep-18	02-Oct-18	-1	
C12650-8	Modify mid portion of North central median (TTA Drg. 031A)	16	6d	0%	16	13-Sep-18*	03-Oct-18	12-Sep-18	02-Oct-18	-1	
Tree felling and transplanting		306	6d		0	24-Apr-18 A	15-Aug-18 A	08-Sep-18	29-Nov-21		
C12580	Tree felling (Po Yap Road)	12	6d	100%	0	24-Apr-18 A	19-Jul-18 A	29-Nov-21	29-Nov-21		
C12590	Tree transplanting (Po Yap Road) central median	54	6d	100%	0	25-Jun-18 A	19-Jul-18 A	29-Nov-21	29-Nov-21		
C12610	Tree transplanting (adjacent TKO Sports Centre) T304, T21005 to T21008	48	6d	100%	0	01-Jun-18 A	02-Jun-18 A	08-Sep-18	08-Sep-18		
C12770	Tree felling (Chui Ling Road)	12	6d	100%	0	07-May-18 A	15-Aug-18 A	27-Dec-18	27-Dec-18		
C13540	Tree felling (Po Shun Road central median)	6	6d	100%	0	24-Apr-18 A	30-Apr-18 A	01-Jun-20	01-Jun-20		
Groundwater monitoring point		27	6d		13	22-Aug-18 A	09-Oct-18	28-Sep-18	14-Mar-19	127	

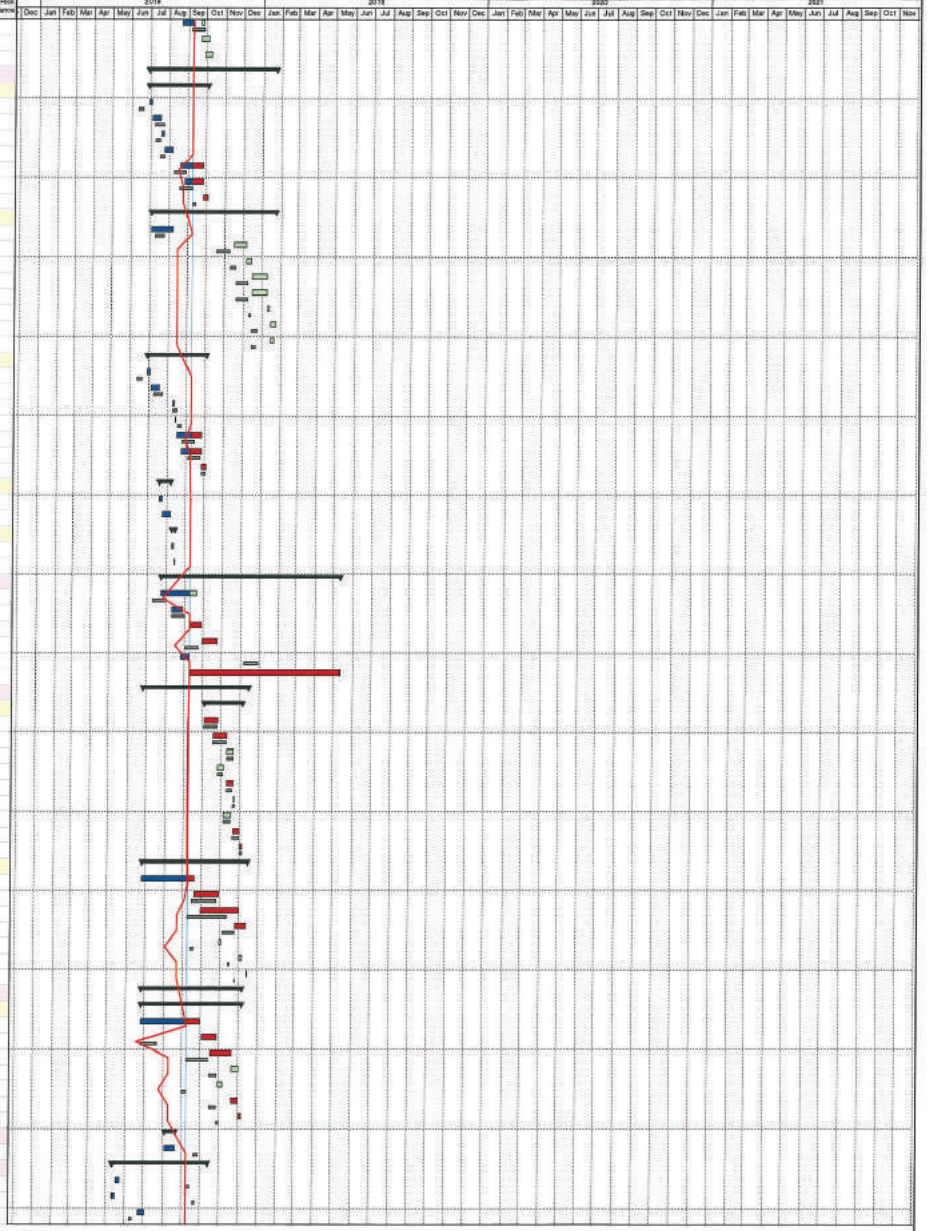


Baseline: Programme of August 2018
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

NE/2017/02 - Tseung Kwan O - Lam Tin Tunnel
Road P2/D4 and Associated Works
Updated Programme (September 2018)

Date	Revision	Checked	Approved
08-Sep-18	RWP-2018-09 (Data date 8-Sep-18)	TC	

Activity ID	Activity Name	Original Duration	Calendar	Activity % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	Free Float Allowance
C12640	Install groundwater monitoring point GWMP 04	9	6d	75%	2	22-Aug-18 A	26-Sep-18	28-Sep-18	02-Oct-18	5	
C12641	Install groundwater monitoring point GWMP 05	9	6d	0%	9	22-Sep-18*	04-Oct-18	05-Mar-19	14-Mar-19	131	
C12642	Install groundwater monitoring point GWMP 01	9	6d	0%	9	28-Sep-18*	09-Oct-18	26-Oct-18	05-Nov-18	22	
Drainage		227			138	28-Jun-18 A	23-Jan-19	07-Sep-18	29-Jan-19	5	
Stormwater SMH5101-SMH5101A		122			25	28-Jun-18 A	03-Oct-18	07-Sep-18	02-Oct-18	0	
C12660-1	Install ELS & excavate	7	6d	100%	0	28-Jun-18 A	03-Jul-18 A	07-Sep-18	07-Sep-18	1	
C12660-2	Idle due to shortage of supply of aggregate (NCE No.8) & design review	15	7d	100%	0	04-Jul-18 A	18-Jul-18 A	07-Sep-18	07-Sep-18		
C12660-3	Re-excavate	7	6d	100%	0	19-Jul-18 A	23-Jul-18 A	07-Sep-18	07-Sep-18		
C12660-4	Lay drain pipe	7	6d	100%	0	24-Jul-18 A	07-Aug-18 A	07-Sep-18	07-Sep-18		
C12660-5	Manhole SMH5101	18	6d	20%	14	20-Aug-18 A	26-Sep-18	07-Sep-18	24-Sep-18	0	
C12660-6	Manhole SMH5101A	18	6d	20%	14	27-Aug-18 A	26-Sep-18	07-Sep-18	24-Sep-18	0	
C12660-7	Backfill	5	6d	0%	5	26-Sep-18	03-Oct-18	26-Sep-18	02-Oct-18	0	
Stormwater DN525 (PMI No.003)		165	6d		57	03-Jul-18 A	23-Jan-19	08-Sep-18	29-Jan-19	5	
C12665-1	Trial pits, removal of existing planter, modify existing manhole	14	6d	100%	0	03-Jul-18 A	08-Aug-18 A	08-Sep-18	08-Sep-18		
C12665-2	Install ELS & excavate	18	6d	0%	18	15-Nov-18	05-Dec-18	21-Nov-18	11-Dec-18	5	6
C12665-3	Lay drain DN525 pipe	8	6d	0%	8	06-Dec-18	14-Dec-18	12-Dec-18	20-Dec-18	5	
C12665-4	Manhole SMH6702	18	6d	0%	18	15-Dec-18	08-Jan-19	21-Dec-18	14-Jan-19	5	
C12665-5	Manhole SMH6703	18	6d	0%	18	15-Dec-18	08-Jan-19	21-Dec-18	14-Jan-19	5	
C12665-6	Connection to existing manholes	4	6d	0%	4	09-Jan-19	12-Jan-19	15-Jan-19	18-Jan-19	5	
C12665-7	Backfill	9	6d	0%	9	14-Jan-19	23-Jan-19	19-Jan-19	29-Jan-19	5	
C12665-8	Demolish existing manhole	6	6d	0%	6	14-Jan-19	19-Jan-19	23-Jan-19	29-Jan-19	8	
Stormwater SMH5001-SMH5001A		122			25	28-Jun-18 A	03-Oct-18	07-Sep-18	02-Oct-18	0	
C12680-1	Install ELS & excavate	7	6d	100%	0	28-Jun-18 A	03-Jul-18 A	07-Sep-18	07-Sep-18	1	
C12680-2	Idle due to shortage of supply of aggregate (NCE No.8) & design review	15	7d	100%	0	04-Jul-18 A	18-Jul-18 A	07-Sep-18	07-Sep-18		
C12680-3	Re-excavate	7	6d	100%	0	09-Aug-18 A	12-Aug-18 A	07-Sep-18	07-Sep-18		
C12680-4	Lay drain pipe	7	6d	100%	0	13-Aug-18 A	15-Aug-18 A	07-Sep-18	07-Sep-18		
C12680-5	Manhole SMH5001	18	6d	20%	14	17-Aug-18 A	26-Sep-18	07-Sep-18	24-Sep-18	0	
C12680-6	Manhole SMH5001A	18	6d	20%	14	24-Aug-18 A	26-Sep-18	07-Sep-18	24-Sep-18	0	
C12680-7	Backfill	5	6d	0%	5	26-Sep-18	03-Oct-18	26-Sep-18	02-Oct-18	0	
Stormwater SMH5101A-SMH5101B		7	6d		0	19-Jul-18 A	07-Aug-18 A	16-Nov-18	16-Nov-18		
C12682-1	Install ELS & excavate (Stage 1)	7	6d	100%	0	19-Jul-18 A	23-Jul-18 A	16-Nov-18	16-Nov-18		
C12682-2	Lay drain pipe (Stage 1)	7	6d	100%	0	24-Jul-18 A	07-Aug-18 A	16-Nov-18	16-Nov-18		
Stormwater SMH5001A-SMH5002		7	6d		0	09-Aug-18 A	15-Aug-18 A	08-Nov-18	08-Nov-18		
C12684-1	Install ELS & excavate (Stage 1)	7	6d	100%	0	09-Aug-18 A	12-Aug-18 A	08-Nov-18	08-Nov-18		
C12684-2	Lay drain pipe (Stage 1)	7	6d	100%	0	13-Aug-18 A	15-Aug-18 A	08-Nov-18	08-Nov-18		
Utilities		250	6d		197	23-Jul-18 A	11-May-19	08-Sep-18	11-May-19	0	
C12700	Gas main at Chui Ling Road (central median) by HKCG	19	6d	50%	10	23-Jul-18 A	19-Sep-18	10-Oct-18	22-Oct-18	25	1
C12790	Lay 11kV cables at Po Shun Road by CLPP	19	6d	100%	0	10-Aug-18 A	28-Aug-18 A	08-Sep-18	06-Sep-18	1	
C12791	Connection switch over of 11kV cables at Po Shun Road by CLPP	16	6d	0%	16	10-Sep-18*	28-Sep-18	08-Sep-18	27-Sep-18	-1	
C12800	Gas main at Po Shun Road by HKCG	19	6d	0%	19	29-Sep-18	23-Oct-18	28-Sep-18	22-Oct-18	-1	1
C12820	Lay & divert CLP 11kV cable at Road P2 (By CLPP) - 1st Stage cross-road ducts	19	6d	100%	0	25-Aug-18 A	08-Sep-18 A	10-Sep-18	10-Sep-18	1	
C12821	Lay & divert CLP 11kV cable at Road P2 (By CLPP) - 2nd Stage	196	6d	0%	196	10-Sep-18*	11-May-19	10-Sep-18	11-May-19	0	1
Fresh Watermain		145	6d		81	25-Jun-18 A	14-Dec-18	07-Sep-18	13-Dec-18	-1	
Fresh watermain CHB 0 to 37,202, CHC 0 to 74,858, CHD 0 to 29,591		53	6d		53	03-Oct-18	05-Dec-18	03-Oct-18	04-Dec-18	0	
C12830-1	Install ELS & excavate CHC	19	6d	0%	19	03-Oct-18	26-Oct-18	03-Oct-18	25-Oct-18	0	
C12830-2	Lay fresh watermain CHC	19	6d	0%	19	18-Oct-18	09-Nov-18	18-Oct-18	08-Nov-18	0	
C12830-3	Backfill CHC	9	6d	0%	9	09-Nov-18	20-Nov-18	24-Nov-18	04-Dec-18	13	
C12830-4	Install ELS & excavate CHD	8	6d	0%	8	26-Oct-18	05-Nov-18	29-Oct-18	06-Nov-18	2	
C12830-5	Lay fresh watermain CHD	8	6d	0%	8	09-Nov-18	19-Nov-18	09-Nov-18	17-Nov-18	0	
C12830-6	Backfill CHD	3	6d	0%	3	19-Nov-18	22-Nov-18	01-Dec-18	04-Dec-18	11	
C12830-7	Install ELS & excavate CHB	10	6d	0%	10	05-Nov-18	16-Nov-18	07-Nov-18	17-Nov-18	2	
C12830-8	Lay fresh watermain CHB	10	6d	0%	10	19-Nov-18	30-Nov-18	19-Nov-18	29-Nov-18	0	
C12830-9	Backfill CHB	4	6d	0%	4	30-Nov-18	05-Dec-18	30-Nov-18	04-Dec-18	0	
Fresh watermain CHA 0 to 127,921, CHA1 0 to 15,540		145	6d		81	25-Jun-18 A	14-Dec-18	07-Sep-18	13-Dec-18	-1	
C12860-0	Trial pits	74	6d	87.84%	9	25-Jun-18 A	18-Sep-18	07-Sep-18	17-Sep-18	-1	
C12860-1	Install ELS & excavate CHA	32	6d	0%	32	19-Sep-18	29-Oct-18	18-Sep-18	27-Oct-18	-1	
C12860-2	Lay fresh watermain CHA	52	6d	0%	52	29-Sep-18	30-Nov-18	28-Sep-18	29-Nov-18	-1	
C12860-3	Backfill CHA	16	6d	0%	16	24-Nov-18	12-Dec-18	23-Nov-18	11-Dec-18	-1	
C12860-4	Install ELS & excavate CHA1	4	6d	0%	4	30-Oct-18	02-Nov-18	03-Dec-18	06-Dec-18	29	
C12860-5	Lay fresh watermain CHA1	4	6d	0%	4	01-Dec-18	05-Dec-18	07-Dec-18	11-Dec-18	5	
C12860-6	Backfill CHA1	2	6d	0%	2	13-Dec-18	14-Dec-18	12-Dec-18	13-Dec-18	-1	
Salt Watermain		82	6d		73	25-Jun-18 A	05-Dec-18	07-Sep-18	04-Dec-18	-1	
Salt watermain CHA 0 to 84,786, CHB 0 to 25,141		82	6d		73	25-Jun-18 A	05-Dec-18	07-Sep-18	04-Dec-18	-1	
C12710-0	Trail pits	82	6d	78.05%	18	25-Jun-18 A	29-Sep-18	07-Sep-18	28-Sep-18	-1	
C12710-1	Install ELS & excavate CHA	22	6d	0%	22	02-Oct-18	27-Oct-18	29-Sep-18	26-Oct-18	-1	
C12710-2	Lay salt watermain CHA	29	6d	0%	29	16-Oct-18	19-Nov-18	15-Oct-18	17-Nov-18	-1	
C12710-3	Backfill CHA	11	6d	0%	11	20-Nov-18	01-Dec-18	22-Nov-18	04-Dec-18	2	
C12710-4	Install ELS & excavate CHB	7	6d	0%	7	29-Oct-18	05-Nov-18	10-Nov-18	17-Nov-18	11	
C12710-5	Lay salt watermain CHB	10	6d	0%	10	20-Nov-18	30-Nov-18	19-Nov-18	29-Nov-18	-1	
C12710-6	Backfill CHB	4	6d	0%	4	01-Dec-18	05-Dec-18	30-Nov-18	04-Dec-18	-1	
CCTV High Mast		5	6d		0	04-Aug-18 A	21-Aug-18 A	28-Feb-19	28-Feb-19		
C12920	Predrilling at CCTV/PH1 (1 no.) PD#1	5	6d	100%	0	04-Aug-18 A	21-Aug-18 A	28-Feb-19	28-Feb-19		
Footbridge Predrilling		266			36	11-May-18 A	13-Oct-18	18-Sep-18	18-Aug-19	180	
C12970	Predrilling at PC1-3/PH1 (1 no.) PD#1	4	6d	100%	0	17-May-18 A	23-May-18 A	24-Apr-19	24-Apr-19		
C13010	Predrilling at PC7/PH1 (1 no.) PD#1	4	6d	100%	0	11-May-18 A	16-May-18 A	18-Sep-18	18-Sep-18		
C13020	Predrilling at PC4/PH1 (1 no.) PD#1	4	6d	100%	0	22-Jun-18 A	03-Jul-18 A	18-Sep-18	18-Sep-18		



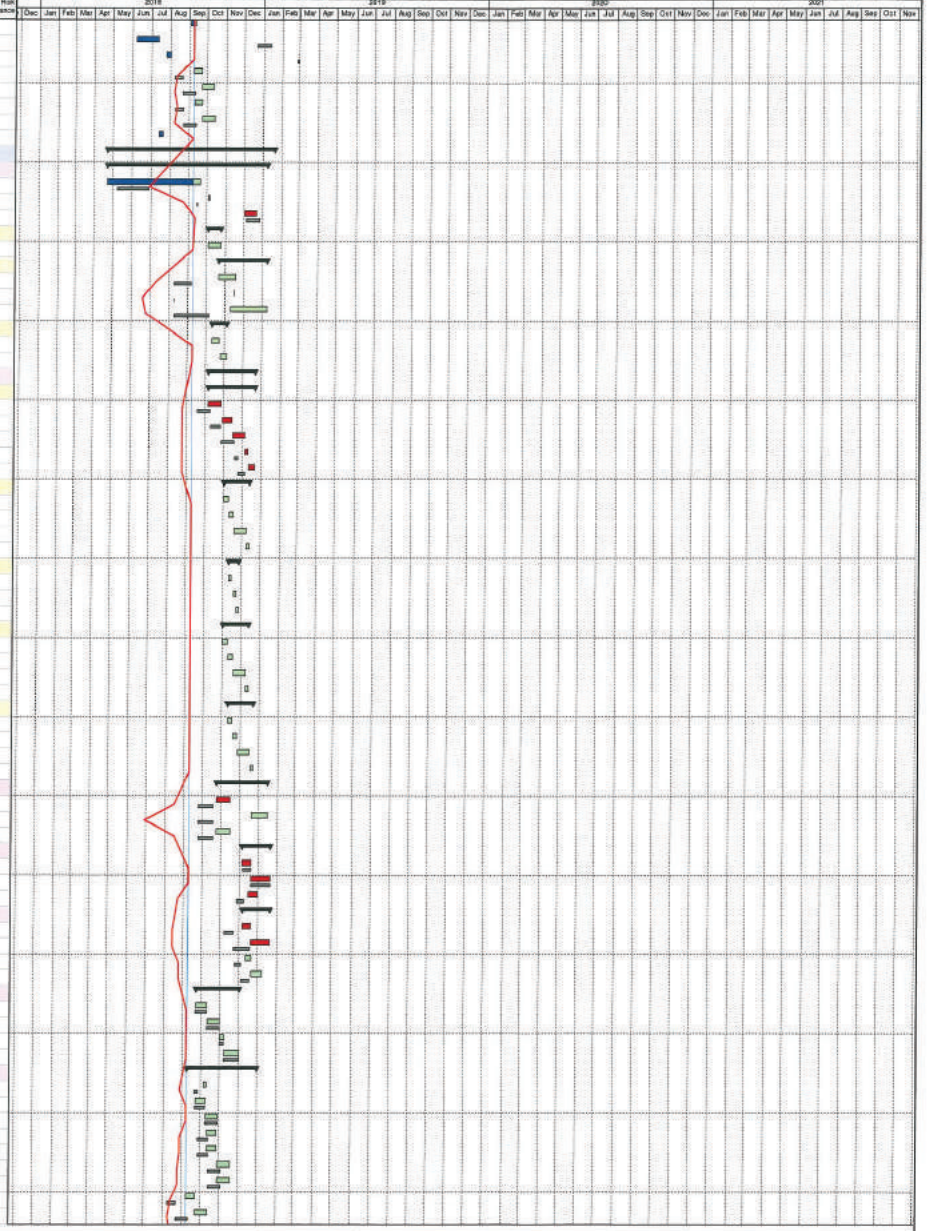
Baseline: Programme of August 2018
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

NE/2017/02 - Tseung Kwan O - Lam Tin Tunnel
Road P2/D4 and Associated Works
Updated Programme (September 2018)

Date	Revision	Checked	Approved
08-Sep-18	RWP-2018-09 (Data date 8-Sep-18)	TC	

NE/2017/02 - Updated Programme (Sep 2018)

Activity ID	Activity Name	Original Duration	Calendar	Activity % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	Time Risk Allowance
C13051	Predrilling at PC2-1/PH2 (Pier 02) (1 no.) PD#1	5	6d	50%	3	03-Sep-18 A	11-Sep-18	05-Nov-18	07-Nov-18	47	
C13320	Predrilling at PC2-2/PH3 & PH4 (Pier 03) (2 nos.) PD#1	16	6d	100%	0	07-Jun-18 A	12-Jul-18 A	19-Jan-19	19-Jan-19		
C13410	Predrilling at PC1-2/PH1 (1 no.) PD#1	4	6d	100%	0	25-Jul-18 A	02-Aug-18 A	04-Apr-19	04-Apr-19		
C13411	Propose founding level PC1-2	12	6d	0%	12	08-Sep-18	21-Sep-18	15-Jul-19	27-Jul-19	248	
C13412	Acceptance of founding level PC1-2	21	7d	0%	21	22-Sep-18	12-Oct-18	29-Jul-19	18-Aug-19	310	
C13413	Propose founding level PC3-1	12	6d	0%	12	10-Sep-18*	22-Sep-18	04-Apr-19	18-Apr-19	168	
C13414	Acceptance of founding level PC3-1	21	7d	0%	21	23-Sep-18	13-Oct-18	23-Apr-19	13-May-19	212	
C13421	Predrilling at PC2-3/PH3 (Pier 04) (1 no.) PD#2	4	6d	100%	0	14-Jul-18 A	20-Jul-18 A	19-Feb-19	19-Feb-19		
TTA Stage 1C		257			134	23-Apr-18 A	19-Jan-19	18-Sep-18	10-Jul-19	172	
TTA		201	6d		98	23-Apr-18 A	07-Jan-19	18-Sep-18	11-Jun-19	123	
C12740	Design and acceptance of TTA Stage 1C (south of roundabout)	42	6d	75%	11	23-Apr-18 A	20-Sep-18	18-Sep-18	02-Oct-18	9	
C12750	Implementation of TTA Stage 1C	2	6d	0%	2	04-Oct-18	05-Oct-18	03-Oct-18	04-Oct-18	-1	1
C13100	Temporary roadwork for TTA Stage 2A	18	6d	0%	18	01-Dec-18	21-Dec-18	30-Nov-18	20-Dec-18	-1	
Modify central median (Chui Ling Road)		18	6d		18	04-Oct-18	25-Oct-18	30-Nov-18	20-Dec-18	46	
C12550-9	Modify west portion of central median (Chui Ling Road)	18	6d	0%	18	04-Oct-18	25-Oct-18	30-Nov-18	20-Dec-18	46	
Tree transplanting		64	6d		64	22-Oct-18	07-Jan-19	14-Nov-18	11-Jan-19	4	
C12591	Tree transplanting (Po Yap Road) south side	24	6d	0%	24	22-Oct-18*	17-Nov-18	23-Nov-18	20-Dec-18	28	
C12611	Tree transplanting C100	1	6d	0%	1	15-Nov-18	15-Nov-18	03-Dec-18	03-Dec-18	15	
C12630	Tree transplanting (Chui Ling Road)	48	6d	0%	48	09-Nov-18*	07-Jan-19	14-Nov-18	11-Jan-19	4	
Groundwater monitoring point		20	6d		20	11-Oct-18	03-Nov-18	15-Feb-19	11-Jun-19	175	
C12643	Install groundwater monitoring point GWMP 03	9	6d	0%	9	11-Oct-18*	22-Oct-18	15-Feb-19	25-Feb-19	102	
C12644	Install groundwater monitoring point GWMP 02	9	6d	0%	9	25-Oct-18*	03-Nov-18	31-May-19	11-Jun-19	175	
Drainage		65	6d		65	06-Oct-18	21-Dec-18	05-Oct-18	31-Dec-18	6	
Stormwater DN900 (PMI No.004)		65	6d		65	06-Oct-18	21-Dec-18	05-Oct-18	20-Dec-18	-1	
C12670-1	Install ELS & excavate	18	6d	0%	18	06-Oct-18	27-Oct-18	05-Oct-18	26-Oct-18	-1	1
C12670-2	Lay drain DN900 pipe	14	6d	0%	14	29-Oct-18	13-Nov-18	27-Oct-18	12-Nov-18	-1	
C12670-3	Manhole SMH6701	18	6d	0%	18	14-Nov-18	04-Dec-18	13-Nov-18	03-Dec-18	-1	
C12670-4	Connection to existing manholes	5	6d	0%	5	05-Dec-18	10-Dec-18	04-Dec-18	08-Dec-18	-1	
C12670-5	Backfill	10	6d	0%	10	11-Dec-18	21-Dec-18	10-Dec-18	20-Dec-18	-1	
Stormwater SMH5101A-SMH5101B		37	6d		37	01-Nov-18	13-Dec-18	16-Nov-18	31-Dec-18	13	
C12682-3	Install ELS & excavate (Stage 2 start after part of Portion I & Portion II handed over by C2)	7	6d	0%	7	01-Nov-18*	08-Nov-18	16-Nov-18	23-Nov-18	13	1
C12682-4	Lay drain pipe (Stage 2)	7	6d	0%	7	09-Nov-18	16-Nov-18	24-Nov-18	01-Dec-18	13	
C12682-5	Manhole SMH5101B (Stage 2)	18	6d	0%	18	17-Nov-18	07-Dec-18	03-Dec-18	22-Dec-18	13	
C12682-6	Backfill (Stage 2)	5	6d	0%	5	08-Dec-18	13-Dec-18	24-Dec-18	31-Dec-18	13	
Stormwater SMH5101B-SMH5002		15	6d		15	09-Nov-18	26-Nov-18	15-Dec-18	31-Dec-18	28	
C12686-1	Install ELS & excavate (Stage 2)	4	6d	0%	4	09-Nov-18	13-Nov-18	15-Dec-18	19-Dec-18	31	1
C12686-2	Lay drain pipe (Stage 2)	4	6d	0%	4	17-Nov-18	21-Nov-18	20-Dec-18	24-Dec-18	28	
C12686-3	Backfill (Stage 2)	4	6d	0%	4	22-Nov-18	26-Nov-18	27-Dec-18	31-Dec-18	28	
Stormwater SMH5001A-SMH5002		37	6d		37	01-Nov-18	13-Dec-18	08-Nov-18	22-Dec-18	8	
C12684-3	Install ELS & excavate (Stage 2 start after part of Portion I & Portion II handed over by C2)	7	6d	0%	7	01-Nov-18*	08-Nov-18	08-Nov-18	15-Nov-18	6	1
C12684-4	Lay drain pipe (Stage 2)	7	6d	0%	7	09-Nov-18	16-Nov-18	16-Nov-18	23-Nov-18	6	
C12684-5	Manhole SMH5002 (Stage 2)	18	6d	0%	18	17-Nov-18	07-Dec-18	27-Nov-18	17-Dec-18	8	
C12684-6	Backfill (Stage 2)	5	6d	0%	5	08-Dec-18	13-Dec-18	18-Dec-18	22-Dec-18	8	
Stormwater SMH5002-SMH5003		37	6d		37	09-Nov-18	21-Dec-18	16-Nov-18	31-Dec-18	6	
C12688-1	Install ELS & excavate (Stage 2)	7	6d	0%	7	09-Nov-18	16-Nov-18	16-Nov-18	23-Nov-18	6	1
C12688-2	Lay drain pipe (Stage 2)	7	6d	0%	7	17-Nov-18	24-Nov-18	24-Nov-18	01-Dec-18	6	
C12688-3	Manhole SMH5003 (Stage 2)	18	6d	0%	18	26-Nov-18	15-Dec-18	03-Dec-18	22-Dec-18	6	
C12688-4	Backfill (Stage 2)	5	6d	0%	5	17-Dec-18	21-Dec-18	24-Dec-18	31-Dec-18	6	
Utilities		68	6d		68	24-Oct-18	14-Jan-19	23-Oct-18	18-Jan-19	4	
C12701	Gas main at Chui Ling Road (North) by HKCG	19	6d	0%	19	24-Oct-18	14-Nov-18	23-Oct-18	13-Nov-18	-1	1
C12780	Telecom cables at Chui Ling Road by HGC, CATV, PCCW (incl. Chui Shin Street)	19	6d	0%	19	20-Dec-18	14-Jan-19	27-Dec-18	18-Jan-19	4	1
C12810	Telecom cables at Po Shun Road (North) by HGC, HKBN, CATV, PCCW	19	6d	0%	19	24-Oct-18	14-Nov-18	30-Oct-18	20-Nov-18	5	1
Fresh Watermain		36	6d		36	05-Dec-18	19-Jan-19	05-Dec-18	18-Jan-19	0	
C12840	Fresh watermain testing CHB, CHC, CHD	12	6d	0%	12	05-Dec-18	19-Dec-18	05-Dec-18	18-Dec-18	0	
C12850	Connection of fresh watermain CHB, CHC, CHD	24	6d	0%	24	19-Dec-18	19-Jan-19	19-Dec-18	18-Jan-19	0	
C13220	Fresh watermain testing CHA, CHA1	12	6d	0%	12	15-Dec-18	31-Dec-18	14-Dec-18	29-Dec-18	-1	
Salt Watermain		36	6d		36	06-Dec-18	19-Jan-19	05-Dec-18	13-Jun-19	114	
C12870	Salt watermain testing CHA, CHB	12	6d	0%	12	06-Dec-18	19-Dec-18	05-Dec-18	18-Dec-18	-1	
C12880	Connection and commissioning of salt watermain CHA, CHB	24	6d	0%	24	20-Dec-18	19-Jan-19	19-Dec-18	18-Jan-19	-1	
C12890	Salt watermain CHC 0 to 9,178	9	6d	0%	9	11-Dec-18	20-Dec-18	20-May-19	29-May-19	125	
C12900	Salt watermain testing CHC	12	6d	0%	12	21-Dec-18	07-Jan-19	30-May-19	13-Jun-19	125	
CCTV High Mast		71			71	22-Sep-18	01-Dec-18	28-Feb-19	11-May-19	161	
C12930	Propose founding levels at CCTV high mast	14	6d	0%	14	22-Sep-18	10-Oct-18	28-Feb-19	15-Mar-19	127	
C12940	Acceptance of proposed founding level at CCTV high mast	21	7d	0%	21	11-Oct-18	31-Oct-18	16-Mar-19	05-Apr-19	156	
C12950	Mobilize plant SP#1	6	6d	0%	6	01-Nov-18	07-Nov-18	06-Apr-19	12-Apr-19	127	
C12960	Socketted H-piles at CCTV High Mast (3 nos.) SP#1	21	6d	0%	21	08-Nov-18	01-Dec-18	13-Apr-19	11-May-19	127	3
Footbridge Predrilling		115			115	08-Sep-18	31-Dec-18	18-Sep-18	10-Jul-19	191	
C12720	Predrilling at PC5/PH4 (1 no.) PD#1	4	6d	0%	4	06-Oct-18	10-Oct-18	23-Oct-18	25-Oct-18	13	
C12971	Propose founding level PC1-3	12	6d	0%	12	22-Sep-18	08-Oct-18	24-Apr-19	08-May-19	170	
C12972	Acceptance of founding level PC1-3	21	7d	0%	21	09-Oct-18	29-Oct-18	09-May-19	29-May-19	212	
C12980	Propose founding level PC1-1	14	6d	0%	14	11-Oct-18	27-Oct-18	27-Oct-18	12-Nov-18	13	
C12981	Propose founding level PC8	14	6d	0%	14	11-Oct-18	27-Oct-18	13-Nov-18	28-Nov-18	27	
C12990	Acceptance of founding level PC1-1	21	7d	0%	21	28-Oct-18	17-Nov-18	13-Nov-18	03-Dec-18	16	
C12991	Acceptance of founding level PC8	21	7d	0%	21	28-Oct-18	17-Nov-18	29-Nov-18	19-Dec-18	32	
C13011	Propose founding level PC7	12	6d	0%	12	08-Sep-18	21-Sep-18	11-May-19	25-May-19	196	
C13012	Acceptance of founding level PC7	21	7d	0%	21	22-Sep-18	12-Oct-18	27-May-19	16-Jun-19	247	



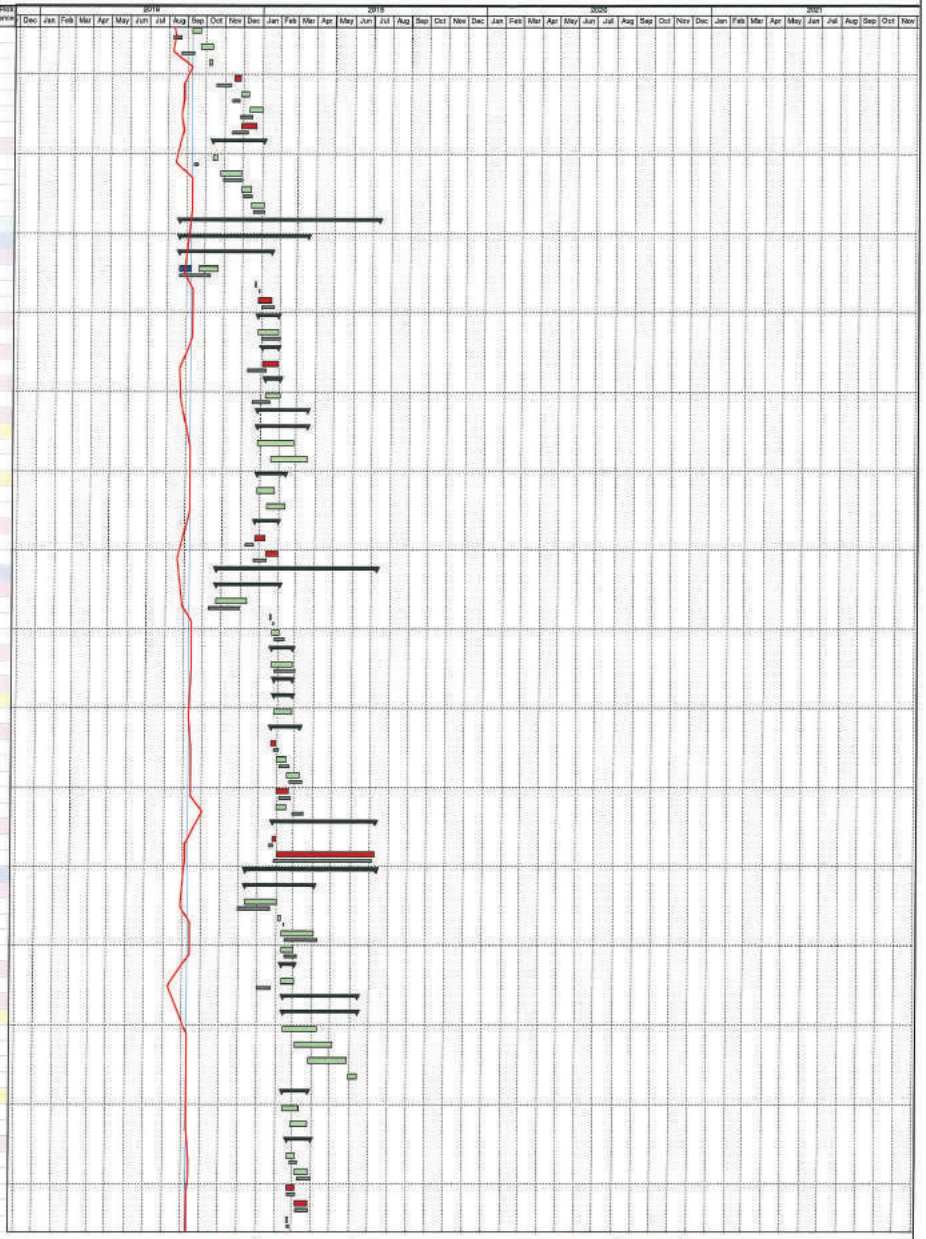
Baseline: Programme of August 2018
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

NE/2017/02 - Tseung Kwan O - Lam Tin Tunnel Road P2/D4 and Associated Works
Updated Programme (September 2018)

Date	Revision	Checked	Approved
08-Sep-18	RWP-2018-09 (Data date 8-Sep-18)	TC	

NE/2017/02 - Updated Programme (Sep 2018)

Activity ID	Activity Name	Original Duration	Calendar	Activity % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	Free Float	Allowance
C13030	Propose founding level PC4	12	6d	0%	12	08-Sep-18	21-Sep-18	18-Sep-18	03-Oct-18	8		
C13040	Acceptance of founding level PC4	21	7d	0%	21	22-Sep-18	12-Oct-18	04-Oct-18	24-Oct-18	12		
C13049	Predrilling at PC2-1/PH4 (Pier 02) (1 nos.) PD#1	5	6d	0%	5	06-Oct-18	11-Oct-18	08-Nov-18	13-Nov-18	27		
C13050	Predrilling at PC2-1/PH1, PH3 (Pier 02) (2 nos.) PD#1	10	6d	0%	10	15-Nov-18	26-Nov-18	14-Nov-18	24-Nov-18	-1		
C13060	Propose founding level PC2-1 (Pier 02)	12	6d	0%	12	27-Nov-18	10-Dec-18	05-Jun-19	19-Jun-19	151		
C13070	Acceptance of founding level PC2-1 (Pier 02)	21	7d	0%	21	11-Dec-18	31-Dec-18	20-Jun-19	10-Jul-19	191		
C13110	Predrilling at PC5-PH1 to PH3, PH5, PH6 (Pier 01) (5 nos.) PD#1	23	6d	0%	23	27-Nov-18	22-Dec-18	26-Nov-18	21-Dec-18	-1		
Footbridge Piling		66	6d		66	13-Oct-18	03-Jan-19	25-Oct-18	08-Jan-19	5		
C13140	Mobilize plant SP#2	6	6d	0%	6	13-Oct-18	20-Oct-18	25-Oct-18	31-Oct-18	9		
C13150	Socketted H-piles at PC4 (4 nos.) SP#2	28	6d	0%	28	26-Oct-18	28-Nov-18	01-Nov-18	03-Dec-18	5	4	
C13250	Socketted H-piles at PC1-1 (2 nos.) SP#2	14	6d	0%	14	28-Nov-18	14-Dec-18	04-Dec-18	19-Dec-18	5	2	
C13260	Socketted H-piles at PC8 (2 nos.) SP#2	14	6d	0%	14	14-Dec-18	03-Jan-19	20-Dec-18	08-Jan-19	5	2	
Stage 2 Works		326			295	20-Aug-18 A	11-Jul-19	26-Oct-18	10-Jan-20	183		
TTA Stage 2A		211			180	20-Aug-18 A	18-Mar-19	26-Oct-18	10-Jul-19	114		
TTA		124	6d		97	20-Aug-18 A	17-Jan-19	26-Oct-18	16-Jan-19	-1		
C13180	Design and acceptance of TTA Stage 2A	42	6d	40%	25	20-Aug-18 A	23-Oct-18	26-Oct-18	24-Nov-18	28		
C13190	Implementation of TTA Stage 2A	2	6d	0%	2	22-Dec-18	24-Dec-18	21-Dec-18	22-Dec-18	-1	1	
C13200	Temporary footpath and cycle track (for TTA Stage 2B)	18	6d	0%	18	27-Dec-18	17-Jan-19	24-Dec-18	16-Jan-19	-1		
Drainage		28	6d		28	27-Dec-18	29-Jan-19	04-Jun-19	08-Jul-19	126		
C13210	Stormwater SMH6401-SMH6402 and SMH6402-exist.manhole	28	6d	0%	28	27-Dec-18	29-Jan-19	04-Jun-19	08-Jul-19	126	1	
Fresh Watermain		24	6d		24	02-Jan-19	29-Jan-19	31-Dec-18	28-Jan-19	-1		
C13310	Connection of fresh watermain CHA, CHA1	24	6d	0%	24	02-Jan-19	29-Jan-19	31-Dec-18	28-Jan-19	-1		
Salt Watermain		22	6d		22	08-Jan-19	01-Feb-19	14-Jun-19	10-Jul-19	125		
C12910	Connection and commissioning of salt watermain CHC	22	6d	0%	22	08-Jan-19	01-Feb-19	14-Jun-19	10-Jul-19	125		
Roadworks		66	6d		66	27-Dec-18	18-Mar-19	23-Jan-19	24-May-19	52		
South Po Yap Road (East of footbridge)		66	6d		66	27-Dec-18	18-Mar-19	23-Jan-19	13-Apr-19	22		
C13230-10	Excavation	48	6d	0%	48	27-Dec-18	25-Feb-19	23-Jan-19	22-Mar-19	22		
C13230-20	Gullies	48	6d	0%	48	18-Jan-19	18-Mar-19	16-Feb-19	13-Apr-19	22		
South Chui Ling Road (West of footbridge)		36	6d		36	27-Dec-18	11-Feb-19	08-Apr-19	24-May-19	82		
C13232-10	Excavation	24	6d	0%	24	27-Dec-18	24-Jan-19	08-Apr-19	09-May-19	82		
C13232-20	Gullies	24	6d	0%	24	11-Jan-19	11-Feb-19	25-Apr-19	24-May-19	82		
Footbridge Predrilling		38			38	24-Dec-18	30-Jan-19	22-Dec-18	29-Jan-19	-1		
C13120	Propose founding level PC5 (Pier 01)	12	6d	0%	12	24-Dec-18	09-Jan-19	22-Dec-18	08-Jan-19	-1		
C13130	Acceptance of founding level PC5 (Pier 01)	21	7d	0%	21	10-Jan-19	30-Jan-19	09-Jan-19	29-Jan-19	-1		
TTA Stage 2B		259			259	23-Oct-18	09-Jul-19	26-Nov-18	31-Dec-19	175		
TTA		85	6d		85	23-Oct-18	02-Feb-19	26-Nov-18	10-May-19	75		
C13270	Design and acceptance of TTA Stage 2B	42	6d	0%	42	23-Oct-18	11-Dec-18	26-Nov-18	16-Jan-19	28		
C13280	Implementation of TTA Stage 2B	2	6d	0%	2	18-Jan-19	19-Jan-19	17-Jan-19	18-Jan-19	-1	1	
C13290	Temporary road for Chui Shin Street (for TTA Stage 2C)	12	6d	0%	12	21-Jan-19	02-Feb-19	26-Apr-19	10-May-19	75		
Drainage		28	6d		28	21-Jan-19	25-Feb-19	27-Nov-19	31-Dec-19	252		
C13300	Stormwater SMH6601-SMH6602, SMH5001-SMH6602	28	6d	0%	28	21-Jan-19	25-Feb-19	27-Nov-19	31-Dec-19	252	1	
Roadworks		24	6d		24	25-Jan-19	25-Feb-19	10-May-19	08-Jun-19	82		
South Chui Ling Road (West of footbridge)		24	6d		24	25-Jan-19	25-Feb-19	10-May-19	08-Jun-19	82		
C13232-30	Road lighting ducting	24	6d	0%	24	25-Jan-19	25-Feb-19	10-May-19	08-Jun-19	82		
Footbridge Predrilling		47			47	21-Jan-19	08-Mar-19	19-Jan-19	25-Mar-19	17		
C13321	Predrilling at PC2-2/PH1 & PH2 (Pier 03) (2 nos.) PD#1	8	6d	0%	8	21-Jan-19	29-Jan-19	19-Jan-19	28-Jan-19	-1		
C13322	Propose founding level PC2-2 (Pier 03)	12	6d	0%	12	30-Jan-19	15-Feb-19	19-Feb-19	04-Mar-19	14		
C13323	Acceptance of founding level PC2-2 (Pier 03)	21	7d	0%	21	16-Feb-19	08-Mar-19	05-Mar-19	25-Mar-19	17		
C13400	Predrilling at PC6/PH1 to PH3 (Pier 05) (3 nos.) PD#1	15	6d	0%	15	30-Jan-19	19-Feb-19	29-Jan-19	18-Feb-19	-1		
C13420	Predrilling at PC2-3/PH1, PH2, PH4 (Pier 04) (3 nos.) PD#2	12	6d	0%	12	30-Jan-19	15-Feb-19	01-Feb-19	18-Feb-19	2		
Footbridge Piling		132	6d		132	24-Jan-19	09-Jul-19	23-Jan-19	08-Jul-19	-1		
C13340	Mobilize plant BP#1	6	6d	0%	6	24-Jan-19	30-Jan-19	23-Jan-19	29-Jan-19	-1		
C13350	Bored piles at PC5 (Pier 01) (6 nos.) BP#1	126	6d	0%	126	31-Jan-19	09-Jul-19	30-Jan-19	08-Jul-19	-1	6	
TTA Stage 2C		212			212	11-Dec-18	11-Jul-19	19-Feb-19	10-Jan-20	183		
TTA		90	6d		90	11-Dec-18	02-Apr-19	18-Mar-19	08-Jul-19	75		
C13360	Design and acceptance of TTA Stage 2C	42	6d	0%	42	11-Dec-18	01-Feb-19	18-Mar-19	10-May-19	76		
C13370	Implementation of TTA - Stage 2C	2	6d	0%	2	04-Feb-19	08-Feb-19	11-May-19	14-May-19	75	1	
C13380	Modification of road formation and layout	45	6d	0%	45	09-Feb-19	02-Apr-19	15-May-19	08-Jul-19	75		
C13390	Temporary footpath and cycle track (for TTA Stage 3A)	18	6d	0%	18	09-Feb-19	01-Mar-19	17-Jun-19	08-Jul-19	102		
Utilities		19	6d		19	09-Feb-19	02-Mar-19	15-Jun-19	08-Jul-19	101		
C12690	Gas main at Chui Ling Road (South) by HKCG	19	6d	0%	19	09-Feb-19	02-Mar-19	15-Jun-19	08-Jul-19	101	1	
Roadworks		97	6d		97	12-Feb-19	12-Jun-19	09-Mar-19	08-Jul-19	21		
South Po Yap Road (East of footbridge)		97	6d		97	12-Feb-19	12-Jun-19	09-Mar-19	08-Jul-19	21		
C13230-30	Road lighting ducting	48	6d	0%	48	12-Feb-19	09-Apr-19	09-Mar-19	09-May-19	22		
C13230-40	Formation, sub-base and kerbs	48	6d	0%	48	05-Mar-19	04-May-19	30-Mar-19	31-May-19	22		
C13230-50	Footpath, cycle track and layby pavement	48	6d	0%	48	26-Mar-19	27-May-19	25-Apr-19	22-Jun-19	22		
C13230-60	Type 2 railing	12	6d	0%	12	29-May-19	12-Jun-19	24-Jun-19	08-Jul-19	21		
South Chui Ling Road (West of footbridge)		36	6d		36	12-Feb-19	25-Mar-19	25-May-19	08-Jul-19	82		
C13232-40	Formation, sub-base and kerbs	24	6d	0%	24	12-Feb-19	11-Mar-19	25-May-19	22-Jun-19	82		
C13232-50	Footpath, cycletrack and layby pavement	24	6d	0%	24	26-Feb-19	25-Mar-19	10-Jun-19	08-Jul-19	82		
Footbridge Predrilling		39			39	20-Feb-19	30-Mar-19	19-Feb-19	10-Jan-20	286		
C13401	Propose founding level PC6 (Pier 05)	12	6d	0%	12	20-Feb-19	05-Mar-19	07-Dec-19	20-Dec-19	238		
C13402	Acceptance of founding level PC6 (Pier 05)	21	7d	0%	21	06-Mar-19	26-Mar-19	21-Dec-19	10-Jan-20	290		
C13430	Propose founding level PC2-3 (Pier 04)	12	6d	0%	12	20-Feb-19	05-Mar-19	19-Feb-19	04-Mar-19	-1		
C13440	Acceptance of founding level PC2-3 (Pier 04)	21	7d	0%	21	06-Mar-19	26-Mar-19	05-Mar-19	25-Mar-19	-1		
C13450	Predrilling at PC3-2 (1 no.) PD#2	4	6d	0%	4	20-Feb-19	23-Feb-19	14-May-19	17-May-19	65		



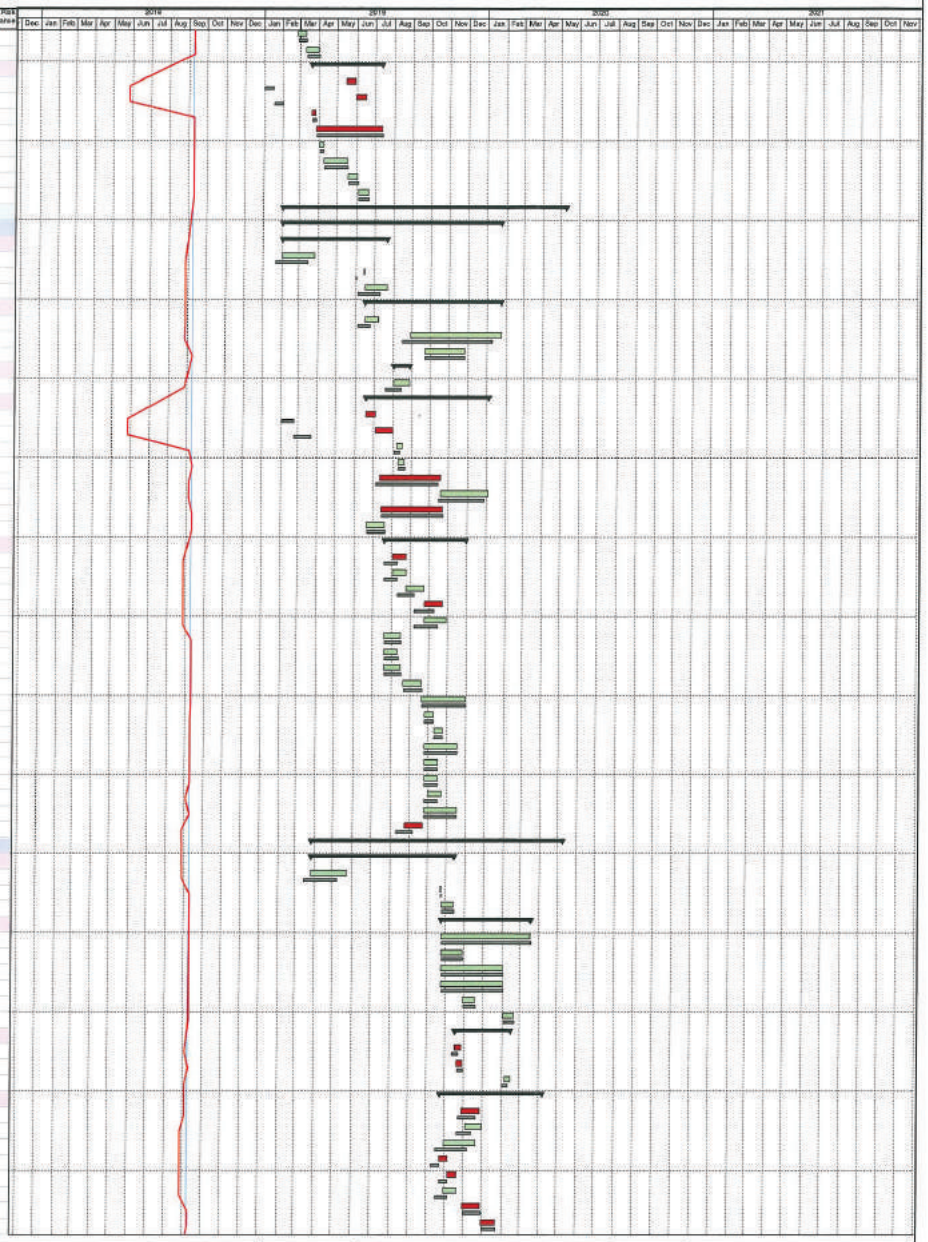
Baseline: Programme of August 2018
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

NE/2017/02 - Tseung Kwan O - Lam Tin Tunnel
Road P2/D4 and Associated Works
Updated Programme (September 2018)

Date	Revision	Checked	Approved
08-Sep-18	RWP-2018-09 (Data date 8-Sep-18)	TC	

NE/2017/02 - Updated Programme (Sep 2018)

Activity ID	Activity Name	Original Duration	Calendar	Activity % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	Time Risk Allowance
C13460	Propose founding level PC3-2	12	6d	0%	12	25-Feb-19	09-Mar-19	18-May-19	31-May-19	65	
C13470	Acceptance of founding level PC3-2	21	7d	0%	21	10-Mar-19	30-Mar-19	01-Jun-19	21-Jun-19	83	
Footbridge Piling		90	6d		90	20-Mar-19	11-Jul-19	19-Mar-19	03-Sep-19	46	
C13160	Socketted H-piles at PC3-1 P1 & P3 (2 nos.) SP#1	14	6d	0%	14	14-May-19	29-May-19	14-May-19	29-May-19	0	2
C13170	Socketted H-piles at PC1-3 (2 nos.) SP#1	14	6d	0%	14	30-May-19	15-Jun-19	30-May-19	15-Jun-19	0	2
C13480	Mobilize plant BP#2	6	6d	0%	6	20-Mar-19	26-Mar-19	19-Mar-19	25-Mar-19	-1	
C13490	Bored piles at PC2-2 (Pier 03) (4 nos.) BP#2	84	6d	0%	84	27-Mar-19	11-Jul-19	26-Mar-19	10-Jul-19	-1	4
C13500	Mobilize plant SP#2	6	6d	0%	6	01-Apr-19	08-Apr-19	22-Jun-19	28-Jun-19	64	
C13510	Socketted H-piles at PC3-2 (4 nos.) SP#2	28	6d	0%	28	09-Apr-19	16-May-19	29-Jun-19	01-Aug-19	64	4
C13670	Socketted H-piles at PC3-1 P2 & P4 (2 nos.) SP#2	14	6d	0%	14	17-May-19	01-Jun-19	02-Aug-19	17-Aug-19	64	2
C13680	Socketted H-piles at PC1-2 (2 nos.) SP#2	14	6d	0%	14	03-Jun-19	19-Jun-19	19-Aug-19	03-Sep-19	64	2
Stage 3 Works		370	6d		370	01-Feb-19	08-May-20	18-May-19	28-Nov-20	170	
TTA Stage 3A		287	6d		287	01-Feb-19	22-Jan-20	18-May-19	02-Jun-20	104	
TTA		134	6d		134	01-Feb-19	20-Jul-19	18-May-19	01-Nov-19	86	
C13520	Design and acceptance of TTA Stage 3A	42	6d	0%	42	01-Feb-19	26-Mar-19	18-May-19	08-Jul-19	81	
C13530	Implementation of TTA - Stage 3A	2	6d	0%	2	13-Jun-19	14-Jun-19	09-Jul-19	10-Jul-19	21	1
C13550	Modification of existing roundabout to temporary signalized junction	30	6d	0%	30	15-Jun-19	20-Jul-19	26-Sep-19	01-Nov-19	86	
Roadworks		183	6d		183	15-Jun-19	22-Jan-20	12-Oct-19	02-Jun-20	104	
C13570	Footpath and cycle track (for TTA Stage 3B)	18	6d	0%	18	15-Jun-19	06-Jul-19	12-Oct-19	01-Nov-19	98	
C13580	Roadworks at Chui Ling Road (North), Po Shun Road (North), Po Yap Road (North)	120	6d	0%	120	29-Aug-19	22-Jan-20	02-Jan-20	30-May-20	102	
C13590	Roadwork within Portion IV	54	6d	0%	54	21-Sep-19	25-Nov-19	25-Mar-20	02-Jun-20	151	
CCTV High Mast		24	6d		24	01-Aug-19	28-Aug-19	02-Dec-19	31-Dec-19	102	
C13600	Pile cap for CCTV high mast	24	6d	0%	24	01-Aug-19	28-Aug-19	02-Dec-19	31-Dec-19	102	
Footbridge Piling		166	6d		166	17-Jun-19	03-Jan-20	17-Jun-19	27-Mar-20	69	
C13240	Socketted H-piles at PC7 (2 nos.) SP#1	14	6d	0%	14	17-Jun-19	03-Jul-19	17-Jun-19	03-Jul-19	0	2
C13330	First loading test (socketted H-piles)	24	6d	0%	24	04-Jul-19	31-Jul-19	04-Jul-19	31-Jul-19	0	
C13610	Bored pile testing (Pier 01)	9	6d	0%	9	07-Aug-19	16-Aug-19	12-Nov-19	21-Nov-19	80	
C13620	Bored pile testing (Pier 03)	9	6d	0%	9	09-Aug-19	19-Aug-19	31-Aug-19	10-Sep-19	19	
C13630	Bored piles at PC2-3 (Pier 04) (4 nos.) BP#1	84	6d	0%	84	10-Jul-19	18-Oct-19	09-Jul-19	17-Oct-19	-1	4
C13650	Bored piles at PC6 (Pier 05) (3 nos.) BP#1	63	6d	0%	63	19-Oct-19	03-Jan-20	11-Jan-20	27-Mar-20	69	3
C13660	Bored pile at PC2-1 (Pier 02) (4 nos.) BP#2	84	6d	0%	84	12-Jul-19	21-Oct-19	11-Jul-19	19-Oct-19	-1	4
C13690	Second loading test (socketted H-piles)	24	6d	0%	24	20-Jun-19	18-Jul-19	04-Sep-19	03-Oct-19	64	
Footbridge Substructure		112	6d		112	19-Jul-19	29-Nov-19	01-Aug-19	22-May-20	138	
C13700	Pile cap PC1-3	20	6d	0%	20	01-Aug-19	23-Aug-19	01-Aug-19	23-Aug-19	0	
C13710	Pile cap PC1-1	20	6d	0%	20	01-Aug-19	23-Aug-19	30-Sep-19	24-Oct-19	50	
C13720	Pile cap PC8	24	6d	0%	24	24-Aug-19	21-Sep-19	25-Oct-19	21-Nov-19	50	
C13730	Pile cap PC4	24	6d	0%	24	23-Sep-19	22-Oct-19	23-Sep-19	22-Oct-19	0	
C13740	Pile cap PC5 (Pier 01)	30	6d	0%	30	23-Sep-19	29-Oct-19	22-Nov-19	28-Dec-19	50	
C13750	Pile cap PC3-2	24	6d	0%	24	19-Jul-19	15-Aug-19	04-Oct-19	01-Nov-19	64	
C13770	Pile cap PC1-2	20	6d	0%	20	19-Jul-19	10-Aug-19	03-Feb-20	25-Feb-20	161	
C13780	Pile cap PC3-1	24	6d	0%	24	19-Jul-19	15-Aug-19	29-Nov-19	28-Dec-19	111	
C13790	Pile cap PC2-2 (Pier 03)	25	6d	0%	25	20-Aug-19	18-Sep-19	11-Sep-19	12-Oct-19	19	
C13800	Column at PC2-2 (Pier 03)	60	6d	0%	60	19-Sep-19	29-Nov-19	14-Oct-19	21-Dec-19	19	
C13820	Column PC1-2 (Staircase 01) - 1st pour	12	6d	0%	12	24-Sep-19	09-Oct-19	26-Feb-20	10-Mar-20	125	
C13830	Column PC1-2 (Staircase 01) - 3rd pour	12	6d	0%	12	10-Oct-19	23-Oct-19	11-Mar-20	24-Mar-20	125	
C13840	Wall at PC3-1 (Lift shaft 1A & 1B)	45	6d	0%	45	24-Sep-19	16-Nov-19	30-Dec-19	24-Feb-20	79	
C13860	Column at PC1-1 (Staircase 02) - 1st pour	18	6d	0%	18	24-Sep-19	16-Oct-19	02-May-20	22-May-20	176	
C13870	Wall at PC8 (Staircase 02) - 2nd pour	18	6d	0%	18	24-Sep-19	16-Oct-19	02-May-20	22-May-20	176	
C13880	Column at PC1-3 (Staircase 01) - 2nd pour	18	6d	0%	18	30-Sep-19	22-Oct-19	04-Mar-20	24-Mar-20	126	
C13920	Wall at PC3-2 (Lift shaft 3A & 3B)	45	6d	0%	45	24-Sep-19	16-Nov-19	30-Dec-19	24-Feb-20	79	
C14040	Pile cap PC7	24	6d	0%	24	24-Aug-19	21-Sep-19	24-Aug-19	21-Sep-19	0	
TTA Stage 3B		328	6d		328	25-Mar-19	08-May-20	11-Sep-19	28-Nov-20	170	
TTA		188	6d		188	25-Mar-19	13-Nov-19	11-Sep-19	30-May-20	159	
C13930	Design and acceptance of TTA Stage 3B	42	6d	0%	42	25-Mar-19	21-May-19	11-Sep-19	01-Nov-19	136	
C13940	Implementation of TTA - Stage 3B	2	6d	0%	2	22-Oct-19	23-Oct-19	02-Nov-19	04-Nov-19	10	1
C13950	Permanent footpath and cycle track (for TTA Stage 4A)	18	6d	0%	18	24-Oct-19	13-Nov-19	11-May-20	30-May-20	159	
Roadworks		119	6d		119	24-Oct-19	17-Mar-20	05-Nov-19	30-May-20	58	
C13960	Drainage works along Chui Ling Road and Po Yap Road	119	6d	0%	119	24-Oct-19	17-Mar-20	03-Jan-20	30-May-20	58	
C13970	Directional sign DS26,27,28 (incl. footing & steel frame)	30	6d	0%	30	24-Oct-19	27-Nov-19	03-Jan-20	10-Feb-20	58	
C13980	Roadwork for carriageway and cycle track	80	6d	0%	80	24-Oct-19	31-Jan-20	05-Nov-19	12-Feb-20	10	
C13990	Ductings for TCSS and road lighting	80	6d	0%	80	24-Oct-19	31-Jan-20	05-Nov-19	12-Feb-20	10	
C14000	Signage	18	6d	0%	18	28-Nov-19	18-Dec-19	11-Feb-20	02-Mar-20	58	
C14010	Lighting posts	16	6d	0%	16	01-Feb-20	19-Feb-20	13-Feb-20	02-Mar-20	10	
Footbridge Piling		72	6d		72	16-Nov-19	14-Feb-20	15-Nov-19	12-May-20	69	
C13640	Bored pile testing (Pier 04)	9	6d	0%	9	16-Nov-19	26-Nov-19	15-Nov-19	25-Nov-19	-1	
C14020	Bored pile testing (Pier 02)	9	6d	0%	9	19-Nov-19	28-Nov-19	18-Nov-19	27-Nov-19	-1	
C14030	Bored pile testing (Pier 05)	9	6d	0%	9	05-Feb-20	14-Feb-20	02-May-20	12-May-20	69	
Footbridge Substructure		136	6d		136	23-Oct-19	06-Apr-20	23-Oct-19	03-Jul-20	69	
C13750	Pile cap PC2-3 (Pier 04)	25	6d	0%	25	27-Nov-19	27-Dec-19	26-Nov-19	24-Dec-19	-1	
C13810	Column at PC5 (Pier 01)	21	6d	0%	21	04-Dec-19	30-Dec-19	09-May-20	02-Jun-20	123	
C13850	Wall at PC5 (Lift shaft 2A & 2B)	45	6d	0%	45	30-Oct-19	20-Dec-19	30-Dec-19	24-Feb-20	50	
C13890	Wall at PC4 (Staircase 03) - 1st pour	12	6d	0%	12	23-Oct-19	05-Nov-19	23-Oct-19	05-Nov-19	0	
C13900	Wall at PC4 (Staircase 03) - 2nd pour	12	6d	0%	12	06-Nov-19	19-Nov-19	06-Nov-19	19-Nov-19	0	
C13910	Wall at PC7 (Staircase 01) - 4th pour	18	6d	0%	18	30-Oct-19	19-Nov-19	04-Mar-20	24-Mar-20	102	
C14050	Pile Cap PC2-1 (Pier 02)	24	6d	0%	24	29-Nov-19	28-Dec-19	28-Nov-19	27-Dec-19	-1	
C14060	Column at PC2-1 (Pier 02)	18	6d	0%	18	30-Dec-19	20-Jan-20	28-Dec-19	18-Jan-20	-1	



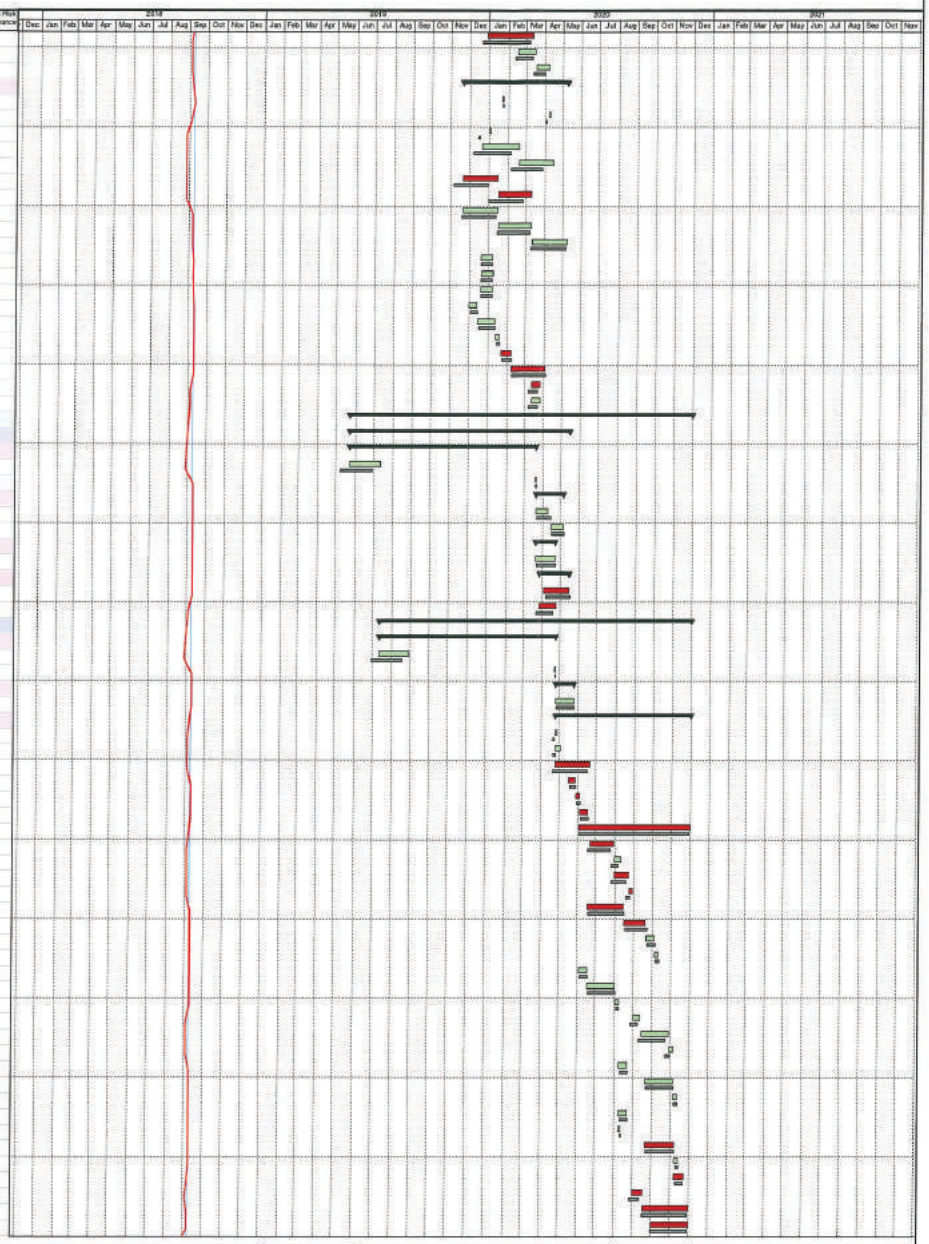
Baseline: Programme of August 2018
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

NE/2017/02 - Tseung Kwan O - Lam Tin Tunnel
Road P2/D4 and Associated Works
Updated Programme (September 2018)

Date	Revision	Checked	Approved
08-Sep-18	RWP-2018-09 (Data date 8-Sep-18)	TC	

NE/2017/02 - Updated Programme (Sep 2018)

Activity ID	Activity Name	Original Duration	Calendar	Activity % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	Free Float Allowance
C14070	Column at PC2-3 (Pier 04)	60	6d	0%	60	28-Dec-19	11-Mar-20	27-Dec-19	10-Mar-20	-1	
C14090	Pile Cap PC6 (Pier 05)	25	6d	0%	25	15-Feb-20	14-Mar-20	13-May-20	10-Jun-20	69	
C14100	Column at PC6 (Pier 05)	18	6d	0%	18	16-Mar-20	06-Apr-20	11-Jun-20	03-Jul-20	69	
Footbridge Superstructure		135	6d		135	20-Nov-19	08-May-20	20-Nov-19	28-Nov-20	170	
C14080	Bearing Pier 02	3	6d	0%	3	21-Jan-20	23-Jan-20	20-Jan-20	22-Jan-20	-1	
C14110	Bearing Pier 05	3	6d	0%	3	07-Apr-20	09-Apr-20	18-Jul-20	21-Jul-20	81	
C14120	Bearing Pier 01	3	6d	0%	3	31-Dec-19	03-Jan-20	17-Jun-20	19-Jun-20	135	
C14130	Staircase 02 structure - 3rd pour	45	6d	0%	45	21-Dec-19	18-Feb-20	23-May-20	16-Jul-20	120	
C14140	Staircase 02 structure - 4th pour	45	6d	0%	45	19-Feb-20	15-Apr-20	17-Jul-20	07-Sep-20	120	
C14150	Staircase 03 structure - 3rd pour	45	6d	0%	45	20-Nov-19	14-Jan-20	20-Nov-19	14-Jan-20	0	
C14160	Staircase 03 structure -4th pour	45	6d	0%	45	15-Jan-20	10-Mar-20	15-Jan-20	10-Mar-20	0	
C14170	Staircase 01 structure - 5th pour	45	6d	0%	45	20-Nov-19	14-Jan-20	25-Mar-20	22-May-20	102	
C14180	Staircase 01 structure - 6th pour	45	6d	0%	45	15-Jan-20	10-Mar-20	23-May-20	16-Jul-20	102	
C14190	Staircase 01 structure - 7th pour	45	6d	0%	45	11-Mar-20	08-May-20	17-Jul-20	07-Sep-20	102	
C14200	Lift shaft steelworks (Lift 1A & 1B)	12	6d	0%	12	20-Dec-19	06-Jan-20	25-Feb-20	09-Mar-20	51	
C14210	Lift shaft steelworks (Lift 2A & 2B)	12	6d	0%	12	21-Dec-19	07-Jan-20	25-Feb-20	09-Mar-20	50	
C14220	Lift shaft steelworks (Lift 3A & 3B)	12	6d	0%	12	20-Dec-19	06-Jan-20	25-Feb-20	09-Mar-20	51	
C14230	Falsework Portion 1	12	6d	0%	12	30-Nov-19	13-Dec-19	23-Dec-19	08-Jan-20	19	
C14240	Deck structure Portion 1	21	6d	0%	21	14-Dec-19	10-Jan-20	09-Jan-20	05-Feb-20	19	
C14250	Remove falsework Portion 1	6	6d	0%	6	11-Jan-20	17-Jan-20	23-Nov-20	28-Nov-20	257	
C14260	Falsework Portion 2	12	6d	0%	12	21-Jan-20	06-Feb-20	20-Jan-20	05-Feb-20	-1	
C14270	Deck structure Portion 2	48	6d	0%	48	07-Feb-20	02-Apr-20	06-Feb-20	01-Apr-20	-1	
C14290	Falsework at Portion 0 (Pier 04)	12	6d	0%	12	12-Mar-20	25-Mar-20	11-Mar-20	24-Mar-20	-1	
C14310	Falsework Portion 3a	12	6d	0%	12	12-Mar-20	25-Mar-20	06-Apr-20	22-Apr-20	20	
Stage 4 Works		457	6d		457	21-May-19	30-Nov-20	18-Mar-20	28-Nov-20	-1	
TTA Stage 4A		292	6d		292	21-May-19	15-May-20	18-Mar-20	01-Aug-20	65	
TTA		249	6d		249	21-May-19	19-Mar-20	18-Mar-20	02-Jun-20	58	
C14320	Design and acceptance of TTA Stage 4A	42	6d	0%	42	21-May-19	11-Jul-19	18-Mar-20	12-May-20	247	
C14330	Implementation of TTA - Stage 4A	2	6d	0%	2	18-Mar-20	19-Mar-20	01-Jun-20	02-Jun-20	58	1
Drainage		34	6d		34	20-Mar-20	05-May-20	22-Jun-20	01-Aug-20	74	
C14340	Stormwater SMH6501 to SMH6503	17	6d	0%	17	20-Mar-20	09-Apr-20	22-Jun-20	13-Jul-20	74	1
C14350	Stormwater SMH 6503 to SMH 6502	17	6d	0%	17	14-Apr-20	05-May-20	14-Jul-20	01-Aug-20	74	1
Roadworks		24	6d		24	20-Mar-20	21-Apr-20	03-Jun-20	02-Jul-20	58	
C14360	Roadworks at Po Shun Road north and west of interchange	24	6d	0%	24	20-Mar-20	21-Apr-20	03-Jun-20	02-Jul-20	58	
Footbridge superstructure		38	6d		38	26-Mar-20	15-May-20	25-Mar-20	14-May-20	-1	
C14280	Cure and prestress Portion 2 (Stage 1 stressing)	31	6d	0%	31	03-Apr-20	15-May-20	02-Apr-20	14-May-20	-1	1
C14300	Deck structure Portion 0 (Pier 04)	21	6d	0%	21	26-Mar-20	23-Apr-20	25-Mar-20	22-Apr-20	-1	
TTA Stage 4B		415	6d		415	11-Jul-19	30-Nov-20	23-Apr-20	28-Nov-20	-1	
TTA		233	6d		233	11-Jul-19	23-Apr-20	13-May-20	04-Jul-20	58	
C14430	Design and acceptance of TTA Stage 4B	42	6d	0%	42	11-Jul-19	29-Aug-19	13-May-20	02-Jul-20	247	
C14440	Implementation of TTA - Stage 4B	2	6d	0%	2	22-Apr-20	23-Apr-20	03-Jul-20	04-Jul-20	58	1
Roadworks		24	6d		24	24-Apr-20	23-May-20	06-Jul-20	01-Aug-20	58	
C14450	Roadworks at Po Shun Road north of interchange	24	6d	0%	24	24-Apr-20	23-May-20	06-Jul-20	01-Aug-20	58	
Footbridge superstructure		182	6d		182	24-Apr-20	30-Nov-20	23-Apr-20	28-Nov-20	-1	
C14370	Bearing Pier 04	3	6d	0%	3	24-Apr-20	27-Apr-20	29-Jul-20	31-Jul-20	78	
C14380	Remove falsework Portion 0 (Pier 04)	6	6d	0%	6	24-Apr-20	02-May-20	23-Nov-20	28-Nov-20	175	
C14390	Deck structure Portion 3a	48	6d	0%	48	24-Apr-20	20-Jun-20	23-Apr-20	19-Jun-20	-1	
C14400	Deck outer section Portion 2	10	6d	0%	10	16-May-20	27-May-20	15-May-20	26-May-20	-1	
C14410	Remove falsework Portion 2	6	6d	0%	6	28-May-20	03-Jun-20	27-May-20	02-Jun-20	-1	
C14420	Falsework Portion 3b	12	6d	0%	12	04-Jun-20	17-Jun-20	03-Jun-20	16-Jun-20	-1	
C14460	Erect steel canopy	150	6d	0%	150	03-Jun-20	30-Nov-20	02-Jun-20	28-Nov-20	-1	
C14470	Cure and prestress Portion 3a (Stage 2 stressing)	31	6d	0%	31	22-Jun-20	29-Jul-20	20-Jun-20	28-Jul-20	-1	1
C14480	Deck outer section Portion 3a	10	6d	0%	10	30-Jul-20	10-Aug-20	11-Aug-20	21-Aug-20	10	
C14490	Deck structure Portion 3a adjacent Portion 0	21	6d	0%	21	30-Jul-20	22-Aug-20	29-Jul-20	21-Aug-20	-1	
C14500	Remove falsework Portion 3a	6	6d	0%	6	24-Aug-20	29-Aug-20	22-Aug-20	28-Aug-20	-1	
C14510	Deck structure Portion 3b	48	6d	0%	48	18-Jun-20	14-Aug-20	17-Jun-20	13-Aug-20	-1	
C14520	Cure and prestress Portion 3b (Stage 3 stressing)	31	6d	0%	31	15-Aug-20	19-Sep-20	14-Aug-20	18-Sep-20	-1	1
C14530	Deck outer section Portion 3b	10	6d	0%	10	21-Sep-20	03-Oct-20	24-Oct-20	05-Nov-20	27	
C14540	Remove falsework Portion 3b	6	6d	0%	6	05-Oct-20	10-Oct-20	23-Nov-20	28-Nov-20	41	
C14550	Falsework Portion 4	12	6d	0%	12	04-Jun-20	17-Jun-20	04-Jul-20	17-Jul-20	24	
C14560	Deck structure Portion 4	36	6d	0%	36	18-Jun-20	31-Jul-20	18-Jul-20	28-Aug-20	24	
C14570	Remove falsework Portion 4	6	6d	0%	6	01-Aug-20	07-Aug-20	29-Aug-20	04-Sep-20	24	
C14580	Falsework Portion 5	12	6d	0%	12	31-Aug-20	12-Sep-20	08-Sep-20	21-Sep-20	7	
C14590	Deck structure Portion 5	36	6d	0%	36	14-Sep-20	28-Oct-20	22-Sep-20	05-Nov-20	7	
C14600	Remove falsework Portion 5	6	6d	0%	6	29-Oct-20	04-Nov-20	23-Nov-20	28-Nov-20	21	
C14610	Falsework Portion 6a	12	6d	0%	12	08-Aug-20	21-Aug-20	08-Sep-20	21-Sep-20	26	
C14620	Deck structure Portion 6a	36	6d	0%	36	21-Sep-20	04-Nov-20	22-Sep-20	05-Nov-20	1	
C14630	Remove falsework Portion 6a	6	6d	0%	6	05-Nov-20	11-Nov-20	23-Nov-20	28-Nov-20	15	
C14640	Falsework Portion 6b	12	6d	0%	12	08-Aug-20	21-Aug-20	05-Sep-20	18-Sep-20	24	
C14650	Bearing Portion 6b	3	6d	0%	3	08-Aug-20	11-Aug-20	19-Sep-20	22-Sep-20	36	
C14660	Deck structure Portion 6b	38	6d	0%	38	21-Sep-20	06-Nov-20	19-Sep-20	05-Nov-20	-1	2
C14670	Remove falsework Portion 6b	6	6d	0%	6	07-Nov-20	13-Nov-20	23-Nov-20	28-Nov-20	13	
C14680	Install fabricated movement joints (4 nos.)	14	6d	0%	14	07-Nov-20	23-Nov-20	06-Nov-20	21-Nov-20	-1	
C14690	Falsework for arch structure and arch cladding	16	6d	0%	16	31-Aug-20	17-Sep-20	29-Aug-20	16-Sep-20	-1	
C14700	Erect arch structure and arch cladding	60	6d	0%	60	18-Sep-20	30-Nov-20	17-Sep-20	28-Nov-20	-1	
C14710	Finishing works	50	6d	0%	50	30-Sep-20	30-Nov-20	29-Sep-20	28-Nov-20	-1	



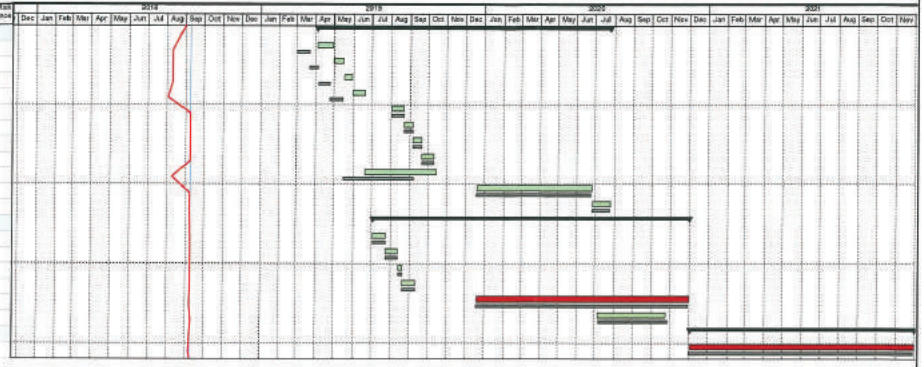
Baseline: Programme of August 2018
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

NE/2017/02 - Tseung Kwan O - Lam Tin Tunnel
Road P2/D4 and Associated Works
Updated Programme (September 2018)

Date	Revision	Checked	Approved
08-Sep-18	RWP-2018-09 (Data date 8-Sep-18)	TC	

NE/2017/02 - Updated Programme (Sep 2018)

Activity ID	Activity Name	Original Duration	Calendar	Activity % Complete	Remaining Duration	Start	Finish	Late Start	Late Finish	Total Float	Time Risk Allowance
Irrigation System		479			479	04-Apr-19	25-Jul-20	24-Jun-19	01-Aug-20	7	
C14720	Details of irrigation system (prepare & submit)	18	6d	0%	18	04-Apr-19*	29-Apr-19	24-Jun-19	15-Jul-19	62	
C14730	Details of irrigation system (review & discuss)	12	6d	0%	12	30-Apr-19	15-May-19	16-Jul-19	29-Jul-19	62	
C14740	Details of irrigation system (resubmit)	12	6d	0%	12	16-May-19	29-May-19	30-Jul-19	12-Aug-19	62	
C14750	Details of irrigation system (accept)	21	7d	0%	21	30-May-19	19-Jun-19	13-Aug-19	02-Sep-19	75	
C14760	MS for irrigation system (prepare & submit)	18	6d	0%	18	01-Aug-19*	21-Aug-19	21-Oct-19	09-Nov-19	66	
C14770	MS for irrigation system (review & discuss)	12	6d	0%	12	22-Aug-19	04-Sep-19	11-Nov-19	23-Nov-19	66	
C14780	MS for irrigation system (resubmit)	12	6d	0%	12	05-Sep-19	19-Sep-19	25-Nov-19	07-Dec-19	66	
C14790	MS for irrigation system (accept)	21	7d	0%	21	20-Sep-19	10-Oct-19	09-Dec-19	29-Dec-19	80	
C14800	Material order and delivery of irrigation system	95	6d	0%	95	20-Jun-19	14-Oct-19	03-Sep-19	28-Dec-19	53	
C14810	Install irrigation system	150	6d	0%	150	20-Dec-19	26-Jun-20	30-Dec-19	04-Jul-20	5	
C14820	Testing and commissioning of irrigation system	24	6d	0%	24	27-Jun-20	25-Jul-20	06-Jul-20	01-Aug-20	6	
Landscaping Softworks		518			518	02-Jul-19	30-Nov-20	10-Oct-19	28-Nov-20	-2	
C14830	MS for landscaping works (prepare & submit)	18	6d	0%	18	02-Jul-19*	22-Jul-19	10-Oct-19	30-Oct-19	83	
C14840	MS for landscaping works (review & discuss)	18	6d	0%	18	23-Jul-19	12-Aug-19	31-Oct-19	20-Nov-19	83	
C14850	MS for landscaping works (resubmit)	6	6d	0%	6	13-Aug-19	19-Aug-19	21-Nov-19	27-Nov-19	83	
C14860	MS for landscaping works (accept)	21	7d	0%	21	20-Aug-19	09-Sep-19	28-Nov-19	18-Dec-19	100	
C14870	Landscaping Softworks (at-grade)	280	6d	0%	280	20-Dec-19	30-Nov-20	19-Dec-19	28-Nov-20	-1	
C14880	Landscaping Softworks (on footbridge)	94	6d	0%	94	06-Jul-20	24-Oct-20	08-Aug-20	28-Nov-20	29	
Establishment Works		365	7d		365	01-Dec-20	30-Nov-21	30-Nov-20	29-Nov-21	-1	
C14890	Establishment Works	365	7d	0%	365	01-Dec-20	30-Nov-21	30-Nov-20	29-Nov-21	-1	



Baseline: Programme of August 2018
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

NE/2017/02 - Tseung Kwan O - Lam Tin Tunnel
Road P2/D4 and Associated Works
Updated Programme (September 2018)

Date	Revision	Checked	Approved
08-Sep-18	RWP-2018-09 (Data date 8-Sep-18)	TC	

Subject: 3 Months Look Ahead Programme

Activities	Oct, 2018	Nov, 2018	Dec, 2018
Construction of Main deck			
Construction of lift shaft			
Bearing installation at Tiu Keng Leng Sports Centre			

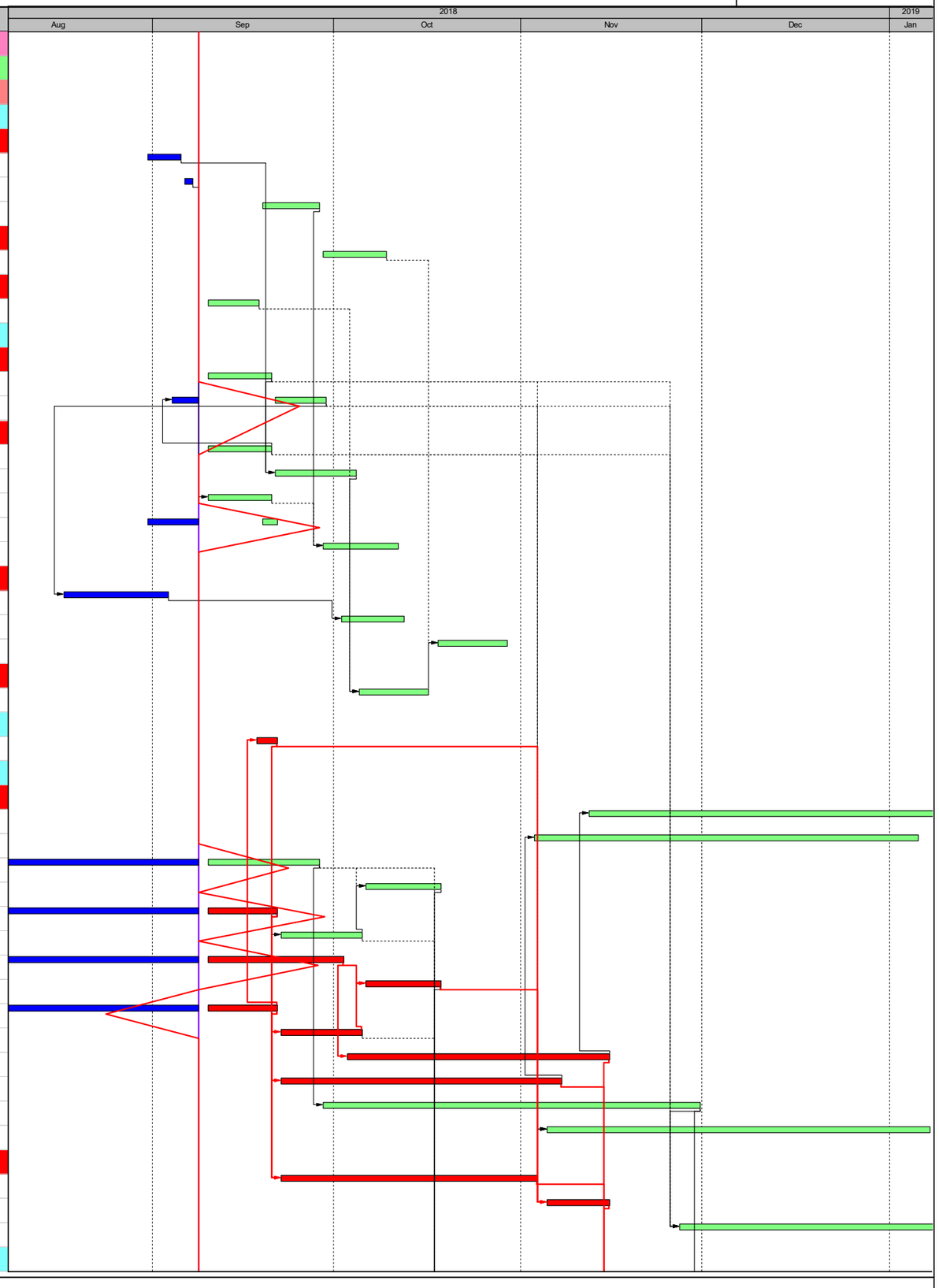
Subject: Construction Programme (Sep, 2018)

Activities	Week 1	Week 2	Week 3	Week 4
Construction of Main deck				
Construction of lift shaft				

NE/2017/01 Tseung Kwan O - Lam Tin Tunnel- Tseung Kwan O Interchange and Associated Works

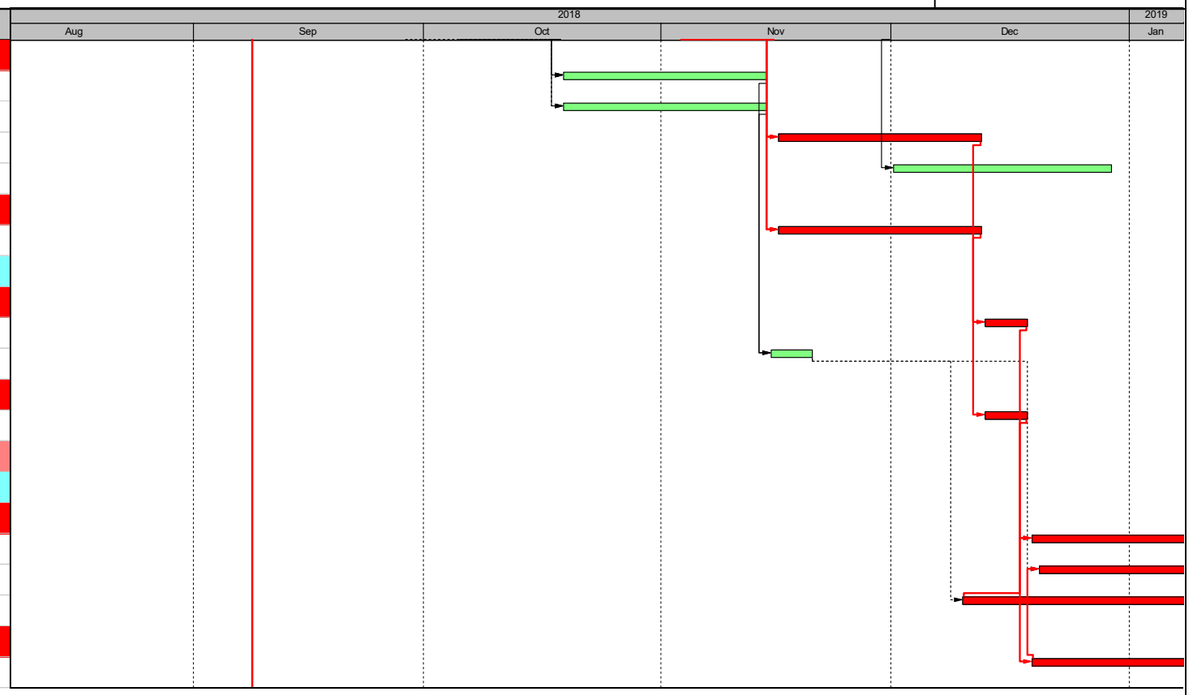
Rolling programme (September 2018 to December 2018)

Activity ID	Activity Name	Original Duration	Start	Finish
Tseung Kwan O Lam Tin Tunnel - Tseung Kwan O Interchange and Associated Works		146	30-Jul-18 A	29-Jan-19
Construction Work		146	30-Jul-18 A	29-Jan-19
Pre-Drilling & Piling Work		146	30-Jul-18 A	29-Jan-19
Temporary Platform erection for Pre-drilling & Piling		49	31-Aug-18 A	09-Oct-18
Bridge S300		41	31-Aug-18 A	28-Sep-18
CON-10100	Temporary Platform Erection & Silt Curtain Installationfor Pier 4F	8	31-Aug-18 A	05-Sep-18 A
CON-10120	Temporary Platform Erection & Silt Curtain Installation for Pier 4G	8	06-Sep-18 A	07-Sep-18 A
CON-10140	Temporary Platform Erection & Silt Curtain Installation for Pier 4H	8	19-Sep-18	28-Sep-18
Bridge S200		8	29-Sep-18	09-Oct-18
CON-10220	Temporary Platform Erection & Silt Curtain Installation for Pier 2D	8	29-Sep-18	09-Oct-18
Bridge S100		8	10-Sep-18	18-Sep-18
CON-10260	Temporary Platform Erection & Silt Curtain Installation for Pier 3C	8	10-Sep-18	18-Sep-18
Pre-drilling		40	17-Aug-18 A	29-Oct-18
Bridge ML		20	04-Sep-18 A	29-Sep-18
CON-10400	Pre-drill 1J Including Plant Mobilisation and Demobilisation (2 nos./Team 3)	10	10-Sep-18	20-Sep-18
CON-10410	Pre-drill 1K Including Plant Mobilisation and Demobilisation (2 nos./Team 2)	10	04-Sep-18 A	29-Sep-18
Bridge S300		26	31-Aug-18 A	11-Oct-18
CON-10430	Pre-drill 4E Including Plant Mobilisation and Demobilisation (2 nos./Team 2)	10	10-Sep-18	20-Sep-18
CON-10450	Pre-drill 4F Including Plant Mobilisation and Demobilisation (2 nos./Team 3)	10	21-Sep-18	04-Oct-18
CON-10470	Pre-drill 4G Including Plant Mobilisation and Demobilisation (2 nos./Team 1)	10	10-Sep-18	20-Sep-18
CON-10480	Pre-drill 4D Including Plant Mobilisation and Demobilisation (2 nos./Team 4)	10	31-Aug-18 A	21-Sep-18
CON-10490	Pre-drill 4H Including Plant Mobilisation and Demobilisation (2 nos./Team 1)	10	29-Sep-18	11-Oct-18
Bridge S200		23	17-Aug-18 A	29-Oct-18
CON-10550	Pre-drill 2H Including Plant Mobilisation and Demobilisation (2 nos./Team 2)	10	17-Aug-18 A	03-Sep-18 A
CON-10560	Pre-drill 2J Including Plant Mobilisation and Demobilisation (2 nos./Team 2)	10	02-Oct-18	12-Oct-18
CON-10570	Pre-drill 2D Including Plant Mobilisation and Demobilisation (2 nos./Team 3)	10	18-Oct-18	29-Oct-18
Bridge S100		10	05-Oct-18	16-Oct-18
CON-10610	Pre-drill 3C Including Plant Mobilisation and Demobilisation (2 nos./Team 3)	10	05-Oct-18	16-Oct-18
Establishment of Bored Pile Machine		4	18-Sep-18	21-Sep-18
CON-10632	Establishment of Piling Plant for Bridge S300 (1st Piling of the Bridge)	4	18-Sep-18	21-Sep-18
Bored Pile Include Fabrication & Delivery of Pile Cage and Casing		146	30-Jul-18 A	29-Jan-19
Bridge ML		133	30-Jul-18 A	14-Jan-19
CON-10640	Bored Pile 1E-N Including Plant Mobilisation and Demobilisation (2 nos. Pile / Team 2)	52	12-Nov-18	14-Jan-19
CON-10650	Bored Pile 1E-S Including Plant Mobilisation and Demobilisation (2 nos. Pile / Team 3)	52	03-Nov-18	05-Jan-19
CON-10660	Bored Pile 1F-N - P1 Casing + Excavation (1 no. Pile / Team 1)	27	31-Jul-18 A	28-Sep-18
CON-10661	Bored Pile 1F-N - P1 Installation of Rebar Cage + Concreting (1 no. Pile / Team 1)	10	06-Oct-18	18-Oct-18
CON-10662	Bored Pile 1F-N - P2 Casing + Excavation(1 no. Pile / Team 3)	27	31-Jul-18 A	21-Sep-18
CON-10663	Bored Pile 1F-N - P2 Installation of Rebar Cage + Concreting (1 no. Pile / Team 3)	10	22-Sep-18	05-Oct-18
CON-10670	Bored Pile 1F-S - P1 Casing + Excavation (1 no. Pile / Team 2)	27	31-Jul-18 A	02-Oct-18
CON-10671	Bored Pile 1F-S - P1 Installation of Rebar Cage + Concreting (1 no. Pile / Team 2)	10	06-Oct-18	18-Oct-18
CON-10672	Bored Pile 1F-S - P2 Casing + Excavation (1 no. Pile / Team 4)	27	30-Jul-18 A	21-Sep-18
CON-10673	Bored Pile 1F-S - P2 Installation of Rebar Cage + Concreting (1 no. Pile / Team 4)	10	22-Sep-18	05-Oct-18
CON-10680	Bored Pile 1G - P1 Including Plant Mobilisation and Demobilisation (1 no. Pile / Team 2)	37	03-Oct-18	15-Nov-18
CON-10681	Bored Pile 1G - P2 Including Plant Mobilisation and Demobilisation(1 no. Pile / Team 3)	37	22-Sep-18	07-Nov-18
CON-10690	Bored Pile 1H Including Plant Mobilisation and Demobilisation (2 nos/ Team 1)	52	29-Sep-18	30-Nov-18
CON-10700	Bored Pile 1J Including Plant Mobilisation and Demobilisation (2 nos. Pile / Team 4)	52	05-Nov-18	07-Jan-19
Bridge S300		105	22-Sep-18	29-Jan-19
CON-10720	Bored Pile 4A Casing + Excavation (1 nos. Pile / Team 4)	34	22-Sep-18	03-Nov-18
CON-10721	Bored Pile 4A Installation of Rebar Cage + Concreting (1 nos. Pile / Team 4)	10	05-Nov-18	15-Nov-18
CON-10760	Bored Pile 4E Including Plant Mobilisation and Demobilisation (2 nos. Pile / Team 1)	52	27-Nov-18	29-Jan-19
Curing and Bored Pile Test (Sonic + Interface Core/Full Core)		60	19-Oct-18	29-Dec-18



Milestone | Works | Critical Works | Actual | Actual Progress of Regular Submission | BL Milestone

Activity ID	Activity Name	Original Duration	Start	Finish
Bridge ML		60	19-Oct-18	29-Dec-18
CON-10940	Curing and Bored Pile Test (Sonic + Full Core/Interface Core) 1F-N Including Plant Mobilisation and Demobilisation	23	19-Oct-18	14-Nov-18
CON-10950	Curing and Bored Pile Test (Sonic + Full Core/Interface Core) 1F-S Including Plant Mobilisation and Demobilisation	23	19-Oct-18	14-Nov-18
CON-10960	Curing and Bored Pile Test (Sonic + Full Core/Interface Core) 1G Including Plant Mobilisation and Demobilisation	23	16-Nov-18	12-Dec-18
CON-10990	Curing and Bored Pile Test (Sonic + Full Core/Interface Core) 1H Including Plant Mobilisation and Demobilisation	23	01-Dec-18	29-Dec-18
Bridge S300		23	16-Nov-18	12-Dec-18
CON-11020	Curing and Bored Pile Test (Sonic + Full Core/Interface Core) 4A Including Plant Mobilisation and Demobilisation	23	16-Nov-18	12-Dec-18
Removal of Temp. Working platform		29	15-Nov-18	18-Dec-18
Bridge ML		29	15-Nov-18	18-Dec-18
CON-11240	Removal of Temporary Platform Erection for Pier 1GN & 1GS	5	13-Dec-18	18-Dec-18
CON-11250	Removal of Temporary Platform Erection for Pier 1F-N & 1F-S	5	15-Nov-18	20-Nov-18
Bridge S300		5	13-Dec-18	18-Dec-18
CON-11300	Removal of Temporary Platform Erection for Pier 4A	5	13-Dec-18	18-Dec-18
Pile Cap Construction		36	10-Dec-18	23-Jan-19
Installation of Precast Shell		36	10-Dec-18	23-Jan-19
Bridge ML		33	10-Dec-18	19-Jan-19
CON-11520	Install Precast Shell for Pier 1G (1 no. Shell / Team 2)	24	19-Dec-18	18-Jan-19
CON-11530	Install Precast Shell forPier 1F-N (1 nos. Shell / Team 1)	24	20-Dec-18	19-Jan-19
CON-11540	Install Precast Shell for Pier 1F-S (1 nos. Shell / Team 2)	28	10-Dec-18	14-Jan-19
Bridge S300		28	19-Dec-18	23-Jan-19
CON-11600	Install Precast Shell for Pier 4A (1 nos. Shell / Team 1)	28	19-Dec-18	23-Jan-19



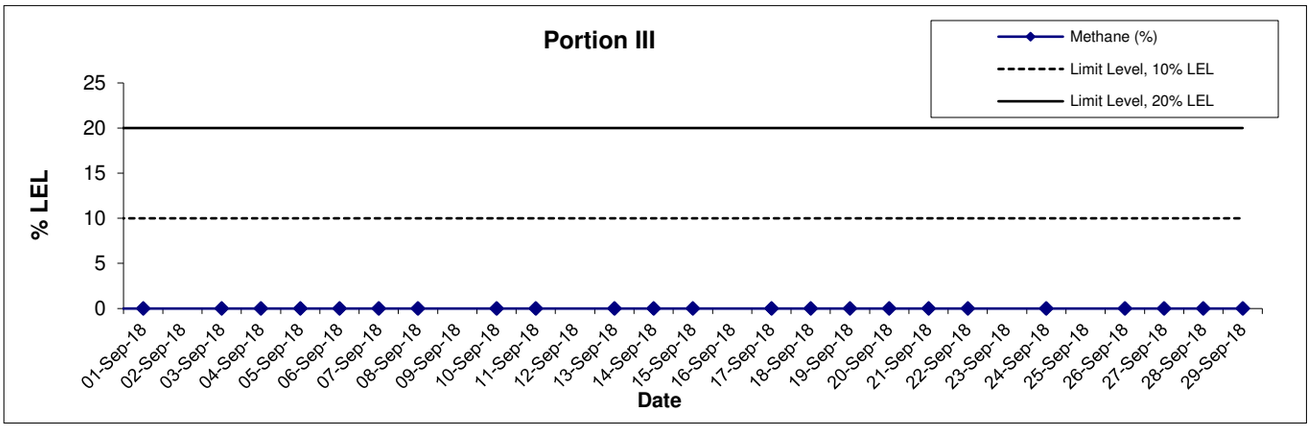
Milestone | Works | Critical Works | Actual | Actual Progress of Regular Submission | BL Milestone

APPENDIX R
RECORD OF LANDFILL GAS MONITORING BY CONTRACTOR

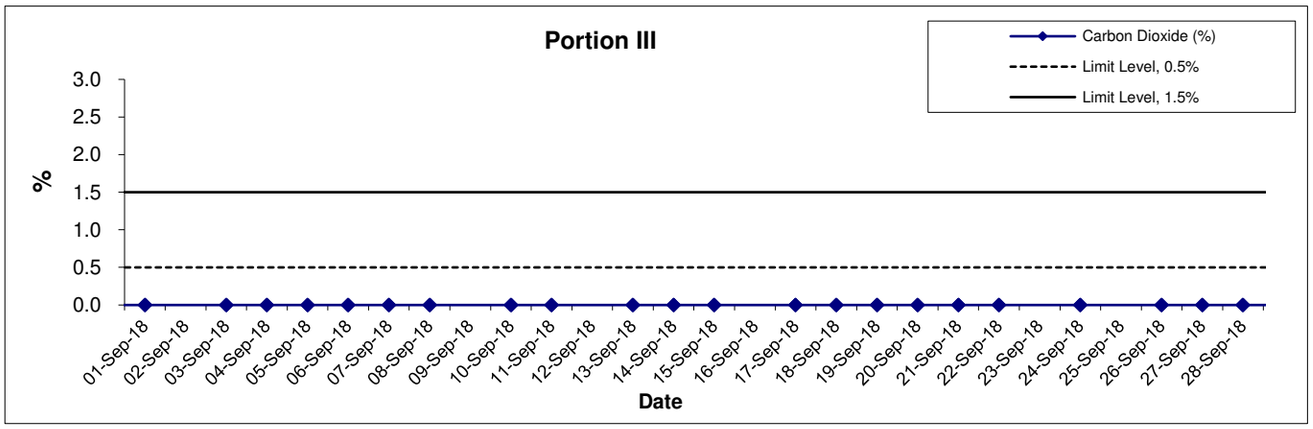
APPENDIX R - RECORD OF LANDFILL GAS MONITORING BY THE CONTRACTOR

Location	Date of Measurement	Sampling time	Weather Condition	Temperature (°C)	Methane (%)	Carbon dioxide (%)	Oxygen (%)
Portion III	1-Sep-18	08:30	Rainy	25	0	0	20.9
	1-Sep-18	13:02	Rainy	28	0	0	20.9
	3-Sep-18	08:30	Cloudy	25	0	0	20.9
	3-Sep-18	13:00	Cloudy	30	0	0	20.9
	4-Sep-18	08:30	Sunny	27	0	0	20.9
	4-Sep-18	13:00	Sunny	32	0	0	20.9
	5-Sep-18	08:30	Sunny	27	0	0	20.9
	5-Sep-18	13:01	Sunny	33	0	0	20.9
	6-Sep-18	08:30	Sunny	28	0	0	20.9
	6-Sep-18	13:00	Sunny	32	0	0	20.9
	7-Sep-18	08:30	Rainy	28	0	0	20.9
	7-Sep-18	13:00	Rainy	32	0	0	20.9
	8-Sep-18	08:30	Rainy	25	0	0	20.9
	8-Sep-18	13:03	Rainy	30	0	0	20.9
	10-Sep-18	08:30	Sunny	24	0	0	20.9
	10-Sep-18	13:01	Cloudy	29	0	0	20.9
	11-Sep-18	08:30	Sunny	25	0	0	20.9
	11-Sep-18	13:00	Sunny	33	0	0	20.9
	13-Sep-18	08:30	Cloudy	26	0	0	20.9
	13-Sep-18	13:01	Cloudy	31	0	0	20.9
	14-Sep-18	08:28	Sunny	26	0	0	20.9
	14-Sep-18	13:04	Sunny	32	0	0	20.9
	15-Sep-18	08:30	Cloudy	26	0	0	20.9
	15-Sep-18	13:00	Cloudy	35	0	0	20.9
	17-Sep-18	10:00	Rainy	25	0	0	20.9
	17-Sep-18	13:00	Cloudy	31	0	0	20.9
	18-Sep-18	08:30	Cloudy	25	0	0	20.9
	18-Sep-18	13:02	Cloudy	32	0	0	20.9
	19-Sep-18	08:30	Sunny	26	0	0	20.9
	19-Sep-18	13:00	Sunny	32	0	0	20.9
	20-Sep-18	08:30	Sunny	27	0	0	20.9
	20-Sep-18	13:00	Sunny	32	0	0	20.9
	21-Sep-18	08:30	Sunny	27	0	0	20.9
	21-Sep-18	13:02	Sunny	32	0	0	20.9
	22-Sep-18	08:30	Sunny	27	0	0	20.9
	22-Sep-18	13:02	Sunny	34	0	0	20.9
	24-Sep-18	08:30	Rainy	24	0	0	20.9
	24-Sep-18	13:01	Rainy	30	0	0	20.9
	26-Sep-18	08:30	Cloudy	24	0	0	20.9
	26-Sep-18	13:03	Cloudy	29	0	0	20.9
	27-Sep-18	08:30	Cloudy	26	0	0	20.9
	27-Sep-18	13:01	Cloudy	30	0	0	20.9
	28-Sep-18	08:30	Sunny	25	0	0	20.9
	28-Sep-18	13:05	Sunny	31	0	0	20.9
	29-Sep-18	08:30	Sunny	24	0	0	20.9
	29-Sep-18	13:04	Sunny	31	0	0	20.9

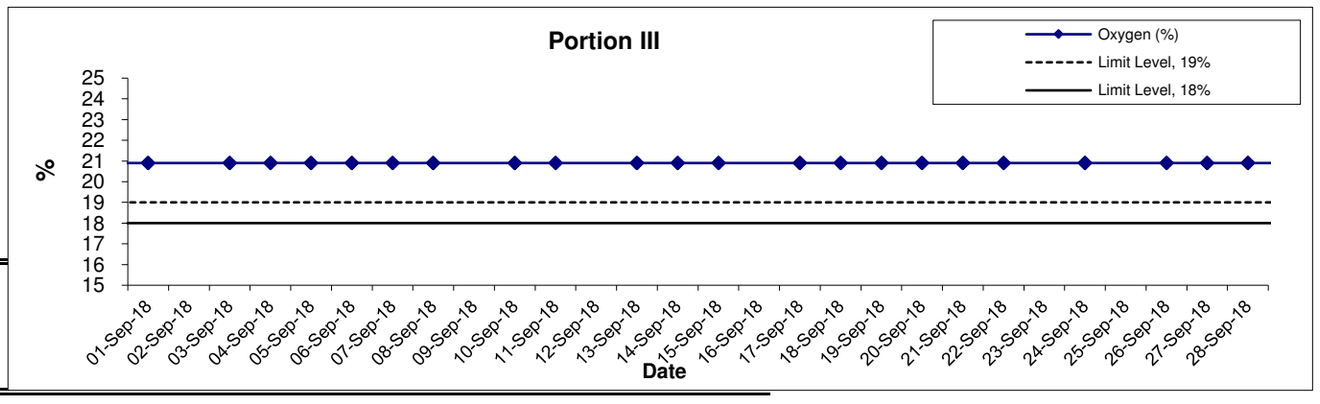
Methane



Carbon Dioxide



Oxygen



Title		Scale	Project
Agreement No. CE 59/2015 (EP) Environmental Team for Tseung Kwan O - Lam Tin Tunnel – Design and Construction		N.T.S	No. MA16034
Graphical Presentation of Landfill Gas Measurement		Date Sep 18	Appendix R

CINOTECH

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: 09
Date: 28 July 2018

Noise Mitigation Plan

Document No: CSF/0/0008E
Revision: 09
Date: 28 July 2018

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

Noise Mitigation Plan

Document No: CSF/0/0008E
Revision: 09
Date: 28 July 2018

Checked by:

Position	Signature	Name	Date

Prepared by:

Environmental Officer		Gary Fung	28 July 2018

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 9 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.

.

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</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 (Road P2 Underpass (Piling)) (Stage 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 (Road P2 Underpass (ELS))	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
	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 (Road & Drainage Works) (Stage 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 (Road & Drainage Works) (Stage 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 V (Road P2 Underpass (Piling)) (Stage 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 VI Installation of Dewatering System	Drill Rig, Rotary Type (Diesel)	CNP 072	Noise Barrier	-5
	Air Compressor	CNP 002	Noise Barrier	-5
Portion VI (Road P2 Underpass (Piling)) (Stage 1 & 2)	Drill Rig, Rotary Type (Diesel)	CNP 072	Noise Barrier	-5
	Air Compressor	CNP 002	Noise Barrier	-5

Portion VII (Road P2 Underpass, U Trough (Piling))	Crane (240 kw) (105T)	BS C4/52	Noise Barrier	-5
	Drill Rig, Rotary Type (Diesel)	CNP 072	Noise Barrier	-5
	Air Compressor	CNP 002	Noise Barrier	-5
	Excavator (223 kw) (40T)	BS C4/63	Noise Barrier	-5
	Concrete Lorry Mixer (6 m^3)	BS D6/33	Noise Barrier	-5
	Water pump, submersible (electric)	CNP 283	Noise Barrier	-5

Portion VII (Road P2 Underpass, U Trough (ELS))	Crane (240 kw) (105T)	BS C4/52	Noise Barrier	-5
	Generator, Silenced,<=75 dB(A) at 7m	CNP102	Noise Barrier	-5
	Breaker, excavator mounted (hydraulic)	CNP 028	Acoustic box / Noise Barrier (SilentUp)	-10 / -11.7
	Piling, Vibration Hammer	CNP 172	Noise Barrier	-5
	Power pack (diesel)	CNP 174	Noise Barrier	-5
	Excavator (223 kw) (40T)	BS C4/63	Noise Barrier	-5
	Dump Truck	CNP 068	Noise Barrier	-5
	Water pump, submersible (electric)	CNP 283	Noise Barrier	-5
Portion VII (Road & Drainage Works)	Crane (240 kw) (105T)	BS C4/52	Noise Barrier	-5
	Excavator (223 kw) (40T)	BS C4/63	Noise Barrier	-5
	Concrete Lorry Mixer (6 m^3)	BS D6/33	Noise Barrier	-5
	Water pump, submersible (electric)	CNP 283	Noise Barrier	-5
	Road Roller	CNP 185	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 IX (Marine Ground Treatment)	Band Drain Machine (hydarulic Vibratory lance starting up)	BS D4/107a	Noise Barrier	-5
	Excavator (223 kw) (40T)	BS C4/63	Noise Barrier	-5
Portion IX (Road P2 Underpass, U Trough (Piling)) (Stage 1 -3)	Drill Rig, Rotary Type (Diesel)	CNP 072	Noise Barrier	-5
Portion IX (Road P2 Underpass, U Trough (Piling)) (Stage 4)	Piling, Large Diameter Bored, Reverse Circulation Drill	CNP 166	Noise Barrier	-5
Area A	Breaker, excavator mounted (hydraulic)	CNP 028	Noise Barrier	-5

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 -74 (49-75)*	No
N5072	CM7	Block 7, Ocean Shores	75	62 -70 (48-69)*	No
N7603	CM8	Tower 6, Park Central	75	60 -71 (43-70)*	No

*() The predicted cumulative noise levels from EIA report

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.

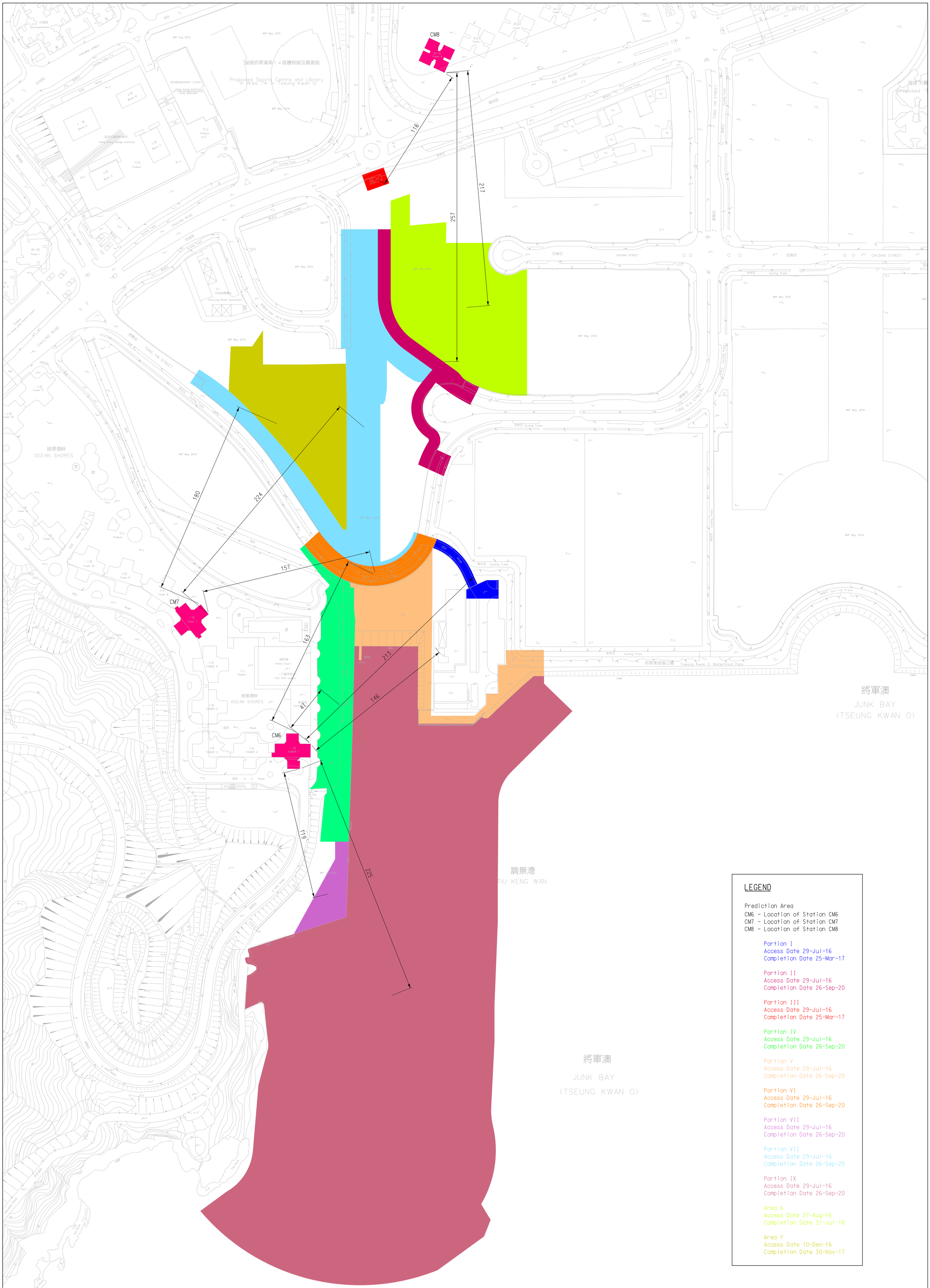
Where necessary, further review and updated will be performed during the construction and operation phases and liaison with affected parties is recommended to minimize the construction and operation phases traffic noise impacts as far as practicable.

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



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

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

CHUNG STREET

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

Tseung Kwan O Waterfront Park

將軍澳海濱公園

維景灣畔

OCEAN SHORES

將軍澳

JUNK BAY

(TSEUNG KWAN O)

調景灣

TIU KENG WAN

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

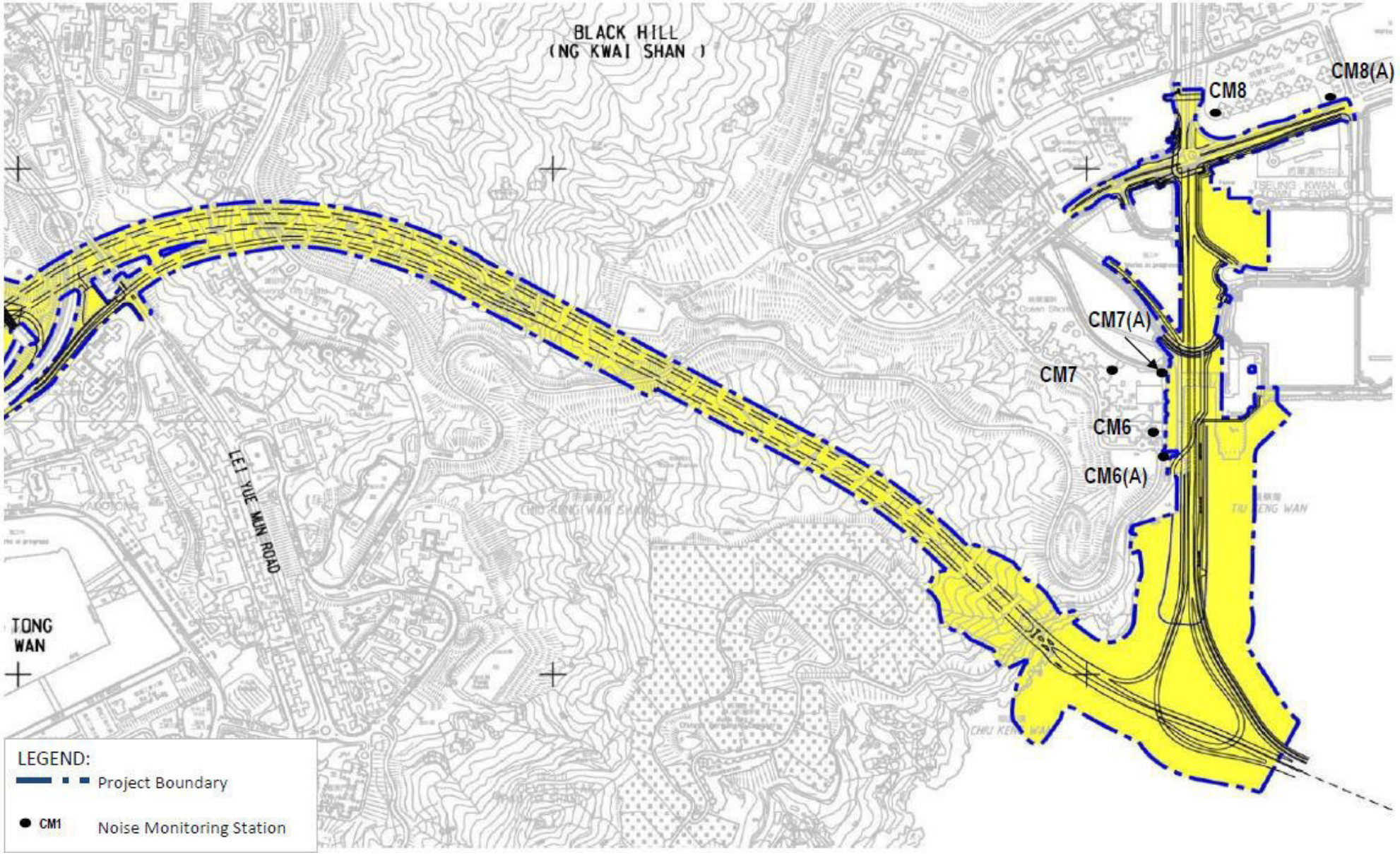
Portion VII
Access Date 29-Jul-16
Compietion Date 26-Sep-20

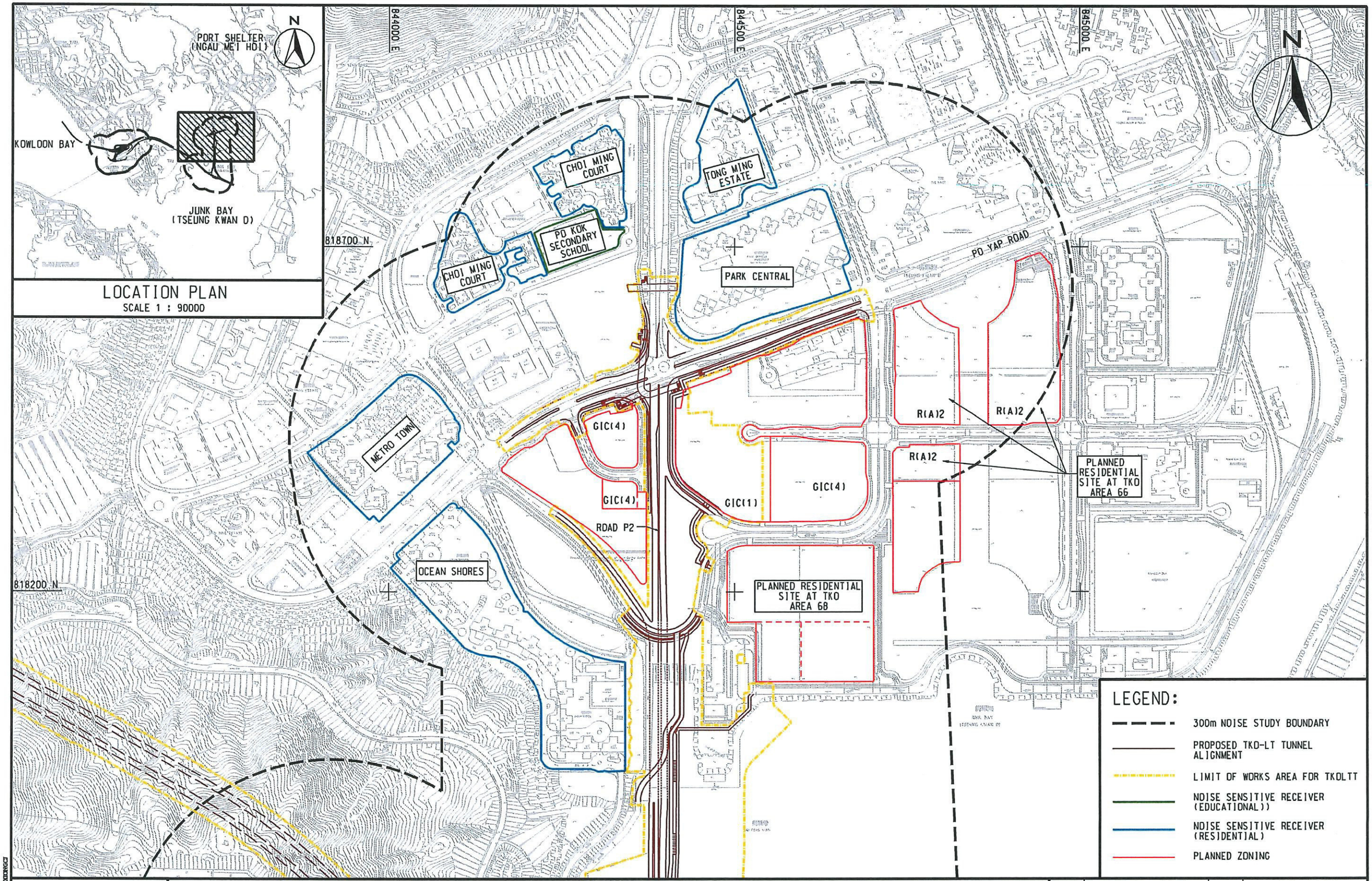
Portion IX
Access Date 29-Jul-16
Compietion Date 26-Sep-20

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 Date by: 24/01/2013 XDENGCJ

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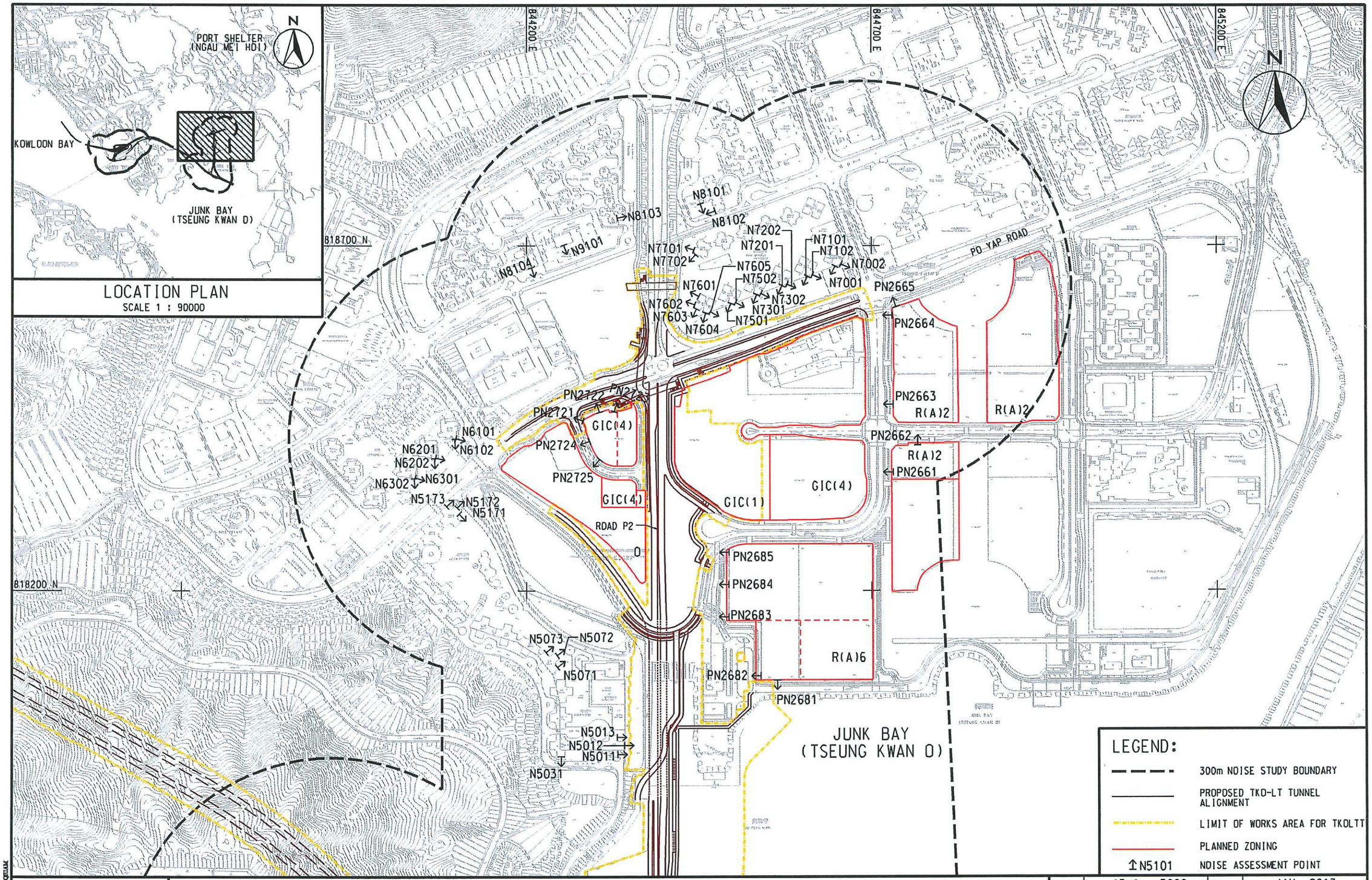

AECOM

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 : 1/28/2013 QUAM

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Appendix B

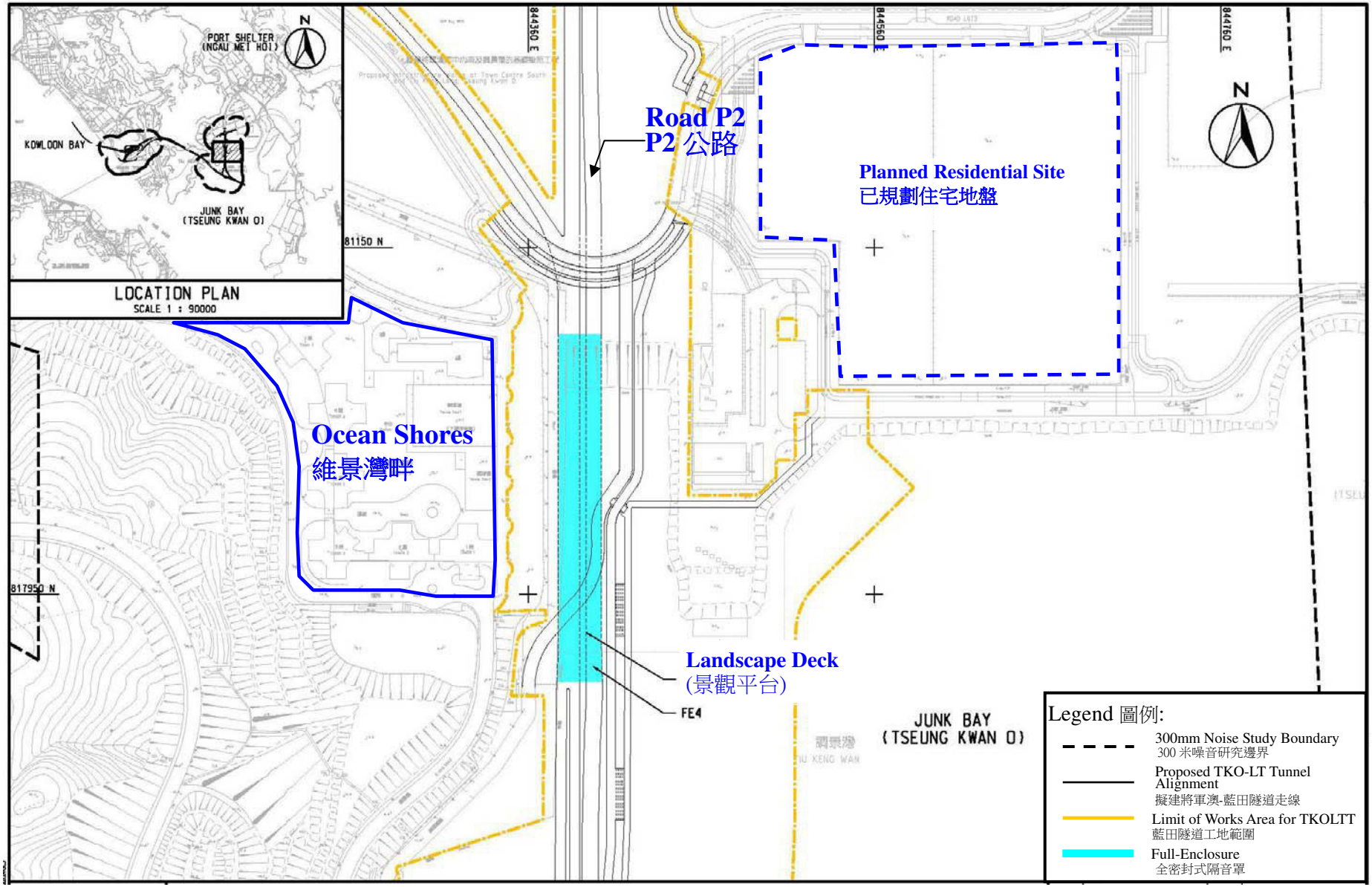
Updated Preliminary Construction Programme

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	25/10/2019
Portion IV	Road P2 Underpass (Piling) (Stage 1)	25/05/2017	31/08/2018
Portion IV	Road P2 Underpass (Piling) (Stage 2)	1/09/2018	30/09/2018
Portion IV	Road P2 Underpass (ELS)	14/08/2017	30/09/2018
Portion IV	Road & Drainage Works (Stage 1)	1/10/2018	31/12/2018
Portion IV	Road & Drainage Works (Stage 2)	1/01/2019	19/11/2020
Portion V	Road P2 Underpass, U-Trough (Piling) (Stage 1)	1/07/2018	31/08/2018
Portion V	Road P2 Underpass, U-Trough (Piling) (Stage 2)	1/09/2018	30/09/2018
Portion V	Road P2 Underpass, U-Trough (ELS)	1/05/2018	30/09/2018
Portion V	Road P2 Underpass, U-Trough (Structure)	1/10/2018	30/06/2019
Portion V	Road & Drainage Works	29/03/2019	6/12/2019
Portion VI	Road P2 Underpass, U-Trough (Removal of Existing Abandoned Box Culvert)	5/02/2018	30/04/2018
Portion VI	Installation of Dewatering System	1/09/2018	31/10/2018
Portion VI	Road P2 Underpass, U-Trough (Piling) (Stage 1)	1/05/2018	31/08/2018
Portion VI	Road P2 Underpass, U-Trough (Piling) (Stage 2)	1/09/2018	30/09/2018
Portion VI	Road P2 Underpass, U-Trough (ELS)	1/06/2018	30/09/2018
Portion VI	Road P2 Underpass, U-Trough (Structure)	1/10/2018	4/06/2019
Portion VI	Road & Drainage Works	29/03/2019	6/12/2019
Portion VII	Road P2 Underpass (Piling)	4/07/2017	16/10/2017
Portion VII	Road P2 Underpass (Piling)	1/04/2018	31/07/2018
Portion VII	Road P2 Underpass (ELS)	1/05/2018	30/09/2018
Portion VII	Road & Drainage Works	7/10/2018	5/12/2020
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	31/10/2018
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	28/02/2019
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	Dredging and Reclamation	11/11/2017	11/05/2019
Portion IX	Marine Ground Treatment	1/08/2018	31/12/2018
Portion IX	Road P2 Underpass, U Trough (Backfilling)	1/08/2018	28/02/2019
Portion IX	Road P2 Underpass, U Trough (Pre Drill) (Stage 1)	1/01/2019	31/03/2019
Portion IX	Road P2 Underpass, U Trough (Pre Drill) (Stage 2)	1/08/2018	31/12/2018
Portion IX	Road P2 Underpass, U Trough (Pre Drill) (Stage 3)	1/04/2019	30/04/2019
Portion IX	Road P2 Underpass, U Trough (Pre Drill) (Stage 4)	1/06/2019	30/06/2019
Portion IX	Road P2 Underpass, U Trough (Pre Drill) (Stage 5)	-	-
Portion IX	Road P2 Underpass, U Trough (Pre Drill) (Stage 6)	1/05/2019	31/05/2019
Portion IX	Road P2 Underpass, U Trough (Piling) (Stage 1)	1/11/2018	31/12/2018
Portion IX	Road P2 Underpass, U Trough (Piling) (Stage 1)	1/02/2019	31/03/2019
Portion IX	Road P2 Underpass, U Trough (Piling) (Stage 1)	1/05/2019	31/05/2019
Portion IX	Road P2 Underpass, U Trough (Piling) (Stage 1)	1/11/2019	30/11/2019
Portion IX	Road P2 Underpass, U Trough (Piling) (Stage 2)	1/01/2019	31/01/2019
Portion IX	Road P2 Underpass, U Trough (Piling) (Stage 2)	1/06/2019	31/10/2019
Portion IX	Road P2 Underpass, U Trough (Piling) (Stage 3)	1/12/2018	31/12/2018
Portion IX	Road P2 Underpass, U Trough (Piling) (Stage 3)	1/04/2019	30/04/2019
Portion IX	Road P2 Underpass, U Trough (Piling) (Stage 4)	1/06/2019	31/08/2019
Portion IX	Road P2 Underpass, U Trough (ELS) (Sheet Piling)	25/01/2019	31/07/2019
Portion IX	Road P2 Underpass, U Trough (ELS) (Welding & Excavation)	1/05/2019	31/12/2019
Portion IX	Road P2 Underpass, U Trough (Structure)	22/10/2019	17/10/2020
Portion IX	Road & Drainage Works	19/10/2020	23/04/2021

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



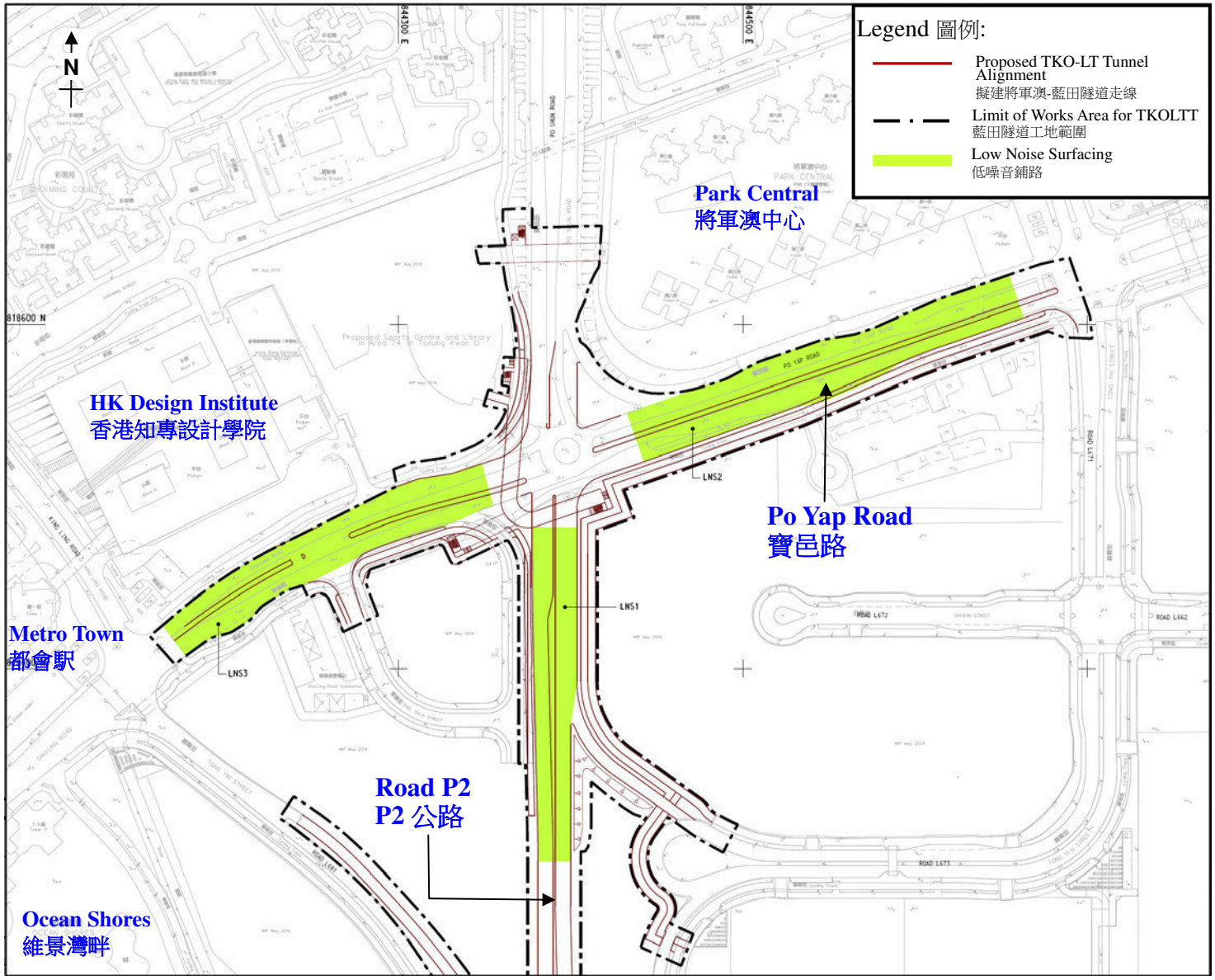
Project Title: Tseung Kwan O – Lam Tin Tunnel and Associated Works
工程項目名稱: 將 軍 澳 – 藍 田 隧 道 及 相 關 工 程
Noise Mitigation Measure at Road P2
P2公路的噪音緩解措施

(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



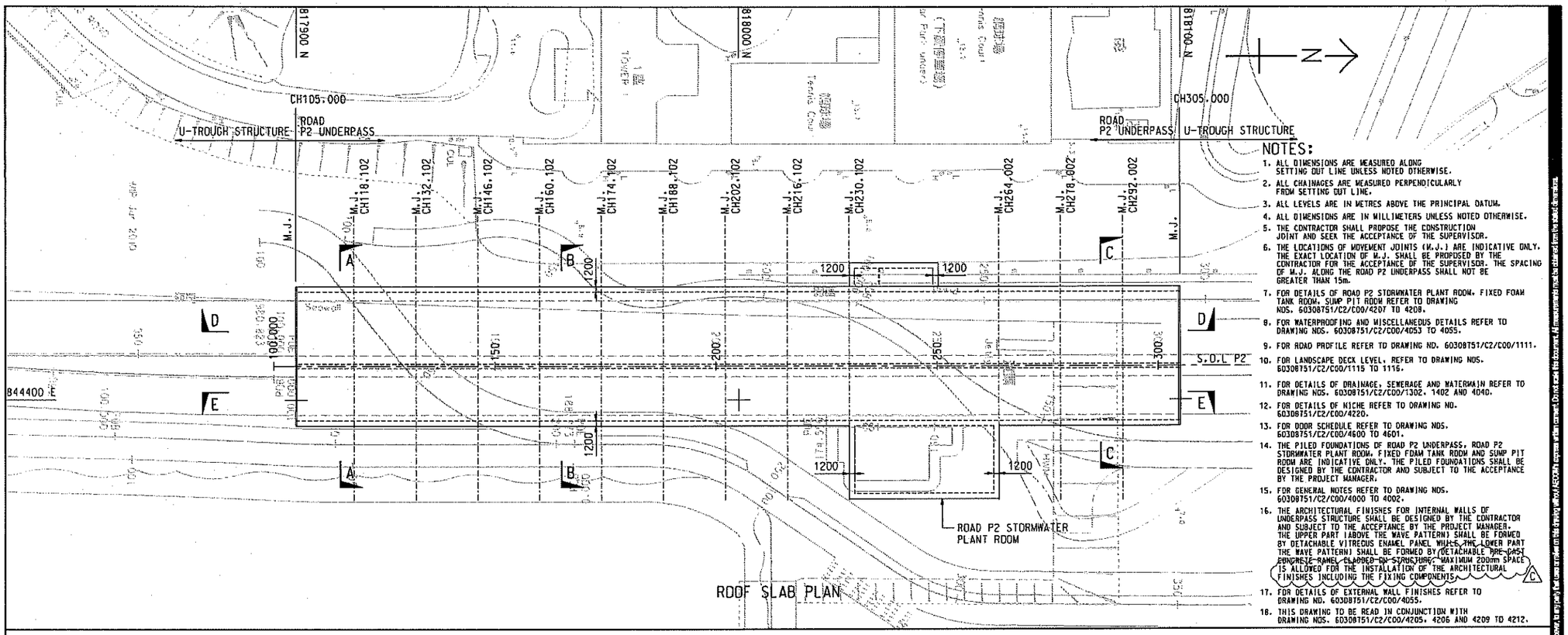
Project Title: Tseung Kwan O – Lam Tin Tunnel and Associated Works
工程項目名稱: 將 軍 澳 – 藍 田 隧 道 及 相 關 工 程
Noise Mitigation Measure at Road P2 and Po Yap Road
P2公路及寶邑路的噪音緩解措施

(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

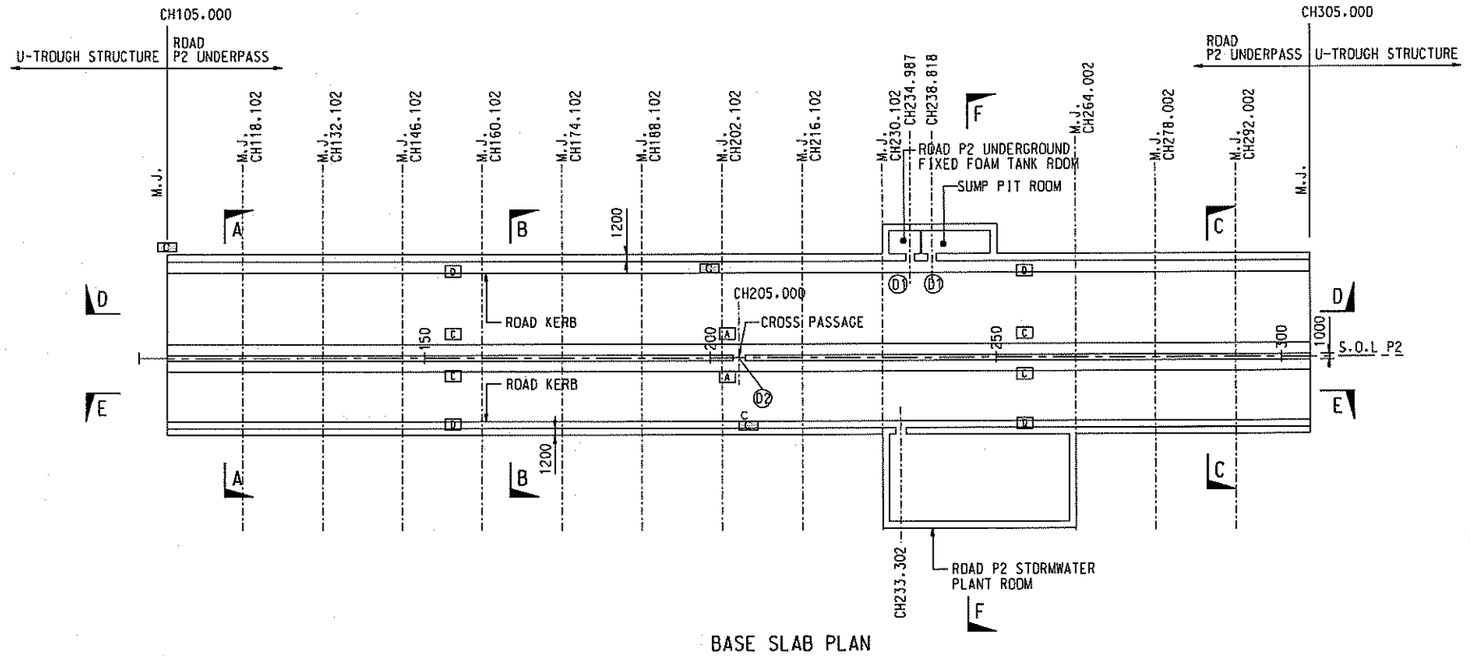
Environmental Permit No. EP-458/2013/C
環境許可證編號: EP-458/2013/C

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
01	DOOR TYPE
CS	TCSS CABINETS

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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土木工程拓展署
Civil Engineering and Development Department

CONSULTANT
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B	APR.16	TENDER ADDENDUM NO. 3	RPCM
A	FEB.16	TENDER ADDENDUM NO. 1	RPCM
-	JAN.16	TENDER DRAWING	RPCM
VR	DATE	DESCRIPTION	CHK.

STATUS

SCALE: A1 1:500
DIMENSION UNIT: MILLIMETRES

KEY PLAN

PROJECT NO.: 60308751
CONTRACT NO.: NE/2015/02

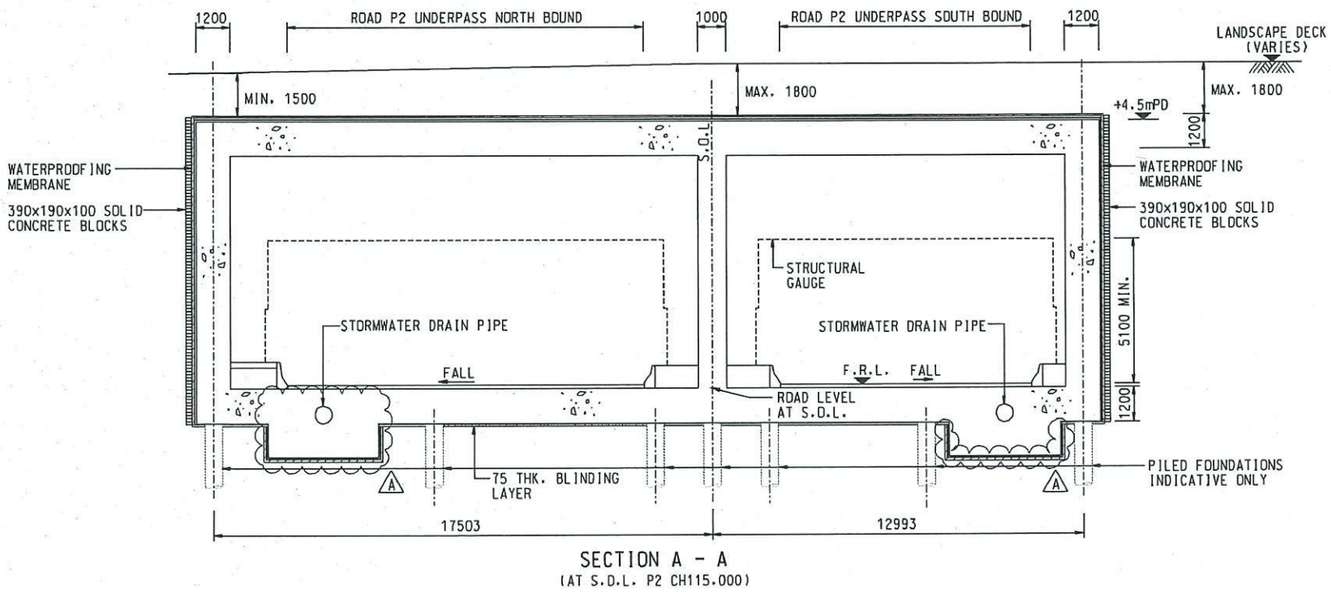
SHEET TITLE
ROAD P2 UNDERPASS - ROOF AND BASE SLAB PLAN

SHEET NUMBER
60308751/C2/C00/4201C

NOTES:

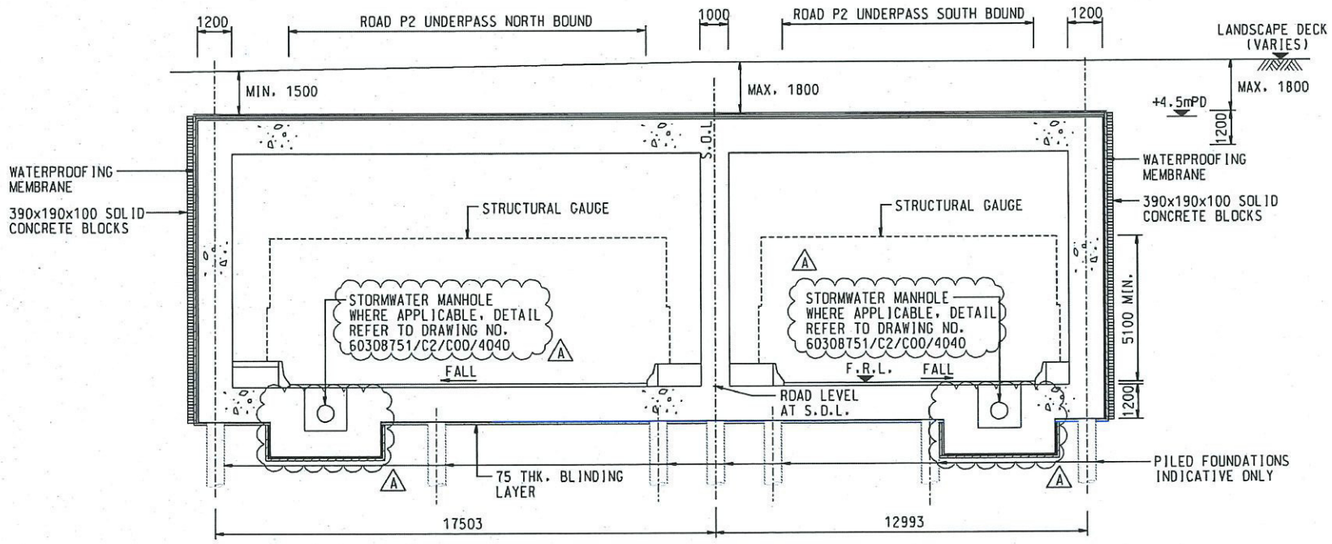
1. FOR NOTES, REFER TO DRAWING NO. 60308751/C2/C00/4201.
2. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING NO. 60308751/C2/C00/4201.

FE4



SECTION A - A
(AT S.D.L. P2 CH115.000)

FE4



SECTION B - B
(AT S.D.L. P2 CH165.000)

Project Management Initials: Designer: ATHH Checked: RPCM Approved: CWN Date: ISO A1 594mm x 841mm

Plot File by: WANGFY2 2016/2/29
PATH: J:\Projects\60308751\Drawing\Contract\C2\4000\C2_C00_4205.dgn

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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-	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

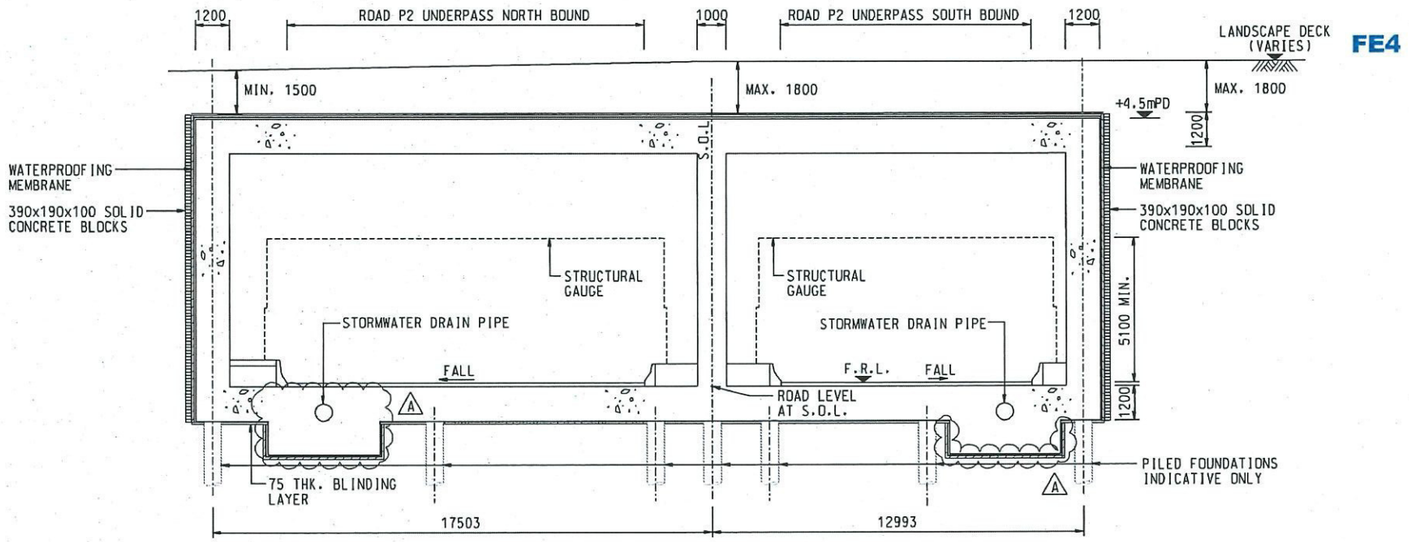
SHEET TITLE
ROAD P2 UNDERPASS - SECTION

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)

A	FEB.16	TENDER ADDENDUM NO.1	RPCM
-	JAN.16	TENDER DRAWING	RPCM
修訂	DATE 日期	DESCRIPTION 內容摘要	CHK 核對

Project Management Initials: Designed: ATHH Checked: RPCM Approved: CWW ISO A1 594mm x 841mm

Plot File by: WANGFY2 2016/2/28
PATH: P:\Projects\60308751\Drawing\Contract\C2\4000\C2_C00_4208.dgn

AECOM

PROJECT 項目
TSEUNG KWAN O - LAM TIN TUNNEL

CONTRACT TITLE
TSEUNG KWAN O - LAM TIN TUNNEL ROAD P2 AND ASSOCIATED WORKS

CLIENT 業主
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Civil Engineering and Development Department

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ISSUE/REVISION 修訂

STATUS 狀況

SCALE 比例
A1 1 : 100

DIMENSION UNIT 尺寸單位
MILLIMETRES

KEY PLAN 索引圖

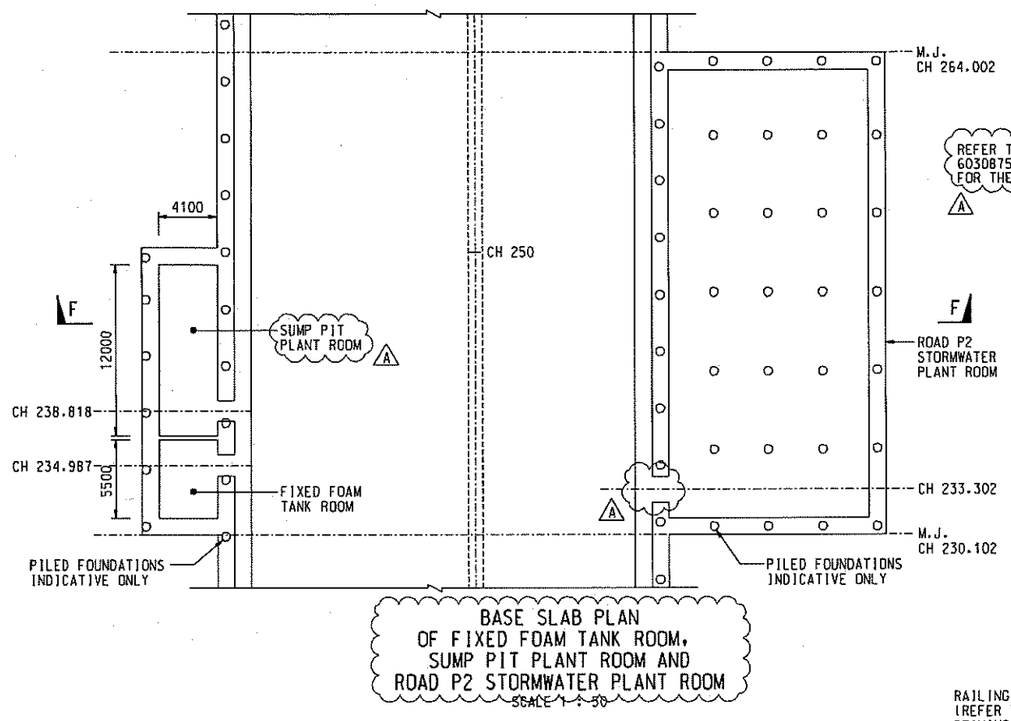
PROJECT NO. 項目編號
60308751

CONTRACT NO. 合約編號
NE/2015/02

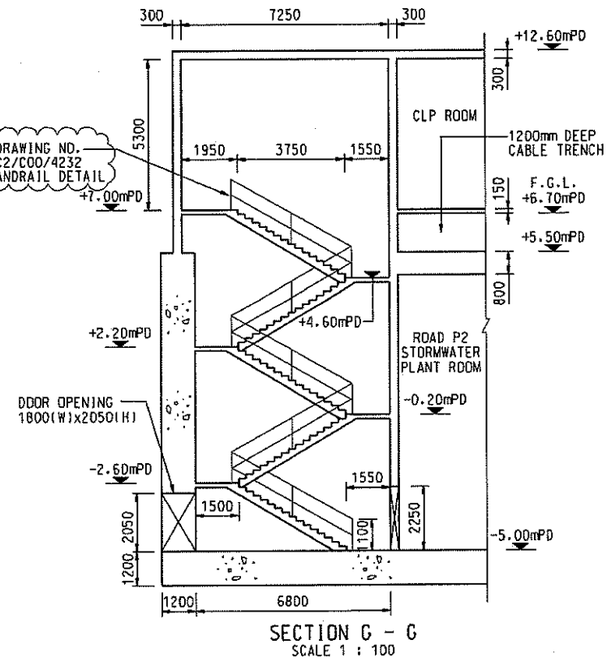
SHEET TITLE 圖紙名稱
ROAD P2 UNDERPASS - SECTION

SHEET 2 OF 2

SHEET NUMBER 圖紙編號
60308751/C2/C00/4208A



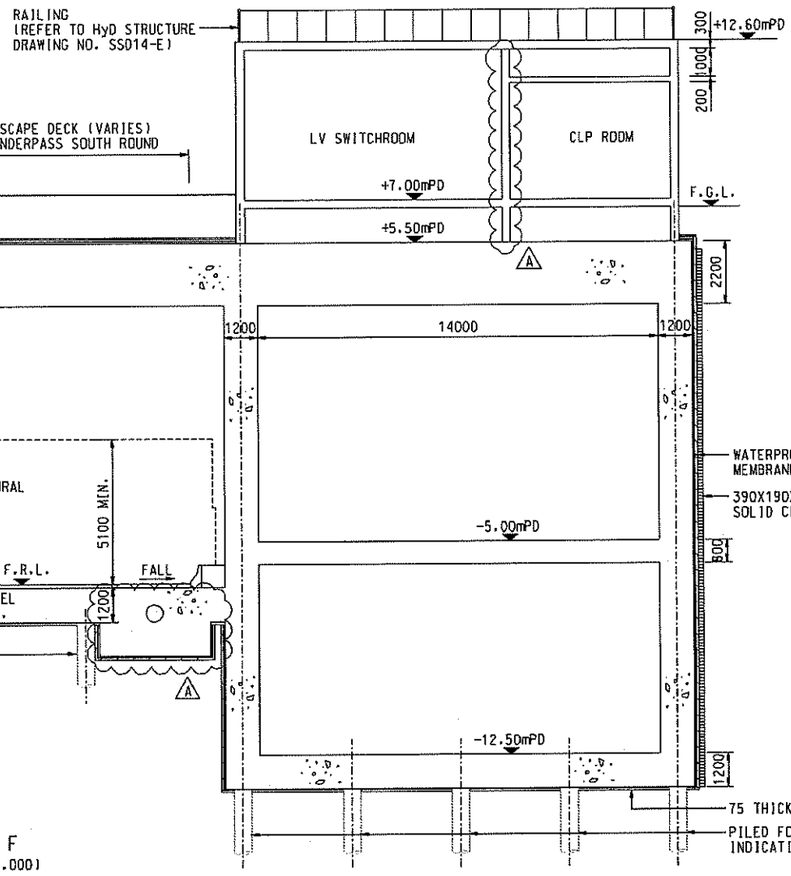
BASE SLAB PLAN
OF FIXED FOAM TANK ROOM,
SUMP PIT PLANT ROOM AND
ROAD P2 STORMWATER PLANT ROOM
SCALE 1 : 50



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.



SECTION F - F
(AT S.O.L. P2 CH245.000)
SCALE 1 : 100

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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VR	DATE	DESCRIPTION	CHK

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

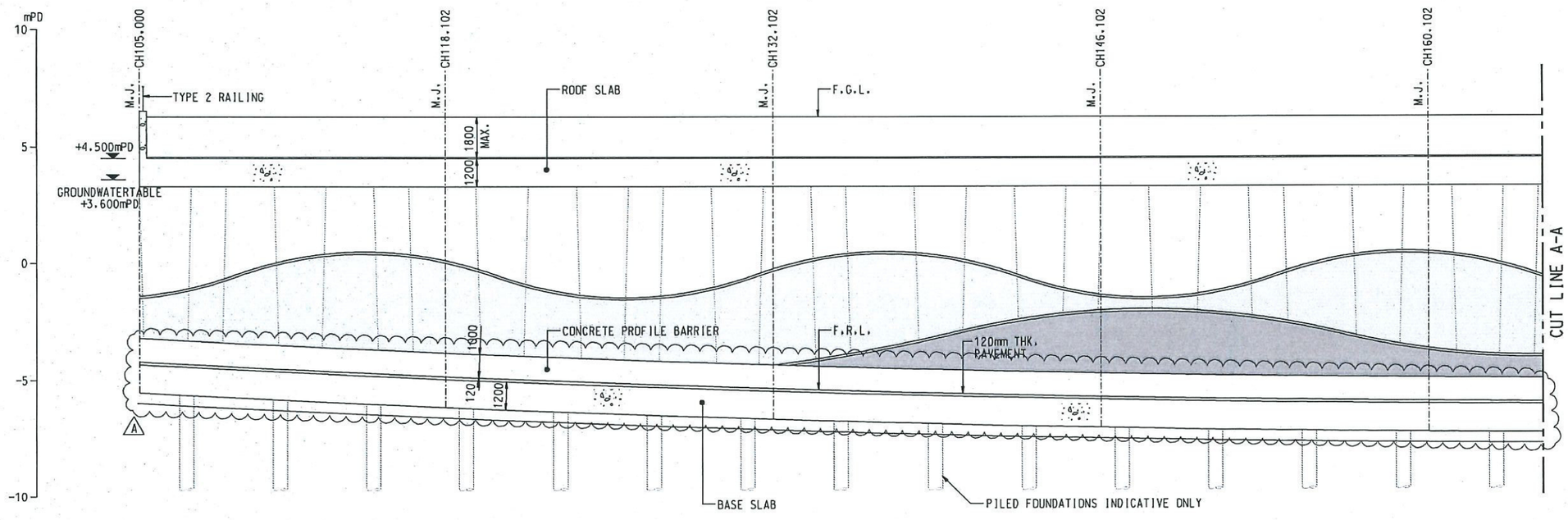
Project Management Initials: Designed: ATHH Checked: RPCM Approved: CWN Drawn: ISO A1 594mm x 841mm

Plot File by: WANGFY2 2016/2/26
PATH: P:\Projects\60308751\Drawing\Contract\C2\4000\C2_C00_4208.dgn

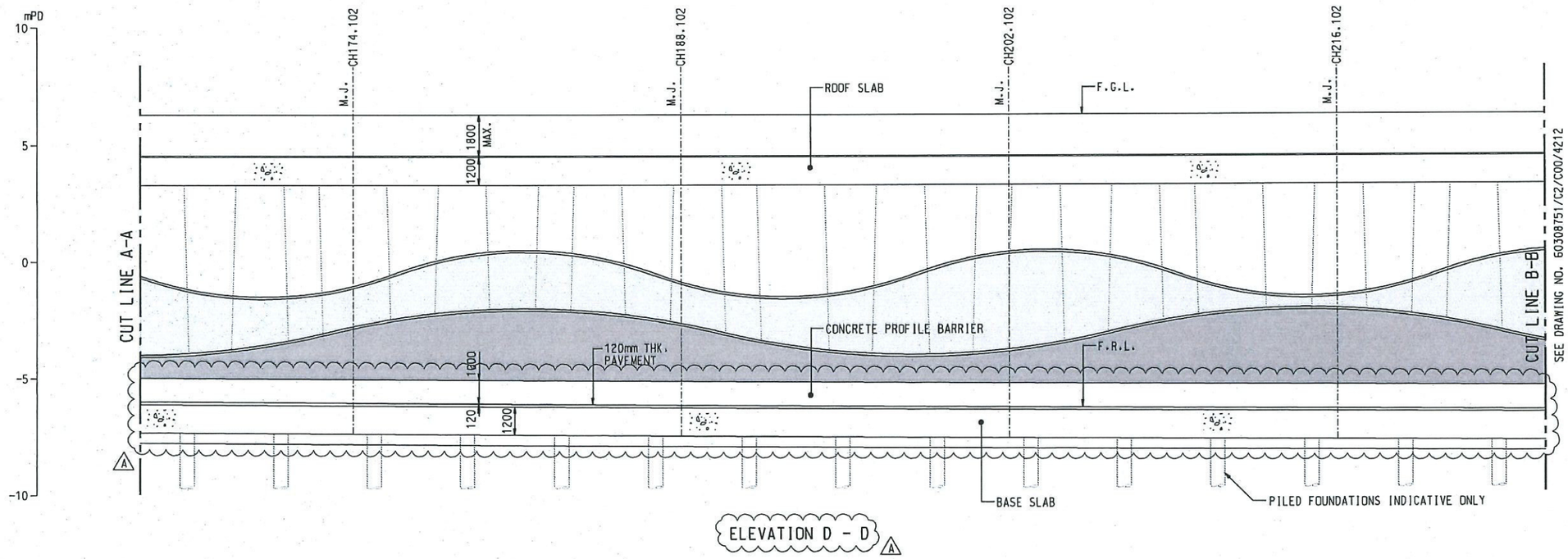
Project Management Initiate: Designer: ATHH Checked: RPCM Approved: CWN ISO A1 594mm x 841mm

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: WANGELW 20160228
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

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I/R	DATE	DESCRIPTION	CHK.

STATUS

SCALE: A1 1 : 100
DIMENSION UNIT: MILLIMETRES

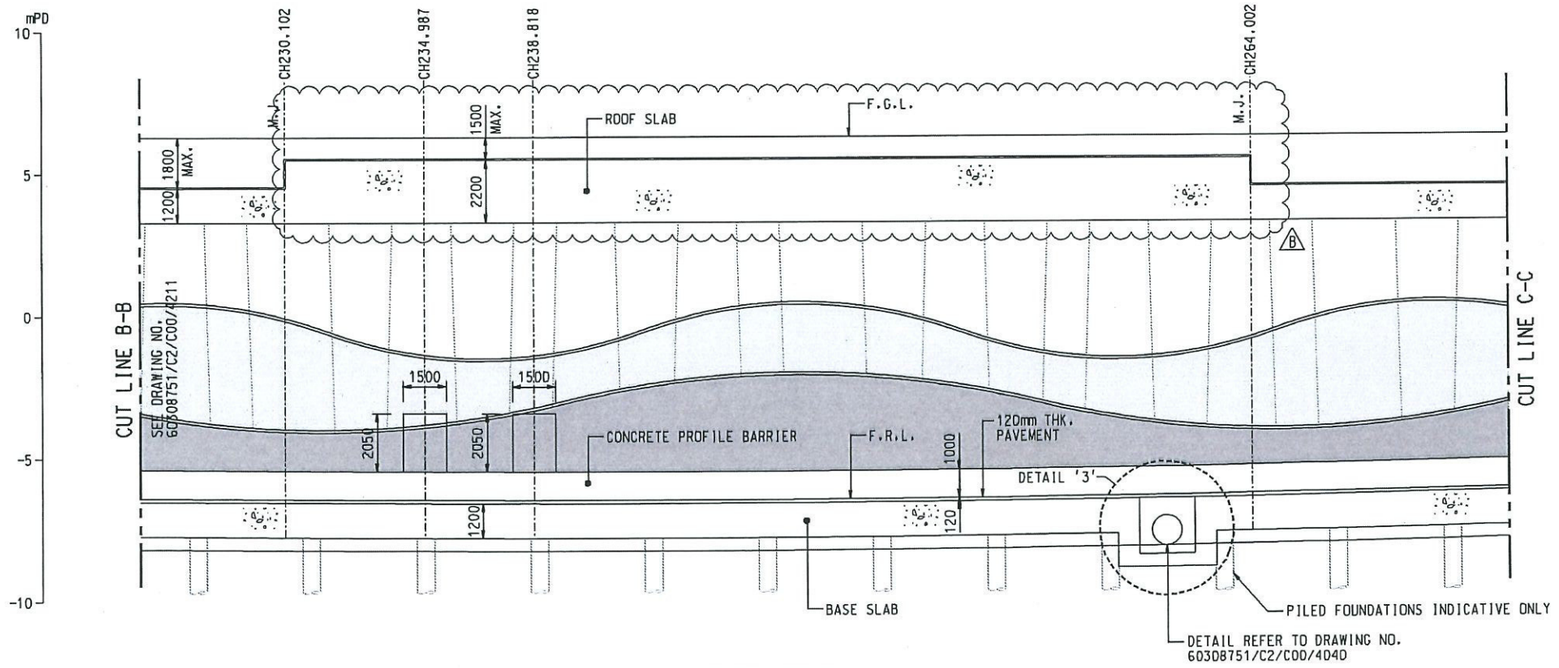
KEY PLAN

PROJECT NO.: 60308751
CONTRACT NO.: NE/2015/02

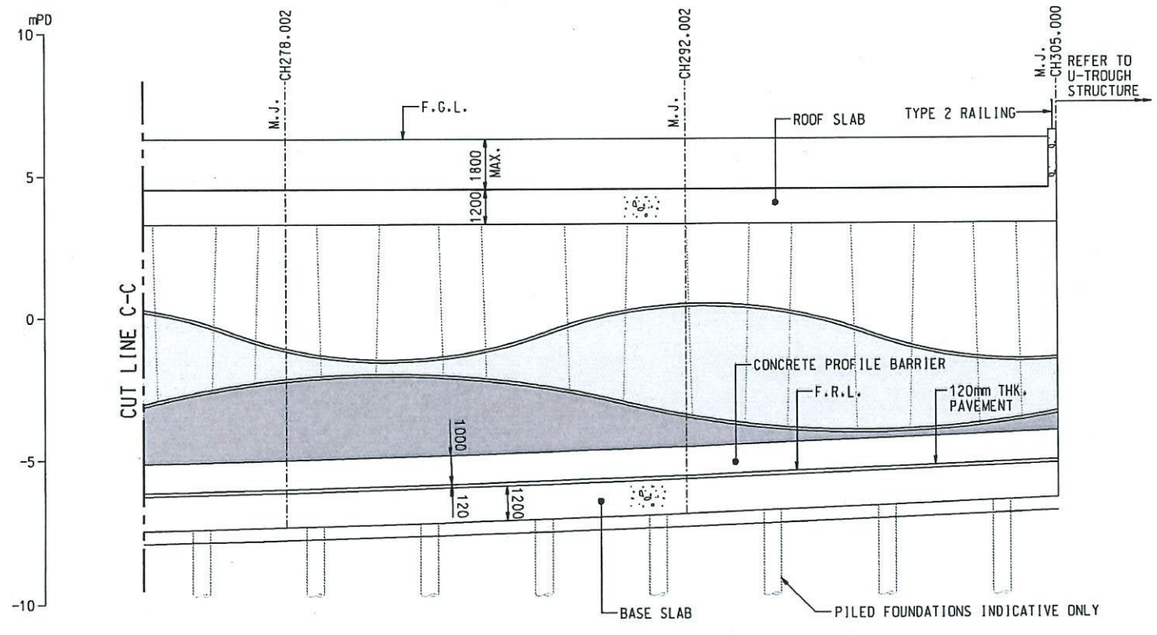
SHEET TITLE
ROAD P2 UNDERPASS - NORTHBOUND ELEVATION

SHEET 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.

Project Management Initials: | Designer: ATHH | Checked: RPCM | Approved: CWM | Date: | ISO A1 594mm x 841mm

Plot File by: WANGPT2 2016/03/18
PATH: P:\Projects\60308751\DRAWINGS\Contract\C2\4000\C2_C00_4210.dgn

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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B	MAR.16	TENDER ADDENDUM NO. 2	RPCM
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-	JAN.16	TENDER DRAWING	RPCM

STATUS

SCALE: A1 1 : 100
DIMENSION UNIT: MILLIMETRES

KEY PLAN

PROJECT NO.: 60308751
CONTRACT NO.: NE/2015/02

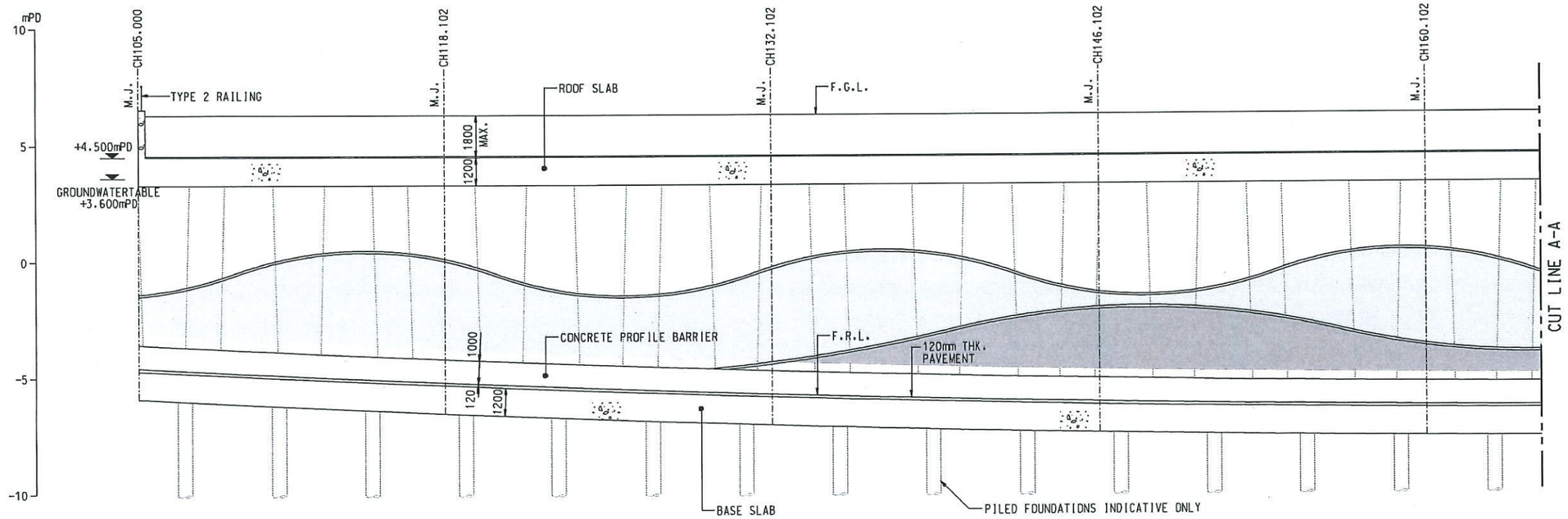
SHEET TITLE
ROAD P2 UNDERPASS - NORTHBOUND ELEVATION

SHEET 2 OF 2

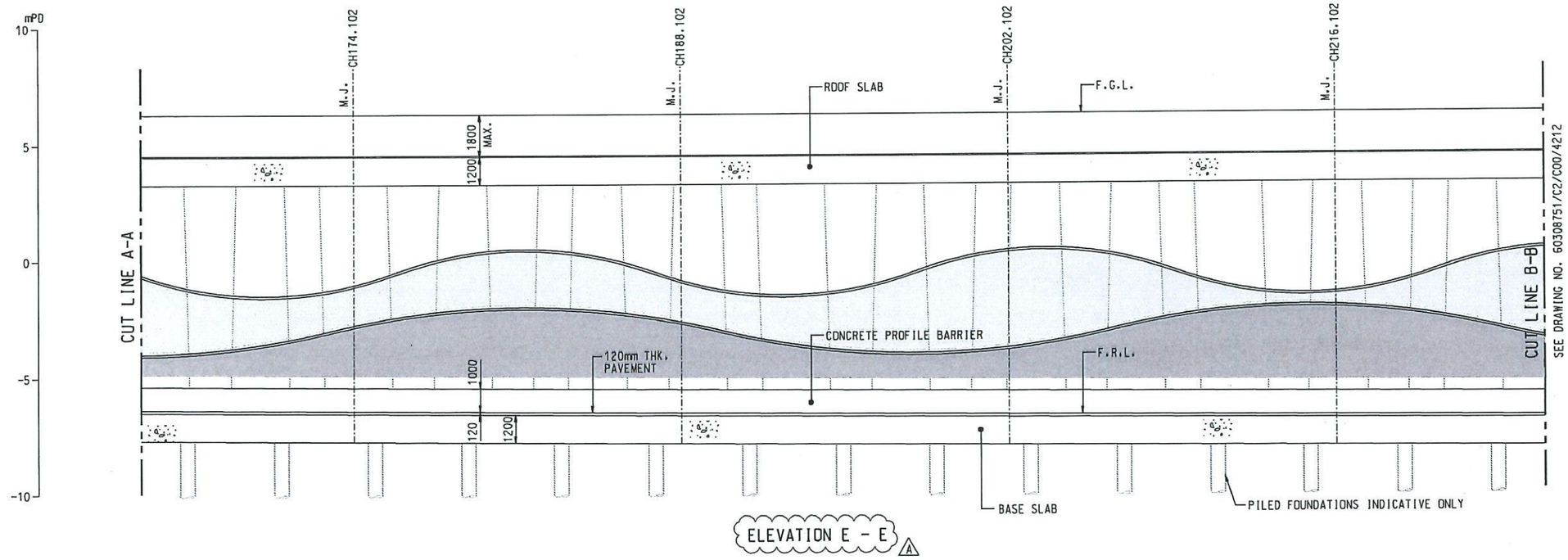
SHEET NUMBER
60308751/C2/C00/4210B

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)

Project Management Initials: Designer: ATHH Checked: RPCM Approved: CWN ISO A1 594mm x 841mm

Plot File by: WANGSLW 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

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-	JAN.16	TENDER DRAWING	RPCM

STATUS

SCALE: A1 1 : 100
DIMENSION UNIT: MILLIMETRES

KEY PLAN

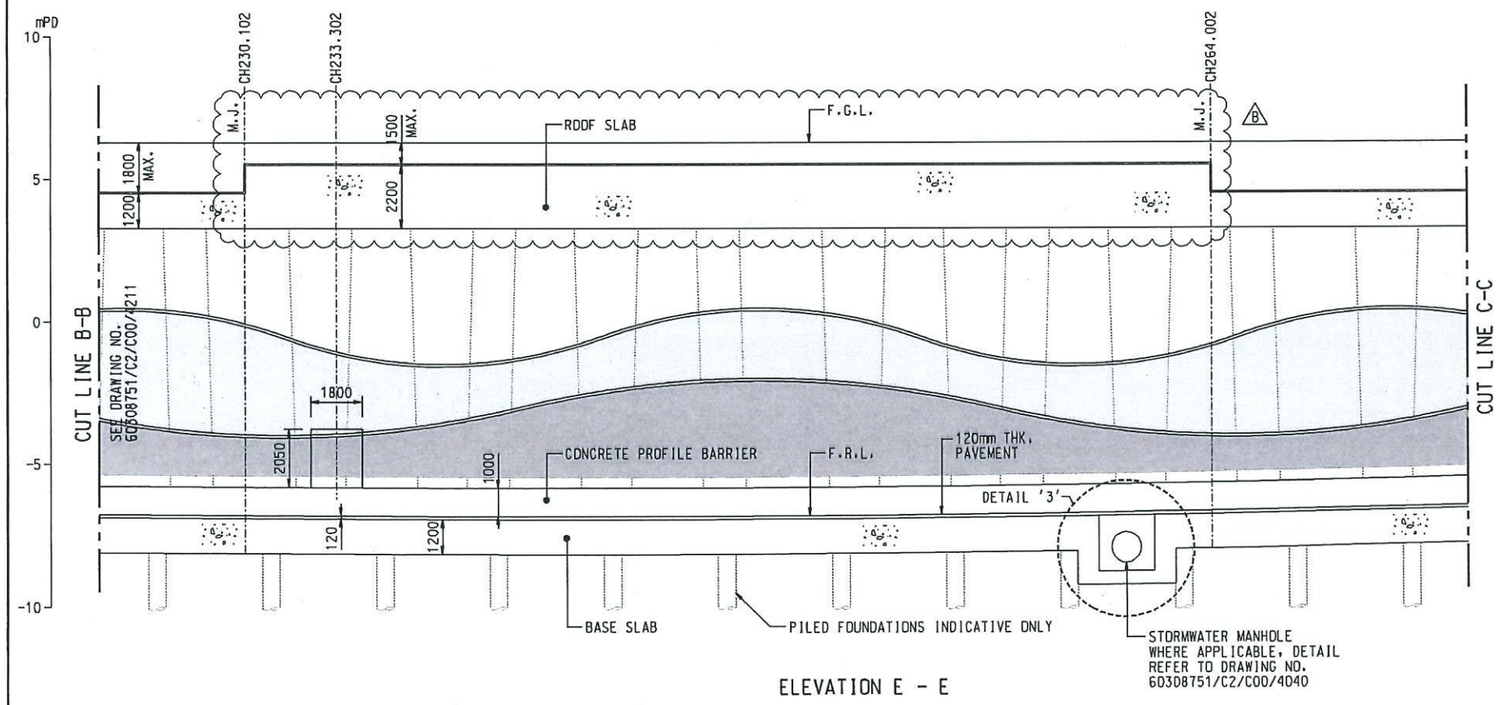
PROJECT NO.: 60308751
CONTRACT NO.: NE/2015/02

SHEET TITLE
ROAD P2 UNDERPASS - SOUTHBOUND AND CROSS PASSAGE ELEVATION
SHEET 1 OF 2

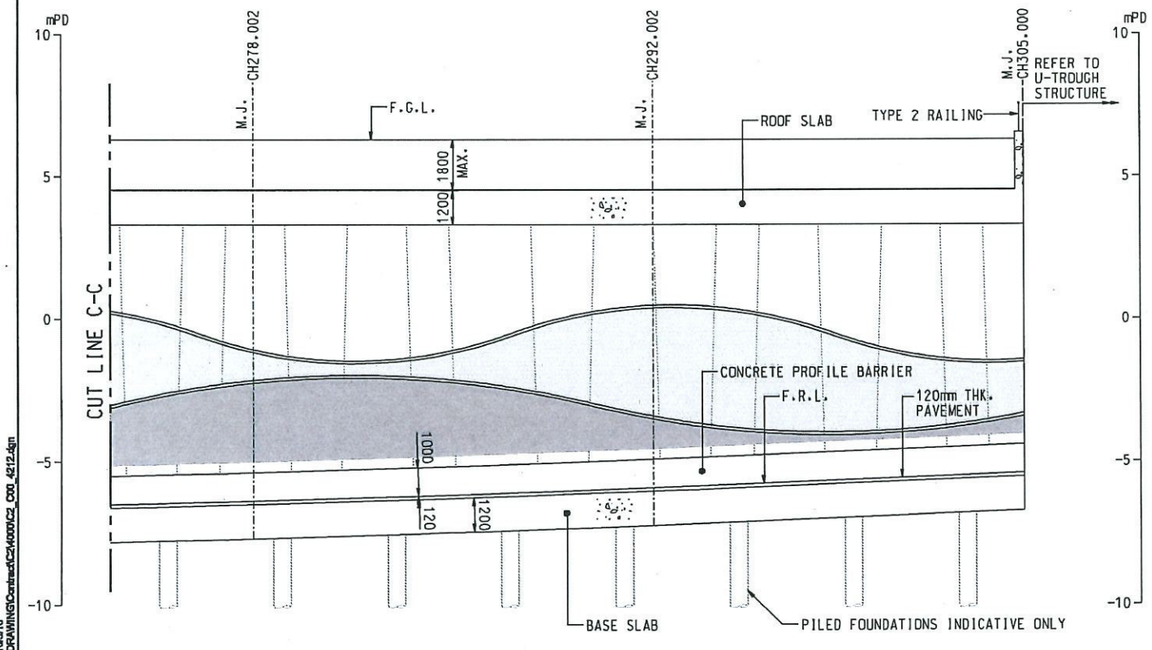
SHEET NUMBER
60308751/C2/C00/4211A

NOTES:

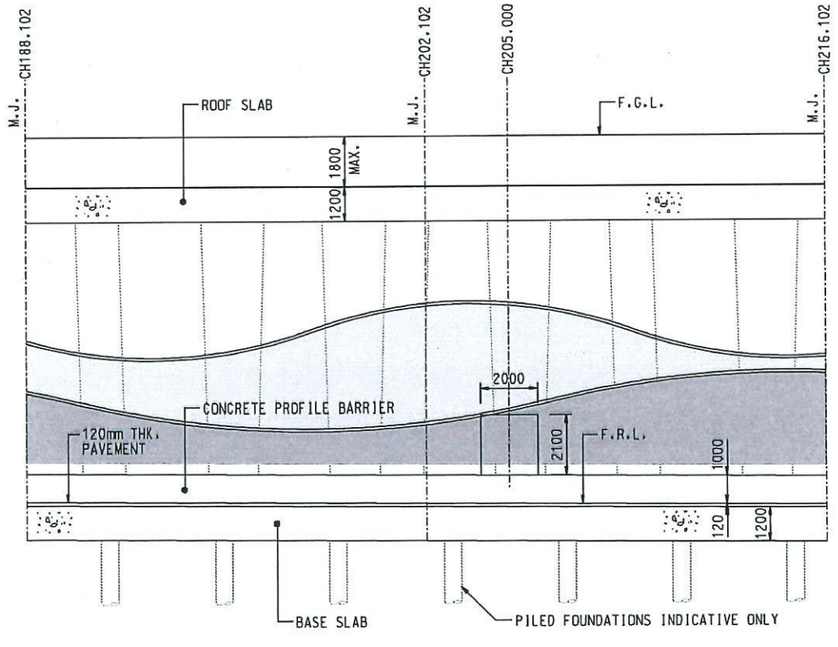
1. FOR NOTES AND LEGEND, REFER TO DRAWING NO. 6D308751/C2/C00/4201.
2. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING NOS. 6D308751/C2/C00/4201 AND 4211.



ELEVATION E - E



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

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-	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 - SOUTHBOUND AND CROSS PASSAGE ELEVATION
SHEET 2 OF 2

SHEET NUMBER
60308751/C2/C00/4212B

Project Management Initials: Designer: ATHH Checked: RPCM Approved: CWN ISO A1 594mm x 841mm

817600 N
817700 N
817800 N
844300 E
844400 E
TIU KENG LENG
Pat Rock
WIP Jan 2010
VIADUCT STRUCTURE BY OTHERS
VIADUCT STRUCTURE BY OTHERS
S.O.L. S200 CH821.000
CUT LINE A-A
SEE DRAWING NO. 60308751/C2/C00/1212
TSEUNG KWAN O

NOTES:

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING NOS. 60308751/C2/C00/1211 TO 1213.
2. FOR ROAD PAVEMENT CONSTRUCTION DETAILS REFER TO DRAWING NOS. 60308751/C2/C00/1231 TO 1233.

LEGEND:

- LIMIT OF SITE BOUNDARY
- FLEXIBLE PAVEMENT (TYPE 1)
- FLEXIBLE PAVEMENT (TYPE 2)
- FLEXIBLE PAVEMENT (TYPE 3)
- RIGID PAVEMENT
- FOOTPATH PAVEMENT
- CYCLE TRACK PAVEMENT
- CYCLE PARKING AREA

Plot File by: LUOPXA 2016/2/18
PATH: P:\Projects\60308751\DRAWINGS\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
CEDD 土木工程拓展署 Civil Engineering and Development Department

CONSULTANT
AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS

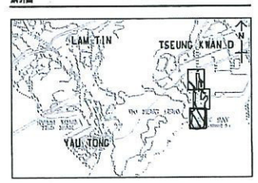
ISSUE/REVISION

A	FEB.16	TENDER ADDENDUM NO. 1	RPCM
-	JAN.16	TENDER DRAWING	RPCM
VR	DATE	DESCRIPTION	CHK.

STATUS

SCALE: A1 1 : 500
DIMENSION UNIT: METRES

KEY PLAN A1 1 : 50000



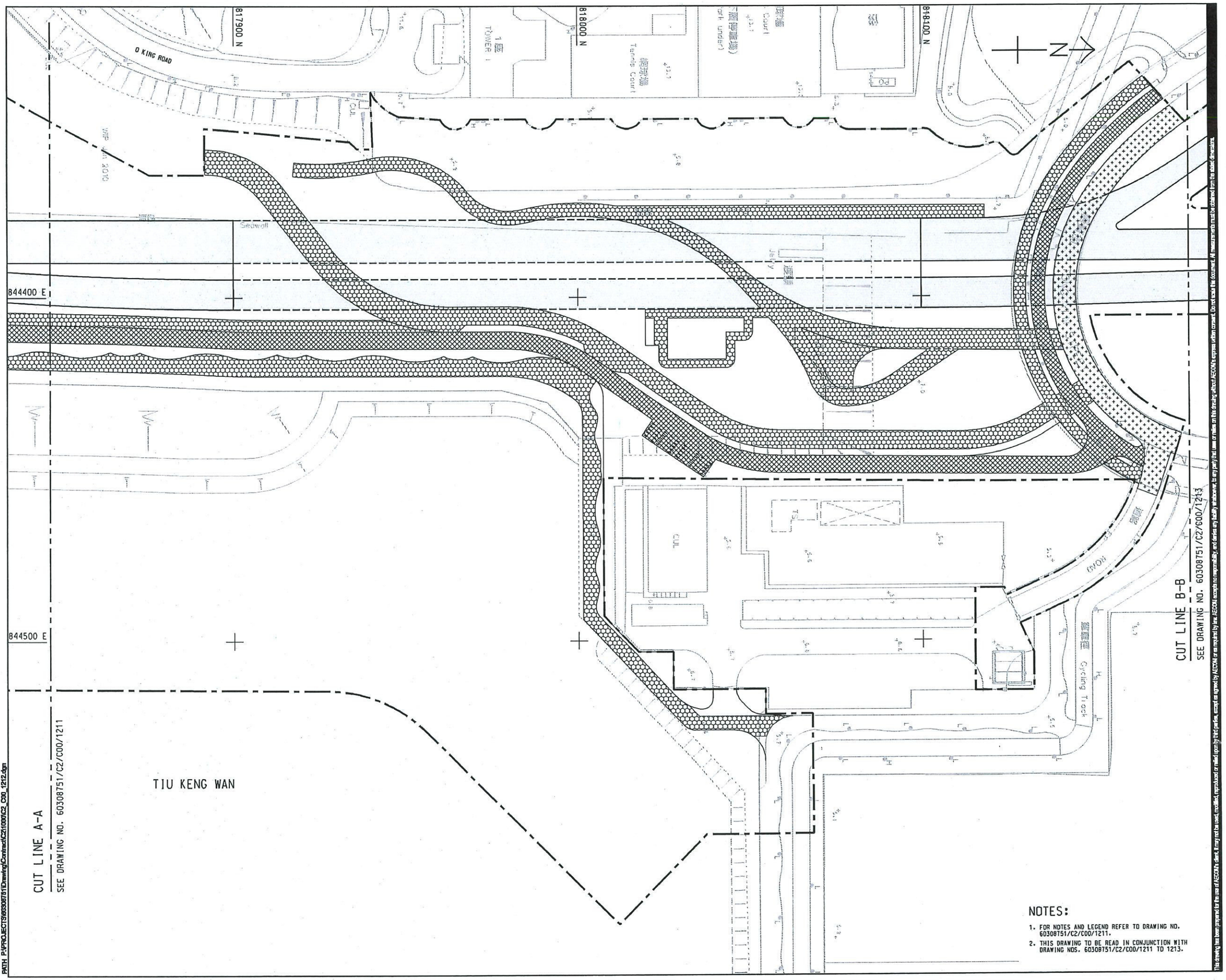
PROJECT NO.: 60308751
CONTRACT NO.: NE/2015/02

SHEET TITLE
ROAD PAVEMENT LAYOUT

SHEET 1 OF 3

SHEET NUMBER
60308751/C2/C00/1211A

Project Management Initials: Designer: ATHH Checked: RPCM Approved: CWY DWN ISO A1 594mm x 841mm



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
AECOM Asia Company Ltd.
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SUB-CONSULTANTS

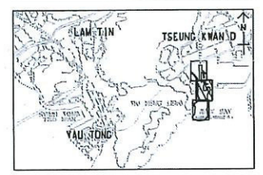
ISSUE/REVISION

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

Plot File by: WANGFY2 2016/1/24
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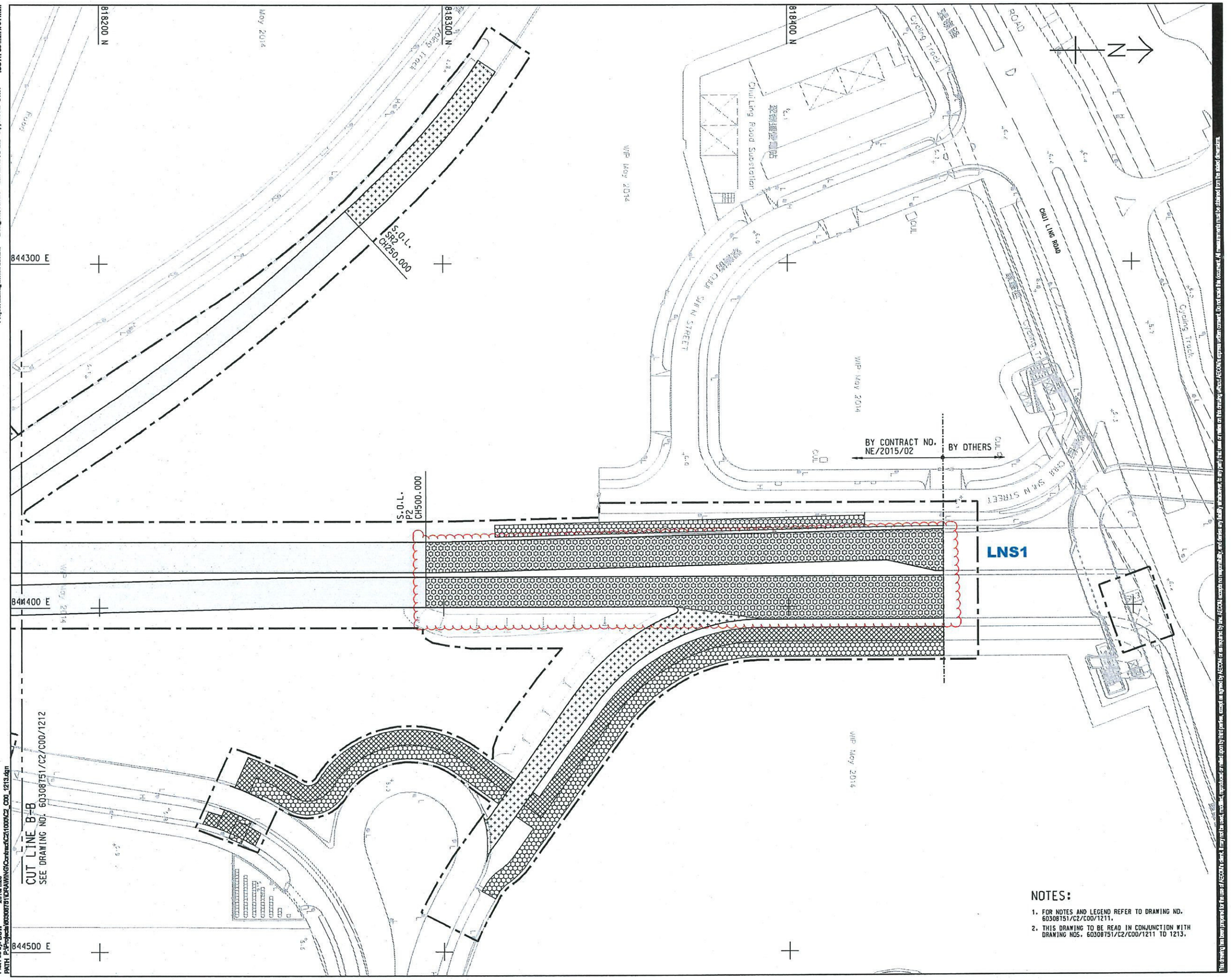

NOTES:

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: DJW 2016/1/28
PATH: P:\Projects\60308751\DRAWING\Contract\C2\1000\C2_C00_1213.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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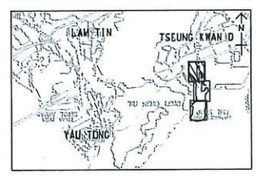
ISSUE/REVISION

VR	DATE	DESCRIPTION	CHK.
-	JAN.16	TENDER DRAWING	RPCM

STATUS

SCALE: A1 1 : 500
DIMENSION UNIT

KEY PLAN A1 1 : 50000

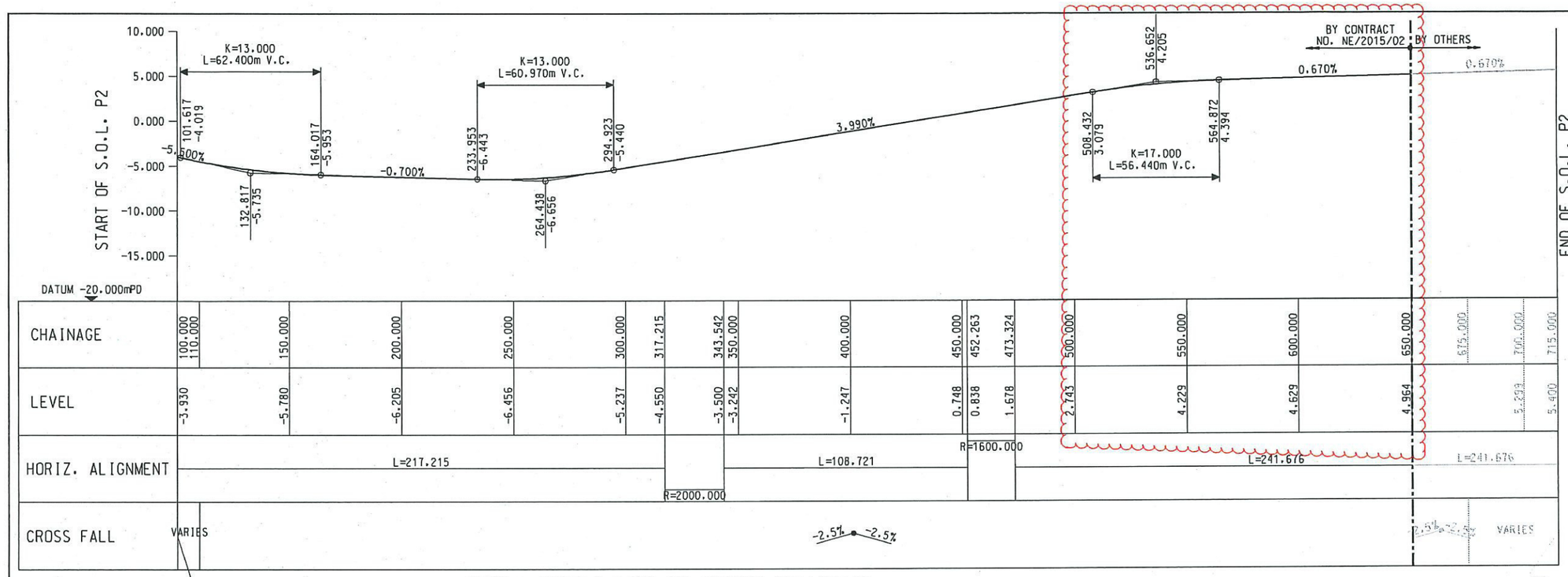


PROJECT NO. 60308751
CONTRACT NO. NE/2015/02

SHEET TITLE
ROAD PAVEMENT LAYOUT

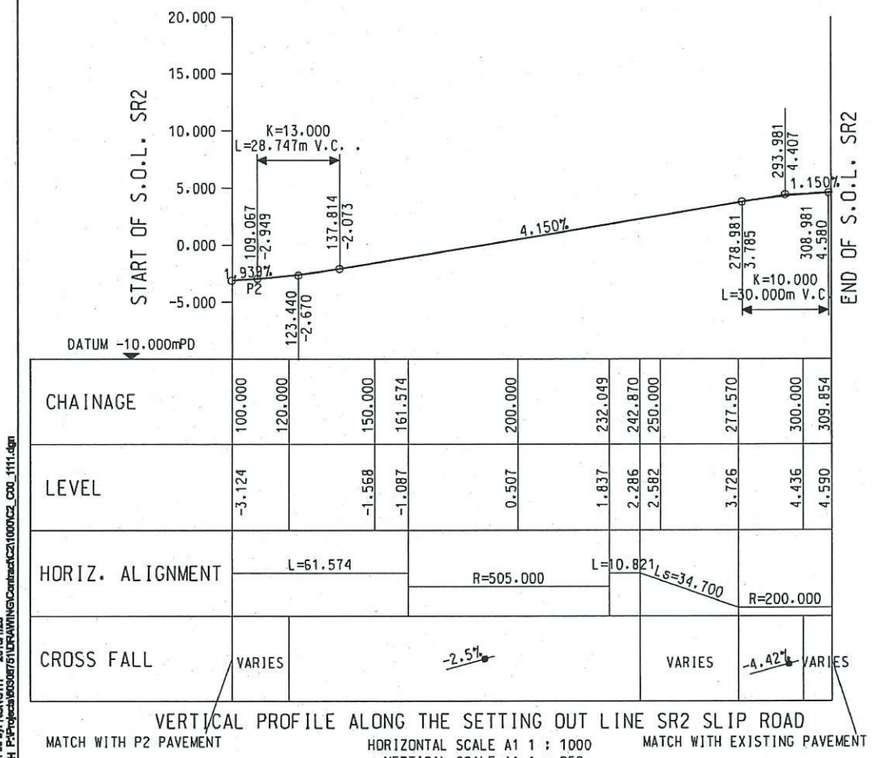
SHEET 3 OF 3

SHEET NUMBER
60308751/C2/C00/1213



VERTICAL PROFILE ALONG THE SETTING OUT LINE P2

HORIZONTAL SCALE A1 1 : 1000
VERTICAL SCALE A1 1 : 250

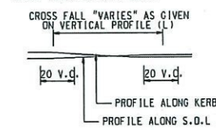


VERTICAL PROFILE ALONG THE SETTING OUT LINE SR2 SLIP ROAD

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
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.
-	JAN.16	TENDER DRAWING	RPCM

STATUS

SCALE: A1 AS SHOWN
DIMENSION UNIT: METRES

KEY PLAN

PROJECT NO.: 60308751
CONTRACT NO.: NE/2015/02

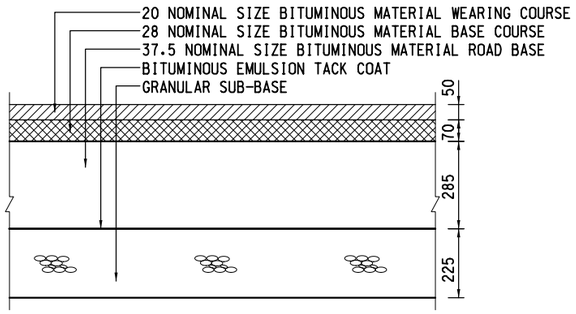
SHEET TITLE
ROAD WORKS - VERTICAL PROFILES

SHEET 1 OF 5

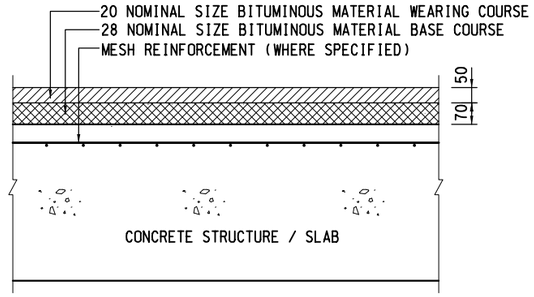
SHEET NUMBER
60308751/C2/C00/1111

Project Management Initials: Designer: ATHH Checked: RPCM Approved: CWN ISO A1 594mm x 841mm

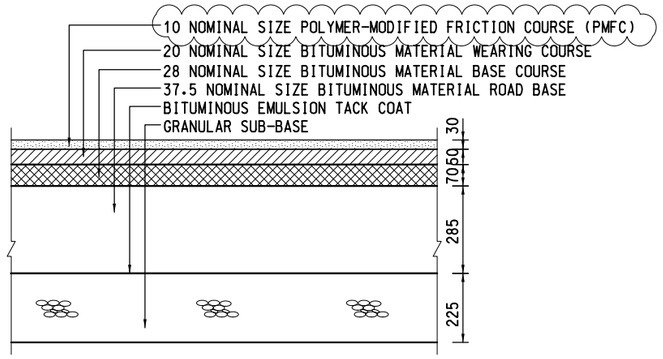
Plot File by: RONGTH 2016/1/25
PATH P:\Projects\60308751\DRAWINGS\Contract\C2\1000\C2_C00_1111.dgn



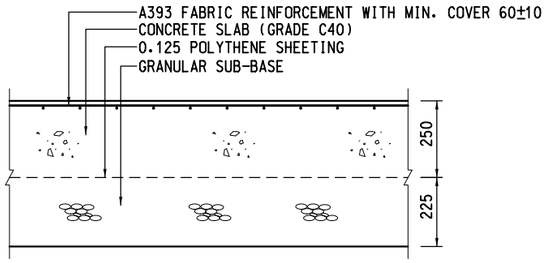
TYPICAL DETAILS FOR FLEXIBLE PAVEMENT (TYPE 1)



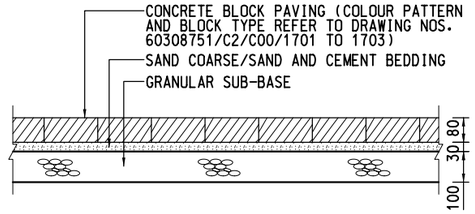
TYPICAL DETAILS FOR FLEXIBLE PAVEMENT (TYPE 2)



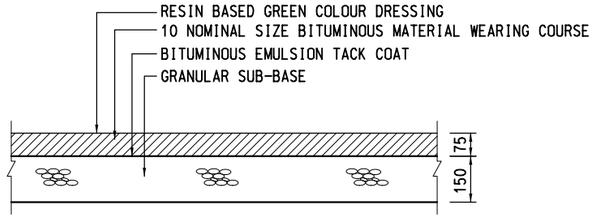
TYPICAL DETAILS FOR FLEXIBLE PAVEMENT (TYPE 3)



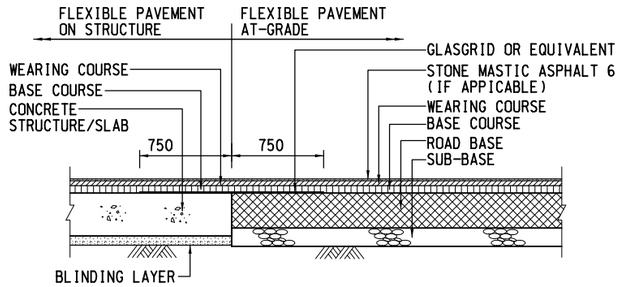
TYPICAL DETAILS FOR RIGID PAVEMENT



TYPICAL DETAILS FOR FOOTPATH PAVEMENT

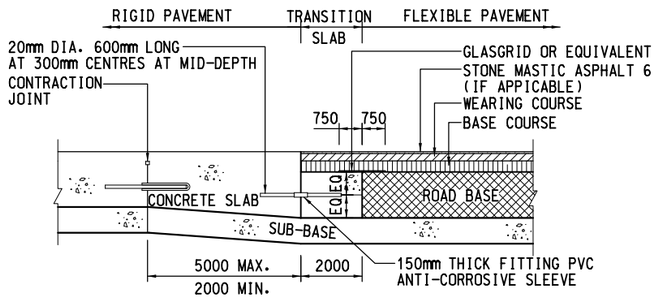


TYPICAL DETAILS FOR CYCLE TRACK PAVEMENT



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 Underpass, U-Trough (Removal of Existing Abandoned Box Culvert)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	163	-52.20	0	3	50.77	
		Piling, large diameter bored, oscillator	CNP 165	1	115	115	30	-5	163	-52.20	0	3	60.56	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	163	-52.20	0	3	52.77	
		Water pump, subersible (electric)	CNP 283	2	85	88	50	-3	163	-52.20	0	3	35.78	61.61
VI	Installation of Dewatering System	Air Compressor	CNP 002	3	102	107	30	-5	163	-52.20	-5	3	47.33	
		Drill Rig, Rotary Type (Diesel)	CNP 072	3	110	115	30	-5	163	-52.20	-5	3	55.33	55.97
VI	Road P2 Underpass, U Trough (Piling) (Stage 1)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	163	-52.20	0	3	50.77	
		Drill Rig, Rotary Type (Diesel)	CNP 072	1	110	110	30	-5	163	-52.20	-5	3	50.56	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	163	-52.20	0	3	47.77	
		Air Compressor	CNP 002	2	102	105	30	-5	163	-52.20	-5	3	45.57	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	163	-52.20	0	3	52.77	
		Concrete Lorry Mixer (6 m3)	BS D6/33	1	96	96	50	-3	163	-52.20	0	3	43.77	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	163	-52.20	0	3	38.79	
		Welding Machine	CNP 107	4	99	105	50	-3	163	-52.20	0	3	52.79	59.69
VI	Road P2 Underpass, U Trough (Piling) (Stage 2)	Crane (240 kw) (105T)	BS C4/52	2	103	106	50	-3	163	-52.20	0	3	53.78	
		Drill Rig, Rotary Type (Diesel)	CNP 072	2	110	113	30	-5	163	-52.20	-5	3	53.57	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	163	-52.20	0	3	47.77	
		Air Compressor	CNP 002	4	102	108	30	-5	163	-52.20	-5	3	48.58	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	163	-52.20	0	3	52.77	
		Concrete Lorry Mixer (6 m3)	BS D6/33	1	96	96	50	-3	163	-52.20	0	3	43.77	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	163	-52.20	0	3	38.79	
		Welding Machine	CNP 107	4	99	105	50	-3	163	-52.20	0	3	52.79	60.04
VI	Road P2 Underpass, U Trough (ELS)	Piling, Vibration Hammer	CNP 172	1	115	115	30	-5	163	-52.20	0	3	60.56	
		Power pack (diesel)	CNP 174	1	100	100	30	-5	163	-52.20	0	3	45.56	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	163	-52.20	0	3	38.79	
		Welding Machine	CNP 107	4	99	105	50	-3	163	-52.20	0	3	52.79	61.37
VI	Road P2 Underpass, U Trough (Structure)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	163	-52.20	0	3	50.77	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	163	-52.20	0	3	52.77	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	163	-52.20	0	3	50.78	
		Saw, Circular Wood	CNP 201	2	108	111	50	-3	163	-52.20	0	3	58.78	
		Concrete Lorry Mixer (6 m3)	BS D6/33	1	96	96	50	-3	163	-52.20	0	3	43.77	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	163	-52.20	0	3	38.79	
		Welding Machine	CNP 107	4	99	105	50	-3	163	-52.20	0	3	52.79	61.48
VI	Road and Drainage Works	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	163	-52.20	0	3	50.77	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	163	-52.20	0	3	52.77	
		Roller, Vibratory (51kw)	BS D8/30	1	101	101	50	-3	163	-52.20	0	3	48.77	
		Concrete Lorry Mixer (6 m3)	BS D6/33	1	96	96	50	-3	163	-52.20	0	3	43.77	
		Light goods vehicle, gross vehicle weight < 5.5 tonne	CNP 143	1	101	101	50	-3	163	-52.20	0	3	48.77	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	163	-52.20	0	3	38.79	
		Dump Truck	CNP 068	1	105	105	50	-3	163	-52.20	0	3	52.77	
		Road Roller	CNP 185	1	108	108	50	-3	163	-52.20	0	3	55.77	
		Welding Machine	CNP 107	4	99	105	50	-3	163	-52.20	0	3	52.79	60.96

Note: SPL = SWL + TF + DC + BC + FC, where

SPL = Predicted noise level in dB(A)

SWL = Sound Power Level in dB(A)

TF = Time factor in dB(A) = 10 log (P)

P = On-time percentage

DC = Distance attenuation correction in dB(A) = -(20 log D + 8)

D = Distance in m between the noise source and the receiver

BC = Barrier correction in dB(A)

FC = Façade correction in dB(A) = 3 dB(A)

CRBC - Build King Joint Venture

Construction Noise Assessment

Period: 0700 to 1900 (except general holidays)

Noise Sensitive Receiver: CM6 (0-39m)

Mitigation Measures Scenario

Noise Criteria: 75dB(A)

Portion	Activity	PME	TM Ref. / other Ref.	No. of plants	SWL	Total SWL	On-time, %	Time Factor	Distance from Notional Sources, m	Distance Attenuation*, dB(A)	Barrier Correction, dB(A)	Façade Correction, dB(A)	Predicted Noise Level, dB(A)	Total Predicted Noise Level for each group, dB(A)
I	DSD Transformer Room	Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	213	-54.57	0	3	45.42	
		Bar Bender and Cutter	CNP 021	1	90	90	50	-3	213	-54.57	0	3	35.42	
		Breaker, hand-held, mass > 10kg < 20kg	CNP 024	1	108	108	50	-3	213	-54.57	0	3	53.42	
		Concrete Lorry Mixer (6 m3)	BS D6/33	1	96	96	50	-3	213	-54.57	0	3	41.42	
		Saw, Circular Wood	CNP 201	1	108	108	50	-3	213	-54.57	0	3	53.42	
		Water pump, subersible (electric)	CNP 283	2	85	88	50	-3	213	-54.57	0	3	33.43	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	213	-54.57	0	3	50.42	
		Dump Truck	CNP 068	1	105	105	50	-3	213	-54.57	0	3	50.42	58.53
IV	Road P2 Underpass (Piling) (Stage 1)	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	30	-5	47	-41.39	-11.7	3	59.46	
		Air Compressor	CNP 002	6	102	110	30	-5	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	63.61	67.77
IV	Road P2 Underpass (Piling) (Stage 2)	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	30	-5	47	-41.39	-11.7	3	54.68	
		Air Compressor	CNP 002	2	102	110	30	-5	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	Road P2 Underpass (ELS)	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	30	-5	47	-41.39	-5	3	44.62	
		Excavator (223 kw) (40T)	BS C4/63	3	105	110	30	-5	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	69.7
IV	Road and Drainage Works (Stage 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	Road and Drainage Works (Stage 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 (51kw)	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
V	Road P2 Underpass, U Trough (Piling) (Stage 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	30	-5	146	-51.26	-5	3	51.51	
		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	30	-5	146	-51.26	-5	3	46.52	
		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	10	-10	146	-51.26	-10	3	53.74	59.65
V	Road P2 Underpass, U Trough (Piling) (Stage 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	30	-5	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	30	-5	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	
		Breaker, excavator mounted (hydraulic)	CNP 028	1	122	122	10	-10	146	-51.26	-10	3	53.74	60.99
V	Road P2 Underpass, U Trough (ELS)	Piling, Vibration Hammer	CNP 172	1	115	115	30	-5	146	-51.26	0	3	61.51	
		Power pack (diesel)	CNP 174	1	100	100	30	-5	146	-51.26	0	3	46.51	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	146	-51.26	0	3	39.75	61.67
V	Road P2 Underpass, U Trough (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	2	105	108	50	-3	146	-51.26	0	3	56.74	
		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	
														63.47
V	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 (51kw)	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
VII	Road P2 Underpass, U Trough (Piling)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	119	-49.50	-5	3	48.50	
		Drill Rig, Rotary Type (Diesel)	CNP 072	1	110	110	30	-5	119	-49.50	-5	3	53.29	
		Air Compressor	CNP 002	2	102	105	30	-5	119	-49.50	-5	3	48.30	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	119	-49.50	-5	3	50.50	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	119	-49.50	-5	3	41.50	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	119	-49.50	-5	3	36.52	56.83
VII	Road P2 Underpass, U Trough (ELS)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	119	-49.50	-5	3	48.50	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	119	-49.50	-5	3	45.50	
		Breaker, excavator mounted (hydraulic)	CNP 028	1	122	122	10	-10	119	-49.50	-10	3	55.51	
		Piling, Vibration Hammer	CNP 172	1	115	115	30	-5	119	-49.50	-5	3	58.29	
		Power pack (diesel)	CNP 174	1	100	100	30	-5	119	-49.50	-5	3	43.29	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	119	-49.50	-5	3	50.50	
		Dump Truck	CNP 068	1	105	105	50	-3	119	-49.50	-5	3	50.50	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	119	-49.50	-5	3	36.52	61.42
VII	Road and Drainage Works	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	119	-49.50	-5	3	48.50	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	119	-49.50	-5	3	50.50	
		Concrete Lorry Mixer	BS D6/33	1	96	96	50	-3	119	-49.50	-5	3	41.50	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	119	-49.50	-5	3	36.52	
		Road Roller	CNP 185	1	108	108	50	-3	119	-49.50	-5	3	53.50	56.29
IX	Dredging and Reclamation	Dredger	CNP 070	2	103	106	50	-3	225	-55.10	0	3	50.94	
		Derrick Barge	CNP 061	4	104	110	50	-3	225	-55.10	0	3	54.95	
		Tug boat	CNP 221	2	110	113	50	-3	225	-55.10	0	3	57.94	
		Water pump, subersible (electric)	CNP 283	6	85	93	50	-3	225	-55.10	0	3	37.71	
		Dump Truck	CNP 068	6	105	113	50	-3	225	-55.10	0	3	57.71	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	4	100	106	50	-3	225	-55.10	0	3	50.95	
		Winch (Electric)	CNP 262	4	95	101	50	-3	225	-55.10	0	3	45.95	
		Excavator (223 kw) (40T)	BS C4/63	3	105	110	50	-3	225	-55.10	0	3	54.70	
		Vibration Hammer	CNP 172	1	115	115	50	-3	225	-55.10	0	3	59.93	
		Hopper barge	-	6	-	-	50	-3	225	-55.10	0	3	-	64.91
IX	Steel Cofferdam and Water Gate	Derrick Barge	CNP 061	3	104	109	50	-3	225	-55.10	0	3	53.70	
		Tug boat	CNP 221	2	110	113	50	-3	225	-55.10	0	3	57.94	59.33
IX	Marine Ground Treatment	Band Drain Machine (hydarulic Vibratory lance starting up)	BS D4/107a	1	113	113	30	-5	225	-55.10	-5	3	50.71	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	30	-5	225	-55.10	-5	3	42.71	51.35

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 3 dB(A)

CRBC - Build King Joint Venture

Construction Noise Assessment

Period: 0700 to 1900 (except general holidays)

Noise Sensitive Receiver: CM6 (0-39m)

Mitigation Measures Scenario

Noise Criteria: 75dB(A)

Portion	Activity	PME	TM Ref. / other Ref.	No. of plants	SWL	Total SWL	On-time, %	Time Factor	Distance from Notional Sources, m	Distance Attenuation*, dB(A)	Barrier Correction, dB(A)	Façade Correction, dB(A)	Predicted Noise Level, dB(A)	Total Predicted Noise Level for each group, dB(A)
IX	U - Trough (Backfilling)	Road Roller	CNP 185	1	108	108	50	-3	225	-55.10	0	3	52.93	
		Excavator (223 kw) (40T)	BS C4/63	2	105	108	50	-3	225	-55.10	0	3	52.94	
		Dump Truck	CNP 068	3	105	110	50	-3	225	-55.10	0	3	54.70	58.38
IX	U - Trough (Pre-Drill)(Stage 1)	G.I. drilling rig (18kw)	BS C2/43	3	102	107	50	-3	225	-55.10	0	3	51.70	51.70
IX	U - Trough (Pre-Drill)(Stage 2)	G.I. drilling rig (18kw)	BS C2/43	5	102	109	50	-3	225	-55.10	0	3	52.95	53.92
IX	U - Trough (Pre-Drill)(Stage 3)	G.I. drilling rig (18kw)	BS C2/43	6	102	110	50	-3	225	-55.10	0	3	54.71	54.71
IX	U - Trough (Pre-Drill)(Stage 4)	G.I. drilling rig (18kw)	BS C2/43	7	102	110	50	-3	225	-55.10	0	3	55.38	55.38
IX	U - Trough (Pre-Drill)(Stage 5)	G.I. drilling rig (18kw)	BS C2/43	8	102	111	50	-3	225	-55.10	0	3	55.96	55.96
IX	U - Trough (Pre-Drill)(Stage 6)	G.I. drilling rig (18kw)	BS C2/43	14	102	113	50	-3	225	-55.10	0	3	58.39	58.39
IX	U - Trough (Piling)(Stage 1)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	225	-55.10	0	3	47.93	
		Drill Rig, Rotary Type (Diesel)	CNP 072	1	110	110	30	-5	225	-55.10	-5	3	47.71	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	225	-55.10	0	3	47.94	
		Air Compressor	CNP 002	2	102	105	30	-5	225	-55.10	0	3	47.72	
		Excavator (223 kw) (40T)	BS C4/63	2	105	108	50	-3	225	-55.10	0	3	52.94	
		Concrete Lorry Mixer (6 m3)	BS D6/33	1	96	96	50	-3	225	-55.10	0	3	40.93	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	225	-55.10	0	3	35.95	
		Dump Truck	CNP 068	3	105	110	50	-3	225	-55.10	0	3	54.70	
		Welding Machine	CNP 107	4	99	105	50	-3	225	-55.10	0	3	49.95	59.3
IX	U - Trough (Piling)(Stage 2)	Crane (240 kw) (105T)	BS C4/52	8	103	112	50	-3	225	-55.10	0	3	56.96	
		Drill Rig, Rotary Type (Diesel)	CNP 072	8	110	119	30	-5	225	-55.10	-5	3	56.75	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	8	100	109	50	-3	225	-55.10	0	3	53.96	
		Air Compressor	CNP 002	16	102	114	30	-5	225	-55.10	0	3	56.76	
		Excavator (223 kw) (40T)	BS C4/63	8	105	114	50	-3	225	-55.10	0	3	58.96	
		Concrete Lorry Mixer (6 m3)	BS D6/33	4	96	102	50	-3	225	-55.10	0	3	46.95	
		Water pump, subersible (electric)	CNP 283	10	85	95	50	-3	225	-55.10	0	3	39.93	
		Dump Truck	CNP 068	3	105	110	50	-3	225	-55.10	0	3	54.70	
														64.53
IX	U - Trough (Piling)(Stage 3)	Crane (240 kw) (105T)	BS C4/52	12	103	114	50	-3	225	-55.10	0	3	58.72	
		Drill Rig, Rotary Type (Diesel)	CNP 072	12	110	121	30	-5	225	-55.10	-5	3	58.51	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	12	100	111	50	-3	225	-55.10	0	3	55.72	
		Air Compressor	CNP 002	24	102	116	30	-5	225	-55.10	0	3	58.52	
		Excavator (223 kw) (40T)	BS C4/63	12	105	116	50	-3	225	-55.10	0	3	60.72	
		Concrete Lorry Mixer (6 m3)	BS D6/33	8	96	105	50	-3	225	-55.10	0	3	49.96	
		Water pump, subersible (electric)	CNP 283	10	85	95	50	-3	225	-55.10	0	3	39.93	
		Dump Truck	CNP 068	3	105	110	50	-3	225	-55.10	0	3	54.70	
														66.15
IX	U - Trough (Piling)(Stage 4)	Crane (240 kw) (105T)	BS C4/52	3	108	106	50	-3	225	-55.10	0	3	52.70	
		Piling, large diameter bored, reverse circulation drill	CNP 166	3	105	105	30	-5	225	-55.10	-5	3	42.49	53.1
IX	U - Trough (ELS) (Sheet Piling)	Crane (240 kw) (105T)	BS C4/52	4	103	109	50	-3	225	-55.10	0	3	53.95	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	8	100	109	50	-3	225	-55.10	0	3	53.96	
		Piling, Vibration Hammer	CNP 172	4	115	121	30	-5	225	-55.10	0	3	63.73	
		Power pack (diesel)	CNP 174	4	100	106	30	-5	225	-55.10	0	3	48.73	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	225	-55.10	0	3	35.95	
		Excavator (223 kw) (40T)	BS C4/63	4	105	111	50	-3	225	-55.10	0	3	55.95	
														65.23
IX	U - Trough (ELS) (Welding & Excavation)	Crane (240 kw) (105T)	BS C4/52	4	103	109	50	-3	225	-55.10	0	3	53.95	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	8	100	109	50	-3	225	-55.10	0	3	53.96	
		Excavator (223 kw) (40T)	BS C4/63	8	105	114	50	-3	225	-55.10	0	3	58.96	
		Dump Truck	CNP 068	8	105	114	50	-3	225	-55.10	0	3	58.96	
		Water pump, subersible (electric)	CNP 283	20	85	98	50	-3	225	-55.10	0	3	42.94	
		Derrick Barge	CNP 061	2	104	107	50	-3	225	-55.10	0	3	51.94	
														63.52
IX	U - Trough (Structure)	Crane (240 kw) (105T)	BS C4/52	2	103	106	50	-3	225	-55.10	0	3	50.94	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	225	-55.10	0	3	47.94	
		Air Blower	CNP 006	10	95	105	50	-3	225	-55.10	0	3	49.93	
		Saw, Circular Wood	CNP 201	10	108	118	50	-3	225	-55.10	0	3	62.93	
		Concrete Lorry Mixer (6 m3)	BS D6/33	4	96	102	50	-3	225	-55.10	0	3	46.95	
		Concrete pump, stationary/lorry mounted	CNP 047	4	109	115	50	-3	225	-55.10	0	3	59.95	
		Poker, vibratory, hand-held	CNP 170	4	113	119	50	-3	225	-55.10	0	3	63.95	
		Water pump, subersible (electric)	CNP 283	20	85	98	50	-3	225	-55.10	0	3	42.94	67.63
IX	U - Trough (Road and Drainage Works)	Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	225	-55.10	0	3	49.93	
		Roller, Vibratory (51kw)	BS D8/30	1	101	101	50	-3	225	-55.10	0	3	45.93	
		Concrete Lorry Mixer (6 m3)	BS D6/33	1	96	96	50	-3	225	-55.10	0	3	40.93	
		Light goods vehicle, gross vehicle weight < 5.5 tonne	CNP 143	1	101	101	50	-3	225	-55.10	0	3	45.93	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	225	-55.10	0	3	35.95	
		Dump Truck	CNP 068	1	105	105	50	-3	225	-55.10	0	3	49.93	
		Road Roller	CNP 185	1	108	108	50	-3	225	-55.10	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

Mitigation Measures Scenario

Noise Criteria: 75dB(A)

Portion	Activity	PME	TM Ref. / other Ref.	No. of plants	SWL	Total SWL	On-time, %	Time Factor	Distance from Notional Sources, m	Distance Attenuation*, dB(A)	Barrier Correction, dB(A)	Façade Correction, dB(A)	Predicted Noise Level, dB(A)	Total Predicted Noise Level for each group, dB(A)
VI	Road P2 Underpass, U-Trough (Removal of Existing Abandoned Box Culve	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	157	-51.92	0	3	51.07	
		Piling, large diameter bored, oscillator	CNP 165	1	115	115	30	-5	157	-51.92	-5	3	55.85	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	157	-51.92	0	3	53.07	
		Water pump, subersible (electric)	CNP 283	2	85	88	50	-3	157	-51.92	0	3	36.08	58.57
VI	Installation of Dewatering System	Air Compressor	CNP 002	3	102	107	30	-5	157	-51.92	-5	3	47.62	
		Drill Rig, Rotary Type (Diesel)	CNP 072	3	110	115	30	-5	157	-51.92	-5	3	55.62	56.26
VI	Road P2 Underpass, U Trough (Piling) (Stage 1)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	157	-51.92	0	3	51.07	
		Drill Rig, Rotary Type (Diesel)	CNP 072	1	110	110	30	-5	157	-51.92	-5	3	50.85	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	157	-51.92	0	3	48.07	
		Air Compressor	CNP 002	2	102	105	30	-5	157	-51.92	-5	3	45.86	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	157	-51.92	0	3	53.07	
		Concrete Lorry Mixer (6 m3)	BS D6/33	1	96	96	50	-3	157	-51.92	0	3	44.07	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	157	-51.92	0	3	39.09	
		Welding Machine	CNP 107	4	99	105	50	-3	157	-51.92	0	3	53.09	58.99
VI	Road P2 Underpass, U Trough (Piling) (Stage 2)	Crane (240 kw) (105T)	BS C4/52	2	103	106	50	-3	157	-51.92	0	3	54.08	
		Drill Rig, Rotary Type (Diesel)	CNP 072	2	110	113	30	-5	157	-51.92	-5	3	53.86	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	157	-51.92	0	3	48.07	
		Air Compressor	CNP 002	4	102	108	30	-5	157	-51.92	-5	3	48.87	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	157	-51.92	0	3	53.07	
		Concrete Lorry Mixer (6 m3)	BS D6/33	1	96	96	50	-3	157	-51.92	0	3	44.07	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	157	-51.92	0	3	39.09	
		Welding Machine	CNP 107	4	99	105	50	-3	157	-51.92	0	3	53.09	60.34
VI	Road P2 Underpass, U Trough (ELS)	Piling, Vibration Hammer	CNP 172	1	115	115	30	-5	157	-51.92	0	3	60.83	
		Power pack (diesel)	CNP 174	1	100	100	30	-5	157	-51.92	0	3	45.83	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	157	-51.92	0	3	39.06	
		Welding Machine	CNP 107	4	99	105	50	-3	157	-51.92	0	3	53.06	61.64
VI	Road P2 Underpass, U Trough (Structure)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	157	-51.92	0	3	51.04	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	157	-51.92	0	3	53.04	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	157	-51.92	0	3	51.05	
		Saw, Circular Wood	CNP 201	2	108	111	50	-3	157	-51.92	0	3	59.05	
		Concrete Lorry Mixer (6 m3)	BS D6/33	1	96	96	50	-3	157	-51.92	0	3	44.04	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	157	-51.92	0	3	39.06	
		Welding Machine	CNP 107	4	99	105	50	-3	157	-51.92	0	3	53.06	61.75
VI	Road and Drainage Works	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	157	-51.92	0	3	58.93	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	157	-51.92	0	3	53.04	
		Roller, Vibratory (51kw)	BS D8/30	1	101	101	50	-3	157	-51.92	0	3	49.04	
		Concrete Lorry Mixer (6 m3)	BS D6/33	1	96	96	50	-3	157	-51.92	0	3	44.04	
		Light goods vehicle, gross vehicle weight < 5.5 tonne	CNP 143	1	101	101	50	-3	157	-51.92	0	3	49.04	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	157	-51.92	0	3	39.06	
		Dump Truck	CNP 068	1	105	105	50	-3	157	-51.92	0	3	53.04	
		Road Roller	CNP 185	1	108	108	50	-3	157	-51.92	0	3	56.04	
		Welding Machine	CNP 107	4	99	105	50	-3	157	-51.92	0	3	53.06	62.98
VIII	Road P2 Underpass, U Trough (Piling)	Crane (240 kw) (105T)	BS C4/52	2	103	106	50	-3	224	-55.00	0	3	51.00	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	4	100	106	50	-3	224	-55.00	0	3	51.01	
		Air Compressor	CNP 002	4	102	108	50	-3	224	-55.00	0	3	53.01	
		Drill Rig, Rotary Type (Diesel)	CNP 072	2	110	113	50	-3	224	-55.00	-5	3	53.00	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	224	-55.00	0	3	49.98	
		Concrete Lorry Mixer (6 m3)	BS D6/33	2	96	99	50	-3	224	-55.00	0	3	44.00	
		Piling, Vibration Hammer	CNP 172	1	115	115	50	-3	224	-55.00	0	3	59.98	
		Power pack (diesel)	CNP 174	1	100	100	50	-3	224	-55.00	0	3	44.98	
		Water pump, subersible (electric)	CNP 283	2	85	88	50	-3	224	-55.00	0	3	33.00	62.57
VIII	Road P2 Underpass, U Trough (ELS)	Crane (240 kw) (105T)	BS C4/52	2	103	106	50	-3	224	-55.00	0	3	51.00	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	4	100	106	50	-3	224	-55.00	0	3	51.01	
		Air Compressor	CNP 002	4	102	108	50	-3	224	-55.00	0	3	53.01	
		Piling, Vibration Hammer	CNP 172	2	115	118	50	-3	224	-55.00	0	3	63.00	
		Power pack (diesel)	CNP 174	2	100	103	50	-3	224	-55.00	0	3	48.00	
		Excavator (223 kw) (40T)	BS C4/63	4	105	111	50	-3	224	-55.00	0	3	56.01	
		Breaker, excavator mounted (hydraulic)	CNP 028	1	122	122	50	-3	224	-55.00	-10	3	56.98	
		Dump Truck	CNP 068	2	105	108	50	-3	224	-55.00	0	3	53.00	
		Water pump, subersible (electric)	CNP 283	16	85	97	50	-3	224	-55.00	0	3	42.03	65.59
VIII	Road P2 Underpass, U Trough (Backfilling)	Piling, Vibration Hammer	CNP 172	2	115	118	50	-3	224	-55.00	0	3	63.00	
		Excavator (223 kw) (40T)	BS C4/63	4	105	111	50	-3	224	-55.00	0	3	56.01	
		Roller, Vibratory (51kw)	BS D8/30	2	101	104	50	-3	224	-55.00	0	3	49.00	
		Breaker, excavator mounted (hydraulic)	CNP 028	1	122	122	50	-3	224	-55.00	0	3	56.98	
		Dump Truck	CNP 068	2	105	108	50	-3	224	-55.00	0	3	53.00	
		Water pump, subersible (electric)	CNP 283	16	85	97	50	-3	224	-55.00	0	3	42.03	65.03
VIII	Road P2 Underpass, U Trough (Structure)	Crane (240 kw) (105T)	BS C4/52	2	103	106	50	-3	224	-55.00	0	3	51.00	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	224	-55.00	0	3	48.00	
		Air Compressor	CNP 002	1	102	102	50	-3	224	-55.00	0	3	46.98	
		Saw, Circular Wood	CNP 201	2	108	111	50	-3	224	-55.00	0	3	56.00	
		Concrete Lorry Mixer (6 m3)	BS D6/33	2	96	99	50	-3	224	-55.00	0	3	44.00	
		Poker, Vibratory, Handheld	CNP 170	1	113	113	50	-3	224	-55.00	0	3	57.98	
		Concrete Pump	CNP 047	1	109	109	50	-3	224	-55.00	0	3	53.98	
		Water pump, subersible (electric)	CNP 283	16	85	97	50	-3	224	-55.00	0	3	42.03	61.92
VIII	Road and Drainage Works	Excavator (223 kw) (40T)	BS C4/63	2	105	108	50	-3	224	-55.00	0	3	53.00	
		Roller, Vibratory (51kw)	BS D8/30	2	101	104	50	-3	224	-55.00	0	3	49.00	
		Saw, Circular Wood	CNP 201	2	108	111	50	-3	224	-55.00	0	3	56.00	
		Asphalt Paver (90 kw)	BS DB/24	1	101	101	50	-3	224	-55.00	0	3	45.98	
		Dump Truck	CNP 068	2	105	108	50	-3	224	-55.00	0	3	53.00	
		Lorry (10T / 24T)	BS D8/25	2	96	99	50	-3	224	-55.00	0	3	44.00	
		Crane (240 kw) (105T)	BS D7/114	2	101	104	50	-3	224	-55.00	0	3	49.00	
		Concrete Pump	CNP 047	1	109	109	50	-3	224	-55.00	0	3	53.98	
		Concrete Lorry Mixer (6 m3)	BS D6/33	1	96	96	50	-3	224	-55.00	0	3	40.98	
		Poker, Vibratory, Handheld	CNP 170	1	113	113	50	-3	224	-55.00	0	3	57.98	
		Power Rammer Petrol	CNP 169	1	108	108	50	-3	224	-55.00	0	3	52.98	
		Water pump, subersible (electric)	CNP 283	16	85	97	50	-3	224	-55.00	0	3	42.03	63.28
Area Y		Bar Bender and Cutter	CNP 021	4	90	96	50	-3	180	-53.11	0	3	42.90	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	180	-53.11	0	3	49.89	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	180	-53.11	0	3	37.90	50.91

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		
		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 (6 m3)	BS D6/33	2	96	99	50	-3	257	-56.20	0	3	42.80		
		Roller, Vibratory (51kw)	BS D8/30	1	101	101	50	-3	257	-56.20	0	3	44.79	59.94	59.94
Area A		Breaker, excavator mounted (hydraulic)	CNP 028	1	122	122	50	-3	217	-54.73	-5	3	62.26		
		Excavator (223 kw) (40T)	BS C4/63	6	105	113	50	-3	217	-54.73	0	3	58.04		
		Dump Truck	CNP 068	7	105	113	50	-3	217	-54.73	0	3	58.71		
		Bobcat	CNP 081	1	112	112	100	0	217	-54.73	0	3	60.27		
		Water pump, subersible (electric)	CNP 283	3	85	90	50	-3	217	-54.73	0	3	35.03	66.16	66.16
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 (6 m3)	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 (6 m3)	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	CNP 068	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 (6 m3)	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	CNP 068	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 (6 m3)	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

Portion	Activity	2018						2019												2020												2021			
		Jul	Aug	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	Road P2 Underpass (Piling) (Stage 1)	67.8	67.8																																
IV	Road P2 Underpass (Piling) (Stage 2)			65.6																															
IV	Road P2 Underpass (ELS)	69.7	69.7	69.7																															
IV	Road and Drainage Works (Stage 1)				66.1	66.1	66.1																												
IV	Road and Drainage Works (Stage 2)							66.1	66.1	66.1	66.1	66.1	66.1	66.1	66.1	66.1	66.1	66.1	66.1	66.1	66.1	66.1	66.1	66.1	66.1	66.1	66.1	66.1	66.1	66.1					
V	Road P2 Underpass, U Trough (Piling) (Stage 1)	59.7	59.7																																
V	Road P2 Underpass, U Trough (Piling) (Stage 2)			61.0																															
V	Road P2 Underpass, U Trough (ELS)	61.7	61.7	61.7																															
V	Road P2 Underpass, U Trough (Structure)				63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5																							
V	Road and Drainage Works									60.7	60.7	60.7	60.7	60.7	60.7	60.7	60.7	60.7	60.7																
VI	Road P2 Underpass, U-Trough (Removal of Existing Abandoned Box Culvert)																																		
VI	Installation of Dewatering System			56.0	56.0																														
VI	Road P2 Underpass, U Trough (Piling) (Stage 1)	58.7	58.7																																
VI	Road P2 Underpass, U Trough (Piling) (Stage 2)			60.0																															
VI	Road P2 Underpass, U Trough (ELS)	61.4	61.4	61.4																															
VI	Road P2 Underpass, U Trough (Structure)				61.5	61.5	61.5	61.5	61.5	61.5	61.5	61.5	61.5																							
VI	Road and Drainage Works									61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0	61.0																
VII	Road P2 Underpass, U Trough (Piling)	58.45																																	
VII	Road P2 Underpass, U Trough (ELS)	61.4	61.4	61.4																															
VII	Road and Drainage Works				56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3	56.3					
IX	Steel Cofferdam & Water Gate																																		
IX	Dredging & Reclamation	64.9	64.9	64.9	64.9	64.9	64.9	64.9	64.9	64.9	64.9	64.9																							
IX	Marine Ground Treatment		51.4	51.4	51.4	51.4	51.4																												
IX	Road P2 Underpass, U Trough (Backfilling)		58.4	58.4	58.4	58.4	58.4	58.4	58.4																										
IX	Road P2 Underpass, U Trough (Pre Drill) (Stage 1)							51.7	51.7	51.7																									
IX	Road P2 Underpass, U Trough (Pre Drill) (Stage 2)		53.9	53.9	53.9	53.9	53.9																												
IX	Road P2 Underpass, U Trough (Pre Drill) (Stage 3)										54.7																								
IX	Road P2 Underpass, U Trough (Pre Drill) (Stage 4)												55.4																						
IX	Road P2 Underpass, U Trough (Pre Drill) (Stage 5)																																		
IX	Road P2 Underpass, U Trough (Pre Drill) (Stage 6)											58.4																							
IX	Road P2 Underpass, U Trough (Piling) (Stage 1)					59.3	59.3		59.3	59.3		59.3						59.3																	
IX	Road P2 Underpass, U Trough (Piling) (Stage 2)							64.5					64.5	64.5	64.5	64.5	64.5																		
IX	Road P2 Underpass, U Trough (Piling) (Stage 3)						66.2				66.2																								
IX	Road P2 Underpass, U Trough (Piling) (Stage 4)												53.1	53.1	53.1																				
IX	Road P2 Underpass, U Trough (ELS) (Sheet Piling)							65.2	65.2	65.2	65.2	65.2	65.2	65.2																						
IX	Road P2 Underpass, U Trough (ELS) (Welding & Excavation)											63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5																
IX	Road P2 Underpass, U Trough (Structure)																67.6	67.6	67.6	67.6	67.6	67.6	67.6	67.6	67.6	67.6	67.6								
IX	Road and Drainage Works																													56.9	56.9	56.9	56.9	56.9	56.9	56.9
	Cumulative Noise / dB(A)	74	74	74	71	71	72	73	72	73	73	73	73	72	71	71	72	72	72	70	70	70	70	70	70	70	70	70	70	67	60	57	57	57	57
		Jul	Aug	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									
		Jul	Aug	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
VI	Road P2 Underpass, U-Trough (Removal of Existing Abandoned Box Culvert)																												
VI	Installation of Dewatering System			56.3	56.3																								
VI	Road P2 Underpass, U Trough (Piling) (Stage 1)	59.0	59.0																										
VI	Road P2 Underpass, U Trough (Piling) (Stage 2)			60.3																									
VI	Road P2 Underpass, U Trough (ELS)	61.6	61.6	61.6																									
VI	Road P2 Underpass, U Trough (Structure)				61.8	61.8	61.8	61.8	61.8	61.8	61.8	61.8	61.8																
VI	Road and Drainage Works									63.0	63.0	63.0	63.0	63.0	63.0	63.0	63.0	63.0	63.0										
VIII	Road P2 Underpass, U Trough (Piling)														62.6	62.6	62.6												
VIII	Road P2 Underpass, U Trough (ELS)																65.6	65.6	65.6	65.6									
VIII	Road P2 Underpass, U Trough (Backfilling)	65.0	65.0	65.0	65.0	65.0	65.0																						
VIII	Road P2 Underpass, U Trough (Structure)	61.9	61.9	61.9	61.9															61.9	61.9	61.9	61.9	61.9	61.9	61.9	61.9	61.9	
VIII	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	63.3	63.3	63.3	63.3	63.3						63.3	63.3	63.3	63.3
Area Y																													
	Cumulative Noise / dB(A)	70	70	70	69	68	68	66	66	67	67	67	67	66	68	68	70	69	69	69	62	62	62	62	62	66	66	66	63
		Jul	Aug	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
		2018						2019												2020									

NSR CM8

Portion	Activity	2018						2019									
		Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
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
Area A		66.2	66.2	66.2	66.2	66.2	66.2	66.2	66.2								
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	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	64.0	64.0						
	Cumulative Noise / dB(A)	71	71	71	71	71	71	71	71	70	70	60	60	60	60	60	60
		Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
		2018						2019									

Note: Regarding to the noise assessment before July 2018 (Refer to previous revision for the details of noise assessment)

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 Underpass, U-Trough (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	60.34	
		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	61.39
VI	Installation of Dewatering System	Air Compressor	CNP 002	3	102	107	30	-5	167	-52.43	-5	3	47.11	
		Drill Rig, Rotary Type (Diesel)	CNP 072	3	110	115	30	-5	167	-52.43	-5	3	55.11	55.75
VI	Road P2 Underpass, U Trough (Piling) (Stage 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	30	-5	167	-52.43	-5	3	50.34	
		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	30	-5	167	-52.43	-5	3	45.35	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	167	-52.43	0	3	52.55	
		Concrete Lorry Mixer (6 m3)	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	58.47
VI	Road P2 Underpass, U Trough (Piling) (Stage 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	30	-5	167	-52.43	-5	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	30	-5	167	-52.43	-5	3	48.36	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	167	-52.43	0	3	52.55	
		Concrete Lorry Mixer (6 m3)	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	59.82
VI	Road P2 Underpass, U Trough (ELS)	Piling, Vibration Hammer	CNP 172	1	115	115	30	-5	167	-52.43	0	3	60.34	
		Power pack (diesel)	CNP 174	1	100	100	30	-5	167	-52.43	0	3	45.34	
		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	61.15
VI	Road P2 Underpass, U Trough (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 (6 m3)	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 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 (51 kw)	BS D8/30	1	101	101	50	-3	167	-52.43	0	3	48.55	
		Concrete Lorry Mixer (6 m3)	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)
I	DSD Transformer Room	Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	217	-54.71	0	3	45.29	
		Bar Bender and Cutter	CNP 021	1	90	90	50	-3	217	-54.71	0	3	35.29	
		Breaker, hand-held, mass > 10kg < 20kg	CNP 024	1	108	108	50	-3	217	-54.71	0	3	53.29	
		Concrete Lorry Mixer (6 m3)	BS D6/33	1	96	96	50	-3	217	-54.71	0	3	41.29	
		Saw, Circular Wood	CNP 201	1	108	108	50	-3	217	-54.71	0	3	53.29	
		Water pump, subersible (electric)	CNP 283	2	85	88	50	-3	217	-54.71	0	3	33.30	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	217	-54.71	0	3	50.29	
		Dump Truck	CNP 068	1	105	105	50	-3	217	-54.71	0	3	50.29	58.4
IV	Road P2 Underpass (Piling) (Stage 1)	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	30	-5	60	-43.50	0	3	69.05	
		Air Compressor	CNP 002	6	102	110	30	-5	60	-43.50	-5	3	59.06	
		Concrete Lorry Mixer (6 m3)	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	70.48
IV	Road P2 Underpass (Piling) (Stage 2)	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	30	-5	60	-43.50	0	3	64.27	
		Air Compressor	CNP 002	2	102	110	30	-5	60	-43.50	-5	3	54.28	
		Concrete Lorry Mixer (6 m3)	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	Road P2 Underpass (ELS)	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	30	-5	60	-43.50	-5	3	42.51	
		Excavator (223 kw) (40T)	BS C4/63	3	105	110	30	-5	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	67.72
IV	Road and Drainage Works (Stage 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	Road and Drainage Works (Stage 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 (51 kw)	BS D8/30	1	101	101	50	-3	60	-43.50	-5	3	52.49	
		Concrete Lorry Mixer (6 m3)	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
V	Road P2 Underpass, U Trough (Piling) (Stage 1)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	150	-51.53	0	3	51.46	
		Drill Rig, Rotary Type (Diesel)	CNP 072	1	110	110	30	-5	150	-51.53	-5	3	51.24	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	150	-51.53	0	3	48.46	
		Air Compressor	CNP 002	2	102	105	30	-5	150	-51.53	-5	3	46.25	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	150	-51.53	0	3	53.46	
		Concrete Lorry Mixer (6 m3)	BS D6/33	1	96	96	50	-3	150	-51.53	0	3	44.46	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	150	-51.53	0	3	39.48	
		Breaker, excavator mounted (hydraulic)	CNP 028	1	122	122	10	-10	150	-51.53	-10	3	53.47	59.38
V	Road P2 Underpass, U Trough (Piling) (Stage 2)	Crane (240 kw) (105T)	BS C4/52	2	103	106	50	-3	150	-51.53	0	3	54.47	
		Drill Rig, Rotary Type (Diesel)	CNP 072	2	110	113	30	-5	150	-51.53	-5	3	54.25	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	150	-51.53	0	3	48.46	
		Air Compressor	CNP 002	4	102	108	30	-5	150	-51.53	-5	3	49.26	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	150	-51.53	0	3	53.46	
		Concrete Lorry Mixer (6 m3)	BS D6/33	1	96	96	50	-3	150	-51.53	0	3	44.46	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	150	-51.53	0	3	39.48	
		Breaker, excavator mounted (hydraulic)	CNP 028	1	122	122	10	-10	150	-51.53	-10	3	53.47	60.72
V	Road P2 Underpass, U Trough (ELS)	Piling, Vibration Hammer	CNP 172	1	115	115	30	-5	150	-51.53	0	3	61.24	
		Power pack (diesel)	CNP 174	1	100	100	30	-5	150	-51.53	0	3	46.24	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	150	-51.53	0	3	39.48	61.4
V	Road P2 Underpass, U Trough (Structure)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	150	-51.53	0	3	51.46	
		Excavator (223 kw) (40T)	BS C4/63	2	105	108	50	-3	150	-51.53	0	3	56.47	
		Dump Truck	CNP 068	2	105	108	50	-3	150	-51.53	0	3	56.47	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	2	100	103	50	-3	150	-51.53	0	3	51.47	
		Saw, Circular Wood	CNP 201	2	108	111	50	-3	150	-51.53	0	3	59.47	
		Concrete Lorry Mixer (6 m3)	BS D6/33	1	96	96	50	-3	150	-51.53	0	3	44.46	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	150	-51.53	0	3	39.48	
														63.2
V	Road and Drainage Works	Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	150	-51.53	0	3	53.46	
		Roller, Vibratory (51 kw)	BS D8/30	1	101	101	50	-3	150	-51.53	0	3	49.46	
		Concrete Lorry Mixer (6 m3)	BS D6/33	1	96	96	50	-3	150	-51.53	0	3	44.46	
		Light goods vehicle, gross vehicle weight < 5.5 tonne	CNP 143	1	101	101	50	-3	150	-51.53	0	3	49.46	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	150	-51.53	0	3	39.48	
		Dump Truck	CNP 068	1	105	105	50	-3	150	-51.53	0	3	53.46	
		Road Roller	CNP 185	1	108	108	50	-3	150	-51.53	0	3	56.46	60.41
VII	Road P2 Underpass, U Trough (Piling)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	124	-49.89	-5	3	48.10	
		Drill Rig, Rotary Type (Diesel)	CNP 072	1	110	110	30	-5	124	-49.89	-5	3	52.88	
		Air Compressor	CNP 002	2	102	105	30	-5	124	-49.89	-5	3	47.89	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	124	-49.89	-5	3	50.10	
		Concrete Lorry Mixer (6 m3)	BS D6/33	1	96	96	50	-3	124	-49.89	-5	3	41.10	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	124	-49.89	-5	3	36.12	56.43
VII	Road P2 Underpass, U Trough (ELS)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	124	-49.89	-5	3	48.10	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	1	100	100	50	-3	124	-49.89	-5	3	45.10	
		Breaker, excavator mounted (hydraulic)	CNP 028	1	122	122	10	-10	124	-49.89	-10	3	55.11	
		Piling, Vibration Hammer	CNP 172	1	115	115	30	-5	124	-49.89	-5	3	57.88	
		Power pack (diesel)	CNP 174	1	100	100	30	-5	124	-49.89	-5	3	42.88	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	124	-49.89	-5	3	50.10	
		Dump Truck	CNP 068	1	105	105	50	-3	124	-49.89	-5	3	50.10	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	124	-49.89	-5	3	36.12	61.02
VII	Road and Drainage Works	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	124	-49.89	-5	3	48.10	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	50	-3	124	-49.89	-5	3	50.10	
		Concrete Lorry Mixer (6 m3)	BS D6/33	1	96	96	50	-3	124	-49.89	-5	3	41.10	
		Water pump, subersible (electric)	CNP 283	4	85	91	50	-3	124	-49.89	-5	3	36.12	
		Road Roller	CNP 185	1	108	108	50	-3	124	-49.89	-5	3	53.10	55.89
IX	Dredging and Reclamation	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	6	105	113	50	-3	228	-55.17	0	3	57.60	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	4	100	106	50	-3	228	-55.17	0	3	50.84	
		Winch (Electric)	CNP 262	4	95	101	50	-3	228	-55.17	0	3	45.84	
		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	
		Hopper barge	-	6	-	-	50	-3	228	-55.17	0	3	-	64.8
IX	Steel Cofferdam and Water Gate	Derrick Barge	CNP 061	3	104	109	50	-3	228	-55.17	0	3	53.59	
		Tug boat	CNP 221	2	110	113	50	-3	228	-55.17	0	3	57.83	59.22
IX	Marine Ground Treatment	Band Drain Machine (hydarulic Vibratory lance starting up)	BS D4/107a	1	113	113	30	-5	228	-55.17	-5	3	50.60	
		Excavator (223 kw) (40T)	BS C4/63	1	105	105	30	-5	228	-55.17	-5	3	42.60	51.24

Note: SPL = SWL + TF + DC + BC + FC, where

SPL = Predicted noise level in dB(A)

SWL = Sound Power Level in dB(A)

TF = Time factor in dB(A) = 10 log (P)

P = On-time percentage

DC = Distance attenuation correction in dB(A) = -(20 log D + 8)

D = Distance in m between the noise source and the receiver

BC = Barrier correction in dB(A)

FC = Façade correction in dB(A) = 3 dB(A)

CRBC - Build King Joint Venture

Construction Noise Assessment

Period: 0700 to 1900 (except general holidays)

Noise Sensitive Receiver: CM6 (Above 39m)

Mitigation Measures Scenario

Noise Criteria: 75dB(A)

Portion	Activity	PME	TM Ref. / other Ref.	No. of plants	SWL	Total SWL	On-time, %	Time Factor	Distance from Notional Sources, m	Distance Attenuation*, dB(A)	Barrier Correction, dB(A)	Façade Correction, dB(A)	Predicted Noise Level, dB(A)	Total Predicted Noise Level for each group, dB(A)
IX	U - Trough (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	
		Dump Truck	CNP 068	3	105	110	50	-3	228	-55.17	0	3	54.59	58.27
IX	U - Trough (Pre-Drill)(Stage 1)	G.I. drilling rig	BS C2/43	3	102	107	50	-3	228	-55.17	0	3	51.59	51.59
IX	U - Trough (Pre-Drill)(Stage 2)	G.I. drilling rig	BS C2/43	5	102	109	50	-3	228	-55.17	0	3	53.81	53.81
IX	U - Trough (Pre-Drill)(Stage 3)	G.I. drilling rig	BS C2/43	6	102	110	50	-3	228	-55.17	0	3	54.6	54.6
IX	U - Trough (Pre-Drill)(Stage 4)	G.I. drilling rig	BS C2/43	7	102	110	50	-3	228	-55.17	0	3	55.27	55.27
IX	U - Trough (Pre-Drill)(Stage 5)	G.I. drilling rig	BS C2/43	8	102	111	50	-3	228	-55.17	0	3	55.85	55.85
IX	U - Trough (Pre-Drill)(Stage 6)	G.I. drilling rig	BS C2/43	14	102	113	50	-3	228	-55.17	0	3	58.28	58.28
IX	U - Trough (Piling)(Stage 1)	Crane (240 kw) (105T)	BS C4/52	1	103	103	50	-3	228	-55.17	0	3	47.82	
		Drill Rig, Rotary Type (Diesel)	CNP 072	1	110	110	30	-5	228	-55.17	-5	3	47.60	
		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	2	102	105	30	-5	228	-55.17	0	3	47.61	
		Excavator (223 kw) (40T)	BS C4/63	2	105	108	50	-3	228	-55.17	0	3	52.83	
		Concrete Lorry Mixer (6 m3)	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	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	59.18
IX	U - Trough (Piling)(Stage 2)	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	30	-5	228	-55.17	-5	3	56.63	
		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	30	-5	228	-55.17	0	3	56.64	
		Excavator (223 kw) (40T)	BS C4/63	8	105	114	50	-3	228	-55.17	0	3	58.85	
		Concrete Lorry Mixer (6 m3)	BS D6/33	4	96	102	50	-3	228	-55.17	0	3	46.84	
		Water pump, subersible (electric)	CNP 283	10	85	95	50	-3	228	-55.17	0	3	39.82	
		Dump Truck	CNP 068	3	105	110	50	-3	228	-55.17	0	3	54.59	
														64.41
IX	U - Trough (Piling)(Stage 3)	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	30	-5	228	-55.17	-5	3	58.39	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	12	100	111	50	-3	228	-55.17	0	3	55.61	
		Air Compressor	CNP 002	24	102	116	30	-5	228	-55.17	0	3	58.40	
		Excavator (223 kw) (40T)	BS C4/63	12	105	116	50	-3	228	-55.17	0	3	60.61	
		Concrete Lorry Mixer (6 m3)	BS D6/33	8	96	105	50	-3	228	-55.17	0	3	49.85	
		Water pump, subersible (electric)	CNP 283	10	85	95	50	-3	228	-55.17	0	3	39.82	
		Dump Truck	CNP 068	3	105	110	50	-3	228	-55.17	0	3	54.59	
														66.04
IX	U - Trough (Piling)(Stage 4)	Tracked mobile crane (240 kw) (105T)	BS C4/52	3	108	106	50	-3	228	-55.17	0	3	52.59	
		Piling, large diameter bored, reverse circulation drill	CNP 166	3	105	105	30	-5	228	-55.17	-5	3	42.37	52.98
IX	U - Trough (ELS) (Sheet Piling)	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	8	100	109	50	-3	228	-55.17	0	3	53.85	
		Piling, Vibration Hammer	CNP 172	4	115	121	30	-5	228	-55.17	0	3	63.62	
		Power pack (diesel)	CNP 174	4	100	106	30	-5	228	-55.17	0	3	48.62	
		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	4	105	111	50	-3	228	-55.17	0	3	55.84	
														65.11
IX	U - Trough (ELS) (Welding & Excavation)	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	8	100	109	50	-3	228	-55.17	0	3	53.85	
		Excavator (223 kw) (40T)	BS C4/63	8	105	114	50	-3	228	-55.17	0	3	58.85	
		Dump Truck	CNP 068	8	105	114	50	-3	228	-55.17	0	3	58.85	
		Water pump, subersible (electric)	CNP 283	20	85	98	50	-3	228	-55.17	0	3	42.83	
		Derrick Barge	CNP 061	2	104	107	50	-3	228	-55.17	0	3	51.83	
														63.40
IX	U - Trough (Structure)	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	
		Air Blower	CNP 006	10	95	105	50	-3	228	-55.17	0	3	49.82	
		Saw, Circular Wood	CNP 201	10	108	118	50	-3	228	-55.17	0	3	62.82	
		Concrete Lorry Mixer (6 m3)	BS D6/33	4	96	102	50	-3	228	-55.17	0	3	46.84	
		Concrete pump, stationary/lorry mounted	CNP 047	4	109	115	50	-3	228	-55.17	0	3	59.84	
		Poker, vibratory, hand-held	CNP 170	4	113	119	50	-3	228	-55.17	0	3	63.84	
		Water pump, subersible (electric)	CNP 283	20	85	98	50	-3	228	-55.17	0	3	42.83	67.51
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 (51 kw)	BS D8/30	1	101	101	50	-3	228	-55.17	0	3	45.82	
		Concrete Lorry Mixer (6 m3)	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

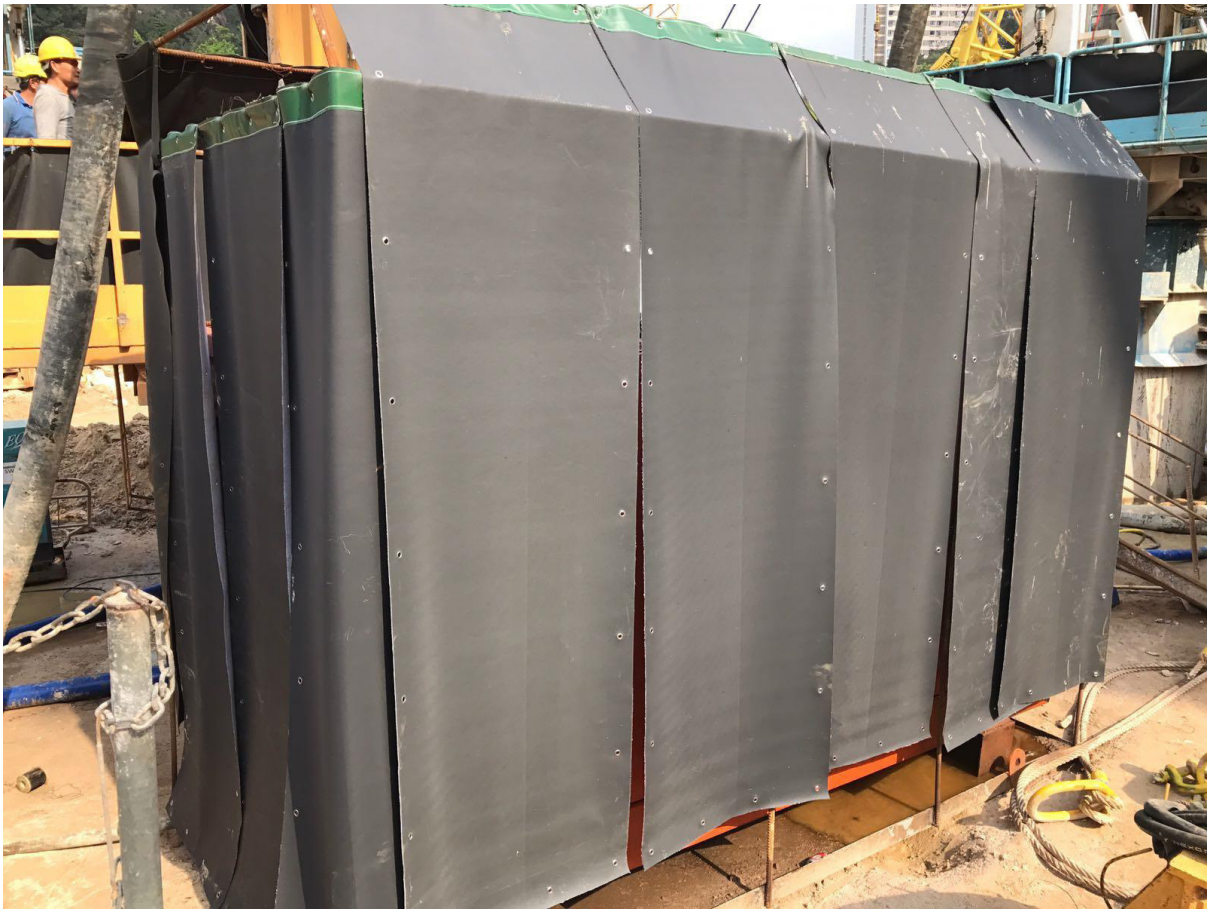
Portion	Activity	2018						2019												2020												2021			
		Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
I	DSD Transformer Room																																		
IV	Road P2 Underpass (Piling) (Stage 1)	70.5	70.5																																
IV	Road P2 Underpass (Piling) (Stage 2)			66.7																															
IV	Road P2 Underpass (ELS)	67.7	67.7	67.7																															
IV	Road and Drainage Works (Stage 1)				64.0	64.0	64.0																												
IV	Road and Drainage Works (Stage 2)							64.0	64.0	64.0	64.0	64.0	64.0	64.0	64.0	64.0	64.0	64.0	64.0	64.0	64.0	64.0	64.0	64.0	64.0	64.0	64.0	64.0	64.0	64.0					
V	Road P2 Underpass, U Trough (Piling) (Stage 1)	59.4	59.4																																
V	Road P2 Underpass, U Trough (Piling) (Stage 2)			60.7																															
V	Road P2 Underpass, U Trough (ELS)	61.4	61.4	61.4																															
V	Road P2 Underpass, U Trough (Structure)				63.2	63.2	63.2	63.2	63.2	63.2	63.2	63.2	63.2																							
V	Road and Drainage Works									60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4	60.4																
VI	Road P2 Underpass, U-Trough (Removal of Existing Abandoned Box Culvert)																																		
VI	Installation of Dewatering System			55.8	55.8																														
VI	Road P2 Underpass, U Trough (Piling) (Stage 1)	58.5	58.5																																
VI	Road P2 Underpass, U Trough (Piling) (Stage 2)			59.8																															
VI	Road P2 Underpass, U Trough (ELS)	61.2	61.2	61.2																															
VI	Road P2 Underpass, U Trough (Structure)				61.3	61.3	61.3	61.3	61.3	61.3	61.3	61.3	61.3																							
VI	Road and Drainage Works									60.8	60.8	60.8	60.8	60.8	60.8	60.8	60.8	60.8	60.8																
VII	Road P2 Underpass, U Trough (Piling)	58.45																																	
VII	Road P2 Underpass, U Trough (ELS)	61.0	61.0	61.0																															
VII	Road and Drainage Works				55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9					
IX	Steel Cofferdam & Water Gate																																		
IX	Dredging & Reclamation	64.8	64.8	64.8	64.8	64.8	64.8	64.8	64.8	64.8	64.8	64.8																							
IX	Marine Ground Treatment		51.2	51.2	51.2	51.2	51.2																												
IX	Road P2 Underpass, U Trough (Backfilling)		58.3	58.3	58.3	58.3	58.3	58.3	58.3																										
IX	Road P2 Underpass, U Trough (Pre Drill) (Stage 1)							51.6	51.6	51.6																										
IX	Road P2 Underpass, U Trough (Pre Drill) (Stage 2)		53.8	53.8	53.8	53.8	53.8																												
IX	Road P2 Underpass, U Trough (Pre Drill) (Stage 3)										54.6																								
IX	Road P2 Underpass, U Trough (Pre Drill) (Stage 4)												55.3																						
IX	Road P2 Underpass, U Trough (Pre Drill) (Stage 5)																																		
IX	Road P2 Underpass, U Trough (Pre Drill) (Stage 6)											58.3																							
IX	Road P2 Underpass, U Trough (Piling) (Stage 1)					59.2	59.2		59.2	59.2		59.2						59.2																		
IX	Road P2 Underpass, U Trough (Piling) (Stage 2)							64.4					64.4	64.4	64.4	64.4	64.4																		
IX	Road P2 Underpass, U Trough (Piling) (Stage 3)						66.0				66.0																								
IX	Road P2 Underpass, U Trough (Piling) (Stage 4)												53.0	53.0	53.0																				
IX	Road P2 Underpass, U Trough (ELS) (Sheet Piling)							65.1	65.1	65.1	65.1	65.1	65.1	65.1																						
IX	Road P2 Underpass, U Trough (ELS) (Welding & Excavation)											63.4	63.4	63.4	63.4	63.4	63.4	63.4	63.4																
IX	Road P2 Underpass, U Trough (Structure)																	67.5	67.5	67.5	67.5	67.5	67.5	67.5	67.5	67.5	67.5	67.5	67.5	67.5					
IX	Road and Drainage Works																														56.8	56.8	56.8	56.8	56.8	56.8	56.8
	Cumulative Noise / dB(A)	74	74	73	70	70	72	72	72	72	73	73	72	71	70	70	70	71	71	69	69	69	69	69	69	69	69	69	70	65	59	57	57	57	57
		Jul	Aug	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			

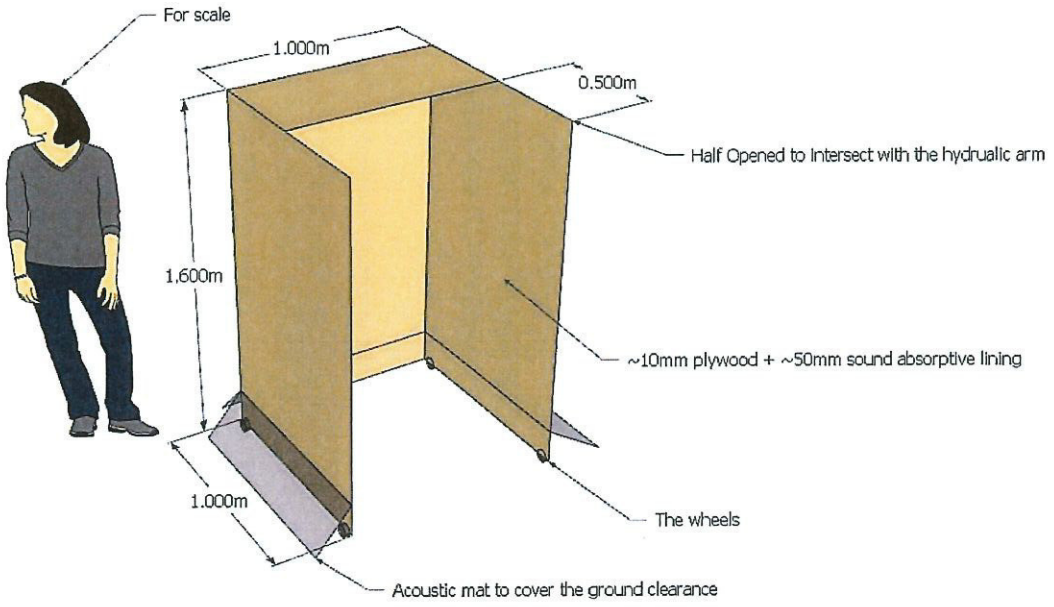
Note: Regarding to the noise assessment before July 2018 (Refer to previous revision for the details of noise assessment)

Appendix D

Sample of Movable Noise Barriers, Acoustic Mat and Enclosure

Noise Enclosure for generator & air compressor




For scale
1.000m
0.500m
Half Opened to intersect with the hydrualic arm
1,600m
~10mm plywood + ~50mm sound absorptive lining
1.000m
The wheels
Acoustic mat to cover the ground clearance


防音
防音
防音
防音
防音
CEDD

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

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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

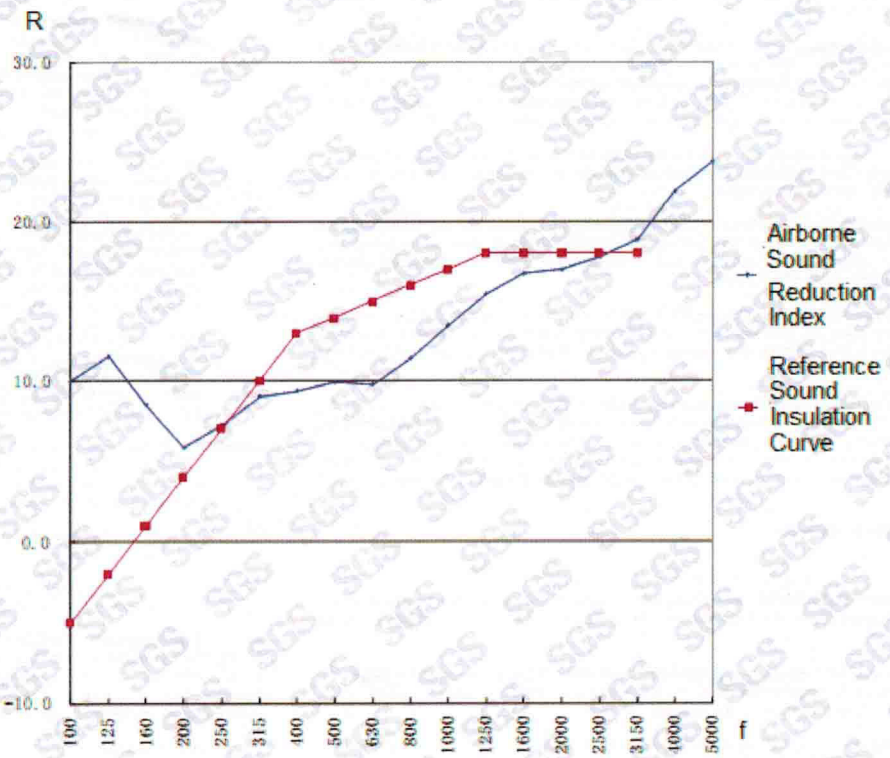
The test is performed in accordance with ISO 10140-2-2010 Acoustics -- Laboratory measurement of sound insulation of building elements -- Part 2: Measurement of airborne sound insulation
The evaluation of the single-number rating from the results in one-third octave bands is done in accordance with ISO 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...

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

SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch Testing Center Furniture Hardgoods Laboratory.

SDHG 072324

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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)22805858 e sgs.china@sgs.com

Wilson Acoustics Limited

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5 - 7 Yuen Shun Circuit, Shatin, NT
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E-mail: who@wal.hk
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)

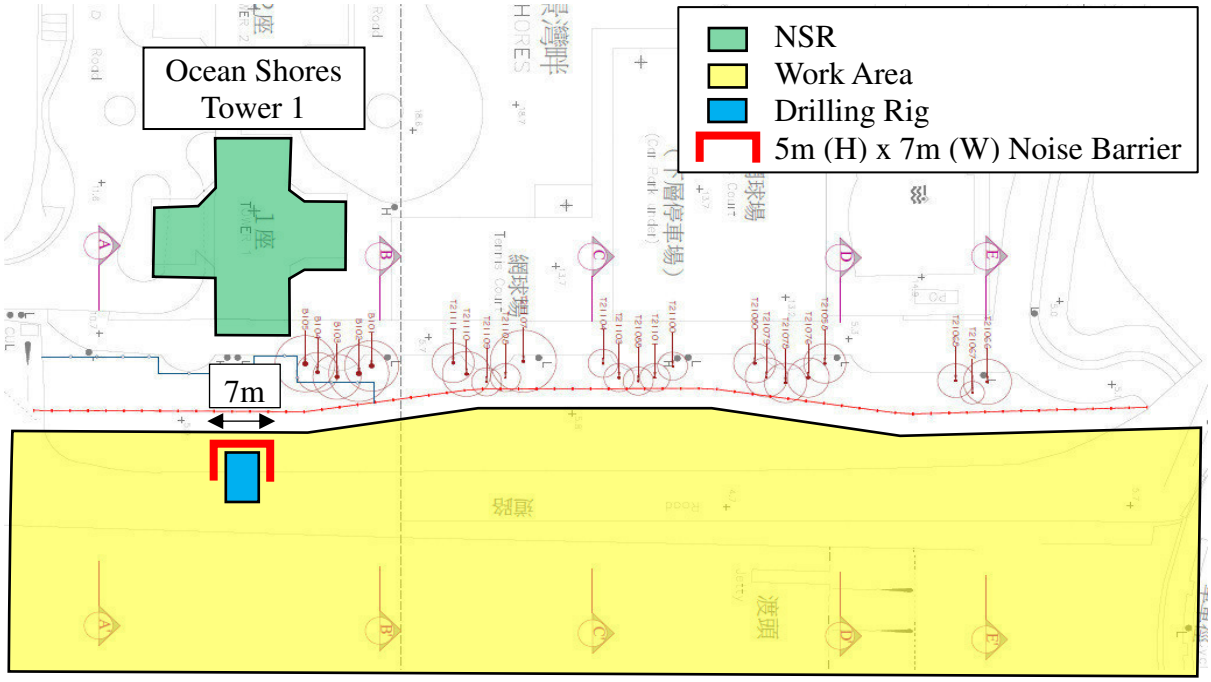

Figure 1. Site Plan with NSR of Noise Barrier Worst-case Location (Top View)

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.

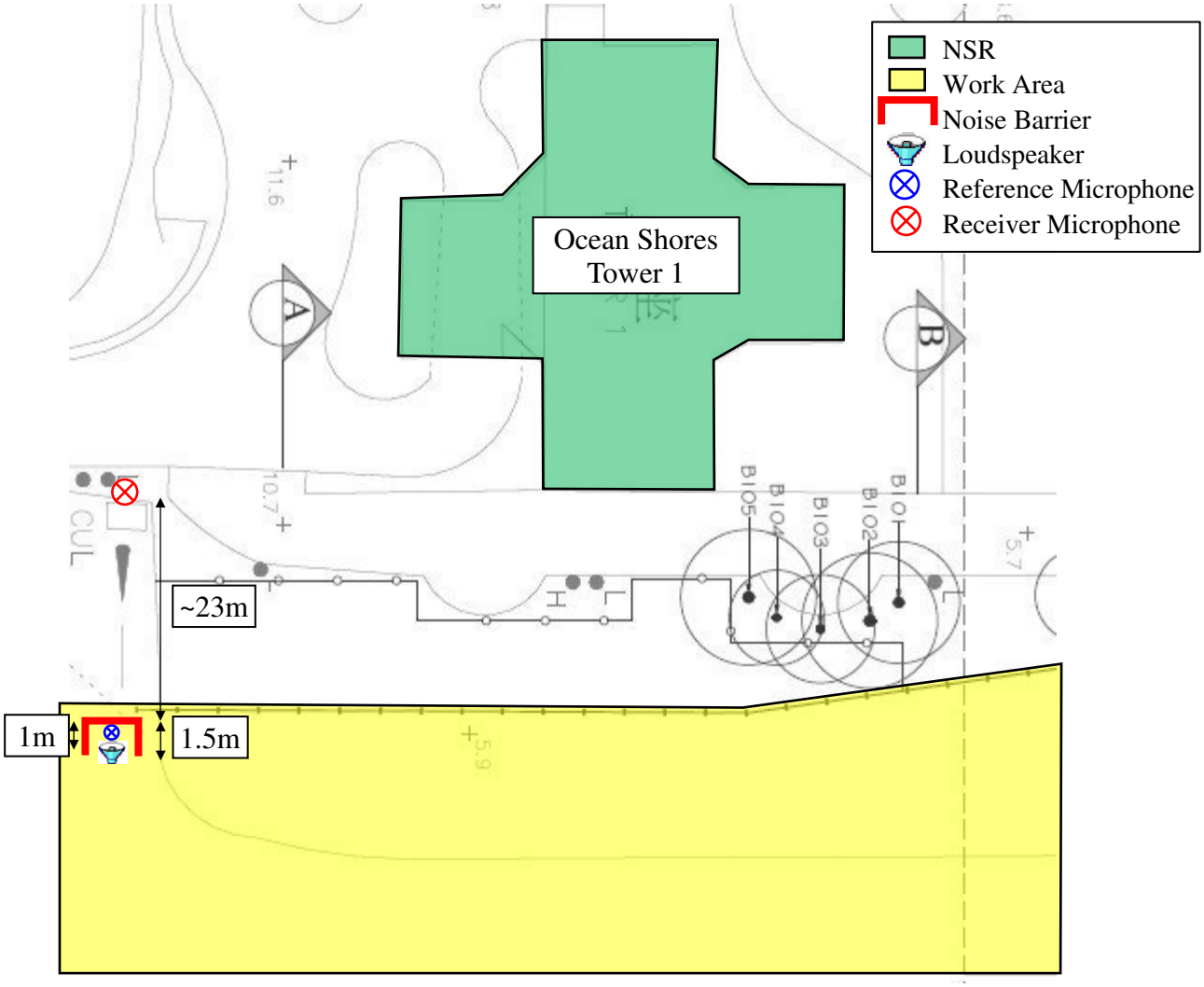

Figure 2. Schematic Concept of IL Measurement (Plan View)

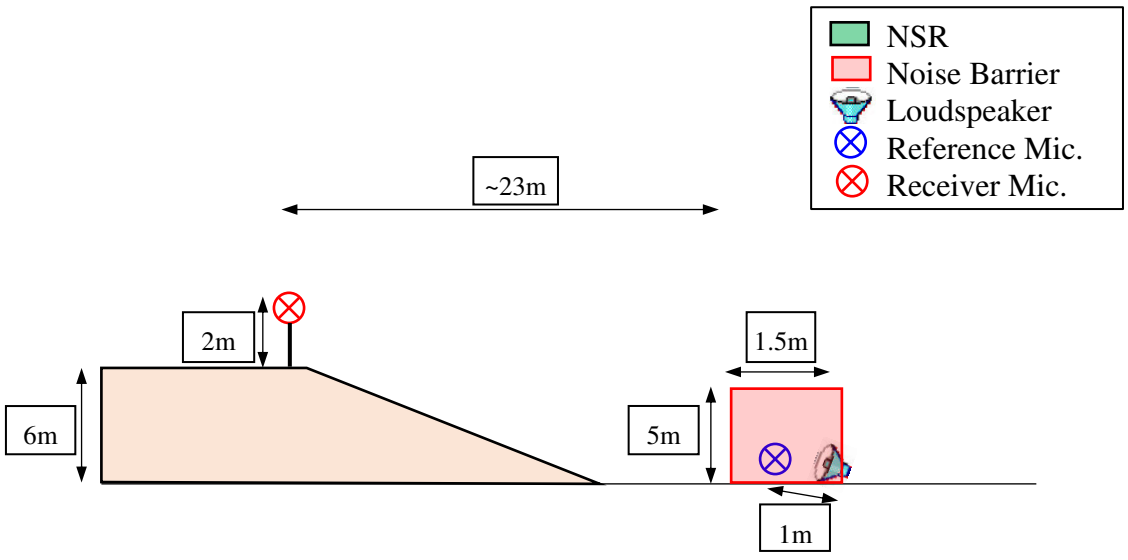

Figure 3. Schematic Concept of IL Measurement (Side View)

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*

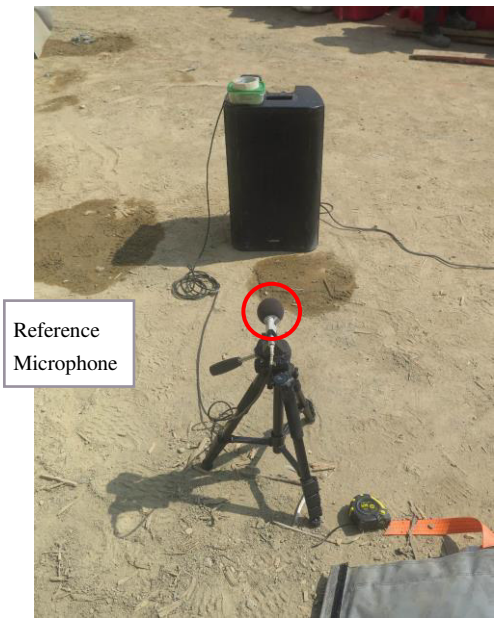

Photo A3. *Loudspeaker and Reference Microphone for without Noise Barrier Scenario*

Appendix B: Noise Spectrum

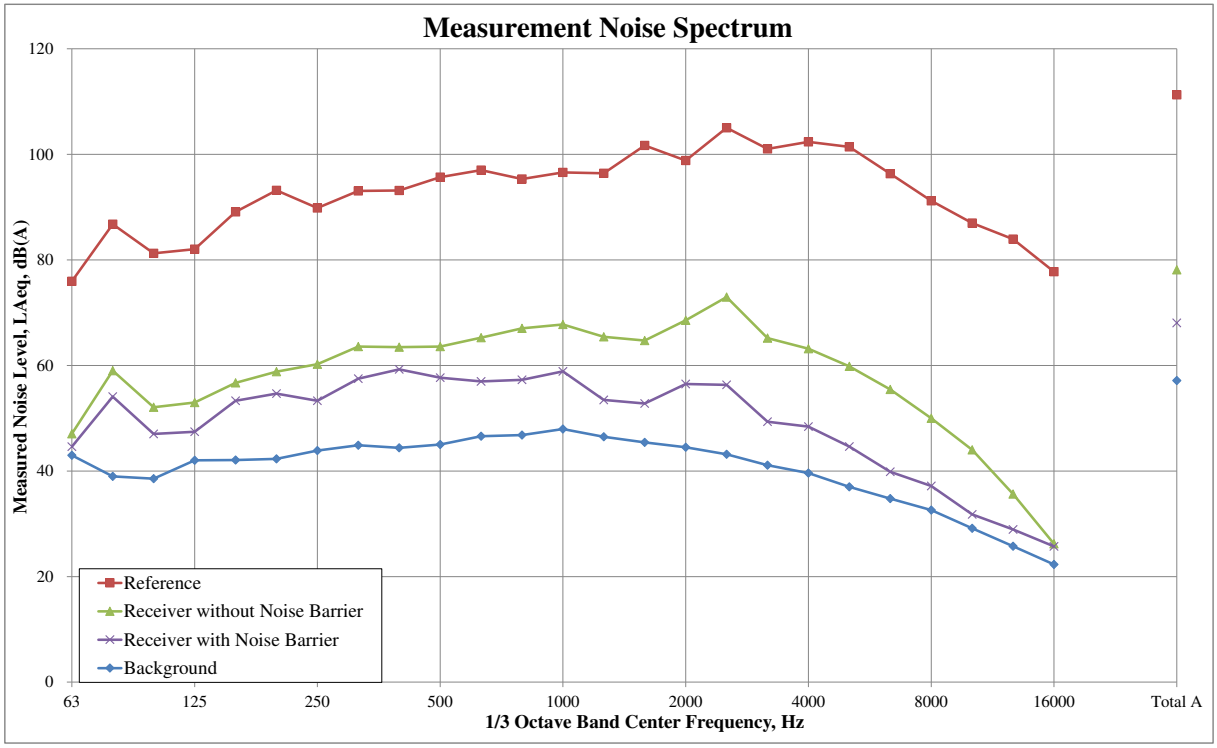

Figure B1: Measurement Noise Spectrum

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.
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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 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

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Figure C3: SVAN 958 (23412) Calibration Certificate, Page 1

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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.
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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

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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.
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Figure C6: Acoustics Calibrator (10814) Calibration Certificate, Page 2

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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.

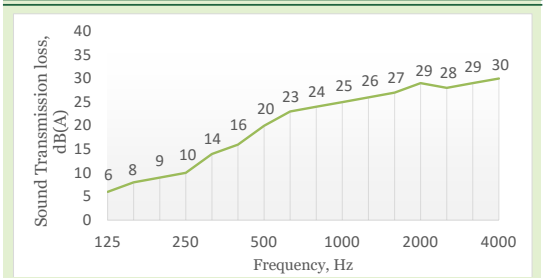
BS EN ISO 15025:2002 6 TYPE B
GB8624-1997 TYPE B

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

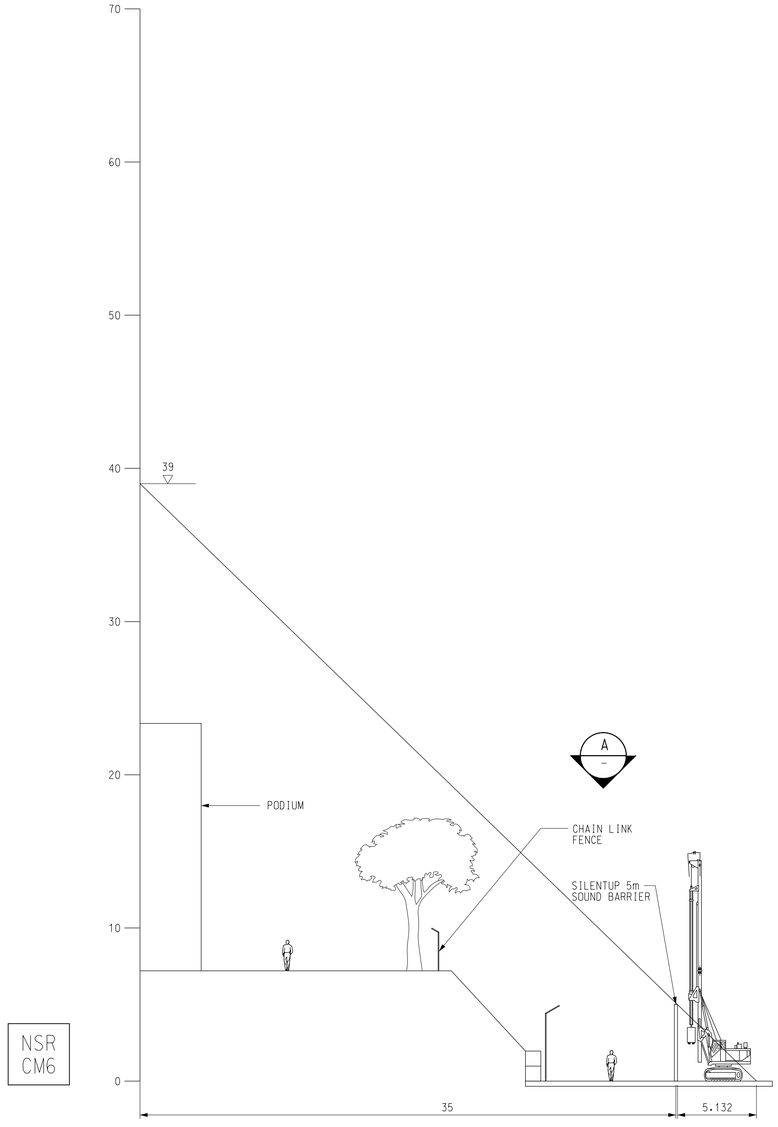
"SilentUP is definitely a useful tool to minimize the noise pollution. We successfully obtained a CNP and most importantly no complaint has been received from the NSRs."

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



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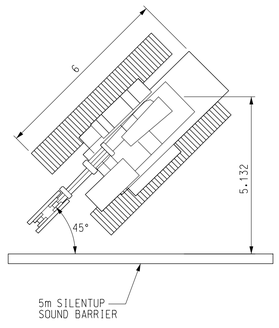

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METRES
1 : 200

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
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
SCHEMATIC DIAGRAMS

Drawing no. 圖紙編號	Rev. 修訂
NE/2015/02/SK/0084	–

Drawn By 繪圖	Checked By 覆核	Approved By 批准人
AL		

Scale 比例	Status 階段
AS SHOWN @ A1	

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

On-site Plant Inventory

Location	Construction Activities	PME Type	TM Ref. / Other Ref / BS5228 Ref	SWL	Remarks
Portion I	DSD Transformer Room	Generator, Silenced, <=75 dB(A) at 7m	CNP 102	100	
		Bar Bender and Cutter	CNP 021	90	
		Breaker, hand-held, mass > 10kg < 20kg	CNP 024	108	
		Concrete Lorry Mixer (6 m3)	BS D6/33	96	
		Saw, Circular Wood	CNP 201	108	
		Water pump, submersible (electric)	CNP 283	85	
		Excavator (223 kw) (40T)	BS C4/63	105	
		Dump Truck	CNP 068	105	
Portion II	Retaining Wall	Excavator (223 kw) (40T)	BS C4/63	105	
		Dump Truck	CNP 068	105	
		Saw, Circular Wood	CNP 201	108	
		Bar Bender and Cutter	CNP 021	90	
		Water pump, submersible (electric)	CNP 283	85	
		Concrete Lorry Mixer (6 m3)	BS D6/33	96	
		Roller, Vibratory (51kw)	BS D8/30	101	
Portion III	Demolition of DSD Transformer Room	Breaker, excavator mounted (hydraulic)	CNP 028	122	
		Excavator (223 kw) (40T)	BS C4/63	105	
		Water pump, submersible (electric)	CNP 283	85	
Portion IV	Road P2 Underpass (Piling) (Stage 1) Road P2 Underpass (Piling) (Stage 2) Road P2 Underpass (ELS) Road and Drainage Works (Stage 1) Road and Drainage Works (Stage 2)	Crane (240 kw) (105T)	BS C4/52	103	
		Drill Rig, Rotary Type (Diesel)	CNP 072	110	
		Air Compressor	CNP 002	102	
		Concrete Lorry Mixer (6 m3)	BS D6/33	96	
		Water pump, submersible (electric)	CNP 283	85	
		Breaker, excavator mounted (hydraulic)	CNP 028	122	
		Piling, Vibration Hammer	CNP 172	115	
		Power pack (diesel)	CNP 174	100	
		Excavator (223 kw) (40T)	BS C4/63	105	
		Dump Truck	CNP 068	105	
		Generator, Silenced, <=75 dB(A) at 7m	CNP 102	100	
		Welding Machine	CNP 107	99	
		Roller, Vibratory (51 kw)	BS D8/30	101	
		Light goods vehicle, gross vehicle weight < 5.5 tonne	CNP 143	101	
		Road Roller	CNP 185	108	
Portion V	Road P2 Underpass, U Trough (Piling) (Stage 1) Road P2 Underpass, U Trough (Piling) (Stage 2) Road P2 Underpass, U Trough (ELS) Road P2 Underpass, U Trough (Structure) Road and Drainage Works	Crane (240 kw) (105T)	BS C4/52	103	
		Drill Rig, Rotary Type (Diesel)	CNP 072	110	
		Generator, Silenced, <=75 dB(A) at 7m	CNP 102	100	
		Air Compressor	CNP 002	102	
		Excavator (223 kw) (40T)	BS C4/63	105	
		Concrete Lorry Mixer (6 m3)	BS D6/33	96	
		Water pump, submersible (electric)	CNP 283	85	
		Breaker, excavator mounted (hydraulic)	CNP 028	122	

		Piling, Vibration Hammer	CNP 172	115	
		Power pack (diesel)	CNP 174	100	
		Dump Truck	CNP 068	105	
		Saw, Circular Wood	CNP 201	108	
		Roller, Vibratory (51 kw)	BS D8/30	101	
		Light goods vehicle, gross vehicle weight < 5.5 tonne	CNP 143	101	
		Road Roller	CNP 185	108	
Portion VI	Road P2 Underpass, U-Trough (Removal of Existing Abandoned Box Culvert) Installation of Dewatering System Road P2 Underpass, U Trough (Piling) (Stage 1) Road P2 Underpass, U Trough (Piling) (Stage 2) Road P2 Underpass, U Trough (ELS) Road P2 Underpass, U Trough (Structure) Road and Drainage Works	Crane (240 kw) (105T)	BS C4/52	103	
		Piling, large diameter bored, oscillator	CNP 165	115	
		Excavator (223 kw) (40T)	BS C4/63	105	
		Water pump, submersible (electric)	CNP 283	85	
		Air Compressor	CNP 002	102	
		Drill Rig, Rotary Type (Diesel)	CNP 072	110	
		Generator, Silenced, <=75 dB(A) at 7m	CNP 102	100	
		Concrete Lorry Mixer (6 m^3)	BS D6/33	96	
		Welding Machine	CNP 107	99	
		Piling, Vibration Hammer	CNP 172	115	
		Power pack (diesel)	CNP 174	100	
		Saw, Circular Wood	CNP 201	108	
		Roller, Vibratory (51 kw)	BS D8/30	101	
		Light goods vehicle, gross vehicle weight < 5.5 tonne	CNP 143	101	
		Dump Truck	CNP 068	105	
		Road Roller	CNP 185	108	
Portion VII	Road P2 Underpass, U Trough (Piling) Road P2 Underpass, U Trough (ELS) Road and Drainage Works	Crane (240 kw) (105T)	BS C4/52	103	
		Drill Rig, Rotary Type (Diesel)	CNP 072	110	
		Air Compressor	CNP 002	102	
		Excavator (223 kw) (40T)	BS C4/63	105	
		Concrete Lorry Mixer (6 m3)	BS D6/33	96	
		Water pump, subersible (electric)	CNP 283	85	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	100	
		Breaker, excavator mounted (hydraulic)	CNP 028	122	
		Piling, Vibration Hammer	CNP 172	115	
		Power pack (diesel)	CNP 174	100	
		Dump Truck	CNP 068	105	
		Road Roller	CNP 185	108	
Portion VIII	Road P2 Underpass, U Trough (Piling) Road P2 Underpass, U Trough (ELS) Road P2 Underpass, U Trough (Backfilling) Road P2 Underpass, U Trough (Structure) Road and Drainage Works	Crane (240 kw) (105T)	BS C4/52	103	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	100	
		Air Compressor	CNP 002	102	
		Drill Rig, Rotary Type (Diesel)	CNP 072	110	
		Excavator (223 kw) (40T)	BS C4/63	105	
		Concrete Lorry Mixer (6 m3)	BS D6/33	96	
		Piling, Vibration Hammer	CNP 172	115	
		Power pack (diesel)	CNP 174	100	
		Water pump, subersible (electric)	CNP 283	85	
		Breaker, excavator mounted (hydraulic)	CNP 028	122	
		Dump Truck	CNP 068	105	

		Saw, Circular Wood	CNP 201	108	
		Poker, Vibratory, Handheld	CNP 170	113	
		Concrete Pump	CNP 047	109	
		Roller, Vibratory (51 kw)	BS D8/30	101	
		Asphalt Paver (90 kw)	BS D8/24	101	
		Lorry (10T / 24T)	BS D8/25	96	
		Crane (240 kw) (105T)	BS C4/52	103	
		Power Rammer Petrol	CNP 169	108	
Portion IX	Dredging and Reclamation Steel Cofferdam and Water Gate Marine Ground Treatment U - Trough (Backfilling) U - Trough (Pre-Drill)(Stage 1) U - Trough (Pre-Drill)(Stage 2) U - Trough (Pre-Drill)(Stage 3) U - Trough (Pre-Drill)(Stage 4) U - Trough (Pre-Drill)(Stage 5) U - Trough (Pre-Drill)(Stage 6) U - Trough (Piling)(Stage 1) U - Trough (Piling)(Stage 2) U - Trough (Piling)(Stage 3) U - Trough (Piling)(Stage 4) U - Trough (ELS) (Sheet Piling) U - Trough (ELS) (Welding & Excavation) U - Trough (Structure) U - Trough (Road and Drainage Works)	Air Blower	CNP 006	95	
		Air Compressor	CNP 002	102	
		Band Drain Machine (hydarulic Vibratory lance starting up)	BS D4/107a	113	
		Concrete Lorry Mixer (6 m3)	BS D6/33	96	
		Concrete pump, stationary/Lorry mounted	CNP 047	109	
		Crane (240 kw) (105T)	BS C4/52	103	
		Derrick Barge	CNP 061	104	
		Dredger	CNP 070	103	
		Drill Rig, Rotary Type (Diesel)	CNP 072	110	
		Dump Truck	CNP 068	105	
		Excavator (223 kw) (40T)	BS C4/63	105	
		G.I. drilling rig (18kw)	BS C2/43	102	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	100	
		Hopper barge	-	-	
		Light goods vehicle, gross vehicle weight < 5.5 tonne	CNP 143	101	
		Piling, large diameter bored, reverse circulation drill	CNP 166	105	
		Piling, Vibration Hammer	CNP 172	115	
		Poker, vibratory, hand-held	CNP 170	113	
		Power pack (diesel)	CNP 174	100	
		Road Roller	CNP 185	108	
		Roller, Vibratory (51 kw)	BS D8/30	101	
		Saw, Circular Wood	CNP 201	108	
		Tug boat	CNP 221	110	
		Vibration Hammer	CNP 172	115	
		Water pump, subersible (electric)	CNP 283	85	
		Welding Machine	CNP 107	99	
		Winch (Electric)	CNP 262	95	
Area A		Breaker, excavator mounted (hydraulic)	CNP 028	122	
		Excavator (223 kw) (40T)	BS C4/63	105	
		Dump Truck	CNP 068	105	
		Bobcat	CNP 081	112	
		Water pump, subersible (electric)	CNP 283	85	
Area Y		Bar Bender and Cutter	CNP 021	90	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	100	
		Water pump, subersible (electric)	CNP 283	85	
Construction of Northern Footbridge	Pre-drilling works (Near Tiu Keng Leng Sports Centre) Construction of soldier wall (Near Tiu Keng Leng Sports Centre) Pre-drilling & Piling works	Drill Rig	CNP 072	110	
		Breaker, excavator mounted (hydraulic)	CNP 028	122	
		Air Compressor	CNP 002	102	
		Crane	BS D7/114	101	
		Generator, Silenced,<=75 dB(A) at 7m	CNP 102	100	
		Concrete Lorry Mixer	BS D6/33	96	

	(Near Park Central Block 6) Construction of Footbridge (Near Park Central Block 6) Construction of Footbridge (Near Tiu Keng Leng Sports Centre)	Piling, Vibration Hammer	CNP 172	115	
		Water Pump, Submersible (electric)	CNP 283	85	
		Excavator	BS D8/13	110	
		Dump Truck	BS D8/25	105	
		Saw, Circular Wood	CNP 201	108	

Appendix F

Catalogues of On-site Plant

Hydraulic Crawler Crane

CKS

900

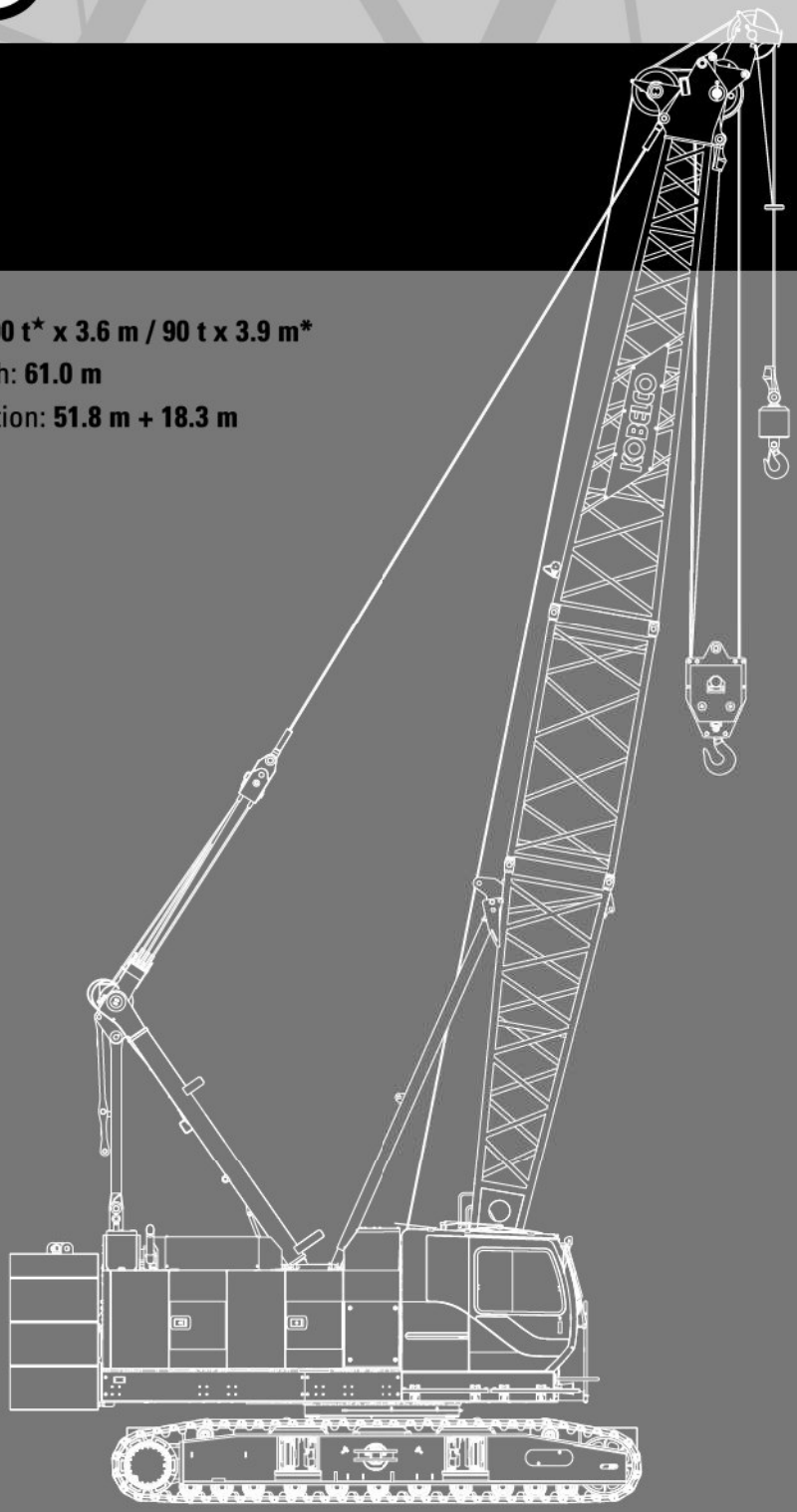
Model : CKS900

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.

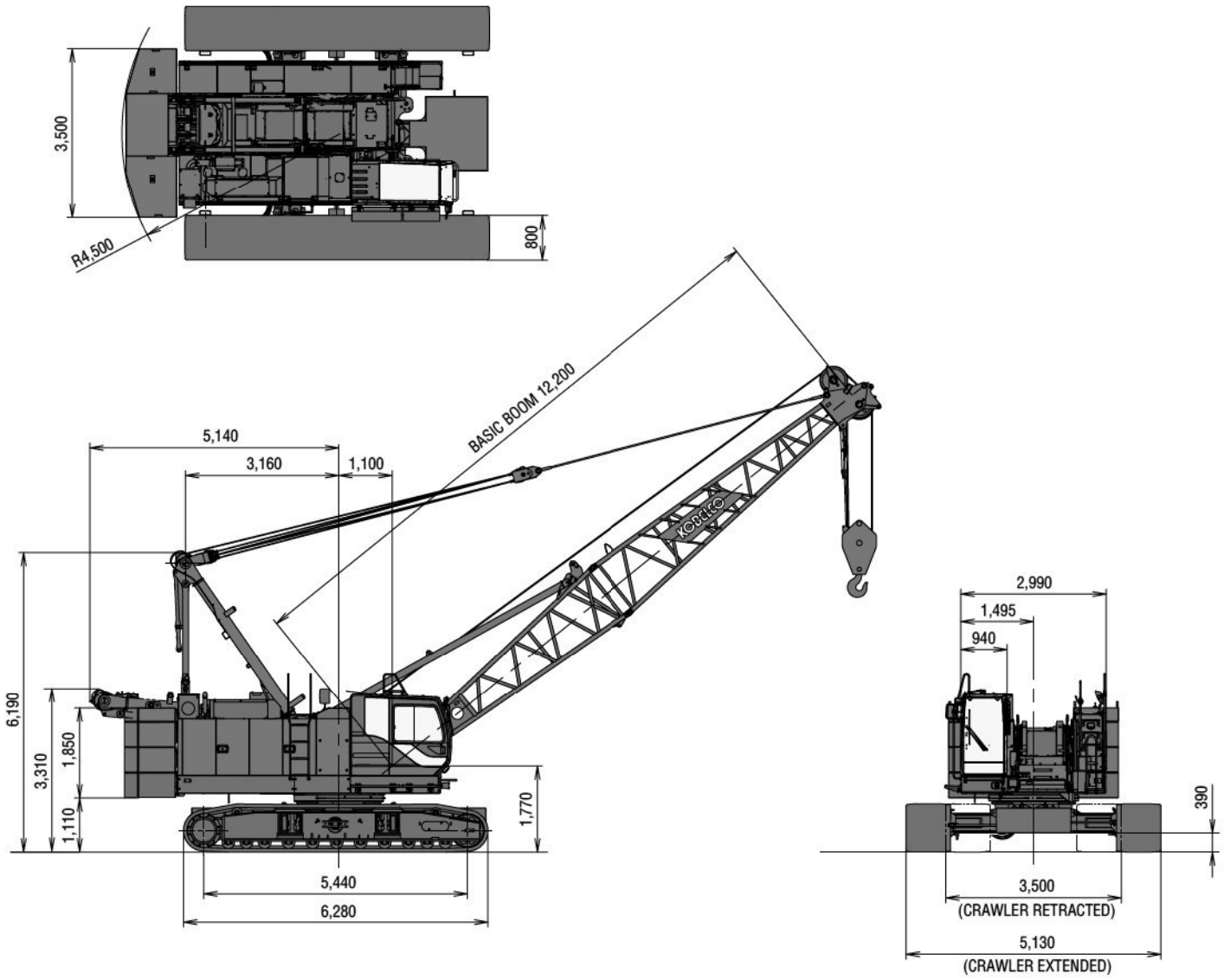
*2 Base machine with boom base, gantry, crawlers, and wire ropes (front/boom hoist)

*3 Auxiliary sheave is must.

* The value are theorical result.

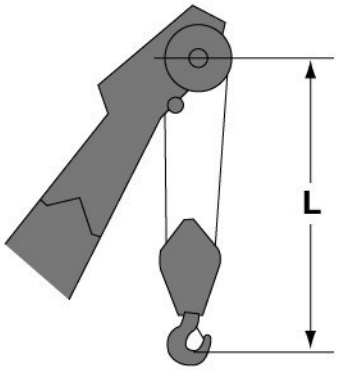
GENERAL DIMENSIONS

(Unit: mm)

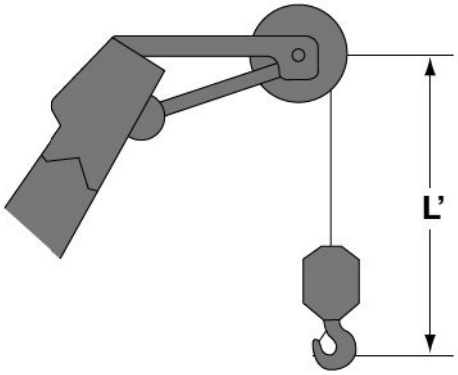


This catalog may contain photographs of machines with specifications, attachments and optional equipment.

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.

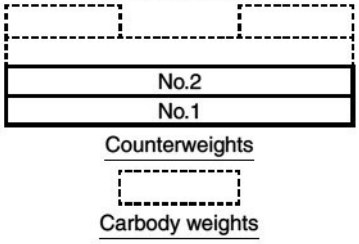
(Crane boom lifting)

- 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

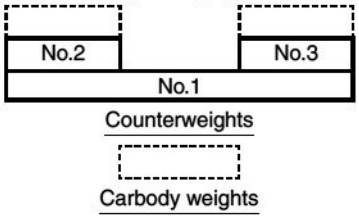
Assembling the counterweight

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

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.

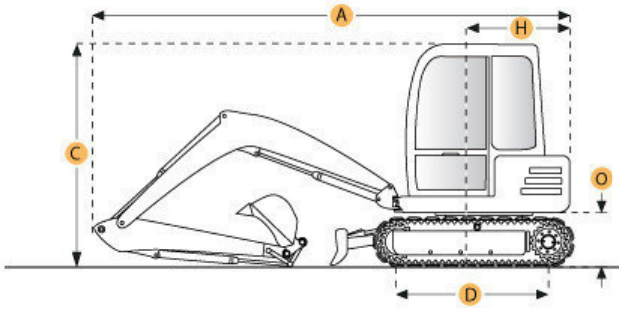
Ground pressure

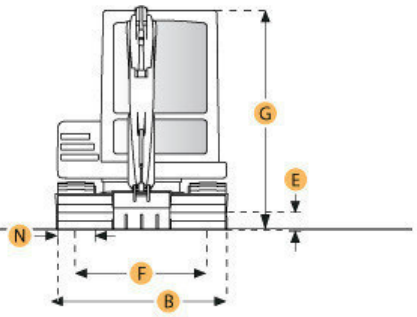
Approximately 88.8 kPa (12.9 psi) with basic boom and no load.

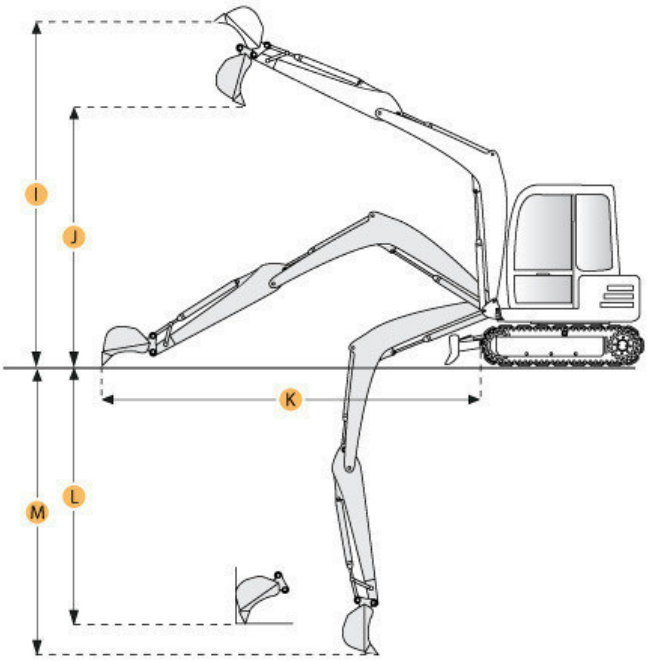
Gradeability

With basic boom: 40%.

SUMITOMO SH75U MIDI EXCAVATOR







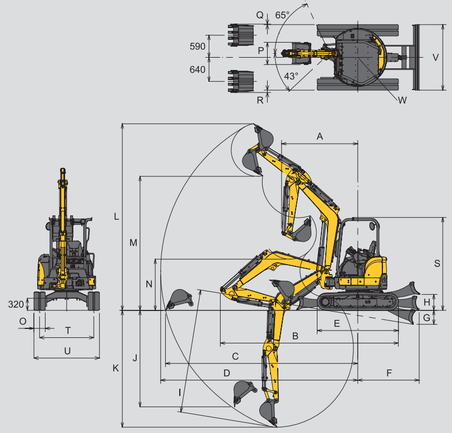
Selected Dimensions

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)							

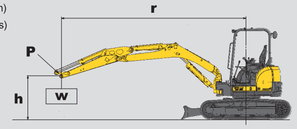
Hydraulic PTO

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

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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

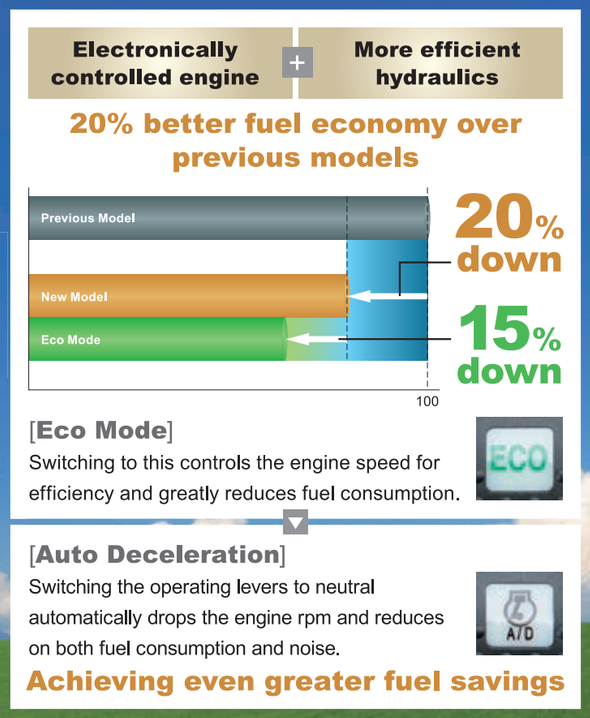
Allowing reduced emissions and stubborn strength

[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.



[Eco Mode]

Switching to this controls the engine speed for efficiency and greatly reduces fuel consumption.

[Auto Deceleration]

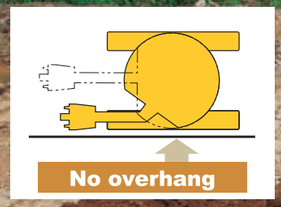
Switching the operating levers to neutral automatically drops the engine rpm and reduces on both fuel consumption and noise.

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.



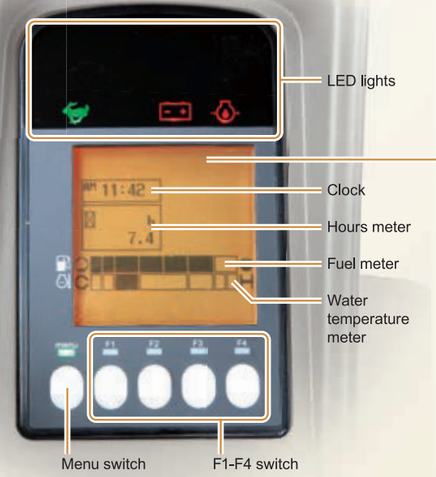
UNIVERSAL DESIGN

A wider range of people can operate the machinery easily and enjoyably

Easily check all sorts of important information even at night

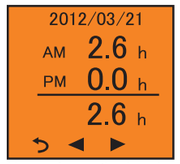
[Back light large-screen LCD monitor]

Important information such as operating status and problems are shown using lights and buzzers on and an easy-to-read monitor.



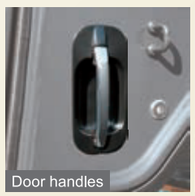
LCD monitor display examples

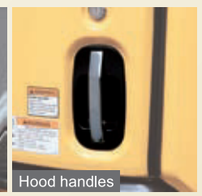
Hours of operation over a month



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]

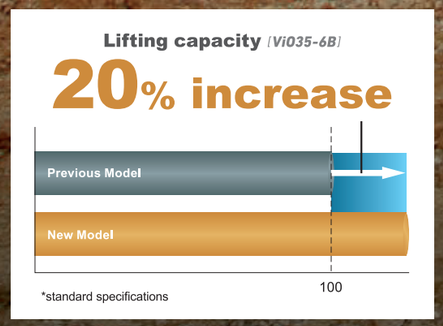
1740mm (ViO35-6B) (5'9")

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]

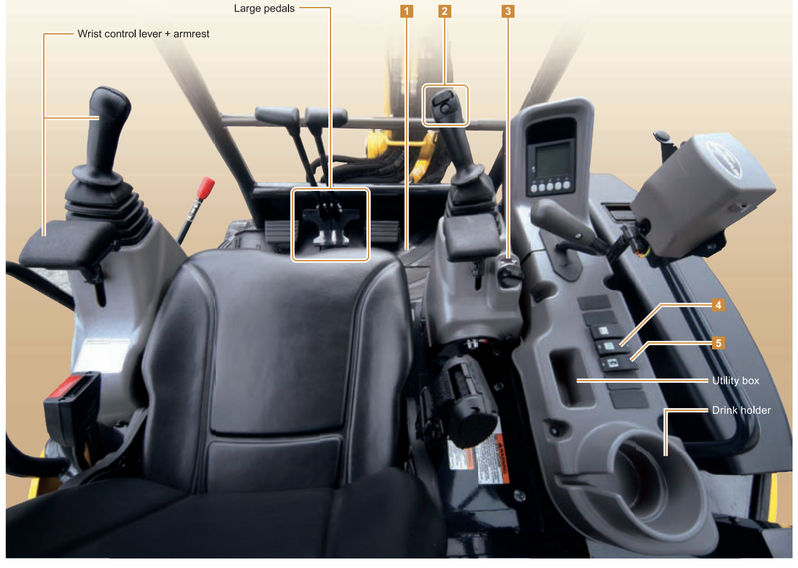
Guarded from damage [Boom-mounted light]

[Engine stop switch]

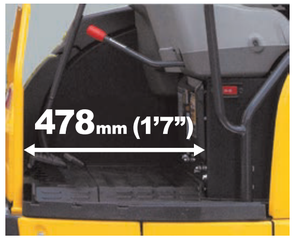
A Pleasant Operating Environment

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]

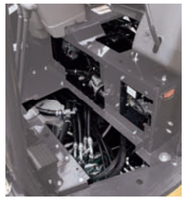
5 [Auto Deceleration switch]

[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]

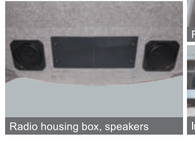
8 [Right upper opens without tools]

9 [Toolbox]

10 [Fuel tank drain cock]

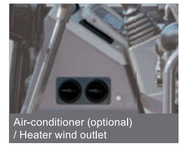
Options

CABIN SPEC



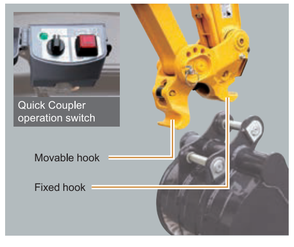
[Air-conditioner condenser]

The air-conditioner condenser is built into the cabin rear. Hood open without tools.



Quick Coupler

Simple and easy replacement of attachments



Bucket Removal

Bucket Attachment

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.

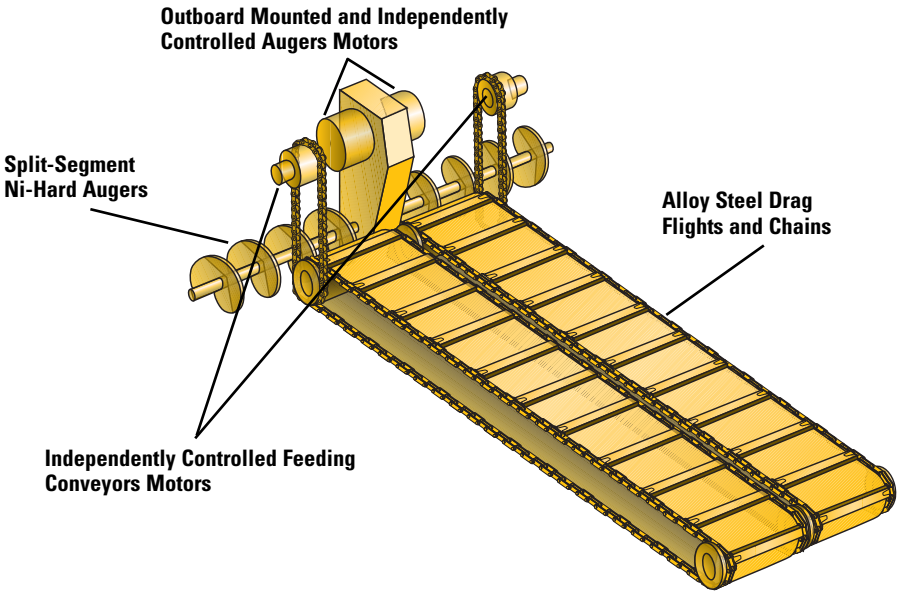
Industrial, Single-Phase A.C. Generator. The optional onboard generator provides simultaneous power to the electric screed heating elements, auxiliary lights and job site tools. The generator provides 12 kW output to power screed heating, 220 V for night lighting system and 1.5 kW electric utility power 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.

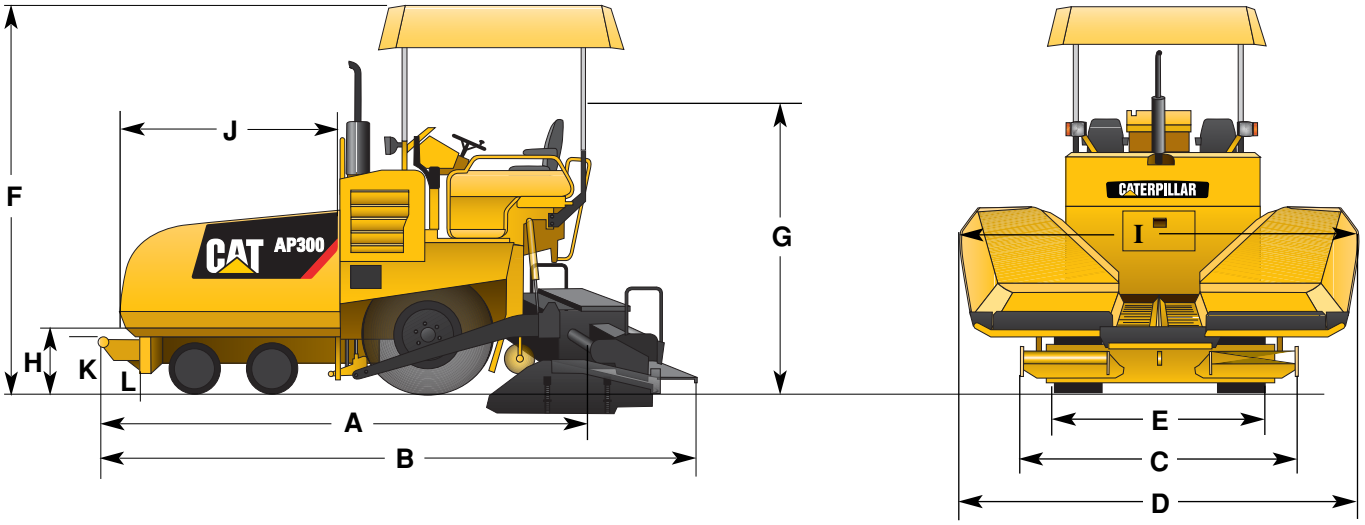
Electrical System

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

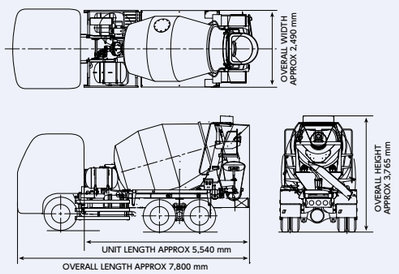
Materials and specifications are subject to change without notice. Featured machines in photos may include additional equipment. See your Caterpillar dealer for available options.

HEHG3660 (01/2008) hr

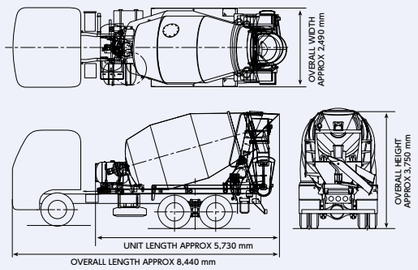
CATERPILLAR®

■ Outside Dimensions (Reference)

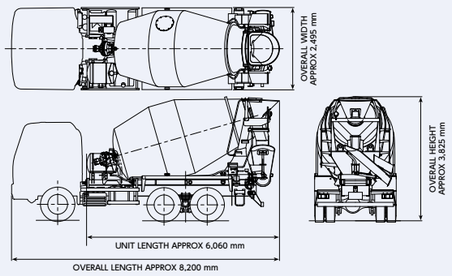
EA089-30[6m³]



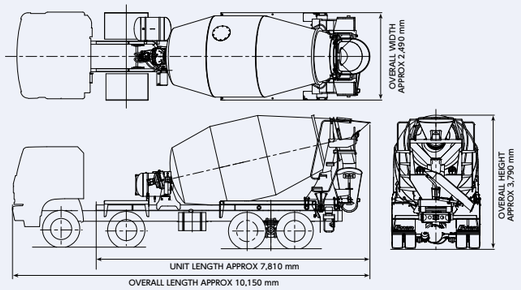
EA106-30[7m³]



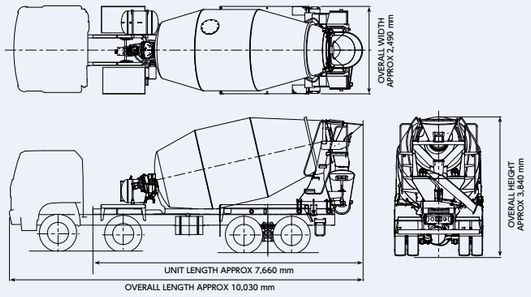
EA122-30[8m³]



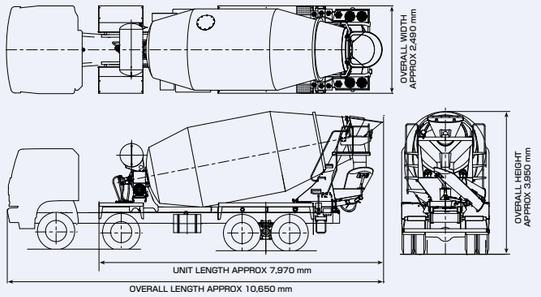
EA148-30[9m³]



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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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

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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

Focusing on the Future.

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.

Note: Caution plates affixed to the machine vary depending on countries.

Zaxis: Z-axis means the third coordinate — the continuation of the Z, X and Y axes. This dimension is not limited to flat surfaces; it is the power of creativity that extends into space. Hitachi chose the name Zaxis because in encompasses the concepts for the machine of today that stands ready for the challenges of tomorrow.

ZAXIS

Smarter & Faster.

ZAXIS uses advanced technology to reduce costs while working faster.

Powerful yet Efficient Engine

The large powerfull engine provides an excellent balance of power and fuel efficiency.

Direct-Feel Control From a Refined Hydraulic System

It almost seems as if the wishes of the operator become excavating operations. The refined hydraulic system gives the operator excellent control.

Power to Master Tough Excavating Jobs

The powerful engine and hydraulic system work together to focus maximum excavating force on the job. Zaxis dominates tough work sites.

Dependable Travel and Swing Torque

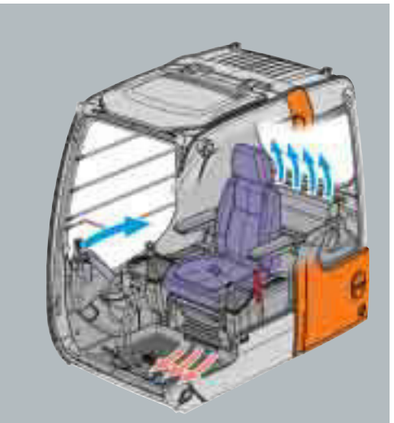
Plenty of dependable power for travel and swing operations makes the Zaxis ready for rough terrain. Compared to the previous model, the Zaxis offers 4% more travel power and 5% more swing torque.

Auto Accelerator Control Cuts Fuel Consumption

Automatic adjustment of engine speed to the amount of lever operation helps reduce unnecessary engine operation. Reducing engine operation for light loads contributes to lower fuel consumption.

All Excavating Operations in a Single Mode

Simply select the "Digging" mode for smooth and speedy control of front operations. No need to select from among multiple modes.



Easy-to-Monitor Instruments

Strategically positioned instruments allow the operator to monitor the status of key areas with just a glance.

Easy-to-Reach Switches

Switches and other essential controls are located near the operator. This helps keep operator movement to a minimum, enhancing control and helping to fight fatigue.

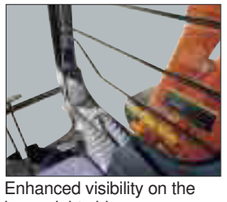
Auto Control Air Conditioner (Option)

Simply set the temperature and forget about it. Ducts are positioned to promote even air flow throughout the cab.

Z A X I S

Minimum Effort. Maximum Efficiency.

Operator's compartment is designed for both comfort and operating efficiency.

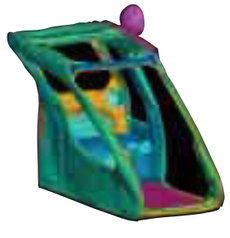


Enhanced visibility on the lower right side.

Drink holder

- Storage box
- Easy-lock front window latch
- Wide and comfortable arm rests

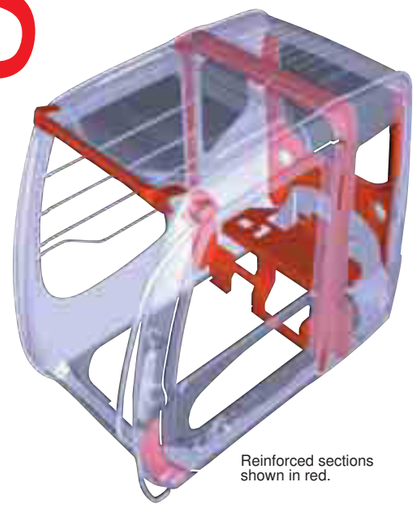
Simulated crash deformation test



Z A X I S

Protect & Serve.

A design that both guards the operator and contributes to efficient operation.



Reinforced sections shown in red.

CRES (Center pillar Reinforced Structure)

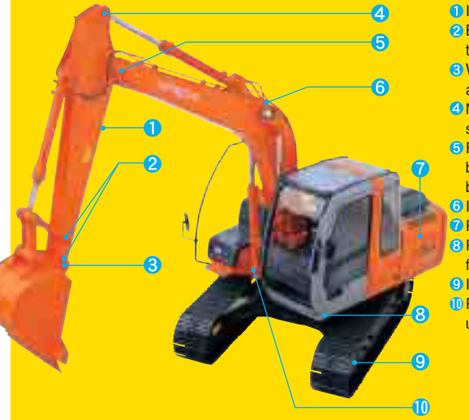
** The CRES cab meets OPG top guard level 1 (ISO).*

The cab is designed to help with "just in case" protection for the operator. The rigid cab design can help prevent injury to the operator during an accident.

ZAXIS

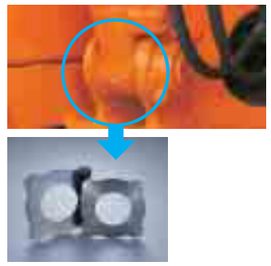
Functional & Durable.

Extensive steps have been taken to support basic performance and overall durability.



1. Increased arm plate thickness.
2. Bucket joint pins lubricated through bosses.
3. WC thermal spraying for arm and bucket joint sections.
4. New HN bushing used for front sections.
5. Flanged pin is used for the boom/arm joint sections and the boom foot section.
6. Increased boom plate thickness.
7. Reinforcing rib for door covers.
8. Reinforced upperstructure main frame.
9. Improved idler bracket shape.
10. Reinforced resin thrust plates used for front sections.

New HN Bushing



Reinforced Resin Thrust Plates

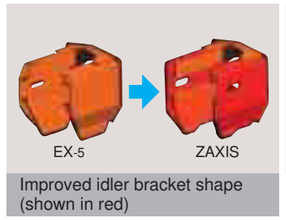
Designed to reduce noise and resist wear.

WC Thermal Spraying (Tungsten Carbide)

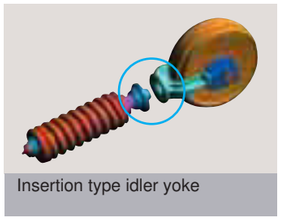
Used at arm end and bucket connection to increase wear resistance and reduce jerking.

Strengthened Swing Circle

Provides support for strong excavating power.



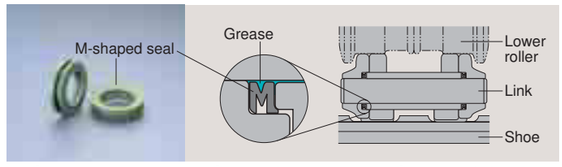
Improved idler bracket shape (shown in red)



Insertion type idler yoke

Rigid Undercarriage

Strong undercarriage section for increased durability. Designed for tough work sites.



M-Shaped Track Link Seals Provide High Grease Retention

ZAXIS

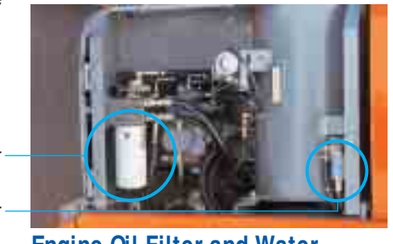
Smart Savings.

Advanced technology help reduce maintenance cost by 30%.

Comparative information based on current Japan domestic model.

Front and Bucket Components Only Need Lubrication Every 500 Hours

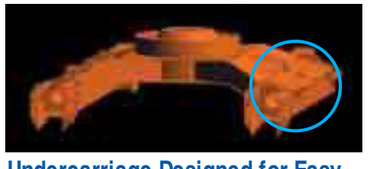
The improved HN grooved bushings and reinforced resin thrust plates help reduce maintenance time and expense. *(See the Operators Manual)*



Engine Oil Filter and Water Separator Positioned for Easy Checking from Ground

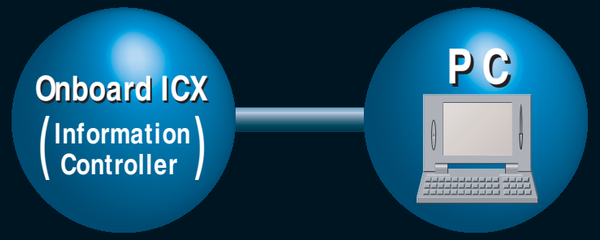
Hydraulic Oil Filter Only Needs Replacement Every 1000 Hours

The hydraulic oil filter can be used nearly twice as long as the previous model dramatically reducing maintenance time and expense.



Undercarriage Designed for Easy Mud Removal

Equipment Operation Status Report

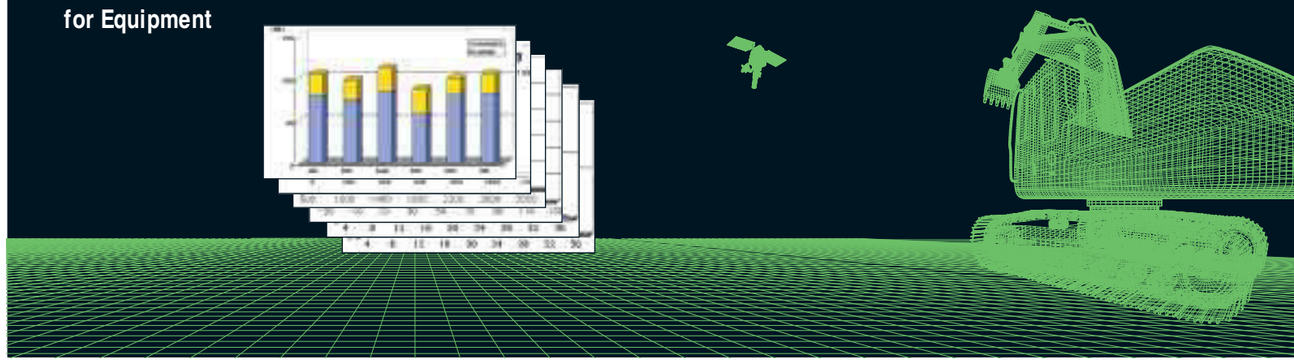


ZAXIS

Information Technology Support.

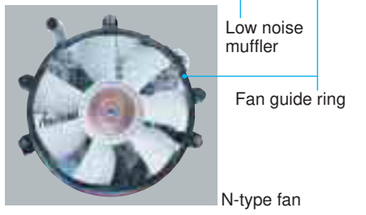
Providing the data for making the right decisions.

Information Services for Equipment



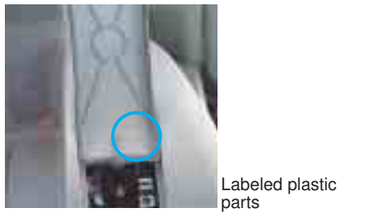
Low Noise Operation

A low-noise muffler and other such steps have been taken to reduce the amount of noise released from the engine compartment.



Emissions Control Engine

Conforms to U.S. EPA Tier 2 and EU Stage Ⅱ emission regulations.



Labeled Plastic Parts

The type of plastic used in various parts is imprinted on them to facilitate easy recycling.

Lead-Free Wiring and Aluminium Radiator and Oil Cooler

Helps keep harmful materials from the environment.

ZAXIS

Environmentally Friendly Design.

Helping ensure a cleaner tomorrow.

ZAXIS 110M

Muddy Terrain Version M-Series (ZAXIS110M)

- Wide track gauge.
- 700 mm (28") shoe and long crawler.
- Provides both low ground contact pressure and high stability.
- Excellent travel and operation on soft and uneven ground.

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 × 125 mm (4.13" × 4.92")
Batteries ..... 2 × 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 × 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

	Qty.	Bore	Rod diameter
Boom	2	95 mm (3.74")	70 mm (2.76")
Arm	1	105 mm (4.13")	75 mm (2.95")
Bucket	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

Shoe type	Shoe width	Standard undercarriage	
		Operating weight	Ground pressure
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

Shoe type	Shoe width	Marsh type undercarriage	
		Operating weight	Ground pressure
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

Capacity		Width		No. of teeth	Weight	Recommendation					
						ZAXIS110			ZAXIS110M		
SAE, PCSA heaped	CECE heaped	Without side cutters	With side cutters			1.96 m (6'5") arm	2.26 m (7'5") arm	2.81 m (9'3") arm	1.96 m (6'5") arm	2.26 m (7'5") arm	2.81 m (9'3") arm
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

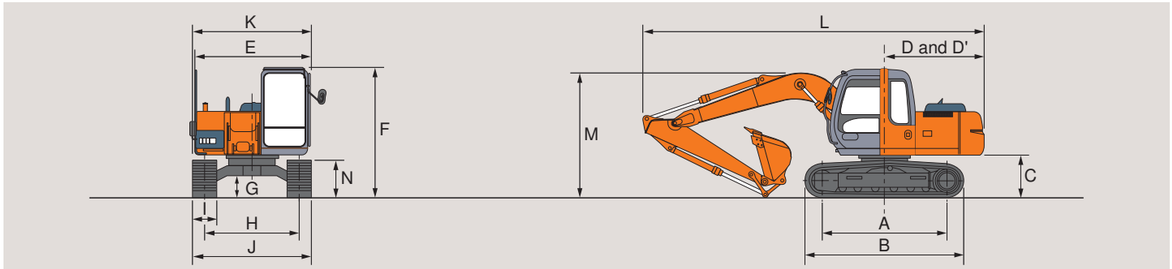
SERVICE REFILL CAPACITIES

		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

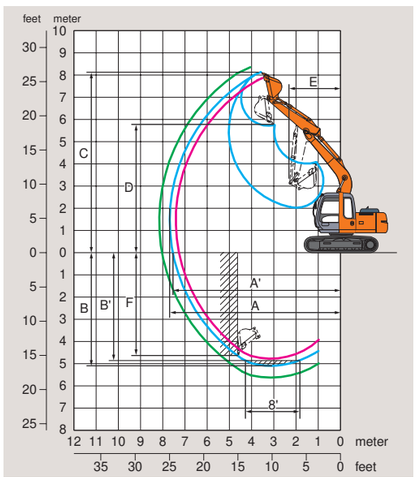


Unit: mm (ft in)

		ZAXIS110				ZAXIS110M		
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

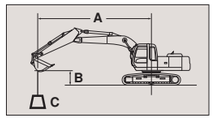
WORKING RANGES



Unit: mm (ft in)

Arm length		ZAXIS110			ZAXIS110M		
		1.96 m (6'5")	2.26 m (7'5")	2.81 m (9'3")*	1.96 m (6'5")	2.26 m (7'5")	2.81 m (9'3")*
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

Load point height	2 m		3 m		4 m		5 m		6 m		7 m		At max. reach		
															meter
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

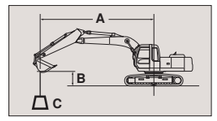
Boom 4.27 m
Arm 2.26 m
Bucket
SAE, PCSA : 0.45 m³
CECE : 0.40 m³
Shoe 500 mm

Load point height	2 m		3 m		4 m		5 m		6 m		7 m		At max. reach		
															meter
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

Load point height	2 m		3 m		4 m		5 m		6 m		7 m		At max. reach		
															meter
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

Load point height	2 m		3 m		4 m		5 m		6 m		7 m		At max. reach		
															meter
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

Load point height	2 m		3 m		4 m		5 m		6 m		7 m		At max. reach		
															meter
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

Load point height	2 m		3 m		4 m		5 m		6 m		7 m		At max. reach		
															meter
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

Comparative information based on current Japan domestic model.
These specifications are subject to change without notice.
Illustrations and photos show the standard models, and may or may not include optional equipment, accessories, and all standard equipment with some differences in color and features.
Before use, read and understand Operator's Manual for proper operation.

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KS-E342Q 05.09 (SA/HP, GT_3)

Printed in Japan

Band Drain Machine is modified by the excavator

APPENDIX T
CULTURAL HERITAGE MONITORING RESULTS

Appendix T – Cultural Heritage Monitoring Results

Date	Time	Tilting	Settlement (mm)		Vibration (mm/s)					
		Angle (deg) between THT-BSP-1 & THT-BSP-2	Angle (deg) between THT-BSP-1 & THT-BSP-3	Angle (deg) between THT-BSP-2 & THT-BSP-3	THT-BSP-1	THT-BSP-2	THT-BSP-3	Measurement Direction		
								Tran	Vertical	Longitudinal
1-Sep-18	16:58	1 : 13792	1 : 14018	0	+1	+0	+0	0.127	0.254	0.127
3-Sep-18	17:14	0	1 : 4673	1 : 5634	+1	+1	-2	0.127	0.254	0.127
4-Sep-18	16:56	Measurement missing			+0	Stop monitoring	Stop monitoring	0.127	0.254	0.254
5-Sep-18	17:08	Measurement missing			+2	Stop monitoring	Stop monitoring	0.254	0.254	0.127
6-Sep-18	17:11	Measurement missing			+1	Stop monitoring	Stop monitoring	0.127	0.254	0.127
7-Sep-18	17:24	1 : 3448	1 : 14018	-1 : 5634	+2	-2	+1	0.127	0.254	0.254
8-Sep-18	16:53	1 : 13792	1 : 7009	1 : 16901	+0	-1	-2	0.127	0.254	0.127
10-Sep-18	17:04	-1 : 13792	1 : 14018	1 : 8451	-1	+0	-2	0.127	0.254	0.254
11-Sep-18	17:21	1 : 6896	1 : 7009	0	+2	+0	+0	0.254	0.254	0.127
12-Sep-18	17:33	-1 : 13792	0	1 : 16901	-1	+0	-1	0.254	0.254	0.127
13-Sep-18	17:21	1 : 4597	1 : 4673	0	+3	+0	+0	0.254	0.127	0.127
14-Sep-18	17:08	1 : 13792	1 : 4673	1 : 8451	+1	+0	-2	0.127	0.254	0.127
15-Sep-18	17:25	0	1 : 7009	1 : 8451	+0	+0	-2	0.127	0.127	0.127
17-Sep-18	17:25	Measurement missing	No data due to damaged THT-BSP-03 after typhoon		Measurement missing			0.254	0.254	0.254
18-Sep-18	17:07	Measurement missing			Measurement missing			0.254	0.254	0.127
19-Sep-18	17:09	1 : 4597			+3	+0	Damage	0.127	0.254	0.254
20-Sep-18	17:32	1 : 4597			+3	+0	Damage	0.127	0.254	0.127
21-Sep-18	17:24	1 : 13792			+2	+1	Damage	0.127	0.127	0.127
22-Sep-18	17:15	1 : 13792			+0	-1	Damage	0.127	0.127	0.127
24-Sep-18	11:05	1 : 4597			+3	+0	Damage	0.254	0.254	0.127
26-Sep-18	16:59	1 : 6896			+2	+0	Damage	0.127	0.127	0.127
27-Sep-18	16:49	1 : 13792			+1	+0	Damage	0.127	0.254	0.127
28-Sep-18	16:51	1 : 4597			+3	+0	Stop Monitoring	0.127	0.254	0.127
29-Sep-18	15:41	0			+0	+0	Stop Monitoring	0.127	0.127	0.127
Alert Level		1:2000			6			4.5		

Date	Time	Tilting	Settlement (mm)		Vibration (mm/s)					
		Angle (deg) between THT-BSP-1 & THT-BSP-2	Angle (deg) between THT-BSP-1 & THT-BSP-3	Angle (deg) between THT-BSP-2 & THT-BSP-3	THT-BSP-1	THT-BSP-2	THT-BSP-3	Measurement Direction		
								Tran	Vertical	Longitudinal
Alarm Level		1:1500			8			4.8		
Action Level		1:1000			10			5		

Note: ***Bold*** means Alert Level exceedance ***Bold Italic*** means Alarm Level exceedance ***Bold Italic with underline*** means Action Level exceedance

APPENDIX U
PIEZOMETER MONITORING RESULTS

Appendix U – Construction Phase Daily Piezometer Monitoring Results

Date	Daily Piezometer Monitoring	
	38568-LDH1	**TKO-LBH907**
1-Sep-18	+87.65	
3-Sep-18	+87.65	
4-Sep-18	+87.65	
5-Sep-18	+87.65	
6-Sep-18	+87.65	
7-Sep-18	+87.65	
8-Sep-18	+87.65	
10-Sep-18	+87.65	
11-Sep-18	+87.65	
12-Sep-18	+87.65	
13-Sep-18	+87.65	
14-Sep-18	+87.65	
15-Sep-18	+87.65	
17-Sep-18	Obstructed	
18-Sep-18	+87.65	
19-Sep-18	+87.65	
20-Sep-18	+87.65	
21-Sep-18	+87.65	
22-Sep-18	+87.65	
24-Sep-18	+87.65	
26-Sep-18	+87.65	
27-Sep-18	+87.65	
28-Sep-18	+87.65	
29-Sep-18	+87.65	
30-Sep-18	+87.65	
Action Level(mpD)	+74.65	+17.59

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